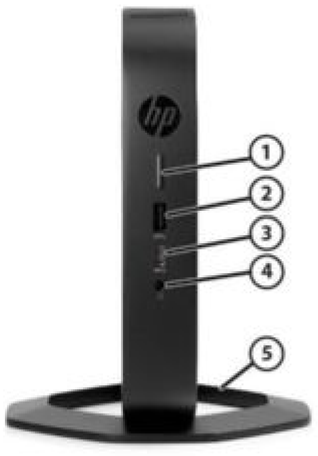
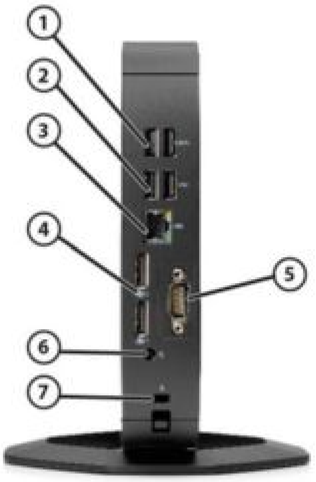
HP t540 Thin Client





	FRONT
1	Power Button
2	(1) USB-A 3.1 Gen1 (5Gbps)
3	(1) USB-C® 3.1 Gen1 (5Gbps)
4	3.5mm Universal Audio Jack
5	System stand

	BACK
1	(2) USB-A 3.1 Gen2 (10Gbps)
2	(2) USB-A 2.0
3	(1) RJ45 1Gb Ethernet
4	(2) DisplayPort™ 1.2
5	Configurable Option Port supporting one of the following: • Serial • VGA • External Wi-Fi® antenna • HDMI • 2x USB-A 3.1 Gen1(5Gbps) • DisplayPort™ over USB-C® • No optional port
6	DC 4.5mm
7	Cable Lock support

AT A GLANCE

- AMD Ryzen^{TM} Embedded R1305G with Radeon^{TM} Vega 3 Graphics (1.5 GHz base clock, up to 2.8 GHz max boost clock, 4 MB L3 cache, 2 cores)
- DDR4 single channel SDRAM system memory; up to 2400 MT/s transfer rate; t1 SODIMM slot
- 2 x DisplayPort^{TM} 1.2 video outputs supporting up to UHD/4K (3840 x 2160) resolutions
  NOTE: DisplayPort^{TM} cables and displays sold separately.

- 16 GB up to 512 GB NAND flash memory; non-volatile; M.2 form factor module
- RJ45 Gigabit Ethernet (GbE) network connection
- Optional Wi-Fi® 6 AX200 ax 2x2 +BT 5including antennas integrated internally in the chassis
  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

- • Option Port with a selection of available factory options (see detailed listing later in this document)
- • 3.5 mm combo headset audio jack
- 45W non-PFC external power adapter
- • TPM version 2.0 (available with WIN 10 IoT system); UEFI (BIOS), cable lock slot
- 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 and EPEAT® Silver 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.
- • Post-consumer recycled plastics content 45% total unit plastics (by weight)
- • Low halogen[2] material content
- • All models TAA compliant in North America

[1] Wireless access point and Internet access is required; availability of public wireless access points is limited

[2] This product is low halogen except for power cords, cables and peripherals; service parts obtained aftermarket may not be low halogen

[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. AMD's numbering is not a measurement of clock speed.

Warranty

HP Customer Support: limited three-year hardware limited warranty in most regions; Optional HP Care Packs are available and are extended service contracts that go beyond your standard limited warranties; for more details visit http://www.hp.com/go/cpc

OPERATING SYSTEMS

- HP ThinPro, including HP Smart Zero Core
- • ~~Windows 10 IoT Enterprise LTSC 2019~~

PROCESSOR

Model	CPU Frequency Max/Base	Cores/Threads	GPU Type	GPU Frequency
AMD Ryzen™ R1305G	1.5/2.8 GHz	2/4	Radeon™ Vega 3	1000 MHz

GRAPHICS

Number of displays supported:	Up to 2x simultaneous displays	
Video outputs:	Standard:	(2) DisplayPort™ 1.2
	Optional:	(1) DisplayPort™ over USB-C® with USB Power Delivery (1) VGA analog output (1) HDMI digital output
	NOTE: adding and optional output does not increase the number of displays supported.	
Max. screen resolution:	DP and HDMI max: 3840x2160 VGA max: 2048x1152@50Hz / 1920x1080	

Windows 10 IoT	**=2 x 1080p FHD (1920x1080) 60Hz**	**1 x 4K UHD (3840x2160) 30Hz**	**2 x 4K UHD (3840x2160) 30Hz**	**1 x 4K UHD (3840x2160) 60Hz**
Static screen (no video)	√	√	√	√
Play 1080p 30fps (or below) video	√	√	√	√
Play 1080p 60fps video				
Play 4k @ 30fps video				

Thinpro7.1+SP8	**=2 x 1080p FHD (1920x1080) 60Hz**	**1 x 4K UHD (3840x2160) 30Hz**	**2 x 4K UHD (3840x2160) 30Hz**	**1 x 4K UHD (3840x2160) 60Hz**
Static screen (no video)	√	√	√	√

MEMORY

Type:	DDR4 Single Channel SODIMM
Data Transfer Rate:	Up to 2,400 MT/s
Number of Slots	1 x SODIMM
Capacities:	4, 8, 16 GB

NOTEs:

- The system's 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

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 guidelines

STORAGE

Type:	NAND flash memory; non-volatile
Number of Sockets:	1 x M.2
Capacities:	16 GB M.2 eMMC Flash Memory* 32 GB M.2 eMMC Flash Memory 64 GB M.2 eMMC Flash Memory 128 GB M.2 NVMe Flash Memory 256 GB M.2 NVMe Flash Memory 512 GB M.2 NVMe Flash Memory *This option is only for ThinPro and Smart Zero.

Input/Output

	Front access:	(1) USB-A 3.1 Gen 1 (5Gbps signaling rate) (1) USB-C® 3.1 Gen 1 port (5Gbps signaling rate) (1) 3.5mm Universal Audio Jack
	Rear access:	(2) DisplayPort™ 1.2 (2) USB-A 3.1 Gen2 (10Gbps) (2) 2xUSB-A 2.0 RJ45 1Gb Ethernet Cable Lock support
Video Outputs:	Standard:	(2) DisplayPort™ 1.2 digital outputs
	Optional:	(1) VGA analog output (1) HDMI 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 1Gb Ethernet (Rear) (1) 3.5 mm universal audio jack (front)
Option Port:	The rear I/O panel includes an Option Port that can be configured with one of the following factory options:	

- Serial
- VGA
- External Wi-Fi® antenna
- HDMI
- 2x USB-A 3.1 Gen1(5Gbps signaling rate)
- DisplayPort^{TM} over USB-C® with USB Power Delivery
- No optional port

AUDIO/VIDEO

Audio

- Integrated PC speaker for basic audio playback
- 3.5 mm headset audio port on front supporting headphones, headset, external speaker systems, or microphone.
- Realtek ALC3247 high definition audio Codec; 4-channel DAC supports 16/20/24-bit PCM for independent stereo sound output (streaming playback); the 4-channel ADC supports 16/20/24-bit
- PCM format for two stereo and independent analog sound inputs; incorporating Realtek converter technology achieves a 97dB dynamic range playback quality and a 90dB dynamic range recording quality. It meets WLP (Windows Logo Program) requirements for Windows systems.

Video CODECs

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

HARDWARE SECURITY

- Security lock support (cable lock sold separately)
- Trusted Platform Module (version 1.2 or 2.0 depending on the model's operating system)

NETWORKING

Local Area Networking	Realtek RTL8111HSH Gigabit Ethernet (GbE) Controller
Wi-Fi® Networking	Intel® Wireless-AX200 ax 2x2 and Bluetooth 5

NOTES:

Wireless access point and internet access required. Availability of public wireless access points limited

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

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 ThinPro	Micros Windows 10 IoT 2
Remote Desktop Services	Remote FX (RFX), RDP	√	√
Citrix®	ICA, HDX	√	√
VMware® Horizon	RDP, PCoIP, Blast Extreme	√	√

Protocol Clients	HP ThinPro	Microsoft Windows 10 IoT 2019 L
Citrix® Workspace app	√	√
Microsoft Remote Desktop Client		√
Free Remote Desktop Client	√	
VMware™ Horizon View™ Client	√	√
HP ZCentral Remote Boost	via add-on	via add-on
Turbosoft TTerm for Linux® Terminal emulation Software	via add-on	
Turbosoft TTWin Terminal emulation software		via add-on

Browser Support	HP ThinPro	Microsoft Windows 10 IoT 2019 L
Internet Browser	√	
Internet Explorer		√

Security	HP ThinPro	Microsoft Windows 10 IoT 2019 L
Smart Card	√	√
Log-on Manager	√	√
Read only Operating System	√	
802.1x	√	√
Microsoft Windows Defender		√
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 requi

Technical Specifications

Management Tools	**HP ThinPro**	**Microsoft Windows 10 IoT 2019 LT**
HP Device Manager	√	√
HP ThinUpdate		√
HP Easy Tools	√	
HP Smart Zero Client Services	√	
Microsoft SCCM/EDM agent		√
HP USB Port Manager		√

Additional Windows Components	**HP ThinPro**	**Microsoft Windows 10 IoT 2019 LT**
HP Easy Shell		√
Windows Media Player		√
Microsoft Direct Access		√
Microsoft BranchCache		√
Microsoft AppLocker		√
Microsoft Sideloading		√
CyberLink		√
Microsoft BitLocker		√

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

Audio/Video CODECs	**HP ThinPro**	**Microsoft Windows 10 IoT 2019 LT**
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)	√	√
WMV 7/8/9/ VC-1 & ASF Demuxer	√	√

WEIGHTS & DIMENSIONS

W x D x H: (vertical orientation)	35 x 200 x200 mm; (1.38 x 7.87 x 7.87 in.)
Volume:	1.4 liter
System Weight (unit with stand)	969g
Shipping Weight	2,879g

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

EXTERNAL POWER SUPPLY

45W non-PFC Smart external power adapter; 4.5mm Right Angle 1.8m output cable

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

Entergy saving automatic power-down; surge tolerant

External power adapters are sourced from several suppliers in order to ensure adequate supply and availability is maintained. The actu 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

COMPLIANCE/CERTIFICATIONS

Accessibility:	Section 508 Accessibility; VPAT report available.
Environmental Stewardship:	Worldwide (ENERGY STAR®, EPEAT® 2.0, RoHS2, ERP, TCO, CECP& SEPA, HP GSE, W
Product Safety:	Worldwide (UL, CB, GS, CCC, BSMI, etc.)
Electromagnetic Compliance (EMC):	Worldwide (FCC/CISPR/EN/VCCI/ICES/AS/NZS/CNS/KCC) "Class B"? EMI regulations
Eco-Label Certifications & declarations	This product has received or is in the process of being certified to the following approvals and may be labeled with one or more of these marks: • US ENERGY STAR® • EPEAT® Silver registered in the United States. Based on US EF registration according to IEEE 1680.1-2018 EPEAT®. Status va Visit www.epeat.net for more information. • IT ECO declaration

ENVIRONMENTAL

Operating Temperature Range:	50° to 104° F 10° to 40° C	
Non-operating Temperature Range:	-22° to 140° F -30° to 60° C	
Humidity:	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 sunligh be limited by the type and number of options installed.

Technical Specifications

Basic Configuration :

Energy Consumption (in accordance with US ENERGY STAR® test method)	**115 V ac, 60 Hz**	**230 V ac, 50 Hz**	**1**
Normal Operation (Short idle)	7.03W	7.04W	
Normal Operation (Long idle)	6.63W	6.63W	
Sleep	0.82W	0.86W	
Off	0.77W	0.78W	

Heat Dissipation*	**115 V ac, 60 Hz**	**230 V ac, 50 Hz**	**1**
Normal Operation (Short idle)	25 BTU/hr	26 BTU/hr	
Normal Operation (Long idle)	20 BTU/hr	21 BTU/hr	
Sleep	3 BTU/hr	3 BTU/hr	
Off			

NOTE: Heat dissipation is calculated based on the measured watts, assuming the ser one hour.

System configuration includes: ThinPro- 64 bit, 16/32/64/128/256 GB storage, 4/8/16 GB of syst Keyboard and USB Mouse

Additional Information

- This product is in compliance with the Restrictions of Hazardous Substances (RoHS) directive -2011/65/E
- This HP product is designed to comply with the Waste Electrical and Electronic Equipment (WEEE) Directi 2002/96/EC.
- This product is in compliance with California Proposition 65 (State of California; Safe Drinking Water and T Enforcement Act of 1986).
- This product is in compliance with the IEEE 1680 (EPEAT) standard at the silver level, see www.epeat.net
- Plastics parts weighing over 25 grams used in the product are marked per ISO 11469 and ISO1043.
- This product contains 13.9 % post-consumer recycled plastic (by wt.) | Plastic declaration for main chassis
- This product is 93.4 % recycle-able when properly disposed of at end of life.

Packaging Materials External: PAPER/Corrugated 455 g
Internal: PLASTIC/Polyethylene Expanded - EPE 44 g
PLASTIC/Polyethylene low density - LDPE 5 g

RoHS Compliance 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 o requirements of the RoHS Directive on a worldwide basis. By July 1, 2006, RoHS substances will be virtually eliminated (virtually = to for all HP electronic products subject to the RoHS Directive, except where it is widely recognized that there is no technically feasible a an exemption under the EU RoHS Directive).

Material Usage

This product does not contain any of the following substances in excess of regulatory limits (refer to the HP General Specification fo http://www.hp.com/hpinfo/globalcitizenship/environment/supplychain/gen_specifications.html):

- Asbestos
- Certain Azo Colorants
- Certain Brominated Flame Retardants – may not be used as flame retardants in plastics | t540 uses only L coatings
- Cadmium
- Chlorinated Hydrocarbons
- Chlorinated Paraffins
- Formaldehyde

Technical Specifications

- Halogenated Diphenyl Methanes
- Lead carbonates and sulfates
- Lead and Lead compounds
- Mercuric Oxide Batteries
- Nickel – finishes must not be used on the external surface designed to be frequently handled or carried by t
- Ozone Depleting Substances
- Polybrominated Biphenyls (PBBs)
- Polybrominated Biphenyl Ethers (PBBEs)
- Polybrominated Biphenyl Oxides (PBBOs)
- Polychlorinated Biphenyl (PCB)
- Polychlorinated Terphenyls (PCT)
- Polyvinyl Chloride (PVC) – except for wires and cables, and certain retail packaging has been voluntarily re most applications.
- Radioactive Substances
- Tributyl Tin (TBT), Triphenyl Tin (TPT), Tributyl Tin Oxide (TBTO)

Packaging

HP follows these guidelines to decrease the environmental impact of product packaging:

- Eliminate the use of heavy metals such as lead, chromium, mercury and cadmium in packaging materials.
- Eliminate the use of ozone-depleting substances (ODS) in packaging materials.
- Design packaging materials for ease of disassembly.
- Maximize the use of post-consumer recycled content materials in packaging materials.
- Use readily recyclable packaging materials such as paper and corrugated materials.
- Reduce size and weight of packages to improve transportation fuel efficiency.
- Plastic packaging materials are marked according to ISO 11469 and DIN 6120 standards.

End-of-life Management and Recycling

HP Inc. offers end-of-life HP product return and recycling programs in many geographic areas. To recycle your product, please go to: http://www.hp.com/go/reuserecycle or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or responsible manner.

The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by trea information (product disassembly instructions) is posted on the HP Inc. web site at: http://www.hp.com/go/recyclers. These instruc recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

HP, Inc. Corporate Environmental Information

For more information about HP's commitment to the environment:
Global Citizenship Report
http://www.hp.com/hpinfo/globalcitizenship/gcreport/index.html
Eco-label certifications
http://www.hp.com/hpinfo/globalcitizenship/environment/productdesign/ecolabels.html
ISO 14001 certificates:
http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=c04755842
and
http://www.hp.com/hpinfo/globalcitizenship/environment/pdf/cert.pdf

Summary of Changes

Date of change:	Version History:	Type of change	Description of change:
November 23, 2020	From v1 to v2	Changed	At a Glance and GRAPHICS sections

title

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