Power Configurator

Lenovo ThinkStation P350 (Tower and Small Form Factor)

Contents

Overview

The ThinkStation P350 Tower and Small Form Factor (SFF) platforms are the new series of desktop workstations that replace the P340 series. The power supply (PSU) options in both the Tower and SFF workstations have been changed from the comparable P340 platforms, as shown here:

P340 Tower PSU options: 300W and 500W

P350 Tower PSU options: 500W and 750W

P340 SFF PSU options: 310W and 380W

P350 SFF PSU options: 380W

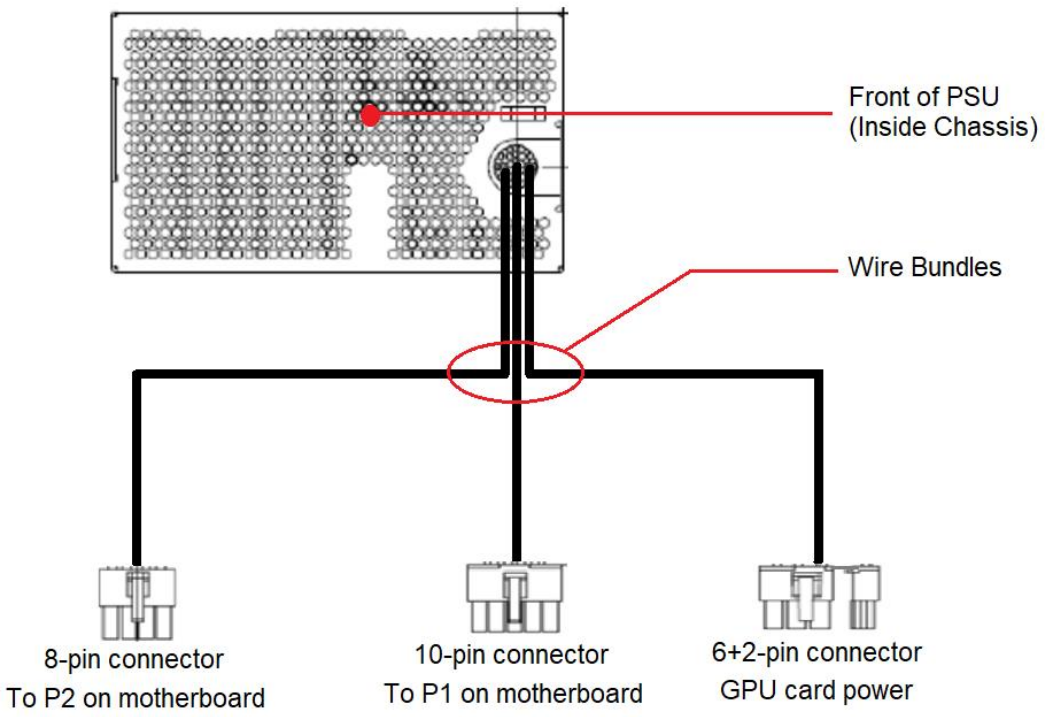
These power supplies allow the P350 platform to support an expanded configuration of system components -- notably the Intel Rocket Lake CPU family.

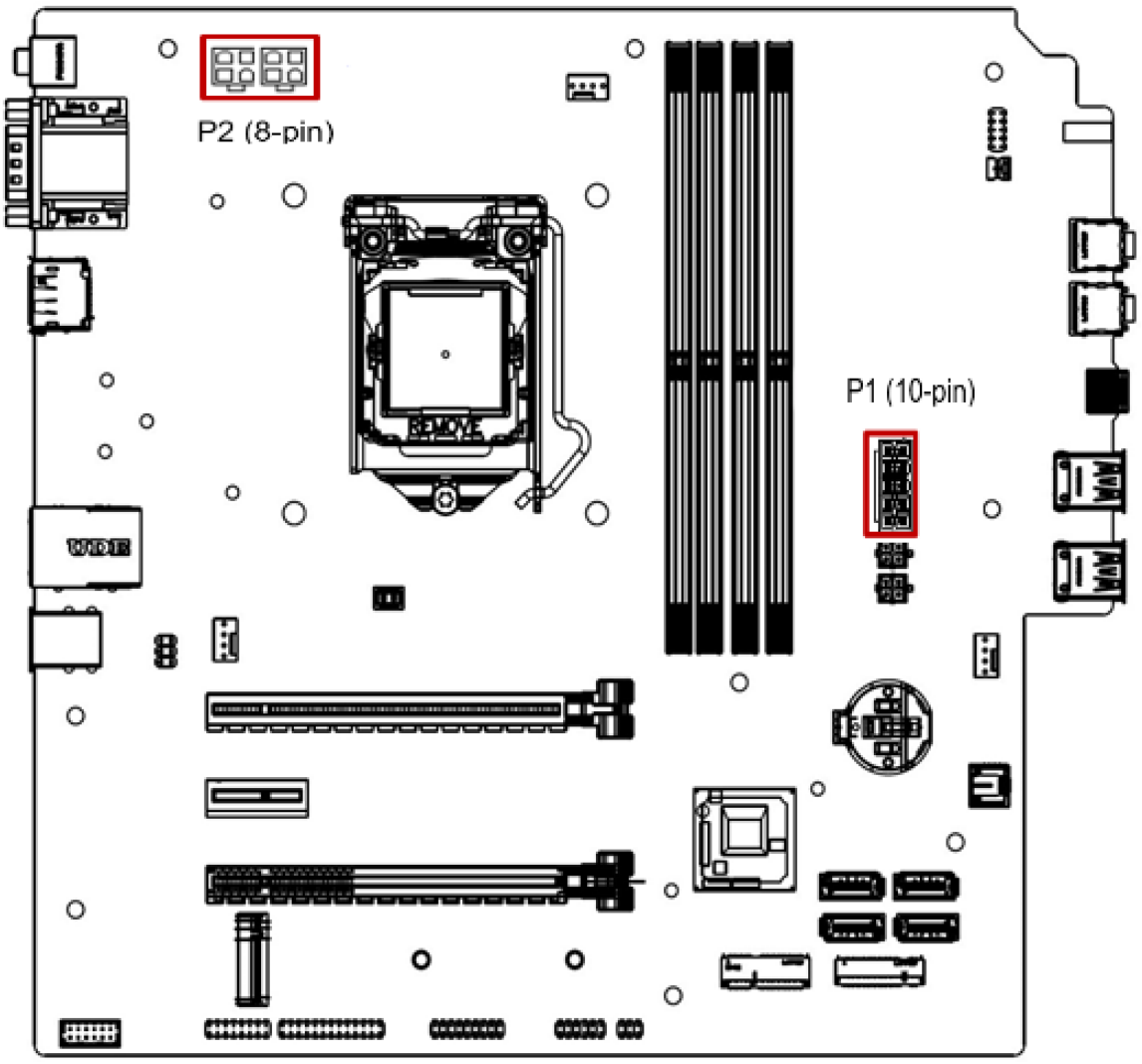
The purpose of this document is to highlight these changes so that users can make informed decisions regarding which power supply to configure in the system and which add-in cards can be officially supported.

Section 1 – Key Architectural Design

The P350 utilizes a traditional approach to powering system components. All onboard components and add-in cards are powered through direct cable connections from the power supply. The diagrams in *Figure 1* show a high-level design on how the power supply directly attaches to the motherboard and add-in cards.

Figure 1 – P350 Power Design





P350 Motherboard

Section 2 – Power Ratings for Key System Components

To fully understand the power capabilities of the ThinkStation P350, it's important to know the power ratings of the individual system components. Figure 2 shows the power ratings for the various CPUs supported on P350.

Figure 2 - CPU Power Ratings

CPU Name (Xeon Rocket Lake)	CPU Power	Additional CPU Information
W-1390P	125W	3.5GHz, 8 cores, DDR4-3200, Turbo, Hyper-threading, GT32
W-1390	80W	2.8GHz, 8 cores, DDR4-3200, Turbo, Hyper-threading, GT32
W-1370P	125W	3.6GHz, 8 cores, DDR4-3200, Turbo, Hyper-threading, GT32
W-1370	80W	2.9GHz, 8 cores, DDR4-3200, Turbo, Hyper-threading, GT32
W-1350P	125W	4.0GHz, 6 cores, DDR4-3200, Turbo, Hyper-threading, GT32
W-1350	80W	3.3GHz, 6 cores, DDR4-3200, Turbo, Hyper-threading, GT32

CPU Name (Core Rocket Lake)	CPU Power	Additional CPU Information
i9-11900K	125W	3.5GHz, 8 cores, DDR4-3200, Turbo, GT32
i9-11900	65W	2.5GHz, 8 cores, DDR4-3200, Turbo, GT32
i7-11700K	125W	3.6GHz, 8 cores, DDR4-3200, Turbo, GT32
i7-11700	65W	2.5GHz, 8 cores, DDR4-3200, Turbo, GT32
i5-11600K	125W	3.9GHz, 6 cores, DDR4-3200, Turbo, GT32
i5-11600	65W	2.8GHz, 6 cores, DDR4-3200, Turbo, GT32
i5-11500	65W	2.7GHz, 6 cores, DDR4-3200, Turbo, GT32
i5-11400	65W	2.6GHz, 6 cores, DDR4-3200, Turbo, GT24

CPU Name (Core Comet Lake)	CPU Power	Additional CPU Information
i9-10900K	125W	3.7GHz, 10 cores, DDR4-2933, Turbo, GT2
i9-10900	65W	2.8GHz, 10 cores, DDR4-2933, Turbo, GT2
i7-10700K	125W	3.8GHz, 8 cores, DDR4-2933, Turbo, GT2
i7-10700	65W	2.9GHz, 8 cores, DDR4-2933, Turbo, GT2
i5-10500	65W	3.1GHz, 6 cores, DDR4-2666, Turbo, GT2
i5-10400	65W	2.9GHz, 6 cores, DDR4-2666, Turbo, GT2
i3-10325	65W	3.9GHz, 4 cores, DDR4-2666, Turbo, GT2
i3-10305	65W	3.8GHz, 4 cores, DDR4-2666, Turbo, GT2
i3-10105	65W	3.7GHz, 4 cores, DDR4-2666, Turbo, GT2

Figure 3 lists the power ratings for the various add-in cards supported across P350 Tower and SFF. Note that not all cards are supported on each platform.

Figure 3 - Add-in Card Power Ratings

Max Power Rating	Card Name	Card Type	Aux Power Connectors Required (if any)
230W	RTX A5000	Graphics Card (Dual Slot)	8-pin (PCIe)
170W	GeForce RTX 3060	Graphics Card (Dual Slot)	8-pin (PCIe)
140W	RTX A4000	Graphics Card (Single Slot)	6-pin (PCIe)
75W (or less)	Quadro P2200, Radeon Pro WX3200, T1000, T600, T400	Graphics Card (Single Slot)	None
	I210-T1, I350-T2, I350-T4, I350-F2, Bitland BN8E88, AX201 Wifi, Aquantia 10G	Networking (Single Slot)	None

Section 3 – P350 Tower Power Configurations

P350 Tower supports 500W and 750W power supplies, which allow customers to tailor their system to best meet the requirements of the components they intend to support.

500 Watt PSU

- Single 6+2 pin PCIe auxiliary power drop
- Provides single dedicated 12V rail
- GPUs cannot be mixed in dual-GPU configs

CPU (up to 80W and 6 cores)

All UDIMM Memory

No Storage Limitations

GPU Support

230W x 1

170W x 1

140W x 1

75W x 2**

***Except for dual P2200, which is only allowed w/ 750W PSU**

750 Watt PSU

- Single 6+2 pin PCIe auxiliary power drop
- Provides single dedicated 12V rail
- GPUs cannot be mixed in dual-GPU configs
- Some supported GPU configurations might require additional cabling (See Appendix)

CPU (up to 125W and 8 cores)

All UDIMM Memory

No Storage Limitations

GPU Support

230W x 1

170W x 1

140W x 1

75W x 2

Single 6+2 pin Power Drop

****125W Comet Lake CPUs not allowed with RTX A5000 due to thermal concerns**

P350 Tower Power Supply Configuration Notes:

- **For configurations that are not listed above but appear to be feasible, please work with the Technical Solutions Team to have the configuration validated/vetted.**
- Officially supported configurations could still be limited by additional factors not defined within this document.
- Some supported GPU/add-in-card configurations might require additional cabling to be supported. See Appendix.
- Use of full-length graphics cards, such as RTX A5000, requires that the front chassis mechanical bracket to be removed to be able to install the card efficiently. The two lower bracket screws secure the bracket to the rear of the GPU and the top screw anchors the whole assembly to the chassis. See Figure 4 below for details. Additionally, these full-length graphics cards require a right-angle power dongle to fit into the front chassis space (these dongles are included in models manufactured with full-length cards).

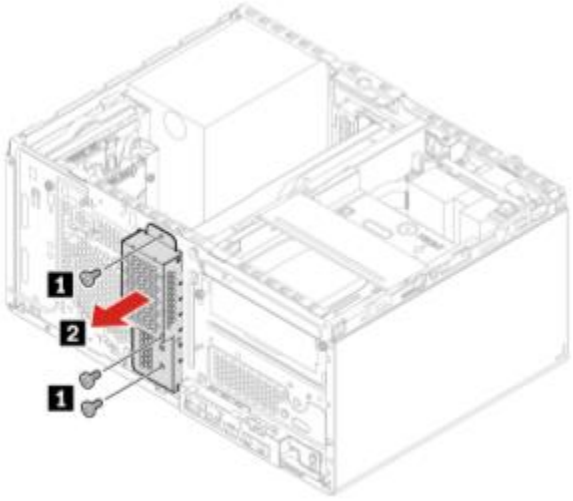
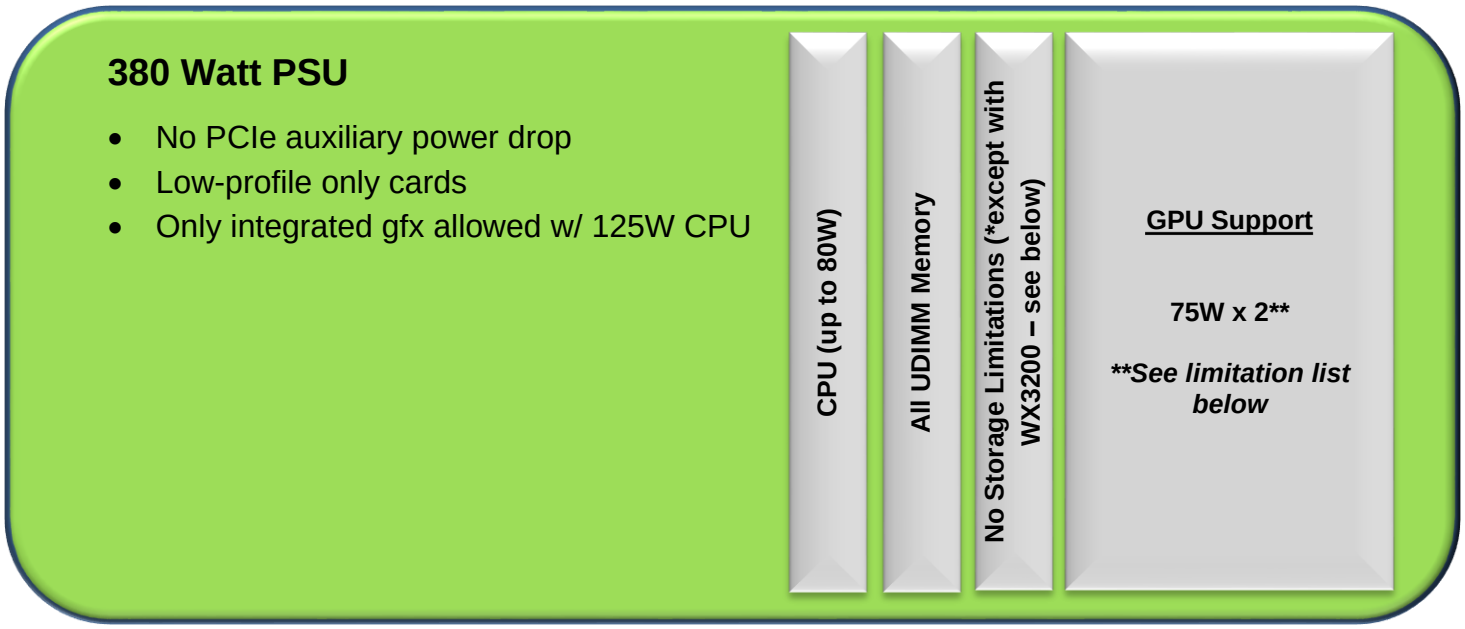


Figure 4

Section 4 – P350 SFF Power Configurations

P350 SFF supports a 380W power supplies. Unlike the P350 Tower, this power supply does not have an auxiliary power drop.



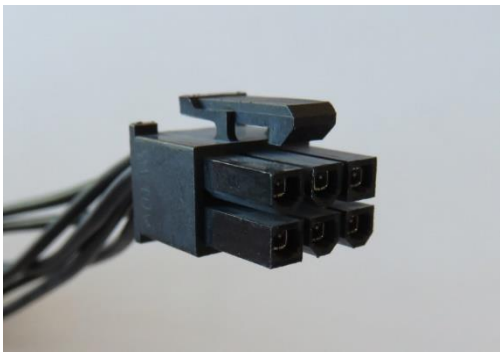
P350 SFF Power Supply Configuration Notes:

- **For configurations that are not listed above but appear to be feasible, please work with the Technical Solutions Team to have the configuration validated/vetted.**
- Dual-GPU config limitations:
  - Special Bid only
  - Can only use T400 or T600 adapter
  - Cannot mix GPUs
- Only 1pc 2.5” HDD is allowed with the WX3200 adapter.
- Officially supported configurations could still be limited by additional factors not defined within this document.

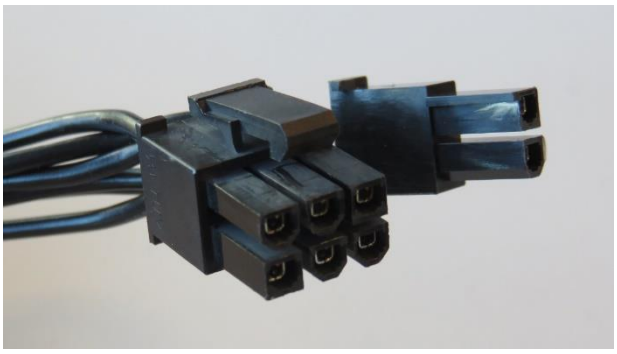
Section 5 – Appendix

This section contains additional useful information about the hardware used to power adapter cards in ThinkStation systems.

PCIe Power Connectors



6-pin PCIe Power Connector



6+2 pin PCIe Power Connector

Supported PCIe Power Cable Adapters

TBD

Section 6 – Revision History

Version	Date	Author	Changes/Updates
1.0	7/19/2021	Jim Pfaltzgraff	Initial launch release