

X13DEH

USER'S MANUAL

Revision 1.0b

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Manual Revision 1.0b

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Preface

About This Manual

This manual is written for system integrators, IT technicians, and knowledgeable end users. It provides information for the installation and use of the X13DEH motherboard, which is intended to be used in a Supermicro proprietary server.

About This Motherboard

The Supermicro X13DEH motherboard supports dual 4th/5th Gen Intel® Xeon® Scalable Processors (in Socket E LGA 4677) with four UPIs (20 GT/s max.) and a Thermal Design Power (TDP) up to 350 W. Built with the Intel C741 chipset, the X13DEH supports up to 8 TB 3DS RDIMM/RDIMM DDR5 ECC memory with speeds up to 5600 MT/s in 16 DIMM slots (or up to 4400 MT/s in 32 DIMM slots).

This motherboard features superior I/O expansibility and flexibility, including 20 PCIe 5.0 x8 via MCIO Vertical connectors for riser cards, eight SATA 3.0 ports via SlimSAS LP x8 connections, one SideBand to I/O module header, one USB/video signal port, and one USB connector with two USB 3.0 connections (USB 2/3) for rear access. It also offers the most advanced data protection with onboard M.2 connector support.

Coupling Supermicro's superiority in AI platform support with Nvidia's BlueField®-3 DPU technology built in, the X13DEH offers unprecedented computing power with tremendous PCIe expansibility, networking connectivity, and storage capability for diverse system deployments. It is ideal for NVIDIA Lego projects with optional GPU support. For processor/memory updates, refer to our website at http://www.supermicro.com/products/.

Note 1: Memory speed support depends on the processors used in the system. The 4th Gen Intel Xeon Scalable processors support DDR5 memory with speeds up to 4800 MT/s (or up to 4400 MT/s in 32-DIMM configuration). The 5th Gen Intel Xeon Scalable processors support DDR5 memory with speeds up to 5600 MT/s (or up to 4400 MT/s in 32-DIMM configuration).

Note 2: For TPM support, an optional part is needed. Contact Supermicro Technical Support for more information.

Conventions Used in the Manual

Special attention should be given to the following symbols for proper system installation and protection against component damage or personal injury.



Warning! Indicates important information given to prevent equipment/property damage or personal injury.



Warning! Indicates high voltage may be encountered while performing a procedure.



Important: Important information given to ensure proper system installation or to relay safety precautions.



Note: Additional Information given to provide information for proper system setup.

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Chapter 1

Introduction

Congratulations on purchasing your system board from an industry leader. Supermicro motherboards are designed to provide you with the highest standards in quality and performance.

1.1 System Board Overview

This chapter provides detailed information on the components installed on the X13DEH system board and specifications/features supported by your computer system.

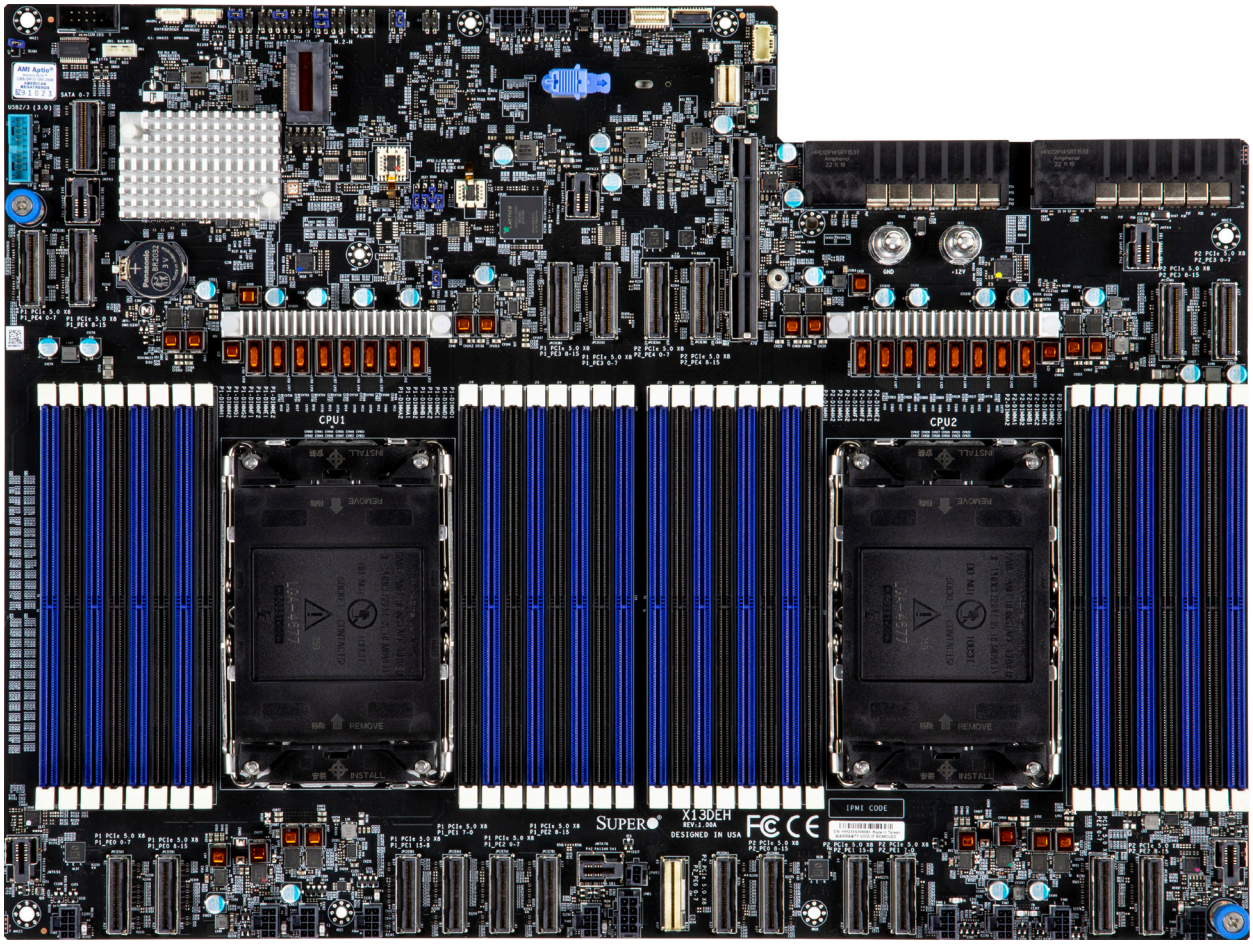
Important Links

For your motherboard to work properly, follow the links to download all necessary drivers/utilities and the user's manual for your computer.

- Supermicro product manuals: http://www.supermicro.com/support/manuals/
- Product drivers and utilities: https://www.supermicro.com/wdl/driver
- Product safety info: http://www.supermicro.com/about/policies/safety_information.cfm
- A secure data deletion tool designed to fully erase all data from storage devices can be found at our website: https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility/
- Firmware-related and AOC user's guides: http://www.supermicro.com/support/manuals/
- If you have any questions, contact our support team at: support@supermicro.com

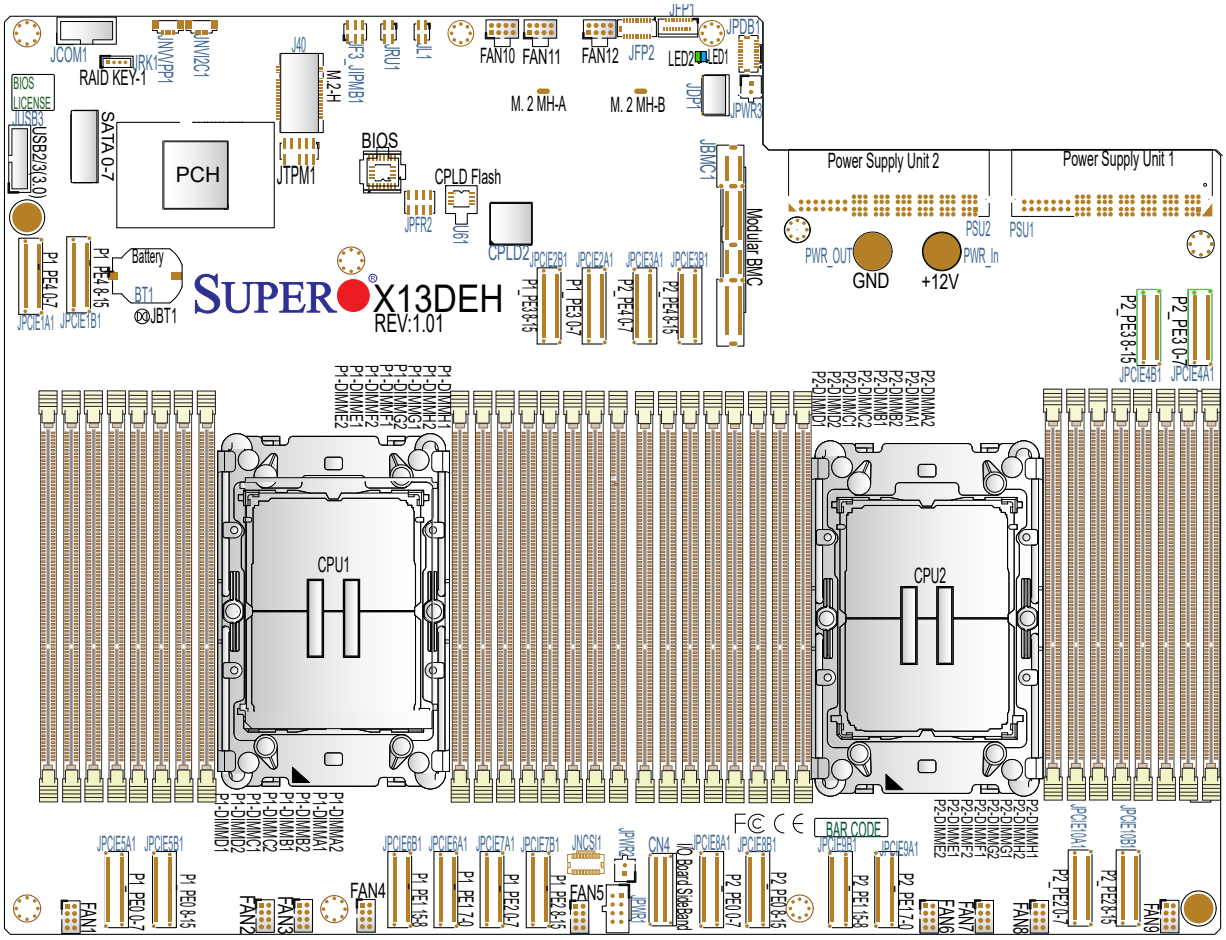
This manual may be periodically updated without notice. Check the Supermicro website for possible updates to the manual revision level.

Figure 1-1: X13DEH Motherboard Image



Note: All graphics shown in this manual were based upon the latest PCB revision available at the time of publication of this manual. The motherboard you received may or may not look exactly the same as the graphics shown in the manual.

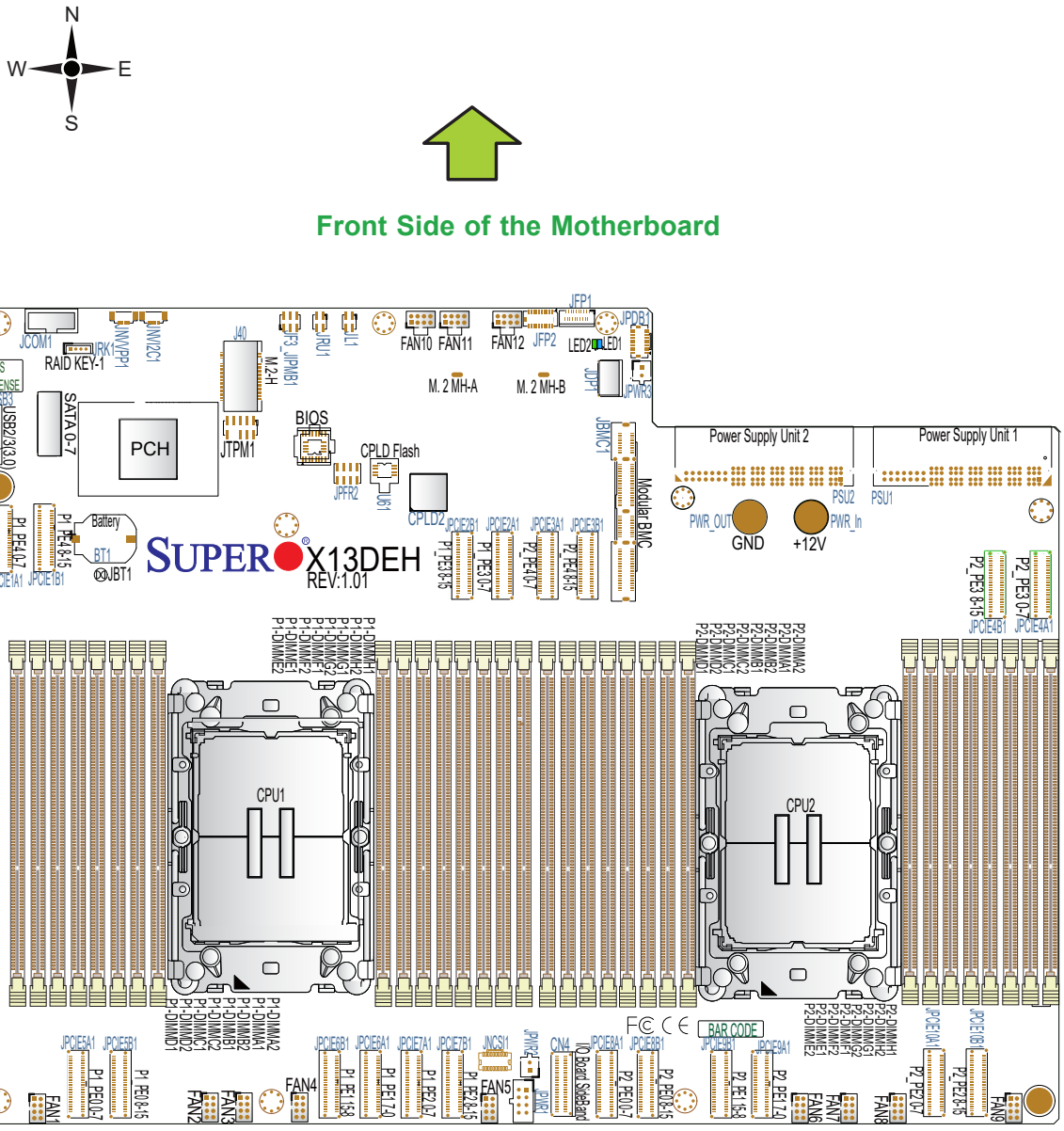
Figure 1-2: X13DEH Motherboard Layout
(not drawn to scale)



Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports, and front panel connections.
- " " indicates the location of Pin 1.
- Jumpers/LED indicators not indicated are used for testing only.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid a possible explosion.

Figure 1-3: Orientation of the X13DEH Motherboard



Note: This motherboard has a different orientation from a regular Supermicro motherboard. The front side of this motherboard is facing North, while the rear side of the motherboard faces South.

Quick Reference

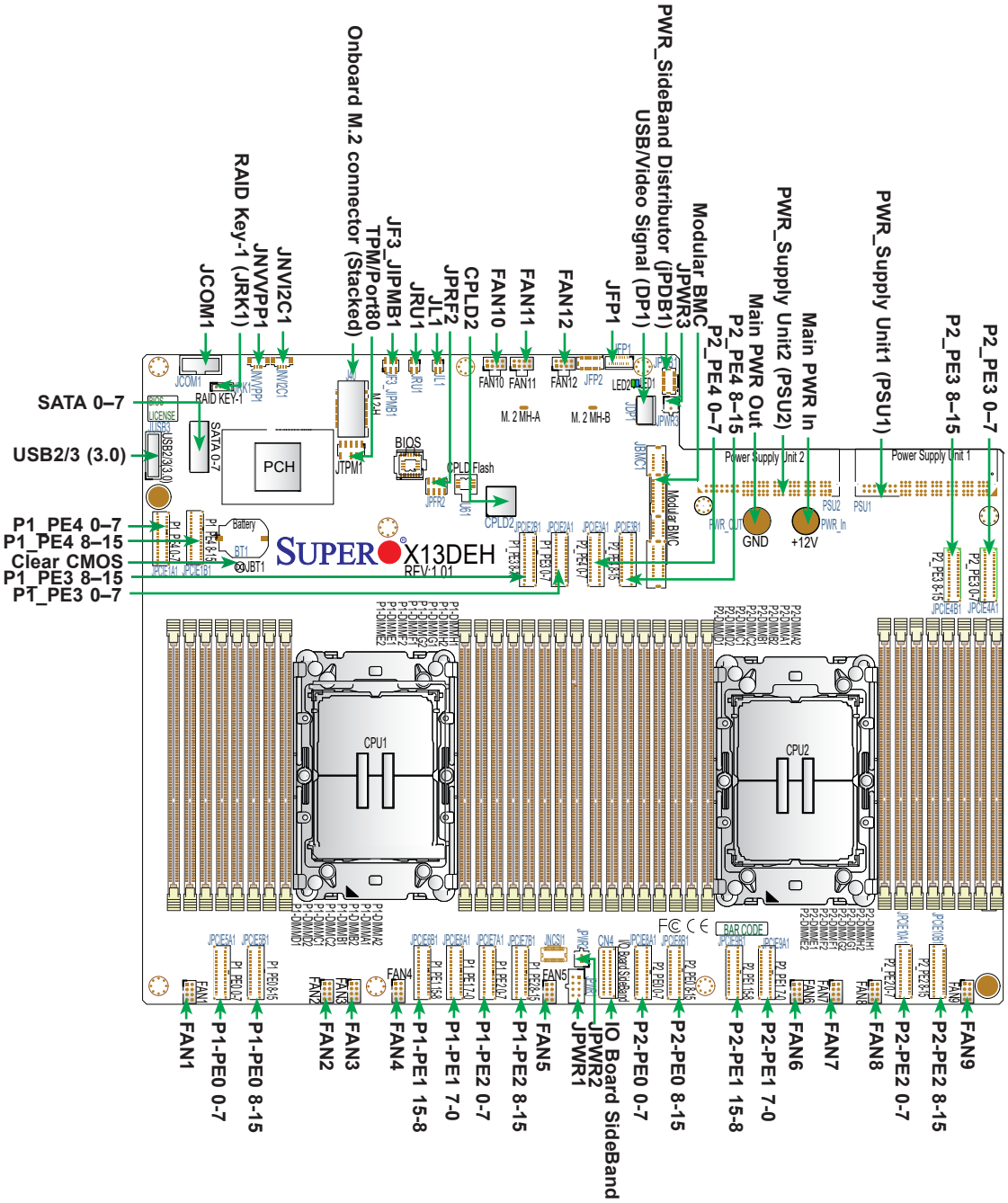


Figure 1-4: Components Reference

Note: Components not documented are for internal testing only.

Quick Reference Table

Jumper	Description	Jumper Setting (Bold: Default)
JBT1	CMOS Clear	**Open (Normal)**
JPFR2	Platform Firmware Resilience Jumper	**Pins 3/4: PFR Update** (See Chapter 2 for details)
JRU1	Unit Identifier (UID)/System Reset Select Switch	**Pins 1/2: UID Select (Default)** Pins 3/4: System Reset

LED	Description	Status
LED1	Unit Identifier (UID) LED	Blue on: Unit/system in need of service is identified
LED2	Onboard Power LED	Green Blinking: Onboard Power Active Green on: Onboard Power on

Connector	Description
+12V (CST Pin)	+12V: CST pin used for Main Power In (to be connected to the power sideband distributor board located on JPDB1) to provide power to Nvidia proprietary systems
GND (CST Pin)	Ground (GND): CST pin used for Main Power Out (to be connected to the power sideband distributor board located on JPDB1) for use in Nvidia proprietary systems
Battery (BT1)	Onboard battery
CN4	Supermicro & Nvidia proprietary I/O board sideband connector
CPLD2	Complex Programmable Logic Device (CPLD) header
FAN1 – FAN12	8-pin fan headers for system cooling
JBMC1	4c+ connector for modular Baseboard Management Controller (BMC)
JCOM1	A communication (COM) port pin header used for debugging
JF3_JIPMB1	6-pin BMC external I²C header
JFP1	SMCI proprietary front panel control connector
JFP2	Nvidia proprietary Front Panel Control connector for various power, networking, and IO support
JL1	Chassis intrusion header
JNVI2C1	BMC I²C for NVMe connector
JNCSI1	Nvidia proprietary connector for BlueField-3 Data Processing Unit (DPU) NC-SI support
JNVVPP1	Virtual pin port for NVMe connector
JPDB1	Power Sideband header used for the power distributor board (PDB) to provide main system power to Nvidia proprietary systems
JPWR1	8-pin standard power connector
JPWR2	P12 (+12)V auxiliary power connector
JPWR3	P12 (+12)V standby power connector
M.2-H (J40)	PCIe 3.0/SATA3 Hybrid M.2 slot (stacked) with support of M-Key 2280 and 22110 form factors
P1_PE0/P1_PE2/P1_PE3/ P1_PE4 0–7; 8–15	PCIe 5.0 x8 via MCIO vertical connectors supported by CPU1
P1_PE1 7–0, 15–8	PCIe 5.0 x8 via MCIO vertical connectors supported by CPU1
P2_PE0/P2_PE2/P2_PE3/ P2_PE4 0–7, 8–15	PCIe 5.0 x8 via MCIO vertical connectors supported by CPU2

P2_PE1 7–0, 15 – 8	PCIe 5.0 x8 via MCIO vertical connectors supported by CPU2
PSU1/PSU2	Power Supply Unit1/Power Supply Unit2 used to provide power to Supermicro (1U) systems
SATA 0–7	SATA connector with support of eight Intel PCH SATA 3.0 via Slim SAS LP x8 connections (RAID 0, RAID 1, RAID 5, RAID 10 supported)
TPM/Port80 (JTPM1)	Trust Platform Module (TPM)/Port 80 connector
USB2/3 (3.0) (JUSB1)	USB 3.0 connector with two rear USB ports supported (USB 2/3)
VROC RAID Key (JRK1)	Intel VROC RAID key header for NVMe RAID support



Note 1: For TPM support, an optional part is needed. Contact Supermicro Technical Support for more information.

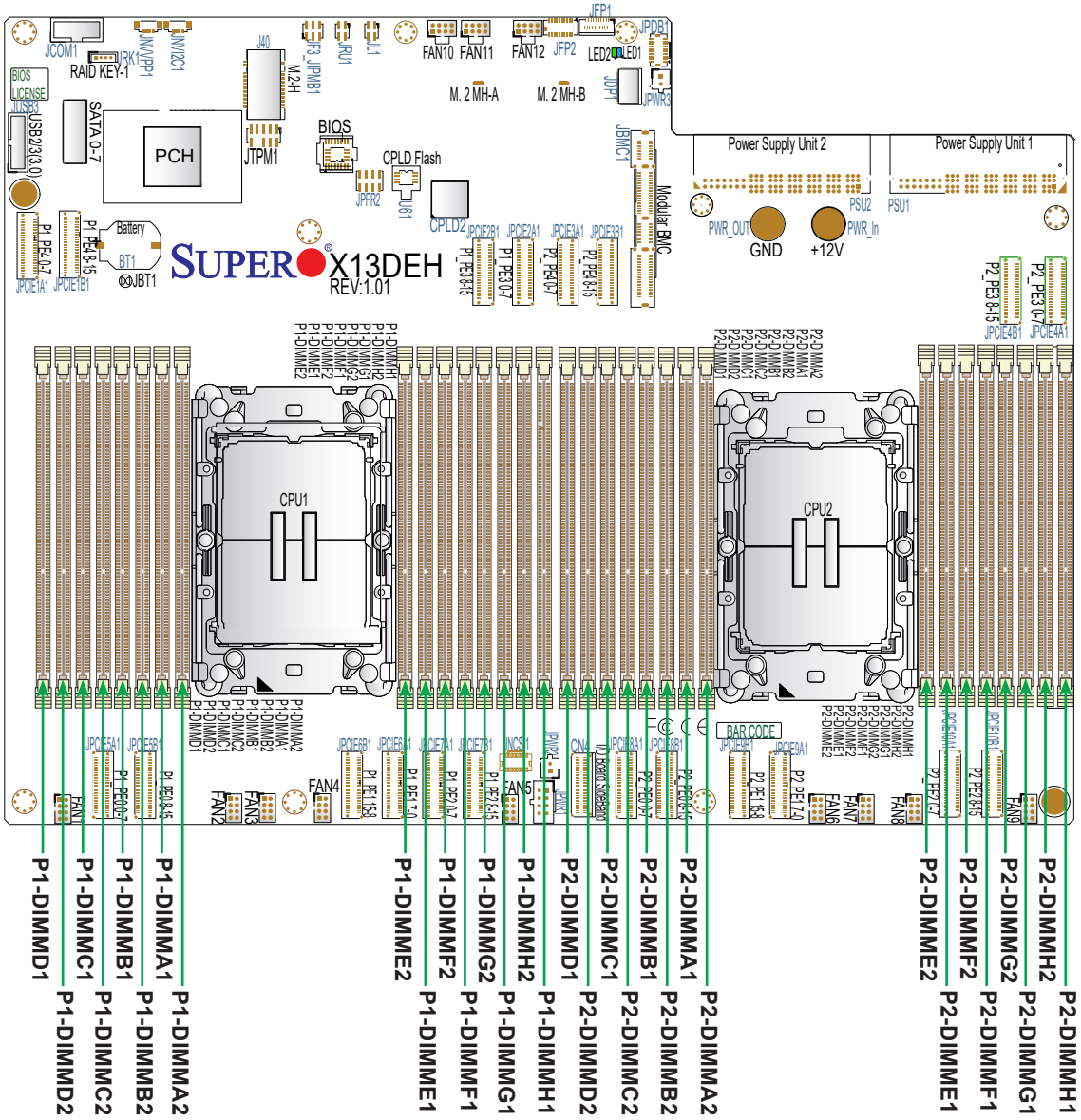
Note 2: For detailed instructions on how to configure VROC RAID settings, refer to the VROC RAID Configuration User's Guide posted on the web page under the link: http://www.supermicro.com/support/manuals/.

Memory Slots

The motherboard supports 3DS RDIMM/RDIMM DDR5 ECC memory with speeds up to 8 TB 5600 MT/s in 16 DIMM slots (or up to 4400 MT/s in 32 DIMM slots). Refer to the layout drawing for the locations of the DIMM slots:

DIMM Slots Supported by CPU1	DIMM Slots Supported by CPU2
P1-DIMMA2	P2-DIMMA2
P1-DIMMA1	P2-DIMMA1
P1-DIMMB2	P2-DIMMB2
P1-DIMMB1	P2-DIMMB1
P1-DIMMC2	P2-DIMMC2
P1-DIMMC1	P2-DIMMC1
P1-DIMMD2	P2-DIMMD2
P1-DIMMD1	P2-DIMMD1
P1-DIMMH1	P2-DIMMH1
P1-DIMMH2	P2-DIMMH2
P1-DIMMG1	P2-DIMMG1
P1-DIMMG2	P2-DIMMG2
P1-DIMMF1	P2-DIMMF1
P1-DIMMF2	P2-DIMMF2
P1-DIMME1	P2-DIMME1
P1-DIMME2	P2-DIMME2

Figure 1-5: DIMM Slot Locations



Motherboard Features

Motherboard Features
CPU
• Supports dual 4th and 5th Gen Intel Xeon Scalable Processors (in Socket E LGA 4677) with four UPIs (20 GT/s max.) and Thermal Design Power (TDP) up to 350 W. This motherboard supports SP XCC, Max Series (HBM), and SP MCC SKUs.
Memory
• Supports up to 8 TB 3DS RDIMM/RDIMM DDR5 ECC memory • Memory speeds of up to 4800 MT/s (DDR5-4400 MT/s when fully populated) in 16 memory slots (4th Generation Intel Xeon) • Memory speeds of up to 5600 MT/s (DDR5-4400 MT/s when fully populated) in 16 memory slots (5th Generation Intel Xeon) **Note:** Memory speed and capacity support are dependent on the processors used in the system.
DIMM Size
• Up to 256 GB **Note:** For the latest CPU/memory updates, refer to our website at http://www.supermicro.com/products/motherboard.
Chipset
• Intel PCH C741
Expansion Slots
• Twenty PCIe 5.0 x8 via MCIO vertical connections for riser cards • One x8 SATA 3.0 via Slim SAS-LP (Low Profile) (x8) connections (SATA 0–7) • One sideband I/O module header • One USB 3.0 header with two rear USB ports (USB 2/3 3.0) • One BF-3 DPU NC-SI header with support of Nvidia BlueField-3 Data Processor Unit (DPU)
Baseboard Management Controller (BMC)/Network
• ASPEED AST2600 Modular BMC
Graphics (Video Support)
• USB/VGA support connector via ASPEED AST2600 BMC
I/O Devices
• One USB/Video signal connector on rear I/O panel (JCOM1)
Peripheral Devices
• One USB 3.0 header with two rear USB ports (USB2/3)
BIOS
• AMI SPI BIOS • EFI GUI, SPI dual/quad speed control, riser card auto-detection, IPMIView, SMCIPMITOOL, IPMI CFG, Redundant power supply unit detection, SSM, and SUM-OOB/InBand support

Power Management
• Power Supply Unit1/Power Supply Unit2 (PSU1/PSU2) are used to provide main system power to Supermicro (1U) systems • Power Distributor Board (PDB) installed on the power sideband header (JPDB1) is used to supply main power to Nvidia proprietary systems • ACPI power management • Power button override mechanism • Power-on mode for AC power recovery • Wake-on-LAN (WoL) • Power-on mode for AC power recovery
System Health Monitoring
• Onboard voltage monitoring for +12V, +5V/+5V standby, +3.3V, +3.3V standby, Vcore, and Vmem • Onboard temperature monitoring for CPU, VRM, LAN, PCH, system, and memory • 8+4 CPU switch phase voltage regulator • CPU thermal trip support • Platform Environment Control Interface (PECI)/TSI
Fan Control
• Fan status monitoring via BMC connections • Single cooling zone • Low-noise fan speed control
System Management
• Chassis intrusion header and detection • Server platform service
Firmware Integrity/System Security
• Boot Guard • BMC recovery, BIOS recovery, CPLD recovery
LED Indicators
• Power LED (LED2) • UID/remote UID (LED1) (Blue)
Dimensions
• 16.50" x 12.00" NV Lego (419.10 mm x 304.80 mm) (W x L)

Note 1: The CPU maximum Thermal Design Power (TDP) is subject to motherboard, chassis, and heatsink cooling restrictions. For proper thermal management, check the chassis and heatsink specifications.

Note 2: For BMC configuration instructions, refer to the Embedded BMC Configuration User's Guide available at http://www.supermicro.com/support/manuals/.

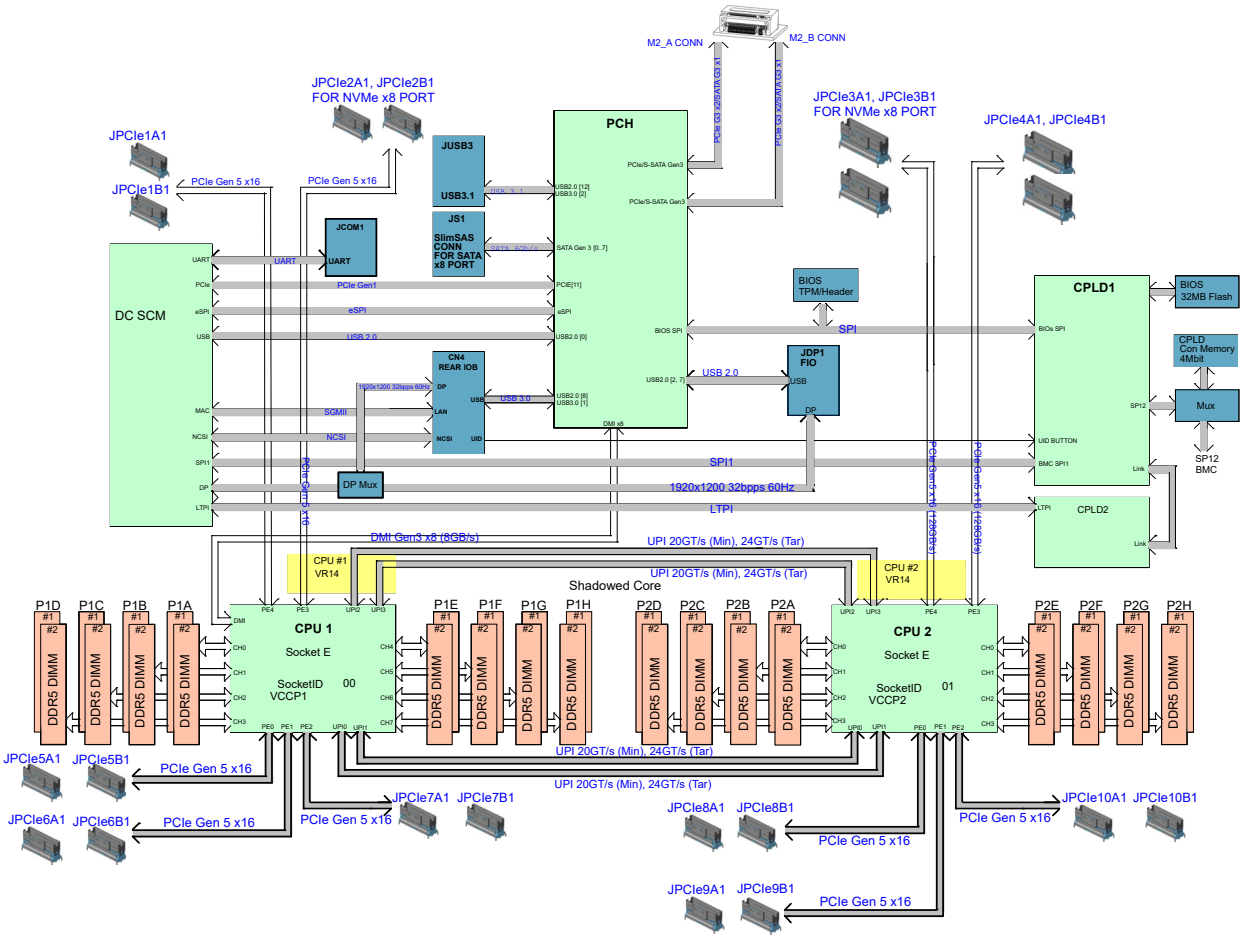


Figure 1-6: System Block Diagram

Note: This is a general block diagram and may not exactly represent the features on your motherboard. See the previous pages for the actual specifications of your motherboard.

1.2 Processor and Chipset Support

Built upon the functionality and capability of the 4th and 5th Gen Intel Xeon Scalable Processors (Socket E) and the Intel C741 PCH, the X13DEH motherboard offers critical, pivotal technological breakthroughs that unleash unprecedented computing capabilities and provides a scalable platform optimized for applications used in Artificial Intelligence (AI) Acceleration, Deep Learning Boost, Network Interconnectivity, and Platform Manageability technologies. The key features supported by the platform include the following:

Processor Features Supported

- Increased, scalable performance with substantial advancements, including UPI speed improvement, memory speed/capacity/utilization enhancement, hardware-based security innovations for virtualization, and platform interconnectivity optimization
- Integrated accelerators optimized for workload enhancement, including Advanced Matrix Extensions (IntelAMX), In-Memory Analytic Accelerator (IAX), Data Streaming Accelerator (IntelDSA), and QuickAssist Technology (Intel QAT)
- Breakthroughs in memory and I/O support, including DDR5 (5600 MT/s max.), HBM (with 1 TB bandwidth max.), PCIe 5.0 (80 lanes max.), and CXL 1.1 (four devices per CPU)
- Increased operation and performance efficiency with substantial enhancements in virtualization, network security and telemetry, and power management
- Integrated AI accelerators with support of 4th Gen Intel Deep Learning Boost and new Tile Matrix Multiply (AMX/MUL)
- Enhanced Intel Security Boost Software Guard Extensions with Integrity Platform Firmware Resilience support
- Intel Ultra Path Interconnect (Intel UPI) up to four links per processor at 20 GT/s
- New Compute Express Link (CXL) and Intel Speed Select Technology
- CPU with 52 physical addresses/57 virtual addresses support
- Intel Trusted Domain Extensions (TDX) support (5th Gen Xeon Scalable processors only)

PCH Features Supported

- Flexible I/O at 20 lanes for PCIe 3.0, 1 G Ethernet in PCH for manageability, and eight DMIs at PCIe 3.0

1.3 Special Features

Recovery from AC Power Loss

The Basic I/O System (BIOS) provides a setting that determines how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must press the power switch to turn it back on) or for it to automatically return to the power-on state. See the Advanced BIOS Setup section for this setting. The default setting is **Last State.**

1.4 System Health Monitoring

Onboard Voltage Monitors

An onboard voltage monitor will scan the voltages of the onboard chipset, memory, and CPU continuously. Once a voltage becomes unstable, a warning is given, or an error message is sent to the screen.

Fan Status Monitor with Firmware Control

The system health monitor embedded in the BMC chip can check the RPM status of the cooling fans. The CPU and chassis fans are controlled via BMC.

Environmental Temperature Control

System Health sensors monitor temperatures and voltage settings of onboard processors and the system in real time via the BMC interface. Whenever the temperature of the CPU or the system exceeds Supermicro's pre-defined threshold, the system and CPU cooling fan speed will increase to prevent the CPU or system from overheating.



Note: To avoid possible system overheating, be sure to provide adequate airflow to your system.

1.5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a computer system, including its hardware, operating system, and application software. This enables the system to automatically turn on and off peripherals such as network cards, hard disks, and printers.

1.6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates, where noisy power transmission is present.

The X13DEH motherboard accommodates two power supply units (PSU1/PSU2) for main system power use for Supermicro (1U) systems. Connecting the power sideband distributor board (PDB), located at JPDB1, to the Main Power In (+12V) and the Main Power Out (GND) to provide system power to Nvidia proprietary systems. In addition, an 8-pin power connector (JPWR1) and two 2-pin power connectors (JPWR2/JPDWR3) are also used to supply power to onboard devices. Although most power supplies generally meet the specifications required by the system, some are inadequate. All these power connections are also required to ensure adequate power supply to the system.



Warning! To avoid damaging the power supply or the motherboard, be sure to connect Power Supply Unit1/Unit2 to your power outlet for use in Supermicro systems, and connect the power sideband distributor board to the +12V CST pin and the Ground (GND) CST pin to provide system power to Nvidia proprietary systems. Be sure to also connect the standard 8-pin power connector (JPWR1) and the 2-pin auxiliary power connectors (JPWR2/JPWR3) to appropriate power supplies to provide adequate power to your system. Failure to do so may void the manufacturer warranty on your power supply and your motherboard.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI-compliant.

Chapter 2

Installation

2.1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid damaging your motherboard, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the motherboard from the antistatic bag.
- Handle the motherboard by its edges only; do not touch its components, peripheral chips, memory modules, or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure that your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners, and the motherboard.
- Use only the correct type of onboard CMOS battery. Do not install the onboard battery upside down to avoid a possible battery explosion.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the motherboard, make sure that the person handling it is static protected.

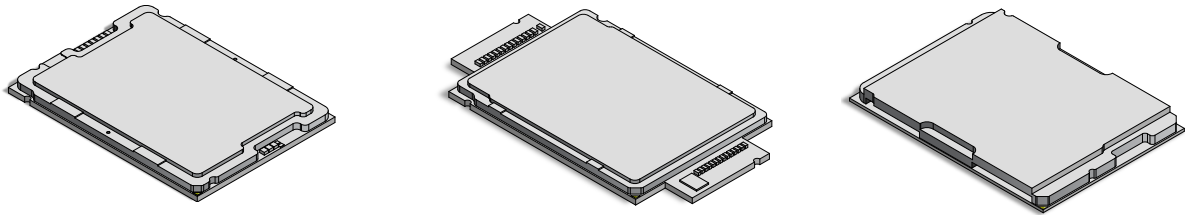
2.2 Processor and Heatsink Installation

The processor (CPU) and processor carrier should be assembled together first to form the processor carrier assembly. This assembly will then be attached to the heatsink to form the processor heatsink module (PHM) before being installed into the processor socket. Before installation, be sure to perform the following steps:

- Carefully follow the instructions given on the previous page to avoid ESD-related damages.
- Unplug the AC power cords from all power supplies after shutting down the system.
- Check that the plastic protective cover is on the processor socket, and none of the socket pins are bent. If they are, contact your retailer.
- When handling the processor, avoid touching or placing direct pressure on the LGA lands (gold contacts). Improper installation or socket misalignment can cause serious damage to the processor or processor socket, which may require manufacturer repairs.
- When installing the processor and heatsink, ensure a torque driver set to the correct force is used for each screw.
- Thermal grease is pre-applied on a new heatsink. No additional thermal grease is needed.
- Refer to the Supermicro website for updates on processor and memory support.
- All graphics in this manual are for illustrative purposes only. Your components may look different.

Note: The installation process is the same for both 4th/5th Gen Intel Xeon Scalable processors. Use the 4th Gen Intel Xeon Scalable processor installation process as a reference.

The 4th/5th Gen Intel Xeon Scalable Processor



SP XCC Series | Max Series (HBM) | SP MCC Series

Figure 2-1: Processor Top Views

1. The 4th/5th Gen Intel Xeon Scalable Processor

Figure 2-2: Processor Top Views

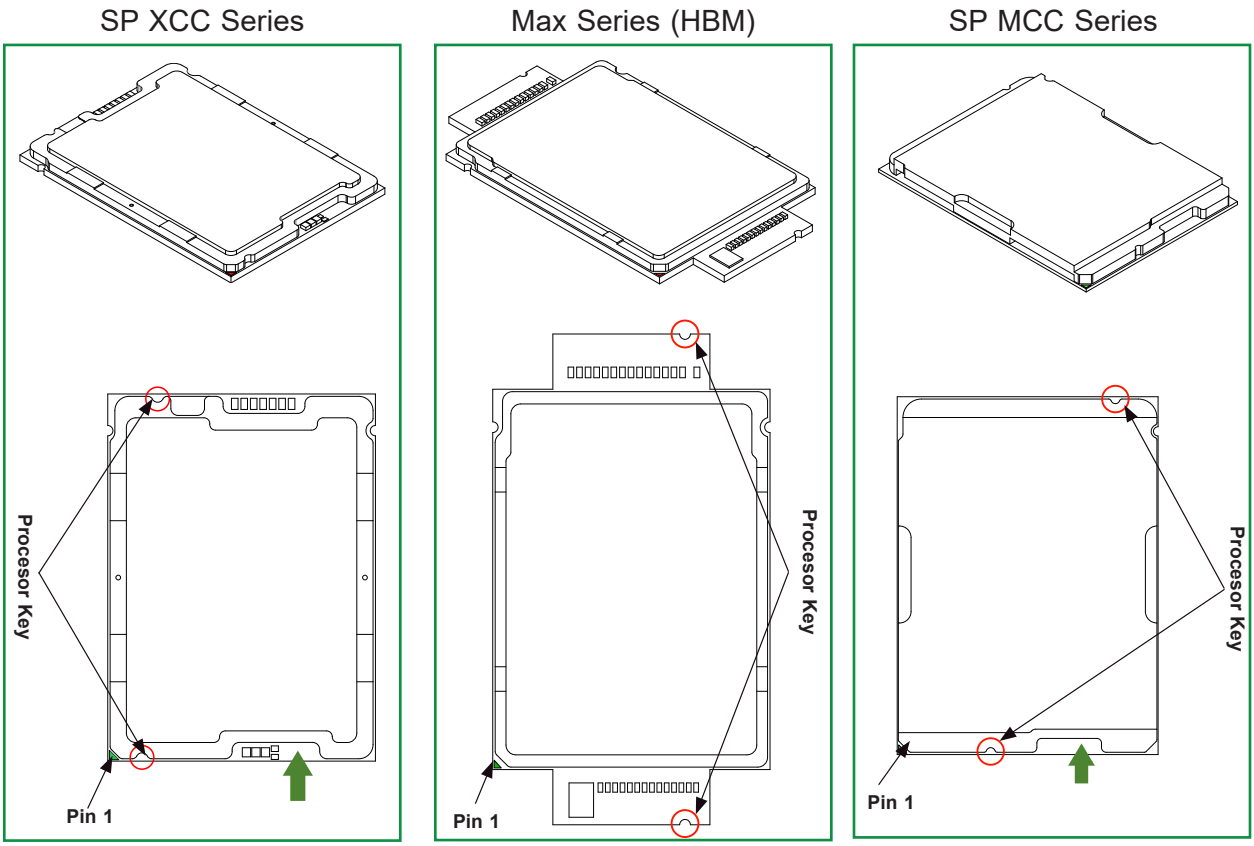


Figure 2-3: Processor Bottom Views

2. The Processor Carrier

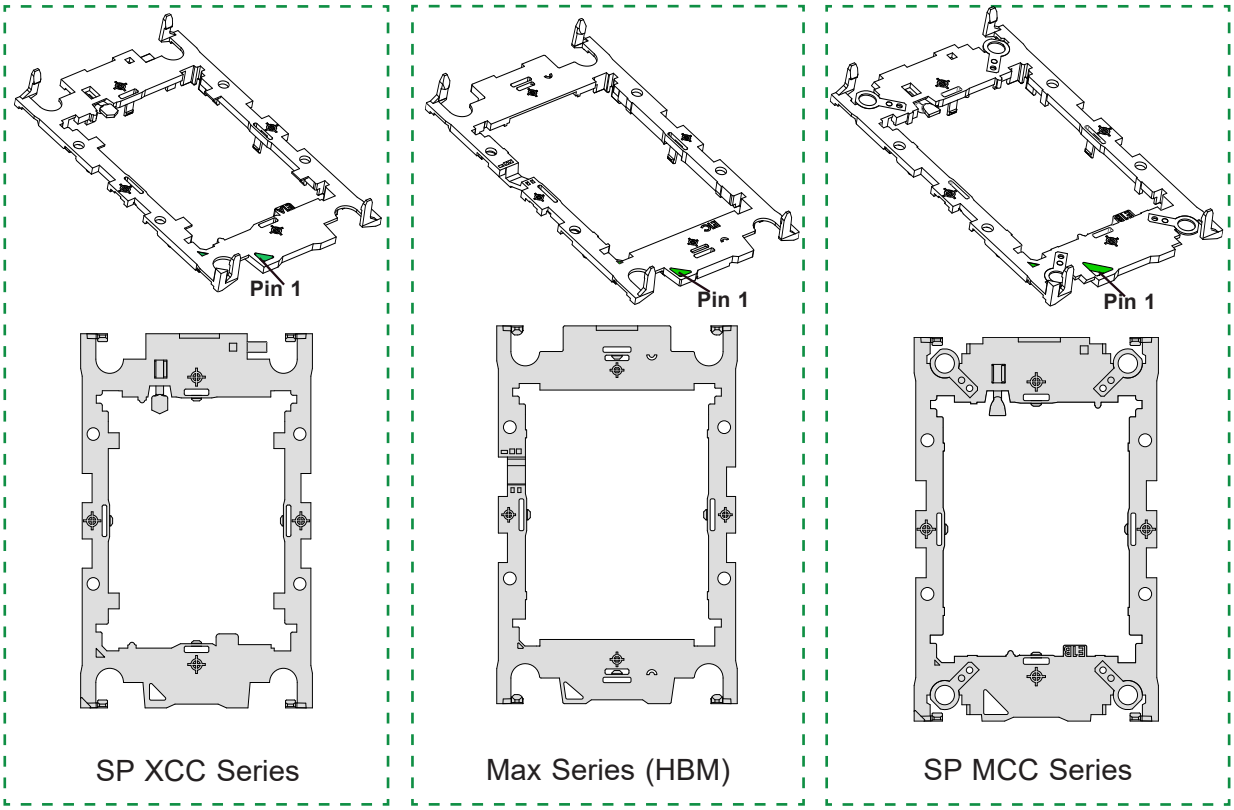


Figure 2-4: Processor Bottom Views

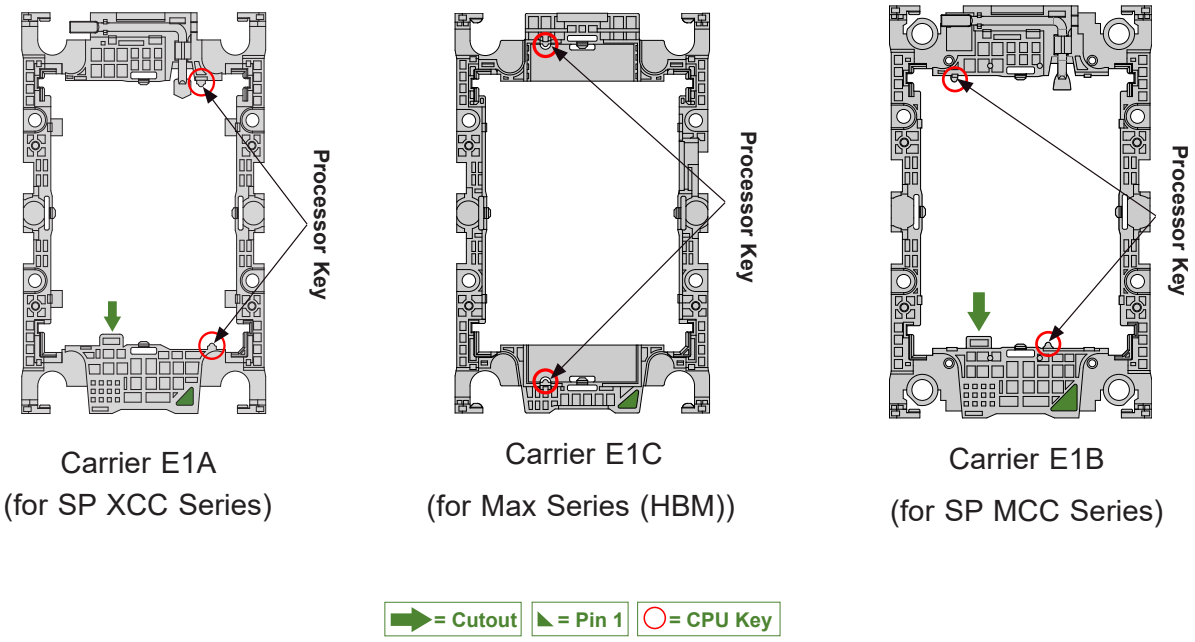


Figure 2-5: Carrier Bottom Views

Note 1: The 4th/5th Gen Intel Xeon Scalable Processor comes with three processor SKUs: SP XCC, Max Series (HBM), and SP MCC. Each processor SKU supports a specific carrier. The SP XCC processor supports Carrier E1A; Max Series (HBM) processors support Carrier E1C, SP MCC, and Carrier E1B.

Note 2: Be sure to use processors of the same SKU on this motherboard.

3. Heatsink

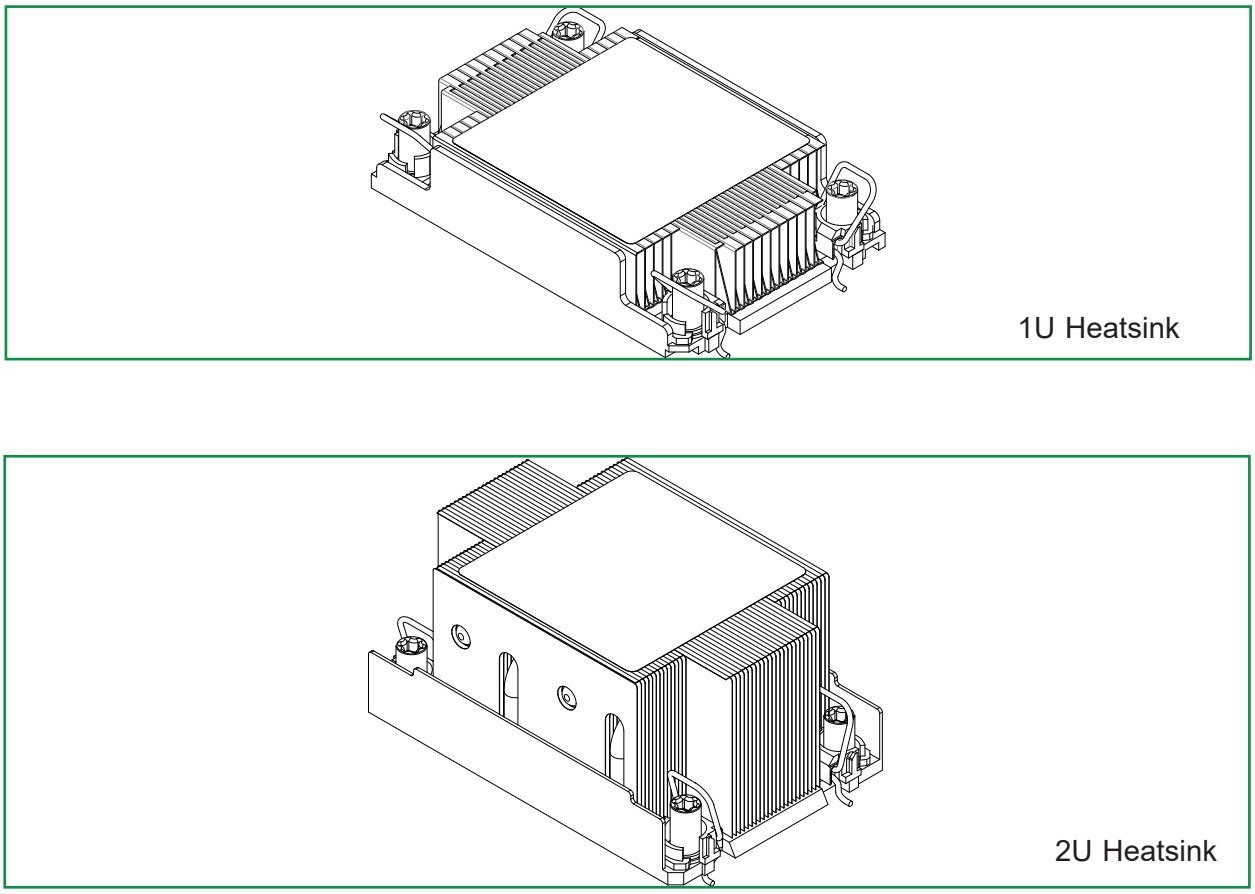


Figure 2-6: 1U and 2U Heatsinks

Note: Exercise extreme care when handling the heatsink. Pay attention to the edges of the heatsink fins, which can be sharp! To avoid damaging the heatsink, do not apply excessive force on the fins.

Note 2: This installation section provides instructions on how to install a 1U heatsink/2U heatsink, which are supported by your system.

Overview of the Processor Socket

The processor socket is protected by a plastic protective cover.

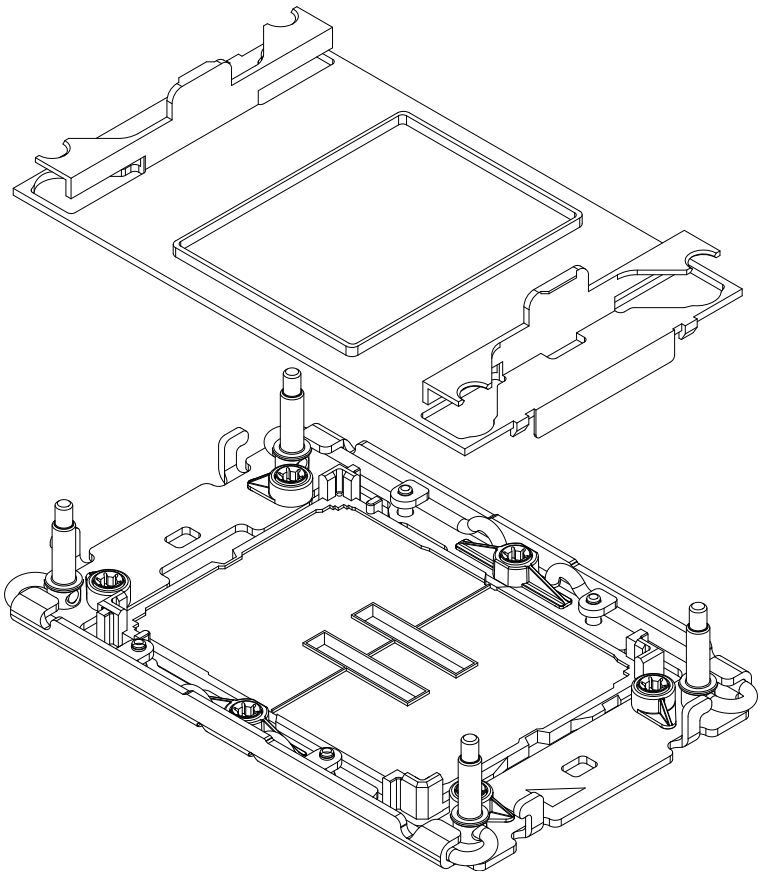


Figure 2-7: Processor Socket and Plastic Protective Cover

Overview of the Processor Carrier Assembly

The processor carrier assembly contains a 4th/5th Gen Intel Xeon Scalable processor and a processor carrier. Carefully follow the instructions given in the installation section to place a processor into the carrier to create a processor carrier.

The processor carrier assembly includes a processor and a carrier as shown:

1. The 4th/5th Gen Intel Xeon Scalable Processor

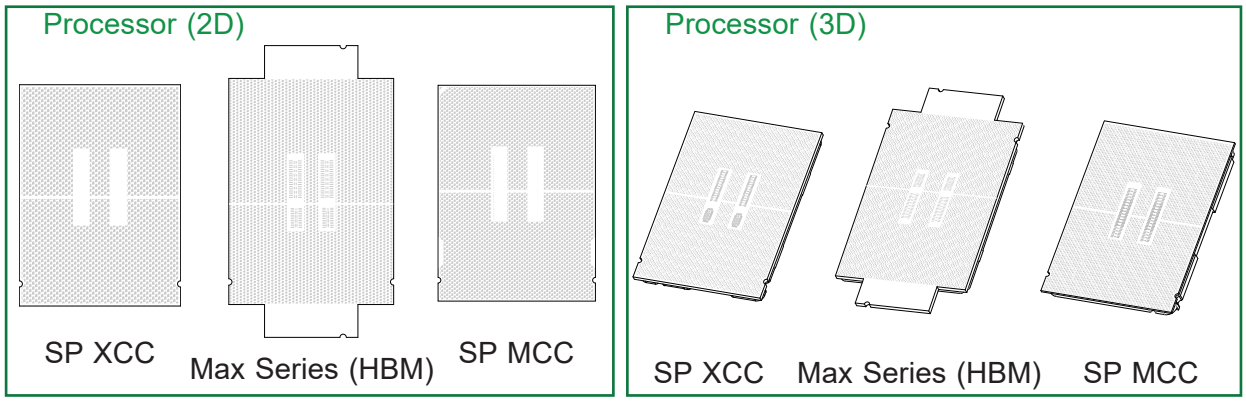


Figure 2-8: Component Side View

2. Processor Carrier

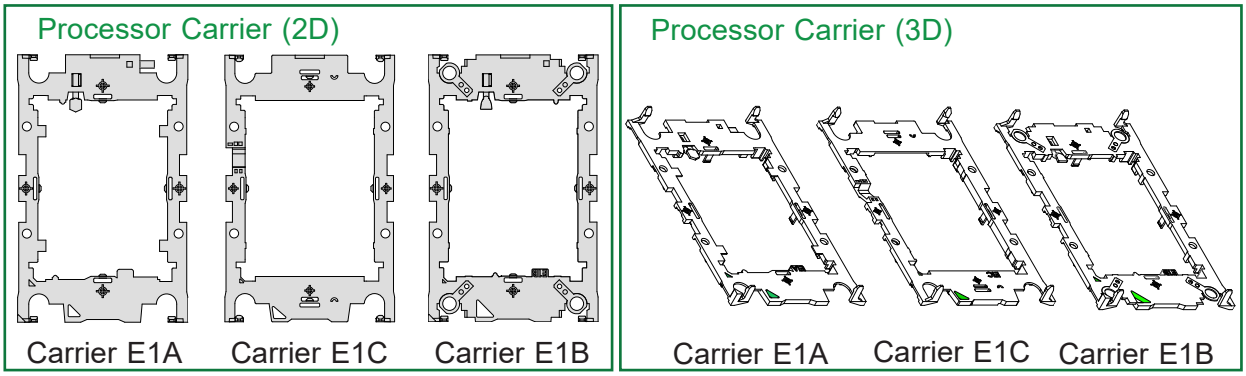


Figure 2-9: Processor Carrier Top View

3. Processor Carrier Assembly

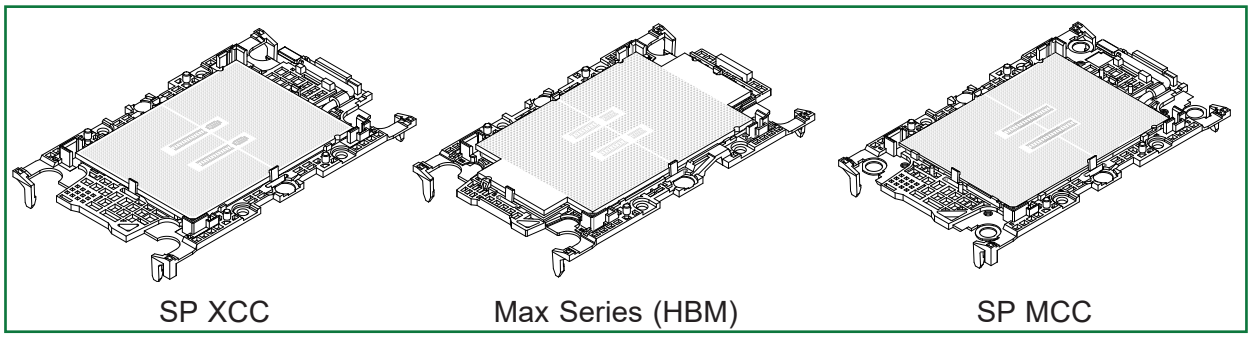


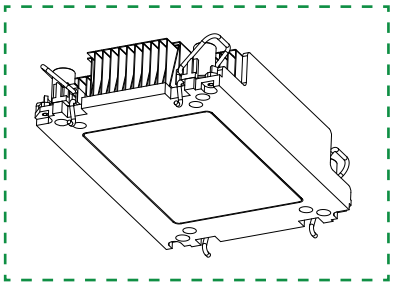
Figure 2-10: With Processor Seated Inside the Carrier

Overview of the Processor Heatsink Module (PHM)

The Processor Heatsink Module (PHM) contains a heatsink, a processor carrier, and a 4th/5th Gen Intel Xeon Scalable processor.

1. Heatsink: For SP XCC Processor Illustration

1U Heatsink



2U Heatsink

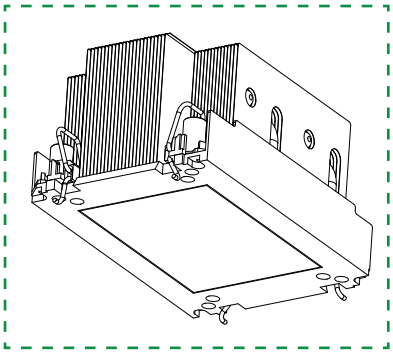
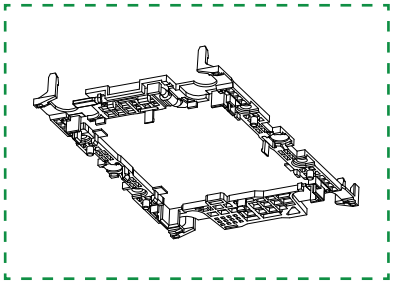


Figure 2-11: Bottom Side View

2. Processor Carrier E1A

1U Heatsink



2U Heatsink

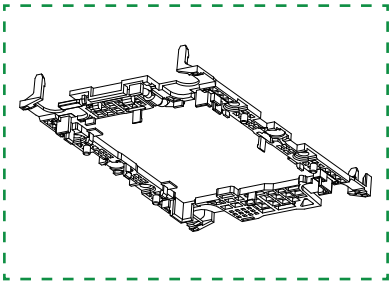
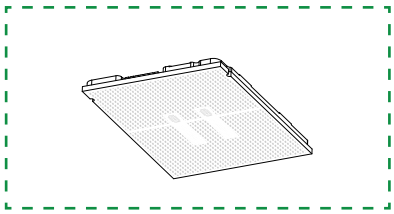


Figure 2-12: Component Side View

3. The 4th/5th Gen Intel Xeon Scalable Processor (SP XCC)

1U Heatsink



2U Heatsink

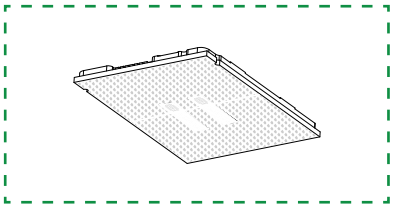
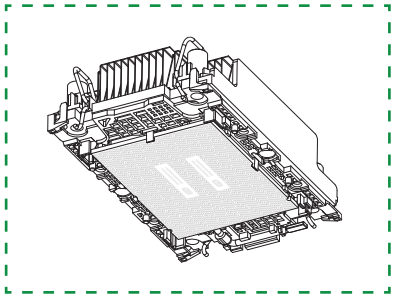


Figure 2-13: Component Side View

4. Processor Heatsink Module (PHM)

1U Heatsink



2U Heatsink

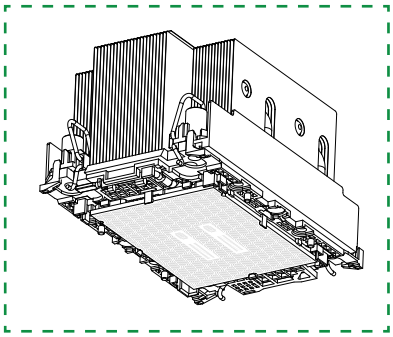
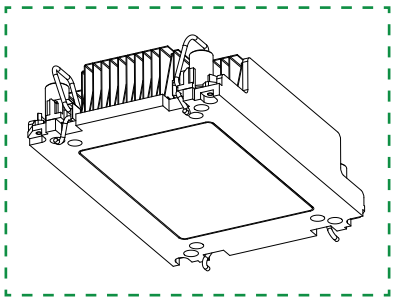


Figure 2-14: Bottom Side View

1. Heatsink: For Max Series (HBM) Processor Illustration

1U Heatsink



2U Heatsink

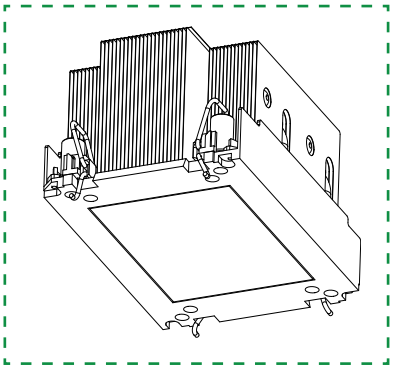
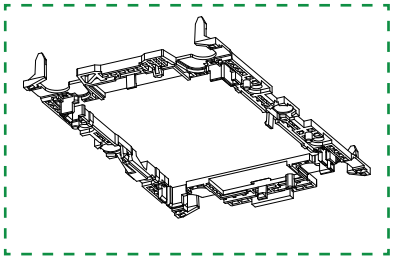


Figure 2-15: Bottom Side View

2. Processor Carrier E1C

1U Heatsink



2U Heatsink

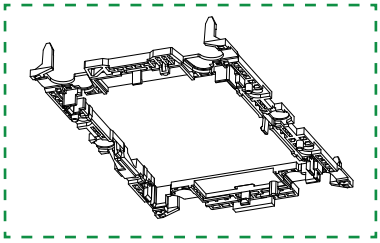


Figure 2-16: Component Side View

3. The 4th/5th Gen Intel Xeon Scalable Processor (Max Series ((HBM))

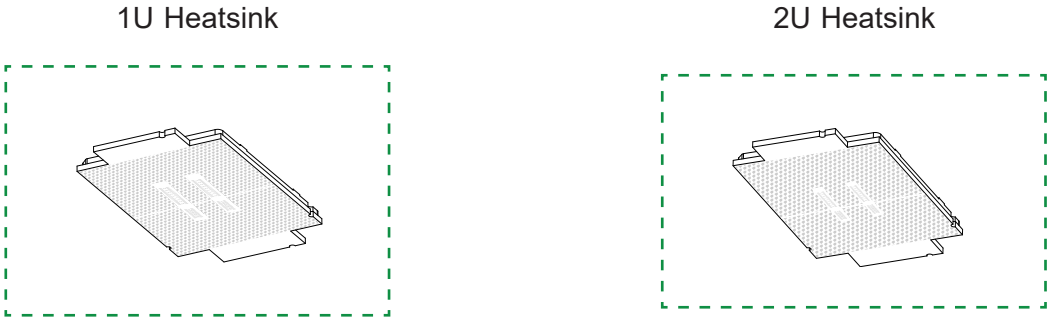


Figure 2-17: Component Side View

4. Processor Heatsink Module (PHM)

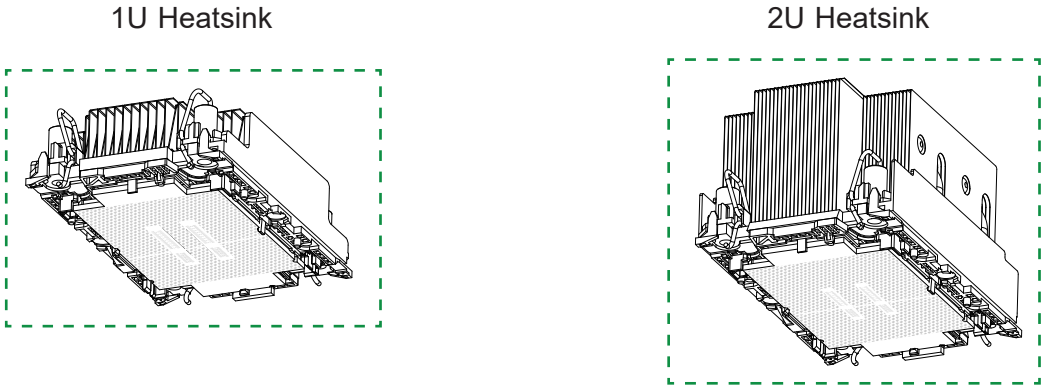


Figure 2-18: Bottom View

1. Heatsink: For SP MCC Processor Illustration

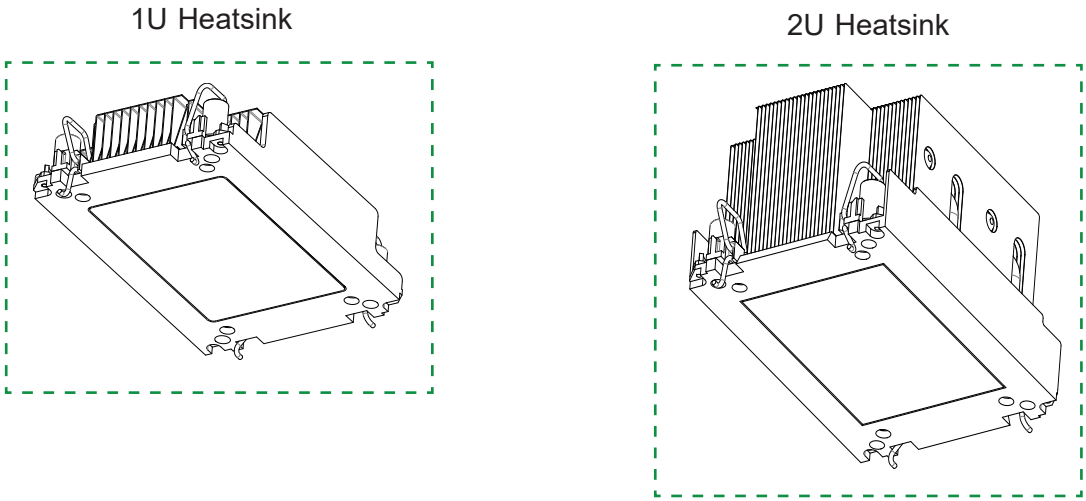


Figure 2-19: Bottom Side View

2. Processor Carrier E1B

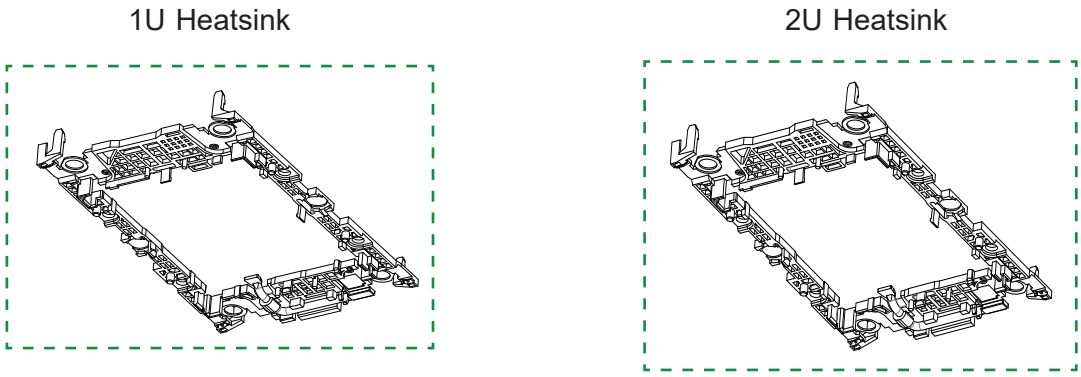
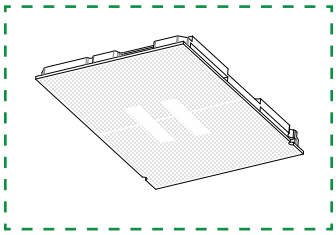


Figure 2-20: Component Side View

3. The 4th/5th Gen Intel Xeon Scalable Processor (SP MCC)

1U Heatsink



2U Heatsink

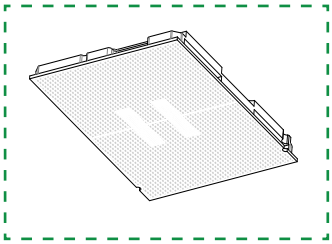
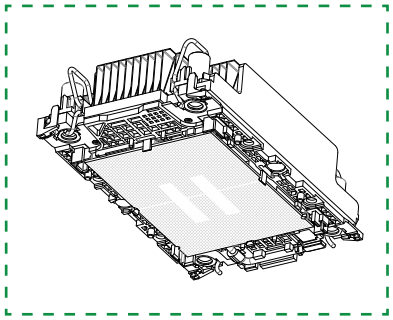


Figure 2-21: Component Side View

4. Processor Heatsink Module (PHM)

1U Heatsink



2U Heatsink

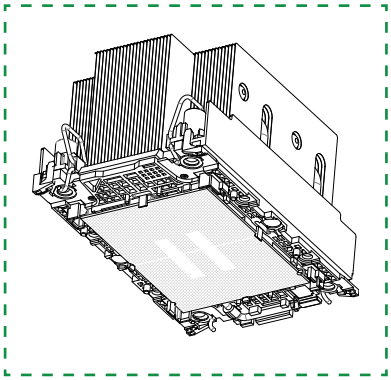


Figure 2-22: Bottom Side View

Creating the Processor Carrier Assembly

The processor carrier assembly contains a 4th/5th Gen Intel Xeon Scalable processor and a processor carrier.

To create the processor carrier assembly, follow the steps:

Note: Before installation, be sure to follow the instructions given on pages 1 and 2 of this chapter to properly prepare for installation.

1. Hold the processor with the component side (including the gold contacts) facing down.
2. Locate the small, gold triangle at the corner of the processor and the corresponding hollowed triangle on the processor carrier as shown in the graphics. Note that the triangle indicates the Pin 1 location.

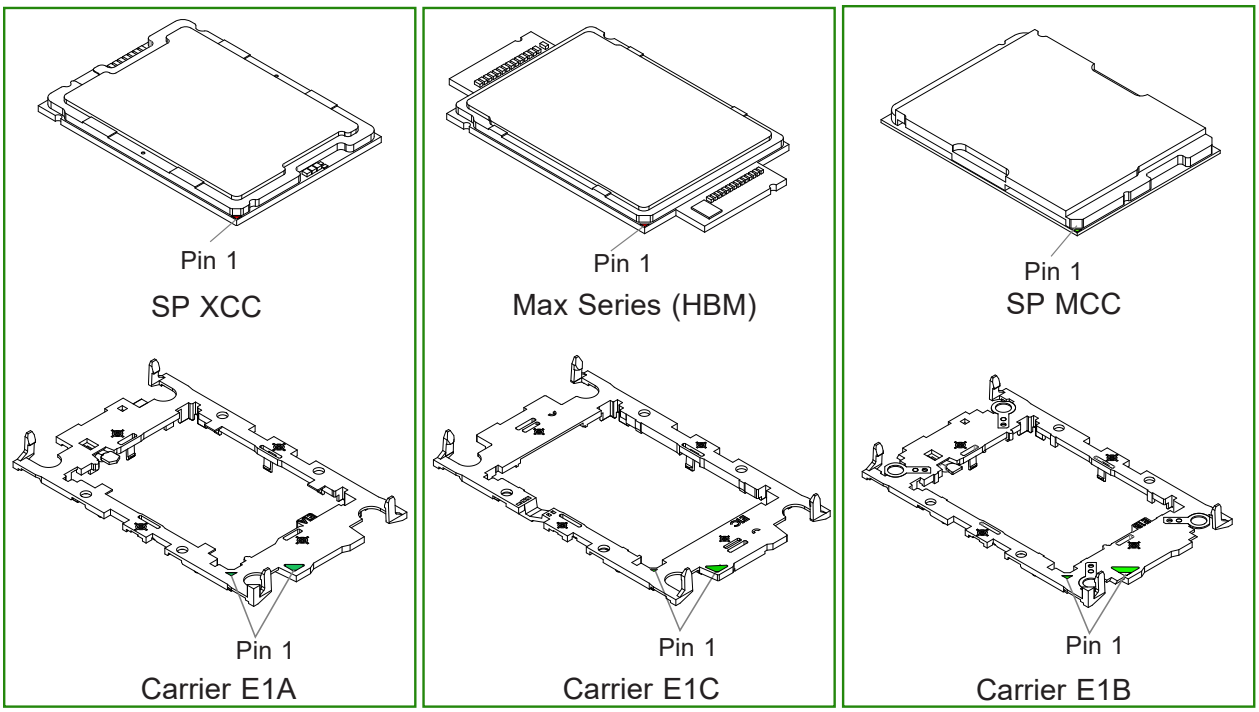


Figure 2-23: Pin Locations

3. Turn over the processor carrier and locate Pin 1 on the processor and Pin 1 on the carrier.
4. Turn the processor over with the component side (including the gold contacts) facing up and locate the processor keys on the processor.

5. Locate the processor keys and four latches on the carrier.

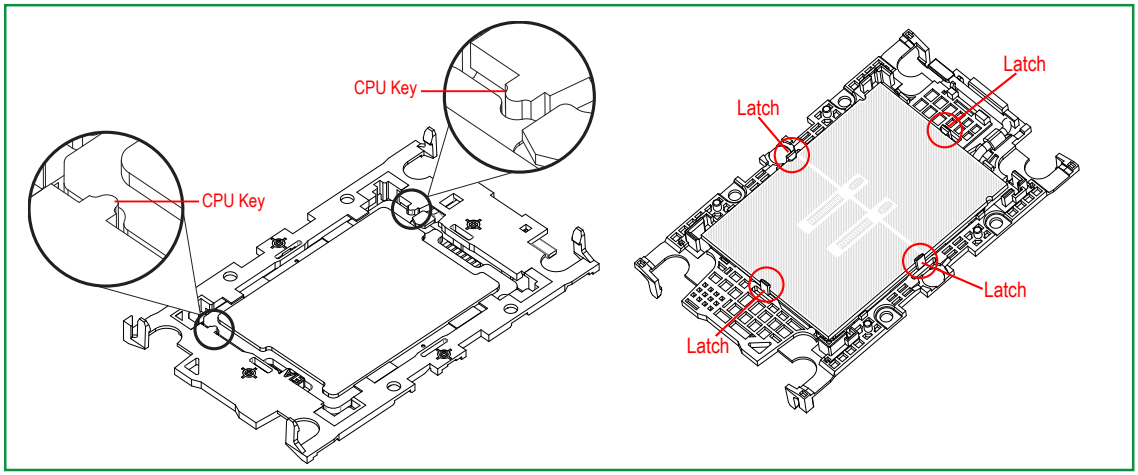


Figure 2-24: SP XCC

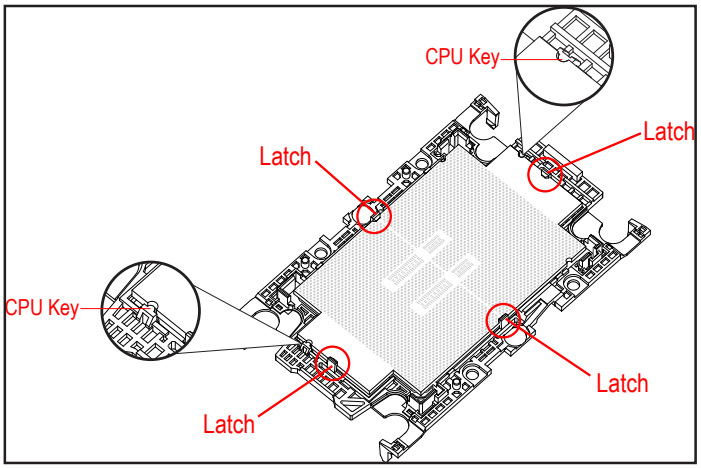


Figure 2-25: Max Series (HBM)

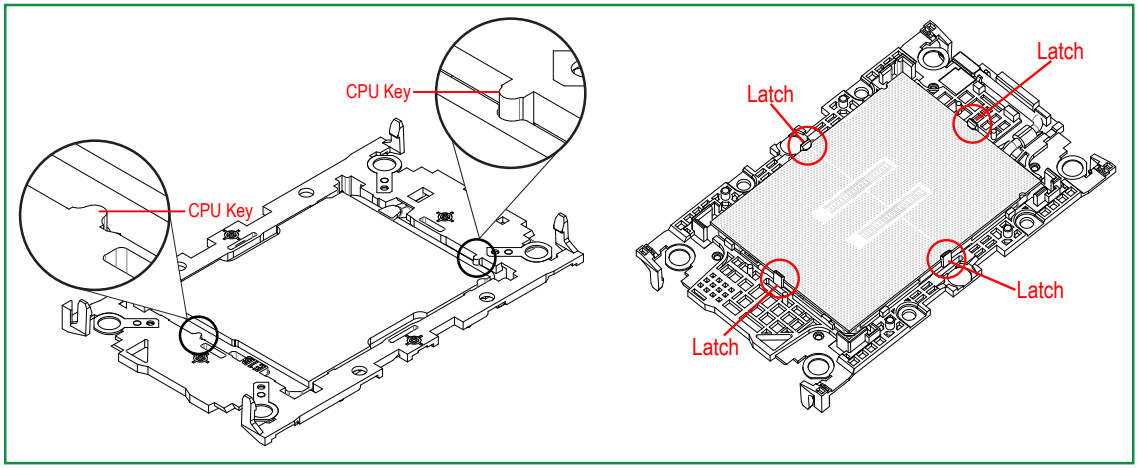


Figure 2-26: SP MCC

6. Locate the lever on the processor socket and press it down.

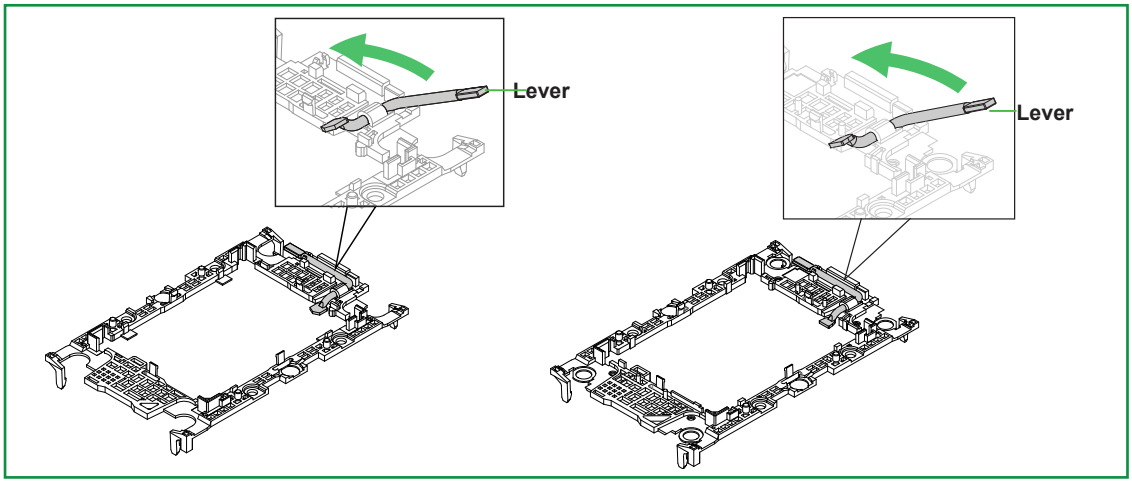


Figure 2-27: Lever Locations on Carriers

7. Using Pin 1 as a guide, carefully align the processor keys (A and B) on the processor against the processor keys on the carrier (a and b) as shown in the drawing.

8. Once they are properly aligned, carefully insert the processor into the carrier. Make sure that the processor is properly secured by latches 1, 2, 3, and 4.

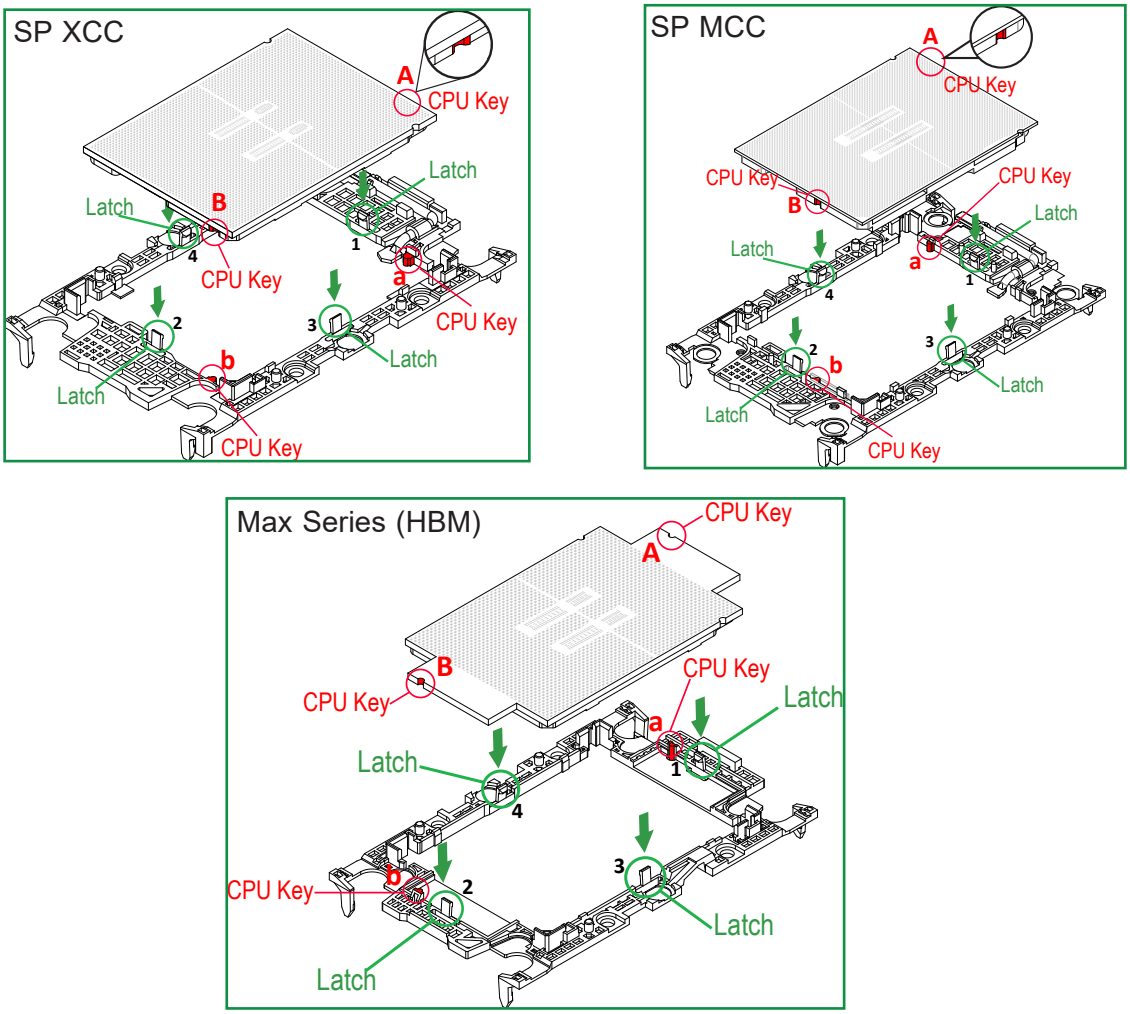


Figure 2-28: Inserting the Processor Into the Carrier

9. After the processor is placed inside the carrier, examine the four sides of the processor. Make sure that the processor is properly seated on the carrier.

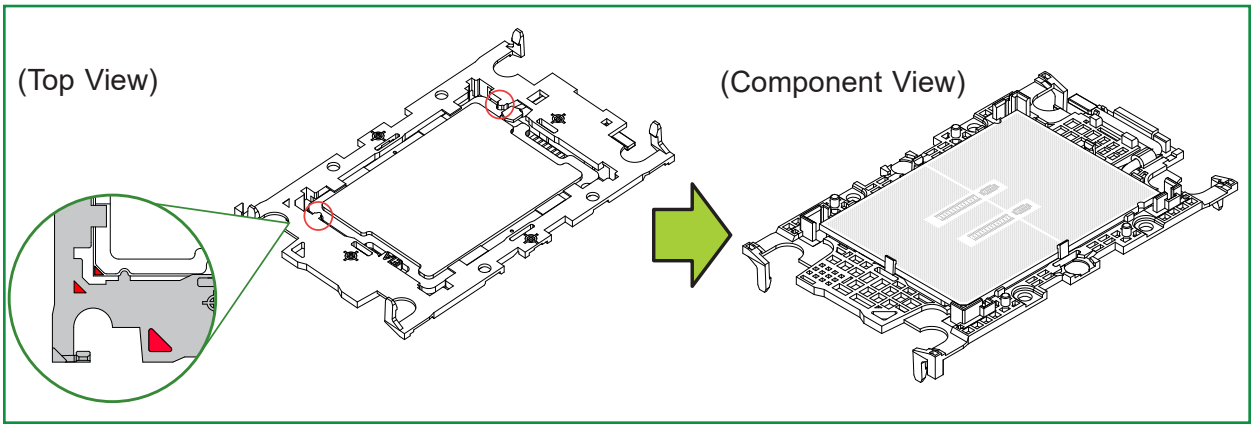


Figure 2-29: SP XCC Processor Carrier Assembly

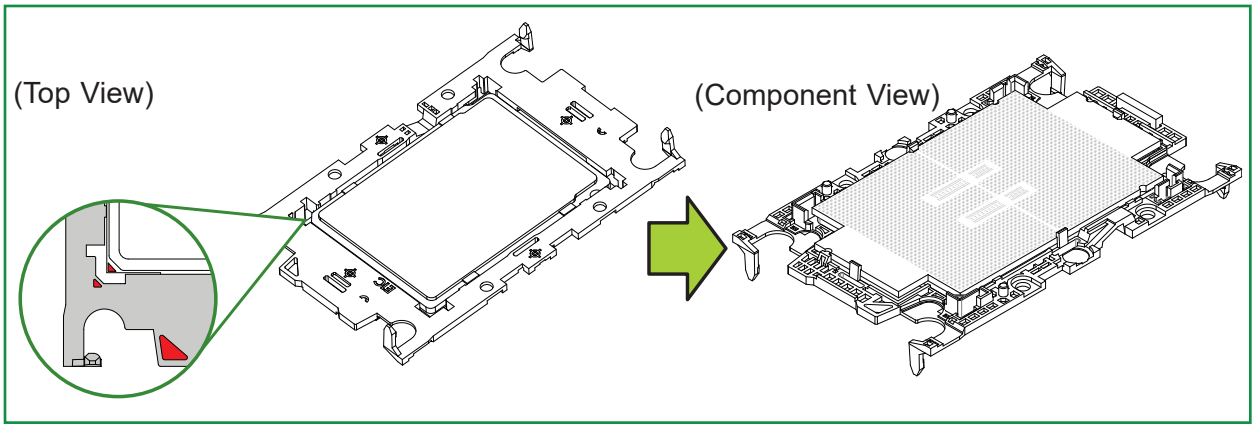


Figure 2-30: Max Series (HBM) Processor Carrier Assembly

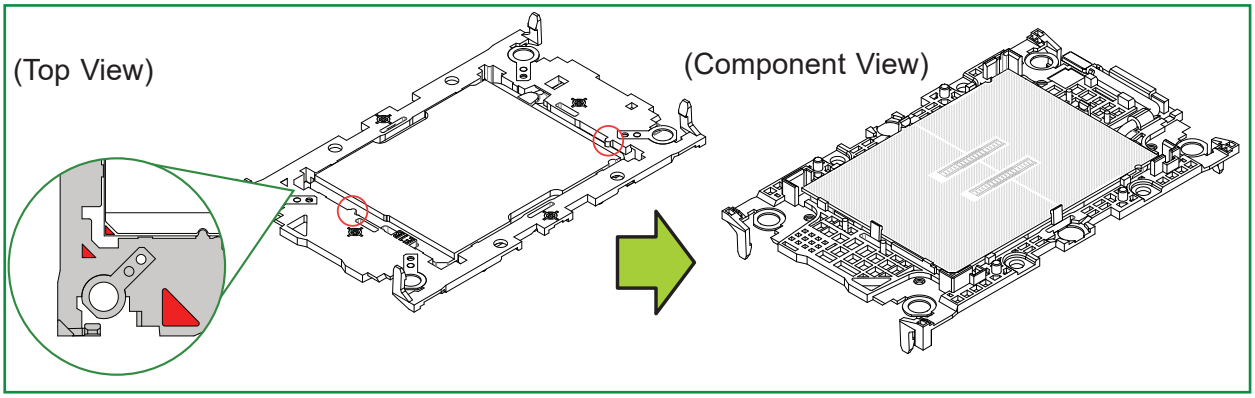


Figure 2-31: SP MCC Processor Carrier Assembly

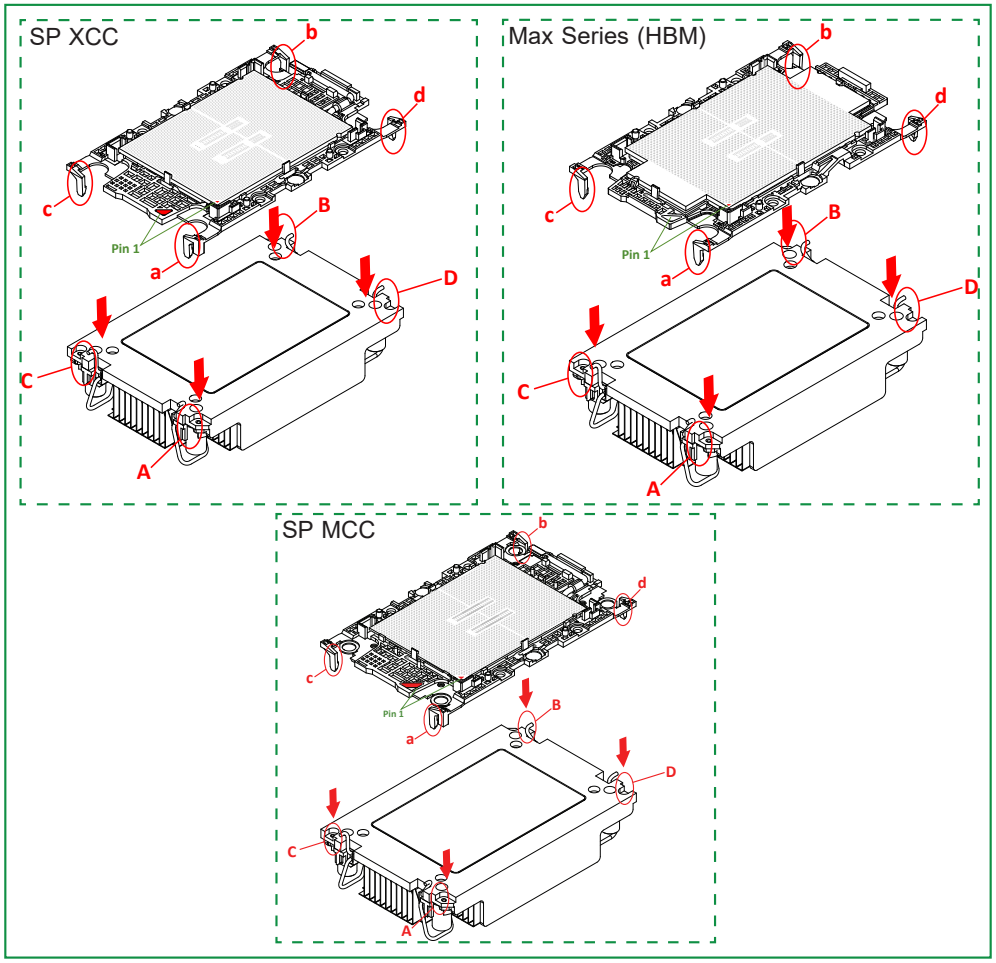
Creating the PHM

After creating the processor carrier assembly, follow the instructions to mount the processor carrier into the heatsink to form the PHM.

Note: If this is a new heatsink, the thermal grease has been pre-applied on the underside. Otherwise, apply the proper amount of thermal grease.

1. Turn the heatsink over with the thermal grease, which is on the reverse side of the heatsink, facing up. Pay attention to the two triangle cutouts (A, B) located at the diagonal corners of the heatsink as shown in the following drawings.
2. Hold the processor carrier component side facing up, and locate the triangle on the processor and the triangle on the carrier. (Triangle indicates Pin 1.)
3. Using Pin 1 as a guide, turn the processor carrier assembly over with the gold contacts facing up. Locate Pin 1 (A) on the processor and Pin 1 (a) on the processor carrier assembly.
4. Align the corner marked a on the processor carrier assembly against the triangle cutout A on the heatsink, and align the corners marked b, c, and d on the processor assembly against the corners marked B, C, and D on the heatsinks.
5. Once they are properly aligned, place the corners marked a, b, c, and d on the processor carrier assembly into the corners of the heatsink marked A, B, C, and D, making sure that all plastic clips are properly attached to the heatsink.

Figure 2-32: Processor Carrier Assembly (Processor Component Side and Heatsink Bottom Side)



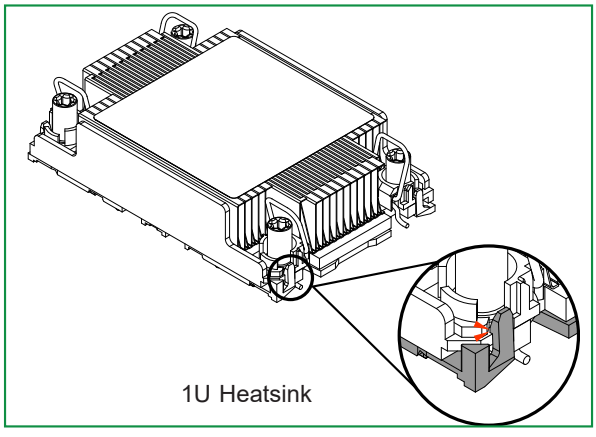
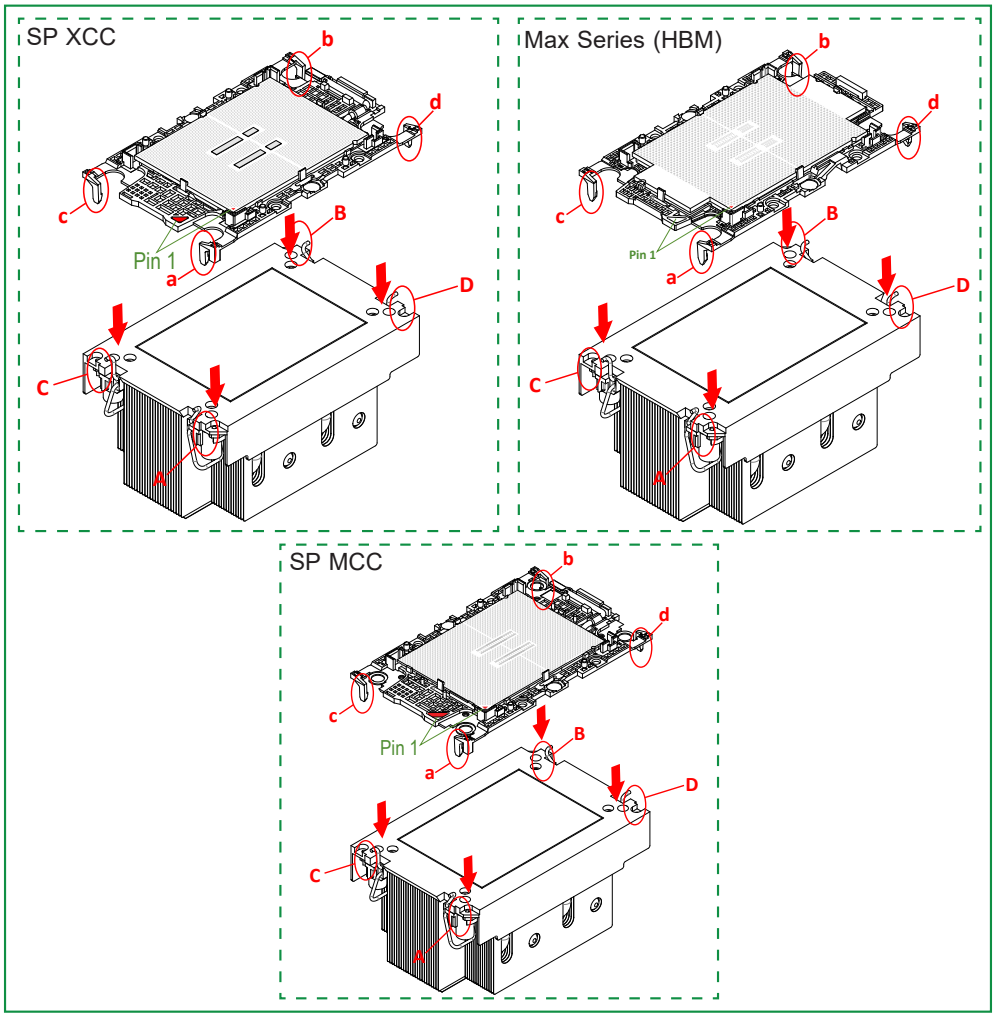


Figure 2-33: Processor Heatsink Module (PHM)

Figure 2-34: Processor Carrier Assembly (Processor Component Side and Heatsink Bottom Side)



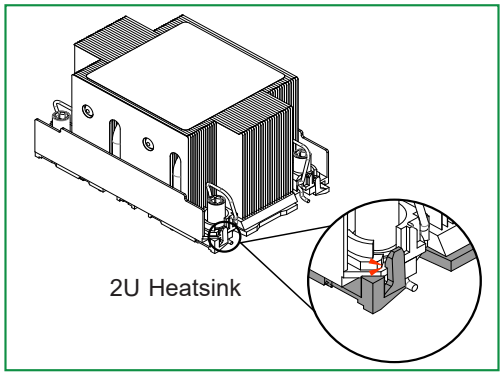


Figure 2-35: Processor Heatsink Module (PHM)

Preparing the Processor Socket for Installation

This motherboard comes with a plastic protective cover installed on the processor socket. Remove it from the socket by following the instructions:

1. Press the tabs inward.

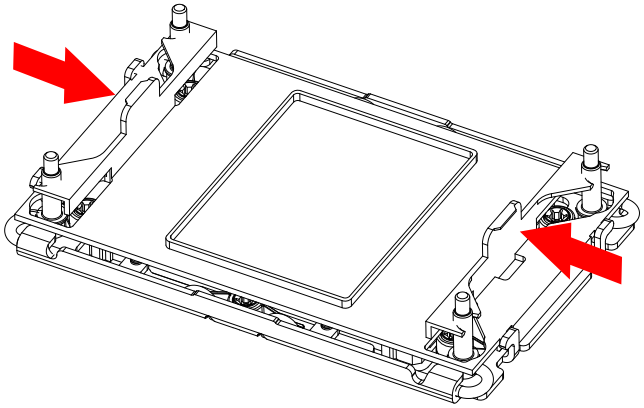


Figure 2-36: Pushing Tabs Inwards

2. Pull up the protective cover from the socket.

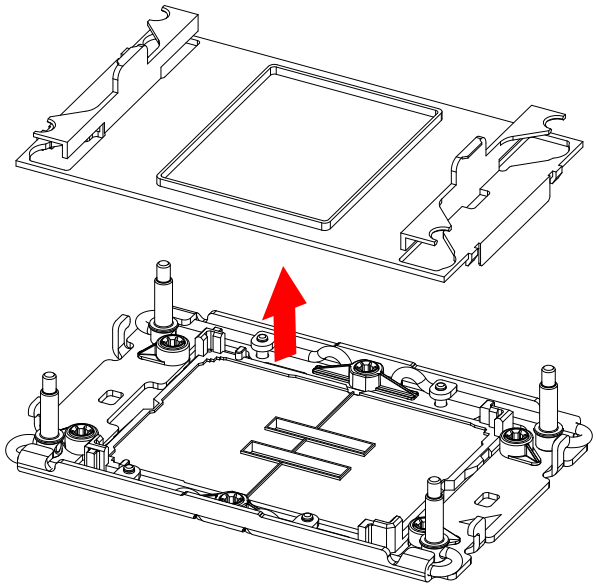


Figure 2-37: Pulling Protective Cover from Socket

Preparing to Install the PHM into the Processor Socket

After assembling the Processor Heatsink Module, you are ready to install it into the processor socket. To ensure the proper installation, follow the procedures:

1. Locate four threaded fasteners (a, b, c, d) on the processor socket.

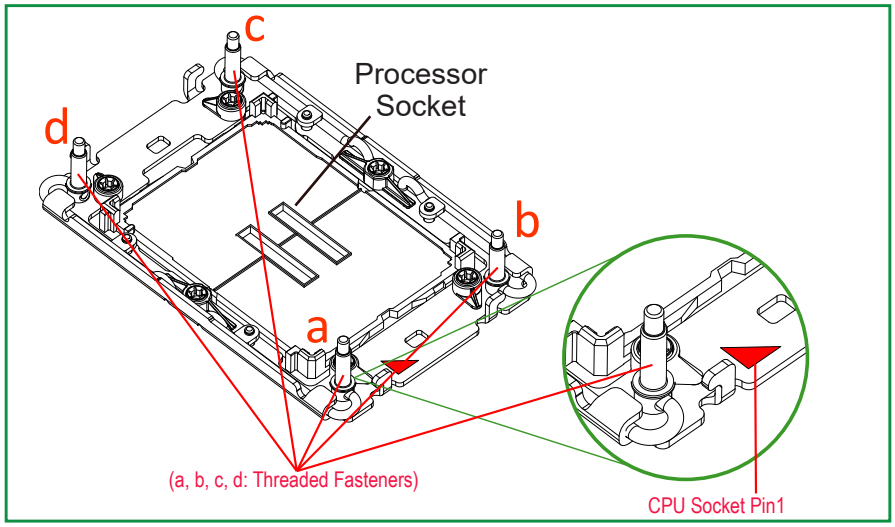


Figure 2-38: Locations of Threaded Fasteners

2. Locate four PEEK nuts (A, B, C, D) and four rotating wires QSFP56 (1, 2, 3, 4) on the heatsink.

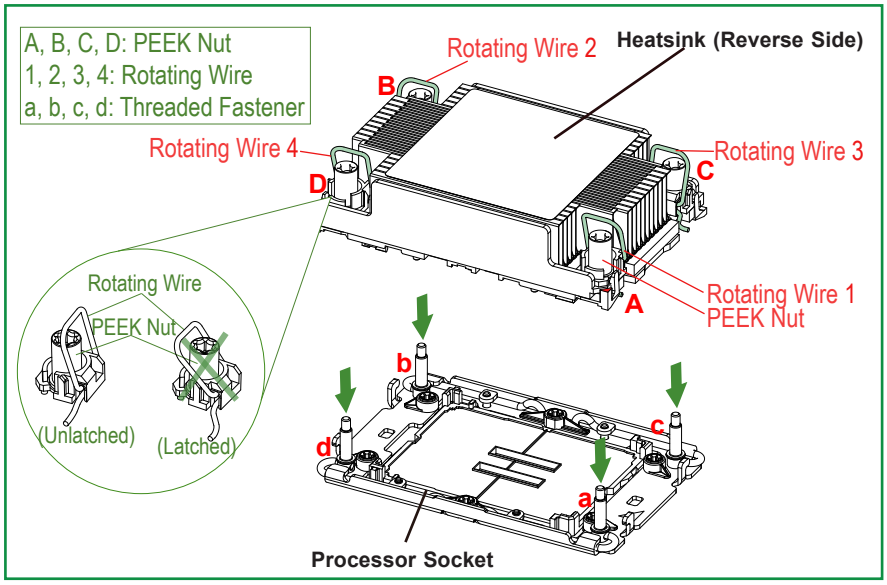


Figure 2-39: 1U Heatsink

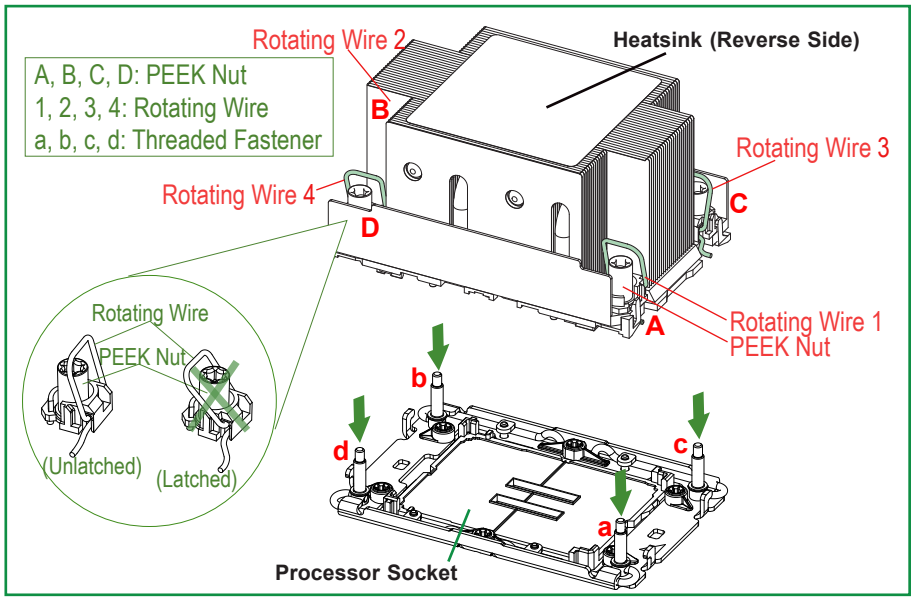


Figure 2-40: 2U Heatsink

3. Check the rotating wires (1, 2, 3, 4) to make sure that they are at the unlatched positions as shown in the drawing before installing the PHM into the processor socket.

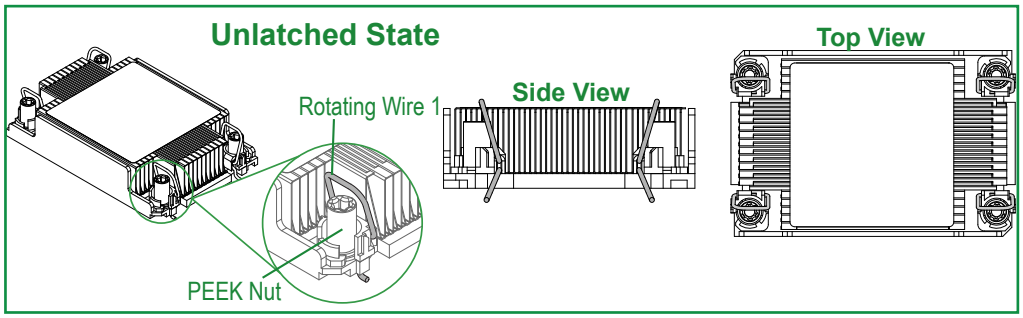


Figure 2-41: 1U Heatsink

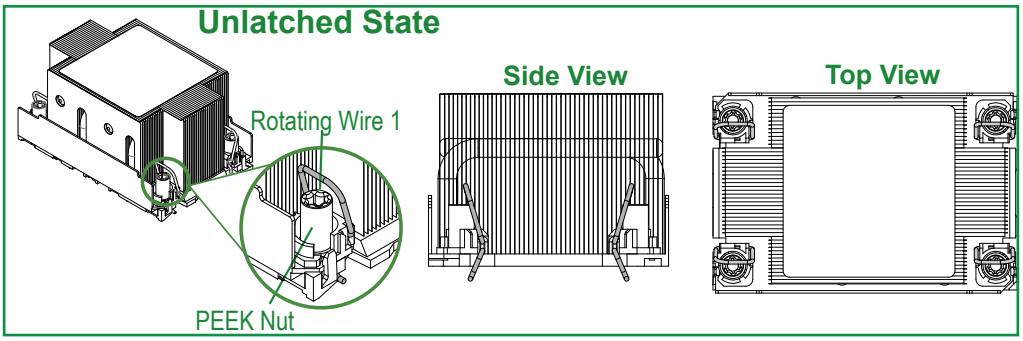


Figure 2-42: 2U Heatsink

Installing the PHM into the Processor Socket

1. Align PEEK nut A, which is next to the triangle (Pin 1) on the heatsink, against threaded fastener a on the processor socket. Then align PEEK nuts B, C, and D on the heatsink against threaded fasteners b, c, and d on the processor socket, making sure that all PEEK nuts on the heatsink are properly aligned with the corresponding threaded fasteners on the processor socket.
2. Once they are aligned, gently place the heatsink on top of the processor socket, making sure that each PEEK nut is properly attached to its corresponding threaded fastener.

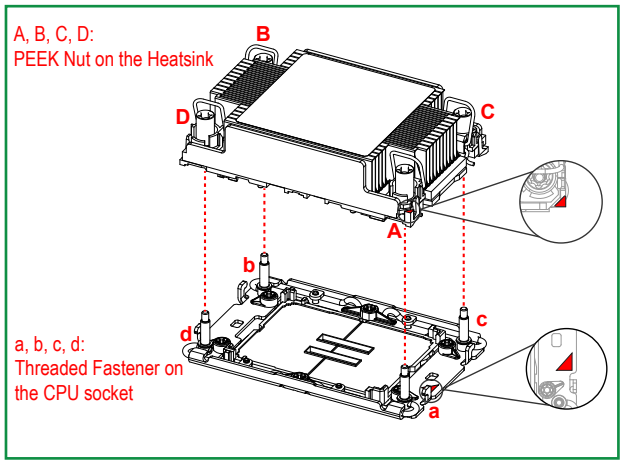


Figure 2-43: 1U Heatsink

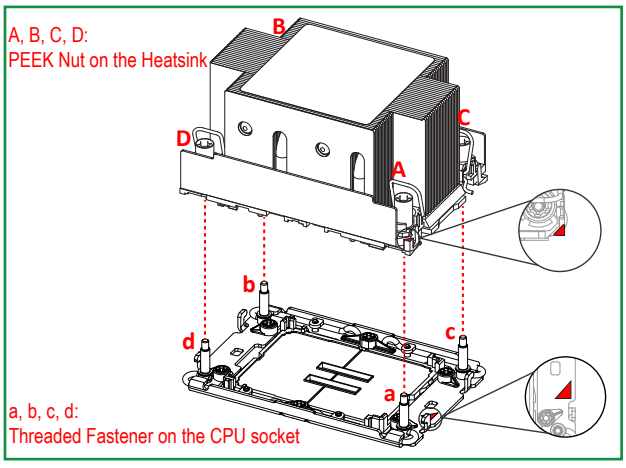


Figure 2-44: 2U Heatsink

3. Press all four rotating wires outwards and make sure that the heatsink is securely latched onto the processor socket.

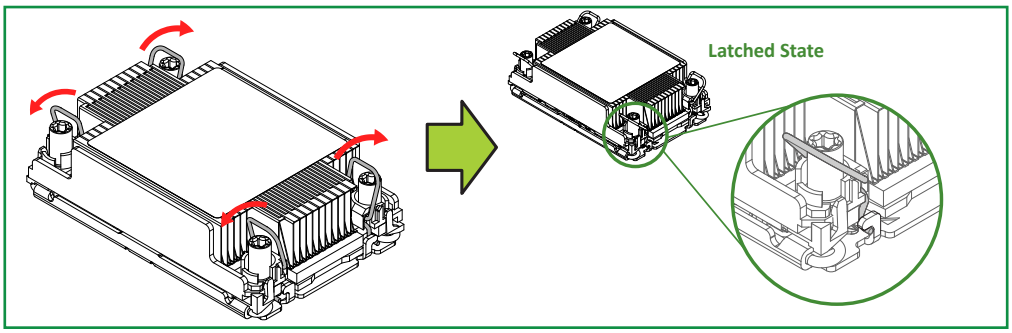


Figure 2-45: 1U Heatsink

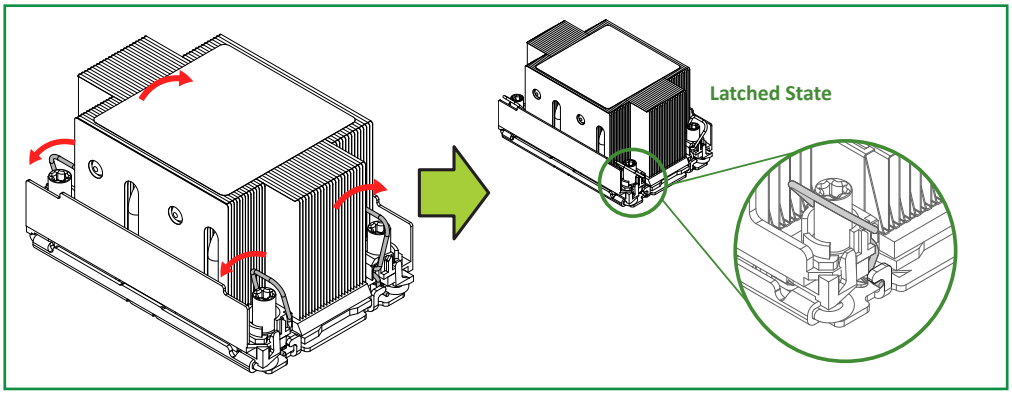


Figure 2-46: 2U Heatsink

4. With a T30 bit torque driver set to a force of 8.0 in-lbf (0.904 N-m), gradually tighten all PEEK nuts in the sequence of A, B, C, and D with even pressure. To avoid damaging the processor or socket, do not use excessive force when tightening the PEEK nuts. For best durability, 8.0 in-lbf torque is recommended.

   Important: Do not use a force greater than 8.0 in-lbf (0.904 N-m). Exceeding this force may over-torque the screw, causing damage to the processor, heatsink, and nuts.

5. Examine all corners of the heatsink to ensure that the PHM is firmly attached to the processor socket.

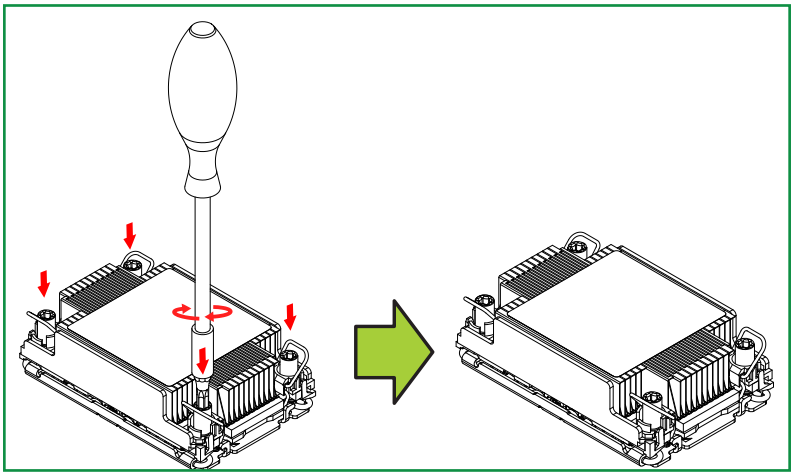


Figure 2-47: 1U Heatsink

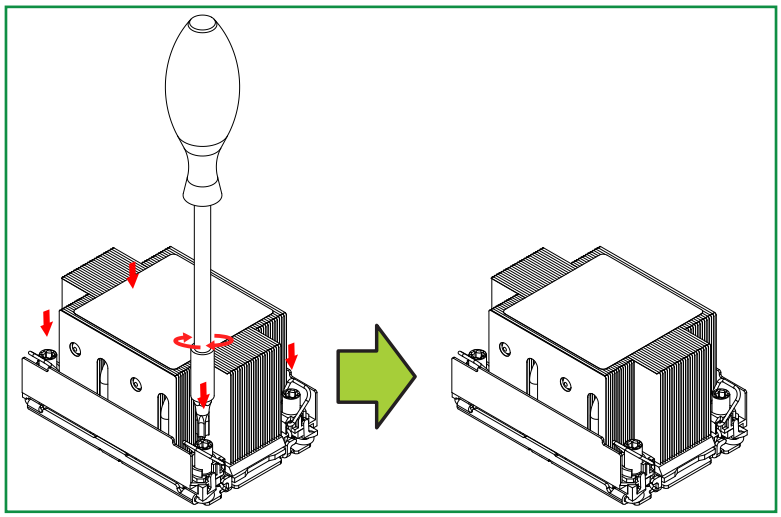


Figure 2-48: 2U Heatsink

Removing the PHM from the Processor Socket

Before removing the PHM from the motherboard, be sure to shut down the system and unplug the power cables from the power supply. Then follow the steps:

1. Use a T30 driver to loosen the four PEEK nuts on the heatsink in the sequence of A, B, C, and D.

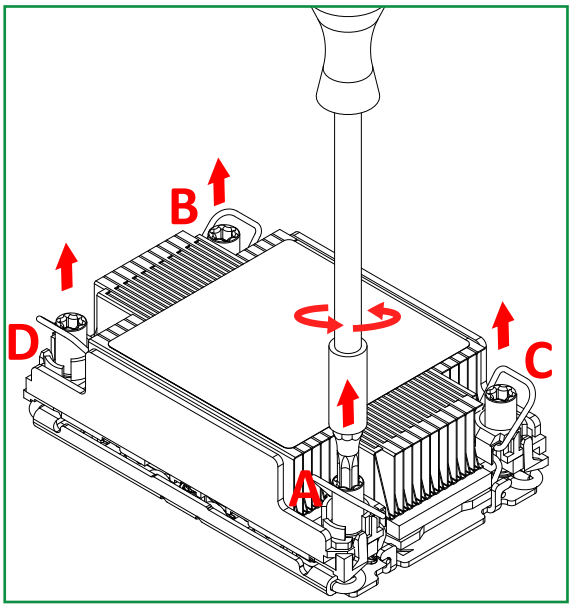


Figure 2-49: 1U Heatsink

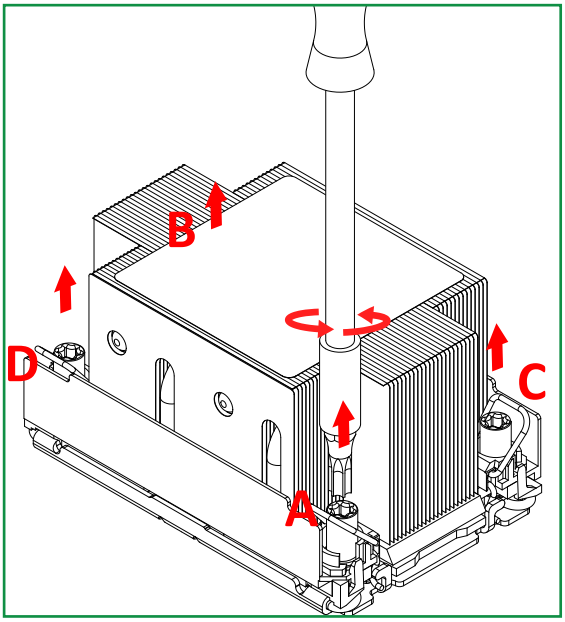


Figure 2-50: 2U Heatsink

2. Once the PEEK nuts are loosened from the processor socket, press the rotating wires inwards to unlatch the PHM from the socket as shown in the drawings.

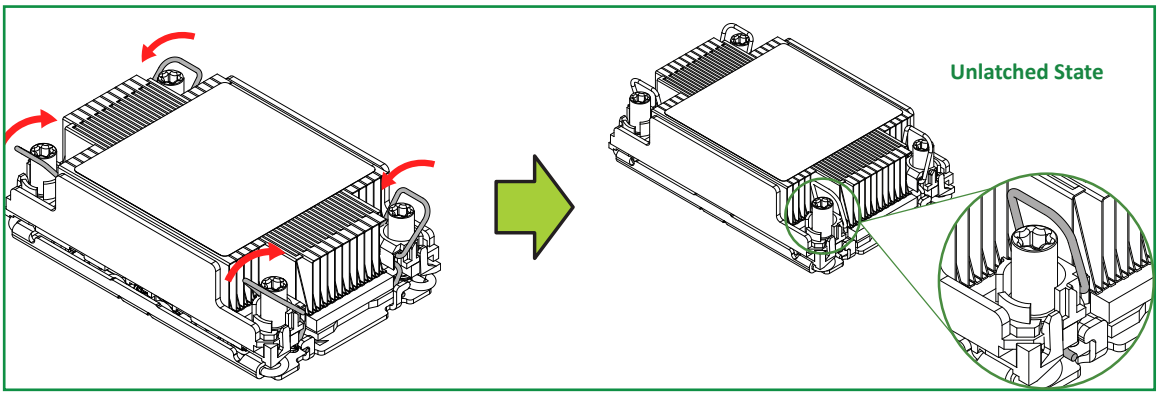


Figure 2-51: 1U Heatsink

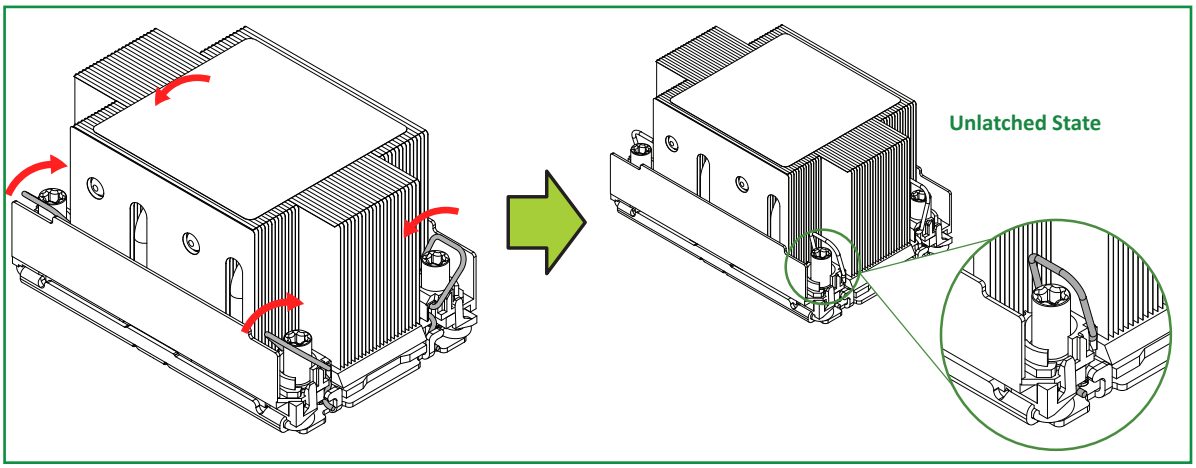


Figure 2-52: 2U Heatsink

3. Gently pull the PHM upwards to remove it from the processor socket.

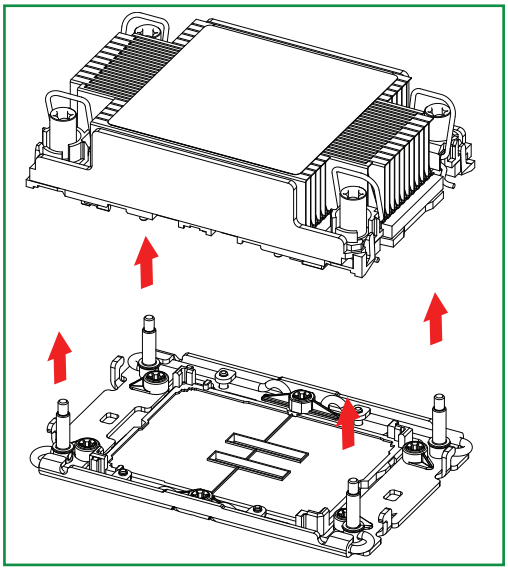


Figure 2-53: 1U Heatsink

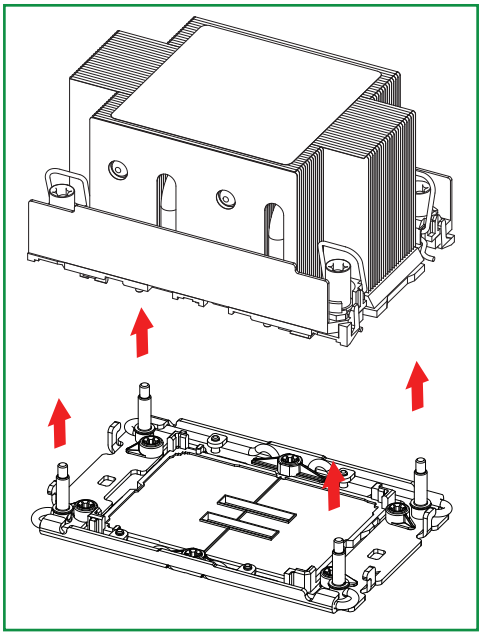
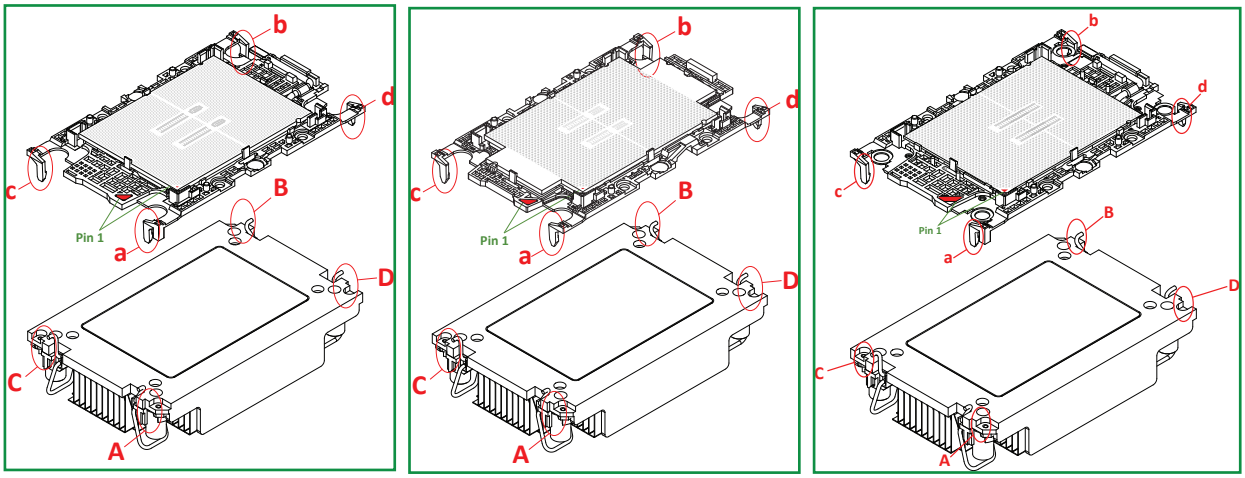


Figure 2-54: 2U Heatsink

Removing the Processor Carrier Assembly from the PHM

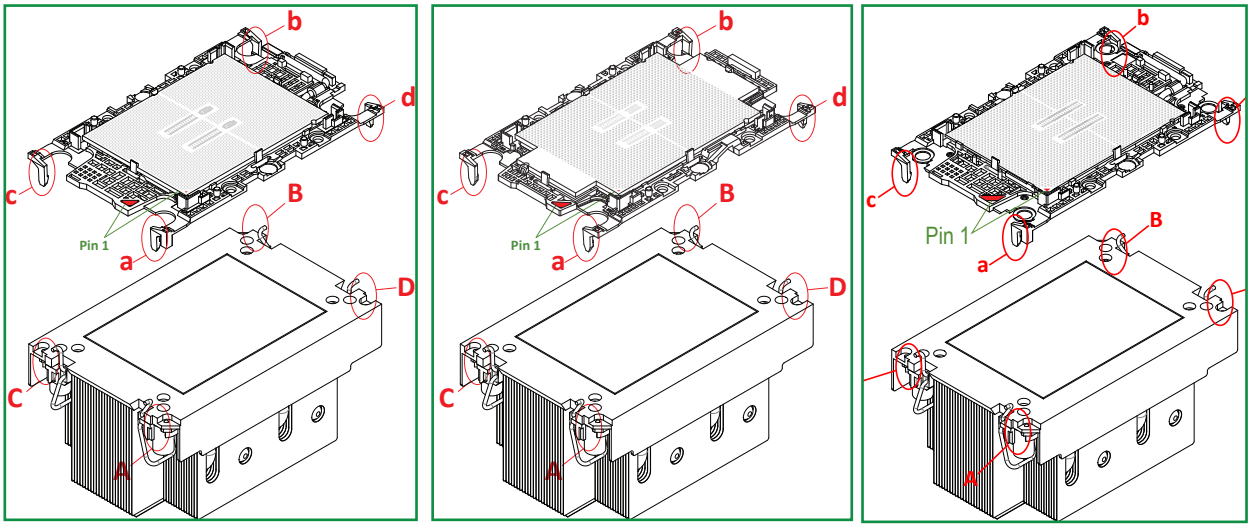
To remove the processor carrier assembly from the PHM, follow the steps:

1. Detach the four plastic clips (marked a, b, c, d) on the processor carrier assembly from the four corners of the heatsink (marked A, B, C, D) as shown in the drawings.



SP XCC | Max Series (HBM) | SP MCC

Figure 2-55: 1U Heatsink View of Component Side and Heatsink Bottom Side



SP XCC | Max Series (HBM) | SP MCC

Figure 2-56: 2U Heatsink View of Component Side and Heatsink Bottom Side

2. When all plastic clips are detached from the heatsink, remove the processor carrier assembly from the heatsink.

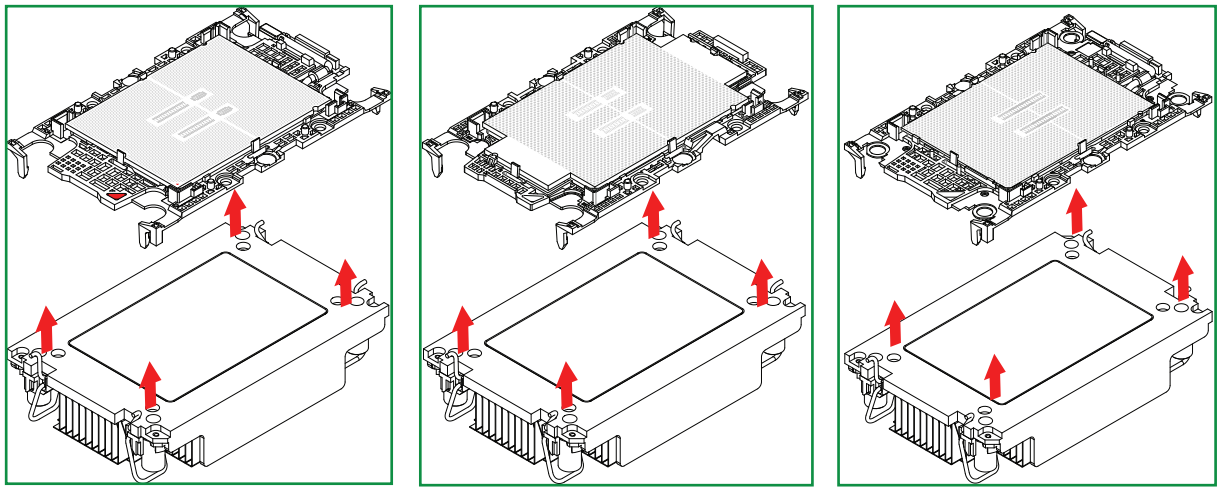


Figure 2-57: 1U Heatsink View of Component Side and Heatsink Bottom Side

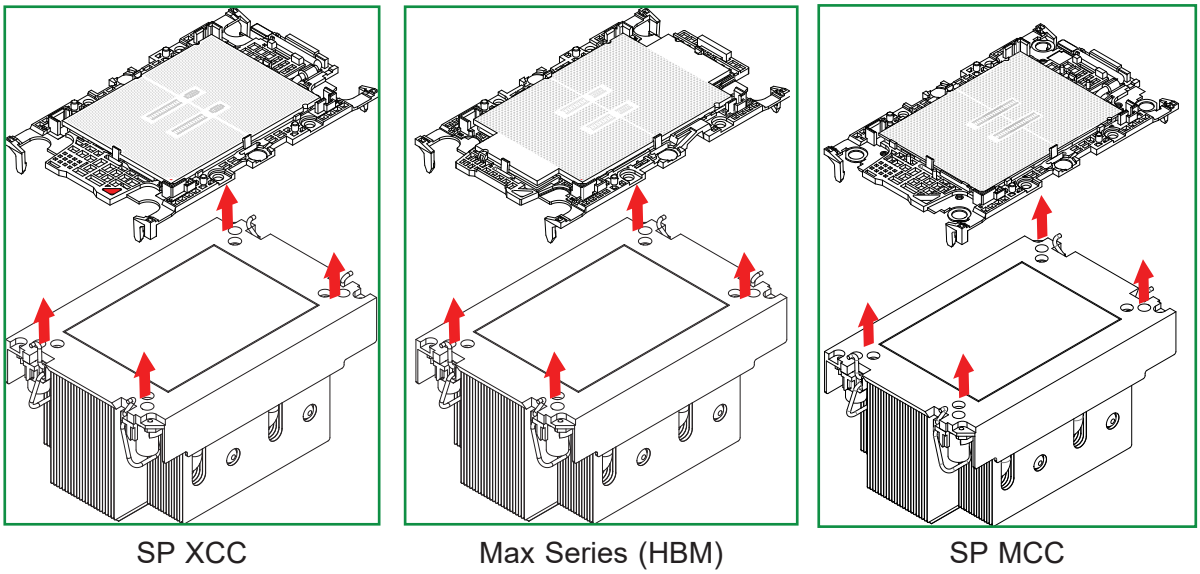


Figure 2-58: 2U Heatsink View of Component Side and Heatsink Bottom Side

Removing the Processor from the Processor Carrier Assembly

Once you have removed the processor carrier assembly from the PHM, you are ready to remove the processor from the processor carrier by following the instructions:

1. Unlock the lever from its locked position and push the lever upwards to disengage the processor from the processor carrier as shown in the drawing on the right.

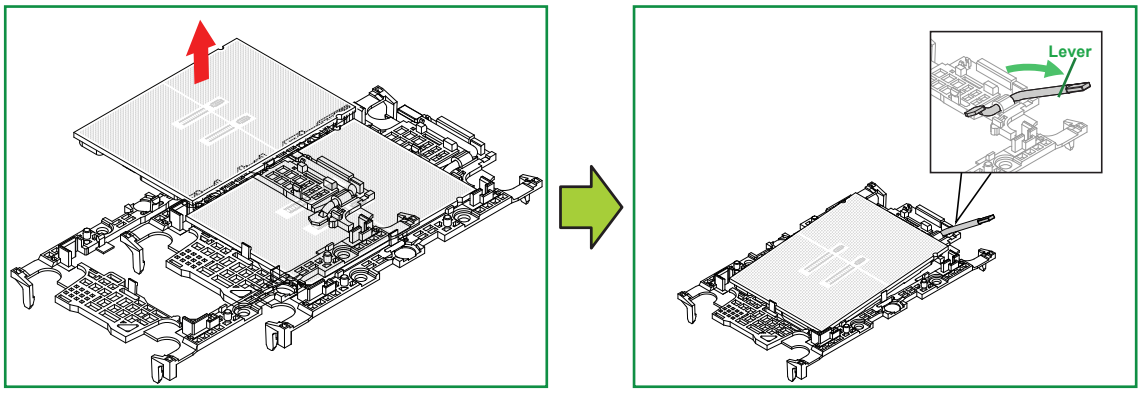


Figure 2-59: Processor Carrier Assembly (Carrier E1A)

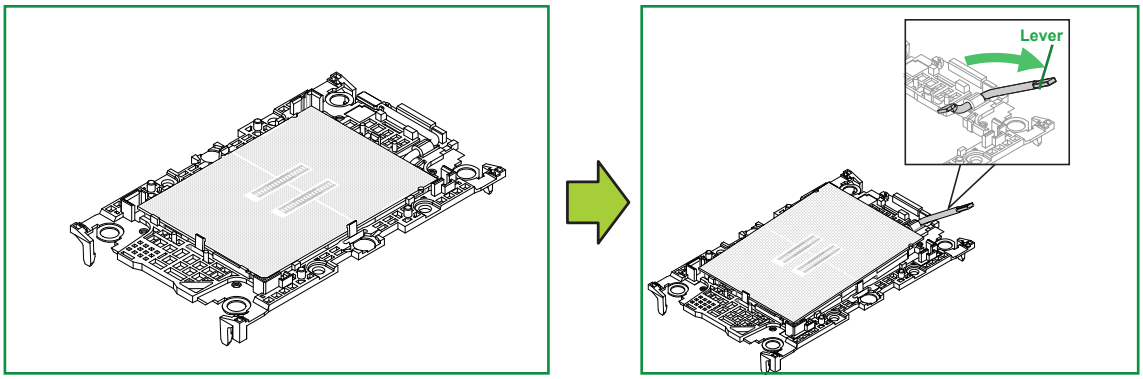
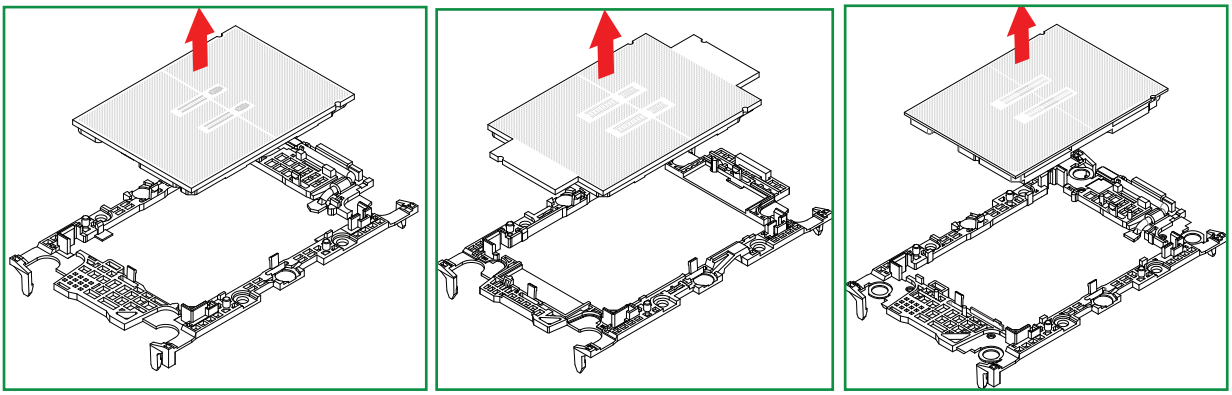


Figure 2-60: Processor Carrier Assembly (Carrier E1B)

2. Once the processor is loosened from the carrier, carefully remove the processor from the processor carrier.

Note: Handle the processor with care to avoid damaging the processor and its pins.



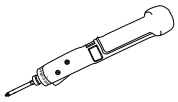
SP XCC | Max Series (HBM) | SP MCC

Figure 2-61: Removing the Processor from the Processor Carrier

2.3 Motherboard Installation

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly.

Tools Needed



Phillips Screwdriver (1)



Phillips Screws (9)



Standoffs (9)
(Only if Needed)

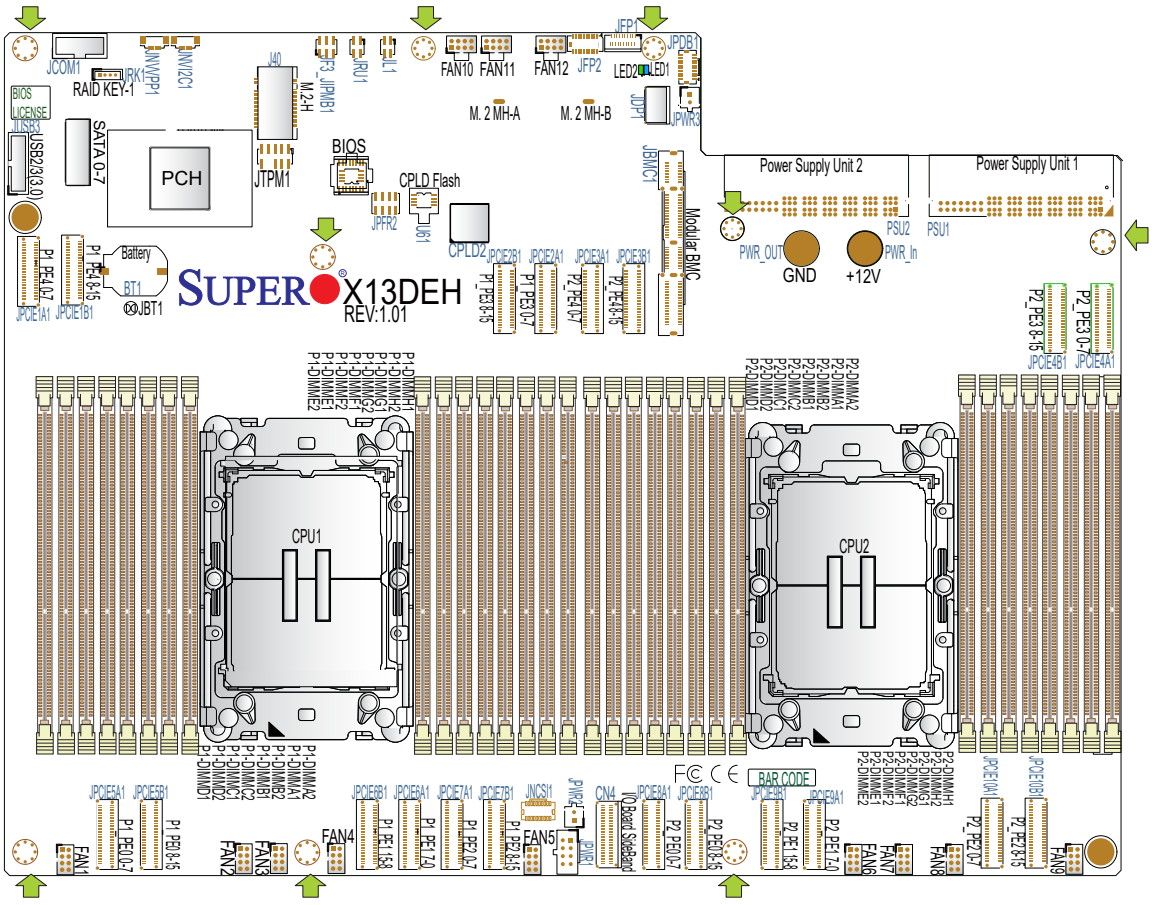


Figure 2-62: Locations of Mounting Holes

Location of Mounting Holes



Note 1: Do not use a force greater than 8 in-lbf (0.904 N-m) on each mounting screw during motherboard installation. Exceeding this force may over-torque the screw, causing damage to the motherboard and screw.

Note 2: Some components are very close to the mounting holes. Take precautionary measures to avoid damaging these components when installing the motherboard into the chassis.

Installing the Motherboard

1. Install the I/O shield into the back of the chassis, if applicable.
2. Locate the mounting holes on the motherboard. See the layout at the beginning of section 2.3 for the location.

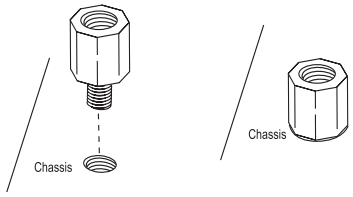


Figure 2-63: Screwing Necessary Standoff Into Mounting Hole

3. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.

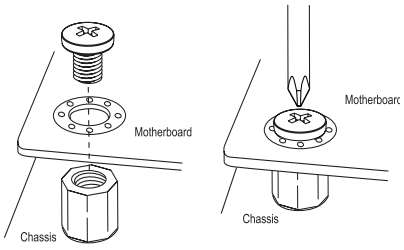


Figure 2-64: Screwing Phillips Screws Into Mounting Hole

4. Install standoffs in the chassis as needed.
5. Install the motherboard into the chassis carefully to avoid damaging other motherboard components.
6. Using the Phillips screwdriver, insert a pan head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.
7. Repeat Step 5 to insert #6 screws into all mounting holes.
8. Make sure that the motherboard is securely placed in the chassis.

Note: Images displayed are for illustration only. Your chassis or components might look different from those shown in this manual.

2.4 Memory Support and Installation

Note: Check the Supermicro website for recommended memory modules.

Important: Exercise extreme care when installing or removing memory modules to prevent any possible damage.

Memory Support

This motherboard supports up to 8 TB RDIMM DDR5 (288-pin) ECC memory with speeds up to 5600 MT/s in 16 DIMM slots and 4400 MT/s in 32 DIMM slots. To enhance memory performance, do not mix memory modules of different speeds and sizes. Follow all memory installation instructions:

Note: Memory speed and capacity support depend on the processors used in the system. The 4th Gen Intel Xeon Scalable processors support DDR5 memory with speeds up to 4800 MT/s (or up to 4400 MT/s in 32-DIMM configuration). The 5th Gen Intel Xeon Scalable processors support DDR5 memory with speeds up to 5600 MT/s (or up to 4400 MT/s in 32-DIMM configuration).

DDR5 Memory Support for 4th/5th Gen Intel Xeon Scalable Processors

For your system memory to work properly, follow the memory population tables to install the memory modules on your motherboard. These memory population tables were created based on the general memory population guidelines provided by Intel to support Supermicro X13DP motherboards.

DDR5 Memory Support for the 4th Gen Intel Xeon Scalable Processors					
Type	Ranks Per DIMM and Data Width (Stack)	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); DIMM Per Channel (DPC)	
				1 DPC (Note)	2 DPC
		16 GB	24 GB	1.1V	
RDIMM	SRx8 (RC D)	16 GB	24 GB	4800	4400
	SRx4 (RC C)	32 GB	48 GB		
	SRx4 (RC F) 9x4	32 GB	N/A		
	DRx8 (RC E)	32 GB	48 GB		
	DRx4 (RC A)	64 GB	96 GB		
	DRx4 (RC B) 9x4	64 GB	N/A		
RDIMM 3DS	(4R/8R) x4 (RC A)	2H-128 GB 4H-256 GB	N/A		
LRDIMM/LRDIMM-3DS	N/A	N/A	N/A	Not Supported	Not Supported

Note 1: 1 DPC applies to 1 SPC or 2 SPC implementation (SPC – sockets per channel).

Note 2: 24 GB XXC only with limited configs: 1 DPC all DIMM types, 2 DPC 96 GB only. Only 8 and 16 DIMM configs, no fallbacks.

Note 3: Memory speed will be 4800 MT/s 1 DPC and 4400 MT/s 2 DPC.

Note 4: Mixing DRAM density (16 GB/24 GB) and/or frequency is not allowed.

DDR5 Memory Support for the 5th Gen Intel Xeon Scalable Processors					
Type	Ranks Per DIMM and Data Width (Stack)	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); DIMM Per Channel (DPC)	
				1 DPC (Note)	2 DPC
		16 GB	24 GB	1.1V	
RDIMM	SRx8 (RC D)	16 GB	24 GB	5600	4400
	SRx4 (RC C)	32 GB	48 GB		
	SRx4 (RC F) 9x4	N/A	N/A		
	DRx8 (RC E)	32 GB	48 GB		
	DRx4 (RC A)	64 GB	96 GB		
	DRx4 (RC B) 9x4	N/A	N/A		
RDIMM 3DS	(4R/8R) x4 (RC A)	2H-128 GB 4H-256 GB	N/A	5600	
LRDIMM/LRDIMM-3DS	N/A	N/A	N/A	Not Supported	Not Supported

Note: 1 DPC applies to 1 SPC or 2 SPC implementation (SPC — sockets per channel).

DDR5 Memory Population Table (with SPXCC and MCC Processors and 32 DIMMs Installed)	
1 CPU:	***Memory Population Sequence***
1 CPU and 1 DIMM	P1-DIMMA1 P1-DIMME1 P1-DIMMB1 P1-DIMMF1
1 CPU and 2 DIMMs	P1-DIMMA1/P1-DIMMG1 P1-DIMMC1/P1-DIMME1
1 CPU and 4 DIMMs	P1-DIMMA1/P1-DIMMC1/P1-DIMME1/P1-DIMMG1
1 CPU and 6 DIMM	P1-DIMMA1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMG1 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMME1/P1-DIMMG1/P1-DIMMH1 P1-DIMMB1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMH1 P1-DIMMA1/P1-DIMMB1/P1-DIMMD1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1
1 CPU and 8 DIMMs	P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1
1 CPU and 12 DIMMs	P1-DIMMA1/P1-DIMMA2/P1-DIMMB1/P1-DIMMC1/P1-DIMMC2/P1-DIMMD1/P1-DIMME1/P1-DIMME2/P1-DIMMF1/P1-DIMMG1/P1-DIMMG2/P1-DIMMH1 P1-DIMMA1/P1-DIMMB1/P1-DIMMB2/P1-DIMMC1/P1-DIMMD1/P1-DIMMD2/P1-DIMME1/P1-DIMMF1/P1-DIMMF2/P1-DIMMG1/P1-DIMMH1/P1-DIMMH2
1 CPU and 16 DIMMs	P1-DIMMA1/P1-DIMMA2/P1-DIMMB1/P1-DIMMB2/P1-DIMMC1/P1-DIMMC2/P1-DIMMD1/P1-DIMMD2/P1-DIMME1/P1-DIMME2/P1-DIMMF1/P1-DIMMF2/P1-DIMMG1/P1-DIMMG2/P1-DIMMH1/P1-DIMMH2
2 CPUs: (Recommended)	***Memory Population Sequence***
2 CPUs and 2 DIMMs	**CPU1:** P1-DIMMA1, **CPU2:** P2-DIMMA1 **CPU1:** P1-DIMME1, **CPU2:** P2-DIMME1 **CPU1**: P1-DIMMB1, **CPU2:** P2-DIMMB1 **CPU1:** P1-DIMMF1, **CPU2:** P2-DIMMF1
2 CPUs and 4 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMG1, **CPU2:** P2-DIMMA1/P2-DIMMG1 **CPU1:** P1-DIMMC1/P1-DIMME1, **CPU2:** P2-DIMMC1/P2-DIMME1
2 CPUs and 8 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMC1/P1-DIMME1/P1-DIMMG1 **CPU2:** P2-DIMMA1/P2-DIMMC1/P2-DIMME1/P2-DIMMG1
2 CPUs and 10 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMG1 **CPU2:** P2-DIMMA1/P2-DIMMC1/P2-DIMME1/P2-DIMMG1
2 CPUs and 12 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMG1 **CPU2:** P2-DIMMA1/P2-DIMMC1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1/P2-DIMMG1 **CPU1:** P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMME1/P1-DIMMG1/P1-DIMMH1 **CPU2:** P2-DIMMA1/P2-DIMMB1/P2-DIMMC1/P2-DIMME1/P2-DIMMG1/P2-DIMMH1 **CPU1:** P1-DIMMB1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMH1 **CPU2:** P2-DIMMB1/P2-DIMMC1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1/P2-DIMMH1 **CPU1:** P1-DIMMA1/P1-DIMMB1/P1-DIMMD1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1 **CPU2:** P2-DIMMA1/P2-DIMMB1/P2-DIMMD1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1
2 CPUs and 16 DIMMs	**CPU1**: P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1 **CPU2**: P2-DIMMA1/P2-DIMMB1/P2-DIMMC1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1
2 CPUs and 22 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMA2/P1-DIMMB1/P1-DIMMB2/P1-DIMMC1/P1-DIMMC2/P1-DIMMD1/P1-DIMMD2/P1-DIMME1/P1-DIMME2/P1-DIMMF1/P1-DIMMF2/P1-DIMMG1/P1-DIMMG2/P1-DIMMH1/P1-DIMMH2 **CPU2:** P2-DIMMA1/P2-DIMMC1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1/P2-DIMMG1
2 CPUs and 24 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMA2/P1-DIMMB1/P1-DIMMB2/P1-DIMMC1/P1-DIMMC2/P1-DIMMD1/P1-DIMMD2/P1-DIMME1/P1-DIMME2/P1-DIMMF1/P1-DIMMF2/P1-DIMMG1/P1-DIMMG2/P1-DIMMH1/P1-DIMMH2 **CPU2**: P2-DIMMA1/P2-DIMMB1/P2-DIMMC1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1
2 CPUs and 32 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMA2/P1-DIMMB1/P1-DIMMB2/P1-DIMMC1/P1-DIMMC2/P1-DIMMD1/P1-DIMMD2/P1-DIMME1/P1-DIMME2/P1-DIMMF1/P1-DIMMF2/P1-DIMMG1/P1-DIMMG2/P1-DIMMH1/P1-DIMMH2 **CPU2:** P2-DIMMA1/P2-DIMMA2/P2-DIMMB1/P2-DIMMB2/P2-DIMMC1/P2-DIMMC2/P2-DIMMD1/P2-DIMMD2/P2-DIMME1/P2-DIMME2/P2-DIMMF1/P2-DIMMF2/P2-DIMMG1/P2-DIMMG2/P2-DIMMH1/P2-DIMMH2

Note: This memory configuration is recommended by Supermicro for optimal memory performance. Use this configuration to maximize your memory performance.

DDR5 Memory Population Table (with Max Series (HBM) CPUs and 32 DIMMs Installed)	
1 CPU:	***Memory Population Sequence***
1 CPU and 1 DIMM	P1-DIMMA1 P1-DIMME1
1 CPU and 2 DIMMs	P1-DIMMA1/P1-DIMMG1 P1-DIMMC1/P1-DIMME1
1 CPU and 4 DIMMs	P1-DIMMA1/P1-DIMMC1/P1-DIMME1/P1-DIMMG1
1 CPU and 8 DIMMs	P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1
1 CPU and 16 DIMMs	P1-DIMMA1/P1-DIMMA2/P1-DIMMB1/P1-DIMMB2/P1-DIMMC1/P1-DIMMC2/P1-DIMMD1/P1-DIMMD2/P1-DIMME1/P1-DIMME2/P1-DIMMF1/P1-DIMMF2/P1-DIMMG1/P1-DIMMG2/P1-DIMMH1/P1-DIMMH2
2 CPUs: (Recommended)	***Memory Population Sequence***
2 CPUs and 2 DIMMs	**CPU1:** P1-DIMMA1, **CPU2:** P2-DIMMA1 **CPU1:** P1-DIMME1, **CPU2:** P2-DIMME1
2 CPUs and 4 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMG1, **CPU2:** P2-DIMMA1/P2-DIMMG1 **CPU1:** P1-DIMMC1/P1-DIMME1, **CPU2:** P2-DIMMC1/P2-DIMME1
2 CPUs and 8 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMC1/P1-DIMME1/P1-DIMMG1 **CPU2:** P2-DIMMA1/P2-DIMMC1/P2-DIMME1/P2-DIMMG1
2 CPUs and 16 DIMMs	**CPU1**: P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMG1/P1-DIMMH1 **CPU2**: P2-DIMMA1/P2-DIMMB1/P2-DIMMC1/P2-DIMMD1/P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1
2 CPUs and 32 DIMMs	**CPU1:** P1-DIMMA1/P1-DIMMA2/P1-DIMMB1/P1-DIMMB2/P1-DIMMC1/P1-DIMMC2/P1-DIMMD1/P1-DIMMD2/P1-DIMME1/P1-DIMME2/P1-DIMMF1/P1-DIMMF2/P1-DIMMG1/P1-DIMMG2/P1-DIMMH1/P1-DIMMH2 **CPU2:** P2-DIMMA1/P2-DIMMA2/P2-DIMMB1/P2-DIMMB2/P2-DIMMC1/P2-DIMMC2/P2-DIMMD1/P2-DIMMD2/P2-DIMME1/P2-DIMME2/P2-DIMMF1/P2-DIMMF2/P2-DIMMG1/P2-DIMMG2/P2-DIMMH1/P2-DIMMH2

Notes:

1. Max Series (HBM) Processors support 1 DPC (5600 MT/s) / 2 DPC (4400 MT/s) to optimize the memory bandwidth. Max Series (HBM) Processors support 1, 2, 4, 8, or 16 DIMMs in Flat Mode as well as Cache Mode, and 0 DIMMs, in HBM-Only mode. HBM-Only mode runs exclusively using HBM memory.
2. For the best memory performance in Flat mode and Cache mode, use 4, 8, or 16 DIMM configurations. At least use one DIMM per memory controller for a balanced configuration.

   4 DIMMs -> populate 1 DIMM/Integrated Memory Controller (iMC)

   8 DIMMs -> populate 1 DIMM/Channel, 2 DIMM/iMC

   16 DIMMs -> populate 2 DIMM/Channel, 4 DIMM/iMC
3. All other configurations not listed above are not supported.
4. For the 2-socket design, each socket has to be populated identically.

DIMM Installation

1. Insert the desired number of DIMMs into the memory slots based on the recommended DIMM population tables in the previous section. Locate DIMM memory slots on the motherboard as shown on the right.

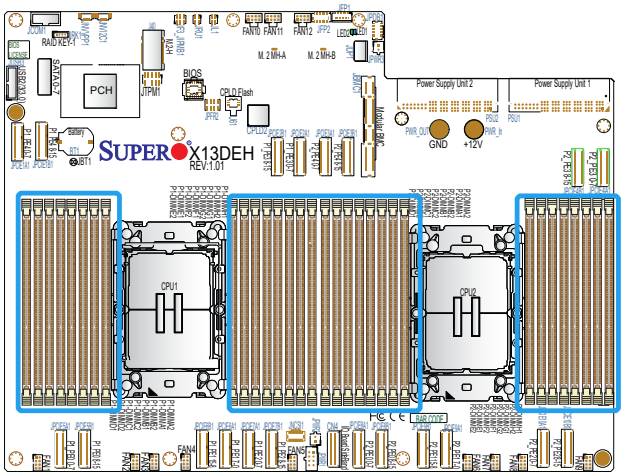


Figure 2-65: Locations of DIMM Memory Slots

2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.

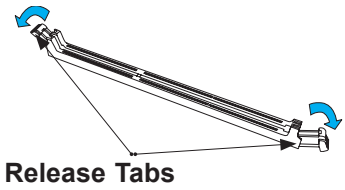


Figure 2-66: Pushing Release Tabs Outwards

3. Align the key of the memory module with the receptive point on the memory slot.

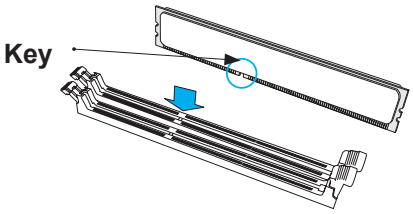


Figure 2-67: Aligning Key with Memory Slot

4. Align the notches on both ends of the module against the receptive points on the ends of the slot.

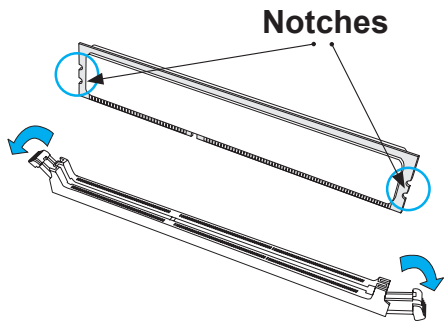


Figure 2-68: Aligning Notches to Receptive Points

5. Push both ends of the module straight down into the slot until the module snaps into place.
6. Press the release tabs to the locking positions to secure the memory module into the slot.

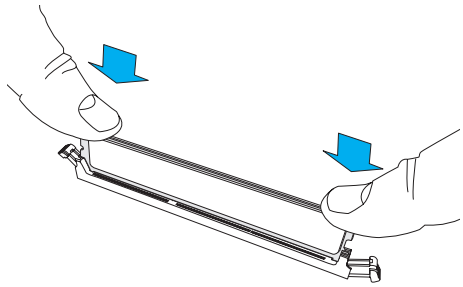


Figure 2-69: Pushing Both Ends Straight Down Into the Memory Slot

DIMM Removal

Press both release tabs on the ends of the memory module outwards to unlock it. Once the memory module has been loosened, remove it from the memory slot.

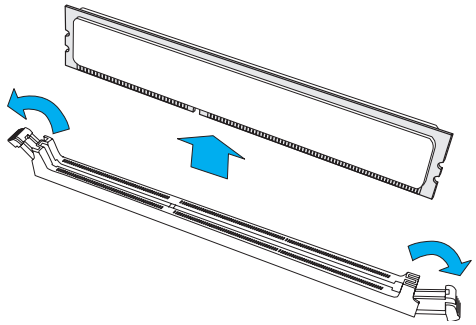


Figure 2-70: Releasing Tabs and Removing the Module

Warning! Do not use excessive force when pressing the release tabs on the ends of the DIMM socket to avoid causing any damage to the memory module or the DIMM socket. Handle memory modules with care. Carefully follow all the instructions given on page 1 of this chapter to avoid ESD-related damage to your memory modules or components.

2.5 Front Control Panel Headers

Front Control Panel Headers

Two front control panel headers (JFP1/JFP2) are located on the front side of the motherboard. Front Control Panel Header 1 (JFP1) is a Supermicro proprietary control panel header that contains header pins for various buttons and LED indications with I²C support for front access. This control panel header is designed specifically for use with Supermicro chassis. See the following figure for the pin-out descriptions for JFP1. For Front Panel Control Header 2 (JFP2), refer to the last page of the Front Control Panel 1 (JFP1) section.

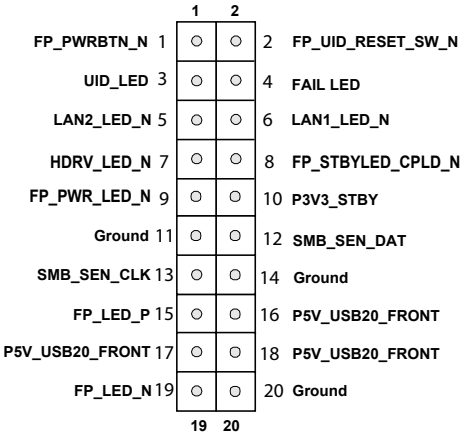
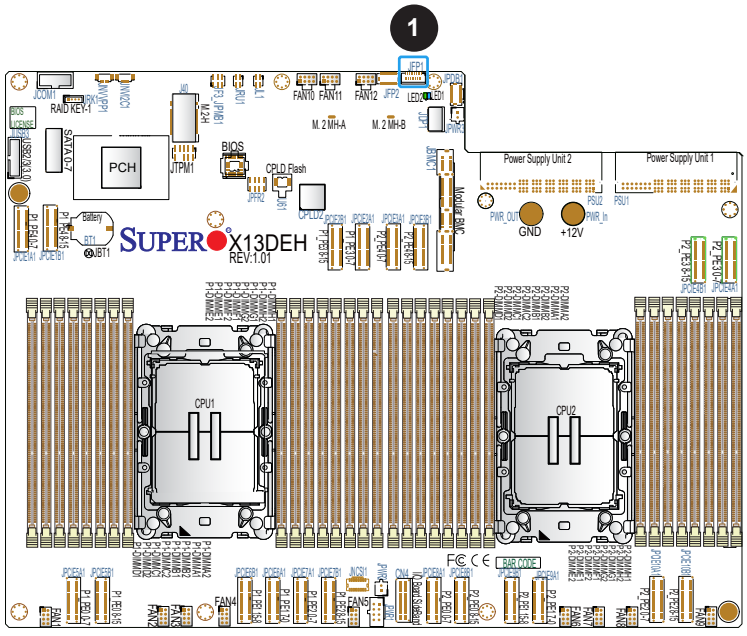


Figure 2-71: JFP1 Header Pins



1. JFP1 (Control Panel Header)

Power On

The Power On and BMC/BIOS Status LED button is located on Pin 1 of the front control panel header (JFP1). Momentarily contacting Pin 1 of JFP1 will power on/off the system. Refer to the table for more information.

Power Button BMC/BIOS Status LED Indicator	
Status	**Event**
Green: solid on	System power on
BMC/BIOS blinking green at 4 Hz	BMC/BIOS checking
BIOS blinking green at 4 Hz	BIOS recovery/update in progress
BMC blinking red x2 (two blinks red) at 4 Hz, one pause at 2 Hz (on-on-off-off)	BMC recovery/update in progress
BMC/BIOS blinking green at 1 Hz	Flash not detected or golden image checking failure

Unit Identifier (UID)/System Reset Button Switch

The UID/System Reset button switch connection, located on Pin 2 of JFP1, is used in conjunction with the UID/Reset Switch Select Jumper (JRU1). To configure Pin 2 of JFP1 for UID switch use in a chassis that supports front UID connection, close Pin 1 and Pin 2 of Jumper JRU1. To set Pin 2 of JFP1 for System Reset, close Pin 3 and Pin 4 of Jumper JRU1. Refer to the jumper section for more information on JRU1 and the layout for the location.

Front UID Switch/Reset Button Select Jumper (JRU1) Jumper Settings	
State	**Description**
Close Pin 1 and Pin 2 of JRU1	Pin 2 of JFP1: used for front UID Switch support
Close Pin 3 and Pin 4 of JRU1	Pin 2 of JFP1: used for System Reset support

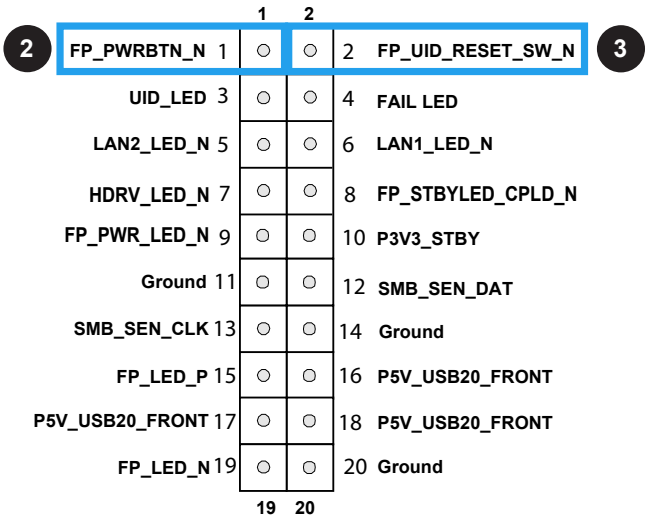
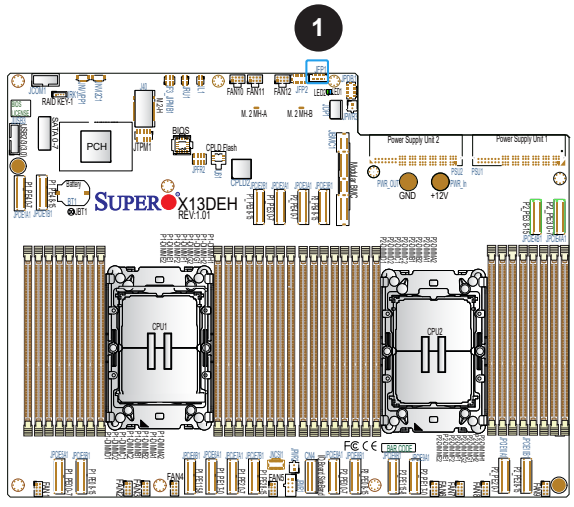


Figure 2-72: JFP1 Header Pins



1. JFP1 (Control Panel Header)
2. Pin 1: PWR Button (Negative)
3. Pin 2: UID/System Reset (Negative)

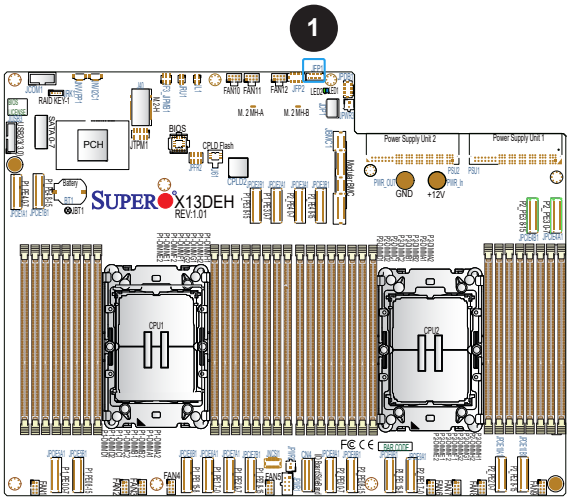
UID LED

The unit identifier LED connection is located on Pin 3 of JFP1. See the figure and table for more information on JFP1.

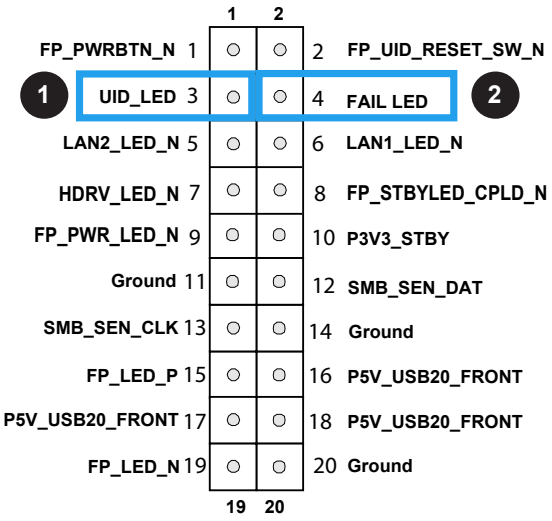
Failure LED (Information LED for OH/FF/PF)

The Failure LED (Information LED for OH/Fan Fail/PWR Fail) connection is located on Pin 4 of JFP1. The LED provides warnings of overheating, power failure, or fan failure. Refer to the figure and table for more information.

Failure LED (Information LED) (OH/Fan Fail/PWR Fail) LED States	
Status	**Description**
Solid red (on)	An overheating has occurred.
Blinking red (1 Hz)	Fan failure: check for an inoperative fan.
Blinking red (0.25 Hz)	Power failure: check for a non-operational power supply
Blinking red (10 Hz) (FP red LED)	CPLD recovery mode error(s)
Solid blue	UID has been activated locally. Use this function to locate a unit in the system that might be in need of service.
Blinking blue (1 Hz)	Local UID has been activated locally on. Use this function to identify a unit that might be in need of service.
BIOS/BMC blinking blue (10 Hz)	BIOS/BMC: recovery and/or update in progress
Red Info LED blinking (10 Hz) and MB UID LED blue blinking (10 Hz)	CPLD: recovery and/or update in progress



1. JFP1 (Control Panel Header 1)



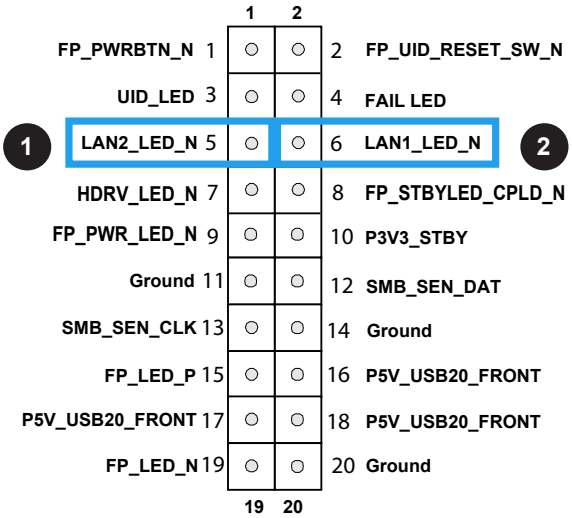
1. Pin 3: UID LED
2. Pin 4: Fail LED

Figure 2-73: JFP1 Header Pins

LAN1 LED/LAN2 LED

The Network Interface LED connection for LAN Port 1 is located on Pin 6 of JFP1, and LAN Port 2 is on Pin 5.

LAN1/LAN2 LED LED States	
Color	**State**
Pin 5: LED2: Blinking green	LAN 2: Active
Pin 6: LED1: Blinking green	LAN 1: Active



1. Pin 5: LAN2 LED (Negative)
2. Pin 6: LAN1 LED (Negative)

Figure 2-74: JFP1 Header Pins

HDD Activity LED

The HDD activity LED connection is located on Pin 7 of JFP1. When this LED is blinking green, it indicates HDD activity.

HDD Activity LED LED State	
Color	**State**
Blinking Green	HDD Active

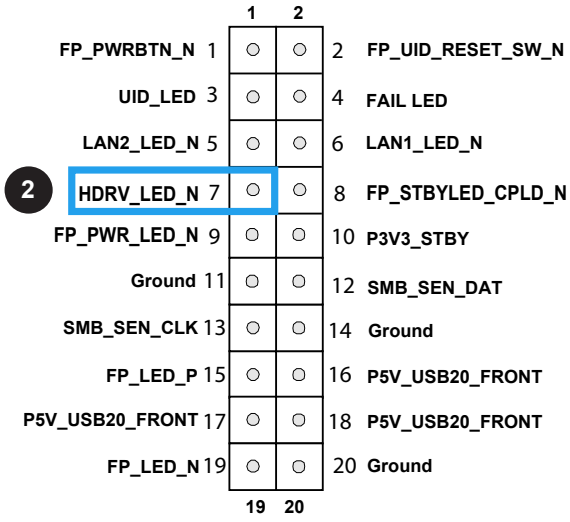
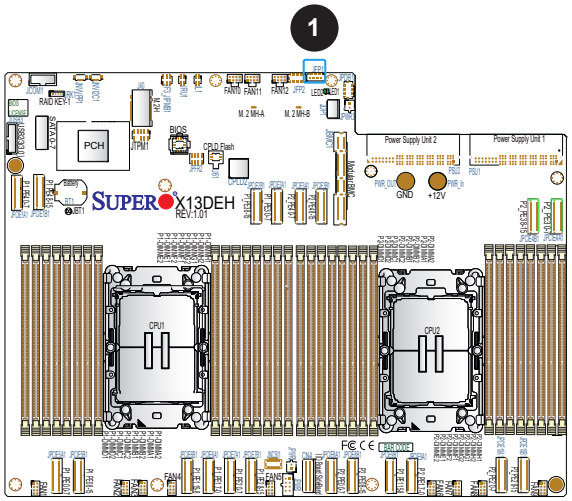


Figure 2-75: JFP1 Header Pins



1. JFP1 (Control Panel Header)
2. Pin 7: HDD Activity LED (Negative)

Standby Power/CPLD LED

The LED indicator for Standby Power/Complex Programmable Logic Device (CPLD) LED is located on Pin 8 of JFP1. If this LED is on, Standby Power/CPLD is on.

Root of Trust (RoT) Power LED

The LED for Root of Trust (RoT) power is located on Pin 9 of JFP1. If this LED is on, RoT is on.

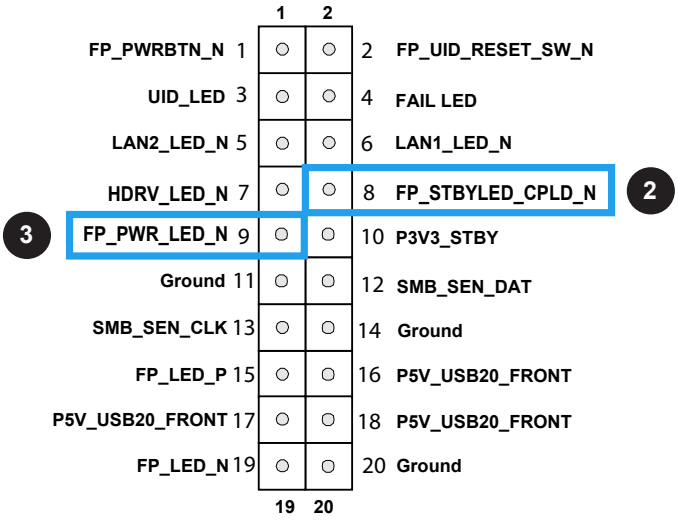
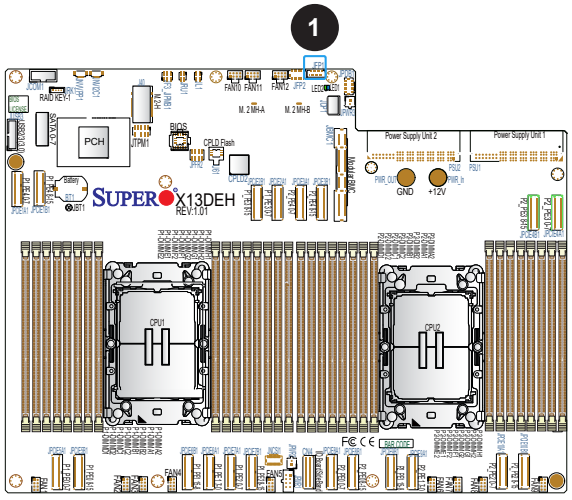


Figure 2-76: JFP1 Header Pins



1. JFP1 (Control Panel Header)
2. Pin 8: Standby PWR/CPLD LED (Negative)
3. Pin 9: RoT PWR On (Negative)

Standby Power SMB (I²C)

A Standby Power (I²C) connection, located on Pin 10 through Pin 14 of JFP1, provides power to the system when it is in standby mode. The table has the pin definitions.

3.3V Standby PWR Pin Definitions

Pin#	Definition
10	P3V3 Standby
11	Ground
12	I²C Data (SMB_SEN_DAT)
13	I²C Clock (SMB_SEN_CLK)
14	Ground

Power Fail LED Indicators

Power Failure LED Indicators are located on Pin 15 and Pin 19 of JFP1. The table has the pin definitions.

FP Power LED Pin Definitions (JFP1)	
Pin#	**Definition**
15	PWR Failure LED-Positive
19	PWR Failure LED-Negative

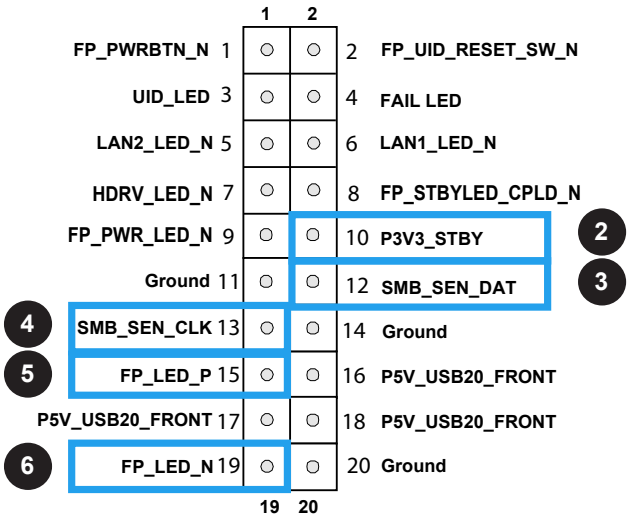
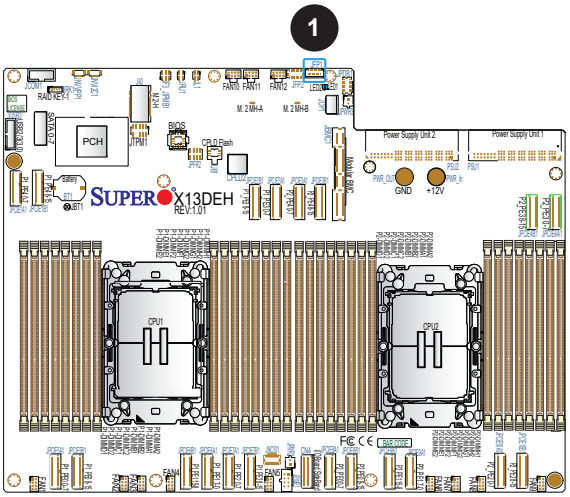


Figure 2-77: JFP1 Header Pins



1. JFP1 (Control Panel Header)
2. Pin 10: P3V3 Standby
3. Pin 12: I²C Data (SMB_SEN_DAT)
4. Pin 13: I²C Clock (SMB_SEN_CLK)
5. Pin 15: PWR Failure LED-Positive
6. Pin 19: PWR Failure LED-Negative

FP USB Power

Front Panel USB power connections, located on Pin 16 through Pin 18 of JFP1, provide power to front USB devices. Refer to the table for pin definitions.

FP USB PWR Pin Definitions	
Pin#	**Definition**
16	+5V USB PWR
17	
18	

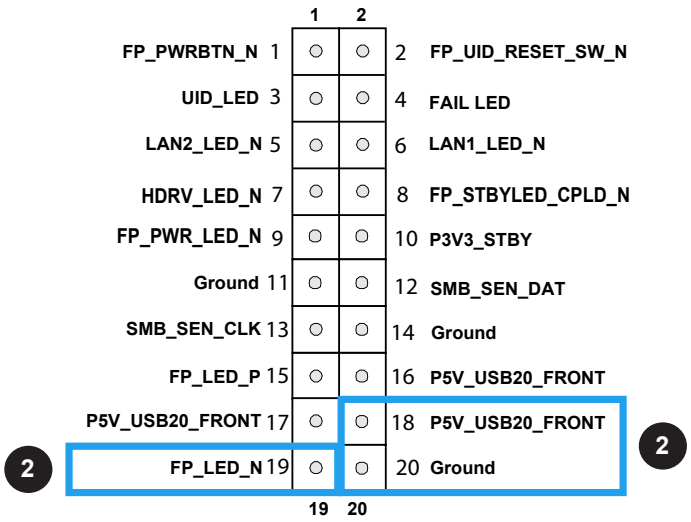
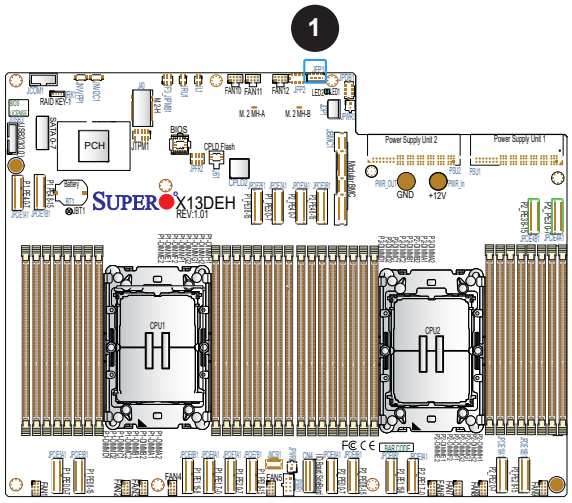


Figure 2-78: JFP1 Header Pins

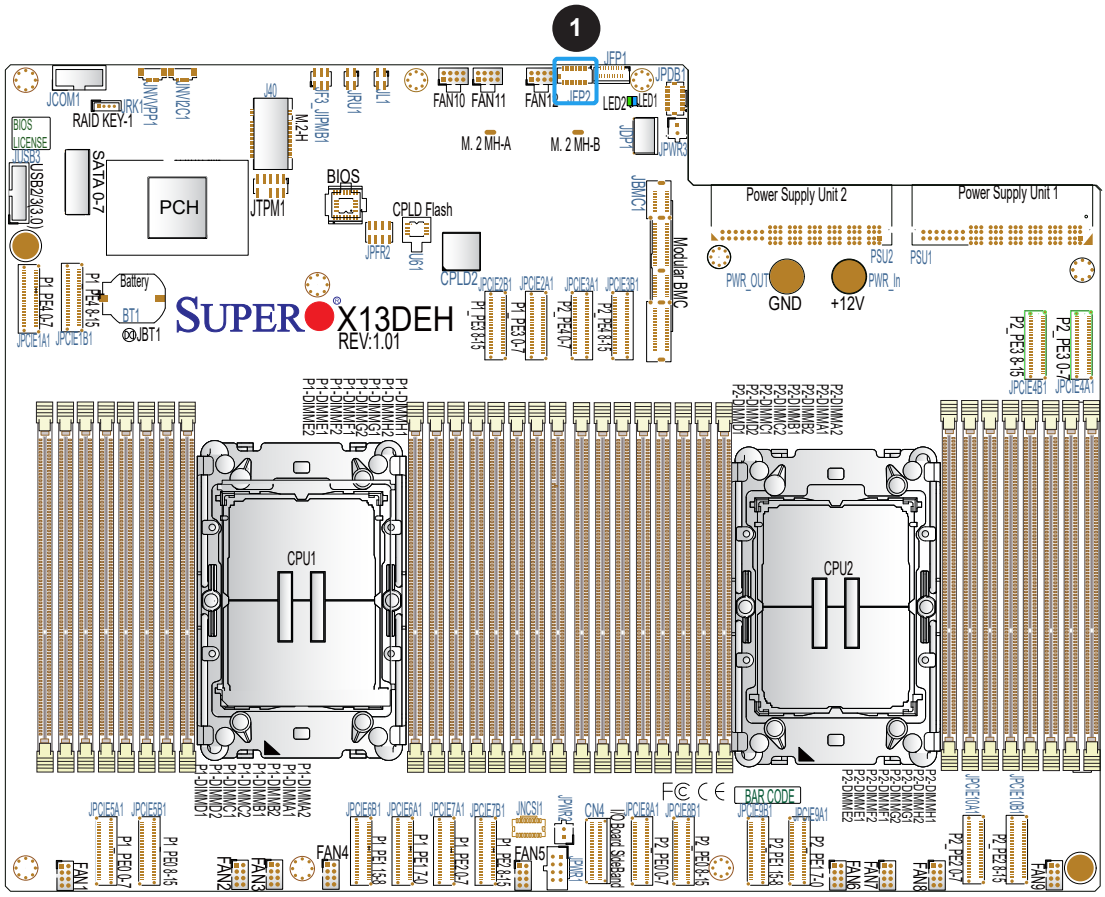


1. JFP1 (Control Panel Header)
2. Pin 16 Through Pin 18: +5V Front USB PWR

Front Control Panel Header 2

The front control panel header, located at JFP2, contains header pins that provide various power, networking. and I/O support for user interaction and applications. It is an Nvidia proprietary connector, and the information pertaining to this header is used under a partnership agreement between Supermicro and Nvidia.

1. JFP2: Nvidia Proprietary control panel header



2.6 Connectors and Headers

Power Connectors

Two power supply units (PSU1/PSU2) provide main power to Supermicro (1U) systems. The Power Distributor Board (PDB), located on the power sideband board header (JPDB1), provides main system power to Nvidia proprietary systems when the PDB is connected to the Main Power In (+12V) and the Main Power Out (GND). An 8-pin Standard Power connector (JPWR1) is used to provide power to onboard devices. In addition, two 2-pin +12V power connectors (JPWR2/JPWR3) are used for peripheral devices. (JPWR2 is used as an auxiliary power connector, while JPWR3 is used as a +12V standby power connector.) All these power connectors meet the ATX SSI EPS 12V specification and must be connected to your power supply to provide adequate power to your system. See the drawing on the next page for the locations of the power connectors.

Important: To provide adequate power to your system, be sure to connect Power Supply Unit1/Unit2 to your power outlet to provide adequate power to Supermicro (1U) systems. Connect the power sideband distributor board to the +12V CST pin and the GND CST pin to provide power to Nvidia proprietary systems. Also, be sure to connect the standard 8-pin power connector (JPWR1) and the 2-pin auxiliary power connectors (JPWR2/JPWR3) to appropriate power supplies to provide adequate power to your system. Failure to do so may void the manufacturer warranty on your power supply and your motherboard.

12V 8-pin Standard Power Pin Definitions (JPWR1)

Pin#	Definition
1 - 4	Ground
5 - 8	+12V

Required Connection

+12V 2-pin Auxiliary Power Pin Definitions (JPWR2)

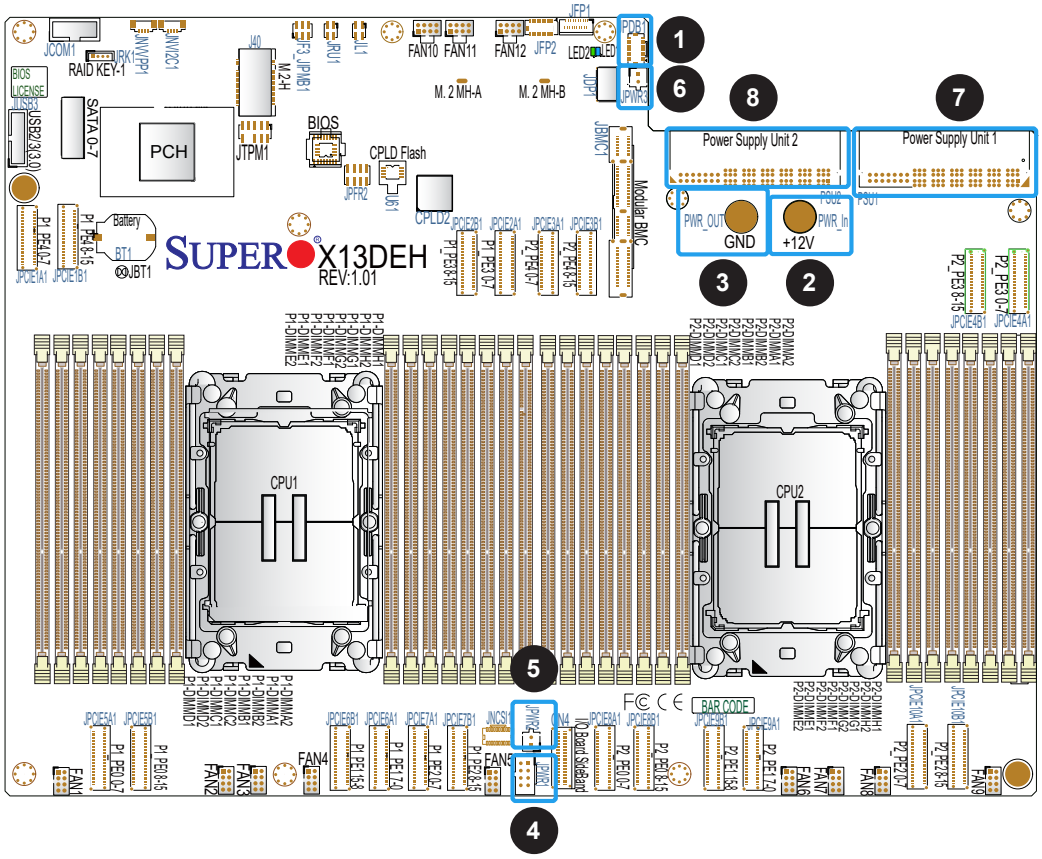
Pin#	Definition
1	Ground
2	P12V_AUX

Required Connection

+12V 2-pin Standby Power Pin Definitions (JPWR3)

Pin#	Definition
1	Ground
2	P12V_STBY

Required Connection



1. JPDB1: PWR Sideband Distributor Board Connector
2. +12V: Main PWR In
3. Ground (GND): Main PWR Out
4. JPWR1: 8-pin Standard PWR Connector
5. JPWR2: 2-pin Auxiliary PWR Connector
6. JPWR3: 2-pin Standby PWR Connector
7. PWR Supply Unit1
8. PWR Supply Unit2

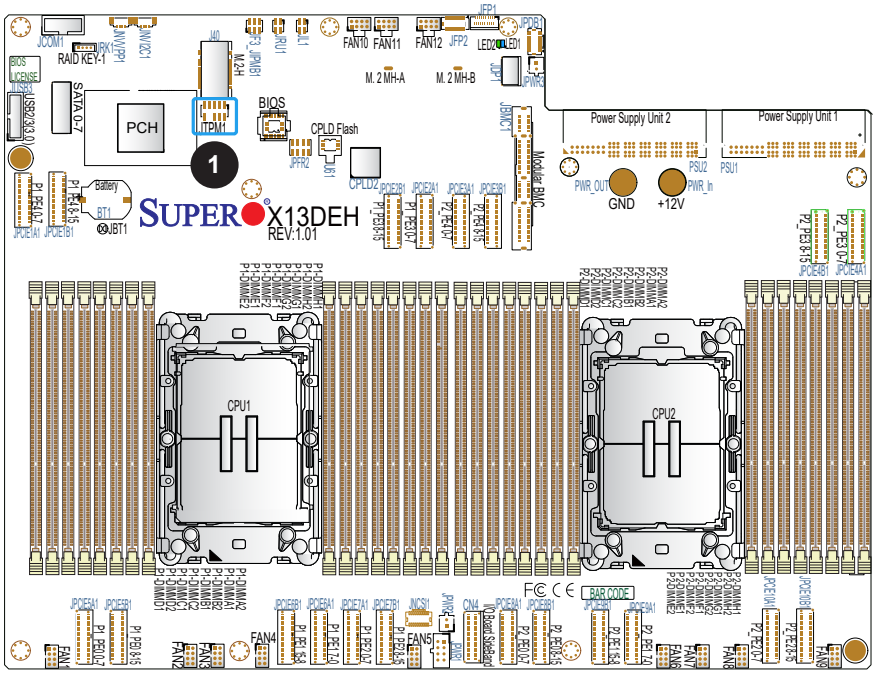
TPM/Port 80 Header

The JTPM1 header is used to support the Trusted Platform Module (TPM)/Port 80, which is available from Supermicro (optional). The TPM/Port 80 module is a security device that supports encryption and authentication in hard drives. It allows the motherboard to deny access to the system if the TPM key associated with the hard drive is not installed in the system. See the layout for the location of the TPM header. Go to the following link for more information on the TPM: http://www.supermicro.com/manuals/other/TPM.pdf.

Note: For TPM support, an optional part is needed. Contact Supermicro Technical Support for more information.

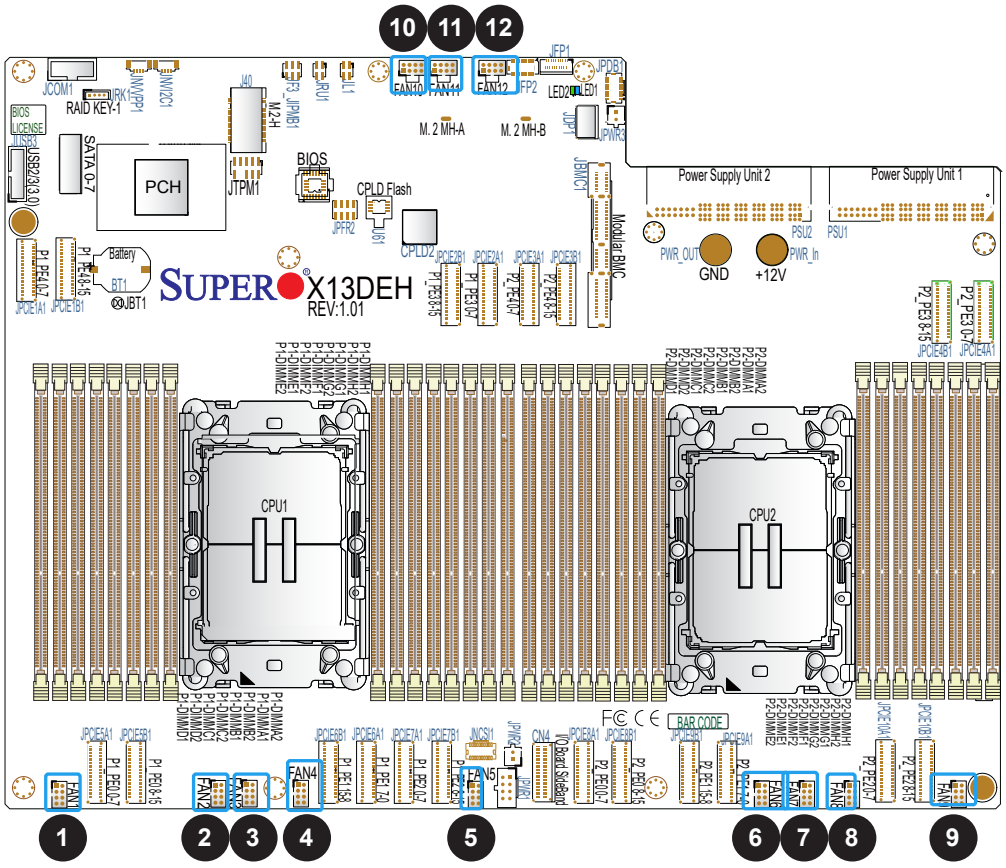
Trusted Platform Module Header Pin Definitions			
Pin#	**Definition**	**Pin#**	**Definition**
1	+3.3V	2	SPI_CS#
3	RESET#	4	SPI_MISO
5	SPI_CLK	6	GND
7	SPI_MOSI	8	NC
9	+3.3V Stdby	10	SPI_IRQ#

1. TPM/Port80 connector



Fan Headers

There are 12 8-pin fan headers (FAN1 to FAN12) used for your system cooling. Fan speed control for these fans is supported by Thermal Management via BMC 2.0 interface. Refer to the layout for the locations of the fan headers.



1. FAN1
2. FAN2
3. FAN3
4. FAN4
5. FAN5
6. FAN6
7. FAN7
8. FAN8
9. FAN9
10. FAN10
11. FAN11
12. FAN12

Chassis Intrusion

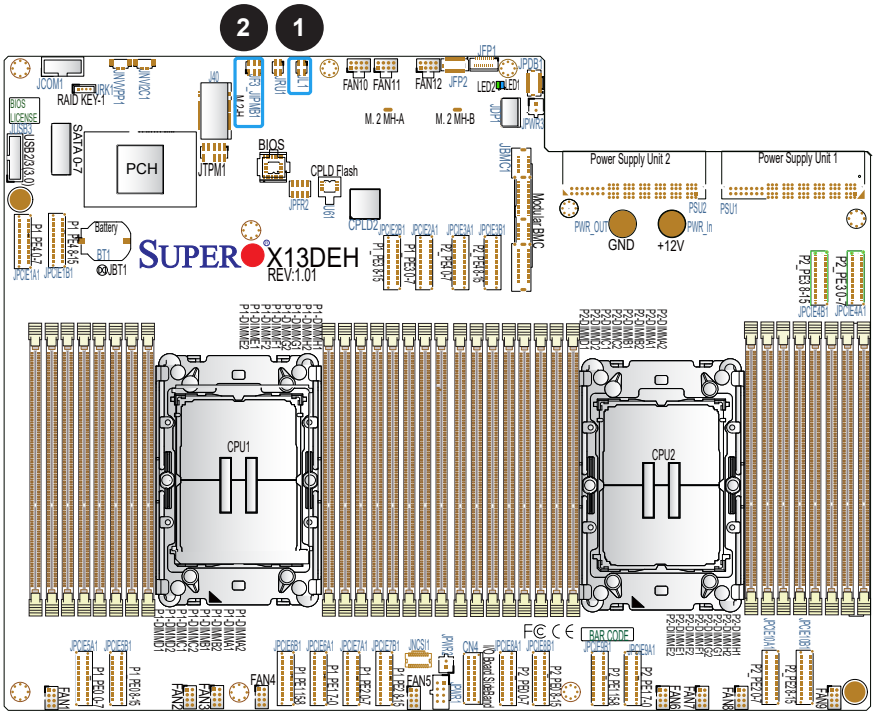
A Chassis Intrusion header is located at JL1 on the front side of the motherboard. Attach the appropriate cable from the chassis to this header to inform you of possible chassis intrusion when the chassis is opened. Refer to the table for pin definitions.

Chassis Intrusion (JL1) Pin Definitions	
Pin#	**Definition**
1	Intrusion Input
2	Ground

6-pin BMC External I2C Header

A 6-pin System Management Bus header for the BMC is located at JF3_JIPMB1. Connect an appropriate cable here to use the IPMB I²C connection on your system. Refer to the layout for the location of JF3_JIPMB1.

1. JL1: Chassis Intrusion
2. JF3_JIPMB1: IPMB I²C



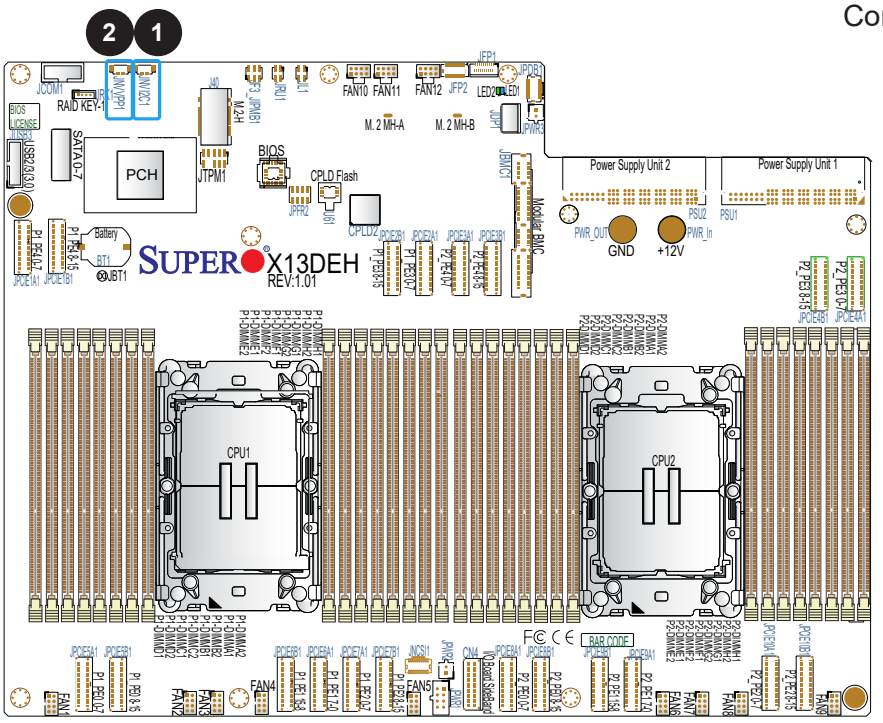
Nvidia BF-3 DPU Header

An Nvidia-defined NC-SI header, located at JNCSI1, is used for the NVIDIA BlueFrield-3 Data Processing Unit (DPU). The BF-3 DPU supports up to 400 Gb/s Ethernet or NDR 400 Gb/s InfiniBand network connectivity, and 16 GB onboard DDR5 memory support, providing software-defined networking, storage, security, and management functions for performance enhancement.

NVMe VPP Bus Connector

An NVMe VPP Bus connector is located at JNVVPP1 on the motherboard. The NVMe VPP connector provides hot plug support for the NVMe devices, which will allow you to replace NVMe devices without shutting down or powering off the system. Refer to the layout for the location of JNVVPP1.

1. JNVI2C1: NVMe SMBus (I^2C) Connector
2. JNVVPP1: NVMe VPP Bus Connector



VROC RAID Key Header

A VROC RAID Key header is located at JRK1 on the motherboard. Install a VROC RAID key on JRK1 for Virtual RAID on CPU (VROC) RAID support as shown in the illustration.

Note: For detailed instructions on how to configure VROC RAID settings, refer to the VROC RAID Configuration User's Guide posted on the web page under the link: http://www.supermicro.com/support/manuals/.

Intel VROC Key Pin Definitions	
Pin#	**Definition**
1	Ground
2	3.3V Standby
3	Ground
4	PCH RAID Key

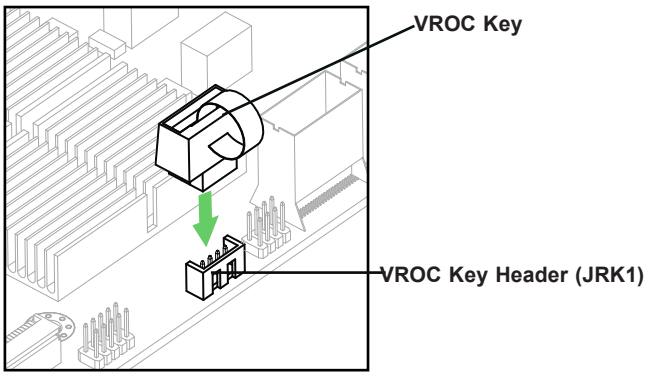
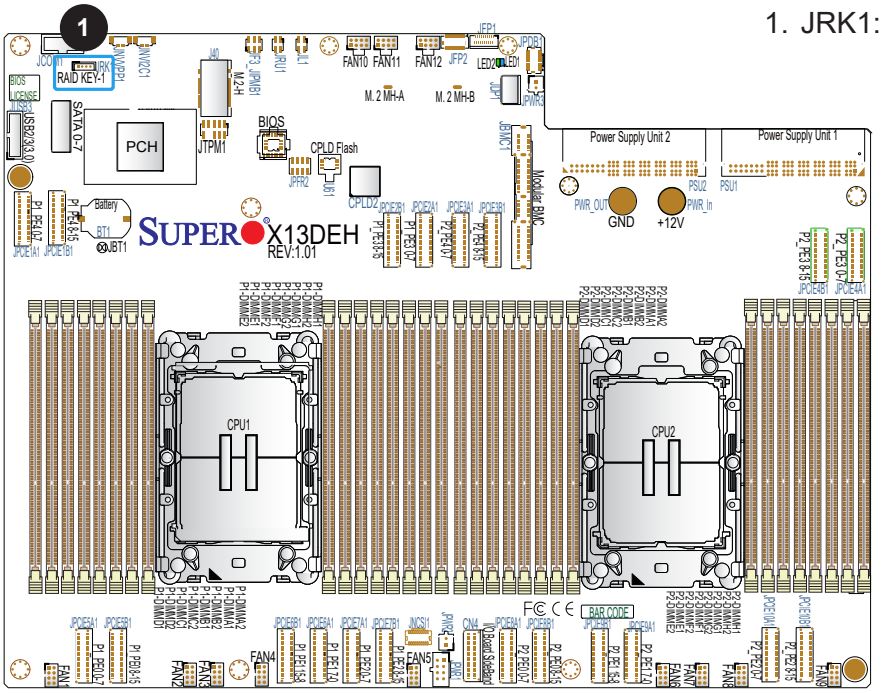


Figure 2-79: Installing VROC Key Into VROC Key Header

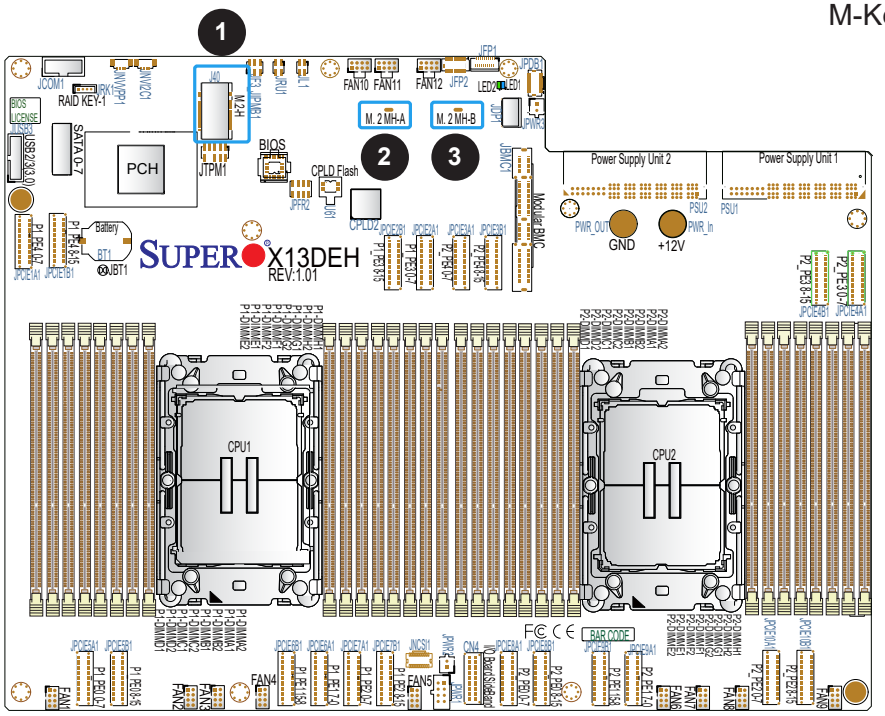
1. JRK1: VROC RAID Key Header



Onboard M.2-H Connector (for NVMe Only)

A PCIe 3.0/SATA3 Hybrid M.2 slot is located at J40. This M.2/SATA3 Hybrid slot supports PCIe 3.0 x4 Solid State Devices (SSDs) in the 2280 and 22110 form factors. To accommodate 2280 and 22110 form factors, two M.2 mounting holes are provided on the motherboard. Use the mounting hole marked *A* for form factor 2280 support, and use the mounting hole marked *B* for form factor 22110 support. M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. Refer to the layout for the locations of the M.2-H Hyrbrid slot and the mounting holes used for form factors 2280 and 22110 support.

1. Hybrid M.2-H Connector (Stacked)
2. M.2 Mounting Hole "A" for M-Key 2280 support
3. M.2 Mounting Hole "B" for M-Key 22110 support

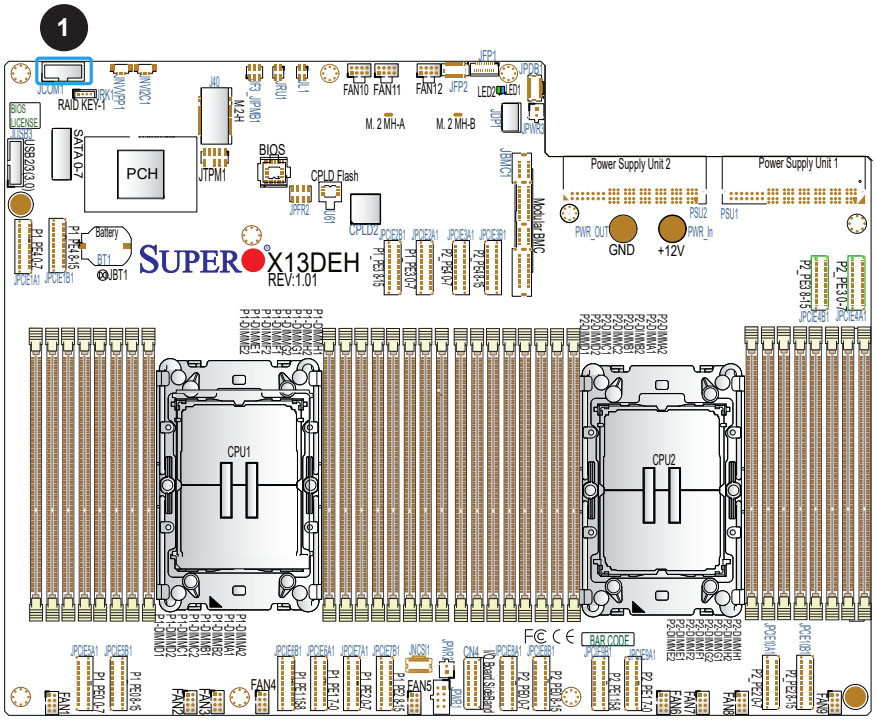


COM Port Pin Table Header for Debugging

A communication (COM) port pin table header used for debugging is located at JCOM1 on the front side of the motherboard. Refer to the board layout for the location of JCOM1.

COM Port Pin Table Header for Debugging (JCOM1) Pin Definitions			
Pin#	**Definition**	**Pin#**	**Definition**
1	No Connection	6	No Connection
2	SPI_RXD1	7	No Connection
3	SPI_TXD1	8	No Connection
4	No Connection	9	No Connection
5	Ground		

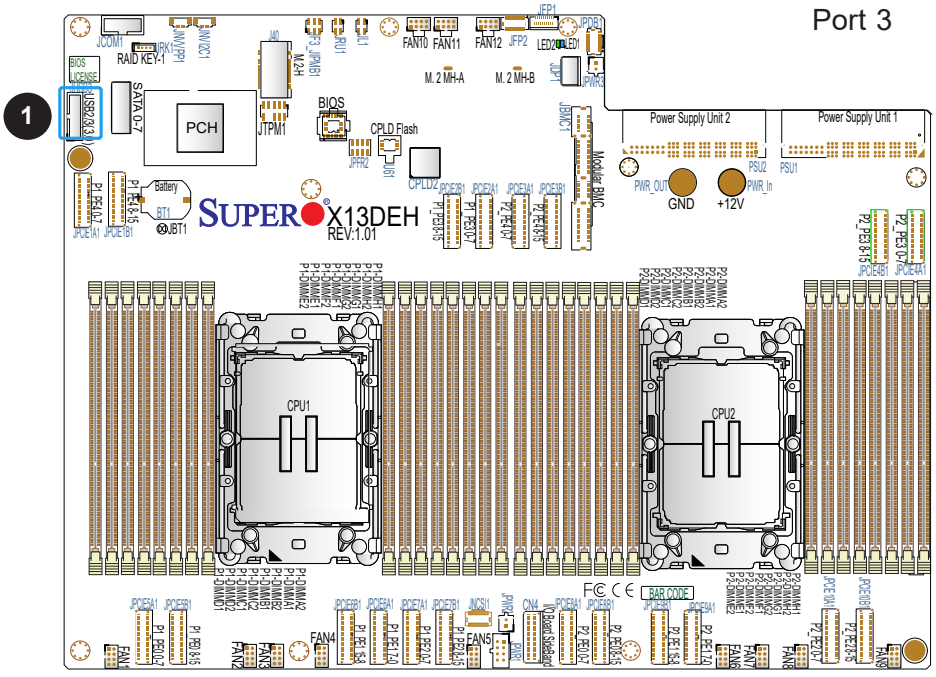
1. JCOM1: COM Port Pin Table Header for Debugging



Universal Serial Bus (USB) Ports

The USB connector, located at JUSB3, supports two USB 3.0 ports (USB2/3) for front access. These USB ports can be used for USB support via USB cables (not included).

USB 2/3 (3.0) Pin Definitions			
Pin#	**Definition**	**Pin#**	**Definition**
1	VBS	11	2DP
2	1RN	12	2DN
3	1RP	13	GND
4	GND	14	2TP
5	1TN	15	2TN
6	1TP	16	GND
7	GND	17	2RP
8	1DN	18	2RN
9	1DP	19	VBS
10	ID		

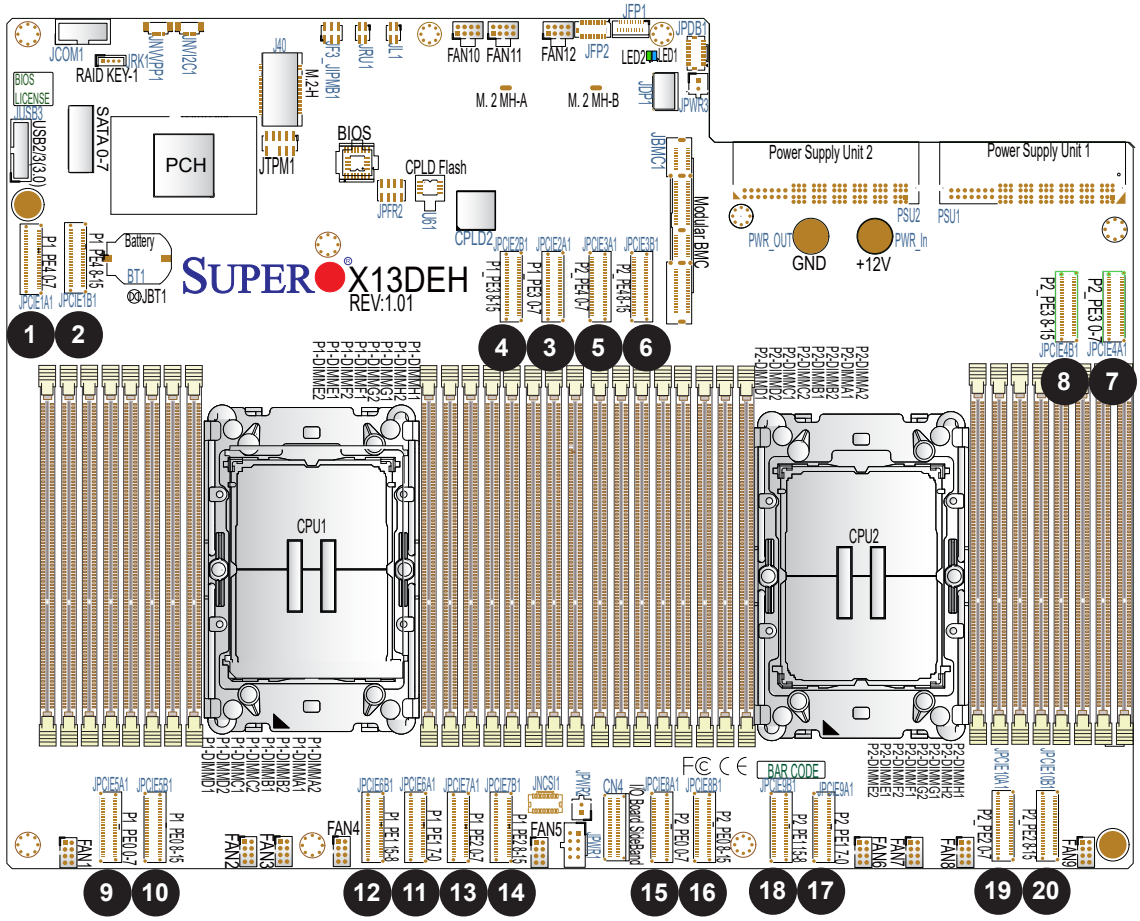


1. JUSB3 for USB (3.0) Port 2/ Port 3

PCIe 5.0 x8 via MCIO Vertical Connectors

This motherboard supports 20 PCIe 5.0 x8 via MCIO Vertical connectors that can be used for PCIe high-speed storage devices. These connectors are supported by CPU 1 or CPU 2. Refer to the table on the next page for details.

PCIe 5.0 x8 via MCIO Vertical Connectors Slot Location/Connector Number			
CPU Support	**Slot/Connector#**	**CPU Support**	**Slot/Connector#**
CPU1	JPCIE1A1: P1_PE4 0 to 7	CPU2	JPCIE3A1: P2_PE4 0 to 7
CPU1	JPCIE1B1: P1_PE4 8 to 15	CPU2	JPCIE3B1: P2_PE4 8 to 15
CPU1	JPCIE2A1: P1_PE3 0 to 7	CPU2	JPCIE4A1: P2_PE3 0 to 7
CPU1	JPCIE2B1: P1_PE3 8 to 15	CPU2	JPCIE4B1: P2_PE3 8 to 15
CPU1	JPCIE5A1: P1_PE0 0 to 7	CPU2	JPCIE8A1: P2_PE0 0 to 7
CPU1	JPCIE5B1: P1_PE0 8 to 15	CPU2	JPCIE8B1: P2_PE0 8 to 15
CPU1	JPCIE6A1: P1_PE1 7 to 0	CPU2	JPCIE9A1: P2_PE1 7 to 0
CPU1	JPCIE6B1: P1_PE1 15 to 8	CPU2	JPCIE9B1: P2_PE1 15 to 8
CPU1	JPCIE7A1: P1_PE2 0 to 7	CPU2	JPCIE10A1: P2_PE2 0 to 7
CPU1	JPCIE7B1: P1_PE2 8 to 15	CPU2	JPCIE10B1: P2_PE2 8 to 15

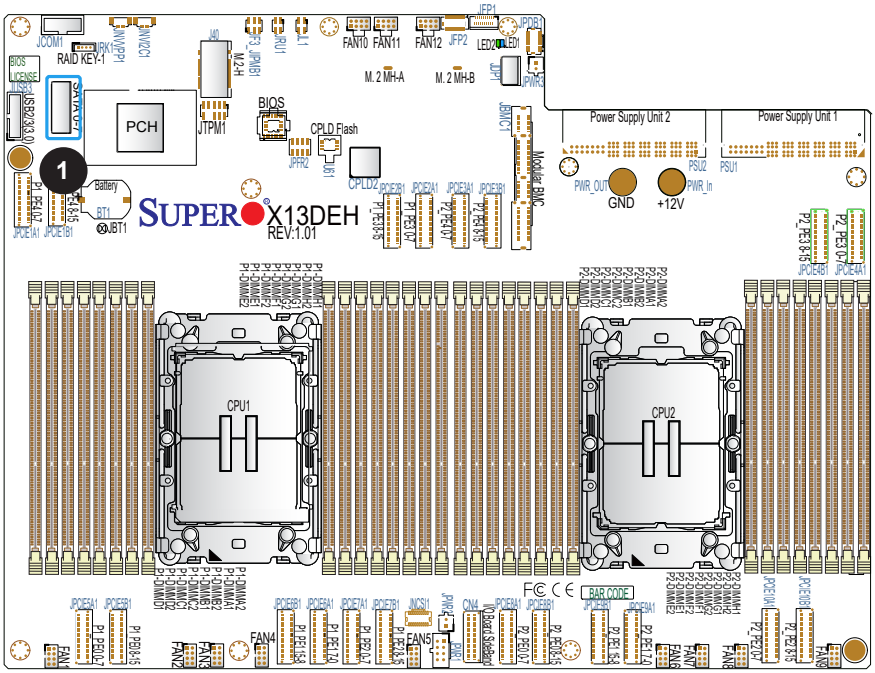


1. JPCIE1A1: P1_PE4 0 to 7
2. JPCIE1B1: P1_PE4 8 to 15
3. JPCIE2A1: P1_PE3 0 to 7
4. JPCIE2B1: P1_PE3 8 to 15
5. JPCIE3A1: P2_PE4 0 to 7
6. JPCIE3B1: P2_PE4 8 to 15
7. JPCIE4A1: P2_PE3 0 to 7
8. JPCIE4B1: P2_PE3 8 to 15
9. JPCIE5A1: P1_PE0 0 to 7
10. JPCIE5B1: P1_PE0 8 to 15
11. JPCIE6A1: P1_PE1 7 to 0
12. JPCIE6B1: P1_PE1 15 to 8
13. JPCIE7A1: P1_PE2 0 to 7
14. JPCIE7B1: P1_PE2 8 to 15
15. JPCIE8A1: P2_PE0 0 to 7
16. JPCIE8B1: P2_PE0 8 to 15
17. JPCIE9A1: P2_PE1 7 to 0
18. JPCIE9B1: P2_PE1 15 to 8
19. JPCIE10A1: P2_PE2 0 to 7
20. JPCIE10B1: P2_PE2 8 to 15

SATA 3.0 Ports 0 Through 7

A SATA 3.0 connector that supports eight SATA 3.0 connections (SATA 0 through 7) is located on the front side of the motherboard. These SATA 3.0 ports are supported by the Intel C741 PCH chipset. Connect proper SATA cables to this SATA 3.0 connector to use SATA 3.0 connections.

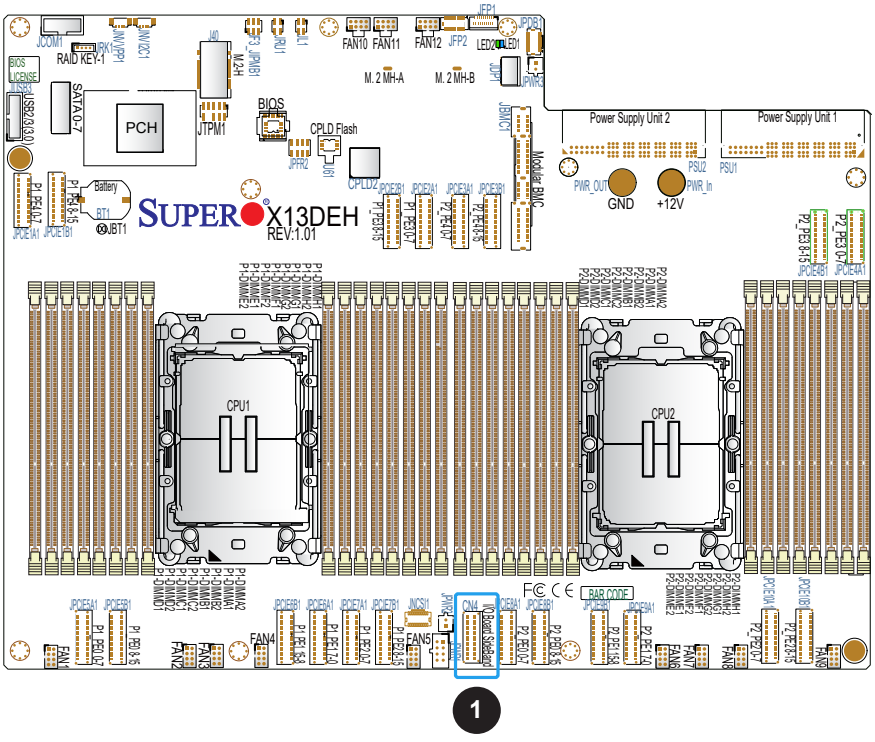
1. SATA 3.0 Connector for 8 SATA connections (SATA 0 through 7)



I/O Board Sideband Connector (CN4)

A Supermicro and Nvidia proprietary I/O board sideband connector, located at CN4 on the rear side of the motherboard, provides AIOM sideband support. See the layout for the location of CN4.

1. CN4: I/O Board SideBand Connector



2.7 Jumper Settings

How Jumpers Work

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the diagram on the right for an example of jumping Pin 1 and Pin 2. Refer to the motherboard layout page for jumper locations.

Note: On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

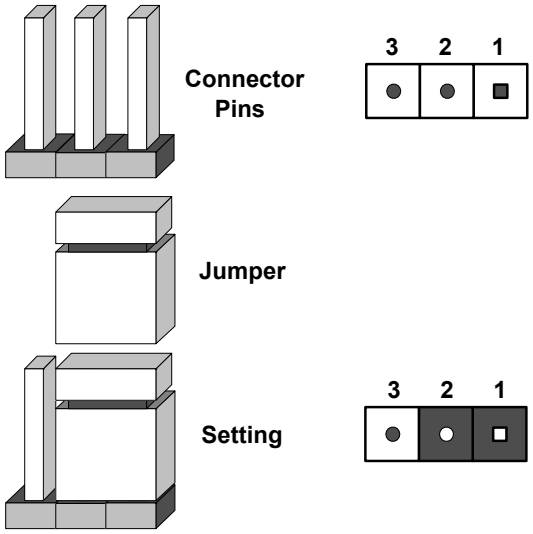


Figure 2-80: 3-Pin Jumper

CMOS Clear

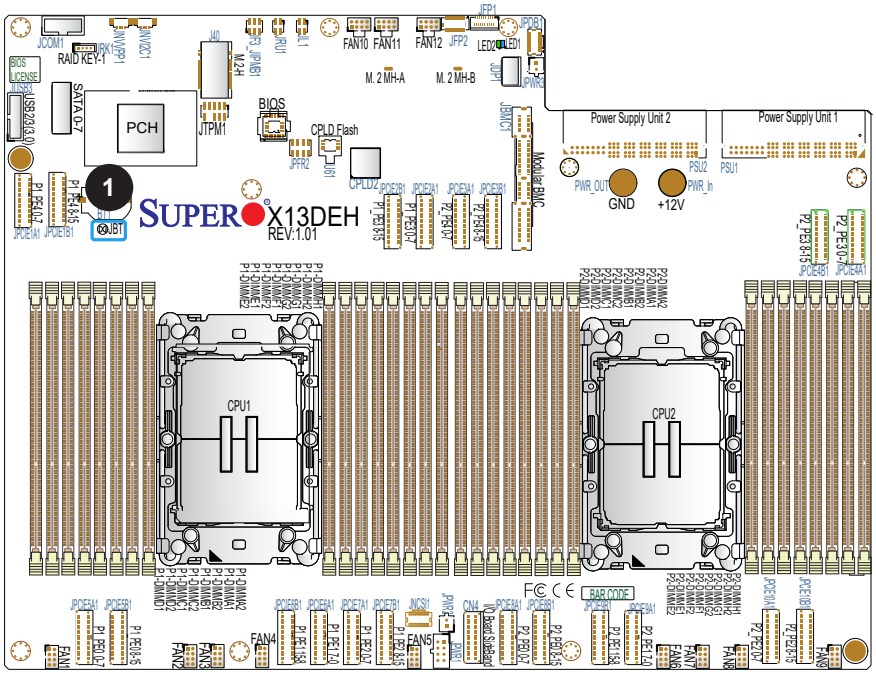
JBT1 is used to clear CMOS, which will also clear any passwords. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To Clear CMOS

1. Power down the system and unplug the power cord(s).
2. Remove the cover of the chassis to access the motherboard.
3. Remove the battery from the motherboard.
4. Short the CMOS pads, JBT1, with a metal object such as a small screwdriver for at least four seconds.
5. Remove the screwdriver (or shorting device).
6. Replace the cover, reconnect the power cord(s), and power on the system.

Note: Clearing CMOS will also clear all passwords.

1. JBT1: Clear CMOS

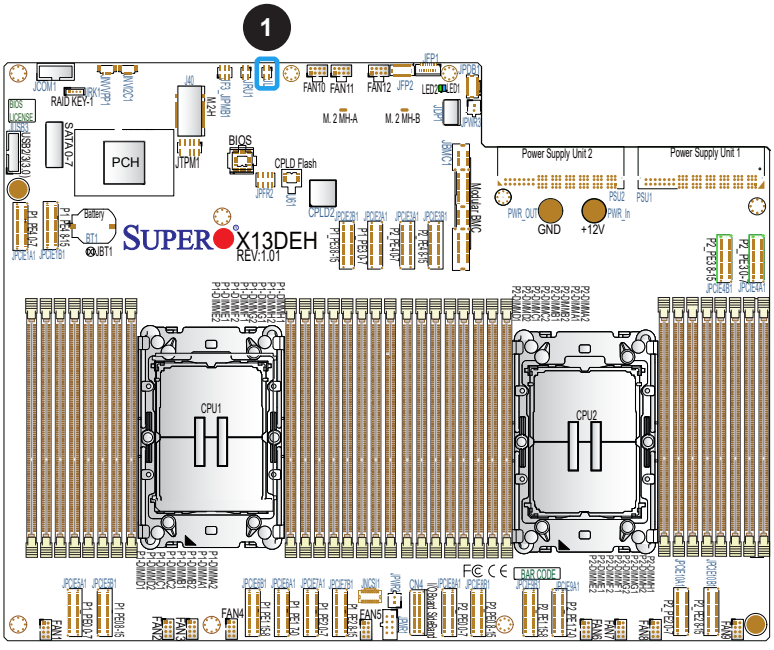


UID/System_Reset Select Jumper

Jumper JRU1 is used in conjunction with Pin 2 of Front Control Panel header 1 (JFP1) to function as a System_Reset button or a Unit Identifier (UID) button. To configure Pin 2 of JFP1 for front UID button use in a chassis that supports front UID connection, close Pins 1 and 2 of jumper JRU1. To set Pin 2 of JFP1 for System Reset support, close Pins 3 and 4 of jumper JRU1. Refer to the table and layout for more information on JRU1.

UID/System Reset Select (JRU1) Jumper Settings	
Jumper Setting	**Definition**
Pins 1-2	Used as a UID Button **(Default)**
Pins 2-3	Used as for System Reset

1. JRU1: UID/System Reset Select



Platform Firmware Resilience Jumper (JPFR2)

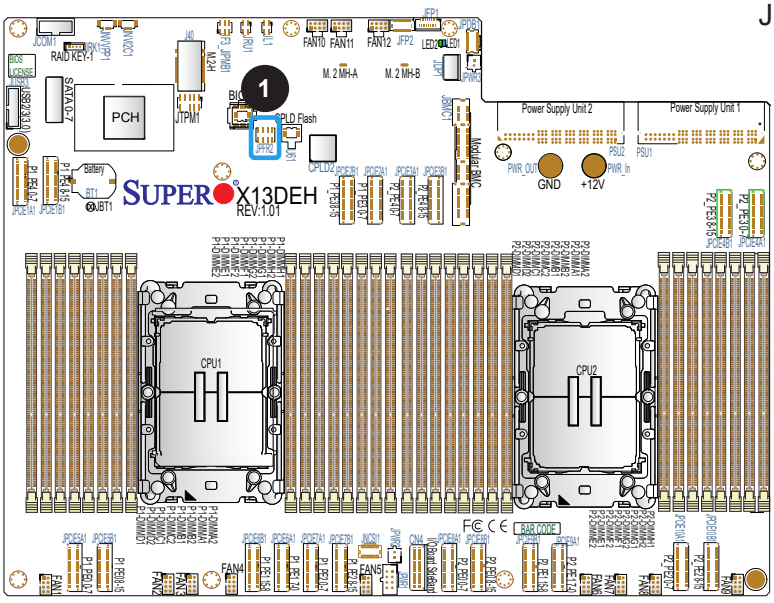
Jumper JPFR2 is used to enhance and synchronize system firmware features for overall platform performance optimization. The JPFR2 connector contains the Firmware Optimization chip that will allow you to customize platform firmware settings by configuring the pins contained in the JPFR2 chip. Refer to the tables for pin definitions of the JPFR2 chip and the Jumper settings that are created by configuring the pins of the JPFR2 chip.

Note: Pins not listed are unavailable for use.

JPFR2 Firmware Optimization Chip Pin Definitions			
Pin#	**Definition**	**Pin#**	**Definition**
1	FW_Flash_Security_Strap	2	JPFR1_PU_P3V3_STBY
3	PFR_PROV_Update_N	4	GND
7	ME_Recovery__N	10	JPFR1_PD

Platform Firmware Resilience Jumper Jumper Settings			
ME_MFR_Mode (Pins 1 and 2)	Pin1: off, Pin 2: On	**Off (Close Pin 2 only)**	**Normal (Default)**
	Pin 1: On, Pin 2: On	On (Close Pins 1 and 2)	Enable Manufacture (ME) Mode
PFR_PROV_Update_N (Pins 3 and 4)	Pin 3: off, Pin 4: On	**Off (Close Pin 4 Only)**	**Normal (Default)**
	Pin 3: On, Pin 4: On	On (Close Pins 3 and 4)	PFR Update
ME_Recovery_N (Pins 7 and 8)	Pin 7: off, Pin 8: On	**Off (Close Pin 8 Only)**	**Normal (Default)**
	Pin 7: On, Pin 8: On	On (Close Pins 7 and 8)	Force ME Recovery

1. JPFR2: Platform FW Resilience Jumper



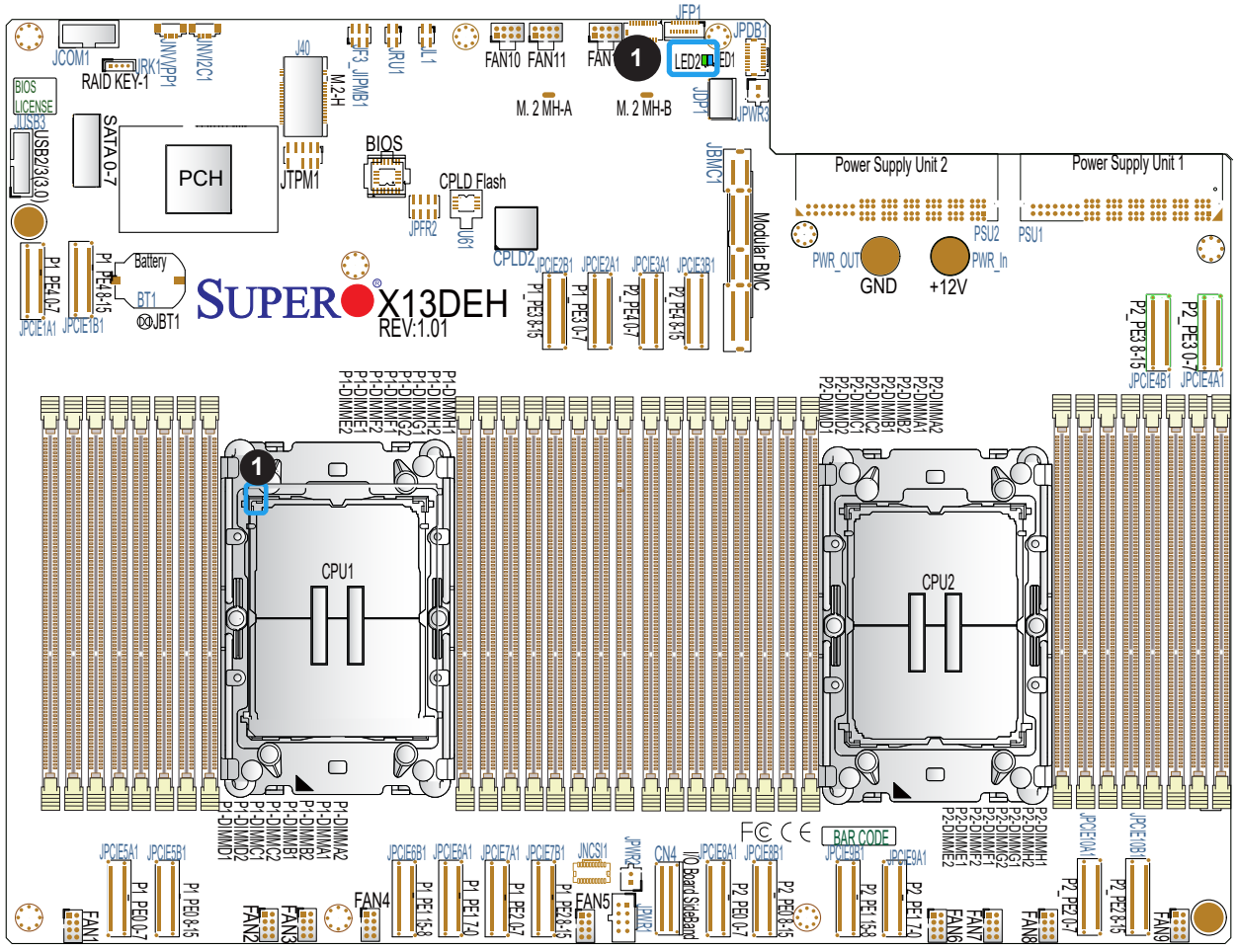
2.8 LED Indicators

Onboard Power LED

The Onboard Power LED is located at LED2 on the front side of the motherboard. When this LED is on, the system power is on. Be sure to turn off the system power and unplug the power cords before removing or installing components. Refer to the table for more information.

Onboard Power LED (LED2) LED Indicator	
LED Color	**Definition**
Off	System Power Off (power cable not connected)
Green Blinking	System Power Active
Green (Solid) On	System Power On

1. LED2: Onboard PWR LED

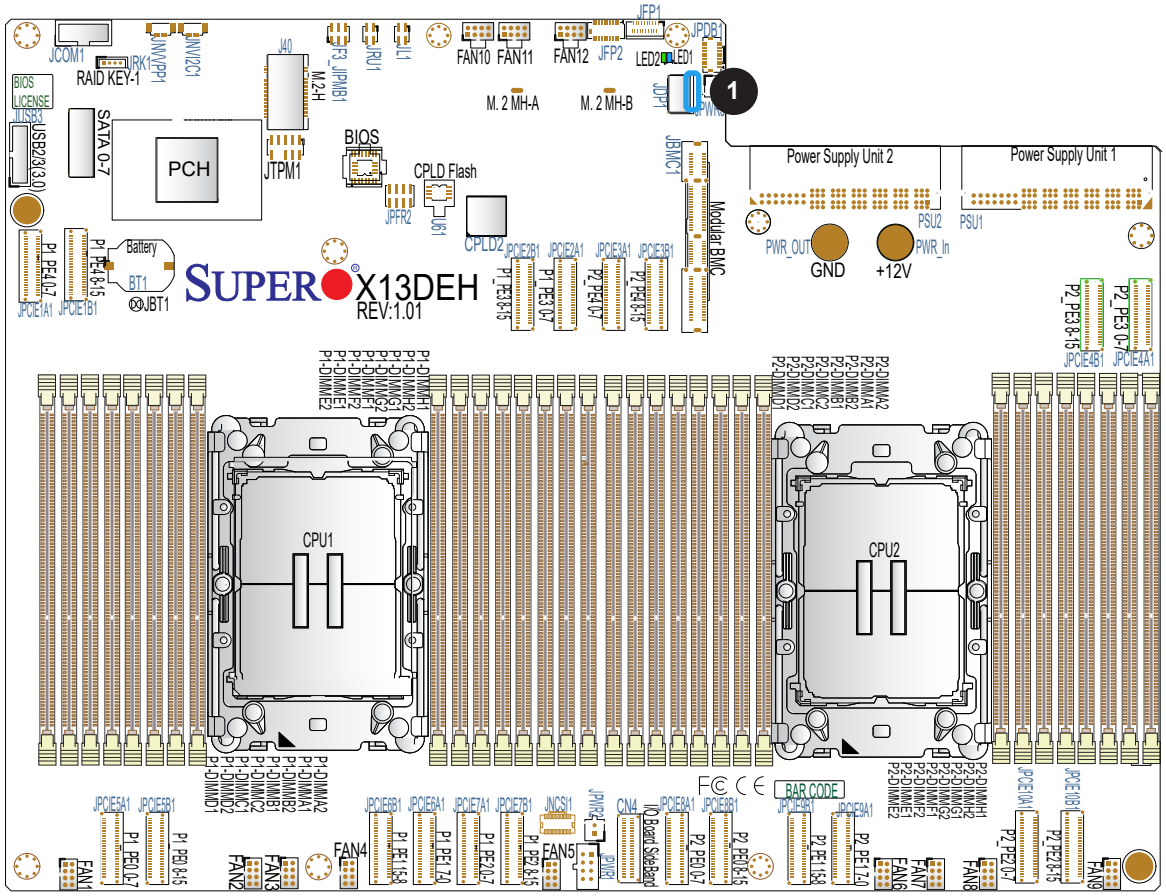


Unit ID LED

The front UID LED indicator is located at LED1. This UID indicator provides easy identification of a system that may need attention or service.

UID LED (LED1) LED Indicator	
LED Color	**Definition**
Blue: On	System Identified

1. LED1: UID LED



Chapter 3

Troubleshooting

3.1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. Always disconnect the AC power cord before adding, changing, or installing any non hot-swap hardware components.

Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install the processor (making sure that it is fully seated) and connect the front panel connectors to the motherboard.

No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. The battery on your motherboard may be old. Check to verify that it still supplies around 3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on, but you do not have video, remove all add-on cards and cables.
2. Remove all memory modules and turn on the system (if the alarm is on, check the specs of memory modules, reset the memory, or try a different one).

System Boot Failure

If the system does not display Power-On-Self-Test (POST) or does not respond after the power is turned on, check the following:

1. Remove all components from the motherboard, especially the DIMM modules. Power on the system and check if the Power Status LED (LED2) is on, and the system fans are spinning.
2. Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this chapter.

Memory Errors

1. Make sure that the memory modules are compatible with the system and are properly installed. See Chapter 2 for installation instructions. For memory compatibility, refer to the "Tested Memory List" link on the motherboard's product page to see a list of supported memory.
2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same type and speed for all DIMM modules in the system.
3. Make sure that you are using the correct type of ECC DDR5 modules recommended by the manufacturer.
4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and checking the results.

Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose the CMOS setup information. Refer to Chapter 1 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies around 3VDC. If it does not, replace it with a new one.

When the System Becomes Unstable

A. If the system becomes unstable during or after OS installation, check the following:

1. CPU/BIOS support: Make sure that your processor is supported and that you have the latest BIOS installed in your system.

2. Memory support: Make sure that the memory modules are supported by testing the modules using memtest86 or a similar utility.

   Note: Click on the "Tested Memory List" link on the motherboard's product page to see a list of supported memory.

3. HDD support: Make sure that all hard disk drives (HDDs) work properly. Replace the bad HDDs with good ones.

4. System cooling: Check the system cooling to make sure that all heatsink fans and processor/system fans, etc., work properly. Check the hardware monitoring settings in the BMC to make sure that the processor and system temperatures are within the normal range. Also, check the front panel Overheat LED and make sure that it is not on.

5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Refer to our website for more information on the minimum power requirements.

6. Proper software support: Make sure that the correct drivers are used.

B. If the system becomes unstable before or during OS installation, check the following:

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such as CD/media drive.

2. Cable connection: Check to make sure that all cables are connected and working properly.

3. Using the minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use the minimum configuration (but with one processor and a memory module installed) to identify the trouble areas. Refer to the steps listed in Section A above for proper troubleshooting procedures.

4. Identifying bad components by isolating them: If necessary, remove the component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.

5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.

6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

3.2 Technical Support Procedures

Before contacting Technical Support, take the following steps. Also, note that as a motherboard manufacturer, Supermicro also sells motherboards through its channels, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problems with the specific system configuration that was sold to you.

1. Go through the Troubleshooting Procedures and Frequently Asked Questions (FAQ) sections in this chapter or see the FAQs on our website (http://www.supermicro.com/FAQ/index.php) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our website (http://www.supermicro.com/ResourceApps/BIOS_BMC_Intel.html).
3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:
   - Motherboard model and PCB revision number
   - BIOS release date/version (This can be seen on the initial display when your system first boots up.)
   - System configuration
4. An example of a Technical Support form is on our website at http://www.supermicro.com/RmaForm/.
5. Distributors: For immediate assistance, have your account number ready when placing a call to our Technical Support department. We can be reached at support@supermicro.com.

3.3 Frequently Asked Questions

Question: What type of memory does my motherboard support?

Answer: This motherboard supports up to 8 TB 3DS RDIMM/RDIMM DDR5 ECC memory with speeds up to 5600 MT/s in 16 DIMM slots (or up to 4400 MT/s in 32 DIMM slots). To enhance memory performance, do not mix memory modules of different speeds and sizes. Follow all memory installation instructions given in Section 2-4.

Note: Memory speed and capacity support depend on the processors used in the system. The 4th Gen Intel Xeon Scalable processor supports DDR5 memory up to 4800 MT/s (supports up to 4400 MT/s in 32-DIMM configuration). The 5th Gen Intel Xeon Scalable processor supports DDR5 memory up to 5600 MT/s (supports up to 4400 MT/s in 32-DIMM configuration).

Question: How do I update my BIOS?

Answer: It is recommended that you do not update your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at http://www.supermicro.com/ResourceApps/BIOS_BMC_Intel.html. Check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading.

Note 1: The SPI BIOS chip used on this motherboard cannot be removed. Send your motherboard back to our RMA Department at Supermicro for repair.

Note 2: For BIOS Update and Recovery instructions, refer to the Firmware Update and Recovery Instructions for Supermicro's X13 Motherboards User's Guide posted at http://www.supermicro.com/support/manuals/.

3.4 Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps:

1. Power off your system and unplug your power cable.
2. Locate the onboard battery.
3. Using a tool such as a pen or a small screwdriver, push the battery lock outwards to unlock it. Once unlocked, the battery will pop out from the holder.
4. Remove the battery.

Proper Battery Disposal

Warning: Handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or public landfill. Comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Battery Installation

To install an onboard battery, follow the steps:

1. Power off your system and unplug your power cable.
2. Locate the onboard battery.
3. Identify the battery's polarity. The positive (+) side should be facing up.
4. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.

Warning: When replacing a battery, be sure to only replace it with the same type of battery.

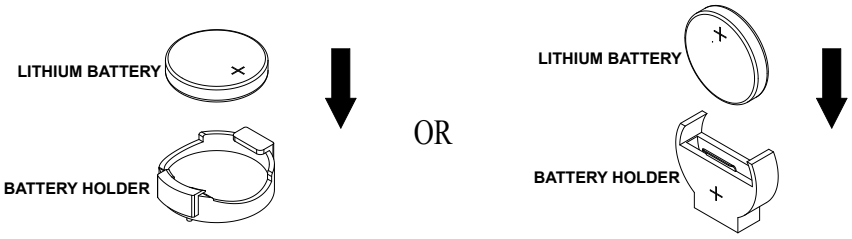


Figure 3-1: Battery Installation

3.5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service is rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning the motherboard to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and the shipping package should be mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when the service is complete. For faster service, you can also request a RMA authorization online (http://www.supermicro.com/RmaForm/).

The manufacturer warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure caused by alteration, misuse, abuse, or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Chapter 4

UEFI BIOS

4.1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the motherboard. The BIOS is stored on a chip and can be easily upgraded using the BMC WebUI or the SUM utility.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Refer to the Manual Download area of our website for any changes to the BIOS that may not be reflected in this manual.

Starting the Setup Utility

To enter the BIOS Setup utility, press the <Delete> key while the system is booting up. In most cases, the <Delete> key is used to invoke the BIOS Setup screen; however, in other cases, other hot keys, such as <F1>, <F2>, may be used for this purpose. Each main BIOS menu option is described in this manual.

The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white, and often a text message will accompany it. Note that BIOS display screens have default text messages built in, and we retain the option to include, omit, or change any of these text messages. Settings printed in **Bold** are the default values.

A "▶" indicates a submenu. Highlighting such an item and pressing the <Enter> key will open the list of settings within that submenu.

The BIOS Setup utility uses a key-based navigation system called hot keys. Most of these hot keys (e.g., <F1>, <F2>, <F3>, <F4>, <Enter>, <ESC>, <Arrow> keys, etc.) can be used at any time during the setup navigation process.

4.2 Main Setup

When you first enter the AMI BIOS Setup utility, you will see the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen.

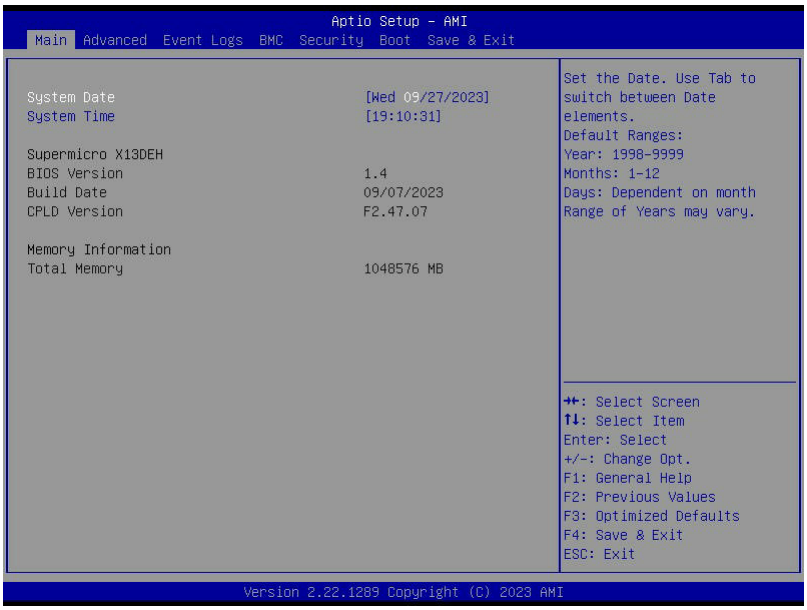


Figure 4-1: Main Tab

System Date / System Time

Use these two features to change the system date and time. To change system date and time settings, highlight System Date or System Time using the arrow keys and enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in Day MM/DD/YYYY format. The time is entered in HH:MM:SS format.

Note: The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00. The date's default value is the BIOS build date after the Real Time Clock (RTC) reset.

Supermicro X13DEH

BIOS Version

This feature displays the version of the BIOS ROM used in the system.

Build Date

This feature displays the date when the version of the BIOS ROM used in the system was built.

CPLD Version

This feature displays the version of the Complex-Programmable Logical Device (CPLD) used in the system.

Memory Information

Total Memory

This feature displays the total size of memory available in the system.

4.3 Advanced Setup Configurations

Use the arrow keys to select the Advanced submenu and press <Enter> to access the submenu items:

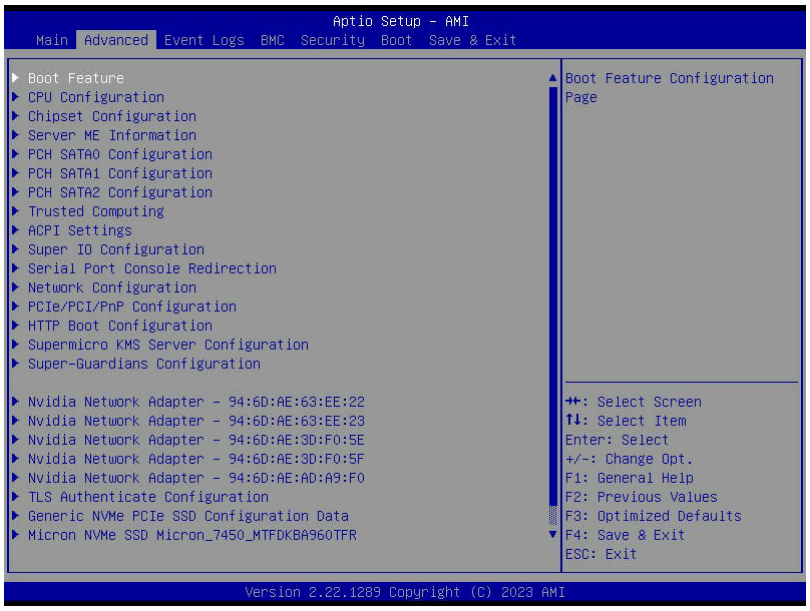


Figure 4-2: Advanced Setup

Warning: Take caution when changing the Advanced settings. An incorrect value, an improper DRAM frequency, or a wrong BIOS timing setting may cause the system to malfunction. When this occurs, restore the setting to the manufacturer default setting.

▶Boot Feature

Quiet Boot

Use this feature to select the screen between displaying Power-on Self Test (POST) messages or the OEM logo at bootup. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are Disabled and **Enabled**.

Note: BIOS POST messages are always displayed regardless of the setting for this feature.

Option ROM Messages

Use this feature to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM display settings. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup NumLock State

Use this feature to set the Power-on state for the NumLock key. The options are **On** and Off.

Wait For "F1" If Error

Select Enabled to force the system to wait until the <F1> key is pressed if an error occurs. The options are **Disabled** and Enabled.

INT19 Trap Response

Interrupt 19 is the software interrupt that handles the boot disk function. When this feature is set to Immediate, the BIOS ROM of the host adaptors will "capture" Interrupt 19 at bootup immediately and allow the drives that are attached to these host adaptors to function as bootable disks. If this feature is set to Postponed, the BIOS ROM of the host adaptors will not capture Interrupt 19 immediately to allow the drives attached to these adaptors to function as bootable devices at bootup. The options are **Immediate** and Postponed.

Re-try Boot

When Extensible Firmware Interface (EFI) Boot is selected, the system BIOS will automatically reboot the system from an EFI boot device after an initial boot failure. Select Legacy Boot to allow the BIOS to automatically reboot the system from a Legacy boot device after an initial boot failure. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration

Watch Dog Function

Select Enabled to allow the Watch Dog timer to reboot the system when it is inactive for more than five minutes. The options are **Disabled** and Enabled.

Watch Dog Action (Available when "Watch Dog Function" is set to Enabled)

Use this feature to configure the Watchdog Time_out setting. The options are **Reset** and NMI.

Front USB Port(s) (Available when "Lockdown Mode" is set to Enabled with the DCMS key)

Select Enabled to allow the specific type of USB devices to be used in the front USB ports. Select Enabled (Dynamic) to allow or disallow this particular type of USB device to be used in the front USB ports without rebooting the system. The options are **Enabled**, Disabled, and Enabled (Dynamic).

Note 1: Supermicro DataCenter Management Suite per Node License Key (SFT-DC-MS-SINGLE) is Supermicro's Data Center Management Suite license that enables server node to take full advantage of Supermicro Management Software and Utilities features. Contact us for more information.

Note 2: Refer to the submenu of Security > Supermicro Security Erase Configuration to set "Lockdown Mode."

Rear USB Port(s) (Available when "Lockdown Mode" is set to Enabled with the DCMS key)

Select Enabled to allow the specific type of USB devices to be used in the rear USB ports. Select Enabled (Dynamic) to allow or disallow this particular type of USB device to be used in the rear USB ports without rebooting the system. The options are **Enabled**, Disabled, and Enabled (Dynamic).

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power Off for the system power to remain off after a power loss. Select Power On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last power state before a power loss. The options are Stay Off, Power On, and **Last State**.

Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override to power off the system after pressing and holding the power button for four seconds or longer. Select Instant Off to instantly power off the system as soon as the user presses the power button. The options are **Instant Off** and 4 Seconds Override**.**

▶CPU Configuration



Warning: Setting the wrong values for the features included in the following sections may cause the system to malfunction.

Processor Configuration

The following processor information is displayed:

- Processor BSP Revision
- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision

- L1 Cache RAM (Per Core)
- L2 Cache RAM (Per Core)
- L3 Cache RAM (Per Package)
- Processor 0 Version
- Processor 1 Version

▶Advanced Power Management Configuration

Power Technology

Select Energy Efficient to support power-saving mode. Select Custom to customize system power settings. Select Disabled to disable power-saving settings. The options are Disable, Energy Efficient, and **Custom**.

Power Performance Tuning (Available when "Power Technology" is set to Custom)

Set this feature to allow either the operating system (OS) or BIOS to control the EPB. The options are **OS Controls EPB** and BIOS Controls EPB. EPB is the abbreviation for Intel Performance and Energy Bias Hint.

ENERGY_PERF_BIAS_CFG Mode (ENERGY PERFORMANCE BIAS CONFIGURATION Mode) (Available when "Power Performance Tuning" is set to BIOS Controls EPB)

Use this feature to configure the proper operation settings for your machine by achieving the desired system performance level and energy saving (efficiency) level at the same time. Select Maximum Performance to maximize system performance to its highest potential; however, this may consume the maximum amount of power as energy is needed to fuel processor operation. Select Performance to enhance system performance; however, this may consume more power as energy is needed to fuel the processors for operation. The options are Extreme Performance, Maximum Performance, Performance, **Balanced Performance**, Balanced Power, Power, and Max Power Efficient. Note that the options of "Extreme Performance" and "Max Power Efficient" are motherboard-specific.

Optimized Power Mode (Available when "Power Technology" is set to Custom)

Set this feature to Enable to reduce overall power consumption. The options are **Disable** and Enable. When this feature is set to Enable, the following features will be automatically set by the BIOS:

- "Power Performance Tuning" — BIOS controls EPB

- "ENERGY_PERF_BIAS_CFG Mode" — Balanced Performance
- "Enhanced Halt State (C1E)" — Enable

▶CPU P State Control

This feature allows you to configure the following processor power settings:

AVX P1 (Available when "SpeedStep (P-States)" is set to Enable)

Use this feature to set the appropriate TDP level for the system. The Intel Advanced Vector Extensions (Intel AVX) P1 feature allows you to set the base P1 ratio for Streaming SIMD Extensions (SSE) and AVX workloads. Each P1 ratio has the corresponding AVX Impressed Current Cathodic Protection (ICCP) pre-grant license level, which refers to the selection between different AVX ICCP transition levels. The options are **Nominal**, Level 1, and Level 2.

SpeedStep (P-States)

Enhanced Intel SpeedStep Technology (EIST) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Refer to Intel's website for detailed information. The options are Disable and **Enable**.

Intel SST-PP (Available when "SpeedStep (P-States)" is set to Enable and "Dynamic SST-PP" is set to Disable)

SST-PP is the abbreviation for Speed Select Technology-Performance Profile. This feature allows you to choose from two additional Base-Frequency conditions maximum for CPU P State Control. The options are **Auto**, Level 0, Level 3, and Level 4.

Dynamic SST-PP (Available when "SpeedStep (P-States)" is set to Enable and when your processor supports the Intel Speed Select function)

If this feature is set to Enable, it allows you to configure Intel SST-PP features, including Base, Configuration 3, and Configuration 4 settings under various processor working conditions. The options are **Disable** and Enable.

The following information is displayed when "SpeedStep (P-States)" is set to Enable:

- SST-PP Level
- Capable
- Core Count
- P1 Ration
- Package TDP (W)
- DTS_Max

Activate SST-BF (Available when your processor supports the Intel Speed Select function)

SST-BF is the abbreviation for Speed Select Technology-Base Frequency. Select Enable for Intel Speed Select Technology-Base Frequency support. The options are **Disable** and Enable.

Configure SST-BF (Available when your processor supports the Intel Speed Select function and when "Activate SST-BF" is set to Enable)

When this feature is set to Enable, the system BIOS will configure SST-BF High Priority Core settings so that system software does not have to configure these settings. The options are Disable and **Enable**.

EIST PSD Function (Available when "SpeedStep (P-States)" is set to Enable)

This feature reduces the latency that occurs when one P-state changes to another, thus allowing the transitions to occur more frequently. This will allow for more demand-based P-state switching to occur based on the real-time energy needs of applications so that the power-to-performance balance can be optimized for energy efficiency. The options are **HW_ALL** and SW_ALL.

Turbo Mode (Available when "SpeedStep (P-States)" is set to Enable)

Select Enable to allow the processor to operate at the manufacturer-defined turbo speed by increasing the processor clock frequency. This feature is available when it is supported by the processors used in the system. The options are Disable and **Enable**.

▶Hardware PM State Control

Hardware P-States

If this feature is set to Disable, system hardware will choose a P-state setting for the system based on an OS request. If this feature is set to Native Mode, the hardware will choose a P-state setting based on the OS guidance. If this feature is set to Native Mode with No Legacy Support, system hardware will choose a P-state setting independently without OS guidance. The options are **Disable**, Native Mode, Out of Band Mode, and Native Mode with No Legacy Support.

▶Frequency Prioritization (Available when "Power Technology" is set to Custom, "Hardware P-states" is set to Native Mode or Native Mode with No Legacy Support, and when your processor supports Intel SST-CP)

SST-CP

With Intel Speed Select Technology (SST-CP), surplus frequency is allocated based on the cores' weights. The weight for each core is assigned by the OS or the Virtual Machine Manager (VMM). The options are Enable and **Disable**.

▶CPU C State Control

Enable Monitor MWAIT

Select Enable to support Monitor and MWAIT, which are two instructions in Streaming SIMD Extension 3 (SSE3), to improve synchronization between multiple threads for processor performance enhancement. The options are Disable, Enable, and **Auto**.

CPU C1 Auto Demotion

Enable this feature to allow the processor to automatically demote to the C1 state. Reboot the system for the change to take effect. The options are Disable, Enable, and **Auto**.

CPU C6 Report

ACPI is the abbreviation for Advanced Configuration and Power Interface. Select Enable to allow the BIOS to report the processor C6 State (ACPI C3) to the operating system. During the processor C6 State, the power to all caches is turned off. The options are Disable, Enable, and **Auto**.

Enhanced Halt State (C1E)

Select Enable to enable "Enhanced Halt State" support, which will significantly reduce the processor's power consumption by minimizing the processor's clock cycles and reducing voltage during a "Halt State." The options are Disable and **Enable**.

▶Package C State Control

Package C State

Use this feature to optimize and reduce the processor package power consumption in the idle mode. Note that the changes you've made in this setting will affect all the processor cores and circuits in the entire system. The options are C0/C1 state, C2 state, C6 (non Retention) state, C6 (Retention) state, No Limit, and **Auto**.

▶CPU1 Core Disable Bitmap / CPU2 Core Disable Bitmap

Available Bitmap:

This feature displays the available bitmap.

Disable Bitmap

Enter 0 to enable this feature for all processor cores. Enter FFFFFFFFFF to disable this feature for all processor cores. Note that at least one core per processor must be enabled. Disabling all cores is not allowed. The default setting is **0**.

Hyper-Threading [ALL]

Select Enable to use Intel Hyper-Threading Technology to enhance processor performance. The options are **Enable** and Disable.

Hardware Prefetcher

If this feature is set to Enable, the hardware prefetcher will prefetch data from the main system memory to Level 2 cache to help expedite data transactions. This will enhance memory performance. The options are **Enable** and Disable.

Adjacent Cache Prefetch

Select Enable for the processor to prefetch both cache lines for 128 bytes as comprised. Select Disable for the processor to prefetch both cache lines for 64 bytes. The options are **Enable** and Disable.

DCU Streamer Prefetcher

If this feature is set to Enable, the Data Cache Unit (DCU) streamer prefetcher will prefetch data streams from the cache memory to the DCU to speed up data accessing and processing to enhance processor performance. The options are **Enable** and Disable.

DCU IP Prefetcher

This feature allows the system to use the sequential load history, which is based on the instruction pointer of previous loads, to determine whether the system will prefetch additional lines. The options are **Enable** and Disable.

LLC Prefetch

If this feature is set to Enable, LLC (hardware cache) prefetching on all threads will be supported. The options are **Disable** and Enable.

Extended APIC

APIC is the abbreviation for Extended Advanced Programmable Interrupt Controller. Based on the Intel Hyper-Threading technology, each logical processor (thread) is assigned 256 APIC IDs (APIDs) in 8-bit bandwidth. When this feature is set to Enable, the APIC ID will be expanded from 8 bits to 16 bits to provide 512 APIDs to each thread to enhance processor performance. The options are Disable and **Enable**.

Intel Virtualization Technology

Select Enable to enable the Intel Vanderpool Technology for Virtualization platform support, which will allow multiple operating systems to run simultaneously on the same computer to maximize system resources for performance enhancement. The options are Disable and **Enable**.



Note: Reboot the system for any changes to the setting to take effect.

Enable SMX

Select Enable to support Safer Mode Extensions (SMX) which provides a programming interface for system software to establish a controlled environment to support the trusted platform configured by the end user and to verify a virtual machine monitor before it is allowed to run. The options are **Disable** and Enable.

PPIN Control

Select Unlock/Enable to use the Protected Processor Inventory Number (PPIN) in the system. The PPIN is a unique number set for tracking a given Intel Xeon server processor. The options are Lock/Disable and **Unlock/Enable**.

AES-NI

Select Enable to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are Disable and **Enable**.

Limit CPU PA to 46 Bits

Select Enable to limit processor physical address to 46 bits to support the older Hyper-V processor platform. The options are Disable and **Enable**.

TME, TME-MT, TDX

Memory Encryption (TME) (Available when your processor supports Intel TME)

Select Enabled for Intel Total Memory Encryption (TME) support to enhance memory data security. The options are **Disabled** and Enabled.

Total Memory Encryption (TME) Bypass (Available when "Memory Encryption (TME)" is set to Enabled)

Use this feature to disable/enable the TME function for physical memory protection. The options are **Auto**, Disabled, and Enabled.

Total Memory Encryption Multi-Tenant (TME-MT) (Available when "Memory Encryption (TME)" is set to Enabled and when "Limit CPU PA to 46 Bits" is set to Disable)

Use this feature to support tenant-provided (SW-provided) keys. The options are **Disabled** and Enabled.

Memory Integrity (Available when both "Memory Encryption (TME)" and "Total Memory Encryption Multi-Tenant (TME-MT)" are set to Enabled and when "Limit CPU PA to 46 Bits" is set to Disable)

Use this feature to enable TME-MT memory integrity protection for memory transactions. The options are **Disabled** and Enabled.

Key Stock Amount (Available when "Memory Encryption (TME)" is set to Enabled and when your system supports this feature)

Use this feature to set the number of unique keys per system (the number of tenants per platform). The default setting is **0**.

TME-MT Key ID Bits (Available when "Memory Encryption (TME)" is set to Enabled)

Use this feature to set the number of bits for each key ID. The default setting is **0**.

Trust Domain Extension (TDX) (Available when your processor supports Intel TDX)

Use this feature to enable Intel Trust Domain Extension (TDX) technology support to enhance control of data security. The options are **Disabled** and Enabled.

TDX Secure Arbitration Mode Loader (SEAM Loader) (Available when your processor supports Intel TDX)

The SEAM Loader (SEAMLDR) is used to load and update Intel TDX modules into the SEAM memory range by verifying the digital signature. The options are **Disabled** and Enabled.

Disable Excluding Mem Below 1 MB In CMR (Available when "Memory Encryption (TME)" is set to Enabled and when "Trust Domain Extension (TDX)" is set to Enabled)

Use this feature to enable/disable TDX Excluding CMR below 1 MB. The options are Disabled, Enabled, and **Auto**.

TME-MT/TDX Key Split (Available when "Memory Encryption (TME)" is set to Enabled and when "Trust Domain Extension (TDX)" is set to Enabled)

Use this feature to set the number of bits for TDX. The other bits will be used by TME-MT. The default setting is **1**.

TME-MT Keys: (Available when "Memory Encryption (TME)" is set to Enabled and when "Trust Domain Extension (TDX)" is set to Enabled)

This feature displays the number of keys designated for TME-MT.

TDX Keys: (Available when "Memory Encryption (TME)" is set to Enabled and when "Trust Domain Extension (TDX)" is set to Enabled)

This feature displays the number of keys designated for TDX.

Software Guard Extension (SGX)

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*The following SGX features are available when "Memory Encryption (TME)" is set to Enabled and when your processor supports Intel SGX.

Note: Each memory channel must have at least one DIMM populated on the motherboard to support the Intel SGX features.

SGX Factory Reset

Use this feature to perform an SGX factory reset to delete all registration data and force an Initial Platform Establishment flow. Reboot the system for the changes to take effect. The options are **Disabled** and Enabled.

SW Guard Extensions (SGX)

Use this feature to enable Intel Software Guard Extensions (SGX) support. Intel SGX is a set of extensions that increases the security of application code and data by using enclaves in memory to protect sensitive information. The options are **Disabled** and Enabled.

SGX Package Info In-Band Access

Setting this feature to Enabled is required before the BIOS provides software with the key blobs, which are generated for each processor package. The options are **Disabled** and Enabled.

PRM Size for SGX (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Use this feature to set the Processor Reserved Memory Range Register (PRMRR) size. The options are **Auto**, 128M, 256M, 512M, 1G, 2G, 4G, 8G, 16G, 32G, 64G, 128G, 256G, and 512G. Note that the available options are based on your motherboard features, memory size, and memory map.

SGX QoS (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Use this feature to enable Intel SGX Quality of Service (QoS) support. QoS can enhance network performance by prioritizing network traffic. The options are Disabled and **Enabled**.

Select Owner EPOCH Input Type (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Owner EPOCH is used as a parameter to allow you to add personal entropy into the key derivation process. A correct Owner EPOCH is required to have access to personal data previously sealed by other platform users. There are two Owner EPOCH modes. One is New Random Owner EPOCH, and the other is manually entered by the user. Each EPOCH is 64-bit. The options are Change to New Random Owner EPOCHs and **Manual User Defined Owner EPOCHs**.



Note: Changing the Owner EPOCH value will lose the data in enclaves.

Software Guard Extensions Epoch 0 (Available when "SW Guard Extensions (SGX)" is set to Enabled and "Select Owner EPOCH input type" is set to Manual User Defined Owner EPOCHs)

Use this feature to enter the EPOCH value. The default is **0**.

Software Guard Extensions Epoch 1 (Available when "SW Guard Extensions (SGX)" is set to Enabled and "Select Owner EPOCH input type" is set to Manual User Defined Owner EPOCHs)

Use this feature to enter the EPOCH value. The default is **0**.

SGXLEPUBKEYHASHx Write Enable (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Select Enabled to allow the OS and software to write to SGXLEPUBKEYHASH[3..0]. The options are Disabled and **Enabled**. Only those processors that support Intel SGX Flexible Launch Control (FLC) feature have SGXLEPUBKEYHASH, which contains the hash of the public key for the SGX Launch Enclave (LE) to be signed with.

SGXLEPUBKEYHASH0 (Available when both "SW Guard Extensions (SGX)" and "SGXLEPUBKEYHASHx Write Enable" are set to Enabled)

Use this feature to enter the bytes 0–7 of SGX Launch Enclave Public Key Hash.

SGXLEPUBKEYHASH1 (Available when both "SW Guard Extensions (SGX)" and "SGXLEPUBKEYHASHx Write Enable" are set to Enabled)

Use this feature to enter the bytes 8–15 of SGX Launch Enclave Public Key Hash.

SGXLEPUBKEYHASH2 (Available when both "SW Guard Extensions (SGX)" and "SGXLEPUBKEYHASHx Write Enable" are set to Enabled)

Use this feature to enter the bytes 16–23 of SGX Launch Enclave Public Key Hash.

SGXLEPUBKEYHASH3 (Available when both "SW Guard Extensions (SGX)" and "SGXLEPUBKEYHASHx Write Enable" are set to Enabled)

Use this feature to enter the bytes 24–31 of SGX Launch Enclave Public Key Hash.

SGX Auto MP Registration (Available when "SW Guard Extensions (SGX)" is set to Enabled)

Use this feature to enable/disable SGX Auto Multi-Package Registration Agent (MPA) running automatically at boot time. The options are **Disabled** and Enabled.

▶Chipset Configuration



Warning: Setting the wrong values in the following features may cause the system to malfunction.

▶North Bridge

This feature allows you to configure the following North Bridge settings:

▶Uncore Configuration

The following information is displayed:

- Number of processors
- Current UPI Link Speed
- Current UPI Link Frequency
- Global MMIO Low Base / Limit
- Global MMIO High Base / Limit
- PCIe Configuration Base / Size

Degrade Precedence

Use this feature to select the degrading precedence option for Ultra Path Interconnect (UPI) connections. Select Topology Precedent to degrade UPI features if system options are in conflict. Select Feature Precedent to degrade UPI topology if system options are in conflict. The options are **Topology Precedence** and Feature Precedence.

Link L0p Enable

Select Enable for the system BIOS to enable Link L0p support, which will allow the processor to reduce the UPI links from full width to half width in the event when the processor's workload is low in an attempt to save power. This feature is available for the system that uses Intel processors with UPI technology support. The options are Disable, Enable, **Auto**, and Full L0p Enable.

Note 1: You can change the performance settings for non-standard applications by using this parameter. It is recommended that the default settings be used for standard applications.

Note 2: The option of Full L0p Enable is available when the 5th Gen. Intel Xeon Scalable Series processor is used.

Link L1 Enable

Select Enable for the BIOS to activate Link L1 support, which will power down the UPI links to save power when the system is idle. This feature is available for the system that uses Intel processors with UPI technology support. The options are Disable, Enable, and **Auto**.

Note: Link L1 is an excellent feature for an idle system. L1 is used during Package C-States when its latency is hidden by other components during a wakeup.

KTI Prefetch

Keizer Technology Interconnect (KTI) is also known as the Intel Ultra Path Interconnect (UPI) technology. Select Enable for the KTI prefetcher to preload the L1 cache with data deemed relevant, which will allow the memory read to start earlier on a DDR bus in an effort to reduce latency. Select Auto for the KTI prefetcher to automatically preload the L1 cache with relevant data whenever it is needed. The options are Disable, Enable, and **Auto**.

IO Directory Cache (IODC)

Select Enable for the IODC to generate snoops instead of generating memory lockups for remote IIO (InvIToM) and/or WCiLF (Cores). Select Auto for the IODC to generate snoops (instead of memory lockups) for WCiLF (Cores). The options are Disable, **Auto**, Enable for Remote InvItoM Hybrid Push, InvItoM AllocFlow, Enable for Remote InvItoM Hybrid AllocNonAlloc, and Enable for Remote InvItoM and Remote WViLF.

SNC

Sub NUMA Clustering (SNC) is a feature that breaks up the Last Level Cache (LLC) into clusters based on address range. Each cluster is connected to a subset of the memory controller. Enable this feature to improve average latency and reduce memory access congestion for higher performance. The options are **Auto**, Disable, Enable SNC2 (2-clusters), and Enable SNC4 (4-clusters).

Note: The option of Enable SNC4 (4-clusters) depends on our system configuration and the processor.

Stale AtoS (A to S)

The in-memory directory has three states: I, A, and S states. The I (-invalid) state indicates that the data is clean and does not exist in the cache of any other sockets. The A (-snoop All) state indicates that the data may exist in another socket in an exclusive or modified state. The S state (-Shared) indicates that the data is clean and may be shared in the caches across one or more sockets. When the system is performing "read" on the memory and if the directory line is in A state, we must snoop all other sockets because another socket may have the line in a modified state. If this is the case, a "snoop" will return the modified data. However, it may be the case that a line "reads" in an A state, and all the snoops come back with a "miss." This can happen if another socket reads the line earlier and then has it silently dropped from its cache without modifying it. If "Stale AtoS" is enabled, a line will transition to the S state when the line in the A state returns only snoop misses. That way, subsequent reads to the line will encounter it in the S state and will not have to snoop, saving the latency and snoop bandwidth. Stale "AtoS" may be beneficial in a workload where there are many cross-socket reads. The options are Disable, Enable, and **Auto**.

LLC Dead Line Alloc

Select Enable to opportunistically fill the dead lines in the LLC. The options are Disable, **Enable**, and Auto.

UPI3 (Available when your motherboard supports dual processors)

Use this feature to enable/disable the 4th Intel Ultra Path Interconnect (UPI) link. The default setting is Enable if your motherboard supports UPI3. The options are Disable and **Enable**. This feature depends on your system configuration.

▶Memory Configuration

This feature allows you to configure the Integrated Memory Controller (iMC) settings.

Enforce DDR Memory Frequency POR

Select POR to enforce Plan of Record (POR) restrictions for DDR memory frequency and voltage programming. The options are **POR** and Disable.

Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 3200, 3600, 4000, 4400, 4800, 5200, and 5600. Note that the available options are processor dependent.

Data Scrambling for PMem (Available when any PMem device is detected by the BIOS)

Select Enable to enable data scrambling for PMem modules to enhance memory data security. Select Auto to use the Memory Reference Code (MRC) default setting for PMem data scrambling. The options are Disable, Enable, and **Auto**. Note that this feature depends on the support of Intel Optane PMem 300 Series.

Data Scrambling for DDR5

Select Enable to enable data scrambling for DDR5 modules to enhance memory data security. The options are Disable and **Enable**.

Enable fADR

Select Enable to have Fast Asynchronous DRAM Refresh (fADR) support to enhance memory performance on Intel PMem 300 series DIMMs. With the support of fADR feature, the ADR safe domain (flush domain) includes processor caches, IIO caches, and Write Pending Queue (WPQ). The implementation of fADR can lower flush time and reduce flush times. The support of fADR is based on your motherboard hardware features. The options are **Disable** and Enable. Note that this feature depends on the support of Intel Optane PMem 300 Series.

Enable ADR (Available when "Enable fADR" is set to Disable)

Select Enable for Asynchronous DRAM Refresh (ADR) support to enhance memory performance. The options are Disable and **Enable**.

Legacy ADR Mode (Available when "Enable fADR" is set to Disable and "Enable ADR" is set to Enable)

Use this feature to support the Legacy ADR mode to enhance memory performance. In the Legacy ADR mode, the ADR safe domain (flush domain) includes the WPQ in memory controllers. The options are Disable, Enable, and **Auto**.

▶fADR Configuration (Available when "Enable fADR" is set to Enable)

Note: This submenu depends on the support of Intel Optane PMem 300 Series.

Number of Cores

Use this feature to set the number of processor cores to be involved in the fADR event. The options are 1 Core, 4 Cores, and **All Cores**.

Core Ratio

Use this feature to set the processor core ratio to be involved in the fADR event. The options are **Auto** and Manual.

Core Ratio Value (Available when "Core Ratio" is set to Manual)

Use this feature to enter the core ratio value. The default value is **FF**.

Mesh Ratio

Use this feature to set the mesh ratio to be involved in the fADR event. The mesh ratio determines the frequency of data access between processor cores and caches. The options are **Auto** and Manual.

Mesh Ratio Value (Available when "Mesh Ratio" is set to Manual)

Use this feature to enter the mesh ratio value. The default value is **FF**.

Flush Timeout

Use this feature to set the timeout settings when the data in the processor cache memory will be flushed by the applications to persistent memory in the absence of system power. The options are **Auto** and Manual.

Flush Timeout Value (Available when "Flush Timeout" is set to Manual)

Use this feature to enter the flush timeout value. The default value is **FFF**.

DDR 2X Refresh Enable

Select Enable for memory 2X refresh support to enhance memory performance. The options are **Auto**, Disable, and Enable.

CXL Type 3 Legacy

Select Enable to use the CXL Type 3 memory device, which can be supported by the CXL Type 2 flows, for memory bandwidth and capacity expansion. The options are **Disable** and Enable.

Note: This feature depends on the CXL Type 2 flow and the memory device used.

Volatile Memory Mode

Use this feature to select the volatile memory mode. The options are **1LM** and 2LM. Note that this feature depends on the support of Intel Optane PMem 300 Series.

Note: This feature is available when your motherboard has the high bandwidth memory (HBM) processor installed and when "NUMA" (Advanced > ACPI Settings > NUMA) is set to Enabled.

▶Memory Topology

This feature displays the information of onboard memory modules as detected by the BIOS, for example:

P1-DIMMA1: 4800 MT/s Hynix DRx8 32 GB RDIMM through P1-DIMMH2: 4800 MT/s Hynix DRx8 32GB RDIMM

P2-DIMMA1: 4800 MT/s Hynix DRx8 32 GB RDIMM through P2-DIMMH2: 4800 MT/s Hynix DRx8 32 GB RDIMM

▶Page Policy

Page Policy

Use this feature to set your memory page policy. The options are Closed and Adaptive. The Closed Page Policy is good for random memory access patterns. The Adaptive Page Policy can reduce the average memory latency.

▶Memory RAS Configuration

Use this submenu to configure the Memory Reliability_Availability_Serviceability (RAS) settings.

Mirror Mode (Available when "ADDDC Sparing" is set to Disabled and "UEFI ARM Mirror" is set to Disabled)

Use this feature to configure the mirror mode settings for all 1LM/2LM memory modules in the system, which will create a duplicate copy of data stored in the memory to increase memory security, but it will reduce the memory capacity by half. The options are **Disabled**, Full Mirror Mode, and Partial Mirror Mode.

UEFI ARM Mirror (Available when "ADDDC Sparing" is set to Disabled and "Mirror Mode" is set to Disabled)

If this feature is set to Enable, mirror mode configuration settings for UEFI-based Address Range memory will be enabled upon system boot. This will create a duplicate copy of data stored in the memory to increase memory security, but it will reduce the memory capacity by half. The options are **Disabled** and Enabled.

ARM Mirror Percentage (Available when "UEFI ARM Mirror" is set to Enabled)

Use this feature to set the percentage of memory space to be used for UEFI ARM mirroring for memory security enhancement. The default setting is **0**.

Correctable Error Threshold

Use this feature to specify the threshold value for correctable memory-error logging, which sets a limit on the maximum number of events that can be logged in the memory error log at a given time. The default setting is **512**.

Leaky Bucket Low Bit

Use this feature to set the Low Bit value for the Leaky Bucket algorithm, which is used to check the data transmissions between processor sockets and the memory controller. The default setting is **11**.

Leaky Bucket High Bit

Use this feature to set the High Bit value for the Leaky Bucket algorithm which is used to check the data transmissions between processor sockets and the memory controller. The default setting is **14**.

ADDDC Sparing (Available when populating 1Rx4, 2Rx4, and 4Rx4 DIMM)

Select Enabled for Adaptive Double Device Data Correction (ADDDC) support, which will not only provide memory error checking and correction but will also prevent the system from issuing a performance penalty before a device fails. Note that virtual lock-step mode will only start to work for ADDDC after a faulty DRAM module is spared. The options are Disabled and **Enabled**.

Patrol Scrub

Patrol Scrubbing is a process that allows the processor to correct correctable memory errors detected in a memory module and send the corrections to the requestor (the original source). When this feature is set to Enable, the IO hub will read and write back one cache line every 16 K cycles if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub will be scrubbed every day. The options are Disabled and **Enable at End of POST**. POST is the abbreviation for Power_On Self Test.

DDR PPR Type

Post Package Repair (PPR) is a new feature available for the DDR4/DDR5 technology. PPR provides additional spare capacity within a DDR4/DDR5 DRAM module that is used to replace faulty cell areas detected during system boot. PPR offers two types of memory repairs. Soft Post Package Repair (sPPR) provides a quick, temporary fix on a raw element in a bank group of a DDR4/DDR5 DRAM device, while hard Post Package Repair (hPPR) will take a longer time to provide a permanent repair on a raw element. The options are PPR Disabled, **Hard PPR**, and Soft PPR.

Enhanced PPR

Use this feature to set advanced memory test. Select Enabled to always execute for every boot. Select Once to execute only one time. The options are **Disabled**, Enabled, and Persistent.

Memory PFA Support (Available when the DCMS key is activated)

Select Enabled to enable memory Predictive Failure Analysis (PFA) support. PFA can be used to avoid uncorrectable faults in the same memory page. The options are **Disabled** and Enabled.

▶IIO Configuration

▶CPU1 Configuration / CPU2 Configuration

IOU0 (IIO PCIe Port 1)

This feature is processor-dependent. Use this feature to configure the PCIe Bifurcation setting for a PCIe port specified by the user. The options are **Auto**, x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16.

IOU1 (IIO PCIe Port 2)

This feature is processor-dependent. Use this feature to configure the PCIe Bifurcation setting for a PCIe port specified by the user. The options are **Auto**, x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16.

IOU2 (IIO PCIe Port 3)

This feature is processor-dependent. Use this feature to configure the PCIe Bifurcation setting for a PCIe port specified by the user. The options are **Auto**, x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16.

IOU3 (IIO PCIe Port 4)

This feature is processor-dependent. Use this feature to configure the PCIe Bifurcation setting for a PCIe port specified by the user. The options are **Auto**, x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16.

IOU4 (IIO PCIe Port 5)

This feature is processor-dependent. Use this feature to configure the PCIe Bifurcation setting for a PCIe port specified by the user. The options are **Auto**, x4x4x4x4, x4x4x8, x8x4x4, x8x8, and x16.

▶CPU1 PE0 PCIe 5.0 X8 / CPU1 PE2 PCIe 5.0 X8 / CPU1 PE3 PCIe 5.0 X8 / CPU1 PE4 0-7, 8-15 PCIe 5.0 X8 / P1_NVMe1 / P1_NVMe2 / P1_NVMe3 / CPU2 PE0 PCIe 5.0 X8 / CPU2 PE2 PCIe 5.0 X8 / CPU2 PE3 PCIe 5.0 X8 / CPU2 PE4 0-7, 8-15 PCIe 5.0 X8 / M.2-HC PCIe 3.0 (*Available when the PCIe devices are detected by the BIOS)

Note: The number of slots and the slot naming vary based on your motherboard features.

PCIe Port

Use this feature to set the PCIe Root Port. The options are Auto, No, and Yes. If this feature is set to Auto, the PCIe device will be automatically detected by the BIOS.

Select No/Yes to disable/enable the PCIe Root Port manually. Note that this feature depends on your motherboard specifications.

Link Speed

Use this feature to select the link speed for the PCIe port specified by the user. The options are **Auto,** Gen 1 (2.5 GT/s), Gen 2 (5 GT/s), Gen 3 (8 GT/s), Gen 4 (16 GT/s), and Gen 5 (32 GT/s).

The following information is displayed:

- PCIe Port Link Status
- PCIe Port Link Max
- PCIe Port Link Speed

Data Link Feature Exchange

Use this feature to enable/disable the PCIe port to enter PCIe 4.0 DL_Feature negotiation state. The options are Disable and **Enable.**

PCIe Port Max Payload Size

Use this feature to set the maximum payload size supported in Direct Media Interface (DMI) device capabilities register for the device installed in the PCIe port. The options are 128B, 256B, 512B, and **Auto.**

Equalization Bypass To Highest Rate

Set this feature to Enable to reduce the link training time for PCIe 5.0 devices by skipping equalization of intermediate data rates. The options are Disable and **Enable**.

▶IOAT Configuration

Relaxed Ordering

Select Yes to allow certain transactions to be processed and completed before other transactions that have already been enqueued. The options are **No** and Yes.

▶Intel VT for Directed I/O (VT-d)

Intel VT for Directed I/O (VT-d)

DMA is the abbreviation for Direct Memory Access. DMAR is the abbreviation for DMA Remapping Reporting. Select Enable to use Intel Virtualization Technology for Direct I/O VT-d support by reporting the I/O device assignments to the Virtual Machine Monitor

(VMM) through the DMAR ACPI tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security, and availability in networking and data-sharing. The options are **Enable** and Disable.

Pre-boot DMA Protection (Available when "Intel VT for Directed I/O (VT-d)" is set to Enable)

Select Enable to establish DMA protection during pre-boot processing by setting DMA_CTRL_PLATFORM_OPT_IN_FLAG in the DMAR ACPI table. The options are Enable and **Disable**.

Interrupt Remapping (Available when "Intel VT for Directed I/O (VT-d)" is set to Enable)

Select Enable to support I/O DMA transfer remapping and device-generated interrupts. The options are **Auto**, Enable, and Disable.

PCIe ACSCTL (Available when "Intel VT for Directed I/O (VT-d)" is set to Enable)

Select Enable to program ACS control to Chipset PCIe Root Port bridges. Select Disable to program ACS control to all PCIe Root Port bridges. The options are Enable and **Disable**.

Opt-Out Illegal MSI Mitigation (Available when "Intel VT for Directed I/O (VT-d)" is set to Enable)

If this feature is set to Enable, "Illegal OxzFEE Platform Mitigation" will be opted out. The options are Enable and **Disable**.

▶Intel VMD Technology

This section describes the configuration settings for the Intel VMD technology.

Note 1: After you've enabled VMD in the BIOS on a PCIe slot, this PCIe slot will be dedicated for VMD use only, and it will no longer support any PCIe device. To re-activate this slot for PCIe use, disable VMD in the BIOS.

Note 2: The number of PCIe slots and the slot naming can differ depending on the PCIe devices connected to your motherboard.

NVMe Mode Switch

When this feature is set to Auto, VMD support will be automatically enabled when a VROC key is detected by the BIOS. When this feature is set to Manual, all PCIe ports will be in legacy mode, but user can manually switch each port to VMD mode in sub menu. When this feature is set to VMD, all detected NVMe ports will be in VMD mode while other PCIe ports will still be in legacy mode. The options are Manual, VMD, and **Auto**.

▶Intel VMD for Volume Management Device on Socket 0 (Available when "NVMe Mode Switch" is set to Manual)

VMD Config for PCH ports

Enable/Disable VMD

Select Enable to enable the Intel Volume Management Device (VMD) technology support for the root port specified. The options are **Disable** and Enable.

M.2-P1 VMD / M.2-P2 VMD (Available when the device is detected by the system and "Enable/Disable VMD" above is set to Enable)

Select Enable to enable the Intel VMD technology support for the root port specified. The options are **Disable** and Enable.

VMD Config for IOU 0 / VMD Config for IOU 1 / VMD Config for IOU 2 / VMD Config for IOU 3 (Available when the device is detected by the BIOS)

Enable/Disable VMD

Select Enable to enable the Intel VMD technology support for the root port specified. The options are **Disable** and Enable.

Hot Plug Capable (Available when the device is detected by the system and "Enable/Disable VMD" above is set to Enable)

Select Enable to enable Hot Plug support for the root ports specified, which allows you to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.

VMD Config for IOU 4 / VMD Config for IOU 5 / VMD Config for IOU 6

(Available when the device is detected by the BIOS)

Enable/Disable VMD

Select Enable to enable the Intel VMD technology support for the root port specified. The options are **Disable** and Enable.

Hot Plug Capable (Available when the device is detected by the system and "Enable/Disable VMD" above is set to Enable)

Select Enable to enable Hot Plug support for the root ports specified, which allows you to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.

▶Intel VMD for Volume Management Device on Socket 1 (Available when "NVMe Mode Switch" is set to Manual)

VMD Config for IOU 0 / VMD Config for IOU 1 / VMD Config for IOU 2 / VMD Config for IOU 3 (Available when the device is detected by the BIOS)

Enable/Disable VMD

Select Enable to enable the Intel VMD technology support for the root port specified. The options are **Disable** and Enable.

Hot Plug Capable (Available when the device is detected by the system and "Enable/Disable VMD" above is set to Enable)

Select Enable to enable Hot Plug support for the root ports specified, which allows you to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.

VMD Config for IOU 4 / VMD Config for IOU 5 / VMD Config for IOU 6 (Available when the device is detected by the BIOS)

Enable/Disable VMD

Select Enable to enable the Intel VMD technology support for the root port specified. The options are **Disable** and Enable.

Hot Plug Capable (Available when the device is detected by the system and "Enable/Disable VMD" above is set to Enable)

Select Enable to enable Hot Plug support for the root ports specified, which allows you to change the devices on those root ports without shutting down the system. The options are **Disable** and Enable.

▶PCIe Leaky Bucket Configuration

Gen2 Link Degradation

Use this feature to enable PCIe Gen. 2 link degradation. The options are Disable and **Enable**.

Gen3 Link Degradation

Use this feature to enable PCIe Gen. 3 link degradation. The options are Disable and **Enable**.

Gen4 Link Degradation

Use this feature to enable PCIe Gen. 4 link degradation. The options are Disable and **Enable**.

Gen5 Link Degradation

Use this feature to enable PCIe Gen. 5 link degradation. The options are Disable and **Enable**.

IIO-PCIe Express Global Options

PCIe ASPM Support (Global)

Use this feature to disable the Active State Power Management (ASPM) support for all PCIe root ports. The options are **Disable** and Auto.

PCIe Max Read Request Size

Use this feature to set the maximum read request size in the PCI hierarchy. The options are **Auto**, 128B, 256B, 512B, 1024B, 2048B, and 4096B.

Equalization Bypass To Highest Rate

Set this feature to Enable to reduce the link training time for PCIe 5.0 devices by skipping equalization of intermediate data rates. The options are Disable and **Enable**.

IIO eDPC Support (Available when your system supports this feature)

Use this feature to configure the settings for IIO Enhanced Downstream Port Containment (eDPC) support for your system in an effort to improve the error containment capacity within the PCIe subsystem when an uncorrected error is detected either at the root port or at the switch downstream port. Select Disable to disable IIO eDPC support. Select On Fatal Error to enable IIO eDPC support in your system when a fatal error occurs. Select On Fatal and Non-Fatal Error to enable IIO eDPC support when an error, fatal or non-fatal, has occurred. The options are **Disable**, On Fatal Error, and On Fatal and Non-Fatal Errors.

IIO eDPC Interrupt (Available when your system supports this feature and when "IIO eDPC Support" is set to On Fatal Error/On Fatal and Non-Fatal Errors)

Select Enable to enable IIO eDPC Interrupt support. The options are **Enable** and Disable.

IIO eDPC ERR_COR Message (Available when your system supports this feature and when "IIO eDPC Support" is set to On Fatal Error/On Fatal and Non-Fatal Errors)

If this feature is set to Enable, an IIO eDPC error correction message will be displayed. The options are **Enable** and Disable.

CXL Security Level

By defining security protocols, CXL standards provide protection against the data security threats. Use this feature to set the CXL security level for data transiting the CXL link. The options are Fully Trusted, Partially Trusted, Untrusted, and **Auto**.

- Fully Trusted: This option allows the CXL device to access CXL.$ for both host-attached and device-attached memory ranges in the write-back (WB) address space.
- Partially Trusted: This option allows the CXL device to access CXL.$ for device-attached memory ranges only.
- Untrusted: If this option is selected, the host (your system) will abort all requests on CXL.$.
- Auto: This option is based on Si Compatibility.

CXL Header Bypass

Set this feature to enable or disable the CXL header bypass. The options are **Disable** and Enable.

▶South Bridge

The following information is displayed:

- USB Devices:

Legacy USB Support

Select Enabled to support onboard legacy USB devices. Select Auto to disable legacy support if there are no legacy USB devices present. Select Disabled to have all USB devices available for EFI applications only. The options are **Enabled,** Disabled, and Auto.

XHCI Hand-off

This is a workaround solution for operating systems that do not support Extensible Host Controller Interface (XHCI) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The options are **Enabled** and Disabled.

Port 60/64 Emulation

Select Enabled for I/O port 60h/64h emulation support, which in turn, provides complete legacy USB keyboard support for the operating systems that do not support legacy USB devices. The options are **Disabled** and Enabled.

PCIe PLL SSC

Select Enabled for PCH PCIe Spread Spectrum Clocking (SSC) support, which allows the BIOS to monitor and attempt to reduce the level of electromagnetic interference caused by the components whenever needed. The options are **Disabled** and Enabled.

▶Server ME Information

The following information is displayed:

- General ME Configuration
- Oper. Firmware Version
  - Current State
  - Error Code

▶PCH SATA0 Configuration / ▶PCH SATA1 Configuration / ▶PCH SATA2 Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of a SATA device supported by the Intel PCH chip and displays the following features:

SATA Controller(s)

This feature enables or disables the onboard SATA controller(s) supported by the Intel PCH chip. The options are Disabled and **Enabled**.

SATA Mode Selection (Available when "SATA Controller(s)" is set to Enabled)

Use this feature to set the SATA mode for a device that is installed in the system. The options are **AHCI** and RAID.

Note 1: The option of RAID is unavailable when "Boot Mode Select" is set to Legacy.

Note 2: Refer to the Boot submenu in the BIOS Setup to set "Boot Mode Select."

Support Aggressive Link Power Management (Available when "SATA Controller(s)" is set to Enabled)

When this feature is set to Enabled, the SATA AHCI controller manages the power use of the SATA link. The controller will put the link in a low-power mode during an extended period of I/O inactivity, and will return the link to an active state when I/O activity resumes. The options are **Disabled** and Enabled.

SATA SGPIO Mode (Available when "SATA Controller(s)" is set to Enabled)

Use this feature to change the serial GPIO mode for SATA controller. The options are LED and **SGPIO**.

SATA Port 0 - SATA Port 7 (M.2-H1) (Available when "SATA Controller(s)" is set to Enabled)

Note: The SATA port naming may vary based on the related configuration.

Hot Plug

Select Enabled to support Hot-plugging for the device installed on a selected SATA port to allow you to replace the device installed in the slot without shutting down the system. The options are Disabled and **Enabled.**

Spin Up Device

Select Enabled for Staggered Spin Up support to allow the SATA devices specified by the user to spin up one at a time at boot up in an effort to prevent all hard drive disks from spinning up at the same time, causing a power surge. The options are **Disabled** and Enabled.

SATA Device Type

Use this feature to specify if the device installed on the SATA port specified by the user should be connected to a solid state drive or a hard disk drive. The options are **Hard Disk Drive** and Solid State Drive.

▶Trusted Computing (Available when a TPM device is installed and detected by the BIOS)

When a Trusted-Platform Module (TPM) device is detected by your system, the following information is displayed:

- TPM 2.0 Device Found
- Firmware Version:
- Vendor:

Security Device Support

Select Enable to enable BIOS support for onboard security devices, which are not displayed in the OS. If this feature is set to Enable, TCG EFI protocol and INT1A interface will not be available. The options are Disable and **Enable**.

*When "Security Device Support" is set to Enable, the following information is displayed:

- Active PCR banks
- Available PCR banks

SHA-1 PCR Bank (Available when "Security Device Support" is set to Enable)

Select Enabled to enable SHA-1 PCR Bank support to enhance system integrity and data security. The options are Disabled and **Enabled**.

SHA256 PCR Bank (Available when "Security Device Support" is set to Enable)

Select Enabled to enable SHA256 PCR Bank support to enhance system integrity and data security. The options are Disabled and **Enabled**.

Pending Operation (Available when "Security Device Support" is set to Enable)

Use this feature to schedule a TPM-related operation to be performed by a security (TPM) device at the next system boot to enhance system data integrity. The options are **None** and TPM Clear.



Note: Your system will reboot to carry out a pending TPM operation.

Platform Hierarchy (Available when "Security Device Support" is set to Enable) (for TPM version 2.0 and above)

Select Enabled for TPM Platform Hierarchy support, which allows the manufacturer to utilize the cryptographic algorithm to define a constant key or a fixed set of keys to be used for initial system boot. These early boot codes are shipped with the platform and are included in the list of "public keys." During system boot, the platform firmware uses the trusted public keys to verify a digital signature in an attempt to manage and control the security of the platform firmware used in a host system via a TPM device. The options are Disabled and **Enabled**.

Storage Hierarchy (Available when "Security Device Support" is set to Enable)

Select Enabled for TPM Storage Hierarchy support that is intended to be used for non-privacy-sensitive operations by a platform owner such as an IT professional or the end user. Storage Hierarchy has an owner policy and an authorization value, both of which can be set and are held constant (-rarely changed) through reboots. This hierarchy can be cleared or changed independently of the other hierarchies. The options are Disabled and **Enabled**.

Endorsement Hierarchy (Available when "Security Device Support" is set to Enable)

Select Enabled for Endorsement Hierarchy support, which contains separate controls to address the user's privacy concerns because the primary keys in the hierarchy are certified by the TPM key or by a manufacturer with restrictions on how an authentic TPM device that is attached to an authentic platform can be accessed and used. A primary key can be encrypted and certified with a certificate created by using TPM2_ ActivateCredential, which allows the user to independently enable "flag, policy, and authorization values" without involving other hierarchies. A user with privacy concerns can disable the endorsement hierarchy while still using the storage hierarchy for TPM applications, permitting the platform software to use the TPM. The options are Disabled and **Enabled**.

PH Randomization (for TPM version 2.0 and above)

Select Enabled for Platform Hierarchy (PH) Randomization support, which is used only during the platform developmental stage. This feature cannot be enabled in the production platforms. The options are **Disabled** and Enabled.

Supermicro BIOS-Based TPM Provision Support

If this feature is set to Enabled, Supermicro BIOS-based TPM provision will be supported. The options are Disabled and **Enabled**.



Note: Enabling this feature will lock your TPM on the production platform, and you will not be able to delete the NV indexes.

TXT Support

Select Enabled to enable Intel Trusted Execution Technology (TXT) support to enhance system integrity and data security. The options are **Disabled** and Enabled.

Note 1: If this feature is set to Enabled, be sure to disable Device Function On-Hide (EV DFX) support when it is present in the BIOS for the system to work properly.

Note 2: For more information on TPM, refer to the TPM manual at https://www.supermicro.com/manuals/other/AOM-TPM-9670V_9670H.pdf.

▶ACPI Settings

NUMA

Use this feature to enable Non-Uniform Memory Access (NUMA) to enhance system performance. The options are Disabled and **Enabled**.

UMA-Based Clustering

When this feature is set to Hemisphere, Uniform Memory Access (UMA)-based clustering will support 2-node cluster configuration for system performance enhancement. The options are Disabled (All2All), Hemisphere (2-clusters), and **Quadrant (4-clusters)**.

WHEA Support

Select Enabled to support the Windows Hardware Error Architecture (WHEA) platform and provide a common infrastructure for the system to handle hardware errors within the Windows OS environment to reduce system crashes and to enhance system recovery and health monitoring. The options are Disabled and **Enabled**.

High Precision Event Timer

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the processor. The HPET is used to replace the 8254 Programmable Interval Timer. The options are Disabled and **Enabled**.

▶Super IO Configuration (Available when your system supports this feature)

The following information is displayed:

- Super IO Chip

▶Serial Port 1 Configuration

Serial Port 1

Select Enabled to enable serial port 1. The options are Disabled and **Enabled**.

Device Settings (Available when "Serial Port 1" above is set to Enabled)

This feature displays the base I/O port address and the Interrupt Request address of serial port 1.

Change Settings (Available when "Serial Port 1" above is set to Enabled)

This feature specifies the base I/O port address and the Interrupt Request address of serial port 1. Select Auto for the BIOS to automatically assign the base I/O and IRQ address to serial port 1. The options are **Auto**, (IO=3F8h; IRQ=4;), (IO=2F8h; IRQ=4;), (IO=3E8h; IRQ=4;), and (IO=2E8h; IRQ=4;).

▶Serial Port 2 Configuration

Note: It can be "Serial Port 2 Configuration" or "SOL Configuration" based on your system support.

Serial Port 2/SOL ("Serial Port 2" or "SOL" based on your system support)

Select Enabled to enable serial port 2 (or SOL). The options are Disabled and **Enabled**.

Device Settings (Available when "Serial Port 2/SOL" is set to Enabled)

This feature displays the base I/O port address and the Interrupt Request address of serial port 2 (or SOL).

Change Settings (Available when "Serial Port 2/SOL" is set to Enabled)

This feature specifies the base I/O port address and the Interrupt Request address of serial port 2 (or SOL). Select Auto for the BIOS to automatically assign the base I/O and IRQ address to serial port 2. The options are **Auto**, (IO=2F8h; IRQ=3;), (IO=3F8h; IRQ=3;), (IO=3E8h; IRQ=3;), and (IO=2E8h; IRQ=3;).

Serial Port 2 Attribute (Available for Serial Port 2 only)

Select SOL to use serial port 2 as a Serial Over LAN (SOL) port for console redirection. The options are **SOL** and COM.

▶Serial Port Console Redirection

COM1 (Available when your system supports the serial port of COM1)

Console Redirection

Select Enabled to enable COM port 1 for Console Redirection, which allows a client machine to be connected to a host machine at a remote site for networking. The options are **Disabled** and Enabled.

Note: This feature will be set to Enabled if there is no BMC support.

▶Console Redirection Settings (Available when "Console Redirection" above is set to Enabled)

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, **VT100+**, VT-UTF8, and ANSI.

Bits Per Second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600, and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 and **8** (bits).

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark, and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are Disabled and **Enabled.**

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

SOL/COM2

Note: This feature is available when your system supports the serial port of SOL and/or COM2. The "SOL/COM2" here indicates a shared serial port, and SOL is used as the default.

Console Redirection

Select Enabled to use the SOL/COM2 port for Console Redirection. The options are Disabled and **Enabled.**

▶Console Redirection Settings (Available when "Console Redirection" above is set to Enabled)

Use this feature to specify how the host computer will exchange data with the client computer.

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, **VT100+**, VT-UTF8, and ANSI.

Bits Per Second

Use this feature to set the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 38400, 57600, and **115200** (bits per second).

Data Bits

Use this feature to set the data transmission size for Console Redirection. The options are 7 and **8** (bits).

Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark, and Space.

Stop Bits

A stop bit indicates the end of a serial data packet. Select 1 Stop Bit for standard serial data communication. Select 2 Stop Bits if slower devices are used. The options are **1** and 2.

Flow Control

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None** and Hardware RTS/CTS.

VT-UTF8 Combo Key Support

Select Enabled to enable VT-UTF8 Combination Key support for ANSI/VT100 terminals. The options are Disabled and **Enabled.**

Recorder Mode

Select Enabled to capture the data displayed on a terminal and send it as text messages to a remote server. The options are **Disabled** and Enabled.

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are Disabled and **Enabled**.

Putty KeyPad

This feature selects Function Keys and KeyPad settings for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SCO, ESCN, and VT400.

Legacy Console Redirection

▶Legacy Console Redirection Settings

Legacy Serial Redirection Port

Use this feature to select a COM port to display redirection of Legacy OS and Legacy OPROM messages. The options are **COM1** and SOL/COM2. Note that the available options are based on your motherboard features.

Resolution

Use this feature to select the number of rows and columns used in Console Redirection for Legacy OS support. The options are 80x24 and **80x25**.

Redirect After BIOS POST

Use this feature to enable or disable legacy console redirection after BIOS POST. When the option - BootLoader is selected, legacy console redirection is disabled before booting the OS. When the option Always Enable is selected, legacy console redirection remains enabled upon OS bootup. The options are **Always Enable** and BootLoader.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

The feature allows you to configure Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection EMS

Select Enabled to use the SOL port for Console Redirection. The options are **Disabled** and Enabled**.**

▶Console Redirection Settings (Available when "Console Redirection EMS" above is set to Enabled)

Out-of-Band Mgmt Port

The feature selects a serial port in a client server to be used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1** and SOL/COM2. Note that the option of SOL/COM2 indicates a shared serial port. SOL is available with BMC support.

Terminal Type EMS

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, VT100+, **VT-UTF8**, and ANSI.

Bits Per Second EMS

This feature sets the transmission speed for a serial port used in Console Redirection. Make sure that the same speed is used in the host computer and the client computer. A lower transmission speed may be required for long and busy lines. The options are 9600, 19200, 57600, **115200**, 230400, 460800, and 921600 (bits per second).

Flow Control EMS

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start sending data when the receiving buffer is empty. The options are **None,** Hardware RTS/CTS, and Software Xon/Xoff.

The following information is displayed:

Data Bits EMS / Parity EMS / Stop Bits EMS

▶Network Configuration

Network Stack

Select Enabled to enable Preboot Execution Environment (PXE) or Unified Extensible Firmware Interface (UEFI) for network stack support. The options are Disabled and **Enabled**.

IPv4 PXE Support (Available when "Network Stack" is set to Enabled)

Select Enabled to enable IPv4 PXE boot support. If this feature is disabled, it will not create the IPv4 PXE boot option. The options are Disabled and **Enabled**.

IPv4 HTTP Support (Available when "Network Stack" is set to Enabled)

Select Enabled to enable IPv4 HTTP boot support. If this feature is disabled, it will not create the IPv4 HTTP boot option. The options are **Disabled** and Enabled.

IPv6 PXE Support (Available when "Network Stack" is set to Enabled)

Select Enabled to enable IPv6 PXE boot support. If this feature is disabled, it will not create the IPv6 PXE boot option. The options are **Disabled** and Enabled.

IPv6 HTTP Support (Available when "Network Stack" is set to Enabled)

Select Enabled to enable IPv6 HTTP boot support. If this feature is disabled, it will not create the IPv6 HTTP boot option. The options are **Disabled** and Enabled.

PXE Boot Wait Time (Available when "Network Stack" is set to Enabled)

Use this feature to set the wait time (in seconds) upon which the system BIOS will wait for you to press the <ESC> key to abort PXE boot instead of proceeding with PXE boot by connecting to a network server immediately. Press "+" or "-" on your keyboard to change the value. The default setting is **0**.

Media Detect Count

Use this feature to select the wait time (in seconds) for the BIOS ROM to detect the presence of a LAN media either via the Internet connection or a LAN port. Press "+" or "-" on your keyboard to change the value. The default setting is **1**.

▶MAC:(MAC address)-IPv6 Network Configuration

▶Enter Configuration Menu

The following information is displayed:

Interface Name:

Interface Type:

MAC address: Host address:

Route Table:

Gateway addresses:

Domain Network System (DNS) addresses

Interface ID

Use this feature to change/enter the 64-bit alternative interface ID for the device. The string format is colon separated. The default setting is the MAC address above.

DAD Transmit Count

This feature displays the number of consecutive neighbor solicitation messages that have been sent while performing duplicate address detection on a tentative address. The default setting is **1**.

Policy

Use this feature to select how the policy is to be configured. The options are **automatic** and manual.

▶Advanced Configuration (Available when "Policy" is set to manual)

New IPv6 address

Use this feature to enter the IPv6 address for the local machine.

New Gateway address

Use this feature to set the gateway address for the local machine.

New Domain Network System (DNS) address

Use this feature to set the DNS server address for the local machine.

Commit Changes and Exit

Press <Enter> to save changes and exit. The options are **Yes** and No.

Discard Changes and Exit

Press <Enter> to discard changes and exit. The options are **Yes** and No.

Save Changes and Exit

Press <Enter> to save changes and exit. The options are **Yes** and No.

▶MAC:(MAC address)-IPv4 Network Configuration

Configured

Select Enabled to show whether the network address has been successfully configured. The options are **Enabled** and Disabled.

Enable DHCP (Available when "Configured" is set to Enabled)

Select Enabled to support Dynamic Host Configuration Protocol (DHCP), which allows the BIOS to search for a DHCP server attached to the network and request the next available IP address for this computer. The options are **Disabled** and Enabled.

Local IP Address (Available when "Configured" is set to Enabled and "Enabled DHCP" is set to Disabled)

Use this feature to enter an IP address for the local machine.

Local NetMask (Available when "Configured" is set to Enabled and "Enabled DHCP" is set to Disabled)

Use this feature to set the netmask for the local machine.

Local Gateway (Available when "Configured" is set to Enabled and "Enabled DHCP" is set to Disabled)

Use this feature to set the gateway address for the local machine.

Local DNS Servers (Available when "Configured" is set to Enabled and "Enabled DHCP" is set to Disabled)

Use this feature to set the Domain Name System (DNS) server address for the local machine.

Save Changes and Exit

Press <Enter> to save changes and exit. The options are **Yes** and No.

▶PCIe/PCI/PnP Configuration

The following information is displayed:

- PCI Bus Driver Version

PCI Devices Common Settings:

Above 4G Decoding (Available when the system supports 64-bit PCI decoding)

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. The options are Disabled and **Enabled**.

MMCFG Base

This feature determines how the lowest Memory Mapped Configuration (MMCFG) base is assigned to onboard PCI devices. The options are 1G, 1.5G, 1.75G, 2G, 2.25G, 3G, and **Auto**.

MMCFG Size

Use this feature to set the MMCFG size. The options are 64M, 128M, 256M, 512M, 1G, 2G, and **Auto**. Note that the MMCFG size is based on the memory populated.

Note 1: The options shown here depend on your memory size.

Note 2: The option of 64M is not available on the motherboard with dual processors.

MMIO High Base

Use this feature to select the base memory size according to memory-address mapping for the IO hub. The options are 56T, 40T, **32T**, 24T, 16T, 4T, 2T, 1T, 512G, and 3584T.

MMIO High Granularity Size

Use this feature to select the high memory size according to memory-address mapping for the IO hub. The options are 1G, 4G, 16G, 64G, **256G,** and 1024G.

Re-Size BAR Support

Use this feature to enable the Resizable BAR support. Resizable BAR is a PCIe interface technology that allows the processor to access the entire frame buffer. With this technology, your system will be able to handle multiple processor to GPU transfers simultaneously rather than queuing, which can improve the frame rate performance. The options are **Disabled** and Enabled.

SR-IOV Support

Select Enabled for Single-Root IO Virtualization support. The options are Disabled and **Enabled**.

ARI Support

Select Enabled for Alternative Routing-ID Interpretation (ARI) support. The options are Disabled and **Enabled**.

Bus Master Enable

If it is set to Enabled, the PCI Bus Driver will enable the Bus Master Attribute for DMA transactions. If it is set to Disabled, the PCI Bus Driver will disable the Bus Master Attribute for Pre-Boot DMA protection. The options are Disabled and **Enabled**.

Consistent Device Name Support

Select Enabled for ACPI_DSM (DSM: Device Specific Method) device name support for onboard devices and slots. The options are **Disabled** and Enabled.

NVMe Firmware Source

Use this feature to select the NVMe firmware to support system boot. The options are **Vendor Defined Firmware** and AMI Native Support. The default option, Vendor Defined Firmware, is pre-installed on the drive and may resolve errata or enable innovative functions for the drive. The other option, AMI Native Support, is offered by the BIOS with a generic method.

VGA Priority

Use this feature to select the graphics device to be used as the primary video display for system boot. The options are **Onboard** and Offboard.

For features, note the following:

Note 1: The number of slots and slot naming vary based on your motherboard features.

Note 2: The option of Legacy is available when "Boot Mode Select" is set to Dual or Legacy.

Note 3: Refer to the Boot submenu in the BIOS Setup main menu to set "Boot Mode Select."

Onboard Video Option ROM

Select EFI to allow you to boot the computer using the Extensible Firmware Interface (EFI) device installed on the onboard video port. The options are Disabled, **EFI**, and Legacy.

M.2-A OPROM / M.2-B OPROM / AOM-GP101-IPMI OPROM / AOM-PCIe5-GP201 Slot3 OPROM / AOM-PCIe5-GP201 Slot1 OPROM / AOM-PCIe5-GP201 Slot7 OPROM / AOM-PCIe5-GP201 Slot2 OPROM / AOM-PCIe5-GP201 Slot4 OPROM / AOM-PCIe5-GP201 Slot6 OPROM / AOM-PCIe5-GP201 Slot5

Select EFI to allow you to boot the computer using the EFI device installed in the specified PCIe slot. The options are Disabled, Legacy, and **EFI**.

Note: The option of Legacy is available when a Legacy device is detected by the BIOS.

Onboard LAN Device (Available when onboard LAN devices are detected)

Select Enabled to use the onboard LAN device. The options are Disabled and **Enabled**.

Onboard LAN1 Option ROM (Available when "Onboard LAN Device" is set to Enabled)

Use this feature to select the type of device installed in LAN Port 1 used for system boot. The options are Disabled, PXE, iSCSI, Legacy, FCoE, and **EFI**. Note that available options are based on your LAN OPROM ROM.

Note: the options of Legacy, PXE, iSCSI, FCoE devices are available when related devices are installed and detected by the BIOS.

Onboard LAN2 Option ROM (Available when "Onboard LAN Device" is set to Enabled and "Onboard LAN1 Option ROM" is set to Disabled or PXE)

Use this feature to select the type of device installed in LAN Port 2 used for system boot. The default setting for LAN2 Option ROM is Disabled. Note that available options are based on your LAN OPROM ROM.

Onboard NVME1 Option ROM / Onboard NVME2 Option ROM / Onboard NVME3 Option ROM / Onboard NVME4 Option ROM / Onboard NVME5 Option ROM / Onboard NVME6 Option ROM / Onboard NVME7 Option ROM / Onboard NVME8 Option ROM (Available when NVME devices are installed and detected)

Use this feature to select which firmware function to be loaded for the NVMe device in this slot. The options are Disabled, Legacy, and **EFI**.



Note: The option of Legacy is available when a Legacy device is detected by the BIOS.

▶HTTP Boot Configuration

HTTP Boot Policy

Use this feature to set the HTTP boot policy. The options are Apply to all LANs, **Apply to each LAN**, and Boot Priority #1 instantly.

HTTPS Boot Checks Hostname

Enable this feature for HTTPS boot to check the hostname of the TLS certificates to see if it matches the host name provided by the remote server. The options are **Enabled** and Disabled (WARNING: Security Risk!!).

Priority of HTTP Boot

Instance of Priority 1 (Available when your motherboard supports this feature)

This feature sets the rank target port. The default setting is **1**.

Select IPv4 or IPv6

This feature specifies which connection the target LAN port should boot from. The options are **IPv4** and IPv6.

Boot Description

Use this feature to enter a boot description, which cannot be longer than 75 characters. Be sure to enter a boot description; otherwise, the boot option for the URI cannot be created.

Boot URI

Enter a Boot Uniform Research Identifier (URI) with 128 characters or fewer. This Boot URI determines how IPv4 Boot Option and IPv6 Boot Option will be created. This feature is only supported on Dual or EFI Boot Mode.

Instance of Priority 2: / Instance of Priority 3: / Instance of Priority 4: / Instance of Priority 5: / Instance of Priority 6: / Instance of Priority 7: / Instance of Priority 8: (Available when your motherboard supports this feature)

This feature sets the rank target port. The default setting is **1**.

Select IPv4 or IPv6 (Unavailable when "Instance of Priority x:" is set to 0)

This feature specifies which connection the target LAN port should boot from. The options are **IPv4** and IPv6.

Boot Description (Unavailable when "Instance of Priority x:" is set to 0)

Use this feature to enter a boot description, which cannot be longer than 75 characters. Be sure to enter a boot description; otherwise, the boot option for the URI cannot be created.

Boot URI (Unavailable when "Instance of Priority x:" is set to 0)

Enter a Boot URI with 128 characters or shorter. This Boot URI determines how IPv4 Boot Option and IPv6 Boot Option will be created. This feature is only supported on Dual or EFI Boot Mode.

▶Supermicro KMS Server Configuration

Note: Be sure to configure all the features in the section of Supermicro KMS Server Configuration and the feature of "KMS Security Policy" so that your system can communicate with the KMS server.

Supermicro KMS Server IP address

Use this feature to set the Supermicro Key Management Service (KMS) server IPv4 address in dotted-decimal notation.

Second Supermicro KMS Server IP address

Use this feature to set the second Supermicro KMS server IPv4 address in dotted-decimal notation.

Supermicro KMS TCP Port number

Use this feature to set the TCP port number used in Supermicro KMS Server. The valid range is 100–9999. The default setting is **5696**. Do not change the default setting unless a different TCP port number has been specified and used in the Supermicro KMS Server.

KMS Time Out

Use this feature to set the KMS server connecting timeout (in seconds). The default setting is **5** (seconds).

TimeZone

Use this feature to set the correct time zone. The default setting is **0** (not specified).

Client UserName

Press <Enter> to set the client identity (UserName). The maximum length is 63 characters.

Client Password

Press <Enter> to set the client identity (Password). The maximum length is 31 characters.

▶CA Certificate/ ▶Client Certificate/ ▶Client Private Key

Use the three features to enroll factory defaults or load the KMS Transport Layer Security (TLS) certificates, which are generated by the KMS Server, from the file stored in the USB flash drive.

Private Key Password (Available when "Client Private Key" above has been set)

Use this feature to change the private key password.

▶Super-Guardians Configuration

This section allows the user to configure Super-Guardians Configuration settings.

Super-Guardians Protection Policy

Use this feature to enable the Super-Guardians Protection Policy. Select Storage to protect your storage devices (TCG NVMe devices) by limiting access to the user using an Authentication-Key (AK). Select System to protect your motherboard or your system by limiting access to the user using an Authentication-Key (AK). Select System and Storage to protect your motherboard, your system, and your storage devices (TCG NVMe devices) by limiting access to the user using an Authentication-Key (AK). The options are **Storage**, System, and System and Storage.

KMS Security Policy (Available when "TPM Security Policy" and "USB Security Policy" are set to Disabled)

Set this feature to Enabled to enable the KMS Security Policy. The options are **Disabled** and Enabled. The default setting is **Disabled**. Save settings (you can press <F4>) and reboot the system for changes to take effect.

Note 1: Be sure that the KMS Server is ready before configuring this feature.

Note 2: Use the professional KMS Server solutions (e.g., Thales Server) or the Supermicro PyKMIP Software Package to establish the KMS Server.

KMS Server Retry Count (Available when "TPM Security Policy" and "USB Security Policy" are set to Disabled)

Use this feature to specify how many attempts a user may try to connect to the KMS server. The valid range is 0–10. Press "+" or "-" on your keyboard to change the value. The default setting is **5** (times). The value of 0 indicates a infinite-retrying.

TPM Security Policy (Available when "KMS Security Policy" and "USB Security Policy" are set to Disabled)

Select Enabled to support the TPM Security Policy. The options are **Disabled** and Enabled. Save settings (you can press <F4>) and reboot the system for changes to take effect.

Note: Be sure to install a Trusted Platform Module (TPM) device (TPM 2.0) to your system before configuring this feature.

Load Authentication-Key (Available when "KMS Security Policy" and "TPM Security Policy" are set to Disabled)

Select Enabled to load authentication keys to the system. To save the authentication keys in the system, press <F4> and reboot the system for changes to take effect. While booting, the BIOS will automatically load the Authentication-Key (filename: TPMAuth.bin) from the USB flash drive. Afterwards, the default setting will be set to Disabled by the BIOS.

Note 1: Be sure to connect a USB flash drive with the Authentication-Key (filename: TPMAuth.bin) to your system before the system reboot.

Note 2: Be sure to save the Authentication-Key (filename: TPMAuth.bin) to the USB flash drive and have a backup. Load the Authentication-Key (filename: TPMAuth.bin) after installing a TPM device. Otherwise, the TPM function can not work properly.

Save Authentication-Key (Available when "TPM Security Policy" is set to Enabled and "USB Security Policy" is set to Disabled)

The options are **Disabled** and Enabled. Set this feature to Enabled; save settings (you can press <F4>) and reboot the system for changes to take effect. While booting, the BIOS will automatically save the Authentication-Key (filename: TPMAuth.bin) to the USB flash drive. Afterwards, the default setting will be set to Disabled by the BIOS.

Note: Be sure to connect a USB flash drive to your system before the system reboot.

USB Security Policy (Available when "KMS Security Policy" and "TPM Security Policy" are set to Disabled)

Use this feature to enable the USB Security Policy. The options are **Disabled** and Enabled. The default setting is Disabled. Set this feature to Enabled; save settings (you can press <F4>) and reboot the system for changes to take effect. Connect a USB flash drive to your

system before the system reboot. While booting, the BIOS will automatically create the USB Authentication-Key (filename: USBAuth.bin) and save it to the USB flash drive.

Note 1: Be sure to connect a USB flash drive to your system before configuring this feature.

Note 2: Be sure to save the USB Authentication-Key (filename: USBAuth.bin) to the USB flash drive and have a backup.

▶Nvidia Network Adapter

Note: This feature is available when Nvidia Network adapters are installed and detected. The network adapter controller and MAC addresses shown above depend on system features.

▶Firmware Image Properties (Available when related devices are detected by the BIOS)

The following information is displayed:

- Family Firmware Version
- EFI Version

▶NIC Configuration

Banner Message Time Out

Use this feature to specify how long the OptionROM banner message should be displayed during Power On Self-Testing (POST). The default setting is **4** (seconds).

Legacy Boot Protocol

Use this feature to select a Legacy network boot protocol, which will allow the BIOS to automatically reboot the system from a Legacy boot device after an initial boot failure. The options are None, **PXE**, iSCSI, PXE without fail-over, and iSCSI without fail-over.

IPv4/IPv6 Support

Use this feature to determine whether IPv4 or IPv6 will be used as the networking address for the iSCSI initiator and the targets. The options are **IPv4**, IPv6, and IPv4/IPv6.

Virtual LAN Mode

Select Enabled for Virtual LAN (VLAN) mode support, which will allow a VLAN tag to be used by PXE. The options are Enabled and **Disabled**.

Virtual LAN ID

This feature displays VLAN ID. The default setting is **1**.

Boot Retry Count

Use this feature to specify how many times a system should try to reboot in the event of a boot failure. The options are No Retry, 1 Retry, 2 Retries, 3 Retries, 4 Retries, 5 Retries, 6 Retries, and Indefinite Retries.

Boot Strap Type

Use this feature to set the Boot Strap type (method) for the BIOS to boot to the OS. The default setting is **Int 19h**.

PKey

Use this feature to set the PKey ID used by a PXE device to boot the system. Enter a value between 0 and 65535. The default setting is **0**.

Boot Legacy Interrupt Disable

Select Enabled to disable the feature support for "Boot Legacy Interrupt Disable." The options are Enabled and **Disabled**.

DHCP HW Type IB

When this feature is set to Enabled, DHCP networking signals will be sent with GUID in IB mode. The options are **Disabled** and Enabled.

DHCP Client-ID HW Type IB

When this feature is set to Enabled, DHCP networking signals will be sent with Hardware type in IB mode to the Client's ID (a destination specified by the client). The options are **Disabled** and Enabled.

▶TLS Authenticate Configuration

This submenu allows you to configure Transport Layer Security (TLS) settings.

▶Server CA Configuration

This feature allows you to configure the client certificate that is to be used by the server.

▶Enroll Certification

This feature allows you to enroll the certificate in the system.

▶Enroll Certification Using File

This feature allows you to enroll the security certificate in the system by using a file.

Certification GUID

Press <Enter> and input the certification Global Unique Identifier (GUID).

▶Commit Changes and Exit

Use this feature to save all changes and exit TLS settings.

▶Discard Changes and Exit

Use this feature to discard all changes and exit TLS settings.

▶Delete Certification

This feature is used to delete the certificate if a certificate has been enrolled in the system. The options are **Disabled** and Enabled.

▶Client Certification Configuration

This feature allows you to configure the client certificate to be used by the server.

▶Enroll Certification

This feature allows you to enroll the certificate in the system.

▶Enroll Certification Using File

This feature allows you to enroll the security certificate in the system by using a file.

Certification GUID

Press <Enter> and input the certification GUID.

▶Commit Changes and Exit

Use this feature to save all changes and exit TLS settings.

▶Discard Changes and Exit

Use this feature to discard all changes and exit TLS settings.

▶Delete Certification

This feature is used to delete the certificate if a certificate has been enrolled in the system.

▶Generic NVMe PCIe SSD Configuration Data

Note 1: This feature is available when a generic NVMe PCIe SSD device is installed.

Note 2: The network controller and MAC addresses shown above are based on your system features.

▶View Physical Device Properties

The following information is displayed:

- Model Number
- Firmware Revision
- Capacity (GB)

▶Micron NVMe SSD Micron_7450_MTFDKBA960TFR

Note 1: This feature is available when a Micron NVMe SSD Micron_7450_MTFDK-BA960TFRe is installed.

Note 2: The network controller and MAC addresses shown above are based on your system features.

The following information is displayed:

- Bus Protocol:
- PCI Vendor ID:
- PCI Device ID:
- PCI Vendor Subsystem ID:
- Model Number:
- Serial Number:
- Firmware Revision:
- IEEE Organization Unique ID:

- Number of Namespaces:
- Device Size:
- Device Health:
- Option ROM Version:

▶Intel(R) VROC SATA Controller (Available when your system supports this feature and required components are installed)

Note 1: This section is based on your system features and related device(s) installed.

Note 2: This section is available when "SATA Mode Selection" is set to RAID.

Note 3: Refer to PCH SATA0 Configuration, PCH SATA1 Configuration, and PCH SATA2 Configuration submenus in the BIOS Setup main menu to set "SATA Mode Selection."

The following information is displayed:

- Intel VROC SATA driver version

▶Create RAID Volume

Name:

This feature allows you to enter the unique name of RAID volume.

RAID Level:

This feature allows you to select the RAID level. The options are **RAID0(Stripe)**, RAID1(Mirror), RAID5(Parity), and RAID10(RAID0+1).

Select Disks:

Select the desired RAID disks one by one by setting them to **X**. The options are (not selected) and **X (selected)**.

Strip Size:

Use this feature to select the RAID strip size. The options are 4KB, 8KB, 16KB, 32KB, 64KB, and **128KB**. The available options are based on the setting of "RAID Level:" above.

Capacity (GB):

This feature allows you to enter the desired RAID capacity (in GB).

▶Create RAID Volume

Use this feature to create a RAID volume with the settings above. The options are **Yes** and No.

Non-RAID Physical Disks:

This feature displays the information of non-RAID physical disk(s).

RAID Volumes:

This feature displays the information of RAID volumes that have been created earlier.

▶Intel(R) VROC sSATA Controller (Available when the system supports this feature and required components are installed)

Note 1: This section is based on your system features and related device(s) installed.

Note 2: This section is available when "SATA Mode Selection" is set to RAID.

Note 3: Refer to PCH SATA0 Configuration, PCH SATA1 Configuration, and PCH SATA2 Configuration submenus in the BIOS Setup main menu to set "SATA Mode Selection."

The following information is displayed:

- Intel VROC sSATA driver version

▶Create RAID Volume

Name:

This feature allows you to enter the unique name of RAID volume.

RAID Level:

This feature allows you to select the RAID level. The options are **RAID0(Stripe)**, RAID1(Mirror), RAID5(Parity), and RAID10(RAID0+1).

Select Disks:

Select the desired RAID disks one by one by setting them to **X**. The options are (not selected) and **X (selected)**.

Strip Size:

Use this feature to select the RAID strip size. The options are 4KB, 8KB, 16KB, 32KB, 64KB, and **128KB**. The available options are based on the setting of "RAID Level:" above.

Capacity (GB):

This feature allows you to enter the desired RAID capacity (in GB).

▶Create RAID Volume

Use this feature to create a RAID volume with the settings above. The options are **Yes** and No.

Non-RAID Physical Disks:

This feature displays the information of non-RAID physical disk(s).

RAID Volumes:

This feature displays the information of RAID volumes that have been created earlier.

▶Intel(R) VROC tSATA Controller (Available when the system supports this feature and required components are installed)

Note 1: This section is based on your system features and related device(s) installed.

Note 2: This section is available when "SATA Mode Selection" is set to RAID.

Note 3: Refer to PCH SATA0 Configuration, PCH SATA1 Configuration, and PCH SATA2 Configuration submenus in the BIOS Setup main menu to set "SATA Mode Selection."

The following information is displayed:

- Intel VROC tSATA driver version

▶Create RAID Volume

Name:

This feature allows you to enter the unique name of RAID volume.

RAID Level:

This feature allows you to select the RAID level. The options are **RAID0(Stripe)**, RAID1(Mirror), RAID5(Parity), and RAID10(RAID0+1).

Select Disks:

Select the desired RAID disks one by one by setting them to **X**. The options are (not selected) and **X (selected)**.

Strip Size:

Use this feature to select the RAID strip size. The options are 4KB, 8KB, 16KB, 32KB, 64KB, and **128KB**. The available options are based on the setting of "RAID Level:" above.

Capacity (GB):

This feature allows you to enter the desired RAID capacity (in GB).

▶Create RAID Volume

Use this feature to create a RAID volume with the settings above. The options are **Yes** and No.

Non-RAID Physical Disks:

This feature displays the information of non-RAID physical disk(s).

RAID Volumes:

This feature displays the information of RAID volumes that have been created earlier.

▶Intel(R) Ethernet Controller (Ethernet controller) — (MAC address) (Available when the system supports this feature and required components are installed)

Note: The Ethernet controller and MAC addresses shown above are based on you system features.

▶Firmware Image Properties

The following information is displayed:

- Option ROM version
- Unique NVM/EEPROM ID
- NVM Version

▶NIC Configuration

Link Speed

Use this feature to set the connection speed of a LAN port specified. The options are **Auto Negotiated**, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, and 100 Mbps Full.

Wake On LAN

Set this feature to support system wake-up via the selected LAN device. If this feature is set to Enabled, the LAN port selected will be enabled when the system is powered on. The options are Disabled and **Enabled**.

Blink LEDs

Use this feature to identify the physical network port by blinking the associated LED. The default setting is **0** (up to 15 seconds).

The following information is displayed:

- UEFI Driver
- Adapter PBA
- Device Name
- Chip Type
- PCI Device ID
- PCI Address
- Link Status
- MAC Address
- Virtual MAC Address

▶Intel Virtual RAID on CPU (Available when the system supports this feature and required components are installed)

Note: It is available when your system supports this feature and when "Enable/Disable VMD" is set to Enable.

The following information is displayed:

- Intel VROC with VMD Technology x.x.x.xxxx
- Upgrade key:
- Intel VROC Managed Controllers:

▶Driver Health

This feature displays the health information of the drivers installed in your system, including LAN controllers, as detected by the BIOS. Select one and press <Enter> to see the details.

Note: This section is provided for reference only as the driver health status will differ depending on the drivers installed in your system. It is also based on your system configuration and the environment that your system is operating in.

4.4 Event Logs

Use this feature to configure Event Logs settings.

Note: After you've made any changes in this section, be sure to reboot the system for the changes to take effect.



Figure 4-3: Event Logs Tab

▶Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable System Management BIOS (SMBIOS) Event Logging during system boot. The options are Disabled and **Enabled**.

Erasing Settings

Erase Event Log (Available when "SMBIOS Event Log" is set to Enabled)

Select No to keep the event log without erasing it upon next system bootup. Select Yes, Next, reset to erase the event log upon next system reboot. The options are **No**, (Yes, Next reset), and (Yes, Every reset).

When Log is Full (Available when "SMBIOS Event Log" is set to Enabled)

Select Erase Immediately to immediately erase all errors in the SMBIOS event log when the event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event (Available when "SMBIOS Event Log" is set to Enabled)

Select Enabled to log system boot events. The options are Enabled and **Disabled**.

MECI (Available when "SMBIOS Event Log" is set to Enabled)

Enter the increment value for the multiple event counter. Enter a number between 1 to 255. The default setting is **1**. (MECI is the abbreviation for Multiple Event Count Increment.)

METW (Available when "SMBIOS Event Log" is set to Enabled)

This feature is used to determine how long (in minutes) the multiple event counter should wait before generating a new event log. Enter a number between 0 to 99. The default setting is **60**. (METW is the abbreviation for Multiple Event Count Time Window.)

Note: Reboot the system for the changes above to take effect.

▶View SMBIOS Event Log

This feature allows you to view the event in the system event log. Select this feature and press <Enter> to view the status of an event in the log. The following information is displayed: DATE / TIME / ERROR CODE / SEVERITY.

4.5 BMC

Use this feature to configure BMC settings.



Figure 4-4: BMC Tab

BMC Firmware Revision

This feature indicates the BMC firmware revision used in your system.

BMC STATUS

This feature indicates the status of the BMC firmware installed in your system.

▶System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled to enable all system event logging upon system boot. The options are Disabled and **Enabled**.

Erasing Settings

Erase SEL (Available when "SEL Components" is set to Enabled)

Select (Yes, On next reset) to erase all system event logs upon next system boot. Select (Yes, On every reset) to erase all system event logs upon each system reboot. Select No to keep all system event logs after each system reboot. The options are **No,** (Yes, On next reset), and (Yes, On every reset).

When SEL is Full (Available when "SEL Components" is set to Enabled)

This feature allows you to determine what the BIOS should do when the system event log is full. Select Erase Immediately to erase all events in the log when the system event log is full. The options are **Do Nothing** and Erase Immediately.

Note: After making changes to a setting, be sure to reboot the system for the changes to take effect.

▶BMC Network Configuration

Update BMC LAN Configuration

Select Yes for the BIOS to implement all IP/MAC address changes upon next system boot. The options are **No** and Yes.

****

Configure IPv4 Support

****

BMC LAN Selection

Use this feature to select the type of IPMI LAN. The default setting is **Failover**.

BMC Network Link Status:

This feature displays the status of the IPMI network link for this system. The default setting is **Dedicated LAN**.

Configuration Address Source (Available when "Update BMC LAN Configuration" is set to Yes)

Use this feature to select the source of the IPv4 connection. If Static is selected, you will need to know the IP address of the IPv4 connection and enter it into the system manually in the field. If DHCP is selected, the BIOS will search for a Dynamic Host Configuration Protocol (DHCP) server in the network that is attached to and request the next available IP address for this computer. The options are Static and **DHCP**.

Station IP Address (Available when "Configuration Address Source" is set to Static)

This feature displays the Station IP address in decimal and in dotted quad form (i.e., 172.29.176.131).

Subnet Mask (Available when "Configuration Address Source" is set to Static)

This feature displays the sub-network that this computer belongs to. The value of each three-digit number separated by dots should not exceed 255.

Station MAC Address (Available when "Configuration Address Source" is set to Static)

This feature displays the Station MAC address for this computer. MAC addresses are six two-digit hexadecimal numbers.

Gateway IP Address (Available when "Configuration Address Source" is set to Static)

This feature displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 172.29.0.1).

VLAN (Available when "Update BMC LAN Configuration" is set to Yes)

This feature displays the status of virtual LAN (VLAN) support. The options are **Disable** and Enable.

VLAN ID (Available when "VLAN" is set to Enable)

Use this feature to create a new VLAN ID by using an existing VLAN or creating a new VLAN ID. Enter a valid value between 1 - 4094. The default setting is **1**.

****

Configure IPv6 Support

****

IPv6 Address Status

This feature displays the status of the IPv6 address.

IPv6 Support

Use this feature to enable IPv6 support. The options are **Enabled** and Disabled.

Configuration Address Source (Available when "IPv6 Support" is set to Enabled)

Use this feature to select the source of the IPv6 connection. If Static Configuration is selected, you will need to know the IP address of the IPv6 connection and enter it into the system manually in the field. If the other two options are selected, the BIOS will search for a DHCP server in the network that is attached and request the next available IP address for this computer. The options are Static Configuration, **DHCPv6 Stateless**, and DHCPv6 Stateful.

IPv6 Address ("Static," "DHCPv6 Stateless," or "DHCPv6 Stateful," depending on the option you selected for "Configuration Address Source" above)

This feature displays the station IPv6 address. Press <Enter> to change the setting.

Prefix Length (Available when "Configuration Address Source" is set to Static Configuration)

This feature displays the prefix length. Press <Enter> to change the setting.

Gateway IP (Available when "Configuration Address Source" is set to Static Configuration)

Use this feature to enter the IPv6 gateway IP address. Press <Enter> to change the setting.

Advanced Settings

The default setting is **Auto obtain DNS server IP**. This default setting allows your system to obtain the DNS server IP automatically.

Preferred DNS server IP

This feature displays the preferred DNS server IP. It can be configured via Redfish.

Alternative DNS server IP

This feature displays the alternative DNS server IP. It can be configured via Redfish.

4.6 Security

This feature allows you to configure the security settings for the system.

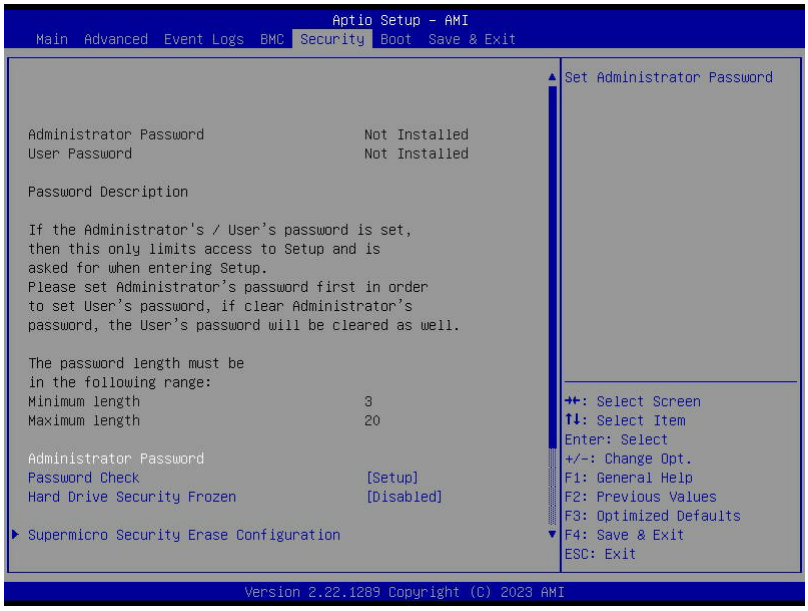


Figure 4-5: Security Tab

Disable Block Sid (Available when your motherboard supports NVMe)

Select Enabled to allow SID authentication to be performed in TCG Storage devices. The options are **Disabled** and Enabled.

The following information is displayed:

- Administrator Password
- User Password
- Password Description

Administrator Password

This feature indicates if an administrator password has been installed. It also allows you to set the administrator password, which is required to enter the BIOS Setup utility. The length of the password should be from 3 to 20 characters long.

Note: For detailed instructions on how to configure Security Boot settings, refer to the Security Boot Configuration User's Guide posted on the web page under the link: https://www.supermicro.com/support/manuals/.

User Password (Available when "Administrator Password" has been set)

This feature indicates if a user password has been installed. It also allows you to set the user password, which is required to enter the BIOS Setup utility. The length of the password should be from 3 to 20 characters long.

Password Check

Select Setup for the system to check for a password at Setup. Select Always for the system to check for a password at bootup and upon entering the BIOS Setup utility. The options are **Setup** and Always.

Hard Drive Security Frozen

Select Enabled to freeze the Lock Security feature for HDD to protect key data in hard drives from being altered. The options are **Disabled** and Enabled.

▶Supermicro Security Erase Configuration (Available when a storage device is detected by the BIOS)

Note: For more information, refer to https://www.supermicro.com/manuals/other/X11_X12_X13_B11_B12_B13_H11_H12_BH12_H13_Secure_Erase_Guide.pdf.

This section allows you to configure the Supermicro proprietary Security Erase settings. When this section is selected, the following information is displayed. Note that the order of the information may differ based on the storage devices being detected.

- HDD Name: This feature displays the name of the storage device that is detected by the BIOS.
- HDD Serial Number: This feature displays the serial number of the storage device that is detected by the BIOS.
- Security Mode: This feature displays the security mode of the storage device that is detected by the BIOS.
- Estimated Time: This feature displays the estimated time needed to perform the selected Security Erase features.
- HDD User Pwd Status: This feature indicates if a password has been set as a storage device user password, which allows you to configure Supermicro Security Erase settings on the storage device by using this user password.
- TCG Device Type: This feature displays the TCG device type detected by the system.
- Admin Pwd Status: This feature indicates if a password has been set as a storage device administrator password, which allows you to configure Supermicro Security Erase settings on the storage device by using this administrator password.

Security Function

Select Set Password to set a storage device password, which allows you to configure the security settings of the storage device.

- Select *Security Erase – Password* to enter a storage device user password to allow you to erase the password and the contents previously stored in the storage device.
- Select *Security Erase – Without Password* to use the manufacturer default password "111111111" as the storage device user password and allow you to erase the contents of the storage device by using this default password.

The options are **Disable**, Set Password, Change Password, Clear Password, Security Erase – Password, Security Erase – PSID, and Security Erase – Without Password.

Note 1: The option of Security Erase – PSID is based on the storage device support. PSID is the abbreviation for Physical Security Identification.

Note 2: The options of Change Password and Clear Password are available when "Password" has been set.

Note 3: The option of Set Password is not available when "Password" has been set.

Password

Use this feature to set the storage device user password, which allows you to configure the Supermicro Security Erase settings by using this user password.

New Password (Available when "Password" above has been set)

Use this feature to set the new user password for the storage device which allows you to configure the Supermicro Security Erase settings by using this new user password.

Lockdown Mode (Available when the DCMS key is activated)

Select Enabled to support Lockdown Mode, which will prevent the existing data or keys stored in the system from being altered or changed in an effort to preserve system integrity and security. The options are **Disabled** and Enabled.

HDD Security Configuration:

▶P4: (Storage Device Name)

This section is available when the storage device is detected by the BIOS. Select this device. Press <Enter> and the following information is displayed:

- HDD Password Description:
- HDD PASSWORD CONFIGURATION:

- Security Supported:
- Security Enabled:
- Security Locked:
- Security Frozen:
- HDD User Pwd Status:
- HDD Master Pwd Status:

Set User Password (Available when "Security Frozen:" above is No)

Press <Enter> to set the HDD user password.

▶Secure Boot

Note: For detailed instructions on how to configure Security Boot settings, refer to the Security Boot Configuration User's Guide posted on the web page under the link: https://www.supermicro.com/support/manuals/.

The following information is displayed:

- System Mode
- Secure Boot

Secure Boot

Select Enabled to configure Secure Boot settings. The options are **Disabled** and Enabled.

Secure Boot Mode

Use this feature to select the desired secure boot mode for the system. The options are Standard and **Custom**.

CSM Support

If this feature is set to Enabled, legacy BIOS boot mode will be supported by the system. Be sure to use a device that can support legacy boot. The options are Disabled and **Enabled**.

▶Enter Audit Mode (Available when "Secure Boot Mode" is set to Custom)

Select Ok to enter the Audit Mode workflow. It will result in erasing of Platform Key (PK) variables and reset the system to the Setup/Audit Mode.

▶Enter Deployed Mode / Exit Deployed Mode (Available when "Secure Boot Mode" is set to Custom)

Select Ok to reset the system to the User Mode or to the Deployed Mode.

▶Key Management (Available when "Secure Boot Mode" is set to Custom)

The following information is displayed:

- Vendor Keys

Provision Factory Defaults

Select Enabled to install the provision factory default settings after a platform reset while the system is in the Setup Mode. The options are **Disabled** and Enabled.

▶Restore Factory Keys (Available when any secure keys have been installed)

Select Yes to restore manufacturer default keys to ensure system security. The options are **Yes** and No. Selecting Yes will reset the system to the Deployed mode.

▶Reset To Setup Mode (Available when any secure keys have been installed)

This feature resets the system to the Setup Mode. The options are **Yes** and No.

▶Export Secure Boot Variables (Available when any secure keys have been installed)

This feature exports the NVRAM contents of secure boot variables to a storage device. The options are **Yes** and No.

▶Enroll Efi Image

This feature allows the Efi image to run in the secure boot mode, which will enroll the SHA256 Hash certificate of a PE image into the Authorized Signature Database (DB).

Secure Boot variable / Size / Keys / Key Source

▶Platform Key (PK)

Use this feature to enter and configure a set of values to be used as platform firmware keys for the system. These values also indicate the sizes, keys numbers, and the sources of the authorized signatures. Select Update to update the platform key.

▶Key Exchange Keys (KEK)

Use this feature to enter and configure a set of values to be used as Key-Exchange-Keys for the system. These values also indicate the sizes, keys numbers, and the sources of the authorized signatures. Select Update to update your "Key Exchange Keys." Select Append to append your "Key Exchange Keys."

▶Authorized Signatures (db)

Use this feature to enter and configure a set of values to be used as Authorized Signatures for the system. These values also indicate the sizes, keys numbers, and the sources of the authorized signatures. Select Update to update your "Authorized Signatures." Select Append to append your "Authorized Signatures."

▶Forbidden Signatures (dbx)

Use this feature to enter and configure a set of values to be used as Forbidden Signatures for the system. These values also indicate sizes, key numbers, and key sources of the forbidden signatures. Select Update to update your "Forbidden Signatures." Select Append to append your "Forbidden Signatures."

▶Authorized TimeStamps (dbt)

This feature allows you to set and save the timestamps for the authorized signatures, which will indicate the time when these signatures are entered into the system. These values also indicate sizes, keys, and key sources of the authorized timestamps. Select Update to update your "Authorized TimeStamps." Select Append to append your "Authorized TimeStamps."

▶OsRecovery Signature (dbr)

This feature allows you to set and save the authorized signatures used for OS recovery. Select Update to update your "OS Recovery Signatures." These values also indicate sizes, keys, and key sources of the OsRecovery signatures. Select Append to append your "OS Recovery Signatures."

TCG Storage Security Configuration:

▶(Storage Device Name) (Available when a storage device is detected and compliant with TCG specifications)

Select this device. Press <Enter> and the following information is displayed:

- TCG Storage Security Password Description:
- PASSWORD CONFIGURATION:
  - Security Subsystem Class:
  - Security Supported:
  - Security Enabled:
  - Security Locked:
  - Security Frozen:
  - Admin Pwd Status:

Set Admin Password

Use this feature to set the administrator password for this storage device.

Set User Password (Available when the administrator password has been set)

Use this feature to set the user password for this storage device.

Device Reset

Use this feature to reset the password configuration for this storage device.

4.7 Boot

Use this feature to configure Boot settings:

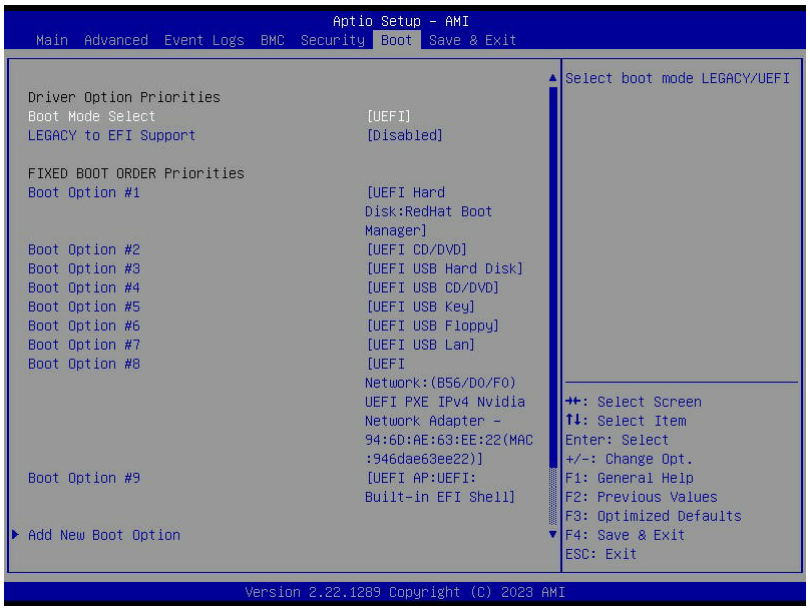


Figure 4-6: Boot Tab

Boot Mode Select

Use this feature to select the type of devices from which the system will boot. The options are Legacy, **UEFI**, and Dual.

Note: When "Boot Mode Select" is set to Dual, all OPROM-related features will be set to Legacy.

LEGACY to EFI Support

Select Enabled to boot EFI OS support after a Legacy boot order has failed. The options are **Disabled** and Enabled.

FIXED BOOT Option Priorities

This feature prioritizes the order of a bootable device from which the system will boot. Press <Enter> on each item sequentially to select devices.

When "Boot Mode Select" is set to Dual, the following features will be displayed for configuration:

- Boot Option #1 through Boot Option #17

When "Boot Mode Select" is set to Legacy, the following features will be displayed for configuration:

- Boot Option #1 through Boot Option #8

When "Boot Mode Select" is set to UEFI, the following features will be displayed for configuration:

- Boot Option #1 through Boot Option #9

▶Add New Boot Option (Available when any storage device is detected by the BIOS)

This feature allows you to add a new boot option to the boot priority features for system boot.

Add Boot option

This feature allows you to specify the name of a new device to be used for boot option.

Path for Boot option

Use this feature to enter the path for the new boot option in the format fsx:\path\filename.efi.

Boot Option File Path

This feature allows you to specify the file path for the new boot option.

Create

After the name and the file path for the boot option are set, press <Enter> to create the new boot option in the boot priority list.

▶Delete Boot Option

This feature allows you to select a boot device to delete from the boot priority list.

Delete Boot Option

This feature allows you to remove an EFI boot option from the boot priority list.

▶UEFI NETWORK Drive BBS Priorities

This feature allows you to set the system boot order for detected UEFI network devices.

▶UEFI Application Boot Priorities

This feature allows you to set the system boot order for detected UEFI application devices.

▶UEFI USB Key Drive BBS Priorities

This feature allows you to set the system boot order for detected UEFI USB key drive devices.

▶UEFI Hard Disk Drive BBS Priorities

This feature allows you to set the system boot order for detected UEFI HDD devices.

▶Hard Disk Drive BBS Priorities

This feature allows you to set the system boot order for detected HDD devices.

▶USB Key Drive BBS Priorities

This feature allows you to set the system boot order for detected USB key devices.

▶NETWORK Drive BBS Priorities

This feature allows you to set the system boot order for detected network devices.

4.8 Save & Exit

Select Save & Exit from the BIOS Setup screen to configure the settings.

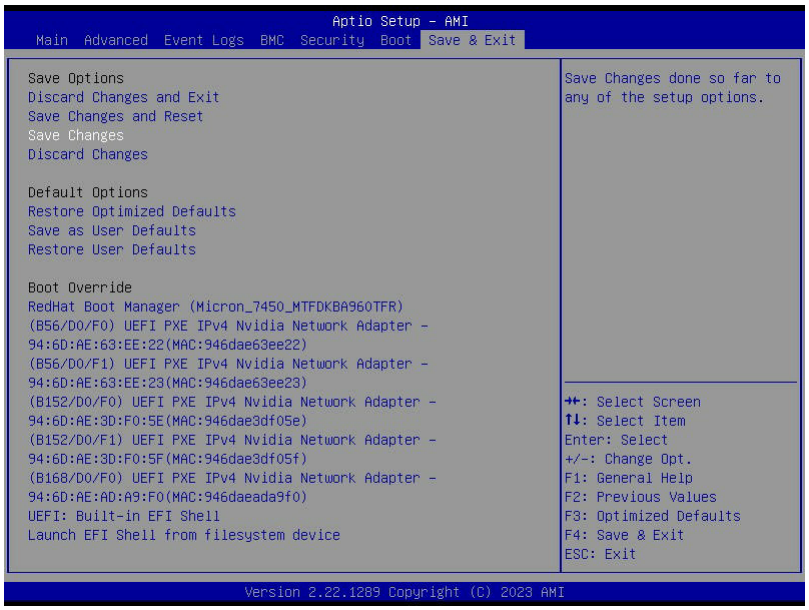


Figure 4-7: Save & Exit Tab

Save Options

Discard Changes and Exit

Use this feature to exit from the BIOS Setup utility without making any permanent changes to the system configuration and reboot the computer.

Save Changes and Reset

When you have completed system configuration changes, use this feature to exit the BIOS Setup utility and reboot the computer for the new system configuration parameters to become effective.

Save Changes

When you have completed system configuration changes, use this feature to save all changes you've made. This will not reset (reboot) the system.

Discard Changes

Select this feature and press <Enter> to discard all the changes you've made and return to the BIOS Setup utility.

Default Options

Restore Optimized Defaults

Select this feature and press <Enter> to load manufacturer optimized default settings which are intended for maximum system performance but not for maximum stability.

Note: For the changes to take effect, reboot the system to ensure that your system has the optimized default settings.

Save as User Defaults

Select this feature and press <Enter> to save all changes on the default values specified in the BIOS Setup utility for future use.

Restore User Defaults

Select this feature and press <Enter> to retrieve user-defined default settings that have been saved previously.

Boot Override

This feature allows you to override the Boot priorities sequence in the Boot menu, and immediately boot the system with a device specified instead of the one specified in the boot list. This is a one-time override.

Appendix A

BIOS POST Codes

A.1 BIOS POST Codes

The AMI BIOS supplies additional checkpoint codes, which are documented online at https://www.supermicro.com/support/manuals/ ("AMI BIOS POST Codes User's Guide").

For information on AMI updates, refer to http://www.ami.com/products/.

Appendix B

Software

After your system hardware has been installed, you can install the Operating System (OS), configure RAID settings, and install the drivers.

B.1 Microsoft Windows OS Installation

If you will be using RAID, you must configure RAID settings before installing the Windows OS and the RAID driver. Refer to the RAID Configuration User Guides posted on our website at www.supermicro.com/support/manuals.

Installing the OS

1. Create a method to access the MS Windows installation ISO file. That might be a media drive, perhaps using an external USB/SATA drive, a USB flash drive, or the BMC KVM console.

2. Retrieve the proper RST/RSTe driver. Go to the Supermicro webpage for your motherboard and click on "Download the Latest Drivers and Utilities," select the proper driver, and copy it to a USB flash drive.

3. Boot from a bootable device with Windows OS installation. You can see a bootable device list by pressing **F11** during the system startup.

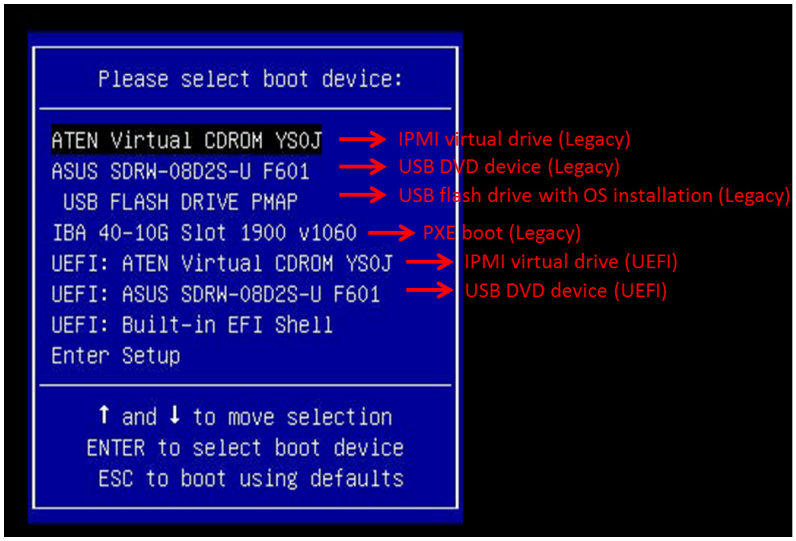


Figure B-1: Motherboard Drivers and Tools Menu

4. During Windows Setup, continue to the dialogue box where you select the drives on which to install Windows. If the disk you want to use is not listed, click on the “Load driver” link at the bottom left corner.

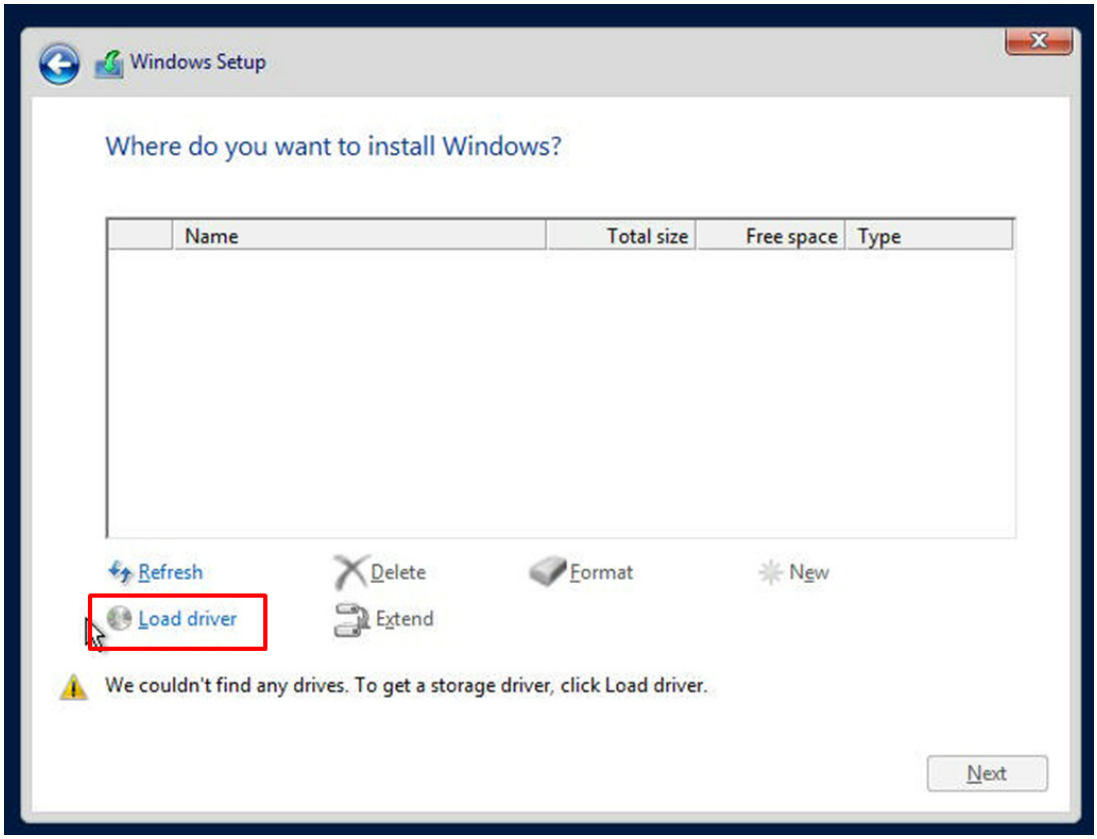


Figure B-2: Windows Setup

To load the driver, browse the USB flash drive for the proper driver files.

- For RAID, choose the SATA/sSATA RAID driver indicated, and then choose the storage drive on which you want to install it.
- For non-RAID, choose the SATA/sSATA AHCI driver indicated, and then choose the storage drive on which you want to install it.

5. Once all devices are specified, continue with the installation.
6. After the Windows OS installation has completed, the system will automatically reboot multiple times.

B.2 Driver Installation

The Supermicro website contains drivers and utilities for your system at https://www.supermicro.com/wdl/driver. Some of these must be installed, such as the chipset driver.

After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to a USB flash drive or a media drive. You may also use a utility to extract the ISO file if preferred.

Another option is to go to the Supermicro website at http://www.supermicro.com/products/. Find the product page for your motherboard, and "Download the Latest Drivers and Utilities".

Insert the flash drive or disk, and the following screenshot should appear:

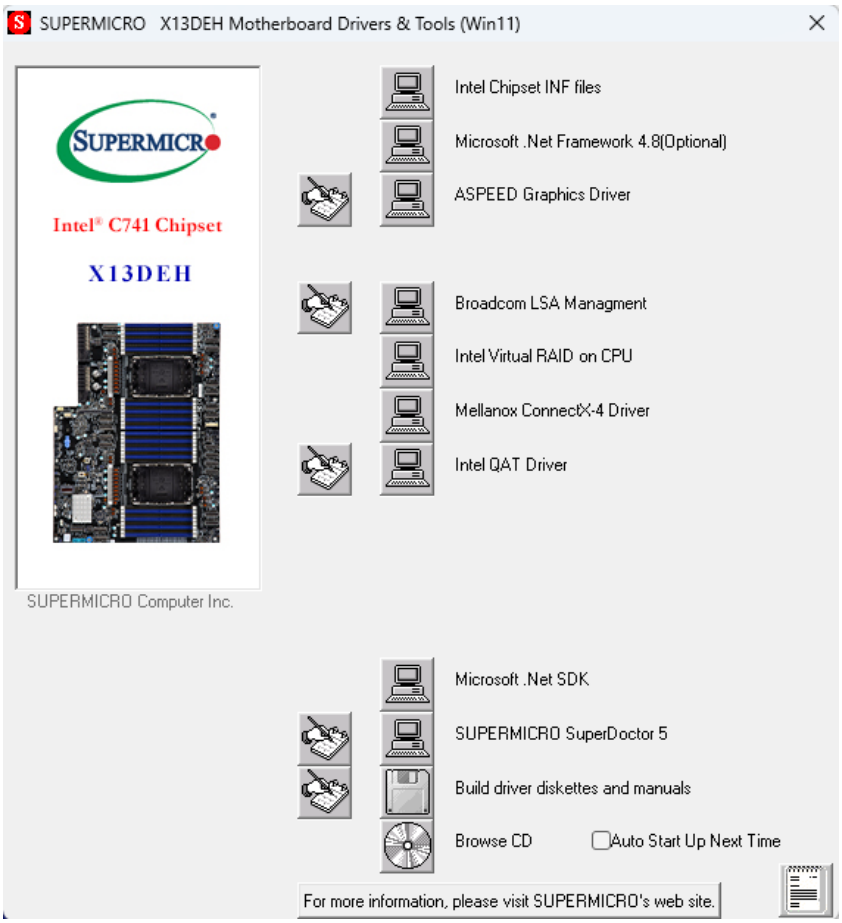


Figure B-3: Motherboard Drivers and Tools Menu

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to bottom) one at a time. **After installing each item, you must reboot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view all the content.

B.3 Baseboard Management Controller (BMC)

The X13DEH supports the ASPEED AST2600 Baseboard Management Controller (BMC). BMC is used to provide remote access, system monitoring, and management. There are several BIOS settings that are related to BMC.

For general documentation and information on BMC, visit our website at: http://www.supermicro.com/products/nfo/BMC.cfm.

B.4 Logging into the BMC

Supermicro ships standard products with a unique password for the BMC ADMIN user. This password can be found on a label on the motherboard.

When logging in to the BMC for the first time, use the unique password provided by Supermicro to log in. You can change the unique password to a user name and password of your choice for subsequent logins.

For more information regarding BMC passwords, visit our website at http://www.supermicro.com/bmcpassword.

Appendix C

Standardized Warning Statements

The following statements are industry standard warnings, provided to alert the user of situations where potential product damage or bodily injury may occur. Should you have any questions or experience any difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install/remove components or configure system settings.

Read this section in its entirety before installing or configuring components.

These warnings may also be found on our website at http://www.supermicro.com/about/policies/safety_information.cfm.

Battery Handling



Warning! There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

警告

电池更换不当会有爆炸危险。请只使用同类电池或制造商推荐的功能相当的电池更换原有电池。请按制造商的说明处理废旧电池。

警告

電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。

Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

Attention

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

¡Advertencia!

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

אזהרה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף
את הסוללה בסוג התואם מחברת יצרן מומלצת.
סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة اسحبذال البطارية بطريقة غير صحيحة فعليل
اسحبذال البطارية
فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة
جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

Waarschuwing

Er is ontploffingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

Product Disposal



Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

סילוק המוצר

אזהרה!

סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القانين واللائح البطنية

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

(Disclaimer Continued)

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.