

Memory Configurator

Lenovo ThinkStation P360 Tower, Tiny, Ultra



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Overview

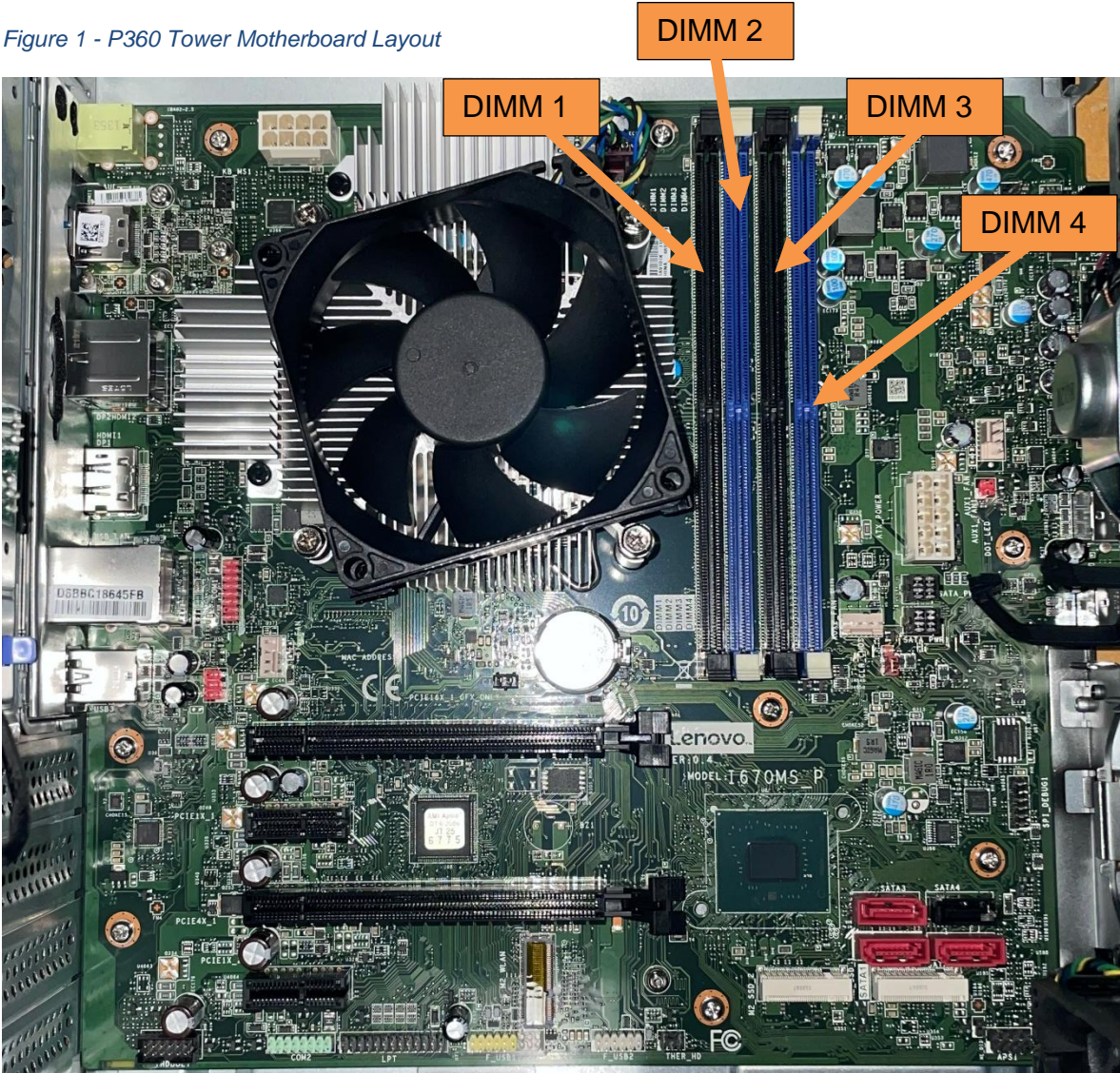
The ThinkStation P360 Intel Alder Lake-S platform is the new replacement desktop workstation for the ThinkStation P350 Intel Rocket Lake-S platform.

The purpose of this document is to highlight the major differences between the different memory platform architectures from the previous platforms and to help guide users to optimally configure their memory configuration in the ThinkStation P360 platform.

Section 1 – P360 Tower Memory Architectural Design

The ThinkStation P360 Tower platform is the first Lenovo workstation platform to introduce DDR5 memory with higher top memory bus speeds of 4800MHz, depending on the system processor and number of DIMMs per channel. This platform offers a dual memory channel design based on Intel Alder Lake processors. There is a total of four memory DIMM slots, allowing the P360 to take full advantage of supporting a two DIMM per channel design.

Figure 1 - P360 Tower Motherboard Layout



Section 2 – P360 Tower Memory Configurations

The ThinkStation P360 Tower platform can be a bit overwhelming on trying to figure out how to optimally configure memory for best overall system performance. The following recommended guidelines will help obtain the best overall memory bandwidth from the P360 Tower system.

- Install DIMM slots in multiples of two to fully take advantage of both memory channels. Utilizing one DIMM per channel (DPC) will allow for full maximum memory bandwidth performance.
- DIMM slots should be filled in the order listed in *Figure 2*.
- Mixing ECC and non-ECC memory UDIMMs are not supported.
- Registered DIMMs (RDIMMs) are not supported in the P360 platform.
- Lenovo does not recommend installing three (3) DIMMs resulting in an unbalanced memory channel configuration.
- Lenovo does not recommend mixing memory DIMM vendors within a DIMM channel.
- Lenovo does not recommend mixing different memory DIMM capacities.
- Lenovo does not recommend mixing single rank (1R) and dual rank (2R) memory DIMMs.

Figure 2 - P360 Tower Slot Fill Order Recommendations

# of DIMMs	DIMM slots used
1 DIMM	DIMM slot 2
2 DIMMs	DIMM slot 2, DIMM slot 4
3 DIMMs ¹	DIMM slot 2, DIMM slot 4, DIMM slot 1
4 DIMMs	DIMM slot 2, DIMM slot 4, DIMM slot 1, DIMM slot 3

Figure 3 – 1R (single rank) and 2R (dual rank) Memory Installation and Maximum Frequency

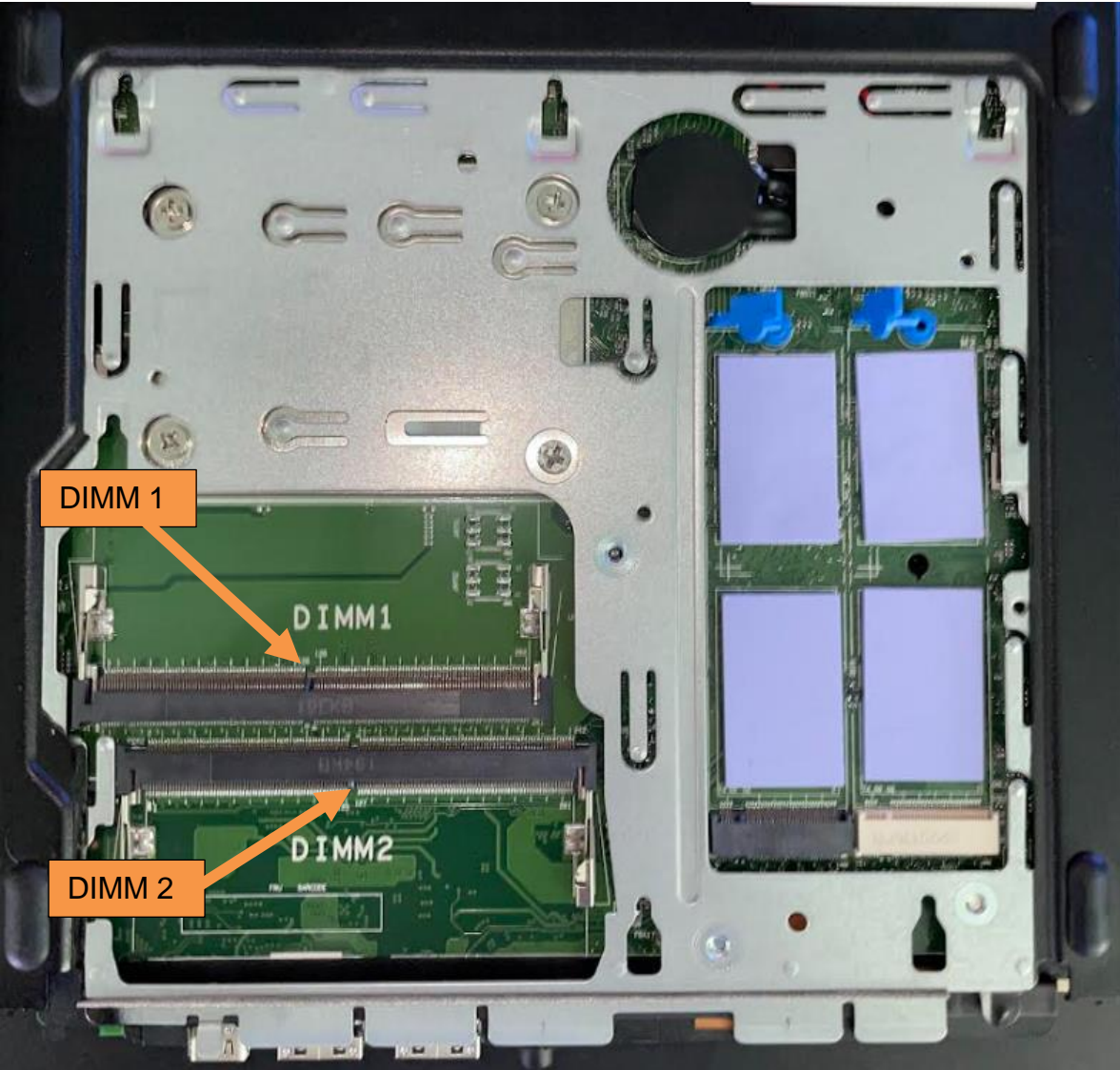
Slot 1	Slot 2	Slot 3	Slot 4	Actual Speed
	1R			4400 MHz
	1R		1R	4400 MHz
1R	1R	1R	1R	4000 MHz
	2R			4400 MHz
	2R		2R	4400 MHz
2R	2R	2R	2R	3600 MHz

¹ Lenovo does not support or recommend this number of DIMM quantity as it results in an unbalanced memory configuration across the dual channels.

Section 3 – P360 Tiny Memory Architectural Design

The ThinkStation P360 Tiny platform is the first Lenovo Tiny workstation platform to introduce DDR5 memory with higher top memory bus speeds of 4800MHz, depending on the system processor and number of DIMMs per channel. This platform offers a dual memory channel design based on Intel Alder Lake processors. There is a total of two memory DIMM slots, allowing the P360 Tiny to take advantage of supporting a single DIMM per channel design.

Figure 4 - P360 Tiny Motherboard Layout



Section 4 – P360 Tiny Memory Configurations

The ThinkStation P360 Tiny platform is fairly straight-forward on trying to figure out how to optimally configure memory for best overall system performance. The following recommended guidelines will help obtain the best overall memory bandwidth from the P360 Tiny system.

- Utilizing one DIMM per channel (DPC) will allow for full maximum memory bandwidth performance.
- DIMM slots should be filled in the order listed in *Figure 5*.
- Small Outline Dual In-Line Memory Modules (SODIMMs) only are supported in the P360 Tiny platform.
- Mixing ECC and non-ECC memory SODIMMs are not supported.
- Lenovo does not recommend mixing memory DIMM vendors within a DIMM channel.
- Lenovo does not recommend mixing different memory DIMM capacities.
- Lenovo does not recommend mixing single rank (1R) and dual rank (2R) memory DIMMs.

Figure 5 - P360 Tiny Slot Fill Order Recommendations

# of DIMMs	DIMM slots used
1 DIMM	DIMM slot 1
2 DIMMs	DIMM slot 1, DIMM slot 2

Figure 6 – 1R (single rank) and 2R (dual rank) Memory Installation and Maximum Frequency

Slot 1	Slot 2	Actual Speed
1R		4400 MHz
	1R	4400 MHz
1R	1R	4400 MHz
2R		4400 MHz
	2R	4400 MHz
2R	2R	4400 MHz

Section 5 – P360 Ultra Memory Architectural Design

The ThinkStation P360 Ultra platform is the first Lenovo Ultra small form factor workstation platform. It introduces DDR5 memory with higher top memory bus speeds of 4800MHz, depending on the system processor and number of DIMMs per channel. This platform offers a dual memory channel design based on Intel Alder Lake processors. There is a total of four memory DIMM slots, allowing the P360 Ultra to take advantage of supporting a dual DIMM per channel design.

Figure 7 - P360 Ultra Motherboard Layout (CPU side)

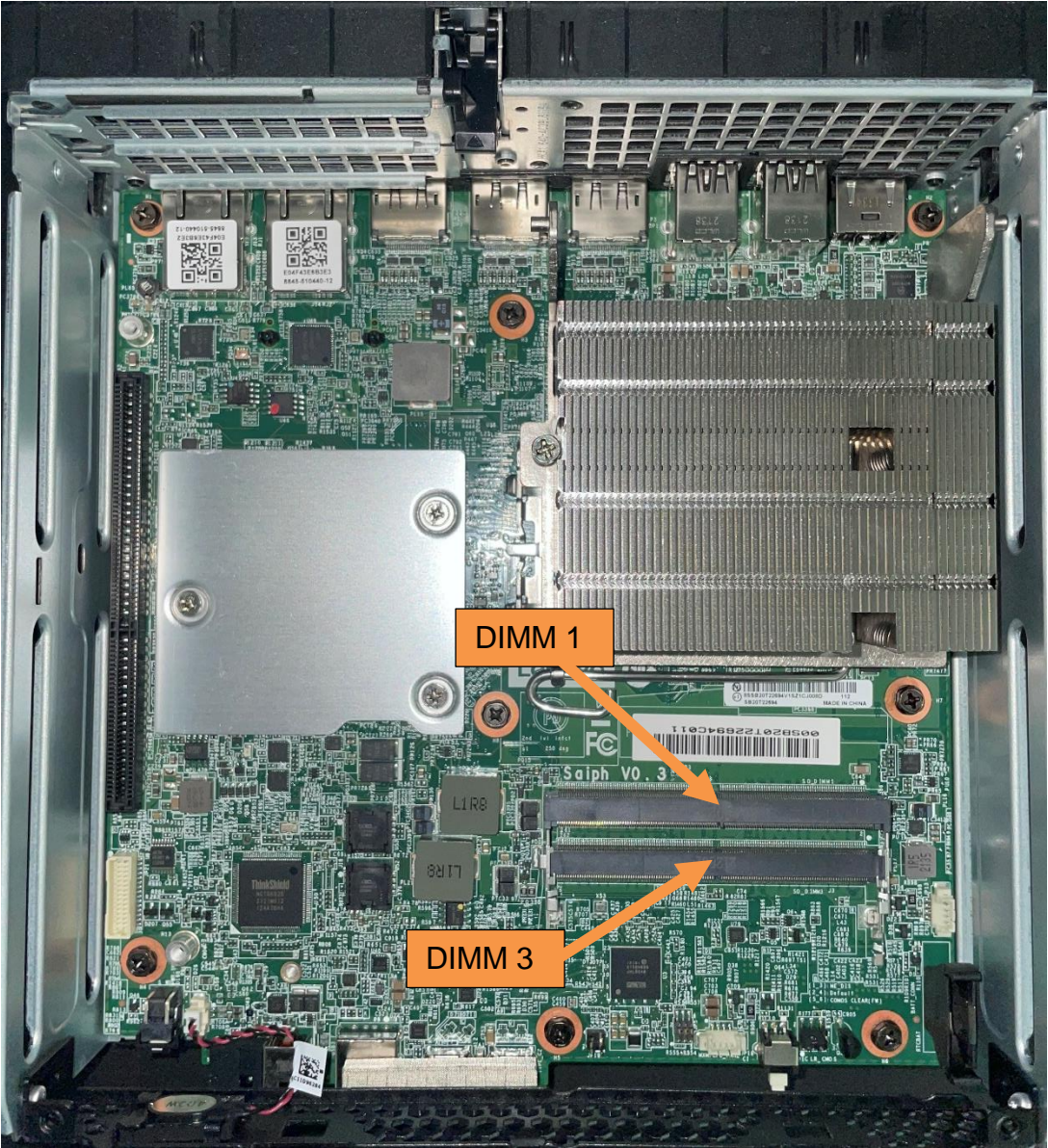
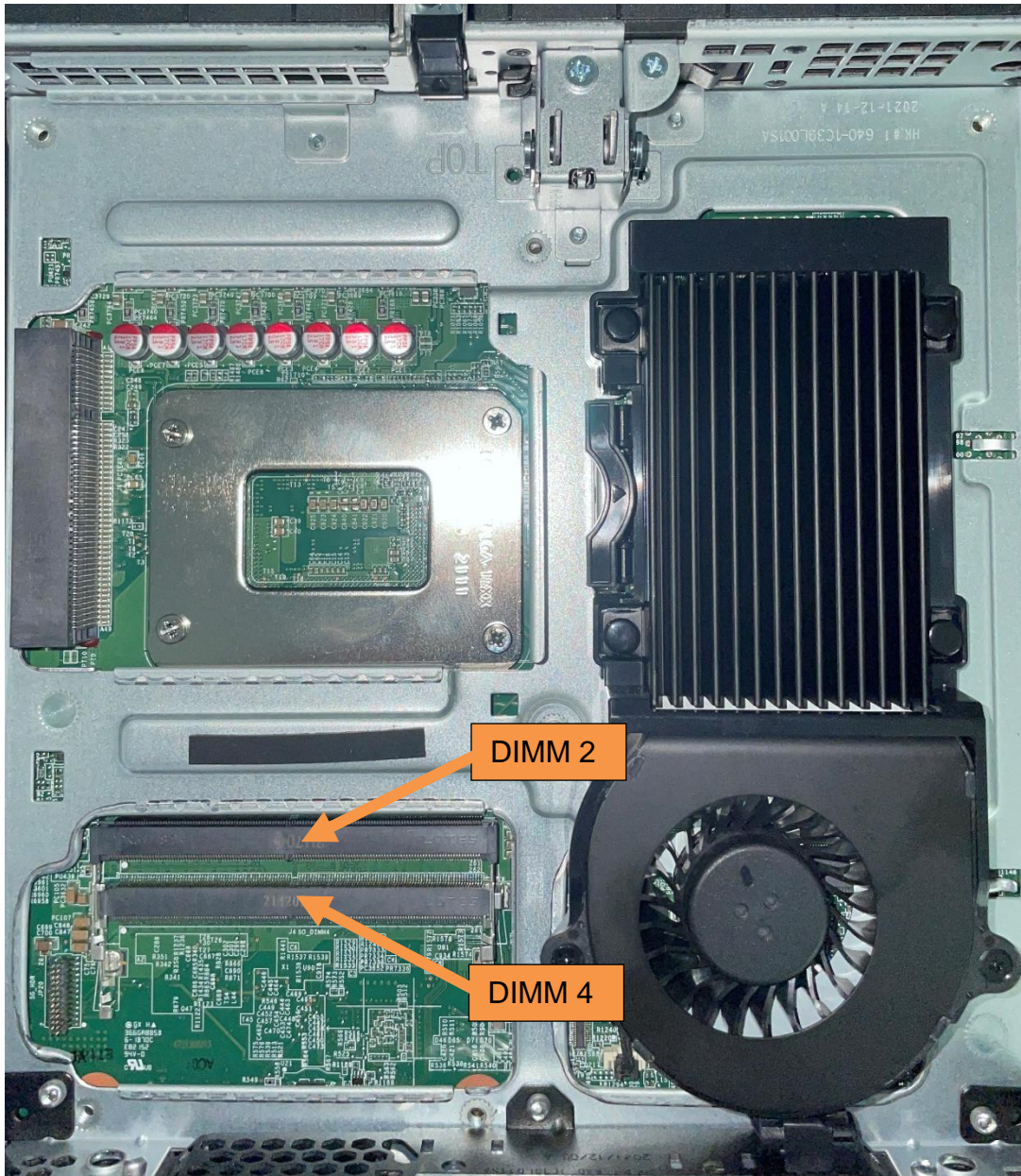


Figure 8 - P360 Ultra Motherboard Layout (SSD side)



Section 6 – P360 Ultra Memory Configurations

The ThinkStation P360 Ultra platform can be a bit overwhelming, like the P360 Tower, on trying to figure out how to optimally configure memory for best overall system performance. The following recommended guidelines will help obtain the best overall memory bandwidth from the P360 Ultra system.

- Install DIMM slots in multiples of two to fully take advantage of both memory channels. Utilizing one DIMM per channel (DPC) will allow for full maximum memory bandwidth performance.
- DIMM slots should be filled in the order listed in *Figure 9 or 10*, depending on ECC or non-ECC memory being used.
- Small Outline Dual In-Line Memory Modules (SODIMMs) only are supported in the P360 Ultra platform.
- Mixing ECC and non-ECC memory SODIMMs are not supported.
- Lenovo does not recommend installing three (3) DIMMs resulting in an unbalanced memory channel configuration.
- Lenovo does not recommend mixing memory DIMM vendors within a DIMM channel.
- Lenovo does not recommend mixing different memory DIMM capacities.
- Lenovo does not recommend mixing single rank (1R) and dual rank (2R) memory DIMMs.

Figure 9 - P360 Ultra Slot Fill Order Recommendations for non-ECC SODIMMs

# of DIMMs	DIMM slots used
1 DIMM	DIMM slot 1
2 DIMMs	DIMM slot 1, DIMM slot 3
3 DIMMs ²	DIMM slot 1, DIMM slot 3, DIMM slot 2, DIMM slot 4
4 DIMMs	DIMM slot 1, DIMM slot 3, DIMM slot 2, DIMM slot 4

Figure 10 - P360 Ultra Slot Fill Order Recommendations for ECC SODIMMs

# of DIMMs	DIMM slots used
1 DIMM	DIMM slot 2
2 DIMMs	DIMM slot 2, DIMM slot 4
3 DIMMs ³	DIMM slot 2, DIMM slot 4, DIMM slot 1, DIMM slot 3
4 DIMMs	DIMM slot 2, DIMM slot 4, DIMM slot 1, DIMM slot 3

Figure 11 – 1R (single rank) and 2R (dual rank) Memory Installation and Maximum Frequency

Memory Type	Slot 1	Slot 3	Slot 2	Slot 4	Actual Speed	Wifi Yes/No
ECC			1R		4000 MHz	No
ECC			1R	1R	4000 MHz	No
ECC	1R	1R	1R	1R	4000 MHz	No
ECC			2R		4000 MHz	No
ECC			2R	2R	4000 MHz	No
ECC	2R	2R	2R	2R	3600 MHz	No
non-ECC	1R				4000 MHz	No
non-ECC	1R	1R			4000 MHz	No
non-ECC	1R	1R	1R	1R	4000 MHz	No
non-ECC	2R				4000 MHz	No
non-ECC	2R	2R			4000 MHz	No
non-ECC	2R	2R	2R	2R	3600 MHz	No
non-ECC	1R				4000 MHz	Yes
non-ECC	1R	1R			4000 MHz	Yes
non-ECC	1R	1R	1R	1R	3600 MHz	Yes
non-ECC	2R				4000 MHz	Yes
non-ECC	2R	2R			4000 MHz	Yes
non-ECC	2R	2R	2R	2R	3600 MHz	Yes

² Lenovo does not support or recommend this number of DIMM quantity as it results in an unbalanced memory configuration across the dual channels.

³ Lenovo does not support or recommend this number of DIMM quantity as it results in an unbalanced memory configuration across the dual channels.

Revision History

Version	Date	Author	Changes/Updates
0.4	7/18/2022	Jason Moebis	Added P360 Ultra config rules.
0.3	5/23/2022	Jason Moebis	Added P360 Tiny config rules.
0.2	4/22/2022	Jason Moebis	Edit memory config rules.
0.1	4/13/2022	Jason Moebis	Initial draft.