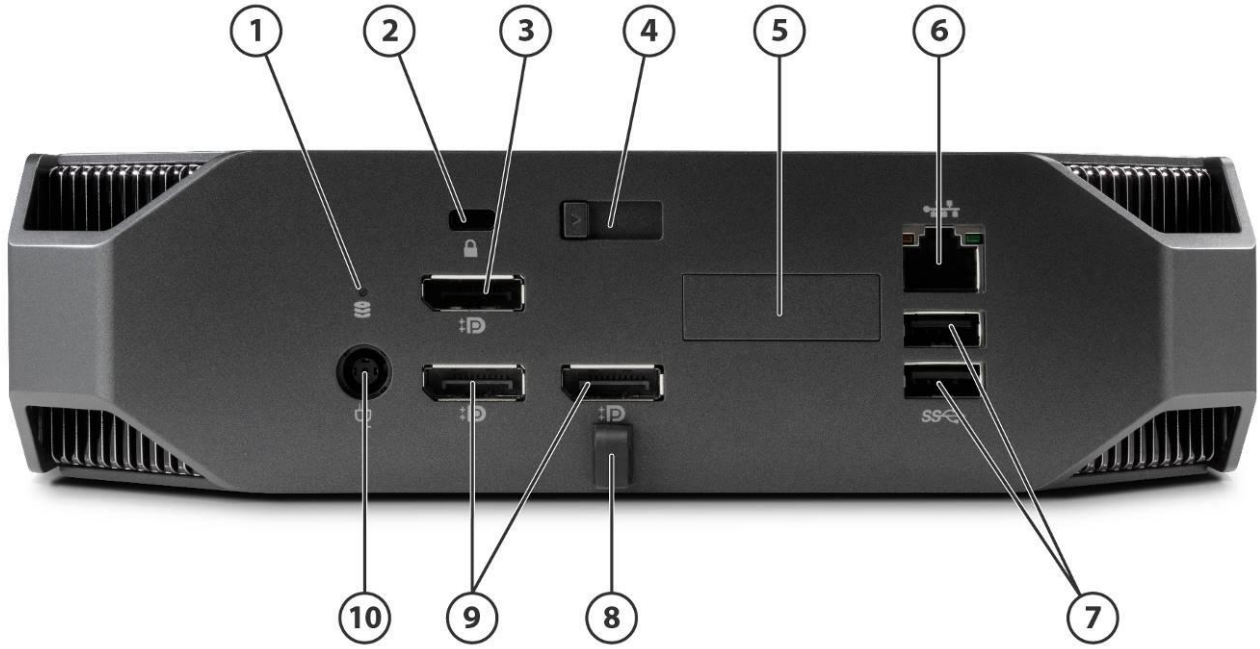
Overview

HP Z2 Mini Workstation

Front View

1. Power Button
2. Headset
3. USB 3.0 charging data port
4. USB 3.0 data port

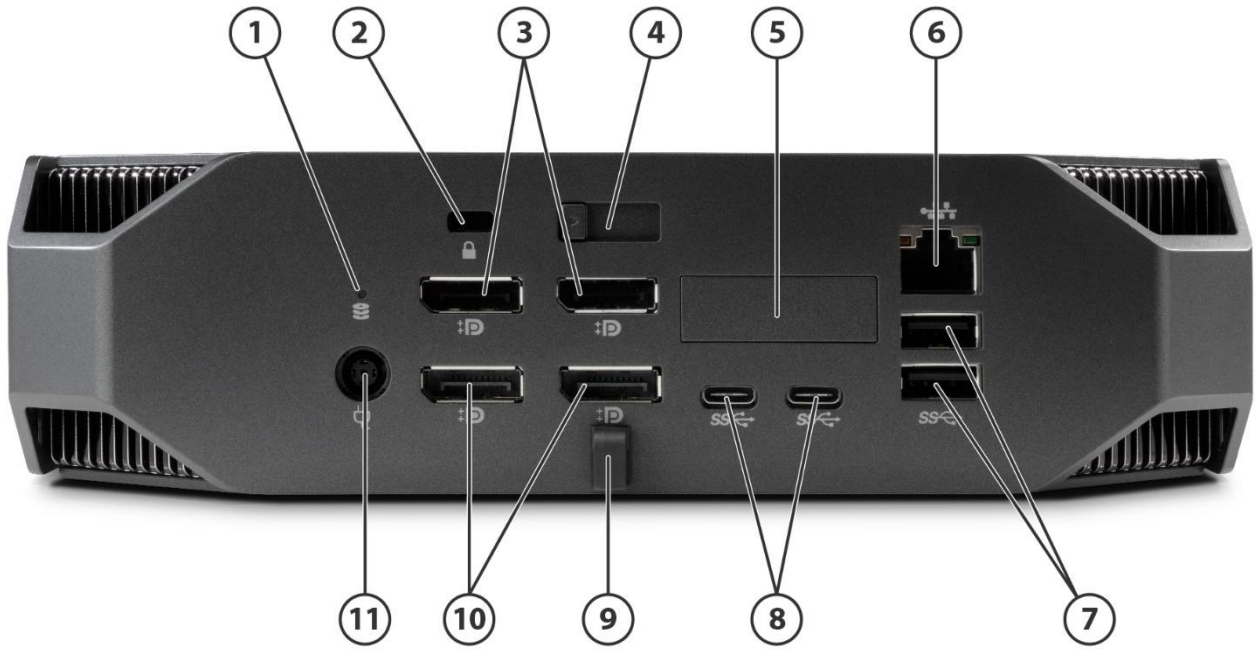
Overview



HP Z2 Mini Entry, back view

1. HDD LED
2. Security slot
3. (1) DisplayPort™
4. Cover latch
5. Serial port (optional)
6. RJ-45 (Ethernet)
7. (2) USB 3.0 ports
8. DC cable clip
9. (2) DisplayPort™
10. DC In

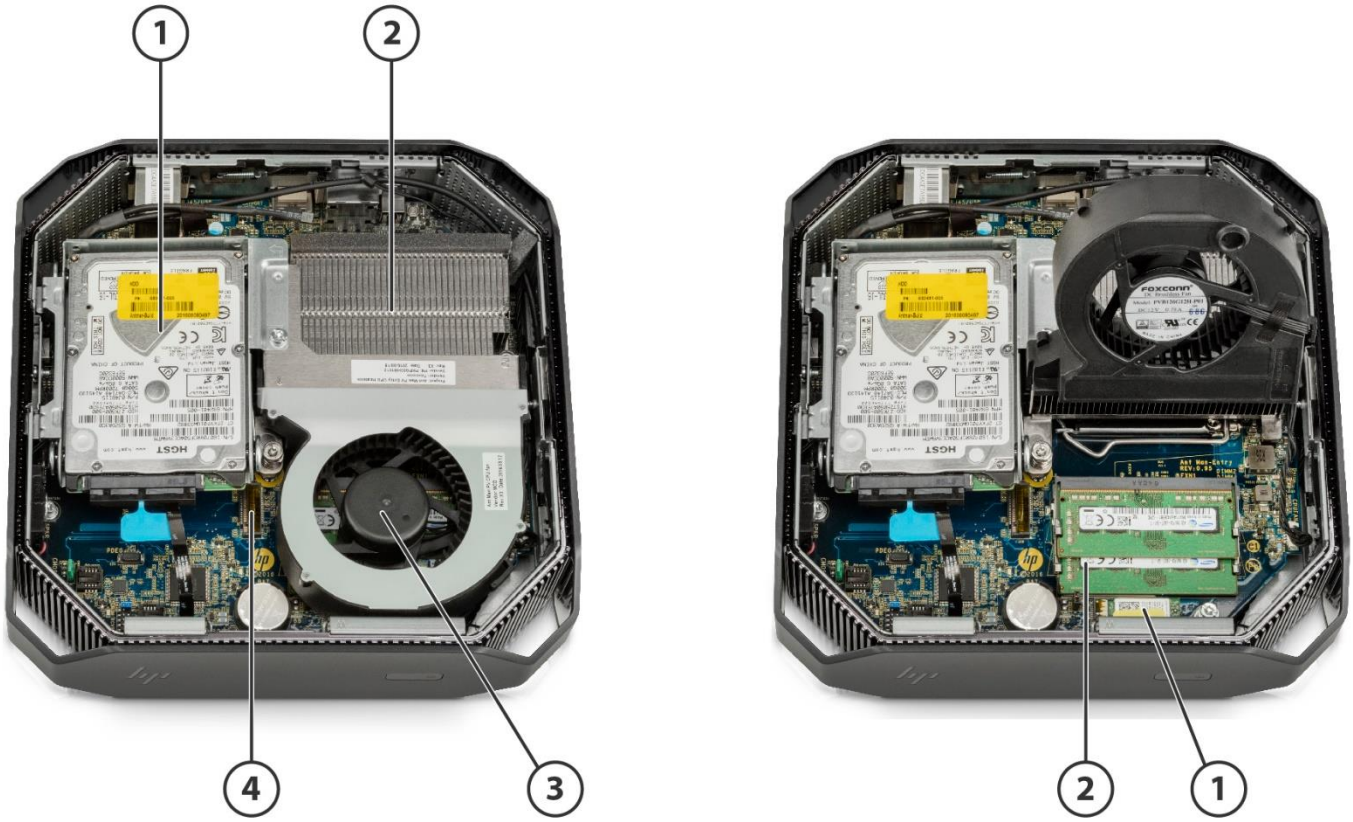
Overview



HP Z2 Mini Performance, back view

1. HDD LED
2. Security slot
3. (2) DisplayPort™
4. Cover latch
5. Serial port (optional)
6. RJ-45 (Ethernet)
7. (2) USB 3.0 ports
8. (2) USB Type C™
9. DC cable clip
10. (2) DisplayPort™
11. DC In

Overview



HP Z2 Mini Entry, Internal View

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

1. M.2 30mm WLAN/BT
2. (2) SODIMM memory slots

Overview

HP Z2 Mini Performance, Internal View

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

1. GPU heatsink (underneath HDD/SSD cage)
2. M.2 30mm WLAN/BT
3. (2) SODIMM memory slots
4. GPU blower

Overview

HP Z2 Mini, bottom view

Removable bottom feet for access to integrated VESA mounting holes

Overview

Form Factor	Mini Form Factor
Operating Systems	Preinstalled: • Windows 10 Pro 64[1] • Windows 10 Pro License MSNA[1] • Windows 7 Professional 64 (available through downgrade rights from Windows 10 Pro)[2] • HP Linux® -ready • Red Hat® Enterprise Linux Workstation (1 year paper license available; Preinstall not available) Supported: • Red Hat® Enterprise Linux Desktop 6.7, 7.2 • SUSE Linux® Enterprise Desktop 11 SP4, 12 SP1 **Notes:** For detailed OS/hardware support information for Linux, see: http://www.hp.com/support/linux_hardware_matrix 1. Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com 2. This system is preinstalled with Windows 7 Professional software and also comes with a license and media for Windows 10 Pro software. You may only use one version of the Windows software at a time. Switching between versions will require you to uninstall one version and install the other version. You must back up all data (files, photos, etc.) before uninstalling and installing operating systems to avoid loss of your data.

Overview

Processors*

Name	Cores	Clock Speed (GHz)	Intel® Turbo Boost Technology[1]	Cache (MB)	Memory Speed (MT/s)	Hyper-Threading	Integrated Graphics	Featuring Intel® vPro™ Technology	TDP (W)
Z2 Mini G3 Performance base unit									
Intel® Xeon® processor E3-1245v6	4	3.7	4.1	8	2400	Y	Intel® HD Graphics P630	Y	80W
Intel® Xeon® processor E3-1225v6	4	3.3	3.7	8	2400	N	Intel® HD Graphics P630	Y	80W
Intel® Xeon® processor E3-1205v6	4	3.0	N/A	8	2400	N	Intel® HD Graphics P630	Y	65W
Intel® Xeon® processor E3-1245v5	4	3.5	3.9	8	2133	Y	Intel® HD Graphics P530	Y	80W
Intel® Xeon® processor E3-1225v5	4	3.3	3.7	8	2133	N	Intel® HD Graphics P530	Y	80W
Intel® Core™ i7-7700 processor	4	3.6	4.2	8	2400	Y	Intel® HD Graphics 630	Y	65W
Intel® Core™ i5-7500 processor	4	3.4	3.8	6	2400	N	Intel® HD Graphics 630	Y	65W
Intel® Core™ i3-7100 processor	2	3.9	N/A	3	2400	N	Intel® HD Graphics 630	N	51W
Intel® Core™ i7-6700 processor	4	3.4	4.0	8	2133	Y	Intel® HD Graphics 530	Y	65W
Intel® Core™ i5-6500 processor	4	3.2	3.6	6	2133	N	Intel® HD Graphics 530	Y	65W
Intel® Core™ i3-6100 processor	2	3.7	N/A	3	2133	N	Intel® HD Graphics 530	N	51W
Z2 Mini G3 Entry base unit									
Intel® Xeon® processor E3-1205v6	4	3.0	N/A	8	2400	N	Intel® HD Graphics P630	Y	65W
Intel® Core™ i7-7700 processor	4	3.6	4.2	8	2400	Y	Intel® HD Graphics 630	Y	65W
Intel® Core™ i5-7500 processor	4	3.4	3.8	6	2400	N	Intel® HD Graphics 630	Y	65W
Intel® Core™ i3-7100 processor	2	3.9	N/A	3	2400	N	Intel® HD Graphics 630	N	51W
Intel® Core™ i7-6700 processor	4	3.4	4.0	8	2133	Y	Intel® HD Graphics 530	Y	65W
Intel® Core™ i5-6500 processor	4	3.2	3.6	6	2133	N	Intel® HD Graphics 530	Y	65W
Intel® Core™ i3-6100 processor	2	3.7	N/A	3	2133	N	Intel® HD Graphics 530	N	51W

[1]The specifications shown in this 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.

Overview

NOTES:
Integrated Intel® HD graphics P530 is supported on all Intel® Xeon® E3 processors.
Intel® Xeon® E3, Intel® Core™ i3 can support either ECC or non-ECC memory; Intel® Core™ i5/i7 processors only support non-ECC memory.

* 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 is not a measurement of higher performance.

Color	Space grey with black chrome accents
Convertibility	The Z2 Mini G3 can either be placed flat on the desktop or mounted behind a display* or under a desk. * Additional HP Hardware is needed for the VESA Mount for the display.
Expansion Slots (see system board section for more details)	1 80mm M.2 slot (PCIe Gen3 x4) 1 30mm M.2 slot (PCIe Gen3 x1)* * For WLAN/BT M.2 module only
Expansion Bays (see system board section for more details)	1 internal 2.5" bay (for For SATA HDDs & SSDs only only)
Front I/O	Power button
Slide I/O	1 USB 3.0 Charging Data Port, 1 USB 3.0 data port, combo headset/microphone port
Rear I/O	**Z2 Mini Entry:** 3 DisplayPort™ (DP 1.2) outputs from Intel® HD graphics, 2 USB 3.0 ports, 1 serial port (optional), RJ-45 (LoM) **Z2 Mini Performance[1]:** 4 DisplayPort™ (DP 1.2) outputs from NVIDIA® Quadro® M620 graphics, 2 USB 3.0 ports, 2 USB 3.1 G1 Type-C™ ports, 1 serial port (optional),RJ-45 (LoM) **NOTE 1:** Capable of supporting 6 displays. 6 display solution is achieved using a combination of Intel® HD graphics and NVIDIA Quadro® graphics 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: 2.04 kg (4.50 lb) Typical Weight*: 2.08 kg (4.59 lb) Maximum Weight: 2.11 kg (4.65 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
Temperature	Operating: 40° to 95°F (5° to 35°C) Non-operating: -40° to 140°F (-40° to 60°C) **Notes:** Derate the maximum operating temperature by one degree C (1.8 degrees F) for every 305m (1,000 ft) altitude over 1,524m (5,000 ft).
Humidity	Operating: 8% to 85%

Overview

	Non-operating: 8% to 90%
Maximum Altitude (non-pressurized)	Operating: 3,000 m (10,000 ft) Non-operating: 9,100 m (30,000 ft).
Power Supply	Z2 Mini G3 Entry: 135W 88% Efficiency at 115Vac Z2 Mini G3 Performance: 200W 89% Efficiency at 230Vac **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
Chipset	Intel® C236 chipset
Memory	2 SODIMM slots, supporting up to 32GB ECC/non-ECC, DDR4 2133 MT/s

The CPUs determine the speed at which the memory is clocked. If a 2133 MT/s capable CPU is used in the system, the maximum speed the memory will run at is 2133 MT/s regardless of the specified speed of the memory.
Note: Transfer rates up to 2133 MT/s

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

Supported Components

Processors		Factory Configured	Option Kit
	Intel® Xeon® processor E3-1200 v5 family		
	Inte® Xeon® E3-1205v6 3.0 8M GT2 4C CPU	Y	N
	Intel® Xeon® E3-1225v6 3.3 8M GT2 4C CPU	Y	N
	Intel® Xeon® E3-1245v6 3.7 8M GT2 4C CPU	Y	N
	Intel® Xeon® E3-1225 v5 3.3 2133 4C CPU[1]	Y	N
	Intel® Xeon® E3-1245 v5 3.5 2133 4C CPU[1]	Y	N
	7th generation Intel® Core™ processor family		
	Intel® Core™ i5-7500 3.4 6M 4C CPU	Y	N
	Intel® Core™ i7-7700 3.6 8M 4C CPU	Y	N
	Intel® Core™ i3-7100 3.9 3M 2C CPU	Y	N
	6th generation Intel® Core™ processor family		
	Intel® Core™ i7-6700 3.4 2133 4C CPU[3]	Y	N
	Intel® Core i5-6500 3.2 2133 4C CPU[3]	Y	N
	6th generation Intel® Core™ i3/Pentium processor family		
	Intel® Core™ i3-6100 3.7 2133 2C CPU[2]	Y	N

NOTE 1: Only supported on Z2 Mini Performance Base Unit
NOTE 2: These processor support either ECC or non-ECC memory
NOTE 3: These processors support only non-ECC memory
NOTE: Intel® Integrated Graphics P530 for Xeon® processors supports workstation-specific graphics drivers for improved compatibility and performance on select professional applications, compared to Intel® HD Graphics 530.

Monitors / Displays	Factory Configured	Option Kit	Option Kit Part Number
HP DreamColor Z24x Professional Display			
HP DreamColor Z27x Professional Display			
HP Z22n Narrow Bezel IPS Display			
HP Z23n Narrow Bezel IPS Display			
HP Z24n Narrow Bezel IPS Display			
HP Z24nf Narrow Bezel IPS Display			
HP Z24nq Narrow Bezel IPS Display			
HP Z24s IPS UHD 4K Display			
HP Z25n Narrow Bezel IPS Display			
HP Z27n Narrow Bezel IPS Display			
HP Z27n Narrow Bezel IPS Display			
Supported by all Operating Systems available from HP			
Notes			
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
SATA Solid State Drives	HP 256GB SATA 6Gb/s SSD	Y	Y	A3D26AA

PCIe SSDs	PCIe SSDs for HP Workstations	Factory Configured	Option Kit	Option Kit Part Number
	HP Z Turbo Drive G2 256GB MLC (Z2 Mini)	Y	Y	Y7B58AA
	HP Z Turbo Drive G2 256GB TLC (Z2 Mini)	Y	Y	Y7B60AA
	HP Z Turbo Drive G2 512GB MLC (Z2 Mini)	Y	Y	Y7B58AA
	HP Z Turbo Drive G2 1TB MLC (Z2 Mini)	Y	Y	1MK25AA
	** Installed in native M.2 slot on Z2 Mini motherboard			

The HP Z Turbo Drive G2 (NVMe) is not supported with Windows 7 32-bit.

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® HD Graphics (Z2)**				
	Intel® HD Graphics P630	Y	N		1
	Intel® HD Graphics P530	Y	N		1
	Intel® HD Graphics 530	Y	N		1
	Intel® HD Graphics 630	Y	N		1
Discrete Graphics	NVIDIA® Quadro® M620 2GB Graphics[1]	Y	N		1
Graphics DisplayPort™ Cable Adapters	HP Short 34cm DisplayPort™ Cable Kit	N	Y	1FN83AA	
	HP DisplayPort™ To DVI-D Adapter	N	Y	FH973AA	
	HP DisplayPort™ To VGA Adapter	Y	Y	AS615AA	
	HP DisplayPort™ to Dual Link DVI Adapter	N	Y	NR078AA	

Notes

NOTE 1: Only offered on Z2 Mini Performance base unit

NOTE: Intermixing integrated Intel® HD graphics and discrete graphics cards in order 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 more displays are required to be supported. 6 display solution is achieved using a combination of Intel® HD graphics and NVIDIA Quadro® graphics is ONLY supported on Windows 10.

Supported Components

Memory

DDR4-2400 ECC Unbuffered SODIMMs - CTO

HP 8GB (1x8GB) DDR4-2400 ECC RAM

HP 16GB (2x8GB) DDR4-2400 ECC RAM

HP 32GB (2x16GB) DDR4-2400 ECC RAM

DDR4-2400 non-ECC Unbuffered SODIMMs - CTO

HP 4GB (1x4GB) DDR4-2400 nECC RAM

HP 8GB (2x4GB) DDR4-2400 nECC RAM

HP 8GB (1x8GB) DDR4-2400 nECC RAM

HP 16GB (2x8GB) DDR4-2400 nECC RAM

HP 32GB (2x16GB) DDR4-2400 nECC RAM

NOTES: Intel® Xeon® E3, 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 2133 MT/s capable CPU is used in the system, the maximum speed the memory will run at is 2133 MT/s regardless of the specified speed of the memory.

Transfer rates up to 2133 MT/s with Intel Skylake processors.

AMO	Option Kit Part Number
DDR4-2400 ECC Unbuffered DIMMs - AMO	
HP 8GB (1x8GB) DDR4-2400 ECC RAM	Y7B56AA
HP 16GB (1x16GB) DDR4-2400 ECC RAM	Y7B53AA
HP 4GB (1x4GB) DDR4-2400 non-ECC RAM	Y7B55AA
HP 8GB (1x8GB) DDR4-2400 non-ECC RAM	Y7B57AA
HP 16GB (1x16GB) DDR4-2400 non-ECC RAM	Y7B54AA

NOTE: Only unbuffered DDR4 DIMMs are supported.

NOTE: Factory-configured CTO (xxxxxAV) and aftermarket AMO (xxxxxAA, xxxxxAT) HP memory part numbers designated as “2133” or “2400” will be transitioned to using 2666MHz 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 “2133” or “2400” have been tested to work with 2666MHz memory and are fully-supported by HP under standard support terms.

Multimedia and Audio Devices	Factory Configured	Option Kit	Option Kit Part Number
Integrated Realtek HD ALC221-VB Audio	Y	N	

Supported Components

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.
With Blu-ray, certain disc, digital connection, compatibility and/or performance issues may arise, and do not constitute defects in the product. Flawless playback on all systems is not guaranteed. In order for some Blu-ray titles to play, they may require a DVI or HDMI digital connection and your display may require HDCP support. HD-DVD movies cannot be played on this workstation.

Networking and Communications	Factory Configured	Option Kit	Option Kit Part Number
Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro™ with Intel AMT 11.0)	Y	N	
Intel® 8265 Wireless LAN (802.11ac) and Bluetooth® 4.2 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

Input Devices	Factory Configured	Option Kit	Option Kit Part Number
HP USB 1000dpi Laser Mouse	Y	Y	QY778AA
HP USB Optical Mouse	Y	Y	QY777AA
HP USB CCID SmartCard Keyboard	Y	Y	BV813AA
HP USB Business Slim Keyboard	Y	Y	N3R87AA
HP Wireless Business Slim Keyboard	Y	Y	QY449AA
HP Wireless Premium Keyboard	Y	Y	Z9N41AA/AT

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

Supported Components

Z2 Mini Z Display VESA Mount Solution - Legacy Displays	N	Y	E5J35AA**

* Current: "n" displays. This mounting kit supports the following displays: Z22n/Z23n/Z24n/Z25n/Z27n, /Z24nf/Z24nq/Z24s/Z27q/Z32s/Z32x/HC240/HC270/E240c/E272.

** Legacy: "I" displays. This mounting kit supports the following displays: Z24i/Z27i/Z30i, /Z30i/Z24x/Z27x.

Software

	Factory Configured	Option Kit	Support Notes
Intel® Unite™	Y	N	
HP Performance Advisor	Y	N	See Note 1
HP Remote Graphics Software (RGS) 7.1	Y	N	
HP PC Hardware Diagnostics UEFI	Y	N	See Note 2
HP Client Security Software	Y	N	

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

Operating Systems

Windows 10 Pro 64
Windows 10 Pro License MSNA
Windows 7 Professional 64(available through downgrade rights from Windows 10 Pro 64)
Red Hat® Enterprise Linux® (RHEL) Workstation - Paper License (1yr)
See http://www.microsoft.com/windows/windows-7/for support details.
See http://www.redhat.com/rhel/desktop/

Remote Power On

Benefits of the Remote Power:

- Make it easier to power-on Antman 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 S5 (Shutdown).

Limitations:

- Support only at USB charging port which is the only port supplying USB power in S4/S5.
- Waking from S4/S5 is limited to only via keyboard/mouse device.

Instructions:

1. Connect USB keyboard/mouse to USB charging 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.)
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

Supported Components

System Technical Specifications

System Board

System Board Form Factor	Entry: 200mm x 200mm (7.9 x 7.9 inches) 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 C236	
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	2133MHz DDR4 for Skylake processors; pre-enabled for 2400 MHz DDR4	
Memory Protection	ECC available on data *Requires ECC DIMMs to be installed, as well as a CPU that supports ECC	
Maximum Memory	32GB	
Memory Configuration (Supported)	4GB, 8GB and 16GB non-ECC/ 8GB and 16GB 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® 7 Professional 64-Bit or Red Hat Linux 64-bit.	
Supported Drive Interfaces	**SATA**	Integrated (1) Serial ATA interfaces (6Gb/s SATA).
	Integrated Graphics	Intel® HD Graphics 530 (on Core™ i3/i5/i7-6xxx processors); Intel® HD Graphics P530 for Xeon® E3 processors based on Unified Memory Architecture (UMA). A region of system memory is reserved and dedicated to the graphics display. Support for Microsoft DirectX 12.1, OpenGL 4.4 and OpenCL 2.0 on Intel® HD Graphics P530. (3) DP 1.2 graphics ports integrated on motherboard; Supports up to three simultaneous displays across DP outputs. Max. resolution supported: 4096x2160 @60Hz
	Network Controller	Integrated Ethernet PHY Connection I219LM. Management capabilities: WOL, PXE 2.1 and AMT 11.0
	Serial	1 rear port (configurable option)
IEEE 1394 Connector(s)		

System Technical Specifications

USB Connector(s)	**Front**	Side I/O: 2 USB 3.0 Type-A
	Rear	2 USB 3.0 Type-A 2 USB 3.1 G1 Type-C™ (Z2 Mini Performance only)
HD Integrated Audio	Yes; supports CTIA headset	
Flash ROM	Yes	
Chassis Fan Header	Yes Additional CPU/GFX Cooler (Z2 Mini 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. 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 G3 Entry: 135W, 88% efficiency, wide-ranging, active PFC Power Supply Z2 Mini G3 Performance: 200W, 89% efficiency, wide-ranging, active PFC Power Supply The Z2 Mini PSU Efficiency Report can be found at this link: TBD	
Operating Voltage Range	115-230 VAC	
Rated Voltage Range	100–240 VAC	
Rated Line Frequency	50-60 Hz	
Operating Line Frequency Range	47–63 Hz	
Rated Input Current	Z2 Mini G3 Entry: 1.9A @ 90Vac Z2 Mini G3 Performance: 2.9A @ 90Vac	
Heat Dissipation	Typical: TBD btu/hr (TBD kcal/hr) Maximum: TBD btu/hr (TBD kcal/hr)	
ENERGY STAR® qualified (Config Dependent)	Yes	
FEMP Standby Power Compliant	Yes, with Wake-on-LAN disabled: <1W in S5- Power Off	
Surge Tolerant Full Ranging Power Supply	Yes	

System Technical Specifications

(withstands power surges up to 2000V)

System Configurations

Z2 Mini Configuration #1

ENERGY STAR QUALIFIED

Processor Info	1x Intel® Xeon® E3-1245v5 3.5 8M GT2 4C
Memory Info	32GB (2x16GB) DDR4-2400 ECC SO-DIMM
Graphics Info	NVIDIA® Quadro® M620 GPU
Disks/Optical/Floppy	1x 1TB 7200 RPM SATA HDD / 1x Z Turbo Drive G2 512GB PCIe 1st 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)	23.61 W		23.01 W		22.95 W	
Windows short Idle (S0)	25.24 W		25.2 W		25.56 W	
Windows Busy Typ(S0)	112.64 W		112.76 W		113.67 W	
Windows Busy Max (S0)	157.71 W		155.95 W		159.22 W	
Sleep (S3)	2.52 W	2.47 W	2.55 W	2.47 W	2.51 W	2.5 W
Off (S5)	1.27 W	1.25 W	1.36 W	1.24 W	1.34 W	1.25 W
Zero Power Mode (ErP)	0.31 W		0.33 W		0.31 W	

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)	80.56 btu/hr		78.51 btu/hr		78.31 btu/hr	
Windows short Idle (S0)	86.12 btu/hr		85.99 btu/hr		87.21 btu/hr	
Windows Busy Typ(S0)	384.34 btu/hr		384.75 btu/hr		387.86 btu/hr	
Windows Busy Max (S0)	538.13 btu/hr		532.12 btu/hr		543.28 btu/hr	
Sleep (S3)	8.6 btu/hr	8.43 btu/hr	8.7 btu/hr	8.43 btu/hr	8.56 btu/hr	8.53 btu/hr
Off (S5)	4.33 btu/hr	4.27 btu/hr	4.64 btu/hr	4.23 btu/hr	4.57 btu/hr	4.27 btu/hr
Zero Power Mode (ErP)	1.06 btu/hr		1.13 btu/hr		1.06 btu/hr	

Z2 Mini Configuration #2

Processor Info	1x Intel® Xeon® E3-1225v5 3.3 8M GT2 4C
Memory Info	HP 8GB (2x4GB) DDR4-2400 ECC SO-DIMM
Graphics Info	NVIDIA® Quadro® M620 GPU
Disks/Optical/Floppy	1x 1TB 7200 RPM SATA HDD
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)	19.2 W		19.85 W		19.62 W	
Windows short Idle (S0)	21.92 W		22.18 W		21.73 W	
Windows Busy Typ(S0)	96.02 W		94.19 W		97.79 W	
Windows Busy Max (S0)	141.2 W		142.16 W		140.6 W	
Sleep (S3)	1.78 W	1.7 W	1.83 W	1.75 W	1.79 W	1.71 W
Off (S5)	1.16 W	1.14 W	1.2 W	1.19 W	1.16W	1.14 W
Zero Power Mode (ErP)	0.31 W		0.35 W		0.31 W	

System Technical Specifications

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)	65.51 btu/hr		67.73 btu/hr		66.95 btu/hr	
Windows short Idle (S0)	74.79 btu/hr		75.68 btu/hr		74.15 btu/hr	
Windows Busy Typ(S0)	327.63 btu/hr		321.39 btu/hr		333.67 btu/hr	
Windows Busy Max (S0)	481.79 btu/hr		485.07 btu/hr		479.75 btu/hr	
Sleep (S3)	6.07 btu/hr	5.8 btu/hr	6.24 btu/hr	5.97 btu/hr	6.11 btu/hr	5.83 btu/hr
Off (S5)	3.96 btu/hr	3.89 btu/hr	4.1 btu/hr	4.06 btu/hr	3.96 btu/hr	3.89 btu/hr
Zero Power Mode (ErP)	1.06 btu/hr		1.19 btu/hr		1.06 btu/hr	

Z2 Mini Configuration #3

ENERGY STAR QUALIFIED

Processor Info	1x Intel® Core™ i7-6700 3.4 8M 4C
Memory Info	32GB (2x16GB) DDR4-2400 nECC SO-DIMM
Graphics Info	Intel® HD Graphics 530
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)	12.98 W		13.18 W		13.02 W	
Windows short Idle (S0)	13.52 W		13.82 W		13.67 W	
Windows Busy Typ(S0)	96.2 W		98.06 W		99.7 W	
Windows Busy Max (S0)	105.74 W		105.85 W		103.7 W	
Sleep (S3)	2.29 W	2.24 W	2.35 W	2.34 W	2.3 W	2.27 W
Off (S5)	1.25 W	1.22 W	1.37 W	1.33 W	1.41 W	1.37 W
Zero Power Mode (ErP)	0.27 W		0.32 W		0.27 W	

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)	44.29 btu/hr		44.97 btu/hr		44.43 btu/hr	
Windows short Idle (S0)	46.13 btu/hr		47.16 btu/hr		46.64 btu/hr	
Windows Busy Typ(S0)	328.25 btu/hr		334.59 btu/hr		340.19 btu/hr	
Windows Busy Max (S0)	360.8 btu/hr		361.18 btu/hr		353.84 btu/hr	
Sleep (S3)	7.81 btu/hr	7.64 btu/hr	8.02 btu/hr	7.98btu/hr	7.85 btu/hr	7.75 btu/hr
Off (S5)	4.27 btu/hr	4.16 btu/hr	4.67 btu/hr	4.54 btu/hr	4.81 btu/hr	4.67 btu/hr
Zero Power Mode (ErP)	0.92 btu/hr		1.09 btu/hr		0.92 btu/hr	

Z2 Mini Configuration #4

ENERGY STAR QUALIFIED

Processor Info	1x Intel® Core™ i3-6100 3.7 3M 2C
Memory Info	32GB (2x16GB) DDR4-2400 nECC SO-DIMM
Graphics Info	NVIDIA® Quadro® M620 GPU
Disks/Optical/Floppy	1x 1TB 7200 RPM SATA HDD / 1x Z Turbo Drive G2 512GB PCIe 1st 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)	22.92 W		22.42 W		22.51 W	
Windows short Idle (S0)	24.42 W		23.65 W		23.95 W	
Windows Busy Typ(S0)	79.39 W		80.34 W		77.93 W	
Windows Busy Max (S0)	118.18 W		118.24 W		119.18 W	

System Technical Specifications

Sleep (S3)	2.49 W	2.47 W	2.48 W	2.48 W	2.49 W	2.45 W
Off (S5)	1.48 W	1.14 W	1.3 W	1.13 W	1.29 W	1.26 W
Zero Power Mode (ErP)	0.31 W		0.33 W		0.31 W	

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)	78.21 btu/hr		76.5 btu/hr		76.81 btu/hr	
Windows short Idle (S0)	83.32 btu/hr		80.7 btu/hr		81.72 btu/hr	
Windows Busy Typ(S0)	270.89 btu/hr		274.13 btu/hr		265.91 btu/hr	
Windows Busy Max (S0)	403.25 btu/hr		403.45 btu/hr		406.66 btu/hr	
Sleep (S3)	8.5 btu/hr	8.43 btu/hr	8.46 btu/hr	8.46 btu/hr	8.5 btu/hr	8.36 btu/hr
Off (S5)	5.05btu/hr	3.89 btu/hr	4.44 btu/hr	3.86 btu/hr	4.4 btu/hr	4.3 btu/hr
Zero Power Mode (ErP)	1.06 btu/hr		1.13btu/hr		1.06 btu/hr	

Z2 Mini Configuration #5

Processor Info	1x Intel® Core™ i3-6100 3.7 3M 2C
Memory Info	4GB (1x4GB) DDR4-2400 nECC SO-DIMM
Graphics Info	Intel® HD Graphics 530
Disks/Optical/Floppy	1x 1TB 7200 RPM SATA HDD
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)	13.26 W		10.58 W		12.05 W	
Windows short Idle (S0)	14.84 W		12.99 W		12.39 W	
Windows Busy Typ(S0)	64.06 W		65.23 W		64.26 W	
Windows Busy Max (S0)	87.97 W		92.15 W		88.17 W	
Sleep (S3)	1.8 W	1.67 W	1.87 W	1.77 W	1.78 W	1.66 W
Off (S5)	1.19 W	1.18 W	1.27 W	1.26 W	1.17 W	1.15 W
Zero Power Mode (ErP)	0.31 W		0.37W		0.31 W	

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)	45.24 btu/hr		36.1 btu/hr		41.12 btu/hr	
Windows short Idle (S0)	50.64 btu/hr		44.32 btu/hr		42.28 btu/hr	
Windows Busy Typ(S0)	218.58 btu/hr		222.57btu/hr		219.26 btu/hr	
Windows Busy Max (S0)	300.17 btu/hr		314.43 btu/hr		300.85 btu/hr	
Sleep (S3)	6.14 btu/hr	5.7 btu/hr	6.38 btu/hr	6.04 btu/hr	6.07 btu/hr	5.66 btu/hr
Off (S5)	4.06 btu/hr	4.03 btu/hr	4.33 btu/hr	4.3 btu/hr	3.99 btu/hr	3.92 btu/hr
Zero Power Mode (ErP)	1.06 btu/hr		1.26 btu/hr		1.06 btu/hr	

System Technical Specifications

Declared Noise Emissions Z2 Mini (Entry)

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

System Configuration (Entry level With HDD)	**Processor Info**	Intel® Core™ i3-6100 QJZG/3.7G/4M/2c	
	Memory Info	1 - 4GB DDR4-2400 SO-DIMM Memory	
	Graphics Info	iGfx	
	Disks/SSD	1 - Hitachi 500GB SATA 7200RPM HDD 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	3.08	16.2
	Hard drive Operating (random reads)	3.08	17.1
System Configuration (Entry level Only SSD)	**Processor Info**	Intel® Core™ i3-6100 QJZG/3.7G/4M/2c	
	Memory Info	1 - 4GB DDR4-2400 SO-DIMM Memory	
	Graphics Info	iGfx	
	Disks/SSD	N / A 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	2.97	11.7
	Hard drive Operating (random reads)	/	/
System Configuration (High-end)	**Processor Info**	Intel® Core™ i7-6700 QJE9/3.4G/8M/4c	
	Memory Info	2 - 8GB DDR4-2400 SO-DIMM Memory	
	Graphics Info	iGfx	
	Disks/SSD	1 - Hitachi 1TB SATA 7200RPM HDD 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 Performance

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

System Configuration (Entry level With HDD)	**Processor Info**	Intel® Core™ i3-6100 SR2HG/3.7G/4M/2c	
	Memory Info	1 - 4GB DDR4-2400 SO-DIMM Memory	
	Graphics Info	NVIDIA Quadro / N17	
	Disks/SSD	1 - Hitachi 500GB SATA 7200RPM HDD 1 - Samsung 256GB PCIe M.2 SSD	
		Sound Power (LWAd, bels)	**Deskside Sound Pressure** (LpAm, decibels)

System Technical Specifications

Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)	**Idle**	3.16	20.3
	Hard drive Operating (random reads)	3.17	20.4
System Configuration (Entry level Only SSD)	**Processor Info**	Intel® Core™ i3-6100 SR2HG/3.7G/4M/2c	
	Memory Info	1 - 4GB DDR4-2400 SO-DIMM Memory	
	Graphics Info	NVIDIA Quadro / N17	
	Disks/SSD	N / A 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 E3-1245v5 QJ70/3.5G/8M/4c	
	Memory Info	2 - 8GB DDR4-2400 SO-DIMM Memory	
	Graphics Info	NVIDIA Quadro / N17	
	Disks/SSD	1 - Hitachi 1TB SATA 7200RPM HDD 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

System Technical Specifications

Environmental Requirements	**Temperature**	Operating: 40° to 95° F (5° to 35° C) Non-operating: -40° to 140° F (-40° to 60° C)
	Humidity	Operating: 8% to 85% RH, non-condensing Non-operating: 8% to 90% RH, non-condensing
	Maximum Altitude	Operating: 10,000 feet (3,000 m) Non-operating: 30,000 feet (9,100 m)
	Dynamic (new)	**Shock** Operating: ½-sine: 40g, 2-3ms Non-operating: ½-sine: 160 cm/s, 2-3ms (~100g) square: 422 cm/s, 20g **Vibration** Operating random: 0.5g (rms), 5-300 Hz Non-operating random: 2.0g (rms), 10-500 Hz **Notes:** Values represent individual shock events and do not indicate repetitive shock events. Values do not indicate continuous vibration.
	Cooling	Above 5,000 ft (1524 m) altitude, maximum operating temperature is de-rated by 1.8° F (1° C) per 1,000 ft (305 m) elevation increase

Physical Security and Serviceability

Access Panel	Tool-less 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.
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 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 G3)
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
Setup Password	Yes, prevents an unauthorized person from changing the workstation configuration

System Technical Specifications

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. 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 Entry & Performance CPU blower solution: 11.1 mm x 65mm x 82.1mm Z2 Mini Performance GPU blower solution: 29mm x 103.6mm x 102.2mm
Chassis Fan	Z2 Mini G3 Entry: Single system blower Z2 Mini G3 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). • 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
Trusted Platform Module Chip	Yes
M.2 Card Retention	Yes, all M.2 modules are retained by a single screw
Flash ROM	Yes
Diagnostic Power Switch LED on board	Yes
Clear Password Jumper	Yes
Clear CMOS Jumper	Yes

CMOS Battery Holder	Yes: Z2 Min iG3 Entry Yes: Z2 Mini G3 Performance
DIMM Connectors	Yes

BIOS

BIOS 32-bit Services	Standard BIOS 32-bit Service Directory Proposal v0.4
PCI 3.0 Support	Full BIOS support for PCI Express through industry standard interfaces.
ATAPI	ATAPI Removable Media Device BIOS Specification Version 1.0.
BBS	BIOS Boot Specification v1.01. Provides more control over how and from what devices the workstation will boot.
WMI Support	WMI is Microsoft's implementation of Web-Based Enterprise Management (WBEM) for Windows. WMI is fully compliant with the Distributed Management Task Force (DMTF) Common Information Model (CIM) and WBEM specifications.
BIOS Power On	Users can define a specific day-of-week and time for the system to power on.
ROM Based Computer Setup Utility (F10)	Review and customize system configuration settings controlled by the BIOS.
System/Emergency ROM Flash Recovery with Video	Recovers system BIOS in corrupted Flash ROM.
Replicated Setup	Saves BIOS settings to USB flash device in human readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering Computer Configuration Utility (F10 Setup).
SMBIOS	System Management BIOS 2.7.1, for system management information.
Boot Control	Disables the ability to boot from removable media on supported devices.
Memory Change Alert	Alerts management console if memory is removed or changed.
Thermal Alert	Monitors the temperature state within the chassis. Three modes: • NORMAL - normal temperature ranges. • ALERTED - excessive temperatures are detected. Raises a flag so action can be taken to avoid shutdown or provide for a smoother system shutdown. • SHUTDOWN - excessive temperatures are encountered. Automatically shuts down the computer without warning before hardware component damage occurs.
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console. Updates can be performed before starting the OS. Updates can be periodically scheduled.

System Technical Specifications

ACPI (Advanced Configuration and Power Management Interface)	Allows the system to enter and resume from low power modes (sleep states). Enables an operating system to control system power consumption based on the dynamic workload. Makes it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system. Supports ACPI 4.0 for full compatibility with 64-bit operating systems.
Ownership Tag	A user-defined string stored in non-volatile memory that is displayed in the BIOS splash screen.
Remote Wakeup/Remote Shutdown	System administrators can power on, restart, and power off a client computer from a remote location.
ASF 2.0 Compliant	Yes.
Instantly Available PC (Suspend to RAM - ACPI sleep state S3)	Allows for very low power consumption with quick resume time.
Remote System Installation via F12 (PXE 2.1) (Remote Boot from Server)	Allows a new or existing system to boot over the network and download software, including the operating system.
ROM revision levels	Reports the system BIOS revision level in Computer Configuration Utility (F10 Setup). Version is available through an industry standard interface (SMBIOS) so that management SW applications can use and report this information.
System board revision level	Allows management SW to read revision level of the system board. Revision level is digitally encoded into the HW and cannot be modified.
Start-up Diagnostics (Power-on Self-Test)	Assesses system health at boot time with selectable levels of testing.
Auto Setup when new hardware installed	System automatically detects addition of new hardware.
Keyboard-less Operation	The system can be booted without a keyboard.
Localized ROM Setup	Common BIOS image supports System Configuration Utility (F10 Setup) menus in 12 languages with local keyboard mappings.
Asset Tag	The user or IT administrator to set a unique tag string in non-volatile memory.
Per-slot Control	Allows I/O slot parameters (option ROM enable/disable) to be configured individually.
Adaptive Cooling	Control parameters are set according to detected hardware configuration for optimal acoustics.
Pre-boot Diagnostics	(Pre-video) critical errors are reported via beeps and blinks on the power LED.
Digitally and Cryptographically Signed BIOS	Helps to prevent the installation of unauthorized versions of a BIOS (a rogue BIOS) from a virus, malware, or other code that could lead to compromised system security, data access, physical service, or even system board replacement.

System Technical Specifications

Master Boot Record Protection	A feature in the HP BIOS that prevents changes and/or infections to the Master Boot Record. Useful in protecting from viruses.
Boot Block Emergency Recovery Mode (BIOS Recovery)	The HP BIOS offers a write-protected boot block ROM that provides recovery from a failed flashing of the computer BIOS. This special recovery mode prevents the system from becoming unusable or "bricked" when a BIOS update is interrupted.
Industry Standard Specification Support	
Industry Standard	Revision Supported by the BIOS
UEFI Specification Revision	UEFI 2.4.0
ACPI	Advanced Configuration and Power Management Interface, Version 4.0
ASF	Alert Standard Format Specification, Version 2.0
EDD	- Enhanced Disk Drive Specification Version 1.1 - BIOS Enhanced Disk Drive Specification Version 3.0
PCI Express	PCI Express Base Specification, Revision 2.0; PCI Express Base Specification, Revision 3.0.
PMM	POST Memory Manager Specification, Version 1.01
SATA	- Serial ATA Specification, Revision 1.0a - Serial ATA II: Extensions to Serial ATA 1.0, Revision 1.0a - Serial ATA II Cables and Connectors Volume 2 Gold - SATA-IO SATA Revision 3.0 Specification
SPD	PC SDRAM Serial Presence Detect (SPD) Specification, Revision 1.2B
TPM	Trusted Computing Group TPM Specification Version 2.0
USB	Universal Serial Bus Revision 1.1 Specification Universal Serial Bus Revision 2.0 Specification Universal Serial Bus Revision 3.0 Specification

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.

Low Halogen Statement

This product is low halogen except for power cords, cables and peripherals, as well as the following customer-configurable internal components: Creative Recon3D PCIe Audio Card is not Low Halogen. Service parts obtained after purchase may not be Low Halogen.

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® Gold registered in the U.S. EPEAT registration varies by country. See http://www.epeat.net for registration status by country.

Packaging

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

- Does not contain restricted substances listed in HP Standard 011-1 General Specification for the Environment

System Technical Specifications

- 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 25% recycled content.

Manageability

Intel® Active Management Technology (AMT)	The HP Z2 Mini G3 workstation supports Intel® vPro™ technology when purchased with a vPro™ technology capable CPU: Intel® Xeon® processor family or 6th Generation Intel® Core™ i5/i7 processors with Intel® VT-d/VT-x and Intel® TXT technology.
Remote Manageability Software Solutions	Visit: http://www.hp.com/go/easydeploy
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**
	X8V05AV	Intel® Xeon® E3- 1225v5 3.3GHz CPU
	X8V06AV	Intel® Xeon® E3- 1245v5 3.5GHz CPU

Hard Drives	**Product #**	**Offering**
	X8U91AV	HDD 500GB 7200RPM SATA 2.5
	X8U90AV	HDD 1TB 7200RPM SATA 2.5

Memory	**Product #**	**Offering**
	X8V29AV	RAM 8GB (1x8GB) DDR4 2400 ECC Unbuffered
	X8V24AV	RAM 16GB (2x8GB) DDR4 2400 ECC Unbuffered

NOTE: Factory-configured CTO (xxxxxAV) and aftermarket AMO (xxxxxAA, xxxxxAT) HP memory part numbers designated as “2133” or “2400” will be transitioned to using 2666MHz 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 “2133” or “2400” have been tested to work with 2666MHz memory and are fully-supported by HP under standard support terms.

Technical Specifications - Processors

Intel® Xeon® processor E3-1200 v5 family

Intel® Xeon® E3-1245 v5 3.5 2133 4C CPU
Intel® Xeon® E3-1225 v5 3.3 2133 4C CPU

Intel® Core™ i7-6700 3.4 2133 4C CPU
Intel® Core™ i5-6500 3.2 2133 4C CPU

Intel® Core™ i3-6100 3.7 2133 2C CPU

Technical Specifications - Hard Drives

SATA Hard Drives for HP Workstations	**500GB SATA 7200 rpm 6Gb/s 2.5" 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)
	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)
SATA SSDs for HP Workstations	**HP 256GB SATA 6Gb/s SSD**	**Capacity**	256GB
		Protocol	SATA
		Form Factor	2.5"
		Controller	AHCI
		NAND Type	MLC
		Endurance	200TBW (TB Written)
		Reliability (MTTF)	1.5M hours
		Physical Size (Height)	0.28 in; 0.7 cm
		Physical Size (Width)	2.5 in; 6.36 cm
		Interface	SATA 6Gb/s
		Synchronous Transfer Rate (Maximum)	Up to 600MB/s
		Operating Temperature	32° to 158° F (0° to 70° C)
		Performance	**Sequential Read** 560MB/s (max)
			Sequential Write 510MB/s (max)
			Random Read 100K IOPS (max)
			Random Write 88K IOPS (max)

Technical Specifications - Graphics

Integrated Intel® HD Graphics (Z2)	**Form Factor**	Integrated in select Intel® Xeon® E3, Intel® Core™ i7, Intel® Core™ i5, and Intel® Core™ i3 processors. Check specific platform specifications for selections.
	Graphics Controller	Intel® HD 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: - up to 4096x2160 x 30 bpp @ 60Hz - supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST) HDMI 2.0 output: - up to 4096x2160 x 30 bpp @ 60Hz Dual Link DVI(I) output: - up to 2560 x 1600 x 32 bpp @ 60Hz Single Link-DVI(I) output: - up to 1920 x 1200 x 32 bpp @ 60Hz VGA output: - 2048 × 1536 × 32 bpp @ 85 Hz Note: For HDMI, DVI, and VGA outputs, separate adapters required.
	Shading Architecture	Shader Model 5.0
	Supported Graphics APIs	OpenGL 4.0 DirectX 11.1
	Available Graphics Drivers	Windows 10 Windows 7

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

Technical Specifications - Graphics

NVIDIA® Quadro® M620 2GB Graphics	**Maximum Resolution**	DisplayPort 1.2: - up to 4096x2160 x 30 bpp @ 60Hz - supports High Bit Rate 2 (HBR2) and Multi-Stream Transport (MST) HDMI 2.0 output: - 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: - 4 direct attached monitors 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 DP1.3 MST capable hub): - 4 1920x1200 @ 60 Hz - 2 2560x1600 @ 60 Hz - 1 4096x2160 @ 60 Hz Maximum number of monitors across all available Quadro M620 outputs is 4.
	Supported Graphics APIs	OpenGL 4.5 DirectX 12 API support includes: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
	Available Graphics Drivers	Microsoft Windows 10 Microsoft Windows 7 Linux - Full OpenGL implementation, complete with NVIDIA and ARB extensions HP qualified drivers may be preloaded or available from the HP support Web site: http://welcome.hp.com/country/us/en/support.html

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 DVD+R DVD+RW DVD+R DL DVD-R DL DVD-R DVD-RW CD-R 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 CD-RW Up to 24X
		DVD ROM Read	DVD-RAM Up to 8X DVD+RW Up to 8X DVD-RW Up to 8X DVD+R DL Up to 8X DVD-R DL Up to 8X DVD-ROM Up to 8X DVD-ROM DL Up to 8X DVD+R Up to 8X 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*. Red Hat Enterprise Linux(RHEL) WS4**, 5, 6 Desktop/Workstation, Removed reference to "Novell" because of acquisition and changed product reference to "SUSE Linux Enterprise Desktop 10 & 11", 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.	

Technical Specifications - Networking and Communications

Integrated Intel® I219LM PCIe GbE Controller (Intel® vPro™ with Intel® AMT 11.0)	**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 10BASE-T (full-duplex) 20 Mbps 100BASE-TX (half-duplex) 100 Mbps 100BASE-TX (full-duplex) 200 Mbps 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 11.0 support, Circuit Breaker, VLAN, Multicast Listener Discovery (MLD)

Intel® 8265 Wireless LAN (802.11ac) and Bluetooth 4.2 Module	**Connector**	M.2 (Supports 2230 form factor; E Key) Motherboard Interface
	Controller	Intel® Dual Band Wireless-AC 8260
	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 Bluetooth®: Dual Mode Bluetooth® 2.1, 2.1+EDR, 3.0, 4.0, BLE, and 4.2
	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 887 Mbps (802.11ac) for WLAN

Technical Specifications - Other Hardware

HP Z2 Mini 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	-
		Weight	Unpackaged	1.7 kg (3.7 lb)
			Packaged	-
	Other	**Option kit contents**	HP Z2 Mini VESA Sleeve, mounting screws, installation guide, warranty card.	
	Limited Warranty	The HP Z2 Mini 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.		

Summary of Changes

Date of change:	Version History:		Description of change:
January 1, 2017	From v1 to v2	**Added**	Remote Power On feature in Supported components; Declared noise emissions in System Technical Specifications.
March 1, 2017	From v2 to v3	**Added**	7th Gen Intel processors, Intel HD Graphics 630, bottom view and disc, mounting kits for displays.
April 1, 2017	From v3 to v4	**Added**	Intel HD Graphics P630 Intel Xeon v6 processors, HP Short 34cm DisplayPort Cable Kit
		Changed	NVIDIA M620 from Entry 3D to Discrete Graphcis
		Removed	Factory configured flag to DP to DVI-D adapters in Cable adapters section
May 1, 2017	From v4 to v5	**Added**	Added the HP Z Turbo Drive G2 1TB SSD to PCIe SSDs section, added the HP Z2 Mini VESA Sleeve to Other Hardware section, added the Intel® Unite™ into Software section.
June 1, 2017	From v5 to v6	**Added**	Windows 10 Pro License MSNA to Operating Systems section
September 6, 2017	From v6 to v7	**Removed**	iSCSI Boot as Management Capabilities for the Integrated Intel I219LM PCIe GbE Networking Controller
October 5, 2017	From v7 to v8	**Added**	HP Wireless Premium Keyboard to the imput devices section
March 6, 2018	From v8 to v9	**Changed**	500GB SATA 7200 rpm 6Gb changed to 2.5” from 3.5” in SATA Hard Drives for HP Workstations section
August 9, 2018	From v9 to v10	**Changed**	Memory support