

# Lenovo P3 Tower Gen 2

**Version:** 2.0 | 10/16/2025

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|                             |                             |
|-----------------------------|-----------------------------|
| Product Name                | P3 Tower Gen 2              |
| Product Display Name        | ThinkStation P3 Tower Gen 2 |
| Information Date            | 11-Jun-25                   |
| Hardware Maintenance Manual | TBD                         |
| Drivers & Software          | TBD                         |
| Available Whitepapers       | TBD                         |

## SECTION I: Platform Overview

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|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description | Experience the power of a workstation at the price of a desktop with the Lenovo ThinkStation P3 Tower Gen 2. Supporting the latest Intel® Core™ Ultra processors (Series 2) with an integrated NPU and up to NVIDIA RTX PRO™ 6000 Blackwell Max-Q Workstation Edition+ graphics, the P3 Tower is built for mission-critical tasks that require superior reliability and AI-optimized performance, providing the value you need without compromising on compute power. |
|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## CPU

|                   |                           |
|-------------------|---------------------------|
| Processor Support | Intel Arrow Lake-S Series |
| Socket Type       | Socket-V (LGA 1851)       |

## Operating Systems

|           |                                                                     |
|-----------|---------------------------------------------------------------------|
| Preloaded | Windows 11 Pro 64-bit<br>Windows 11 Home 64-bit<br>Ubuntu 24.04 LTS |
| Supported | Red Hat Enterprise Linux<br>Ubuntu 24.04 LTS                        |

## Memory

|                   |                                                                                                                                     |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| Slots             | 4                                                                                                                                   |
| Channels          | Supports up to 4 DIMM Sockets, 2 Channels                                                                                           |
| Type              | DDR5 ECC and non-ECC UDIMM                                                                                                          |
| ECC Support       | Yes, CPU Dependent                                                                                                                  |
| Speed             | Up to 5600MT/s                                                                                                                      |
| Max DIMM Size     | 48GB DDR5 UDIMM<br>64GB DDR5 CUDIMM                                                                                                 |
| Max System Memory | 256GB                                                                                                                               |
| Disclaimers       | *Memory speed impacted by number and type of DIMMs installed.<br>*Memory speed can be dependent on the individual CPU capabilities. |

## Storage

|                 |                            |
|-----------------|----------------------------|
| Total Bays/Size | Up to 4 x 3.5"             |
| SATA            | 3 x SATA Connectors, Gen 3 |

|             |                                                                                                                                                                                                                                                                                      |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PCIe        | 1 x M.2 2240/2280 PCIe Connector, Gen 5 Onboard (from CPU)<br>2 x M.2 2240/2280/22110 PCIe Connector, Gen 4 Onboard (from PCH)<br>Additional M.2 2280 NVMe Drive Supported by Single Adapter, Gen 3                                                                                  |
| eSATA       | 1 x eSATA Connector, Gen 3                                                                                                                                                                                                                                                           |
| Disclaimers | A configuration with four (4) 3.5" HDDs will block both onboard M.2 Gen 4 drive connectors, leaving the single onboard M.2 Gen 5 drive connector available.<br>Additional parts/enclosures may be required for some configurations.<br>Refer to storage whitepaper for more details. |

## Video

|                     |                                                                                                                                                                                                                                                                                                                             |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Integrated Graphics | Intel Graphics (CPU dependent)                                                                                                                                                                                                                                                                                              |
| Discrete Graphics   | Nvidia RTX A400 (miniDP x4) – 4GB GDDR6, PCIe4, Single-Slot<br>Nvidia RTX A1000 (miniDP x4) – 8GB GDDR6, PCIe4, Single-Slot<br>Nvidia RTX 2000 Ada (miniDP x4) – 16GB GDDR6, PCIe4, Dual-Slot<br>Nvidia RTX 4000 Ada (DP x4) – 20GB GDDR6, PCIe4, Single-Slot<br>Nvidia RTX 5000 Ada (DP x4) – 32GB GDDR6, PCIe4, Dual-Slot |
| Multi-GPU Support   | Yes                                                                                                                                                                                                                                                                                                                         |
| Type                | PCIe Add-In-Card                                                                                                                                                                                                                                                                                                            |
| Bus Interface       | PCIe x16                                                                                                                                                                                                                                                                                                                    |

## Slots

|             |                                                                                                                |
|-------------|----------------------------------------------------------------------------------------------------------------|
| Slot 1      | PCIe 5.0 x16, Full Height, Full Length, 75W, With Latch                                                        |
| Slot 2      | PCIe 3.0 x1, Full Height, Half Length, 25W, open-ended                                                         |
| Slot 3      | PCIe 4.0 x4, Full Height, Half Length, 25W, With Latch                                                         |
| Slot 4      | PCIe 3.0 x1, Full Height, Half Length, 25W, open-ended                                                         |
| Disclaimers | PCIe Slot 1 is limited to Graphics Adapters only.<br>PCIe Slot 3 is a x16 mechanical slot, x4 electrical slot. |

## Front I/O

|                   |                                                                                                                                                    |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| USB               | 2 x USB-A 3.2 Gen 2 (10Gb/s)<br>2 x USB-A 3.2 Gen 1 (5Gb/s)<br>1 x USB-C 3.2 Gen 2×2 (20Gb/s)                                                      |
| Audio             | 1 x Combo Audio Jack (3.5mm)<br>1 x Microphone Jack (3.5mm)                                                                                        |
| Media Card Reader | Optional: Front 3-in-1 Media Card Reader (USB 2.0)                                                                                                 |
| Flex Bay          | One 3.5" Flex Bay, Supports one of the following:<br>– Flex storage enclosure<br>– Front-access storage enclosure<br>–Optical disk drive enclosure |
| Disclaimers       | Actual USB throughput will vary depending on the type and quantity of USB devices used.                                                            |

## Rear I/O

|                          |                                                                                                                                            |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| USB                      | 2 x USB-A 3.2 Gen 1 (5Gb/s)<br>2 x USB-A 2.0 (480Mb/s)                                                                                     |
| Audio                    | 1 x Line Out                                                                                                                               |
| DisplayPort              | 2 x Standard DP++ / DP 1.4 HBR2<br>Optional 1 x DP 1.2 (CPU dependent), via flexible I/O port card                                         |
| HDMI                     | 1 x Standard HDMI 2.1 TMDS<br>Optional 1 x HDMI 2.0 (CPU dependent), via flexible I/O port card                                            |
| Type-C                   | Optional 1 x USB-C 3.1 Gen 1 (CPU dependent), via flexible I/O port card                                                                   |
| VGA Port                 | Optional 1 x VGA Port (CPU dependent), via flexible I/O port card                                                                          |
| Serial Port              | Optional 1 x Serial Port Cable<br>Optional 1 x 4-Port Serial Port Expansion PCIe x1 Adapter                                                |
| Ethernet                 | 1 x 1GbE – RJ45                                                                                                                            |
| Parallel Port            | Parallel Port Cable (300mm with ESD and 2.0 pitch)                                                                                         |
| Optional USB Adapter     | Rear USB 4.0 PCIe x4 Adapter<br>Rear USB-C 3.2 Gen 2×2 PCIe x4 Adapter<br>Rear 2-Port USB 3.0 PCIe x1 Adapter<br>Rear 2-port USB 2.0 Cable |
| Optional Network Adapter | Bitland RTL8125BGS Single Port PCIe x1 2.5Gigabit Ethernet Adapter<br>Intel I210-T1 Single Port PCIe x1 Gigabit Ethernet Adapter           |

|             |                                                                                                                                                                                                                                                         |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | Intel I350-T4 Quad Port PCIe x4 Gigabit Ethernet Adapter<br>Intel X710-T2L Dual Port PCIe x8 10Gigabit Ethernet Adapter<br>Intel E830-XXVDA2 Dual Port PCIe x8 25Gigabit Ethernet Adapter<br>Intel Gale Peak 2 BE200 WIFI7 + Bluetooth 5.4 PCIe Adapter |
| Disclaimers | Actual USB throughout will vary depending on the type and quantity of USB devices used.                                                                                                                                                                 |

## Ethernet

|            |                                          |
|------------|------------------------------------------|
| Vendor     | Intel Jacksonville I219-LM (w/ AMT 16.x) |
| Speeds     | 10/100/1000 Mbps                         |
| Functions  | PXE, ASF, WOL, Jumbo Frames, Teaming     |
| Connectors | 1 x RJ45                                 |

## Audio

|                                 |                                                                                  |
|---------------------------------|----------------------------------------------------------------------------------|
| Vendor                          | Realtek                                                                          |
| Type                            | Integrated Audio                                                                 |
| Internal Speaker                | Yes, 2W (8 ohms)                                                                 |
| Connectors                      | 2 x Front 3.5mm Jacks (Microphone & Headphone)<br>1 x Rear 3.5mm Jack (Line Out) |
| Chipset                         | ALC623-CG                                                                        |
| Number of Channels              | 2                                                                                |
| Number of Bits/Audio Resolution | 6 channels of DAC support 16/20/24-bit PCM format for 5.1 audio solution         |

## Thermal

|              |                                              |
|--------------|----------------------------------------------|
| Temp Sensors | Ambient Sensor                               |
| Fans         | 1 x CPU Fan<br>1 x Front Fan<br>1 x Rear Fan |

|                                                                     |
|---------------------------------------------------------------------|
| 2 x Side Panel Fans (optional)<br>1 x Power Supply Fan (inside PSU) |
|---------------------------------------------------------------------|

## Power Specifications

|                                           |                          |                          |                          |
|-------------------------------------------|--------------------------|--------------------------|--------------------------|
| Power Supply                              | 1100W                    | 750W                     | 500W                     |
| Power Efficiency                          | 92% Efficient @ 50% Load | 92% Efficient @ 50% Load | 92% Efficient @ 50% Load |
| Main                                      | C14                      | C14                      | C14                      |
| Operating Voltage Range                   | 100 – 240V               | 100 – 240V               | 100 – 240V               |
| Rated Voltage Range                       | 90-264VAC                | 90-264VAC                | 90-264VAC                |
| Rated Line Frequency                      | 50Hz / 60Hz              | 47Hz / 63Hz              | 47Hz / 63Hz              |
| Operating Line Frequency Range            | 50Hz / 60Hz              | 50Hz / 60Hz              | 50Hz / 60Hz              |
| Rated Input Current                       | 15A                      | 10A                      | 7A                       |
| Graphics                                  | 1 x 12VHPWR (16-pin)     | 1 x 8 pin (6+2)          | 1 x 8 pin (6+2)          |
| Power Supply Fan                          | Yes                      | Yes                      | Yes                      |
| ENERGY STAR® Qualified (config dependent) | Yes                      | Yes                      | Yes                      |
| 80 PLUS Compliant                         | Yes                      | Yes                      | Yes                      |
| Built-in Self Test (BIST) LED             | No                       | No                       | No                       |
| Aux Power Drop                            | Yes                      | Yes                      | Yes                      |

## BIOS

|                   |     |
|-------------------|-----|
| Vendor            | AMI |
| Self-Healing BIOS | Yes |

## Chassis Information

|            |                                                               |
|------------|---------------------------------------------------------------|
| Color      | Raven Black                                                   |
| PSU        | 1100W, 750W and 500W Available, Autosensing, 80 PLUS Platinum |
| Dimensions | 415mm/16.34" H<br>370mm/14.57" D<br>180mm/7.09" W             |
| Weight     | 14.38 kg / 31.70 lbs                                          |

## Packaging Dimensions

|                  |                      |
|------------------|----------------------|
| Height (mm/in)   | 570mm / 22.44"       |
| Width (mm/in)    | 315mm / 12.40"       |
| Depth (mm)       | 500mm / 19.69"       |
| Weight (kgs/lbs) | 16.54 kg / 36.46 lbs |

## Security & Serviceability

|                                                                    |                                     |
|--------------------------------------------------------------------|-------------------------------------|
| TPM                                                                | Infineon SLB9672 TPM 2.0            |
| Asset ID                                                           | Yes, 1024 x 8bit                    |
| vPro                                                               | Intel vPro for WS (AMT 16.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                                                    | Yes                                 |

|                                         |                                                                          |
|-----------------------------------------|--------------------------------------------------------------------------|
| Boot without keyboard and/or mouse      | Yes                                                                      |
| Access Panel                            | Tool-less Side Cover Removal                                             |
| Optical Drive                           | Optional                                                                 |
| Hard Drives                             | Tool-less                                                                |
| Expansion Cards                         | Tool-less                                                                |
| 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 <sup>0</sup> C to 35 <sup>0</sup> C (50 <sup>0</sup> F to 95 <sup>0</sup> F)<br>Non-Operating: -40 <sup>0</sup> C to 60 <sup>0</sup> C (-40 <sup>0</sup> F to 140 <sup>0</sup> F)                                                          |
| Storage         | Storage: -40 <sup>0</sup> C to 60 <sup>0</sup> C (-40 <sup>0</sup> F to 140 <sup>0</sup> F) in Original Shipping Carton<br>Storage: -10 <sup>0</sup> C to 60 <sup>0</sup> C (14 <sup>0</sup> F to 140 <sup>0</sup> F) Without Carton                     |
| Humidity        | Operating Humidity: 10% to 90% (Humidity+EELP)                                                                                                                                                                                                           |
| Altitude        | Operating: 0m to 3048m (0ft to 10000ft)<br>Storage: 0m to 12192m (0ft to 40000ft)                                                                                                                                                                        |
| Vibration       | Package Vibration:<br>Random,1.04G at 2-200 Hz, 15 Minutes (X,Y,Z) axes<br>Operating Vibration:<br>Random,0.27G at 5-500 Hz, 30 Minutes Per Surface (X,Y,Z) axes<br>Non-Operating Vibration:<br>Random,1.04G at 2-200 Hz, 15 Minutes Per Surface 6 faces |
| Shock           | Operating Shock: Half-sine wave, 15G/3ms(X,Y), 30G/3ms(Z)<br>Rack Operating Shock: Half-sine wave, 15G/5ms<br>Non-operating Shock: Trapezoidal wave, 45G/11ms                                                                                            |
| Disclaimers     | Extended operating temperatures are possible – please contact your Lenovo Rep                                                                                                                                                                            |



## SECTION II: Platform Detail

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|            |                                |
|------------|--------------------------------|
| Board Size | 10.51" x 9.72" (267mm x 247mm) |
| Layout     | Custom ATX                     |

### Motherboard Core

|                   |                                                    |
|-------------------|----------------------------------------------------|
| Processor Support | Intel Arrow Lake-S Series                          |
| Socket Type       | Socket-V (LGA 1851)                                |
| Memory Support    | DDR5 up to 6400MT/s UDIMM Memory (ECC or non-ECC)* |
| Voltage Regulator | 125W TDP Capable                                   |
| Chipset (PCH)     | Intel W880 Chipset                                 |
| Flash             | Single 64MB                                        |
| Super I/O         | Nuvoton NCT6801D                                   |
| Clock             | Intel Native isCLK                                 |
| Audio             | Realtek ALC623-CG Codec                            |
| Ethernet          | Intel Jacksonville I219-LM                         |
| Disclaimers       | *Memory speed dependent on CPU support.            |

### Supported Components

|                 |                                                                                                                                                                         |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Processor Level | Intel Arrow Lake                                                                                                                                                        |
| Processor       | Intel Ultra 9 285K<br>Intel Ultra 9 285<br>Intel Ultra 7 265K<br>Intel Ultra 7 265<br>Intel Ultra 5 245K<br>Intel Ultra 5 245<br>Intel Ultra 5 235<br>Intel Ultra 5 225 |

|             |                                                                                                                                                                                                                                                                                          |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Memory Type | ECC/non-ECC UDIMMs – 5600MT/s                                                                                                                                                                                                                                                            |
| Memory      | 16GB DDR5 5600 MT/s ECC UDIMM<br>32GB DDR5 5600 MT/s ECC UDIMM<br>48GB DDR5 5600 MT/s ECC UDIMM<br>8GB DDR5 5600 MT/s non-ECC UDIMM<br>16GB DDR5 5600 MT/s non-ECC UDIMM<br>32GB DDR5 5600 MT/s non-ECC UDIMM<br>48GB DDR5 5600 MT/s non-ECC UDIMM<br>64GB DDR5 6400 MT/s non-ECC CUDIMM |
| Disclaimers | *Memory speed dependent on CPU support.                                                                                                                                                                                                                                                  |

## Storage

|                                   |                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3.5" SATA Hard Disk Drive (HDD)   | 2TB SATA HDD 7200rpm, 6Gb/s, 3.5"<br>2TB SATA HDD 7200rpm, 6Gb/s, 3.5" (enterprise class)<br>4TB SATA HDD 7200rpm, 6Gb/s, 3.5" (enterprise class)<br>6TB SATA HDD 7200rpm, 6Gb/s, 3.5" (enterprise class)<br>12TB SATA HDD 7200rpm, 6Gb/s, 3.5" (enterprise class)                                                                                                                                                        |
| 2.5" SATA Solid State Drive (SSD) | 3.84TB SATA SSD, 6Gb/s, TLC, 2.5" OPAL Enterprise<br>7.68TB SATA SSD, 6Gb/s, TLC, 2.5" OPAL Enterprise                                                                                                                                                                                                                                                                                                                    |
| M.2 PCIe Solid State Drive (SSD)  | 256GB M.2 (2280) PCIe SSD, Gen 4 x4, NVMe, OPAL<br>512GB M.2 (2280) PCIe SSD, Gen 4 x4, NVMe, OPAL<br>1024GB M.2 (2280) PCIe SSD, Gen 4 x4, NVMe, OPAL<br>2048GB M.2 (2280) PCIe SSD, Gen 4 x4, NVMe, OPAL<br>4096GB M.2 (2280) PCIe SSD, Gen 4 x4, NVMe, OPAL<br>512GB M.2 (2280) PCIe SSD, Gen 5 x4, NVMe, OPAL<br>1024GB M.2 (2280) PCIe SSD, Gen 5 x4, NVMe, OPAL<br>2048GB M.2 (2280) PCIe SSD, Gen 5 x4, NVMe, OPAL |

## RAID

|                              |                                                                                                                                                                                                                                                                    |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| RAID Levels and Requirements | NVMe Drives Support RAID 0/1/5<br>SATA Drives Support RAID 0/1/5/10                                                                                                                                                                                                |
| 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. |

## Optical Drive/Removable Media

|                                  |                                                 |
|----------------------------------|-------------------------------------------------|
| DVD-ROM Drive                    | Slim DVD-ROM drive                              |
| DVD Burner/CD-RW Drive           | Slim DVD Burner/CD-RW Drive                     |
| Blu-Ray Burner Drive             | Slim Blu-Ray ODD DVD Burner                     |
| Media Card Reader Specifications | Optional Front 3-in-1 USB 2.0 Media Card Reader |

## Keyboard and Pointing Devices

|                  |                                                                            |
|------------------|----------------------------------------------------------------------------|
| Keyboard         | Traditional USB Keyboard<br>Calliope USB Keyboard<br>EOS Wireless Keyboard |
| Pointing Devices | Calliope USB Mouse                                                         |

## PCIe Adapters

|                          |                                                                                                                                                                                                                                                                                                                               |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Network                  | Intel I210-T1 Single Port PCIe x1 Gigabit Ethernet Adapter<br>Intel I350-T4 Quad Port PCIe x4 Gigabit Ethernet Adapter<br>RTL8125BGS Single Port PCIe x1 2.5Gigabit Ethernet Adapter<br>Intel X710-T2L Dual Port PCIe x8 10Gigabit Ethernet Adapter<br>Intel E830-XXVDA2 Dual Port PCIe x8 25Gigabit Ethernet Adapter (Fiber) |
| USB                      | USB-C 3.2 Gen 2 PCIe x4 Adapter (Single Port)<br>USB 4 PCIe x4 Adapter (Single Port)<br>USB 3.0 PCIe x1 Adapter (Dual Port)                                                                                                                                                                                                   |
| WiFi Cards               | Intel Gale Peak 2 BE200 WIFI7 + Bluetooth 5.4 PCIe                                                                                                                                                                                                                                                                            |
| Serial Card              | 4-Port Serial Expansion Card PCIe x1                                                                                                                                                                                                                                                                                          |
| PCIe to M.2 Adapter Card | PCIe x4 to M.2 Adapter – Gen 3                                                                                                                                                                                                                                                                                                |

## SECTION III: Supported Component Detail

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### CPU Specifications Group 1

| CPU                      | Intel Core™ Ultra 9 285K                                                                                                                                                                                                                                                                            | Intel Core™ Ultra 7 265K                                                                                                                                                                                                                                                                            | Intel Core™ Ultra 5 245K                                                                                                                                                                                                                                                                            | Intel Core™ Ultra 9 285                                                                                                                                                                                                                                                                           |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| # of Cores               | 24c                                                                                                                                                                                                                                                                                                 | 20c                                                                                                                                                                                                                                                                                                 | 14c                                                                                                                                                                                                                                                                                                 | 24c                                                                                                                                                                                                                                                                                               |
| # of Threads             | 24                                                                                                                                                                                                                                                                                                  | 20                                                                                                                                                                                                                                                                                                  | 14                                                                                                                                                                                                                                                                                                  | 24                                                                                                                                                                                                                                                                                                |
| Processor Base Frequency | 3.7GHz                                                                                                                                                                                                                                                                                              | 3.9GHz                                                                                                                                                                                                                                                                                              | 4.2Ghz                                                                                                                                                                                                                                                                                              | 2.5GHz                                                                                                                                                                                                                                                                                            |
| Max Turbo Frequency      | 5.7GHz                                                                                                                                                                                                                                                                                              | 5.5GHz                                                                                                                                                                                                                                                                                              | 5.2Ghz                                                                                                                                                                                                                                                                                              | 5.6GHz                                                                                                                                                                                                                                                                                            |
| Cache                    | 36                                                                                                                                                                                                                                                                                                  | 30M                                                                                                                                                                                                                                                                                                 | 24M                                                                                                                                                                                                                                                                                                 | 36M                                                                                                                                                                                                                                                                                               |
| TDP                      | 125W                                                                                                                                                                                                                                                                                                | 125W                                                                                                                                                                                                                                                                                                | 125W                                                                                                                                                                                                                                                                                                | 65W                                                                                                                                                                                                                                                                                               |
| Intel ARK Spec Link      | <a href="https://www.intel.com/content/www/us/en/products/sku/241060/intel-core-ultra-9-processor-285k-36m-cache-up-to-5-70-ghz/specifications.html">https://www.intel.com/content/www/us/en/products/sku/241060/intel-core-ultra-9-processor-285k-36m-cache-up-to-5-70-ghz/specifications.html</a> | <a href="https://www.intel.com/content/www/us/en/products/sku/241063/intel-core-ultra-7-processor-265k-30m-cache-up-to-5-50-ghz/specifications.html">https://www.intel.com/content/www/us/en/products/sku/241063/intel-core-ultra-7-processor-265k-30m-cache-up-to-5-50-ghz/specifications.html</a> | <a href="https://www.intel.com/content/www/us/en/products/sku/241067/intel-core-ultra-5-processor-245k-24m-cache-up-to-5-20-ghz/specifications.html">https://www.intel.com/content/www/us/en/products/sku/241067/intel-core-ultra-5-processor-245k-24m-cache-up-to-5-20-ghz/specifications.html</a> | <a href="https://www.intel.com/content/www/us/en/products/sku/241061/intel-core-ultra-9-processor-285-36m-cache-up-to-5-60-ghz/specifications.html">https://www.intel.com/content/www/us/en/products/sku/241061/intel-core-ultra-9-processor-285-36m-cache-up-to-5-60-ghz/specifications.html</a> |

### CPU Specifications Group 2

| CPU                      | Intel Core™ Ultra 7 265                                                                                                                                                                                                                                                                           | Intel® Core™ Ultra 5 245                                                                                                                                                                                                                                                                          | Intel Core™ Ultra 5 235                                                                                                                                                                                                                                                                           | Intel Core™ Ultra 5 225                                                                                                                                                                                                                                                                           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| # of Cores               | 20c                                                                                                                                                                                                                                                                                               | 14c                                                                                                                                                                                                                                                                                               | 14c                                                                                                                                                                                                                                                                                               | 10c                                                                                                                                                                                                                                                                                               |
| # of Threads             | 20                                                                                                                                                                                                                                                                                                | 14                                                                                                                                                                                                                                                                                                | 14                                                                                                                                                                                                                                                                                                | 10                                                                                                                                                                                                                                                                                                |
| Processor Base Frequency | 2.4GHz                                                                                                                                                                                                                                                                                            | 3.5GHz                                                                                                                                                                                                                                                                                            | 3.4GHz                                                                                                                                                                                                                                                                                            | 3.3GHz                                                                                                                                                                                                                                                                                            |
| Max Turbo Frequency      | 5.3GHz                                                                                                                                                                                                                                                                                            | 5.1GHz                                                                                                                                                                                                                                                                                            | 5GHz                                                                                                                                                                                                                                                                                              | 4.9GHz                                                                                                                                                                                                                                                                                            |
| Cache                    | 36M                                                                                                                                                                                                                                                                                               | 24M                                                                                                                                                                                                                                                                                               | 24M                                                                                                                                                                                                                                                                                               | 20M                                                                                                                                                                                                                                                                                               |
| TDP                      | 65W                                                                                                                                                                                                                                                                                               | 65W                                                                                                                                                                                                                                                                                               | 65W                                                                                                                                                                                                                                                                                               | 65W                                                                                                                                                                                                                                                                                               |
| Intel ARK Spec Link      | <a href="https://www.intel.com/content/www/us/en/products/sku/241068/intel-core-ultra-7-processor-265-30m-cache-up-to-5-50-ghz/specifications.html">https://www.intel.com/content/www/us/en/products/sku/241068/intel-core-ultra-7-processor-265-30m-cache-up-to-5-50-ghz/specifications.html</a> | <a href="https://www.intel.com/content/www/us/en/products/sku/241876/intel-core-ultra-5-processor-245-24m-cache-up-to-5-20-ghz/specifications.html">https://www.intel.com/content/www/us/en/products/sku/241876/intel-core-ultra-5-processor-245-24m-cache-up-to-5-20-ghz/specifications.html</a> | <a href="https://www.intel.com/content/www/us/en/products/sku/241674/intel-core-ultra-5-processor-235-24m-cache-up-to-5-20-ghz/specifications.html">https://www.intel.com/content/www/us/en/products/sku/241674/intel-core-ultra-5-processor-235-24m-cache-up-to-5-20-ghz/specifications.html</a> | <a href="https://www.intel.com/content/www/us/en/products/sku/241070/intel-core-ultra-5-processor-225-20m-cache-up-to-5-20-ghz/specifications.html">https://www.intel.com/content/www/us/en/products/sku/241070/intel-core-ultra-5-processor-225-20m-cache-up-to-5-20-ghz/specifications.html</a> |

|  |                                                          |                                                          |                                                          |                                                          |
|--|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
|  | <a href="#">cache-up-to-5-30-ghz/specifications.html</a> | <a href="#">cache-up-to-5-10-ghz/specifications.html</a> | <a href="#">cache-up-to-5-00-ghz/specifications.html</a> | <a href="#">cache-up-to-4-90-ghz/specifications.html</a> |
|--|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|

## HDD Specifications

| Drive                           | 2TB SATA – 7200rpm, 6Gb/s, 3.5"       | 4TB SATA – 7200rpm, 6Gb/s, 3.5" Enterprise | 6TB SATA – 7200rpm, 6Gb/s, 3.5" Enterprise | 12TB SATA 7200 RPM 6Gb/s 3.5" Enterprise |
|---------------------------------|---------------------------------------|--------------------------------------------|--------------------------------------------|------------------------------------------|
| 3.5" SATA Hard Disk Drive (HDD) | Yes                                   | Yes                                        | Yes                                        | Yes                                      |
| 2.5" SATA Hard Disk Drive (HDD) | Not Available                         | Not Available                              | Not Available                              | Not Available                            |
| Connector                       | SATA                                  | SATA                                       | SATA                                       | SATA                                     |
| Transfer Rate (Gb/sec)          | Average Data Rate, Read/Write 156MB/s | Sustained Data Transfer Rate 216-226MB/s   | Sustained Data Transfer Rate 216-226MB/s   | Max Sustained Data Transfer Rate 268MB/s |
| Spindle Speed (RPM)             | 7,200                                 | 7,200                                      | 7,200                                      | 7,200                                    |
| Power Off to Spindle Stop (sec) | NA                                    | NA                                         | NA                                         | NA                                       |
| DC Power to Drive Ready (sec)   | <30.0                                 | <30.0                                      | <30.0                                      | <30.0                                    |
| Average Latency (msec)          | 4.16                                  | 4.16                                       | 4.16                                       | 4.16                                     |
| Input (VDC)                     | 5 & 12                                | 5 & 12                                     | 5 & 12                                     | 5 & 12                                   |
| Typical (Watts)                 | 5.6Max                                | 9.5(Max)                                   | 11(Max)                                    | 8(Max)                                   |
| Idle (Watts)                    | 3.7Max                                | 5.2(Max)                                   | 5.9(Max)                                   | 5.3(Max)                                 |
| Physical Dimensions             | 101.6mm x 147mm x 26.1mm              | 101.85mm x 147mm x 26.1mm                  | 101.85mm x 147mm x 26.1mm                  | 101.85mm x 147mm x 26.1mm                |
| Weight (grams)                  | <535                                  | <715                                       | <715                                       | <700                                     |
| Operating (C) Ambient           | 0 to 55°C                             | 5 to 55                                    | 5 to 55                                    | 5 to 55                                  |
| Operating (C) Base Casting      | <60                                   | <60                                        | <60                                        | <60                                      |
| Non-Operating (C) Ambient       | (-40 to 70)                           | (-40 to 70)                                | (-40 to 70)                                | (-40 to 70)                              |
| Gradient (C per Hour)           | 20                                    | 20                                         | 20                                         | 20                                       |
| Operating (Gs @ 2ms)            | 80                                    | Read 70 Gs / Write 40 Gs                   | Read 70 Gs / Write 40 Gs                   | 50 Gs                                    |

|                          |     |     |     |     |
|--------------------------|-----|-----|-----|-----|
| Non-Operating (Gs @ 2ms) | 300 | 250 | 250 | 250 |
|--------------------------|-----|-----|-----|-----|

## Solid State Storage Specifications

|                                                 |                                              |                                          |                                        |                                        |                                        |                                      |                                      |                                        |                                      |                                      |
|-------------------------------------------------|----------------------------------------------|------------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|----------------------------------------|--------------------------------------|--------------------------------------|
| Drive                                           | NVMe 2280 M.2 Value 256GB M.2 NVMe OPAL Gen4 | NVMe 2280 M.2 512GB PCIe SSD (OPAL) Gen4 | NVMe 2280 M.2 1TB PCIe SSD (OPAL) Gen4 | NVMe 2280 M.2 2TB PCIe SSD (OPAL) Gen4 | NVMe 2280 M.2 4TB PCIe SSD (OPAL) Gen4 | NVMe 2280 M.2 1TB OPAL TLC 2280 Gen5 | NVMe 2280 M.2 2TB OPAL TLC 2280 Gen5 | NVMe 2280 M.2 512GB OPAL TLC 2280 Gen5 | 3.84TB SAT SSD, 2.5" OPAL Enterprise | 7.68T SATA SSD, 2.5" OPAL Enterprise |
| Dimensions Millimeters (W x D x H)              | 22 x 80 x 2.38                               | 22 x 80 x 2.38                           | 22 x 80 x 2.38                         | 22 x 80 x 2.38                         | 22 x 80 x 2.38                         | 22 x 80 x 2.38                       | 22 x 80 x 2.38                       | 22 x 80 x 2.38                         | 100.45 x 69.85 x 7.00                | 100.45 x 69.85 x 7.00                |
| Interface Type                                  | PCIe Gen 4x4                                 | PCIe Gen 4x4                             | PCIe Gen 4x4                           | PCIe Gen 4x4                           | PCIe Gen 4x4                           | PCIe Gen 5x4                         | PCIe Gen 5x4                         | PCIe Gen 5x4                           | SATA 6Gb/s interface                 | SATA 6Gb/s interface                 |
| Power Active (AVG)                              | 5.9W                                         | 5.8W                                     | 8W                                     | 8.25W                                  | 8.2W                                   | 8W(default)<br>10W(performance)      | 8W(default)<br>10W(performance)      | 8W(default)<br>10W(performance)        | 3.8W                                 | 3.9W                                 |
| Power Idle                                      | 100 mW                                       | 35 mW                                    | 35 mW                                  | 25mW                                   | 20mW                                   | 10mW                                 | 10mW                                 | 10mW                                   | 1.5W                                 | 1.5W                                 |
| Typical Sequential Read                         | 3500 MB/s                                    | 6900 MB/s                                | 6900 MB/s                              | 6900 MB/s                              | 6900 MB/s                              | 14000 MB/s                           | 14000 MB/s                           | 12200 MB/s                             | 540MB/s                              | 540MB/s                              |
| Typical Sequential Write                        | 450 MB/s                                     | 6200 MB/s                                | 6800 MB/s                              | 6800 MB/s                              | 6800 MB/s                              | 12500 MB/s                           | 12500 MB/s                           | 6300 MB/s                              | 520MB/s                              | 520MB/s                              |
| Burst Random Read (4K Queue Depth 32/8 thread); | 250K IOPS                                    | 660K IOPS                                | 680K IOPS                              | 800K IOPS                              | 800K IOPS                              | 1600K IOPS                           | 1600K IOPS                           | 800K IOPS                              | 95,000 IOPS                          | 95,000 IOPS                          |
| Burst Random Write (4K Queue Depth 32/8 thread) | 90K IOPS                                     | 600K IOPS                                | 600K IOPS                              | 600K IOPS                              | 600K IOPS                              | 1600K IOPS                           | 1600K IOPS                           | 360K IOPS                              | 65,000 IOPS                          | 65,000 IOPS                          |
| Operating Temperature                           | 0 to 55°C                                    | 0 to 55°C                                | 0 to 55°C                              | 0 to 55°C                              | 0 to 80°C                              | 0 to 70°C                            | 0 to 70°C                            | 0 to 70°C                              | 0~70°C                               | 0~70°C                               |

|                                    |             |             |             |             |             |             |             |             |             |             |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| re Range                           |             |             |             |             |             |             |             |             |             |             |
| Endurance Rating (Lifetime Writes) | 150 TB      | 150 TB      | 300 TB      | 600 TB      | 1600TB      | 600TB       | 1200TB      | 300TB       | 10512       | 9110        |
| Mean Time Between Failures (MTBF)  | 1.5M POH    | 2.0M POH    | 2.0M POH    | 2.0M POH    | 2.0M POH    | 2M POH      | 2M POH      | 2M POH      | 3.0 million | 3.0 million |
| Hardware Encryption                | AES 256 bit | AES 256 bit | AES 256 bit | AES 256 bit | AES 256 bit | AES 256 bit | AES 256 bit | AES 256 bit | Yes         | Yes         |
| Disclaimers                        |             |             | N/A         |             |             |             | N/A         |             |             |             |

## Optical Drive Specifications

|                      |                                                                    |                                                                                                |                                                                                                |
|----------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Description          | 9mm Slim DVD ROM Drive (SATA)                                      | 9mm Slim DVD Burner/CD-RW Drive (SATA)                                                         | 9mm Slim Blu-Ray ODD DVD Burner (SATA)                                                         |
| Interface Type       | SATA 1.5 Gb/s                                                      | SATA 1.5 Gb/s                                                                                  | SATA 1.5 Gb/s                                                                                  |
| Dimensions           | 128±0.4×9.0 ±0.4×127±0.4(Max)<br>Unit:mm (Without Bezel-W x H x D) | 128±0.4×9.0 ±0.4×127±0.4(Max)<br>Unit:mm (Without Bezel-W x H x D)                             | 128±0.4×9.0 ±0.4×127±0.4(Max)<br>Unit:mm (Without Bezel-W x H x D)                             |
| Disc Capacity        | NA                                                                 | NA                                                                                             | NA                                                                                             |
| Type                 | DVDROM                                                             | DVDWriter                                                                                      | BD Rambo                                                                                       |
| External Dimensions  | NA                                                                 | NA                                                                                             | NA                                                                                             |
| Speed                | NA                                                                 | NA                                                                                             | NA                                                                                             |
| Bay Type             | 9.0mm Tray                                                         | 9.0mm Tray                                                                                     | 9.0mm Tray                                                                                     |
| Color                | Business Black or without bezel                                    | Business Black or without bezel                                                                | Business Black or without bezel                                                                |
| Removable            | No                                                                 | No                                                                                             | No                                                                                             |
| Internal Buffer Size | 0.5MB Min                                                          | 0.5MB Min                                                                                      | 4MB                                                                                            |
| Writes               | NA                                                                 | 8XDVD+R / 8XDVD+RW /<br>6XDVD+R DL<br>8XDVD-R / 6XDVD-RW / 6XDVD-R<br>DL<br>24XCD-R / 16XCD-RW | 6x BD-R / 2x BD-RE<br>8XDVD+R / 8XDVD+RW /<br>6XDVD+R DL<br>8XDVD-R / 6XDVD-RW / 6XDVD-R<br>DL |

|                             |                                                                                                                                                                  |                                                                                                                                                                  |                                                                                                                                                                  |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             |                                                                                                                                                                  |                                                                                                                                                                  | 5XDVD-RAM<br>24XCD-R / 16XCD-RW                                                                                                                                  |
| Reads                       | 8XDVD-ROM / 24XCD-ROM                                                                                                                                            | 8XDVD-ROM / 24XCD-ROM                                                                                                                                            | 6x BD-ROM / 8x DVD-ROM / 5x DVD-RAM / 24x CD-ROM                                                                                                                 |
| Source                      | DC Power 5V                                                                                                                                                      | DC Power 5V                                                                                                                                                      | DC Power 5V                                                                                                                                                      |
| DC Power Requirements       | +5V±5%                                                                                                                                                           | +5V±5%                                                                                                                                                           | +5V±5% Ripple less than 100mVp-p                                                                                                                                 |
| DC Current                  | Max 2.5A@5v                                                                                                                                                      | Max 2.5A@5v                                                                                                                                                      | Max 2A@5v                                                                                                                                                        |
| Operating Systems Supported | Windows OS/Linux                                                                                                                                                 | Windows OS/Linux                                                                                                                                                 | Windows OS/Linux                                                                                                                                                 |
| Temperature                 | Operating: 5°C to 45 °C<br>Non-Operating:-30°C to 60°C                                                                                                           | Operating: 5°C to 45 °C<br>Non-Operating:-30°C to 60°C                                                                                                           | Operating: 5°C to 45 °C<br>Non-Operating:-30°C to 60°C                                                                                                           |
| Relative Humidity           | Operating ><br>Read: 15 % to 85 % (Non-Condensing)<br>Write 15 % to 80 % (Depend on the Temperature)<br>Storage/Transportation><br>10 % to 80 % (Non-Condensing) | Operating ><br>Read: 15 % to 85 % (Non-Condensing)<br>Write 15 % to 80 % (Depend on the Temperature)<br>Storage/Transportation><br>10 % to 80 % (Non-Condensing) | Operating ><br>Read: 15 % to 85 % (Non-Condensing)<br>Write 15 % to 80 % (Depend on the Temperature)<br>Storage/Transportation><br>10 % to 80 % (Non-Condensing) |

## Integrated Graphics Adapter

|                        |                                                         |
|------------------------|---------------------------------------------------------|
| Type                   | Intel® Xe LPG Graphics                                  |
| Bus Interface          | Processor onboard                                       |
| Display Interface      | DP/DP/HDMI/DP or HDMI or Type-C or VGA(1 of 4 optional) |
| Video Resolution (max) | 8K60 or 5K60 HDR max(2* 5K60 HDR or 4* 4K60 HDR)        |

## Discrete Graphics Adapter Group 1

|                   |                    |                    |                    |                    |                    |
|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| Adapter           | NVIDA RTX A400     | NVIDA RTX A1000    | NVIDIA RTX2000 Ada | NVIDIA RTX5000 Ada | NVIDIA RTX4000 Ada |
| Bus Interface     | PCI Express 4.0×16 | PCI Express 4.0×16 | PCI Express 4.0×8  | PCI Express 4.0×16 | PCIe 4.0 x 16      |
| Display Interface | DP *4              | DP *4              | mini DP *4         | DP * 4             | DP * 4             |
| Graphics Chipset  | PG172 SKU 570      | PG172 SKU 550      | PG192 SKU 570      | PG132 SKU 550      | PG190 SKU 550      |



|                                                                                |                                                                                                                                                          |                                                                                                                                                          |                                                                                                                                                          |                                                               |                                                               |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| Memory Clock Frequency (MHz)                                                   | 6001 MHz                                                                                                                                                 | 6001 MHz                                                                                                                                                 | 7 GHz (max)                                                                                                                                              | 9000Mhz (max)                                                 | 9000Mhz (max)                                                 |
| Memory Size                                                                    | 4GB GDDR6                                                                                                                                                | 8GB GDDR6                                                                                                                                                | 16GB                                                                                                                                                     | 32GB                                                          | 20GB                                                          |
| Memory Interface                                                               | 64 bits                                                                                                                                                  | 64 bits                                                                                                                                                  | 128 bits                                                                                                                                                 | GDDR6                                                         | GDDR6                                                         |
| Memory Bandwidth                                                               | Up to 96 GB/s                                                                                                                                            | Up to 192 GB/s                                                                                                                                           | Up to 224 GB/s                                                                                                                                           | Up to 576GB/s                                                 | Up to 360GB/s                                                 |
| GPU Cores                                                                      | CUDA Cores: 768                                                                                                                                          | CUDA Cores: 2048                                                                                                                                         | NVIDIA Ada Lovelace architecture-based CUDA Cores:2816                                                                                                   | NVIDIA Ada Lovelace Architecture-Based CUDA Cores:12,800      | NVIDIA Ada Lovelace Architecture-Based CUDA Cores:6,144       |
| GPU Core Frequency (MHz)                                                       | 420MHz (base)/2100MHz (max boost)                                                                                                                        | 1417MHz (base)/2100MHz (max boost)                                                                                                                       | Base:1620 MHz<br>Boost:2130 MHz<br>Maximum boost:3105 MHz                                                                                                | Base: 1155MHz/<br>Boost:2550MHz                               | Base: 1500MHz/<br>Boost:2175MHz                               |
| Maximum Power Consumption                                                      | 30W                                                                                                                                                      | 50W                                                                                                                                                      | 70W                                                                                                                                                      | 250W                                                          | 130W                                                          |
| Supported Resolutions and Max Refresh Rates (Hz) (Note: Analog and/or Digital) | 7680 x 4320 x 24 bpp @ 120Hz<br>7680 x 4320 x 24 bpp @ 60Hz<br>7680 x 4320 x 36 bpp @ 60Hz<br>5120 x 3200 x 24 bpp @ 60Hz<br>5120 x 2880 x 24 bpp @ 60Hz | 7680 x 4320 x 24 bpp @ 120Hz<br>7680 x 4320 x 24 bpp @ 60Hz<br>7680 x 4320 x 36 bpp @ 60Hz<br>5120 x 3200 x 24 bpp @ 60Hz<br>5120 x 2880 x 24 bpp @ 60Hz | 7680 x 4320 x 24 bpp @ 120Hz<br>7680 x 4320 x 24 bpp @ 60Hz<br>7680 x 4320 x 36 bpp @ 60Hz<br>5120 x 3200 x 24 bpp @ 60Hz<br>5120 x 2880 x 24 bpp @ 60Hz | 7680 x 4320 x 24 bpp at 120Hz<br>7680 x 4320 x 36 bpp at 60Hz | 7680 x 4320 x 24 bpp at 120Hz<br>7680 x 4320 x 36 bpp at 60Hz |
| Thermal Solution                                                               | Ultra-quiet Active Fansink                                                                                                                               | Ultra-quiet Active Fansink                                                                                                                               | Active cooled (blower fan)                                                                                                                               | Active cooled                                                 | Active cooled                                                 |
| Dimension                                                                      | 2.713" H x 6.137" L<br>Single Slot, Low Profile                                                                                                          | 2.713" H x 6.137" L<br>Single Slot, Low Profile                                                                                                          | 2.7" H x 6.6" L, Dual Slot                                                                                                                               | 268.6 x 111.15 x 38.5                                         | 254.6 x 126.3 x 21.6                                          |
| Advanced Display                                                               | Not Available                                                                                                                                            | Not Available                                                                                                                                            | Not Available                                                                                                                                            | SYNC 2                                                        | SYNC 2                                                        |
| SLI/NVLink Support                                                             | Not Available                                                                                                                                            | Not Available                                                                                                                                            | Not Available                                                                                                                                            | NA                                                            | NA                                                            |

## Ethernet Specifications Group 1 Part 1

|      |                                                                  |                                                                  |                                     |                                             |                                         |
|------|------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------|---------------------------------------------|-----------------------------------------|
| Card | Intel I210-T1 Single Port Gigabit Ethernet Adapter (Springville) | Intel I350-T4 Quad Port Gigabit Ethernet Adapter (Stony Lake T4) | RTL8125BGS 2.5G Single Port PCIe x1 | Intel X710-T2L PCIe x8 10G Ethernet Adapter | Intel Wi-Fi 7 BE200 PCIE M.2 module SBB |
|------|------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------|---------------------------------------------|-----------------------------------------|

|                                          |                                                                                                                          |                                              |                                                                                                                          |                                   |                                                               |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------------------------------------------------------|
| Supplier PN                              | I210T1, MM# 941033                                                                                                       | I350T4G1P20, MM# 928942                      | RTL8125BGS-CG                                                                                                            | X710-T2L, MM# 99AT6H              | BE200.NGWG, MM# 99C462                                        |
| Data Rates Supported                     | 10/100/1000Mbps copper                                                                                                   | 10/100/1000Mbps (Copper), 1000Mbps (Fiber)   | 10/100/1000/2500Mbps copper                                                                                              | 100Mbps, 1/2.5/5/10Gbps           | 2.4G/5G/6G                                                    |
| Controller Details                       | Intel® Ethernet Controller I210                                                                                          | Intel Ethernet Controller I351               | Ethernet Controller RTL8125B                                                                                             | Intel X710-AT2                    | Intel Wi-Fi 7 BE200                                           |
| Controller Bus Architecture              | PCIe 2.1 (5GT/s)                                                                                                         |                                              | PCIe 2.1 (5GT/s)                                                                                                         | PCIe 2.1 (5GT/s)                  | PCIe 3.0                                                      |
| Data Transfer Mode                       | Ethernet                                                                                                                 | Ethernet                                     | Ethernet                                                                                                                 | Ethernet                          | WLAN                                                          |
| Power Consumption                        | 0.81W                                                                                                                    | Copper: I350T4V2= 5W<br>LC-Fiber: I350F4= 6W | 0.8W                                                                                                                     | 9.6W                              | M.2 power supply: supply: 3.3V worst case: 2000mA             |
| IEEE Standards Compliance                | IEEE 802.3/10BASE-T, 100BASE-TX, 1000BASE-T                                                                              | IEEE 802.3/10BASE-T, 100BASE-TX, 1000BASE-T  | IEEE 802.3 10BASE-Te, 100/1000/2.5G BASE-T                                                                               | 5/2.5/1GbE, 10GBASE-T, 100BASE-TX | IEEE 802.11 be<br>IEEE 802.11 a/b/d/e/g/h/i/k/n/r/u/v/w/ac/ax |
| Boot ROM Support                         | 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 | PXE /UEFI Boot                    | Wireless Functionality inPre-boot Environment<br>WiFi UEFI    |
| Network Transfer Mode (Full/Half Duplex) | Supported                                                                                                                | Supported                                    | Supported                                                                                                                | Support                           | NA                                                            |
| Network Transfer Rate                    | 1,000Mbps Full Duplex                                                                                                    | 1,000Mbps Full Duplex                        | 2500Mbps Full Duplex                                                                                                     | 10Gbps Full Duplex                | NA                                                            |
| a                                        | Windows 7/8/10, Linux, Free BSD, XEN,Vmware                                                                              | Windows 7/8/10, Linux, Free BSD, XEN,Vmware  | Windows 11 64                                                                                                            | Win10, Win11, Linux               | Windows11, Linux, Free BSD                                    |
| Manageability                            |                                                                                                                          | Supported                                    |                                                                                                                          | Supported                         |                                                               |
| Manageability Capabilities Alerting      |                                                                                                                          | Supported                                    |                                                                                                                          | Supported                         |                                                               |
| Lithography                              |                                                                                                                          |                                              | NA                                                                                                                       |                                   |                                                               |
| TDP                                      | Firmware Based Thermal Management                                                                                        | Firmware Based Thermal Management            | Thermal Management                                                                                                       |                                   | NA                                                            |

|                             |                             |                                            |                          |                             |                 |
|-----------------------------|-----------------------------|--------------------------------------------|--------------------------|-----------------------------|-----------------|
| Operating Temperature Range | 0°C to 55°C (32°F to 131°F) | 0°C to 55°C (32°F to 131°F)                | -5°C~50°C(23°F to 122°F) | 0°C to 55°C (32°F to 131°F) | 0°C to 50°C     |
| # of Ports                  | 1                           | 4                                          | 1                        | 2                           | NA              |
| Data Rate Per Port          | 10/100/1000Mbps (copper)    | 10/100/1000Mbps (copper), 1000Mbps (fiber) | 10/100/1000/2500Mbps     | 100Mbps, 1G/2.5G/5G/10Gbps  | 2×2             |
| System Interface Type       | PCIe Gen 2.1                | PCIe Gen 2.1                               | PCIe Gen 2.1             | PCIe3.0                     | M.2: PCIe*, USB |
| NC Sideband Interface       | Not Available               | Not Available                              | Not Available            | Not Available               | Not Available   |
| Jumbo Frames Supported      | Yes                         | Yes                                        | Yes                      | Yes                         | Yes             |
| 1000Base-T                  | Yes                         | Yes                                        | Yes                      | Yes                         | NA              |
| MACsec IEEE 802.1AE         | Coming Soon                 | Coming Soon                                | Not Available            | NA                          |                 |
| IEEE 1588                   | Supported                   | Supported                                  | Supported                | Supported                   | NA              |
| Supported Under vPro        | Not Available               | Not Available                              | Not Available            | Supported                   |                 |
| Disclaimers                 |                             |                                            |                          |                             |                 |

## Ethernet Specifications Group 1 Part 2

|                                                       |                               |                               |                                     |                                             |                                         |
|-------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|---------------------------------------------|-----------------------------------------|
| Model                                                 | i210-T1                       | i350-T4                       | RTL8125BGS 2.5G Single Port PCIe x1 | Intel X710-T2L PCIe x8 10G Ethernet Adapter | Intel Wi-Fi 7 BE200 PCIe M.2 module SBB |
| Connector                                             | RJ-45 Copper                  | 4 x Ports RJ-45 Copper        | RJPA54-5JE3-M1A-0R                  | 2 x RJ45 Copper                             | RF cable                                |
| Website                                               | i210 T1                       | i350 T4                       | RTL8125BGS                          | X710-T2L                                    | BE200                                   |
| 100BASE-TX (IEEE 802.3 specification conformance)     |                               |                               | Yes                                 |                                             |                                         |
| 1000BASE-T (IEEE 802.3 specification conformance)     |                               |                               | Yes                                 |                                             |                                         |
| Auto-Negotiation                                      | IEEE* 802.3* Auto-negotiation | IEEE* 802.3* Auto-negotiation | supported                           | IEEE* 802.3* Auto-negotiation               | IEEE 802.11 be Auto-negotiation         |
| Intel® vPro™                                          | Not Available                 | Not Available                 | Not Available                       | Not Support                                 | Supported                               |
| Intel® Standard Manageability                         | Supported                     |                               | Supported                           |                                             | Supported                               |
| Power Optimizer Platform Low-power Management Systems | Supported                     |                               | Supported                           |                                             | Supported                               |

|                                                           |           |                                                                                   |                           |                                                                                   |                               |
|-----------------------------------------------------------|-----------|-----------------------------------------------------------------------------------|---------------------------|-----------------------------------------------------------------------------------|-------------------------------|
| Energy Efficient Ethernet                                 | Supported | Supported                                                                         | Supported                 | Supported                                                                         | Enabled for 10/5/2.5/1GBASE-T |
| TCP/UDP Checksum and Segmentation Offload (IPv4 and IPv6) | Supported | Supported                                                                         | Supported                 | Supported                                                                         | Supported                     |
| Receive Side Scaling                                      | Supported | Supported                                                                         | Supported                 | Supported                                                                         | Supported                     |
| Dual Tx and Rx Queues                                     | Yes       | Yes                                                                               | Yes                       | Yes                                                                               | Yes                           |
| Jumbo Frames (up to 9KB)                                  | Supported | Supported                                                                         | Jumbo Frames (up to 16KB) | Supported                                                                         | Supported                     |
| Teaming                                                   | Supported | Supported                                                                         | Supported                 | Supported                                                                         | Supported                     |
| Integrated Switched Voltage Regulator (iSVR)              |           |                                                                                   | Yes                       |                                                                                   |                               |
| Shared Flash with System BIOS                             |           |                                                                                   | Not Available             |                                                                                   |                               |
| Wake from Deep Sx                                         | Supported | Supported                                                                         | Supported                 | No Supported                                                                      | Supported(S4)                 |
| Server Operating System Support                           |           | Windows Server 2008, 2012, 2016, 2019<br>Linux (RHEL/SLES), Free BSD, Xen, Vmware |                           | Windows Server 2008, 2012, 2016, 2019<br>Linux (RHEL/SLES), Free BSD, Xen, Vmware |                               |
| Network Proxy/ARP Support                                 | Supported | Supported                                                                         | Supported                 | Supported                                                                         | Supported                     |

## Media Card Reader

|                |                                |
|----------------|--------------------------------|
| Description    | Media Card reader (3 in 1) TWR |
| Interface Type | USB2.0                         |
| Form Factor    | USB 2.0 Mass Storage Device    |

## SECTION IV: BIOS / Certifications / Standards / Environmental

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### BIOS Specifications

|                                                |                                                                                                                                                                                                                                                                            |
|------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| WMI Support                                    | Compliant With Microsoft WBEM and the DMTF Common Information Model                                                                                                                                                                                                        |
| ROM-Based Setup Utility (F1)                   | System Configuration Setup Program, Available at Power-on With F1 Key                                                                                                                                                                                                      |
| Bootblock Recovery                             | Recovers System BIOS if the Flash ROM Becomes 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 Becomes 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, SMP and Power-On Passwords Can Protect Boot and ROM-based Setup <ul style="list-style-type: none"><li>– Support Electronic Lock</li><li>– Chassis Intrusion Detection</li><li>– UEFI Secure Boot Support</li><li>– HDD Password Can Protect HDD Data</li></ul> |

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                 | <ul style="list-style-type: none"> <li>- Windows UEFI Firmware Update Support</li> <li>- Device Guard Support</li> <li>- Optional Access Panel Lock, Kensington Lock, and Pad Lock, BIOS Guard, Boot Guard</li> <li>- BIOS Self-Healing Gen 2 (RoT: EC )</li> <li>- Secure Wipe 2.0</li> <li>- Subscription Certificate Storage</li> <li>- Certificate-based BIOS Authentication and Management – Phase 2</li> <li>- BIOS Modification and Event Logging – Phase 1</li> <li>- Customized BIOS Defaults</li> <li>- BIOS Settings in Intune Settings Catalog</li> <li>- Microsoft Modern (Cloud) Bare Metal Recovery "cBMR"</li> <li>- BIOS Initialization to Factory Default</li> </ul> |
| 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 2.8 Device Guard Support Spec                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## Industry Standard Specification Support

|                                                              |                                                                            |
|--------------------------------------------------------------|----------------------------------------------------------------------------|
| UEFI                                                         | Unified Extensible Firmware Interface v2.9                                 |
| 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                                                      | El Torito Bootable CD-Rom Format Specification, v1.0                       |
| EHCI                                                         | Enhanced Host Controller Interface for Universal Serial Bus, Revision v1.0 |
| PCI                                                          | NA (No PCI slot)                                                           |
| 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<br>Universal Serial Bus v2.0            |

|        |                                                        |
|--------|--------------------------------------------------------|
|        | Universal Serial Bus v3.0<br>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                         | GDX Scip control                                                                                  |
| Batteries                                                    | UN38.3,MSDS                                                                                       |
| Safety, EMC Connection to the Telephone Network and Labeling | Not applicable                                                                                    |

## Acoustic Noise Emissions Declaration

|                 |     |
|-----------------|-----|
| LWAd(bels) Idle | 3.5 |
| LWAd(bels) Oper | 3.5 |

## 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<br>VCCI<br>BSMI<br>KC |
|--------------|------------------------------|

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | RCM<br>GS<br>UL<br>IEC62368 CB Report/Certificate<br>Saudi Arabia EQM<br>Kuwait KUCAS<br>China CCC Mark<br>Singapore PSB<br>South Africa SABS<br>Russia/Belarus/Kazakhstan/Kyrgyzstan/Armenia-EAC<br>Morocco-CM<br>Mexico-NOM<br>Serbia KVALITET<br>Ukraine UKrCEPRO<br>India-BIS<br>China SRRC<br>Indonesia-DJID<br>Malaysia-SIRIM<br>Philippines-NTC<br>Chile-SUBTEL<br>Thailand-NBTC<br>Morocco-ANRT<br>Singapore-IMDA<br>India-ETA |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Environmentals

|                      |                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Energy Star          | ENERGY STAR 9.0                                                                                                                                                   |
| EPEAT                | EPEAT Certification Available on Select Models                                                                                                                    |
| ErP Lot-3 2013       | Yes                                                                                                                                                               |
| Hazardous Substances | GDX Scip control                                                                                                                                                  |
| Materials Used       | System<br>95% PCC recycled plastic front bezel<br>Packaging<br>Carton: 90% Recycled and/or FSC<br>certified content <sup>3</sup><br>Cushion: 90% Recycled EPE     |
| TCO Certification    | 10.0                                                                                                                                                              |
| Disclaimers          | EPEAT registered where applicable. EPEAT registration varies by country. See <a href="http://www.epeat.net">www.epeat.net</a> for registration status by country. |