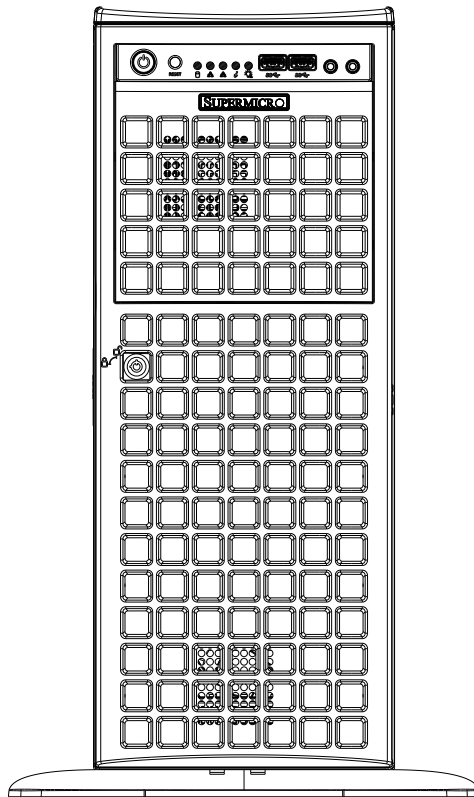




# SUPERWORKSTATION 540A-TR



USER'S MANUAL

Revision 1.0b

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# Preface

## About this Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the workstation. Installation and maintenance should be performed by experienced technicians only.

Please refer to the 540A-TR workstation specifications page on our website for updates on supported memory, processors, and operating systems (<http://www.supermicro.com>).

## Notes

For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your workstation.

- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: <https://www.supermicro.com/wdl>
- Product safety info: [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm)

If you have any questions, please contact our support team at:  
[support@supermicro.com](mailto:support@supermicro.com)

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

## Secure Data Deletion

A secure data deletion tool designed to fully erase all data from storage devices can be found on our website: [https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Log9\\_Secure\\_Data\\_Deletion\\_Utility/](https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Log9_Secure_Data_Deletion_Utility/)

## Warnings

Special attention should be given to the following symbols used in this manual.



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



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

# Contents

Contacting Supermicro.....	9
<b>Chapter 1 Introduction</b>	
1.1 Overview.....	10
1.2 System Features .....	11
Front View .....	11
Control Panel.....	13
Rear View.....	14
1.3 System Block Diagram.....	15
1.4 Motherboard Layout .....	16
Quick Reference Table.....	18
<b>Chapter 2 Installation</b>	
2.1 Overview.....	20
2.2 Unpacking the System .....	20
2.3 Preparing for Setup.....	20
Choosing a Setup Location.....	20
Rack Precautions .....	21
Workstation Precautions .....	21
Rack Mounting Considerations .....	21
Ambient Operating Temperature.....	21
Airflow .....	22
Mechanical Loading.....	22
Circuit Overloading .....	22
Reliable Ground.....	22
2.4 Preparing the Chassis for Rack Mounting .....	23
Removing the Top Tower Cover.....	23
Removing the Chassis Feet.....	23
2.5 Installing the Rails .....	24
Identifying the Sections of the Rack Rails .....	24
Installing the Inner Rails to the Chassis .....	25
Installing the Outer Rails to the Rack.....	26
2.6 Installing the Chassis into the Rack.....	27



## **Chapter 3 Maintenance and Component Installation**

3.1 Removing Power .....	29
3.2 Accessing the System.....	30
3.3 Static-Sensitive Devices.....	33
Precautions .....	33
Unpacking .....	33
3.4 Processor and Heatsink Installation.....	34
The 3rd Gen. Intel Xeon Scalable Processor .....	34
1. The 3rd Gen. Intel Xeon Scalable Processor .....	35
2. The Processor Carrier .....	36
3. Heatsink .....	37
Overview of the CPU Socket .....	38
Overview of the Processor Carrier Assembly .....	39
Overview of the Processor Heatsink Module.....	40
Creating the Processor Carrier Assembly.....	41
Creating the Processor Heatsink Module (PHM).....	44
Preparing the CPU Socket for Installation .....	45
Preparing to Install the Processor Heatsink Module (PHM) into the CPU Socket.....	46
Installing the Processor Heatsink Module (PHM) .....	47
Removing the Processor Heatsink Module from the CPU Socket .....	49
Removing the Processor Carrier Assembly from the Processor Heatsink Module (PHM)..	50
Removing the Processor from the Processor Carrier Assembly .....	51
3.5 Memory.....	52
Memory Support.....	52
Memory Installation Sequence.....	52
General Memory Population Requirements.....	52
Guidelines Regarding Mixing DIMMs .....	53
DDR4 Memory Population Guidelines .....	54
DIMM Installation .....	55
DIMM Removal .....	55
3.6 Motherboard Battery.....	56
3.7 Storage Drives.....	57
Storage Drive Backplane.....	58

Installing Components in the 5.25" Drive Bays .....	58
Removing the Empty Drive Bay .....	58
Adding a DVD-ROM Drive (optional).....	58
M.2 SSD Installation .....	59
2280 M.2 NVMe SSD Module Installation .....	60
2260 M.2 NVMe SSD Module Installation .....	60
22110 M.2 NVMe SSD Module Installation.....	61
System Cooling .....	62
System Fan Failure.....	62
Replacing System Fans .....	62
Power Supply .....	64
Replacing the Power Supply .....	64
<b>Chapter 4 Motherboard Connections</b>	
4.1 Power Connections .....	65
4.2 Headers and Connectors .....	66
Control Panel .....	71
Front Control Panel LEDs .....	72
4.3 Rear I/O Ports .....	76
4.4 Jumper Settings .....	79
How Jumpers Work.....	79
4.5 LED Indicators .....	82
4.6 Storage Ports .....	84
<b>Chapter 5 Software</b>	
5.1 Microsoft Windows OS Installation.....	85
5.2 Driver Installation.....	87
5.3 SuperDoctor® 5.....	88
5.4 BMC.....	89
BMC ADMIN User Password .....	89
<b>Chapter 6 Optional Components</b>	
6.1 Storage Protocols Supported .....	90
6.2 Power Supply Modules .....	90
6.3 Cable Management Arm.....	91
6.4 TPM Security Module.....	93
6.5 Intel Virtual RAID on CPU (VROC).....	94
Requirements and Restrictions .....	94

Supported SSDs and Operating Systems .....	94
Additional Information .....	95
Hardware Key .....	95
Configuring NVMe RAID Manually.....	96
Status Indications .....	101
Hot-Swap Drives .....	101
Hot-unplug .....	101
Hot-plug .....	101
Related Information Links .....	101
<b>Chapter 7 Troubleshooting and Support</b>	
7.1 Information Resources .....	102
Website .....	102
Direct Links for the 540A-TR System.....	102
Direct Links for General Support and Information .....	102
7.2 Intelligent Platform Management Interface (IPMI) .....	103
7.3 Troubleshooting Procedures .....	104
No Power .....	104
No Video .....	106
System Boot Failure .....	106
Memory Errors .....	106
Losing the System's Setup Configuration .....	106
When the System Becomes Unstable .....	106
7.4 BIOS Error Beep (POST) Codes .....	108
Additional BIOS POST Codes .....	108
7.5 Crash Dump Using IPMI .....	109
7.6 UEFI BIOS Recovery .....	110
Overview .....	110
Recovering the UEFI BIOS Image.....	110
Recovering the Main BIOS Block with a USB Device .....	110
7.7 CMOS Clear .....	115
7.8 BMC Reset .....	115
7.9 Where to Get Replacement Components .....	116
7.10 Reporting an Issue .....	116
Technical Support Procedures .....	116

Returning Merchandise for Service.....	116
Vendor Support Filing System .....	117
7.11 Feedback.....	117
7.12 Contacting Supermicro.....	118

***Appendix A Standardized Warning Statements for AC Systems***

***Appendix B System Specifications***

***Appendix C BSMI RoHS and Warnings***

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RMA@supermicro.com.tw (RMA Support)

Website: [www.supermicro.com.tw](http://www.supermicro.com.tw)

# Chapter 1

## Introduction

### 1.1 Overview

This chapter provides a brief outline of the functions and features of the SuperWorkstation 540A-TR.

The following provides an overview of the specifications and capabilities.

System Overview	
<b>Motherboard</b>	X12SPA-TF
<b>Chassis</b>	CSE-747BTS-R2K20BP
<b>Processor Support</b>	3rd Generation Intel® Xeon® Scalable processors
<b>Memory</b>	1TB of ECC RDIMM, 4TB of 3DS RDIMM, 2TB of LRDIMM, or 4TB of 3DS LRDIMM with speeds of up to 3200MHz (2DPC) in 16 DDR4 (288-pin) SMD DIMM slots
<b>Drive Support</b>	Eight 3.5" hot-swap storage drive bays Four M.2 sockets (M-key PCIe 4.0 x4 in the 2260/2280/22110 form factor.
<b>Expansion Slots</b>	Four PCIe 4.0 x16 slots (CPU SLOT1, 3, 5, 7) and three PCIe 4.0 x8 slots (in x16 slots) (CPU SLOT2, 4, 6) (supports seven single-width or four double-width GPU cards) Three 5.25" external peripheral bays
<b>I/O Ports</b>	Front: Two USB 3.2 Gen1 ports, one power button, one system reset button, audio port, two network activity LEDs, HDD LED, power status LED, system information LED Rear: One USB 3.2 Gen2 port, four USB 3.2 Gen1 ports, one GbE port via Intel i210AT, one 10GbE port via AQC107, one BMC LAN port, one VGA port via the BMC, one COM port, one HD audio 7.1 channel connector via Realtek ALC888S, and two USB2.0 ports Onboard: USB 3.2 Gen2, USB 3.2 Gen1, USB 2.0 header, one TPM header, Type-A USB 3.2 Gen2
<b>System Cooling</b>	Four 9.2cm and two 8cm heavy duty fans with optimal fan speed control
<b>Power</b>	1+1 2200W Titanium Redundant Power Supply with PMbus
<b>Form Factor</b>	4U Tower/ Rackmount 18.1 x 7 x 26.5in. / 460 x 178 x 673mm (HxWxD)

**Notes:** A Quick Reference Guide can be found on the product page of the Supermicro website.

The following safety models associated with the 540A-TR have been certified as compliant with UL or CSA: 747B-R22X12, 747B-22, 747-22.

## 1.2 System Features

The following views of the system display the main features. Refer to [Appendix B](#) for additional specifications.

### Front View

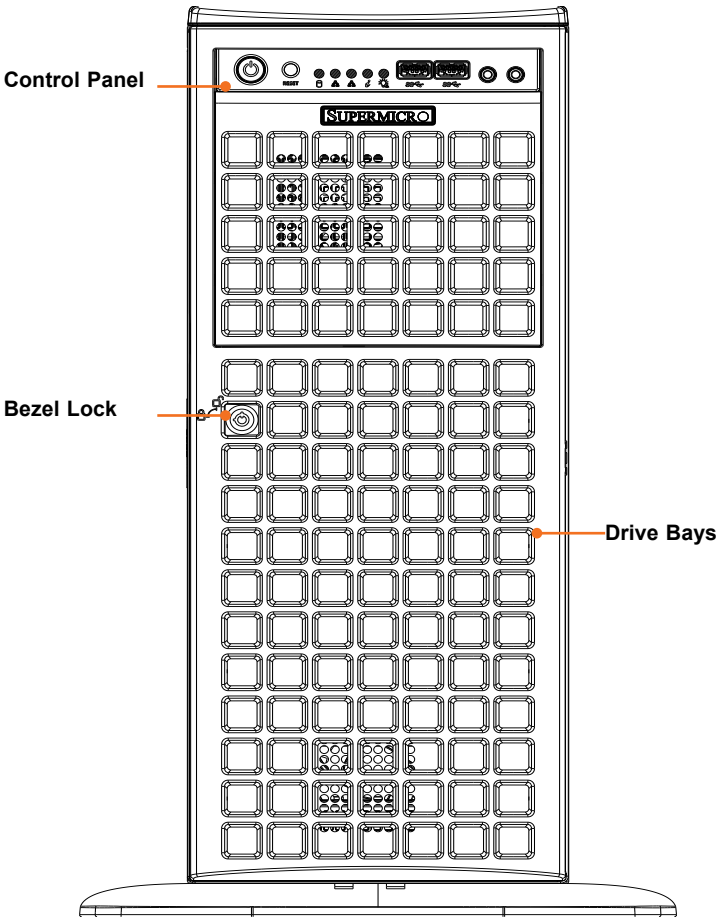


Figure 1-1. Front View 540A-TR

System Features: Front	
Feature	Description
Control Panel	Front control panel (see <a href="#">Control Panel</a> section for details)
Bezel Lock	Locks the bezel for secure access
Hot-swap Drive Bays	Eight 3.5" drive bays

Power Supply Indicators		
Power Supply Condition	Green LED	Amber LED
No AC Power to Power Supply	OFF	OFF
Power Supply critical events causing a shutdown/ failure/ OCP/ OVP/ Fan Fail/ OTP/ UVP	OFF	Amber LED
Power Supply Warning Events Where the power supply continues to operate; High temperature; Over voltage; under voltage, etc.	OFF	1Hz Blink Amber
AC present only 12VSB ON (PS OFF)	1Hz Blink Green	OFF
Output ON and OK	Green	OFF
AC cord unplugged and in redundant mode	OFF	Amber



## Control Panel

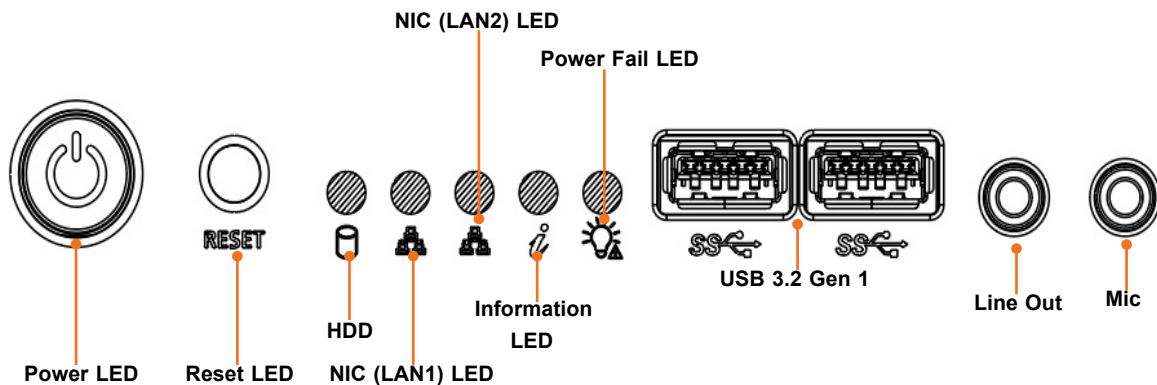


Figure 1-2. Control Panel

Control Panel Features	
Feature	Description
Power button	The main power switch is used to apply or remove power from the power supply to the workstation. Turning off system power with this button removes the main power but maintains standby power. To perform many maintenance tasks, you must unplug the system before servicing.
Reset button	The reset button is used to reboot the system.
HDD LED	Indicates hard drive activity on the hard drive when flashing.
NIC (LAN1) LED	Indicates network activity on LAN1 when flashing.
NIC (LAN2) LED	Indicates network activity on LAN2 when flashing.
Information LED	Alerts operator of several states. See table below for details.
Power Fail LED	Indicates a power failure to the system's power supply units.
USB3.2 Gen1	Two USB 3.2 Gen 1 ports
Line out	Line out port.
Mic	Mic port

Information LED	
Status	Description
Continuously ON and red	An overheat condition has occurred. (This may be caused by cable congestion.)
Blinking red (1Hz)	Fan failure, check for an inoperative fan.
Blinking red (0.25Hz)	Power failure, check for a non-operational power supply.
Solid blue	UID has been activated locally to locate the workstation in a rack environment.
Blinking blue	UID has been activated using the BMC to locate the workstation in a rack environment.

Rear View

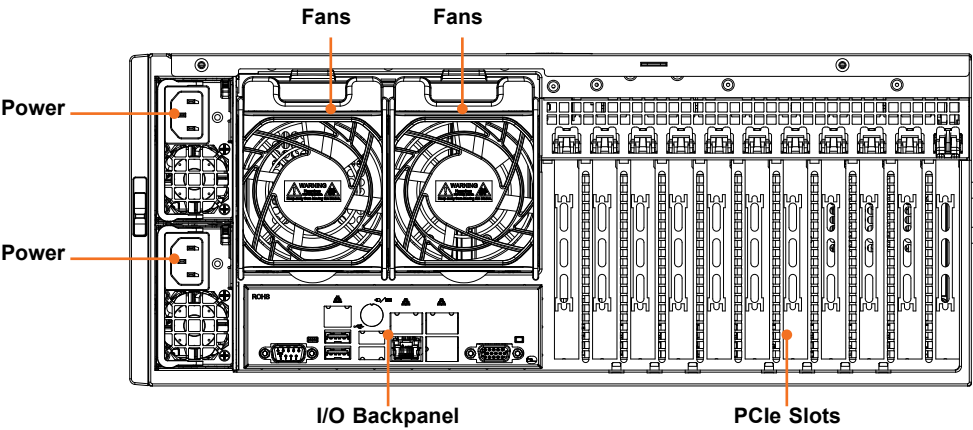


Figure 1-3. System: Rear View

System Features: Rear	
Feature	Description
Power	1+1 2200W Titanium Redundant Power Supply with PMbus
Fans	Two 8cm PWM hot-swap rear fans
I/O Backpanel	Rear input/output ports (details in Chapter 4)
PCIe Slots	Eleven full-height, full-length PCIe slots

## 1.3 System Block Diagram

The block diagram below shows the connections and relationships between the subsystems and major components of the overall system.

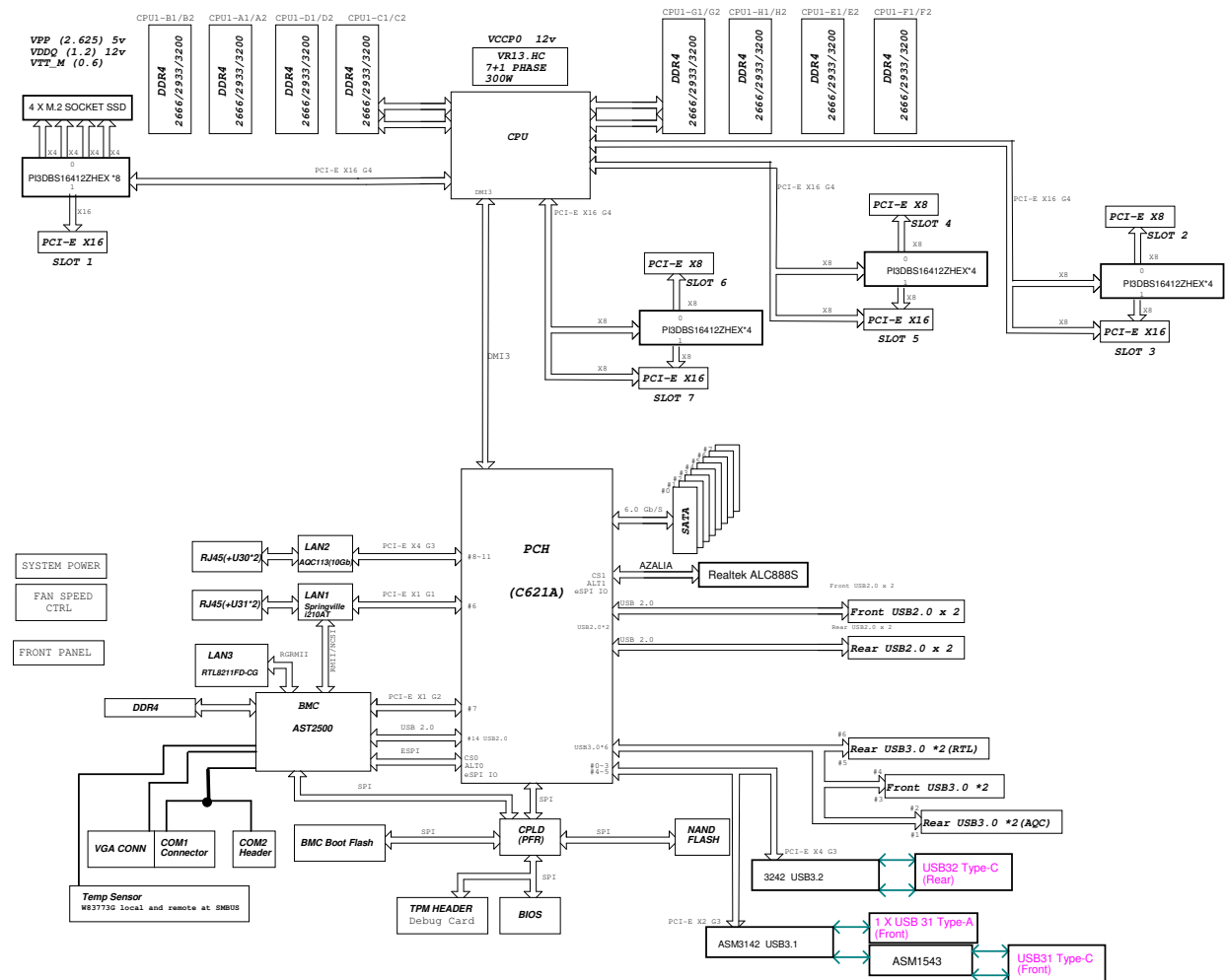


Figure 1-4. System Block Diagram

## 1.4 Motherboard Layout

Below is a layout of the X12SPA-TF motherboard with jumper, connector, and LED locations shown. See the table on the following page for descriptions. For detailed descriptions, pinout information, and jumper settings, refer to [Chapter 4](#) or the [Motherboard Manual](#).

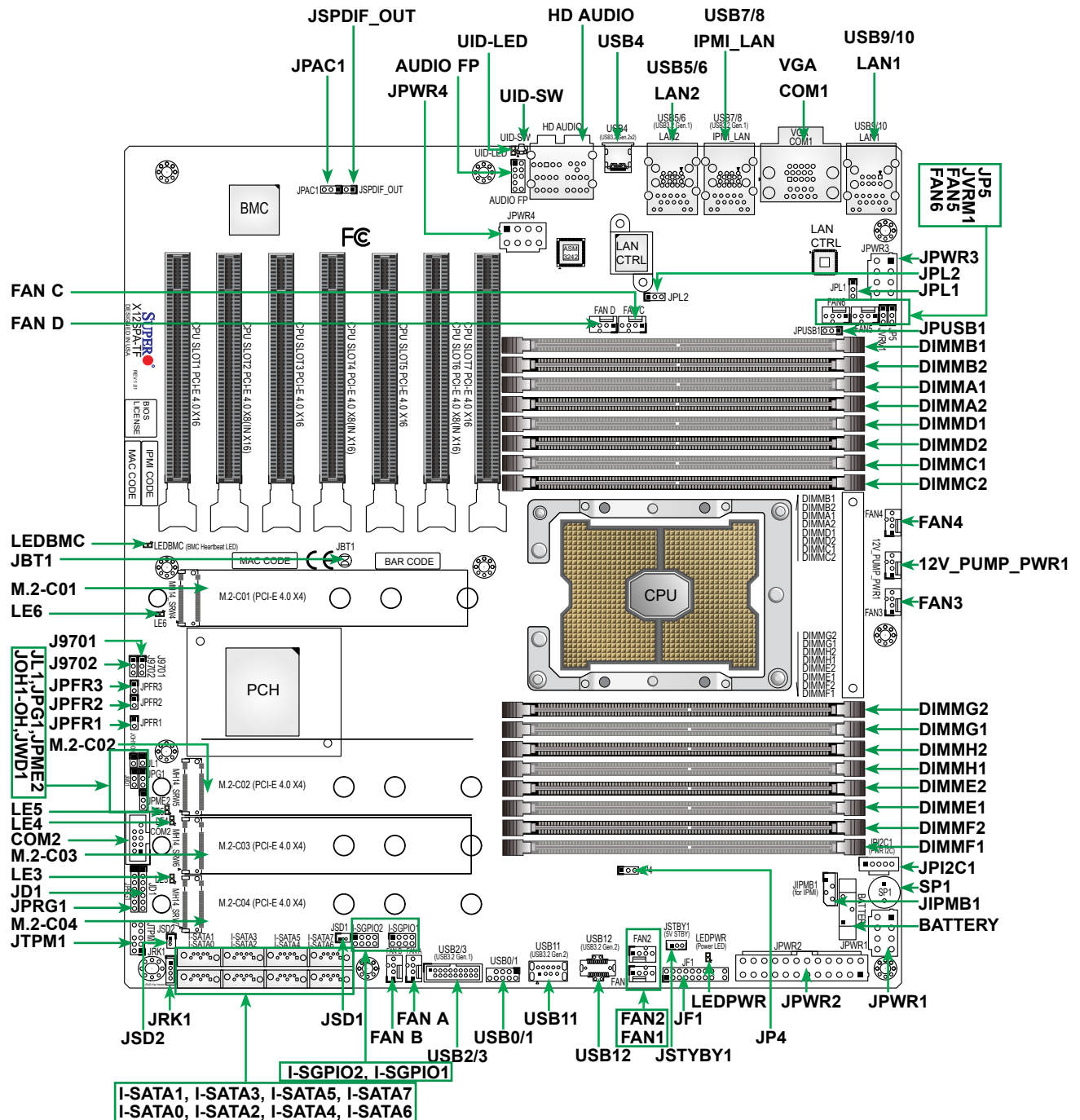



Figure 1-5. Motherboard Layout

**Notes:**

-  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 possible explosion.

## Quick Reference Table

Jumper	Description	Default Setting
JBT1	Clear CMOS (Onboard)	Short Pads to Clear CMOS
JP4	USB11/12 Disable	Pins 1-2 (Normal)
JP5	USB4 Disable	Pins 1-2 (Normal)
JPAC1	HD Audio Enable/Disable	Pins 1-2 (Enabled)
JPFR2	PFR Operation (Close: force power on without CPU installed)	Open (Normal PFR Operation)
JPFR3	PFR Force Recovery (Pins 1-2: force PFR recovery)	None (Normal)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1, JPL2	LAN1/LAN2 Enable/Disable	Pins 1-2 (Enabled)
JPME2	Intel Manufacturing Mode	Pins 1-2 (Normal)
JPUSB1	USB7/8 Wake Up	Pins 1-2 (Enabled)
JWD1	Watch Dog Function Enable	Pins 1-2 (Reset)

LED	Description	Status
LE3, LE4, LE5, LE6	M.2 LEDs for M.2-C04/M.2-C03/M.2-C02/M.2-C01	Blinking Green: Device Working
LEDBMC	BMC Heartbeat LED	Blinking Green: BMC Normal
LEDPWR	Onboard Power LED	Solid Green: Power On
UID-LED	Unit Identifier (UID) LED	Blue On: Unit Identified

Connector	Description
12V_PUMP_PWR1	12V 4-pin Power Connector for CPU Liquid Cooling Pump
AUDIO_FP	Front Panel Audio Header
BATTERY	Onboard Battery
COM1, COM2	COM1: COM Port (Back Panel), COM2: COM Header
CPU SLOT1/3/5/7	PCIe 4.0 x16 Slots
CPU SLOT2/4/6	PCIe 4.0 x8 Slots (in x16 slots)
FAN1 - FAN6	CPU Fan Headers
FAN A - FAN D	System Fan Headers
HD AUDIO	Back Panel High Definition Audio Ports
I-SATA0 - I-SATA7	Intel Serial ATA (SATA 3.0) Ports 0~7 (6Gb/second)
I-SGPIO1, I-SGPIO2	Serial General Purpose I/O Headers
IPMI_LAN	Dedicated IPMI LAN Port
JD1	Power LED / Speaker Header (Pins 1-3: Power LED, Pins 4-7: Speaker)
JF1	Front Control Panel Header

Connector	Description
JIPMB1	4-pin External I <sup>2</sup> C Header (for an IPMI card)
JL1	Chassis Intrusion Header
JOH1-OH	Overheat LED Header
JPI <sup>2</sup> C1	Power Supply SMBus I <sup>2</sup> C Header
JPWR1/3/4	+12V 8-pin CPU Power Connectors (Required)
JPWR2	24-pin ATX Main Power Connector (Required)
JRK1	Intel VROC RAID Key Header ( <b>Note:</b> A VROC hardware key is required to enable an M.2 RAID card.)
JSD1, JSD2	SATA DOM (Disk-On-Module) Power Connectors
JSPDIF_OUT	Sony/Philips Digital Interface (S/PDIF) Out Header
JSTBY1	Standby Power Header (5V)
JTPM1	Trusted Platform Module (TPM)/Port 80 Header
LAN1, LAN2	LAN1: RJ45 1GbE LAN Port, LAN2: RJ45 10GbE LAN Port
M.2-C01 - M.2-C04	PCIe 4.0 x4 M.2 M-key Sockets (Small form factor devices and other portable devices for high speed NVMe SSDs)
MH14_SRW4 - MH14_SRW7	M.2 Mounting Holes
SP1	Internal Speaker/Buzzer
UID-SW	Unit Identifier (UID) Switch / BMC Reset Button
USB0/1	Front Accessible USB 2.0 Header
USB2/3	Front Access USB 3.2 Gen. 1 Header
USB4	Back Panel USB 3.2 Gen. 2x2 Port
USB5,USB6, USB7,USB8	Back Panel USB 3.2 Gen. 1 Ports
USB9, USB10	Back Panel USB 2.0 Ports
USB11	Front Access Type-A USB 3.2 Gen. 2 Port
USB12	Front Access USB 3.2 Gen. 2 Header
VGA	VGA Port

# Chapter 2

## Installation

### 2.1 Overview

This chapter provides advice and instructions for rack or workstation installation. If your system is not already fully integrated with processors, system memory, etc., refer to [Chapter 3](#) for details on installing those specific components.

**Caution:** Electrostatic Discharge (ESD) can damage electronic components. To prevent such damage to PCBs (printed circuit boards), it is important to use a grounded wrist strap, handle all PCBs by their edges and keep them in anti-static bags when not in use.

### 2.2 Unpacking the System

Inspect the box in which the system was shipped, and note if it was damaged in any way. If any equipment appears damaged, file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the workstation. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise, and electromagnetic fields are generated. It will also require a grounded AC power outlet nearby. Be sure to read the precautions and considerations noted or in [Appendix A](#).

### 2.3 Preparing for Setup

The box in which the system was shipped should include the rackmount hardware needed to install it into the rack. Please read this section in its entirety before you begin the installation.

#### Choosing a Setup Location

- The system should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise, and electromagnetic fields are generated.
- Leave enough clearance in front of the rack so that you can open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow sufficient space for airflow and access when servicing.
- This product should be installed only in a Restricted Access Location (dedicated equipment rooms, service closets, etc.).



- This product is not suitable for use with visual display workplace devices according to §2 of the German Ordinance for Work with Visual Display Units.

## Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are extended to the floor so that the full weight of the rack rests on them.
- In single rack installations, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a workstation or other component from the rack.
- You should extend only one workstation or component at a time - extending two or more simultaneously may cause the rack to become unstable.

## Workstation Precautions

- Review the electrical and general safety precautions in [Appendix A](#).
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest workstation components at the bottom of the rack first and then work your way up.
- Use a regulating uninterruptible power supply (UPS) to protect the workstation from power surges and voltage spikes and to keep your system operating in case of a power failure.
- Allow any drives and power supply modules to cool before touching them.
- When not servicing, always keep the front door of the rack and all covers/panels on the workstation closed to maintain proper cooling.

## Rack Mounting Considerations

### *Ambient Operating Temperature*

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the room's ambient temperature. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (TMRA).

### ***Airflow***

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

### ***Mechanical Loading***

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

### ***Circuit Overloading***

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

### ***Reliable Ground***

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).



To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
- Slide rail mounted equipment is not to be used as a shelf or a workspace.



Slide rail mounted equipment is not to be used as a shelf or a workspace.



**Warning:** Do not pick up the workstation with the front handles. They are designed to pull the system from a rack only.

## 2.4 Preparing the Chassis for Rack Mounting

The chassis top tower cover and feet must be removed before rack installation.

### Removing the Top Tower Cover

1. Locate the blue cover lock at the rear of the cover.
2. Slide the lock to the right and push the cover forward.
3. Lift the top cover off the chassis.

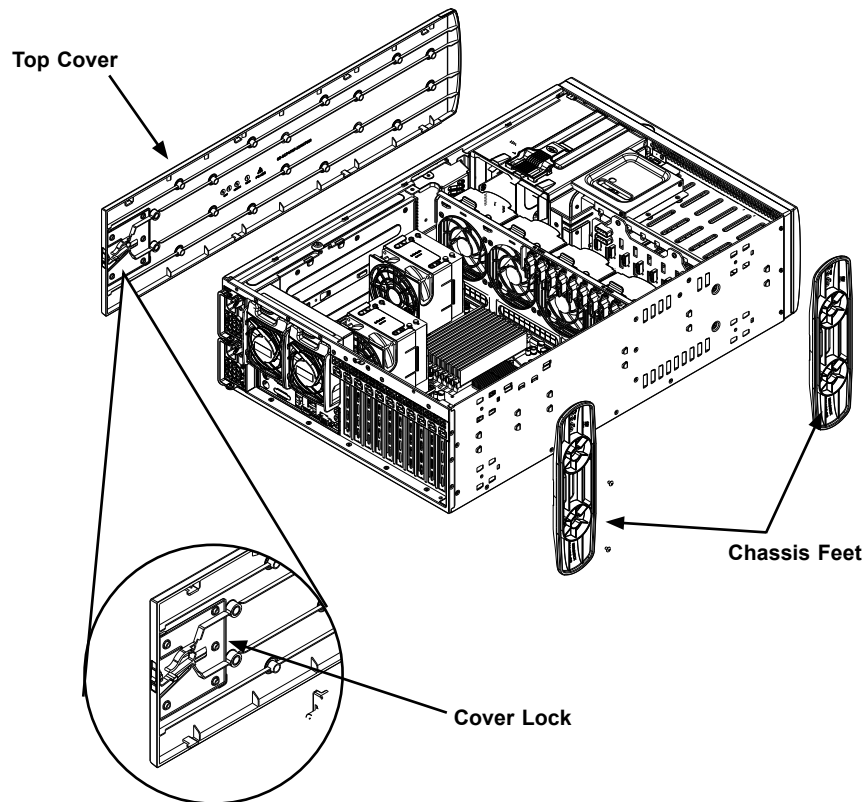


Figure 2-1. Removing the Top Tower Cover

### Removing the Chassis Feet

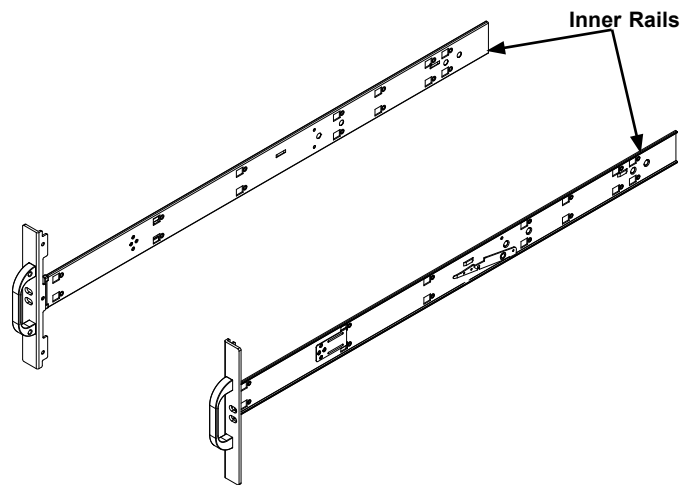
1. Lay the chassis on its side.
2. Remove the screws holding the chassis feet in place.
3. Each foot has a foot lock tab at the center. Use a flat head screwdriver to gently lift the foot lock upward. Slide the foot toward the rear of the chassis.

## 2.5 Installing the Rails

This section provides a guideline for installing the rails to the chassis and to the rack with the optional rack mount kit.

### Identifying the Sections of the Rack Rails

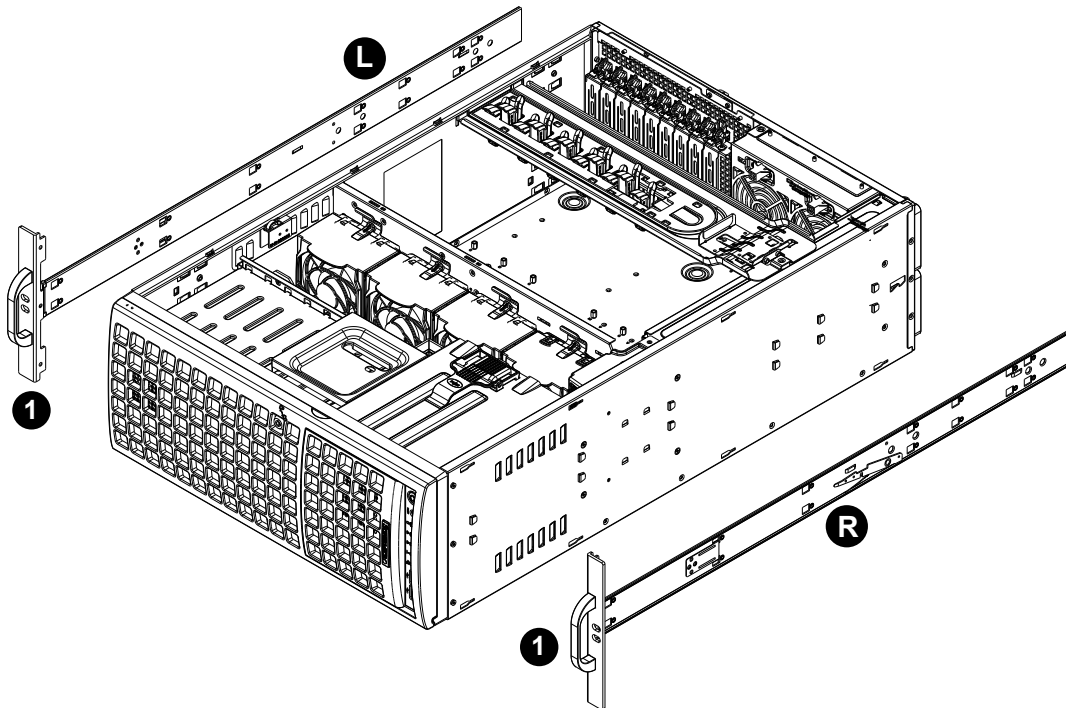
The chassis package includes two optional rack rail assemblies in the rack mounting kit. Each assembly consists of two sections: An inner fixed chassis rail that secures directly to the workstation chassis and an outer fixed rack rail that secures directly to the rack itself.



**Figure 2-2. Attaching the Inner Rack Rails**

## Installing the Inner Rails to the Chassis

1. Attach the handles to the front of the chassis with three screws each.
2. Identify the left and right inner rails. They are labeled on the rails and in the figure below.
3. Align each rail with the screw holes along the side of the chassis.
4. Screw the rails securely to the side of the chassis.

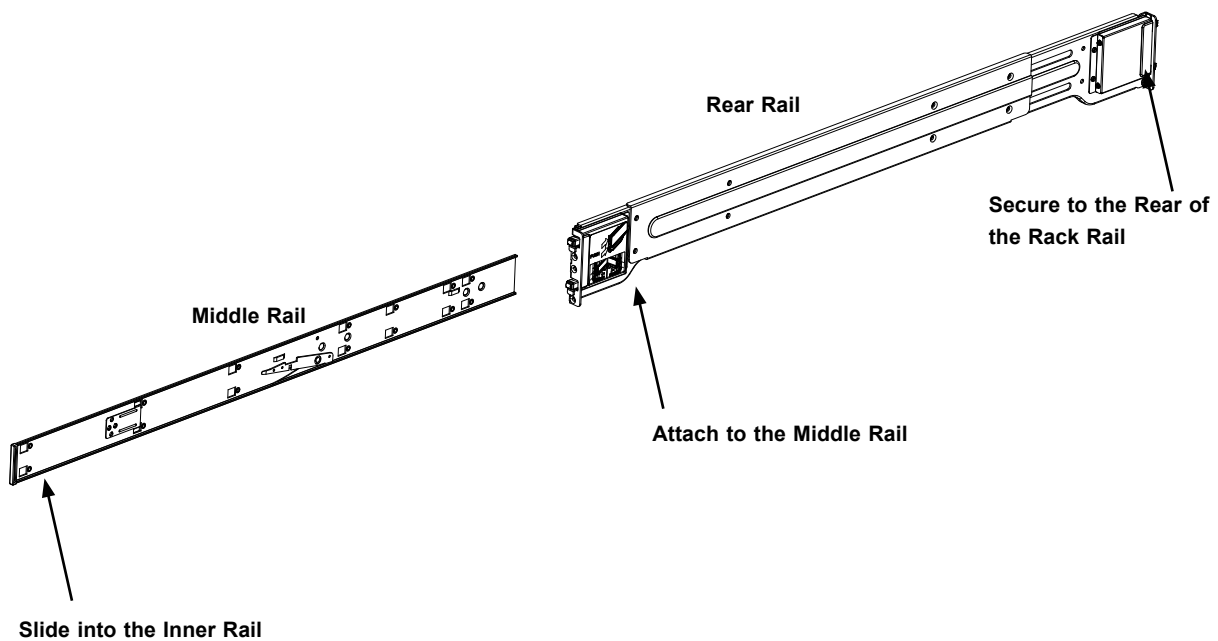


**Figure 2-3. Installing the Handles and Inner Rails to the Chassis**

## Installing the Outer Rails to the Rack

### *Installing the Outer Rails*

1. Attach the rear rail to the middle rail.
2. Adjust both to the proper distance so that the rails fit snugly into the rack.
3. Secure the rear rail with two M5 screws at the rear of the rack.
4. Repeat steps 1-3 for the left outer rail.

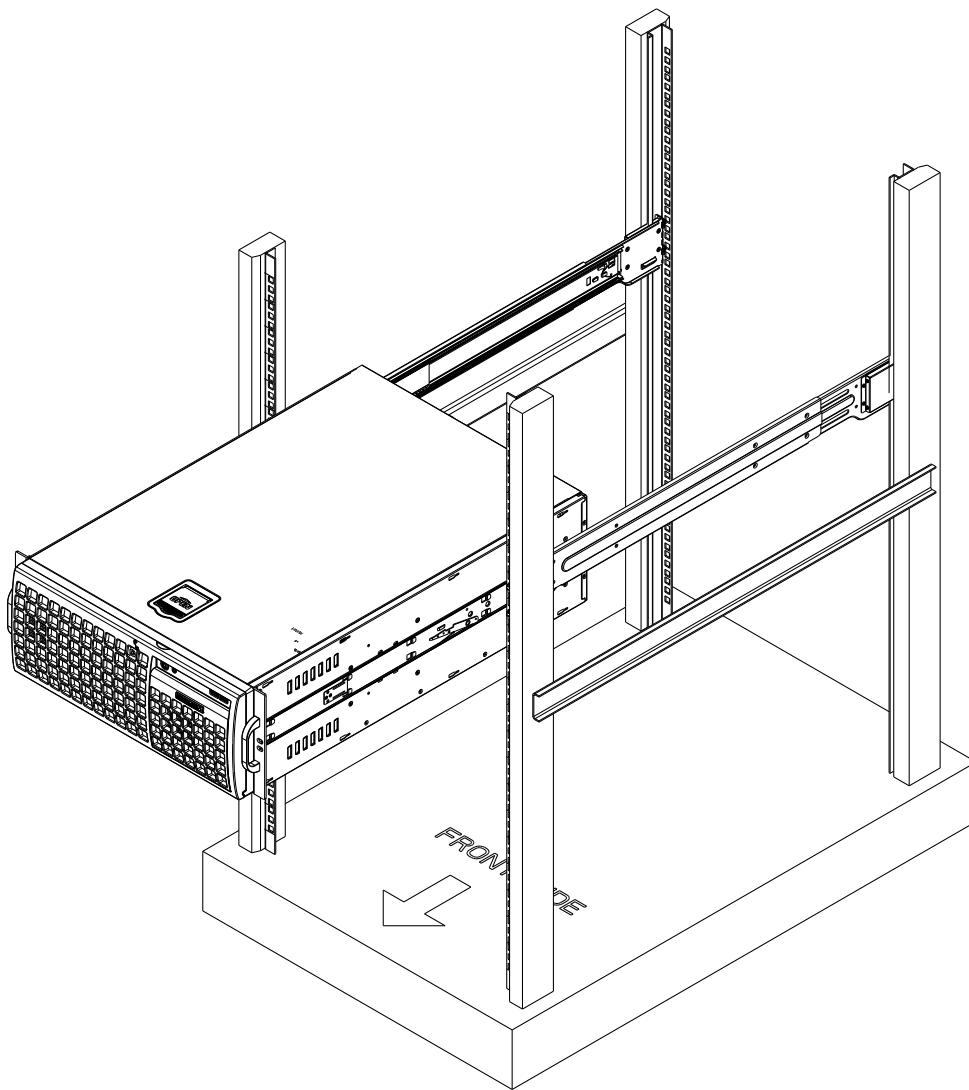


**Figure 2-4. Inner and Outer Rack Rail Sections**

## 2.6 Installing the Chassis into the Rack

With rails attached to both the chassis and the rack, install the system into the rack.

1. Confirm that the chassis includes the inner rails and the outer rails.
2. Align the inner chassis rails with the front of the outer rack rails.
3. Slide the inner rails into the outer rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). When the chassis has been pushed completely into the rack, you should hear the locking tabs "click" into the locked position.



**Figure 2-5. Installing the Workstation into the Rack**

**Note:** The figure is for illustrative purposes only. Always install workstations to the bottom of a rack first.



**Warning:** Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.



When initially installing the system to a rack, test that the rail locking tabs engage to prevent the system from being overextended. Have a rack lift in place as a precaution in case the test fails.



## Chapter 3

### Maintenance and Component Installation

This chapter provides instructions on installing and replacing main system components. To prevent compatibility issues, only use components that match the specifications and/or part numbers given.

Installation or replacement of most components requires that power first be removed from the system. Please follow the procedures given in each section.

#### 3.1 Removing Power

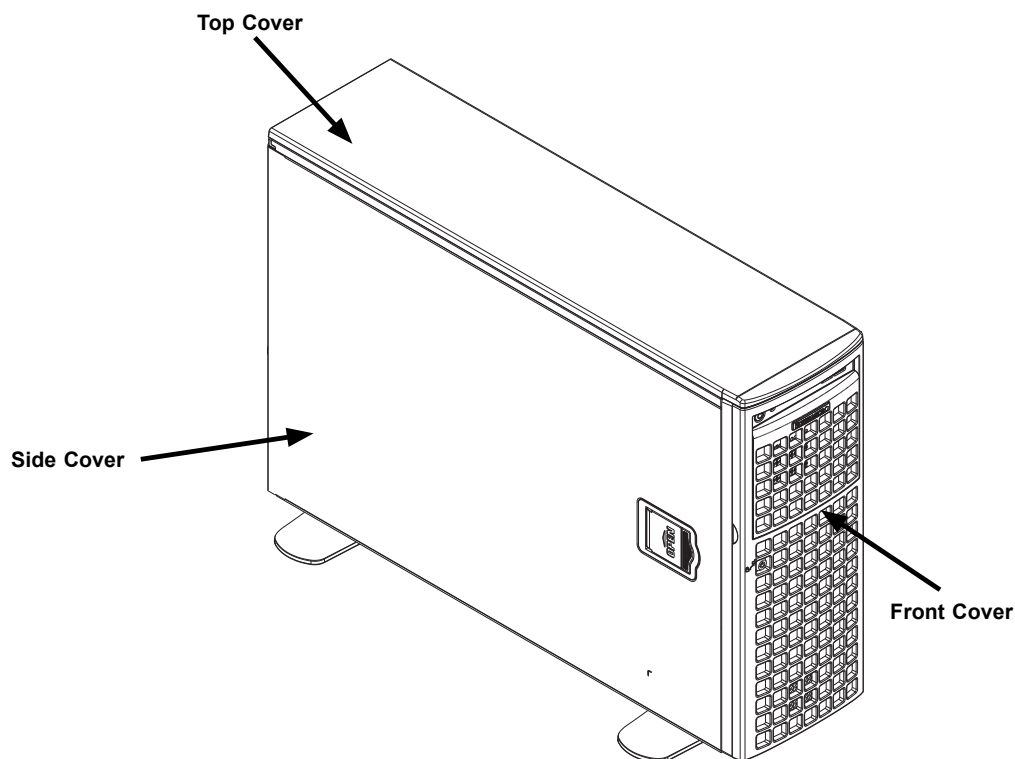
Use the following procedure to ensure that power has been removed from the system. This step is necessary when removing or installing non-hot-swap components or when replacing a non-redundant power supply.

1. Use the operating system to power down the system.
2. After the system has completely shut-down, disconnect the AC power cord(s) from the power strip or outlet. (If your system has more than one power supply, remove the AC or DC power cords from all power supply modules.)
3. Disconnect the power cord(s) from the power supply module(s).

## 3.2 Accessing the System

The CSE-747BTS-R2K20BP chassis features a removable top cover, side cover, and front cover which allows easy access to the inside of the chassis.

See [Section 2.4](#) for instructions to remove the top cover.

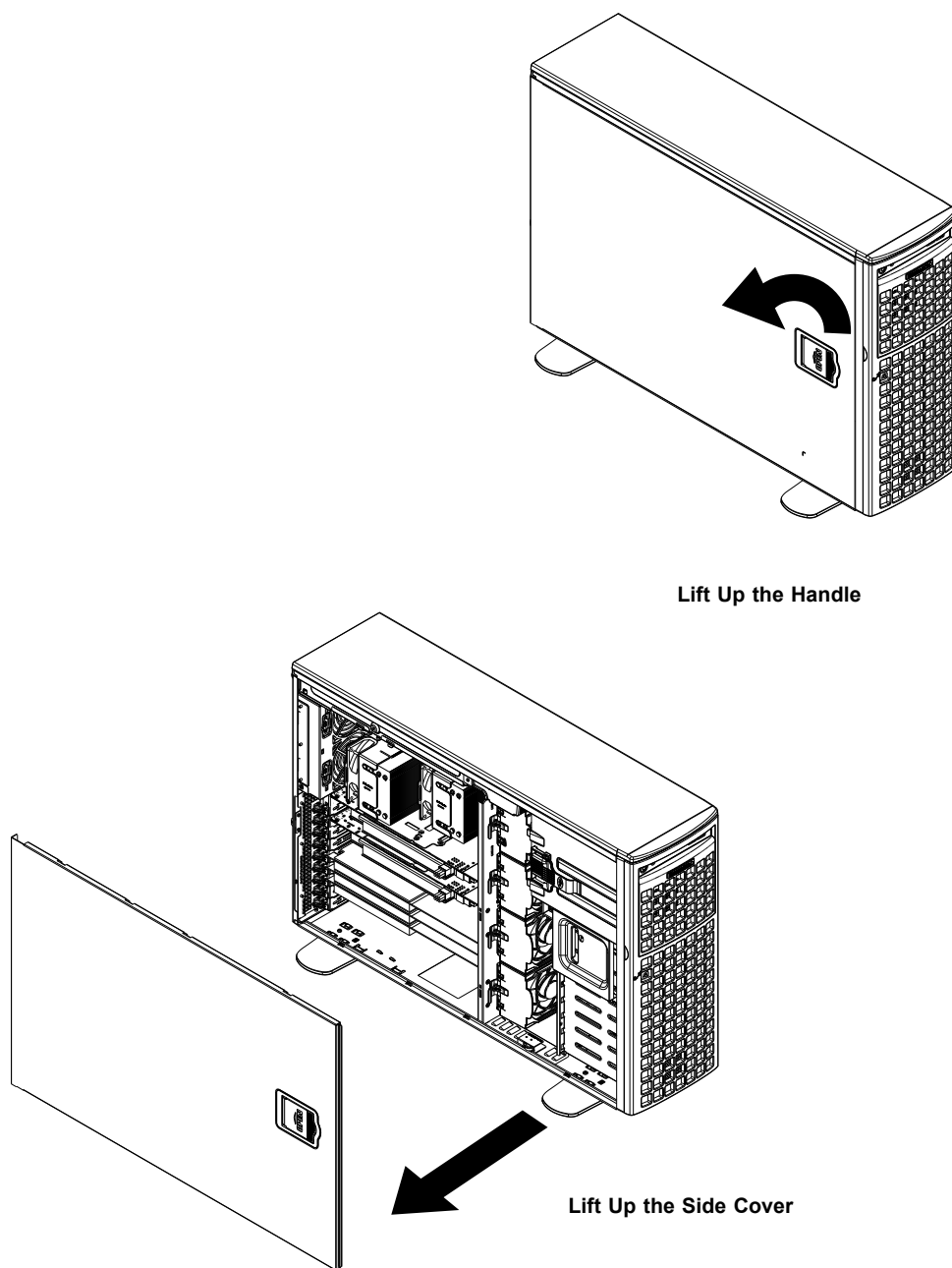


**Figure 3-1. Identifying the Chassis Covers**

**Caution:** Except for short periods of time, do not operate the workstation without the cover in place. The chassis cover must be in place to allow for proper airflow and to prevent overheating.

### ***Removing the Side Cover***

1. Remove power from the system as described in [Section 3.1](#).
2. Lift the handle at the side of the tower.
3. Lift the cover from the chassis.

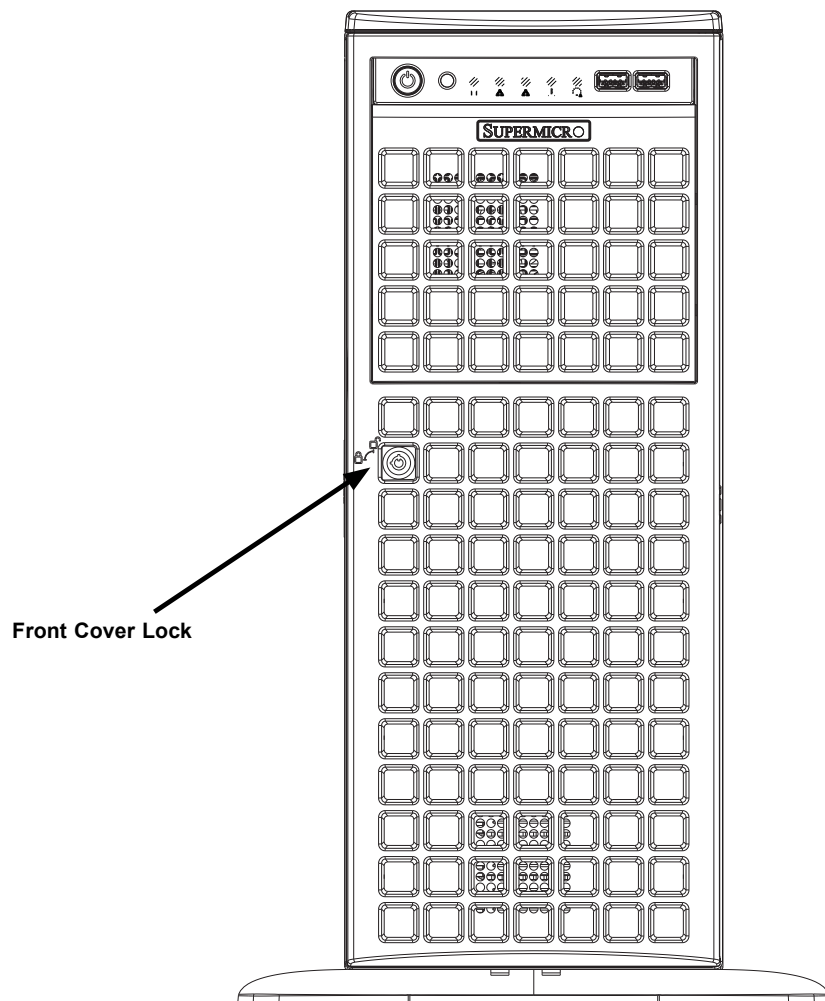


**Figure 3-2. Removing the Side Cover**

### ***Opening the Front Cover***

The front cover houses up to eight hot-swappable hard drives. The cover can be locked to prevent unauthorized access. The key to this lock is shipped with the system.

1. Unlock the front cover using the key shipped with the system.
2. Gently pull the cover open.



**Figure 3-3. Opening the Front Cover**

### 3.3 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 possible explosion.

#### Unpacking

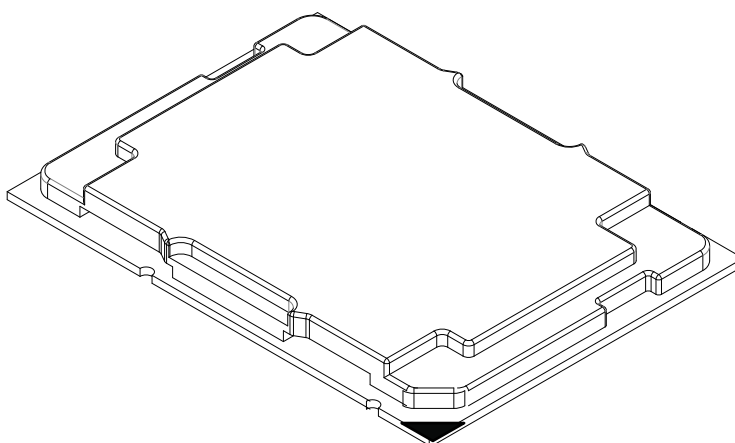
The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the motherboard, make sure that the person handling it is static protected.

## 3.4 Processor and Heatsink Installation

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

- Please 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 CPU 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 CPU socket, which may require manufacturer repairs.
- 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 illustrations only. Your components may look different.

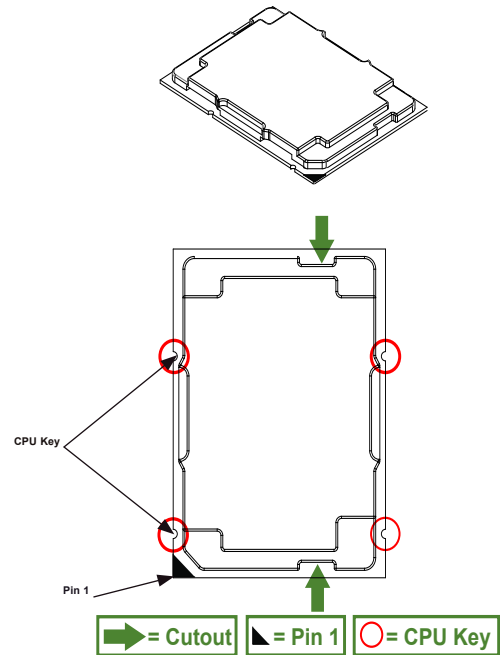
### The 3rd Gen. Intel Xeon Scalable Processor



Processor Top View

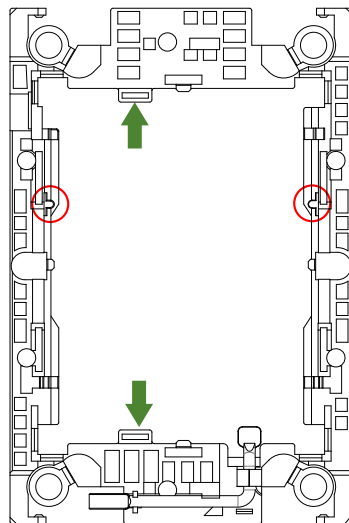
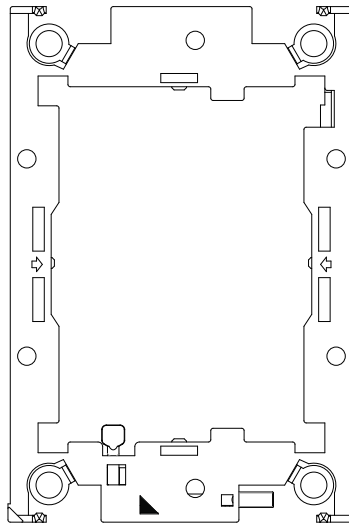
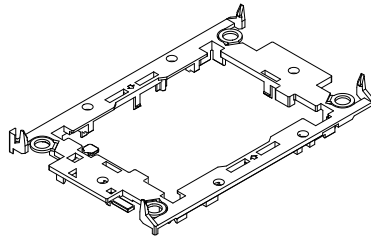
## 1. The 3rd Gen. Intel Xeon Scalable Processor

Processor Top View (3D)



Processor Top View

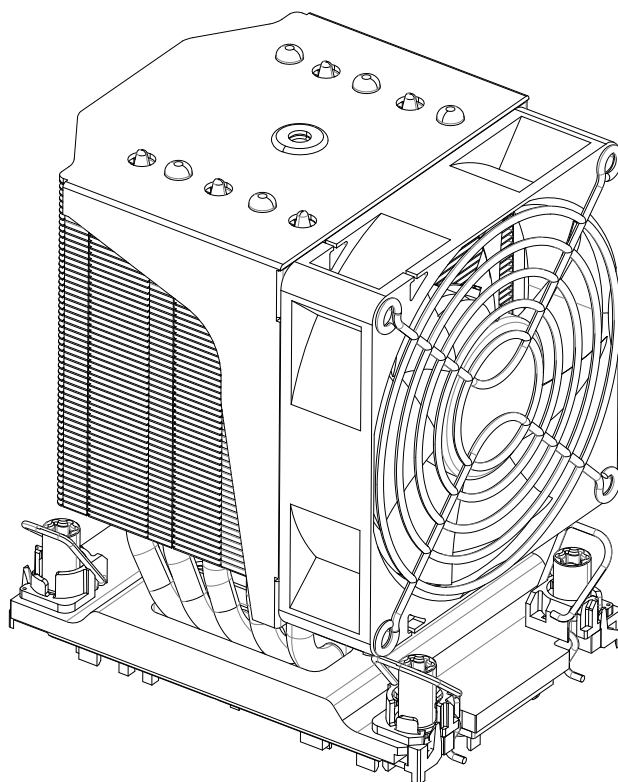
## 2. The Processor Carrier



**Carrier Bottom View**



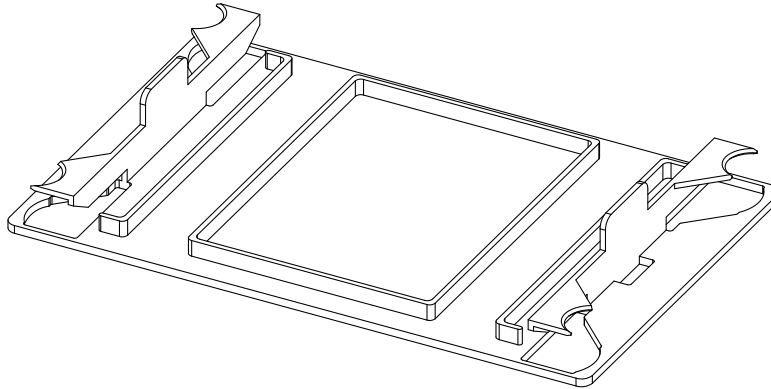
### 3. Heatsink



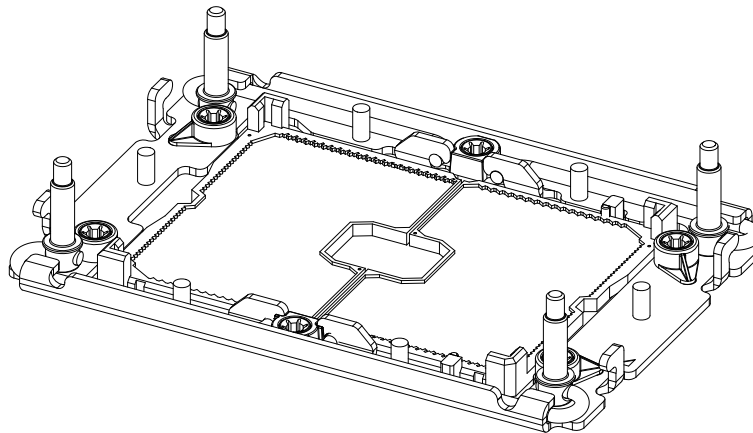
**Note:** Exercise extreme care when handling the heatsink. Pay attention to the edges of heatsink fins which can be sharp! To avoid damaging the heatsink, please do not apply excessive force on the fins when handling the heatsink.

## Overview of the CPU Socket

The CPU socket is protected by a plastic protective cover.



Plastic Protective Cover

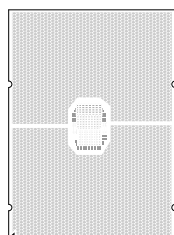


CPU Socket

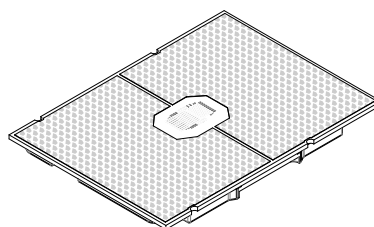
## Overview of the Processor Carrier Assembly

The processor carrier assembly contains a 3rd 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.

### 1. The 3rd Gen Intel Xeon Scalable Processor



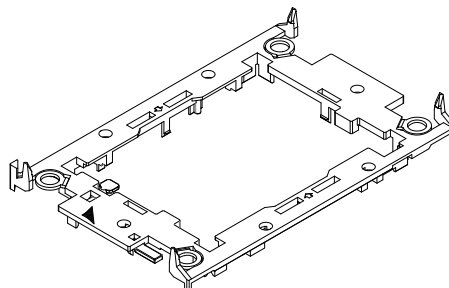
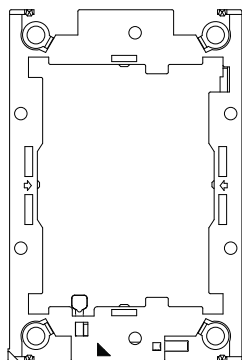
Processor (2D)



Processor (3D)

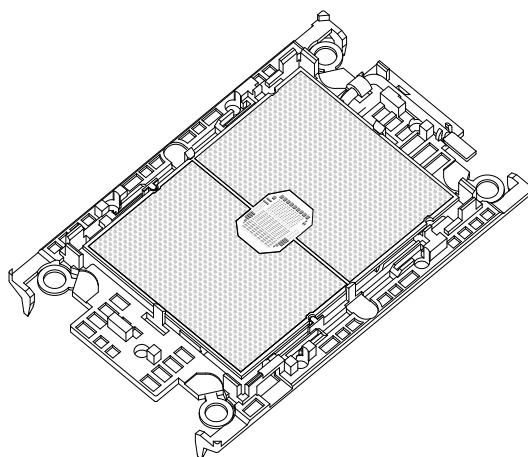
Intel Processor (Bottom View)

### 2. Processor Carrier



Intel Processor Carrier Top View)

### 3. Processor Carrier Assembly

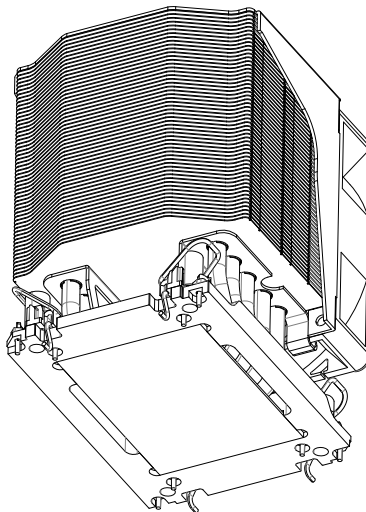


(with Processor Seated inside the Carrier)

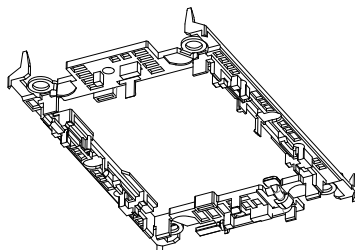
## Overview of the Processor Heatsink Module

The Processor Heatsink Module (PHM) contains a heatsink, a processor carrier, and the 3rd Gen Intel Xeon Scalable Processor

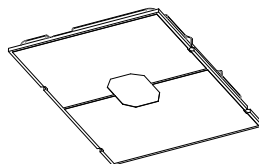
### 1. Heatsink



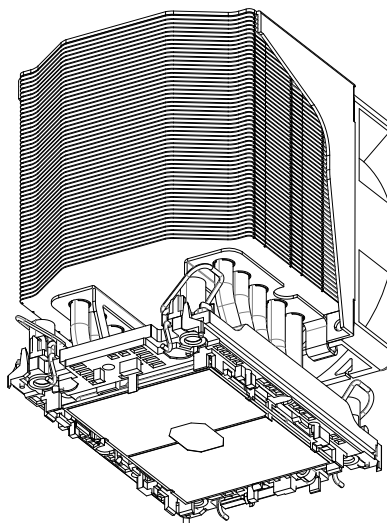
### 2. Processor Carrier



### 3. The 3rd Gen Intel Xeon Scalable Processor



### 4. Processor Heatsink Module (PHM)



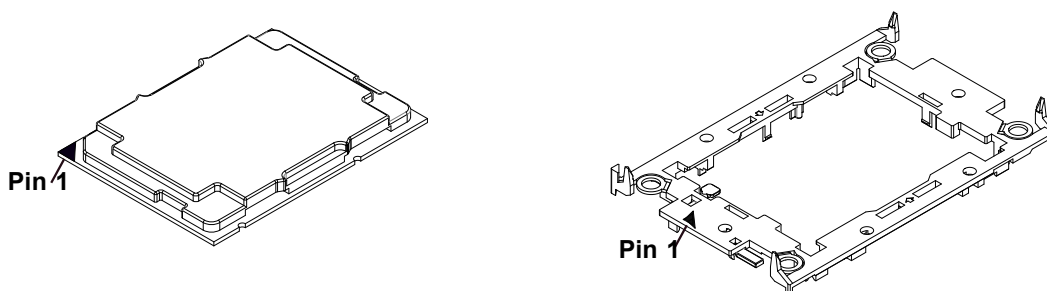
## Creating the Processor Carrier Assembly

The processor carrier assembly contains a 3rd Gen Intel Xeon Scalable processor and a processor carrier.

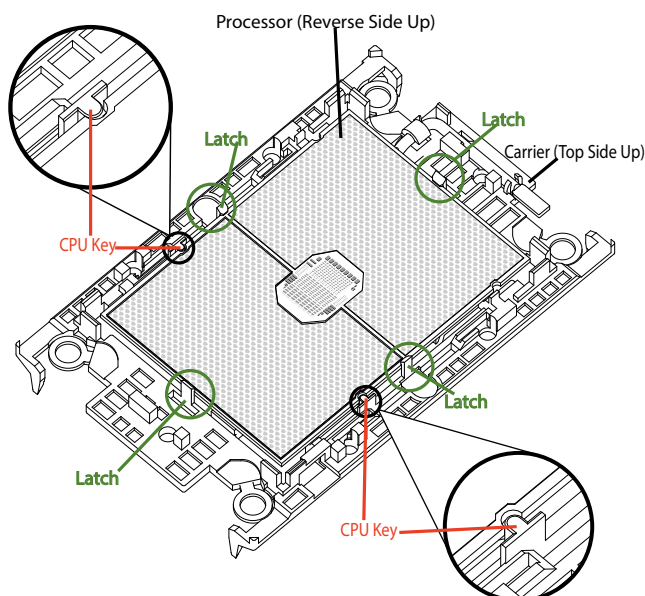
To create the processor carrier assembly, please follow the steps below:

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

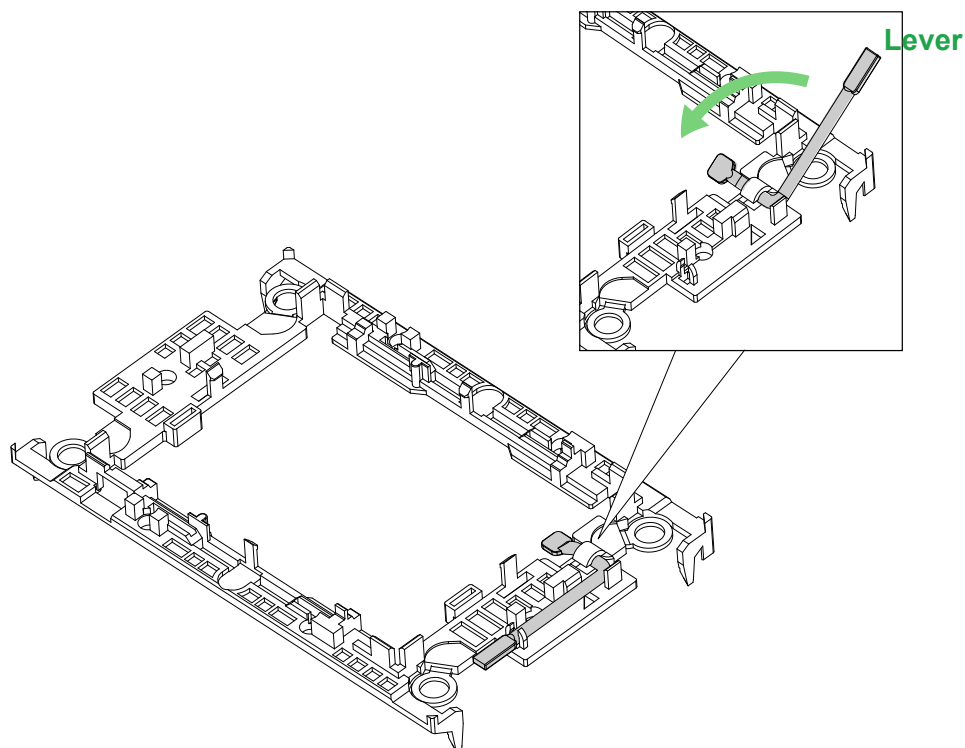
1. Hold the processor with the LGA lands (with Gold CPU contacts) facing down. Locate the small, gold triangle at the corner of the processor and the corresponding hollowed triangle on the processor carrier as shown in the graphics below. Please note that the triangle indicates Pin 1 location.



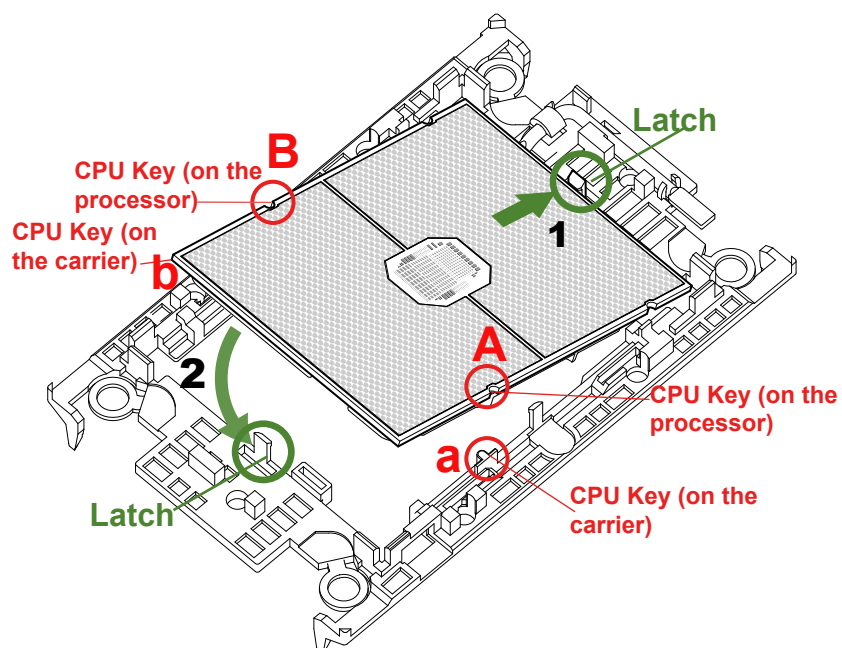
2. First, turn over the processor carrier and locate Pin 1 on the CPU and Pin 1 on the carrier. Then, turn the processor over with the processor reverse side (gold contacts) facing up and locate CPU keys on the processor. Finally, locate the CPU keys and four latches on the carrier as shown below.



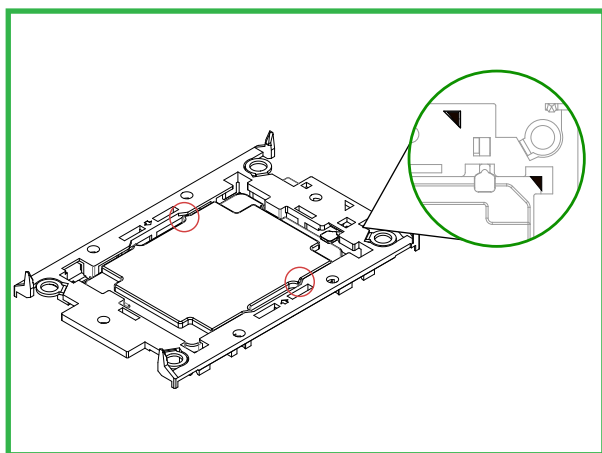
3. Locate the lever on the CPU socket and press the lever down as shown below. Using



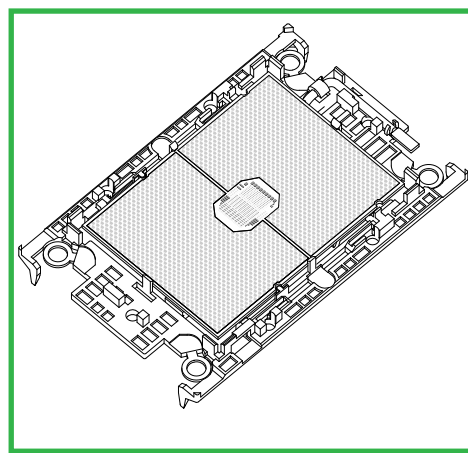
4. Using Pin 1 as a guide, carefully align the CPU keys (A and B) on the processor against the CPU keys on the carrier (a and b) as shown in the drawing below.
5. Once they are properly aligned, carefully place one end of the processor into the latch marked 1 on the carrier, and place the other end of processor into the latch marked 2.



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



Processor Carrier Assembly  
(Top View)



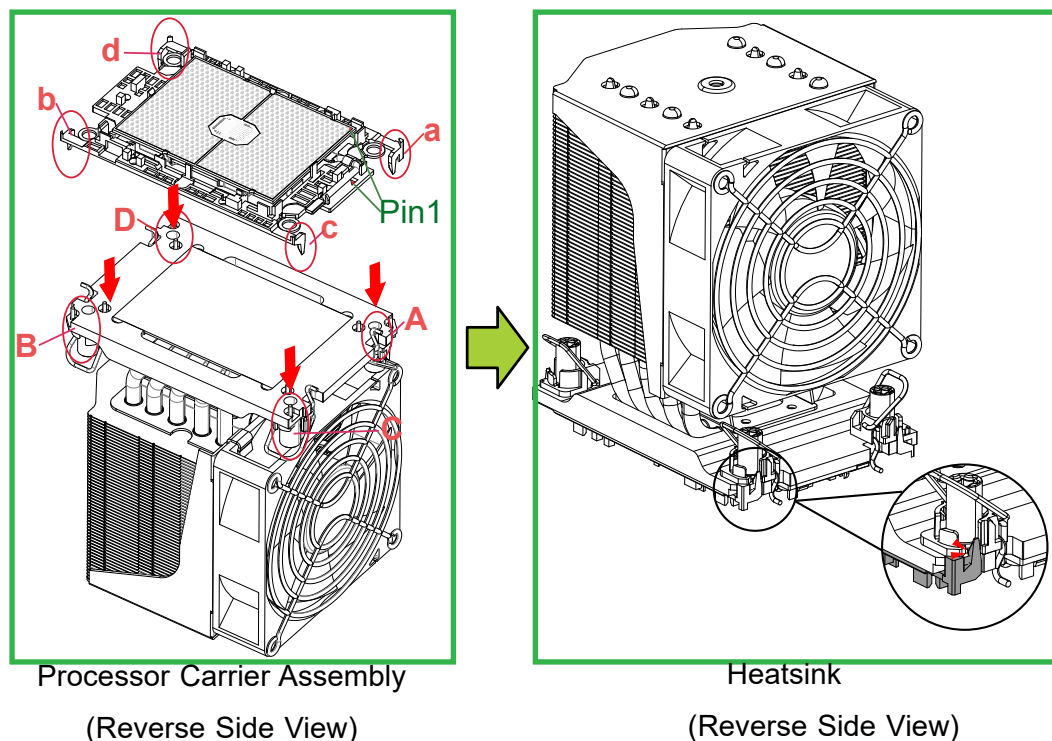
Processor Carrier  
Assembly (bottom view)

## Creating the Processor Heatsink Module (PHM)

After creating the processor carrier assembly, please follow the instructions below to mount the processor carrier into the heatsink to form the processor heatsink module (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.

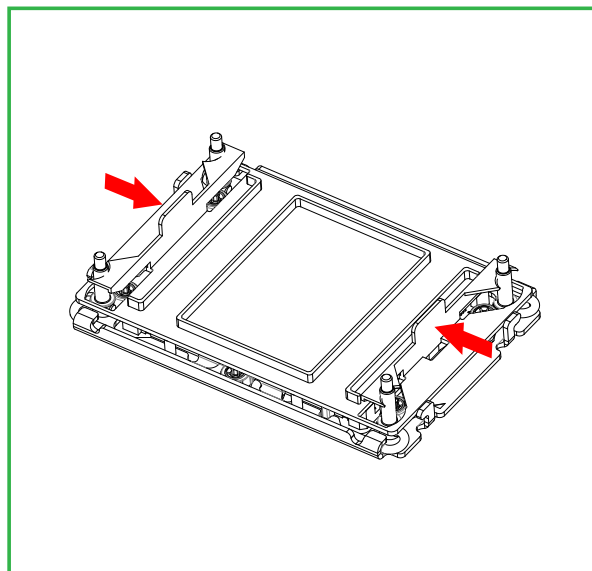
1. Turn the heatsink over with the thermal grease, which is on the reverse side of the heatsink, facing up. Pay attention to the two triangle cutouts (A and B) located at the diagonal corners of the heatsink as shown in the drawing below.
2. Hold the processor carrier assembly top side (with thermal grease) facing up, and locate the triangle on the CPU 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 "a".
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 processor assembly against the corners marked "B", "C", and "D" on the heatsinks
5. Once they are properly aligned, place the corner marked "a" on the processor carrier assembly into the corner of the heatsink marked "A". Repeat the same step to place the corners marked "b", "c", and "d" on the processor carrier assembly into the corners of the heatsink marked "B", "C", and "D". Make sure that all plastic clips are properly attached to the heatsink.



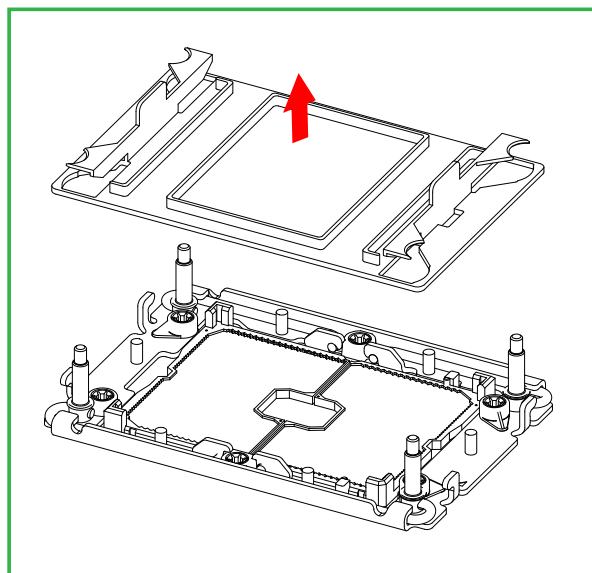


## Preparing the CPU Socket for Installation

This motherboard comes with a plastic protective cover installed on the CPU socket. Remove it from the socket to install the Processor Heatsink Module (PHM). Gently pull up one corner of the plastic protective cover to remove it.



1. Press the tabs inward.

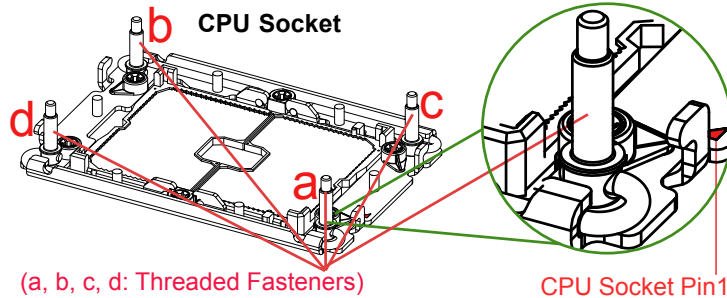


2. Pull up the protective cover from the socket.

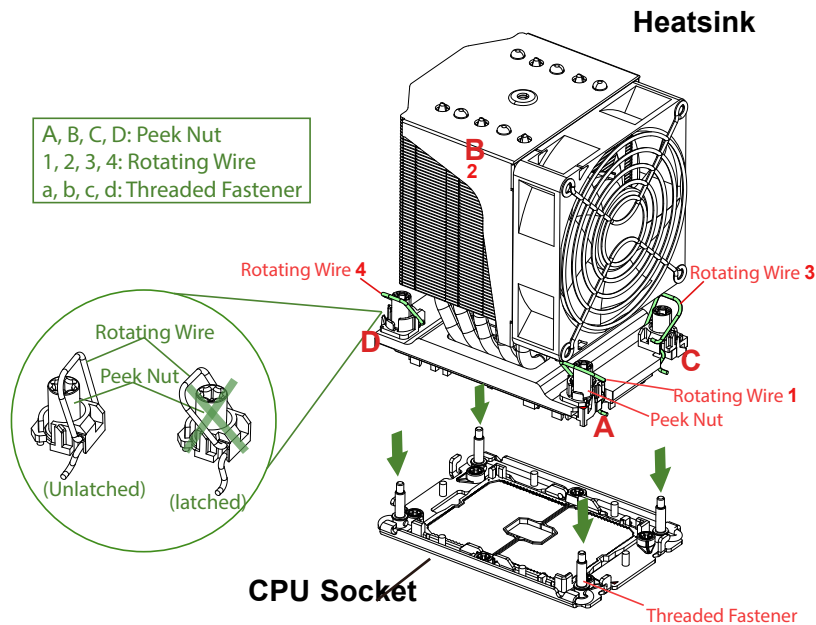
## Preparing to Install the Processor Heatsink Module (PHM) into the CPU Socket

After assembling the Processor Heatsink Module (PHM), you are ready to install it into the CPU socket. To ensure the proper installation, please follow the procedures below:

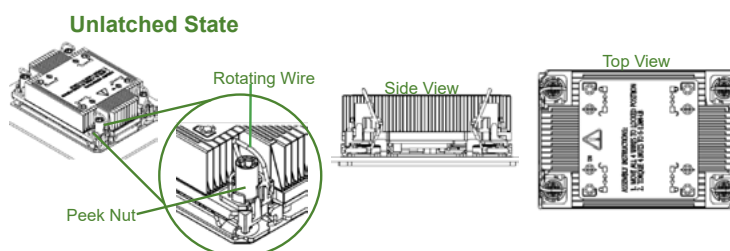
1. Locate four threaded fasteners (a, b, c, and d) on the CPU socket.



2. Locate four peek nuts (A, B, C, and D) and four rotating wires (1, 2, 3, and 4) on the heatsink as shown in the graphics below.

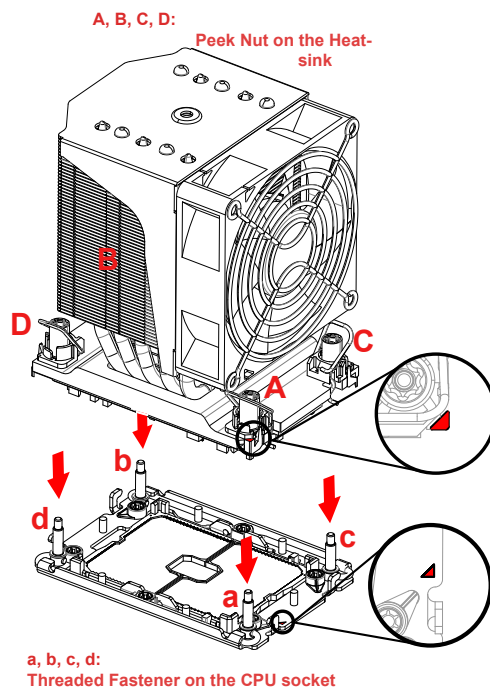


3. Check the rotating wires (1, 2, 3, and 4) to make sure that they are at unlatched positions as shown in the drawing below before installing the PHM into the CPU socket.

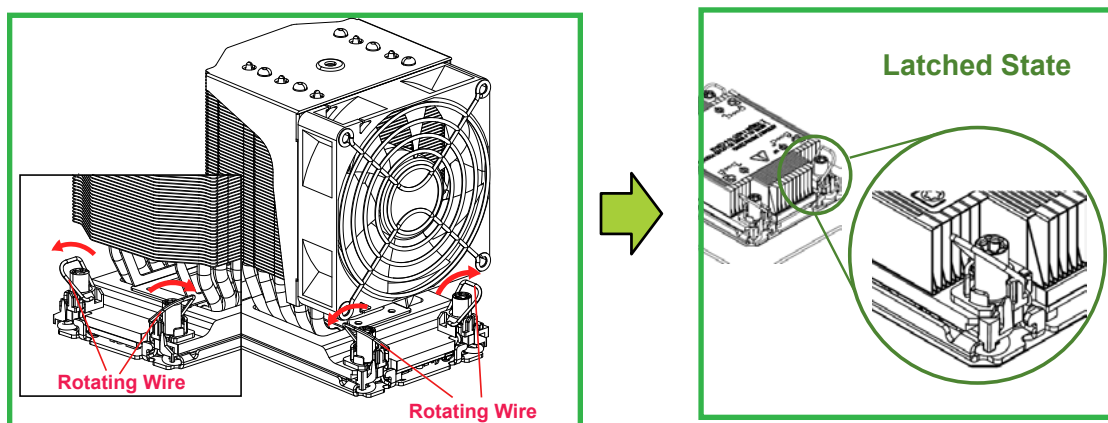


## Installing the Processor Heatsink Module (PHM)

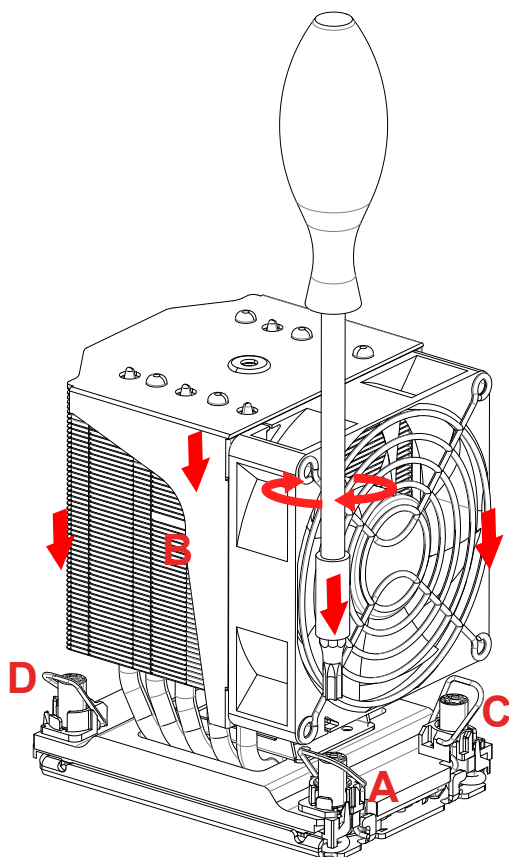
1. Align peek nut "A", which is next to the triangle (Pin 1) on the heatsink, against threaded fastener "a" on the CPU socket. Then align peek nuts "B", "C", and "D" on the heatsink against threaded fasteners "b", "c", and "d" on the CPU socket, making sure that all peek nuts on the heatsink are properly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



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



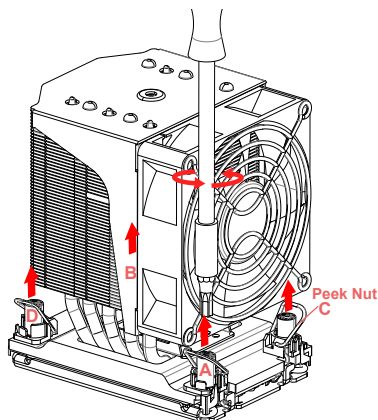
4. With a T30-bit screwdriver, tighten all peek nuts in the sequence of "A", "B", "C", and "D" with even pressure. To avoid damaging the processor or socket, do not use a force greater than 12 lbf-in when tightening the screws.
5. Examine all corners heatsink to ensure that the PHM is firmly attached to the CPU socket.



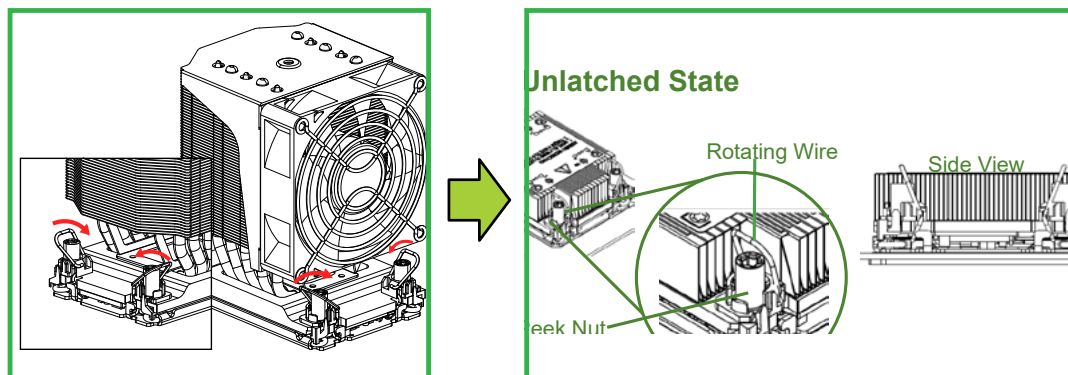
## Removing the Processor Heatsink Module from the CPU Socket

Before removing the processor heatsink module (PHM) from the motherboard, unplug the AC power cord from all power supplies after shutting down the system. Then follow the steps below:

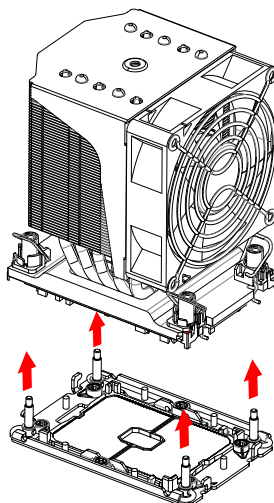
1. Use a T30-bit screwdriver to loosen the four peek nuts on the heatsink in the sequence of #A, #B, #C, and #D.



1. Once the peek nuts are loosened from the CPU socket, press the rotating wires inwards to unlatch the PHM from the socket as shown in the drawings below.



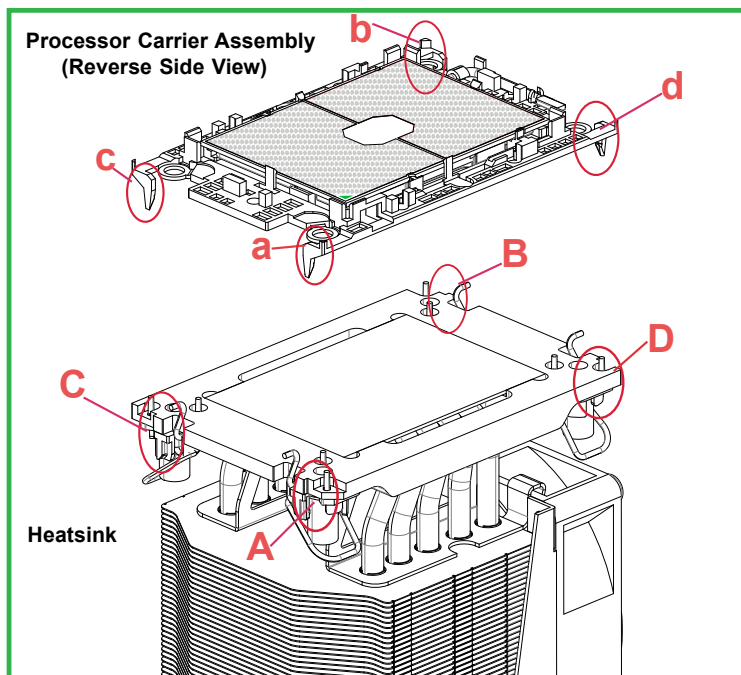
2. Gently lift the PHM upwards to remove it from the CPU socket.



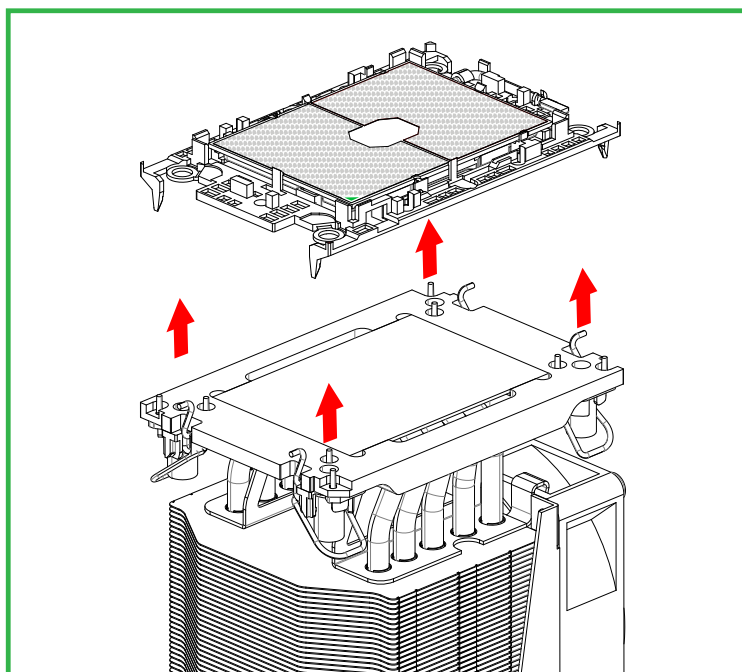
## Removing the Processor Carrier Assembly from the Processor Heatsink Module (PHM)

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

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



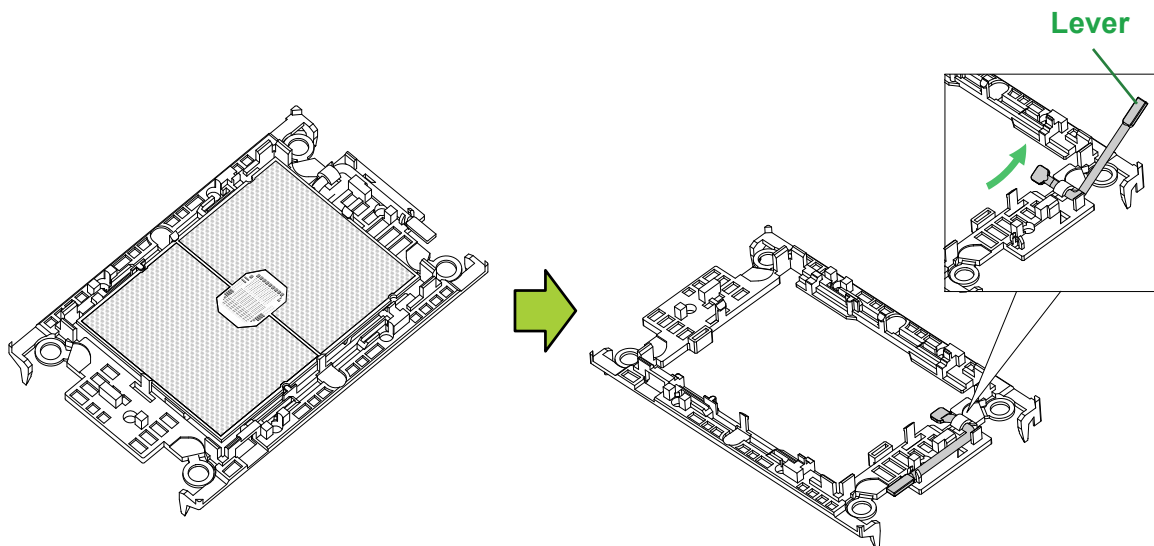
2. When all plastic clips are detached from the heatsink, remove the processor carrier assembly from the heatsink



## Removing the Processor from the Processor Carrier Assembly

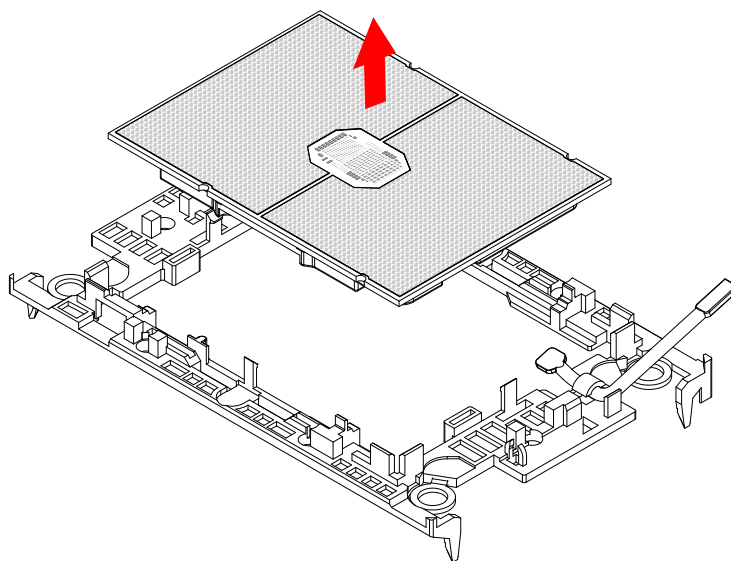
Once you have removed the processor carrier assembly from the PHM, you are ready to remove the processor from the processor carrier by following the steps below.

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



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

**Note:** To avoid damaging the processor and its pins, please handle the processor with care.





## 3.5 Memory

### Memory Support

The X12SPA-TF supports up to 1TB of ECC RDIMM, 4TB of 3DS RDIMM, 2TB of LRDIMM, or 4TB of 3DS LRDIMM with speeds of up to 3200MHz (2DPC) in 16 DDR4 (288-pin) SMD DIMM slots.

**Note:** Memory speed support depends on the processors used in the system.

For validated memory, use our [Product Resources page](#). Check the Supermicro website for possible updates to memory support.

### Memory Installation Sequence

Memory for this motherboard is populated using the "Fill First" method. The DIMM slots with blue release tabs are considered the first DIMM of their channel, and those with white release tabs are the second of the channel. When installing memory modules, be sure to populate the memory slots with the blue release tabs first and then populate those with the white release tabs.

### General Memory Population Requirements

1. Be sure to use the memory modules of the same type and speed on the motherboard. Mixing of memory modules of different types and speeds is not allowed.
2. Using unbalanced memory topology such as populating two DIMMs in one channel while populating one DIMM in another channel will result in the reduced memory performance.
3. Populating memory slots with a pair of DIMM modules of the same type and size will result in interleaved memory, which will improve memory performance.



DDR4 Memory Support for the 3rd Gen. Intel Xeon Scalable Processors					
Type	Ranks Per DIMM & Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slots Per Channel (SPC) and DIMMs Per Channel (DPC)	
				1DPC (1-DIMM Per Channel)	2DPC (2-DIMM Per Channel)
		8Gb	16Gb	1.2 V	1.2 V
RDIMM	SRx8	8GB	16GB	3200	3200
	SRx4	16GB	32GB		
	DRx8	16GB	32GB		
	DRx4	32GB	64GB		
RDIMM 3Ds	(4R/8R) X4	2H- 64 GB 4H-128 GB	2H- 128 GB 4H-256 GB		
LRDIMM	QRx4	64GB	128GB	3200	3200
LRDIMM - 3Ds	(4R/8R) X4	4H-128 GB	2H- 128 GB 4H-256 GB	3200	3200

### *Guidelines Regarding Mixing DIMMs*

- All DIMMs must be DDR4 or a mixture of PMem and DDR4.
- x4 and x8 DIMMs can be mixed in the same channel.
- Mixing of LRDIMMs and RDIMMs is not allowed in the same channel, across different channels, and across different sockets.
- Mixing of non-3DS and 3DS LRDIMM is not allowed in the same channel, across different channels, and across different sockets.
- Mixing of PMem modules and RDIMMs is supported
- Mixing DDR4 and PMem memory operating frequencies is not validated within a socket or across sockets. If DIMMs of different frequencies are mixed in the same channel, all DIMMs will run at the highest common frequency.
- Always populate the DIMM with the higher electrical loading on a channel in DIMMx1 (farther from CPU) followed by DIMMx2.

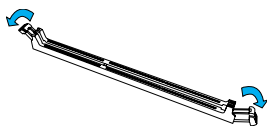
## DDR4 Memory Population Guidelines

The following memory population table was created based on guidelines provided by Intel to support Supermicro motherboards.

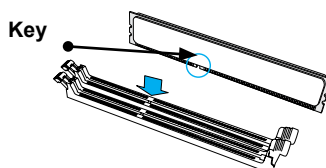
Memory Population Table (with 16 Slots)	
<i>Number of DIMMs</i>	<i>Memory Population Sequence</i>
<b>1 DIMM</b>	CPU1: P1-DIMMA1
<b>2 DIMMs</b>	CPU1: P1-DIMMA1/P1-DIMME1
<b>4 DIMMs</b>	CPU1: P1-DIMMA1/P1-DIMME1/P1-DIMMC1/P1-DIMMG1
<b>6 DIMMs</b>	CPU1: P1-DIMMA1/P1-DIMMB1/P1-DIMME1/P1-DIMMF1/P1-DIMMC1/P1-DIMMG1
<b>8 DIMMs</b>	CPU1: P1-DIMMA1/P1-DIMMB1/P1-DIMMD1/P1-DIMME1/P1-DIMMF1/P1-DIMMC1/P1-DIMMG1/P1-DIMMH1
<b>12 DIMMs</b>	CPU1: P1-DIMMA1/P1-DIMMA2/P1-DIMMB1/P1-DIMMC1/P1-DIMMC2/P1-DIMMD1/P1-DIMME1/P1-DIMME2/ P1-DIMMF1/P1-DIMMG1/P1-DIMMG2/P1-DIMMH1
<b>16 DIMMs</b>	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

## DIMM Installation

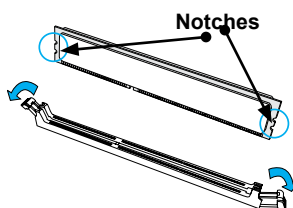
1. Insert the desired number of DIMMs into the slots based on the recommended DIMM population tables shown above.
2. Push the release tabs on both ends of the DIMM slot outwards to unlock it.



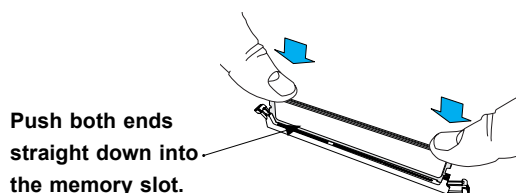
3. Align the key of the DIMM module with the receptive point on the memory slot.



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



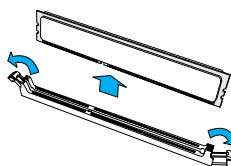
5. Push both ends of the module straight down into the slot until the module snaps into place.



6. Press the release tabs to the lock positions to secure the DIMM module into the slot.

## DIMM Removal

Press both release tabs on the ends of the DIMM module to unlock it. Once the DIMM module is loose, remove it from the memory slot.



**Warning!** To avoid causing any damage to the DIMM module or the DIMM socket, do not use excessive force when pressing the release tabs on the ends of the DIMM socket. Handle DIMMs with care. Be aware and follow the ESD instructions given at the beginning of this chapter.

## 3.6 Motherboard Battery

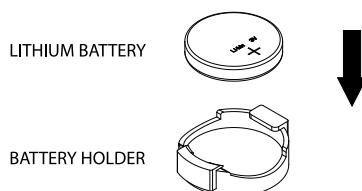
The motherboard uses non-volatile memory to retain system information when system power is removed. This memory is powered by a lithium battery residing on the motherboard.

### *Replacing the Battery*

Begin by [removing power](#) from the system.

1. Push aside the small clamp that covers the edge of the battery. When the battery is released, lift it out of the holder.
2. To insert a new battery, slide one edge under the lip of the holder with the positive (+) side facing up. Then push the other side down until the clamp snaps over it.

**Note:** 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 a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.



**Figure 3-4. Installing the Onboard Battery**

**Warning:** There is a danger of explosion if the onboard battery is installed upside down (which reverses its polarities). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer (CR2032).

## 3.7 Storage Drives

The system supports eight hot-swap storage drive bays housed in the CSE-747BTS-R2K20BP chassis via Storage drive backplane (BPN-SAS3-747TQ-N4). For compatible storage drives, see the [X12SPA-TF motherboard page](#).

The drives are mounted in drive carriers to simplify their installation and removal from the chassis. (Both procedures may be done without removing power from the system.)

### ***Removing a Hot-Swap Drive Carrier***

1. Open the front bezel then push the release button located beside the drive LEDs.
2. Swing the handle fully out and then use it to pull the unit straight out.

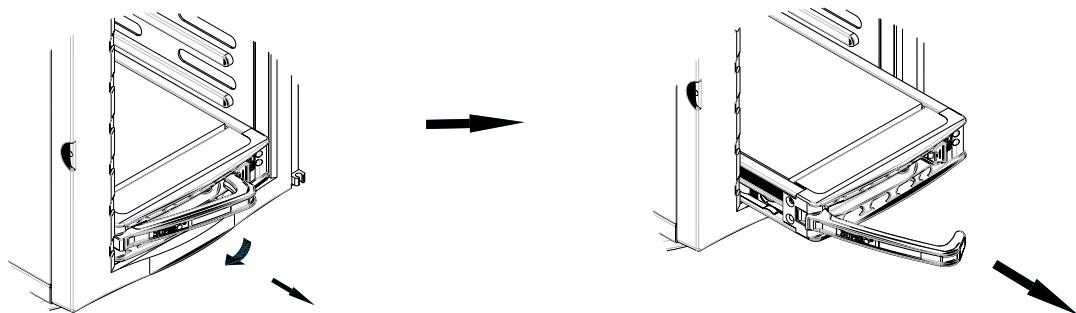
**Note:** Your operating system must have RAID support to enable the hot-swap capability of the storage drives.

### ***Mounting a Drive in a Drive Carrier***

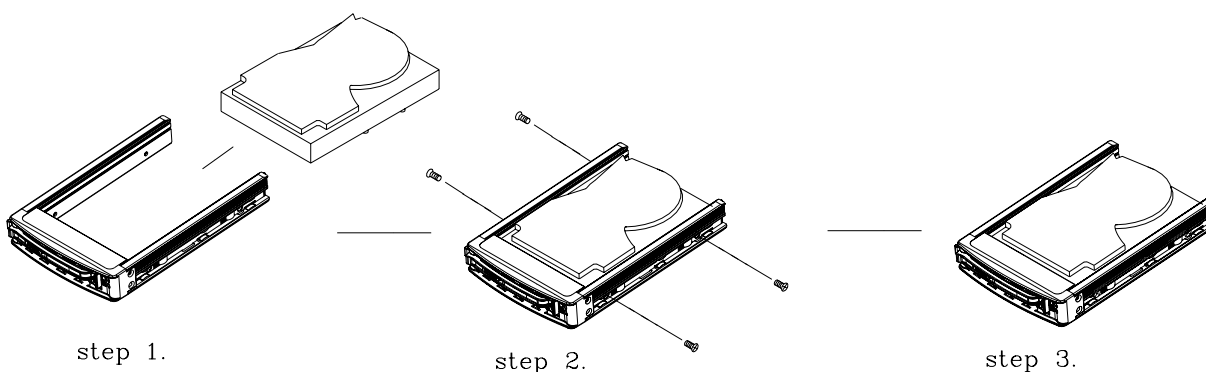
The storage drive carriers help to promote proper airflow for the system. For this reason, even carriers without storage drives must remain in the chassis.

1. To add a new drive, install it into the carrier with the printed circuit board side facing down so that the mounting holes align with those in the carrier.
2. Secure the drive to the carrier with the screws provided, then push the carrier completely into the drive bay. You should hear a \*click\* when the drive is fully inserted. This indicates that the carrier has been fully seated and connected to the midplane, which automatically makes the power and logic connections to the hard drive.

### ***Removing a Drive from a Drive Carrier***



**Figure 3-5. Removing a Drive Carrier**



**Figure 3-6. Mounting a Drive in a Carrier**

**Note:** Enterprise level hard disk drives are recommended for use in Supermicro chassis and workstations. For information on recommended HDDs, visit the Supermicro website at [https:// www.supermicro.com/en/products/superworkstation?pro=cpu%3D1](https://www.supermicro.com/en/products/superworkstation?pro=cpu%3D1)

### ***Storage Drive Backplane***

The storage drives plug into a drive backplane. A data cable for each drive and two LED cables need to be connected from the motherboard to the appropriate connectors on the backplane. Note that you cannot cascade the storage drive backplane.

### ***Installing Components in the 5.25" Drive Bays***

The 540A-TR has three 5.25" drive bays. Components such as an extra DVD-ROM drive can be installed into these 5.25" drive bays.

### ***Removing the Empty Drive Bay***

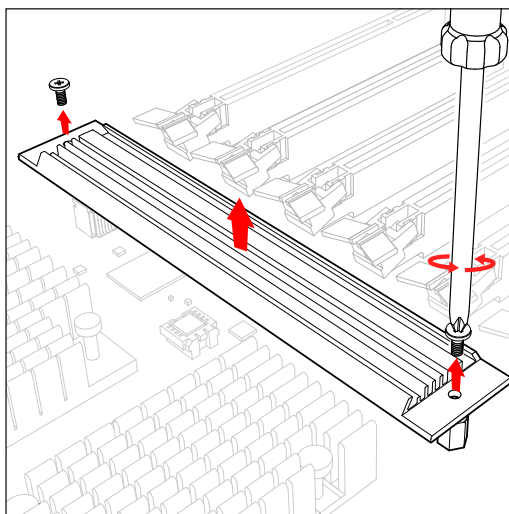
1. First power down the system.
2. Remove the top/left chassis cover to access the drive components.
3. With the cover off, remove the screws that secure the drive carrier to the chassis (one side only) then push the entire empty drive carrier out from the back.

### ***Adding a DVD-ROM Drive (optional)***

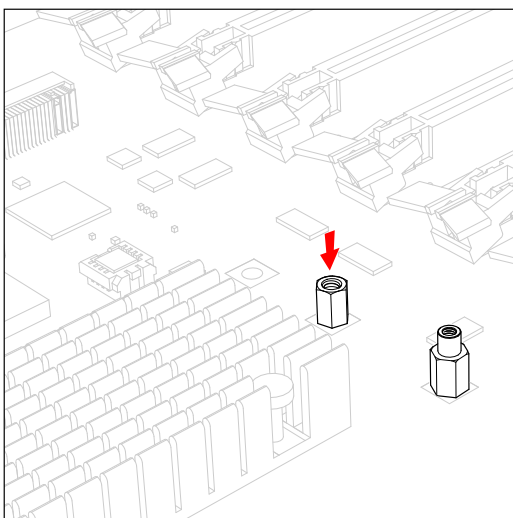
1. Remove the guide plates (one on each side) from the empty drive carrier and screw them into both sides of the DVD-ROM drive using the holes provided.
2. Slide the DVD-ROM into the bay and secure it to the chassis with the drive carrier screws you first removed.
3. Attach the power and data cables to the drive.
4. Replace the top/left chassis cover and restore power to the system.

## M.2 SSD Installation

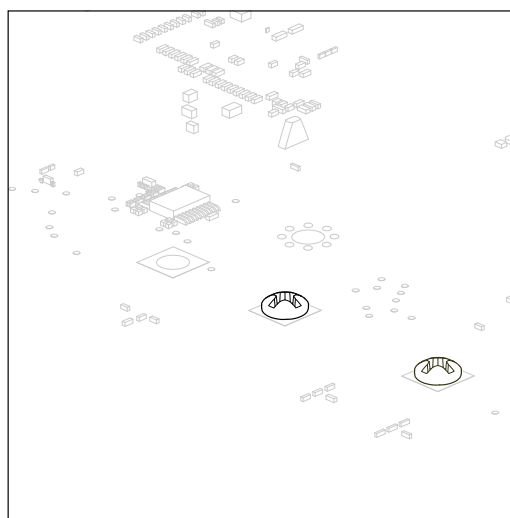
The X12SPA-TF motherboard has four M.2 PCIe 4.0 slots that support 2260, 2280, and 22110 M.2 NVMe SSD modules.



1. Loosen the screws and remove the heatsink.

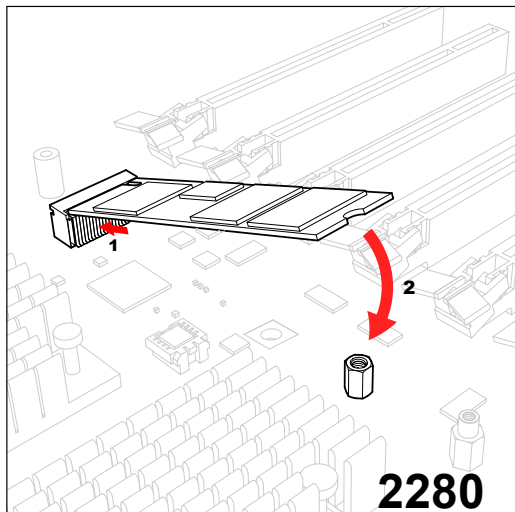


2. The default positions for the standoffs are in the 2280 and 22110 mounting holes.

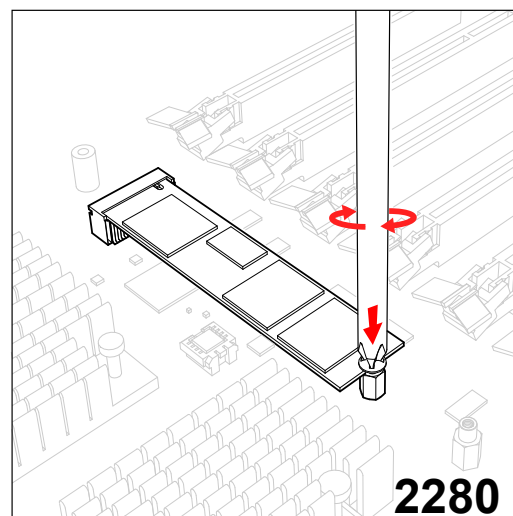


3. The mounting screws on the bottom of the motherboard secure the standoffs.

## 2280 M.2 NVMe SSD Module Installation

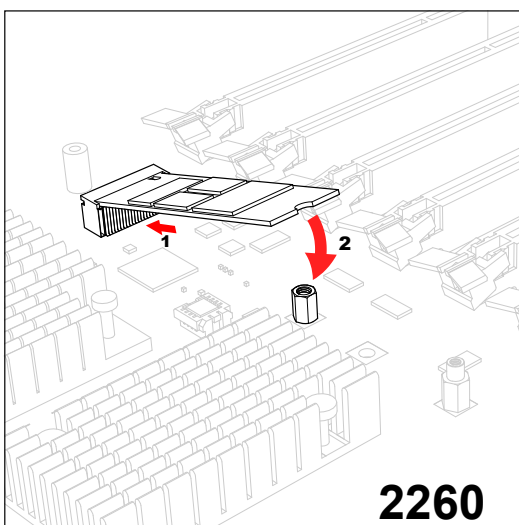


4.1. To install a 2280 M.2 NVMe module, insert it into the slot at a 30 degree angle and press down.

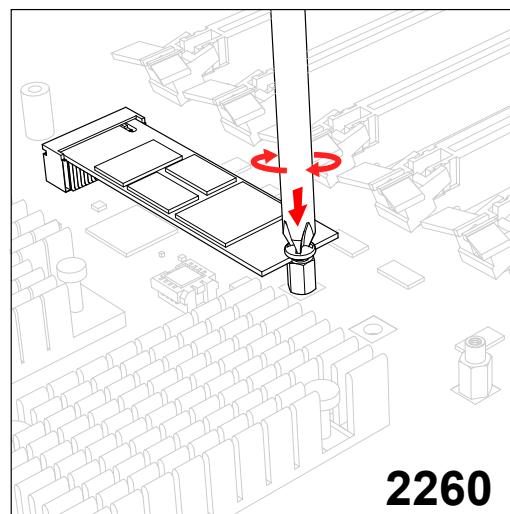
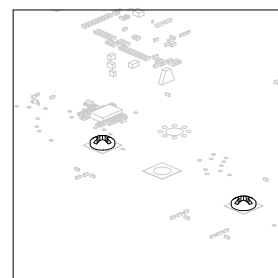
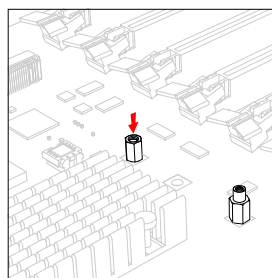


4.2. With the cutoff circle at the end of the module aligned with the standoff, tighten the screw to secure the module. Go to step 5 to complete the installation.

## 2260 M.2 NVMe SSD Module Installation

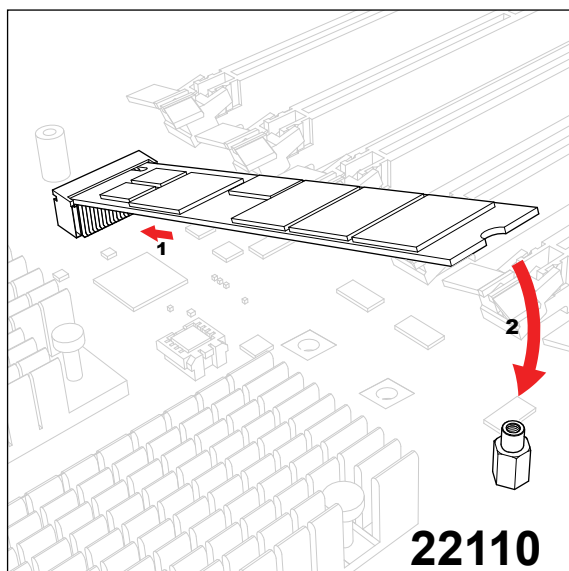


4.3. To prepare for a 2260 M.2 NVMe SSD module installation, begin by repeating steps 1-3. Then, place the standoff and screw underneath the motherboard in the hole closest to the M.2 slot. To install the module, insert it into the slot at a 30 degree angle and press down.

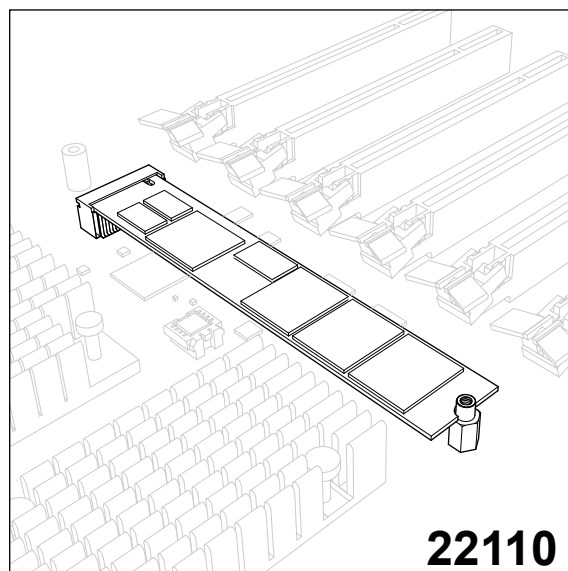




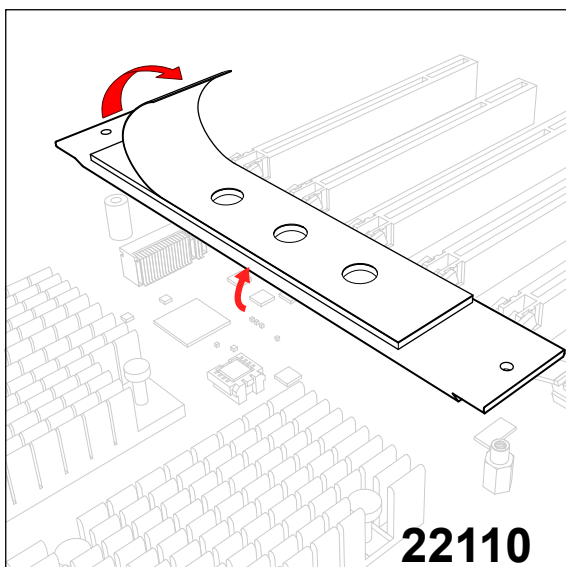
## 22110 M.2 NVMe SSD Module Installation



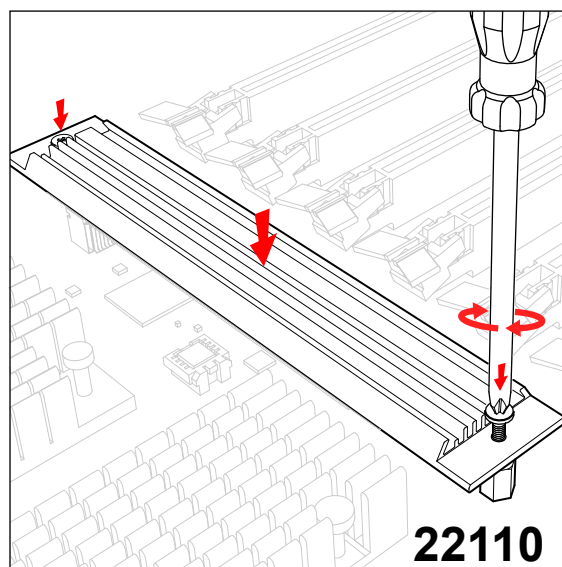
4.5. To install a 22110 M.2 NVMe SSD module, insert it into the M.2 slot at a 30 degree angle and align the cutoff circle at the end with the standoff.



4.6. Go to step 5 to complete the installation.



5. Remove the plastic liner from the heatsink's thermal pad.



6. With the thermal pad faced down, secure the heatsink on top of the module with the same screws removed in step 1.

## System Cooling

Heavy-duty fans provide cooling for the chassis. Four fans are located in the mid-section of the chassis, two fans are located in the rear, and two optional fans can be mounted on the external rear of the chassis, required for passive GPUs.

The internal fans come pre-installed to the chassis. Each fan is hot-swappable and can be replaced without removing any connections.

## System Fan Failure

Fan speed is controlled by system temperature through BMC. If a fan fails, the remaining fans will ramp up to full speed. Replace any failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan).

## Replacing System Fans

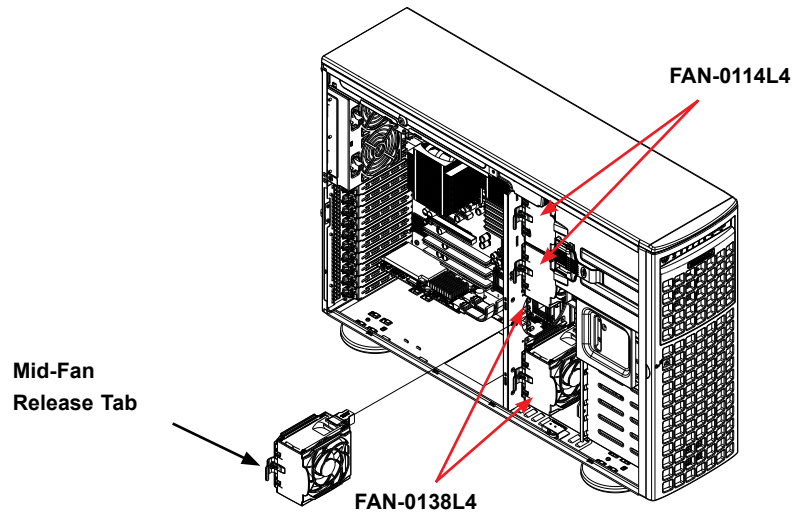
The chassis contains two types of system fans: mid-system fans and rear system fans.

### ***Replacing Mid-System Fans (FAN-0114L4 and FAN-0138L4)***

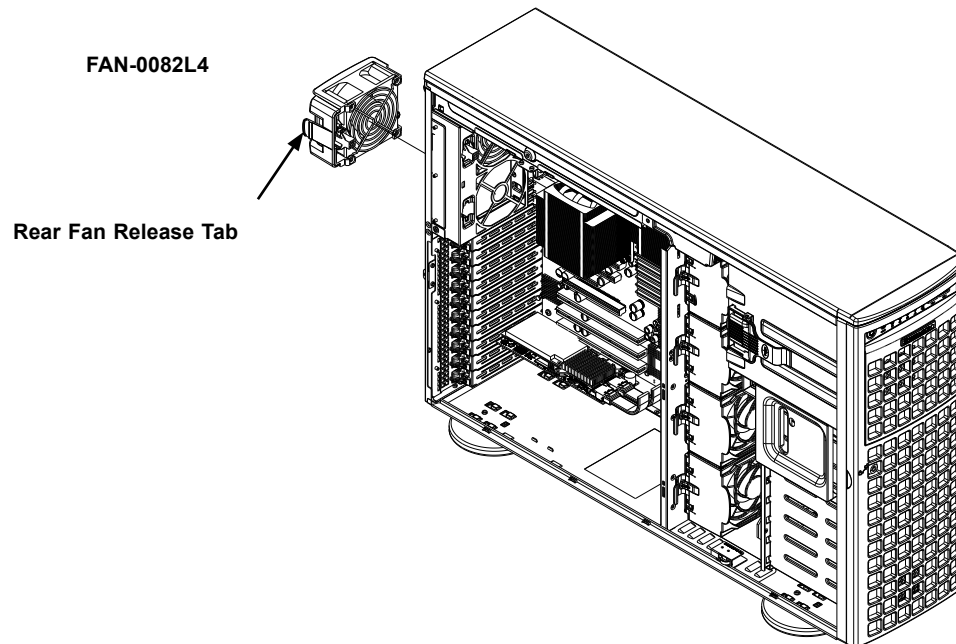
1. Use BMC to determine which fan has failed. Because the fans are hot-swappable, the system does not need to be powered-down.
2. Remove the side cover as described in [Section 3.2](#).
3. Press the fan release tab and lift the failed fan from the chassis. Mid-fans must be pulled straight out of the chassis. Part numbers: top two fans are FAN-0114L4 and bottom two are FAN-0138L4.
4. Place the new fan into the vacant space in the housing. Make sure the arrows indicating air direction point in the same direction as the arrows on the other fans. As soon as the fan is connected, it will begin working.

### ***Replacing the Rear System Fan (FAN-0082L4)***

1. Use BMC to determine which fan has failed.
2. Press the rear fan release tab.
3. Pull the fan away from the chassis by pulling out the top first.
4. Place the new fan in the chassis, inserting the bottom of the fan first.
5. Push the fan fully into the housing until the fan clicks into place. Replace the chassis cover.



**Figure 3-7. Mid-System Chassis Fans**



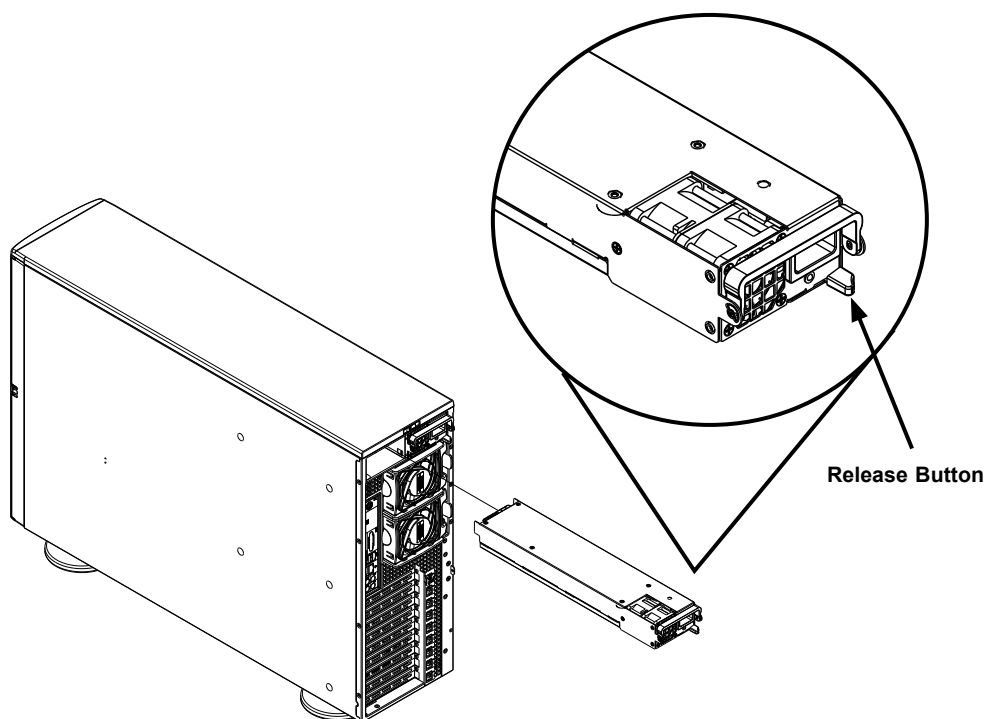
**Figure 3-8. Rear System Chassis Fans**

## Power Supply

The SuperWorkstation 540A-TR includes two 2200W redundant power supplies. These power supplies are auto-switching capable. This enables it to automatically sense and operate at a 100V to 240V input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.

### *Replacing the Power Supply*

1. Push the release button on the back of the failed power module.
2. Pull the power module out using the handle provided.
3. Replace the failed power module with the same model.
4. Push the new power module into the power bay until you hear a click.



**Figure 3-9: Power Supply Release Button**

## Chapter 4

# Motherboard Connections

This section describes the connections on the motherboard and provides pinout definitions. Note that depending on how the system is configured, not all connections are required. The LEDs on the motherboard are also described here. The motherboard layout indicating component locations may be found in Chapter 1.

Please review the Safety Precautions in Appendix B before installing or removing components.

## 4.1 Power Connections

### ATX Power Supply Connector

The 24-pin power supply connector (JPWR2) meets the ATX SSI EPS 12V specification. You must also connect the 8-pin 12V DC power connectors (JPWR1/JPWR3/JPWR4) to the power supply to provide adequate power to your system.

**Important:** To provide adequate power supply to the motherboard, be sure to connect the 24-pin ATX PWR, 8-pin PWR, and 4-pin PWR connectors to the power supply. Failure to do so may void the manufacturer warranty on your power supply and motherboard.

ATX Power 24-pin Connector Pin Definitions			
Pin#	Definition	Pin#	Definition
13	+3.3V	1	+3.3V
14	NC	2	+3.3V
15	Ground	3	Ground
16	PS_ON	4	+5V
17	Ground	5	Ground
18	Ground	6	+5V
19	Ground	7	Ground
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	Ground	12	+3.3V

**Required Connection**

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

**Required Connection**

## 4.2 Headers and Connectors

### Fan Headers

There are 10 4-pin fan headers (FAN1 - FAN6, FAN A - FAN D) on the motherboard. All these 4-pin fan headers are backwards compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only by Thermal Management via the IPMI 2.0 interface. Refer to the table below for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	2.5A/+12V
3	Tachometer
4	PWM_Control

### Internal Speaker/Buzzer

The Internal Speaker/Buzzer (SP1) is used to provide audible indications for various beep codes. Refer to the table below for pin definitions.

Internal Buzzer Pin Definitions		
Pin#	Definition	
1	Pos (+)	Beep In
2	Neg (-)	Alarm Speaker

### S-SGPIO Headers

The SGPIO (Serial General Purpose Input/Output) headers (I-SGPIO1, I-SGPIO2) are used to communicate with the enclosure management chip on the backplane. Refer to the table below for pin definitions.

S-SGPIO Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection

### Audio Front Panel Header

A 10-pin audio header (AUDIO FP) located on the motherboard allows you to use the onboard sound chip (ALC888S) for audio function. Connect an audio cable to this header to use this feature. Refer to the table below for pin definitions.

Audio Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	Microphone_Left	2	Audio_Ground
3	Microphone_Right	4	Audio_Detect
5	Line_2_Right	6	Ground
7	Jack_Detect	8	Key
9	Line_2_Left	10	Ground

### TPM/Port 80 Header

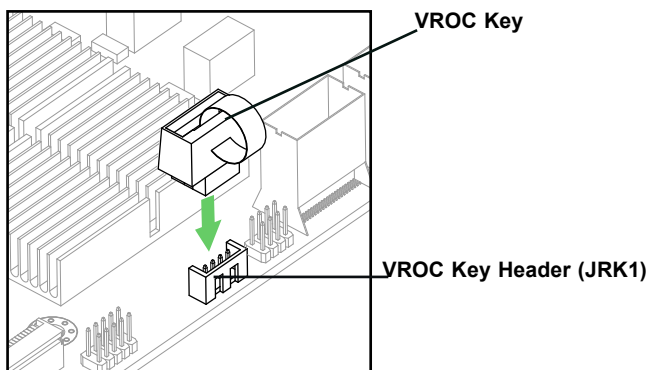
The JTPM1 header is used to connect a Trusted Platform Module (TPM)/Port 80, which is available from Supermicro (optional). A TPM/Port 80 header is a security device that supports encryption and authentication in hard drives. It allows the motherboard to deny access if the TPM associated with the hard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

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 Stdbby	10	SPI_IRQ#

### VROC RAID Key Header

A VROC RAID Key header is located at JRK1 on the motherboard. Install a VROC RAID Key on JRK1 for NVMe RAID support as shown in the illustration below. Refer to the layout below for the location of JRK1.

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



**Note:** The graphics contained in this user's manual are for illustration only. The components installed in your system may or may not look exactly the same as the graphics shown in the manual.

### Standby Power

The Standby Power header is located at JSTBY1 on the motherboard. You must have a card with a Standby Power connector and a cable to use this feature. Refer to the table below for pin definitions.

Standby Power Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	No Connection



### Power SMB (I<sup>2</sup>C) Header

The Power System Management Bus (I<sup>2</sup>C) connector (JPI<sup>2</sup>C1) monitors the power supply, fan, and system temperatures. Refer to the table below for pin definitions.

Power SMB Header Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PMBUS_Alert
4	Ground
5	+3.3V

### 4-pin BMC External I<sup>2</sup>C Header

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I<sup>2</sup>C connection on your system. Refer to the table below for pin definitions.

External I <sup>2</sup> C Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

### Chassis Intrusion

A Chassis Intrusion header is located at JL1 on the motherboard. Attach the appropriate cable from the chassis to inform you when the chassis is opened. Refer to the table below for pin definitions.

Chassis Intrusion Pin Definitions	
Pin#	Definition
1	Intrusion Input
2	Ground

### Pump Power Header

The motherboard has one +12V 4-pin header for optional CPU liquid cooling systems. When using a liquid cooling system, attach the pump power cable to the 12V\_PUMP\_PWR1 header.

Pump Power Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	2A/+12V (Red)
3	N/A
4	N/A

### Power LED/Speaker Header

Pins 1-3 of JD1 are used for power LED indication, and pins 4-7 are for the speaker. Please note that the speaker connector pins (4-7) are used with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a cap. Refer to the tables below for pin definitions.

PWR LED Connector Pin Definitions	
Pin#	Signal
1	JD1_PIN1
2	FP_PWR_LED
3	FP_PWR_LED

Speaker Connector Pin Definitions	
Pin#	Signal
4	P5V
5	Key
6	R_SPKPIN_N
7	R_SPKPIN

### Overheat/Fan Fail LED Header

Header JOH1-OH is used to connect to an LED indicator to provide warnings of chassis overheating and fan failure. This LED will blink when a fan failure occurs. Refer to the tables below for pin definitions.

Overheat LED Header Status	
State	Definition
Solid	Overheat
Blinking	Fan Fail

Overheat LED Header Pin Definitions	
Pin#	Signal
1	Pull high to +3.3V power through 330-ohm resistor
2	OH Active

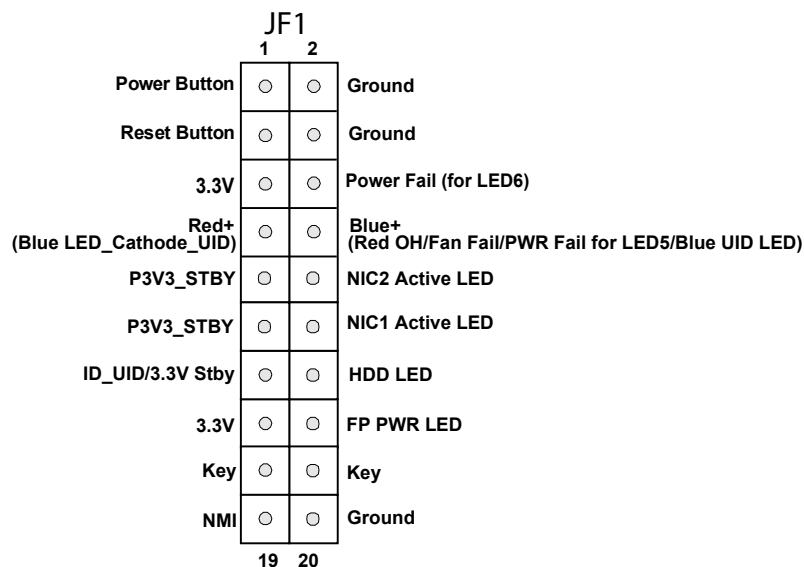
### SPDIF\_IN Header

The Sony/Philips Digital Interface (JSPDIF\_OUT) header is used for digital audio. Place a cap on each header for audio support. A cable is needed to use the connection.

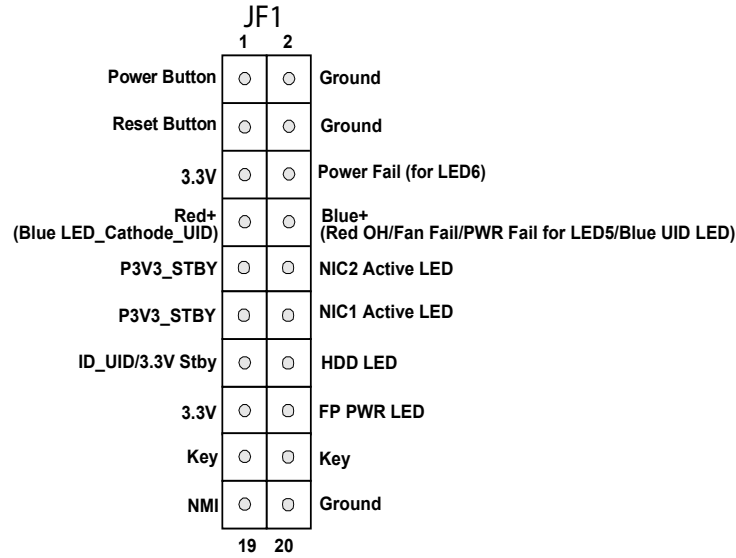
SPDIF_In Pin Definitions	
Pin#	Definition
1	S/PDIF_In
2	Ground

### Control Panel

The front control panel header (JF1) contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro chassis. Refer to the figure below for the descriptions of the front control panel buttons and LED indicators.



## Front Control Panel LEDs



Front Control Panel (JF1) LED Indicators						
Event	Power (LED1)	HDD (LED2)	LAN (LED3/4)	UID (LED5)	Information (LED5)	Power Fail (LED6)
Power On	Solid On					
HDD Activity		Blinking				
NIC Activity			Blinking			
Overheat					Solid On	
Fan Fail					Blinking @1Hz	
Power Fail					Blinking @1/4Hz	Solid On
Local UID On				Solid On		
Remote UID On				Blinking 1Hz		
Checking	BMC/BIOS Blinking @4HZ					
Recovering/Updating	BMC Blinking @4HZ BMC 2 Blinks @4Hz, 1 Pause @2Hz (on-on-off-off)			BIOS/BMC Blinking @10Hz		
Flash Not Detected or Golden Image Check Failed	BMC/BIOS Blinking @1HZ					
CPLD Recovery Mode				Blinking @10Hz (MB UID LED)	Blinking @10Hz (FP Red LED)	

### Power On & BMC/BIOS Status LED Button

The Power On and BMC/BIOS Status LED button is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system or display BMC/BIOS status. Refer to the tables below for more information.

Power Button & BIOS/BMC Status LED Indicator Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	Ground

Power Button Pin Definitions (Pin 1 & Pin 2 of JF1)	
Status	Event
Green: solid on	System power on
BMC/BIOS blinking green @ 4Hz	BMC/BIOS checking
BIOS blinking green @ 4Hz	BIOS recovery/update in progress
BMC blinking red x2 (2 blinks red) @ 4Hz, 1 pause @ 2Hz (on-on-off-off)	BMC recovery/update in progress
BMC/BIOS blinking green @ 1Hz	Flash not detected or golden image checking failure

### Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Momentarily contacting both pins will reset the system. Refer to the table below for pin definitions.

Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

## Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. When this LED turns solid red, it indicates a power failure. Refer to the table below for pin definitions.

Power Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	3.3V
6	PWR Fail for LED6 (Solid red on: PWR failure)

## Information LED (OH/Fan Fail/PWR Fail/UID LED)

The Information LED (OH/Fan Fail/PWR Fail/UID LED) connection is located on pins 7 and 8 of JF1. The LED on pin 7 is active when the UID button (JUIDB1) on the rear I/O panel is pressed. The LED on pin 8 provides warnings of overheating, power failure, or fan failure. Refer to the tables below for more information.

Information LED-Blue+ (OH/Fan Fail/PWR Fail LED for LED5/blue UID LED) Pin Definitions (Pin 7 & Pin 8 of JF1)	
Status	Description
<b>Solid red (on)</b>	An overheat condition has occurred.
<b>Blinking red (1Hz)</b>	Fan failure: check for an inoperative fan.
<b>Blinking red (0.25Hz)</b>	Power failure: check for a non-operational power supply
<b>Blinking red (10Hz) (FP red LED)</b>	CPLD recovery mode error(s)
<b>Solid blue</b>	Local UID is activated. Use this function to locate a unit in a rack mount environment that might be in need of service.
<b>Blinking blue (1Hz)</b>	Remote UID is on. Use this function to identify a unit from a remote location that might be in need of service.
<b>BIOS/BMC blinking blue (10Hz)</b>	BIOS/BMC: recovery and/or update in progress
<b>Red Info LED blinking (10Hz) and MB UID LED blue blinking (10Hz)</b>	CPLD: recovery and/or update in progress

### NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, and LAN port 2 is on pins 9 and 10. Attach the NIC LED cables here to display network activity. Refer to the table below for pin definitions.

LAN1/LAN2 LED Pin Definitions (JF1)	
Pin#	Definition
9	NIC 2 Activity LED
11	NIC 1 Activity LED

### ID\_UID Switch/HDD LED

The UID Switch/HDD LED connection is located on pins 13 and 14 of JF1. The UID switch is used for a chassis that supports a front UID switch. The front UID switch functions in the same way as the rear UID switch; both are for input only and cannot be used for output.

When this LED is blinking green, it indicates HDD is active. Attach a cable to pins 13 and 14 to show ID\_UID status and hard drive activity. Refer to the tables below for pin definitions.

ID_UID/HDD LED Pin Definitions (JF1)	
Pins	Definition
13	ID_UID/3.3V Stdbby
14	HDD Activity

ID_UID/HDD LED Pin Definitions (JF1)	
Color	State
Blinking Green	HDD Active

### FP Power LED

The Front Panel Power LED connection is located on pins 15 and 16 of JF1. Refer to the table below for pin definitions.

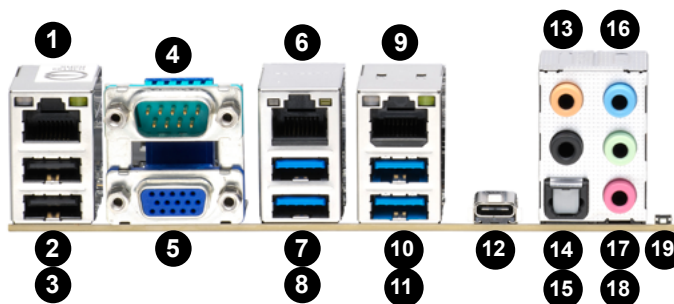
FP Power LED Pin Definitions (JF1)	
Pins	Definition
15	3.3V
16	FP PWR LED

### NMI Button

The non-maskable interrupt (NMI) button header is located on pins 19 and 20 of JF1. Refer to the table below for pin definitions.

NMI Button Pin Definitions (JF1)	
Pins	Definition
19	NMI
20	Ground

## 4.3 Rear I/O Ports



Rear I/O Ports							
#	Description	#	Description	#	Description	#	Description
1	LAN1 (1Gb)	6	Dedicated IPMI LAN	11	USB6 (3.2 Gen. 1)	16	Line In
2	USB9 (2.0)	7	USB7 (3.2 Gen. 1)	12	USB4 (3.2 Gen. 2)	17	Line Out
3	USB10 (2.0)	8	USB8 (3.2 Gen. 1)	13	Center/LFE Out	18	Mic In
4	COM1 Port	9	LAN2 (10Gb)	14	Surround Out	19	UID Switch / BMC Reset Button
5	VGA Port	10	USB5 (3.2 Gen. 1)	15	S/PDIF Out		

### VGA Connection

One VGA port (VGA) is located on the rear I/O panel. The VGA connection provide analog interface support between the computer and the video displays. Refer to the layout below for the location of VGA port.

### COM Port/Header

One COM port (COM1) and one COM header (COM2) that support serial link interface are on the motherboard. COM1 is located on the rear I/O panel. COM2 is located next to JD1. Refer to the layout below for the locations of COM1 and COM2.

### LAN Ports (LAN1/LAN2 and IPMI LAN)

Two Ethernet LAN ports (LAN1, LAN2) and a dedicated IPMI LAN port (IPMI\_LAN) are located on the rear I/O panel. LAN1 supports 1 GbE LAN connections (via the Intel i210AT LAN controller). LAN2 supports 10 GbE LAN connections (via the Aquantia AQC113 LAN controller). The dedicated IPMI LAN port, located above the USB7/8 ports on the rear I/O panel, provides LAN support for the BMC (Baseboard Management Controller). All of these LAN ports accept RJ45 cables. Please refer to the LED Indicator section ([Section 4.5](#)) for LAN LED information.



## Universal Serial Bus (USB) Ports and Headers

There are four USB 3.2 Gen. 1 ports (USB5, USB6, USB7, USB8) located on the rear I/O panel, and one USB 3.2 Gen. 1 header (USB2/3) located on the motherboard to provide front USB access. One USB 3.2 Gen. 2x2 port (USB4) is located on the rear I/O panel. The 10-pin black USB header supports two USB 2.0 connections (USB0/1), and two USB 2.0 ports (USB9, USB10) are located on the rear I/O panel. The motherboard also provides one front accessible Type-A USB 3.2 Gen. 2 port (USB11) and one USB 3.2 Gen. 2 header (USB12). These USB ports and headers can be used for USB support via USB cables (not included).

Front Panel USB 2.0 Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+5V	2	+5V
3	USB_N	4	USB_N
5	USB_P	6	USB_P
7	Ground	8	Ground
9	Key	10	NC

Type-A USB 3.2 Gen. 2 (USB11) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	VBUS	5	SSRX-
2	USB_N	6	SSRX+
3	USB_P	7	GND
4	Ground	8	SSTX-
		9	SSTX+

Front Panel USB 3.2 Gen. 1 Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	VBUS	19	Power
2	Stda_SSRX-	18	USB3_RN
3	Stda_SSRX+	17	USB3_RP
4	GND	16	GND
5	Stda_SSTX-	15	USB3_TN
6	Stda_SSTX+	14	USB3_TP
7	GND	13	GND
8	D-	12	USB_N
9	D+	11	USB_P
10		x	

Front Panel USB 3.2 Gen. 2 (USB12) Pin Definitions									
Pin#	Definition	Pin#	Definition	Pin#	Definition	Pin#	Definition	Pin#	Definition
1	VBUS	5	RX1+	9	NC	13	TX2-	17	GND
2	TX1+	6	RX1-	10	NC	14	GND	18	D-
3	TX1-	7	VBUS	11	VBUS	15	RX2+	19	D+
4	GND	8	CC1	12	TX2+	16	RX2-	20	CC2

## UID (Unit Identifier)/BMC Reset Switch and UID/BMC Reset LED Indicators

A UID / BMC Reset switch (UID-SW) is located on the rear side of the motherboard. This switch has dual functions. It can be used to identify a system unit that is in need of service, and it can also be used to reset the BMC settings.

When functioning as a BMC reset switch, UID-SW will trigger a cold reboot when the user presses and holds the switch for six seconds. It will also restore the BMC to the manufacturer's default when the user presses and holds the switch for 12 seconds.

When functioning as a UID LED switch, UID-SW will turn both rear UID LED (UID-LED) and front UID LED (Pin 7/Pin 8 of JF1) on and off when the user presses the switch on/off.

To achieve these dual purposes, the UID LED/BMC Reset switch works in conjunction with the BMC Heartbeat LED (LEDBMC) and front/rear UID LEDs. Please note that UID can also be triggered via BMC on the motherboard. For more details on the UID LEDs and BMC LEDs, refer to the tables below. Also, refer to the BMC User's Guide posted on our website at <http://www.supermicro.com> for more information on BMC.

UID/BMC Reset Switch (UID-SW) Features & Settings					
When Used as a UID LED Switch			When Used as a BMC Reset Switch		
Work w/Rear UID LED (UID-LED) & Front UID LED (JF1: Pins 7 & 8)			Work with BMC Heartbeat LED (LEDBMC)		
Rear UID LED	UID-LED	Blue: Unit identified	BMC Heartbeat LED	LEDBMC	Green Blinking: BMC Normal
Front UID LED	Pins 7 & 8 (JF1)	Blue: Unit identified	BMC Reset: Press & hold the switch (UID-SW) 6 seconds	LEDBMC: Solid green: during reboot	
Press the switch (UID-SW) to turn on and off both rear and front UID LED indicators.			BMC Reset: Press & hold the switch (UID-SW) 12 seconds	Triggering a cold reboot; LED: solid green on during cold reboot	
				LEDBMC: Solid green: during BMC reset	
				BMC: Reset to the manufacturer's default; LED solid on during BMC Reset	

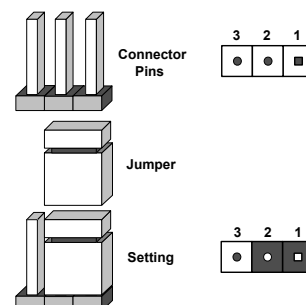
  

UID/BMC Reset Switch (UID-SW) Pin Definitions	
Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Button In

## 4.4 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 below for an example of jumping pins 1 and 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.

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



**Note:** Clearing CMOS will also clear all passwords.

### LAN Port Enable/Disable

JPL1 and JPL2 allow you to enable the onboard LAN ports (LAN1 and LAN2). The default setting is pins 1-2 to enable the connections. Refer to the table below for jumper settings.

LAN Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enable
Pins 2-3	Disable

### ME Manufacturing Mode

JPME2 is used for ME Firmware Recovery mode, which will limit system resource for essential function use only without putting restrictions on power use. In the single operation mode, online upgrade will be available via Recovery mode. Refer to the table below for jumper settings.

ME Recovery Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	ME Manufacturing Mode

### HD Audio Enable

JPAC1 allows you to enable or disable the onboard high definition audio support. The default position is on pins 1-2 to enable onboard audio connections. Refer to the table below for jumper settings.

Audio Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

### Watchdog

Watchdog (JWD1) is a system monitor that can reboot the system when a software application hangs. Close pins 1-2 to reset the system if an application hangs. Close pins 2-3 to generate a non-maskable interrupt (NMI) signal for the application that hangs. Refer to the table below for jumper settings. For this function to work properly, please also enable the Watchdog setting in the BIOS.

Watchdog Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

### VGA Enable/Disable

JPG1 allows you to enable the onboard VGA connector. The default setting is pins 1-2 to enable the connection. Refer to the table below for jumper settings.

VGA Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

### USB (USB7/8) Wake-Up

This jumper allows you to "wake up" the system by pressing a key on the USB keyboard or by clicking the USB mouse of your system. JPUSB1 is used together with the USB Wake-Up feature in BIOS. Both JPUSB1 and the BIOS setting must be enabled to use this feature. The default setting is Enabled (Pins 1-2).

**Note:** Please be sure to remove all other USB devices from the USB ports whose jumpers are set to disabled before the system goes into standby mode.

USB7/8 Wake-Up Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enable (default)
Pins 2-3	Disable USB7/8

### USB11/USB12 Disable (JP4)

JP4 allows you to disable the USB connections for USB11 and USB12. The default setting is pins 1-2 to enable the connections. Refer to the table below for jumper settings.

USB11/USB12 Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal
Pins 2-3	Disable USB11/12

### USB4 Disable (JP5)

JP5 allows you to disable the USB connection for USB4. The default setting is pins 1-2 to enable the connection. Refer to the table below for jumper settings.

USB4 Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal
Pins 2-3	Disable USB4

## 4.5 LED Indicators

### LAN LEDs

Two LAN ports (LAN1 and LAN2) are located on the rear I/O panel of the motherboard. Each Ethernet LAN port has two LEDs. The green LED indicates activity, while the other Link LED may be green, amber, or off to indicate the speed of the connection. Refer to the tables below for more information.

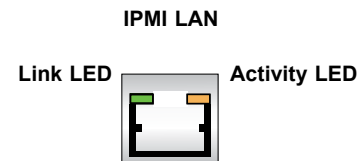
LAN1/2 Activity LED (Right) LED State		
Color	Status	Definition
Green	Flashing	Active

LAN1/2 Link LED (Left) LED State	
LED Color	Definition
Green	10Gbps
Yellow/Amber	1Gbps

### IPMI LAN LEDs

In addition to LAN1 and LAN2, an IPMI LAN is also located on the rear I/O panel. The LED on the right indicates activity, while the LED on the left indicates the speed of the connection. Refer to the table below for more information.

IPMI LAN LEDs		
	Color/State	Definition
Link (left)	Green: Solid	100 Mbps
	Amber: Solid	1Gbps
Activity (Right)	Amber: Blinking	Active



### Onboard Power LED

The Onboard Power LED is located at LEDPWR on the motherboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing any component. Refer to the table below for more information.

Onboard Power LED Indicator	
LED Color	Definition
Off	System Off (power cable not connected)
Green	System On

## M.2 LEDs

Four M.2 LEDs are located at LE3, LE4, LE5, and LE6 on the motherboard. When the M.2 LED is blinking, M.2 functions normally. Refer to the table below for more information.

M.2 LED State	
LED Color	Definition
Green: Blinking	Device Working

**Note:** For information on UID LED Indicators and BMC Heartbeat LED Indicator, please refer to the section on UID LED/BMC Reset Switch and LED Indicator.

## 4.6 Storage Ports

### I-SATA Ports

Eight SATA 3.0 ports (I-SATA0 - I-SATA7) are located on the motherboard, which are supported by the Intel® C621A chipset. These SATA ports support RAID 0, 1, 5, and 10. SATA ports provide serial-link signal connections, which are faster than the connections of Parallel ATA.

### Disk-On-Module Power Connector

The Disk-On-Module (DOM) power connectors at JSD1 and JSD2 provide 5V power to a solid-state DOM storage devices connected to one of the SATA ports. Refer to the table below for pin definitions.

DOM Power Pin Definitions	
Pin#	Definition
1	5V
2	Ground
3	Ground

### PCIe 4.0 M.2 Sockets

The motherboard has four PCIe 4.0 M.2 sockets (M.2-C01 - M.2-C04). M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 slots on the motherboard support PCIe 4.0 x4 M.2 NVMe SSDs in the 2260, 2280, and 22110 form factors.



## Chapter 5

### Software

After the hardware has been installed, you can install the Operating System (OS), configure RAID settings, and install the drivers.

#### 5.1 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](http://www.supermicro.com/support/manuals).

##### *Installing the OS*

1. Create a method to access the MS Windows installation ISO file. That might be a DVD, perhaps using a USB flash or media drive, or the IPMI KVM console.
2. Retrieve the proper RST/RSTe driver. Go to the Supermicro web page 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.

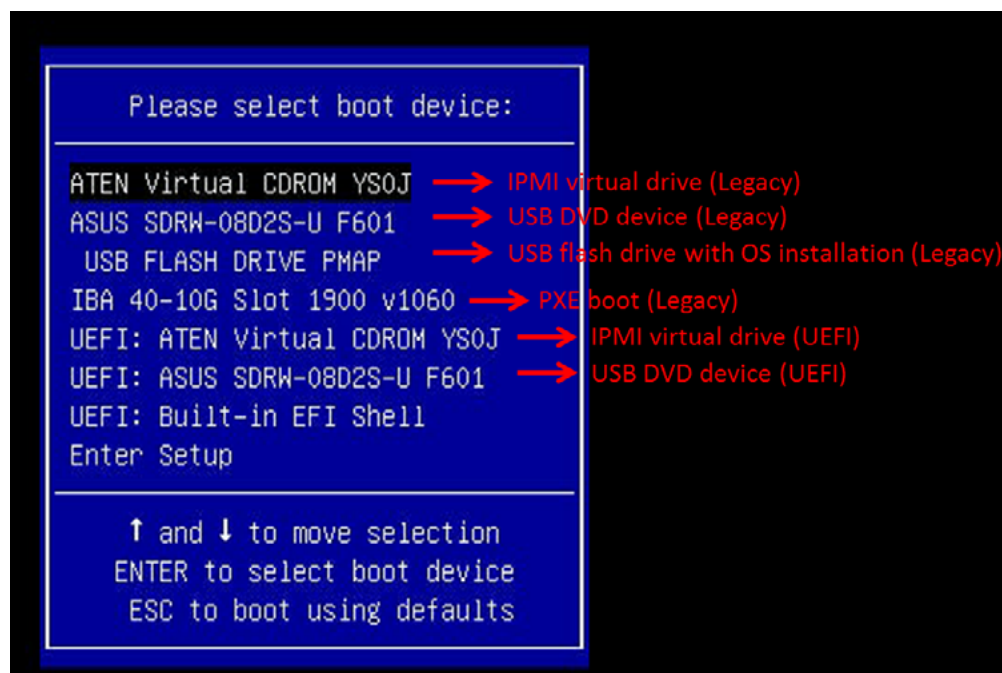
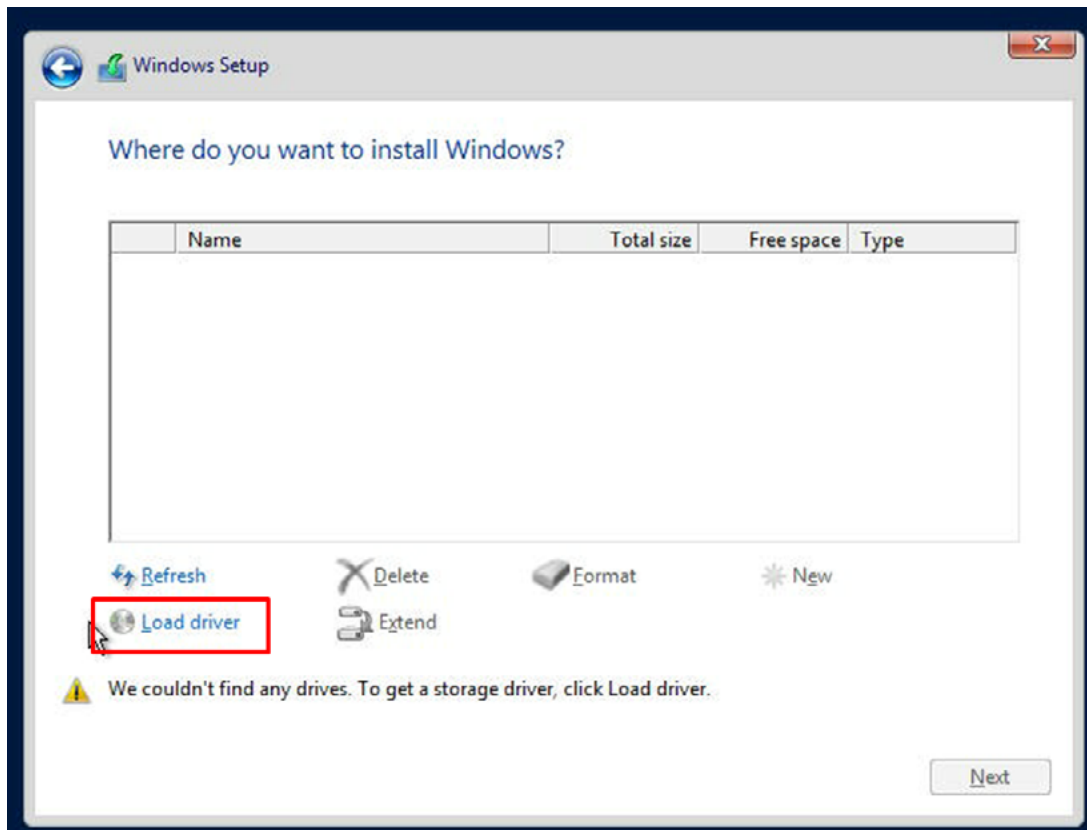


Figure 5-1. Select Boot Device

4. During Windows Setup, continue to the dialog where you select the drives on which to install Windows. If the disk you want to use is not listed, click on “Load driver” link at the bottom left corner.



**Figure 5-2. Load Driver Link**

To load the driver, browse the USB flash or media drive for the proper driver files.

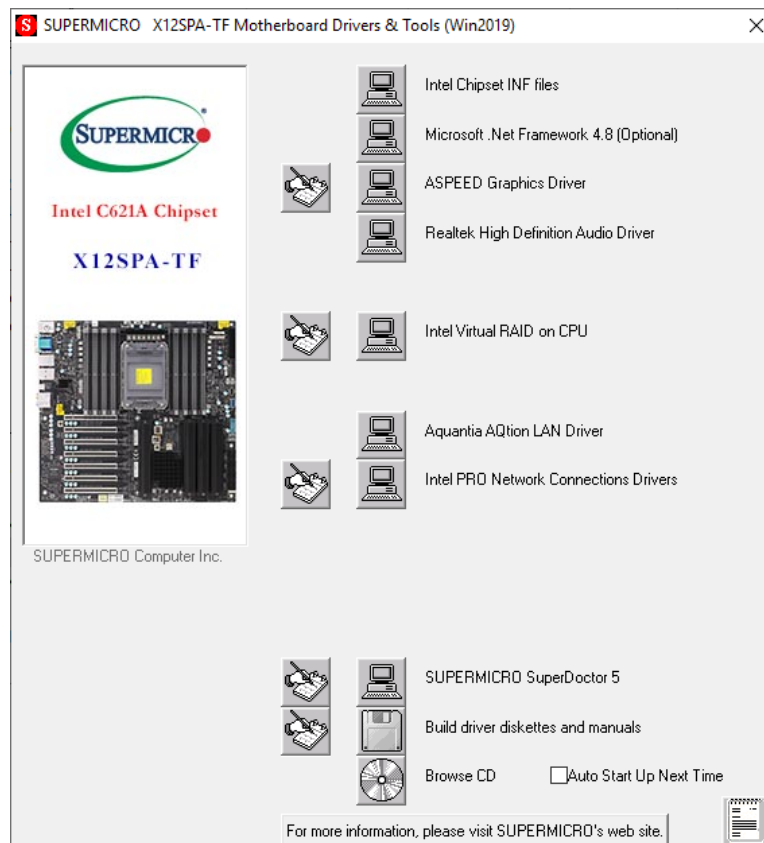
- For RAID, choose the SATA/sSATA RAID driver indicated then choose the storage drive on which you want to install it.
  - For non-RAID, choose the SATA/sSATA AHCI driver indicated then choose the storage drive on which you want to install it.
5. Once all devices are specified, continue with the installation.
  6. After the Windows OS installation has been completed, the system will automatically reboot multiple times.

## 5.2 Driver Installation

The Supermicro website contains drivers and utilities for your system at [https:// www. supermicro. com/wdl/driver](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 DVD. (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 screenshot shown below should appear.



**Figure 5-3. Driver and Tool Installation Screen**

**Note:** Click the icons showing handwriting 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 the 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 the entire content.

## 5.3 SuperDoctor® 5

The Supermicro SuperDoctor 5 is a program that functions in a command-line or web-based interface for Windows and Linux operating systems. The program monitors such system health information as CPU temperature, system voltages, system power consumption, fan speed, and provides alerts via email or Simple Network Management Protocol (SNMP).

SuperDoctor 5 comes in local and remote management versions and can be used with Nagios to maximize your system monitoring needs. With SuperDoctor 5 Management Server (SSM Server) IPMI, you can remotely control power ON/OFF and reset chassis intrusion for multiple systems. SuperDoctor 5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

[SuperDoctor® Manual and Resources](#)

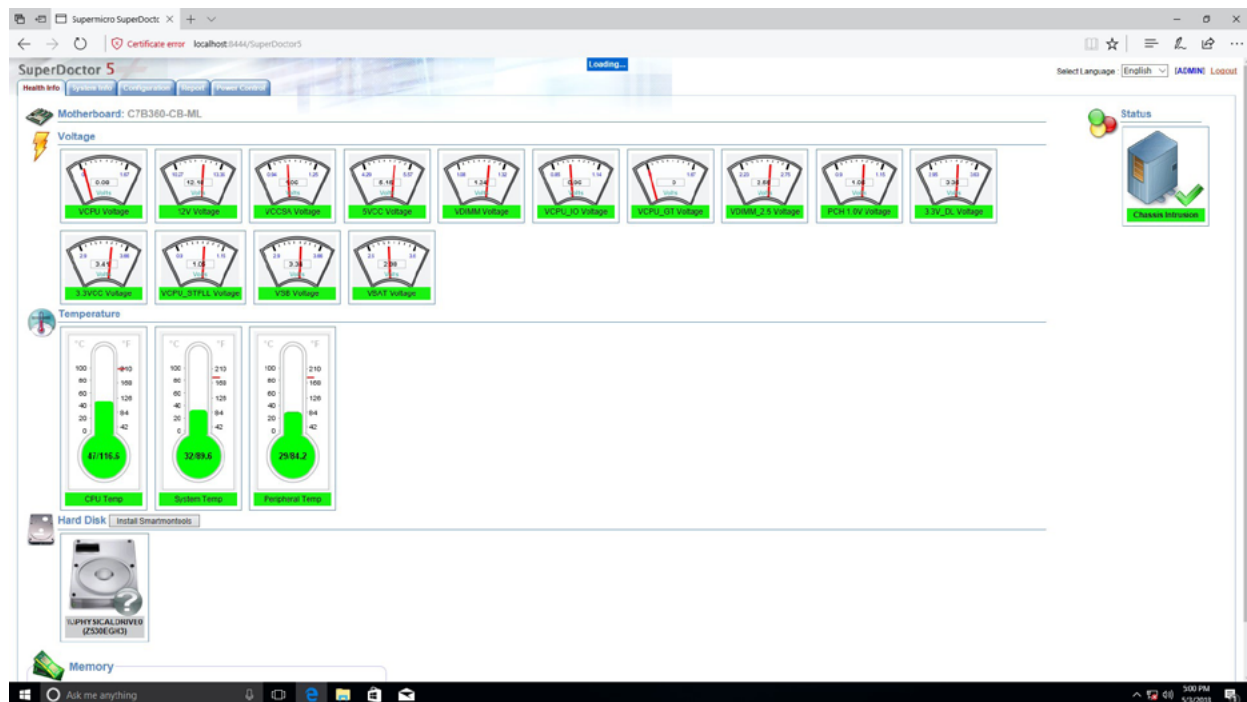


Figure 5-4. SuperDoctor 5 Interface Display Screen (Health Information)

## 5.4 BMC

The motherboard provides remote access, monitoring and management through the baseboard management controller (BMC) and other management controllers distributed among different system modules. There are several BIOS settings that are related to BMC. For general documentation and information on BMC, visit our website at: [www.supermicro.com/en/solutions/management-software/bmc-resources](http://www.supermicro.com/en/solutions/management-software/bmc-resources).

### BMC ADMIN User Password

For security, each system is assigned a unique default BMC password for the ADMIN user. This can be found on a sticker on the chassis and a sticker on the motherboard. The sticker also displays the BMC MAC address. If necessary, the password can be reset using the Supermicro IPMICFG tool.



**Figure 5-5. BMC Password Label**

The sticker can be found on the pull-out service tag at the front of the chassis. See [Chapter 1](#) for label location.

# Chapter 6

## Optional Components

This chapter describes alternate configurations and optional system components.

Optional Parts
Storage drive options
Power options
<a href="#">Cable Management Arm</a>
<a href="#">TPM security module</a>
Intel <a href="#">VROC</a> RAID Key

### 6.1 Storage Protocols Supported

The storage drive bays can support up to four 3.5" SAS3/SATA3 HDD/SSD and four 3.5" NVMe/SAS3/SATA3 storage devices. Once the supporting hardware is installed for a selection of bays, drives of any storage protocol type can be inserted.

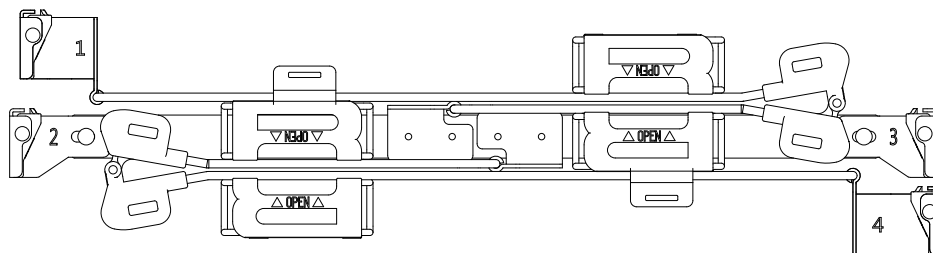
### 6.2 Power Supply Modules

Power Supply Module Options		
Watts	Part Number	80Plus Level
2200	PWS-2K20A-1R (default)	Titanium

## 6.3 Cable Management Arm

The system supports a cable management arm (CMA), which keeps the rear cables organized and clear of the rail mechanisms when the system is extended out the front of the rack for maintenance.

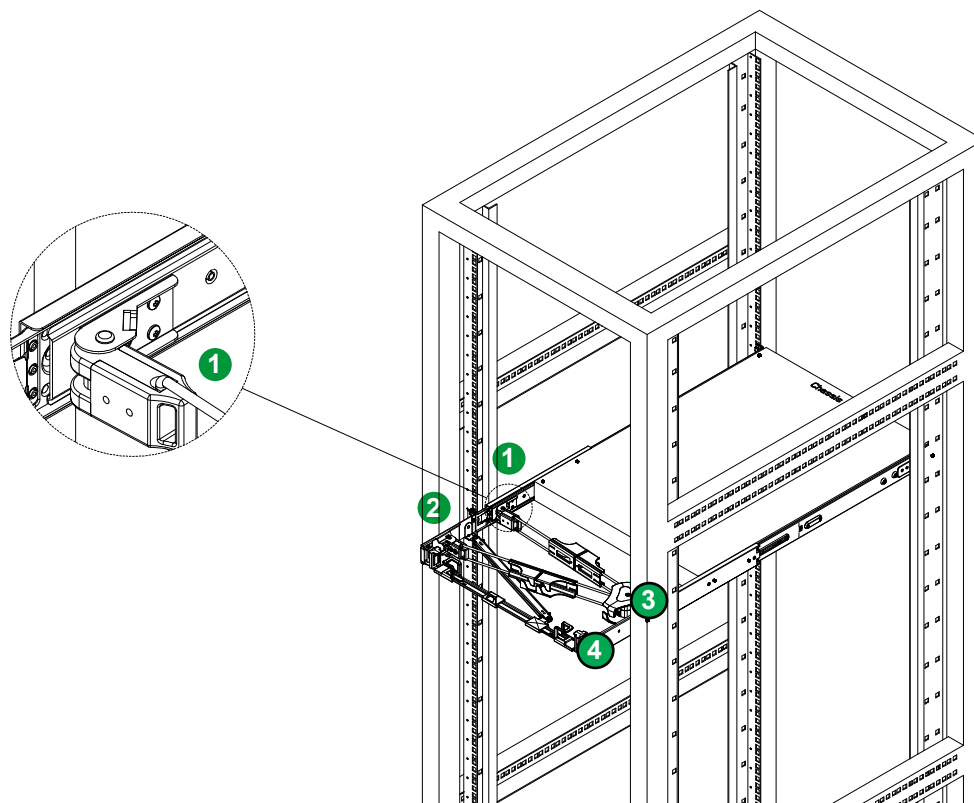
The CMA attaches to the rack mounting rails using four connectors. They are labeled on the connectors 1, 2, 3, and 4.



**Figure 6-1. Cable Management Arm**

### ***Installing the Cable Management Arm***

1. Slide CMA connector #1 forward onto the two posts on the rear of the right *inner* rail (right side when viewed from the front). It snaps into place.
2. Slide CMA connector #2 forward onto the two posts on the rear of the right *middle* rail. It snaps into place.



**Figure 6-2. Installing the Connectors**

3. Slide CMA connector #3 forward onto the two posts on the rear of the left middle rail. It snaps into place.
4. For CMA connector #4, align the metal tabs with the slots on the rear of the left outer rail and push it forward. It snaps into place.
5. Route the cables through the holding brackets, leaving enough slack.

### ***Removing the Cable Management Arm***

1. Remove cables from the CMA,
2. For CMA connector #4, pull the metal release tab toward the center of the rack and slide the connector toward the rear to release it.
3. For CMA connectors #3, #2, and #1, depress the front edge of the yellow plastic rocker lock and slide the connector toward the rear to release it.



## 6.4 TPM Security Module

SPI capable TPM 2.0 (or 1.2) with Infineon 9670 controller, horizontal form factor

The JTPM1 header is used to connect a Trusted Platform Module (TPM). A TPM is a security device that supports encryption and authentication in hard drives. It enables the motherboard to deny access if the TPM associated with the hard drive is not installed in the system.

Details and installation procedures are at:

<http://www.supermicro.com/manuals/other/TPM.pdf>.

- AOM-TPM-9670V
- AOM-TPM-9671V

## 6.5 Intel Virtual RAID on CPU (VROC)

Intel® Virtual RAID on CPU (Intel VROC) is an enterprise RAID solution for NVMe SSDs directly attached to Intel Xeon Scalable processors. Intel Volume Management Device (VMD) is an integrated controller inside the CPU PCIe root complex.

- A single processor supports up to 12 NVMe SSDs and up to 6 RAID arrays.

Stripe sizes are 4K, 8K, 16K, 32K, 64K, 128K.

### Requirements and Restrictions

- **Intel VROC is only available when the system is configured for UEFI boot mode.**
- To enable the **mdadm** command and support for RSTe, install the patch from
  - Linux: <https://downloadcenter.intel.com/download/28158/Intel-Virtual-RAID-on-CPU-Intel-VROC-and-Intel-Rapid-Storage-Technology-enterprise-Intel-RSTe-Driver-for-Linux->
  - Windows: <https://downloadcenter.intel.com/download/28108/Intel-Virtual-RAID-on-CPU-Intel-VROC-and-Intel-Rapid-Storage-Technology-enterprise-Intel-RSTe-Driver-for-Windows->
- To enable Intel VROC, a hardware key must be inserted on the motherboard, and the appropriate processor's Virtual Management Devices must be enabled in the BIOS setup.
- It is possible to enable Intel VROC without a hardware key installed, but only RAID0 will be enabled.
- Intel VROC is not compatible with secure boot. This feature must be disabled.
- When creating bootable OS RAID1 devices, you must have both devices on the same CPU, and a VMD on that CPU.
- Spanning drives when creating RAID devices is not recommended due to performance issues, even though it is supported.

### Supported SSDs and Operating Systems

To see the latest support information: <https://www.intel.com/content/www/us/en/support/articles/000030310/memory-and-storage/ssd-software.html>

## Additional Information

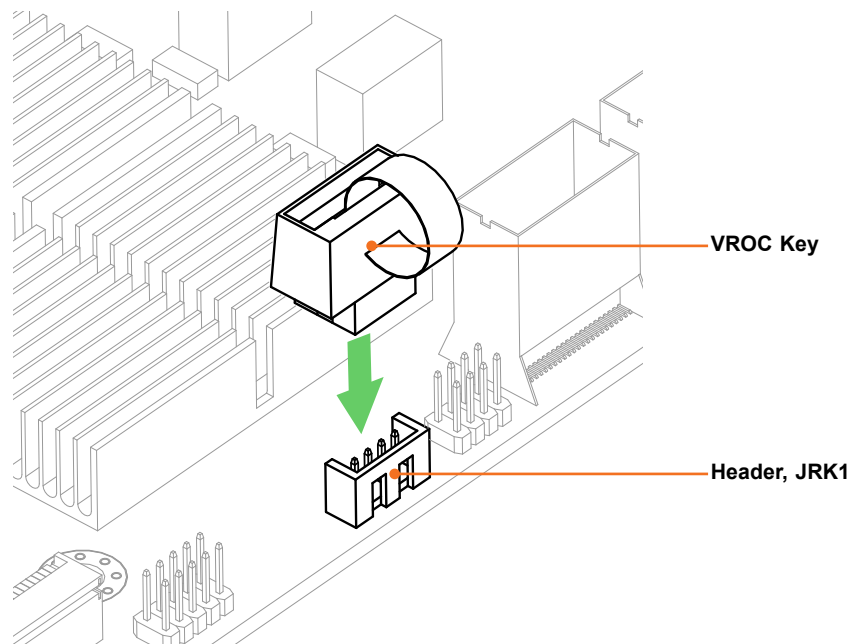
Additional information is available on the product page for the Supermicro add-on card and the linked manuals.

[www.supermicro.com/products/accessories/addon/AOC-VROCxxxMOD.cfm](http://www.supermicro.com/products/accessories/addon/AOC-VROCxxxMOD.cfm)

## Hardware Key

The Intel VROC hardware key is a license key that detects the Intel VROC SKU and activates the function accordingly. The key must be plugged into the Supermicro motherboard (connector JRK1). The key options are:

Intel® VROC Keys			
VROC Package	Description	Part Number	Intel MM Number
Standard	RAID 0, 1, 10 Supports 3rd party SSDs	AOC-VROCSTNMOD	951605
Premium	RAID 0, 1, 5, 10 Supports 3rd party SSDs	AOC-VROCPREMOD	951606
Intel SSD only	RAID 0, 1, 5, 10 Supports Intel SSDs only	AOC-VROCINTMOD	956822

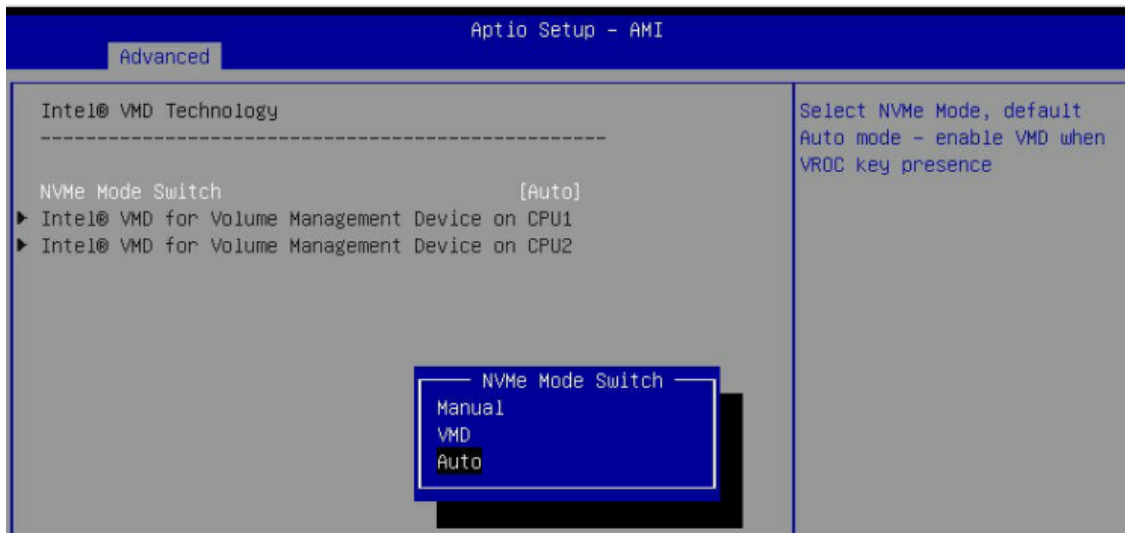


**Figure 6-3. Intel VROC RAID Key and Motherboard Connector JRK1**

## Configuring NVMe RAID Manually

RAID for NVMe SSDs is enabled by default when Intel VROC Raid Key is populated. It may be managed manually through the UEFI BIOS.

1. Reboot the workstation and press the [DEL] key to access the BIOS options.
2. Switch to **Advanced > Chipset Configuration > North Bridge > IIO Configuration > Intel® VMD Technology**.



**Figure 6-4. BIOS, Selecting VMD Mode**

You can select a mode. The default is **Auto**. The **VMD** switch enables VMD mode for all NVMe ports despite the presence of the VROC key. The **Manual** switch allows the user to choose devices on which to enable VMD.

The onboard M.2 NVMe from PCH is located in the CPU1 section.

The screenshot below shows example choices in Manual mode.

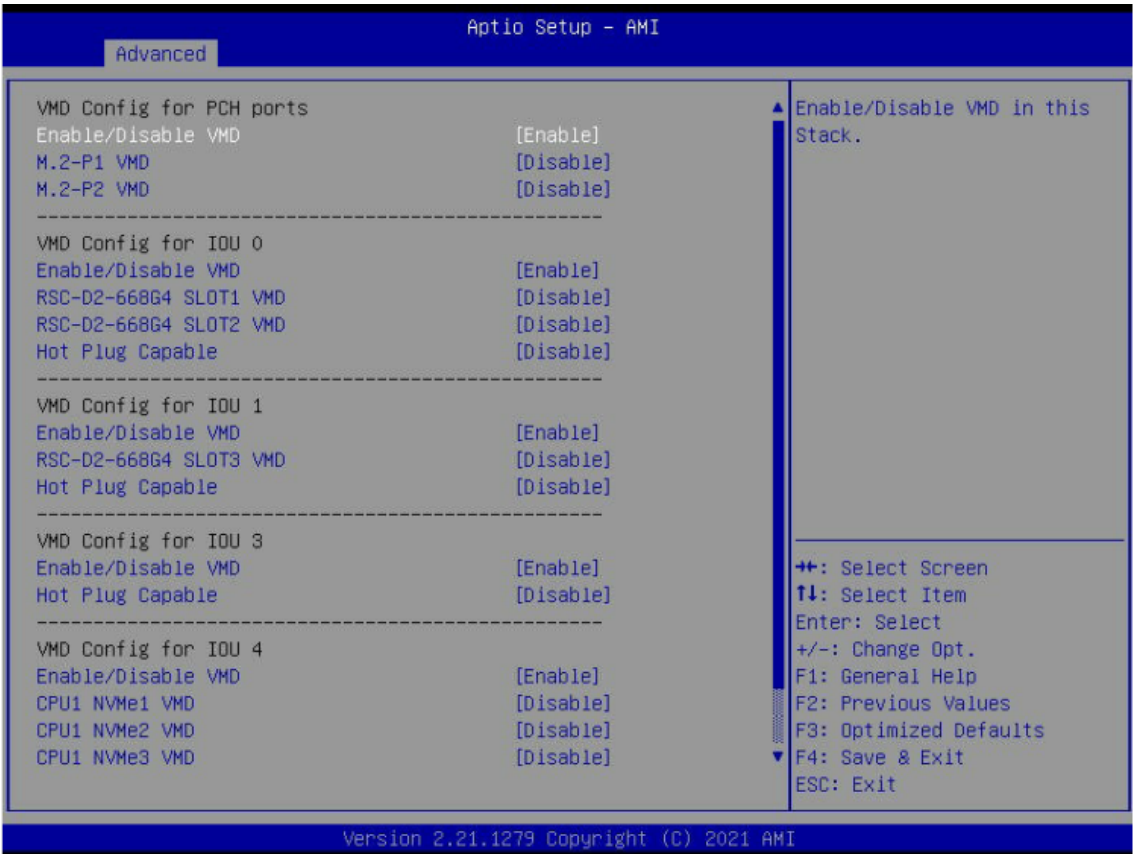


Figure 6-5. BIOS, Manual Mode (Example—your workstation may look different.)

3. Select the desired PStack# to Enable or Disable the corresponding Intel VMD controller

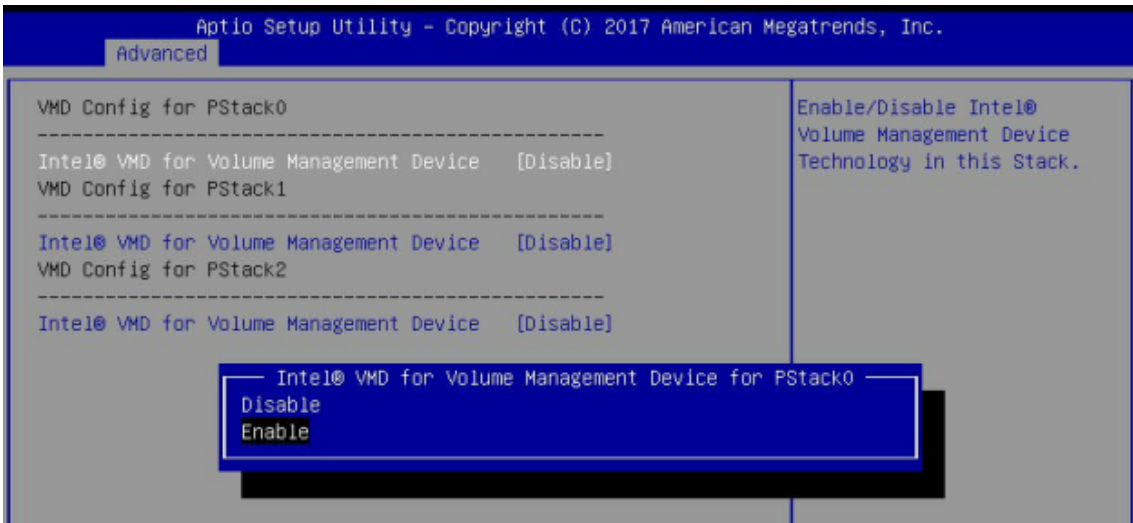
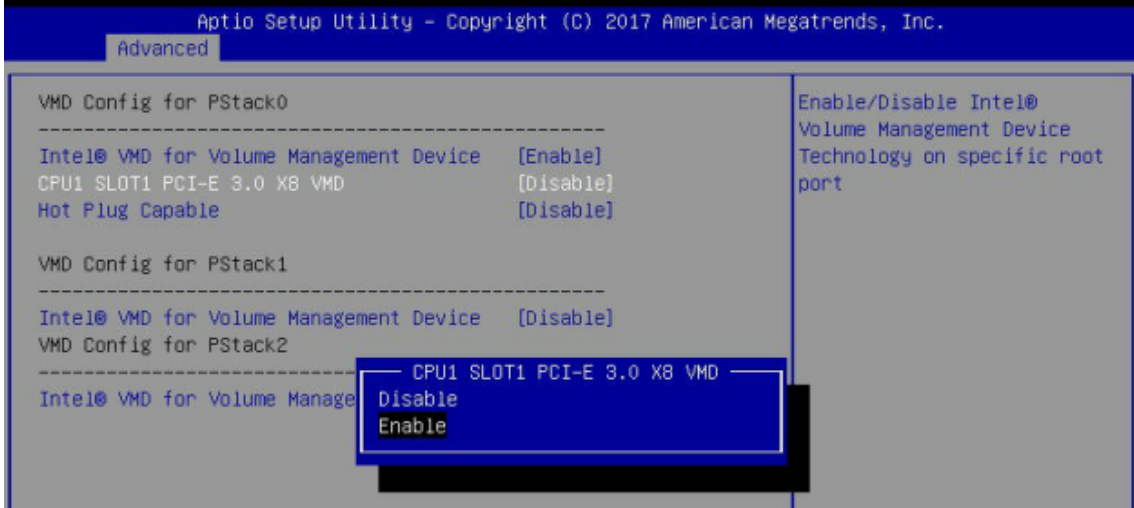


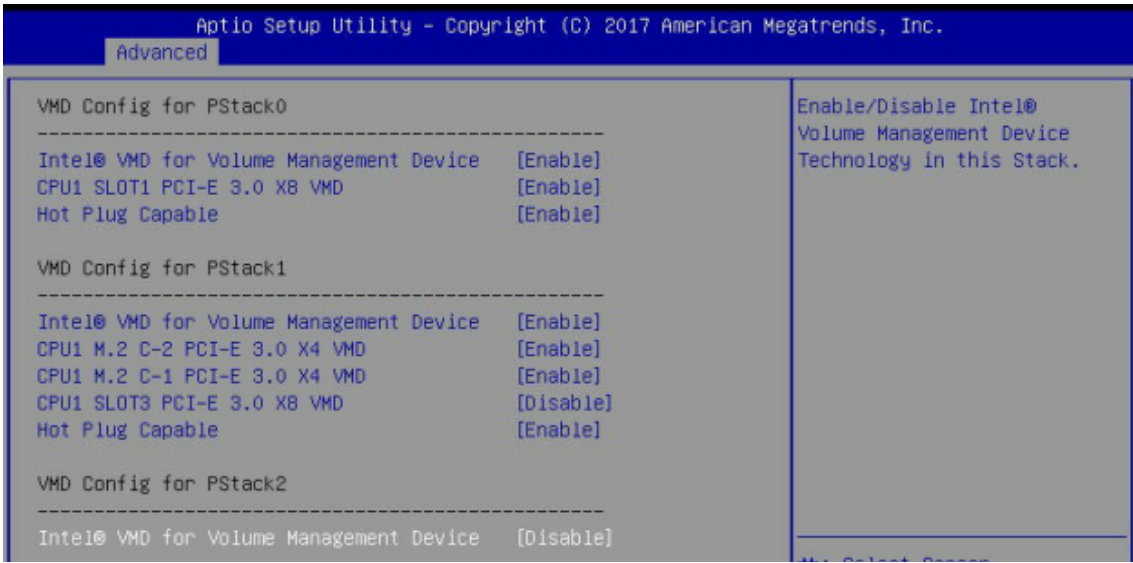
Figure 6-6. BIOS, Enabling VMD for Pstack0

4. Select the desired PCIe slot to Enable or Disable Intel VMD functionality according to the current hardware configuration being used. Hot Plug Capability can also be Enabled or Disabled.

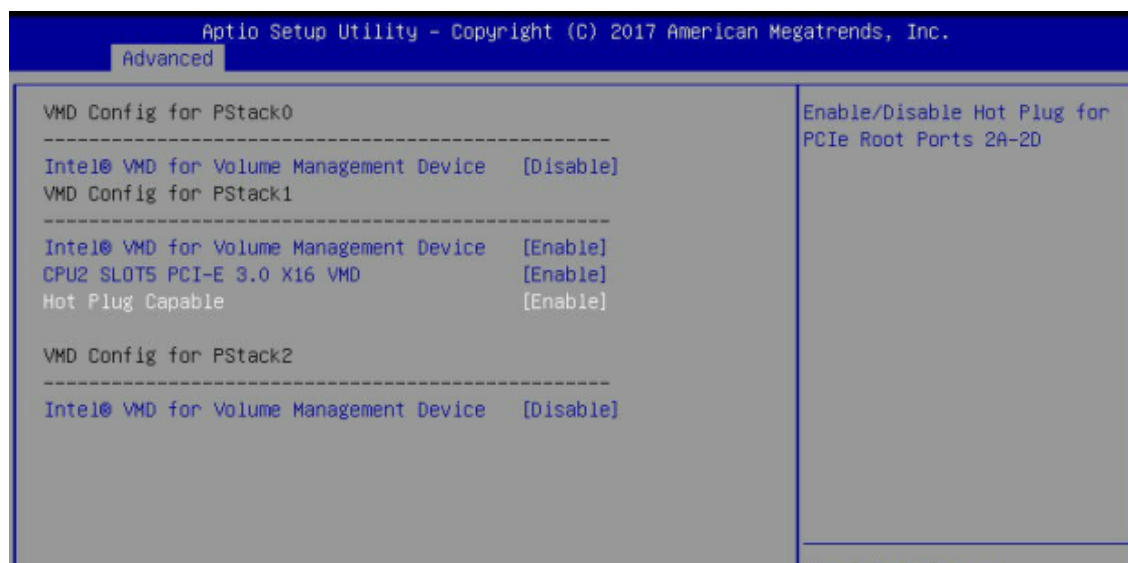


**Figure 6-7. BIOS, Enabling VMD Functionality per Slot**

5. Repeat steps 3 and 4 for each PStack# on each CPU to be enabled or disabled. In this example, we enabled CPU1 Slot1 (Figure 6-11) and CPU2 Slot5 (Figure 6-12) (four U.2 form factor SSDs), as well as CPU1 M.2 C-1 and CPU1 M2. C-2 (two M.2 form factor SSDs)



**Figure 6-8. BIOS, Enabling CPU1 Example**



**Figure 6-9. BIOS, Enabling CPU2 Example**

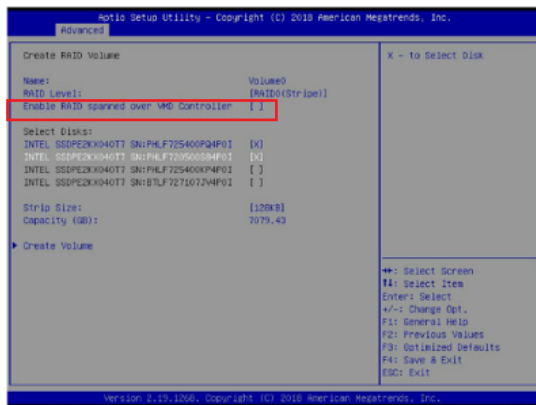
6. Press [F4] to save the configuration and reboot the system and press [DEL] to enter BIOS.

**Note:** Disabling the VMD controller without first deleting the associated existing RAID volume can lead to unexpected behavior. This action is strongly not recommended.

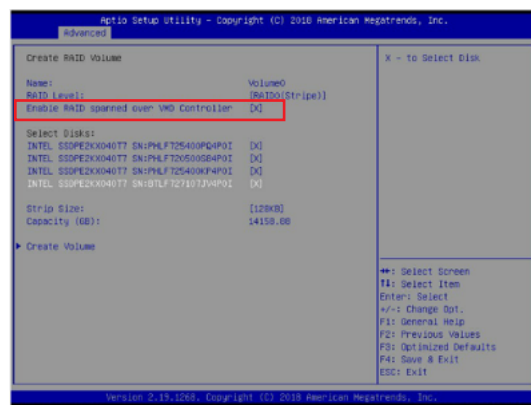
**Note:** The effects of physically changing or swapping a CPU on the VMD controller enablement have not yet been thoroughly tested or documented.

7. Switch to **Advanced > Intel(R) Virtual RAID on CPU > All Intel VMD Controllers > Create RAID Volume**.
8. Set **Name**.
9. Set **RAID Level**.

10. If cross-controller RAID is required, select **Enable RAID spanned over VMD Controller**.



**Figure 6-10. Created Volume *without* enabling RAID spanned over VMD controller**



**Figure 6-11. Created Volume *with* enabling RAID spanned over VMD controller**

11. Select specific disks for RAID with an [X].
- RAID0: Select at least two [2 - 24] disks
  - RAID1: Select only two disks
  - RAID5: Select at least three [3 - 24] disks
  - RAID10: Select only four disks
12. Select **Stripe Size** (Default 64KB).
13. Select **Create Volume**.
14. If another RAID is needed, start again at step 9.
15. Press [F4] to save and reboot.



## Status Indications

An LED indicator on the drive carrier shows the RAID status of the drive.

Drive Carrier Status LED Indicator	
Status	State (red)
Normal function	OFF
Locating	4Hz blink
Fault	Solid ON
Rebuilding	1Hz Blink

IBPI SFF 8489 Defined Status LED States

## Hot-Swap Drives

Intel VMD enables hot-plug and hot-unplug for NVMe SSDs, whether from Intel or other manufacturers. Under vSphere ESXi, several steps are necessary to avoid potential stability issues. See the information at the link [1] below.

### Hot-unplug

1. Prevent devices from being re-detected during rescan:

```
esxcli storage core claiming autoclaim --enabled=false
```

2. Unmount the VMFS volumes on the device. Check [2] for details.
3. Detach the device. Check [3] for details.
4. Physically remove the device.

### Hot-plug

- Physically install the device.

ESXi will automatically discover NVMe SSDs, but a manual scan may be required in some cases.

## Related Information Links

[1] <https://kb.vmware.com/s/article/2151404>

[2] <https://docs.vmware.com/en/VMware-vSphere/6.5/com.vmware.vsphere.storage.doc/GUID-1B56EF97-F60E-4F21-82A7-8F2A7294604D.html>

[3] <https://docs.vmware.com/en/VMware-vSphere/6.5/com.vmware.vsphere.storage.doc/GUID-F2E75F67-740B-4406-9F0C-A2D99A698F2A.html>

# Chapter 7

## Troubleshooting and Support

### 7.1 Information Resources

#### Website

A great deal of information is available on the Supermicro website, [www.supermicro.com](http://www.supermicro.com).

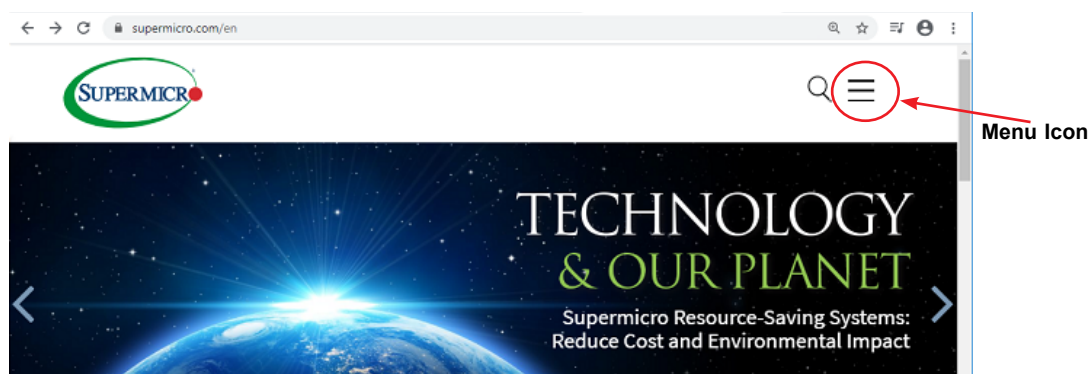


Figure 7-1. Supermicro Website

- Specifications for workstations and other hardware are available by clicking the menu icon, then selecting the **Products** option.
- The **Support** option offers downloads (manuals, BIOS/BMC, drivers, etc.), FAQs, RMA, warranty, and other service extensions.

#### *Direct Links for the 540A-TR System*

[540A-TR](#) specifications page

[X12SPA-TF motherboard page](#) for links to the Quick Reference Guide, User Manual, validated storage drives, etc.

#### *Direct Links for General Support and Information*

[Frequently Asked Questions](#)

[Add-on card descriptions](#)

[TPM User Guide](#)

General Memory Configuration Guide: [X12](#)

[IPMI User Guide](#)

## Direct Links (continued)

### [SuperDoctor5 Large Deployment Guide](#)

For validated memory, see our [Product Resources](#) page

[Product Matrices](#) page for links to tables summarizing specs for systems, motherboards, power supplies, riser cards, add-on cards, etc.

[Security Center](#) for recent security notices

[Supermicro Phone and Addresses](#)

## 7.2 Intelligent Platform Management Interface (IPMI)

The system supports the Intelligent Platform Management Interface (IPMI). IPMI is used to provide remote access, monitoring, and management. There are several BIOS settings that are related to IPMI.

For general documentation and information on IPMI, please visit our website at: <http://www.supermicro.com/products/nfo/IPMI.cfm>.

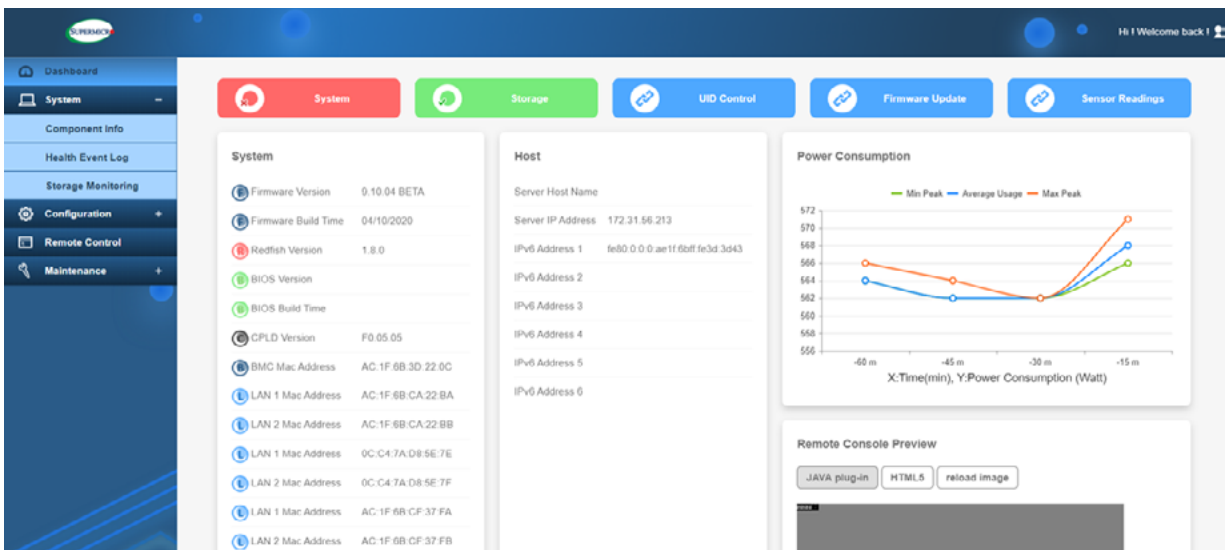


Figure 7-2. IPMI Sample

## 7.3 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the [Technical Support Procedures](#) or [Returning Merchandise for Service](#) section(s) in this chapter. [Power down](#) the system before changing any non-hot-swap hardware components.

### No Power

1. As you try to power up the system, note any beep codes. Refer to the next section for details on [beep codes](#).
2. Check that the power LED on the motherboard is ON.

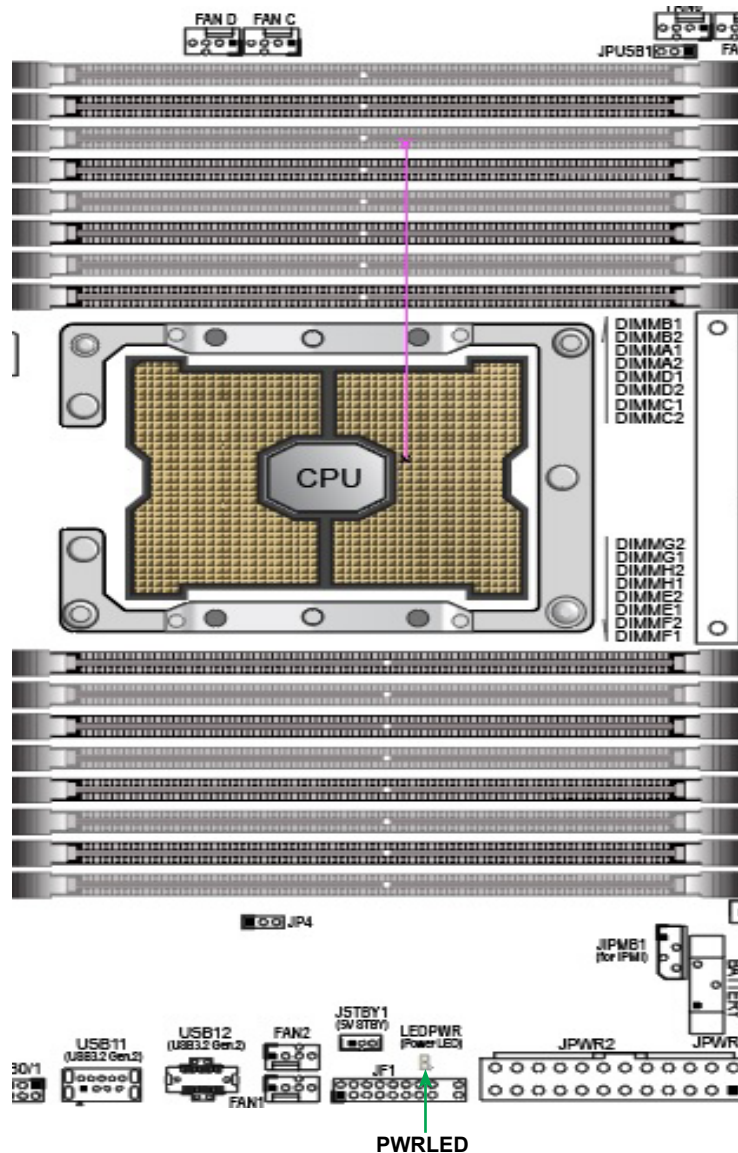


Figure 7-3. Location of the MB Power LED

3. Make sure that the power connector is connected to your power supply.
4. Make sure that no short circuits exist between the motherboard and chassis.
5. Disconnect all cables from the motherboard, including those for the keyboard and mouse.
6. Remove all add-on cards.
7. Install a CPU, a heatsink, connect the internal speaker (if applicable), and the power LED to the motherboard. Make sure that the heatsink is fully seated.
8. Use the correct type of onboard CMOS battery as recommended by the manufacturer. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.  
**Warning:** To avoid possible explosion, do not install the battery upside down.
9. Verify that all jumpers are set to their default positions.
10. Check that the power supplies' input voltage operates at 100-120V or 180-240V.
11. Turn the power switch ON and OFF to test the system.

## No Video

1. If the power is ON but you have no video, remove all the add-on cards and cables.
2. As you try to power up the system, note any beep codes. Refer to the next section for details on [beep codes](#).

## System Boot Failure

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

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 below.

## Memory Errors

1. Make sure that the DIMM modules are properly and fully installed.
2. Confirm that you are using the correct memory. Also, it is recommended that you use the same memory type and speed for all DIMMs in the system. See [Section 3.5](#) for memory details.
3. Check for bad DIMM modules or slots by swapping modules between slots and noting the results.
4. Check the power supply voltage 115V/230V switch.

## 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.
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
3. If the above steps do not fix the setup configuration problem, contact your vendor for repairs.

## When the System Becomes Unstable

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

1. CPU/BIOS support: Make sure that your CPU 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:** Refer to the product page on our website at <http://www.supermicro.com> for memory and CPU support and updates.

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 CPU/system fans, etc., work properly. Check the hardware monitoring settings in the IPMI to make sure that the CPU 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. Please refer to our website for more information on the minimum power requirements.
6. Proper software support: Make sure that the correct drivers are used.

***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.
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 a CPU 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 a 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.

## 7.4 BIOS Error Beep (POST) Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

**Non-fatal errors** are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

**Fatal errors** are those which will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The table below lists some common errors and their corresponding beep codes encountered by users.

BIOS Error Beep (POST) Codes		
Beep Code	Error Message	Description
1 short	Refresh	Circuits have been reset (Ready to power up)
5 short, 1 long	Memory error	No memory detected in the system
5 long, 2 short	Display memory read/write error	Video adapter missing or with faulty memory
1 long continuous	System OH	System overheat condition

### Additional BIOS POST Codes

The AMI BIOS supplies additional checkpoint codes, which are documented online at [http:// www.supermicro.com/support/manuals/](http://www.supermicro.com/support/manuals/) ("AMI BIOS POST Codes User's Guide").

When BIOS performs the Power On Self Test, it writes checkpoint codes to I/O port 0080h. If the computer cannot complete the boot process, a diagnostic card can be attached to the computer to read I/O port 0080h (Supermicro p/n AOC-LPC80-20).

For information on AMI updates, please refer to <http://www.ami.com/products/>.

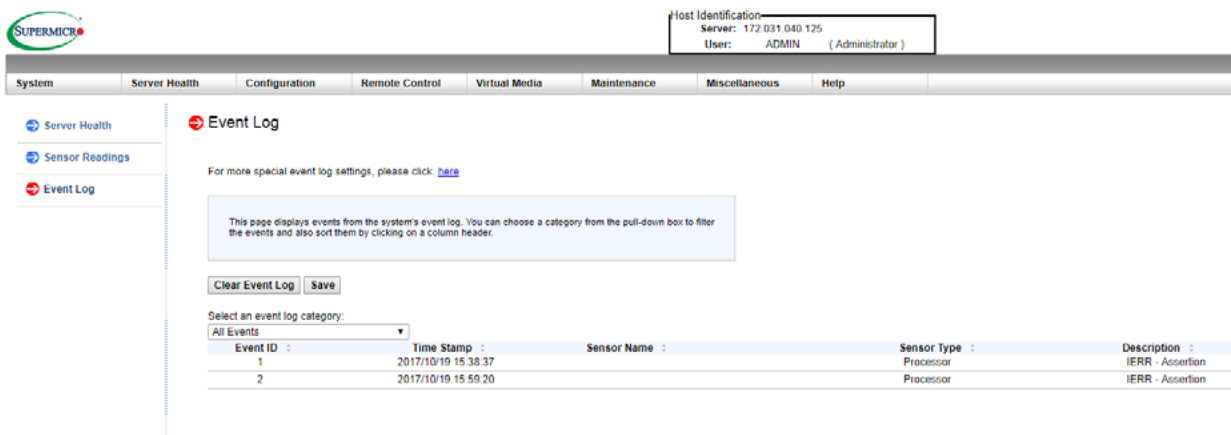


## 7.5 Crash Dump Using IPMI

In the event of a processor internal error (IERR) that crashes your system, you may want to provide information to support staff. You can download a crash dump of status information using IPMI. The IPMI manual is available at <https://www.supermicro.com/solutions/IPMI.cfm>.

### Check IPMI Error Log

1. Access the IPMI web interface.
2. Click the **Server Health** tab, then **Event Log** to verify an IERR error.



**Figure 7-4. IPMI Event Log**

In the event of an IERR, the BMC executes a crash dump. You must download the crash dump and save it.

## 7.6 UEFI BIOS Recovery

**Warning:** Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you do update the BIOS, do not shut down or reset the system while the BIOS is updating to avoid possible boot failure.

### Overview

The Unified Extensible Firmware Interface (UEFI) provides a software-based interface between the operating system and the platform firmware in the pre-boot environment. The UEFI specification supports an architecture-independent mechanism that will allow the UEFI OS loader stored in an add-on card to boot the system. The UEFI offers clean, hands-off management to a computer during system boot.

### Recovering the UEFI BIOS Image

A UEFI BIOS flash chip consists of a recovery BIOS block and a main BIOS block (a main BIOS image). The recovery block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a healthy BIOS image if the original main BIOS image is corrupted. When the system power is turned on, the recovery block codes execute first. Once this process is complete, the main BIOS code will continue with system initialization and the remaining POST (Power-On Self-Test) routines.

**Note 1:** Follow the BIOS recovery instructions below for BIOS recovery when the main BIOS block crashes.

**Note 2:** When the BIOS recovery block crashes, you will need to follow the procedures to make a Returned Merchandise Authorization (RMA) request. Also, you may use the Supermicro Update Manager (SUM) Out-of-Band ([https:// www. supermicro. com. tw/ products/ nfo/ SMS\\_ SUM. cfm](https://www.supermicro.com.tw/products/nfo/SMS_SUM.cfm)) to reflash the BIOS.

### Recovering the Main BIOS Block with a USB Device

This feature allows the user to recover the main BIOS image using a USB-attached device without additional utilities used. A USB flash device such as a USB Flash Drive, or a USB CD/DVD ROM/RW device can be used for this purpose. However, a USB Hard Disk drive cannot be used for BIOS recovery at this time.

The file system supported by the recovery block is FAT (including FAT12, FAT16, and FAT32) which is installed on a bootable or non-bootable USB-attached device. However, the BIOS might need several minutes to locate the SUPER.ROM file if the media size becomes too large due to the huge volumes of folders and files stored in the device.

To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below.

1. Using a different machine, copy the "Super.ROM" binary image file into the Root "\\" directory of a USB device or a writable CD/DVD.

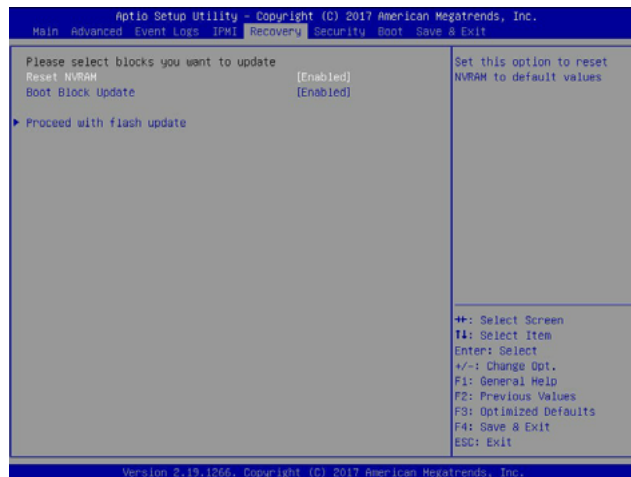
**Note 1:** If you cannot locate the "Super.ROM" file in your drive disk, visit our website at [www.supermicro.com](http://www.supermicro.com) to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

**Note 2:** Before recovering the main BIOS image, confirm that the "Super.ROM" binary image file you download is the same version or a close version meant for your motherboard.

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and reset the system when the following screen appears.
3. After locating the healthy BIOS binary image, the system will enter the BIOS Recovery menu as shown below.



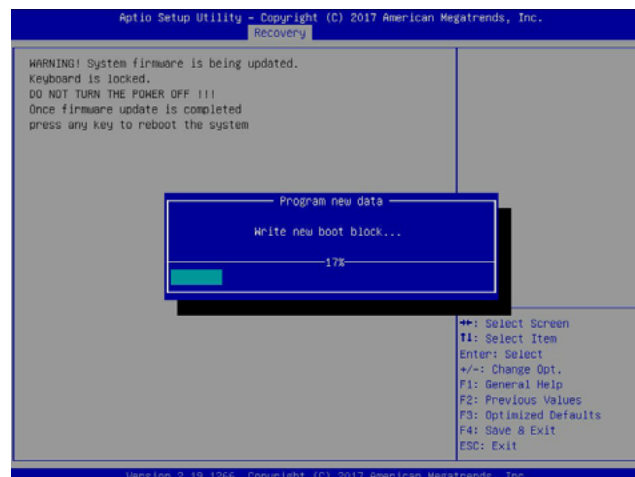
**Note:** At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.



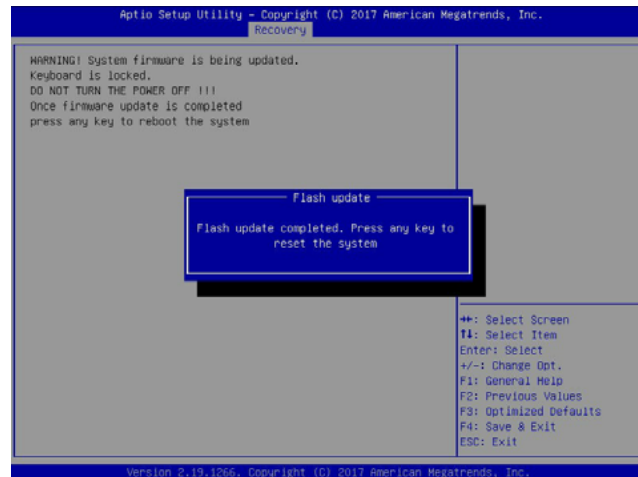
4. When the screen as shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below.

**Note:** Do not interrupt the BIOS flashing process until it has been completed.

5. After the BIOS recovery process is complete, press any key to reboot the system.
6. Using a different system, extract the BIOS package into a USB flash drive.

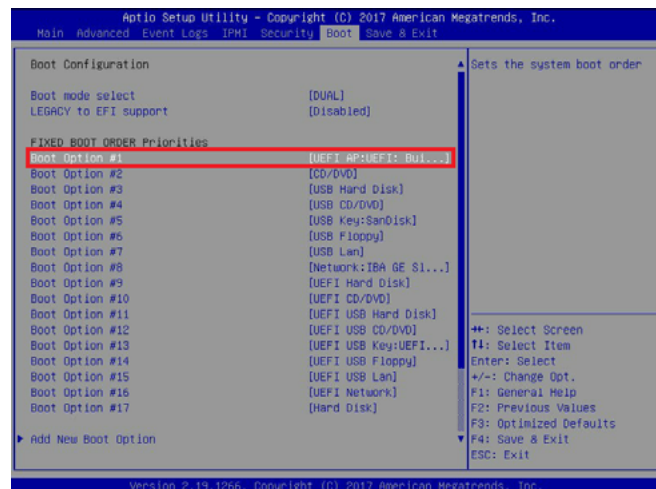


7. Press <Del> continuously during system boot to enter the BIOS Setup utility. From the top of the toolbar, select Boot to enter the submenu. From the submenu list, select Boot Option



#1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press <F4> to save the settings and exit the BIOS Setup utility.

8. When the UEFI Shell prompt appears, type fs# to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter flash.nsh BIOSname.### at the prompt to start the BIOS update process.



**Note:** Do not interrupt this process until the BIOS flashing is complete.

```

UEFI Interactive Shell v2.1
EDK II
UEFI v2.50 (American Megatrends, 3x0005000C)
Mapping table
FS0: Alias(s):HD0\0b:BLK1:
    PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,3x77501D72,0x000,0x1
CR0S02)
    BLK0: Alias(s):
        PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)
Press F10 in 1 seconds to skip startup.nsh or any other key to continue.
Shell> f10
FS0:\> cd AFU005
FS0:\AFU005> cd SKJPM2_03162017
FS0:\AFU005\SKJPM2_03162017> flash.nsh X110PU7.314

```

9. The screen above indicates that the BIOS update process is complete. When you see the screen above, unplug the AC or DC power cable from the power supply, clear CMOS, and

```

Done.
[ Access Cmos Port Ex ]
<Read>
Index 0x51: 0x10

Done.
*****
*
* Program BIOS and ME (including FDT) regions...
*
*****
| AMT Firmware Update Utility v4.09.01.1217 |
| Copyright (C)2017 American Megatrends Inc. All Rights Reserved. |
*****
CPUID = 50652

Reading flash ..... done
- ME Data Size checking - ok
- FFS checksums ..... OK
- Check RomLayout ..... OK
Erasing Boot Block ..... done
Updating Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... 0x0132000 (OK)

```

plug the AC or DC power cable in the power supply again to power on the system.

10. Press <Del> continuously to enter the BIOS Setup utility.

```

Verifying NDB Block ..... done
- Update success for FDR
- Update success for IC
- Successful Update Recovery Loader to OPRx!!
- Successful Update MFSB!!
- Successful Update FPM!!
- Successful Update MFS, IBI and INB!!
- Successful Update FLOG and UTDx!!
- ME Entire Image update success !!
WARNING : System must power-off to have the changes take effect!
Moving FS0:\AFU005\SKJPM2_03162017\fdt\64.efi -> FS0:\AFU005\SKJPM2_03162017\
64.smc
- [ok]
Moving FS0:\AFU005\SKJPM2_03162017\afuef\64.efi -> FS0:\AFU005\SKJPM2_0316201
7\afuef1.smc
- [ok]
*****
* Please ignore this "Shell: Cannot read from file - Device Error"
* warning message due to it does not impact flashing process.
*
*****
Deleting "afuef1.smc"
Delete successful.
FS0:\>

```

11. Press <F3> to load the default settings.
12. After loading the default settings, press <F4> to save the settings and exit the BIOS Setup utility.

## 7.7 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. First [power down](#) the system completely.
2. [Remove the cover](#) of the chassis to access the motherboard.
3. [Remove the onboard battery](#) from the motherboard.
4. Short the CMOS pads 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 cords, and power on the system.



JBT1 contact pads

**Notes:** Clearing CMOS will also clear all passwords.

*Do not use the PW\_ON connector to clear CMOS.*

## 7.8 BMC Reset

The BMC can be reset using the UID button.

- Reset – Press and hold the button. After six seconds, the LED blinks at 2Hz. The BMC resets and the reset duration is ~250 ms. Then the BMC starts to boot.
- Restore factory default configuration – Hold the button for twelve seconds. The LED blinks at 4Hz while defaults are configured. **Note:** All BMC settings including username and password will be removed except the FRU and network settings.

Firmware update – When the BMC firmware is being updated, the UID LED blinks at 10Hz.

BMC Reset Options		
Event	UID LED	BMC Heartbeat LED
Reset	Blue, Blinks at 2Hz	Green, solid
Restore Defaults	Blue, Blinks at 4Hz	OFF
Update	Blue, Blinks at 10Hz	

## 7.9 Where to Get Replacement Components

If you need replacement parts for your system, to ensure the highest level of professional service and technical support, purchase exclusively from our Supermicro Authorized Distributors/System Integrators/Resellers. A list can be found at: <http://www.supermicro.com>. Click the "Where to Buy" tab.

## 7.10 Reporting an Issue

### Technical Support Procedures

Before contacting Technical Support, please take the following steps. If your system was purchased through a distributor or reseller, please contact them for troubleshooting services. They have the best knowledge of your specific system configuration.

1. Please review the [Troubleshooting Procedures](#) in this manual and [Frequently Asked Questions](#) on our website before contacting Technical Support.
2. BIOS upgrades can be downloaded from our website. **Note:** Not all BIOS can be flashed depending on the modifications to the boot block code.
3. If you still cannot resolve the problem, include the following information when contacting us for technical support:
  - System, motherboard, and chassis model numbers and PCB revision number
  - BIOS release date/version (this can be seen on the initial display when your system first boots up)
  - System configuration

An example of a Technical Support form is posted on our [website](#). Distributors: For immediate assistance, please have your account number ready when contacting our technical support department by email.

### Returning Merchandise for Service

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

For faster service, RMA authorizations may be requested online ([http:// www. supermicro. com/ support/rma/](http://www.supermicro.com/support/rma/)).



Whenever possible, repack the chassis in the original Supermicro carton, using the original packaging material. If these are no longer available, be sure to pack the chassis securely, using packaging material to surround the chassis so that it does not shift within the carton and become damaged during shipping.

This warranty only covers normal consumer use and does not cover damages incurred in shipping, or from failure due to the alteration, misuse, abuse or improper maintenance of products.

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

## **Vendor Support Filing System**

For issues related to Intel, use the Intel IPS filing system:

<https://www.intel.com/content/www/us/en/design/support/ips/training/welcome.html>

For issues related to Red Hat Enterprise Linux, since it is a subscription based OS, contact your account representative.

## **7.11 Feedback**

Supermicro values your feedback as we strive to improve our customer experience in all facets of our business. Please email us at [techwriterteam@supermicro.com](mailto:techwriterteam@supermicro.com) to provide feedback on our manuals.

## 7.12 Contacting Supermicro

### Headquarters

Address: Super Micro Computer, Inc.  
980 Rock Ave.  
San Jose, CA 95131 U.S.A.

Tel: +1 (408) 503-8000

Fax: +1 (408) 503-8008

Email: marketing@supermicro.com (General Information)  
Sales-USA@supermicro.com (Sales Inquiries)  
Government\_Sales-USA@supermicro.com (Gov. Sales Inquiries)  
support@supermicro.com (Technical Support)  
RMA@supermicro.com (RMA Support)  
Webmaster@supermicro.com (Webmaster)

Website: [www.supermicro.com](http://www.supermicro.com)

### Europe

Address: Super Micro Computer B.V.  
Het Sterrenbeeld 28, 5215 ML  
's-Hertogenbosch, The Netherlands

Tel: +31 (0) 73-6400390

Fax: +31 (0) 73-6416525

Email: Sales\_Europe@supermicro.com (Sales Inquiries)  
Support\_Europe@supermicro.com (Technical Support)  
RMA\_Europe@supermicro.com (RMA Support)

Website: [www.supermicro.nl](http://www.supermicro.nl)

### Asia-Pacific

Address: Super Micro Computer, Inc.  
3F, No. 150, Jian 1st Rd.  
Zhonghe Dist., New Taipei City 235  
Taiwan (R.O.C)

Tel: +886-(2) 8226-3990

Fax: +886-(2) 8226-3992

Email: Sales-Asia@supermicro.com.tw (Sales Inquiries)  
Support@supermicro.com.tw (Technical Support)  
RMA@supermicro.com.tw (RMA Support)

Website: [www.supermicro.com.tw](http://www.supermicro.com.tw)

## Appendix A

# Standardized Warning Statements for AC Systems

### About Standardized Warning Statements

The following statements are industry standard warnings, provided to warn the user of situations which have the potential for bodily injury. Should you have questions or experience difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install or configure components.

Read this appendix in its entirety before installing or configuring components in the Supermicro chassis.

These warnings may also be found on our website at [http:// www. supermicro. com/ about/ policies/ safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm).

### Warning Definition



**Warning!** This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危險。

您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾的声明号码找到此设备的安全性警告说明的翻译文本。

此警告符號代表危險。

您正處於可能身體可能會受損傷的工作環境中。在您使用任何設備之前，請注意觸電的危險，並且要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。

## Warnung

### WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

### INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES.

### IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS.

## תקנון הזהרות אזהרה

הזהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים. יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

اَكْ ف حالة وُكِي اَي تتسبب ف اصابة جسدهُ هذا الزهرز عُ خطر! تحذُرُ .  
 قبل اَي تعول على اَي هعدات، كي على علن بالوخاطز ال اُجوة عي الذوائر  
 الكهزبائِة  
 وكي على درا ة بالووارسات النقاىِة لو عُ وقع اَي حادث  
 استخدم رقن البِ اى الو صُص ف ها ة كل تحذُر للعشر تزجوتها

안전을 위한 주의사항

경고!

이 경고 기호는 위험이 있음을 알려 줍니다. 작업자의 신체에 부상을 야기 할 수 있는  
 상태에 있게 됩니다. 모든 장비에 대한 작업을 수행하기 전에 전기회로와 관련된  
 위험요소들을 확인하시고 사전에 사고를 방지할 수 있도록 표준 작업절차를 준수해 주시기  
 바랍니다.

해당 번역문을 찾기 위해 각 경고의 마지막 부분에 제공된 경고문 번호를 참조하십시오

## BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwings symbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij een elektrische installatie betrokken risico's en dient u op de hoogte te zijn van de standaard procedures om ongelukken te voorkomen. Gebruik de nummers aan het eind van elke waarschuwing om deze te herleiden naar de desbetreffende locatie.

## BEWAAR DEZE INSTRUCTIES

### Installation Instructions



**Warning!** Read the installation instructions before connecting the system to the power source.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告

将此系统连接电源前,请先阅读安装说明。

警告

將系統與電源連接前，請先閱讀安裝說明。

**Warnung**

Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

**¡Advertencia!**

Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

**Attention**

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقرأ إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

**Waarschuwing**

Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.

**Circuit Breaker**

**Warning!** This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 20 A.

**サーキット・ブレーカー**

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

**警告**

此产品的短路(过载电流)保护由建筑物的供电系统提供,确保短路保护设备的额定电流不大于250V,20A。

**警告**

此產品的短路(過載電流)保護由建築物的供電系統提供,確保短路保護設備的額定電流不大於250V,20A。

**Warnung**

Dieses Produkt ist darauf angewiesen, dass im Gebäude ein Kurzschluss- bzw. Überstromschutz installiert ist. Stellen Sie sicher, dass der Nennwert der Schutzvorrichtung nicht mehr als: 250 V, 20 A beträgt.

**¡Advertencia!**

Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) del edificio. Asegúrese de que el dispositivo de protección no sea superior a: 250 V, 20 A.

**Attention**

Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifiez que le courant nominal du dispositif de protection n'est pas supérieur à :250 V, 20 A.

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא כי המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-250VDC, 20A

هذا المنتج يعتمد على معدات الحماية من الدوائر القصيرة التي تم تثبيتها في المبنى  
تأكد من أن تقييم الجهاز الوقائي ليس أكثر من : 20A, 250V

**경고!**

이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에 의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지 않도록 해야 합니다.

**Waarschuwing**

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw elektrische installatie. Controleer of het beveiligde apparaat niet groter gedimensioneerd is dan 250V, 20A.

## Power Disconnection Warning



**Warning!** The system must be disconnected from all sources of power and the power cord removed from the power supply module(s) before accessing the chassis interior to install or remove system components.



### 電源切断の警告

システムコンポーネントの取り付けまたは取り外しのために、シャーシ内部にアクセスするには、システムの電源はすべてのソースから切断され、電源コードは電源モジュールから取り外す必要があります。

### 警告

在你打开机箱并安装或移除内部器件前,必须将系统完全断电,并移除电源线。

### 警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

### Warnung

Das System muss von allen Quellen der Energie und vom Netzanschlusskabel getrennt sein, das von den Spg.Versorgungsteilmodulen entfernt wird, bevor es auf den Chassisinnenraum zurückgreift, um Systemsbestandteile anzubringen oder zu entfernen.

### ¡Advertencia!

El sistema debe ser disconnected de todas las fuentes de energía y del cable eléctrico quitado de los módulos de fuente de alimentación antes de tener acceso el interior del chasis para instalar o para quitar componentes de sistema.

### Attention

Le système doit être débranché de toutes les sources de puissance ainsi que de son cordon d'alimentation secteur avant d'accéder à l'intérieur du chassis pour installer ou enlever des composants de système.



אזהרה מפני ניתוק חשמלי

אזהרה!

יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כבל החשמלי מהספק לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים.

يجب فصل انظاؤ من جميع مصادر انطاقت وإزانت سهك انكهرباء من وحدة امداد انطاقت قېم

انصل إلى امناطق انداخيت نههيكم نثبيج أو إزانت مكنات الجهاز

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 새시 내부에 접근하기 전에 반드시 전원 공급장치로부터 연결되어있는 모든 전원과 전기코드를 분리해주어야 합니다.

Waarschuwing

Voordat u toegang neemt tot het binnenwerk van de behuizing voor het installeren of verwijderen van systeem onderdelen, dient u alle spanningsbronnen en alle stroomkabels aangesloten op de voeding(en) van de behuizing te verwijderen

## Equipment Installation



**Warning!** Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

機器の設置

トレーニングを受け認定された人だけがこの装置の設置、交換、またはサービスを許可されています。

警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

¡Advertencia!

Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.

**Attention**

Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

אזהרה!

צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לתת שירות עבור הציוד.

والمدربيه لتزكيب واستبدال أو خدمة هذا الجهاز يجب أن يسمح فقط للموظفيه المؤهليه

경고!

훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.

**Waarschuwing**

Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door geschoold en gekwalificeerd personeel.

**Restricted Area**

**Warning!** This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. (This warning does not apply to workstations).

**アクセス制限区域**

このユニットは、アクセス制限区域に設置されることを想定しています。

アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

**警告**

此部件应安装在限制进出的场所，限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

**警告**

此裝置僅限安裝於進出管制區域，進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

**Warnung**

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

**¡Advertencia!**

Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

**Attention**

Cet appareil doit être installé dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

אזור עם גישה מוגבלת

אזהרה!

יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת 'כלי אבטחה בלבד' (מפתח, מנעול וכד.).

تخصيص هذه انحدزة نترك بُها ف مناطق محظورة تم .  
ممكن انصلل إن منطقت محظورة فقط من خلال استخداو أداة خاصت  
أو أ وس هُت أخري نلاأمما ققم ومفتاح

**경고!**

이 장치는 접근이 제한된 구역에 설치하도록 되어있습니다. 특수도구, 잠금 장치 및 키, 또는 기타 보안 수단을 통해서만 접근 제한 구역에 들어갈 수 있습니다.

**Waarschuwing**

Dit apparaat is bedoeld voor installatie in gebieden met een beperkte toegang. Toegang tot dergelijke gebieden kunnen alleen verkregen worden door gebruik te maken van speciaal gereedschap, slot en sleutel of andere veiligheidsmaatregelen.

## 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

電池更換不當會有爆炸危險。請只使用同類電池或制造商推荐的功能相当的電池更換原有電池。請按制造商的說明處理廢舊電池。

### 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 النوع أو ما يعادلها مما أوصت به الشركة المصنعة  
 جخلص من البطاريات المسحعملة وفقا لعمليات الشركة 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 ontplofingsgevaar 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.

## Redundant Power Supplies



**Warning!** This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.

冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

警告

此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

警告

此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

Warnung

Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein Strom zugeführt wird, müssen alle Verbindungen entfernt werden.

**¡Advertencia!**

Puede que esta unidad tenga más de una conexión para fuentes de alimentación. Para cortar por completo el suministro de energía, deben desconectarse todas las conexiones.

**Attention**

Cette unité peut avoir plus d'une connexion d'alimentation. Pour supprimer toute tension et tout courant électrique de l'unité, toutes les connexions d'alimentation doivent être débranchées.

אם קיים יותר מספק אחד

אזהרה!

ליחידה יש יותר מחיבור אחד של ספק. יש להסיר את כל החיבורים על מנת לרוקן את היחידה.

قد يكون لهذا الجهاز عدة اتصالات بوحدات امداد الطاقة .

يجب إزالة كافة الاتصالات لعسل الوحدة عن الكهرباء

**경고!**

이 장치에는 한 개 이상의 전원 공급 단자가 연결되어 있을 수 있습니다. 이 장치에 전원을 차단하기 위해서는 모든 연결 단자를 제거해야만 합니다.

**Waarschuwing**

Deze eenheid kan meer dan één stroomtoevoeraansluiting bevatten. Alle aansluitingen dienen verwijderd te worden om het apparaat stroomloos te maken.

## Backplane Voltage



**Warning!** Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

バックプレーンの電圧

システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。

修理する際には注意ください。

警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

Wenn das System in Betrieb ist, treten auf der Rückwandplatine gefährliche Spannungen oder Energien auf. Vorsicht bei der Wartung.

¡Advertencia!

Cuando el sistema está en funcionamiento, el voltaje del plano trasero es peligroso. Tenga cuidado cuando lo revise.

Attention

Lorsque le système est en fonctionnement, des tensions électriques circulent sur le fond de panier. Prendre des précautions lors de la maintenance.

מתח בפנל האחורי

אזהרה!

קיימת סכנת מתח בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך העבודה.

هناك خطر من التيار الكهربائي أو الطاقة المجددة على الساحة  
عندما يمكن النظام يعمل كه حذرا عند خدمة هذا الجهاز

경고!

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생 합니다.  
서비스 작업 시 주의하십시오.

Waarschuwing

Een gevaarlijke spanning of energie is aanwezig op de backplane wanneer het systeem in gebruik is. Voorzichtigheid is geboden tijdens het onderhoud.

## Comply with Local and National Electrical Codes



**Warning!** Installation of the equipment must comply with local and national electrical codes.

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

设备安装必须符合本地与本国电气法规。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

La instalacion del equipo debe cumplir con las normas de electricidad locales y nacionales.

Attention

L'équipement doit être installé conformément aux normes électriques nationales et locales.



תיאום חוקי החשמל הארצי

אזהרה!

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل للقوايه المحلية والبطية المتعلقة  
بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

Waarschuwing

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

## 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.

التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية عند

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.

**Hot Swap Fan Warning**

**Warning!** Hazardous moving parts. Keep away from moving fan blades. The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

ファン・ホットスワップの警告

警告!回転部品に注意。運転中は回転部(羽根)に触れないでください。シャーシから冷却ファン装置を取り外した際、ファンがまだ回転している可能性があります。ファンの開口部に、指、ドライバー、およびその他のものを近づけないで下さい。

警告!

警告! 危险的可移动性零件。请务必与转动的风扇叶片保持距离。当您从机架移除风扇装置，风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇

警告

危险的可移动性零件。请务必与转动的风扇叶片保持距离。当您从机架移除风扇装置，风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇。

**Warnung**

Gefährlich Bewegende Teile. Von den bewegenden Lüfterblätter fern halten. Die Lüfter drehen sich u. U. noch, wenn die Lüfterbaugruppe aus dem Chassis genommen wird. Halten Sie Finger, Schraubendreher und andere Gegenstände von den Öffnungen des Lüftergehäuses entfernt.

**¡Advertencia!**

Riesgo de piezas móviles. Mantener alejado de las aspas del ventilador. Los ventiladores podran dar vuelta cuando usted quite el montaje del ventilador del chasis. Mantenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

**Attention**

Pieces mobiles dangereuses. Se tenir a l'écart des lames du ventilateur Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirerez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

**אזהרה!**

חלקים נעים מסוכנים. התרחק מלהבי המאוורר בפעולה כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

تحذير! أجزاء متحركة خطيرة. ابتعد عن شفرات المروحة المتحركة. من الممكن أن المراوح لا تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع ومفكات البراغي وغيرها من الأشياء بعيدا عن الفتحات في كتلة المروحة

**경고!**

움직이는 위험한 부품. 회전하는 송풍 날개에 접근하지 마세요. 새시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

**Waarschuwing**

Gevaarlijk bewegende onderdelen. Houd voldoende afstand tot de bewegende ventilatorbladen. Het is mogelijk dat de ventilator nog draait tijdens het verwijderen van het ventilatorsamenstel uit het chassis. Houd uw vingers, schroevendraaiers en eventuele andere voorwerpen uit de buurt van de openingen in de ventilatorbehuizing.

## Power Cable and AC Adapter



**Warning!** When installing the product, use the provided or designated connection cables, power cables and AC adaptors. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA -certified cables (that have UL/CSA shown on the cord) for any other electrical devices than products designated by Supermicro only.

### 電源コードとACアダプター

製品を設置する場合、提供または指定および購入された接続ケーブル、電源コードとACアダプターを、該当する地域の条例や安全基準に適合するコードサイズやプラグと共に使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。

電気用品安全法は、ULまたはCSA認定のケーブル(UL/CSAマークがコードに表記)を Supermicro が指定する製品以外に使用することを禁止しています。

### 警告

安装此产品时,请使用本身提供的或指定的或采购的连接线,电源线和电源适配器。包含遵照当地法规和安全要求的合规的电源线尺寸和插头。使用其它线材或适配器可能会引起故障或火灾。除了Supermicro所指定的产品,电气用品和材料安全法律规定禁止使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

### 警告

安裝此產品時,請使用本身提供的或指定的或採購的連接線,電源線和電源適配器。包含遵照當地法規和安全要求的合規的電源線尺寸和插頭。使用其它線材或適配器可能會引起故障或火災。除了Supermicro所指定的產品,電氣用品和材料安全法律規定禁止使用未經UL或CSA認證的線材。(線材上會顯示UL/CSA符號)。

### Warnung

Nutzen Sie beim Installieren des Produkts ausschließlich die von uns zur Verfügung gestellten Verbindungskabeln, Stromkabeln und/oder Adapter, die Ihre örtlichen Sicherheitsstandards einhalten. Der Gebrauch von anderen Kabeln und Adapter können Fehlfunktionen oder Feuer verursachen. Die Richtlinien untersagen das Nutzen von UL oder CAS zertifizierten Kabeln (mit UL/CSA gekennzeichnet), an Geräten oder Produkten die nicht mit Supermicro gekennzeichnet sind.

## ¡Advertencia!

Cuando instale el producto, utilice la conexión provista o designada o procure cables, Cables de alimentación y adaptadores de CA que cumplan con los códigos locales y los requisitos de seguridad, incluyendo el tamaño adecuado del cable y el enchufe. El uso de otros cables y adaptadores podría causar un mal funcionamiento o un incendio. La Ley de Seguridad de Aparatos Eléctricos y de Materiales prohíbe El uso de cables certificados por UL o CSA (que tienen el certificado UL / CSA en el código) para cualquier otros dispositivos eléctricos que los productos designados únicamente por Supermicro.

## Attention

Lors de l'installation du produit, utilisez les cables de connection fournis ou désigné ou achetez des cables, cables de puissance et adaptateurs respectant les normes locales et les conditions de securite y compris les tailles de cables et les prises electriques appropriées. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et la Loi sur la Sécurité Matériel interdit l'utilisation de câbles certifiés- UL ou CSA (qui ont UL ou CSA indiqué sur le code) pour tous les autres appareils électriques sauf les produits désignés par Supermicro seulement.

AC ימאתמו מילמשח מילבכ

!הרהזא

ךרוצל ומאתוה וא ושכרנ רשא AC מימאתמו מיקפס, מילבכב שמתשהל שי, רצומה תא מיניקתמ רשאכ לכב שומיש. עקתהו לבכה לש הנוכח הדימ ללוכ, תוימוקמה תוחיטבה תושירדל ומאתוה רשאו, הנקתהה למשחה ירישכמב שומישה יקוחל מאתהב. ילמשח רצק וא הלקתל מורגל לולע, רחא גוסמ מאתמ וא לבכ לש דוק מהילע עיפומ רשאכ) UL-ב או CSA-ב -ב מיכמסומה מילבכב שמתשהל רוסיא מייק, תוחיטבה יקוחו דבלב Supermicro י"ע מאתוה רשא רצומב קר אלא, רחא ילמשח רצומ לכ רובע (UL/CSA)

תאלבאלא אארשב מץ וא ענדחמל וא ערפוטמל תאליסוולא מודחטסאב מץ, גתנמל בייקרת דנע כלז יפ אמב עילחמל עמאלסל תאבלטתמו נינאוץב מאזתלל עמ דדרתמל ראיטל תאלוחמו עיזאברמלל קיירח וא לטע יפ בבסטטי דץ ירזא תאלוחמו תאלבאלא יא מודחטסא. מילסל סבאלל ולסומל מץ ח CSA וא UL לבק נמ ענדחמל תאלבאלא מודחטסא תאדעמל עיזאברמלל עזחאלל עמאלסל נונאק רזחי Supermicro לבק נמ ענדחמל עינעמל תאגתנמל ריז ירזא תאדעמ יא עמ (UL/CSA) עמאלל למחתיטלל

### 전원 케이블 및 AC 어댑터

경고! 제품을 설치할 때 현지 코드 및 적절한 굵기의 코드와 플러그를 포함한 안전 요구 사항을 준수하여 제공되거나 지정된 연결 혹은 구매 케이블, 전원 케이블 및 AC 어댑터를 사용하십시오.

다른 케이블이나 어댑터를 사용하면 오작동이나 화재가 발생할 수 있습니다. 전기 용품 안전법은 UL 또는 CSA 인증 케이블 (코드에 UL / CSA가 표시된 케이블)을 Supermicro가 지정한 제품 이외의 전기 장치에 사용하는 것을 금지합니다.

### Stroomkabel en AC-Adapter

Waarschuwing! Bij het aansluiten van het Product uitsluitend gebruik maken van de geleverde Kabels of een andere geschikte aan te schaffen Aansluitmethode, deze moet altijd voldoen aan de lokale voorschriften en veiligheidsnormen, inclusief de juiste kabeldikte en stekker. Het gebruik van niet geschikte Kabels en/of Adapters kan een storing of brand veroorzaken. Wetgeving voor Elektrische apparatuur en Materiaalveiligheid verbied het gebruik van UL of CSA -gecertificeerde Kabels (met UL/CSA in de code) voor elke andere toepassing dan de door Supermicro hiervoor beoogde Producten.

# Appendix B

## System Specifications

### Processor Support

3rd Generation Intel® Xeon® Scalable processors in an LGA4189 socket; Supports CPU TDP up to 270W.  
Note: Refer to the motherboard specifications pages on our website for updates to supported processors.

### Chipset

Intel® C621A

### BIOS

AMI 256Mb SPI Flash

### Memory

1TB of ECC RDIMM, 4TB of 3DS RDIMM, 2TB of LRDIMM, or 4TB of 3DS LRDIMM with speeds of up to 3200MHz (2DPC) in 16 DDR4 (288-pin) SMD DIMM slots

### Storage Drives

Eight 3.5" hot-swap storage drive bays  
Four M.2 sockets (M-key PCIe 4.0 x4 in the 2260/2280/22110 form factor).

### PCI Expansion Slots

Four PCIe 4.0 x16 slots (CPU SLOT1, 3, 5, 7) and three PCIe 4.0 x8 slots (in x16 slots) (CPU SLOT2, 4, 6) (supports seven single-width or four double-width GPU cards)  
Three 5.25" external peripheral bays

### Input/Output

Front: Two USB 3.2 Gen1 ports, one power button, one system reset button, audio port, two network activity LEDs, HDD LED, power status LED, system information LED  
Rear: One USB 3.2 Gen2 port, four USB 3.2 Gen1 ports, one GbE port via Intel i210AT, one 10GbE port via AQC107, one BMC LAN port, one VGA port via the BMC, one COM port, one HD audio 7.1 channel connector via Realtek ALC888S, and two USB2.0 ports  
Onboard: USB 3.2 Gen2, USB 3.2 Gen1, USB 2.0 header, one TPM header, Type-A USB 3.2 Gen2

### Motherboard

X12SPA-TF; Length 13", Width 12" [330.2 mm x 304.8 mm(L x W)]

### Chassis

CSE-747BTS-R2K20BP 4U Tower/Rackmount, 18.1 x 7 x 26.5in. / 460 x 178 x 673mm (HxWxD)

### System Cooling

Four 9.2cm and two 8cm heavy duty fans with optimal fan speed control

### Power Supply

Model: (default) PWS-2K20A-1R, Two 2200W redundant modules, 80Plus Titanium level;

AC Input

1200W: 100-127Vac / 50-60Hz

1800W: 200-220Vac / 50-60Hz

1980W: 220-230Vac / 50-60Hz

2000W: 230-240Vac / 50-60Hz

2200W: 230-240Vac / 50-60Hz

+12V

Max: 100A / Min: 0A

Max: 150A / Min: 0A

Max: 165A / Min: 0A

Max: 174A / Min: 0A

Max: 183.3A / Min: 0A

**Operating Environment**

Operating Temperature: 10° to 35° C (50° to 95° F)

Non-operating Temperature: -40° to 60° C (-40° to 140° F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-operating Relative Humidity: 5% to 95% (non-condensing)

**Regulatory Compliance**

FCC, CE, VCCI, CSA/ UL, CB

**Applied Directives, Standards****EMC/EMI: 2014/30/EU (EMC Directive)**

Electromagnetic Compatibility Regulations 2016

FCC Part 15

ICES-003

VCCI-CISPR 32

AS/NZS CISPR 32

BS/EN 55032

BS/EN 55035

CISPR 32

CISPR 24/CISPR 35

BS/EN 61000-3-2

BS/EN 61000-3-3

BS/EN 61000-4-2

BS/EN 61000-4-3

BS/EN 61000-4-4

BS/EN 61000-4-5

BS/EN 61000-4-6

BS/EN 61000-4-8

BS/EN 61000-4-11

Product Safety: 2014/35/EU (LVD Directive)

UL/CSA 62368-1 (USA and Canada)

Electrical Equipment (Safety) Regulations 2016

IEC/BS/EN 62368-1

Environment:

2011/65/EU (RoHS Directive)

EC 1907/2006 (REACH)

2012/19/EU (WEEE Directive)

Warning! This product can expose you to chemicals including lead, known to the State of California to cause cancer and birth defects or other reproductive harm. For more information, go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

**Perchlorate Warning**

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)"



## BSMI RoHS and Warnings

## Declaration of the Presence Condition of the Restricted Substances Marking

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141

**輸入額定:**

100-127Vac, 60-50Hz, 12-11 A (x2)

200-240Vac, 60-50Hz 10-9.5 A (x2)

**\*使用者不能任意拆除或替換內部配備**

**\*報驗義務人之姓名或名稱：美超微電腦股份有限公司**

**\*報驗義務人之地址：新北市中和區建一路 150 號 3 樓**

**警告使用者：**

此為甲類資訊技術設備，於居住環境中使用時，可能會造成射頻擾動，在此種情況下，使用者會被要求採取某些適當的對策。