

X13SEVR-SP13F

USER'S MANUAL

Revision 1.0a

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Manual Revision 1.0a

Release Date: May 10, 2024

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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 X13SEVR-SP13F motherboard.

About This Motherboard

The Supermicro X13SEVR-SP13F motherboard supports a 4th/5th Generation Intel® Xeon processor with up to 32 cores and TDP of up to 225 W in an LGA6477 socket. Built with the Intel C741 chipset, the X13SEVR-SP13F supports up to 2 TB of DDR5 ECC RDIMM (3DS) memory in eight slots with speeds of up to 5600 MT/s. The motherboard supports one M.2 PCIe 5.0 x4 M-Key slots in the 2280 form factors slots and two SATA 3.0 connector for flexible storage option. It has 12 SFP28 LAN ports with PTP and SyncE support, and an onboard GNSS chip to receive GNSS signal as time sync clock reference. It also has four SMA connectors (two input, two output) to receive or provide 1 PPS and 10 MHz signal with another system. Besides, it also offers one NC-SI (I210) and one NC-SI (E810) (only E810_US3 port 0 supports the NC-SI function) for BMC management. The X13SEVR-SP13F motherboard is optimized for high-performance, high-end computing platforms that address Telco, Cloud, and IoT embedded needs with a short depth Edge server solution. 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 while 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 proper system setup.

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Chapter 1

Introduction

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

In additon to the motherboard, several important parts that are included in the retail box are listed below. If anything listed is damaged or missing, please contact your retailer.

1.1 Checklist

Main Parts List		
Description	**Part Number**	**Quantity**
Supermicro Motherboard	X13SEVR-SP13F	1
Quick Reference Guide	MNL-2633-QRG	1

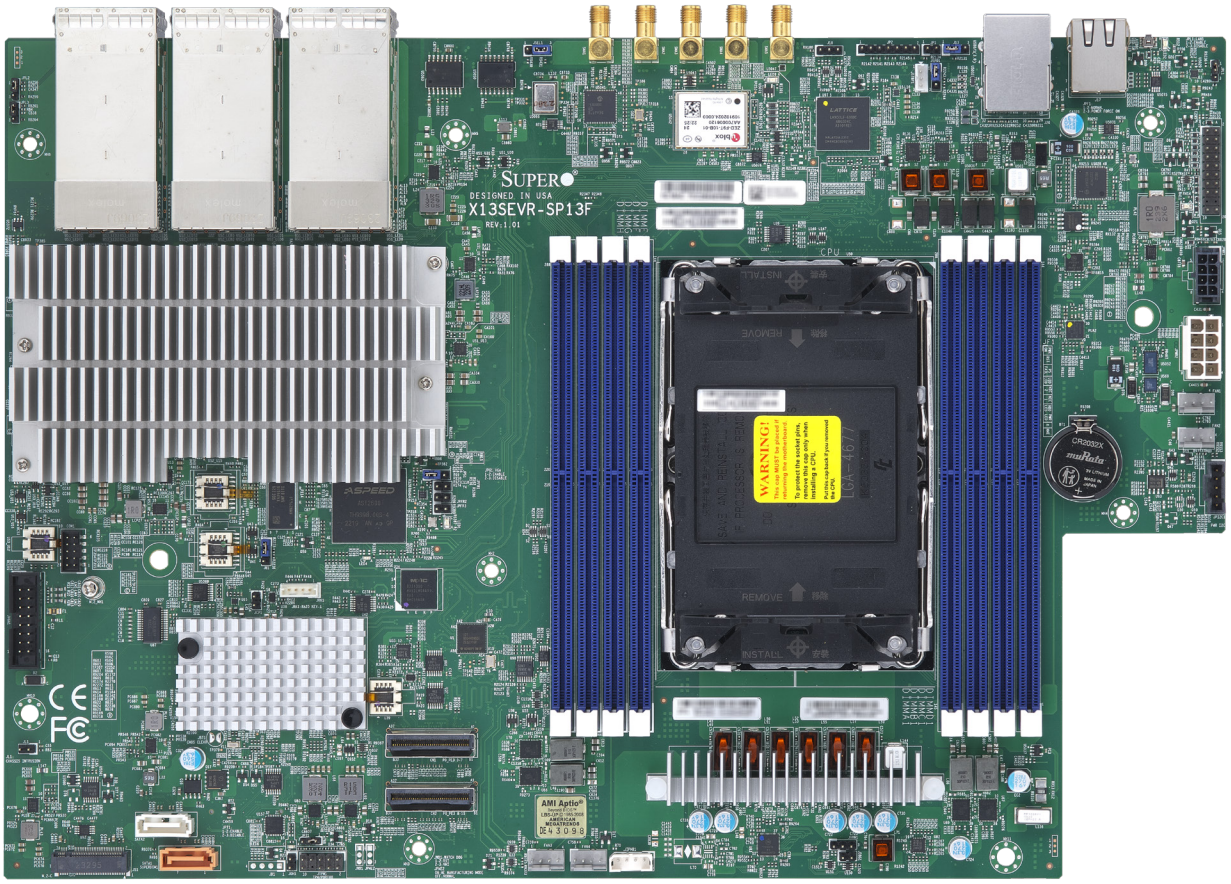
Important Links

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

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

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

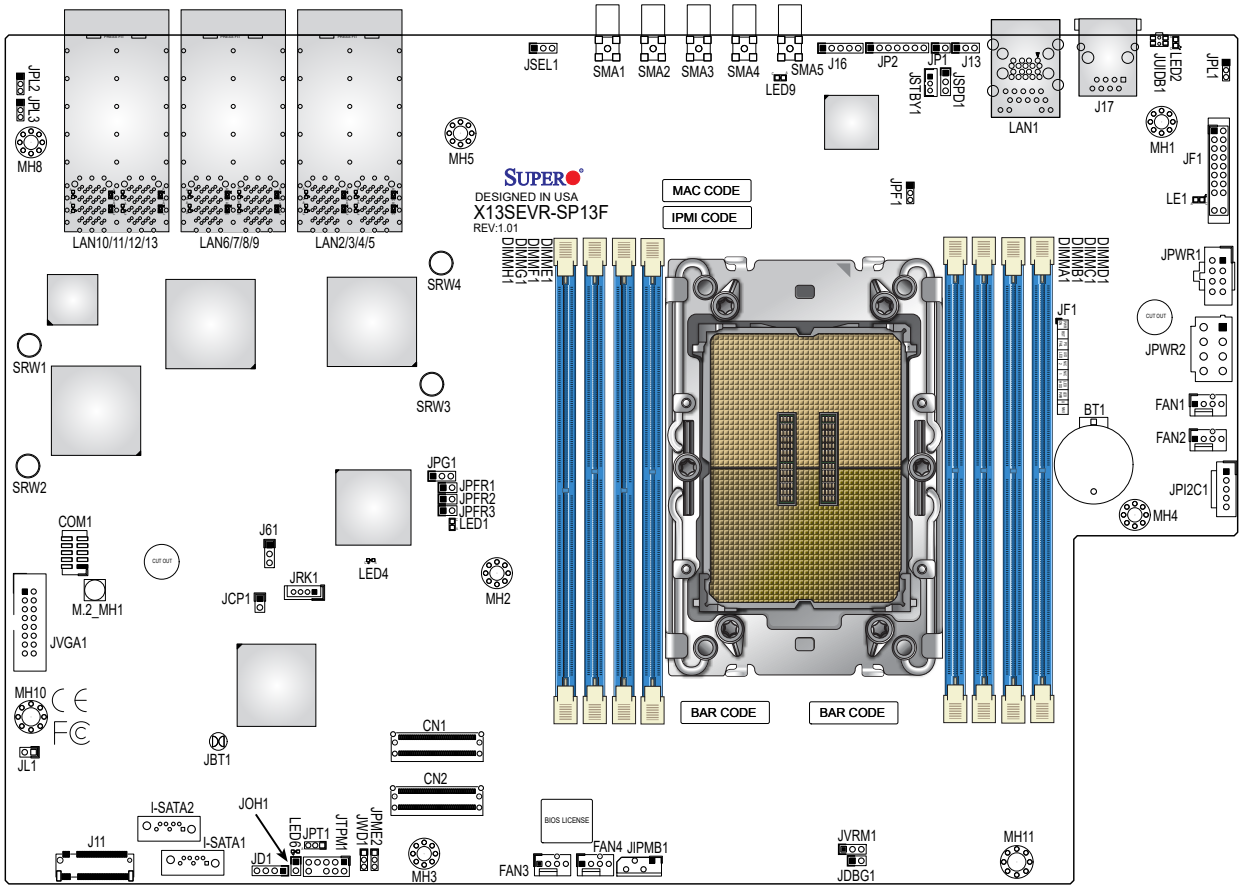
Figure 1-1. X13SEVR-SP13F Motherboard Image



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.

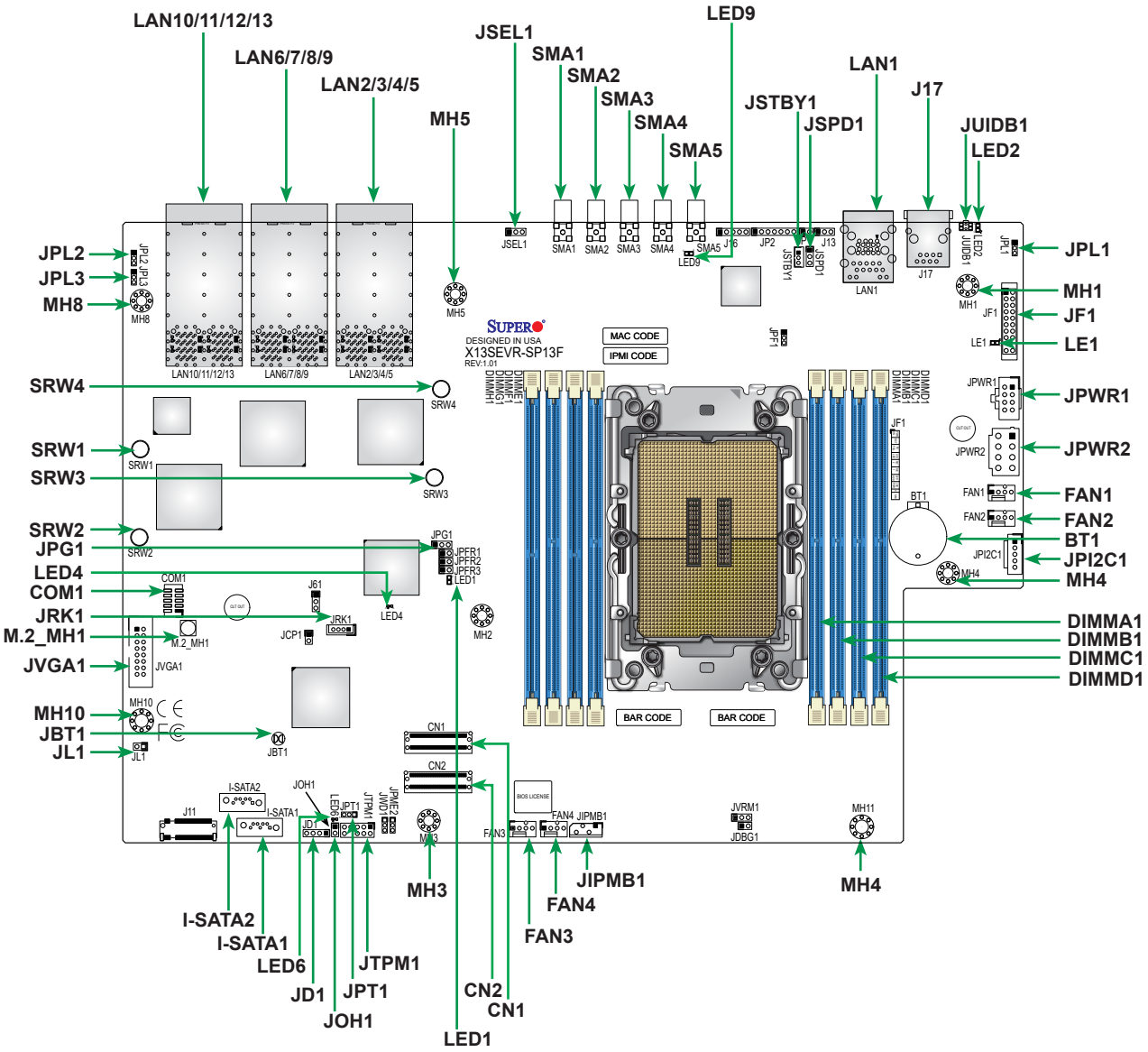
Figure 1-2. X13SEVR-SP13F Motherboard Layout

(not drawn to scale)



Note: Components not documented are for internal testing only.

Quick Reference



Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports, and JF1 front panel connections. Jumpers/LED indicators not indicated are used for testing only.
- "■" indicates the location of Pin 1.
- Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

Quick Reference Table

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JPG1	VGA Enable/Disable	Pins 1–2 (Enabled)
JPL1	LAN1 Enable/Disable	Pins 1–2 (Enabled)
JPL2	LAN2/3/4/5 Enable/Disable	Pins 1–2 (Enabled)
JPL3	LAN6/7/8/9 Enable/Disable	Pins 1–2 (Enabled)
JPT1	Onboard TPM Module Enable/Disable	Pins 1–2 (Enablled)
JSEL1	SMA1 to SMA4 Voltage Level Selection	Pins 1–2 (3.3 V) Pins 2–3 (5 V)

LED	Description	Status
LE1	Power LED	Solid Green: Power On
LED1	BMC Heartbeat LED	Blinking Green: BMC Normal
LED2	UID LED	Solid Blue: Unit Identified
LED6	Power/Fan Fail LED	Solid Red: Power/Fan Failed
LED9	GNSS Timepulse LED	Blinking Blue: Timepulse Normal

Connector	Description
BT1	Extended CMOS Battery
CN1, CN2	PCIe 5.0 x8 MCIO Connectors
COM1	COM Header
FAN1–FAN4	Fan Headers
I-SATA1–2	SATA 3.0 Ports
J17	Dry Contact Connector
JF1	Front Control Panel Header
JIPMB1	4-pin BMC External I^2C Header (for an IPMI card)
JL1	Chassis Intrusion Header
JOH1	Overheat LED Header
JPI2C1	Power System Management Bus (SMB) I^2C Header
JPWR1	8-pin Power Connector (Required). Need to connect 24-pin ATX power cable to 8-pin
JPWR2	8-pin 12 V DC Power Connector (Required)
JRK1	Intel RAID Key Header
JSTBY1	Standby Power Header (5 V)
JTPM1	Trusted Platform Module/Port 80 Connector
JUIDB1	Unit Identifier (UID) Switch
JVGA1	VGA Header
LAN1–13	LAN Ports

Note: Table is continued on the next page.

Connector	Description
MH1–MH5, MH8, MH10, MH11	Mounting Holes
M.2_MH1	M.2 Mounting Hole
SMA1	1 PPS Input
SMA2	10 MHz Input
SMA3	1 PPS Output
SMA4	10 MHz Output
SMA5	GNSS Antenna Input
SRW1–SRW4	M.2 Mounting Holes

Motherboard Features

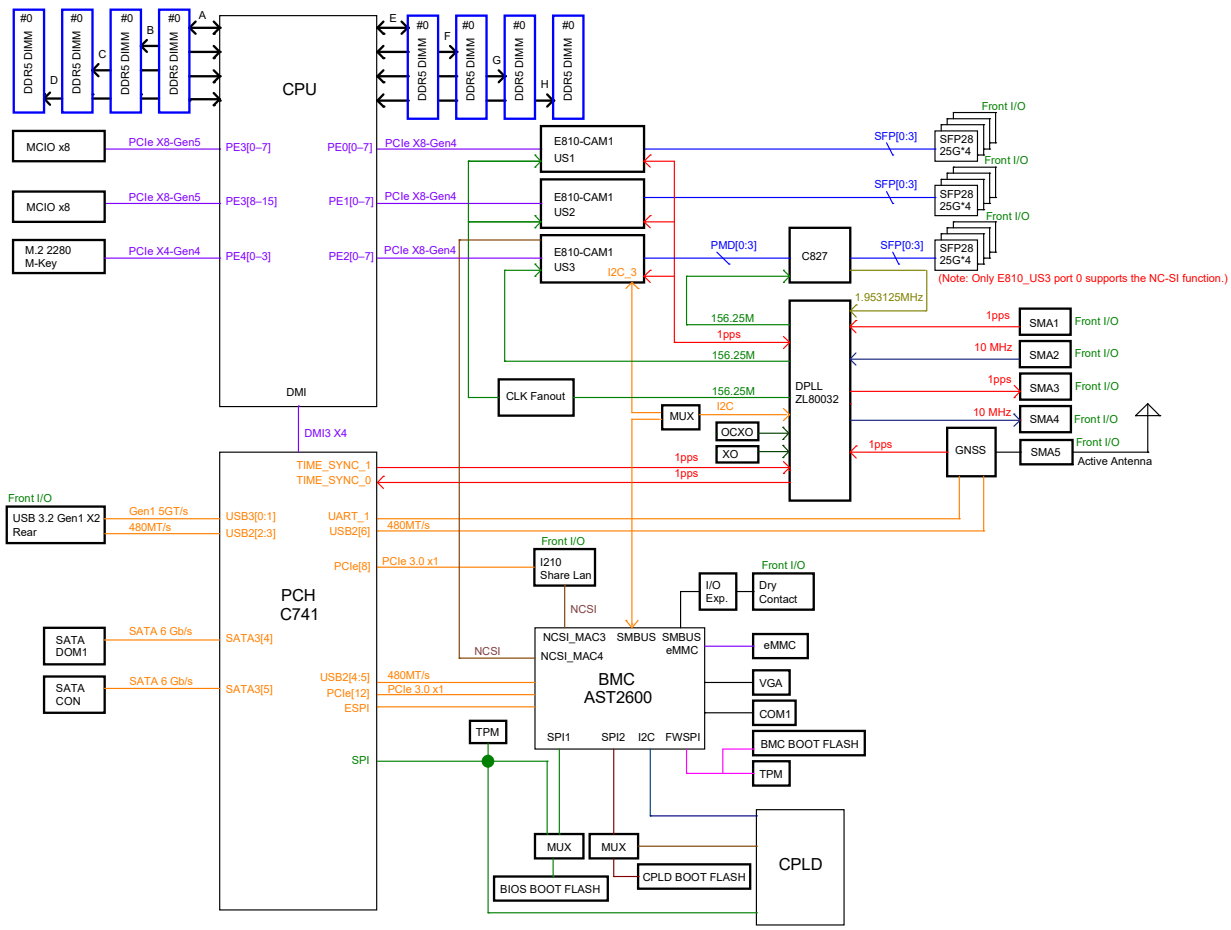
Motherboard Features
CPU
• Supports a 4th/5th Generation Intel Xeon processor with up to 32 cores and TDP of up to 225 W in an LGA4677 socket
Memory
• Supports up to 2 TB of DDR5 ECC RDIMM (3DS) memory with speeds of up to 5600 MT/s in eight memory slots
DIMM Size
• Up to 256 GB **Note:** For the latest CPU/memory updates, please refer to our website at http://www.supermicro.com/products/motherboard.
Chipset
• Intel PCH C741
Expansion Slots
• One M.2 PCIe 4.0 connector (M-Key 2280) • Two PCIe 5.0 x8 MCIO connectors
Network
• I210IT x1 and E810_CAM1 x3
Graphics
• Aspeed AST2600
I/O Devices
• One COM Header (COM1) • Two SATA 3.0 Headers (I-SATA1–I-SATA2) • One VGA Header (JVGA1)
Timing and Synchronization
• IEEE1588 v2 and Synchronous Ethernet support • Onboard GNSS module • DPLL/OCXO design • Up to eight hours hold-over
BIOS
• 512 Mb AMI BIOS® SPI Flash BIOS • ACPI 6.0, Plug and Play (PnP), SPI dual/quad speed support, and Real Time Clock (RTC) wake up

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

Motherboard Features
Power Management
• ACPI power management • S5 • Power button override mechanism • Power-on mode for AC power recovery • Power supply monitoring
System Health Monitoring
• Onboard voltage monitoring for +12 V, +5 V, +3.3 V, +5 V stdby, +3.3 V stdby, Vcore, CPU temperature, PCH temperature, system temperature, and memory temperature • CPU thermal trip support • Platform Environment Control Interface (PECI)/TSI
Fan Control
• Low-noise fan speed control • Four 4-pin fan headers
System Management
• Trusted Platform Module (TPM) support • SuperDoctor® 5 • System resource alert via SuperDoctor®5 • Platform Environment Control Interface (PECI) 3.0 support • Watch Dog, NMI • Chassis intrusion header and detection • Intel Active Management Technology (AMT)
LED Indicators
• Power LED • BMC Heartbeat LED • UID LED • Power/Fan Fail LED • GNSS Timepulse LED
Dimensions
• 13.94" (W) x 9.6" (L) (354.07 mm x 243.84 mm)

Note 1: 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 1-3.
System Block Diagram



Note 1: 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.

Note 2: Only E810_US3 port 0 supports the NC-SI function.

1.2 Processor and Chipset Overview

Built upon the functionality and capability of the 4th/5th Generation Intel Xeon processor and the C741 chipset, the X13SEVR-SP13F motherboard provides system performance, power efficiency, and feature sets to address the needs of next-generation computer users.

With the support of the new Intel Microarchitecture 14nm Process Technology, the X13SEVR-SP13F dramatically increases system performance for a multitude of applications.

The Intel PCH C741 chipset support the following features:

- Intel vPro, AMT 12.0, and TXT
- Intel Turbo Boost and Rapid Storage Technology
- Increased platform security with Intel Boot Guard for hardware-based boot integrity protection and prevention of buffer overflow class security threads
- Intel Rapid Storage Technology enterprise (Intel RSTe)
- Intel Hyper-Threading, Intel VT-d, and VT-x
- Intel 64 Architecture, Execute Disable Bit, Turbo Boost Technology 2.0, Hyper-Threading Technology (Intel HT Technology)

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

This section describes the health monitoring features of the motherboard. The motherboard has an onboard System Hardware Monitoring chip that supports system health monitoring.

Onboard Voltage Monitors

An onboard voltage monitor will scan the voltages of the onboard chipset, memory, CPU, and battery continuously. 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

PC health monitoring in the BIOS can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management. Refer to the below table for available fan modes to choose the most appropriate one for nominal operation.

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.

Figure 1-4. Fan Speed Modes

Fan Mode	Description
Quiet	Use this mode to set fan speed for best power efficiency and maximum noise reduction
Stable	Use this mode to set the fan speed for normal system cooling
Full Speed	Use this mode to set fan speed at full speed for maximum system cooling
Customize	Use this mode to manually adjust the desired PWM according to the specified temperature

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, hard disk 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. It is even more important for processors that have high CPU clock rates where noisy power transmission is present.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above.

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.

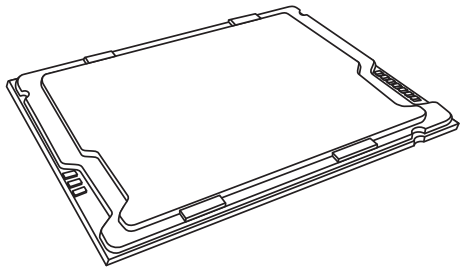
2.2 Processor and Heatsink Installation

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/5th Generation Intel Xeon Scalable Processor

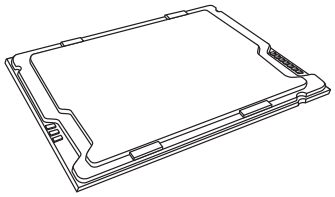


Intel Xeon Scalable Processor

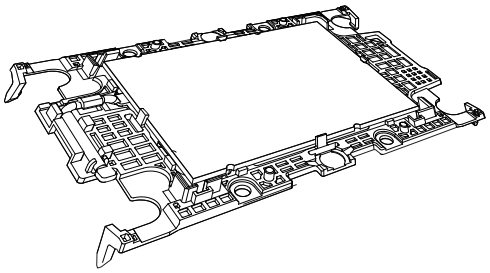
Overview of the Processor Carrier Assembly

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

1. Intel Xeon Scalable Processor



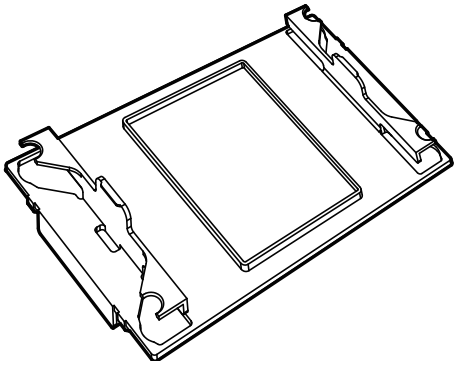
2. Processor Carrier



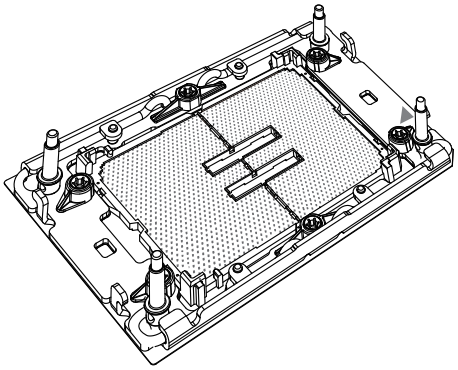
Overview of the CPU Socket

The CPU socket is protected by a plastic protective cover.

1. Plastic Protective Cover



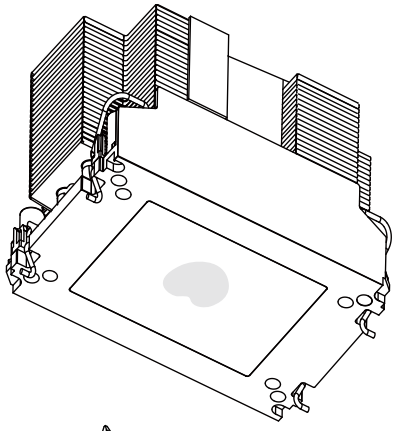
2. CPU Socket



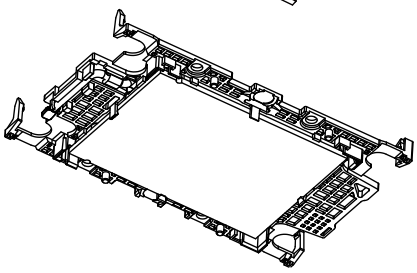
Overview of the Processor Heatsink Module

The Processor Heatsink Module (PHM) contains a heatsink, a processor carrier, and the Intel Xeon processor.

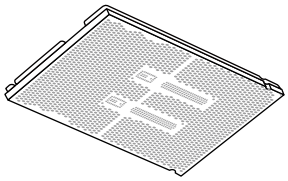
1. Heatsink with Thermal Grease



2. Processor Carrier

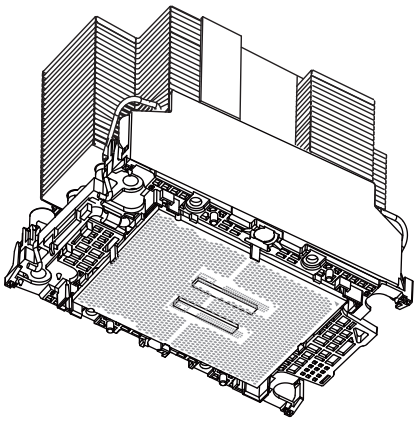


3. Intel Xeon Scalable Processor



Processor Heatsink Module (PHM)



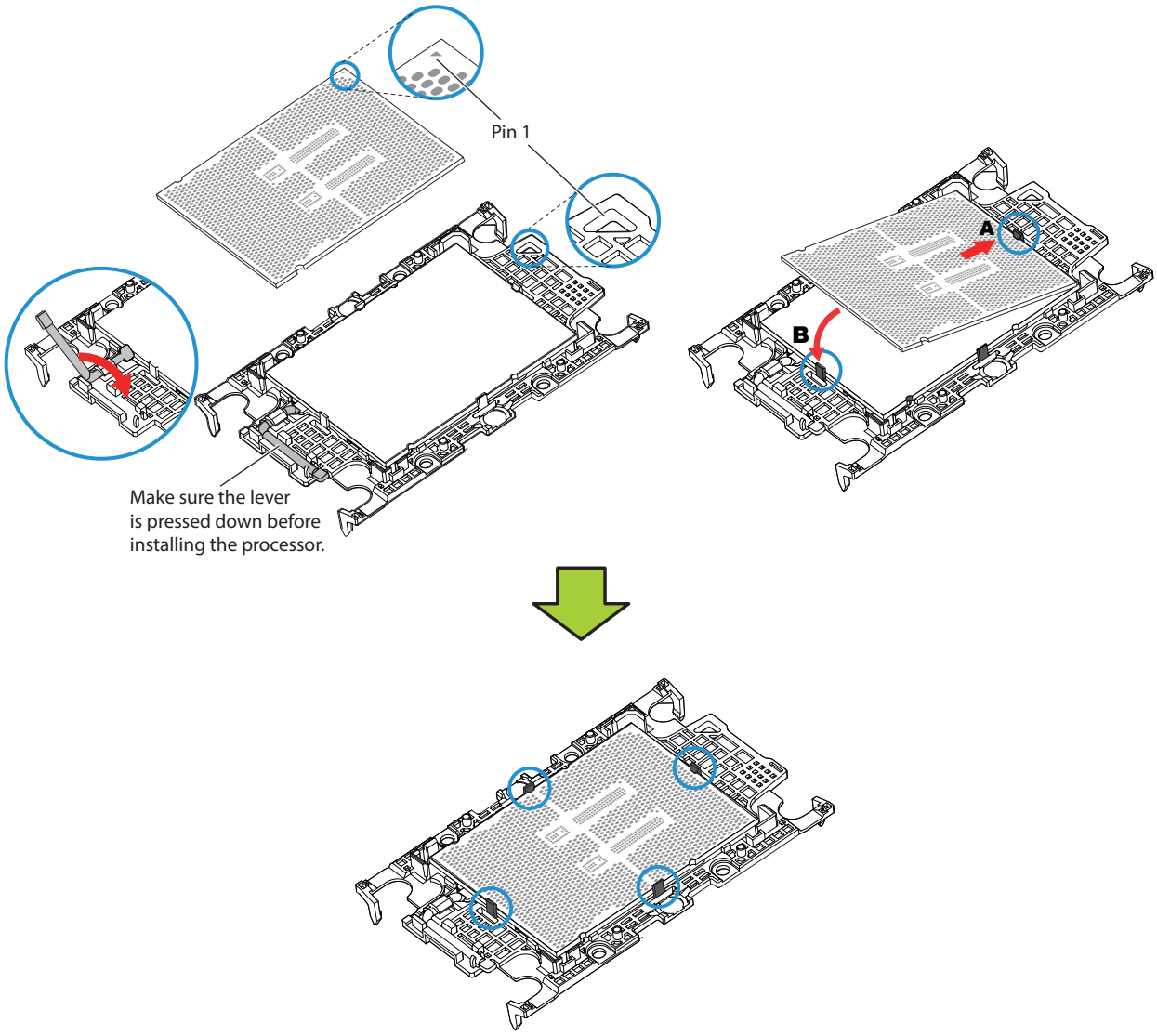


Bottom View

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.



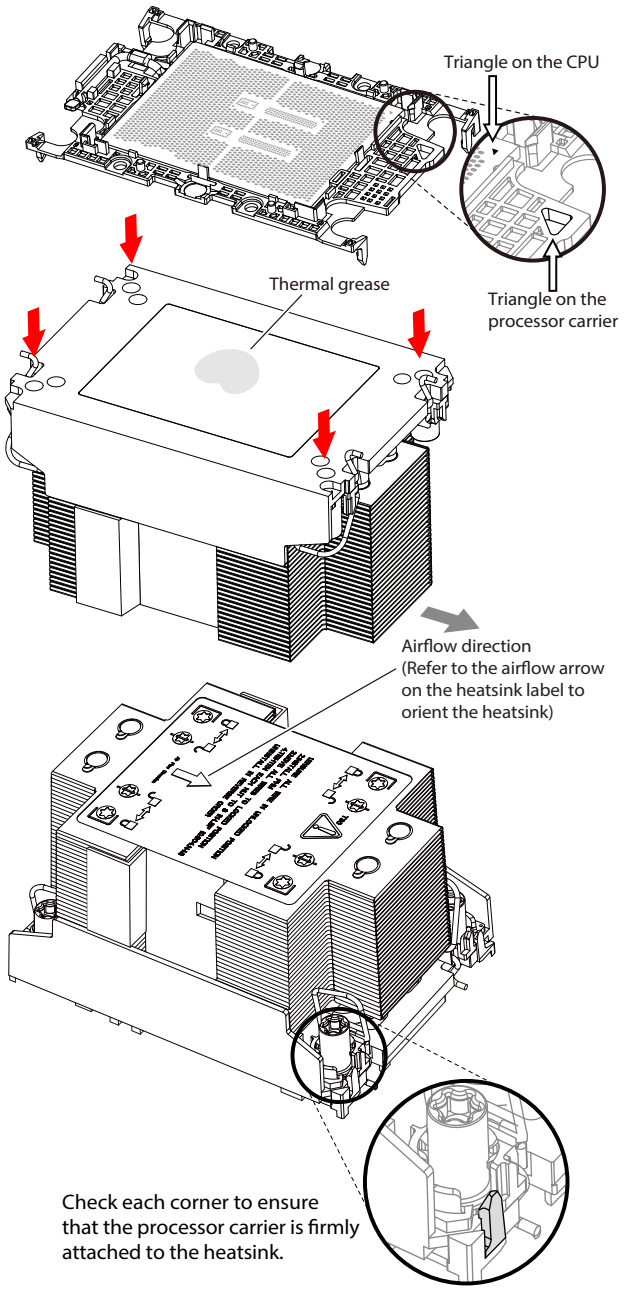
Processor Carrier Assembly

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):

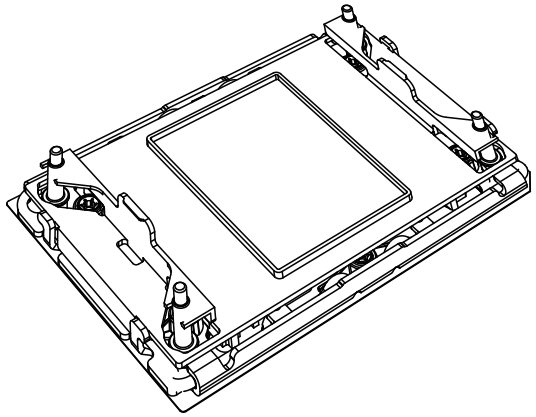
1. Note the label on top of the heatsink, which marks the airflow direction. Turn the heatsink over and orient the heatsink so the airflow arrow points towards the triangle on the processor.
2. If this is a new heatsink, the thermal grease has been pre-applied. Otherwise, apply the proper amount of thermal 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)

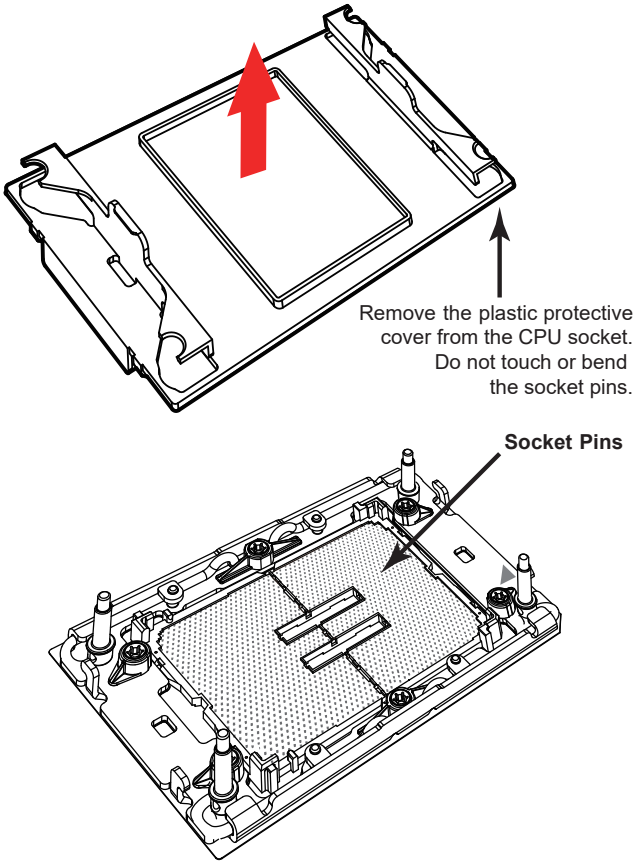


Preparing the CPU Socket for Installation

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



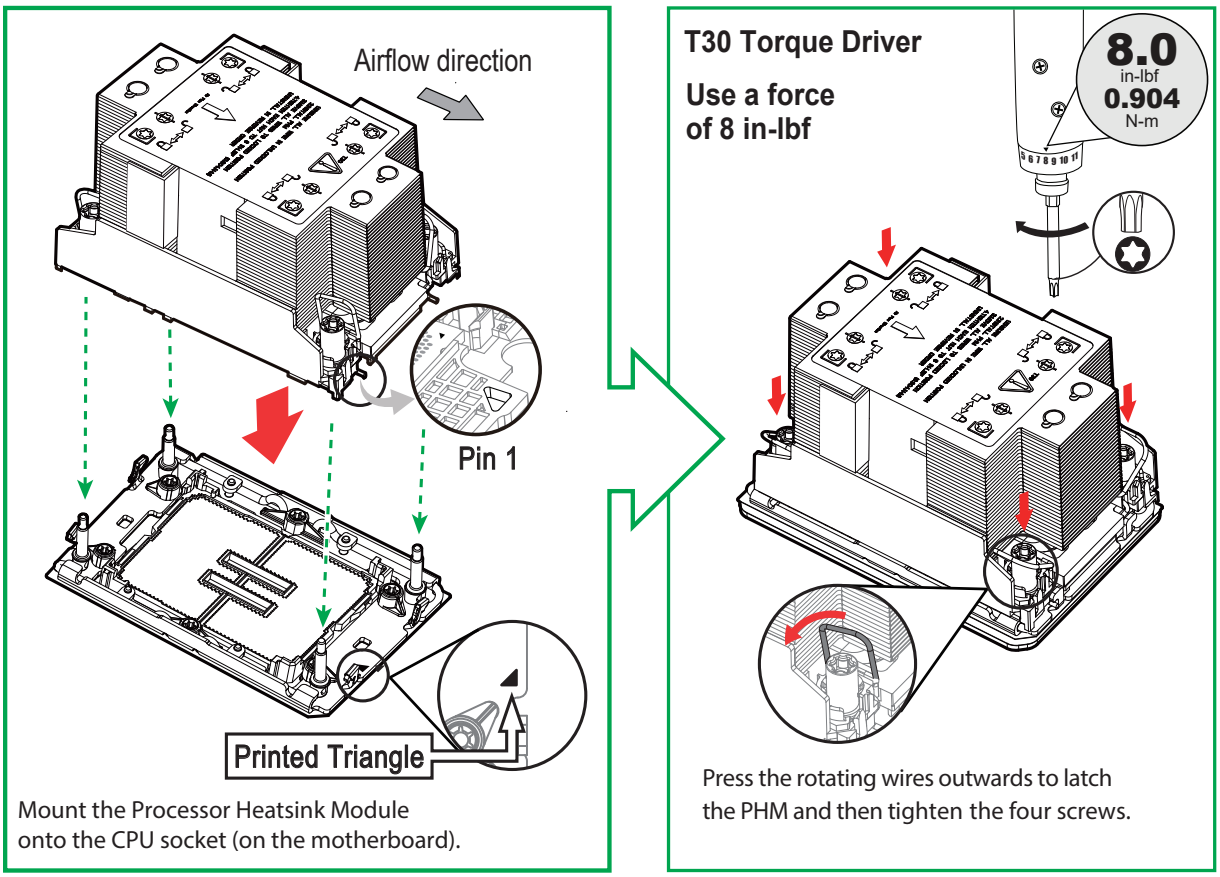
Installing the Processor Heatsink Module

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).

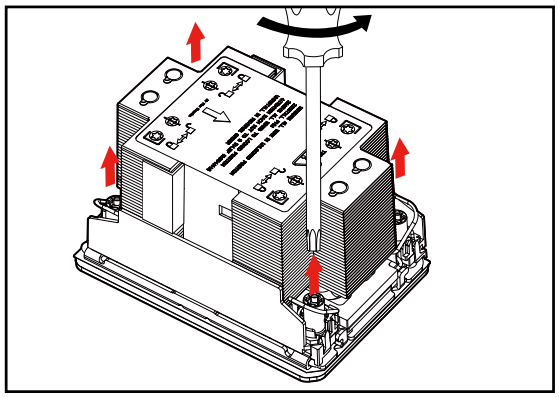
Press the rotating wires outwards to latch the PHM and then tighten the four screws.

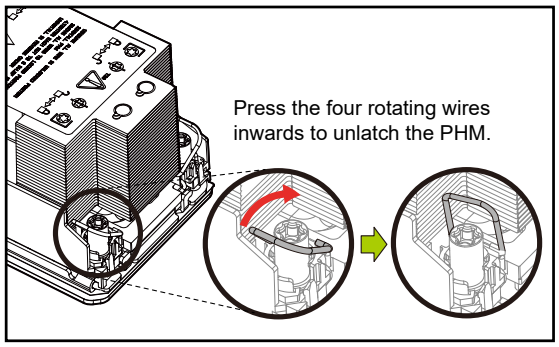
Removing the Processor Heatsink Module

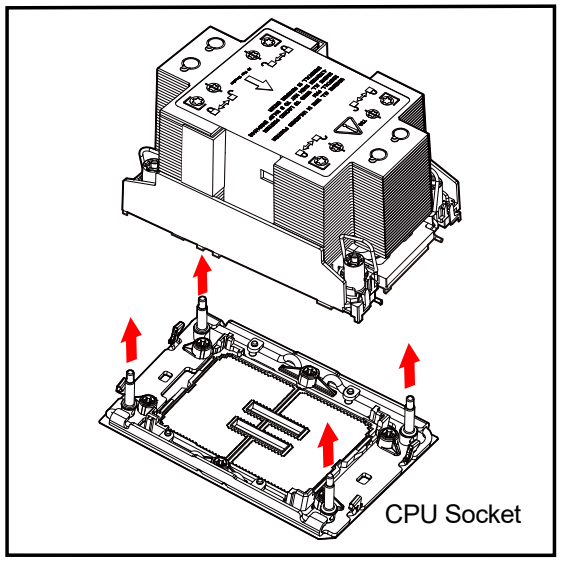
Before removing the processor heatsink module (PHM) from the motherboard, shut down the system and then unplug the AC power cord from all power supplies.

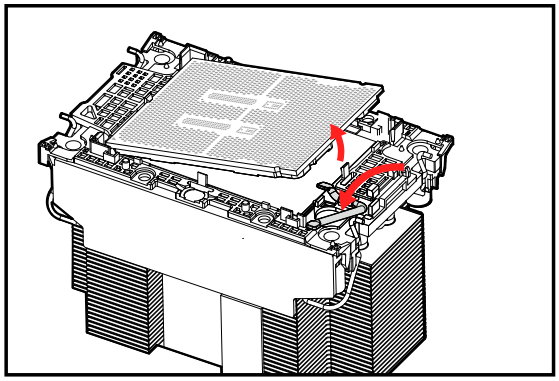
Then follow the steps below:

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.





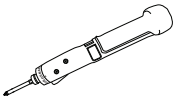




2.3 Motherboard Installation

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



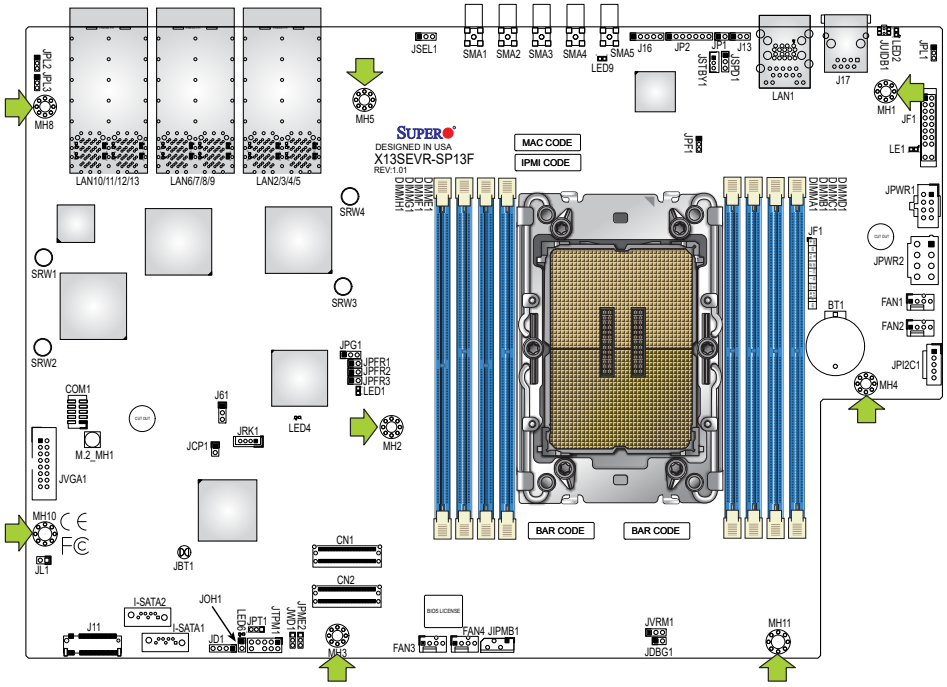
Torque Driver (1)



Phillips Screws (8)



Standoffs (8) Only if Needed



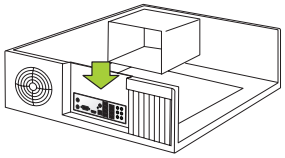
Location of Mounting Holes

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

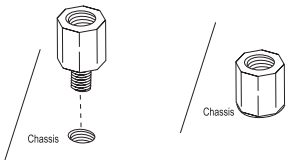
Note 2: Some components are very close to the mounting holes. Take precautionary measures to avoid damaging these components when installing the motherboard to the chassis.

Installing the Motherboard

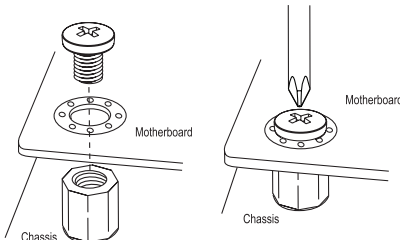
1. Install the I/O shield into the back of the chassis, if applicable.



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. Make sure that the motherboard is securely placed in the chassis.

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

2.4 Memory Support and Installation

Note: Check the Supermicro website for recommended memory modules.

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

Memory Support

The X13SEVR-SP13F motherboard supports up to 2 TB of DDR5 ECC RDIMM (3DS) memory with speeds of up to 5600 MT/s in eight memory slots. Refer to the table below for the recommended DIMM population order and additional memory information.

DIMM Module Population Configuration

For optimal memory performance, follow the table below when populating memory.

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

DDR5 Memory Support for the 4th Generation Intel Xeon Scalable Processor Processors-SP					
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-SP					
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).

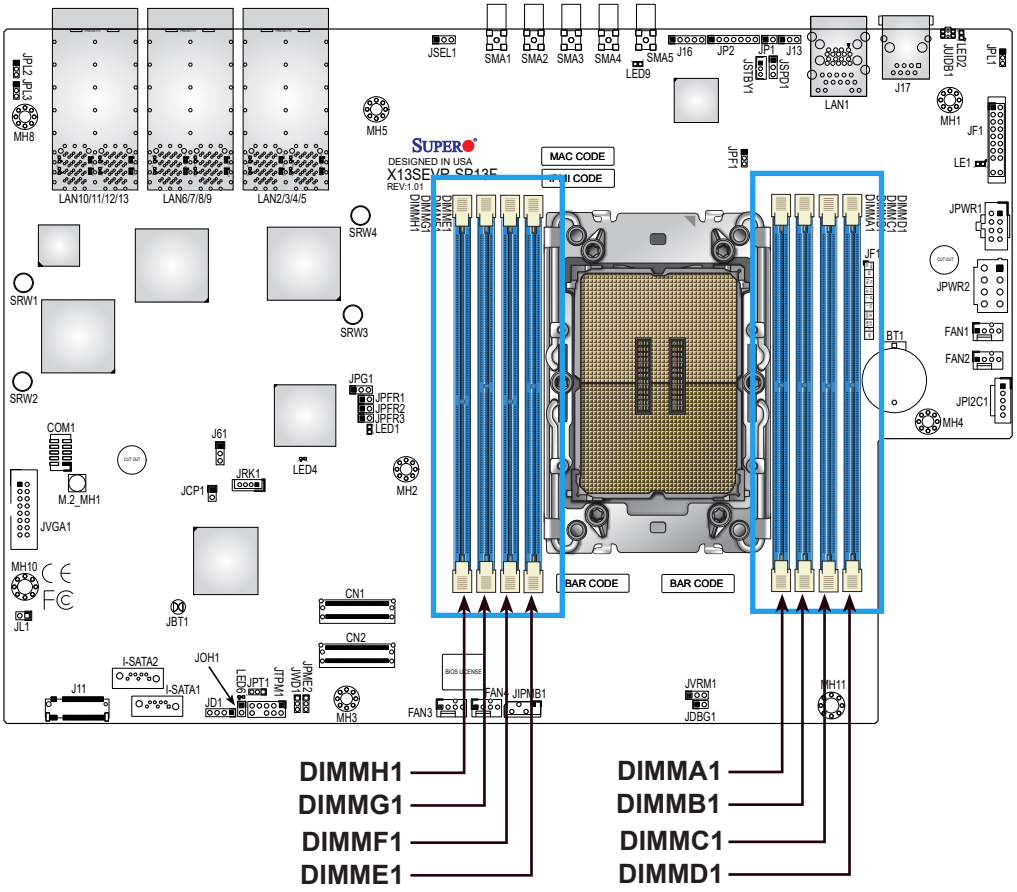
Note 2: 24 Gb 2 DPC is not POR with 24 GB and 48 GB DIMMs.

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.

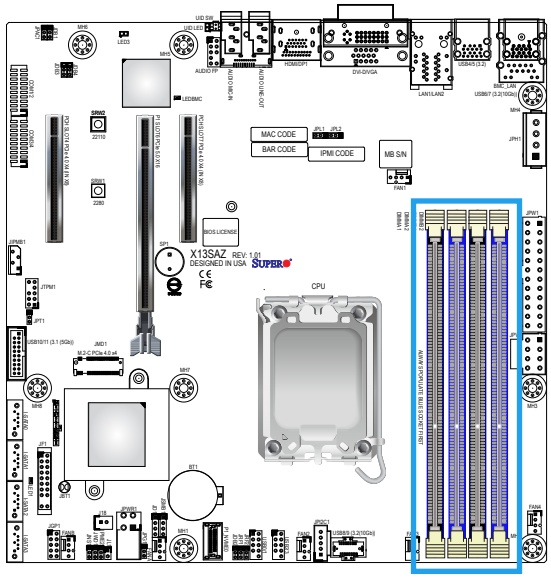
General Guidelines for Optimizing Memory Performance

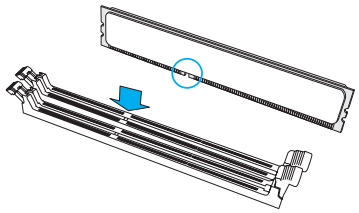
- It's recommended to use DDR5 memory of the same type, size, and speed.
- Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.
- The motherboard will support odd-numbered modules. However, to achieve the best memory performance, a balanced memory population is recommended.



DIMM Installation

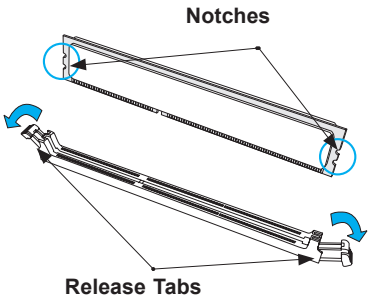
1. Insert DIMM modules in the following order: DIMMA2, DIMMB2 and then DIMMA1, DIMMB1.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
3. Align the key of the DIMM module with the receptive point on the memory slot.
4. Align the notches on both ends of the module against 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.

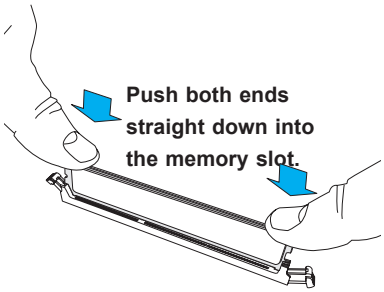




DIMM Removal

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 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.

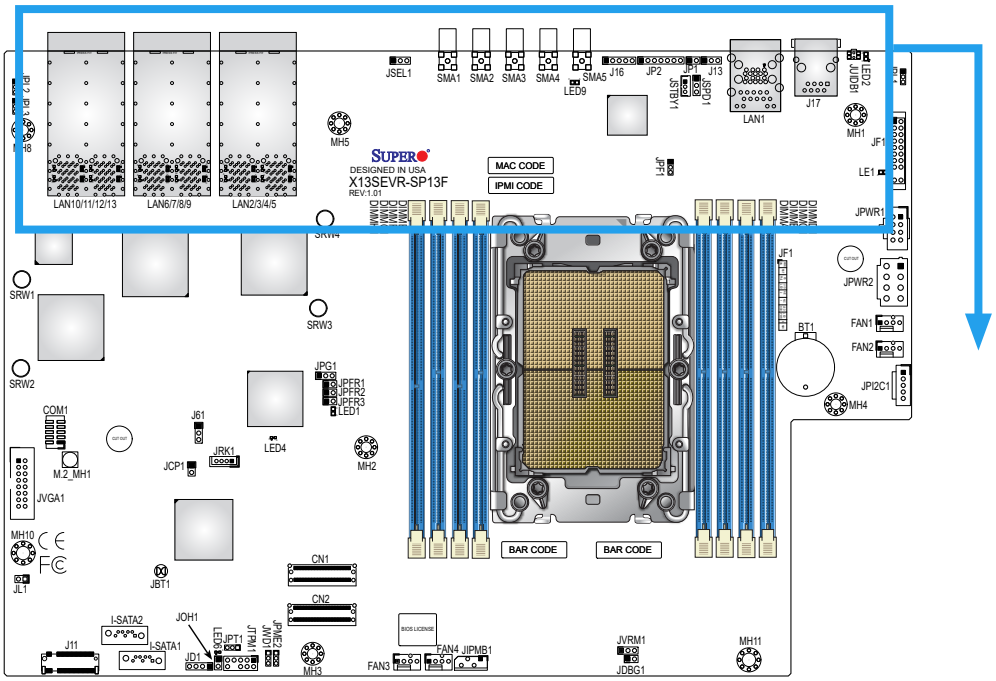
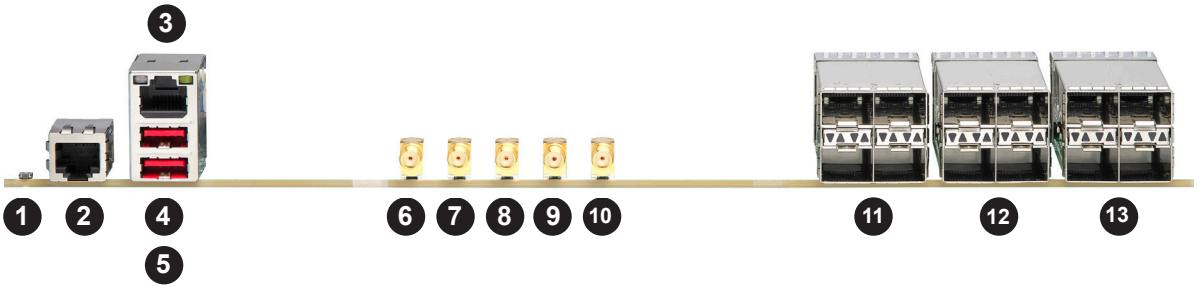


Figure 2-1. I/O Port Locations and Definitions



Rear I/O Ports					
#	Description	#	Description	#	Description
1	UID Switch	6	SMA5	11	LAN2/3/4/5
2	Dry Contact	7	SMA4	12	LAN6/7/8/9
3	LAN1	8	SMA3	13	LAN10/11/12/13
4	USB6	9	SMA2		
5	USB7	10	SMA1		

Note: Only LAN port 10 supports E810 NC-SI.

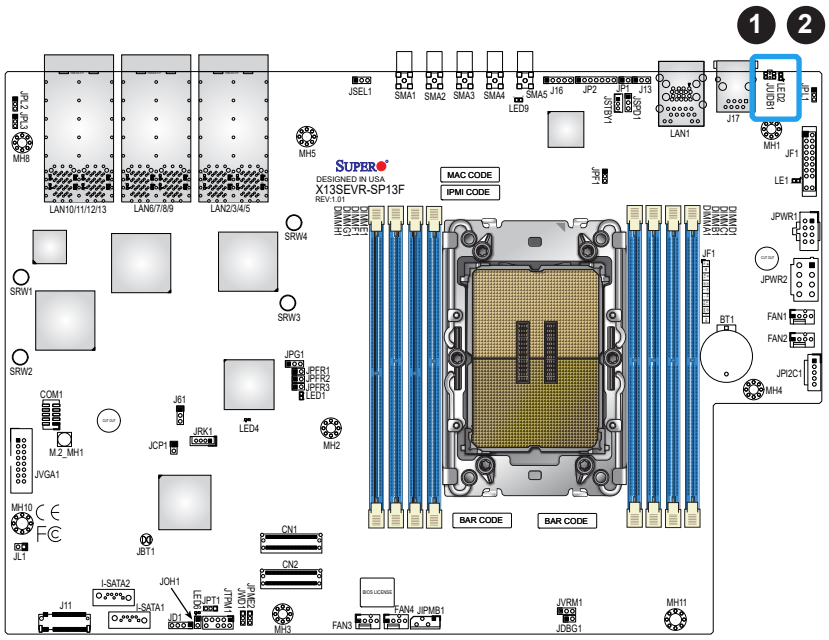
Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch and an LED Indicator are located on the motherboard. The UID switch is located at JUIDB1 on the back panel. The UID LED is located next to the UID switch. 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, please 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

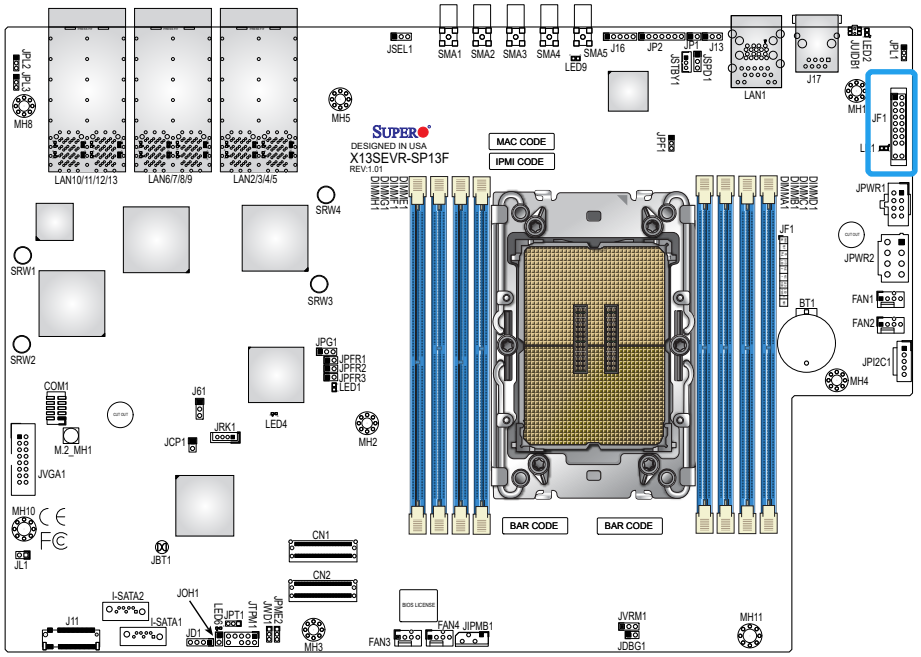
UID LED Pin Definitions	
Color	**Status**
Blue: On	Unit Identified



1. UID Switch
2. UID LED

2.6 Front Control Panel

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



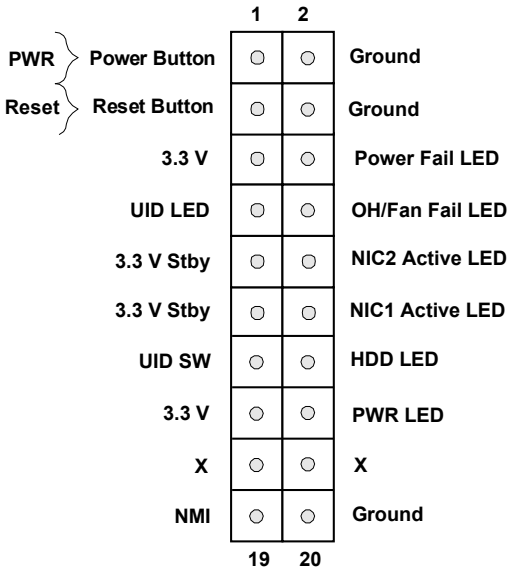


Figure 2-2. JF1 Header Pins

Power Button

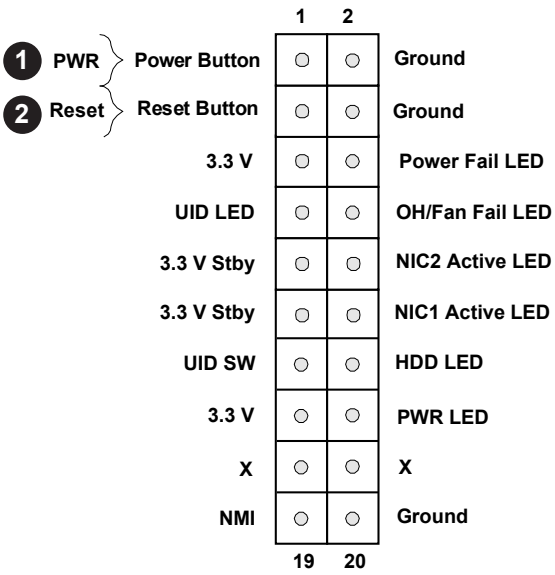
The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 4). To turn off the power when the system is in suspend mode, press the button for four seconds or longer. Refer to the table below for pin definitions.

Power Button Pin Definitions (JF1)	
Pin#	**Definition**
1	Signal
2	Ground

Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1. Attach it to a hardware reset switch on the computer case to reset the system. Refer to the table below for pin definitions.

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



1. PWR Button
2. Reset Button

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table below for pin definitions.

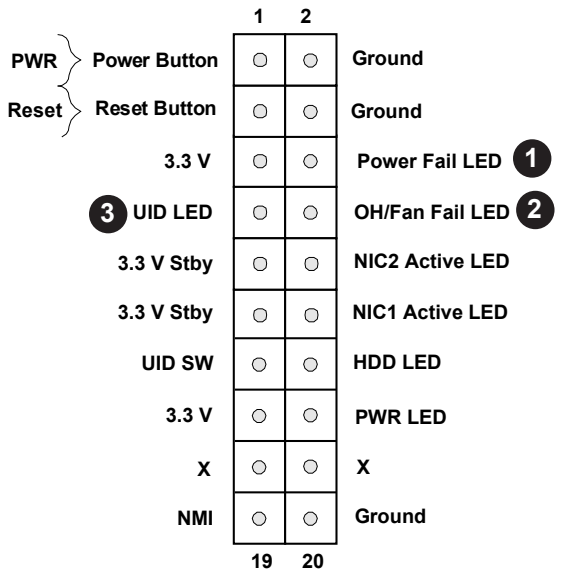
Power Fail LED Pin Definitions (JF1)	
Pin#	**Definition**
5	3.3 V
6	Power Fail LED

Overheat (OH)/Fan Fail and UID LED

Connect an LED cable to pins 7 and 8 of the Front Control Panel to use the Overheat/Fan Fail LED connections. The LED on pin 8 provides warnings of overheating or fan failure. Refer to the tables below for pin definitions.

OH/Fan Fail Indicator Status	
State	**Definition**
Off	Normal
On	Overheat
Flashing	Fan Fail

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	**Definition**
7	Blue UID LED
8	OH/Fan Fail LED



1. Power Fail LED
2. OH/Fan Fail LED
3. UID LED

NIC1/NIC2 (LAN1/LAN2)

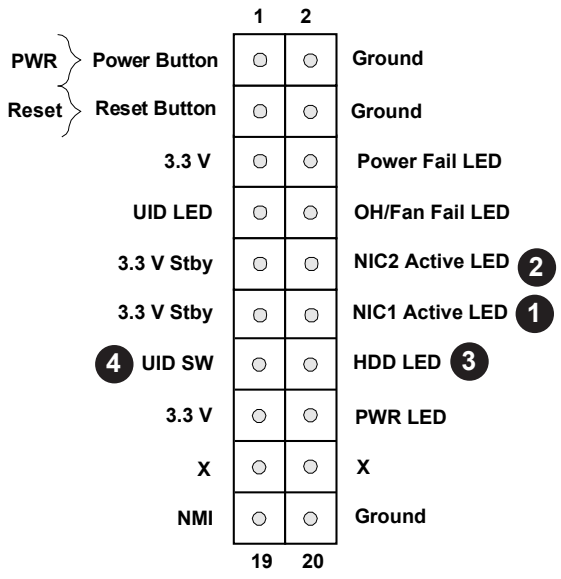
The Network Interface Controller (NIC) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, and LAN port 2 is on pins 9 and 10. Attach the NIC LED cables here to display network activity. Refer to the table below for pin definitions.

NIC1/NIC2 LED Pin Definitions (JF1)	
Pin#	Definition
9	3.3 V Stby
10	NIC 2 Link LED
11	3.3 V Stby
12	NIC 1 Link LED

HDD LED/UID Switch

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable to pin 14 to show hard drive activity status. Refer to the table below for pin definitions.

HDD LED Pin Definitions (JF1)	
Pins	Definition
13	3.3 V/UID SW
14	HDD Active



1. NIC1LED
2. NIC2 LED
3. HDD LED
4. UID Switch

Power LED

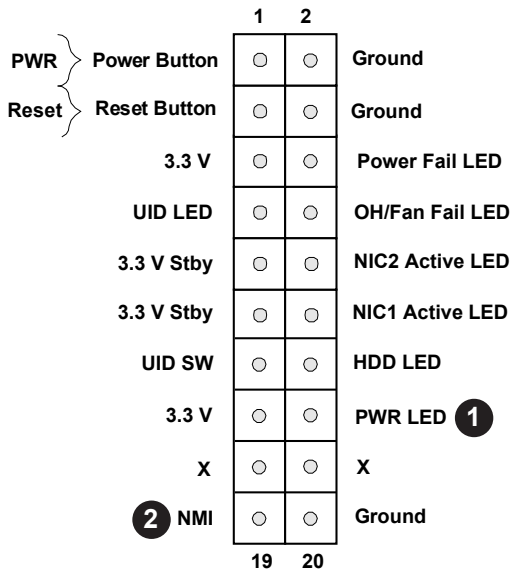
The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table below for pin definitions.

Power LED Pin Definitions (JF1)	
Pins	**Definition**
15	3.3 Stby
16	PWR LED

NMI Button

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

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



1. Power LED
2. NMI

2.7 Connectors

Power Connections

8-Pin Power Connector

JPWR1 is an 8-pin Power Connector intput for CPU. Need to connect 24-pin ATX power cable to 8-pin. Refer to the table below for pin definitions.

8-pin Power Pin Definitions	
Pin#	**Definition**
1	PS-ON#
2–4	Ground
5	PWR_OK
6	+5 VSB
7–8	P12V

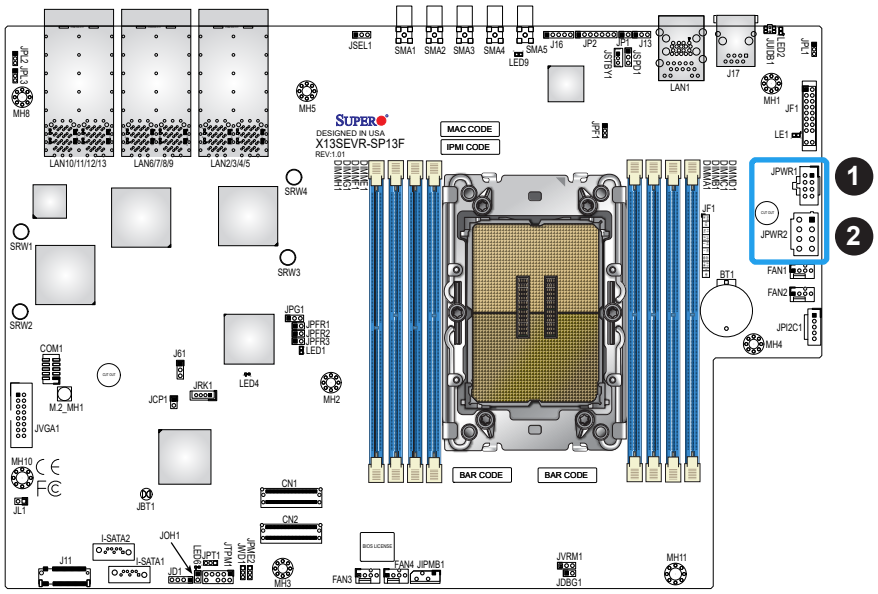
Required Connection

JPWR2

JPWR2 is an 8-pin 12V DC power input for the CPU. Refer to the table below for pin definitions.

8-pin Power Pin Definitions	
Pin#	**Definition**
1–4	Ground
5–8	P12V (12 V Power)

Required Connection



1. JPWR1
2. JPWR2

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 through the thermal management. This allows the fan speeds to be automatically adjusted based on the motherboard temperature.

Fan Header Pin Definitions

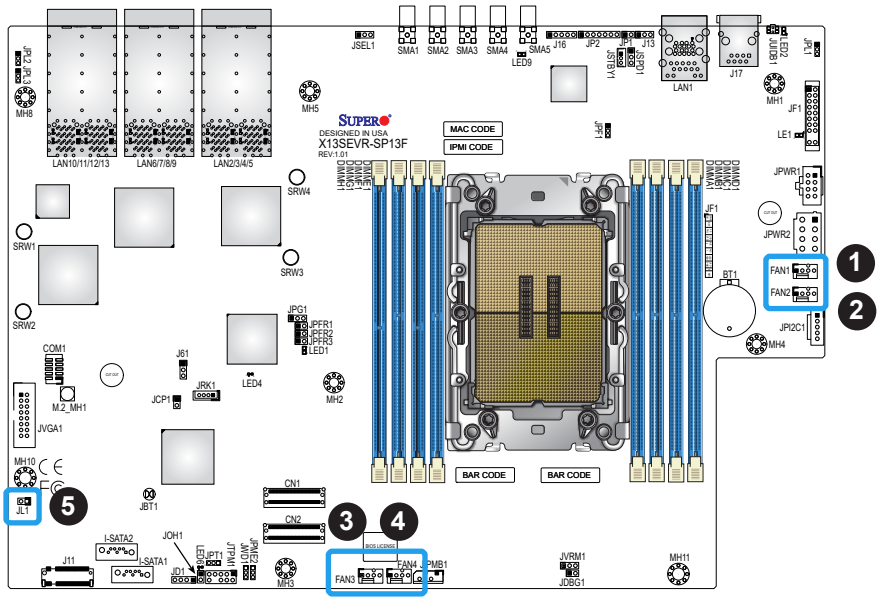
Pin#	Definition
1	Ground (Black)
2	2.5 A/+12 V (Red)
3	Tachometer
4	PWM_Control

Chassis Intrusion

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

Chassis Intrusion Pin Definitions

Pin#	Definition
1	Intrusion Input
2	Ground



1. FAN1
2. FAN2
3. FAN3
4. FAN4
5. Chassis Intrusion

TPM/Port 80 Header

A Trusted Platform Module (TPM)/Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. Refer to the table below for pin definitions. Please go to the following link for more information on the TPM: http://www.supermicro.com/manuals/other/TPM.pdf.

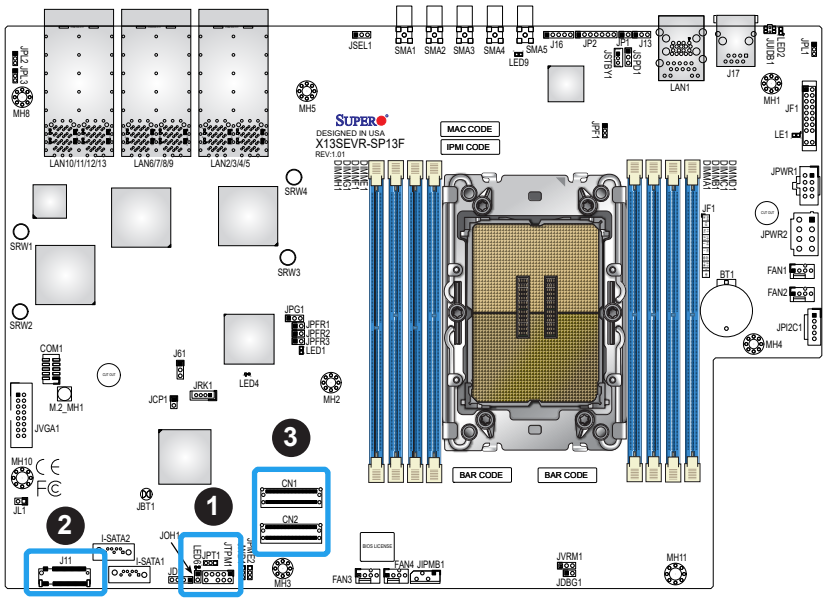
Trusted Platform Module Header Pin Definitions			
Pin#	**Definition**	**Pin#**	**Definition**
1	+3.3 V	2	SPI_CS#
3	RESET#	4	SPI_MISO
5	SPI_CLK	6	GND
7	SPI_MOSI	8	NC
9	+3.3 V Stdby	10	SPI_IRQ#

M.2 M-Key PCIe 4.0 Connector (2280)

The motherboard has one M.2 slot at J11. 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.

MCIO Connectors

The motherboard has two MCIO slots at CN1 and CN2.



1. TPM Header
2. M.2 Connector
3. MCIO Connectors

Power SMB (I²C) Header

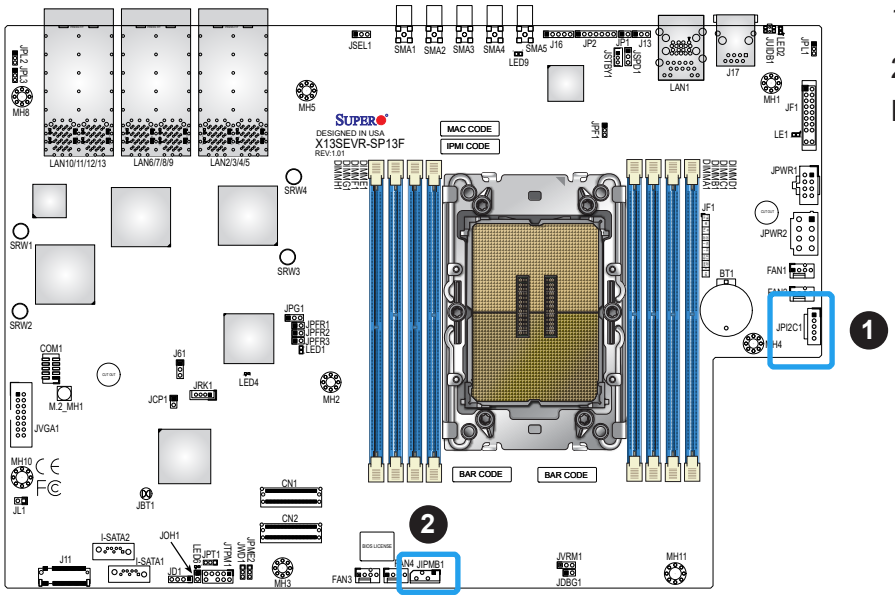
The Power System Management Bus (I²C) connector (JPI²C1) monitors the power supply, fan, and system temperatures. Refer to the table below for pin definitions.

Power SMB Header Pin Definitions	
Pin#	**Definition**
1	Clock
2	Data
3	PMBUS_Alert
4	Ground
5	P3 V

4-pin BMC 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	
Pins	**Definition**
1	Clock
2	GND
3	Data
4	NC



1. Power SMB Header
2. 4-pin BMC External Header

SATA Ports

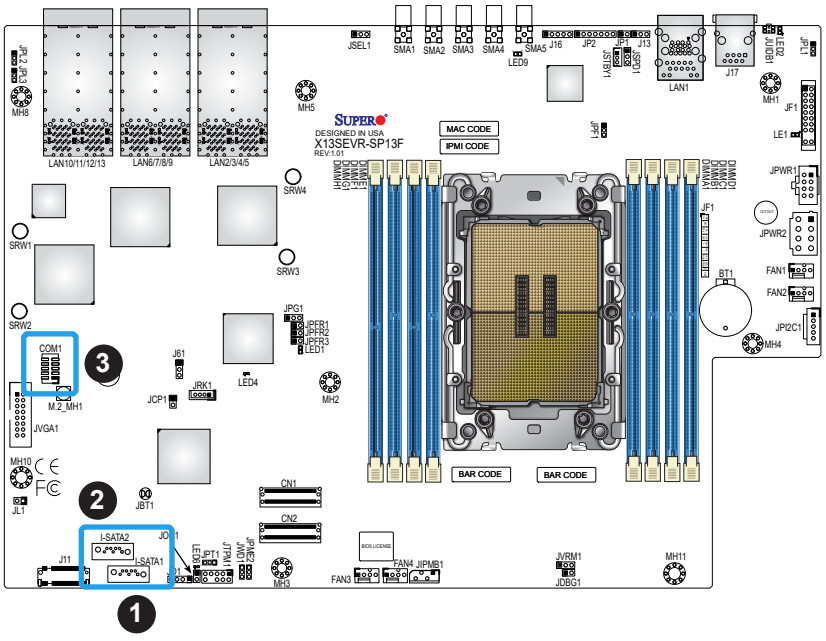
The motherboard has two SATA 3.0 ports supported by the C741 chipset. SATA ports provide serial-link signal connections, which are faster than the connections of Parallel ATA.

COM Header

The motherboard has one COM header that provides one serial connection (COM1) and supports RS-232 function.

COM Port Pin Definitions

Pin#	Definition	Pin#	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	N/A



1. I-SATA1 Port
2. I-SATA2 Port
3. COM1 header

Standby Power

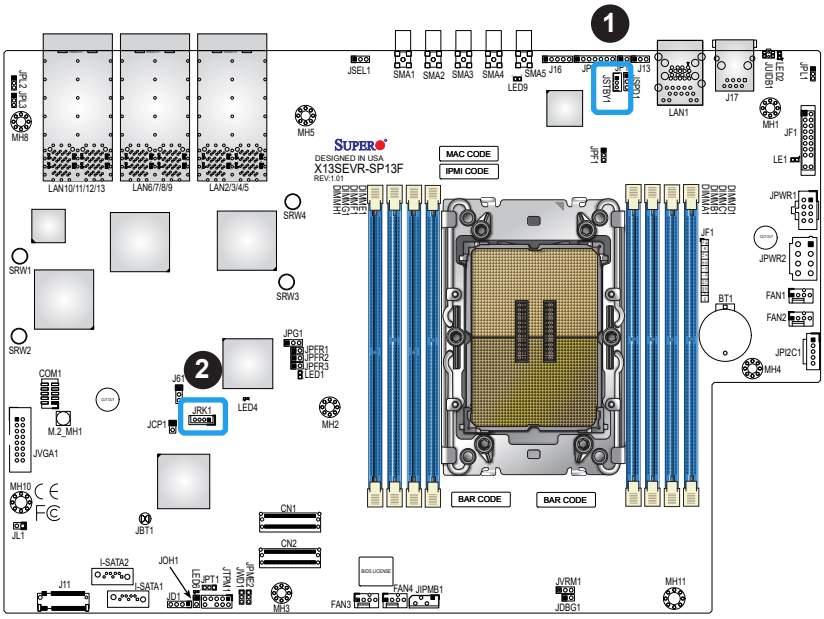
The Standby Power header is located at JSTBY1 on the motherboard. You must have a card with a Standby Power connector and a cable to use this feature. Refer to the table below for pin definitions.

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

Intel RAID Key Header

Use the JRK1 header to enable RAID functions for NVMe connections. Refer to the table below for pin definitions.

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



1. Standby Power
2. Intel RAID Key Header

Overheat LED Header

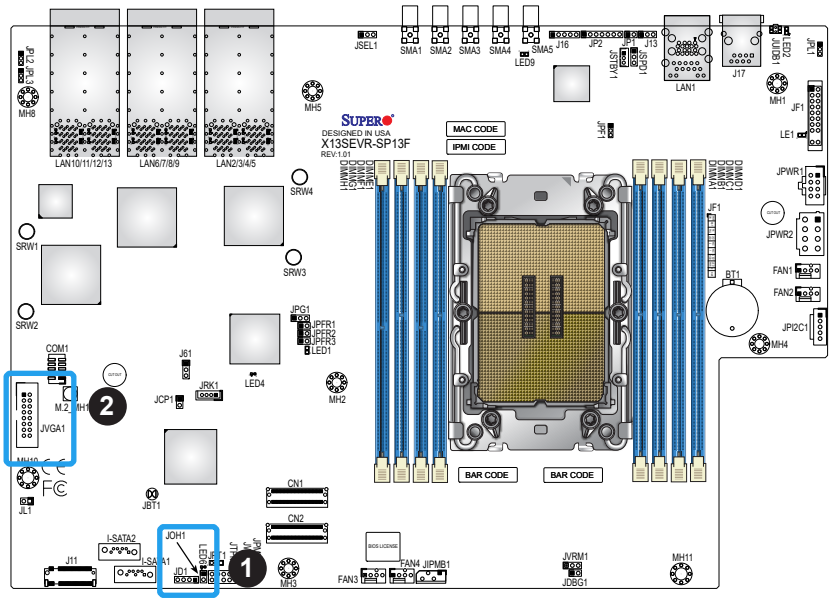
Header JOH1 is used to connect to an LED indicator to provide warnings of chassis overheating and fan failure. This LED will blink when a fan failure occurs. Refer to the tables below for pin definitions.

Overheat LED Header Status	
State	**Definition**
Solid	Overheat
Blinking	Fan Fail

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

VGA Header

JVGA1 is the 16-pin VGA header. Use a 16-pin ribbon cable that connects one end to this header and the other to a panel mount male connector for a VGA monitor connection. Refer to the tables below for pin definitions.



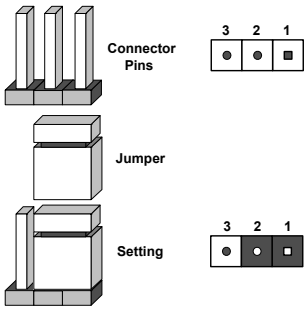
1. Overheat LED Header
2. VGA Header

2.8 Jumper Settings

How Jumpers Work

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

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



CMOS Clear

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

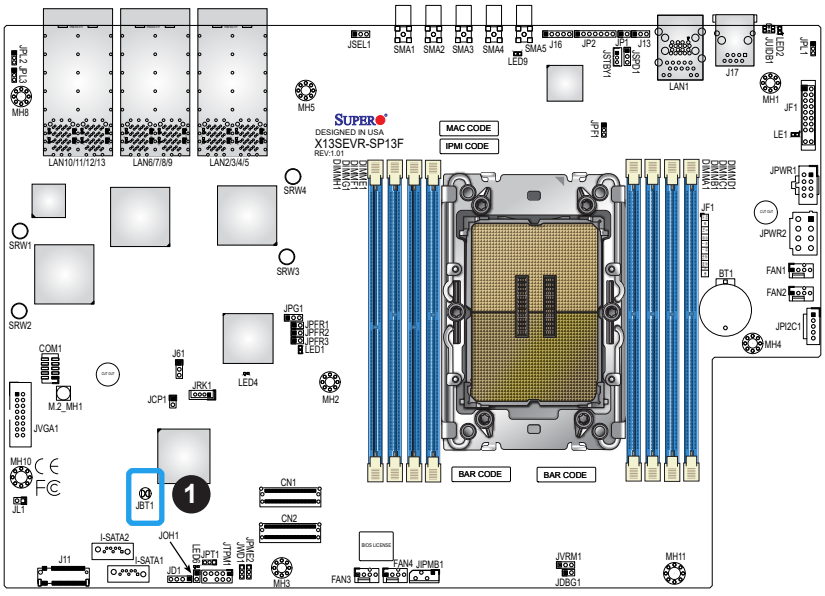
To Clear CMOS

1. First power down the system and unplug the power cord(s).
2. Remove the cover of the chassis to access the motherboard.
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.

Do not use the PW_ON connector to clear CMOS.

JBT1 contact pads



1. CMOS Clear

LAN Port Enable/Disable

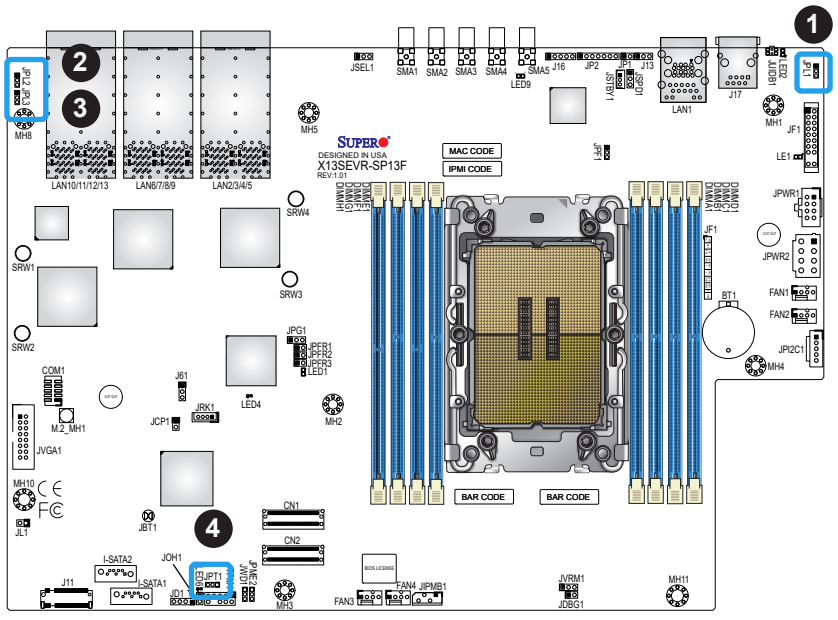
Use jumper JPL1 to enable or disable LAN port 1, JPL2 to enable or disable LAN2/3/4/5, and JPL3 to enable or disable LAN6/7/8/9. Refer to the table below for jumper settings.

LAN Port Enable/Disable Jumper Settings	
Jumper Setting	**Definition**
Pins 1–2	Enabled (Default)
Pins 2–3	Disabled

TPM Enable

Use JPT1 to enable or disable the onboard TPM 2.0. Refer to the table below for jumper settings.

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



1. LAN1 Enable/Disable
2. LAN2–5 Enable/Disable
3. LAN6–9 Enable/Disable
4. TPM Enable/Disable

VGA Enable/Disable

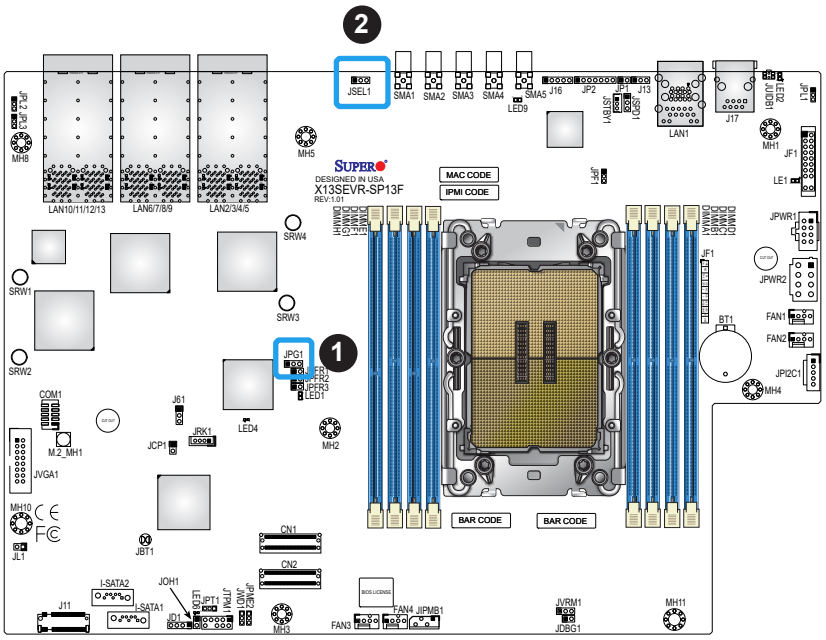
Jumper JPG1 allows you to enable the onboard VGA connector. The default setting is pins 1–2 to enable the connection. Refer to the table below for jumper settings.

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

SMA Voltage Level Selection

Use jumper JSEL1 to select the SMA1–SMA4 voltage level. Refer to the table below for jumper settings.

SMA Voltage Level Selection Jumper Settings	
Jumper Setting	**Definition**
Pins 1–2	3.3 V
Pins 2–3	5 V



1. VGA Enable/Disable
2. SMA Voltage Level Selection

2.9 LED Indicators

Onboard Power LED

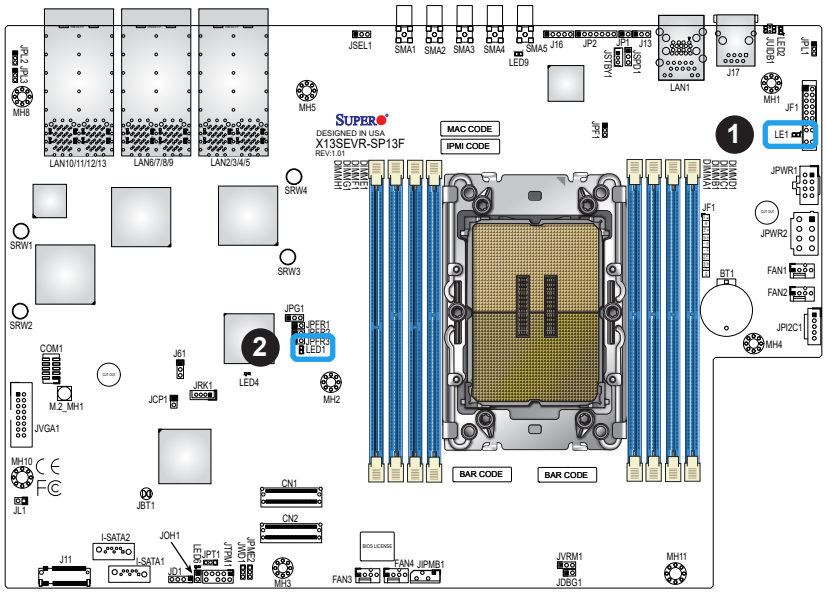
LE1 is the onboard Power LED. When this LED is on, the system is on. Turn off the system and unplug the power cord before removing or installing components. Refer to the table below for more information.

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

BMC Heartbeat LED

LED1 is the BMC Heartbeat LED. When the LED is blinking green, BMC is working. Refer to the table below for the LED status.

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



1. Onboard Power LED
2. BMC Heartbeat LED

Power Fail/Fan Fail LED

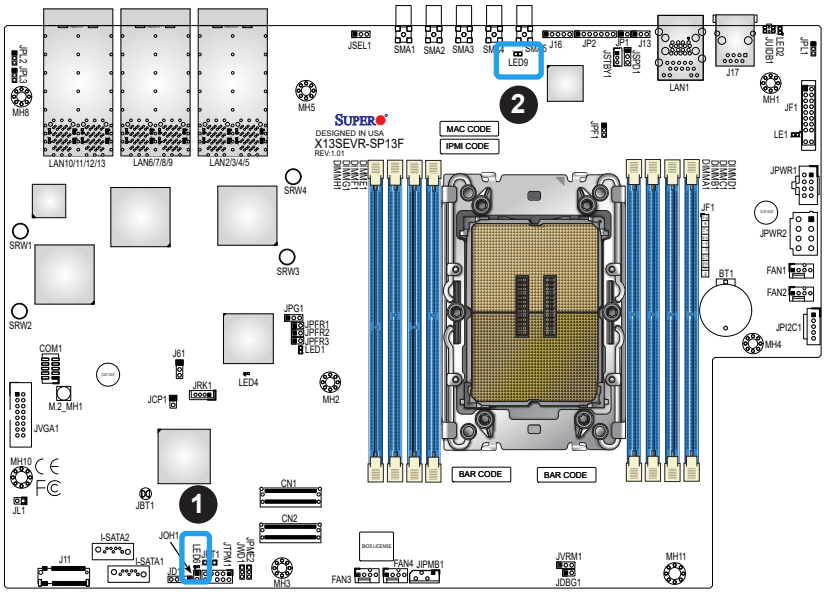
LED6 is the Power and Fan Fail LED. Refer to the table below for the LED status.

Power Fail/Fan Fail LED	
Pin#	**Definition**
Blinking Red	Power Fail or Fan Fail
Solid Red	Overheat

GNSS Timepulse LED

LED9 is the GNSS Timepulse LED. When the LED is blinking blue, the Timepulse is working. Refer to the table below for the LED status.

GNSS Timepulse LED	
LED Color	**Definition**
Blinking Blue	Timepulse Normal



1. Power Fail/Fan Fail LED
2. GNSS Timepulse 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 front 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 2.8 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 are properly installed. See Chapter 2 for installation instructions. (For memory compatibility, refer to the "Tested Memory List" link on the motherboard's product page to see a list of supported memory.)
2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM type and speed for all DIMMs in the system.
3. Make sure that you are using the correct type of ECC DDR5 modules recommended by the manufacturer.
4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.

Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose the CMOS setup information. Refer to Chapter 2 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.
3. 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's 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. Also check the front panel Overheat LED and make sure that it is not on.
5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Please refer to our website for more information on the minimum power requirements.
6. Proper software support: Make sure that the correct drivers are used.

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 USB flash or media drives.
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, please take the following steps. Also, please 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. Please 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 http://www.supermicro.com/RmaForm/.
5. Distributors: For immediate assistance, please 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 2 TB of DDR5 ECC RDIMM memory with speeds of up to 4800 MT/s in eight memory slots. To enhance memory performance, do not mix memory modules of different speeds and sizes. Please 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. Please 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. Please 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, please 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.

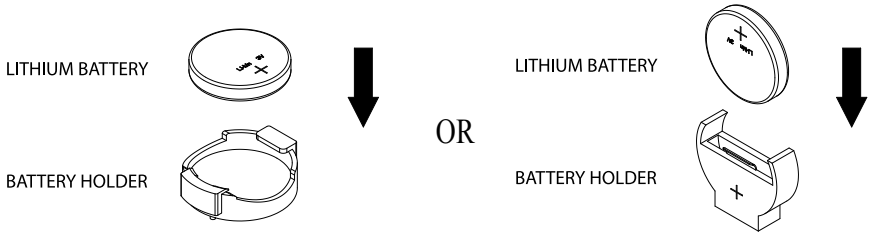
Proper Battery Disposal

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

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 the motherboard to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and the shipping package is 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, you can also request a RMA authorization online (http://www.supermicro.com/RmaForm/).

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

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

Chapter 4

UEFI BIOS

4.1 Introduction

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

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

Starting the Setup Utility

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

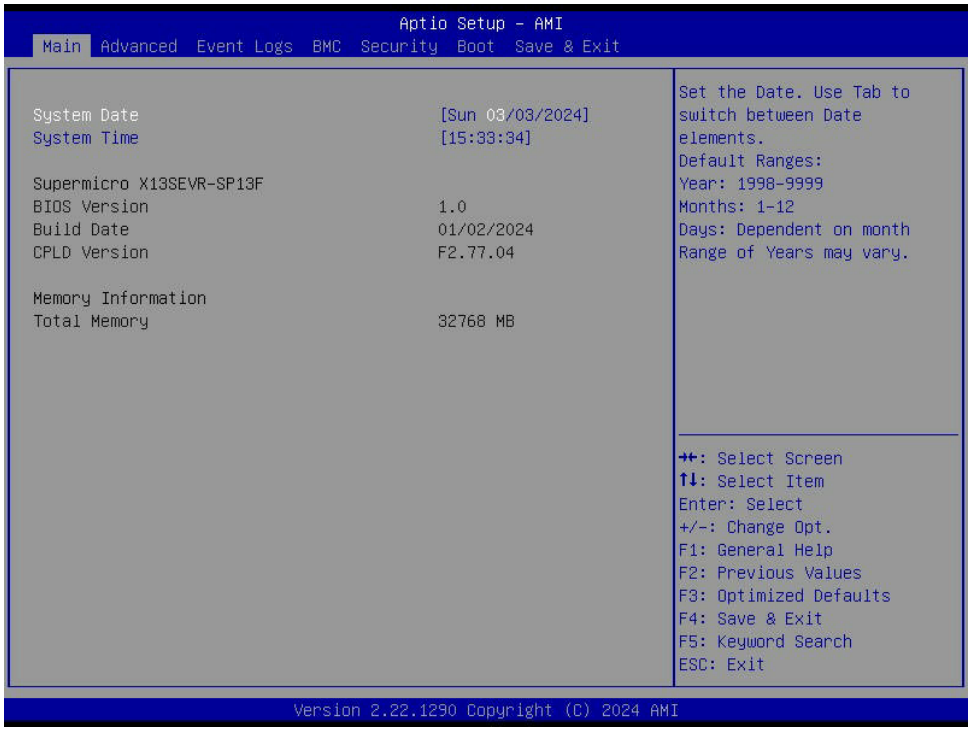
The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is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

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

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

4.2 Main Setup

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



System Date / System Time

Use this feature to change the system date and time. To change system date and time settings, highlight System Date or System Time using the arrow keys and enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in 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 X13SEVR-SP13F

BIOS Version

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

Build Date

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

CPLD Version

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

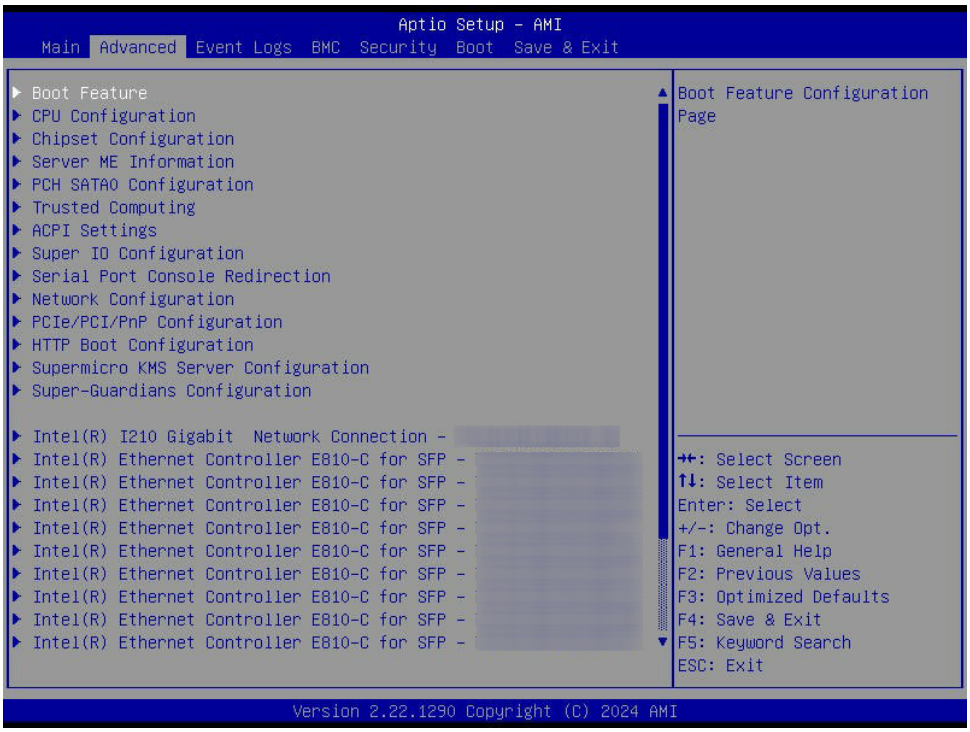
Memory Information

Total Memory

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

4.3 Advanced Setup Configurations

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



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

▶Boot Feature

Quiet Boot

Use this feature to select the screen between displaying 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 for this feature.

Option ROM Messages

Use this feature to set the display mode for the Option ROM. Select Keep Current to display 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 bootup. The options are **Immediate** and Postponed.

Re-try Boot

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

Power Configuration

Watch Dog Function

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

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

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

Restore on AC Power Loss

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

Power Button Function

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

▶CPU Configuration

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

Select BIOS to allow the system BIOS to configure the Power-Performance Tuning Bias setting. The options are **OS Controls EPB** and BIOS Controls EPB.

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

Use this feature to configure the proper operation 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 Maximum Performance, Performance, **Balanced Performance**, Balanced Power, and Power.

Optimized Power Mode

Use this feature to enable or disable Optimized Power modes. The options are **Disable** and Enable.

▶CPU P State Control

This feature allows you to 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 specify the base P1 ratio for Streaming SIMD Extensions (SSE) and AVX workloads and to pre-grant a license level. The options are **Nominal**, Level 1, and Level 2.

SpeedStep (P-States)

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

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 feature allows 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.

▶CPU C State Control

Enable Monitor MWAIT

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

CPU C1 Auto Demotion

Select Enable to allow the CPU to demote C3, C6, or C7 requests to C1 based on un-core auto-demote information. 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. This feature 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(Hex)

Enter 0 to enable this feature for all CPU cores. Enter FFFFFFFFFFFFFFFF 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 Disable and **Enable**.

Hardware Prefetcher

If this feature is set to Enable, the hardware prefetcher will prefectch 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

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. This feature allows multiple operating systems to run simultaneously on the same computer to maximize system resources for performance enhancement. The options are Disable and **Enable**.

Note: The changes take effect after you press Save Changes and Exit, Save Changes and Reset, or Save Changes in the Save and Exit submenu.

Enable SMX

Select Enable to support Safer Mode Extensions (SMX). This feature 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 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)

Select Enabled for total memory encryption 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 Total Memory Encryption (TME) function for physical memory protection. The options are **Auto**, Disabled, and Enabled.

The following information is displayed:

- Total Memory Encryption
- Multi-Tenant (TME-MT)
- Memory Integrity
- Key Stock Amount
- TME-MT Key ID Bits

Trust Domain Extension (TDX)

Software Guard Extension (SGX)

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

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

SGX Factory Reset

Use this feature to perform an SGX factory reset to delete all registration data and force an Initial Platform Establishment flow. Reboot the system for the change 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 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**, 256M, 512M, 1G, 2G, 4G, 8G, 16G, 32G, 64G, and 128G.

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 make better 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 the owner to add entropy to the keys during the derivation. Use this feature to select the two Owner EPOCH modes. One is New Random Owner EPOCH , the other is manually entered by you. 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)

Enter a numeric value for this feature. 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)

Enter a numeric value for this feature. The default is **0**.

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

Use this feature to write SGX LE Public Key Hash 0–3 from OS/SW. The options are Disabled and **Enabled**.

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 wrong values in below sections may cause system to malfunction.

▶North Bridge

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

▶Uncore Configuration

The following information is displayed.

- Number of 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. This feature allows the CPU to reduce the UPI links from full width to half width in the event when the CPU's workload is low in an attempt to save power. This feature is available for the system that uses Intel processors with UPI technology support. The options are Disable, Enable, **Auto**, and Full L0p Enable.

Note: 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.

Link L1 Enable

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

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

KTI Prefetch

Select Enable for the KTI prefetcher to preload the L1 cache with data deemed relevant. This allows 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, and Enable SNC2 (2-clusters).

Stale AtoS (A to S)

The in-memory directory has three states: I, A, and S states. The I (-invalid) state indicates that the data is clean and does not exist in the cache of any other sockets. The A (-snoop All) state indicates that the data may exist in another socket in an exclusive or modified state. The S state (-Shared) indicates that the data is clean and may be shared in the caches across one or more sockets. When the system is performing "read" on the memory and if the directory line is in A state, we must snoop all other sockets because another socket may have the line in a modified state. If this is the case, a "snoop" will return the modified data. However, it may be the case that a line "reads" in an A state, and all the snoops come back with a "miss." This can happen if another socket reads the line earlier and then has 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 the Integrated Memory Controller (iMC) settings.

Enforce DDR Memory Frequency POR

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

Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 3200, 3600, 4000, 4400, 4800, 5200, 5600, 6000, and 6400.

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

Use this feature to support the Legacy ADR mode to enhance memory performance. 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

Use this feature to enable or disable legacy support for CXL Type 3 devices. The options are Enable and **Disable**.

▶Memory Topology

This feature displays the information of memory modules detected by the BIOS.

▶Page Policy

Page Policy

Use this feature to select the DRAM page policy. The options are **Closed** and Adaptive.

▶Memory RAS Configuration Setup

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.

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**.

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 16 K cycles if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind the IO hub will be scrubbed every day. The options are Disabled and **Enable at End of POST**.

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

IOU0/1/2/3/4 (IIO PCIe Port 1/2/3/4/5)

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

For detailed slot bifurcation mapping, refer to the system block diagram in Chapter 1.

▶M.2-C

Link Speed

Use this feature to select or view the link speeds for the PCIe 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) .

The following information is displayed:

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

Data Link Feature Exchange

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

PCIe Port Max Payload Size

Selecting Auto for this feature enables the motherboard to automatically detect the maximum Transaction Layer Packet (TLP) size for the connected PCIe device, allowing for maximum I/O efficiency. Selecting 128B or 256B designates maximum packet size of 128 or 256. The options are 128B, 256B, 512B, and **Auto**.

Equalization Bypass to Highest Rate

Enable this feature to bypass the equalization of intermediate data rates. This will reduce the time for link training in PCIe 5.0 devices. The options are Disable and **Enable**.

▶IOAT Configuration

Relaxed Ordering

Select Yes to enable Relaxed Ordering support. This feature allows certain transactions to violate the strict-ordering rules of PCI bus for a transaction to be completed prior to 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 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

Use this feature to enable or disable Opt-out Illegal 0xFEE Platform Mitigation Select Enable to Opt-Out. Illegal Message Signaled Interrupt (MSI) mitigation prevents non-maskable interrupts generated by improper MSI from causing software panic. The options are **Disable** and Enable.

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

Enable this feature to help block DMA attacks. 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 **Disable** and Enable.

▶Intel® VMD Technology

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

Note: 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.

NVMe Mode Switch

If this feature is set to Auto, VMD mode will be automatically enabled for all NVMe slots when a VROC key is plugged in. 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 PCH ports

Enable/Disable VMD

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

PCH Root Ports 0–11 (Available when the device is detected by the system and "Enable/Disable VMD" above is set to Enable)

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

VMD Config for IOU 0/1/2/3/5/6

Enable/Disable VMD

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

Hot Plug Capable

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

VMD Config for IOU 4

Enable/Disable VMD

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

Socket0 IOU4 VMD port A

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

Hot Plug Capable

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

▶PCIe Leaky Bucket Configuration

Gen2–Gen5 Link Degradation

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

II0-PCIe Express Global Options

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PCIe ASPM Support (Global)

Use this feature to enable or disable ASPM support for all downstream devices. The options are **Disable** and Auto.

PCIe Max Read Request Size

Use this feature to select the Maximum Read Request size of the PCIe device, or select Auto to allow the System BIOS to determine the value. The options are **Auto**, 128B, 256B, 512B, 1024B, 2048B, and 4096B.

Equalization Bypass to Highest Rate

Enable this feature to bypass the equalization of intermediate data rates. This will reduce the time for link training in PCIe 5.0 devices. The options are Disable and **Enable**.

IIO eDPC Support

Use this feature to enable or disable IIO enhanced DPC (eDPC) support. The options are **Disable**, On Fatal Error, and On Fatal and Non-Fatal Errors.

IIO eDPC Interrupt (Available if "IIO eDPC Support" is set to On Fatal Error or On Fatal and Non-Fatal Errors)

Use this feature to enable or disable IIO enhanced DPC (eDPC) interrupt. The options are Disable and **Enable**.

IIO eDPC ERR_COR Message (Available if "IIO eDPC Support" is set to On Fatal Error or On Fatal and Non-Fatal Errors)

Use this feature to enable or disable IIO enhanced DPC (eDPC) error correction message. The options are Disable and **Enable**.

CXL Security Level

Use this feature to set the Computer Express Link security level. The options are Fully Trusted, Partially Trusted, Untrusted, and **Auto**.

CXL Header Bypass

Use this feature to enable or disable the Computer Express Link header bypass. The options are **Disable** and Enable.

▶South Bridge

The following USB 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 support. This feature 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 General ME Configuration is displayed:

- Oper. Firmware Version
- Current State
- Error Code

▶PCH SATA0 Configuration

When the submenu is selected, the AMI BIOS automatically detects the presence of the SATA devices that are supported by the Intel PCH chip and displays the following features.

SATA Controller(s)

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

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

Use this feature to select the mode of installed SATA drives. The options are **AHCI** and RAID.

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

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

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

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

SATA SGPIO Mode

Use this feature to enable serial GPIO for the SATA controller to ensure which storage driver can monitor and auxiliary service in a drive enclosure. This feature is only valid in AHCI/RAID mode. When you select Enable, it supports multiple-activity LEDs to show the per drive status information from the Front Panel. When you select Disabled, the SGPIO signals are off to deliver the LED messages from the Front Panel. The options are **LED** and SGPIO.

Note: The signals are not related to SATALED.

SATA Port 4/SATA Port 5

This feature displays the information detected on the installed SATA drive on the particular SATA port.

Hot Plug

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

Spin Up Device

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

SATA Device Type

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

▶Trusted Computing

The motherboard supports TPM 2.0. The following Trusted Platform Module (TPM) information is displayed if a TPM 2.0 module is detected:

- Firmware Version
- Vendor Name

Security Device Support

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

When "Security Device Support" is set to Enable, the following information will display:

- Active PCR banks
- Available PCR banks

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

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

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

Use this feature to schedule a TPM-related operation to be performed by a security (TPM) device at the next system boot to enhance system data integrity. 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) (for TPM Version 2.0 and above)

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

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

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

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

Select Enabled for Endorsement Hierarchy support. This feature contains separate controls to address your 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. You can disable the endorsement hierarchy while still using the storage hierarchy for TPM applications, permitting the platform software to use the TPM. The options are Disabled and **Enabled**.

PH Randomization (for TPM Version 2.0 and above)

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

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 the 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 High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are Disabled and **Enabled**.

▶Super IO Configuration

The following Super IO information is displayed:

- Super IO Chip AST2600

▶Serial Port 1 Configuration

This submenu allows you to configure the settings of Serial Port 1.

Serial Port 1

Select Enabled to enable the selected onboard serial port. The options are Disabled and **Enabled**.

Device Settings

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

Change Settings

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

▶Serial Port 2 Configuration

This submenu allows you to configure the settings of Serial Port 2.

Serial Port 2

Select Enabled to enable the selected onboard serial port. The options are Disabled and **Enabled**.

Device Settings

This feature displays the status of a serial port.

Change Settings

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

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

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

▶Serial Port Console Redirection

COM1

Console Redirection

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

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

▶COM1 Console Redirection Settings (Available when "Console Redirection " above is set to Enabled)

Terminal Type

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

Bits Per Second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Putty KeyPad

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

SOL/COM2

Console Redirection

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

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

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

Terminal Type

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

Bits Per Second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Putty KeyPad

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

Legacy Console Redirection

▶Legacy Console Redirection Settings

Legacy Serial Redirection Port

Use this feature to select a COM port to display redirection of Legacy OS and Legacy OPROM messages. The options are **COM1** and SOL/COM2.

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 BIOS POST

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

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

Console Redirection EMS

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

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

This feature allows you to specify how the host computer exchanges data with the client computer. The client computer is the remote computer you use.

Out-of-Band Mgmt Port

The feature selects a serial port in a client server to be used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1** and SOL/COM2. Note that the 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 VT100+ to add color and function key support. Select ANSI to use the extended ASCII character set. Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, VT100+, **VT-UTF8**, and, ANSI.

Bits Per Second EMS

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

Flow Control EMS

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

The following information is displayed:

Data Bits EMS / Parity EMS / Stop Bits EMS

▶Network Configuration

Network Stack

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

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

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

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

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

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

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

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

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

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

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

Media Detect Count

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

▶MAC:xxxxxxxxxxxx-IPv6 Network Configuration
▶MAC:xxxxxxxxxxxx-IPv6 Network Configuration
▶MAC:xxxxxxxxxxxx-IPv6 Network Configuration
▶MAC:xxxxxxxxxxxx-IPv6 Network Configuration
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▶MAC:xxxxxxxxxxxx-IPv6 Network Configuration
▶MAC:xxxxxxxxxxxx-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 set the 64-bit alternative interface ID for the device.

DAD Transmit Count

If this set feature is set to 0, the Duplication Address Detection is not performed. Set the value to a preferred selection.

Policy

Use this feature to set the policy to automatic or manual. The options are **automatic** and manual.

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

New IPv6 address

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

New Gateway address

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

New DNS address

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

Commit Changes and Exit

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

Discard Changes and Exit

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

Save Changes and Exit

Select this feature to save the changes for the features above and exit.

▶MAC:xxxxxxxxxxxx-IPv4 Network Configuration
▶MAC:xxxxxxxxxxxx-IPv4 Network Configuration
▶MAC:xxxxxxxxxxxx-IPv4 Network Configuration
▶MAC:xxxxxxxxxxxx-IPv4 Network Configuration
▶MAC:xxxxxxxxxxxx-IPv4 Network Configuration
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▶MAC:xxxxxxxxxxxx-IPv4 Network Configuration
▶MAC:xxxxxxxxxxxx-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). This feature 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 network 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

Select this feature to save the changes for the features above and exit.

▶PCIe/PCI/PnP Configuration

The following information is displayed:

- PCI Bus Driver Version

PCI Devices Common Settings:

Above 4G Decoding (Available if 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 64 M, 128 M, 256 M, 512 M, 1G, 2G, and **Auto**.

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 or disable resizable BAR support. The options are **Disabled** and Enabled.

SR-IOV Support

Use this feature to enable or disable Single Root IO Virtualization Support. The options are Disabled and **Enabled**.

ARI Support

Use this feature to enable or disable 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

Use this feature to enable or disable ACPI_DSM device name support for onboard devices and slots. The options are **Disabled** and Enabled.

NVMe Firmware Source

Use this feature to select the NVMe firmware to support system booting. 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. The options are Vendor Defined Firmware and **AMI Native Support**.

Primary Dual Slot Config

Use this feature to select the PCIe port bifurcation for the card used in the slot. The options are **x8x8** and x16.

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.

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.

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 and **EFI**.

Onboard LAN1–LAN13 Option ROM

Use this option to select the type of device installed in the LAN ports used for system boot. The options are Disabled, **EFI**, and PXE.

▶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 select whether HTTPS Boot checks the hostname of TLS certificates matches the hostname provided by the remote server. 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 value 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 that cannot be longer than 75 characters. Enter a boot description; otherwise, the boot option for the URI cannot be created.

Boot URI

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

Instance of Priority 2–13:

This feature sets the rank target port. The default setting is **0**.

▶Supermicro KMS Server Configuration

Supermicro KMS Server IP address

Use this feature to enter the SMCI Key Management Service (KMS) server IPv4 address in dotted-decimal notation (e.g., 255.255.255.255).

Second Supermicro KMS Server IP address

Use this feature to enter the second SMCI KMS server IPv4 address in dotted-decimal notation (e.g., 255.255.255.255).

Supermicro KMS TCP Port number

Use this feature to enter the SMCI KMS TCP port number. The valid range is 100–9999. The default setting is **5696**.

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 length is 0–63 characters.

Client Password

Press <Enter> to set the client identity (Password). The length is 0–31 characters.

KMS TLS Certificate / Size

▶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.

▶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.

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 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 your system.

▶Firmware Image Properties

The following information is displayed:

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

▶NIC Configuration

Legacy Boot Protocol

Use this feature to select a non-UEFI Boot Protocol. The options are **None**, PXE, iSCSI, PXE without failover, and iSCSI without failover.

Link Speed

This feature displays the connection speed of a LAN port. The options are **Auto Negotiated**, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, and 100 Mbps Full.

Wake On LAN

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

Legacy Virtual LAN ID

Use this feature to configure the virtual LAN ID. This feature accepts a number ranging from 0 to 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 is **1**.

Blink LEDs

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

The following information is displayed:

- UEFI Driver
- Adapter PBA
- Device Name
- Chip Type
- PCI Device ID
- PCI Address
- Link Status
- Link Speed Status
- MAC Address
- Virtual MAC Address

▶Intel(R) Ethernet Controller E810-C for SFP - xx:xx:xx:xx:xx:xx

▶Firmware Image Properties

The following information is displayed:

- Option ROM Version
- Unique NVM/EEPROM ID
- NVM Version

▶NIC Configuration

Link Speed

This feature displays the connection speed of a LAN port. The options are **Auto Negotiated**, 10 Mbps Half, 10 Mbps Full, 100 Mbps Half, and 100 Mbps Full.

Wake On LAN

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

LLDP Agent

If this feature to enable or disable the firmware's LLDP agent. The options are **Disabled** and Enabled.

▶Device Level Configuration

Transmit Balancing

Use this feature to enable or disable transmit balancing. The options are **Disabled** and Enabled.

S-IOV (Scalable IOV)

Use this feature to enable or disable the scalable IOV feature. The options are **Disabled** and Enabled.

▶Port Option Configuration

Port Option

Use this feature to configure the port option of the device. The option is Option 0: 4x25G.

▶Option 0: 4x25G

Blink LEDs

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

The following information is displayed:

- UEFI Driver
- Adapter PBA
- Device Name
- Chip Type
- PCI Device ID
- PCI Address

- Link Status
- Link Speed Status
- MAC Address
- Virtual MAC Address

Media Detection

Use this feature to enable or disable media detection. The options are Enabled and **Disabled**.

Forward Error Correction

Use this feature to specify the type of forward error correction to use. The options are **Auto**, Fire Code (Clause 74), RS-FEC (Clause 91, 108, 134), and Disabled.

No-FEC in FEC Auto

Use this feature to enable or disable the No-FEC mode as an additional one. The options are **Disabled** and Enabled.

▶TLS Authenticate Configuration

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

▶Server CA Configuration

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

▶Enroll Certification

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

▶Enroll Certification Using File

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

Certification GUID

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

Commit Changes and Exit

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

Discard Changes and Exit

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

▶Delete Certification

Use this feature to discard all changes and exit TLS settings. The options are **Disabled** and Enabled.

▶Client Certification Configuration

▶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.

▶Intel(R) PRO/1000 9.8.09 PCIe

Controller information is displayed when a controller is detected.

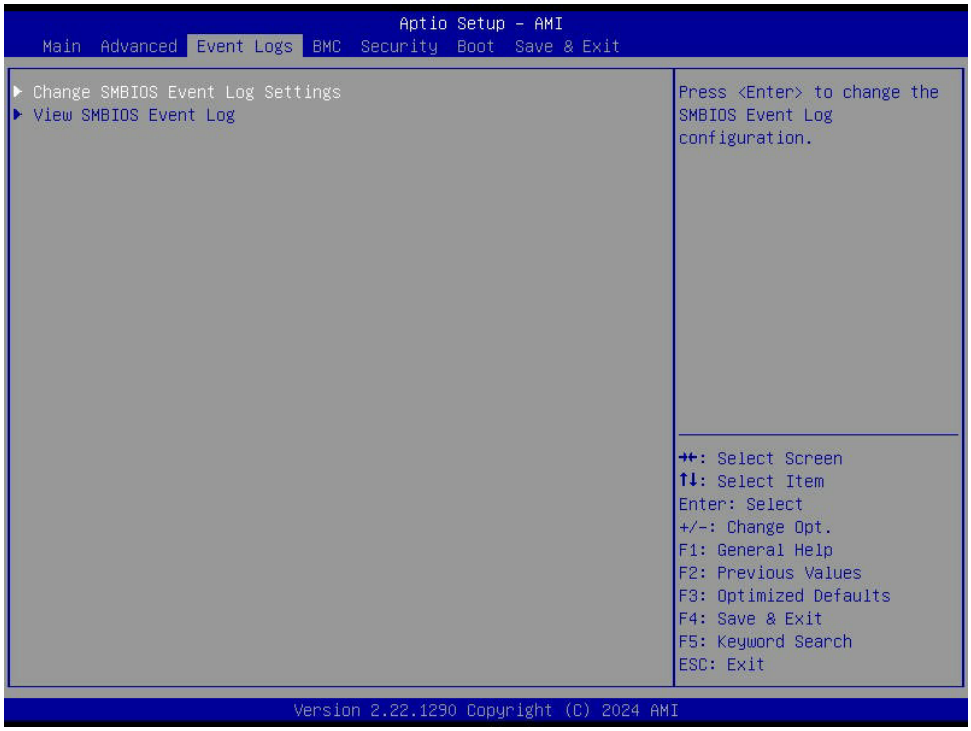
▶Intel(R) 800 Series Ethernet Driver 4.0.48

Intel(R) Ethernet Controller E810-C for SFP

Intel(R) Ethernet Controller E810-C for SFP

4.4 Event Logs

Use this menu to configure Event Log settings.



Note: The changes take effect after you press Save Changes and Exit, Save Changes and Reset, or Save Changes in the Save and Exit submenu.

▶Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

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

Erasing Settings

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

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

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

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

SMBIOS Event Log Standard Settings

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

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

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

Enter the increment value for the multiple event counter. Enter a number between 1 to 255. The default setting is **1**.

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

This feature is used to determine how long (in minutes) should the multiple event counter wait before generating a new event log. Enter a number between 0 to 99. The default setting is **60**.

Note: All values changed here do not take effect until computer is restarted.

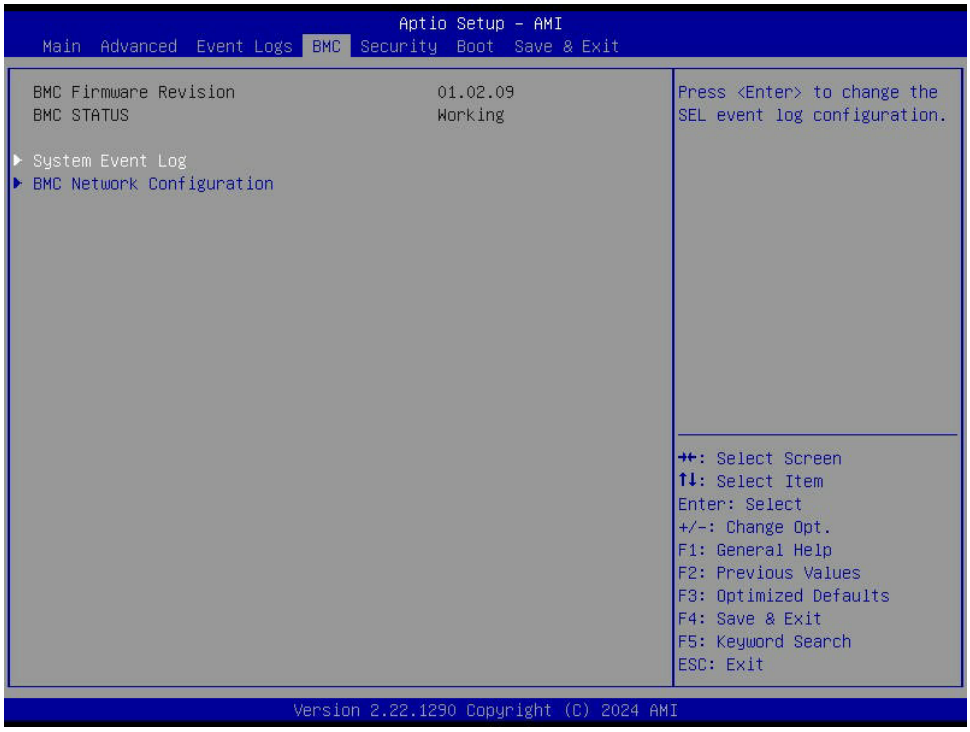
▶View SMBIOS Event Log

This feature allows you to view the event in the system event log. Select this feature and press <Enter> to view the status of an event in the log. The following categories will be displayed:

DATE / TIME / ERROR CODE / SEVERITY.

4.5 BMC

Use this menu to configure 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: All values changed here do not take effect until the computer is restarted.

▶BMC Network Configuration

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 **Shared 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 **DHCP** and Static.

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

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 VLAN support. The options are **Disable** and Enable.

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

Use this feature to create a new LAN ID by using an existing VLAN or creating a new VLAN ID. Enter a valid value between 0–4094.

****

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 Dynamic Host Configuration Protocol (DHCP) related option is 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 (DHCPv6 Stateless) (Available when "Configuration Address Source" is set to Static Configuration)

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

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

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

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

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

Advanced Settings

This feature allows you to automatically obtain the DNS server IP or manually obtain the DNS server IP. The options are **Auto obtain DNS server IP** and Manually obtain DNS server IP.

Preferred DNS server IP

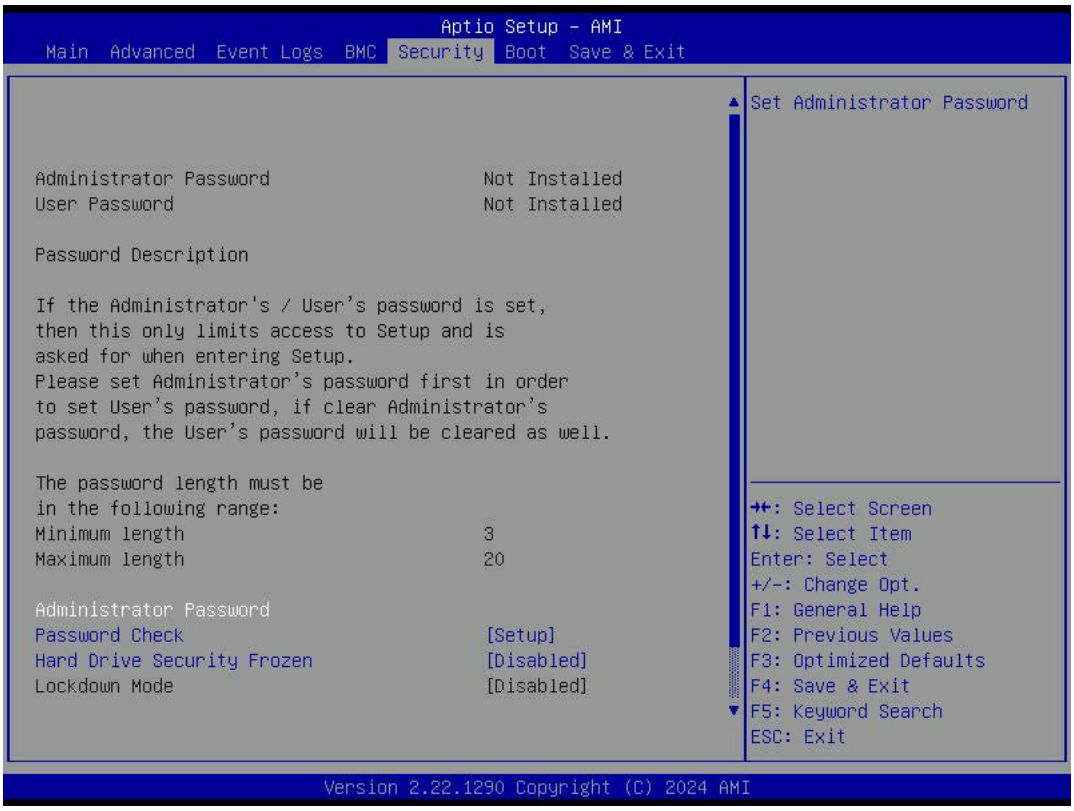
Use this feature to enter the preferred DNS server IP address in dotted-decimal notation (e.g., 255.255.255.255).

Alternative DNS server IP

Use this feature to enter the alternative DNS server IP address in dotted-decimal notation (e.g., 255.255.255.255).

4.6 Security

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



The following information is displayed:

- Administrator Password
- User Password
- Password Description

Administrator Password

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

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

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 Enabled and **Disabled**.

Lockdown Mode (Available when the DCMS key is activated)

Select Enabled to support Lockdown Mode that will prevent 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.

▶Secure Boot

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

This section displays the contents of the following secure boot features:

- 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 devices will be supported by the system. 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 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 provision factory default settings after the platform reset while the system is in the Setup Mode. The options are **Disabled** and Enabled.

▶Restore Factory Keys

Select Yes to restore manufacturer default keys used to ensure system security. The options are **Yes** and No. Select Yes will reset 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.

▶Enroll Efi Image

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

▶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.

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. The default option is **Update**.

▶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. The options are Update and Append.

▶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. The options are Update and Append.

▶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." The options are Update and Append.

▶Authorized TimeStamps (dbt)

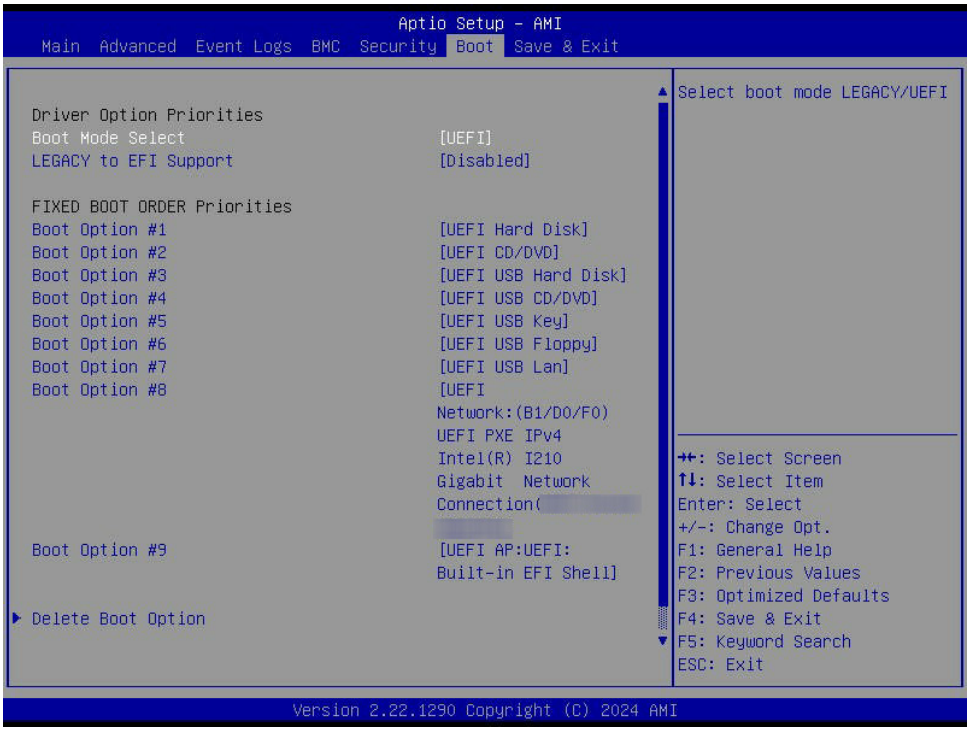
This feature allows you to set and save the timestamps for the authorized signatures which will indicate the time when these signatures are entered into the system. These values also indicate sizes, keys, and key sources of the authorized timestamps. Select Update to update your "Authorized TimeStamps."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

▶OsRecovery Signatures (dbr)

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." The options are Update and Append.

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.

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 prioritizes the order of a bootable device from which the system will boot. Press <Enter> on each item sequentially to select devices.

When "Boot Mode Select" is set to Legacy, the following features will be displayed for configuration:

- Boot Option #1–Boot Option #8

When "Boot Mode Select" is set to **UEFI** (default), the following features will be displayed for configuration:

- Boot Option #1–Boot Option #9

When "Boot Mode Select" is set to Dual, the following features will be displayed for configuration:

- Boot Option #1–Boot Option #17

▶Delete Boot Option

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

Delete Boot Option

Use this feature to remove an EFI boot option from the boot order.

▶UEFI NETWORK Drive BBS Priorities

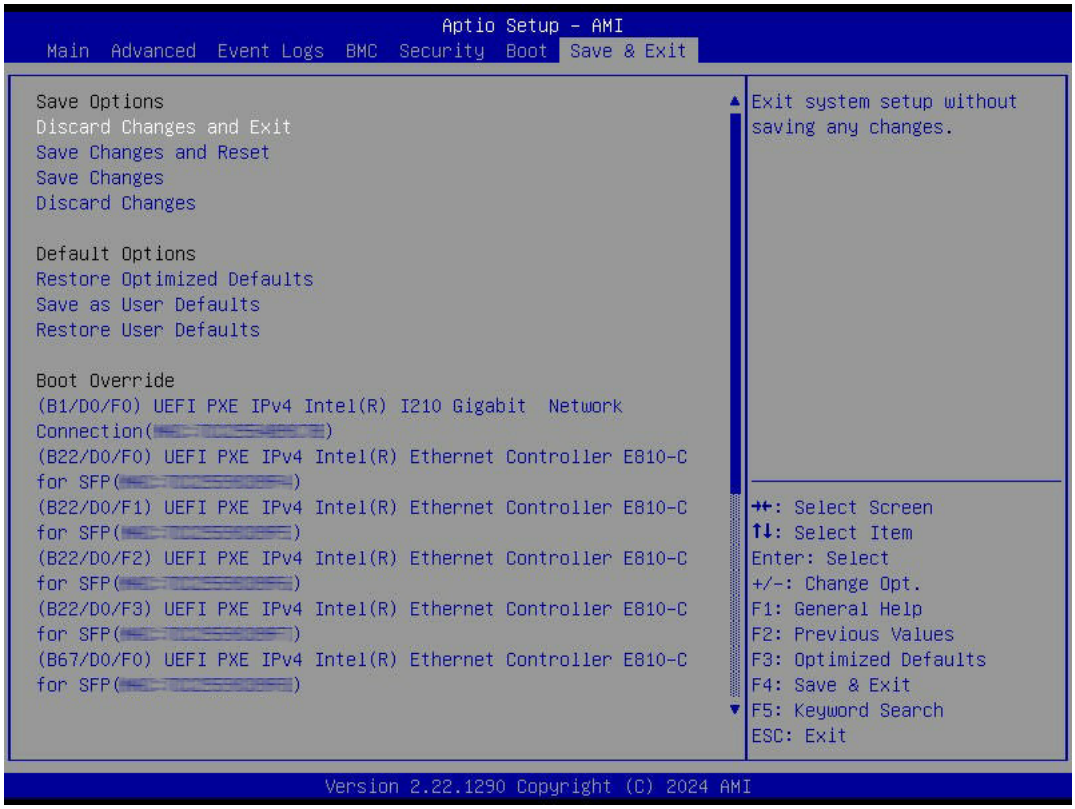
This feature allows you to set the system boot order of detected devices.

▶UEFI Application Boot Priorities

This feature allows you to set 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 leave 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. The default settings are intended for maximum system performance but not for maximum stability.

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>. Use this feature 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 an one-time override.

(B1/D0/F0) UEFI PXE IPv4 Intel® I210 Gigabit Network Connection (MAC: xxxxxxxxxxxx)

(B22/D0/F0) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B22/D0/F1) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B22/D0/F2) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B22/D0/F3) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)UEFI:

(B67/D0/F0) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B67/D0/F1) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B67/D0/F2) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B67/D0/F3) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B112/D0/F0) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B112/D0/F1) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B112/D0/F2) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

(B112/D0/F3) UEFI PXE IPv4 Intel® Ethernet Controller E810-C for SFP (MAC: xxxxxxxxxxxx)

Built-in EFI Shell

Launch EFI Shell from filesystem device

Appendix A

BIOS Codes

A.1 BIOS Error POST (Beep) Codes

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

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

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

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

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

A.2 Additional 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, please 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 can 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.

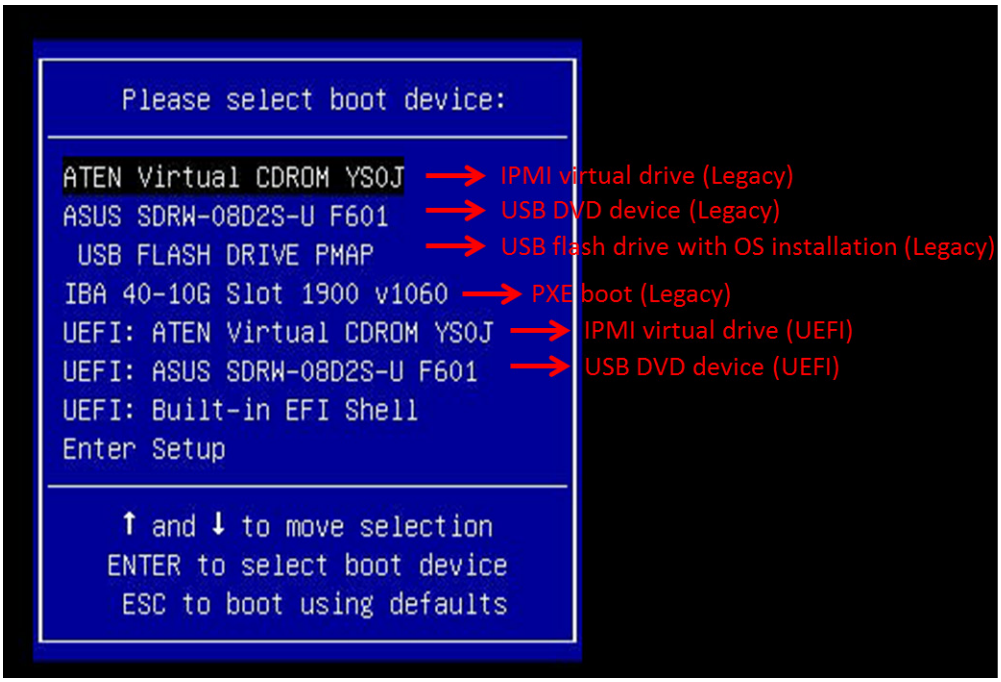


Figure B-1. Select Boot Device

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.

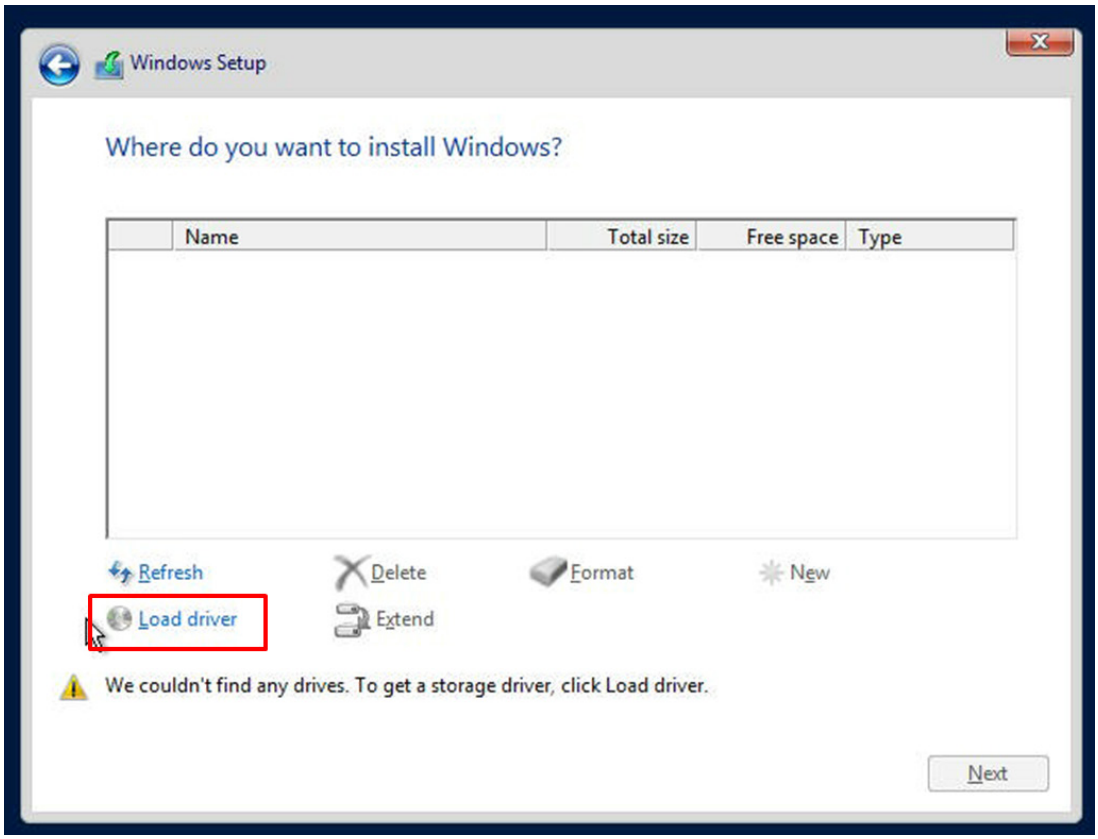


Figure B-2. Load Driver Link

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 contains drivers and utilities for your system at https://www.supermicro.com/wdl/driver. Some of these must be installed, such as the chipset driver.

After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to a USB flash 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.

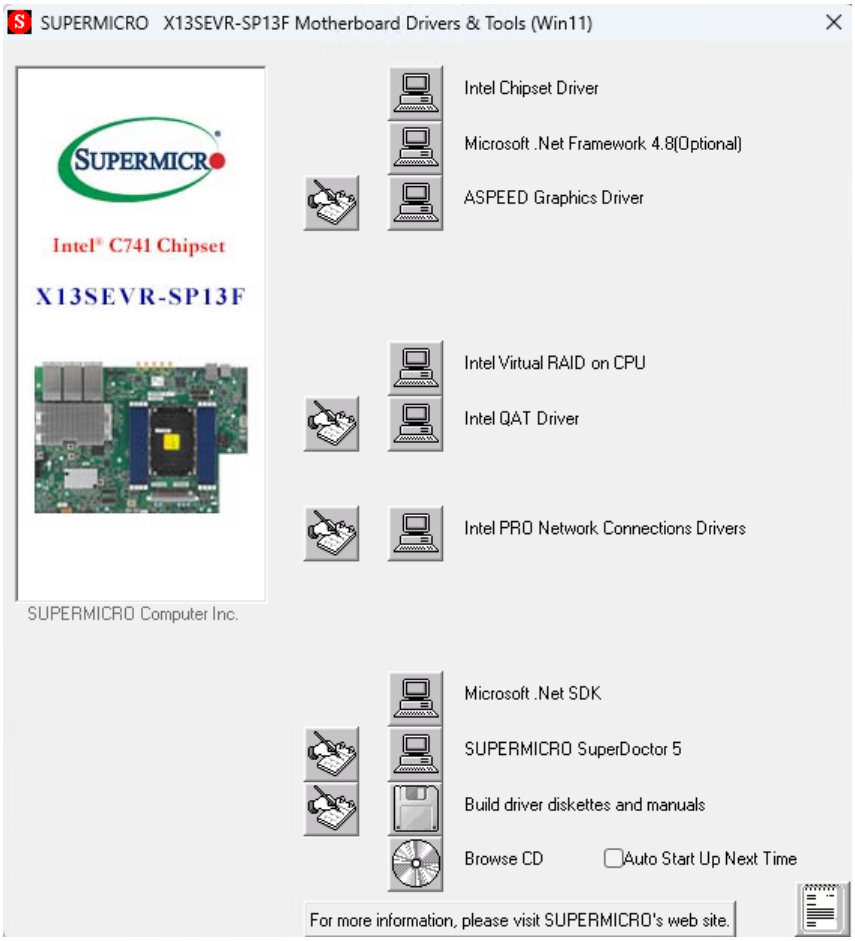


Figure B-3. Driver & Tool Installation Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to 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.

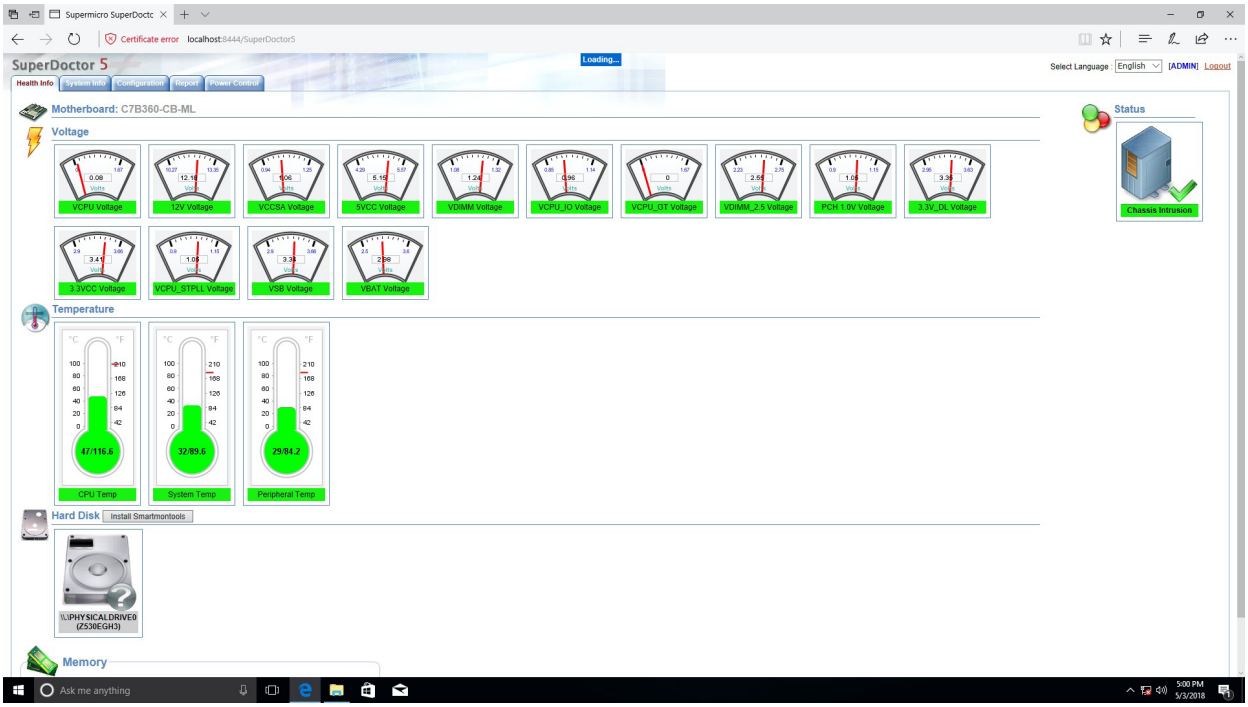


Figure B-4. SuperDoctor 5 Interface Display Screen (Health Information)

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.

Appendix D

UEFI BIOS Recovery

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

D.1 Overview

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

D.2 Recovering the UEFI BIOS Image

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

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

Note 2: When the BIOS recovery block crashes, you will need to follow the procedures to make a Returned Merchandise Authorization (RMA) request. (For a RMA request, please see section 3.5 for more information).

D.3 Recovering the BIOS Block with a USB Device

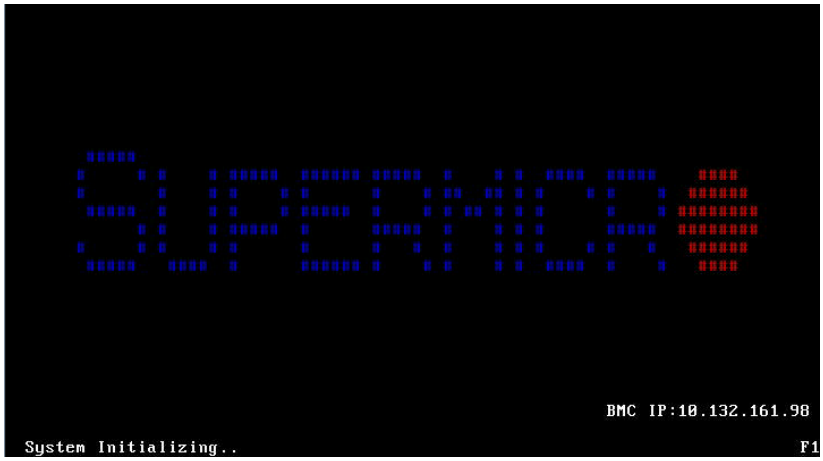
This feature allows you to recover the main BIOS image using a USB-attached device without additional utilities used. A USB flash or media drive can be used for this purpose. However, a USB Hard Disk drive cannot be used for BIOS recovery at this time.

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

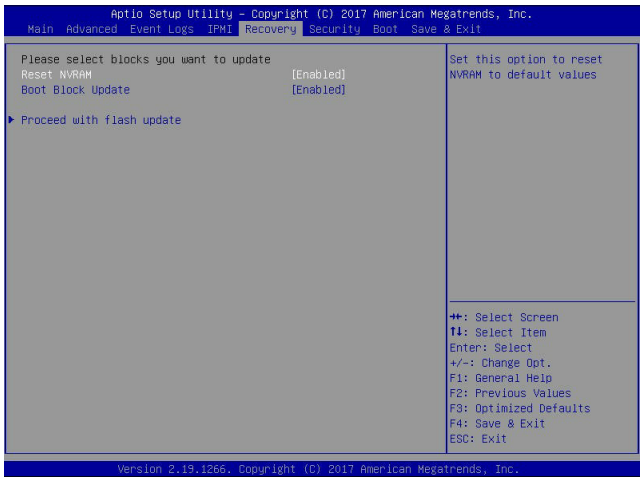
To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below:

1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\" directory of a USB flash or media drive.

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



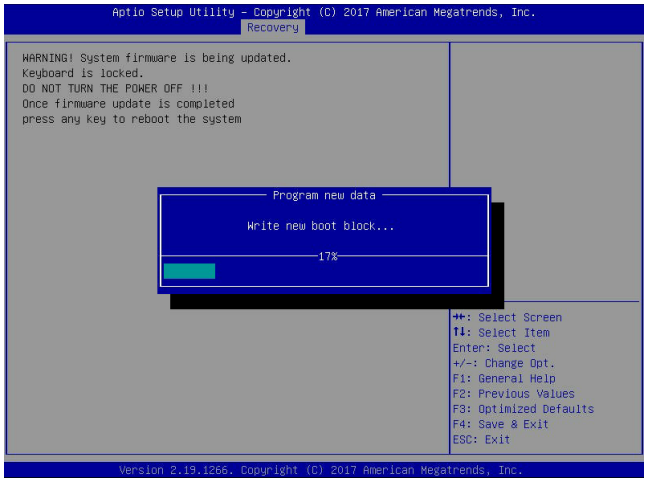
Note 2: Before recovering the main BIOS image, confirm that the "Super.ROM" binary image file you download is the same version or a close version meant for your motherboard.



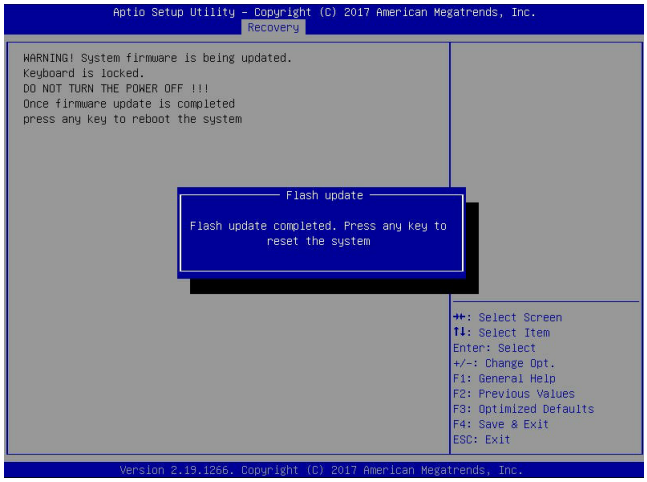
2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB port and reset the system until the following screen appears:

3. After locating the new BIOS binary image, the system will enter the BIOS Recovery menu as shown below:

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



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

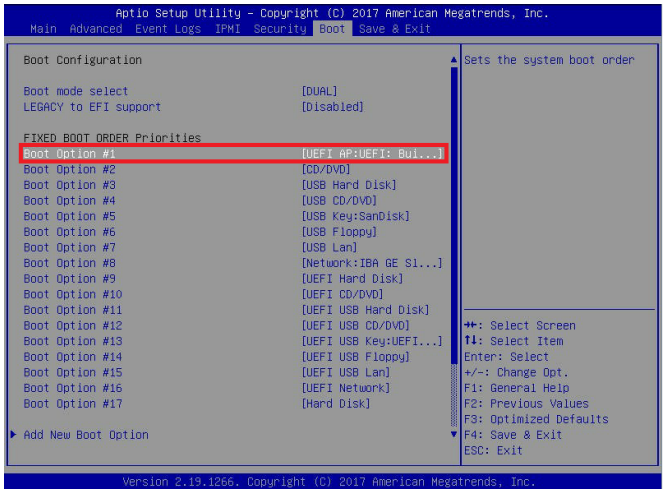


Note: *Do not interrupt the BIOS flashing process until it has completed*.

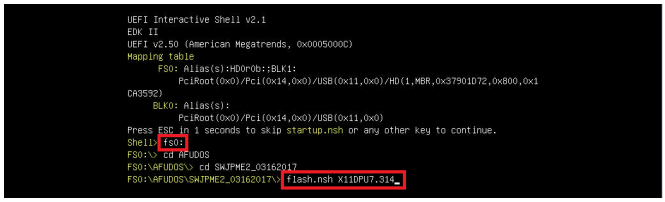
5. After the BIOS recovery process is completed, press any key to reboot the system.

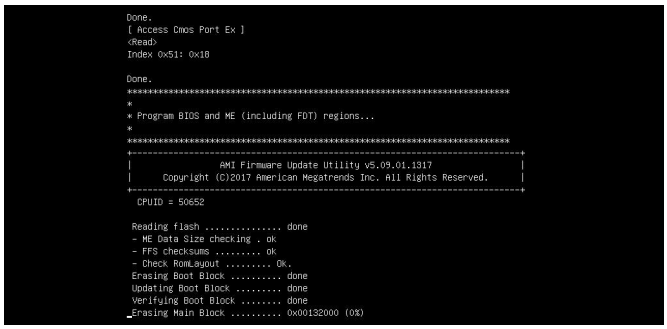
6. Using a different system, extract the BIOS package into a USB flash drive.

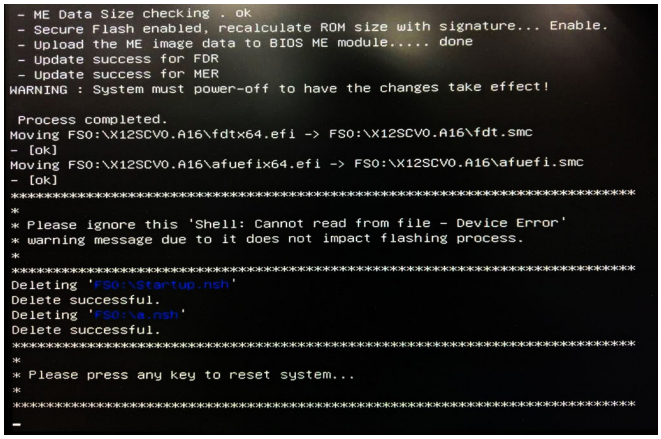
7. Press <Del> during system boot to enter the BIOS Setup utility. From the top of the tool bar, select Boot to enter the submenu. From the submenu list, select Boot Option #1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press <F4> to save the settings and exit the BIOS Setup utility.



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







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

9. The screen below indicates that the BIOS update process is complete. When you see the screen below, unplug the AC power cable from the power supply, clear CMOS, and plug the AC power cable in the power supply again to power on the system.
10. Press <Del> to enter the BIOS Setup utility.
11. Press <F3> to load the default settings.
12. After loading the default settings, press <F4> to save the settings and exit the BIOS Setup utility.