

Lenovo P350 Tiny

Version: 3.0 | 05/05/2023

Downloads

Hardware Maintenance Manual	P350 Tiny HMM
Drivers & Software	P350 Drivers & Software

SECTION I: Platform Overview

Description	Engineered to go where others can't, the ThinkStation® P350 Tiny combines simple and efficient design with the professional power of a workstation.
-------------	-----------------------------------------------------------------------------------------------------------------------------------------------------

CPU

Processor Support	Intel Rocket Lake Core
Socket Type	Socket-H4 (LGA 1200)

Operating Systems

Preloaded	Windows 10 Pro 64-bit Windows 10 Home 64-bit Ubuntu 20.04 LTS (configuration specific)
Supported	Ubuntu 20.04 LTS Red Hat Enterprise Linux 8.3

Memory

Slots	Up to 2 SODIMMs
Channels	Supports up to 2 SODIMM Sockets, 2 Channels
Type	260-Pin, 3200MHz non-ECC SODIMM
ECC Support	No
Speed	Up to 3200MHz
Max DIMM Size	32GB DDR4 SODIMM
Max System Memory	64GB

Storage

PCIe	2 x M.2 PCIe Connectors, Gen 4 Onboard
------	----------------------------------------

Video

Integrated Graphics	Intel Integrated UHD Graphics 750
Discrete Graphics	PCIe Add-In-Card, Details in Section Below
Multi-GPU Support	Yes
Type	PCIe Add-In-Card
Bus Interface	PCIe x8 Gen 3 Routed From CPU

Front I/O

USB	2 x USB 3.2 Gen 2 Type-A 10Gb/s 2 x USB 3.2 Gen 1 Type-A 5Gb/s 1 x USB 3.2 Gen 2 Type-C 10Gb/s 1 x USB 3.2 Gen 2 Type-C 20Gb/s
Audio	1 x Combo Audio/Microphone Jack (3.5mm)
Disclaimers	Note: Actual USB throughput will vary depending on the type and quantity of USB devices used.

Rear I/O

USB	2 x USB 3.2 Gen 2 Type-A 10Gb/s 2 x USB 3.2 Gen 1 Type-A 5Gb/s
DisplayPort	1 x Standard Optional 1 x Rear Port

HDMI	1 x Standard Optional 1 x Rear Port
VGA Port	Optional 1 x Rear Port
Serial Port	Optional 2 x Rear Port
Ethernet	1 x 1GbE - RJ45
Optional USB Adapter	Optional Single Type-C + DP Port
Optional Network Adapter	Intel I350-T2 Dual Port Gigabit Ethernet Adapter Intel I350-T4 Quad Port Gigabit Ethernet Adapter
Disclaimers	Note: Actual USB throughput will vary depending on the type and quantity of USB devices used.

Ethernet

Vendor	Intel Jacksonville I219LM
Speeds	10/100/1000Mbps
Functions	PXE, ASF, WoL, Jumbo Frames, Teaming
Connectors	1 x RJ45

Audio

Vendor	Realtek
Type	Integrated Audio
Internal Speaker	Yes
Connectors	Mic + Headphone combo jack
Chipset	Realtek ALC233VB
Number of Channels	2 Channels
Number of Bits/Audio Resolution	2 Channels of DAC support 24-bit PCM format 2 Channels of ADC support 16-bit PCM format

Thermal

Temp Sensors	Ambient Sensor VR Sensor M.2 Sensor
Fans	1 x CPU Fans

Power Specifications

Power Supply	170W	230W
--------------	------	------

Power Efficiency	89% Efficient @ 50% Load	89% Efficient @ 50% Load
Operating Voltage Range	100 - 240V	100 - 240V
Rated Voltage Range	90-264VAC	90-264VAC
Rated Line Frequency	47Hz / 63Hz	47Hz / 63Hz
Operating Line Frequency Range	50Hz / 60Hz	50Hz / 60Hz
Rated Input Current	2.5A	3.5A
Graphics	No	No
Power Supply Fan	No	No
ENERGY STAR® Qualified (config dependent)	Yes	Yes
Aux Power Drop	No	No

BIOS

Vendor	AMI
Self-Healing BIOS	Yes

Chassis Information

Color	Raven Black
PSU	230W Power Brick (Chicony, A18-230P1A) Dimensions: 200*100*25.4mm Weight: 878.8g Slim 170W Power Brick (Delta, ADP-170CB) Dimensions: 150*77*22mm Weight: 457g
Thermal Solutions	One System Fan Standard
Dimensions	36.5mm/1.437" H 182.9mm/7.2" D 179mm/7.047" W
Weight	1.25kg / 2.756lbs

Packaging Dimensions

Height (mm/in)	490mm / 19.29"
Width (mm/in)	141mm / 5.55"
Depth (mm)	268mm / 10.55"
Weight (kgs/lbs)	2.848kg / 6.28lbs

Security & Serviceability

TPM	Infineon SLB9670, FW 7.85, TPM 2.0
Asset ID	Yes, 1024 x 8bit
vPro	Intel vPro for WS (AMT 14.x)
Cable Lock Support	Yes, Optional Kensington Cable Lock
Serial, Parallel, USB, Audio, Network, Enable/Disable Port Control	Yes
Power-On Password	Yes
Setup Password	Yes
NIC LEDs (integrated)	Yes
Access Panel Key Lock	No
Boot Sequence Control	Yes
Padlock Support	No
Boot without keyboard and/or mouse	Yes
Access Panel	Tool-less Side Cover Removal
Optical Drive	Optional via External ODD Box
Hard Drives	Tool-less
Expansion Cards	Retained With Screws
Processor Socket	Tool-less
Color coded User Touch Points	Yes
Color-coordinated Cables and Connectors	Yes
Memory	Tool-less
System Board	Retained With Screws
Restore CD/DVD/USB Set	Not Included, Restore Media Available via Lenovo Customer Support Center

Operating Environment

Air Temperature	Operating: 10°C to 35°C (50°F to 95°F) Non-operating: -40°C to 60°C (50°F to 140°F)
Storage	Storage: -40°C to 60°C (-40°F to 140°F) in Original Shipping Carton Storage: -10°C to 40°C (14°F to 104°F) Without Carton
Humidity	Relative Humidity Operating: 20% to 80% (non-condensing) Relative Humidity Storage/Transit: 20% to 90% (non-condensing)
Altitude	Operating: -15.2m to 3048m (-50ft to 10000ft) Storage: -15.2m to 10668m (-50ft to 35000ft)
Vibration	Package Vibration: Random, 1.04G at 2-200 Hz, 1 octave/min Operating Vibration: Random, 0.27G at 5-500 Hz, 0.5 octave/min

	Non-Operating Vibration: Random,1.04G at 2-200 Hz, 1 octave/min
Shock	Operating Shock: 45-G faired square wave with a velocity change of 441 cm/sec (173.7 inches/sec) Non-operating Shock: Bottom half-sine pulse with a change in velocity of 37.4 cm/sec (14.7 inches/sec)

SECTION II: Platform Detail

Board Size	6.75" x 6.89" (171.5mm x 175mm)
Layout	Custom ATX

Motherboard Core

Processor Support	Intel Rocket Lake Core
Socket Type	Socket-H4 (LGA 1200)
Memory Support	DDR4 up to 3200MHz SODIMM Memory
Voltage Regulator	65W TDP Capable
Chipset (PCH)	Intel Q570 Chipset
Flash	32MB
Super I/O	Nuvoton NCT6692D
Clock	Intel Native isCLK
Audio	Realtek ALC233VB Codec
Ethernet	Intel Jacksonville I219LM

Supported Components

Processor Level	Intel Rocket Lake Core
Processor	i9-11900 i7-11700 i5-11600 i5-11500 i5-11400 i3-10325 i3-10305 i3-10105 i9-11900T i7-11700T i5-11600T i5-11500T i5-11400T i3-10305T i3-10105T

Memory Type	SODIMM 3200 MHz
Memory	4GB 3200MHz DDR4 SDRAM SODIMM 8GB 3200MHz DDR4 SDRAM SODIMM 16GB 3200MHz DDR4 SDRAM SODIMM 32GB 3200MHz DDR4 SDRAM SODIMM

Storage

M.2 PCIe Solid State Drive (SSD)	256GB M.2 PCIe SSD, Gen 4 x4, NVMe, OPAL 512GB M.2 PCIe SSD, Gen 4 x4, NVMe, OPAL 1024GB M.2 PCIe SSD, Gen 4 x4, NVMe OPAL 2048GB M.2 PCIe SSD, Gen 4 x4, NVMe OPAL
----------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

RAID

Notes	Supported RAID levels for a system will vary from the stated capabilities of the RAID controller due to dependencies on the number and capacity of physical disks in the system and on customer requirements for performance, fault tolerance, or data redundancy. Max supported RAID 0/1.
-------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Optical Drive/Removable Media

DVD-ROM Drive	Optional via External ODD Box - Slim DVD-ROM Drive
DVD Burner/CD-RW Drive	Optional via External ODD Box - Slim DVD Burner/CD-RW Drive

Keyboard and Pointing Devices

Keyboard	Traditional USB Keyboard Calliope Wireless Keyboard
Pointing Devices	Calliope USB Mouse Calliope Wireless Mouse Fingerprint USB Mouse

Expansion Bays

PCIe Adapters

Network	Intel I350-T2 Dual Port Gigabit Ethernet Adapter Intel I350-T4 Quad Port Gigabit Ethernet Adapter
---------	------------------------------------------------------------------------------------------------------

Thunderbolt	Rear Thunderbolt PCIe Adapter
WiFi Cards	Intel PCIe WiFi Card With BT External Antenna Kit (Intel AX201 vPro) Intel PCIe WiFi Card with BT External Antenna Kit (Intel AX201 non-vPro) Intel PCIe WiFi Card With BT External Antenna Kit (Intel 9560 non-vPro) Foxconn PCIe WiFi Card with BT External Antenna Kit (Foxconn RTL8822CE non-vPro)

SECTION III: Supported Component Detail

CPU Specifications

CPU	Intel Core i9-11900	Intel Core i7-11700	Intel Core i5-11600	Intel Core i5-11500	Intel Core i5-11400	Intel Core i3-10325
# of Cores	8c	8c	6c	6c	6c	4c
# of Threads	16	16	12	12	12	8
Processor Base Frequency	2.5GHz	2.5GHz	2.8GHz	2.7GHz	2.6GHz	3.9GHz
Max Turbo Frequency	5.2GHz	4.9GHz	4.8GHz	4.6GHz	4.4GHz	4.7GHz
Cache	16M	16M	12M	12M	12M	8M
TDP	65W	65W	65W	65W	65W	65W

CPU Specifications

CPU	Intel Core i3-10305	Intel Core i3-10105	Intel i9-11900T	Intel i7-11700T	Intel i5-11600T	Intel i5-11500T
# of Cores	4c	4c	8c	8c	6c	6c
# of Threads	8	8	16	16	12	12
Processor Base Frequency	3.8GHz	3.7GHz	1.5GHz	1.4GHz	1.7GHz	1.5GHz
Max Turbo Frequency	4.5GHz	4.4GHz	4.9GHz	4.6GHz	4.1GHz	3.9GHz
Cache	8M	6M	16M	16M	12M	12M
TDP	65W	65W	35W	35W	35W	35W

CPU Specifications

CPU	Intel i5-11400T	Intel i3-10305T	Intel i3-10105T
# of Cores	6c	4c	4c

# of Threads	12	8	8
Processor Base Frequency	1.3GHz	3.0GHz	3.0GHz
Max Turbo Frequency	3.7GHz	4.0Ghz	3.9GHz
Cache	12M	8M	6M
TDP	35W	35W	35W
Disclaimers			

Solid State Storage Specifications

Drive	NVMe 2280 M.2 256GB PCIe SSD (OPAL)	NVMe 2280 M.2 512GB PCIe SSD (OPAL)	NVMe 2280 M.2 1TB PCIe SSD (OPAL)	NVMe 2280 M.2 2TB PCIe SSD (OPAL)
Dimensions Millimeters (W x D x H)	22x80x2.38mm	22x80x2.38mm	22x80x2.38mm	22x80x2.38mm
Interface Type	PCIe Gen 4x4	PCIe Gen 4x4	PCIe Gen 4x4	PCIe Gen 4x4
Power Active (AVG)	5.8W	5.8W	5.8W	5.8W
Power Idle	35mW	35mW	35mW	35mW
Typical Sequential Read	5000 MB/s	6000 MB/s	6400 MB/s	6400 MB/s
Typical Sequential Write	1600 MB/s	3200 MB/s	3800 MB/s	5000 MB/s
Burst Random Read (4K Queue Depth 32/8 thread);	250K IOPS	500K IOPS	550K IOPS	550K IOPS
Burst Random Write (4K Queue Depth 32/8 thread)	200K IOPS	370K IOPS	400K IOPS	400K IOPS
Operating Temperature Range	0 to 70°C	0 to 70°C	0 to 70°C	0 to 70°C
Endurance Rating (Lifetime Writes)	85 TB	150 TB	300 TB	600 TB
Mean Time Between Failures (MTBF)	2.0M POH	2.0M POH	2.0M POH	2.0M POH
Hardware Encryption	AES 256 bit	AES 256 bit	AES 256 bit	AES 256 bit
Disclaimers				
HDD Controllers				
PCI Bus				
PCI Modes				
Data Transfer Rates				
Disclaimers				

Optical Drive Specifications

Description	9mm Slim DVD ROM Drive (SATA)- Win10	9mm Slim DVD Burner/CD-RW Drive (SATA)- No OS/Linux
Interface Type	SATA 1.5 Gb/s	SATA 1.5 Gb/s

Dimensions	128±0.4×9.0 ±0.4×127±0.4(Max) Unit:mm (Without Bezel-W x H x D)	128±0.4×9.0 ±0.4×127±0.4(Max) Unit:mm (Without Bezel-W x H x D)
Disc Capacity	NA	NA
Type	DVDROM	DVDWriter
External Dimensions	NA	NA
Speed	NA	NA
Bay Type	9.0mm Tray	9.0mm Tray
Color	Business Black or without bezel	Business Black or without bezel
Removable	No	No
Internal Buffer Size	0.5MB Min	0.5MB Min
Writes	NA	8XDVD+R / 8XDVD+RW / 6XDVD+R DL 8XDVD-R / 6XDVD-RW / 6XDVD-R DL 24XCD-R / 16XCD-RW
Reads	8XDVD-ROM / 24XCD-ROM	8XDVD-ROM / 24XCD-ROM
Source	DC Power 5V	DC Power 5V
DC Power Requirements	+5V±5%	+5V±5%
DC Current	Max 2.5A@5v	Max 2.5A@5v
Operating Systems Supported	All Windows OS	All Windows OS
Temperature	Operating: 5°C to 45 °C Non-Operating:-30°C to 60°C	Operating: 5°C to 45 °C Non-Operating:-30°C to 60°C
Relative Humidity	Operating > Read: 15 % to 85 % (Non-Condensing) Write 15 % to 80 % (Depend on the Temperature) Storage/Transportation> 10 % to 80 % (Non-Condensing)	Operating > Read: 15 % to 85 % (Non-Condensing) Write 15 % to 80 % (Depend on the Temperature) Storage/Transportation> 10 % to 80 % (Non-Condensing)
Maximum Wet Bulb Temperature		
Disclaimers		

Integrated Graphics Adapter

Type	Intel® UHD Graphics 750	Intel UHD Graphics 630
Display Interface	1x DP 1.2, 1x HDMI 2.0	1x DP 1.2, 1x HDMI 1.4
Video Resolution (max)	4096x2304 @ 60Hz (DP) .4096x2160@60Hz (HDMI)	4096x2304 @ 60Hz (DP), 4096x2304 @ 24Hz (HDMI)
Disclaimers		

Discrete Graphics Adapter

Adapter	Quadro T600	Quadro P1000	NNVIDIA T1000 (miniDP x4) – 4GB GDDR6 Tiny LP
Bus Interface	PCI Express 3.0 x8	PCIe 3.0 x16	PCI Express 3.0 x8
Display Interface	Four mini-DisplayPort connectors	4 x mDP 1.4	Four mini-DisplayPort connectors
Graphics Chipset	TU117-850	Pascal	TU117-875
Memory Clock Frequency (MHz)	5001MHz	1253MHz	5001MHz
Memory Size	4GB	4GB GDDR5	4GB
Memory Interface	128bit	128-bit	128bit
Memory Bandwidth	Up to 160GB/s	Up to 82GB/s	32.4 Gbps
GPU Cores	640	CUDA Cores: 640	896
GPU Core Frequency (MHz)	Base:735 MHz Boost:2100 MHz	1266MHz	Base:1065 MHz Boost:1395 MHz Max Boost:2100 MHz
Maximum Power Consumption	40W	47W	50W
Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital)	4 x 4096x2160 @ 60Hz 4 x 5120x2880 @ 60Hz	4 x 4096x2160 @ 60Hz 4 x 5120x2880 @ 60Hz	DisplayPort 1.4a Maximum pixel clock: 2660M Pixels per second Maximum bandwidth: 32.4 Gbps Example of maximum resolutions with CVT-RB timings: •7680 x 4320 x 24 bpp at 120 Hz •7680 x 4320 x 24 bpp at 60 Hz •5120 x 2880 x 24 bpp at 60 Hz HDMI™ 2.0b Maximum resolution: •7680 x 4320 x 24 bpp at 30 Hz Simultaneous display support Up to four simultaneous displays
Thermal Solution	Active	Ultra-quiet Active Fansink	Ultra-quiet Active Fansink
Dimension	2.713 inches x 6.137 inches, single-slot	2.713” H x 5.7” L Single Slot, Low Profile	2.713 inches x 6.137 inches, single-slot
Disclaimers			

Intel® Ethernet Specifications

Card	Intel Jefferson Peak 2 9560	Intel Wi-Fi 6 AX201 2*2ax+BT5.0	Foxconn RTL8822CE 2*2ac+BT5.0	Intel I350-T2 Dual Port Gigabit	Intel I350-T4 Quad Port Gigabit
------	-----------------------------	---------------------------------	-------------------------------	---------------------------------	---------------------------------

	2*2ac+BT5.0 PCIe Non- vPro M.2 Module (CNVi)	vPro PCIe M.2 2230 Module (CNVi)	PCIe M.2 WLAN module	Ethernet Adapter (Stony Lake T2)	Ethernet Adapter (Stony Lake T4)
Supplier PN	9560.NGWG .NV MM# 957715	AX201.NGWG MM# 985841	T99H152.00	I350T2G1P2 0, MM# 928941	I350T4G1P2 0, MM# 928942
Data Rates Supported	5G/2.4G WIFI	5G/2.4G WIFI	5G/2.4G WIFI	10/100/1000 Mbps (Copper), 1000Mbps (Fiber)	10/100/1000 Mbps (Copper), 1000Mbps (Fiber)
Controller Details	-	-	-	Intel Ethernet Controller I350	Intel Ethernet Controller I351
Controller Bus Architecture	PCIe Gen3	PCIe Gen3	PCIe Gen3	PCIe 2.1 (5GT/s)	PCIe 2.1 (5GT/s)
Data Transfer Mode	Wireless +BT	Wireless +BT	Wireless +BT	Ethernet	Ethernet
Power Consumption	-	-	-	Copper: I350-T2 V2= 4.4W Fiber: I350-F2= 5.5W	Copper: I350T4V2= 5W LC-Fiber: I350F4= 6W
IEEE Standards Compliance	802.11 abgn+acR2 MIMO 2X2 +MU-MIMO	802.11 abgn+acR2 +ax MIMO 2X2	802.11a/b/g/ n/ac	IEEE 802.3/10BA SE-T, 100BASE- TX, 1000BASE-T	IEEE 802.3/10BA SE-T, 100BASE- TX, 1000BASE-T
Boot ROM Support	UEFI boot	Core boot UEFI boot	-	PXE boot, Intel iSCSI Remote Boot for Windows, Linux and Vmware, Intel BootAgent Software via PXE or BootP, WDMS or UEFI	PXE boot, Intel iSCSI Remote Boot for Windows, Linux and Vmware, Intel BootAgent Software via PXE or BootP, WDMS or UEFI
Network Transfer Mode (Full/Half Duplex)	Supported	Supported	-	Supported	Supported
Network Transfer Rate	-	-	-	1,000Mbps Full Duplex	1,000Mbps Full Duplex
Operating System Driver Support	Windows 8.1, Windows 10, Linux, Chrome	Windows 10, Linux, Chrome	Windows 10	Windows 7/8/10, Linux, Free BSD, XEN,Vmware	Windows 7/8/10, Linux, Free BSD, XEN,Vmware
Manageability	-	-	-	Supported	Supported
Manageability Capabilities Alerting	-	-	-	Supported	Supported
TDP	-	-	-	Firmware Based Thermal	Firmware Based Thermal

				Management	Management
Operating Temperature Range	0°C - 80°C	0°C - 80°C	0°C - 70°C	0°C to 55°C (32°F to 131°F)	0°C to 55°C (32°F to 131°F)
# of Ports	-	-	-	2	4
Data Rate Per Port	-	-	-	10/100/1000 Mbps (copper), 1000Mbps (fiber)	10/100/1000 Mbps (copper), 1000Mbps (fiber)
System Interface Type	PCIe Gen3 x4	PCIe Gen3 x4	PCIe Gen3 x4	PCIe Gen 2.1	PCIe Gen 2.1
NC Sideband Interface	-	-	-	Not Available	Not Available
Jumbo Frames Supported	-	-	-	Yes	Yes
1000Base-T	-	-	-	Yes	Yes
IEEE 1588	-	-	-	Supported	Supported
Supported Under vPro	Not Available	Yes	Not Available	Not Available	Not Available
Disclaimers					

Ethernet

Model	Intel I350-T2 Dual Port Gigabit Ethernet Adapter (Stony Lake T2)	Intel I350-T4 Quad Port Gigabit Ethernet Adapter (Stony Lake T4)	Intel Wi-Fi 6 AX201 2*2ax+BT5.0 vPro PCIe M.2 2230 Module (CNVi)	Intel Jefferson Peak 2 9560 2*2ac+BT5.0 PCIe Non-vPro M.2 Module (CNVi)	Foxconn RTL8822CE 2*2ac+BT5.0 PCIe M.2 WLAN module
Connector	2 x Ports RJ-45 Copper	4 x Ports RJ-45 Copper	-	-	-
Website	i350 T2	i350 T4	-	-	-
Auto-Negotiation	IEEE* 802.3* Auto-negotiaton	IEEE* 802.3* Auto-negotiaton	IEEE* 802.11ax* Auto-negotiaton	IEEE* 802.11ac* Auto-negotiaton	IEEE* 802.11ac* Auto-negotiaton
Intel® vPro™	Not Available	Not Available	-	-	-
Intel® Standard Manageability	Supported	Supported	-	-	-
Power Optimizer Platform Low-power Management Systems	Supported	Supported	-	-	-
Energy Efficient Ethernet	Supported	Supported	-	-	-
TCP/UDP Checksum and Segmentation Offload (IPv4 and IPv6)	Supported	Supported	Supported	Supported	Supported
Receive Side Scaling	Supported	Supported	-	-	-

Dual Tx and Rx Queues	Yes	Yes	-	-	-
Jumbo Frames (up to 9KB)	Supported	Supported	-	-	-
Teaming	Supported	Supported	-	-	-
Wake from Deep Sx	Supported	Supported	-	-	-
Server Operating System Support	Windows Server 2008, 2012, 2016, 2019 Linux (RHEL/SLES), Free BSD, Xen, Vmware	Windows Server 2008, 2012, 2016, 2019 Linux (RHEL/SLES), Free BSD, Xen, Vmware	Windows 10, Linux, Chrome	Windows 8.1, Windows 10, Linux, Chrome	Windows 10
Network Proxy/ARP Support	Supported			Supported	
Disclaimers					
Disclaimers					

SECTION IV: BIOS / Certifications / Standards / Environmental

BIOS Specifications

WMI Support	Compliant with Microsoft WBEM and the DMTF common information model
ROM-Based Setup Utility (F1)	System configuration setup program (text/graphic interface) available at power-on with F1 key
Bootblock Recovery	Recovers system BIOS if the flash ROM is corrupted
Replicated Setup	Saves system configuration settings to a file that can then be used to replicate the settings to other systems
Boot Control	Boot control available through ROM-based setup utility or with F12 key at power-on
Memory Change Alert	Power-on error message in the event of a decrease in system memory
Thermal Alert	Power-on error message in the event of a fan failure
Asset Tag	Supports ability to set SMBIOS type 2 baseboard asset tag field
System/Emergency ROM Flash Recovery with Video	Supports process to recover the system BIOS if the flash ROM is corrupted
Remote Wakeup/Remote Shutdown	System admin can power on/off a client computer from a remote location to provide maintenance
Quick Resume Time	Supports low power S3 (suspend to RAM) and prompt resume times
ROM Revision Level	System UEFI (BIOS) version reported in SMBIOS type 0 structure and in BIOS setup

Keyboard-less Operation	System can be booted without a keyboard
Per-port Control	Allows I/O ports to be individually enabled/disabled through ROM-based setup or WMI interface
Adaptive Cooling	Offers multiple settings for fan control ranging between better performance and better acoustics
Security	Supervisor, user and power-on passwords can protect boot and ROM-based setup <ul style="list-style-type: none"> - Chassis Intrusion Detection - UEFI Secure Boot Support - HDD Password Can Protect HDD Data - Windows UEFI Firmware Update Support - Device Guard Support - BIOS Guard, Boot Guard Support
Intel(R) AMT (includes ASF 2.0)	Allows system to be supported from a remote location
Intel(R) TXT	Intel(R) trusted execution technology provides a security foundation to build protections against software based attacks
Memory Modes	Supports mirroring, lock step, and sparing memory modes
Windows 10 Ready	Supports Windows 10 requirements for secure flash, UEFI v 2.7 device guard support spec

Industry Standard Specification Support

UEFI	Unified Extensible Firmware Interface v2.7
ACPI (Advanced Configuration and power Management Interface)	Advanced Configuration and Power Interface v6.2
ASF 2.0	DMTF Alert Standard Format Specification v2.0
ATA (IDE)	AT Attachment 6 with Packet Interface (ATA/ATAPI-6)
CD Boot	EI Torito Bootable CD-Rom Format Specification, v1.0
EHCI	Enhanced Host Controller Interface for Universal Serial Bus, Revision v1.0
PCI	PCI Local Bus v3.0 PC Firmware Specification 3.1
PCI Express	PCI Express Base Specification v4.0
SATA	Serial ATA Revision 3.0 Specification
TPM	Trusted Computing Group TPM Specification v2.0
UHCI	Universal Host Controller Interface Design Guide, Revision v1.1
USB	Universal Serial Bus Revision v1.1 Universal Serial Bus v2.0 Universal Serial Bus v3.0 Universal Serial Bus v3.2
SMBIOS	DMTF System Management Spec v3.2.1
XHCI	XHCI SPEC Revision v1.2

Social and Environmental Responsibility

Quality Control	Lenovo is a member of an eco declaration system that enforces regular independent quality control
Hazardous Substances and Preparation	<ul style="list-style-type: none"> • Products do not contain more than; 0.1% lead, 0.01% cadmium, 0.1% mercury, 0.1% hexavalent chromium, 0.1% polybrominated biphenyls (PBB) or 0.1% polybrominated diphenyl ethers (PBDE). (See legal reference and Note B1) • Products do not contain Asbestos • Products do not contain Ozone Depleting Substances: Chlorofluorocarbons (CFC), hydrobromofluorocarbons (HBFC), hydrochlorofluorocarbons (HCFC), Halons, carbontetrachloride, 1,1,1-trichloroethane, methyl bromide • Products do not contain more than; 0.005% polychlorinated biphenyl (PCB), 0.005% polychlorinated terphenyl (PCT) in preparation • Products do not contain more than 0.1% short chain chloroparaffins (SCCP) with 10-13 carbon atoms in the chain containing at least 48% per mass of chlorine in the SCCP • Parts with direct and prolonged skin contact do not release nickel in concentrations above 0.5 microgram/cm²/week <p>REACH Article 33 information about substances in articles is available at: https://www.lenovo.com/us/en/social_responsibility/social_responsibility_resources/</p>
Batteries	UN38.3,MSDS
Safety, EMC Connection to the Telephone Network and Labeling	Not applicable

Acoustic Noise Emissions Declaration

LWAd(bels) Idle	3.1
LWAd(bels) Oper	3.7

Safety, EMC Connection to the Telephone Network and Labeling

Industry Standard Specifications	not applicable
Remote Manageability Software Solutions	not applicable
System Software Manager	Lenovo ThinkStation supports software management tools by Lenovo Vantage.

Regulations & Standards

EMC & Safety	FCC/IC VCCI BSMI KC
--------------	------------------------------

	RCM TUV-GS cTUVus IEC60950-1&IEC62368 CB Report/Certificate Saudi Arabia EQM Kuwait KUCAS China CCC Mark South Africa SABS Russia/Belarus/Kazakhstan/Kyrgyzstan/Armenia-EAC Morocco-CM Mexico-NOM Serbia KVALITET Ukraine UKrCEPRO India-BIS China SRRC Indonesia-SDPPI Malaysia-SIRIM Philippines-NTC
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Environmentals

Energy Star	ENERGY STAR 8.0
EPEAT	EPEAT Certification Available on Select Models
ErP Lot-3 2013	Yes
Hazardous Substances	<ul style="list-style-type: none"> • Products do not contain more than; 0.1% lead, 0.01% cadmium, 0.1% mercury, 0.1% hexavalent chromium, 0.1% polybrominated biphenyls (PBB) or 0.1% polybrominated diphenol ethers (PBDE) • Products do not contain Asbestos • Products do not contain Ozone Depleting Substances: Chlorofluorocarbons (CFC), hydrobromofluorocarbons (HBFC), hydrochlorofluorocarbons (HCFC), Halons, carbontetrachloride, 1,1,1-trichloroethane, methyl bromide • Products do not contain more than; 0.005% polychlorinated biphenyl (PCB), 0.005% polychlorinated terphenyl (PCT) in preparation • Products do not contain more than 0.1% short chain chloroparaffins (SCCP) with 10-13 carbon atoms in the chain containing at least 48% per mass of chlorine in the SCCP • Parts with direct and prolonged skin contact do not release nickel in concentrations above 0.5 microgram/cm₂/week

Materials Used

TCO Certification	9.0
-------------------	-----