

### Overview

### HP Elite t660 Thin Client



#### FRONT

- 1 Power button (with integrated power indicator)
- 2 USB-A 3.1 Gen 1 port
- 3 USB-A 3.1 Gen 1 port
- 4 USB-C® 4.0 Type C port
- 5 3.5mm combo headset/audio jack
- 6 Flash memory activity indicator
- 7 Stand
- 8 100 x 100mm VESA mounting holes

#### BACK

- 1 (2) USB-A 2.0 port
- 2 (1) USB-A 3.2 Gen 1 port; (1) USB-A 3.2 Gen 2 port
- 3 RJ-45 (network)jack- option without DASH Manageability support
- 4 Audio-out (headphone)
- 5 DisplayPort™ 1.4 connector
- 6 DisplayPort™ 1.4 connector
- 7 DisplayPort™ 1.4 connector
- 8 Power connector
- 9 Security cable slot
- 10 Configurable Option Port supporting one of the following:
  - Blank; no optional configured port
  - DP/USB-C® with PD
  - DisplayPort™ over USB-C® with USB Power Delivery
  - (2) USB-A 3.2 Gen 1 port
  - HDMI 2.1 digital video output
  - VGA analog video output
  - External Wi-Fi® antenna connector
  - Fiber Optic NIC connectors (SC or LC)
  - Serial port with configurable power
  - Dual serial ports (includes cable adapter)

### Overview

#### AT A GLANCE

- Intel Embedded U300E processor; 1.1 – 4.3 GHz; 5 cores, 6 threads<sup>3</sup>
- Intel Threat Detection Technology
- DDR5 dual-channel SDRAM system memory; up to 5200 MT/s transfer rate; two SODIMM slots
- (3) DisplayPort™ 1.4 video outputs supporting up to UHD
  - NOTE:** DisplayPort™ cables and displays sold separately.
- Solid-state flash memory storage; M.2 form factor modules; two slots
- Gigabit Ethernet (GbE) network connection; support for DASH out-of-band remote management
- Optional Allied Telesis M.2 Fiber Optic NICs; Fast Ethernet (100 Mb/s) or Gigabit (1,000 Mb/s)
- Optional Intel AX211 Wi-Fi 6E, and Intel BE200 Wi-Fi 7 including antennas integrated internally in the chassis. (Antenna is internally integrated in the chassis with the Wi-Fi® SKU)
  - NOTE:** Fiber optic and Wi-Fi® NIC options cannot be supported together<sup>1</sup>

**NOTE:** Wireless features, performance and support may vary depending on environmental variables such placement, settings and firmware of your access points. Please contact your wireless vendor for support of your wireless environment

- Optional remote external Wi-Fi® antenna system
- Option Port with a selection of available factory options (see detailed listing later in this document)
- Integrated PC speaker for basic audio playback; 3.5 mm combo headset/audio port on front and 3.5 mm audio port on rear that can be configured as line in or line out supporting headphones, external speaker systems, or microphone
- 45W/65W non-PFC external power adapter
- Security features include a TCG certified TPM version 2.0 and a system UEFI (BIOS) designed to address NIST SP 800-147 BIOS protection guidelines and NIST SP800-155 BIOS integrity measurement guidelines. Case Intrusion Detection to help ensure your information stays safe. A cable lock slot is provided for use with a cable lock to enable the system's physical security
- Passive thermal design (no cooling fans) and active thermal management technology that monitors the system operating temperatures, throttles SOC operation if appropriate and prevents unit thermal shutdown.
- Rated for a maximum ambient operating temperature of 40 degree C
- ENERGY STAR® certified configurations available and EPEAT® Silver registered in the United States. See <http://www.epeat.net> for registration status in other countries
- Post-consumer recycled plastics content greater than 50% total unit plastics (by weight)
- Low halogen<sup>2</sup> material content
- All models TAA compliant in North America

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

### Overview

#### Warranty

HP one-year hardware limited warranty in most regions; HP Care Packs\* are extended service contracts that go beyond your standard limited warranties; for more details visit <http://www.hp.com/go/cpc>

\*HP Care Packs are sold separately. Service levels and response times for HP Care Packs may vary depending on your geographic location. Service starts on date of hardware purchase. Restrictions and limitations apply. For details, visit [www.hp.com/go/cpc](http://www.hp.com/go/cpc). HP Services are governed by the applicable HP terms and conditions of service provided or indicated to Customer at the time of purchase. Customer may have additional statutory rights according to applicable local laws, and such rights are not in any way affected by the HP terms and conditions of service or the HP Limited Warranty provided with your HP Product.

### Technical Specifications

#### OPERATING SYSTEMS

- HP ThinPro, including HP Smart Zero Core, HP Wolf CEM<sup>2</sup>
- Windows 11 IoT Enterprise LTSC 2024<sup>1</sup>
- IGEL
- No OS

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. ISP fees may apply, and additional requirements may apply over time for updates. See <http://www.windows.com>.

2. Not all features are available with HP ThinPro, Smart Zero Core and FreeDOS.

#### PROCESSOR<sup>3,4,5</sup>

Model	CPU Frequency Max/Base	Cores/Threads	GPU Type	GPU Frequency
Intel® Embedded U300E	4.3/1.1 GHz	5/6	Intel® UHD Graphics for 13th Gen Intel® Processors	1.10 GHz

3. 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.

4. Processor speed denotes maximum performance mode; processors will run at lower speeds in battery optimization mode.

5. 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>.

### Technical Specifications

#### DISPLAY SUPPORT

##### Number of displays supported

**A maximum of 4 displays are supported.**

Combination:

3 x DisplayPort™ (onboard)

3 x DisplayPort™ (onboard) + 1 x DisplayPort over USB-C (optional)

2 x DisplayPort™ (onboard) + 1 x HDMI 2.1 (optional)

2 x DisplayPort™ (onboard) + 1 x VGA (optional)

	Rear DP	Rear DP	Rear DP	Option port USB-C
<b>Support Max Resolution</b>	5K @ 60 Hz	5K @ 60 Hz	5K @ 60 Hz	4K @ 60 Hz
U300E <b>with 4 monitors</b>	All monitors support 4K @ 60Hz			
U300E <b>with 3 monitors</b>	One monitor supports 5K @ 60Hz and the others support 4K @ 60Hz			
U300E <b>with 2 monitors</b>	All monitors support 5K @ 60Hz			

#### Video Resolution Support Matrix\*

Windows 11 IoT LTSC 2024* *Min of 8GB required	≤3 x FHD 1920 X 1080 @ 60Hz	1 x UHD/4K 3840 x 2160 @ 60Hz	2 x UHD/4K 3840 x 2160 @ 60Hz	3 x UHD/4K 3840 x 2160 @ 60Hz (2 x 4G RAM or above)
Static screen (no video)	✓	✓	✓	✓
1080 60fps(or below) video	✓	✓	✓	✓
4K 30fps video	✓	✓	✓	✓
4K 60fps video	✓	✓	✓	✓

ThinPro 8	≤3 x FHD 1920 X 1080 @ 60Hz	1 x UHD/4K 3840 x 2160 @ 60Hz	2 x UHD/4K 3840 x 2160 @ 60Hz	3 x UHD/4K 3840 x 2160 @ 60Hz (2 x 4G RAM or above)
Static screen (no video)	✓	✓	✓	✓

\*For best 4K experience dual channel memory is required.

### Technical Specifications

#### HP USB-C® DOCK G5 (support requires system to be configured with the Type-C® option Port)

Maximum resolution support for monitors connected to the HP USB-C® Dock G5:

Single Monitor – Max of 2560 x 1440 @60Hz refresh rate

Dual Monitor – Max of two monitors at 1920x1080 @60Hz refresh rate

For an expanded list of supported monitor combinations, refer to the HP Dock Quickspecs document.

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## GRAPHICS

**Number of displays supported:** 3

**Video outputs:** Standard: (3) DisplayPort™ 1.4

Optional: (1) DisplayPort™ over USB-C® with USB Power Delivery

(1) VGA analog output

(1) HDMI 2.1 digital output

**NOTE:** adding an optional output does not increase the number of displays supported.

**Max. screen resolution:** 3840 x 2160 @ 60 Hz

**NOTE:** HP recommends dual channel memory (two SODIMMs) configurations for optimal display resolution performance

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## MEMORY

**Type:** DDR5 dual channel SDRAM

**Data Transfer Rate:** Up to 5,200 MT/s

**Peak Transfer Rate:** Up to 19,200 MB/s

**Number of Slots** 2 x SODIMM

**Capacities:** 8, 16 and 32 GB

**NOTES:**

- The actual transfer rates will be dependent upon the specification of the SODIMM modules used
- The Graphics Processing Unit (GPU) uses part of the total system memory. System memory dedicated to graphics performance is not available for use by other programs
- HP recommends dual channel memory (two SODIMMs) configurations for optimal system performance

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### Technical Specifications

#### UEFI

##### UEFI Specification Revision

2.7

##### TPM 2.0

Meets requirements for Common Criteria, an independent third-party certification of trustworthiness

Meets requirements for FIPS 140-2, a standard for cryptographic integrity

##### Security features

System UEFI designed to address NIST SP 800-147 BIOS protection guidelines and NIST SP800-155 BIOS integrity measurement guidelines

#### STORAGE\*

**Type:** NAND flash memory; non-volatile

**Number of Sockets:** (2) M.2

**Capacities:**

32 GB M.2 eMMC flash module (32GB not configurable with Windows 11 IoT Enterprise LTSC 2024)

64 GB M.2 eMMC flash module

256 GB M.2 PCIe NVMe flash module

512 GB M.2 PCIe NVMe flash module

\*For storage drives, GB = 1 billion bytes. TB = 1 trillion bytes. Actual formatted capacity is less. Up to 30 GB (for Windows 10 and 11) is reserved for system recovery software.

#### Input/Output

##### USB:

Front access: (2) USB-A 3.2 Gen 1 port  
(1) USB-C® 4.0 Type C port

Rear access: (2) USB-A 2.0 port  
(2) USB-A 3.2 port  
(2) USB-A 3.2 Gen 1 ports (optional)  
(1) USB-C® DisplayPort™ (optional)

##### Video Outputs:

Standard: (3) DisplayPort™ 1.2 digital outputs

Optional: (1) VGA analog output  
(1) HDMI 2.1 digital output  
(1) DisplayPort™ over USB-C® with USB Power Delivery

**NOTE:** adding an optional output does not increase the number of displays supported.

##### I/O Interfaces:

Standard: (1) RJ45 network connector  
(1) 3.5 mm combo headset/audio jack (front)  
(1) 4.5 mm DC audio jack (rear)

Optional: (1) Dual serial port with configurable power  
(2) serial ports enabled with an included cable adapter

##### Option Port:

The rear I/O panel includes an Option Port that can be configured with one of the following factory options:

- Blank; no optional configured port
- 2 x USB-A 3.0 Gen 1 ports
- DisplayPort™ over USB-C® with USB Power Delivery
- HDMI 2.1 digital video output
- VGA analog video output
- External Wi-Fi® antenna connector (requires Wi-Fi® adapter option)
- Fiber Optic NIC connectors; SC or LC connector (requires Fiber Optic NIC option)

### Technical Specifications

- Serial port with configurable power
- Dual serial ports enabled with an included cable adapter

### AUDIO/VIDEO

#### Audio Subsystem

- Internal amplified speaker system for basic audio playback
- 3.5 mm combo headset/headphone/analog microphone audio jack (front access)
- 3.5 mm /4.5mm combo line-out/ line-in socket (rear access)

#### Audio CODECs

- MP3
- AAC Stereo
- HE AAC

#### Video CODECs

- Includes hardware acceleration support
- MPEG-4 part 2 (DivX, Xvid)
- MPEG-4 part 10 (H.264, AVC), Advanced Video Coding (AVC) (H.264 encode & decode )
- MPEG-H part 2, High Efficiency Video Coding (HEVC, available with Windows 10 IoT Only) (H.265 (8-bit / 10-bit) decode and (8-bit) encode
- WMV 7/8/9 VC-1 & ASF Demuxer
- Includes hardware acceleration support

### NETWORKING

#### Local Area Networking

RTL8111EPH-CG Gigabit Ethernet (GbE) Controller with support for DASH out-of-band remote management and Wake-On-Lan. RTL8111HSH-CG Gigabit Ethernet (GbE) Controller with support non-DASH and Wake-On-Lan<sup>2</sup>

#### Wi-Fi® Networking

Intel AX211 Wi-Fi 6E 160 MHz +BT 5.3 WLAN  
Intel BE200 Wi-Fi 7 + BT 5.4 nvP WLAN

1. Wireless access point and Internet service required and sold separately. Availability of public wireless access points limited. Wi-Fi 6 (802.11ax) is backwards compatible with prior 802.11 specs. Wi-Fi 6E is designed to support gigabit data rate when transferring files between two devices connected to the same router. Requires a wireless router, sold separately, that supports 80MHz and higher channels.

2. The term “10/100/1000” or “Gigabit” Ethernet indicates compatibility with IEEE standard 802.3ab for Gigabit Ethernet, and does not connote actual operating speed of 1 Gb/s. For high-speed transmission, connection to a Gigabit Ethernet server and network infrastructure is required.

### FIBER OPTIC NETWORKING

#### Adapter Options:

- Allied Telesis AT-27M2/SC -AA Fiber NIC 100FX
- Allied Telesis AT-29M2/SC- AA Fiber NIC 1000SX
- Allied Telesis AT-29M2/LC -AA Fiber NIC 1000SX

#### Features:

- IEEE 802.1p priority encoding/tagging (QoS, CoS)
- IEEE 802.1q VLAN tagging
- IEEE 802.3x flow control
- Buffer/FIFO: 22K transmit and 40K receive
- Loopback mode

### Technical Specifications

- Descriptor-Based Buffer Management
- Wake-on-LAN from S3 (Sleep) and S4 (Hibernate) not supported (AT-29M2)
- Link Detection and PHY interface power; the PHY interface, Link detection and Link LED should be enabled by default at power-up

**External Interface:** Complies with IEEE 802.3 100BASE-FX operation (AT-27M2)

Complies with IEEE 802.3 1000BASE-X operation (AT-29M2)

**Power:**

- Uses less than 1800 mW of power at full performance (AT-27M2)
- Uses less than 2100 mW of power at full performance (AT-29M2)
- Supports all PCI Express bus states L0, L0s, L1 and L2

**Non-volatile Storage:**

The MAC address is unique for each system; assigned from the board assembly manufacturer's IEEE registered allocation.

The PCI subsystem ID is unique to HP and unique to each design to allow Windows Update to be finely controlled.

### Technical Specifications

#### SOFTWARE SUPPORT

Host Environment	Protocol	HP	Microsoft
		ThinPro	Windows 11 IoT Enterprise 2024
Remote Desktop Services	Remote FX (RFX), RDP	✓	✓
Citrix®	ICA, HDX	✓	✓
Vmware® Horizon	RDP, PcoIP, Blast Extreme	✓	✓

Protocol Clients	HP	Microsoft
	ThinPro	Windows 11 IoT Enterprise 2024
Citrix® Workspace app	✓	✓
Microsoft Remote Desktop Client		✓
Free Remote Desktop Client	✓	
Vmware™ Horizon View™ Client	✓	✓
HP Remote Graphics Software (RGS)	via add-on	✓
Turbosoft Tterm for Linux® Terminal emulation Software	via add-on	
Turbosoft TTWin Terminal emulation software		via add-on
AVD/Win365	via add-on	via add-on
AWS Amazon Workspace	via add-on	via add-on
HP Anyware <sup>1</sup>	via add-on	via add-on

<sup>1</sup>HP Anyware supports Windows®, Linux® and MacOS® host environments and Window, Linux, MacOS, iOS®, Android®, and Chrome OS® end-user devices. For more on the system requirements for installing HP Anyware, refer to the Admin Guides at: <https://docs.teradici.com/find/product/cloud-access-software>

Browser Support	HP	Microsoft
	ThinPro	Windows 11 IoT Enterprise 2024
Mozilla Firefox	✓	
Internet Explorer		✓
Microsoft Edge		✓

Security	HP	Microsoft
	ThinPro	Windows 11 IoT Enterprise 2024

### Technical Specifications

Smart Card	✓	✓
Log-on Manager	✓	✓
Read only Operating System	✓	✓
802.1x	✓	✓
Microsoft Firewall		✓
HP Write Manager		✓
Microsoft Unified Write Filter		✓

**NOTE:** the HP Write Manager is the default active write filter. The Microsoft Unified Write Filter is disabled by default but can be enabled by the user if required.

Management Tools	HP	Microsoft
	ThinPro	Windows 11 IoT Enterprise 2024
HP Wolf CEM	✓	✓
HP Device Manager	✓	✓
HP ThinUpdate		✓
HP Easy Tools	✓	
HP Smart Zero Client Services	✓	
Microsoft SCCM/EDM agent		✓
HP USB Port Manager		✓
HP User State Tool		Add-on only

Additional Windows Components	HP	Microsoft
	ThinPro	Windows 11 IoT Enterprise 2024
HP Easy Shell		✓
Windows Media Player		✓
Microsoft Direct Access		✓
Microsoft BranchCache		✓
Microsoft AppLocker		✓
Microsoft Sideload		✓
CyberLink Media Player		✓

### Technical Specifications

**NOTE:** Other add-on software available (see: <http://www.hp.com/support> for latest list of available add-ons). Software performance and support may vary depending on customer environment and backend.

Audio/Video CODECs	HP	Microsoft
	ThinPro	Windows 11 IoT Enterprise 2024
MP3	✓	✓
WMA stereo	✓	✓
AAC stereo & HE AAC	✓	
Microsoft AC3 encoder		✓
MPEG-1	✓	
MPEG-4 part 2 (DivX, Xvid, H.263)	✓	✓
MPEG-4 part 10 (H.264, AVC)	✓	✓
h.365/HEVC	✓	✓
WMV 7/8/9/ VC-1 & ASF Demuxer	✓	✓

### Recommended TC config for Microsoft Teams media optimization

	TC CPU	Vmware Teams Optimization	Citrix Teams Optimization
t660	2.10 GHz 4 Core	ü	ü
- Not recommended, ü recommended			

### WEIGHTS & DIMENSIONS

**W x D x H:**  
**(vertical orientation)** 35 x 200 x 200 mm

**Volume:** 1.4 liter

**System Weight**  
**(unit with stand)** 1198g  
Lowest weight. Weight will vary by configuration.

**Shipping Weight**  
**(System+Stand+AC+PC)** 2980g

**Shipping Box Dimensions** 495 x 132 x 260 mm

**NOTE:** All measurements are approximate; the addition of optional modules will increase the weight

### EXTERNAL POWER SUPPLY

45W non-PFC Smart external power adapter ; 65W non-PFC Smart external power adapter

### Technical Specifications

Worldwide auto-sensing 100 – 240 VAC; nominal voltage is 120 VAC; 50 – 60 Hz

Energy saving automatic power-down; surge tolerant

1.8m output cable

External power adapters are sourced from several suppliers in order to ensure adequate supply and availability is maintained. The actual dimensions of the power brick will vary by supplier.

HP P/N	Vendor	Dimensions:
L25296-001	Lite-On	94 x 40 x 26.5 mm
L25296-002	Chicony	95 x 40 x 26.5 mm
L25296-003	Delta	94 x 39 x 26.5 mm
L25296-004	AcBel	91.4 x 44 x 26.8 mm

### Technical Specifications

#### COMPLIANCE/CERTIFICATIONS

<b>Accessibility:</b>	Section 508 Accessibility; VPAT report available.
<b>Environmental Stewardship:</b>	Worldwide (ENERGY STAR® configurations available, EPEAT 2.0, RoHS2, ERP, TCO Certified, CECP& SEPA, HP GSE, WEEE, Low Halogen, etc.)
<b>Product Safety:</b>	Worldwide (UL, CB, GS, CCC, BSMI, etc.)
<b>Electromagnetic Compliance (EMC):</b>	Worldwide (FCC/CISPR/EN/VCCI/ICES/AS/NZS/CNS/KCC) "Class B" EMI regulations
<b>International Medical Safety Standard:</b>	EN60601-1-2 (Medical Equipment EMC) passed

#### ENVIRONMENTAL

<b>Operating Temperature Range:</b>	50° to 104° F 10° to 40° C
<b>Non-operating Temperature Range:</b>	-22° to 140° F -30° to 65° C
<b>Humidity:</b>	Condensing: 20% to 80% Non-condensing: 10% to 90%

**NOTE:** Specifications are at sea level with altitude derating of 1° C/300m (1.8° F/1000ft) to a maximum of 3 Km (10,000 ft), with no direct, sustained sunlight. Upper limit may be limited by the type and number of options installed.

<b>Environmental Data</b>	<b>Eco-Label Certifications &amp; declarations</b>	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: <ul style="list-style-type: none"><li>IT ECO declaration</li><li>US ENERGY STAR®</li><li>US Federal Energy Management Program (FEMP)</li><li>EPEAT® Gold registered in the United States. See <a href="http://www.epeat.net">http://www.epeat.net</a> for registration status in your country.</li><li>TCO Certified</li><li>China Energy Conservation Program (CECP)</li><li>China State Environmental Protection Administration (SEPA)</li><li>Taiwan Green Mark</li><li>Korea Eco-label</li><li>Japan PC Green label*</li></ul>
	<b>Sustainable Impact Specifications</b>	<ul style="list-style-type: none"><li><a href="#">Product Carbon Footprint</a></li><li>At least 45% ITE-Derived closed loop plastic<sup>1</sup></li><li>At least 50% post-consumer recycled plastic<sup>1</sup></li><li>External Power Supply 90% Efficiency</li><li>Low Halogen<sup>2</sup></li><li>100% of HP paper-based packaging is from recycled or certified sustainable sources<sup>3</sup></li><li>Bulk packaging available</li></ul>
	<b>System Configuration</b>	The configuration used for the Energy Consumption and Declared Noise Emissions data for the Notebook model is based on a "Typically Configured Notebook".

### Technical Specifications

	<b>Energy Consumption (in accordance with US ENERGY STAR® test method)</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>
Normal Operation (Sort idle)	8.15 W	8.15 W	8.15 W	
Normal Operation (Long idle)	6.17 W	6.17 W	6.17 W	
Sleep	1.06 W	1.06 W	1.06 W	
Off	0.75 W	0.75 W	0.75 W	
	<p><b>Note:</b> Energy efficiency data listed is for an ENERGY STAR® compliant product if offered within the model family. HP computers marked with the ENERGY STAR® Logo are compliant with the applicable U.S. Environmental Protection Agency (EPA) ENERGY STAR® specifications for computers. If a model family does not offer ENERGY STAR® compliant configurations, then energy efficiency data listed is for a typically configured PC featuring a hard disk drive, a high efficiency power supply, and a Microsoft Windows® operating system.</p>			
<b>Heat Dissipation*</b>	<b>115VAC, 60Hz</b>	<b>230VAC, 50Hz</b>	<b>100VAC, 50Hz</b>	
Normal Operation (Short idle)	28 BTU/hr	28 BTU/hr	28 BTU/hr	
Normal Operation (Long idle)	21 BTU/hr	21 BTU/hr	21 BTU/hr	
Sleep	4 BTU/hr	4 BTU/hr	4 BTU/hr	
Off	3 BTU/hr	3 BTU/hr	3 BTU/hr	
	<p><b>*NOTE:</b> Heat dissipation is calculated based on the measured watts, assuming the service level is attained for one hour.</p>			
<b>Declared Noise Emissions (in accordance with ISO 7779 and ISO 9296)</b>	Sound Power ( $L_{Wad}$ , bels)		Sound Pressure ( $L_{pAm}$ , decibels)	
Typically Configured – Idle	2.5		14.3	
Fixed Disk – Random writes	2.5		14.3	
Optical Drive – Sequential reads	N/A		N/A	
<b>Longevity and Upgrading</b>	<p>This product can be upgraded, possibly extending its useful life by several years. Upgradeable features and/or components contained in the</p> <p>Spare parts are available throughout the warranty period and or for up to "5" years after the end of production.</p>			

## Technical Specifications

	<b>Additional Information</b>	<ul style="list-style-type: none"> <li>• This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive - 2011/65/EC.</li> <li>• This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directive – 2002/96/EC.</li> <li>• This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and Toxic Enforcement Act of 1986).</li> <li>• This product is in compliance with the IEEE 1680 (EPEAT) standard at the Gold level, see <a href="http://www.epeat.net">www.epeat.net</a></li> <li>• Plastics parts weighing over 25 grams used in the product are marked per ISO11469 and ISO1043.</li> <li>• This product is 88.9% recycle-able when properly disposed of at end of life.</li> </ul>			
	<b>Packaging Materials</b>	<b>External:</b>	PAPER/Corrugated	561 g	
			PAPER/Paperboard	8 g	
			PAPER/Molded Pulp	103 g	
	<p>The plastic packaging material contains at least 0.00% recycled content.</p> <p>The corrugated paper packaging materials contains at least 86.3% recycled content.</p>				
	<b>RoHS Compliance</b>	<p>HP Inc. complies fully with materials regulations. We were among the first companies to extend the restrictions in the European Union (EU) Restriction of Hazardous Substances (RoHS) Directive to our products worldwide through the HP GSE. HP has contributed to the development of related legislation in Europe, as well as China, India, and Vietnam.</p> <p>We believe the RoHS directive and similar laws play an important role in promoting industry-wide elimination of substances of concern. We have supported the inclusion of additional substances—including PVC, BFRs, and certain phthalates—in future RoHS legislation that pertains to electrical and electronics products.</p> <p>We met our voluntary objective to achieve worldwide compliance with the new EU RoHS requirements for virtually all relevant products by July 2013, and we will continue to extend the scope of the commitment to include further restricted substances as regulations continue to evolve.</p> <p>To obtain a copy of the HP RoHS Compliance Statement, see <a href="#">HP RoHS position statement</a>.</p>			
	<b>Material Usage</b>	<p>This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification for the Environment at <a href="http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html">http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html</a>):</p> <ul style="list-style-type: none"> <li>• Asbestos</li> <li>• Certain Azo Colorants</li> <li>• Certain Brominated Flame Retardants – may not be used as flame retardants in plastics</li> <li>• Cadmium</li> <li>• Chlorinated Hydrocarbons</li> <li>• Chlorinated Paraffins</li> <li>• Bis(2-Ethylhexyl) phthalate (DEHP)</li> <li>• Benzyl butyl phthalate (BBP)</li> <li>• Dibutyl phthalate (DBP)</li> </ul>			

### Technical Specifications

	<ul style="list-style-type: none"><li>• Diisobutyl phthalate (DIBP)</li><li>• Formaldehyde</li><li>• Halogenated Diphenyl Methanes</li><li>• Lead carbonates and sulfates</li><li>• Lead and Lead compounds</li><li>• Mercuric Oxide Batteries</li><li>• Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by the user.</li><li>• Ozone Depleting Substances</li><li>• Polybrominated Biphenyls (PBBs)</li><li>• Polybrominated Biphenyl Ethers (PBBEs)</li><li>• Polybrominated Biphenyl Oxides (PBBOs)</li><li>• Polychlorinated Biphenyl (PCB)</li><li>• Polychlorinated Terphenyls (PCT)</li><li>• Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily removed from most applications.</li><li>• Radioactive Substances</li><li>• Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)</li></ul>
<b>Packaging Usage</b>	HP follows these guidelines to decrease the environmental impact of product packaging: <ul style="list-style-type: none"><li>• Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.</li><li>• Eliminate the use of ozone-depleting substances (ODS) in packaging materials.</li><li>• Design packaging materials for ease of disassembly.</li><li>• Maximize the use of post-consumer recycled content materials in packaging materials.</li><li>• Use readily recyclable packaging materials such as paper and corrugated materials.</li><li>• Reduce size and weight of packages to improve transportation fuel efficiency.</li><li>• Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.</li></ul>
<b>End-of-life Management and Recycling</b>	HP offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: <a href="http://www.hp.com/go/reuse-recycle">http://www.hp.com/go/reuse-recycle</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.  The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <a href="http://www.hp.com/go/recyclers">http://www.hp.com/go/recyclers</a> . These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

### Technical Specifications

	<b>HP, Inc. Corporate Environmental Information</b>	<p>For more information about HP's commitment to the environment:</p> <p>Global Citizenship Report  <a href="http://www.hp.com/hpinfo/globalsustainability/gcreport/index.html">http://www.hp.com/hpinfo/globalsustainability/gcreport/index.html</a></p> <p>Eco-label certifications  <a href="http://www8.hp.com/us/en/hp-information/environment/ecolabels.html">http://www8.hp.com/us/en/hp-information/environment/ecolabels.html</a></p> <p>ISO 14001 certificates:  <a href="http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842">http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842</a>  and  <a href="http://www.hp.com/hpinfo/globalsustainability/environment/pdf/cert.pdf">http://www.hp.com/hpinfo/globalsustainability/environment/pdf/cert.pdf</a></p>
	<b>footnotes</b>	<ol style="list-style-type: none"> <li>1. Recycled plastic is expressed as a percentage of the total weight plastic. Post-consumer recycled is based on the definition set in the EPEAT standard for computers, IEEE 1680.1-2018 standard.</li> <li>2. External power supplies, WWAN modules, power cords, cables and peripherals excluded. Service parts obtained after purchase may not be Low Halogen.</li> <li>3. HP paper and fiber-based packaging for PCs, displays, home and office print, and supplies is reported by suppliers as recycled or certified, with a minimum of 97% by volume verified by HP. Packaging is the box that comes with the product and all paper-based materials inside the box. Packaging for personal systems accessories and spare parts is not included. Plastic cushions are made from &gt;90% recycled plastic.</li> </ol>

<b>Acoustic Noise Emission Declaration</b>						
Measurement and declaration standards:	ISO 7779: Acoustics – Measurement of airborne noise emitted by information technology and telecommunications equipment					
	ISO 9296: Acoustics – Declared noise emission values of computer and business equipment					
<b>Declared Noise Emission Values in accordance with ISO 9296</b>						
Product Configuration or Operating Mode # (see section below for description)	Declared Sound Power Level, $L_{Wd}$ Bels			Declared Sound Pressure Level, $L_{pAm}$ dBA		
	Tested on ISO Table					
Idle	Operating		Idle	Operating		
	ECMA-74 C.15.3.2	Drive Random Seek	ECMA-74 C.15.3.3 g	ECMA-74 C.15.3.2	ECMA-74 C.9.3.2	ECMA-74 C.15.3.3 g
Idle Mode			Active Mode	Idle Mode	Drive Random Seek	Active Mode
Vertical	2.6	2.6	2.6	13.7	13.7	13.7
Horizontal	2.6	2.6	2.6	N/A	N/A	N/A
The Product meets the acoustic noise limits of these voluntary Eco labels:				TCO Certified Blue Angel Nordic Swan EU Flower		

**NOTE:** Measured under ISO 7779 and ISO 9296 measurement and declaration standards.

### Summary of Changes

Date of change:	Version History:	Type of change	Description of change:
February 20, 2025	From v1 to v2	Changed	Environmental Data section
July 9, 2025	From v2 to v3	Changed	Format page 1
August 5, 2025	From v3 to v4	Changed	AT A GLANCE section
December 9, 2025	From v4 to v5	Removal	Front USB-C column removed from resolution table @ Display Support section / M.2 slots number changed to 2

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