SuperServer®
SYS-220GQ-TNAR+

USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

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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 server. Installation and maintenance should be performed by experienced technicians only.

Please refer to the SYS-220GQ-TNAR+ server 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 server.

• 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

If you have any questions, please contact our support team at:
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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/Lot9_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

Chapter 3 Maintenance and Component Installation

Chapter 4 Motherboard Connections

Chapter 5 Software

Chapter 6 Optional Components

Chapter 7 Troubleshooting and Support

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Chapter 1

Introduction

1.1 Overview

This chapter provides a brief outline of the functions and features of the SuperServer SYS-220GQ-TNAR+.

The following provides an overview of the specifications and capabilities.

System Overview	
Motherboard	X12DPG-QR
Chassis	CSE-228GTS-R3K02P
Processor Support	Dual 3rd Gen Intel Xeon Scalable Processors (Socket P+) with up to 40 cores per CPU and Thermal Design Power (TDP) of up to 270W
Chipset	Intel PCH C621A
Memory	32 DIMM slots support only DDR4 or a mix of DDR4 and PMem *Only DDR4:* Up to 8TB 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM DDR4 (288-pin) ECC memory with speeds of 3200/2933/2666 MHz *Mixed DDR4 and PMem:* Up to 4TB of DDR4 and up to 8TB Intel Optane PMem 200 Series with speeds of up to 3200 MHz **Notes:** PMem 200 Series are supported on 3rd Gen Intel Xeon Scalable Platinum, Gold and selected Silver processors. Memory speed support depends on the processors used in the system.
Drive Support	Four hot-swap 2.5" SATA drive bays
Expansion Slots	Four low-profile x16 PCIe 4.0 slots Two onboard M.2 slots in the 22110 form factor

I/O Ports	Via the I/O board AOM-PIO-i2XT:
	    Two 10G Ethernet LAN ports
	    One dedicated BMC LAN port
	    Two USB ports
	    One VGA port

System Cooling	Four hot-swap 80-mm, counter-rotating PWM fans; one air shroud, two CPU heatsinks, four GPU heatsinks
Power	Dual 3000W 80Plus Platinum modules with PMBus with Smart Power throttling
Form Factor	2U rackmount, (WxHxD) 17.2 x 3.5 x 32.4 in. (437 x 89 x 823 mm)

A Quick Reference Guide can be found on the product page of the Supermicro website. The following safety models associated with the SYS-220GQ-TNAR+ have been certified as compliant with UL or CSA: 228G-30, 228G-GPU, 228G-R30X12.

1.2 System Features

The CSE-228GTS-R3K02P is a 2U chassis that supports four hot-swappable 2.5" SATA drives and four hot-swappable fans at the front. Two power supplies, four expansion slots, I/O ports, and liquid cooling ports are supported at the rear.

Front View
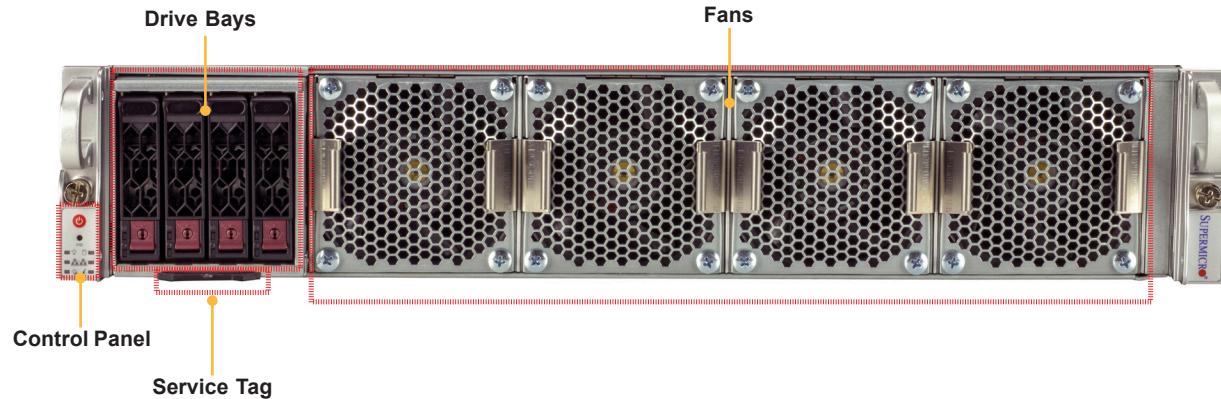
Figure 1-1. Front View

System Features: Front	
Feature	**Description**
Control Panel	Described on the next page
Drive Bays	Four hot-swap 2.5" SATA drive bays
Service Tag	Pull-out service tag
System Cooling Fans	Four hot-swappable system cooling fans
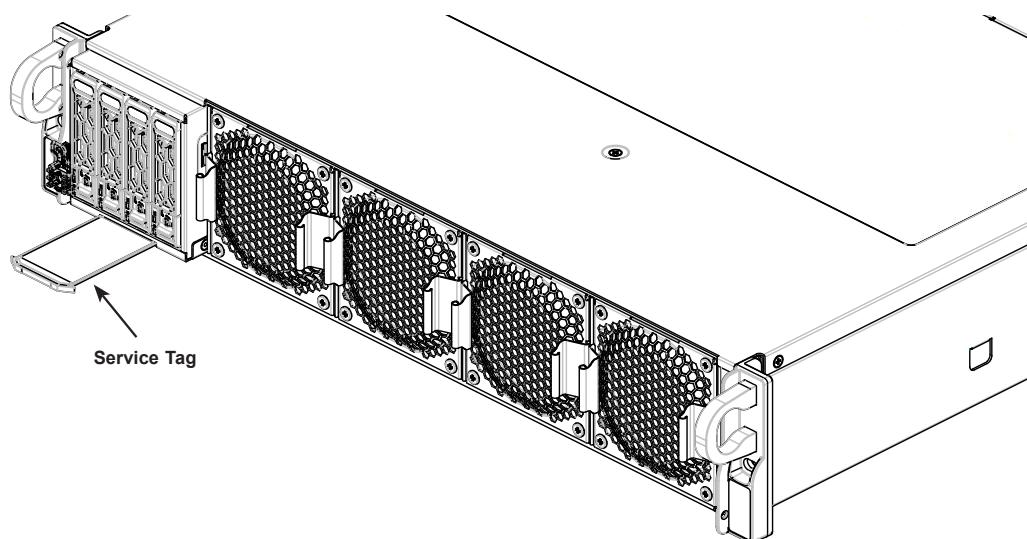
Figure 1-2. Location of Service Tag

Control Panel
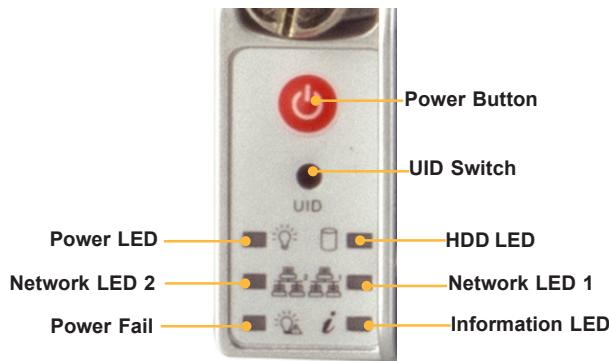
Figure 1-3. Control Panel

Control Panel Features	
Feature	**Description**
Power Button	The main power switch applies or removes primary power from the power supply to the server but maintains standby power. To perform most maintenance tasks, unplug the rear power cables completely from the system and wait 30 seconds for capacitors to discharge.
UID Switch	Use a pin to press the UID switch
Power LED	Indicates power is being supplied to the system power supply units. This LED is illuminated when the system is operating normally.
HDD LED	Indicates hard disk drive activity.
Network LED 1	Indicates network activity on LAN1 when flashing.
Network LED 2	Indicates network activity on LAN2 when flashing.
Information LED	Alerts operator to several states, as noted in the table below.
Power Fail LED	Indicates a power supply module has failed.

Information LED	
Color, Status	**Description**
Red, solid	An overheat condition has occurred.
Red, blinking at 1Hz	Fan failure, check for an inoperative fan.
Red, blinking at 0.25Hz	Power failure, check for a non-operational power supply.
Red, solid, with Power LED blinking green	Fault detected
Blue and red, blinking at 10 Hz	Recovery mode
Blue, solid	UID has been activated locally to locate the server in a rack environment.
Blue, blinking at 1Hz	UID has been activated using the BMC to locate the server in a rack environment.
Blue, blinking at 2Hz	BMC is resetting
Blue, blinking at 4Hz	BMC is setting factory defaults
Blue, blinking at 10Hz with Power LED blinking green	BMC/BIOS firmware is updating

Rear View
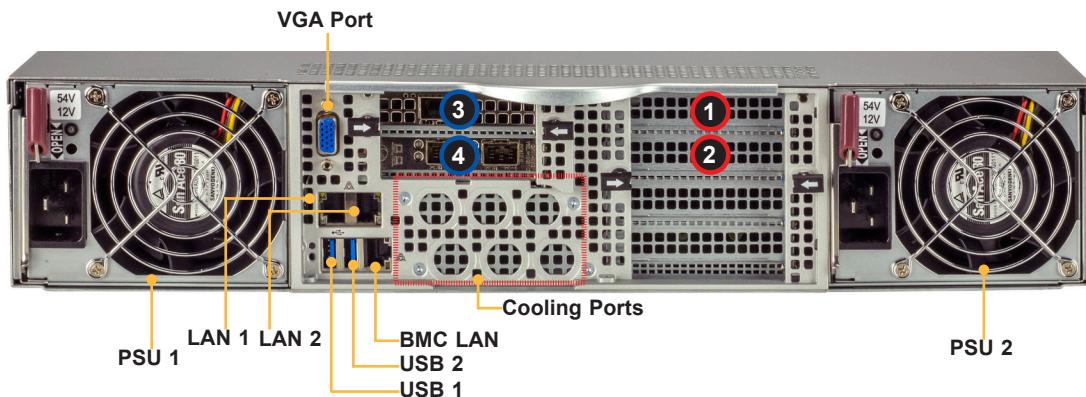
Figure 1-4. Rear View

System Features: Rear	
Feature	**Description**
PSU 1, PSU 2	Two hot swappable power supplies
VGA Port	Video port
LAN 1, LAN 2	Two 10Gigabit-aggregate Ethernet LAN ports
USB 1, USB 2	Two USB 3.0 ports
BMC LAN	BMC LAN port
Cooling Ports	Liquid cooling ports
slots **1** and **2**	Two PCIe 4.0 x16 FH, 2.5"L slots supported on first riser card by CPU1
slots **3** and **4**	Two PCIe 4.0 x16 FH, 2.5"L slots supported on second riser card by CPU2

Full-height = 4.2", Low-profile = 2.5", Full-length = 10.5", Half-length = 6.6"

CPU1 ■ CPU2 ■

Caution: Only Laser Class 1 optical transceivers shall be used.

1.3 System Architecture

Data Plane Block Diagram
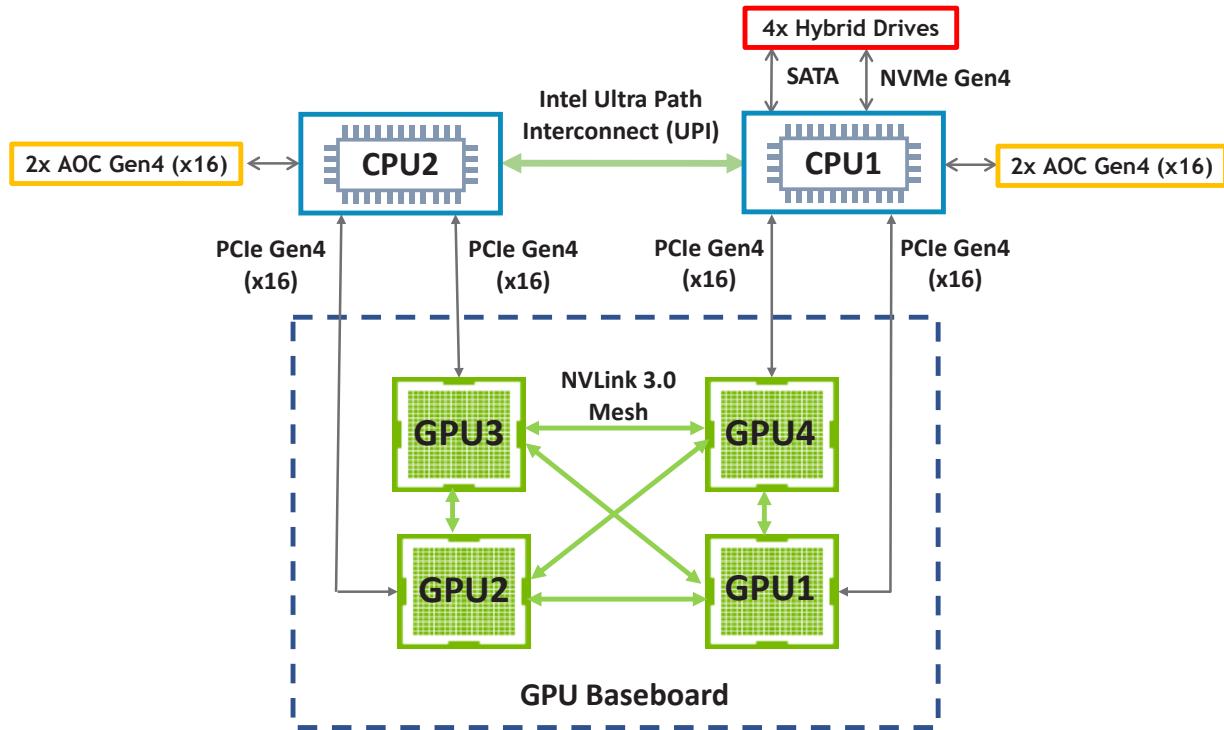
Figure 1-5. System Architecture Block Diagram: Data Plane

Note: The GPU numbering in the figure above is based on BMC interface numbering. See the GPU mapping table for more information.

Motherboard Block Diagram

X12DPG-QR
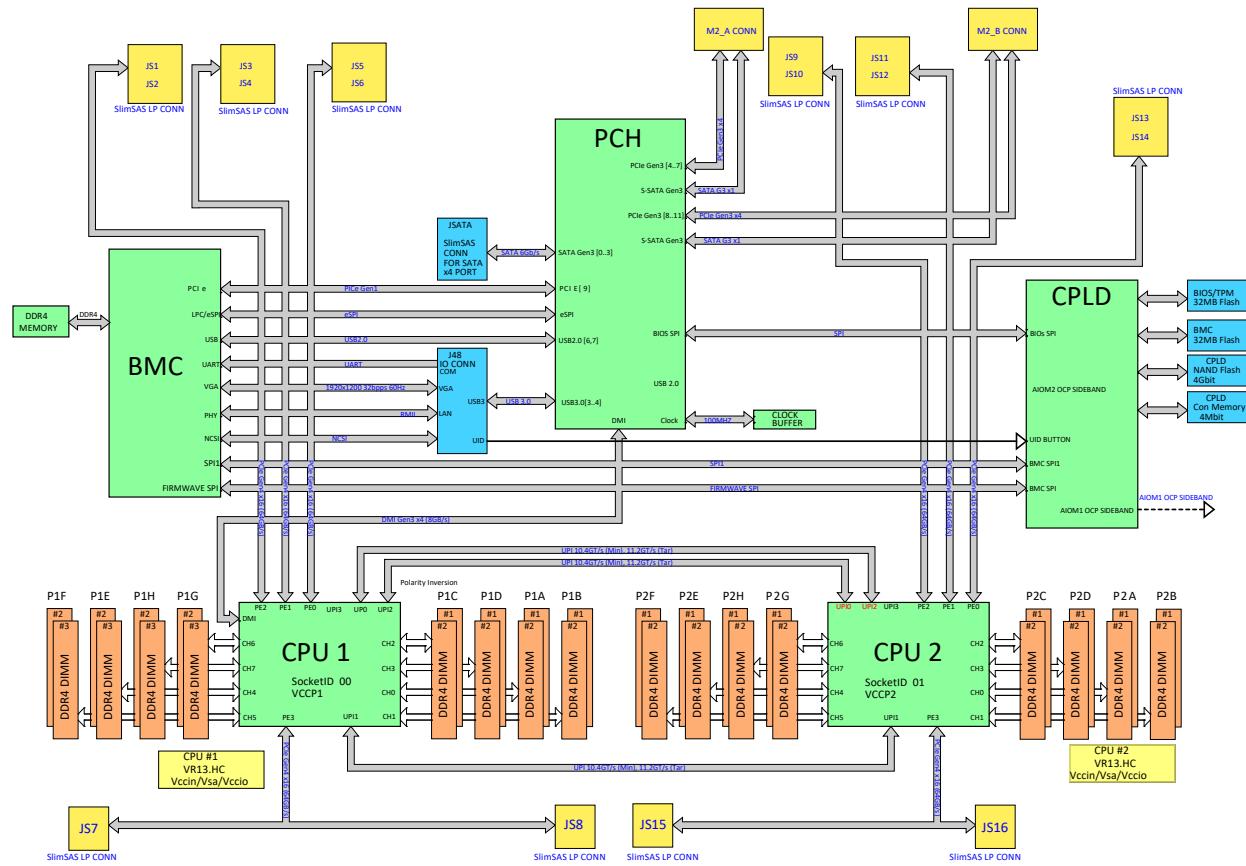
Figure 1-6. Motherboard Block Diagram

PCIe Transition Board

54V Busbar

Fan Board

Motherboard

GPU Baseboard

Riser Card #1

Rear I/O AOM

Riser Card #2
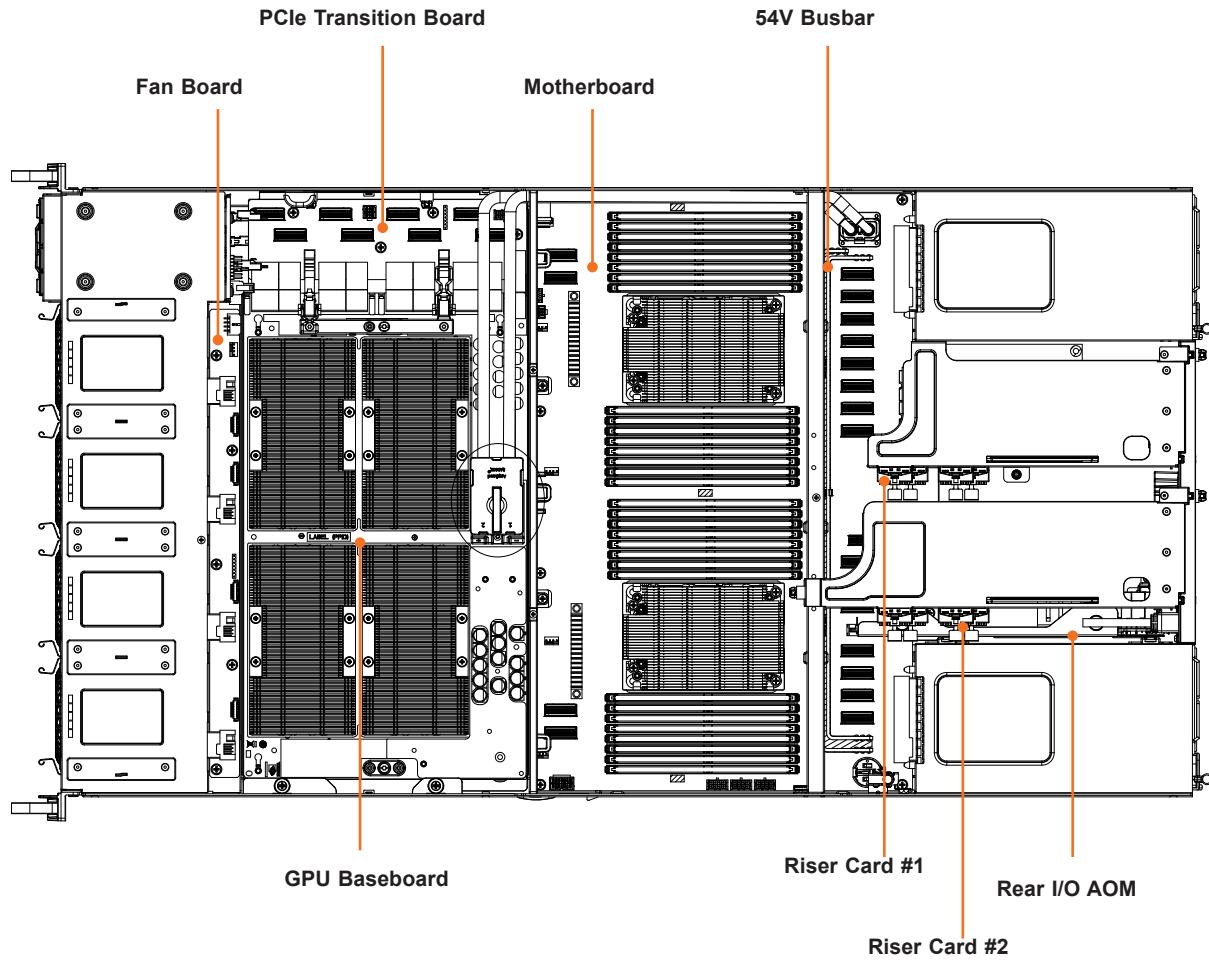
Figure 1-7. Board Locations

1.4 Motherboard Layout

Below is a layout of the X12DPG-QR 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.
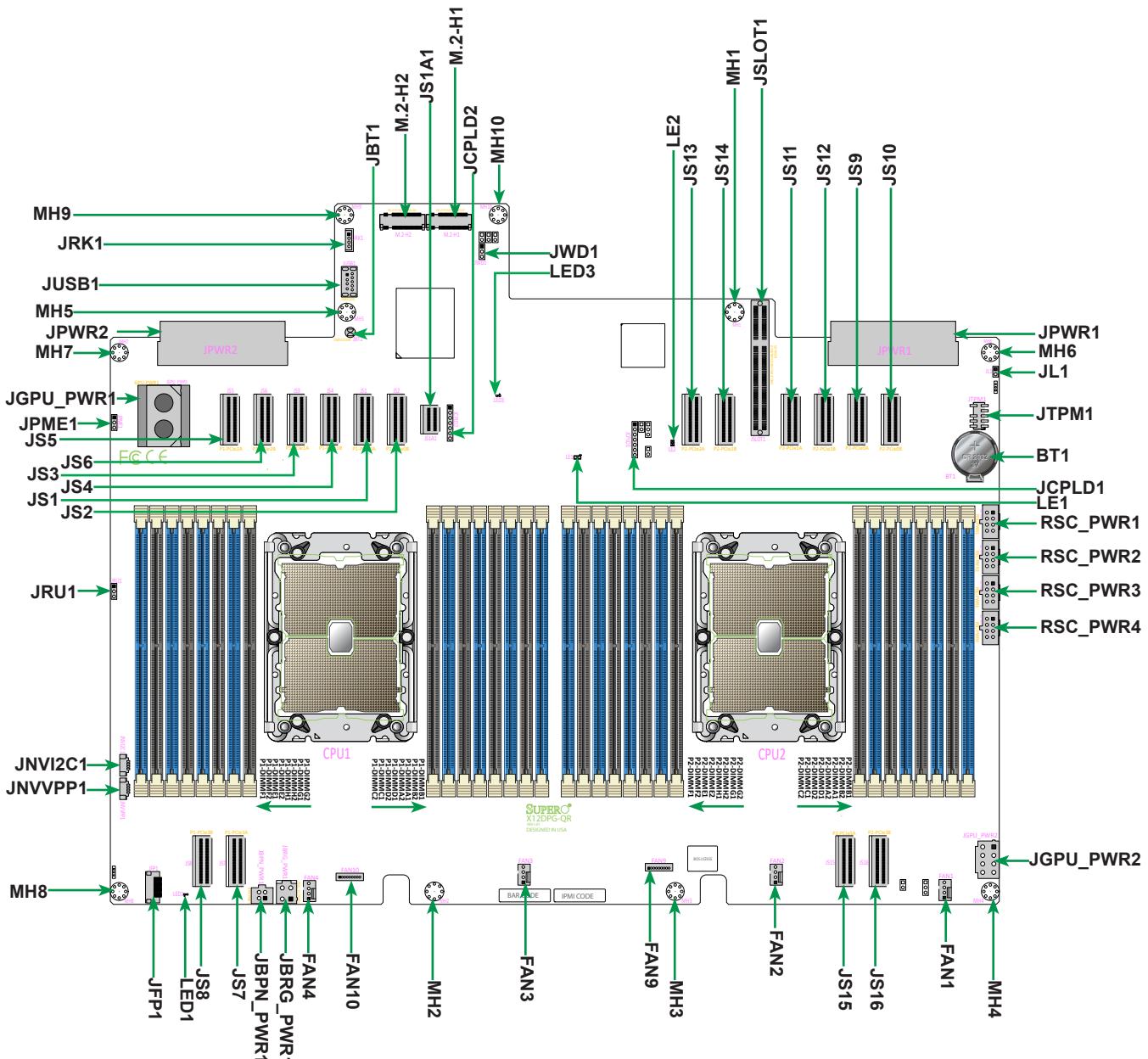
Figure 1-8. Motherboard Layout

Quick Reference Table

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JPME1	ME Manufacturing Recovery	Pins 1-2 (Normal)
JWD1	Watchdog Timer	Pins 1-2 (Reset)
JRU1	Front panel reset/UID switch selection	Pins 1-2 (UID)

LED	Description	Status
LED3	BMC heartbeat LED	Blinking Green: BMC Normal (Active)
LED1	Onboard power LED	LED On: Powered On
LE1	CPLD heartbeat LED	Blinking green: CPLD Normal
LE2	PCH system power indicator	Green: Power on Amber: Standby Red: Platform power error

Connector	Description
BT1	Onboard CMOS battery
FAN1/2/3/4	CPU/System fan headers
FAN9/FAN10	Fan headers for GPU use
JS1A1	SATA connector that supports up to four SATA 3.0 ports
JCPLD1/JCPLD2	Complex programmable logic device headers
JUSB1 (USB3)	Front-accessible Type A USB 3.0 port
JFP1	Front Control Panel header
JS1/JS2/JS3/JS4/JS5/JS6/JS7/JS8	SlimSAS PCIe x8 slots supported by CPU1
JS9/JS10/JS11/JS12/JS13/JS14/JS15/JS16	SlimSAS PCIe x8 slots supported by CPU2
JGPU_PWR1/JGPU_PWR2	Power connectors for GPU cards
JL1	Chassis Intrusion header
M.2-H1/M.2-H2	PCIe 3.0 M.2 x4x4 slots supported by the PCH
JPWR1/JPWR2	Power supply unit connectors
RSC_PWR1~4	8-pin riser card power connectors
JRK1	Intel VROC RAID card header for NVMe SSD devices
JSLOT1	I/O Riser Board slot that supports VGA, COM (serial port), USB 3.0, a dedicated BMC_LAN, and two 1GbE LAN connections
JNVI2C1	NVMe SMBus (I2C) header
JNVVPP1	CPU VPP Bus header for use of the riser card
JBPN_PWR1	Power connector to the backplane
JBRG_PWR1	12V standby power connector for GPU board
JTPM1	Trusted Platform Module/Port 80 connector
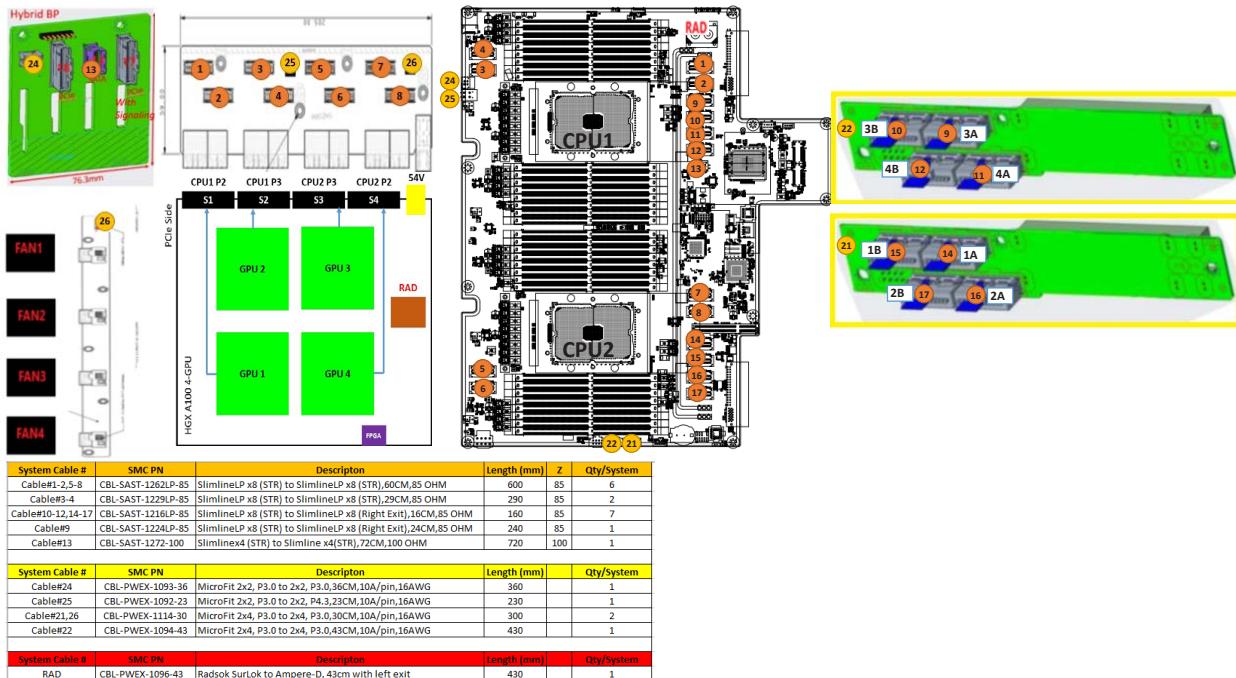
Figure 1-9. Cable Mapping Guide

Note: The GPU numbering in the figure above is based on BMC interface numbering. See the GPU mapping table for more information.

| GPU Mapping Table			
BMC Interface Numbering	BMC Interface Address	Linux OS Numbering	Linux OS Address
GPU1	0x98	GPU0	4b:00:00
GPU2	0x98.	GPU1	65:00:00
GPU3	0x98.	GPU2	ca:00:00
GPU3	0x98	GPU3	e3:00:00

Power Cable Mapping Table				
Cable#	Cable Part Number	Length	Description	Function
21	CBL-PWEX-1114-30	30cm	Microfit 2x4	Riser Slot1,2 12V Power
22	CBL-PWEX-1094-43	43cm	Microfit 2x4	Riser Slot3,4 12V Power
23	CBL-PWEX-1094-43	43cm	Microfit 2x4	Riser Slot5,6 12V Power
24	CBL-PWEX-1093-36	36cm	Microfit 2x2	Backplane 12V/5V Power
25	CBL-PWEX-1092-23	23cm	Microfit 2x2	PCIe Transition Board 12V/5V Power
26	CBL-PWEX-1114-30	30cm	Microfit 2x4	Fan Board 48V/3.3V Power
27	CBL-PWEX-1096-43	43cm	Radsok SurLok to Amphe-D	54V GPU Baseboard Power

Data Cable Mapping Table						
Cable#	Cable P/N	Length	Lanes	MB Connector Name: Reference Designator	CPU	Function
1	CBL-SAST-1262LP-85	62cm	x8	P1-PCIe2A: JS5	CPU1	GPU1 (BMC Interface)
2	CBL-SAST-1262LP-85	62cm	x8	P1-PCIe2B: JS6	CPU1	GPU1 (BMC Interface)
3	CBL-SAST-1262LP-85	29cm	x8	P1-PCIe3A: JS7	CPU1	GPU2 (BMC Interface)
4	CBL-SAST-1262LP-85	29cm	x8	P1-PCIe3B: JS8	CPU1	GPU2 (BMC Interface)
5	CBL-SAST-1266LP-85	62cm	x8	P2-PCIe3A: JS15	CPU2	GPU3 (BMC Interface)
6	CBL-SAST-1266LP-85	62cm	x8	P2-PCIe3B: JS16	CPU2	GPU3 (BMC Interface)
7	CBL-SAST-1266LP-85	62cm	x8	P2-PCIe2A: JS13	CPU2	GPU4 (BMC Interface)
8	CBL-SAST-1266LP-85	62cm	x8	P2-PCIe2B: JS14	CPU2	GPU4 (BMC Interface)
9	CBL-SAST-1224LP-85	24cm	x8	P1-PCIe1A: JS3	CPU1	Riser Slot 3A
10	CBL-SAST-1224LP-85	16cm	x8	P1-PCIe1B: JS4	CPU1	Riser Slot 3B
11	CBL-SAST-1216LP-85	16cm	x8	P1-PCIe0A: JS1	CPU1	Riser Slot 4A
12	CBL-SAST-1216LP-85	72cm	x8	P1-PCIe0B: JS2	CPU1	Riser Slot 4B
13	CBL-SAST-1272-100	16cm	x4	JSATA: JS1A	CPU1	Backplane SATA 0-3
14	CBL-PWEX-1093-36	16cm	x8	P2-PCIe1A: JS11	CPU2	Riser Slot 1A
15	CBL-SAST-1224LP-85	16cm	x8	P2-PCIe1B: JS12	CPU2	Riser Slot 1B
16	CBL-SAST-1224LP-85	16cm	x8	P2-PCIe0A: JS9	CPU2	Riser Slot 2A
17	CBL-SAST-1228LP-85	16cm	x8	P2-PCIe0B: JS10	CPU2	Riser Slot 2B

1.5 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" link.

1.6 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/).

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.

Chapter 2

Server Installation

2.1 Overview

This chapter provides advice and instructions for mounting your system in a server rack. 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 server. 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 server or other component from the rack.

- You should extend only one server or component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server 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 server components at the bottom of the rack first and then work your way up.

- Use a regulating uninterruptible power supply (UPS) to protect the server 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 servers 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 server with the front handles. They are designed to pull the system from a rack only.

2.4 Installing the Rails

This section provides information on installing the chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly from the instructions provided. You should also refer to the installation instructions that came with the rack unit you are using. **Note:** This rail will fit a rack between 26.8" and 36.4" deep.

Identifying the Rails

The chassis package includes two rail assemblies. Each assembly consists of three sections: An inner rail that secures directly to the chassis, an outer rail that secures to the rack, and a middle rail which extends from the outer rail. These assemblies are specifically designed for the left and right side of the chassis and labeled.

Rail Assembly
(Shown with Rails Retracted)

Outer Rail
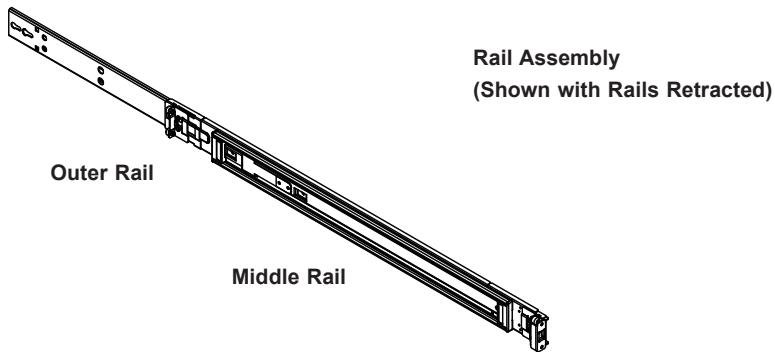
Middle Rail

Figure 2-1. Identifying the Outer Rail, Middle Rail and Inner Rail
(Left Rail Assembly Shown)

Note: Both front chassis rails and the rack rails have a locking tab, which serves two functions. First, it locks the chassis into place when installed and pushed fully into the rack (its normal operating position. In addition, these tabs lock the chassis in place when fully extended from the rack. This prevents the chassis from coming completely out of the rack when pulled out for servicing.

Releasing the Inner Rail

Each inner rail has a locking latch. This latch prevents the chassis from coming completely out of the rack when the chassis is pulled out for servicing.

To mount the rail onto the chassis, first release the inner rail from the outer rails.

1. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.

2. Press the locking tab down to release the inner rail.

3. Pull the inner rail all the way out.

**Rail Assembly
(Shown with Rails Retracted)**

Outer Rail

Middle Rail

**Push the lever down, and pull the inner all the way
out of the middle rail.**
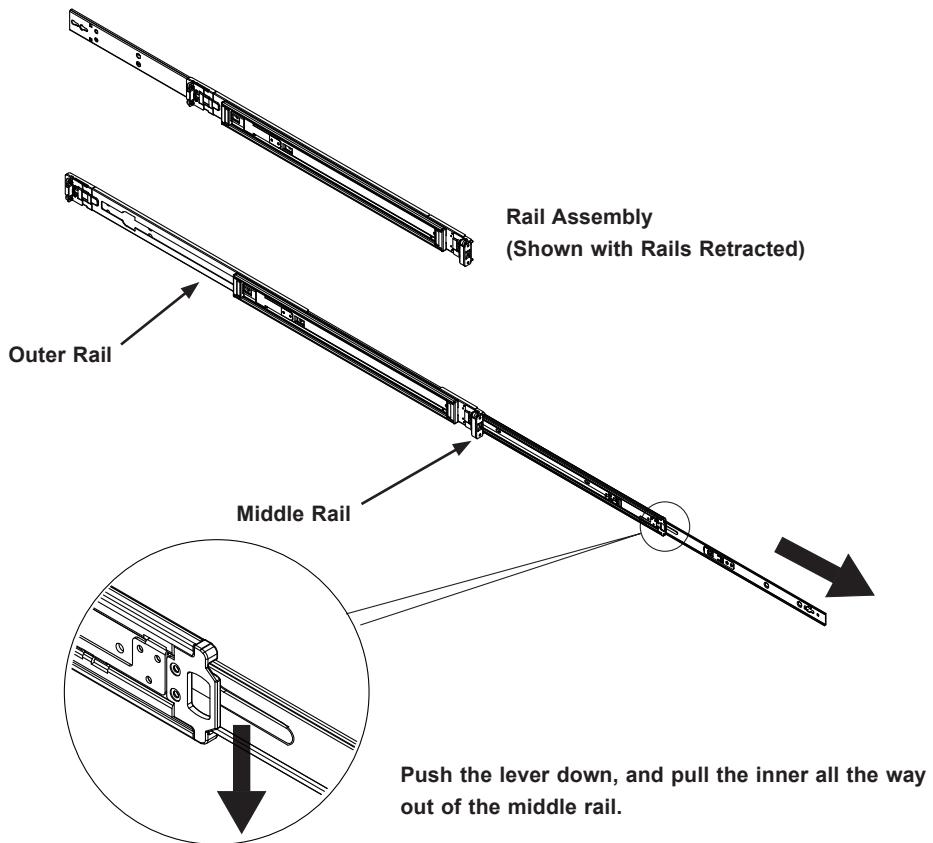
Figure 2-2. Extending and Releasing the Inner Rail

Installing the Inner Rails

Begin the rack mounting procedure by installing the inner rails to the chassis.

1. Identify the left and right inner rails. They are labeled.

2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.

3. Slide the inner rail forward toward the front of the chassis and under the hooks until the quick release bracket snaps into place, securing the rail to the chassis.

4. Optionally, you can further secure the inner rail to the chassis with a screw.

5. Repeat for the other inner rail.
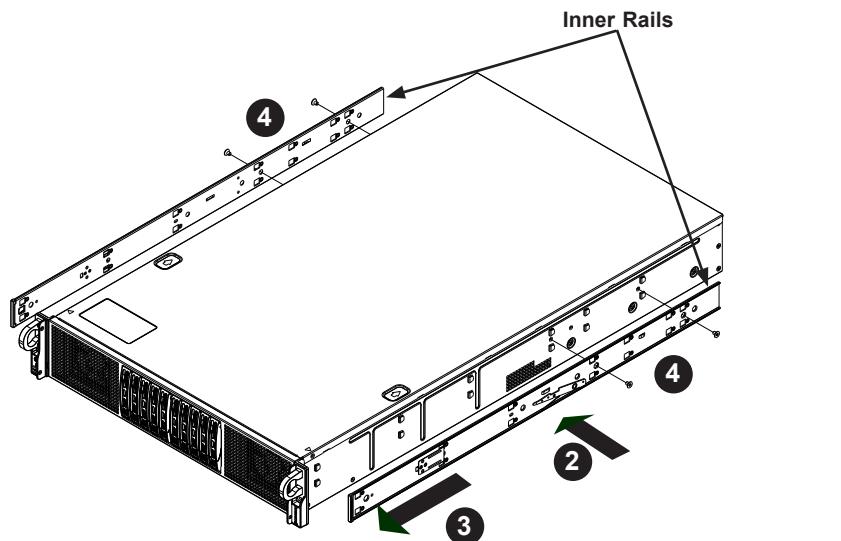
Figure 2-3. Installing the Rails

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

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

Installing the Outer Rails onto the Rack

1. Press upward on the locking tab at the rear end of the middle rail.

2. Push the middle rail back into the outer rail.

3. Hang the hooks on the front of the outer rail onto the square holes on the front of the rack. If desired, use screws to secure the outer rails to the rack.

4. Pull out the rear of the outer rail, adjusting the length until it just fits within the posts of the rack.

5. Hang the hooks of the rear section of the outer rail onto the square holes on the rear of the rack. Take care that the proper holes are used so the rails are level. If desired, use screws to secure the rear of the outer rail to the rear of the rack.
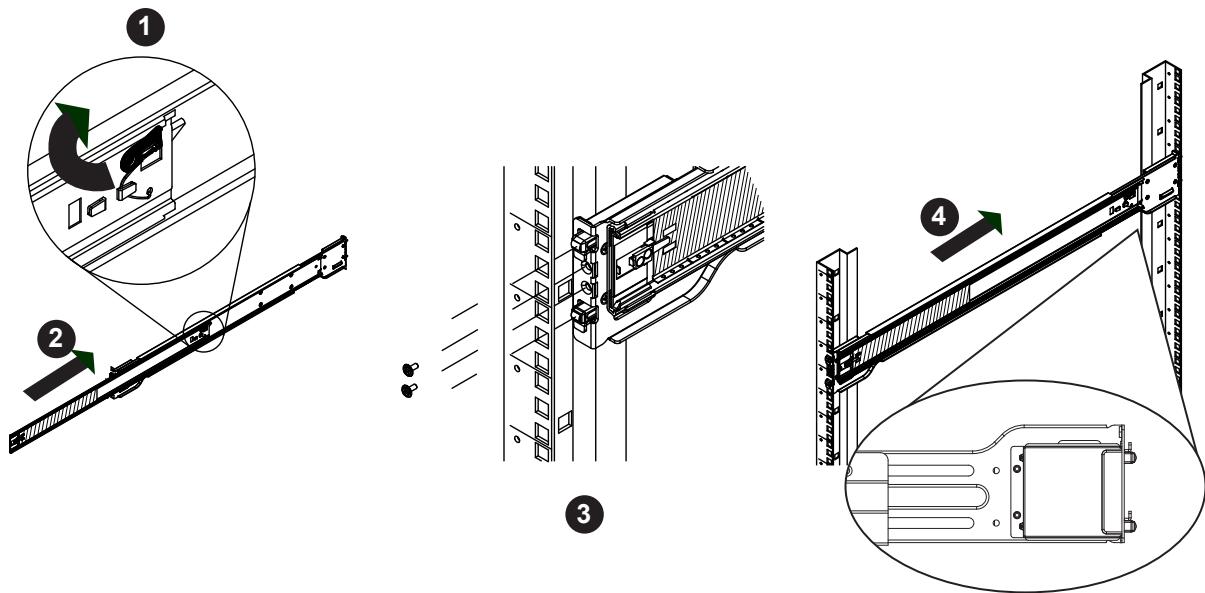
Figure 2-4. Extending and Mounting the Outer Rails

2.5 Installing the Chassis into a Rack

Once rails are attached to the chassis and the rack, you can install the chassis.

1. Pull the middle rail out of the front of the outer rail and make sure that the ball bearing shuttle is locked at the front of the middle rail.

2. Align the rear of the chassis rails with the middle rails and then push evenly on both sides of the chassis until it clicks into the fully extended position.

3. Depress the locking tabs on both sides of the chassis and push the it fully into the rack. The locking tabs should "click".

4. Optional screws may be used to hold the front of the chassis to the rack.

Ball-Bearing Shuttle
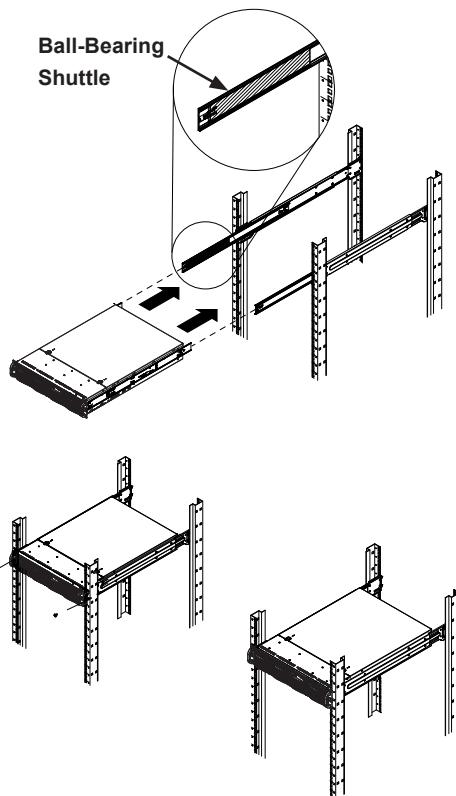
Figure 2-5. Installing the Chassis into the Rack

Notes:

- Keep the ball bearing shuttle locked at the front of the middle rail during installation.

- Figure is for illustrative purposes only. Always install a chassis to the bottom of a rack first.

Removing the Chassis from the Rack

Caution! It is dangerous for a single person to off-load the heavy chassis from the rack without assistance. Be sure to have sufficient assistance supporting the chassis when removing it from the rack. Use a lift.

1. Pull the chassis forward out the front of the rack until it stops.

2. Press the release latches on each of the inner rails downward simultaneously and continue to pull the chassis forward and out of the rack.
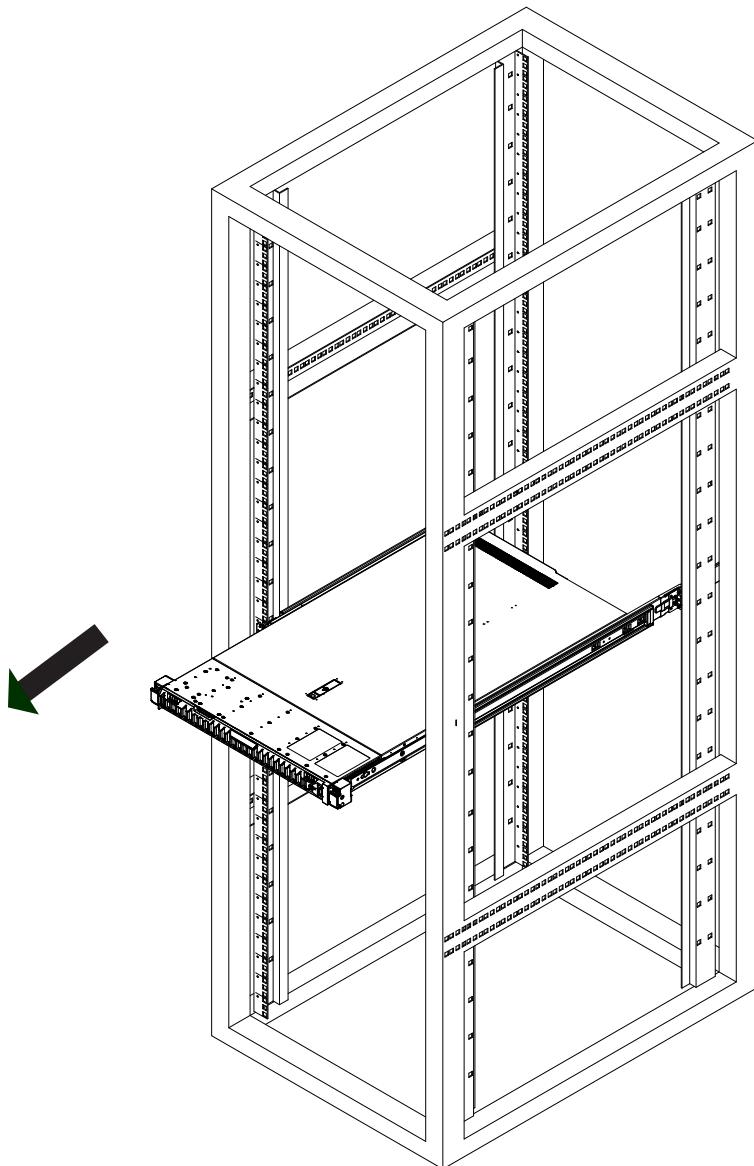
Figure 2-6. Removing the Chassis From the Rack

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 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-228GTS has a removable two-piece top cover. Check that all ventilation openings in the chassis are clear and unobstructed.

Removing the Top Cover

1. Remove four side screws and one top screw from the front cover.

2. Remove six side screws and four top screws from the rear cover.

3. Push the rear top cover towards the rear of the unit, which will separate the two top covers. Now each top cover can be removed by lifting them up.

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

Caution: High voltage (54V) is present in the system.
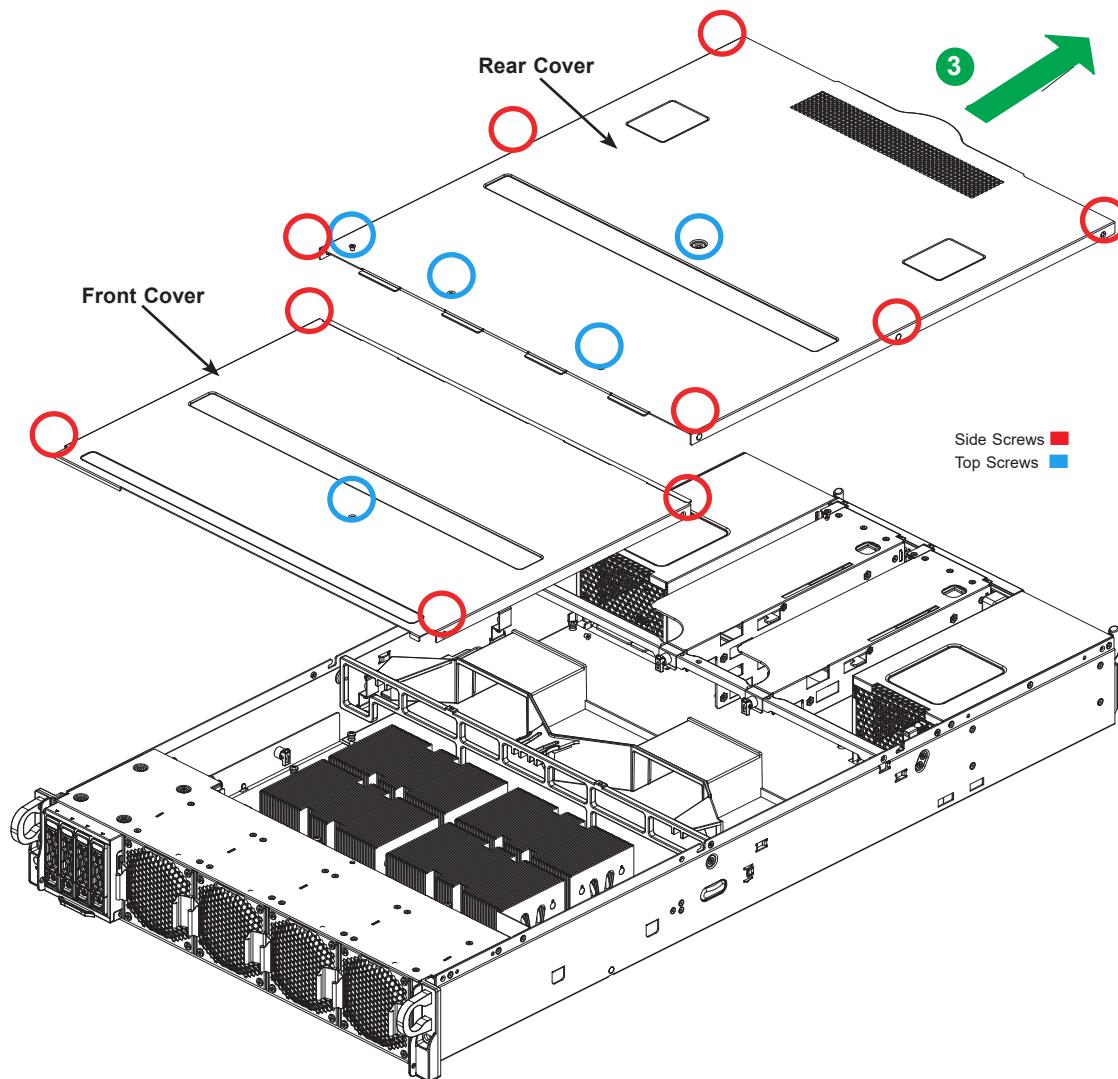
Figure 3-1. Removing the Chassis Cover

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 the system PCBs from ESD.

Precautions

- Use a grounded wrist strap designed to prevent static discharge.

- Touch a grounded metal object before removing any PCB (printed circuit board) from its antistatic bag.

- Handle PCBs by their 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 PCBs back into their antistatic bags when not in use.

- Use only the correct type of onboard CMOS battery. Do not install the onboard battery upside down to avoid a possible explosion.

3.4 Processor and Heatsink Installation

The processor (CPU) must first be attached to the processor carrier to form the processor carrier assembly. This assembly gets attached to the heatsink to form the processor heatsink module (PHM), which is then installed into the CPU socket. Before installing, be sure to perform the steps below:

- Please carefully follow the instructions given on ESD precautions.

- After shutting down the system, unplug the AC power cords from all power supplies.

- Check that the plastic protective cover is on the CPU socket and that 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 the socket and may require manufacturer repairs.

- Thermal grease is pre-applied on new heatsinks. No additional thermal grease is needed.

- Refer to the Supermicro website (https://www.supermicro.com/en) for updates on processor and memory support.

- All graphics in this manual are for illustration only. Your components may look different.

The Processor Carrier Assembly

The processor carrier assembly is comprised of the processor and the processor carrier.

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

Note: Before installation, be sure to review the Static-Sensitive Devices section earlier in this chapter.

1. Hold the processor with the gold pins (LGA lands) facing down. Locate the gold triangle at the corner of the processor and the corresponding hollowed triangle on the processor carrier as shown below. These triangles indicate the location of pin 1.

2. Turn the processor over (with the gold pins up). Locate the CPU keys on the processor and the four latches on the carrier as shown below.
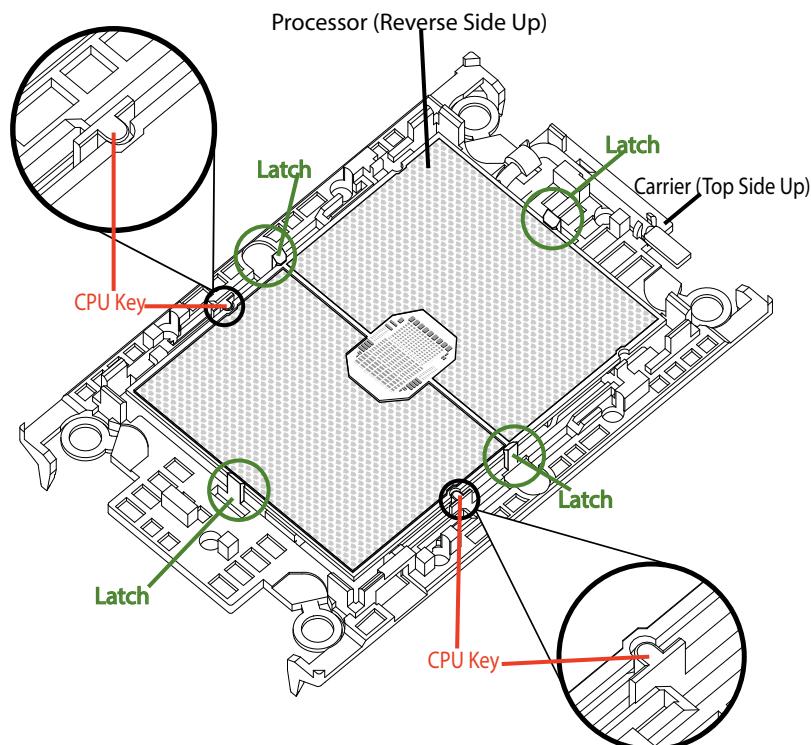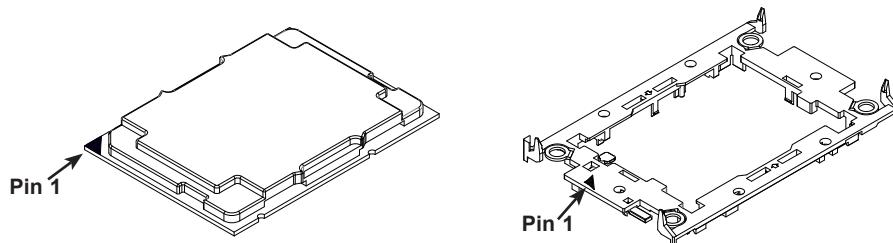
(with Processor Seated inside the Carrier)

3. Locate the lever on the carrier and press it down as shown below.
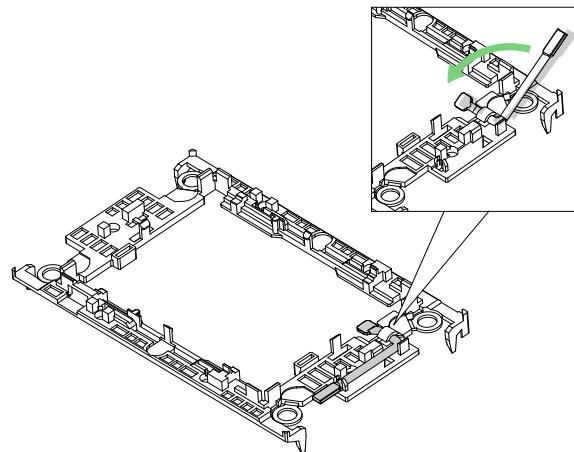
4. Using pin 1 as a guide, carefully align the CPU keys on the processor (A & B) with those on the carrier (a & b) as shown below.
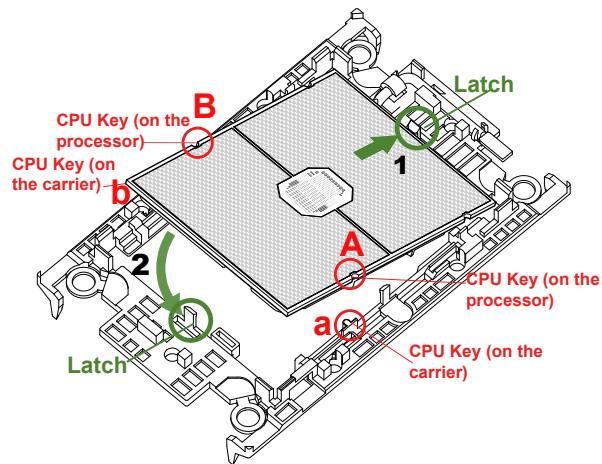
5. Once aligned, carefully place one end of the processor under latch 1 on the carrier, and then press the other end down until it snaps into latch 2.

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 Side View)

Processor Carrier Assembly
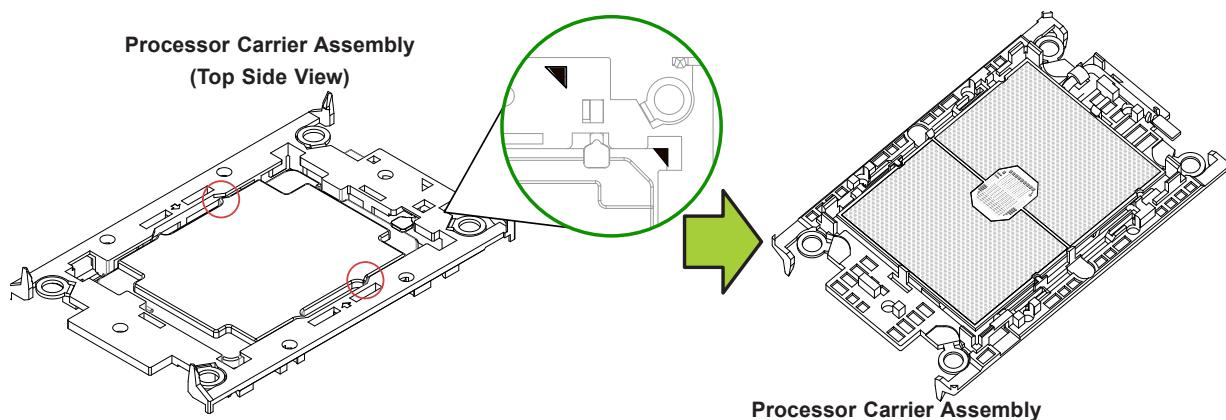
The Processor Heatsink Module (PHM)

After creating the processor carrier assembly, follow the instructions below to mount the heatsink onto the carrier assembly to form the processor heatsink module (PHM).

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

1. Turn the heatsink over with the thermal grease facing up. Pay attention to the two triangle cutouts (A, B) located at the diagonal corners of the heatsink as shown in the drawing below.

2. Hold the processor carrier assembly upside-down to locate the triangles on the processor and the carrier, which indicate pin 1.

3. Turn the processor carrier assembly over so that the gold pins are facing up. Locate the two-pin 1 locations ("A" on the processor and "a" on the processor carrier assembly).

4. Align "a" on the processor carrier assembly with the triangular cutout "A" on the heatsink along with "b", "c", "d" on the processor assembly with "B", "C", "D" on the heatsink.

5. Once properly aligned, place the heatsink on the processor carrier assembly with all corners matched up, making sure that the four clips are properly securing the heatsink.
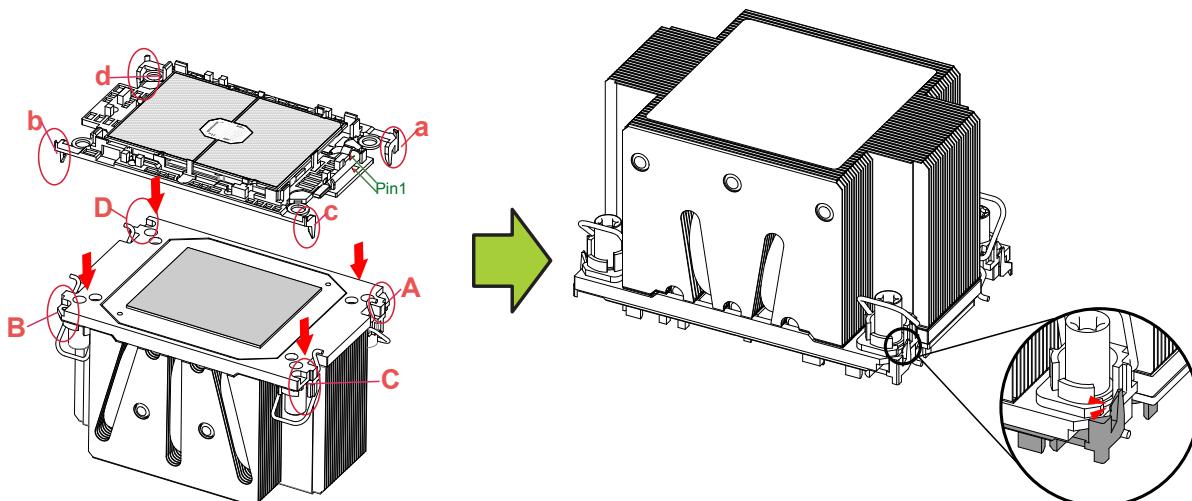
Preparing the CPU Socket for Installation

The CPU socket comes with a plastic protective cover, which needs to be removed before installing the Processor Heatsink Module (PHM). Do this by gently squeezing the grip tabs then pulling the cover off.

CPU Socket with Plastic Protective Cover

Grip Tab
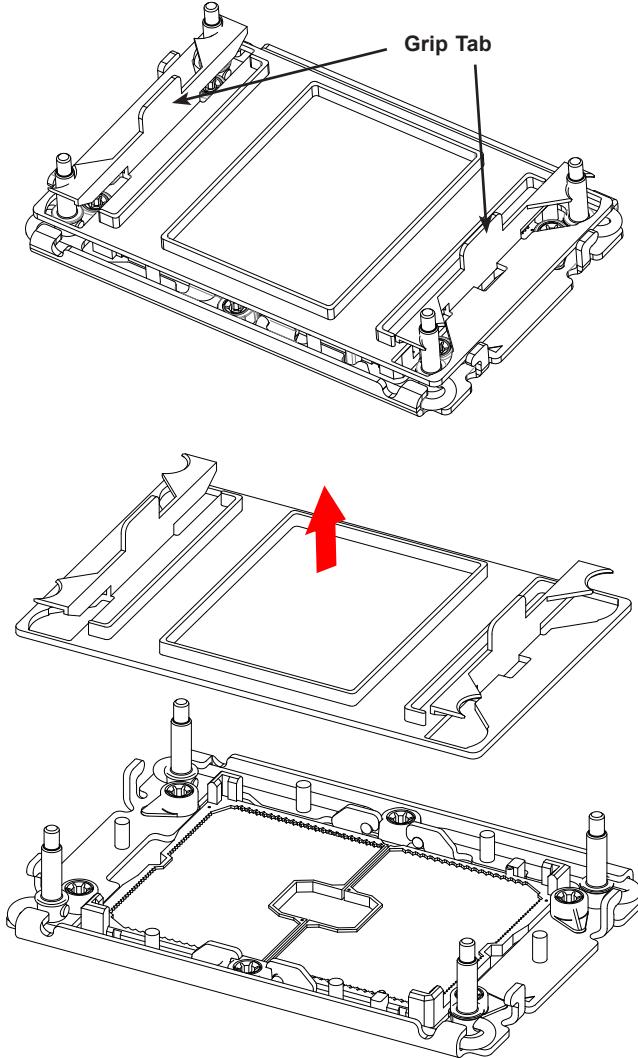
Installing the PHM into the CPU Socket

After assembling the Processor Heatsink Module (PHM), you are ready to install it into the CPU socket.

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

(a, b, c, d: Threaded Fasteners)   CPU Socket Pin1
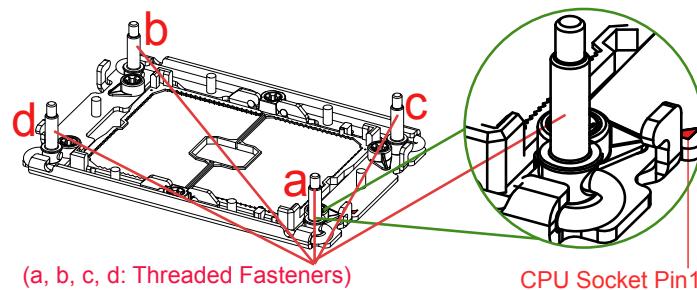
2. Locate four peek nuts (A, B. C. D) and four rotating wires (1, 2, 3, 4) on the heatsink as shown below.

A, B, C, D: Peek Nut
1, 2, 3, 4: Rotating Wire
a, b, c, d: Threaded Fastener
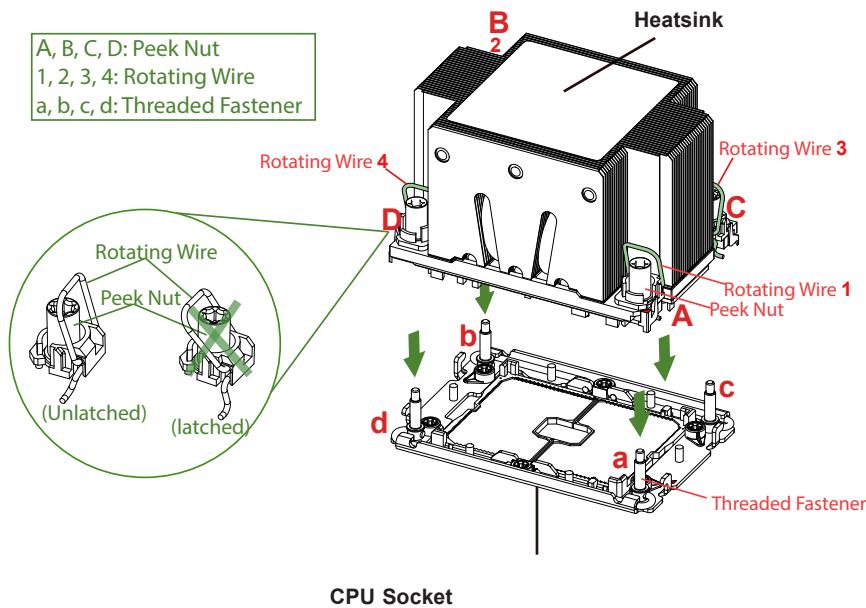
CPU Socket

3. Check the rotating wires (1, 2, 3, 4) to make sure that they are in the unlatched position as shown.
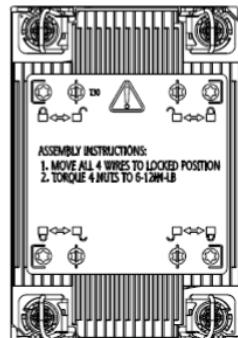
4. Align peek nut "A" (next to the triangular pin 1 on the heatsink) with threaded fastener "a" on the CPU socket. Then align peek nuts "B", "C", "D" on the heatsink with threaded fasteners "b", "c", "d" on the CPU socket, making sure that all peek nuts and threaded fasteners are properly aligned.

5. Once aligned, gently place the heatsink on the CPU socket, making sure that each peek nut is properly attached to its corresponding threaded fastener.

A, B, C, D:
Peek Nut on the Heatsink

a, b, c, d:
Threaded Fastener on the CPU socket
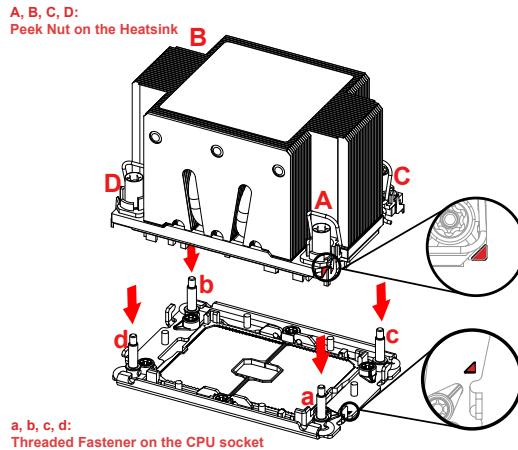
6. Press all four rotating wires outward and make sure that the heatsink is securely latched into the CPU socket.

Rotating Wire   **Rotating Wire**
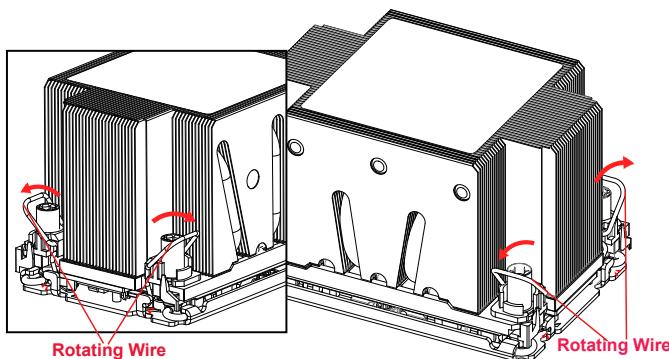
7. With a T30-bit screwdriver, tighten all peek nuts in the sequence of "A", "B", "C", and "D" with even pressure. To avoid damaging the processor or socket, do not use a force greater than 12 lbf-in when tightening the screws.

8. Examine all corners of the heatsink to ensure that the PHM is firmly attached to the CPU socket.
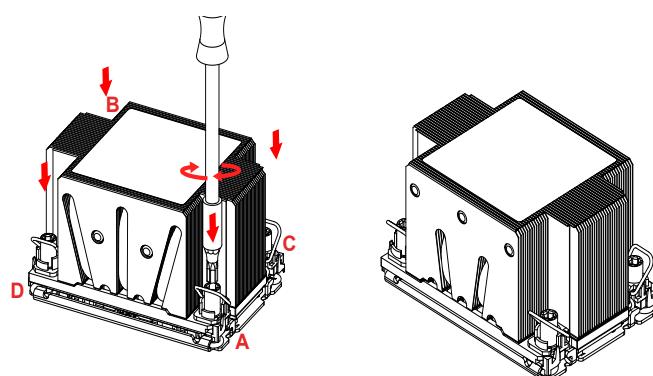
Removing the PHM from the CPU Socket

Before removing the PHM from the motherboard, first shut down the system and unplug the AC power cord from all power supplies.

1. Use a T30-bit screwdriver to loosen the four peek nuts on the heatsink in the sequence of A, B, C, and D.
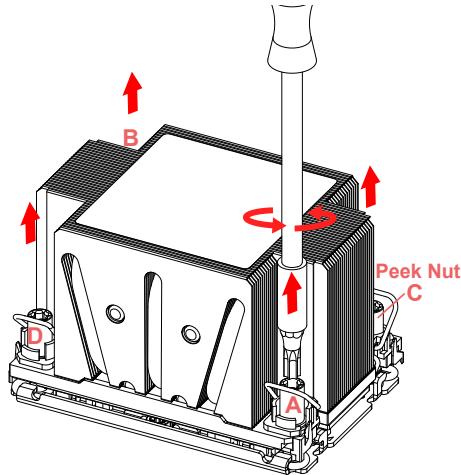
2. Once the peek nuts have been loosened from the CPU socket, press the rotating wires inward to unlatch the PHM from the socket, as shown below.
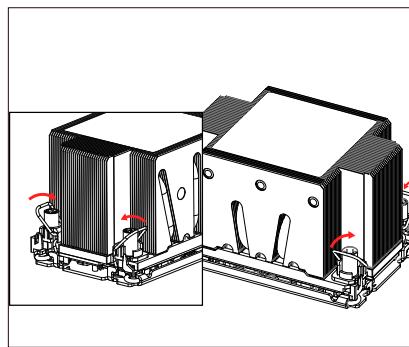
3. Gently lift the PHM upward to remove it from the CPU socket.
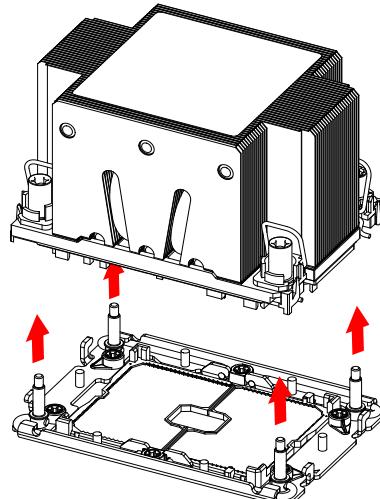
Removing the Processor Carrier Assembly from the PHM

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

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

Processor Carrier Assembly

Pin1
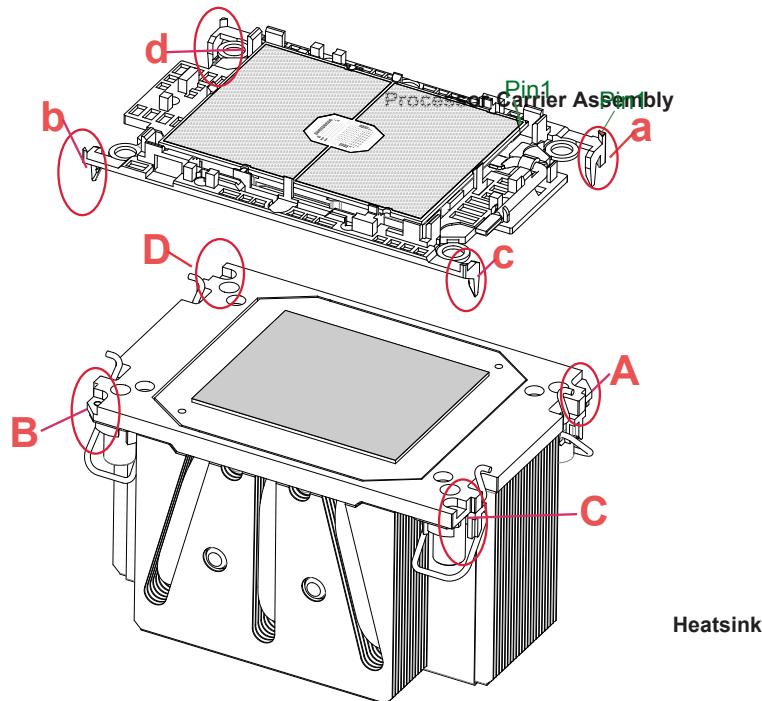
Heatsink

2. When all plastic clips have been detached from the heatsink, remove the processor carrier assembly from the heatsink.
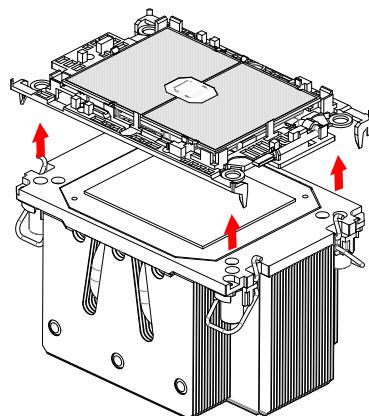
Removing the Processor from the Processor Carrier Assembly

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 locked position and push it upwards to disengage the processor from the processor carrier, as shown below right.

Processor Carrier Assembly

Lever
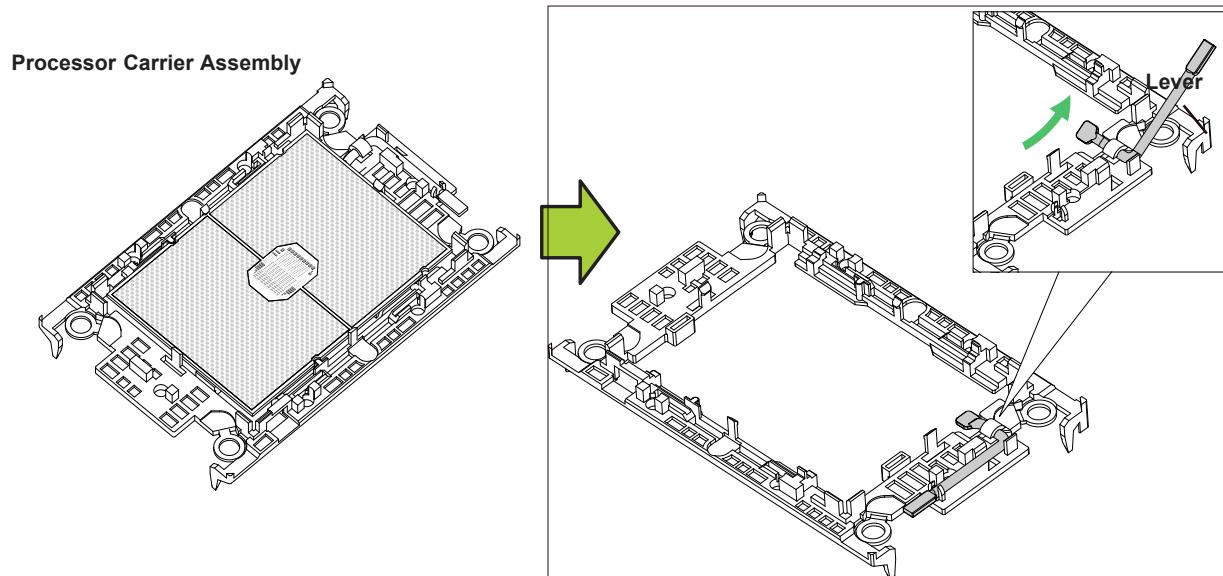
2. Once the processor has been loosened from the carrier, carefully remove the processor from the carrier.

Note: Please handle the processor with care to avoid damaging it or its pins.
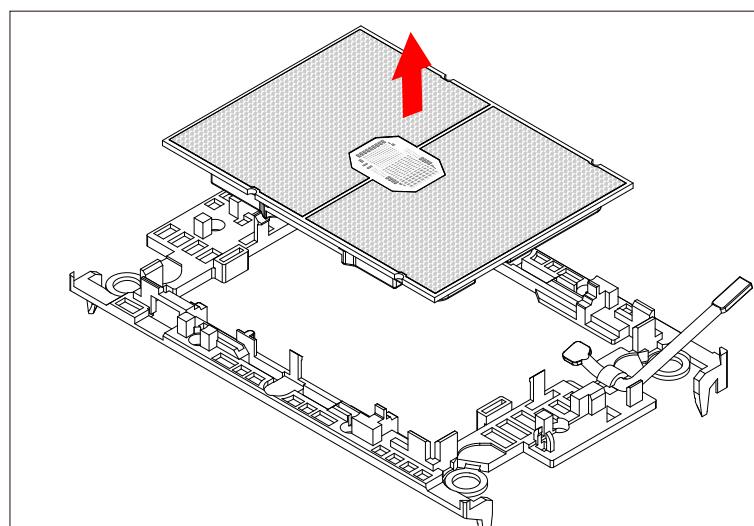
3.5 Memory

Memory Support

The X12DPG-QR has 32 DIMM slots, supporting only DDR4 or mixed DDR4 and PMem.

- *Only DDR4:* 8TB of 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM DDR4 (288-pin) ECC memory with speeds of 3200/2933/2666 MHz

- *Mixed DDR4 and PMem:* 4TB of DDR4 and 8TB of Intel Optane PMem 200 Series with speeds of up to 3200 MHz

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 for DDR4-only Configurations, 32 DIMM Slots	
CPUs/DIMMs	**Memory Population Sequence**
1 CPU & 1 DIMM	A1
1 CPU & 2 DIMMs*	A1, E1
1 CPU & 4 DIMMs*	A1, C1, E1, G1
1 CPU & 6 DIMM	A1, B1, C1, E1, F1, G1
1 CPU & 8 DIMMs*	A1, B1, C1, D1, E1, F1, G1, H1
1 CPU & 12 DIMMs*	A1, A2, B1, C1, C2, D1, E1, E2, F1, G1, G2, H1
1 CPU & 16 DIMMs*	A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2
2 CPUs & 2 DIMMs*	CPU1: A1 CPU2: A1
2 CPUs & 4 DIMMs*	CPU1: A1, E1 CPU2: A1, E1
2 CPUs & 6 DIMMs	CPU1: A1, C1, E1, G1 CPU2: A1, E1
2 CPUs & 8 DIMMs*	CPU1: A1, C1, E1, G1 CPU2: A1, C1, E1, G1
2 CPUs & 10 DIMMs	CPU1: A1, B1, C1, E1, F1, G1 CPU2: A1, C1, E1, G1
2 CPUs & 12 DIMMs*	CPU1: A1, B1, C1, E1, F1, G1 CPU2: A1, B1, C1, E1, F1, G1
2 CPUs & 14 DIMMs	CPU1: A1, B1, C1, D1, E1, F1, G1, H1 CPU2: A1, B1, C1, E1, F1, G1
2 CPUs & 16 DIMMs*	CPU1: A1, B1, C1, D1, E1, F1, G1, H1 CPU2: A1, B1, C1, D1, E1, F1, G1, H1
2 CPUs & 18 DIMMs	CPU1: A1, A2, B1, C1, C2, D1, E1, E2, F1, G1, G2, H1 CPU2: A1, B1, C1, E1, F1, G1
2 CPUs & 20 DIMMs	CPU1: A1, A2, B1, C1, C2, D1, E1, E2, F1, G1, G2, H1 CPU2: A1, B1, C1, D1, E1, F1, G1, H1
2 CPUs & 22 DIMMs	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, B1, C1, E1, F1, G1
2 CPUs & 24 DIMMs*	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, B1, C1, D1, E1, F1, G1, H1
2 CPUs & 32 DIMMs*	CPU1: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2 CPU2: A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, F1, F2, G1, G2, H1, H2

* recommended for optimal performance

• Must have at least one DIMM per CPU.

Optane PMem 200 Series

For 3rd Gen Intel Xeon Scalable Platinum, Gold and selected Silver processors

DDR4 & PMem	Modes	AD interleve	F1	F2	E1	E2	H1	H2	G1	G2	C2	C1	D2	D1	A2	A1	B2	B1
4 DDR4 4 PMem	AD MM	1 - x4	PM	-	DDR4	-	PM	-	DDR4	-	-	DDR4	-	PM	-	DDR4	-	PM
		1 - x4	DDR4	-	PM	-	DDR4	-	PM	-	-	PM	-	DDR4	-	PM	-	DDR4
6 DDR4 1 PMem	AD	One - x1	DDR4	-	DDR4	-	-	-	DDR4	-	-	DDR4	-	PM	-	DDR4	-	DDR4
			-	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	PM
			DDR4	-	DDR4	-	PM	-	DDR4	-	-	DDR4	-	-	-	DDR4	-	DDR4
			PM	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	-
			DDR4	-	DDR4	-	DDR4	-	-	-	-	PM	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	-	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	PM	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	PM	-	-	-	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	PM	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	-	-	DDR4
8 DDR4 1 PMem	AD	One - x1	DDR4	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	PM	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	DDR4	-	PM	DDR4	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	PM	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	DDR4	PM	-	DDR4	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	PM	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	PM	DDR4
			DDR4	PM	DDR4	-	DDR4	-	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	DDR4
			DDR4	-	DDR4	-	DDR4	PM	DDR4	-	-	DDR4	-	DDR4	-	DDR4	-	DDR4
8 DDR4 4 PMem	AD MM	1 - x4	DDR4	-	DDR4	PM	DDR4	-	DDR4	PM	PM	DDR4	-	DDR4	PM	DDR4	-	DDR4
		2 - x2	DDR4	-	DDR4	PM	DDR4	PM	DDR4	-	-	DDR4	PM	DDR4	PM	DDR4	-	DDR4
		1 - x4	DDR4	PM	DDR4		DDR4	-	DDR4	PM	PM	DDR4	-	DDR4	-	DDR4	PM	DDR4
		2 - x2	DDR4	PM	DDR4	-	DDR4	PM	DDR4	-	-	DDR4	PM	DDR4	-	DDR4	PM	DDR4
8 DDR4 8 PMem	AD MM	One - x8	DDR4	PM	DDR4	PM	DDR4	PM	DDR4	PM	PM	DDR4	PM	DDR4	PM	DDR4	PM	DDR4
12 DDR4 2 PMem	AD	One - x2	PM	-	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	-	PM
			DDR4	DDR4	DDR4	DDR4	PM	-	DDR4	DDR4	DDR4	DDR4	-	PM	DDR4	DDR4	DDR4	DDR4
			DDR4	DDR4	PM	-	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	-	PM	DDR4	DDR4	DDR4
			DDR4	DDR4	DDR4	DDR4	DDR4	DDR4	PM	-	-	PM	DDR4	DDR4	DDR4	DDR4	DDR4	DDR4

AD: App Direct, MM: Memory Mode, PM: PMem

Validation Matrix (DDR4 DIMMs Validated with PMem 200 Series)			
DIMM Type (up to 3200)	Ranks Per DIMM & Data Width (Stack)	DIMM Capacity (GB)	
		DRAM Density	
		8GB	16GB
RDIMM	1Rx8	N/A	N/A
	1Rx4	16GB	32GB
	2Rx8	16GB	32GB
	2Rx4	32GB	64GB
RDIMM 3DS	4Rx4 (2H)	N/A	128GB
	8Rx4 (4H)	NA	256GB
LRDIMM	4Rx4	64GB	128GB
LRDIMM 3DS	4Rx4 (2H)	N/A	N/A
	8Rx4 (4H)	128GB	256GB

PMem Notes

- PMem 200 Series are supported on 3rd gen Intel Xeon Scalable Platinum, Gold and selected Silver processors.

- Do not mix PMem and NVDIMMs within the platform.

- For MM, NM/FM ratio is between 1:4 and 1:16. The capacity not used for FM can be used for AD. (NM = Near Memory; FM = Far Memory).

- Matrix targets configs for optimized PMem to DRAM cache ratio in MM and MM + AD modes.

- For each individual population, different PMem rearrangements among channels are permitted so long as the configuration does not break X12 DP Memory population rules.

- Ensure the same DDR4 DIMM type and capacity are used for each DDR4 + PMem population.

- If the system detects an unvalidated config, then the system issues a BIOS warning. The CLI functionality is limited in non-POR configurations, and select commands will not be supported.

- x4 and x8 DDR4 DIMMs cannot be mixed in the same channel in PMem configurations.

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.

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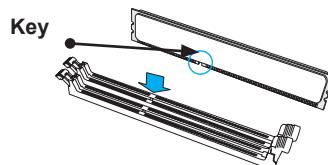
4. Align the notches on both ends of the module with the receptive points on the ends of the slot.

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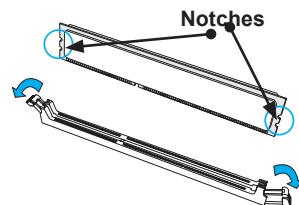
5. Push both ends of the module straight down into the slot until the module snaps into place.

Push both ends straight down into the memory slot.
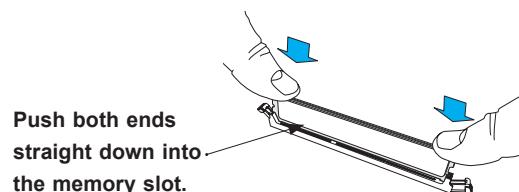
6. Press the release tabs to the lock positions to secure the DIMM module into the slot.

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.
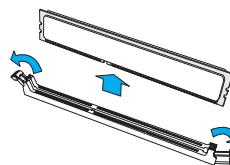
Warning! To avoid causing any damage to the DIMM module or the DIMM socket, do not use excessive force when pressing the release tabs on the ends of the DIMM socket. Handle DIMMs with care. Be aware and follow the ESD instructions in Section 3.3.

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.

LITHIUM BATTERY

BATTERY HOLDER
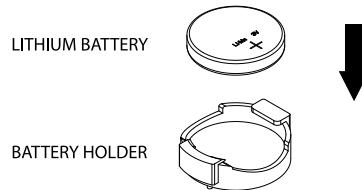
Figure 3-2. Installing the Onboard Battery

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 M.2 SSDs

The X12DPG-QR motherboard has two PCIe 3.0 M.2 slots (M.2-H1, M.2-H2).

Installing M.2 Drives

1. Remove power from the system and then remove the top cover as described in Sections 3.1 and 3.2.

2. Refer to its layout image in the Motherboard manual and locate the M.2 slot. Insert the plastic clip into the hole against the M.2 slot on the motherboard.

3. Turn the plastic clip by 90° degrees.

4. Insert the M.2 sideways into the connector so that it lays flat, then secure it to the motherboard with the plastic clip.

5. Repeat as necessary for more M.2 drives.

6. Finish by replacing the cover and restoring power to the system.
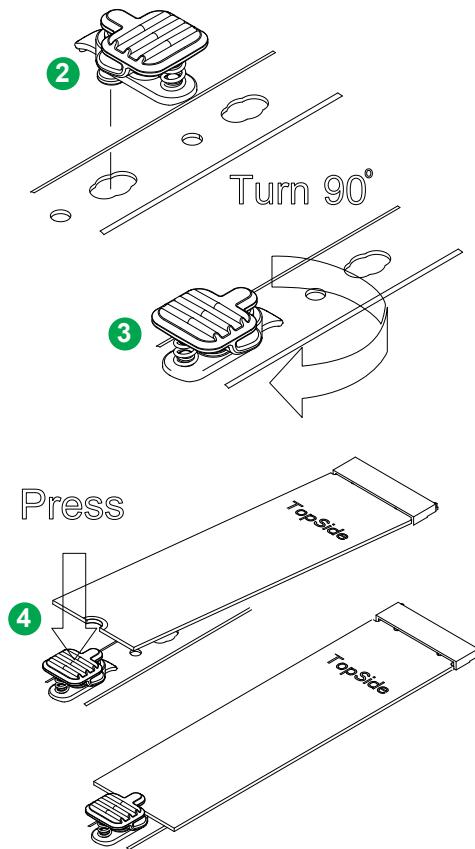
Figure 3-3. Installing an M.2 SSD

3.8 Storage Drives

The CSE-228GTS chassis supports up to four 2.5" storage drives in drive carriers to simplify their removal from the chassis. These carriers also help promote proper airflow. Note that only SSDs are supported, spindle-type HDDs are not.

All four drive carriers reside in a storage module that has Slim-SAS connectors at the rear where the data cables attach to the motherboard. A rear power connector is also used to provide input power to the module backplane from the motherboard.

Note: Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers.

Drive Carriers

Each drive carrier has two LED indicators: an activity indicator and a status indicator. For RAID configurations using a controller, the meaning of the status indicator is described in the table below. For OS RAID or non-RAID configurations, some LED indications are not supported, such as hot spare.

Drive Carrier LED Indicator			
	Color	**Blinking Pattern**	**Behavior for Device**
Activity LED	Blue	Solid On	SAS/NVMe drive installed
	Blue	Blinking	I/O activity
Status LED	Red	Solid On	Failure of drive with RSTe support
	Red	Blinking at 1 Hz	Rebuild drive with RSTe support
	Red	Blinking with two blinks and one stop at 1 Hz	Hot spare for drive with RSTe support (not supported in VMD mode)
	Red	On for five seconds, then off	Power on for drive with RSTe support
	Red	Blinking at 4 Hz	Identify drive with RSTe support
	Green	Solid On	Safe to remove NVMe device (not supported in VMD mode)
	Amber	Blinking at 1 Hz	Attention state---do not remove NVMe device (not supported in VMD mode)

Note: Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, see the Supermicro website, http://www.supermicro.com/products/nfo/files/storage/SBB-HDDCompList.pdf.

Removing Drive Carriers

Removing Drive Carriers from the Chassis

1. Push the release button on the drive carrier. This releases and extends the drive carrier handle. If the release button does not release it, the handle may be locked: use a flat-head screwdriver to unlock the release.

2. Use the handle to pull the carrier out of the chassis as shown below.

Caution: Except for short periods of time (swapping drives), do not operate the server with the drive carriers removed from the bays, regardless of how many drives are installed, for proper airflow.
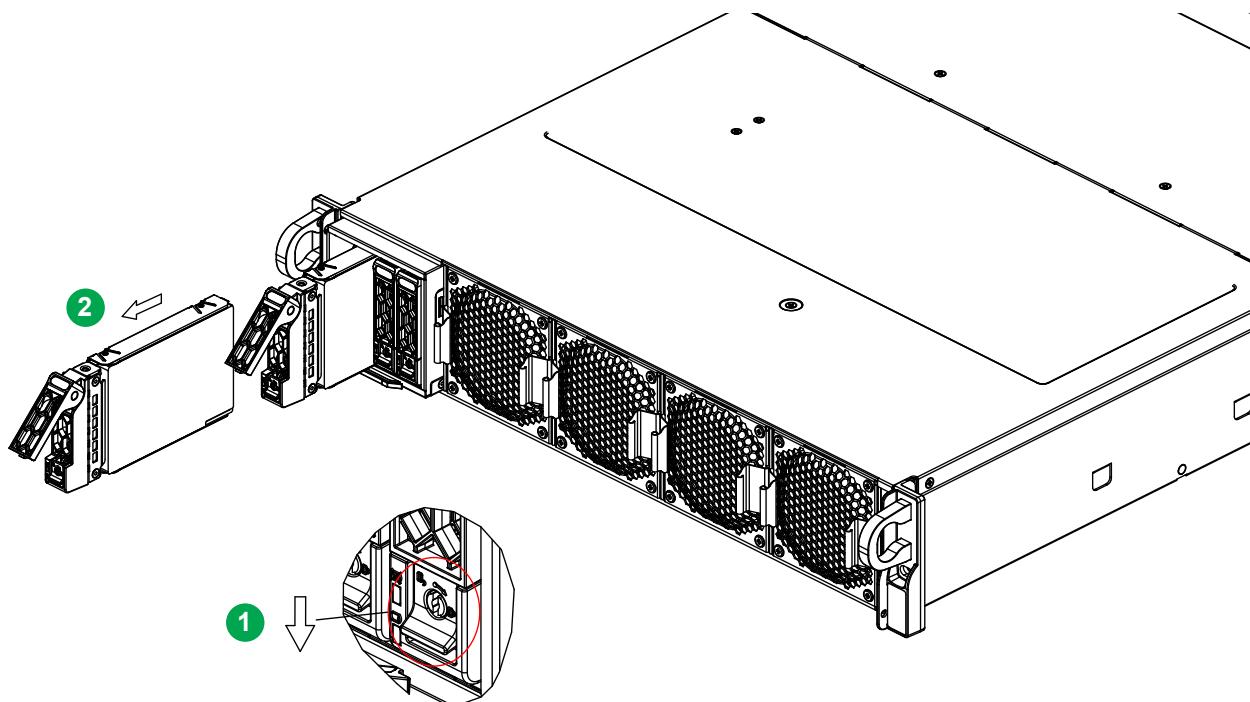
Figure 3-4. Removing a Drive Carrier

Installing 2.5" SSDs

Installing a 2.5" SSD

1. Place the hard drive carrier on a flat surface.

2. Orient the drive with the connector facing the bottom rear of the carrier. The drive can be inserted from above into the clips until a "click" is heard.

3. Use the open handle of the drive carrier to insert the carrier into the open drive bay.

4. Secure the drive carrier into the drive bay by closing the drive carrier handle.

Push down until click
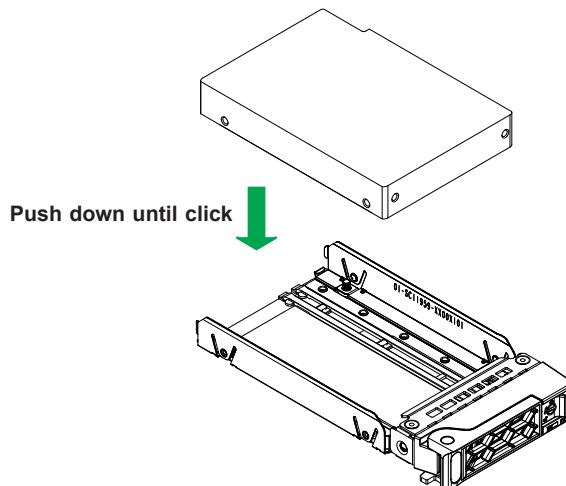
Figure 3-5. Installing a 2.5" SSD

Removing a 2.5" SSD

1. After removing the carrier from the system, push up from the bottom of the drive to remove it from the carrier.

2. Replace with a new drive and insert the carrier back into the open drive bay.

Push up from bottom
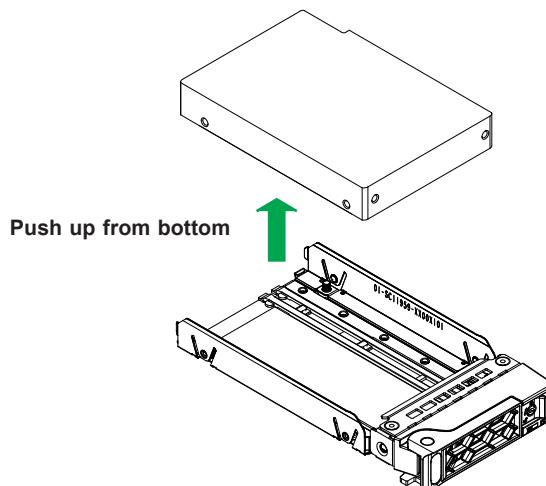
Figure 3-6. Removing a 2.5" SSD

3.9 Expansion Cards

The SYS-220GQ-TNAR+ includes two riser cards to support the use of expansion (add-on) cards.
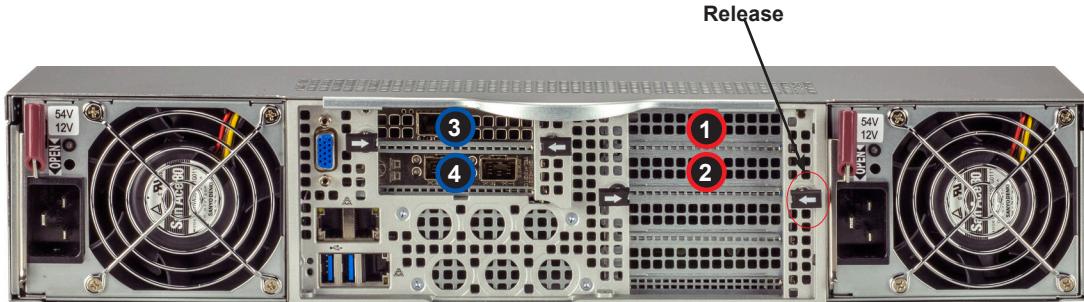
Figure 3-7. Expansion Card Chassis Slots

Riser Cards

This system includes two riser cards that provides PCIe capabilities.

Expansion Slot Locations		
Slot Location (# above)	**Riser Card**	**Description (all PCIe 4.0)**
slots 1-2	RSC-G-66GR #1	x16 FH, 2.5"L (CPU1)
slots 3-4	RSC-G-66GR #2	x16 FH, 2.5"L (CPU2)

Full-height = 4.2", Low-profile = 2.5", Full-length = 10.5", Half-length = 6.6"

CPU1 ■ CPU2 ■

Installing Expansion Cards

The system supports four low-profile PCIe Gen4 x16 slots. Expansion cards are recommended to be serviced by Supermicro due to the optimized density of the 2U form factor.

Installing an Expansion Card

1. Power down the system, remove power cables and wait 30 seconds then remove cover. **Note:** Due to the weight of the system, this should not be attempted in the rack. The system needs to be placed on a flat ESD-safe surface with ample support.

2. Begin by removing the riser assemblies.

3. At the rear of the chassis, remove the PCI riser by unlatching the riser release (see Figure 3-8 for locations). There are two releases at the rear and one at the crossbar.

4. Once the riser releases are extended to the open position, lift the riser assembly vertically. Be careful not to damage the power or data cables attached to the assemblies. If more room is needed the cables can be detached, however, it is important to note the cable numbers and their mated connectors. Please see the cable mapping guide in Chapter 1.

5. Install and secure the expansion cards into the PCI riser.

6. Return and lock the PCI riser back into the back of the chassis and lock its release.
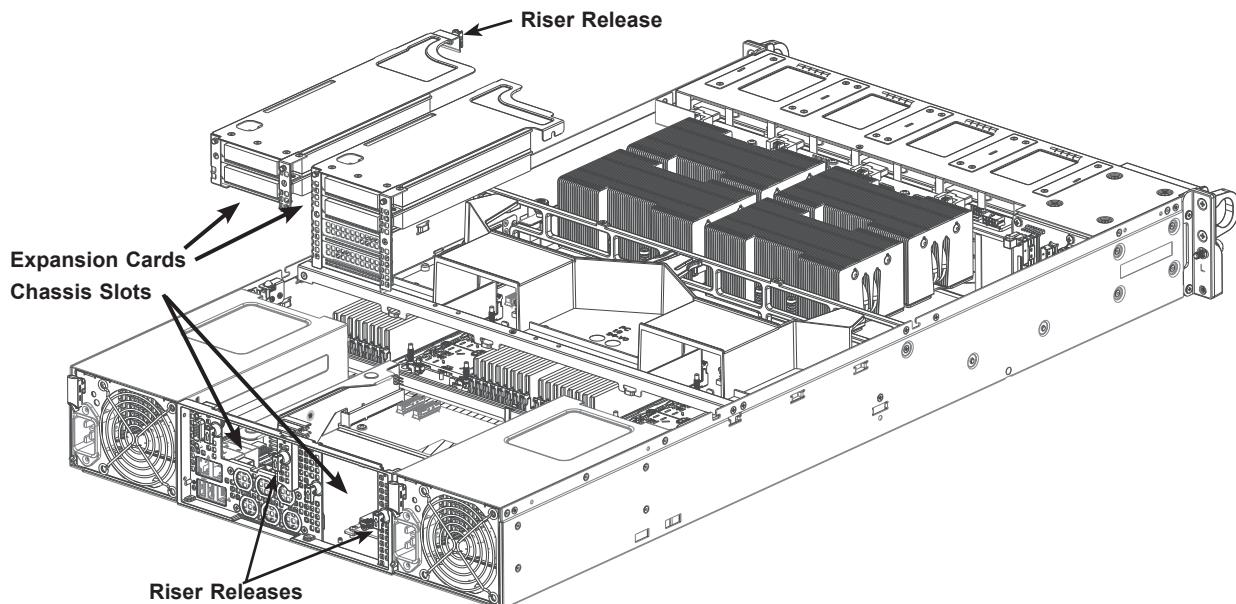
Figure 3-8. Installing Expansion Cards

3.10 Graphics Processing Units

Individual GPU and GPU baseboards are recommended to be serviced by Supermicro due to the optimized density of the 2U form factor.

Prior to submitting an RMA for GPUs, Nvidia requires that their Field Diagnostic tool is first run to isolate hardware failures and obtain a log file for review. Check with Supermicro Technical Services for more details. In addition, more details can be found in Nvidia reference document Baseboard Field Diagnostics Software Guide DU-09163-001.

Replacing GPU Baseboard Module

1. Run Nvidia's Field Diagnostic tool to isolate failures and obtain a log file for review.

2. Remove the GPU heatsinks on the GPU baseboard so that it is lighter and easier to handle.

3. Disconnect the GPU baseboard module's 54V power cable by extending the red colored finger release of the Radsok/Surlok cable (cable #27 as illustrated in Chapter 1) and pulling up. Use a small plastic tool or Velcro loop to gain access to the finger release if needed.

4. Unscrew the GPU baseboard latch and T-handle screws using a T10 torx head driver

5. Release the "bail latch", which will separate the GPU baseboard from the PCIe transition board assembly. The baseboard should then be loose.

6. Hold the "T" handle with one hand while lifting the bail latch at the other end of the baseboard.

7. Lift the GPU baseboard vertically and at a slight angle to remove the GPU baseboard. Be careful not to scratch the GPU baseboard or your hands on the chassis metal edges.

For installation reverse the above steps.

Bail Latch Handle

Latch Clips

**Radsok/Surlock 54V Connector
(Shown with protective cover)**

T10 Screw

T10 Screw

"T" Handle
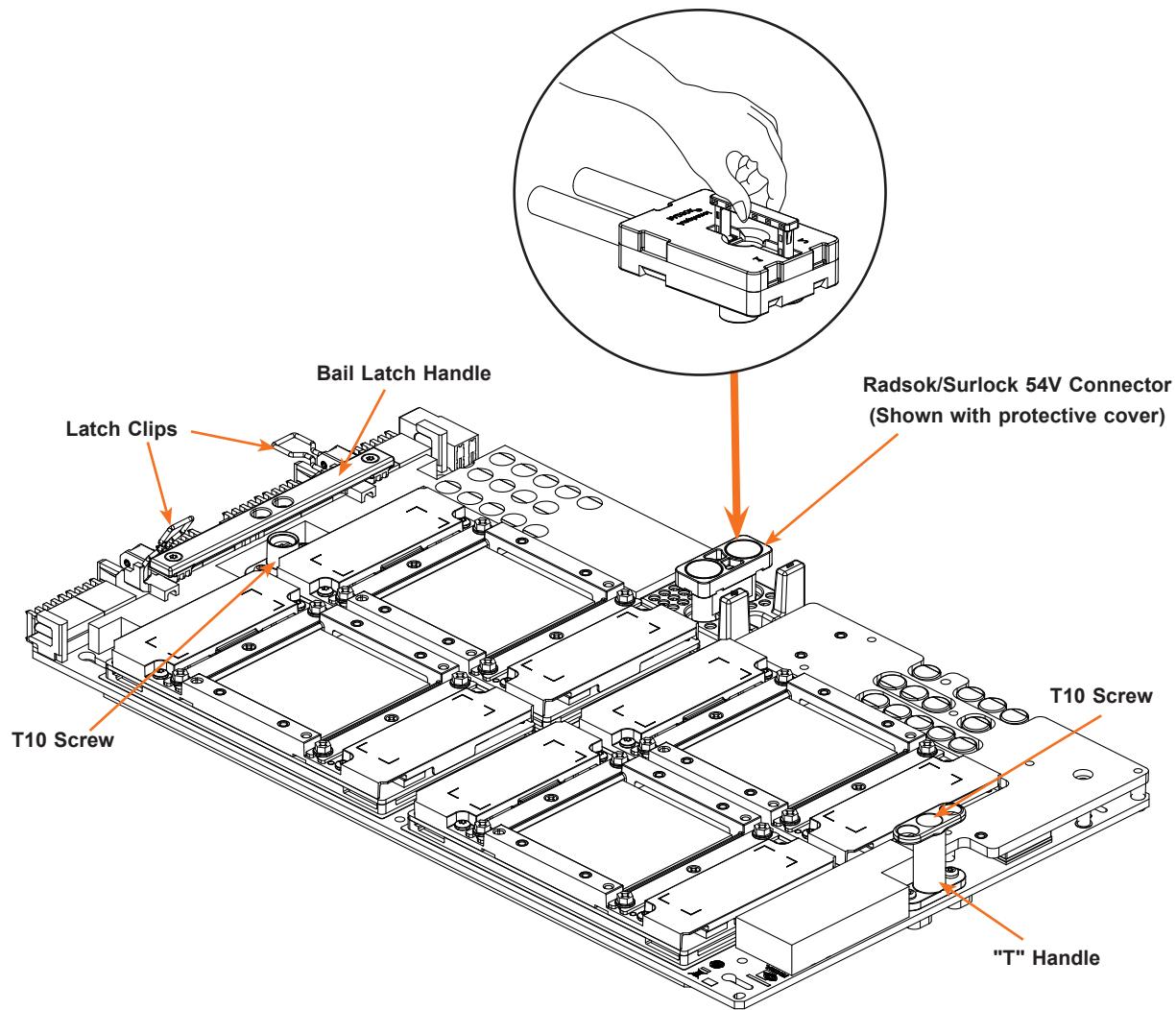
Figure 3-9. Replacing GPU Baseboard Module

Replacing Individual GPUs

Prior to submitting an RMA for GPUs, Nvidia requires that their Field Diagnostic tool is first run to isolate hardware failures and obtain a log file for review. Check with Supermicro Technical Services for more details. In addition, more details can be found in Nvidia reference document Baseboard Field Diagnostics Software Guide DU-09163-001. Use these tools to determine the failed GPU and locate using the Cable Mapping Guide Figure and GPU Mapping Table. Be sure to identify the failed GPU correctly and if any questions reach out to Supermicro Technical Service team to help.

Note: GPU heatsink and individual GPU SXM4 replacement is recommended to be done by a qualified Supermicro service technician. Always ensure that new heatsinks are used. Qualified heatsinks include thermal interface material (TIM) with specified dimension and thickness.

1. Prior to assembly, ensure the GPU devices have no thermal material or grease. Also check that the heatsinks are new and have unused thermal interface material (TIM) present.

2. Gently place the heatsink over the GPU baseboard's SXM4 socket while keeping the heatsink steady and level.

3. Line up the screws to the socket screw holes underneath.

4. Use a Philips-head screwdriver to screw down screws in this order: 1,2,3,4. Ensure a torque force between 3 to 4 lbf-in is used. The use of a torque screwdriver with torque setting feature is recommended.

5. To remove the individual GPU SXM4 module, please follow "Nvidia A100 SXM4/GPU Module: Removal and Installation Instruction" in Nvidia document #1055915.

For installation reverse the above steps.
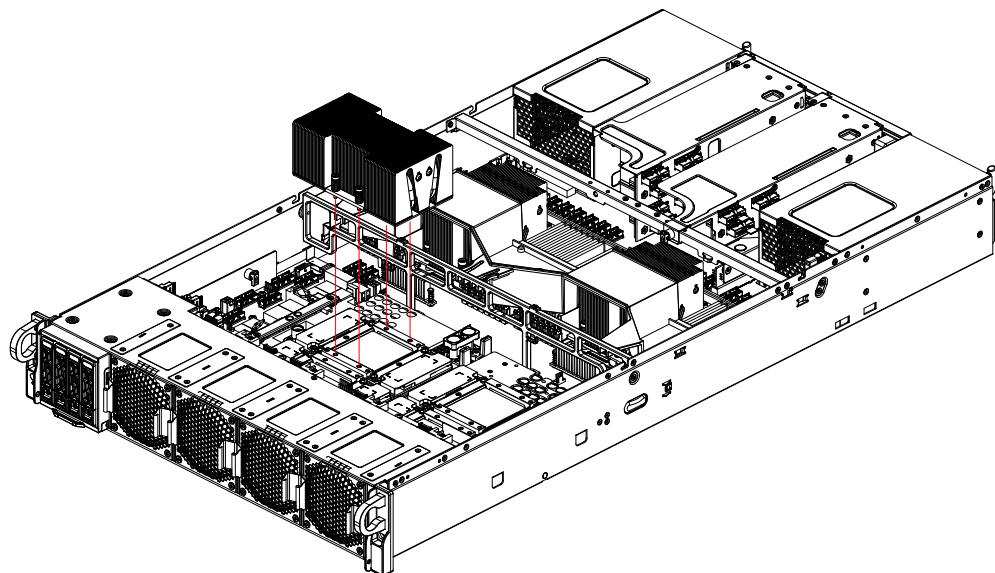
Figure 3-10. Installing GPU Heatsinks (screw locations shown)

3.11 System Cooling

System Fans

Four hot-swap fans provide cooling. They can be replaced without powering down the system. However, failed fans should be replaced quickly to maintain proper system airflow.

Fan speed is controlled by a system temperature setting in the BMC interface. If a fan fails, the remaining fans will ramp up to full speed. The system can continue to run with a failed fan. Replace any failed fan at your earliest convenience with the same type and model.
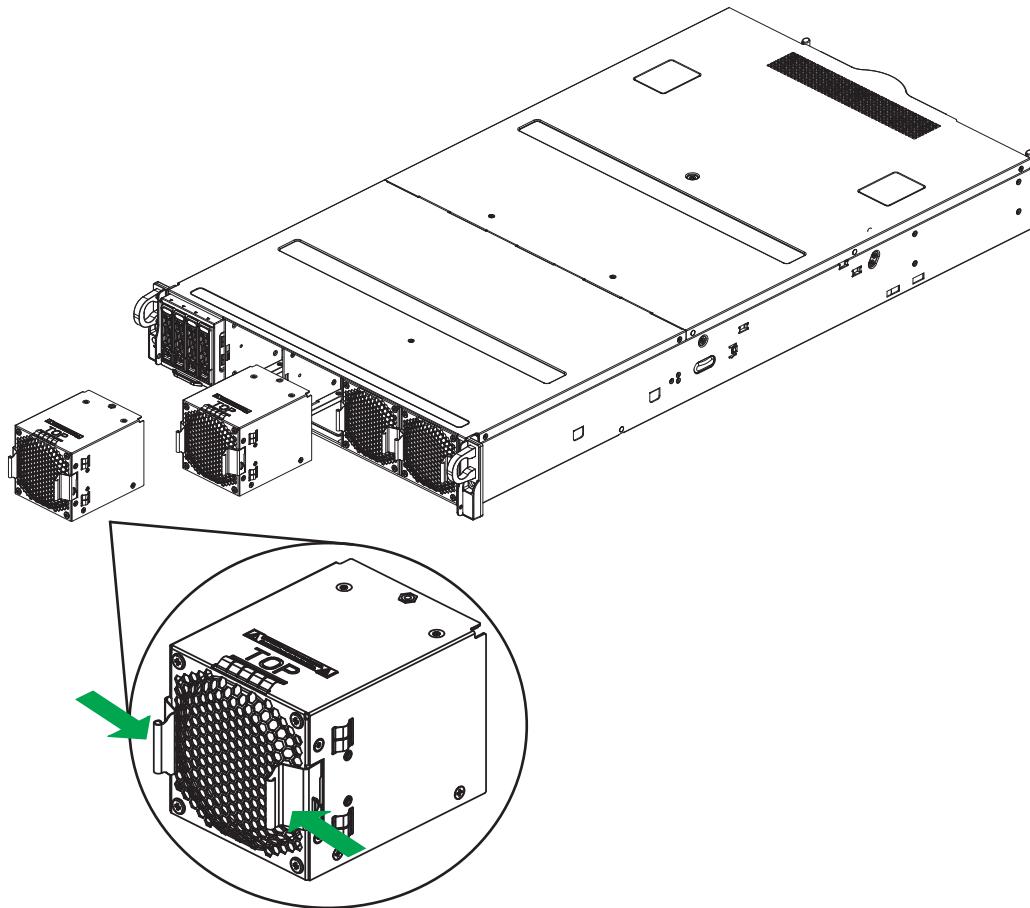
Figure 3-11. Removing System Fans

Note: For system fan operation the following hardware is required: GPU baseboard module, PCIe transition board, fan board, motherboard, PSUs, and cabling.

Changing a System Fan

1. Determine which fan is failing. If possible, use the BMC interface. If not, while the power is on, examine the fans to determine which one has failed.

2. Remove the failed fan from the chassis by squeezing together the two tabs on either side then pulling it out from the chassis.

3. Replace the fan with a new one, making sure it is within specifications.

4. Push the fan into the housing until it is secure and running.

5. Confirm that the fan is working properly.

6. Check the routing of the cables.

Air Shroud

The SYS-220GQ-TNAR+ is a complete system and does not require air shroud installation. However, in case air shrouds need to be installed, begin by removing power from the system. Remove the system from the rack, place on a stable surface, and remove the top cover. Next, follow the steps below.

Installing the Air Shrouds

1. First ensure the CPU, CPU heatsinks, and configured DIMMs are installed

2. Gently place the air shroud over the CPU heatsinks with the front snap locations lining up with metal chassis middle crossbar. Be careful that the air shroud legs at either end do not interfere with any motherboard components such as DIMMs. Guide the air shroud around cable bundles as necessary.
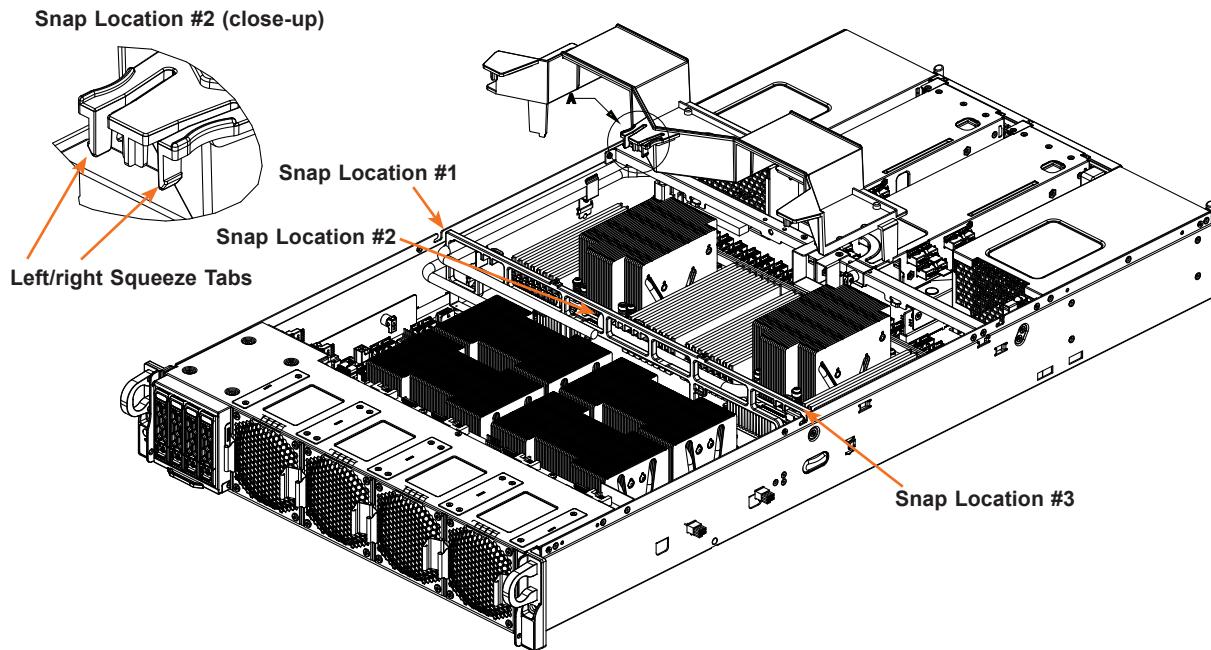
Figure 3-12. Installing the Air Shrouds

Checking the Server Air Flow

- Make sure there are no objects to obstruct airflow in and out of the server.

- If you are using a front bezel, make sure the bezel filter is replaced periodically.

- Do not operate the server without drives or drive trays in the drive bays.

- Use only recommended server parts.

- Make sure no wires or foreign objects obstruct air flow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.

The control panel LEDs display system heat status. See "Control Panel" in Chapter 1 for details.

Overheating

There are several possible responses if the system overheats.

Overheat Temperature Setting

Some backplanes allow the overheat temperature to be set at 45, 50, or 55 by changing a jumper setting. For more information, consult the backplane user manual at www.supermicro.com. (Click Support, then the Manuals link.)

Responses

If the server overheats:

1. Use the LEDs to determine the nature of the overheating condition.

2. Confirm that the chassis covers are installed properly.

3. Make sure all fans are present and operating normally.

3.12 Power Supply

The chassis features dual or fully redundant power supplies. In redundant mode, single power modules can be changed without powering down the system. New units can be ordered directly from Supermicro or authorized distributors.

These power supplies are auto-switching capable. This feature enables them to automatically sense the input voltage and operate at a 100-120v or 180-240v (For high-power or fully configured systems 180-240V service is required). 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.
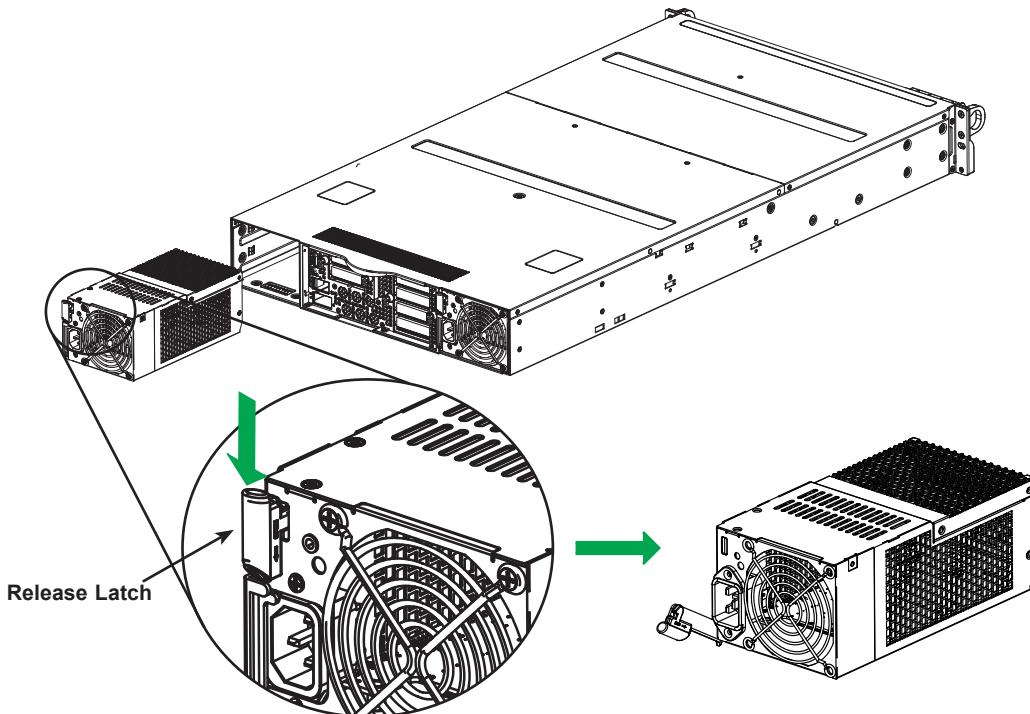
Release Latch

Figure 3-13. Removing the Power Supply

Replacing the Power Supply

1. Unplug the AC cord from the module to be replaced.

2. Push the release latch on the back of the power supply down (see above figure).

3. Pull the power supply out using the latch once released.

4. Replace the failed power module with the same model.

5. Push the new power supply module into the power bay until it clicks.

6. Plug the AC power cord back into the module.

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

Chapter 4

Motherboard Connections

This section describes the connections, jumpers and LED indicators on the motherboard and provides pinout definitions. Not all connections are required. A motherboard layout indicating component locations may be found in Chapter 1.

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

4.1 Power Connections

Power Supply Connectors

The X12DPG-QR utilizes two power supply connectors (JPWR1/JPWR2) to provide main power to the system. Two 8-pin 12V DC power connectors (JGPU_PWR1~2) are used to provide additional power to GPU devices. Another four 8-pin power connectors (RSC_PWR1~4) are for riser cards.

8-Pin GPU Power Connectors

Two 8-pin 12V power connectors are located at (JGPU_PWR1~2) on the motherboard to provide power to GPU devices. Refer to the table below for pin definitions.

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

4-Pin Backplane Power Connectors

Two 4-pin power connectors are located at JBPN_PWR1 and JBRG_PWR1. These two connectors are for backplane devices.

8-pin Backplane Power Pin Definitions	
Pin#	**Definition**
1 - 4	Ground
5 - 6	+12V
7 - 8	+5V

8-Pin Riser Card Power Connectors

Four 8-pin 12V power connectors are located at (RSC_PWR1~4) on the motherboard to provide power to rIser cards. Refer to the table below for pin definitions.

12V 8-pin Power Pin Definitions	
Pin#	Definition
1 - 4	Ground
5 - 6	+12V
7	+3.3V
8	+3.3V_STBY

4.2 Headers and Connectors

The data cables in the system have been carefully routed to maintain airflow efficiency. If you disconnect any of these cables, take care to re-route them as they were originally.

Important! Make sure cables maintain proper clearances and are not being bent or pinched on chassis metal parts.

Fan Headers

There are four cooling fans (FAN1~4) used for system cooling on the motherboard. In addition, two fans (FAN9/FAN10) are used for GPU device cooling. Fan speed control is available by Thermal Management via the BMC interface. Refer to the table below for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	3A/+12V
3	Tachometer
4	PWM_Control
5	3A/12V
6	Ground

Universal Serial Bus (USB) Ports

The motherboard also has one rear-accessible Type A USB 3.0 header JUSB1 (USB3). The onboard headers can be used to provide rear side USB access with a cable (not included).

Type A USB 3 (3.0) 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+

TPM/Port 80 Header

A Trusted Platform Module (TPM)/Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. Refer to the table below for pin definitions. 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	Key
9	+3.3V Stdby	10	SPI_IRQ#

NVMe SMBus Headers

NVMe SMBus (I^{2}C) header (JNVI2C1), used for PCIe SMBus clock and data connections, provides hot-plug support via a dedicated SMBus interface. This feature is only available for a Supermicro complete system with an SMCI-proprietary NVMe add-on card and a proper cable installed.

Chassis Intrusion Header

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

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

M.2 Slot

The X12DPG-QR motherboard has two PCIe M.2 slots (M.2-H1 / M.2-H2). M.2 was formerly known as Next Generation Form Factor (NGFF) and serves to replace mini PCIe. M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 sockets supports PCIe 3.0 x4x4 SSD cards in the 22110 form factor.

I/O Riser Slot

The I/O riser card slot supports VGA, COM (serial port), USB 3.0, a dedicated BMC_LAN, and two 10GbE LAN connections. See Section 4.5 AOM Board for details about the AOM-PIO-i2XT.

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. Please refer to the layout below for the location of JRK1.

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

VROC RAID Key Header Pin Definitions	
Pin#	Definition
1	Ground
2	P3V3_STBY
3	Ground
4	VROC RAID_KEY

VROC Key

VROC Key Header (JRK1)
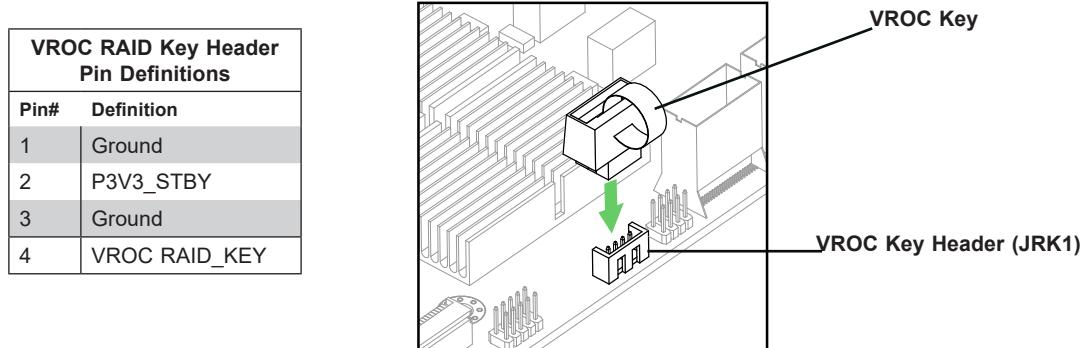
CPU VPP Bus Header for Backplane NVMe Riser Card Device

The CPU VPP Bus header for the riser card is located at JNVVPP1 on the motherboard.

Control Panel

The front control panel header (JFP1) 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. See the figure below for the descriptions of the front control panel buttons and LED indicators.

JFP1

Pin	Signal
1	Power Button
2	Reset/UID Button
3	UID LED_N
4	Fail LED_N (OH/FF/PF)
5	LAN-2 Activity LED
6	LAN-1 Activity LED (Aggregate all LAN)
7	HDD Acitivity LED
8	Standy by LED_N
9	Power/RoT LED_N
10	P3V3_STBY
11	Ground
12	I2C Data
13	I2C Clock
14	Ground
15	Power Fail LED_P
16	
17	
18	
19	Power Fail LED_N
20	Ground
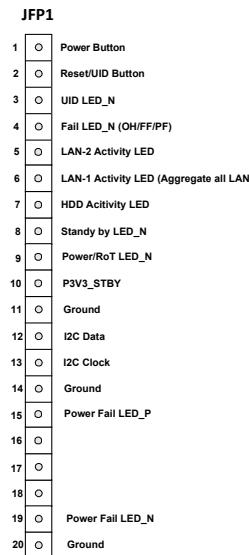
Figure 4-1. JFP1 Header Pins

Front Control Panel LEDs

Front Control Panel (JFP1) 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 and BMC/BIOS Status LED Button

The Power On and BMC/BIOS Status LED button is located on pin 1 of JFP1.

Power Button LED States	
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 green x2 (2 blinks green) @ 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/UID Button

The UID Switch connection is located on pin 2 of JFP1. The UID switch is found in the Front Panel of the chassis. Setting JRU1 to pin 1-2 will configure the UID switch in the Front Panel as a reset button.

Power Fail LED

The Power Fail LED connection is located on pin 19 of JFP1. When this LED turns solid red, it indicates a power failure.

UID LED

The unit identifier LED connection is located on pin 3 of JFP1.

Information LED (OH/FF/PF)

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

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

NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connections for LAN port 1 is located on pin 6 of JFP1, and LAN port 2 is on pin 5. Refer to the tables below for more information.

LAN1/LAN2 LED LED States	
Color	**State**
NIC 2: Blinking green	LAN 2: Active
NIC 1: Blinking green	LAN 1: Active

FP Power LED

The Front Panel Power LED connection is located on pin 9 of JFP1.

HDD Activity LED

The HDD activity LED connection is located on pin 7 of JFP1. When this LED is blinking green, it indicates HDD is active. Refer to the tables below for more information.

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

4.3 Jumpers

Explanation of Jumpers

To modify the operation of the motherboard, jumpers are used to choose between optional settings. Jumpers create shorts between two pins to change the function associated with it. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout page for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" indicates the jumper is either on only one pin or has been completely removed.
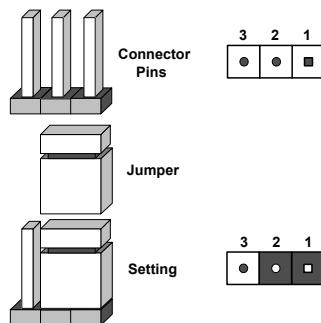
CMOS Clear

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.

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. Re-install the motherboard battery.

7. Replace the cover, reconnect the power cord(s) and power on the system.

Notes: Clearing CMOS will also clear all passwords.

Do not use the PW_ON connector to clear CMOS.

JBT1 contact pads

Reset Button/UID Button

The UID button in conjunction with the jumper JRU1 is used for a chassis that supports a front UID button. Setting JRU1 to pin 1-2 will configure this button as a reset button to reset BMC settings.

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. The Watchdog timer must also be enabled in the BIOS.

4.4 Motherboard LED Indicators

BMC Heartbeat LED

A BMC Heartbeat LED is located at LED3 on the motherboard. When LED3 is blinking, the BMC is functioning normally. Please refer to the table below for more information.

BMC Heartbeat LED Indicator	
LED Color	**Definition**
Green: Blinking	BMC Normal

Onboard Power LED

The Onboard Power LED is located at LE1 on the motherboard. When this LED is on, the system power is on. Be sure to turn off the system power and unplug the power cord before removing or installing components. Refer to the table below for more information.

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

4.5 AOM Board

The low-profile slimSAS I/O connector, located at JSLOT1, is used to connect the motherboard to an I/O board, AOM-PIO-i2XT, to provide LAN/USB ports and VGA/COM headers.

I/O Ports and Headers
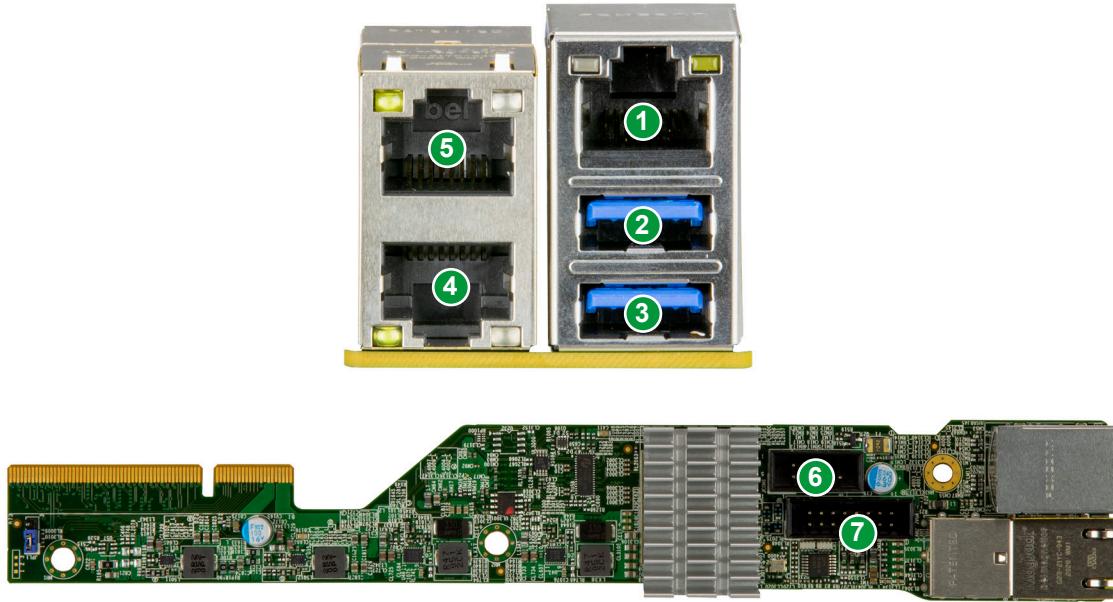
Figure 4-2. AOM-PIO-i2XT

I/O Ports and Headers	
#	**Description**
1	BMC_LAN Port
2	USB 0 (3.0)
3	USB 1 (3.0)
4	10GbE LAN 1
5	10GbE LAN 2
6	VGA Header
7	COM Header

VGA Header

A VGA header is located on the AOM-PIO-i2XT board. This VGA header can be used for a rear VGA connection.

COM Header

A COM header is located on the AOM-PIO-i2XT board. This COM header can be used for a serial output connection.

LEDs

Network LAN LEDs

The Ethernet ports each have two LEDs. One LED indicates activity when flashing green. The other may be green, amber or off to indicate the speed of the connection.

LAN LED (Speed Indicator)	
Color	**Definition**
Green	10Gbps
Amber	1Gbps
Off	100Mbps or less

Dedicated BMC LAN LEDs

The amber LED on the right of the BMC LAN port indicates activity, while the LED color on the left indicates the speed of the connection.

BMC Link LED	
Color	**Definition**
Off	No Connection
Green	100 Mb/s
Amber	1 Gb/s

Link LED (speed) —— Activity LED
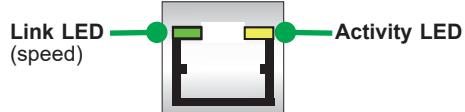
Chapter 5

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.

Installing the OS

1. Create a method to access the MS Windows installation ISO file. That might be a DVD, perhaps using an external USB/SATA DVD drive, or a USB flash drive, or the BMC 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.
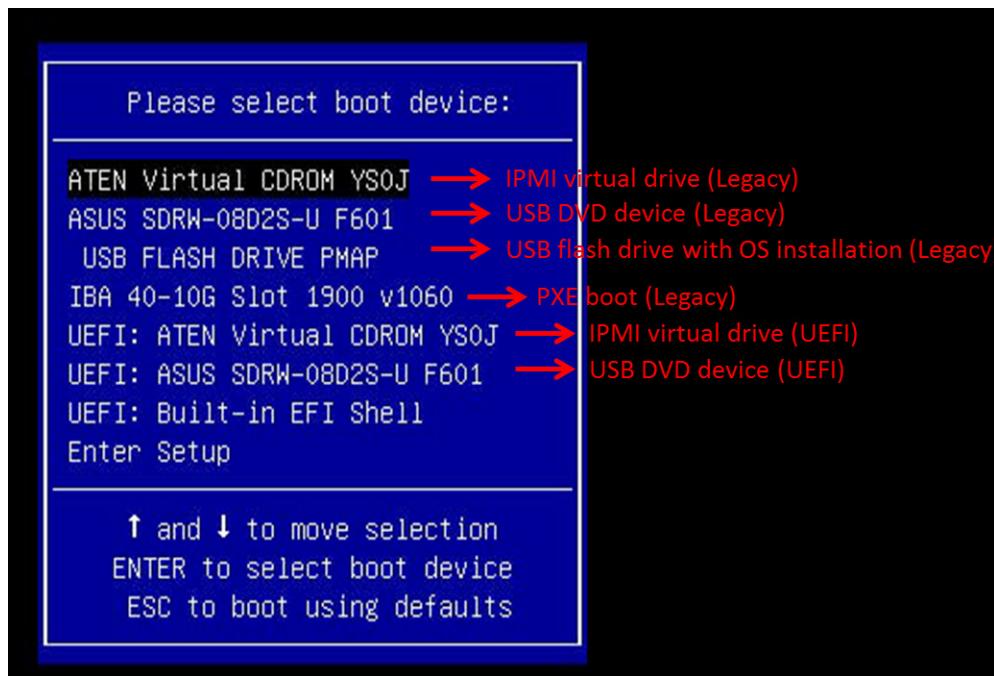
Figure 5-1. Select Boot Device

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.
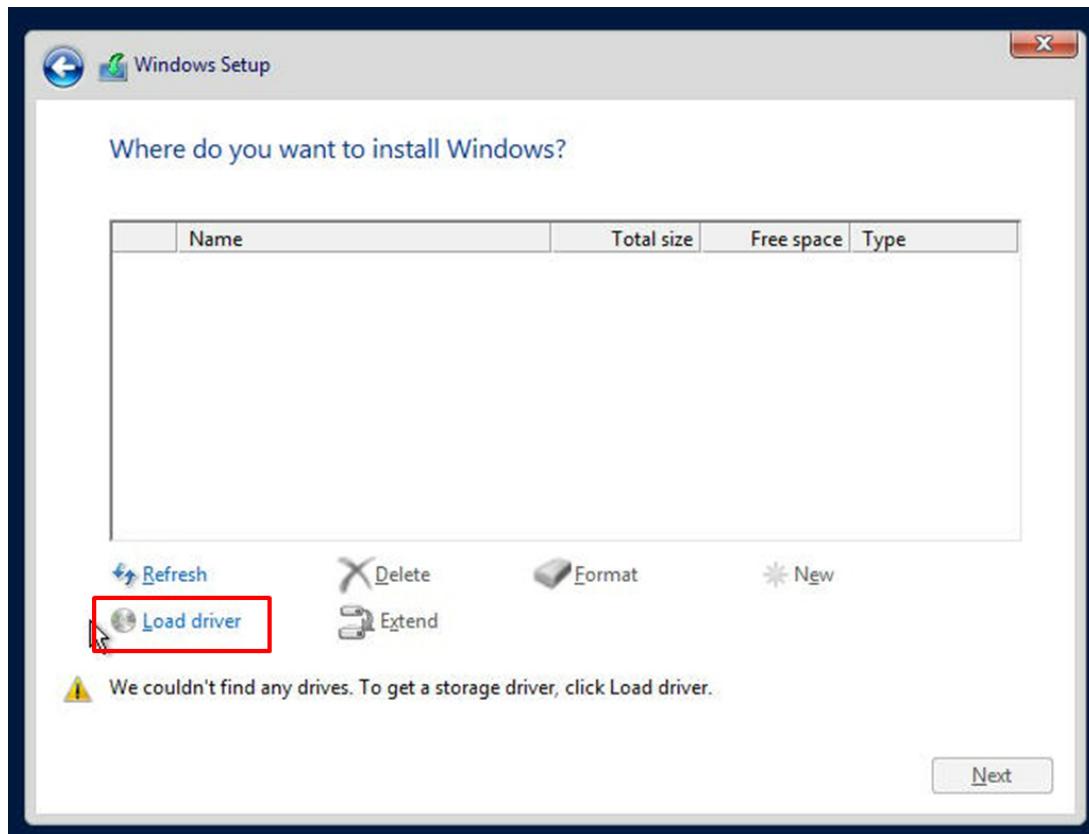
Figure 5-2. Load Driver Link

To load the driver, browse the USB flash 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 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. 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.
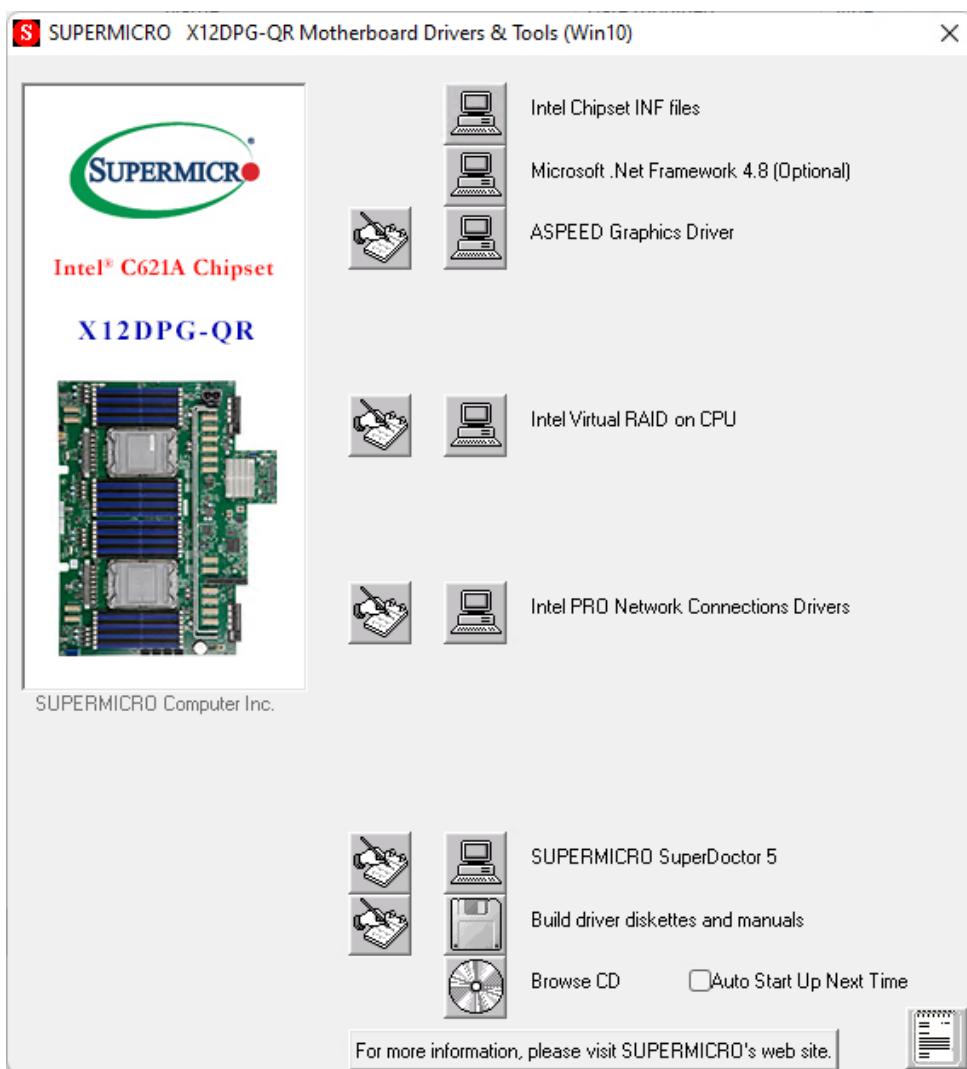
Figure 5-3. Driver & Tool Installation Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot 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 contents.

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), you can remotely control power on/off and reset chassis intrusion for multiple systems with SuperDoctor 5 or BMC. SuperDoctor 5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

SuperDoctor® Manual and Resources
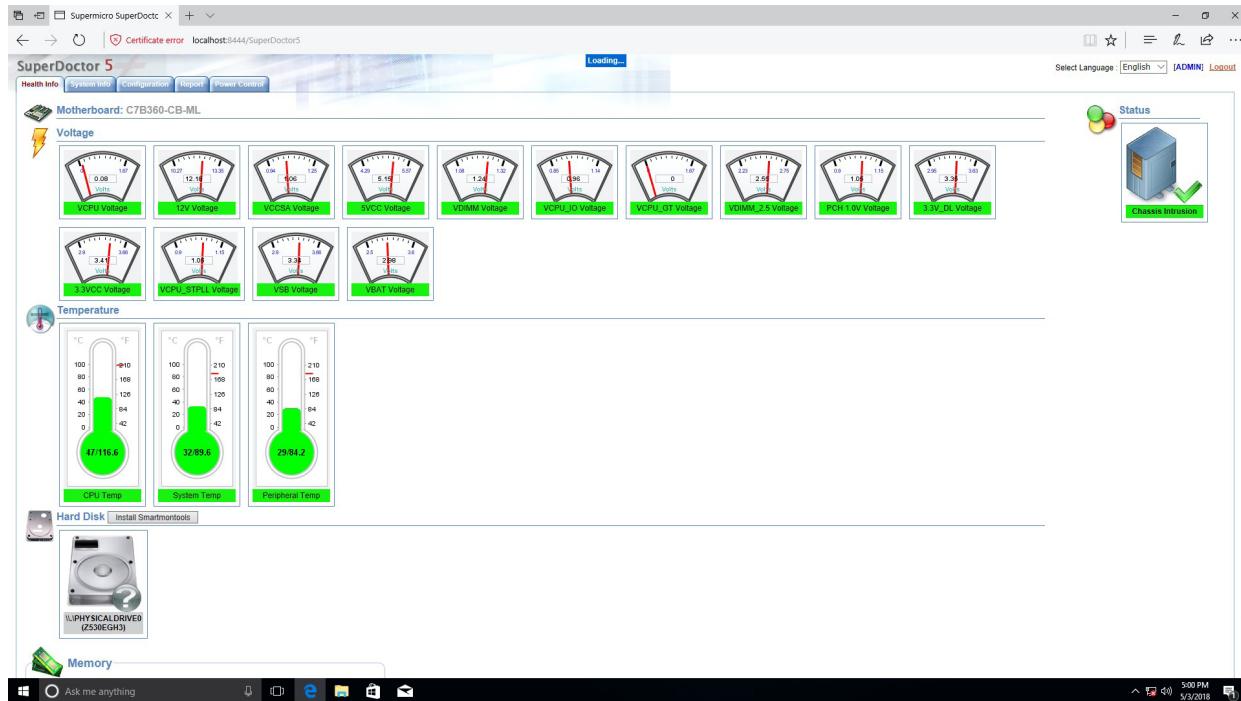
Figure 5-4. SuperDoctor 5 Interface Display Screen (Health Information)

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

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.

Figure 5-5. BMC Password Label

See the System Features in Chapter 1 for the location of the label.

Chapter 6

Optional Components

Please refer to the product page for the latest information about optional system components.

Chapter 7

Troubleshooting and Support

7.1 Information Resources

Website

A great deal of information is available on the Supermicro website, supermicro.com.
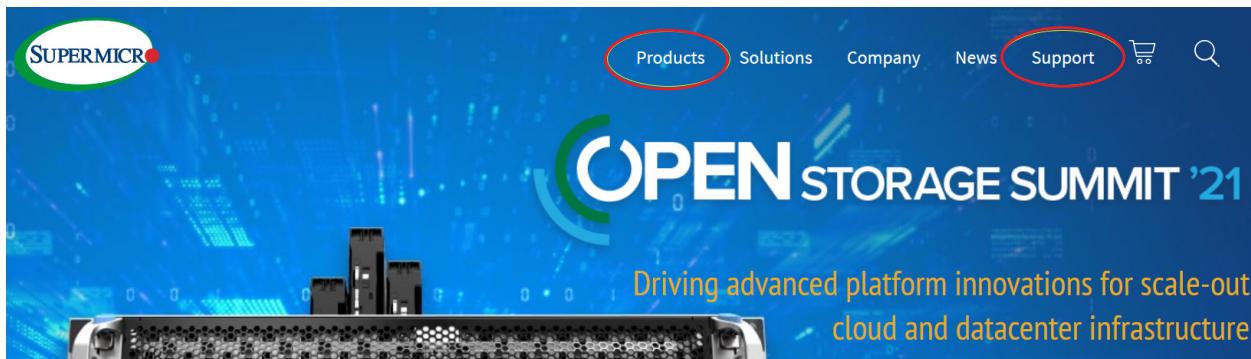
Figure 7-1. Supermicro Website

- Specifications for servers and other hardware are available by clicking the the **Products** option.

- The **Support** option offers downloads (manuals, BIOS/BMC, drivers, etc.), FAQs, RMA, warranty, and other service extensions.

Direct Links for the SYS-220GQ-TNAR+ System

SYS-220GQ-TNAR+ specifications page

X12DPG-QR 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

BMC User Guide

Direct Links (continued)

SuperDoctor5 Large Deployment Guide

For validated memory, use 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 Baseboard Management Controller (BMC)

The system supports the Baseboard Management Controller (BMC). BMC is used to provide remote access, monitoring and management. There are several BIOS settings that are related to BMC.

For general documentation and information on BMC, please visit our website at: https://www.supermicro.com/manuals/other/BMC_Users_Guide_X12_H12.pdf.
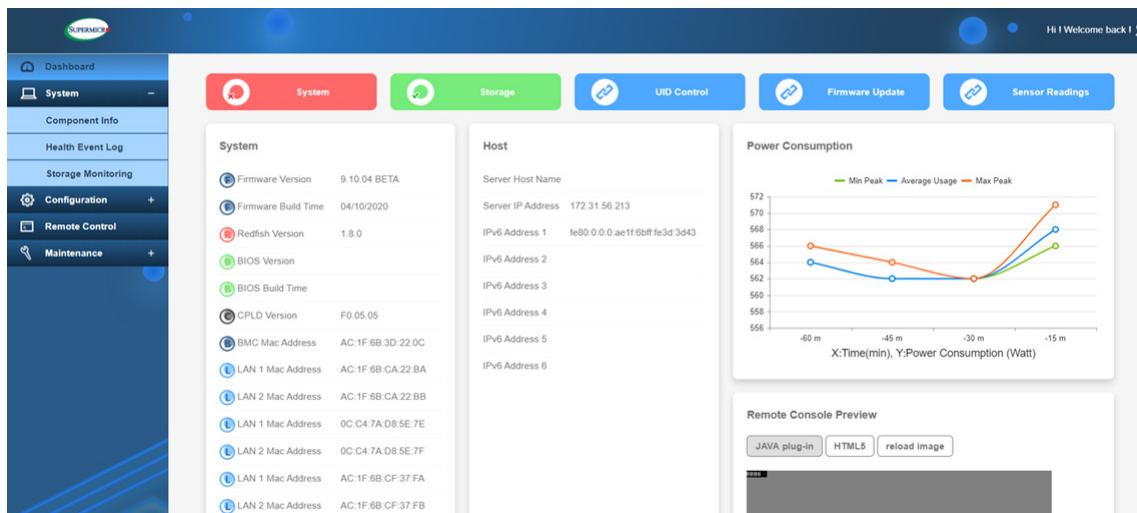
Figure 7-2. BMC Dashboard

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 sections in this chapter. Power down the system before changing any non hot-swap hardware components.

General Technique

If you experience unstable operation or get no boot response, try:

1. With power off, remove all but one DIMM and other added components, such as add-on cards, from the motherboard. Make sure the motherboard is not shorted to the chassis.

2. Set all jumpers to their default positions.

3. Power up. If the system boots, check for memory errors and add-on card problems.

No Power

• Check that the power LED on the motherboard is on.
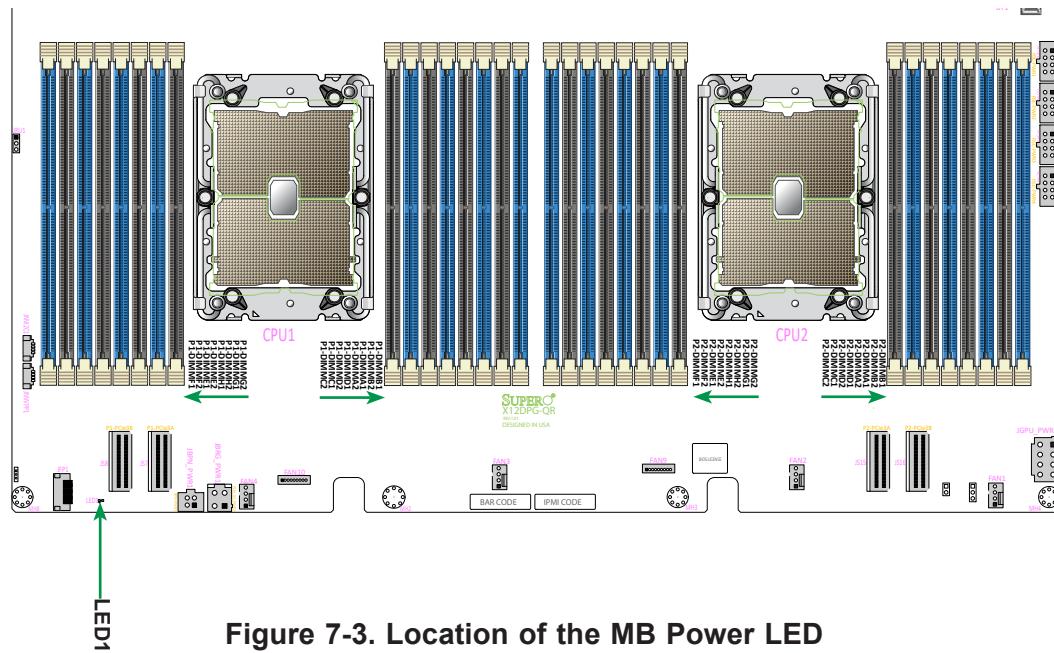
Figure 7-3. Location of the MB Power LED

• Make sure that the power connector is connected to the power supply.

• Check that the motherboard battery still supplies ~3VDC. If it does not, replace it.

• Check that the system input voltage is 100-120v or 180-240v.

• Turn the power switch on and off to test the system

No Video

If the power is on but you have no video, remove all add-on cards and cables.

System Boot Failure

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

- Make sure that the DIMM modules are properly and fully installed.

- 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.

- Check for bad DIMM modules or slots by swapping modules between slots and noting the results.

Losing the System Setup Configuration

- Use a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information.

- Check that the motherboard battery still supplies ~3VDC. If it does not, replace it.

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:

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

- Memory: Make sure that the memory modules are supported. Refer to the product page on our website at www.supermicro.com. Test the modules using **memtest86** or a similar utility.

- Storage drives: Make sure that all drives work properly. Replace if necessary.

- System cooling: Check that all heatsink fans and system fans work properly. Check the hardware monitoring settings in the BMC to make sure that the CPU and system temperatures are within the normal range. Also check the Control panel Overheat LED.

- Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Refer to the Supermicro website for the minimum power requirements.

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

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

- Source of installation: Make sure that the devices used for installation are working properly, including boot devices.

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

- Use 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.

- Identify a bad component by isolating it. Check and change one component at a time.

  - Remove a component in question from the chassis, and test it in isolation. Replace it if necessary.

  - Or swap in a new component for the suspect one.

  - Or install the possibly defective component into a known good system. If the new system works, the component is likely not the cause or the problem.

7.4 Crash Dump Using BMC

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 BMC. The BMC manual is available at https://www.supermicro.com/en/solutions/management-software/bmc-resources.

Check BMC Error Log

1. Access the BMC web interface.

Figure 7-4. BMC Event Log

2. Click the **Server Health** tab, then **Event Log** to verify an IERR error.

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

7.5 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) 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 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.

```
                    Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
       Main  Advanced  Event Logs  IPMI  Recovery  Security  Boot  Save & Exit

       Please select blocks you want to update          Set this option to reset
       Reset NVRAM                        [Enabled]      NVRAM to default values
       Boot Block Update                  [Enabled]

     ▶ Proceed with flash update




                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

                     Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.
```

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 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.

```
                    Aptio Setup Utility - Copyright (C) 2017 American Megatrends, Inc.
                                          Recovery

       WARNING! System firmware is being updated.
       Keyboard is locked.
       DO NOT TURN THE POWER OFF !!!
       Once firmware update is completed
       press any key to reboot the system



                         ─────────── Program new data ───────────
                                   Write new boot block...

                                   ────17%────


                                                         →←: Select Screen
                                                         ↑↓: Select Item
                                                         Enter: Select
                                                         +/-: Change Opt.
                                                         F1: General Help
                                                         F2: Previous Values
                                                         F3: Optimized Defaults
                                                         F4: Save & Exit
                                                         ESC: Exit

                     Version 2.19.1266. Copyright (C) 2017 American Megatrends, Inc.
```

7. Press <Del> continuously during system boot to enter the BIOS Setup utility. From the top of the tool bar, 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.
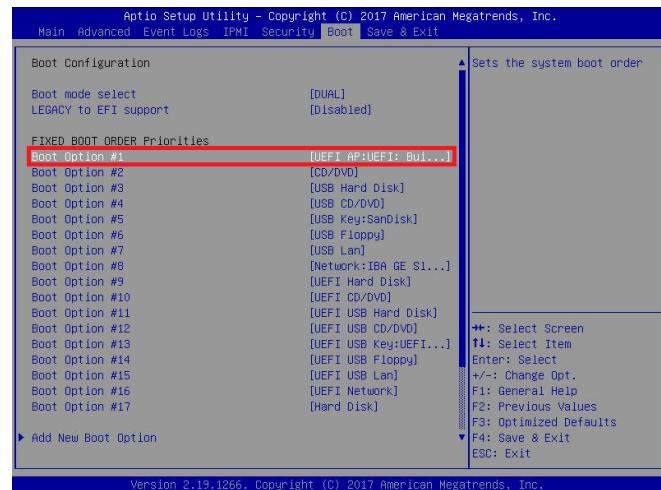
Note: *Do not interrupt this process* until the BIOS flashing is complete.
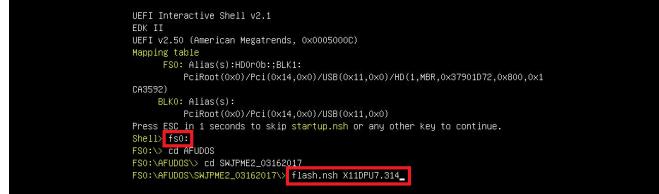
9. The screen above indicates that the BIOS update process is complete. When you see the screen above, unplug the AC power cable from the power supply, clear CMOS, and plug
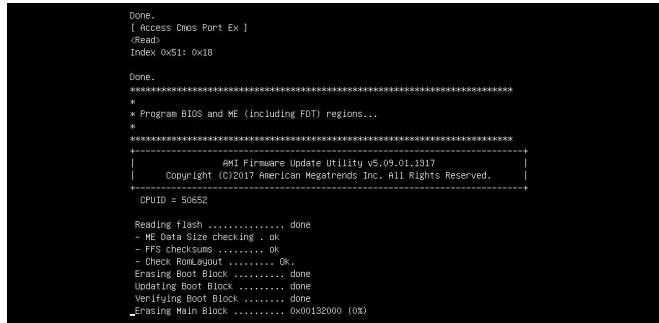
the AC power cable in the power supply again to power on the system.

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

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.

7.6 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 chassis cover 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. Re-install the battery.

7. Replace the cover, reconnect the power cords and power on the system.

Notes: Clearing CMOS will also clear all passwords.

Do not use the PW_ON connector to clear CMOS.

JBT1 contact pads

7.7 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.

7.8 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/).

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.

7.9 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 to provide feedback on our manuals.

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.

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。

此警告符号代表危险。

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 הצהרות אזהרה

הצהרות 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.

<div dir="rtl">

ا كَ ف حالة وُيٖ أى تتسبب ف اصابة جسذ ةٌ هذا الزهز عٌ خطز !تحذ زٌ .

قبل أى تعول على أي هعذات،كٖ على علن بالوخاطز ال اُجوة عٖ الذوائز الكهزبائٕ ةٍ

وكٖ على درا ةٌ بالووارسات النقائٕ ةٍ لو عٌ وقع أي حادث

استخذم رقن الب اٍى الو صُص ف هًا ةٌ كل تحذ زٌ للعشر تزجوتها

</div>

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.

اقر 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 معداث الحمايت مه الدوائرالقصيرة 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 electrische installatie. Controleer of het beveiligde aparaat 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.

CAUTION: This unit has redundant power sources. Please disconnect all the power cords before servicing.

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、シャーシー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 systéme.

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 فصم اننظاو من جميع مصادر انطاقت وإزانت سهك انكهرباء من وحدة امداد
انطاقت قبم
انصل إنى امناطق انداخهيت نههيكم نتثبيج أو إزانت مكناث الجهاز

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 섀시 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 الجهاس يجب أن يسمح فقط للمنظفيه 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 installée 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 اانحذة نترك بُها ف مناطق محظورة تم .
مَكن انصبل إن منطقت محظورة فقط من خلال استخذاو أداة خاصت،
أو أ وس هُت أخري نلاألمما 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

电池更换不当会有爆炸危险。请只使用同类电池或制造商推荐的功能相当的电池更换原有电池。请按制造商的说明处理废旧电池。

警告

電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有電池。請按照製造商的說明指示處理廢棄舊電池。

Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

Attention

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

¡Advertencia!

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

אזהרה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף

את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

<div dir="rtl">

هناك خطر من انفجار في حالة اسحبذال البطارية بطريقة غير صحيحة فعليل

اسحبذال البطارية

فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة

جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

</div>

경고!

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

Waarschuwing

Er is ontploffingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

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 trom 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!
ליחדה 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 خطز مه التيار الكهزبائي أوالطاقة المجددة على اللحة
عندما يكن النظام يعمل كه حذرا عند خدمة هذا الجهاس

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 للقاويه المحلية والطية والمتعلقة

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 القانين واللائح البطنية 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

危險的可移動性零件。請務必與轉動的風扇葉片保持距離。 當您從機架移除風扇裝置，風扇可能仍在轉動。小心不要將手指、螺絲起子和其他物品太靠近風扇。

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 ell montaje del ventilador del chasis. Mandtenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

Attention

Pieces mobiles dangereuses. Se tenir a l'ecart 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 בפעולהכאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

تحذير! أجزاء متحركة خطرة. ابتعد عن شفرات المروحة المتحركة.من الممكن أن المراوح لا تزال تدورعند 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. 섀시로부터 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 Adapater, 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 appropries. 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 certifies- 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.

כבלים חשמליים ומתאמי AC

אזהרה!

כאשר מתקינים את המוצר, שי להשתמש בכבלים, ספקים ומתאמים אשר נרכשו או שהותאם לצורך
ההתקנה, ואשר הותאמו לדרישות הבטיחות המקומיות, לכל מידה של הכבל הנכון של בכה והתקע . שימוש לכב
ובלכ או מתאם מוסג אחר, עלול לגרול להקלת וכר למש .בהתאם לחוקי השימושה במכשירי חשמה
וחוקי הבטיחות, קייק אוסיא רוסי בכבלים המוסמכים ב- UL וא CSA (כאשר מופיע עליהם דוק לש
(UL/CSA) רובע לכ מוצר חשמלי שלמי אחר, אלא קר במוצר אשר הותאם ע"י Supermicro בלבד.

عند تركيب المنتج، قم باستخدام التوصيلات الموفرة أو المحددة قم أو بشراء الكابلات
الكهربائية ومحولات التيار المتردد مع الالتزام بقوانين متطابقتان السلامة المحلية بما في ذلك
حجم الموصل والقابس السليم. استخدام أي كابلات ومحولات أخرى قد يتسبب في عطل أو حريق.
يحظر قانون السلامة للأجهزة الكهربائية استخدام الكابلات المعتمدة من قبل UL وأ CSA
والتي تحمل علامة (UL/CSA) مع أي معدات أخرى غير المنتجات المعينة والمحددة من قبل Supermicro.

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 Supermicro 가 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

Processors

Dual 3rd Gen Intel Xeon Scalable Processors (Socket P+) with up to 40 cores per CPU and Thermal Design Power (TDP) of up to 270W

Chipset

Intel PCH C621A

BIOS

256Mb AMI BIOS® SPI Flash BIOS

ACPI 6.0, Plug and Play (PnP), BIOS rescue hot-key, riser card auto detection support, and SMBIOS 3.0 or later

Memory

32 DIMM slots support only DDR4 or mixed DDR4 and PMem

Only DDR4:

Up to 8TB 3DS LRDIMM/LRDIMM/3DS RDIMM/RDIMM DDR4 (288-pin) ECC memory with speeds of 3200/2933/2666 MHz

Mixed DDR4 and PMem:

Up to 4TB DDR4 and up to 8TB Intel Optane PMem 200 Series with speeds of up to 3200 MHz

Notes: PMem 200 Series are supported on 3rd Gen Intel Xeon Scalable Platinum, Gold and selected Silver processors. Memory speed support depends on the processors used in the system.

GPU Support

Four Nvidia Tesla A100 40GB SXM4 GPUs with NVlink GPU interconnect and PCIe Gen4 to host CPUs (up to 400W TDP)

Storage Drives

Four hot-swap 2.5" bays (SATA/NVMe Hybrid or SAS with optional HBA, SSDs only)

PCI Expansion Slots

Four low-profile x16 PCIe 4.0 slots

Two onboard M.2 slots in the 22110 form factor

Input/Output

Via the I/O board AOM-PIO-i2XT:

    Two 10G Ethernet LAN ports

    One dedicated BMC LAN port

    Two USB ports

    One VGA port

Motherboard

X12DPG-QR

Chassis

CSE-228GTS-R3K02P; 2U rackmount, 17.2 (W) x 3.5 (H) x 32.4 (D) in. (437 x 89 x 823 mm)

System Cooling

Four hot-swap 80-mm, counter-rotating PWM fans; one air shroud, two CPU heatsinks, four GPU heatsinks

Power Supply

SYS-220GQ-TNAR+: PWS-3K02G-2R; 80Plus Titanium level

Total Output Power:

    2880W at 180-207Vac

    3000W at 207.1-240Vac

    3000W at 240Vdc

Input:

    200-207 Vac / 16 - 15.7A / 50-60 Hz

    207.1-240 Vac / 16 - 14.5A / 50-60 Hz

Operating Environment

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

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

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

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

Certified Safety Models

Compliant with UL or CSA: 228G-30, 228G-GPU, 228G-R30X12

Regulatory Compliance

FCC, ICES, CE, VCCI, RCM, UKCA, NRTL, CB

Applied Directives, Standards

EMC/EMI: 2014/30/EU (EMC Directive)

Electromagnetic Compatibility Regulations 2016

FCC Part 15 Subpart B

ICES-003

VCCI-CISPR 32

AS/NZS CISPR 32

BS/EN 55024

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

Green Environment:

2011/65/EU (RoHS Directive)

EC 1907/2006 (REACH)

2012/19/EU (WEEE Directive)

California Proposition 65

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

UL/CSA 62368-1 (USA and Canada)

Electromagnetic Equipment (Safety) Regulations 2016

IEC/BS/EN 62368-1

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"