

X13SEED-F/-SF

USER'S MANUAL

Revision 1.0b

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Manual Revision 1.0b

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Preface

About This Manual

This manual is written for system integrators, IT technicians and knowledgeable end users. It provides information for the installation and use of the X13SEED-F/-SF motherboard.

About This Motherboard

The Supermicro X13SEED-F/-SF motherboard supports the 4th and 5th Generation Intel® Xeon® Scalable Processor series in an LGA4677 socket with a thermal design power (TDP) of up to 350 W. Built with the Intel C741 chipset, the motherboard supports up to 2 TB DDR5 ECC RDIMM/3DSRDIMM memory with speeds of up to 5600 MT/s. It features superior I/O expandability, including two PCIe 5.0 x16 right riser slots with FH/HL PCIe card support, one PCIe 5.0 x16 left riser slot with LP PCIe card support, and two PCIe 5.0 x4 M.2 M-Key slots in the 2280/22110 form factors. It also offers the most advanced data protection capability with a Trusted Platform Module (TPM) 2.0 chip onboard. This motherboard is optimized for the high-performance, high-end computing SuperEdge product line and addresses Telco, Cloud, and IoT embedded needs with a short depth, high density Edge server solution.

The X13SEED-F supports a 1GbE RJ45 LAN port, and the X13SEED-SF supports a 1G SFP port.

Note that this motherboard is intended to be installed and serviced by professional technicians only. For processor/memory updates, refer to our website at http://www.supermicro.com/products/.

Conventions Used in the Manual

Special attention should be given to the following symbols for proper installation and to prevent damage done to the components or injury to yourself:



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



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



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



Note: Additional Information given to differentiate various models or provides information for correct system setup.

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Table of Contents

Chapter 1 Introduction

1.1 Checklist 8
X13SEED-F Quick Reference 13
X13SEED-SF Quick Reference 14
Quick Reference Table 15
Motherboard Features 16
1.2 Processor and Chipset Overview 19
1.3 Special Features 19
Recovery from AC Power Loss 19
1.4 System Health Monitoring 20
Onboard Voltage Monitors 20
Fan Status Monitor with Firmware Control 20
Environmental Temperature Control 20
System Resource Alert 20
1.5 ACPI Features 21
1.6 Power Supply 21

Chapter 2 Installation

2.1 Static-Sensitive Devices 22
Precautions 22
Unpacking 22
2.2 Processor and Heatsink Installation 23
The 4th and 5th Generation Intel Xeon Scalable Processor 23
Overview of the Processor Carrier Assembly 24
Overview of the CPU Socket 24
Overview of the Processor Heatsink Module 25
Creating the Processor Carrier Assembly 26
Assembling the Processor Heatsink Module 27
Preparing the CPU Socket for Installation 28
Installing the Processor Heatsink Module 29
Removing the Processor Heatsink Module 30

2.3 Motherboard Installation 31
Tools Needed 31
Location of Mounting Holes 31
Installing the Motherboard 32
2.4 Memory Support and Installation 33
Memory Support 33
General Guidelines for Optimizing Memory Performance 35
DIMM Installation 36
DIMM Removal 36
2.5 Rear Panel I/O Ports 37
2.6 Connectors & Headers 40
Power Connections 40
Headers 41
2.7 Jumper Settings 46
How Jumpers Work 46
2.8 LED Indicators 50

Chapter 3 Troubleshooting

3.1 Troubleshooting Procedures 54
Before Power On 54
No Power 54
No Video 55
System Boot Failure 55
Memory Errors 56
Losing the System's Setup Configuration 56
When the System Becomes Unstable 56
3.2 Technical Support Procedures 58
3.3 Frequently Asked Questions 59
3.4 Battery Removal and Installation 60
Battery Removal 60
Proper Battery Disposal 60
Battery Installation 60
3.5 Returning Merchandise for Service 61

Chapter 4 UEFI BIOS

4.1 Introduction 62

4.2 Main Setup 63

4.3 Advanced 65

4.4 Event Logs 110

4.5 BMC 112

4.6 Security 116

4.7 Boot 123

4.8 Save & Exit 126

Appendix A BIOS Codes

A.1 BIOS POST Codes 128

Appendix B Software

B.1 Microsoft Windows OS Installation 112

B.2 Driver Installation 114

B.3 SuperDoctor® 5 115

Appendix C Standardized Warning Statements

Chapter 1

Introduction

Congratulations on purchasing your computer motherboard from an industry leader. Supermicro boards are designed to provide you with the highest standards in quality and performance.

1.1 Checklist

Main Parts List		
Description	**Part Number**	**Quantity**
Supermicro Motherboard	X13SEED-F/-SF	1
Quick Reference Guide	MNL-2504-QRG	1

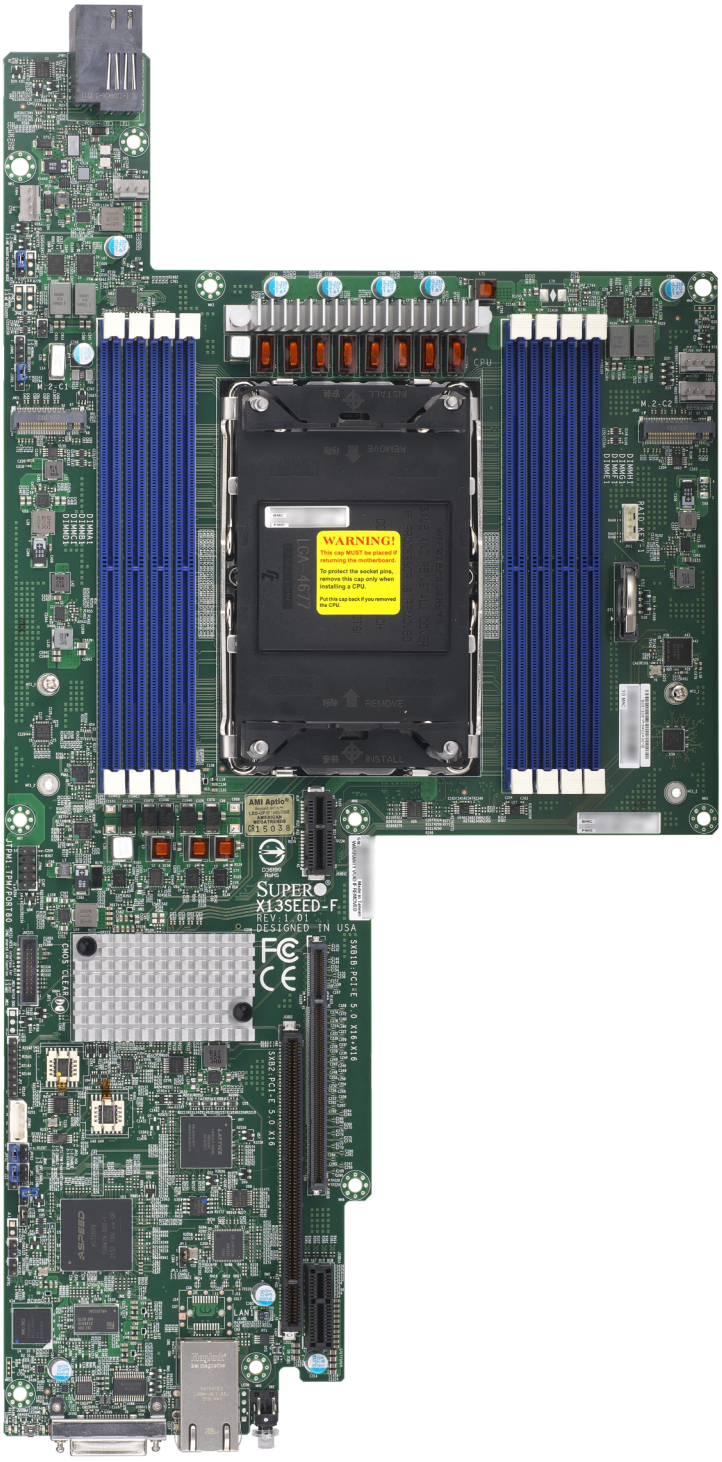
Important Links

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

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

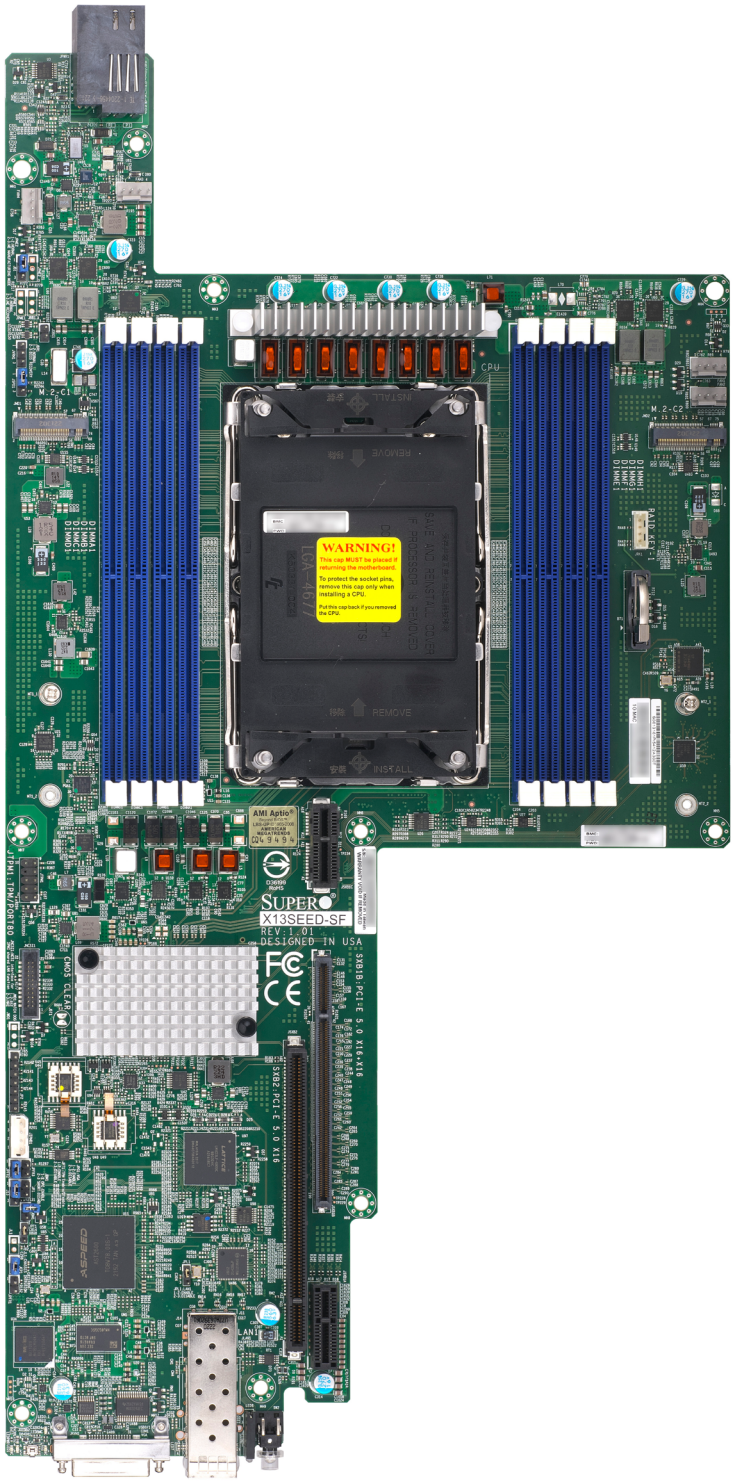
This manual may be periodically updated without notice. Check the Supermicro website for possible updates to the manual revision level.

Figure 1-1. X13SEED-F Motherboard Image



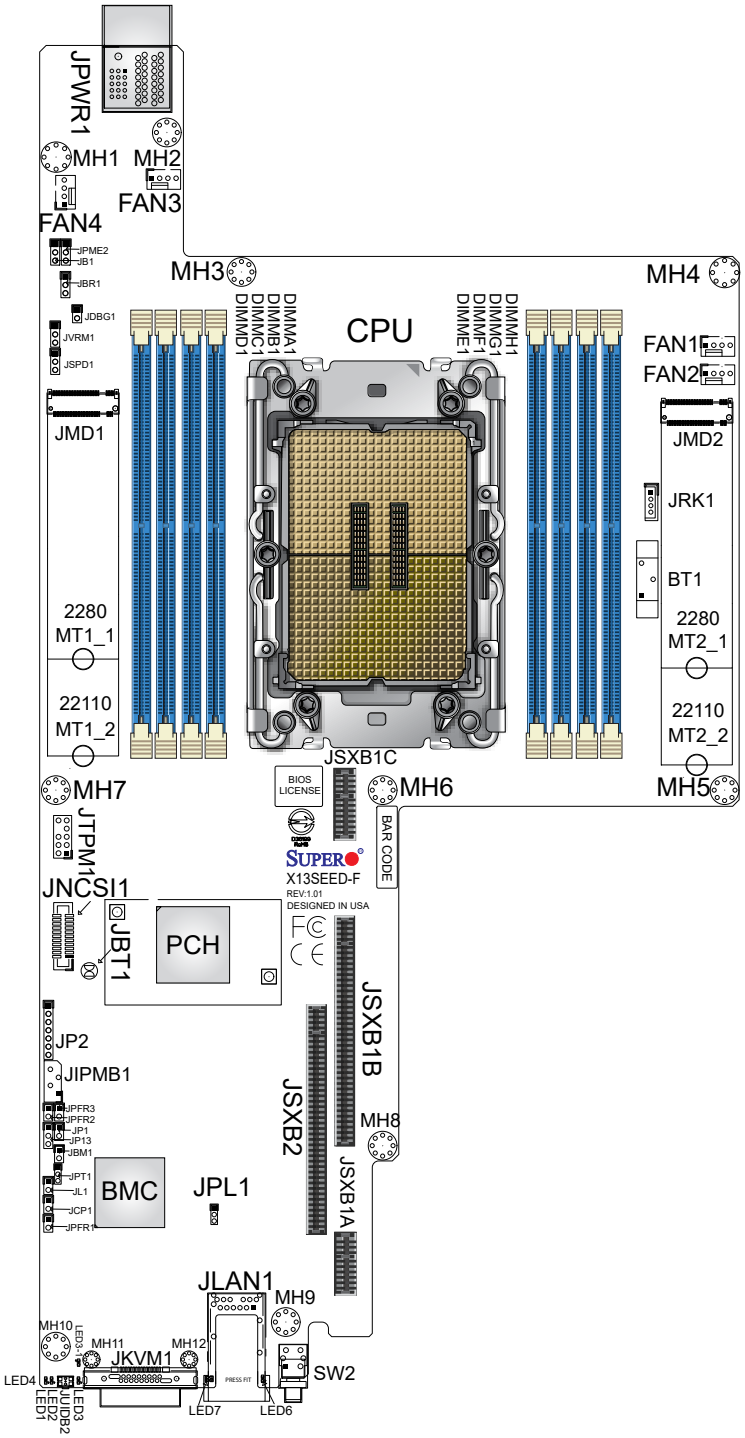
Note: All graphics shown in this manual were based upon the latest PCB revision available at the time of publication of the manual. The motherboard you received may or may not look exactly the same as the graphics shown in this manual.

Figure 1-2. X13SEED-SF Motherboard Image



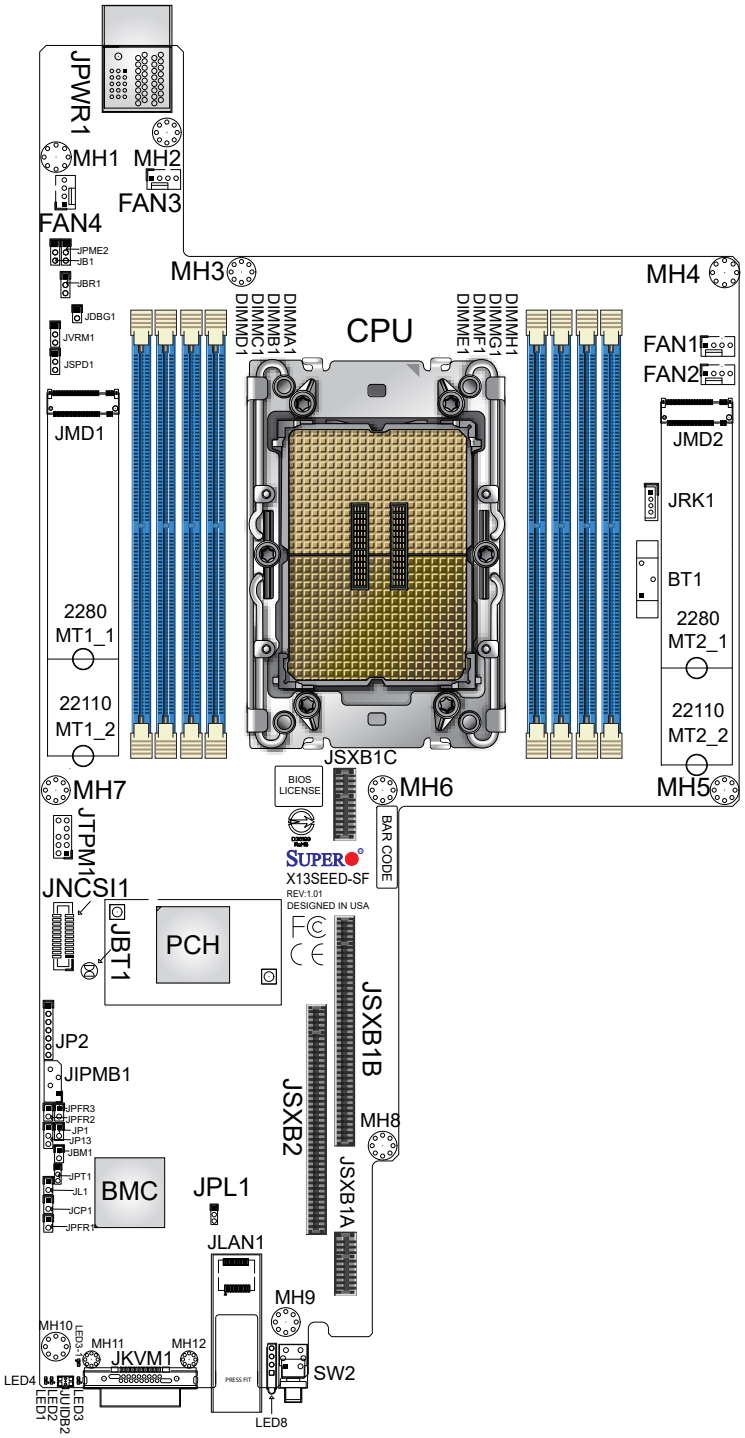
Note: All graphics shown in this manual were based upon the latest PCB revision available at the time of publication of the manual. The motherboard you received may or may not look exactly the same as the graphics shown in this manual.

Figure 1-3. X13SEED-F Motherboard Layout
(not drawn to scale)



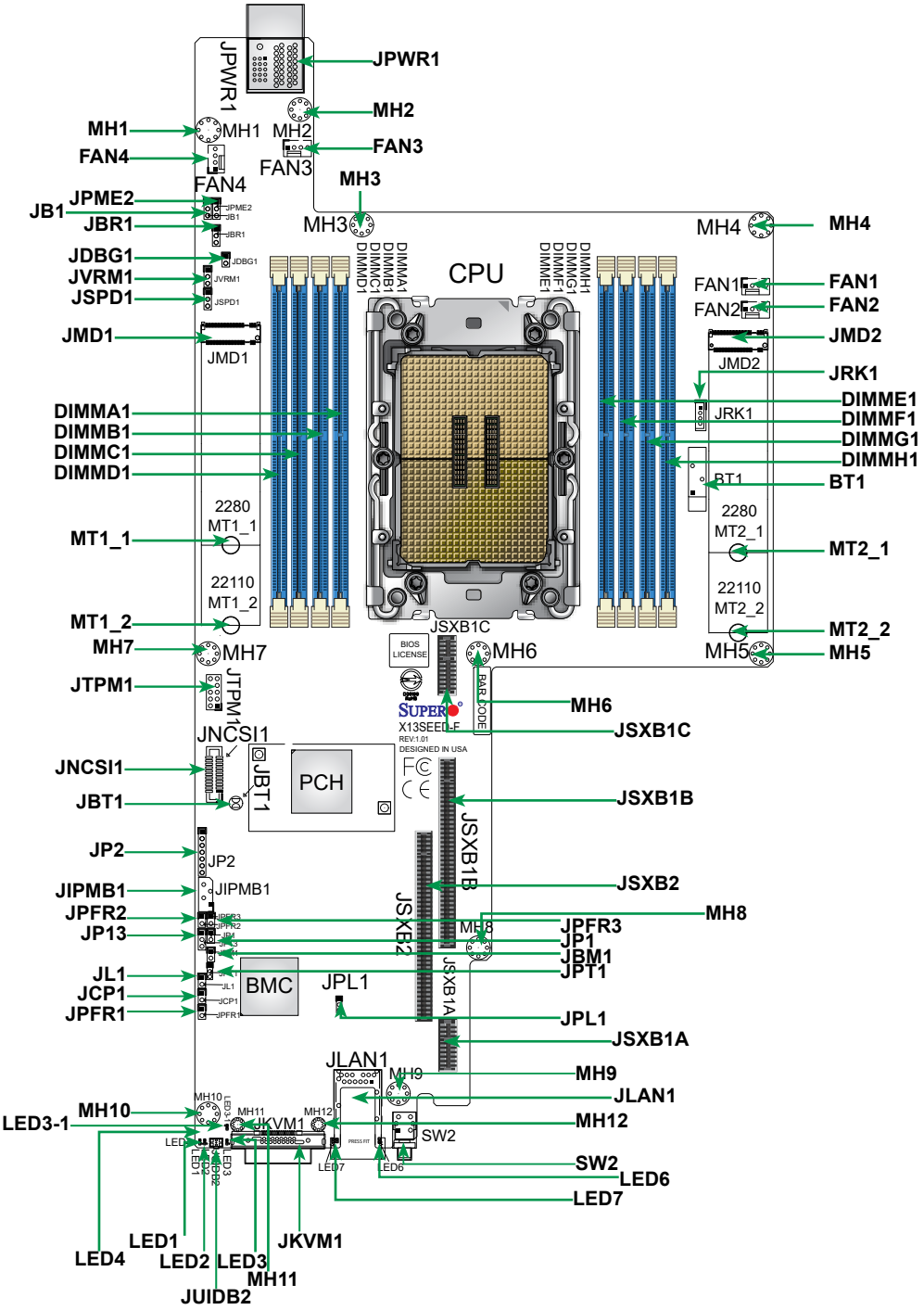
Note: Components not documented are for internal testing only.

Figure 1-4. X13SEED-SF Motherboard Layout
(not drawn to scale)



Note: Components not documented are for internal testing only.

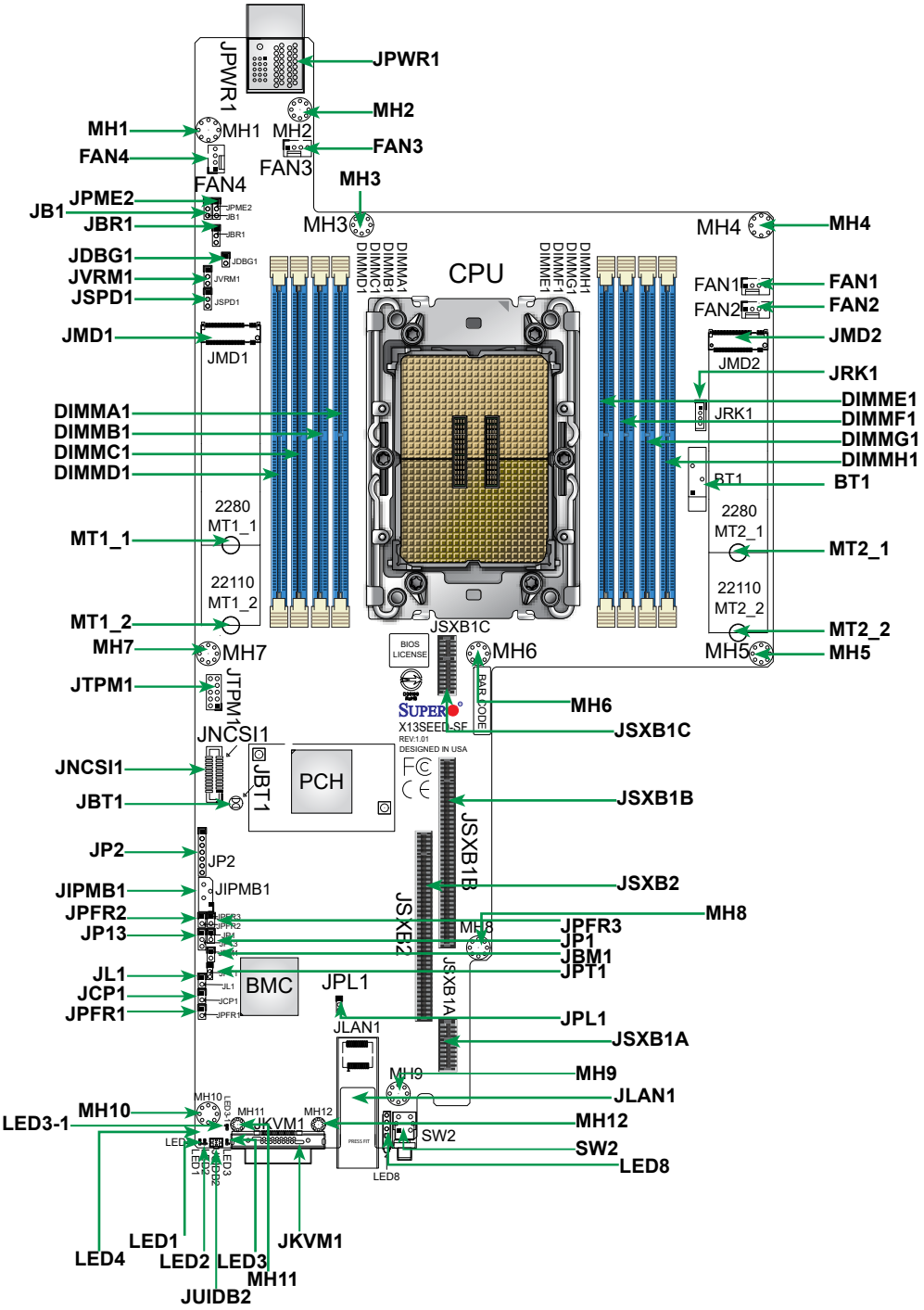
X13SEED-F Quick Reference



Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports, and connections. Jumpers and LED indicators not indicated are used for testing only.
- "▪" indicates the location of Pin 1.

X13SEED-SF Quick Reference



Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports, and connections. Jumpers and LED indicators not indicated are used for testing only.
- "▪" indicates the location of Pin 1.

Quick Reference Table

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JBM1	IPMI Shared LAN Enable/Disable	Pins 1-2 (Enabled)
JPL1	LAN1 Enable/Disable	Pins 1-2 (Enabled)
JPT1	Onboard TPM 2.0 Enable/Disable	Pins 1-2 (Enabled)

LED	Description	Status
LED1	Onboard Power LED	Solid Green: Power On
LED2	Power/Fan Fail LED	Solid Red: Power/Fan Failed
LED3	BMC Heartbeat LED	Blinking Green: BMC Normal
LED4	Unit Identifier LED	Solid Blue: Unit Identified
LED6	RJ45 Port Activity (X13SEED-F)	Yellow: Port Activity
LED7	RJ45 Link (X13SEED-F)	Solid Green: 100 Mb/s Solid Amber: 1 Gb/s
LED8	SFP LED (X13SEED-SF)	Yellow (Top): 1 Gb/s Link Yellow (Bottom): Activity

Connector	Description
BT1	Onboard Battery
FAN1–FAN4	CPU/System Fan Headers (FAN1: CPU Fan)
JIPMB1	4-Pin External I²C Header for an IPMI Card
JKVM1	KVM Connector (supports USB0/1, COM1, VGA)
JLAN1	RJ45 GbE (X13SEED-F) 1G SFP (X13SEED-SF)
JMD1	M.2 M-Key PCIe 5.0 Slot (2280/22110)
JMD2	M.2 M-Key PCIe 5.0 Slot (2280/22110)
JNCSI1	NC-SI Interface for IPMI Shared LAN Function
JRK1	Intel RAID Key Header
JSXB1A/B/C	PCIe 5.0 x32 Right Riser Slot with FH/HL PCIe card support
JSXB2	PCIe 5.0 x16 Left Riser Slot with LP PCIe card support
JTPM1	Trusted Platform Module (TPM)/Port 80
JPWR1	Power Connector (for backplane power connector)
SW2	Power Button

Motherboard Features

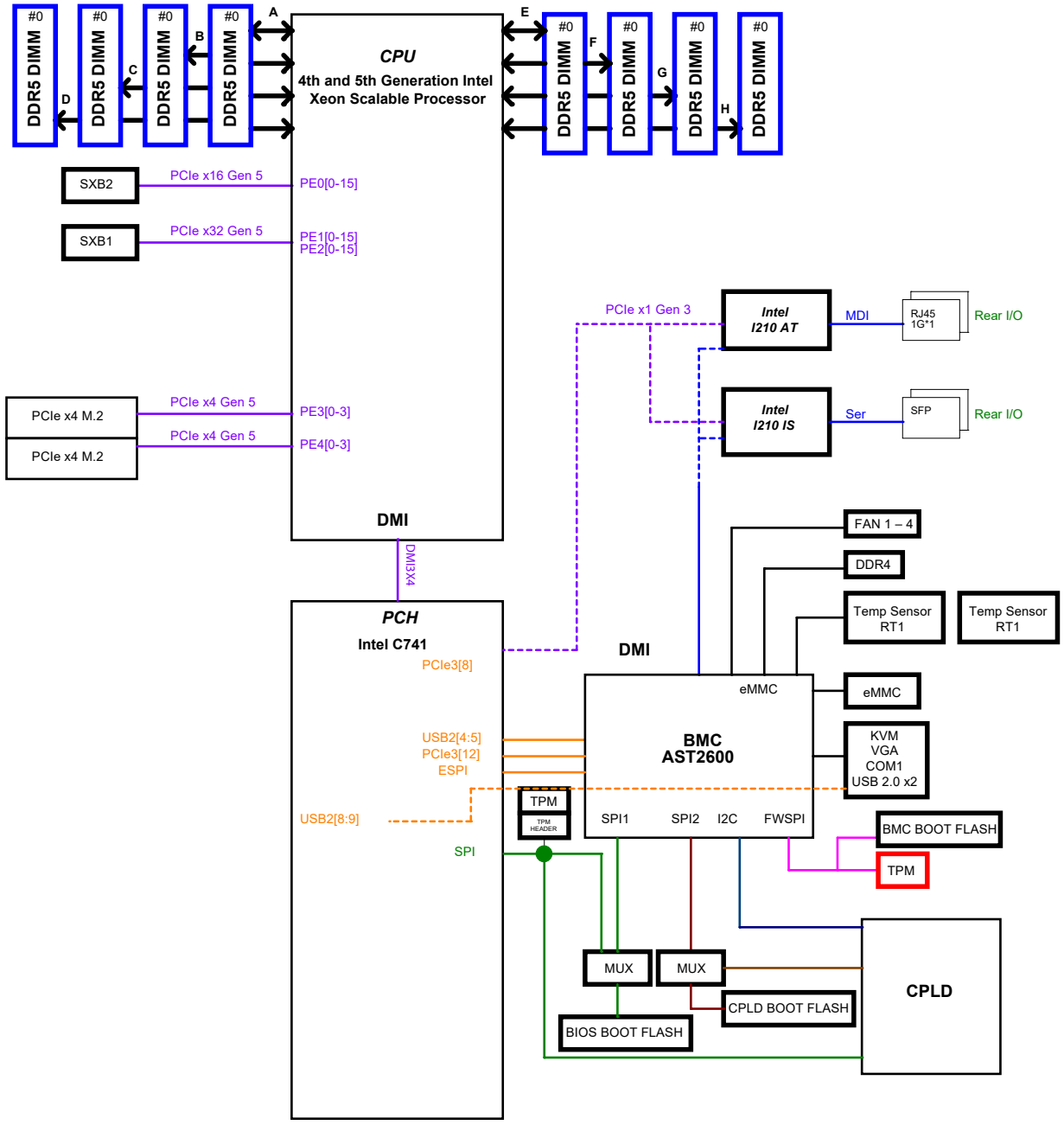
Motherboard Features	
CPU	
• Supports a 4th and 5th Generation Intel Xeon Scalable Processor in an LGA4677 socket with up to 64 cores and 350 W TDP	
Memory	
• Supports up to 2 TB of DDR5 ECC RDIMM/3DSRDIMM memory with speeds of 5600 MT/s in eight memory slots	
DIMM Size	
• Up to 256 GB **Note:** For the latest CPU/memory updates, refer to our website at http://www.supermicro.com/products/motherboard.	
Chipset	
• Intel C741	
Expansion Slots	
• Two PCIe 5.0 x16 Right Riser Slots with FH/HL PCIe card support • One PCIe 5.0 x16 Left Riser Slot with LP PCIe card support • Two PCIe 5.0 x4 M.2 M-Key 2280/22110 Slots	
Baseboard Management Controller (BMC)	
• Aspeed AST2600	
Network	
• Intel I210 for single RJ45 GbE (X13SEED-F) or single 1G SFP (X13SEED-SF)	
Super I/O	
• Aspeed AST2600	
Graphics	
• Aspeed AST2600	
I/O Devices	
• KVM Port	• One VGA Port • One COM Port • Two USB 2.0 Ports

Note: The table above is continued on the next page.

Motherboard Features
BIOS
• 256 Mb AMI BIOS® SPI Flash BIOS • ACPI, Plug and Play (PnP), SPI dual/quad speed support, riser card auto detection
Power Management
• ACPI power management (supports S5) • Power button override mechanism • Power-on mode for AC power recovery • Power supply monitoring
System Health Monitoring
• Onboard voltage monitoring for +3.3 V, +5 V, +12 V, +3.3 VStb, +5 VStb, Vcore, and Vmem • Temperature of CPU, PCH, System, DIMM, and peripheral • CPU thermal trip support • Platform Environment Control Interface (PECI)/TSI
Fan Control
• Four 4-pin fan headers • Low-noise fan speed control
System Management
• Trusted Platform Module (TPM) support • SuperDoctor® 5 • SUM-InBand, SUM-OOB • Server platform service • Intelligent Platform Management Interface (IPMIView, SMCIPMITOOL, IPMICFG)
LED Indicators
• CPU/System Overheat LED • Power/Suspend State Indicator LED • Fan Failed Indicator LED • UID/Remote UID LED • LAN Activity LED
Environment
• Operating Temperature Range: 0°C–55°C
Dimensions
• SuperEdge single node form factor • 16.36" x 8.526" (415.57 mm x 216.56 mm)

Note: The CPU maximum thermal design power (TDP) is subject to chassis and heatsink cooling restrictions. For proper thermal management, check the chassis and heatsink specifications for proper CPU TDP sizing.

Figure 1-5.
System Block Diagram



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

1.2 Processor and Chipset Overview

Built upon the functionality and capability of the 4th and 5th Generation Intel Xeon Scalable Processor and the C741 chipset, the X13SEED-F/-SF motherboard provides system performance, power efficiency, and feature sets to address the needs of next-generation computer users, and dramatically increases system performance for a multitude of server applications.

The motherboard supports the following features:

- Intel Hyper-Threading, Intel VT-D, VT-x, TDX
- Intel Turbo Boost Technology
- Intel Rapid Storage Technology
- ACPI Power Management
- 2 TB of DDR5 ECC RDIMM/3DSRDIMM memory with speeds of up to 5600 MT/s in eight DIMM slots

1.3 Special Features

Recovery from AC Power Loss

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

1.4 System Health Monitoring

Onboard Voltage Monitors

The onboard voltage monitor will continuously scan crucial voltage levels. Once a voltage becomes unstable, a warning is given, or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

The system health monitor chip can check the RPM status of a cooling fan. The CPU and chassis fans are controlled by the BIOS Thermal Management.

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. Once the thermal sensor detects that the CPU temperature is too high, it will automatically turn on the thermal fans to prevent the CPU from overheating. The onboard chassis thermal circuitry can monitor the overall system temperature and alert the user when the chassis temperature is too high.



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

System Resource Alert

This feature is available when used with SuperDoctor 5® in the Windows OS or in the Linux environment. SuperDoctor is used to notify the user of certain system events. For example, you can configure SuperDoctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds go beyond a predefined range.

1.5 ACPI Features

The Advanced Configuration and Power Interface (ACPI) specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a computer system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, solid state drives and printers.

In addition to enabling operating system-directed power management, ACPI also provides a generic system event mechanism for Plug and Play, and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures, while providing a processor architecture-independent implementation that is compatible with appropriate Windows operating systems. For detailed information regarding OS support, refer to the Supermicro website.

1.6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. This is even more important for processors that have high CPU clock rates. In areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

Chapter 2

Installation

2.1 Static-Sensitive Devices

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

Precautions

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

Unpacking

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

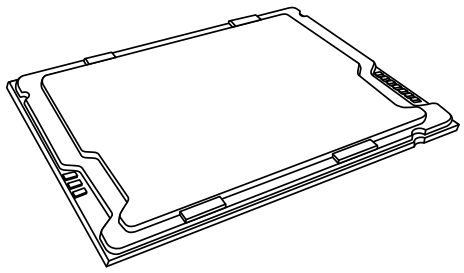
2.2 Processor and Heatsink Installation

The processor (CPU) and processor carrier should be assembled together first to form the processor carrier assembly. This will be attached to the heatsink to form the processor heatsink module (PHM) before being installed onto the CPU socket.

Notes:

- Use ESD protection.
- Shut down the system and then unplug the AC power cord from all power supplies.
- Check that the plastic protective cover is on the CPU socket and none of the socket pins are bent. If they are, contact your retailer.
- When handling the processor, avoid touching or placing direct pressure on the LGA lands (gold contacts). Improper installation or socket misalignment can cause serious damage to the processor or socket, which may require manufacturer repairs.
- When installing the processor and heatsink, ensure a torque driver set to the correct force is used for each screw.
- Thermal grease is pre-applied on a new heatsink. No additional thermal grease is needed.
- Refer to the Supermicro website for updates on processor support.
- All graphics in this manual are for illustrations only. Your components may look different.
- The following CPU carrier has been successfully tested in our labs and is available from Supermicro. Order the CPU carrier with the CPU heatsink.

The 4th and 5th Generation Intel Xeon Scalable Processor

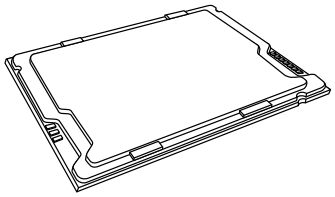


Intel Xeon Processor

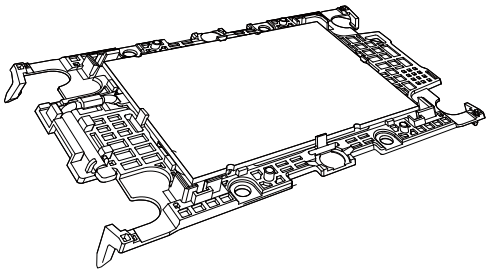
Overview of the Processor Carrier Assembly

The processor carrier assembly contains the Intel Xeon processor and a processor carrier.

1. Intel Xeon Processor



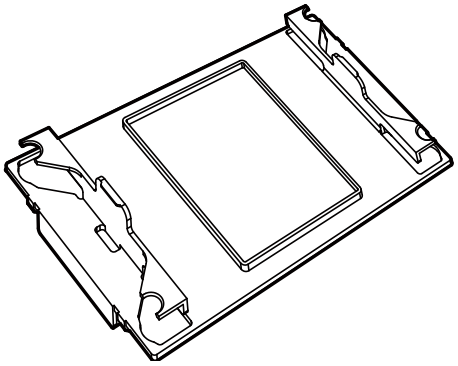
2. Processor Carrier



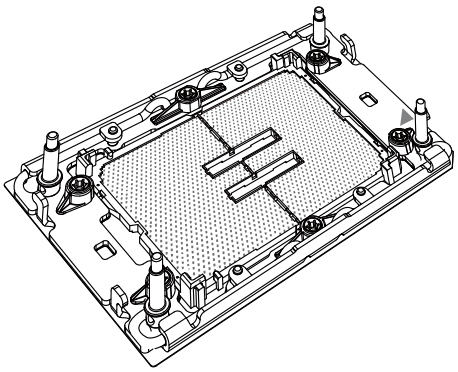
Overview of the CPU Socket

The CPU socket is protected by a plastic protective cover.

1. Plastic Protective Cover



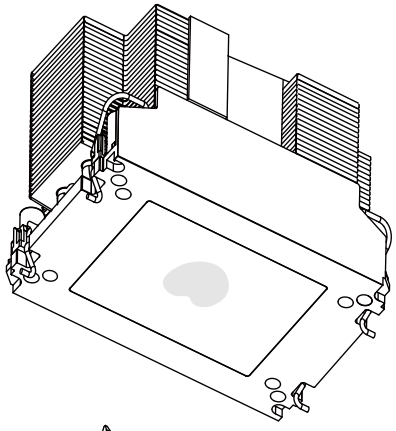
2. CPU Socket



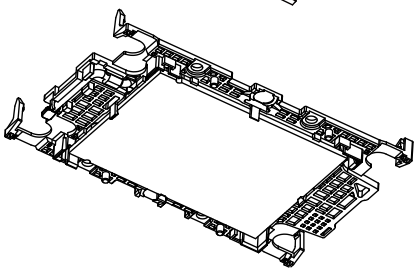
Overview of the Processor Heatsink Module

The processor heatsink module (PHM) contains a heatsink, a processor carrier, and the Intel Xeon processor.

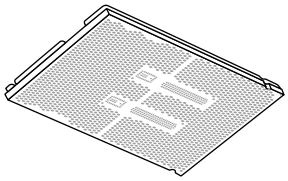
1. Heatsink with Thermal Grease



2. Processor Carrier

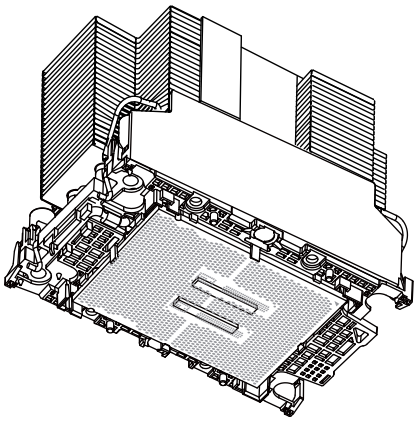


3. Intel Xeon Processor



Processor Heatsink Module (PHM)



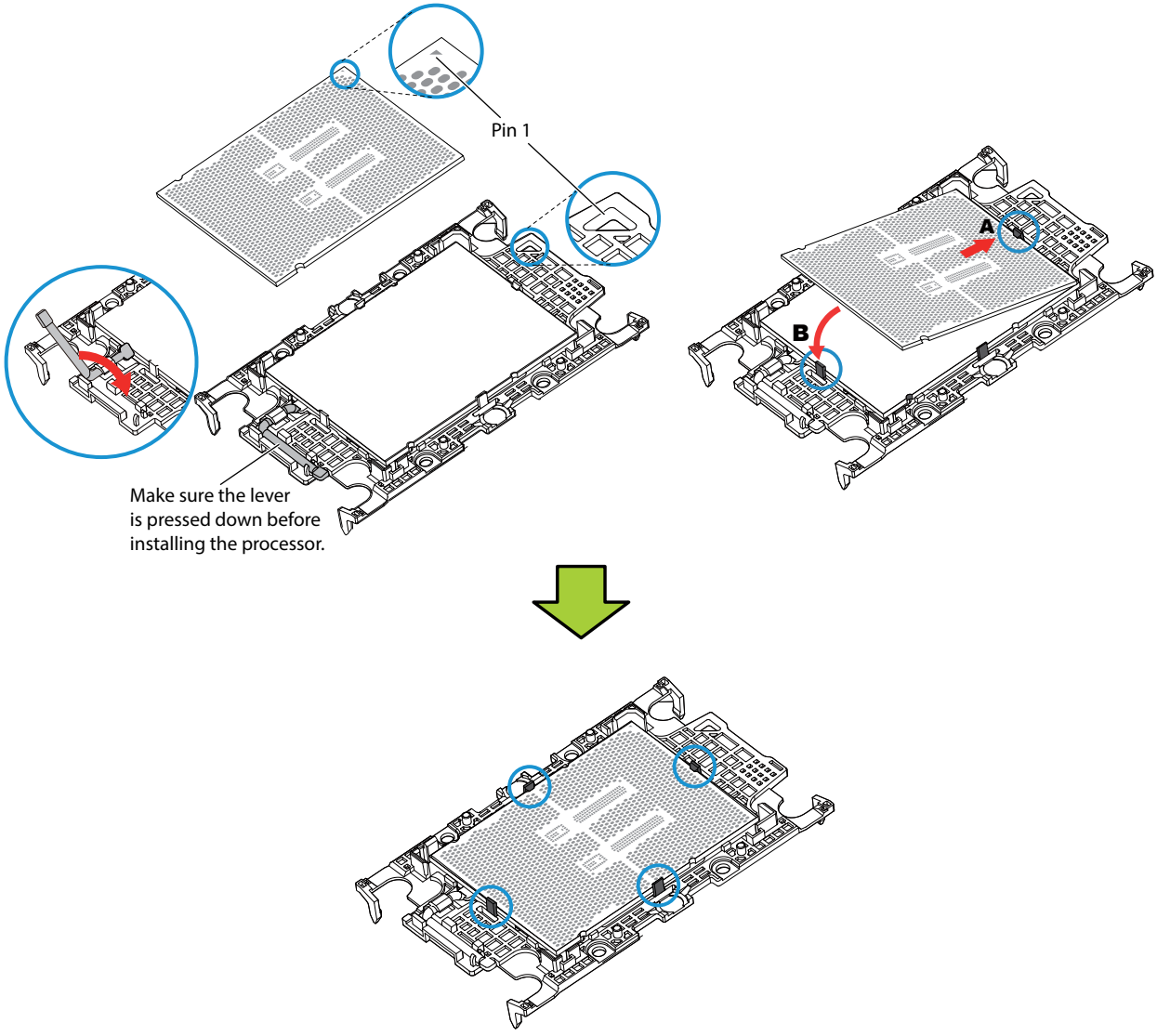


Bottom View

Creating the Processor Carrier Assembly

To install a processor into the processor carrier, follow the steps below:

1. Before installation, make sure the lever on the processor carrier is pressed down as shown below.
2. Hold the processor with the LGA lands (gold contacts) facing up. Locate the small, gold triangle in the corner of the processor and the corresponding hollowed triangle on the processor carrier. These triangles indicate pin 1. See the images below.
3. Use the triangles as a guide to carefully align and place one end of the processor into the latch marked A, and place the other end of processor into the latch marked B as shown below.
4. Examine all corners to ensure that the processor is firmly attached to the carrier.



Processor Carrier Assembly

Assembling the Processor Heatsink Module

After creating the processor carrier assembly for the processor, mount it onto the heatsink to create the processor heatsink module (PHM):

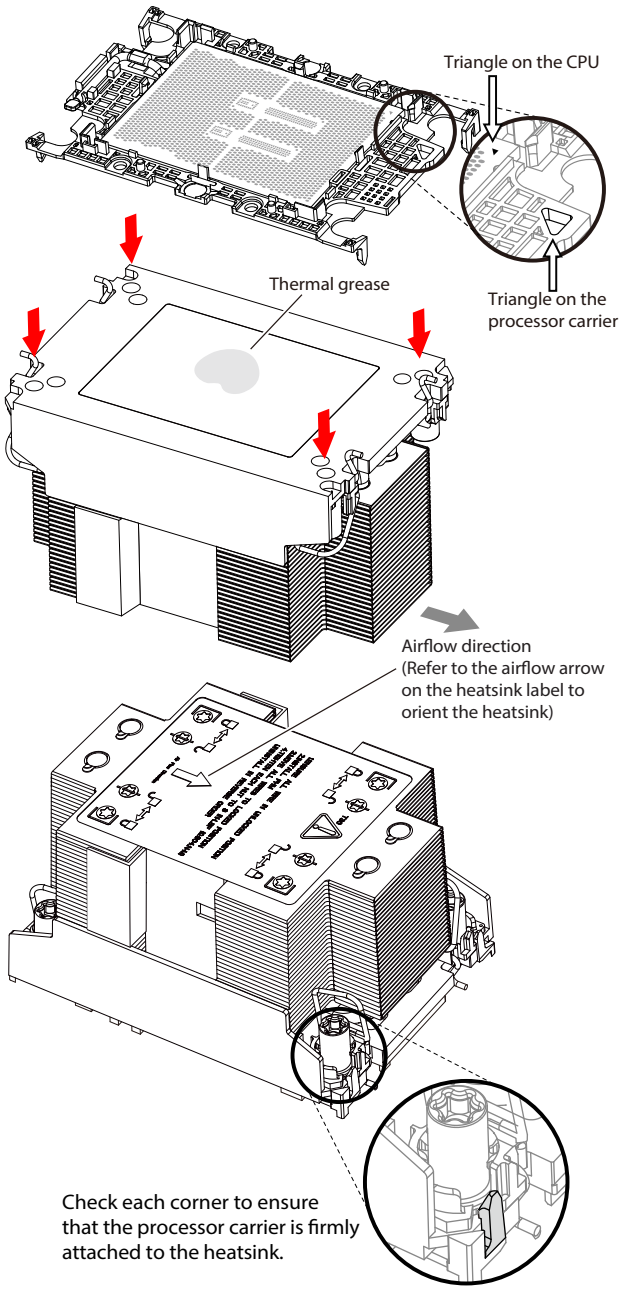
1. Note the label on top of the heatsink, which marks the airflow direction. Turn the heatsink over and orient the heatsink so the airflow arrow is pointing towards the triangle on the processor.

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

3. Hold the processor carrier assembly so the processor's gold contacts are facing up, then align the holes of the processor carrier assembly with the holes on the heatsink. Press the processor carrier assembly down until it snaps into place. The plastic clips of the processor carrier assembly will lock at the four corners.

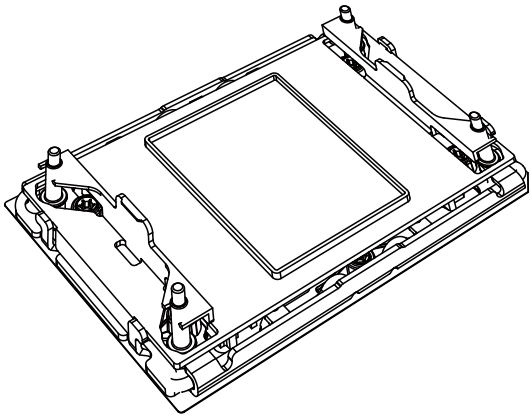
4. Examine all corners to ensure that the plastic clips on the processor carrier assembly are firmly attached to the heatsink.

Processor Carrier Assembly
(Upside Down)

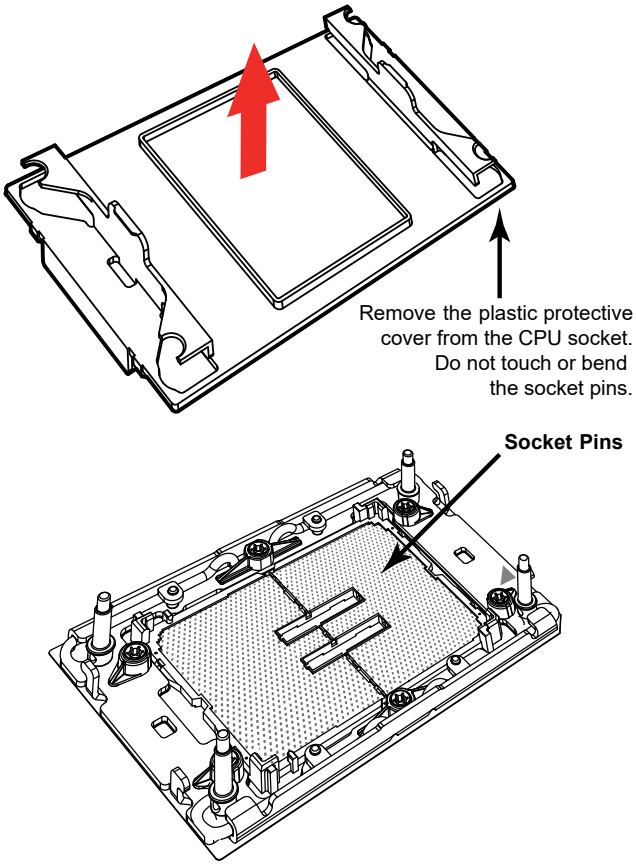


Preparing the CPU Socket for Installation

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



CPU Socket with Plastic Protective Cover



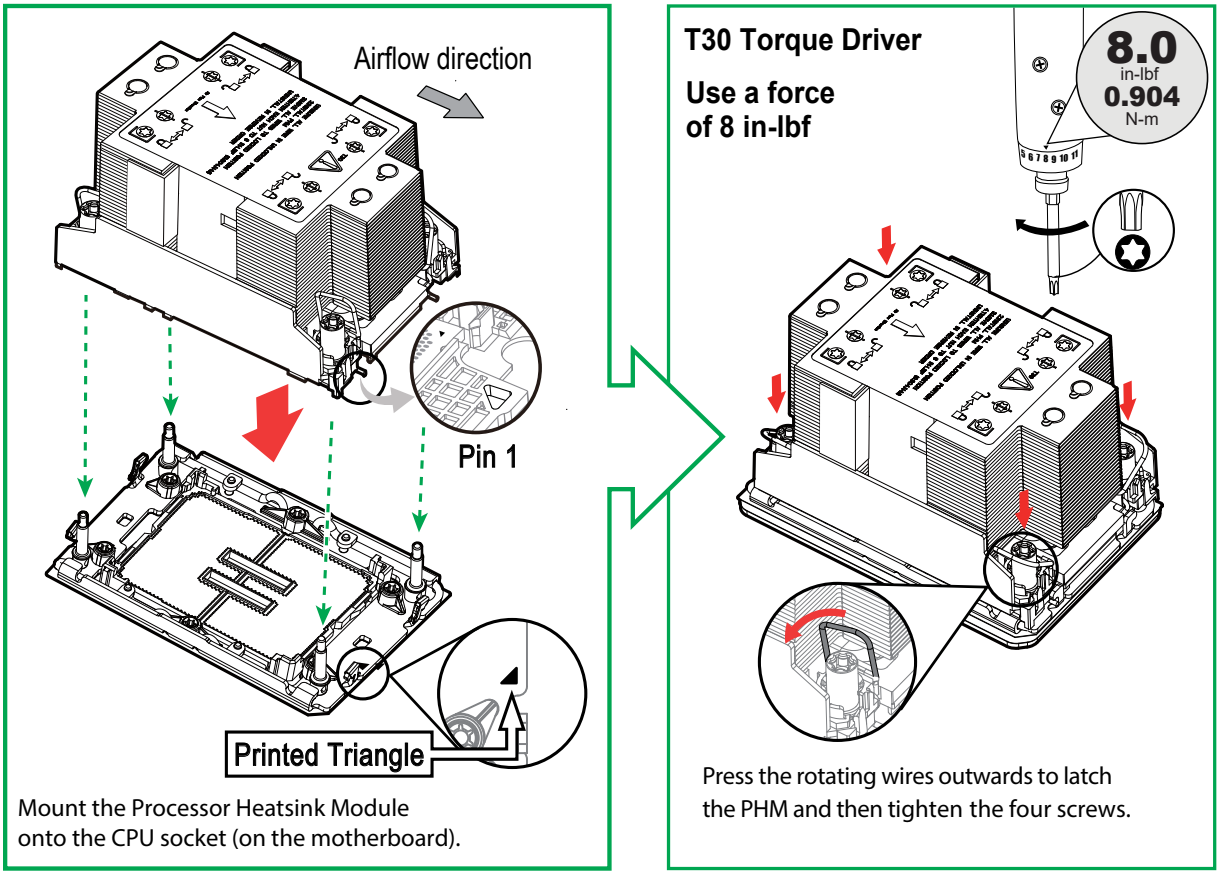
Installing the Processor Heatsink Module

After assembling the Processor Heatsink Module (PHM), install it onto the CPU socket:

1. Align pin 1 of the PHM with the printed triangle on the CPU socket. See the left image below.
2. Make sure all four holes of the heatsink are aligned with the socket, then gently place the heatsink on top of the CPU socket.
3. Press all four rotating wires outwards and make sure that the heatsink is securely latched into the CPU socket.
4. With a T30 bit torque driver set to a force of 8.0 in-lbf (0.904 N-m), gradually tighten the four screws to ensure even pressure. You can start with any screw, but make sure to tighten the screws in a diagonal pattern.

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

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



Mount the Processor Heatsink Module onto the CPU socket (on the motherboard).

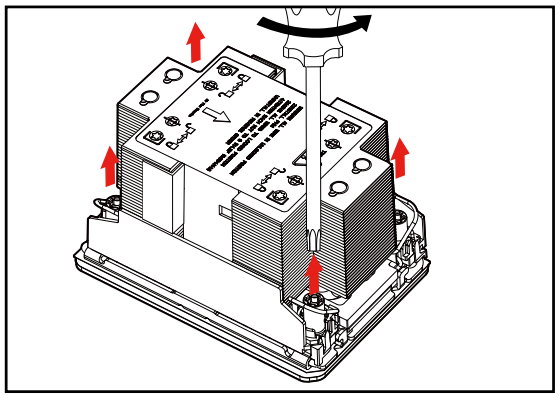
Press the rotating wires outwards to latch the PHM and then tighten the four screws.

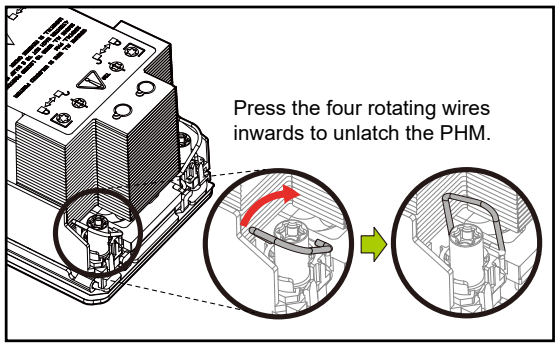
Removing the Processor Heatsink Module

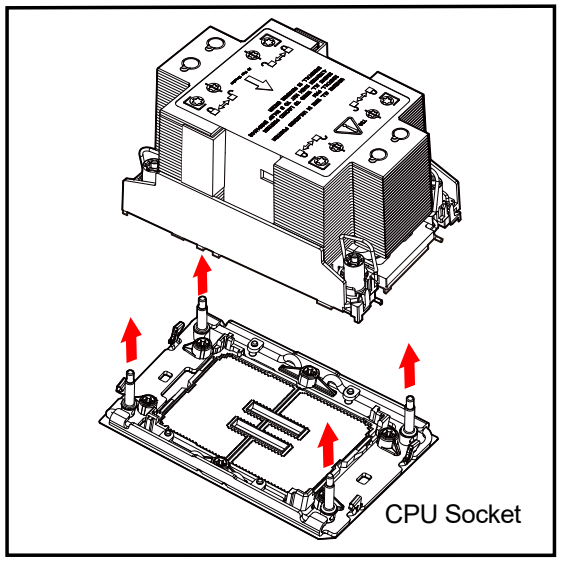
Before removing the processor heatsink module (PHM) from the motherboard, shut down the system and then unplug the AC power cord from all power supplies.

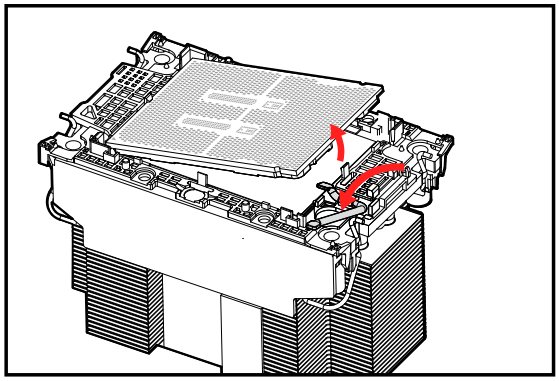
Then follow the steps below:

1. Use a T30 bit driver to loosen the four screws. You can start with any screw, but make sure to tighten the screws in a diagonal pattern.
2. Press the four rotating wires inwards to unlatch the PHM from the socket.
3. Gently lift the PHM upwards to remove it from the socket.
4. To remove the CPU, move the lever to its unlocked position and gently remove the CPU.





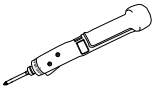




2.3 Motherboard Installation

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

Tools Needed



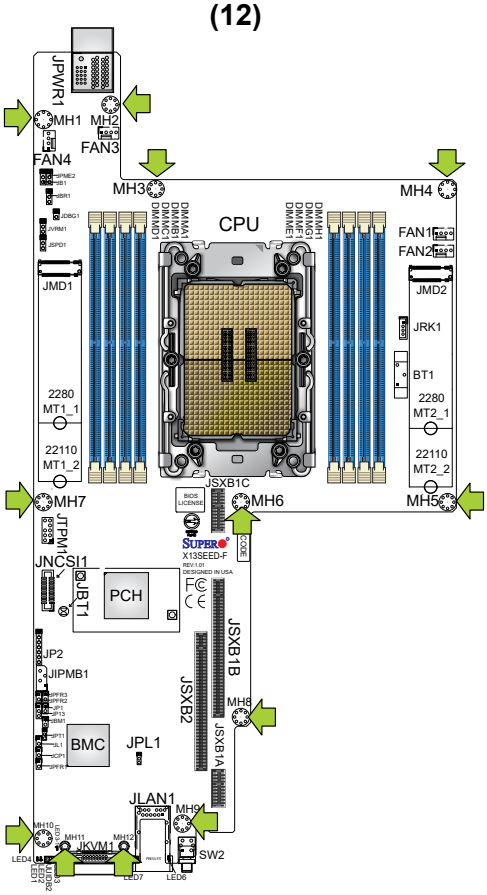
Torque Driver (1)



Phillips Screws (12)



Standoffs (12) Only if Needed



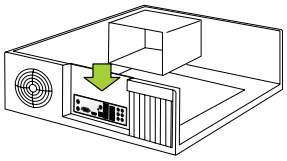
Location of Mounting Holes

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

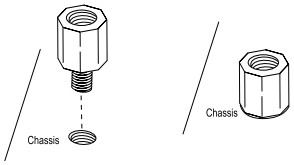
Note 2: Some components are very close to the mounting holes. Take precautionary measures to avoid damaging these components when installing the motherboard to the chassis.

Installing the Motherboard

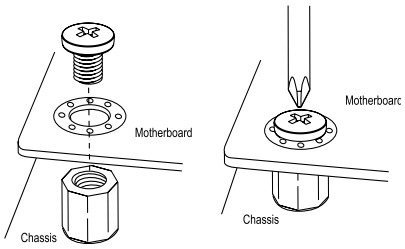
1. Install the I/O shield into the back of the chassis, if applicable.



2. Locate the mounting holes on the motherboard. See the previous page for the location.



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



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

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

2.4 Memory Support and Installation

Note: Check the Supermicro website for recommended memory modules.

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

Memory Support

The X13SEED-F/-SF supports up to 2 TB of DDR5 ECC RDIMM/3DSRDIMM memory with speeds of up to 5600 MT/s in eight DIMM slots. Refer to the tables below for DIMM support information.

1 CPU, 8 DIMM Slots	
Number of DIMMs	**Memory Population Sequence**
1	DIMMA1 DIMME1
2	DIMMA1 / DIMMG1 DIMME1 / DIMMC1
4	DIMMA1 / DIMMC1 / DIMME1 / DIMMG1
6	DIMMA1 / DIMMC1 / DIMMD1 / DIMME1 / DIMMF1 / DIMMG1 DIMMA1 / DIMMB1 / DIMMC1 / DIMME1 / DIMMG1 / DIMMH1 DIMMB1 / DIMMC1 / DIMMD1 / DIMME1 / DIMMF1 / DIMMH1 DIMMA1 / DIMMB1 / DIMMD1 / DIMMF1 / DIMMG1 / DIMMH1
8	DIMMA1 / DIMMB1 / DIMMC1 / DIMMD1 / DIMME1 / DIMMF1 / DIMMG1 / DIMMH1

Compatible and Incompatible DIMM Types in a Channel and a System			
DIMM Type	**RDIMM**	**RDIMM 3DS**	**9x4 RDIMM**
RDIMM	Compatible	Incompatible	Incompatible
RDIMM 3DS	Incompatible	Compatible	Incompatible
9x4 RDIMM	Incompatible	Incompatible	Compatible

DDR5 Memory Support for the 4th Generation Intel Xeon Scalable Processor Processors					
Type	Ranks Per DIMM and Data Width (Stack)	DIMM Capacity (GB)		Speed (MT/s)	
				One DIMM per Channel [1]	Two DIMMs per Channel
		Memory Density 16 Gb	Memory Density 24 Gb[2]	1.1 Volts	
RDIMM	SRx8 (RC D)	16 GB	24 GB	4800*	4400*
	SRx4 (RC C)	32 GB	48 GB		
	SRx4 (RC F) 9x4	32 GB	NA		
	DRx8 (RC E)	32 GB	48 GB		
	DRx4 (RC A)	64 GB	96 GB		
	DRx4 (RC B) 9x4	64 GB	NA		
RDIMM 3DS	(4R/8R) x4 (RC A)	2H-128 GB 4H-256 GB	NA		

*Memory speed and capacity support depends on the processors used in the system.

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

Note 2: 24 Gb XCC only with limited configs: 1 DPC all DIMM types, 2 DPC 96 GB only. Only eight and sixteen DIMM configs, no failbacks. 25 at PLR1 4S/8S later in 2023.

DDR5 Memory Support for the 5th Generation Intel Xeon Scalable Processor Processors					
Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s)	
				One DIMM per Channel (DPC)[1]	Two DIMMs per Channel (DPC)
		Memory Density 16 Gb	Memory Density 24 Gb	1.1 Volts	
RDIMM	SRx8 (RC D)	16 GB	24 GB[2]	5600[3]	4400[3]
	SRx4 (RC C)	32 GB	48 GB[2]		
	SRx4 (RC F) 9x4	NA	NA		
	DRx8 (RC E)	32 GB	48 GB[2]		
	DRx4 (RC A)	64 GB	96 GB		
	DRx4 (RC B) 9x4	NA	NA		
RDIMM 3DS	(4R/8R) x4 (RC A)	2H-128 GB 4H-256 GB	NA		

*Memory speed and capacity support depends on the processors used in the system.

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

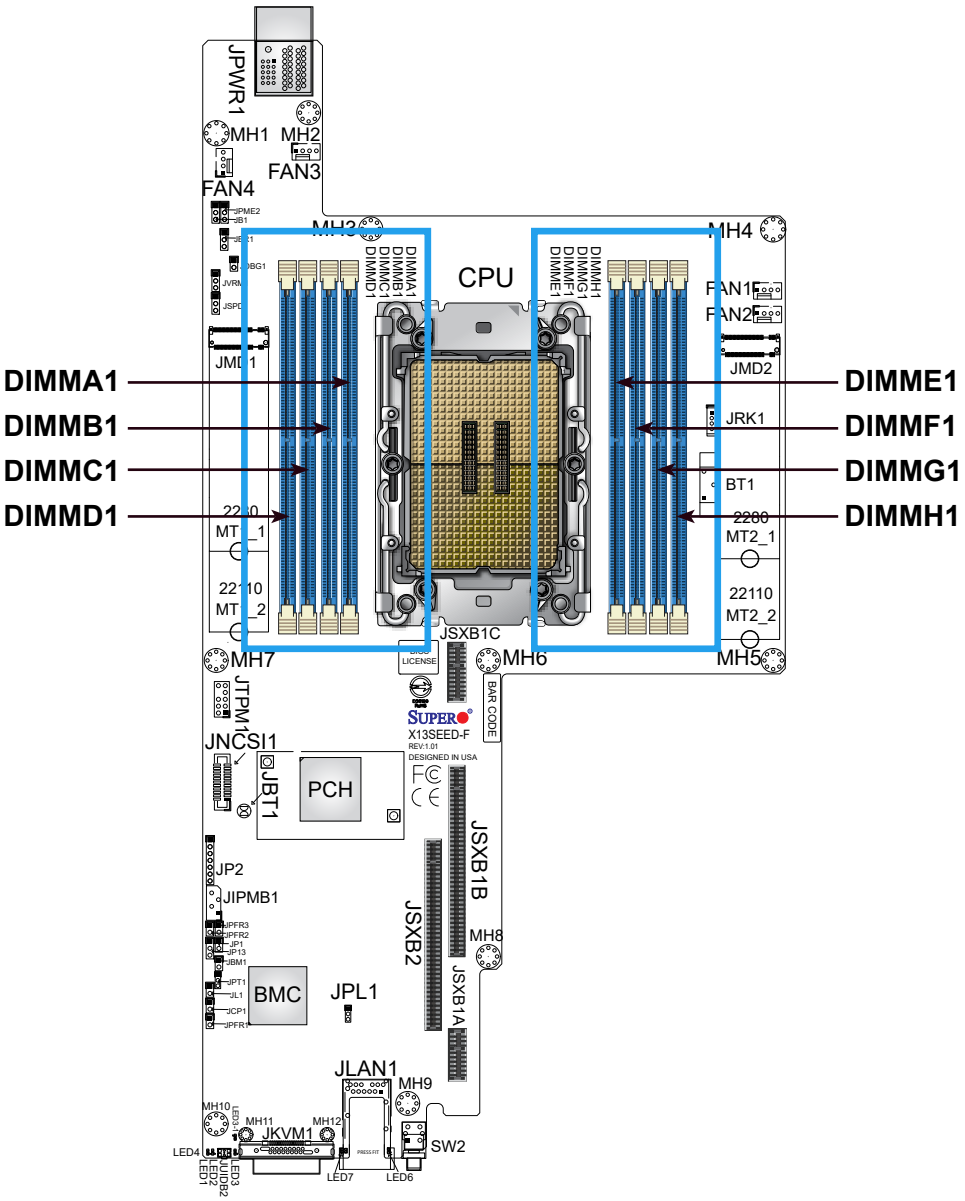
Note 2: 24 Gb 2 DPC is not POR with 24 GB and 48 GB DIMMs.

Note 3: DDR5-5600 DIMMs will be limited to 5600 MT/s 1 DPC and 4400 MT/s 2 DPC. DDR5-4800 DIMMs will be limited to 4800 MT/s 1 DPC and 4400 MT/s 2 DPC.

Note 4: DDR5-5600 DIMMs are requires for 5600 MT/s and 5200 MT/s 1 DPC speeds.

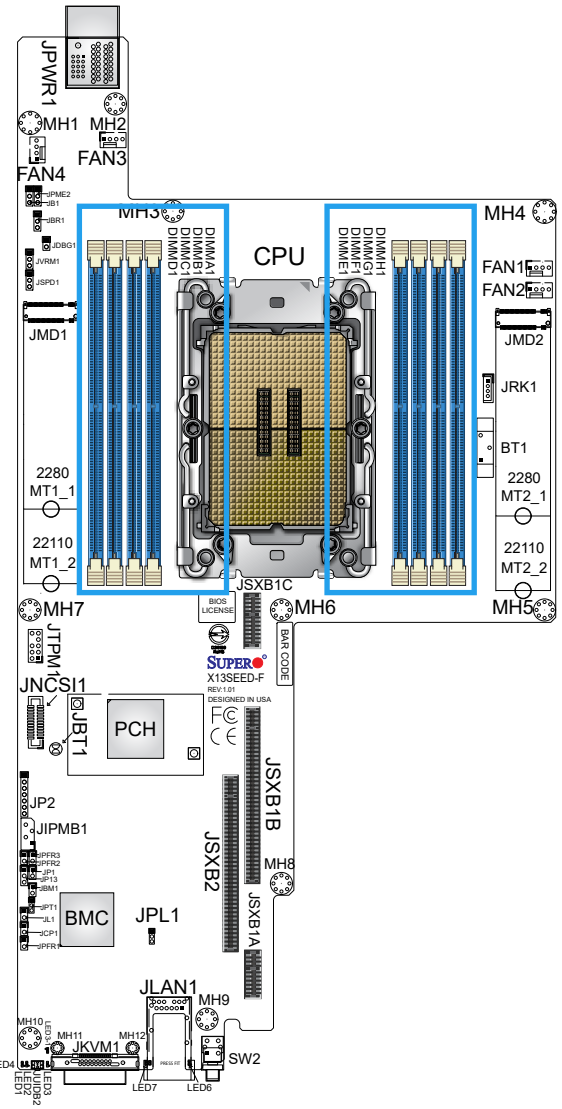
General Guidelines for Optimizing Memory Performance

- It is recommended to use DDR5 memory of the same type, size, and speed.
- Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.
- The motherboard will not support an odd-numbered amount of DIMM modules except for a single DIMM module necessary for board operation.



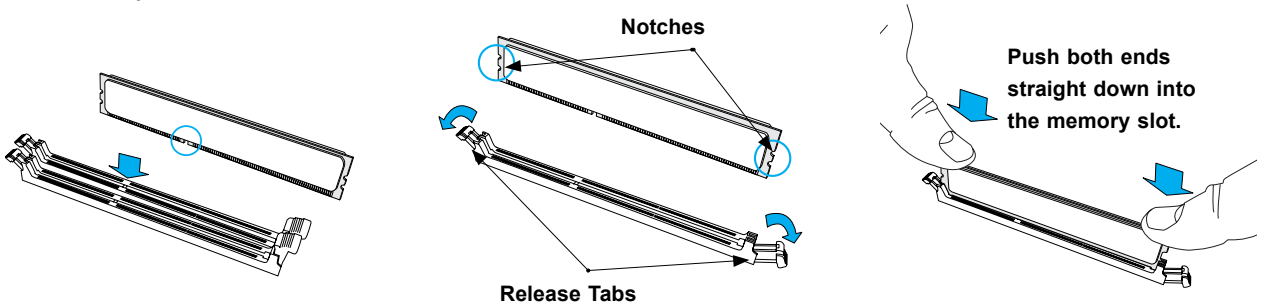
DIMM Installation

1. Insert DIMM modules in the following order: DIMMA1, DIMMB1, DIMMC1, DIMMD1, then DIMME1, DIMMF1, DIMMG1, DIMMH1, and insert the desired number of DIMMs into memory slots based on the memory population sequence on page 33. For the system to work properly, use memory modules of the same type and speed.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
3. Align the key of the DIMM module with the receptive point on the memory slot.
4. Align the notches on both ends of the module against the receptive points on the ends of the slot.
5. Push both ends of the module straight down into the slot until the module snaps into place.
6. Press the release tabs to the lock positions to secure the DIMM module into the slot.



DIMM Removal

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



2.5 Rear Panel I/O Ports

See Figure 2-1 below for the locations and descriptions of the various I/O ports on the rear of the motherboard.

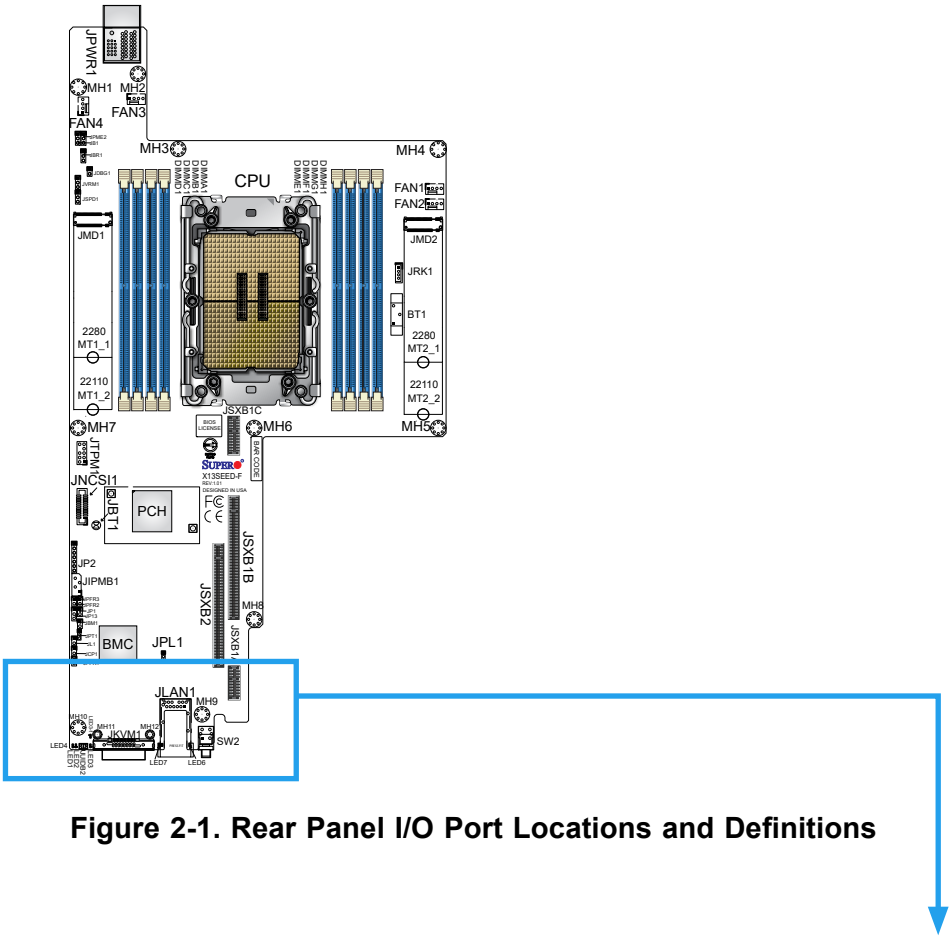
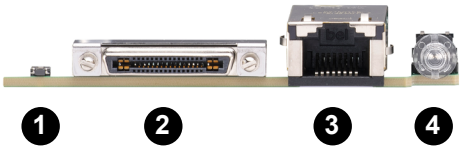
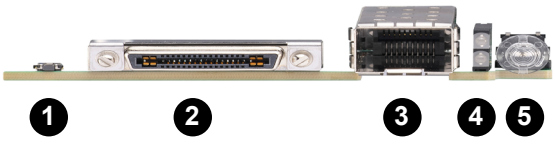


Figure 2-1. Rear Panel I/O Port Locations and Definitions



Rear Panel I/O Ports (X13SEED-F)			
#	Description	#	Description
1	UID Switch	4	Power Button
2.	KVM Port		
3	LAN1 (RJ45)		



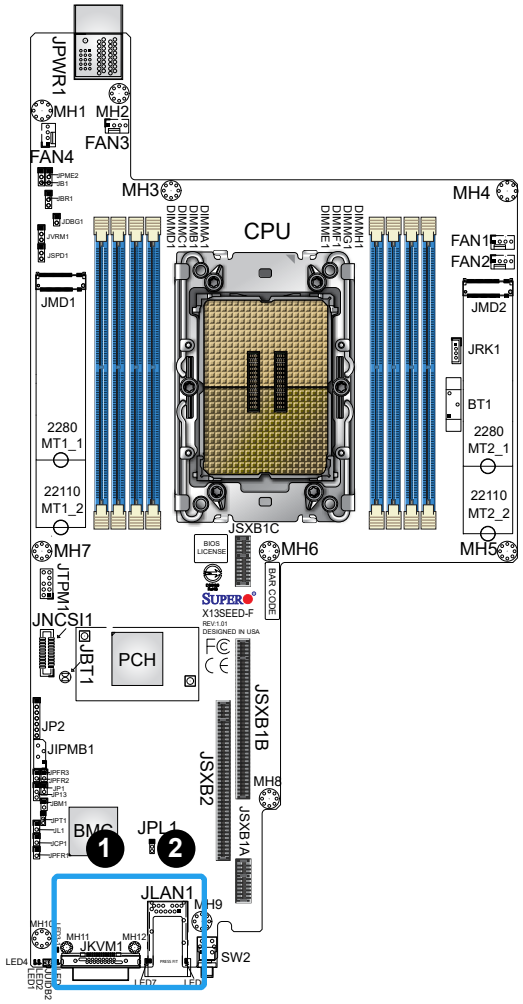
Rear Panel I/O Ports (X13SEED-SF)			
#	Description	#	Description
1	UID Switch	4	LED8
2.	KVM Port	5	Power Button
3	LAN1 (SFP)		

KVM Connector

The Keyboard, Video, and Mouse (KVM) connector at JKVM1 supports a set of keyboard, monitor, and mouse to control multiple computers. It also provides two USB 2.0 connections (USB0/1), one serial connection (COM1), and a VGA connection (VGA).

LAN Port

The motherboard has one GbE (X13SEED-F) or one 1G SFP (X13SEED-SF) LAN port located on the rear panel I/O at JLAN1. Refer to the LED Indicator section for LAN LED information.



1. KVM Connector
2. LAN Port

Power Button

Press the button at SW2 to power on the motherboard. This button can also power off the motherboard instantly or when held for four seconds. The settings for this button can be configured with the Power Button Function feature in the UEFI BIOS.

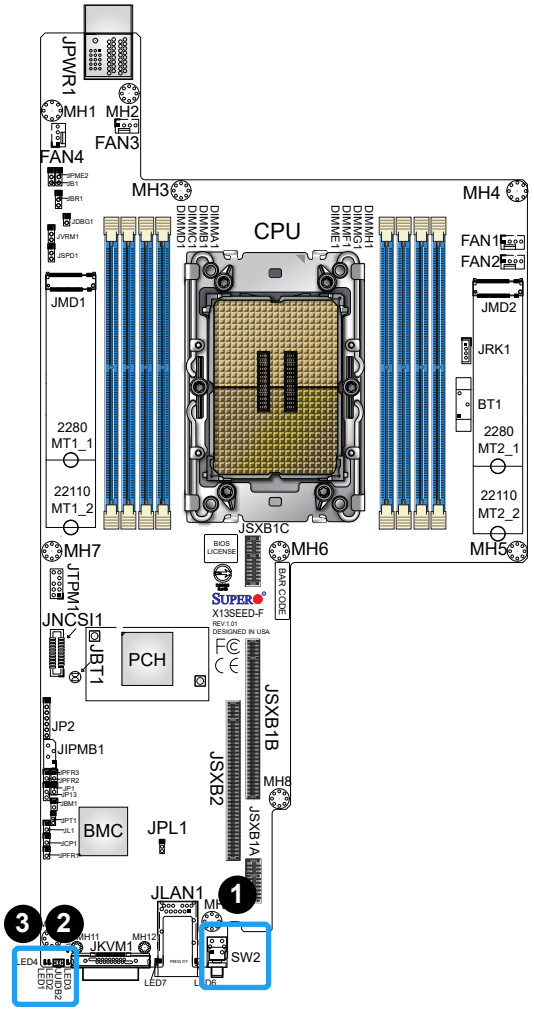
Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch and an LED Indicator are located on the motherboard. The UID switch is located at JUIDB2 on the rear panel I/O. The UID LED is located near the UID switch at LED4. When you press the UID switch, the UID LED will be turned on. Press the UID switch again to turn off the LED indicator. The UID Indicator provides easy identification of a system unit that may be in need of service.

Note: UID can also be triggered via IPMI on the motherboard. For more information on IPMI, refer to the IPMI User's Guide posted on our website at https://www.supermicro.com/support/manuals/.

UID Switch Pin Definitions	
Pin#	**Definition**
1	Ground
2	Ground
3	Button In
4	Button In

UID LED Pin Definitions	
Color	**Status**
Blue: On	Unit Identified



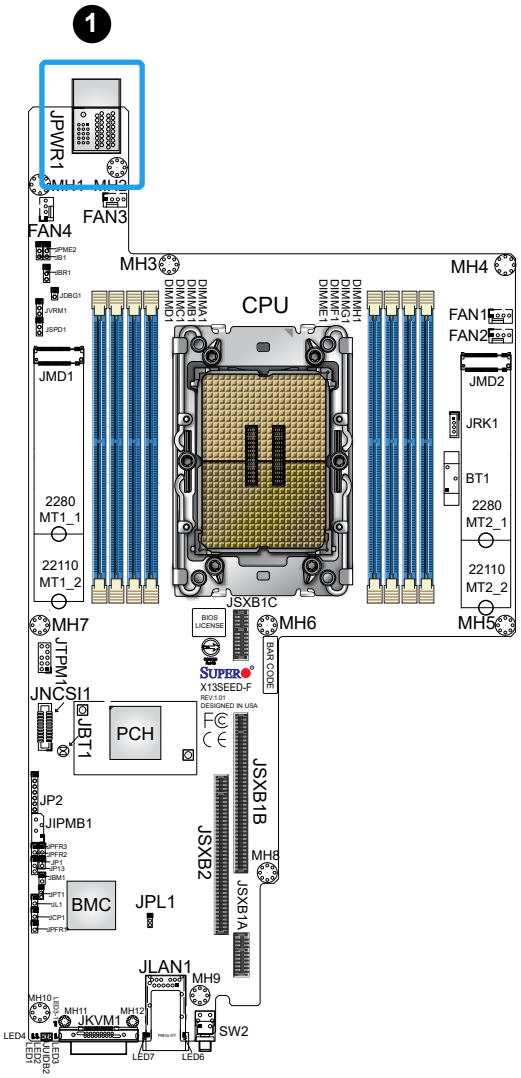
1. Power Button
2. UID Switch
3. UID LED (LED4)

2.6 Connectors & Headers

Power Connections

Power Connector

JPWR1 is the power connector for the backplane power connector.



1. Backplane power

Headers

Fan Headers

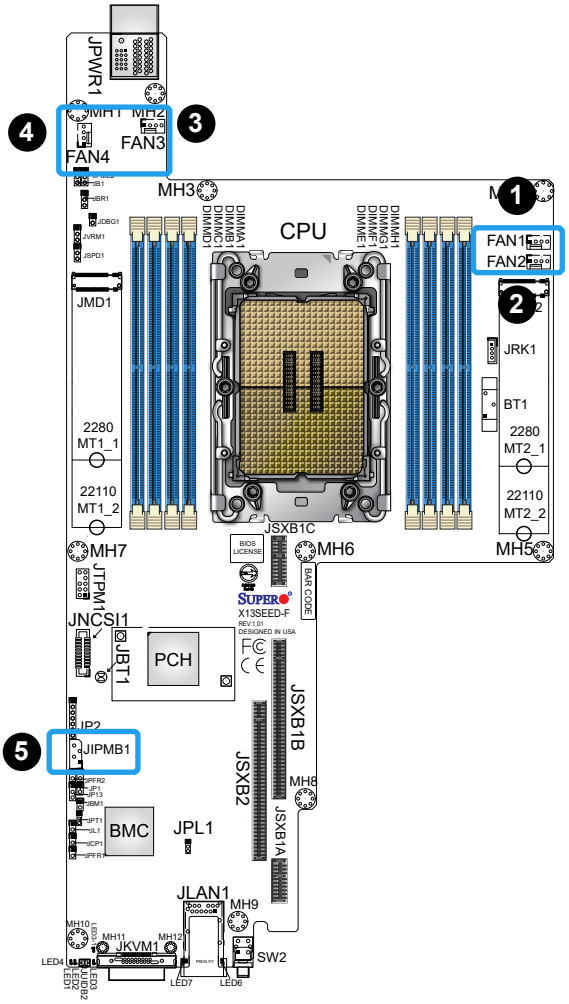
There are four 4-pin fan headers on the motherboard. Although pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans, we recommend you use 4-pin fans to take advantage of the fan speed control via Pulse Width Modulation (PWM) through the thermal management. This allows the fan speeds to be automatically adjusted based on the motherboard temperature.

Fan Header Pin Definitions	
Pin#	**Definition**
1	Ground (Black)
2	2.5 A/+12 V (Red)
3	Tachometer
4	PWM_Control

4-pin External I2C Header

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection on your system. Refer to the table below for pin definitions.

External I²C Header Pin Definitions	
Pin#	**Definition**
1	Data
2	Ground
3	Clock
4	3V3_STBY



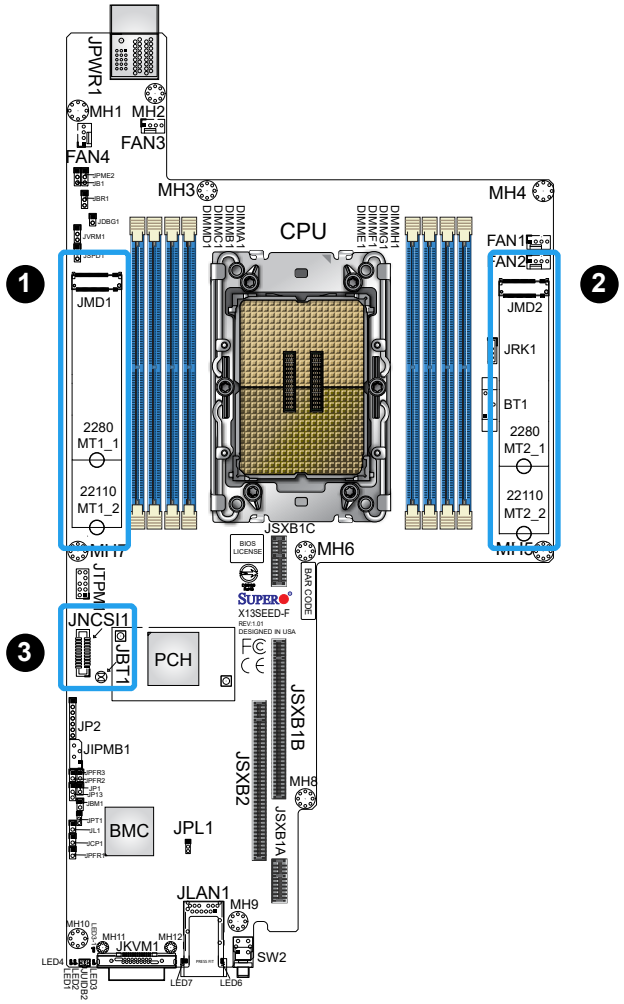
1. FAN1 (CPU Fan) Header
2. FAN2 Header
3. FAN3 Header
4. FAN4 Header
5. 4-pin External I²C Header

M.2 M-Key PCIe 5.0 Connector (2280/22110)

The motherboard has two M.2 slots at JMD1 and at JMD2. 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. JMD1 and JMD2 support M-Key PCIe 5.0 devices in the 2280 and 22110 form factors.

NC-SI Interface for IPMI Shared LAN Function

A Network-Controller Sideband Interface (NC-SI) header is located at JNCSI1 on the motherboard. For remote management, connect the appropriate cable from this header to an add-on card to provide the out-of-band (sideband) connection between the onboard Baseboard Management Controller (BMC) and a Network Interface Controller (NIC). For the network sideband interface to work properly, you will need to use an NIC add-on card that supports NC-SI and also need to use a special cable. Refer to the table below for pin definitions.



NC-SI Header Pin Definitions			
Pin#	**Definition**	**Pin#**	**Definition**
1	Clock	2	GND
3.	CRS_DV	4	GND
5	RX_D0	6	GND
7	RX_D1	8	GND
9	TX_D0	10	GND
11	TX_D1	12	GND
13	TX_EN	14	PRST_IN
15	ARB_IN	16	ARB_OUT
17	Power	18	Power
19	Power	20	Power
21	Power	22	NC

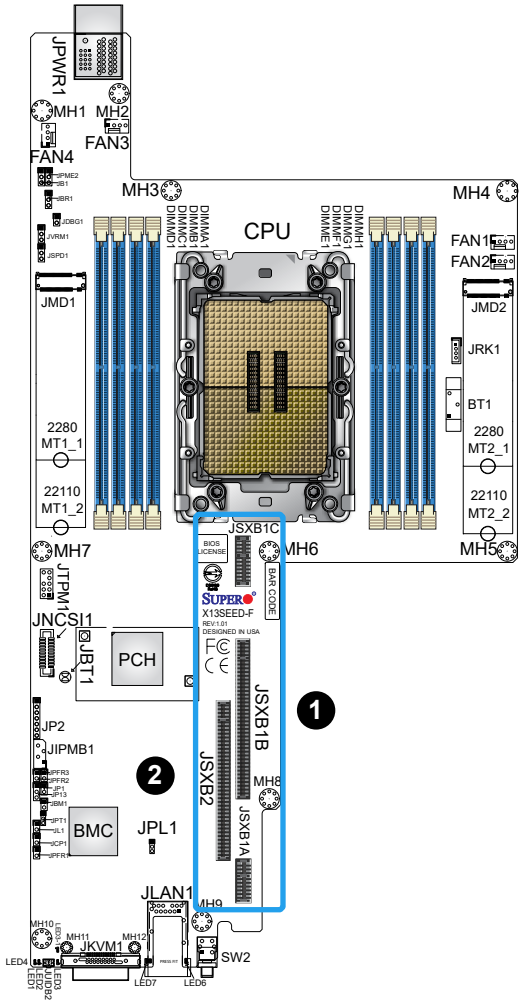
1. M.2 M-Key Connector (JMD1)
2. M.2 M-Key Connector (JMD2)
3. NC-SI Interface

PCIe 5.0 x32 Right Riser Slot with FH/HL PCIe card support

The motherboard has one PCIe 5.0 x32 right riser slot at JSXB1A/B/C. This slot supports two Full Height/Half Length (FH/HL) PCIe cards.

PCIe 5.0 x16 Left Riser Slot with LP PCIe card support

The motherboard has one PCIe 5.0 x16 slot at JSXB2. This slot supports Low Profile (LP) PCIe cards.



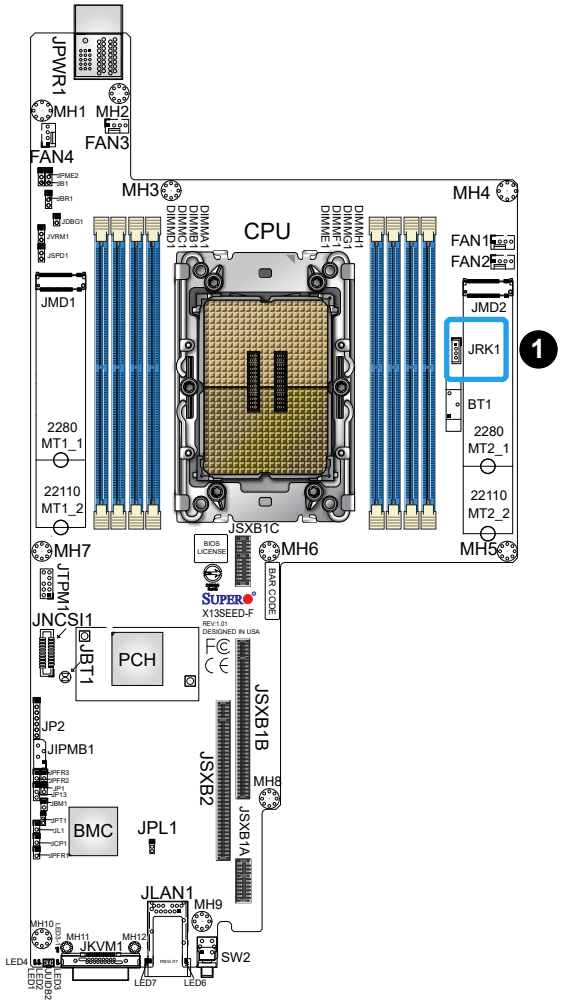
1. PCIe 5.0 x32 (JSXB1A/B/C)
2. PCIe 5.0 x16 (JSXB2)

Intel RAID Key Header

An Intel RAID Key header is located at JREK1 on the motherboard. Install an Intel RAID key on JREK1 for NVMe RAID support. Refer to the table below for pin definitions.

Note: For detailed instructions on how to configure VROC RAID settings, refer to the VROC RAID Configuration User's Guide posted on the Supermicro website at https://www.supermicro.com/support/manuals/.

Intel RAID Key Pin Definitions	
Pin#	**Definition**
1	GND
2	PU 3.3 V Stdby
3	GND
4	PCH RAID KEY

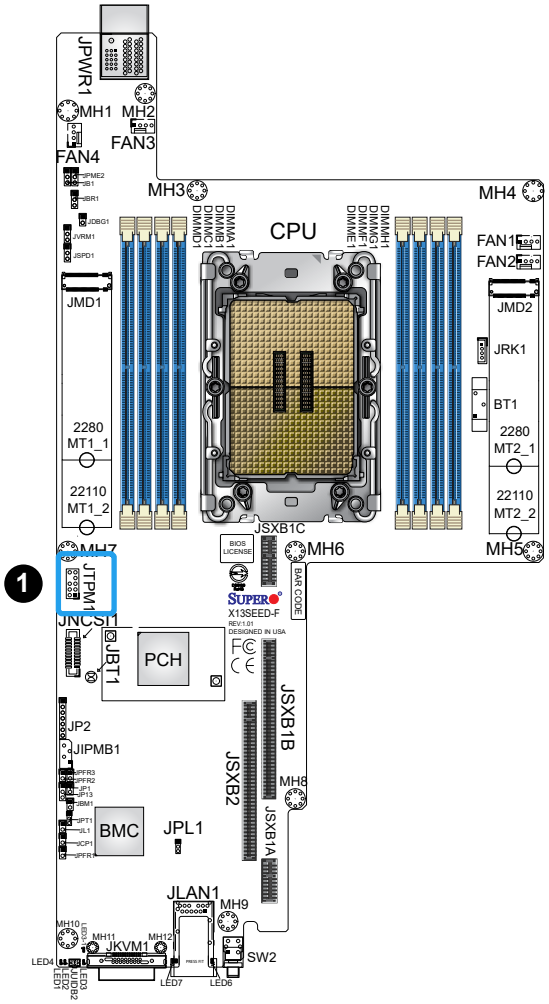


1. Intel RAID Key Header

Trusted Platform Module (TPM)/Port 80

A Trusted Platform Module (TPM) header is located at JTPM1 to provide TPM support and a Port 80 connection. Use this header to enhance system performance and data security. Refer to the table below for pin definitions. 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	+3.3 V	2	SPI_CS#
3	RESET#	4	SPI_MISO
5	SPI_CLK	6	GND
7	SPI_MOSI	8	Key
9	+3.3 V	10	SPI_IRQ#



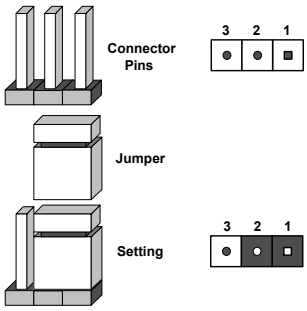
1. TPM/Port 80

2.7 Jumper Settings

How Jumpers Work

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

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



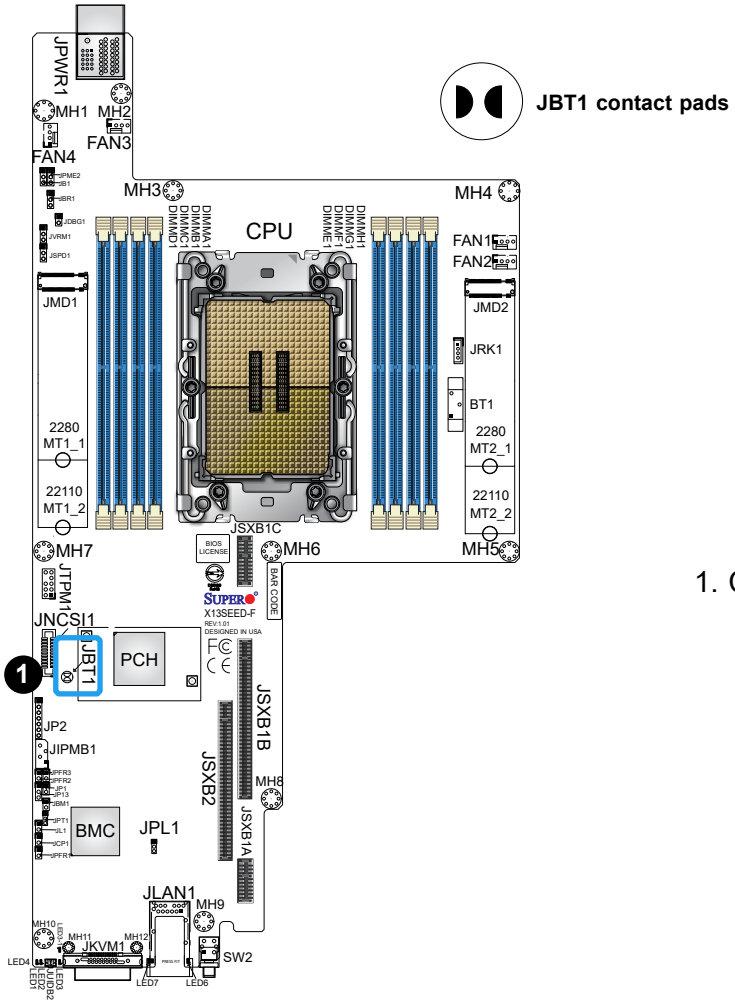
CMOS Clear

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

Note: Clearing CMOS will also clear all passwords.



1. CMOS Clear

IPMI Shared LAN Enable/Disable

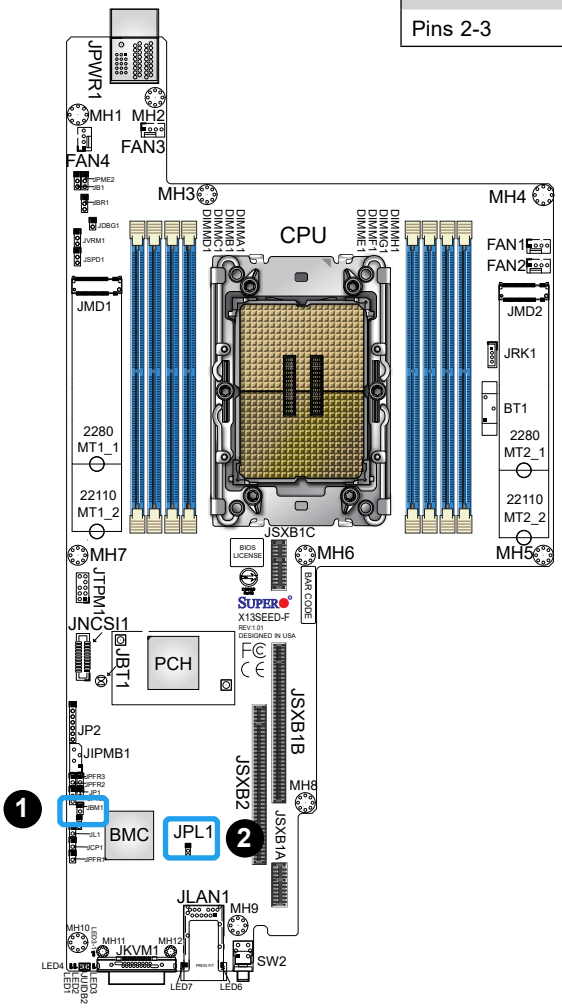
Set the JBM1 jumper to enable or disable IPMI shared access on LAN1. The default setting is Enabled.

IPMI Shared LAN Enable/Disable Jumper Settings	
Jumper Setting	**Definition**
Pins 1-2 (Open)	Enabled (Default)
Pins 1-2 (Short)	Disabled

LAN1 Enable/Disable

Change the setting of jumper JPL1 enable or disable the LAN1 port. The default setting is Enabled.

LAN1 Enable/Disable Jumper Settings	
Jumper Setting	**Definition**
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

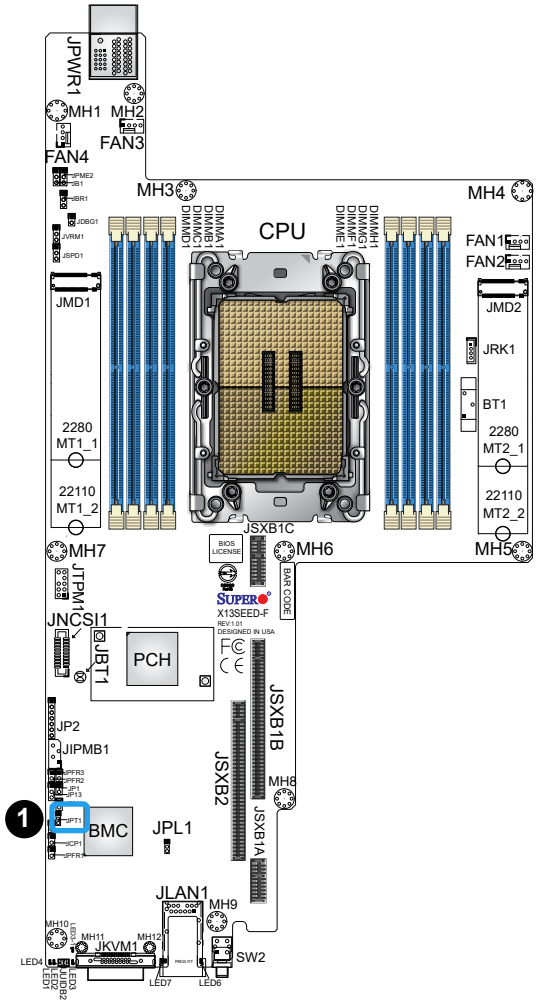


1. IPMI Shared LAN Enable/Disable
2. LAN1 Enable/Disable

Onboard TPM 2.0 Enable/Disable

Use JPT1 to enable or disable support for the onboard TPM 2.0 module. The default setting is Enabled.

TPM 2.0 Enable/Disable Jumper Settings	
Jumper Setting	**Definition**
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled



1. Onboard TPM 2.0 Enable/Disable

2.8 LED Indicators

Onboard Power LED

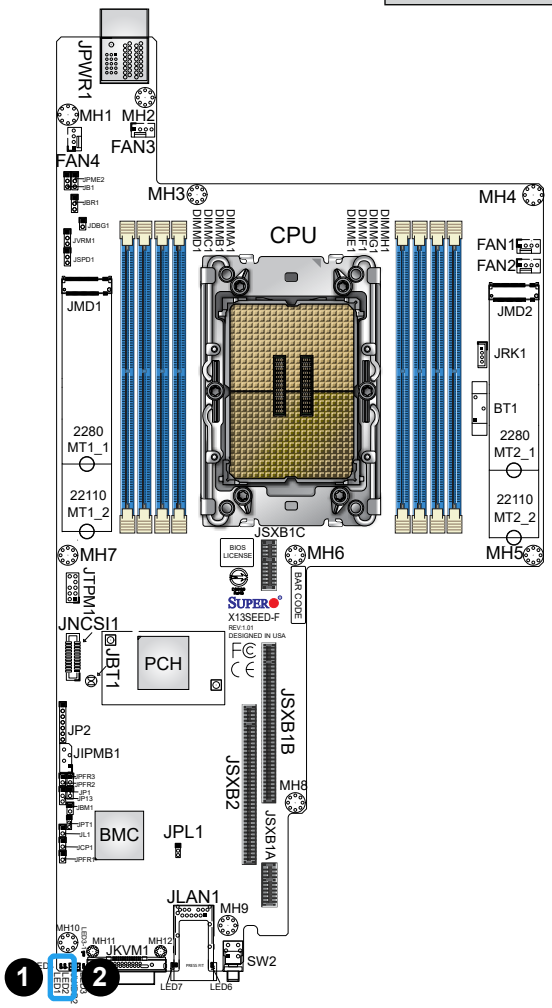
LED1 is the power LED for the motherboard. When power is detected, LED1 will indicate the status of the system power.

Onboard Power LED	
Color/State	**Definition**
Solid Green	Power On

Power/Fan Fail LED

LED2 is the Power Fan and Fail LED.

Power/Fan Fail LED	
LED Color	**Definition**
Solid Red	Power/Fan Failed



1. Onboard Power LED
2. Power/Fan Fail LED

BMC Heartbeat LED

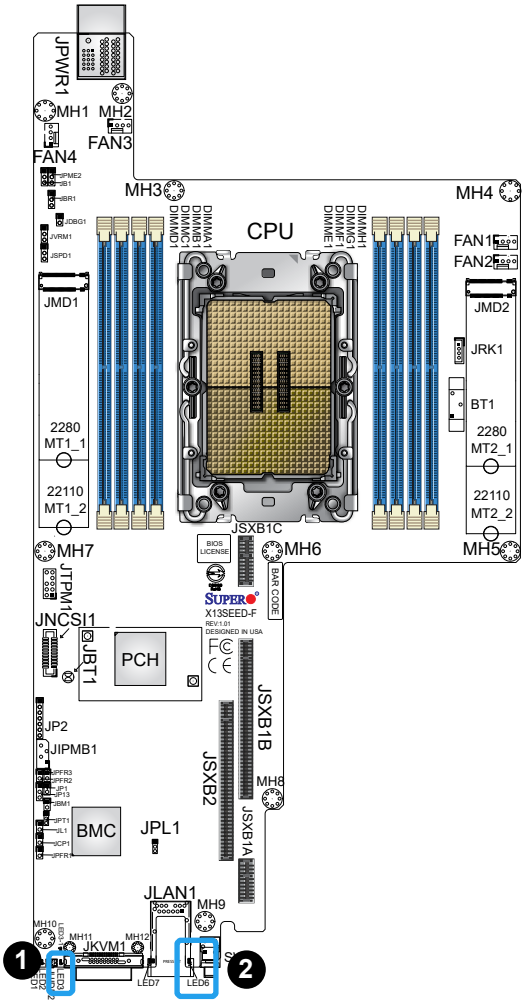
LED3 is the BMC Heartbeat LED. When the LED is blinking greenthe BMC is working.

BMC Heartbeat LED	
Color/State	**Definition**
Blinking Green	BMC Normal

RJ45 Port Activity LED

LED6 is the port activity LED for LAN1 on X13SEED-F. When the LED is yellow, the port has activity.

RJ45 Port Activity LED	
Color/State	**Definition**
Yellow	Port Activity

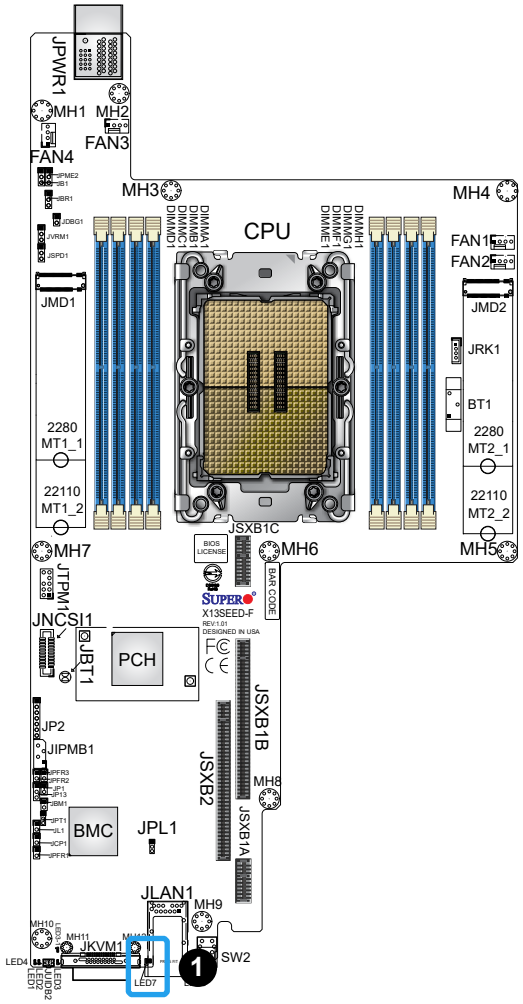


1. BMC Heartbeat LED
2. RJ45 Port Activity LED

RJ45 Link LED

LED7 is the link speed LED for LAN1 on X13SEED-F. When the LED is solid green, the link speed is 100 Mb/s. When the LED is solid amber, the link speed is 1 Gb/s.

RJ45 Link LED	
Color/State	**Definition**
Green	100 Mb/s Link
Amber	1 Gb/s Link

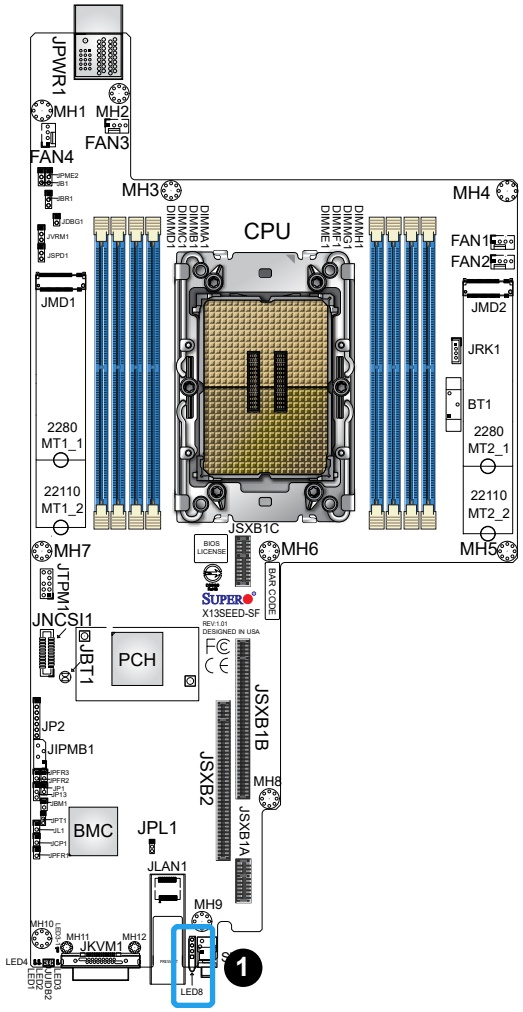


1. RJ45 Link LED

SFP LED

LED8 is two LEDs that indicate the status of LAN1 on X13SEED-SF. The top LED indicates link speed and the bottom LED indicates LAN1 port activity.

SFP LED	
Color/State	**Definition**
Yellow (Top)	1 Gb/s Link
Yellow (Bottom)	Activity



1. SFP LED

Chapter 3

Troubleshooting

3.1 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' and/or 'Returning Merchandise for Service' section(s) in this chapter. Always disconnect the AC power cord before adding, changing or installing any non hot-swap hardware components.

Before Power On

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

No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. Make sure that the ATX power connectors are properly connected.
3. Check that the 115 V/230 V switch, if available, on the power supply is properly set.
4. Turn the power switch on and off to test the system, if applicable.
5. The battery on your motherboard may be old. Check to verify that it still supplies approximately 3 VDC. If it does not, replace it with a new one.

No Video

1. If the power is on but you have no video, remove all add-on cards and cables.
2. Use the speaker to determine if any beep codes are present. Refer to Appendix A for details on beep codes.
3. Remove all memory modules and turn on the system. If the alarm is on, check the specs of memory modules, reset the memory or try a different one.

System Boot Failure

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

1. Check for any error beep from the motherboard speaker.

- If there is no error beep, try to turn on the system without DIMM modules installed. If there is still no error beep, replace the motherboard.
- If there are error beeps, clear the CMOS settings by unplugging the power cord and contacting both pads on the CMOS clear jumper (JBT1). Refer to Section 2-7 in Chapter 2.

2. Remove all components from the motherboard, especially the DIMM modules. Make sure that system power is on and that memory error beeps are activated.
3. Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this chapter.

Memory Errors

When a no-memory beep code is issued by the system, check the following:

1. Make sure that the memory modules are compatible with the system and that the DIMMs are properly and fully installed. Click on the Tested Memory List link on the motherboard product page to see a list of supported memory.
2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM type and speed for all DIMMs in the system.
3. Make sure that you are using the correct type of DIMM modules recommended by the manufacturer.
4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.
5. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in Section 2-4 in Chapter 2.
6. Follow the instructions given in the DIMM population tables listed in Section 2-4 to install your memory modules.

Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose the CMOS setup information. Refer to Section 1-6 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies approximately 3 VDC. If it does not, replace it with a new one. If the above steps do not fix the setup configuration problem, contact your vendor for repairs.

When the System Becomes Unstable

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

1. CPU/BIOS support: Make sure that your CPU is supported and that you have the latest BIOS installed in your system.
2. Memory support: Make sure that the memory modules are supported by testing the modules using memtest86 or a similar utility.

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

3. SSD support: Make sure that all solid state drives (SSDs) work properly. Replace the bad SSDs with good ones.

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

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

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

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

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

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

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

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

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

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

3.2 Technical Support Procedures

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

1. Go through the Troubleshooting Procedures and Frequently Asked Questions (FAQ) sections in this chapter or see the FAQs on our website (http://www.supermicro.com/FAQ/index.php) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our website (http://www.supermicro.com/ResourceApps/BIOS_IPMI_Intel.html).
3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:

- Motherboard model and PCB revision number
- BIOS release date/version (This can be seen on the initial display when your system first boots up.)
- System configuration

4. An example of a Technical Support form is on our website at https://webpr3.supermicro.com/SupportPortal/.

- Distributors: For immediate assistance, have your account number ready when placing a call to our Technical Support department. We can be reached by email at support@supermicro.com.

3.3 Frequently Asked Questions

Question: What type of memory does my motherboard support?

Answer: The motherboard supports up to 2 TB of DDR5 ECC RDIMM/3DSRDIMM memory with speeds of up to 5600 MT/s. To enhance memory performance, do not mix memory modules of different speeds and sizes. Follow all memory installation instructions given on Section 2-4 in Chapter 2.

Question: How do I update my BIOS?

Answer: It is recommended that you **do not** upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at http://www.supermicro.com/ResourceApps/BIOS_IPMI_Intel.html. Check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, unzip the BIOS file onto a bootable USB device. Run the batch file using the format FLASH.BAT filename.rom from your bootable USB device to flash the BIOS. Then, your system will automatically reboot.

Warning: Do not shut down or reset the system while updating the BIOS to prevent possible system boot failure!

Note: The SPI BIOS chip used on this motherboard cannot be removed. Send your motherboard back to our RMA Department at Supermicro for repair. For BIOS Recovery instructions, refer to the AMI BIOS Recovery Instructions posted at http://www.supermicro.com/support/manuals/.

3.4 Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps below:

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

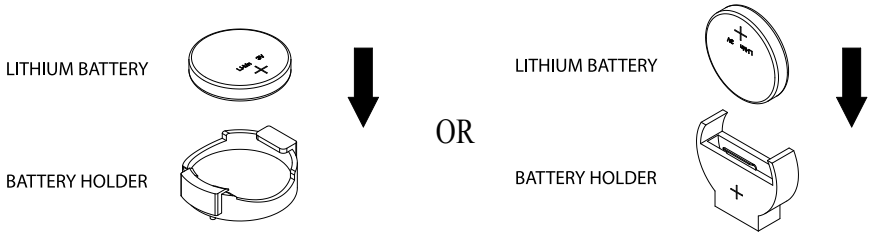
Proper Battery Disposal

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. Comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly.

Battery Installation

1. To install an onboard battery, follow steps 1 and 2 above and continue below:
2. Identify the battery's polarity. The positive (+) side should be facing up.
3. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.

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



3.5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service 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/).

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 4

UEFI BIOS

4.1 Introduction

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

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

Starting the Setup Utility

To enter the BIOS Setup Utility, hit the <Delete> key while the system is booting-up. (In most cases, the <Delete> key is used to invoke the BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.) Each main BIOS menu option is described in this manual.

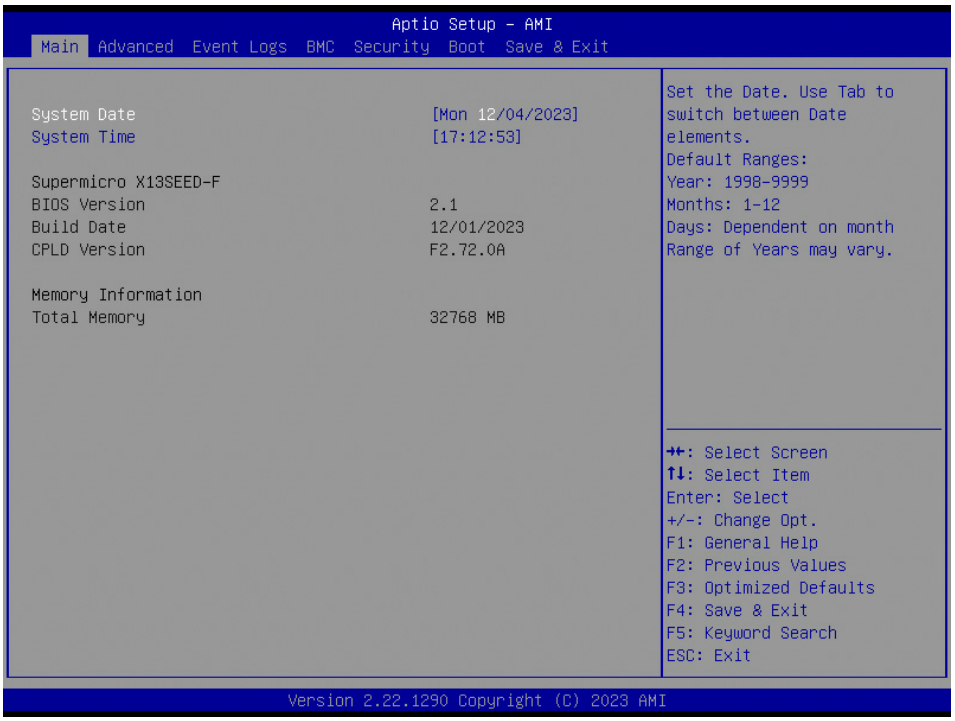
The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is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

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

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

4.2 Main Setup

You will see the Main setup screen when you first enter the AMI BIOS setup utility. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS setup screen is shown below and the following items will be displayed:



System Date/System Time

Use this option to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys. Enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in MM/DD/YYYY format. The time is entered in HH:MM:SS format.

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

Supermicro X13SEED

BIOS Version

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

Build Date

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

CPLD Version

This feature displays the version of the CPLD.

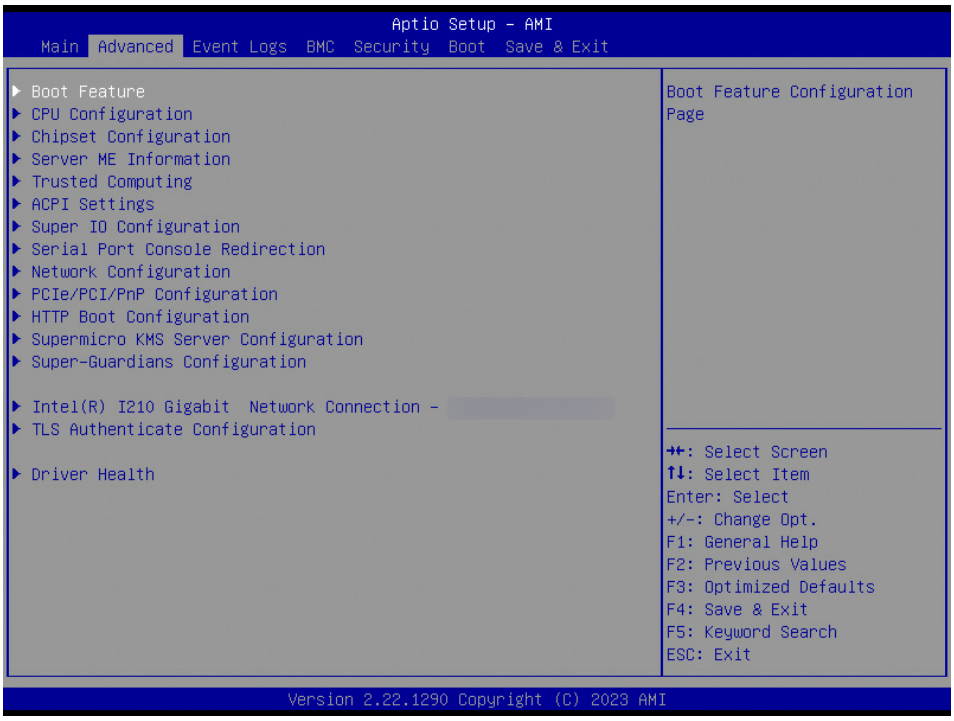
Memory Information

Total Memory

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

4.3 Advanced

Use the arrow keys to select the Advanced menu and press <Enter> to access the menu features.



Warning: Take caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency, or an incorrect DRAM timing setting may make the system unstable. When this occurs, revert to default manufacturer settings.

▶Boot Feature

Quiet Boot

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

Note: BIOS Power-on Self Test (POST) messages are always displayed regardless of the setting of this feature.

Option ROM Messages

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

Bootup NumLock State

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

Wait For "F1" If Error

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

INT19 Trap Response

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

Re-try Boot

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

▶Power Configuration

Watch Dog Function

Select Enabled to allow the Watch Dog timer to reboot the system when it is inactive for more than 5 minutes. The options are **Disabled** and Enabled.

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

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

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

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

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

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

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

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

Restore on AC Power Loss

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

Power Button Function

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

▶CPU Configuration

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

The following CPU information is displayed:

- Processor BSP Revision
- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM (Per Core)
- L2 Cache RAM (Per Core)
- L3 Cache RAM (Per Package)
- Processor 0 Version

▶Advanced Power Management Configuration

Power Technology

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

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

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

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

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

Optimized Power Mode

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

- "Power Performance Tuning" – BIOS Controls EFB
- "ENERGY_PERF_BIAS_CFG Mode" – Balanced Performance
- "Enhanced Halt State (C1E) – Enable

▶CPU P State Control

This feature allows you to the configure the following CPU power settings.

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

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

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

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

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

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

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

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

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

Select Enable for Intel Speed Select Technology-Base Frequency (SST-BF) support. The options are **Disable** and Enable.

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

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

SpeedStep (P-States)

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

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

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

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

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

▶Hardware PM State Control

Hardware P-States

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

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

SST-CP

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

▶CPU C State Control

Enabled Monitor MWAIT

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

CPU C1 Auto Demotion

Select Enable to allow the CPU to automatically demote to the CPU C1 state. The options are Disable, Enable, and **Auto**.

CPU C6 Report

Select Enable to allow the BIOS to report the CPU C6 State (ACPI C3) to the operating system. During the CPU C6 State, the power to all cache is turned off. The options are Disable, Enable, and **Auto**.

Enhanced Halt State (C1E)

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

▶Package C State Control

Package C State

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

▶CPU1 Core Disable Bitmap

Available Bitmap:

This feature displays the available bitmap.

Disable Bitmap

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

Hyper-Threading [ALL]

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

Hardware Prefetcher

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

Adjacent Cache Prefetch

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

DCU Streamer Prefetcher

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

DCU IP Prefetcher

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

LLC Prefetch

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

Extended APIC

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

Intel Virtualization Technology

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



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

Enable SMX

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

PPIN Control

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

AES-NI

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

Limit CPU PA to 46 Bits

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

TME, TME-MT, TDX

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

This feature displays the number of keys designated for TDX.

Software Guard Extension (SGX)

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

SGX Factory Reset (Available when "Memory Encryption (TME)" is set to Enabled and when your CPU supports Intel SGX).

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

SW Guard Extensions (SGX)

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

SGX Package Info In-Band Access

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

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

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

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

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

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

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

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

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

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

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

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

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

Use this feature to enable writes to SGXLEPUBKEYHASH[3..0] from OS/SW. The options are Disabled and **Enabled**. Only those CPUs that support Intel SGX Flexible Launch Control (FLC) feature have SGXLEPUBKEYHASH, which contains the hash of the public key for the SGX Launch Enclave (LE) to be signed with.

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

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

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

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

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

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

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

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

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

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

▶Chipset Configuration

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

▶North Bridge

▶Uncore Configuration

The following Uncore information is displayed:

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

Degrade Precedence

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

Link L0p Enable

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

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

Note 2: The "Full L0P Enable" option is available when a 5th Generation Intel Xeon Scalable Processor is installed.

Link L1 Enable

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

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

KTI Prefetch

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

IO Directory Cache (IODC)

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

SNC

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

Note: The "Enable SNC4 (4-clusters)" is available depending based on your system configuration and processor.

Stale AtoS

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

LLC Dead Line Alloc

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

▶Memory Configuration

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

Enforce DDR Memory Frequency POR

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

Memory Frequency

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

Data Scrambling for DDR5

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

Enable ADR

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

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

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

DDR 2x Refresh Enable

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

CXL Type 3 Legacy

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

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

▶Memory Topology

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

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

▶Page Policy

Page Policy

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

▶Memory RAS Configuration

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

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

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

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

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

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

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

Correctable Error Threshold

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

Leaky Bucket Low Bit

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

Leaky Bucket High Bit

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

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

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

Patrol Scrub

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

DDR PPR Type

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

Enhanced PPR

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

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

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

▶IIO Configuration

▶CPU1 Configuration

IOU0 (IIO PCIe Port 1)

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

IOU1 (IIO PCIe Port 2)

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

IOU2 (IIO PCIe Port 3)

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

▶JMD2 M.2-C

Link Speed

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

PCIe Port Link Status

Use this feature to view the link status of this port.

PCIe Port Link Max

Use this feature to view the max PCIe width of this port.

PCIe Port Link Speed

Use this feature to view the link speed of this port.

Data Link Feature Exchange

Use this feature to enable or disable data link feature negotiation in the Data Link Feature Capabilities (DLFCAP) register. The options are Disable and **Enable**.

PCIe Port Max Payload Size

Use this feature to set the max payload size supported in the PCIe device capabilities register. Select "Auto" to keep the hardware default. The options are 128B, 256B, 512B, and **Auto**.

Equalization Bypass to Highest Rate

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

▶JMD1 M.2-C

Link Speed

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

PCIe Port Link Status

Use this feature to view the link status of this port.

PCIe Port Link Max

Use this feature to view the max PCIe width of this port.

PCIe Port Link Speed

Use this feature to view the link speed of this port.

Data Link Feature Exchange

Use this feature to enable or disable data link feature negotiation in the Data Link Feature Capabilities (DLFCAP) register. The options are Disable and **Enable**.

PCIe Port Max Payload Size

Use this feature to set the max payload size supported in the PCIe device capabilities register. Select "Auto" to keep the hardware default. The options are 128B, 256B, 512B, and **Auto**.

Equalization Bypass to Highest Rate

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

▶IOAT Configuration

Relaxed Ordering

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

▶Intel VT for Directed I/O (VT-D)

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

Select Enable to use Intel Virtualization Technology for Direct I/O VT-d support by reporting the I/O device assignments to the Virtual Machine Monitor (VMM) through the Direct Memory Access Remap Reporting (DMAR) ACPI tables. This feature offers fully-protected I/O resource sharing across Intel platforms, providing greater reliability, security and availability in networking and data-sharing. The options are **Enable** and Disable.

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

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

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

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

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

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

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

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

▶Intel VMD Technology

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

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

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

NVMe Mode Switch

When this feature is set to Auto, VMD support will be automatically enabled when a VROC key is detected by the BIOS. The options are Manual, VMD, and **Auto**.

▶Intel VMD for Volume Management Device on CPU1 (Available when "NVMe Mode Switch" is set to Manual)

VMD Config for IOU 0/1/2

Enable/Disable VMD

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

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

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

VMD Config for IOU 3

Enable/Disable VMD

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

JMD2 M.2-C VMD (Available when the device is detected by the system and "Enable/Disable VMD" above is set to Enable)

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

VMD Config for IOU 4

Enable/Disable VMD

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

JMD1 M.2-C VMD (Available when the device is detected by the system and "Enable/Disable VMD" above is set to Enable)

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

▶PCIe Leaky Bucket Configuration

Gen2 Link Degradation

Use this feature to enable or disable the PCIe Gen2 link degradation. The options are Disable and **Enable**.

Gen3 Link Degradation

Use this feature to enable or disable the PCIe Gen3 link degradation. The options are Disable and **Enable**.

Gen4 Link Degradation

Use this feature to enable or disable the PCIe Gen4 link degradation. The options are Disable and **Enable**.

Gen5 Link Degradation

Use this feature to enable or disable the PCIe Gen5 link degradation. The options are Disable and **Enable**.

IIO-PCIe Express Global Options

==========

PCIe ASPM Support (Global)

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

PCIe Max Read Request Size

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

Equalization Bypass To Highest Rate

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

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

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

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

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

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

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

CXL Security Level

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

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

CXL Header Bypass

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

▶South Bridge

The following information is displayed:

- USB Devices

Legacy USB Support

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

XHCI Hand-off

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

Port 60/64 Emulation

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

PCIe PLL SSC

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

▶Server ME Information

The following information is displayed:

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

▶Trusted Computing

When a Trusted-Platform Module (TPM) device is detected in your machine, the following information will display:

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

Security Device Support

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

- Active PCR banks (Available when "Security Device Support" is set to Enable)
- Available PCR banks (Available when "Security Device Support" is set to Enable)

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

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

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

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

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

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

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

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

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

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

Select Enabled for Endorsement Hierarchy support, which contains separate controls to address privacy concerns because the primary keys in the hierarchy are certified by the TPM key or by a manufacturer with restrictions on how an authentic TPM device that is attached to an authentic platform can be accessed and used. A primary key can be encrypted and certified with a certificate created by using TPM2_ActivateCredential, which allows you to independently enable "flag, policy, and authorization values" without involving other hierarchies. A user with privacy concerns can disable the endorsement hierarchy while still using the storage hierarchy for TPM applications, permitting the platform software to use the TPM. The options are Disabled and **Enabled**.

PH Randomization

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

Supermicro BIOS-Based TPM Provision Support

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

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

TXT Support

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

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

Note 2: For more information on TPM, refer to the TPM manual at http://www.supermicro.com/manuals/other/TPM.pdf.

▶ACPI Settings

NUMA

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

UMA-Based Clustering

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

WHEA Support

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

High Precision Event Timer

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

▶Super IO Configuration

The following information is displayed:

- Super IO Chip

▶Serial Port 1 Configuration

Serial Port 1

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

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

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

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

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

▶SOL Configuration

SOL

Select Enabled to enable SOL (COM). The options are Disabled and **Enabled**.

Device Settings (Available when "SOL" is set to Enabled)

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

Change Settings (Available when "SOL" is set to Enabled)

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

▶Serial Port Console Redirection

COM1 (Port displayed here is based on your motherboard)

Console Redirection

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

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

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100Plus to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, **VT100+**, VT-UTF8, and ANSI.

Bits Per Second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Putty KeyPad

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

SOL (Port displayed here is based on your motherboard)

Console Redirection

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

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

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100Plus to add color and function key support. Select ANSI to use the Extended ASCII Character Set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, **VT100+**, VT-UTF8, and ANSI.

Bits Per Second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Putty KeyPad

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

▶Legacy Console Redirection Settings

Legacy Redirection COM Port

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

Resolution

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

Redirection After POST

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

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

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

Console Redirection EMS

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

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

Out-of-Band Mgmt Port

The feature selects a serial port in a client server to be used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1** and SOL. Note that the SOL option is unavailable if there is no BMC support.

Terminal Type EMS

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII character set. Select VT100Plus to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, VT100+, **VT-UTF8**, and ANSI.

Bits Per Second EMS

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

Flow Control EMS

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

The following information is displayed:

- Data Bits EMS
- Parity EMS
- Stop Bits EMS

▶Network Configuration

Network Stack

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

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

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

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

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

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

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

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

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

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

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

Media Detect Count

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

▶MAC:XX:XX:XX:XX:XX:XX-IPv4 Network Configuration

Configured

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

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

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

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

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

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

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

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

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

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

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

Save Changes and Exit

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

▶MAC:XX:XX:XX:XX:XX:XX-IPv6 Network Configuration

▶Enter Configuration Menu

The following information is displayed:

- Interface Name
- Interface Type
- MAC address
- Host addresses
- Route Table
- Gateway addresses
- DNS addresses

Interface ID

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

DAD Transmit Count

This feature displays the number of consecutive neighbor solicitation messages to be sent while performing duplicate address detection on a tentative address. When this feature is set to 0, duplicate address detection will not be performed. The default setting is **1**.

Policy

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

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

New IPv6 address

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

New Gateway address

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

New DNS address

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

Commit Changes and Exit

Press <Enter> to save changes and exit.

Discard Changes and Exit

Press <Enter> to discard changes and exit.

Save Changes and Exit

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

▶PCIe/PCI/PnP Configuration

The following information is displayed:

- PCI Bus Driver Version

PCI Devices Common Settings:

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

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

MMCFG Base

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

MMCFG Size

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



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

MMIO High Base

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

MMIO High Granularity Size

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

Re-Size BAR Support

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

SR-IOV Support

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

ARI Support

Use this feature to enable or disable Alternate Routing-ID Interpretation (ARI) support. The options are Disabled and **Enabled**.

Bus Master Enable

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

Consistent Device Name Support

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

NVMe Firmware Source

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

VGA Priority

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

For the following features, note that:



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



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



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

Onboard Video Option ROM

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

JMD1 M.2-C OPROM / JMD2 M.2-C OPROM

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

Onboard LAN1 Option ROM

Use this feature to select the type of device installed in LAN1 used for system boot. The options are **EFI** and disabled.

▶HTTP Boot Configuration

HTTP Boot Policy

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

HTTPS Boot Checks Hostname

Use this feature to allow HTTPS Boot to check if the hostname of the TLS certificate matches the hostname provided by the remote server. Selecting Disabled is a violation of RFC6125. The options are **Enabled** and Disabled (WARNING: Security Risk!!).

Priority of HTTP Boot

Instance of Priority 1

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

Select IPv4 or IPv6

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

Boot Description

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

Boot URI

Enter a Boot Uniform Research Identifier (URI). The boot URI cannot be longer than 128 characters. This Boot URI determines how IPv4 Boot Option and IPv6 Boot Option will be created. This feature is only supported on Dual or EFI Boot Mode.

▶Supermicro KMS Server Configuration

Supermicro KMS Server IP address

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

Second Supermicro KMS Server IP address

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

Supermicro KMS TCP Port number

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

KMS Time Out

Use this feature to enter the KMS server connecting time-out in seconds. The default setting is **5** seconds.

TimeZone

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

Client UserName

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

Client Password

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

KMS TLS Certificate | Size

Use the "CA Certificate," "Client Certificate," and "Client Private Key" features to enroll factory defaults or load the KMS Transport Layer Security (TLS) certificates, which are generated by the KMS Server, from a file stored in a USB flash drive.

▶CA Certificate

For the CA certificate, use this feature to enroll factory defaults or load the KMS TLS certificates from the file. The options are **Update**, Delete, and Export.

▶Client Certificate

For the client certificate, use this feature to enroll factory defaults or load the KMS TLS certificates from the file. The options are **Update**, Delete, and Export.

▶Client Private Key

For the client private key, use this feature to enroll factory defaults or load the KMS TLS certificates from the file. The options are **Update**, Delete, and Export.

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

Use this feature to change the private key password.

▶Super-Guardians Configuration

Super Guardians is a unified security solution to facilitate KMS, TPM, or USB-based authentication controls for Supermicro X13 motherboards. Use this submenu to configure the authentication policy, method, and KMS server settings.

Super-Guardians Protection Policy

Use this feature to enable the Super-Guardians Protection Policy. The options are **Storage**, System, and "System and Storage." Set this feature to Storage to protect and have secure access to Trusted Computing Group (TCG) NVMe devices with the Authentication-Key (AK). Set this feature to System to protect and have secure access to your system/motherboard with the AK. Set this feature to "System and Storage" to protect and have secure access to your TCG NVMe devices/system/motherboard with the AK.

KMS Security Policy

Set this feature to Enabled to enable the Key Management Service (KMS) Security Policy. When this feature has not previously been set to Enabled, the options are **Disabled** and Enabled. Changes take effect after you save settings and reboot the system.

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

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

When this feature has previously been set to Enabled, the options are **Enabled**, Reset, and Key Rotation. Set this feature to Key Rotation to obtain an existing Authentication-Key from the KMS server and create a new Authentication-Key. To disable the KMS Security Policy, set this feature to Reset. When this feature is set to reset, the system and TCG NVMe devices chosen in "Super-Guardians Protection Policy" will be in the unprotected mode.

KMS Server Retry Count

Use this feature to specify how many times the system will attempt reconnecting to the KMS server. Press <+> or <-> on your keyboard to change the value. The default setting is **5**. If the value is 0, the system will retry infinitely. The valid range is 0 to 10.

TPM Security Policy

Use this feature to enable or disable the TPM Security Policy. When this feature has not previously been set to Enabled, the options are **Disabled** and Enabled. Changes take effect after you save settings and reboot the system.

Note: Install a Trusted Platform Module 2.0 device to your system before configuring this feature.

When this feature has previously been set to Enabled, the options are **Enabled** and Reset. To disable the TPM Security Policy, set this feature to Reset. When this feature is set to reset, the system and TCG NVMe devices chosen in "Super-Guardians Protection Policy" will be in the unprotected mode.

Load Authentication-Key

Use this feature to toggle whether the BIOS should automatically load an Authentication-Key named TPMAuth.bin from a USB flash drive. The options are **Disabled** and Enabled. Set this feature to Enabled to load the Authentication-Key. After an Authentication Key is loaded, this option will be reset to Disabled. Changes take effect after you save settings and reboot the system.

Note 1: Connect a USB flash drive with the Authentication-Key (TPMAuth.bin) to your system before configuring this feature.

Note 2: Load the Authentication-Key after installing a TPM device. The TPM function will not work properly without an Authentication-Key.

Save Authentication-Key

Use this feature to toggle whether the BIOS should automatically save an Authentication-Key with the name TPMAuth.bin to a USB flash drive. The options are **Disabled** and Enabled. After an Authentication Key is saved, this option will be reset to Disabled. Changes take effect after you save settings and reboot the system.

Note 1: Connect a USB flash drive to your system before configuring this feature. Save the Authentication-Key and keep a backup.

Note 2: Load the Authentication-Key after installing a TPM device. The TPM function will not work properly without an Authentication-Key.

USB Security Policy

Use this feature to configure USB Security Policy settings. When this feature has not previously been set to Enabled, this feature will toggle whether the BIOS should automatically save a USB Authentication-Key named "USBAuth.bin" to a USB flash drive and begin the USB Security Policy. The options are **Disabled** and Enabled. Changes take effect after you save settings and reboot the system.

Note: Connect a USB flash drive to your system before configuring this feature. Save the USB Authentication-Key and keep a backup.

When this feature has been previously set to Enabled, the options are **Enabled** and Reset. To disable the USB Security Policy, set this feature to Reset. When this feature is set to reset, the system and TCG NVMe devices chosen in "Super-Guardians Protection Policy" will be in the unprotected mode.

▶Intel(R) I210 Gigabit Fiber Network Connection - XX:XX:XX:XX:XX:XX

Note 1: This feature is available when "Onboard LAN Option ROM Type" is set to EFI.

Note 2: The Ethernet controller and MAC addresses shown above are based on you system.

▶Firmware Image Properties

The following information is displayed:

- Family Firmware Version
- EFI Version
- Option ROM Version
- Unique NVM/EEPROM ID
- NVM Version

▶NIC Configuration

Link Speed

Use this feature to specify a port speed for the selected boot protocol. The options are **Auto Negotiated**, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, 100 Mbps Full.

Wake On LAN

If this feature is set to Enabled, the LAN port will be enabled when the system is powered on. The options are Disabled and **Enabled**.

Legacy VIrtual LAN ID

Use this feature to create a Legacy Virtual LAN ID by using an existing Virtual LAN ID or creating a new VLAN ID. Enter a value betwee 1–4094. The default setting is **0**.

PCI Virtual Functions Advertised

This feature displays the number of PCI Virtual Functions supported on this device. The default number is **1**.

Blink LEDs

Use this feature to identify the physical network port by blinking the associated LED. The default setting is **0** seconds. The maximum value is 15 seconds.

▶TLS Authenticate Configuration

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

▶Server CA Configuration

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

▶Enroll Certification

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

▶Enroll Certification Using File

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

Certification GUID

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

▶Commit Changes and Exit

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

▶Discard Changes and Exit

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

▶Delete Certification

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

▶Client Certification Configuration

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

▶Enroll Certification

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

▶Enroll Certification Using File

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

Certification GUID

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

▶Commit Changes and Exit

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

▶Discard Changes and Exit

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

▶Delete Certification

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

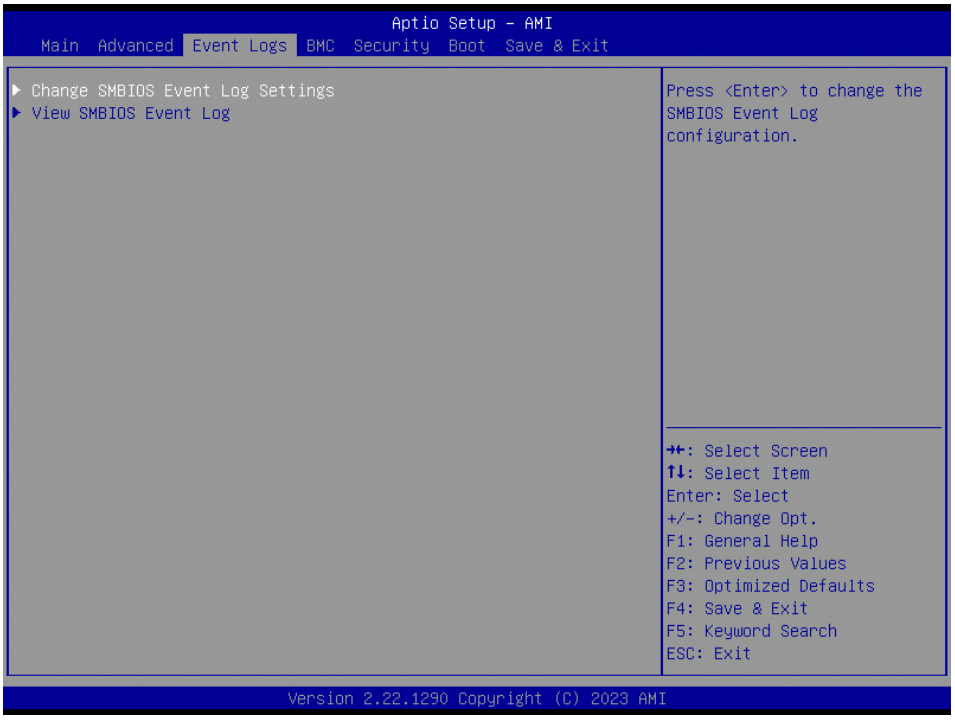
▶Driver Health

This feature displays the health information of the drivers installed in your system, including LAN controllers, as detected by the BIOS. Select one and press <Enter> to see the details.

Note: This section is provided for reference only, for the driver health status will differ depending on the drivers installed in your system. It's also based on your system configuration and the environment that your system is operating in.

4.4 Event Logs

Use this menu to configure Event Log settings.



Note: After you make any changes in this section, reboot the system for the changes to take effect.

▶Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable System Management BIOS (SMBIOS) Event Logging during system boot. The options are Disabled and **Enabled**.

Erasing Settings

Erase Event Log (Available when "SMBIOS Event Log" is set to Enabled)

Select No to keep the event log without erasing it upon next system bootup. Select Yes, Next reset to erase the event log upon next system reboot. The options are **No**, (Yes, Next reset), and (Yes, Every reset).

When Log is Full (Available when "SMBIOS Event Log" is set to Enabled)

Select Erase Immediately to immediately erase all errors in the SMBIOS event log when the event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event (Available when "SMBIOS Event Log" is set to Enabled)

Select Enabled to log system boot events. The options are Enabled and **Disabled**.

MECI (Available when "SMBIOS Event Log" is set to Enabled)

Use this feature to set the Multiple Event Count Increment (MECI) value for the multiple event counter. Enter a number between 1 to 255. The default setting is **1**.

METW (Available when "SMBIOS Event Log" is set to Enabled)

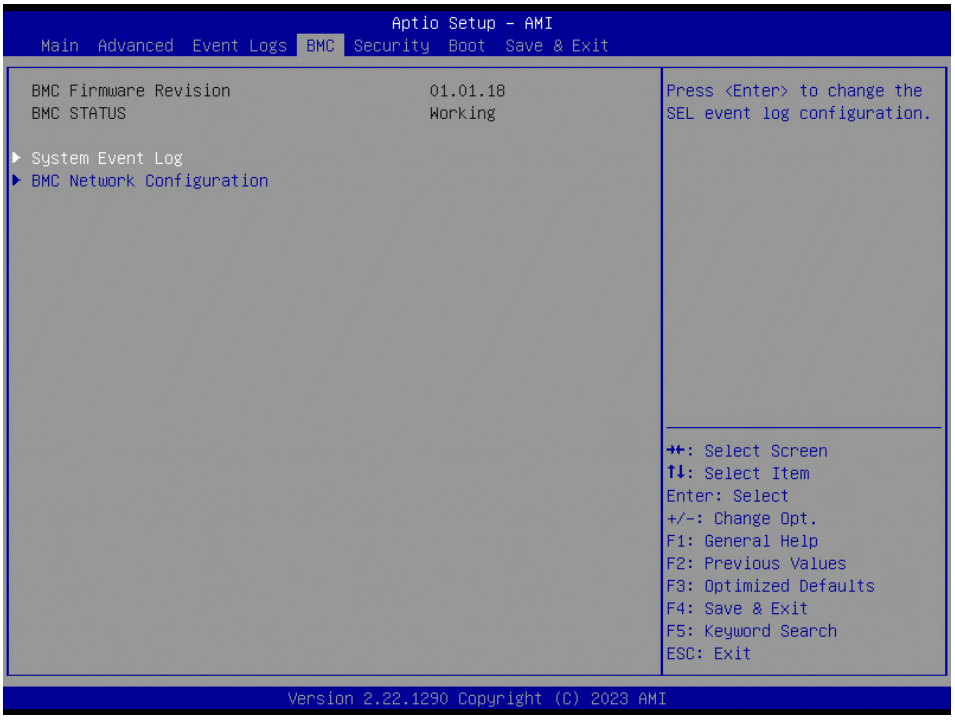
Use this feature to set how long the Multiple Event Count Time Window (METW) should the wait in minutes before generating a new event log. Enter a number between 0 to 99. The default setting is **60**.

▶View SMBIOS Event Log

This feature allows you to view the events in the SMBIOS event log. Select this submenu and press <Enter> to see the contents of the SMBIOS event log. The following categories will be displayed: Date/Time/Error Codes/Severity.

4.5 BMC

Use this feature to configure Baseboard Management Console (BMC) settings.



BMC Firmware Revision

This feature indicates the IPMI firmware revision used in your system.

BMC STATUS

This feature indicates the status of the IPMI firmware installed in your system.

▶System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled to enable all system event logging upon system boot. The options are Disabled and **Enabled**.

Erasing Settings

Erase SEL

Select (Yes, On next reset) to erase all system event logs upon next system boot. Select (Yes, On every reset) to erase all system event logs upon each system reboot. Select No to keep all system event logs after each system reboot. The options are **No,** (Yes, On next reset), and (Yes, On every reset).

When SEL is Full

This feature allows you to determine what the BIOS should do when the system event log is full. Select Erase Immediately to erase all events in the log when the system event log is full. The options are **Do Nothing** and Erase Immediately.

Note: After making changes on a setting, be sure to reboot the system for the changes to take effect.

▶BMC Network Configuration

Update BMC LAN Configuration

Select Yes for the BIOS to implement all IP/MAC address changes upon next system boot. The options are **No** and Yes.

****

Configure IPv4 Support

****

BMC LAN Selection

Use this feature to select the type of the IPMI LAN. The default setting is **Failover (Auto Mode)**.

BMC Network Link Status:

This feature displays the status of the IPMI network link for this system. The default setting is **Dedicated LAN**.

Configuration Address Source (Available when "Update BMC LAN Configuration" is set to Yes)

Use this feature to select the source of the IPv4 connection. If Static is selected, you will need to know the IP address of IPv4 connection and enter it to the system manually in the field. If DHCP is selected, the BIOS will search for a Dynamic Host Configuration Protocol (DHCP) server in the network that is attached to and request the next available IP address for this computer. The options are Static and **DHCP**.

Station IP Address (Available when "Configuration Address Source" is set to Static)

This feature displays the Station IP address in decimal and in dotted quad form (i.e., 172.29.176.131).

Subnet Mask (Available when "Configuration Address Source" is set to Static)

This feature displays the sub-network that this computer belongs to. The value of each three digit number separated by dots should not exceed 255.

Station MAC Address (Available when "Configuration Address Source" is set to Static)

This feature displays the Station MAC address for this computer. Mac addresses are six two-digit hexadecimal numbers.

Gateway IP Address (Available when "Configuration Address Source" is set to Static)

This feature displays the Gateway IP address for this computer. This should be in decimal and in dotted quad form (i.e., 172.29.0.1).

VLAN (Available when "Update BMC LAN Configuration" is set to Yes)

This feature displays the status of virtual LAN (VLAN) support. The options are **Disable** and Enable.

VLAN ID (Available when "VLAN" is set to Enable)

Use this feature to create a new VLAN ID by using an existing VLAN or creating a new VLAN ID. Enter a valid value between 1–4094. The default setting is 1.

****

Configure IPv6 Support

****

IPv6 Address Status

This feature displays the status of the IPv6 address.

IPv6 Support

Use this feature to enable IPv6 support. The options are **Enabled** and Disabled.

Configuration Address Source (Available when "IPv6 Support" is set to Enabled)

Use this feature to select the source of the IPv6 connection. If Static Configuration is selected, you will need to know the IP address of IPv6 connection and enter it to the system manually in the field. If the other two options are selected, the BIOS will search for a DHCP server in the network that is attached to and request the next available IP address for this computer. The options are Static Configuration, **DHCPv6 Stateless**, and DHCPv6 Stateful.

IPv6 Address ("Static", "DHCPv6 Stateless", or "DHCPv6 Stateful", depending on the option you selected for "Configuration Address Source" above)

This feature displays the station IPv6 address. Press <Enter> to change the setting.

Prefix Length (Available when "Configuration Address Source" is set to Static Configuration)

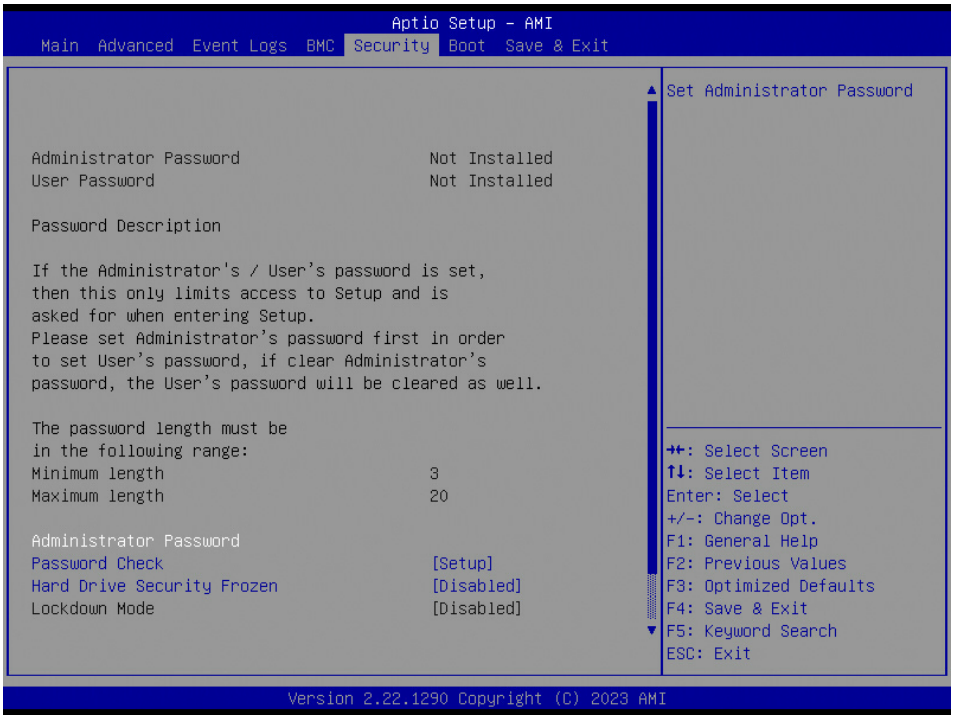
This feature displays the prefix length. Press <Enter> to change the setting.

Gateway IP (Available when "Configuration Address Source" is set to Static Configuration)

Use this feature to enter the IPv6 gateway IP address. Press <Enter> to change the setting.

4.6 Security

Use this menu to configure the following security settings for the system.



Disable Block Sid (Available when your storage devices support TCG)

Select Enabled to allow SID authentication to be performed in TCG storage devices. The options are **Disabled** and Enabled.

The following information is displayed:

- Administrator Password
- User Password
- Password Description

Administrator Password

This feature indicates if an administrator password has been installed. It also allows you to set the administrator password which is required to enter the BIOS Setup utility. The length of the password should be from three characters to 20 characters long.

User Password (Available when "Administrator Password" has been set)

This feature indicates if a user password has been installed. It also allows you to set the user password which is required to enter the BIOS Setup utility. The length of the password should be from three characters to 20 characters long.

Password Check

Select Setup for the system to check for a password at Setup. Select Always for the system to check for a password at bootup and upon entering the BIOS Setup utility. The options are **Setup** and Always.

Hard Drive Security Frozen

Select Enabled to freeze the Lock Security feature for HDD to protect key data in hard drives from being altered. The options are **Disabled** and Enabled.

Lockdown Mode (Available when the DCMS key is activated)

Select Enabled to support Lockdown Mode that will prevent the existing data or keys stored in the system from being altered or changed in an effort to preserve system integrity and security. The options are **Disabled** and Enabled.

▶Supermicro Security Erase Configuration

Note: For more information, refer to https://www.supermicro.com/manuals/other/X11_X12_X13_B11_B12_B13_H11_H12_BH12_H13_Secure_Erase_Guide.pdf.

This section allows you to configure the Supermicro-proprietary Security Erase settings. When this section is selected, the following information is displayed. Please note that the order of the following information may differ based on the storage devices being detected.

- HDD Name: This feature displays the name of the storage device that is detected by the BIOS.
- HDD Serial Number: This feature displays the serial number of the storage device that is detected by the BIOS.
- Security Mode: This feature displays the security mode of the storage device that is detected by the BIOS.
- Estimated Time: This feature displays the estimate time needed to perform the selected Security Erase features.
- HDD User Pwd Status: This feature indicates if a password has been set as a storage device user password which allows you to configure Supermicro Security Erase settings on the storage device by using this user password.
- TCG Device Type: This feature displays the TCG device type detected by the system.
- Admin Pwd Status: This feature indicates if a password has been set as a storage device administrator password which allows you to configure Supermicro Security Erase settings on the storage device by using this administrator password.

Security Function

Select Set Password to set a storage device password which allows you to configure the security settings of the storage device. Select Security Erase - Password to enter a storage device user password to allow you to erase the password and the contents previously stored in the storage device. Select Security Erase - Without Password to use the manufacturer default password "111111111" as the storage device user password and allow you to erase the contents of the storage device by using this default password. The options are **Disable**, Set Password, Change Password, Clear Password, Security Erase - Password, Security Erase - PSID, and Security Erase - Without Password.

Note 1: The Security Erase - Physical Security Identification (PSID) option is based on the storage device support.

Note 2: The Change Password and Clear Password options are available when the "Password" feature has been set.

Note 3: The Set Password option is not available when the "Password" feature has not been set.

Password

Use this feature to set the storage device user password which allows you to configure the Supermicro Security Erase settings by using this user password.

New Password (Available when "Password" above has been set)

Use this feature to set the new user password for the storage device which allows you to configure the Supermicro Security Erase settings by using this new user password.

HDD Security Configuration:

This section is available when a storage device is detected by the BIOS. Press <Enter> to select a device and the following features will be displayed:

- HDD Password Description:
- HDD PASSWORD CONFIGURATION:
  - Security Supported
  - Security Enabled:
  - Security Frozen:
  - HDD User Pwd Status:
  - HDD Master Pwd Status:

Set User Password (Available when "Security Frozen" is set to No)

Press <Enter> to set the HDD user password.

▶Secure Boot

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

The following information is displayed:

- System Mode
- Secure Boot

Secure Boot

Select Enabled to configure Secure Boot settings. The options are **Disabled** and Enabled.

Secure Boot Mode

Use this feature to select the desired secure boot mode for the system. The options are Standard and **Custom**.

CSM Support

If this feature is set to Enabled, legacy BIOS boot mode will be supported by the system. Please make sure you use the device with compatibility support for legacy boot. The options are Disabled and **Enabled**.

▶Enter Audit Mode (Available when "Secure Boot Mode" is set to Custom)

Select Ok to enter the Audit Mode workflow. It will result in erasing of Platform Key (PK) variables and reset system to the Setup/Audit Mode

▶Enter Deployed Mode / Exit Deployed Mode (Available when "Secure Boot Mode" is set to Custom)

Select Ok to reset the system to the User Mode or to the Deployed Mode.

▶Key Management (Available when "Secure Boot Mode" is set to Custom)

The following information is displayed:

- Vendor Keys

Provision Factory Defaults

Select Enabled to install provisioned factory default settings after a platform reset while the system is in Setup Mode. The options are **Disabled** and Enabled.

▶Restore Factory Keys (Available when any secure keys have been installed)

Select Yes to restore manufacturer default keys to ensure system security. The options are **Yes** and No. Selecting Yes will reset the system to the Deployed mode.

▶Reset to Setup Mode (Available when any secure keys have been installed)

This feature resets the system to the Setup mode. The options are **Yes** and No.

▶Export Secure Boot Variables (Available when any secure keys have been installed)

This feature exports the NVRAM contents of secure boot variables to a storage device. The options are **Yes** and No.

▶Enroll EFI Image

This feature allows the Efi image to run in secure boot mode, which will enroll the SHA256 Hash certificate of a PE image into the Authorized Signature Database (DB).

Secure Boot variable / Size / Keys / Key Source

▶Platform Key (PK)

Use this feature to enter and configure a set of values to be used as platform firmware keys for the system. These values also indicate the sizes, keys numbers, and the sources of the authorized signatures. Select Update to update the platform key.

▶Key Exchange Keys (KEK)

Use this feature to enter and configure a set of values to be used as Key-Exchange-Keys for the system. These values also indicate the sizes, keys numbers, and the sources of the authorized signatures. Select Update to update your "Key Exchange Keys". Select Append to append your "Key Exchange Keys".

▶Authorized Signatures (db)

Use this feature to enter and configure a set of values to be used as Authorized Signatures for the system. These values also indicate the sizes, keys numbers, and the sources of the authorized signatures. Select Update to update your "Authorized Signatures". Select Append to append your "Authorized Signatures".

▶Forbidden Signatures (dbx)

Use this feature to enter and configure a set of values to be used as Forbidden Signatures for the system. These values also indicate sizes, key numbers, and key sources of the forbidden signatures. Select Update to update your "Forbidden Signatures". Select Append to append your "Forbidden Signatures".

▶Authorized TimeStamps (dbt)

This feature allows you to set and save the timestamps for the authorized signatures which will indicate the time when these signatures are entered into the system. These values also indicate sizes, keys, and key sources of the authorized timestamps. Select Update to update your "Authorized TimeStamps". Select Append to append your "Authorized TimeStamps".

▶OsRecovery Signature (dbr)

This feature allows you to set and save the authorized signatures used for OS recovery. Select Update to update your "OS Recovery Signatures". These values also indicate sizes, keys, and key sources of the OsRecovery signatures. Select Append to append your "OS Recovery Signatures".

TCG Storage Security Configuration:

▶(Storage Device Name) (Available when the storage device is compliant with TCG specifications)

Select this device. Press <Enter> and the following information is displayed:

- TCG Storage Security Password Description:
- PASSWORD CONFIGURATION:
  - Security Subsystem Class:
  - Security Supported:
  - Security Enabled:
  - Security Locked:
  - Security Frozen:
  - Admin Pwd Status:

Set Admin Password

Use this feature to set the administrator password for this storage device.

Set User Password (Available when the administrator password has been set)

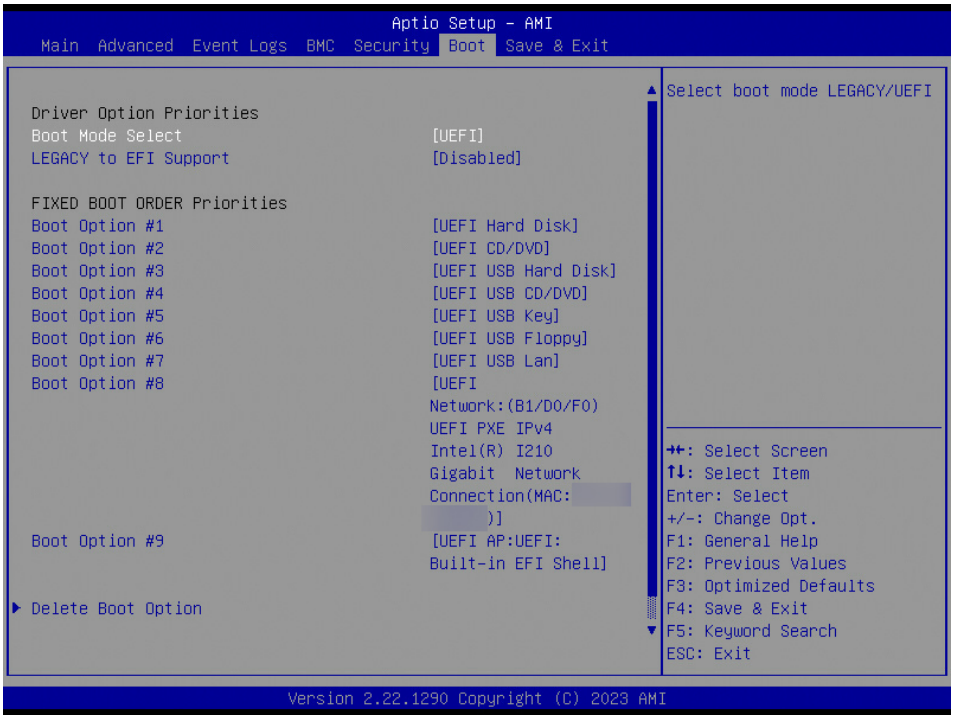
Use this feature to set the user password for this storage device.

Device Reset

Use this feature to reset the password configuration for this storage device.

4.7 Boot

Use this menu to configure Boot settings.



Boot Mode Select

Use this feature to select the type of devices from which the system will boot. The options are Legacy, **UEFI**, and Dual.

Note: When "Boot Mode Select" is set to Dual, all OPROM-related features will be set to Legacy.

Fixed Boot Order Priorities

This option prioritizes the order of bootable devices that the system boots from. Press <Enter> on each entry from top to bottom to select devices.

LEGACY to EFI Support

Select Enabled to boot EFI OS support after Legacy boot order has failed. The options are **Disabled** and Enabled.

FIXED BOOT ORDER Priorities

This feature sets the order priority of bootable devices from which the system will boot. Press <enter> on each item to select devices.

- Boot Option #1
- Boot Option #2
- Boot Option #3
- Boot Option #4
- Boot Option #5
- Boot Option #6
- Boot Option #7
- Boot Option #8
- Boot Option #9

▶Add New Boot Option (Available when any storage device is detected by the BIOS)

This feature allows you to add a new boot option to the boot priority features for system boot.

Add boot option

This feature allows you to specify the name for the new boot option.

Path for boot option

Use this feature to enter the path for the new boot option in the format fsx:\path\filename.efi.

Boot option File Path

This feature allows you to specify the file path for the new boot option.

Create

After the name and the file path for the boot option are set, press <Enter> to create the new boot option in the boot priority list.

▶Delete Boot Option

This feature allows you to select a boot device to delete from the boot priority list.

Delete Boot Option

This feature allows you to remove an EFI boot option from the boot priority list.

▶UEFI NETWORK Drive BBS Priorities

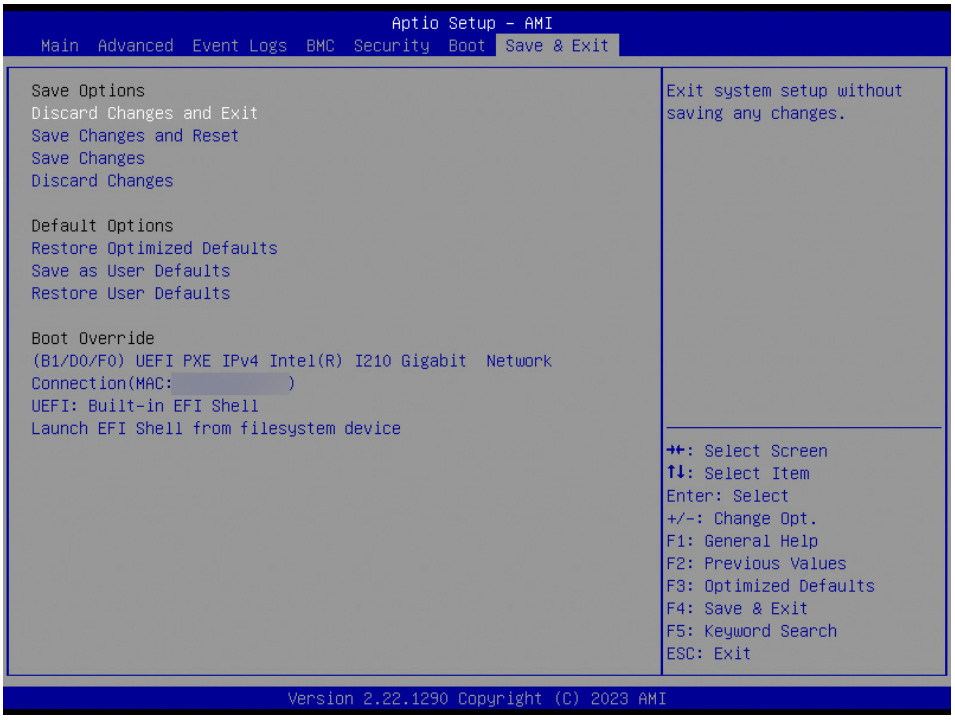
This feature sets the system boot order of detected devices.

▶UEFI Application Boot Priorities

This feature sets the system boot order of detected devices.

4.8 Save & Exit

Use this menu to save settings and exit from the BIOS.



Save Options

Discard Changes and Exit

Use this feature to exit from the BIOS Setup utility without making any permanent changes to the system configuration and reboot the computer.

Save Changes and Reset

When you have completed the system configuration changes, use this feature to exit the BIOS Setup utility and reboot the computer for the new system configuration parameters to become effective.

Save Changes

When you have completed the system configuration changes, use this feature to save all changes you've made. This will not reset (reboot) the system.

Discard Changes

Select this feature and press <Enter> to discard all the changes you've made and return to the BIOS Setup utility.

Default Options

Restore Optimized Defaults

Select this feature and press <Enter> to load manufacturer optimized default settings which are intended for maximum system performance but not for maximum stability.

Note: Please reboot the system for the changes to take effect to ensure that your system has the optimized default settings.

Save as User Defaults

Select this feature and press <Enter> to save all changes on the default values specified to the BIOS Setup utility for future use.

Restore User Defaults

Select this feature and press <Enter> to retrieve user-defined default settings that have been saved previously.

Boot Override

This feature allows you to override the Boot priorities sequence in the Boot menu, and immediately boot the system with a device specified instead of the one specified in the boot list. This is a one-time override.

Appendix A

BIOS Codes

A.1 BIOS POST Codes

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

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

Appendix B

Software

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

B.1 Microsoft Windows OS Installation

If you will be using RAID, you must configure RAID settings before installing the Windows OS and the RAID driver. Refer to the RAID Configuration User Guides posted on our website at www.supermicro.com/support/manuals.

Installing the OS

1. Create a method to access the MS Windows installation ISO file. That might be a USB flash or media drive.
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.

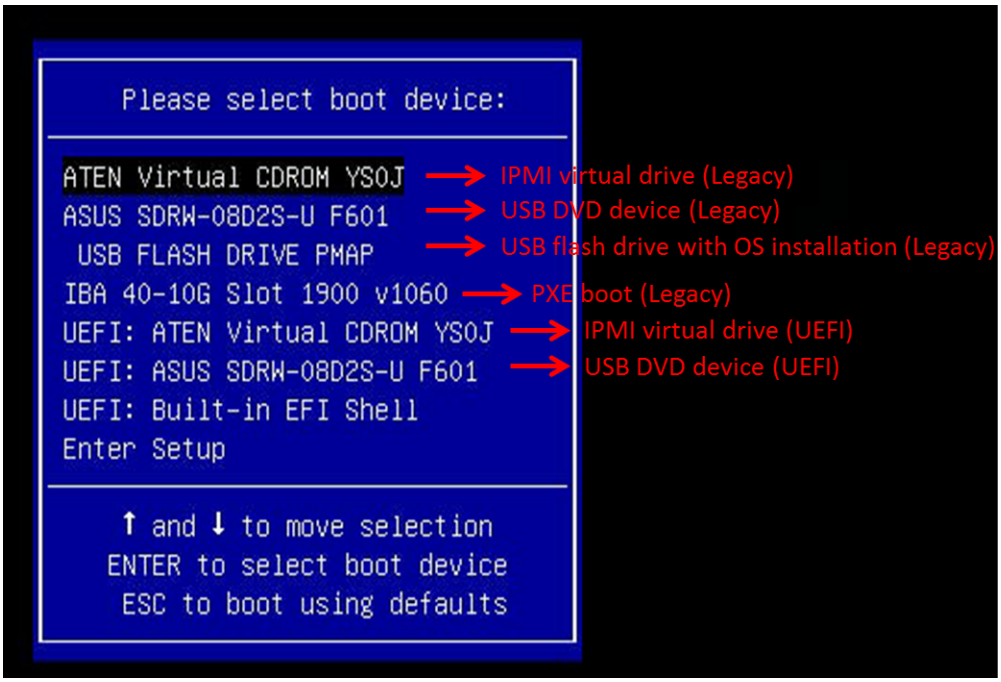


Figure B-1. Select Boot Device

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.

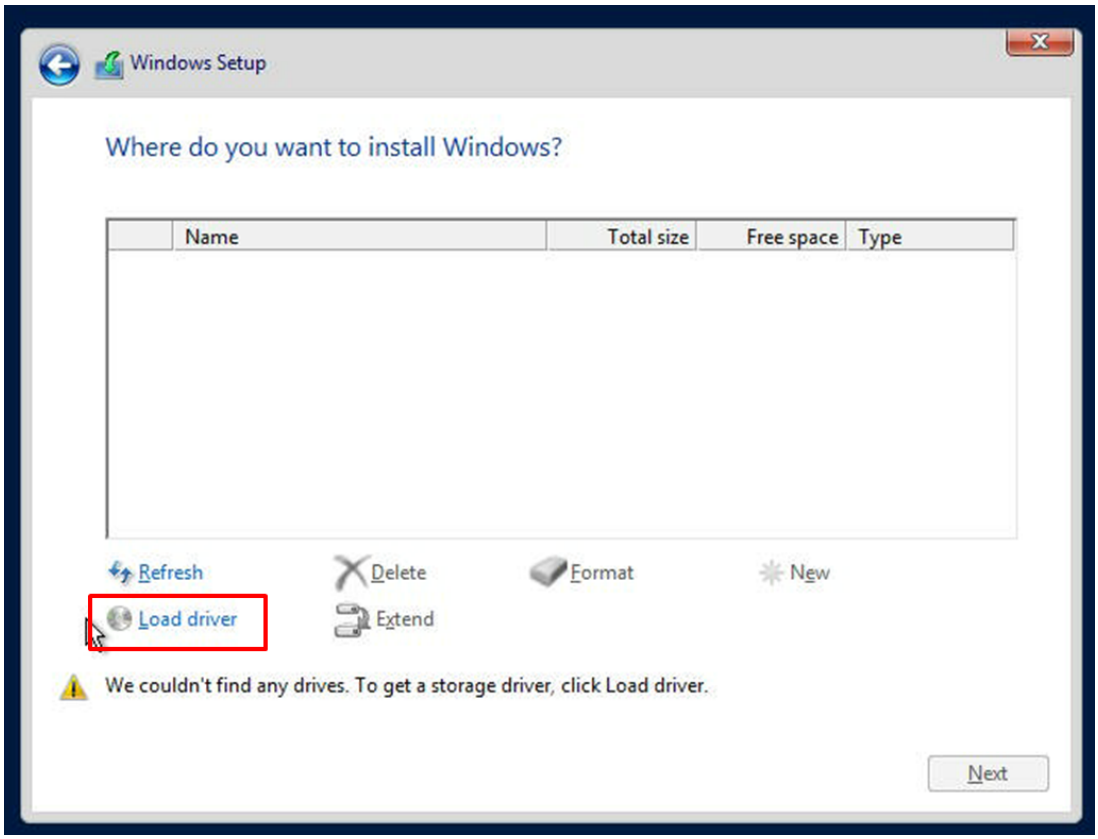


Figure B-2. Load Driver Link

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.

B.2 Driver Installation

The Supermicro website that contains drivers and utilities for your system is 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 or media drive. You may also use a utility to extract the ISO file if preferred.

Another option is to go to the Supermicro website at http://www.supermicro.com/products/. Find the product page for your motherboard, and "Download the Latest Drivers and Utilities".

Insert the flash drive or disk and the screenshot shown below should appear.

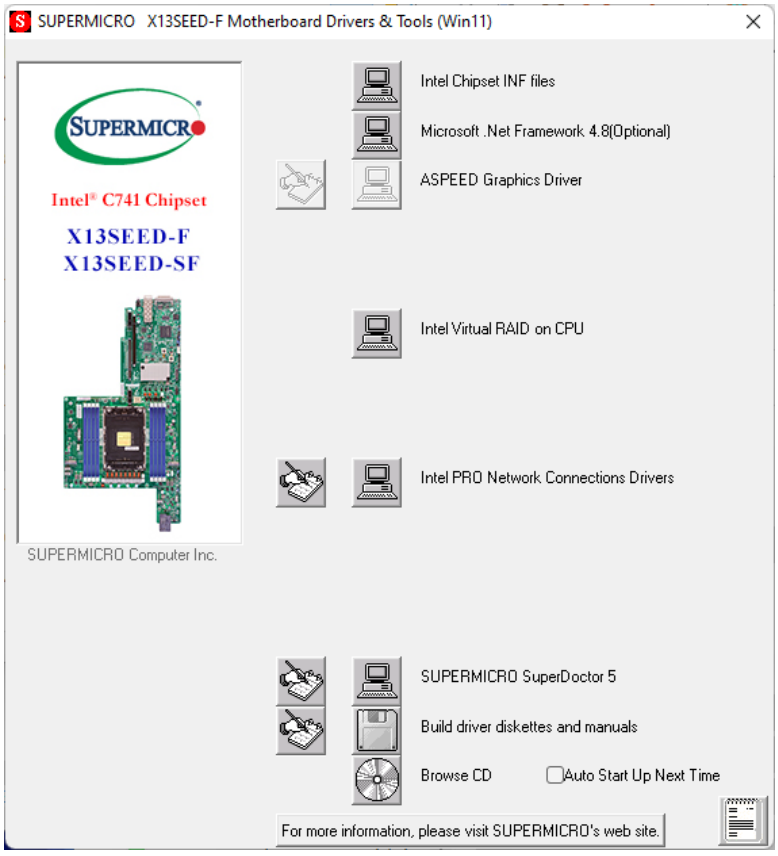


Figure B-1. Driver & Tool Installation Screen

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 bottom one at a time. **After installing each item, you must reboot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents.

B.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. SuperDoctor 5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.

Note: The default User Name and Password for SuperDoctor 5 is ADMIN / ADMIN.

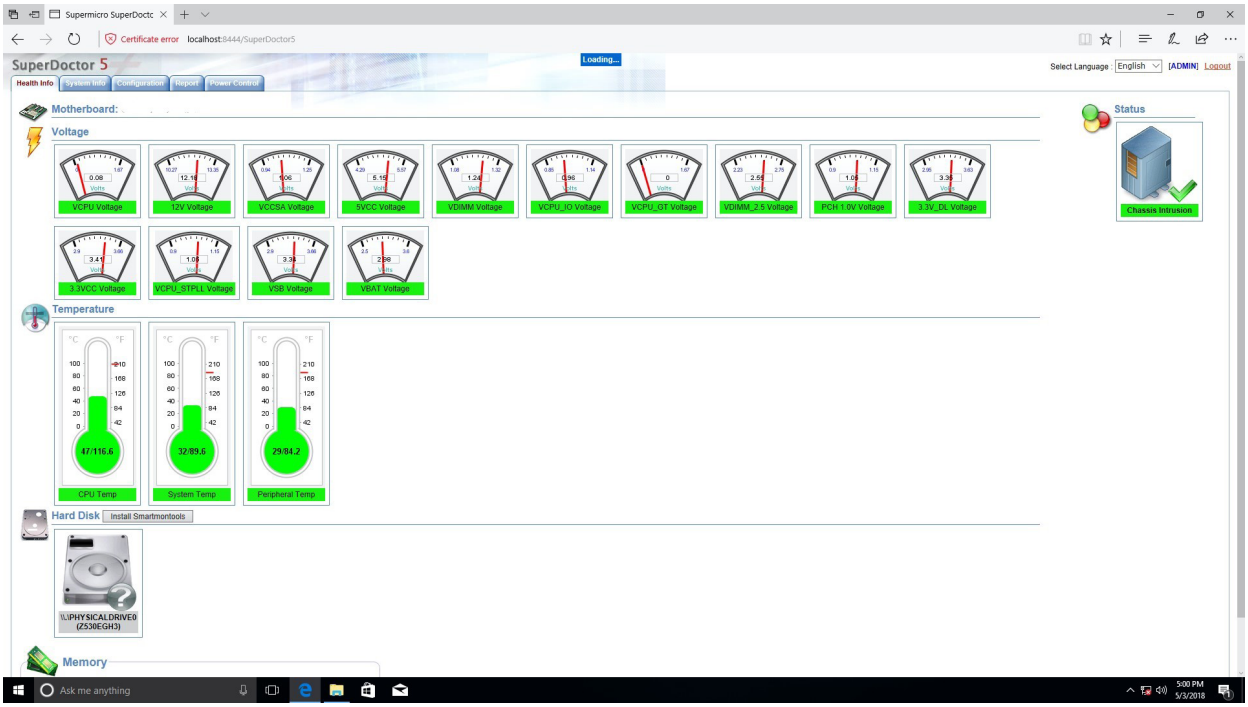


Figure B-2. SuperDoctor 5 Interface Display Screen (Health Information)

Appendix C

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 section in its entirety before installing or configuring components.

These warnings may also be found on our website at http://www.supermicro.com/about/policies/safety_information.cfm.

Battery Handling



Warning! There is the danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions

電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメーカーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従って処分して下さい。

警告

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

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף
את הסוללה בסוג התואם מחברת יצרן מומלצת.
סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة اسحبذال البطارية بطريقة غير صحيحة فعليل
اسحبذال البطارية
فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة
جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

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

Waarschuwing

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

Product Disposal



Warning! Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

סילוק המוצר

אזהרה!

סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القانين واللائح البطنية

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.