X13SAQ

USER'S MANUAL

Revision 1.0b

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Manual Revision 1.0b

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Preface

About This Manual

This manual is written for system integrators, IT technicians and knowledgeable end users. It provides information for the installation and use of the X13SAQ motherboard.

About This Motherboard

The X13SAQ motherboard supports the Intel® 12th Gen i3/i5/i7/i9, Pentium, and Celeron series processor in an LGA1700 socket with a thermal design power (TDP) of 125W. Built with the Intel Q670E chipset, the motherboard supports up to 128GB Non-ECC DDR5 UDIMM memory with speeds of up to 4400MT/s with one DIMM, or 4000MT/s with two DIMM single rank, or 3600MT/s with two DIMM dual rank. It features superior I/O expandability and high-speed connections, including one PCIe 5.0 x16 from the CPU, one PCIe 4.0 x4, one PCIe 3.0 x4, one PCIe 3.0 x2 from the PCH (open slots), M.2 M-key, eight SATA 3.0 ports, dual 2.5 GbE LAN ports, six COM ports, 8-bit GPIO, and an SMbus header. It also offers the most advanced data protection capability with a Trusted Platform Module (TPM) chip onboard. With a mainstream chipset plus ample expansion ports and support for four independent display interfaces, the motherboard is designed to meet the various needs of end customers in different situations.

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

Conventions Used in the Manual

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

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

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

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

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

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Table of Contents

Chapter 1

Introduction

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

In addition to the motherboard, several important parts that are included with the system are listed below. If anything listed is damaged or missing, contact your retailer.

1.1 Checklist

Main Parts List		
Description	**Part Number**	**Quantity**
Supermicro Motherboard	X13SAQ	1
Quick Reference Guide	MNL-2466-QRG	1
I/O Shield	MCP-260-00125-1N	1
SATA Cables	CBL-0044L	8

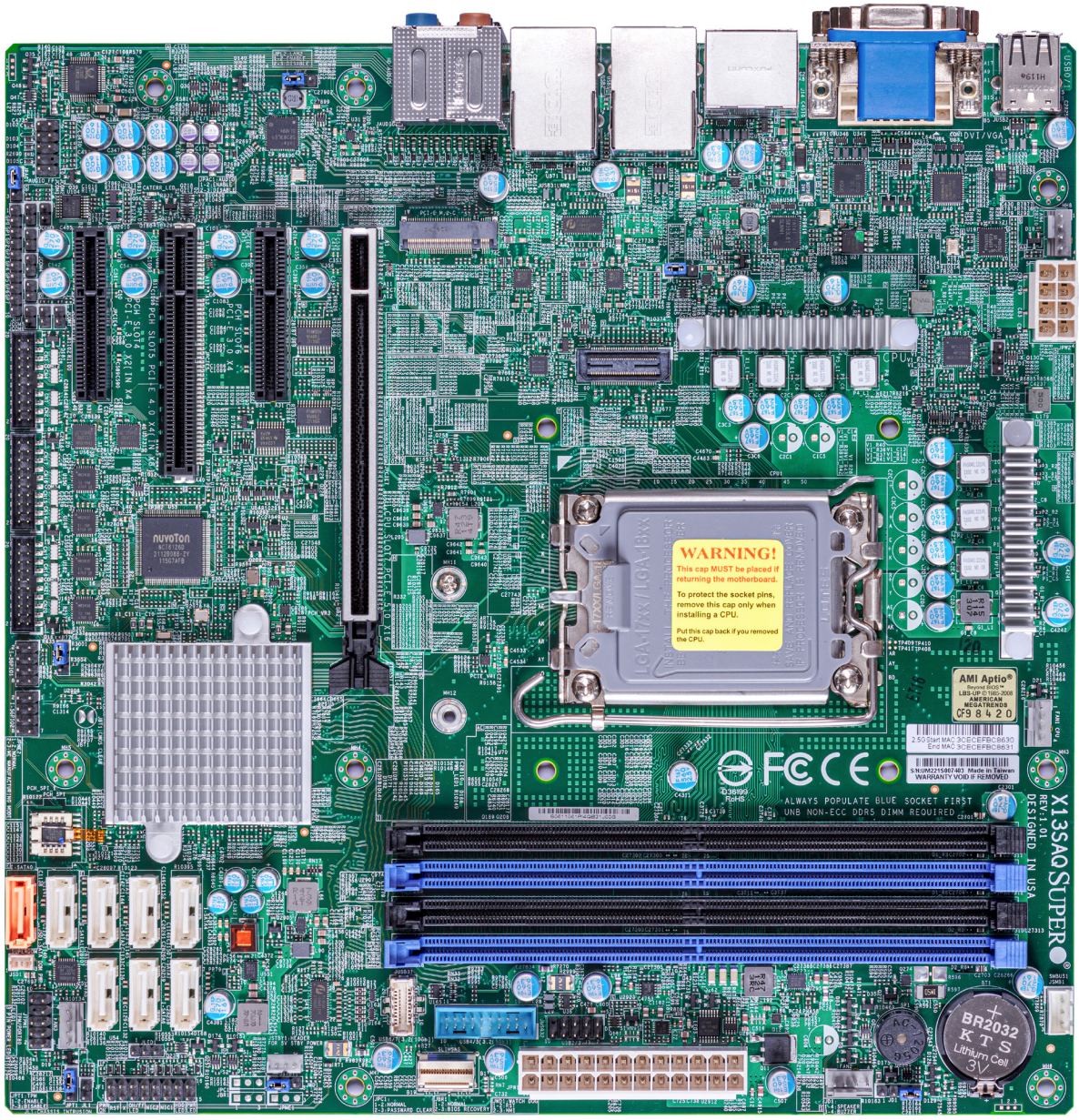
Important Links

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

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

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

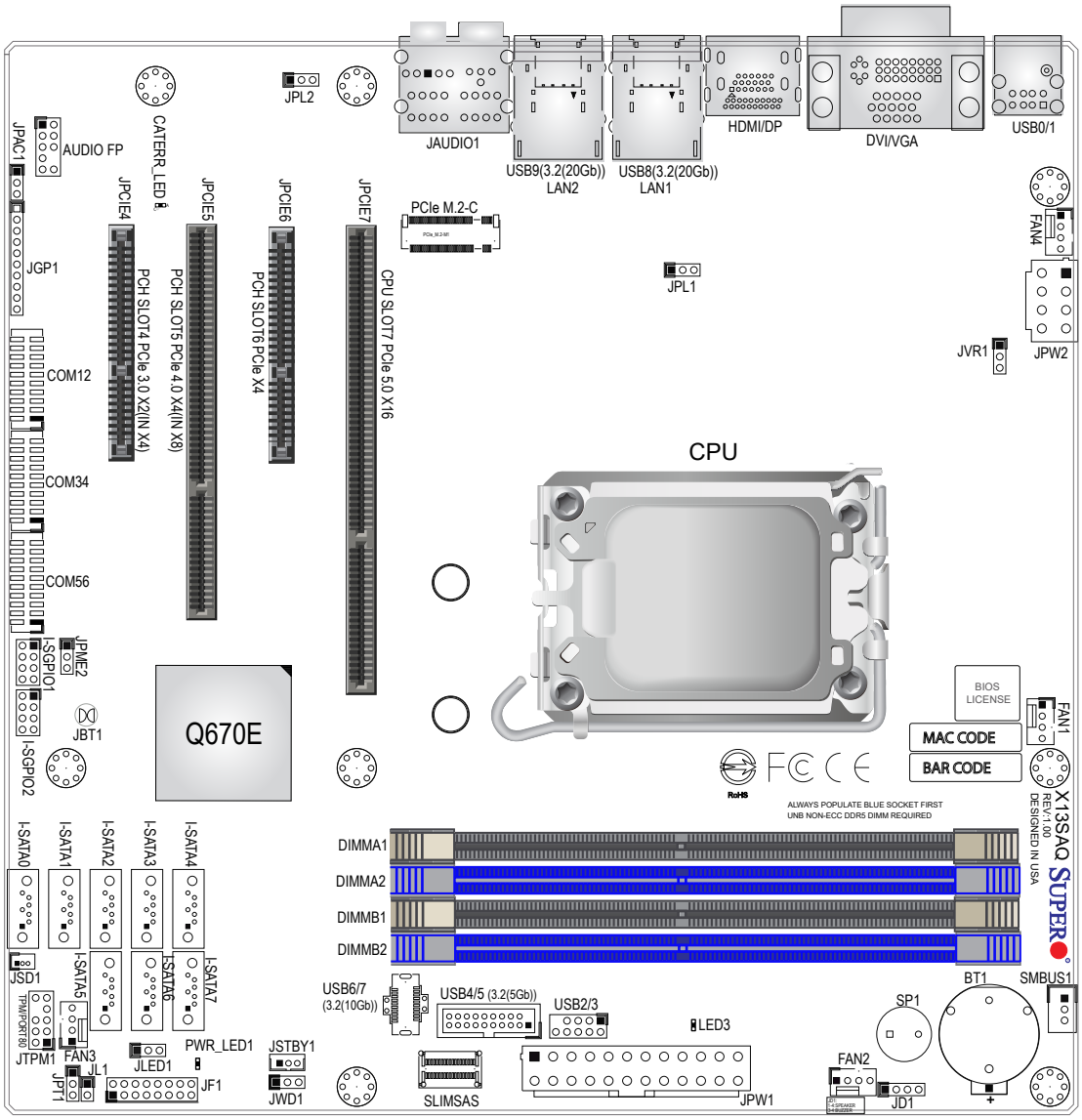
Figure 1-1. X13SAQ Motherboard Image



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.

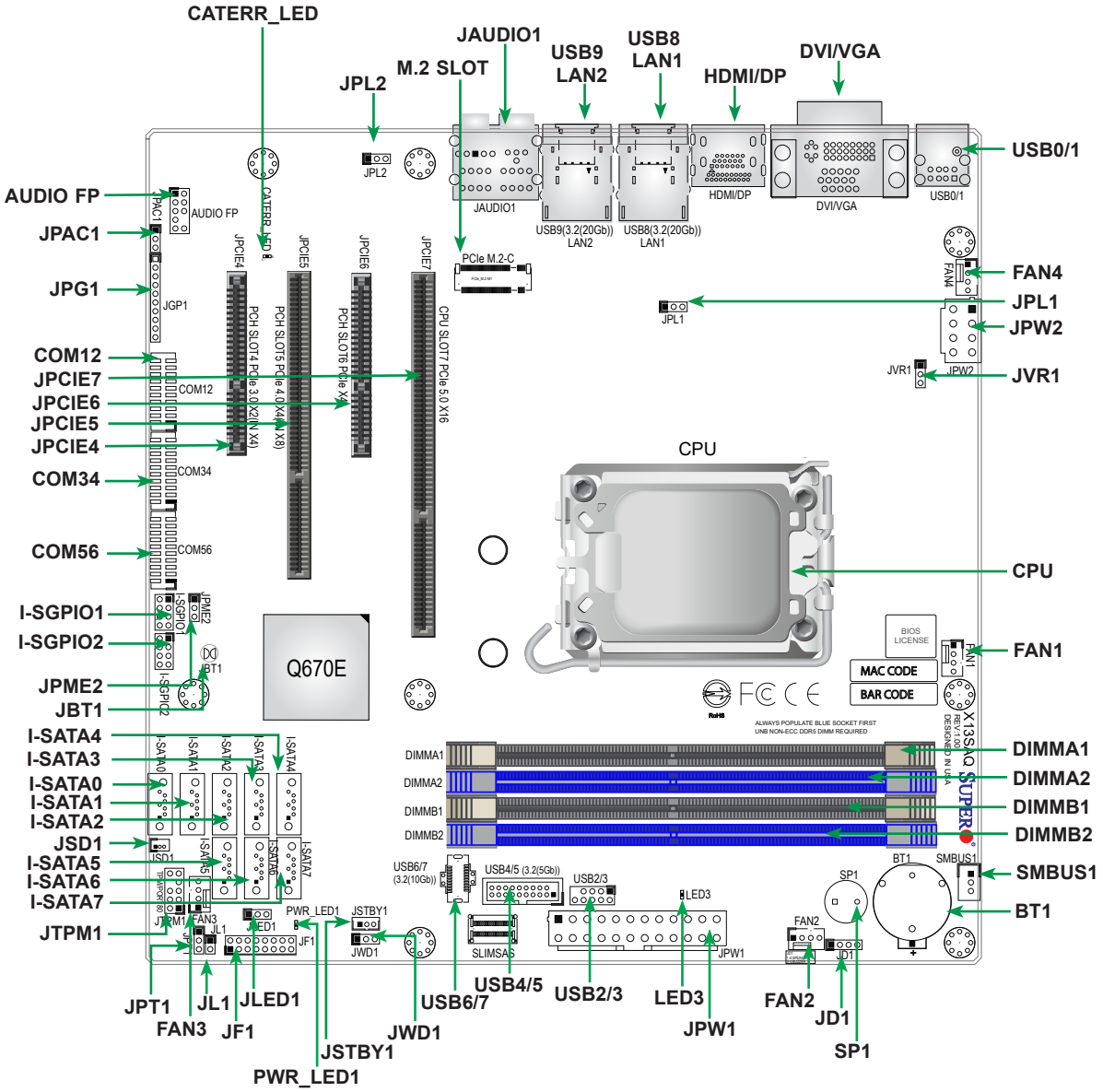
Figure 1-2. Motherboard Layout

(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 connections. Jumpers and LED indicators not indicated are used for testing only.
- "■ indicates the location of Pin 1.

Quick Reference Table

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JPAC1	Audio Enable/Disable	Pins 1-2 (Normal)
JPL1	LAN1 Enable/Disable	Pins 1-2 (Enabled)
JPL2	LAN2 Enable/Disable	Pins 1-2 (Enabled)
JPME2	ME Recovery	Pins 1-2 (Normal)
JPT1	Onboard TPM 2.0 Enable/Disable	Pins 1-2 (Enabled)
JWD1	Watchdog Timer	Pins 1-2 (Reset)

LED	Description	Status
CATERR_LED	Catastrophic error LED	Orange: CAT Error
LED3	Standby Power LED	Green: Power On
PWR_LED1	Main Power LED	Solid Green: Power On

Connector	Description
Audio FP	Front Panel Audio Header (Mic-In/Line-Out)
BT1	Onboard Battery
COM12	COM Port (supports RS232/422/485)
COM34, COM56	COM Ports (support RS232)
DVI	Digital Video Interface Port
FAN1 - FAN4	CPU/System Fan Headers (FAN1: CPU Fan)
HDMI/DP	High Definition Multimedia Interface 2.0, DisplayPort
I-SATA0-7	Intel Serial ATA (SATA 3.0) Ports (6Gb/s) (I-SATA0: SATA DOM)
I-SGPIO1	SGPIO for SATA0-3
I-SGPIO2	SGPIO for SATA4-7
JAUDIO1	HD Audio
JD1	Speaker/Buzzer (Pins 1-4: External Speaker, Pins 3-4: Buzzer)
JGP1	General Purpose I/O Header
JL1	Chassis Intrusion Header
JLED1	3-pin Power LED Header
JPCIE4	PCH SLOT4 PCIe 3.0 X2 (IN X4)
JPCIE5	PCH SLOT5 PCIe 4.0 X4 (IN X8)
JPCIE6	PCH SLOT6 PCIe 3.0 X4
JPCIE7	CPU SLOT7 PCIe 5.0 X16
JPW1	24-pin ATX Main Power Connector (Required)
JPW2	+12V 8-pin CPU Power Connector (Required)
JSD1	SATA DOM Power Connector

Connector	Description
JSTBY1	Standby Power Header (5V)
JTPM1	Trusted Platform Module/Port 80 Connector
JVR1	VRM Programming Header (Manufacturing Use Only)
LAN1, LAN2	2.5 GbE (RJ45) LAN ports
M.2 SLOT	PCIe 4.0 M-key 2280/22110 Slot
SLIMSAS	PCIe 4.0 x4 SlimSAS Connector
SMBUS1	System Management Bus Header
SP1	Internal Speaker/Buzzer
USB0/1	Back Panel USB 2.0 Ports
US2/3	Front Panel USB 2.0 Header
USB4/5	Front Panel USB Header (3.2 (5Gb))
USB6/7	Front Panel USB Header (3.2 (10Gb))
USB8/10	Back Panel USB 3.2 (10Gb) Ports (via Type A)
USB9/11	Back Panel USB 3.2 (20Gb) Ports (via Type C)
VGA	VGA Port

Motherboard Features

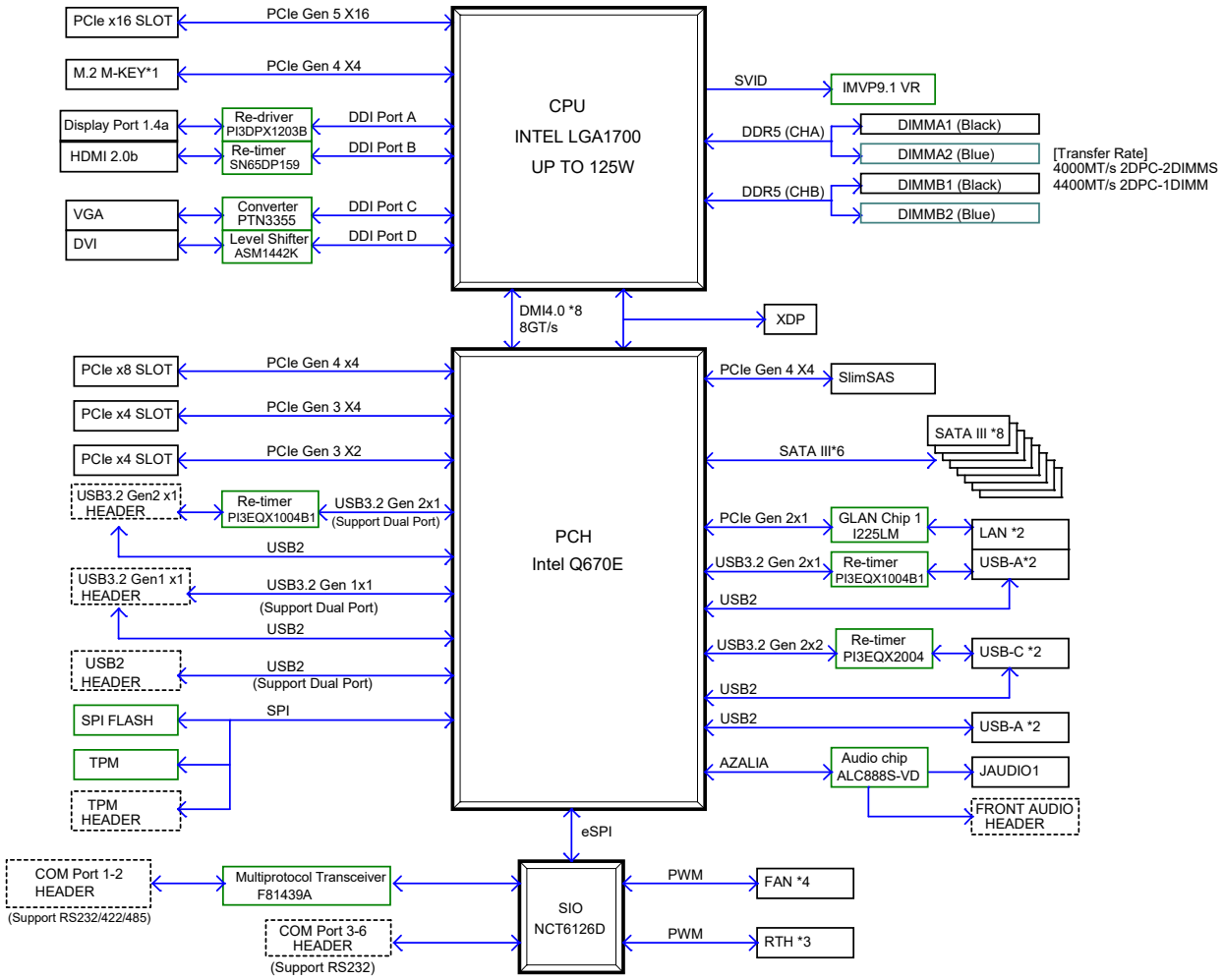
Motherboard Features	
CPU	
• Supports Intel 12th Gen Core i3/i5/i7/i9, Pentium, and Celeron series processor in an LGA1700 socket	
Memory	
• Supports up to 128GB of DDR5 UDIMM memory with speeds of up to 4400MT/s with one DIMM, or 4000MT/s with two DIMM single rank, or 3600MT/s with two DIMM dual rank in four memory slots	
DIMM Size	
• 4GB, 8GB, 16GB, 32GB **Note:** For the latest CPU/memory updates, refer to our website at http://www.supermicro.com/products/motherboard.	
Chipset	
• Intel Q670E	
Expansion Slots	
• One PCIe 5.0 X16 Slot • One PCIe 4.0 X4 (IN X8) Slot • One PCIe 3.0 X4 Slot • One PCIe 3.0 X2 (IN X4) Slot • One M.2 Slot (supports PCIe 4.0, M-key 2280/22110)	
I/O Devices	
• COM Ports	• Six COM ports (COM1/2: RS232/422/485; COM3/4 & COM5/6: RS232)
• SATA Ports	• Eight SATA 3.0 ports (RAID 0, 1, 5, 10)
• DVI-D Port	• One DVI port
• GPIO Header	• One 8-bit General Purpose Input/Output Header
• Video	• One HDMI2.0b port, one Display Port 1.4a, DVI-D, VGA
• Audio Header	• 7.1 HD support Line-in/ Line-out/ Mic-In (Realtek ALC888S)
• SMBus Header	• One SMBus header
Graphics	
• Intel UHD Graphics	
Peripheral Devices	
• Two USB 3.2 Gen2x2 (via Type C in rear) • Two USB 3.2 Gen2x1 (via Type A in rear) • One USB3.2 Gen2x1 header (supports dual Type A) • One USB3.1 Gen1x1 header (supports dual USB3.0) • Four USB2.0 (two in rear, two via headers)	

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

Motherboard Features
BIOS
• 256Mb AMI BIOS® SPI Flash BIOS • ACPI 6.0, Plug and Play (PnP), BIOS rescue hot-key, and SMBIOS 3.0 or later
Power Management
• ACPI power management • Power button override mechanism • Power-on mode for AC power recovery • Wake-on-LAN
System Health Monitoring
• Onboard voltage monitoring for +1.8V, +3.3V, +5V, +12V, +3.3VStb, Vcore, CPU, PCH, System, Peripheral temperature • CPU switch phase voltage regulator • CPU thermal trip support • Platform Environment Control Interface (PECI)/TSI
Network
• Dual 2.5GbE LAN ports
Fan Control
• Low noise fan speed control • Four 4-pin fan headers
System Management
• Trusted Platform Module (TPM) 2.0 header onboard and reserve TPM header • SuperDoctor® 5
LED Indicators
• LAN LEDs • Overheat and Fan Fail LED • Catastrophic error LED • Power indicator LED
Environment
• Operating Temperature Range: 0°C~60°C
Dimensions
• 9.6"(W) x 9.6"(L) (243.8 mm x 243.8 mm)

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

Figure 1-3.
System Block Diagram



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

1.2 Processor and Chipset Overview

Built upon the functionality and capability of the Intel 12th Gen Core i3/i5/i7/i9, Pentium, Celeron series processor and the Intel Q670E chipset, the X13SAQ motherboard provides system performance, power efficiency, and feature sets to address the needs of next-generation computer users, and dramatically increases system performance for a multitude of server applications.

The motherboard supports the following features:

- Intel AMT 12.0, TXT (only supported in UEFI boot), and AMT vPro
- USB 3.2, SATA 3.0
- Intel Hyper-Threading, Intel VT-D, VT-x
- TSX-NI, AES, SGX
- Intel Turbo Boost Technology
- Intel Rapid Storage Technology
- 128GB of Non-ECC DDR5 UDIMM memory with speeds of up to 4400MT/s with one DIMM, or 4000MT/s with two DIMM single rank, or 3600MT/s with two DIMM dual rank

Note: Intel TXT is only supported in the UEFI boot mode. Install the UEFI OS and then enable the Intel TXT feature.

1.3 Special Features

Recovery from AC Power Loss

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

1.4 System Health Monitoring

Onboard Voltage Monitors

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

Fan Status Monitor with Firmware Control

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

Environmental Temperature Control

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

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

System Resource Alert

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

1.5 ACPI Features

The Advanced Configuration and Power Interface (ACPI) specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a computer system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, 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. This is even more important for processors that have high CPU clock rates. In areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

Chapter 2

Installation

2.1 Static-Sensitive Devices

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

Precautions

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

Unpacking

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

2.2 Processor and Heatsink Installation

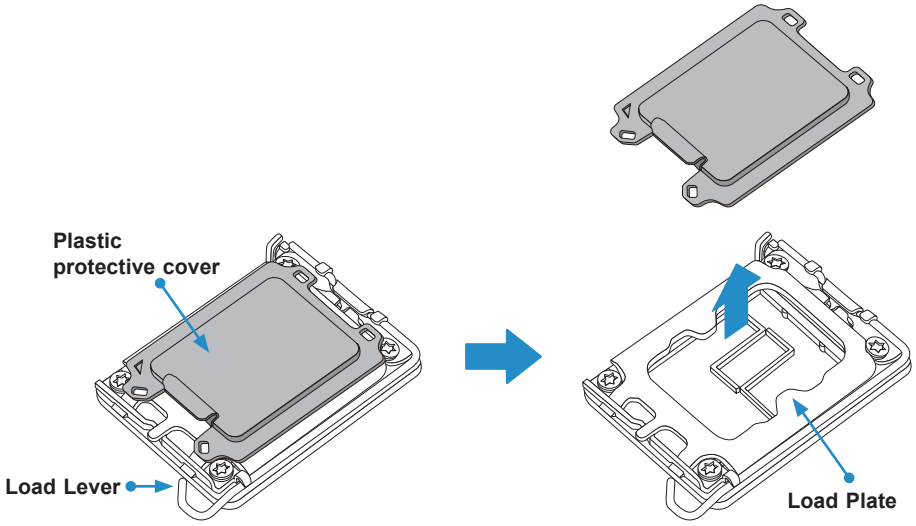
Warning: When handling the processor package, avoid placing direct pressure on the label area of the fan.

Important:

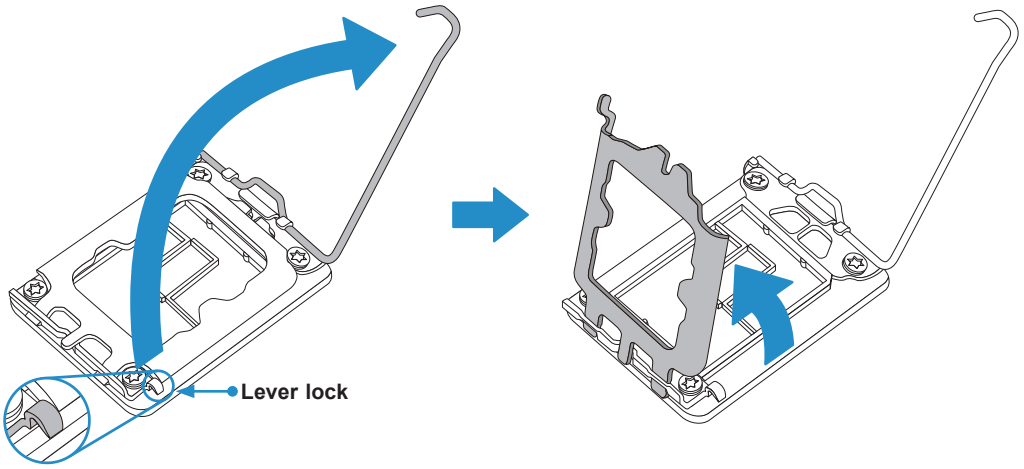
- Use ESD protection.
- Unplug the AC power cord from all power supplies after shutting down the system.
- Check that the plastic protective cover is on the CPU socket and none of the socket pins are bent. If they are, contact your retailer.
- When handling the processor, avoid touching or placing direct pressure on the LGA lands (gold contacts). Improper installation or socket misalignment can cause serious damage to the processor or CPU socket, which may require manufacturer repairs.
- Thermal grease is pre-applied on a new heatsink. No additional thermal grease is needed.
- Refer to the Supermicro website for updates on processor support.
- All graphics in this manual are for illustrations only. Your components may look different.

Installing the LGA1700 Processor

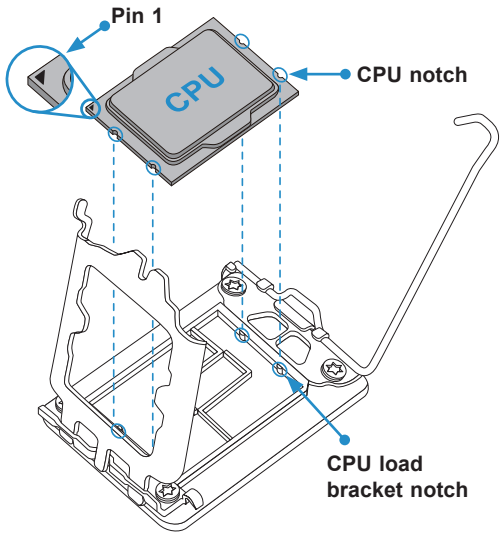
1. Remove the plastic protective cover from the load plate.



2. Gently push down the load lever to release and lift it, then lift the load plate to open it completely.



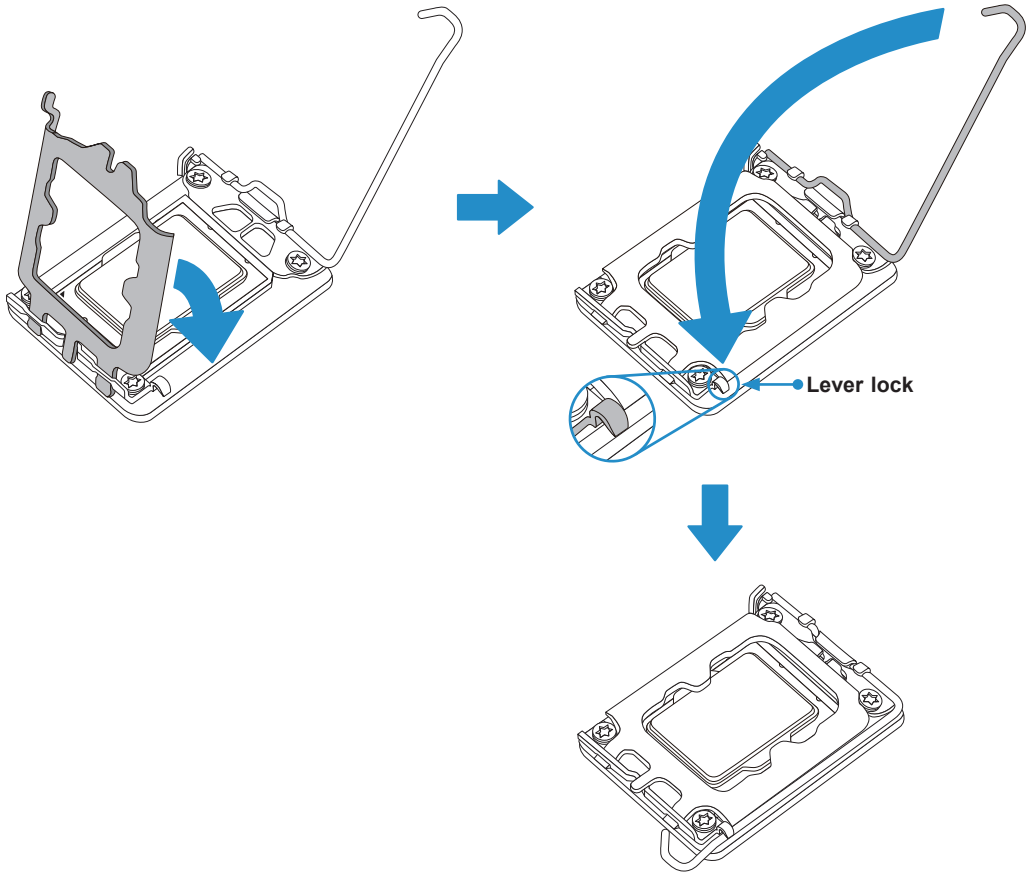
3. Use your thumb and your index finger to hold the CPU. Align the small triangle maker and notches on the CPU to the corresponding triangle maker and notches on the CPU load bracket. Once aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket, or move it horizontally or vertically.)



4. Do not rub the CPU against the surface or against any pins of the socket to avoid damaging the CPU or the socket.

5. With the CPU inside the socket, inspect all the corners to make sure it is properly installed.

6. Close the load plate with the CPU inside the socket. Gently push the load lever down until it locks under the Lever Lock latch.



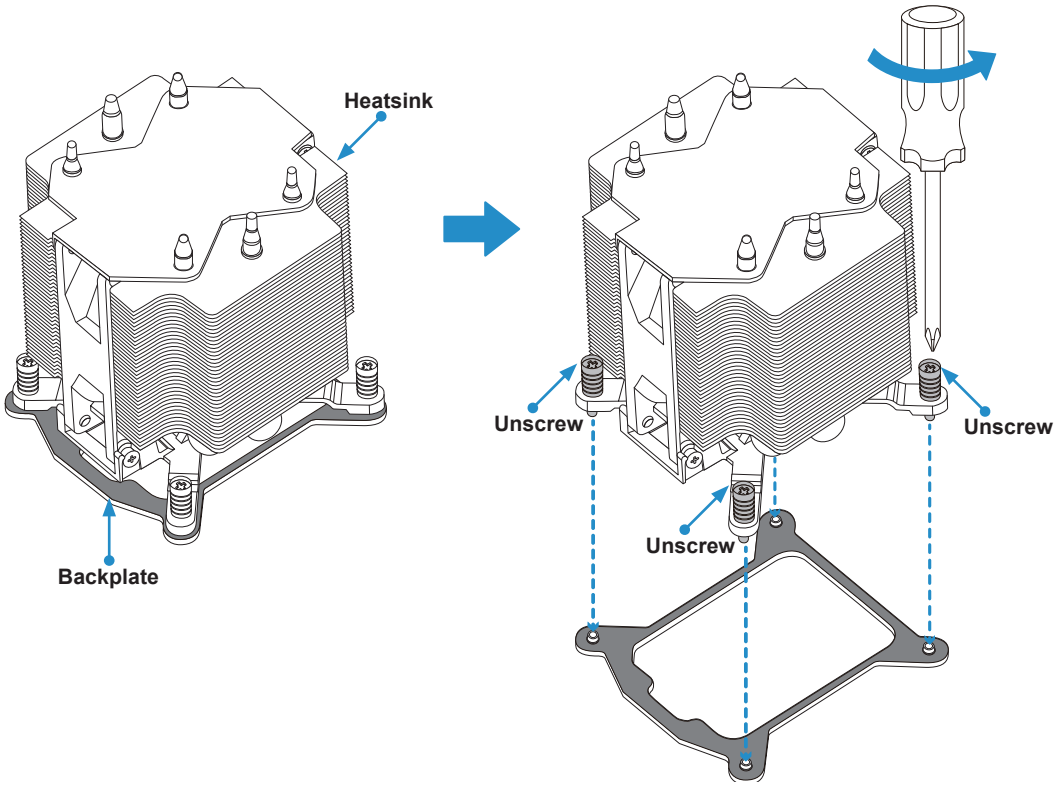
Important! You can only install the CPU inside the socket in one direction. Make sure that it is properly inserted into the CPU socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is aligned properly.

Installing a CPU Heatsink

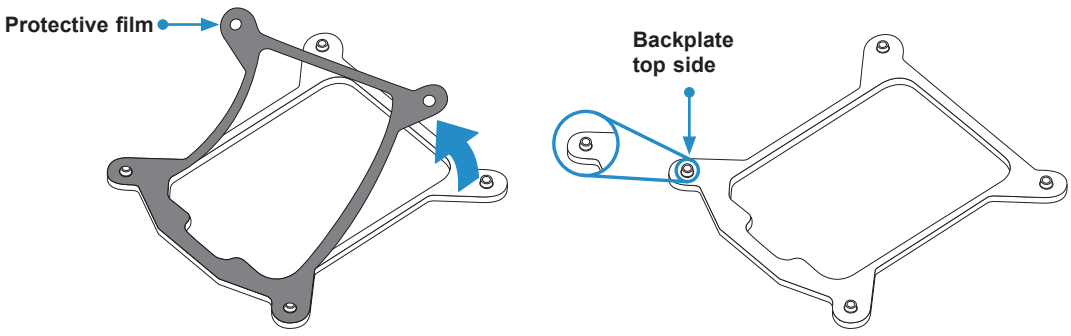
Note 1: The installation described in this section is for reference only. The actual installation steps may vary depending on the CPU heatsink model. Refer to the heatsink instruction for more details.

Note 2: Graphic drawings included in this manual are for reference only. They might look different from the components installed in your system.

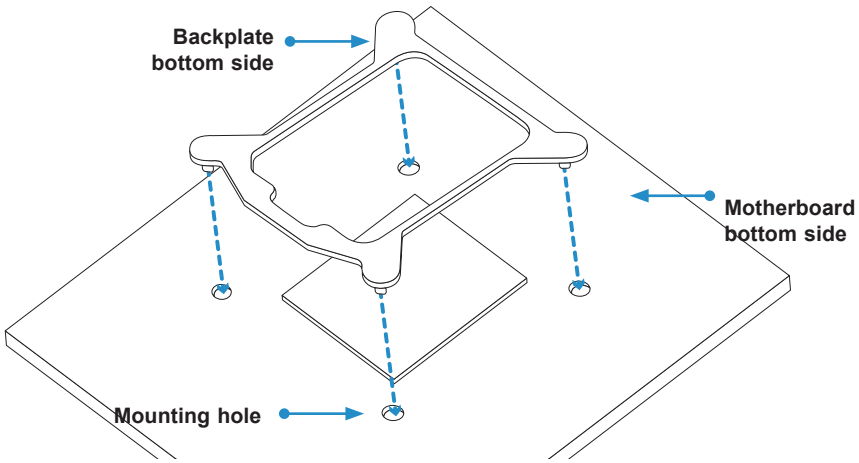
1. Loosen four screws to release the backate. Note that one screw is not shown in the illustration below.

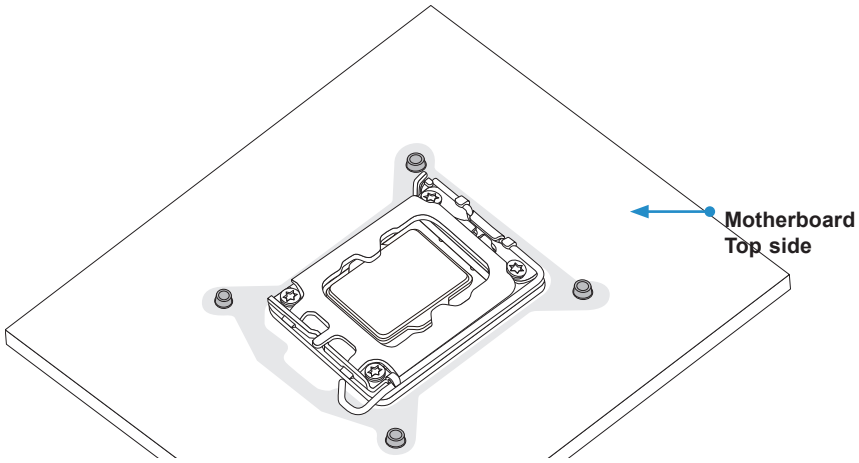


2. If there is a thin layer of protective film on the backplate, remove it.



3. Attach the backplate into the mounting holes around the CPU socket on the bottom side of the motherboard.

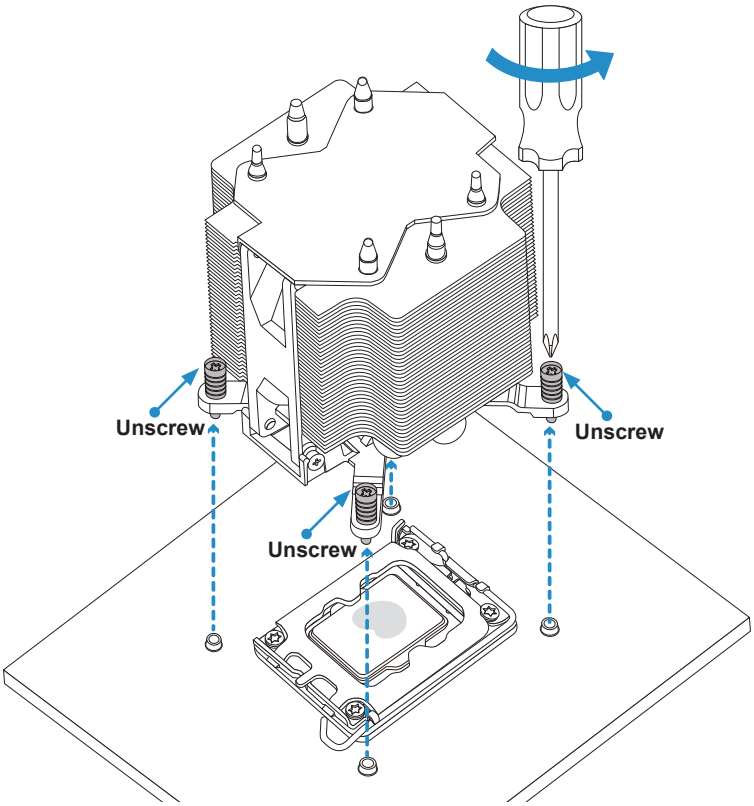




Removing the Heatsink

Warning: We do not recommend that the CPU or heatsink be removed. However, if you do need to remove the heatsink, follow the instructions below to uninstall it to avoid damaging the CPU or other components.

1. Unplug the power cord from the power supply and power connector of the cooler from the fan header on the motherboard.
2. Loosen the screws as shown below.
3. Gently wiggle the heatsink to loosen it. Do not use excessive force when wiggling the heatsink.
4. Once the heatsink is loosened, remove it from the motherboard.



2.3 Motherboard Installation

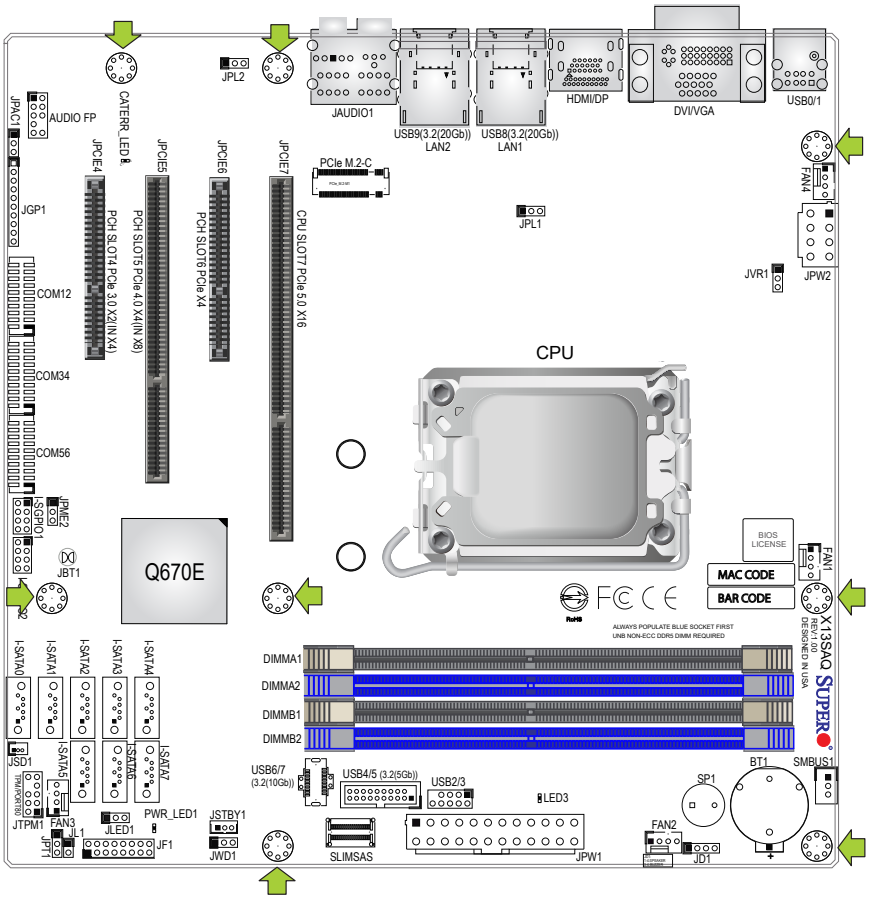
All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they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

Tools Needed

Phillips Screwdriver (1)

Phillips Screws (8)

Standoffs (8) Only if Needed

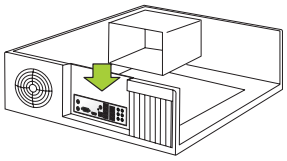


Location of Mounting Holes

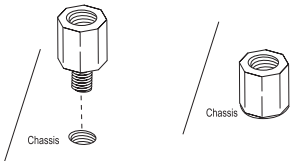
Notes: 1) To avoid damaging the motherboard and its components, please do not use a force greater than 8 lbf-in on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to avoid damaging these components when installing the motherboard to the chassis.

Installing the Motherboard

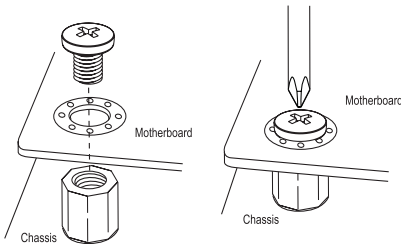
1. Install the I/O shield into the back of the chassis, if applicable.



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 Phillips screwdriver, insert a pan head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.
7. Repeat Step 6 to insert #6 screws into all mounting holes.
8. Check that the motherboard is securely placed in the chassis.

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

2.4 Memory Support and Installation

Note: Check the Supermicro website for recommended memory modules.

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

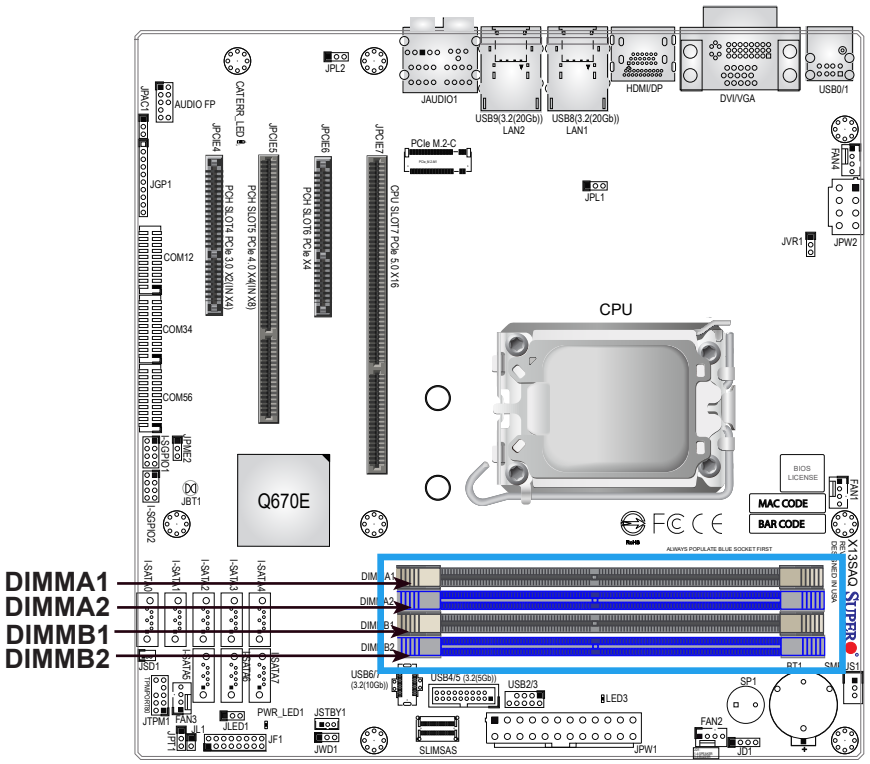
Memory Support

The X13SAQ supports up to 128GB of Non-ECC DDR5 UDIMM memory with speeds of up to 4400MT/s with one DIMM, or 4000MT/s with two DIMM single rank, or 3600MT/s with two DIMM dual rank in four memory slots. Refer to the table below for the recommended DIMM population order.

Recommended Population (Balanced)				
DIMMA1	**DIMMB1**	**DIMMA2**	**DIMMB2**	**Total System Memory**
		8GB	8GB	16GB
8GB	8GB	8GB	8GB	32GB
		16GB	16GB	32GB
16GB	16GB	16GB	16GB	64GB
		32GB	32GB	64GB
32GB	32GB	32GB	32GB	128GB

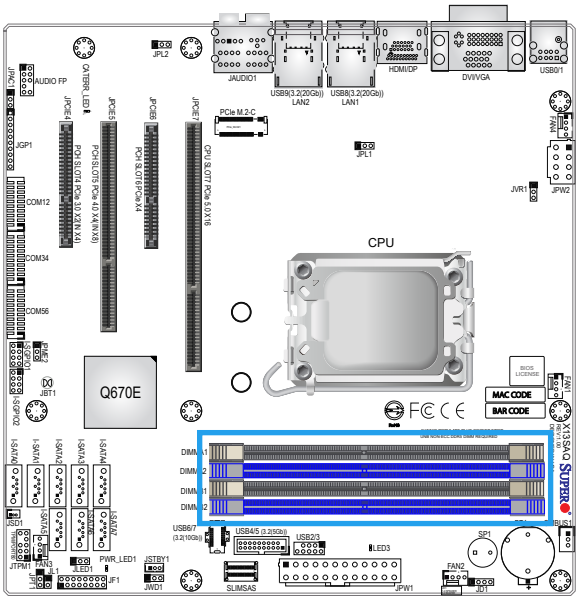
General Guidelines for Optimizing Memory Performance

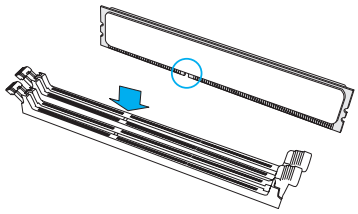
- The blue slots must be populated first.
- It is recommended to use DDR5 memory of the same type, size, and speed.
- Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.
- The motherboard will support odd-numbered modules (one or three modules installed). However, to achieve the best memory performance, a balanced memory population is recommended.



DIMM Installation

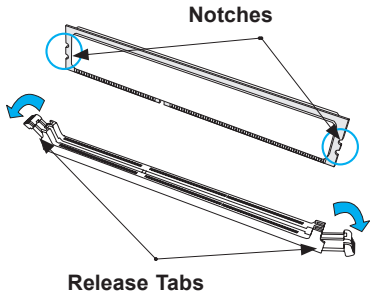
1. Insert DIMM modules in the following order: DIMMB2, DIMMA2, then DIMMB1, DIMMA1. For the system to work properly, please use memory modules of the same type and speed.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
3. Align the key of the DIMM module with the receptive point on the memory slot.
4. Align the notches on both ends of the module against the receptive points on the ends of the slot.
5. Push both ends of the module straight down into the slot until the module snaps into place.
6. Press the release tabs to the lock positions to secure the DIMM module into the slot.

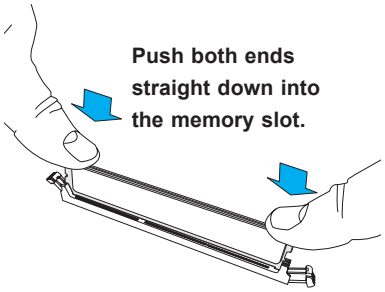




DIMM Removal

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





2.5 Rear I/O Ports

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

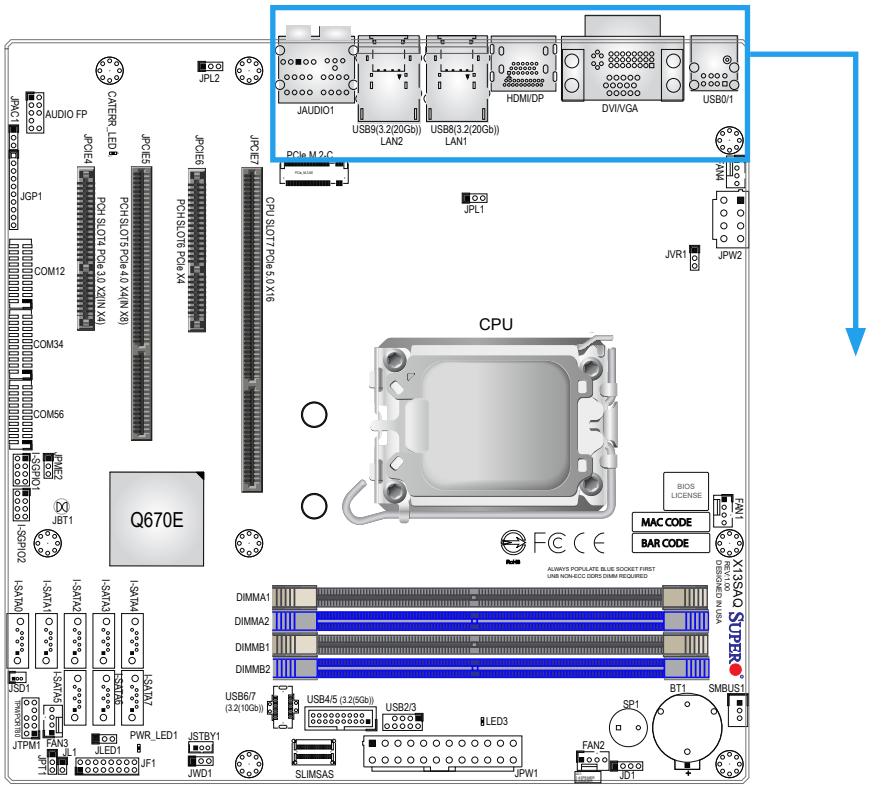
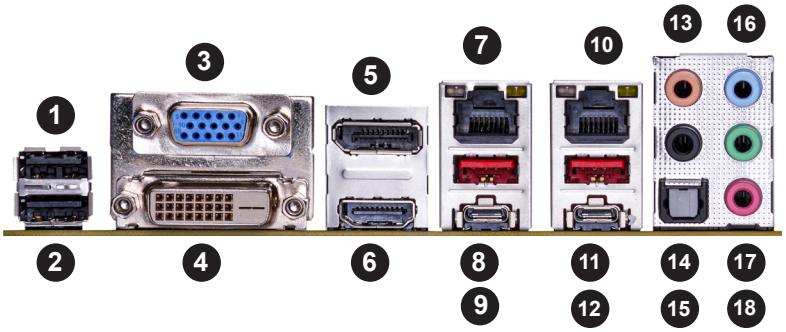


Figure 2-1. Rear I/O Port Locations and Definitions



Rear I/O Ports					
#	Description	#	Description	#	Description
1	USB1	7	LAN1	13	CEN/LFE Out
2	USB0	8	USB8 (3.2) Type A	14	Surround out
3	VGA	9	USB9 (3.2) Type C	15	SPDIF Out
4	DVI	10	LAN2	16	Line In
5	DP	11	USB10 (3.2) Type A	17	Line Out
6	HDMI	12	USB11 (3.2) Type C	18	Mic In

HDMI Port

One High Definition Multimedia Interface (HDMI) port is on the I/O back panel. This connector is used to display both high definition video and digital sound through an HDMI-capable display, using a single HDMI cable (not included).

DP Port

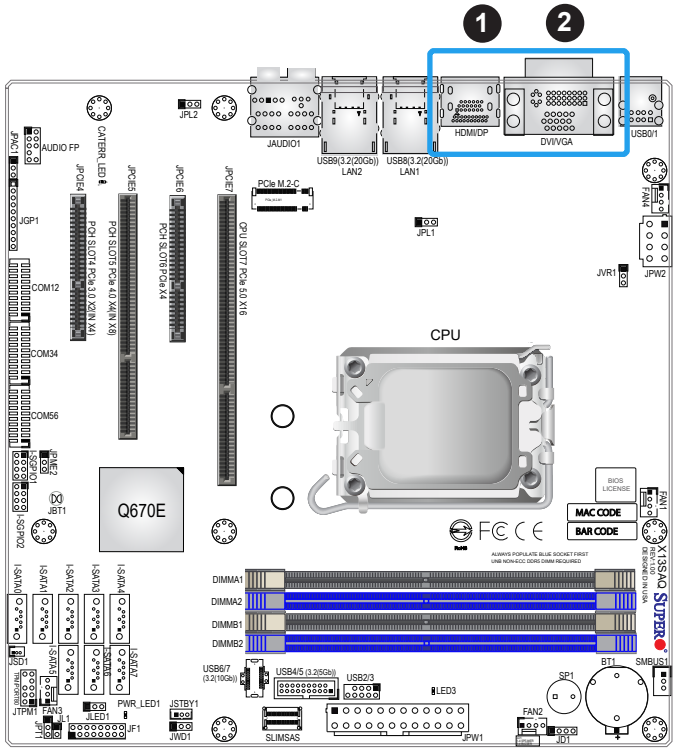
DisplayPort, developed by the VESA consortium, delivers digital display and fast refresh rate. It can connect to virtually any display device using a DisplayPort adapter for devices such as VGA, DVI or HDMI.

VGA Port

A video (VGA) port is located on the I/O back panel. Refer to the board layout below for the location.

DVI-D Port

A DVI-D port is on the I/O back panel. Use this port to connect to a compatible Digital Visual Interface (DVI) display.



1. HDMI/DP Port
2. DVI/VGA Port

Universal Serial Bus (USB) Ports

There are two USB 2.0 ports (USB0/1) and four USB 3.2 ports (USB8/10) via Type A and (USB9/11) Type C in the back panel. The motherboard also has one front accessible USB2.0 header (USB2/3), and two front accessible USB 3.2 headers (USB4/5, USB6/7). The onboard headers can be used to provide front side USB access with a cable (not included).Refer to the table below for USB pin definitions.

Back Panel USB 2.0 Pin Definitions

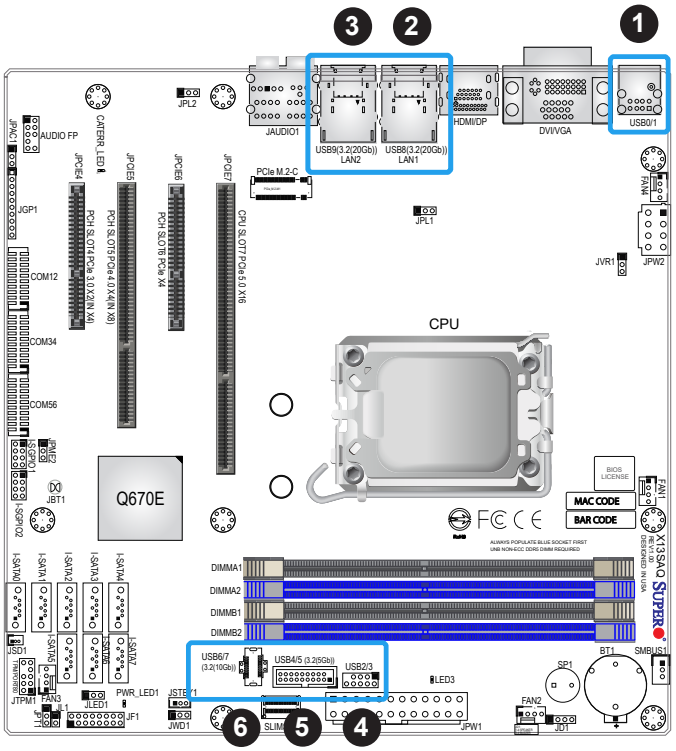
Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_N	6	USB_N
3	USB_P	7	USB_P
4	Ground	8	Ground

Back Panel USB 3.0 Type A Pin Definitions

Pin#	Definition	Pin#	Definition
1	VBUS	8	StdA_SSTX-
2	D-	9	StdA_SSTX+
3	D+	10	GND
4	Ground	11	GND
5	StdA_SSRX-	12	GND
6	StdA_SSRX+	13	GND
7	GND_DRAIN	14	GND

Back Panel USB 3.2 Type C Pin Definitions

Pin#	Definition	Pin#	Definition
A1	GND	B1	GND
A2	TX1+	B2	TX2+
A3	TX1-	B3	TX2-
A4	VBUS	B4	VBUS
A5	CC1	B5	CC2
A6	D1+	B6	D2+
A7	D1-	B7	D2-
A8	SB1	B8	SB2
A9	VBUS	B9	VBUS
A10	RX2-	B10	RX2-
A11	RX2+	B11	RX2+
A13	GND	A14	GND

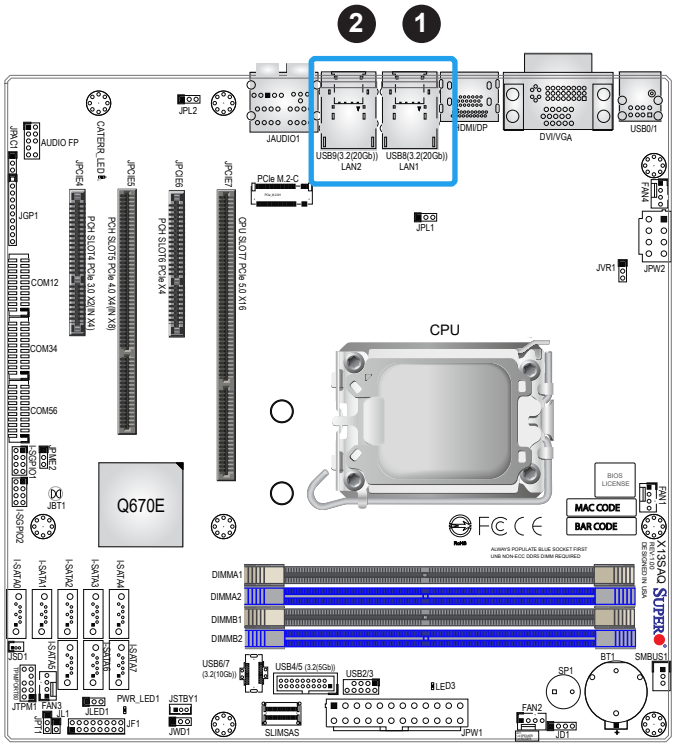


1. USB0/1 Port (2.0)
2. USB8/10 Port (3.2 Type A)
3. USB9/11 Port (3.2 Type C)
4. USB2/3 Header (USB2.0)
5. USB4/5 Header (3.2 (5Gb))
6. USB6/7 Header (3.2 (10Gb))

LAN Ports

Two 2.5 Gigabit Ethernet ports (LAN1, LAN2) are located on the I/O back panel. All of these ports accept RJ45 cables. Please refer to the LED Indicator section for LAN LED information.

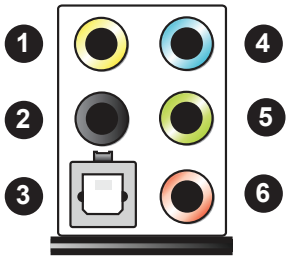
LAN Port Pin Definition			
Pin#	**Definition**	**Pin#**	**Definition**
10	VCC	G1	CG1
11	TRD1+	G2	CG2
12	TRD1-	23	GRE+/ORG-
13	TRD2+	22	GRE-/ORG+
14	TRD2-	21	YEL+
15	TRD3+	20	YEL-
16	TRD3-		
17	TRD4+		
18	TRD4-		
19	GND		



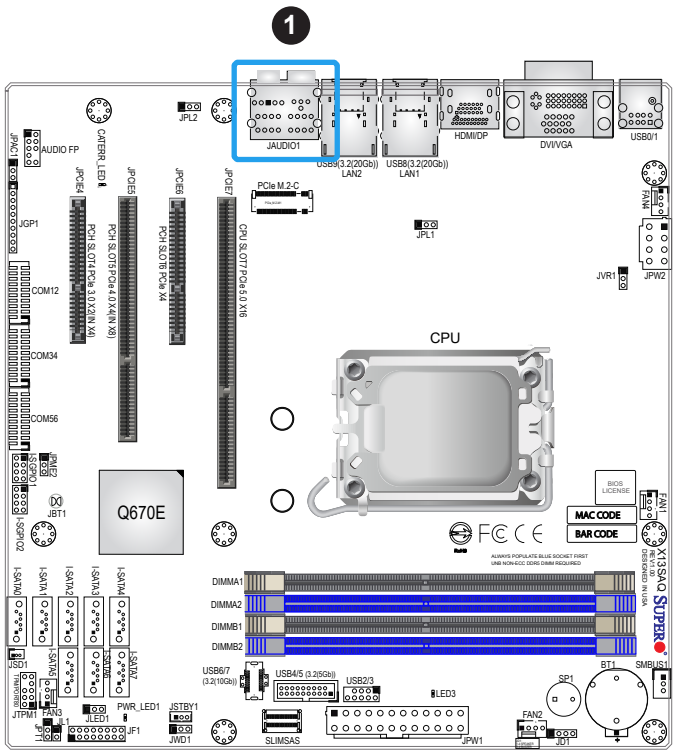
1. LAN1
2. LAN2

High Definition Audio

This motherboard features a 7.1+2 Channel High Definition Audio (HDA) codec that provides 10 DAC channels. The HD Audio connections simultaneously support multiple-streaming 7.1 sound playback with two channels of independent stereo output through the front panel stereo out for front, rear, center and subwoofer speakers. Download the software from our website to enable this feature.



5.1 HD Audio Pin Definitions	
Con#	**Definition**
1	CEN/LFE Out
2	Surround Out
3	SPDIF Out
4	Line In
5	Line Out
6	Mic In



1. HD Audio

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 a custom chassis. Refer to the figure below for the descriptions of the front control panel buttons and LED indicators.

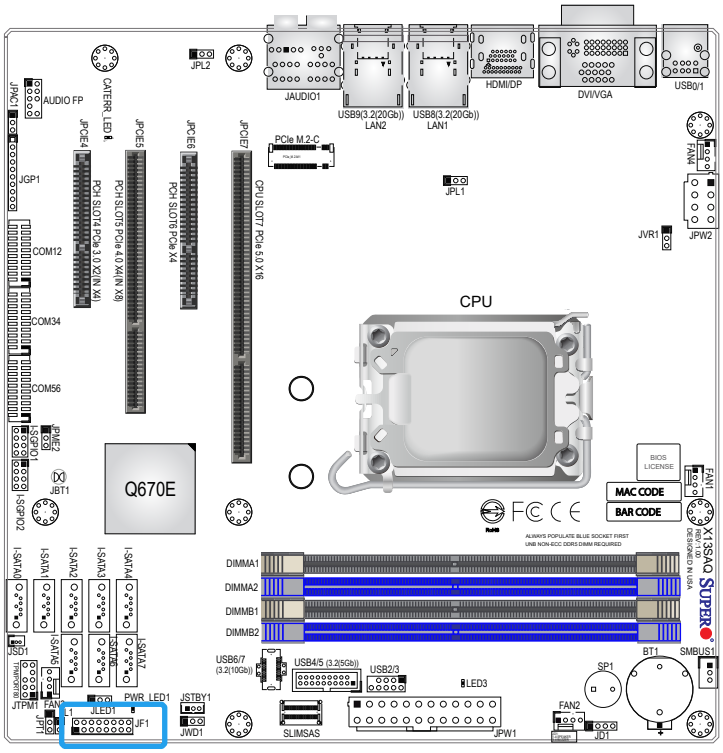


Figure 2-2. JF1 Header Pins

	1	2	
Power Button	○	○	**Ground**
Reset Button	○	○	**Ground**
X	○	○	**X**
3.3V	○	○	**OH/Fan Fail LED**
3.3V Stby	○	○	**NIC2 Active LED**
3.3V Stby	○	○	**NIC1 Active LED**
3.3V	○	○	**HDD LED**
3.3V Stby	○	○	**PWR LED**
	15	**16**	

Power Button

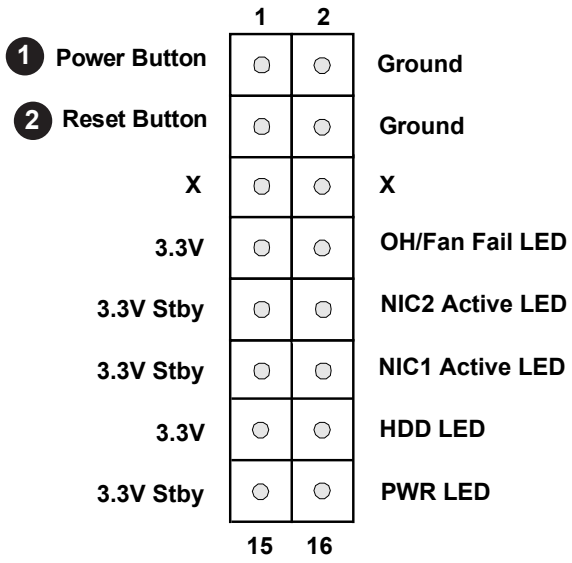
The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 4). To turn off the power in the suspend mode, press the button for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

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Power Button
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. See the table below for pin definitions.

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



1. Power Button
2. Reset Button

Overheat (OH)/Fan Fail

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.

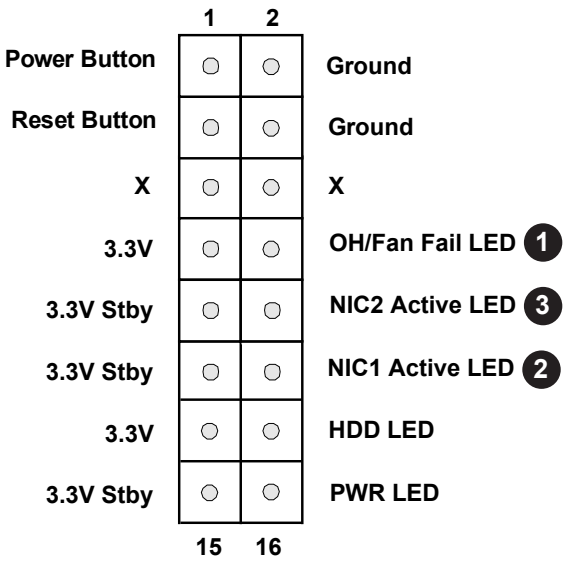
OH/Fan Fail Indicator Status	
State	**Definition**
Off	Normal
On	Overheat
Flashing	Fan Fail

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	**Definition**
7	3.3V
8	OH/Fan Fail LED

NIC1/NIC2 (LAN1/LAN2)

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

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



1. Overheat/Fan Fail
2. NIC1 Active LED
3. NIC2 Active LED

HDD LED

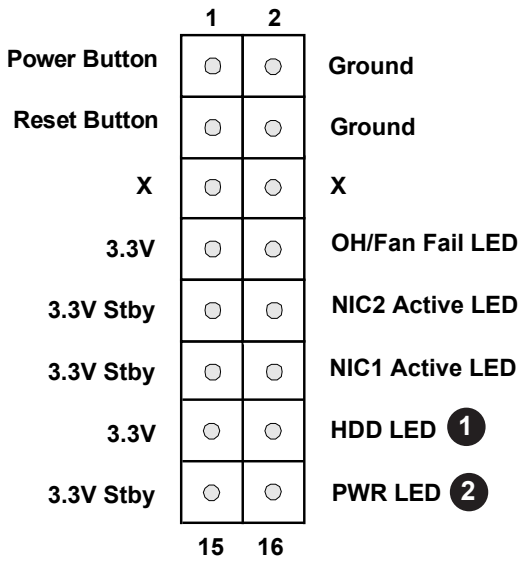
The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable to pin 14 to show hard drive activity status. Refer to the table below for pin definitions.

HDD LED Pin Definitions (JF1)	
Pins	**Definition**
13	3.3V
14	HDD Active

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



1. HDD LED
2. Power LED

2.7 Connectors & Headers

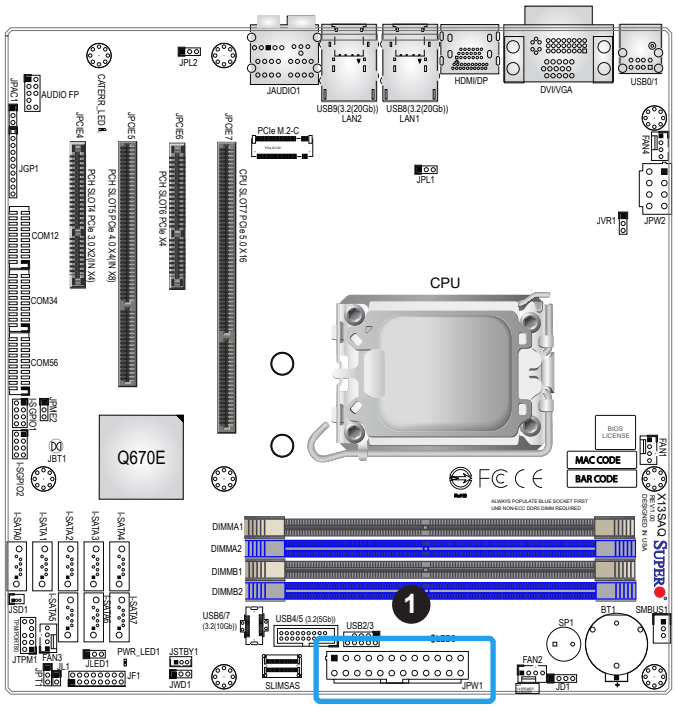
Power Connections

ATX Power Supply Connector

The 24-pin power supply connector (JPW1) meets the ATX SSI EPS 24-pin specification. You must also connect the 8-pin (JPW2) CPU power connector to the power supply.

ATX Power 24-pin Connector Pin Definitions

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



1. 24-pin ATX Power

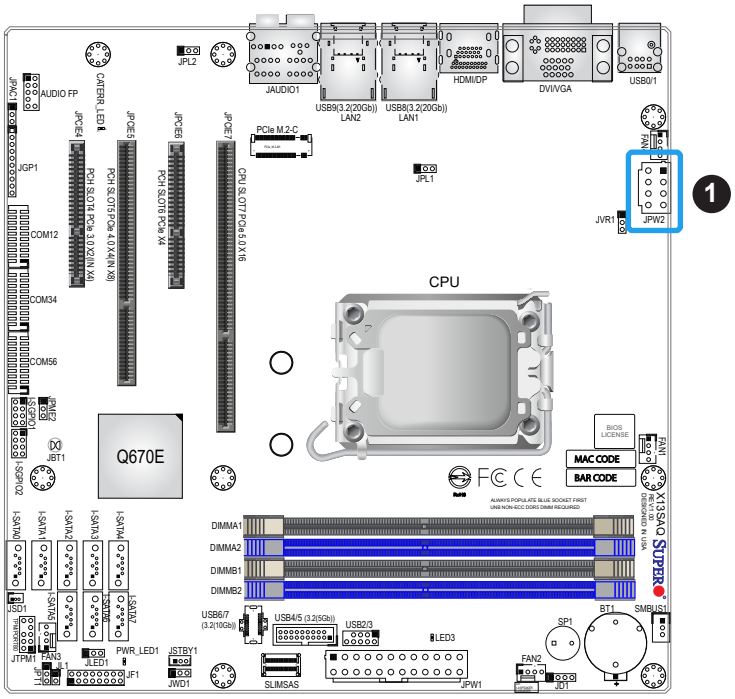
8-Pin Power Connector

JPW2 is an 8-pin 12V DC power input for the CPU that must be connected to the power supply. Refer to the table below for pin definitions.

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

Required Connection

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



1. 8-pin CPU Connector

Headers

TPM Header

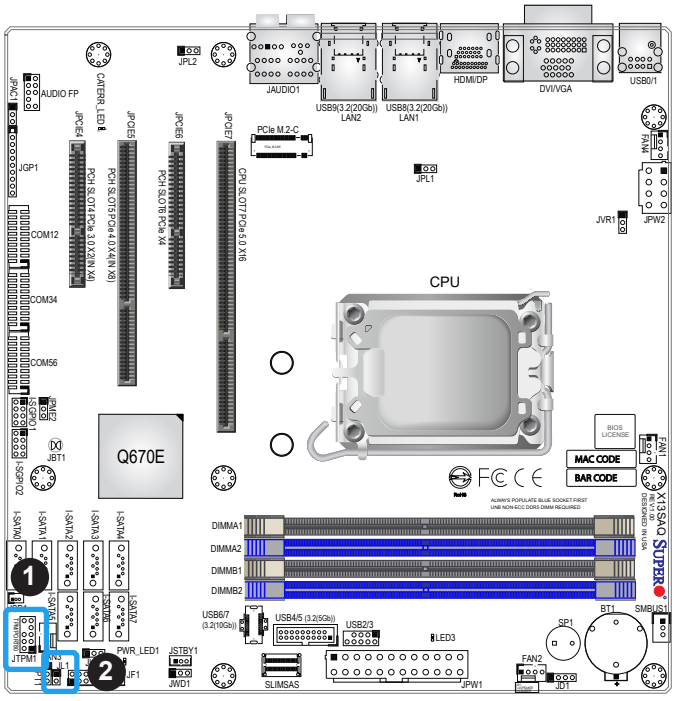
A Trusted Platform Module (TPM)/Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. Refer to the table below for pin definitions. Go to the following link for more information on the TPM: http://www.supermicro.com/manuals/other/TPM.pdf.

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

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

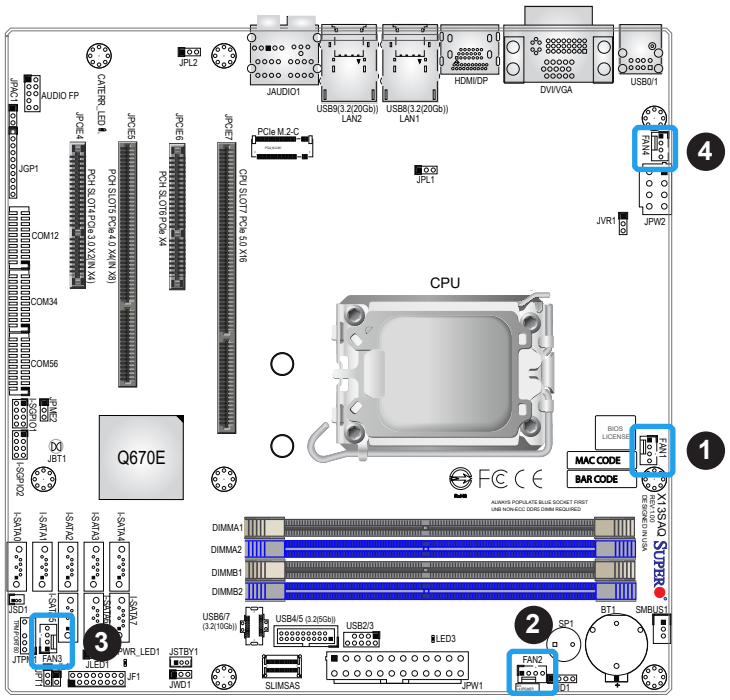


1. TPM Header
2. Chassis Intrusion

Fan Headers

There are four 4-pin fan headers (FAN1 - FAN4) on the motherboard. All these 4-pin fan headers are backwards compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only by Thermal Management via the Hardware Monitoring in the BIOS. Refer to the table below for pin definitions.

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



1. FAN1
2. FAN2
3. FAN3
4. FAN4

Front Panel Audio Header

A 10-pin front panel audio header (Audio FP) located on the motherboard allows you to use the onboard sound for audio playback. Connect an audio cable to the header to use this feature. Refer to the table below for pin definitions.

Audio Header Pin Definitions

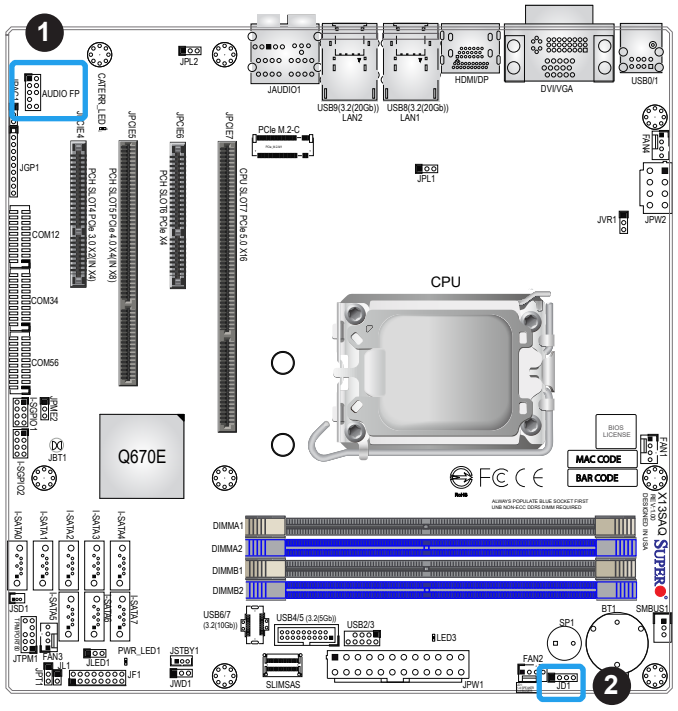
Pin#	Definition	Pin#	Definition
1	Microphone_Left	2	Audio_Ground
3	Microphone_Right	4	Audio_Detect
5	Line_2_Right	6	Ground
7	Jack_Detect	8	Key
9	Line_2_Left	10	Ground

Speaker/Buzzer

JD1 is used to connect an extra speaker. By default, pins 3-4 are closed with a cap to enable the onboard buzzer at SP1. To use an external speaker, connect the speaker header to pins 1-4. Refer to the table below for pin definitions.

Speaker Connector Pin Definitions

Pin#	Signal
1-4	Speaker
3-4	Buzzer



1. Audio FP
2. Speaker/Buzzer

3-Pin Power LED Header

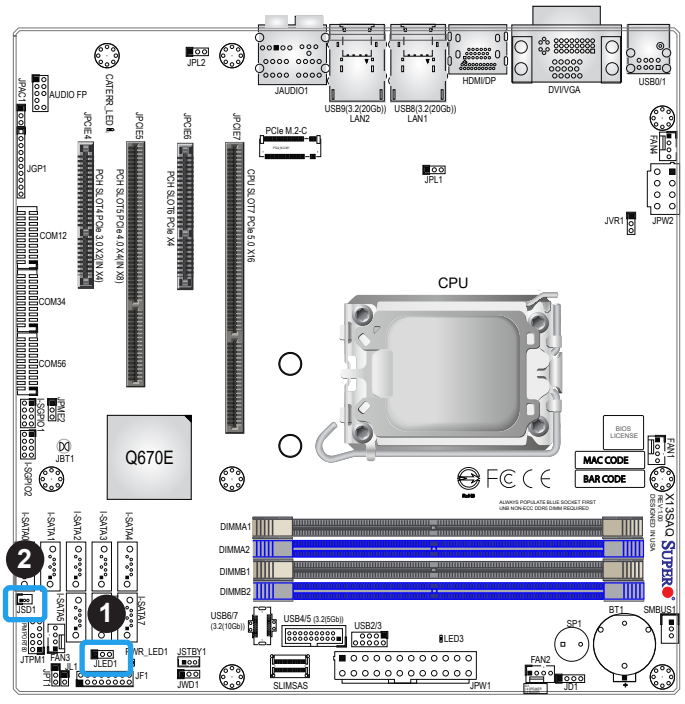
A 3-pin Power LED header is located at JLED1. This Power LED header is connected to the Front Control Panel located at JF1 to indicate the status of the system power. See the table below for pin definitions.

3-Pin Power LED Pin Definitions	
Pins	**Definition**
1	VCC
2	No Connection
3	Connection to PWR LED on JF1

Disk-On-Module Power Connector

One power connector for SATA DOM (Disk-On-Module) devices is located at JSD1. Connect the appropriate cables to provide power support for your Serial Link DOM devices.

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



1. 3-Pin Power LED
2. SATA DOM

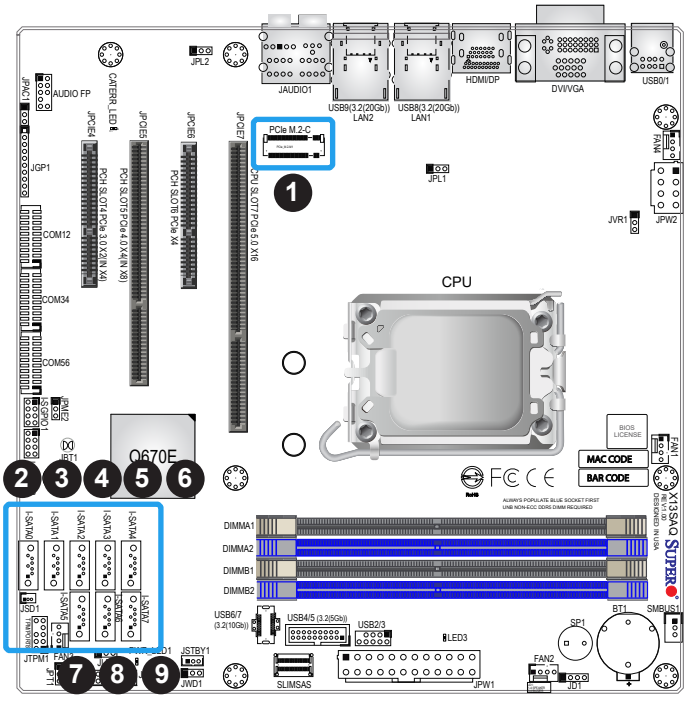
M.2 Slot

This motherboard has one M.2 slot. M.2 was formerly known as Next Generation Form Factor (NGFF) and serves to replace mini PCIe. M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 slot supports PCIe 4.0 x4 SSD cards in the 2280 and 22110 form factors.

SATA Ports

There are eight SATA 3.0 ports (I-SATA0-7) on the motherboard that provide connections for five SATA 3.0 (RAID 0, 1, 5, 10). I-SATA0 can be used with Supermicro SuperDOMs that are yellow SATA DOM connectors with power pins built in, and do not require external power cables. Supermicro SuperDOMs are backward compatible with regular SATA HDDs or SATA DOMs that need external power cables.

Note: For more information on the SATA HostRAID configuration, refer to the Intel SATA HostRAID user's guide posted at https://www.supermicro.com/support/manuals/.



1. M.2 Slot
2. I-SATA0
3. I-SATA1
4. I-SATA2
5. I-SATA3
6. I-SATA4
7. I-SATA5
8. I-SATA6
9. I-SATA7

Standby Power

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

Standby Power Pin Definitions

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

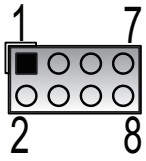
SGPIO Headers

Serial General Purpose Input/Output (SGPIO) headers (I-SGPIO1/2) are used to communicate with the enclosure management chip on the backplane.

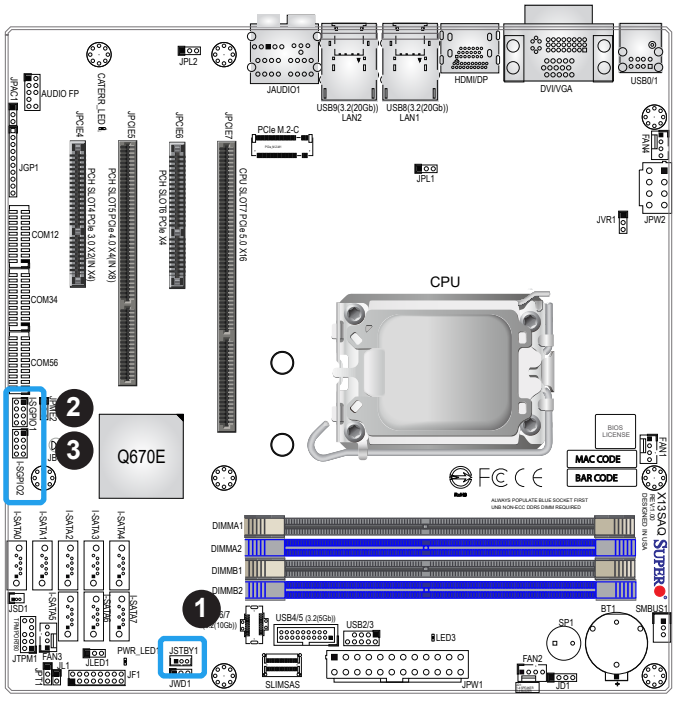
SGPIO Header Pin Definitions

Pin#	Definition	Pin#	Definition
1	NC	2	NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection



SGPIO Pin Layout



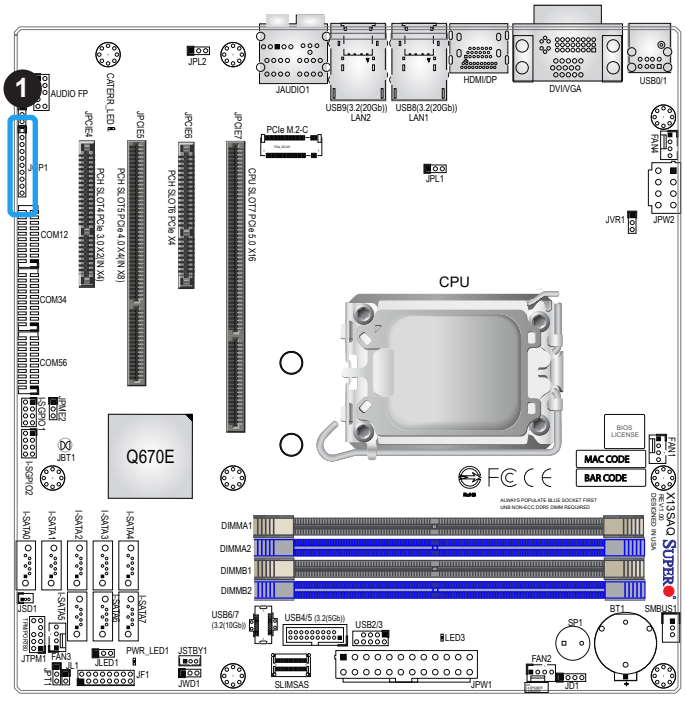
1. Standby Power Header
2. SGPIO1
3. SGPIO2

General Purpose I/O Header

The General Purpose Input/Output header at JGP1 is a general purpose I/O expander on a pin header via the SMBus. Each pin can be configured to be an input pin or output pin in 2.54mm pitch. The GPIO is controlled via the PCA9554APW 8-bit GPIO expansion from PCH SMBus. The base address is 0xEFA0. The expander slave address is 0x70 for WRITE and 0x71 for READ. See the table below for pin definitions.

JGP1 Header Pin Definitions

Pin#	Definition
1	+5V
2	GP0
3	GP1
4	GP2
5	GP3
6	GP4
7	GP5
8	GP6
9	GP7
10	Ground



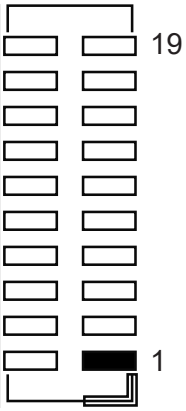
1. General Purpose Header

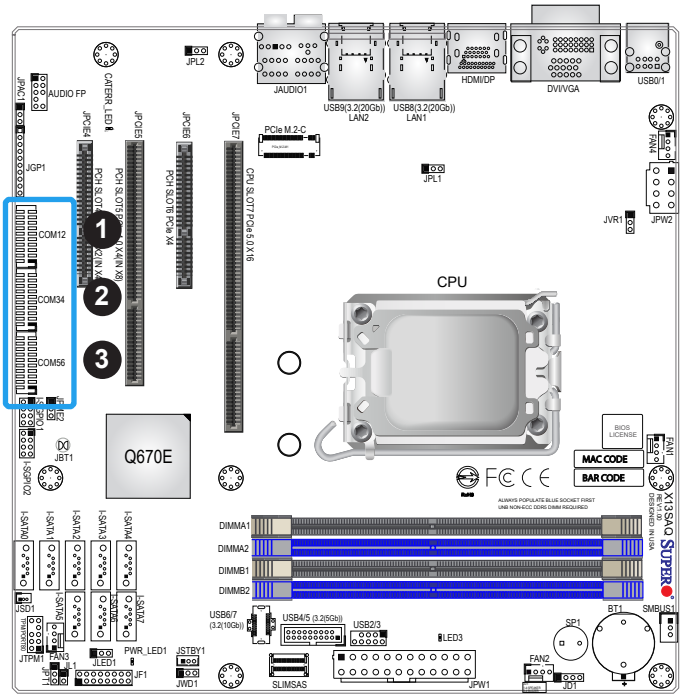
COM Headers

The motherboard has three COM headers that provides six serial connections (COM12, COM34, COM56). COM12 supports RS232/422/485, while COM34 and COM56 support RS-232 function, utilizing Supermicro PN: CBL-CDAT-0604 (not included).

COM Header (COM12, COM34, COM56) Pin Definitions

Pin#	Definition	Pin#	Definition
1	DCD (1/3/5)	2	DSR (1/3/5)
3	RXD (1/3/5)	4	RTS (1/3/5)
5	TXD (1/3/5)	6	CTS (1/3/5)
7	DTR (1/3/5)	8	RI_N (1/3/5)
9	GND	10	N/A
11	DCD (2/4/6)	12	DSR (2/4/6)
13	RXD (2/4/6)	14	RTS (2/4/6)
15	TXD (2/4/6)	16	CTS (2/4/6)
17	DTR (2/4/6)	18	RI_N (2/4/6)
19	GND	20	N/A





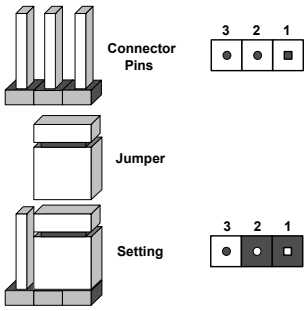
1. COM12
2. COM34
3. COM56

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 the pins and Open means the jumper is off.



CMOS Clear

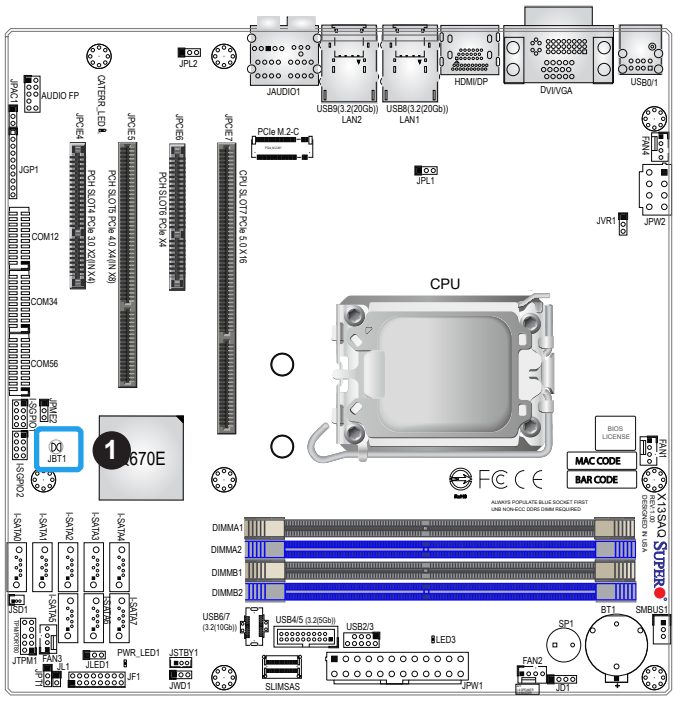
JBT1 is used to clear CMOS, which will also clear any passwords. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To Clear CMOS

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

Note: Clearing CMOS will also clear all passwords.

JBT1 contact pads



1. CMOS Clear

Watchdog

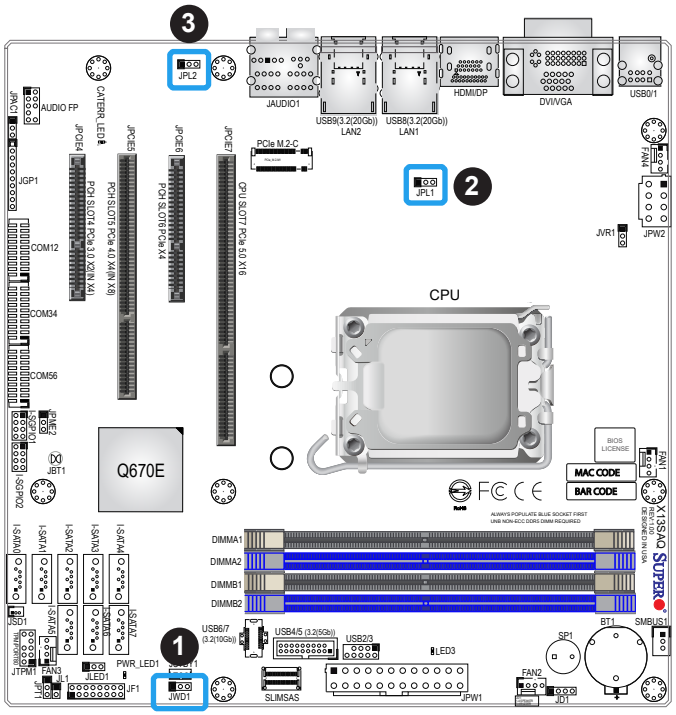
Watchdog (JWD1) is a system monitor that can reboot the system when a software application hangs. Close pins 1-2 to reset the system if an application hangs. Close pins 2-3 to generate a non-maskable interrupt (NMI) signal for the application that hangs. Refer to the table below for jumper settings. The Watchdog must also be enabled in the BIOS.

Watchdog Jumper Settings	
Jumper Setting	**Definition**
Pins 1-2	Reset (Default)
Pins 2-3	NMI
Open	Disabled

LAN Port Enable/Disable

Change the setting of jumpers JPL1 and JPL2 to enable or disable LAN ports 1 and 2, respectively. The default setting is Enabled.

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



1. Watch Dog
2. LAN1 Enable/Disable
3. LAN2 Enable/Disable

ME Recovery

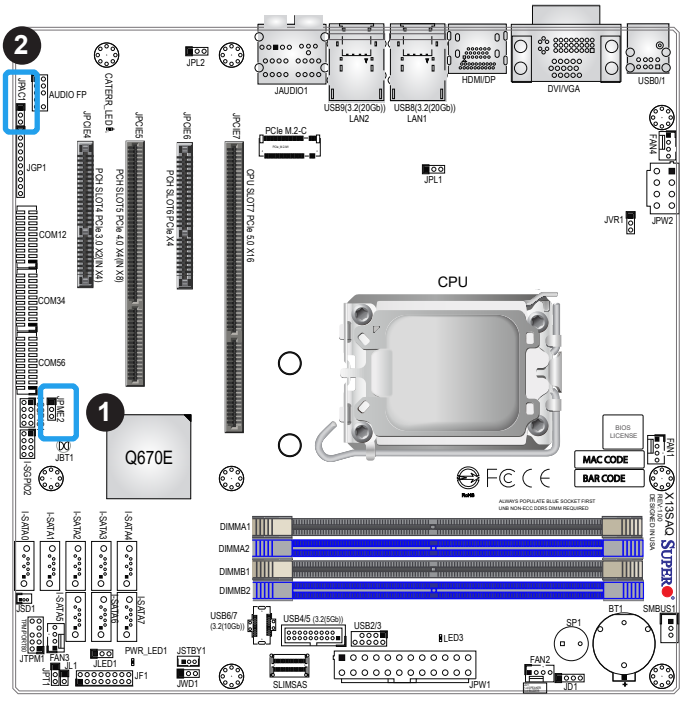
Use jumper JPME2 to select ME Firmware Recovery mode, which will limit resource allocation for essential system operation only in order to maintain normal power operation and management. In the single operation, online upgrade will be available via Recovery mode. See the table below for jumper settings.

ME Recovery Jumper Settings	
Jumper Setting	**Definition**
Pins 1-2	Normal
Pins 2-3	ME Recovery

Audio Enable (JPAC1)

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

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

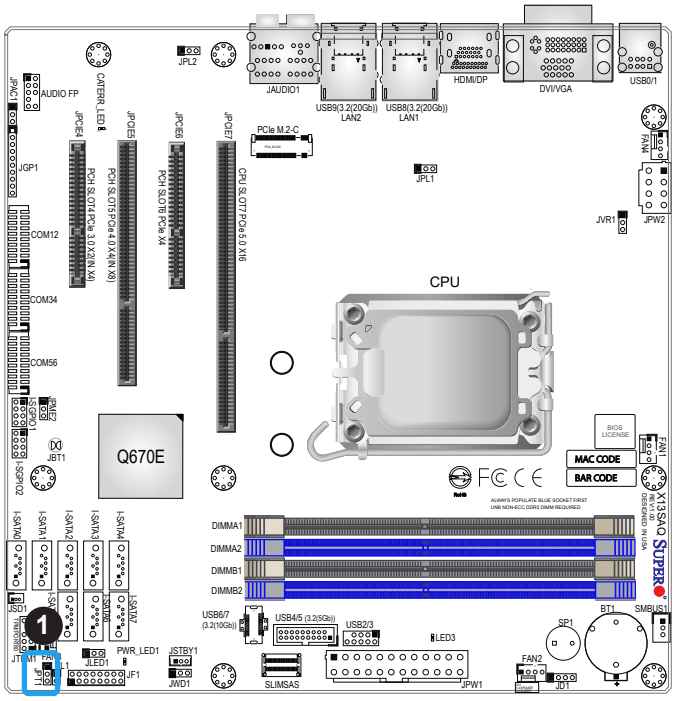


1. ME Recovery
2. Audio Enable

Onboard TPM2.0 Enable/Disable

Use JPT1 to enable or disable support for the onboard TPM 2.0 module. The default setting is Enabled. To use an external TPM module, change the jumper setting to Disabled.

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



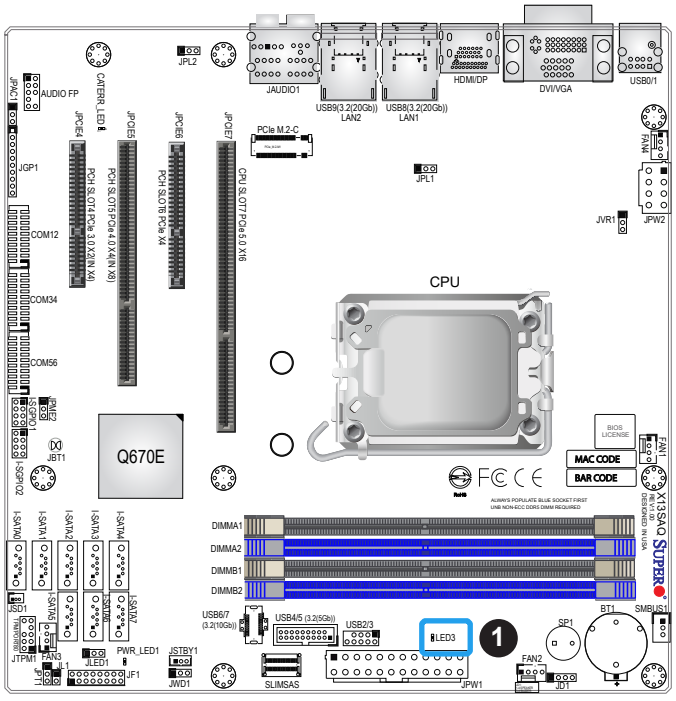
1. TPM Enable/Disable

2.9 LED Indicators

Standby Power LED

The 3V Standby Power LED is located at LED3 on the motherboard. When this LED is on, the standby power is connected. Be sure to unplug the power cable before removing or installing components. See the table in the right for more information.

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



1. Standby Power LED

CATERR LED

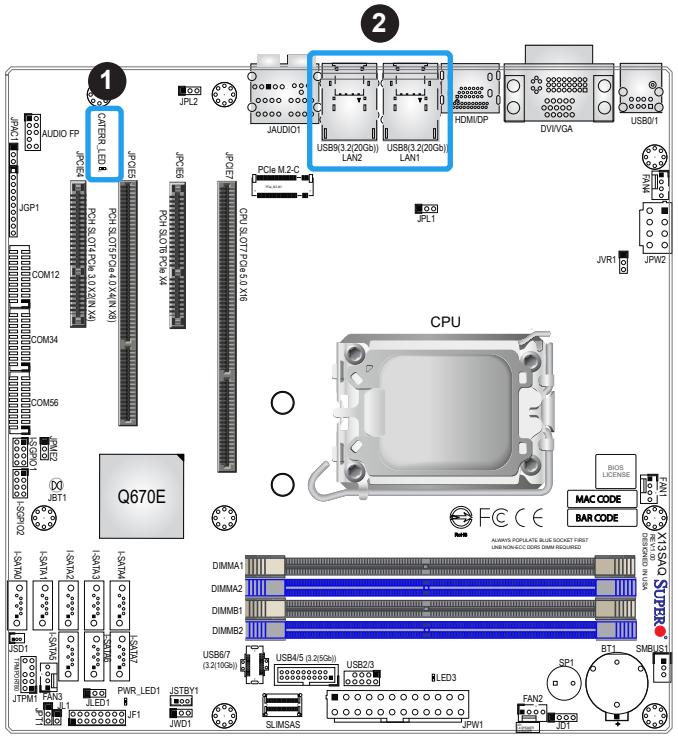
The CATERR_LED is a Catastrophic LED, which is for internal testing only.

CATERR_LED Indicator	
LED Color	**Definition**
Orange	CAT Error

LAN1/2 LEDs

The Ethernet ports (located near the HDMI/DP port) have two LEDs. On each port, one LED indicates activity when flashing while the other LED may be green, amber or off to indicate the speed of the connection.

LAN1/2 LEDs (Connection Speed Indicator)	
LED Color	**Definition**
Off	10 Mb/s
Green	100 Mb/s
Amber	2.5 Gb/s



1. Catastrophic Error LED
2. LAN LEDs

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 115V/230V 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 3VDC. 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 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 that the DIMMs are properly and fully installed. Click on the Tested Memory List link on the motherboard product page to see a list of supported memory.

2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM type and speed for all DIMMs in the system.

3. Make sure that you are using the correct type of DIMM modules recommended by the manufacturer.

4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.

5. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in Section 2-4 in Chapter 2.

6. Follow the instructions given in the DIMM population tables listed in Section 2-4 to install your memory modules.

Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose the CMOS setup information. Refer to Section 2-7 for details on recommended power supplies.

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

When the System Becomes Unstable

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

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

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

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

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

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

5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all appropriate 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 USB flash and 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, take the following steps. Also, note that as a motherboard manufacturer, Supermicro also sells motherboards through its channels, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problems with the specific system configuration that was sold to you.

1. 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 https://webpr3.supermicro.com/SupportPortal/.

- 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 up to 128GB Non-ECC DDR5 UDIMM memory with speeds of up to 4400MT/s with one DIMM, or 4000MT/s with two DIMM single rank, or 3600MT/s with two DIMM dual rank. 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. Check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, 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.

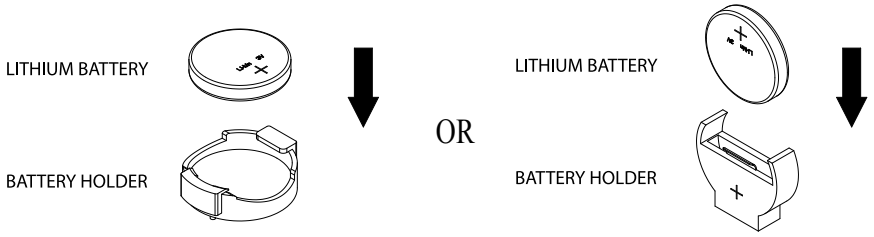
Proper Battery Disposal

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 to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

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

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

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

Chapter 4

UEFI BIOS

4.1 Introduction

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

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

Starting the Setup Utility

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

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

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

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

4.2 Main Setup

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

System Date/System Time

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

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

Supermicro X13SAQ

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.

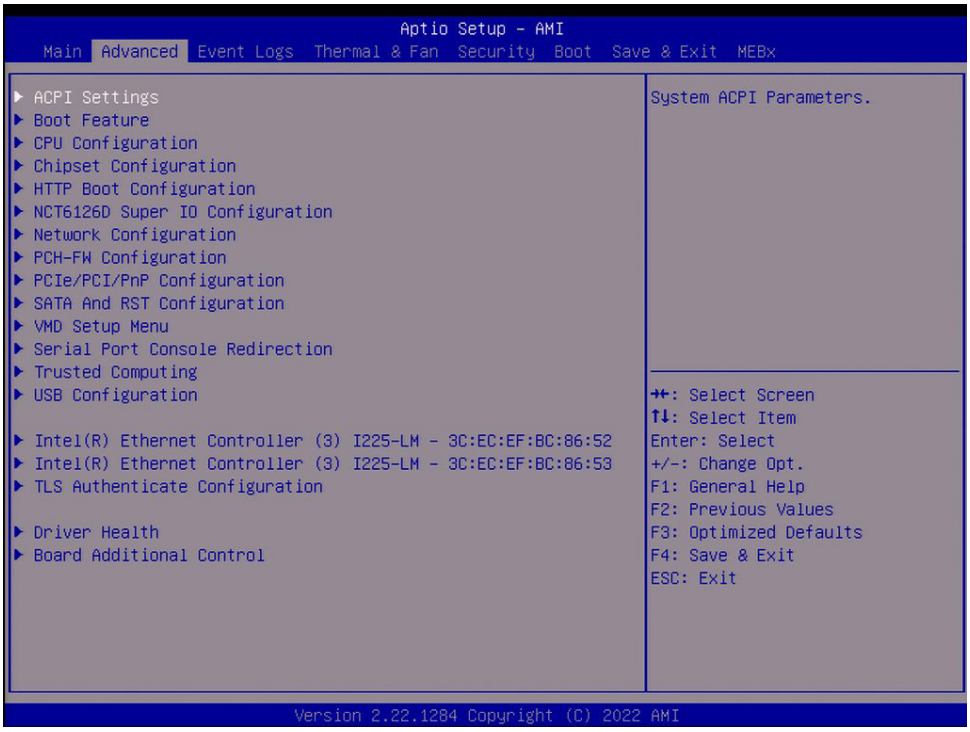
Memory Information

Total Memory

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

4.3 Advanced

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



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

▶ACPI Settings

ACPI Sleep State

Use this feature to select the ACPI Sleep State that the system will enter into when the suspend button is activated. The options are Suspend Disabled and **S3 (Suspend to RAM)**.

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**.

Native PCIe Enable

Enable this feature to grant control of PCI Express Native hot plug, PCI Express Power Management Events, and PCI Express Capability Structure Control. The options are Disabled and **Enabled**.

Native ASPM

Select Enabled for the operating system to control the ASPM, or Disabled for the BIOS to control the ASPM. The options are Auto, Enabled, and **Disabled**.

▶Boot Feature

Fast Boot

Enable this feature to reduce the time the computer takes to boot up. The computer will boot with a minimal set of required devices. This feature does not have an effect on BBS boot options in the Boot tab. The options are **Disabled** and Enabled.

Quiet Boot

Use this feature to select the screen display between the POST messages and the OEM logo upon boot up. 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**.

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

Use this feature to force the system to wait until the "F1" key is pressed if an error occurs. The options are Disabled and **Enabled**.

Re-try Boot

If this feature is enabled, the BIOS will automatically reboot the system from a specified boot device after its initial boot failure. The options are **Disabled** and EFI Boot.

Power Configuration

Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reset or generate NMI based on jumper settings when it is expired for more than five minutes. The options are **Disabled** and Enabled**.**

AC Loss Power Depend On

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 the user presses the power button. The options are **Instant Off** and 4 Seconds Override**.**

DeepSx Power Policies

Use this feature to configure the Advanced Configuration and Power Interface (ACPI) settings for the system. Enable S4 to use Hibernation mode (Suspend to Disk) so that all data stored in the main memory can be saved in a non-volatile memory area such as in a hard drive and then power down the system. Enable S5 to power off the whole system except the power supply unit (PSU) and keep the power button alive so that you can wake up the system by using a USB keyboard or mouse. The options are **Disabled,** Enabled In S4-S5, and Enabled in S5.

▶CPU Configuration

The following CPU information will display:

- CPU Signature
- Microcode Patch
- Max CPU Speed
- Min CPU Speed
- CPU Speed
- Number of Performance-cores
- Number of Efficient-cores

- Hyper Threading Technology
- VMX
- SMX/TXT
- 64-bit
- EIST Technology
- CPU C3 state
- CPU C6 state
- CPU C7 state
- CPU C8 state
- CPU C9 state
- Performance L1 Data Cache
- Performance L1 Instruction Cache
- Performance L2 Cache
- Performance L3 Cache
- Performance L4 Cache
- Efficient L1 Data Cache
- Efficient L1 Instruction Cache
- Efficient L2 Cache
- Efficient L3 Cache
- Efficient L4 Cache

C6DRAM

Use this feature to enable or disable the moving of DRAM contents to PRM memory when the CPU is in the C6 state. The options are Disabled and **Enabled**.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enable, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

Adjacent Cache Prefetch (Available when supported by the CPU)

The CPU prefetches the cache line for 64 bytes if this feature is set to Disabled. The CPU prefetches both cache lines for 128 bytes as comprised if this feature is set to Enable. The options are Disabled and **Enabled**.

Intel (VMX) Virtualization Technology

Use this feature to enable the Vanderpool Technology. This technology allows the system to run several operating systems simultaneously. The options are Disabled and **Enabled**.

Active Performance-cores

This feature determines how many processor cores will be activated for each processor package. When all is selected, all cores in the processor will be activated. The options are **All**, 7, 6, 5, 4, 3, 2, and 1.

Active Efficient-cores

This feature determines how many efficient cores will be activated for each processor package. When all is selected, all cores in the processor will be activated. The options are **All**, 3, 2, 1, and 0.

Hyper-Threading (Available when supported by the CPU)

Select Enable to support Intel Hyper-Threading Technology to enhance CPU performance. The options are Disabled and **Enabled**.

AES

Select Enabled for Intel CPU Advanced Encryption Standard (AES) instructions support to enhance data integrity. The options are Disabled and **Enabled**.

Boot Performance Mode

This feature allows you to select the performance state that the BIOS will set before the operating system handoff. The options are **Max Non-Turbo Performance** and Turbo Performance.

Intel® SpeedStep™

Intel SpeedStep Technology allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disabled and **Enabled**.

Intel® Speed Shift Technology

Use this feature to enable or disable Intel Speed Shift Technology support. When this feature is enabled, the Collaborative Processor Performance Control (CPPC) version 2 interface will be available to control CPU P-States. The options are Disabled and **Enabled**.

Turbo Mode

Select Enable for processor cores to run faster than the frequency specified by the manufacturer. The options are Disabled and **Enabled**.

Power Limit 1 Override

Select Enabled to support average power limit (PL1) override. The options are **Disabled** and Enabled.

Power Limit 2 Override

Select Enabled to support rapid power limit (PL2) override. The options are Disabled and **Enabled**.

Power Limit 2

Use this feature to configure the value for Power Limit 2. The value is in milliwatts and the step size is 125mW. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting. If the value is 0, the BIOS will set PL2 as 1.25* TDP.

C-States

Use this feature to enable the C-State of the CPU. The options are Disabled and **Enabled**.

Enhanced C-states

Use this feature to enable the enhanced C-State of the CPU. The options are Disabled and **Enabled**.

C-State Auto Demotion

Use this feature to prevent unnecessary excursions into the C-states to improve latency. The options are Disabled and **C1**.

C-State Un-Demotion

This feature allows you to enable or disable the un-demotion of C-State. The options are Disabled and **C1**.

Package C-State Demotion

Use this feature to enable or disable the Package C-State demotion. The options are Disabled and **Enabled**.

Package C-State Un-Demotion

Use this feature to enable or disable the Package C-State un-demotion. The options are Disabled and **Enabled**.

C-State Pre-Wake

This feature allows you to enable or disable the C-State Pre-Wake. The options are Disabled and **Enabled**.

Package C-State Limit

Use this feature to set the Package C-State limit. The options are C0/C1, C2, C3, C6, C7, C7s, C8, C9, Cpu Default, and **Auto**.

MonitorMWait

Select Enabled to enable the Monitor/Mwait instructions. The Monitor instructions monitors a region of memory for writes, and MWait instructions instruct the CPU to stop until the monitored region begins to write. The options are Disabled and **Enabled**.

▶Chipset Configuration

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

▶System Agent (SA) Configuration

The following information will display:

- VT-d: Supported

▶Memory Configuration

Memory Configuration

- Memory RC Version
- Memory Frequency
- Memory Timing (tCL-tRCD-tRP-tRAS)
- DIMMA1
- DIMMA2
- DIMMB1
- DIMMB2

Maximum Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 1067, 1333, 1400, 1600, 1800, 1867, 2000, 2133, 2200, 2400, 2600, 2667, 2800, 2933, 3000, 3200, 3467, 3600, 3733, 4000, 4267, and 4400.

Max TOLUD

This feature sets the maximum TOLUD value, which specifies the "Top of Low Usable DRAM" memory space to be used by internal graphics devices, GTT Stolen Memory, and TSEG, respectively, if these devices are enabled. The options are **Dynamic**, 1 GB, 1.25 GB, 1.5 GB, 1.75 GB, 2 GB, 2.25 GB, 2.5 GB, 2.75 GB, 3 GB, 3.25 GB, and 3.5 GB.

Memory Scrambler

Use this feature to enable or disable memory scrambler support. The options are Disabled and **Enabled**.

Force ColdReset

Use this feature to enable or disable a cold boot during a MRC execution. The options are Enabled and **Disabled**.

Force Single Rank

Select enabled to use only Rank 0 in each DIMM. The options are **Disabled** and Enabled.

Memory Remap

Use this feature to enable or disable memory remap above 4GB. The options are **Enabled** and Disabled.

MRC Fast Boot

Use this feature to enable or disable fast path through the memory reference code. The options are Disabled and **Enabled**.

Total Memory Encryption

Use this feature to configure Total Memory Encryption (TME) to protect DRAM data from physical attacks. The options are **Disabled** and Enabled.

▶Graphics Configuration

Graphics Configuration

IGFX GOP Version

Graphics Turbo IMON Current

Use this feature to set the graphics turbo IMON value. The default is **31**.

Skip Scanning of External Gfx Card

If this feature is enabled, the system will not scan for an external graphics card on PEG and PCIe slots. The options are **Disabled** and Enabled.

Primary Display

Use this feature to select the primary video display. The options are **Auto,** IGFX, PEG Slot, and PCH PCI.

Internal Graphics

Select Auto to keep an internal graphics device installed on an expansion slot supported by the CPU to be automatically enabled. The options are **Auto**, Disabled, and Enabled.

GTT Size

Use this feature to set the memory size to be used by the graphics translation table (GTT). The options are 2MB, 4MB, and **8MB**.

Aperture Size

Use this feature to set the Aperture size, which is the size of system memory reserved by the BIOS for graphics device use. The options are 128MB, **256MB,** 512MB, 1024MB, and 2048MB.

DVMT Pre-Allocated

Dynamic Video Memory Technology (DVMT) allows dynamic allocation of system memory to be used for video devices to ensure best use of available system memory based on the DVMT 5.0 platform. The options are 0M, 32M, 64M, 96M, 128M, 160M, 4M, 8M, 12M, 16M, 20M, 24M, 28M, 32M/F7, 36M, 40M, 44M, 48M, 52M, 56M, and **60M**.

PM Support

Enable this feature to activate Power Management BIOS support. The options are **Enabled** and Disabled.

PAVP Enable

Protected Audio Video Path (PAVP) decodes Intel integrated graphics encrypted video. The options are **Enabled** and Disabled.

Cdynmax Clamping Enable

Enable this feature to activate Cdynmax Clamping. The options are Enabled and **Disabled**.

Graphics Clock Frequency

Use this feature to set the internal graphics clock frequency. The options are 192 Mhz, 307.2 Mhz, 326.4 Mhz, 556.8 Mhz, 652.8 MHZ, and **Max CdClock freq based on Reference Clk**.

▶DMI/OPI Configuration

The following DMI information will display:

- DMI: X8 Gen4

DMI Gen3 ASPM

Use this feature to set the ASPM (Active State Power Management) state on the SA (System Agent) side of the DMI Link. The options are Disabled, Auto, ASPM L0s, **ASPM L1**, and ASPM L0sL1.

▶PEG Configuration

PCIe M.2-C

Enable Root Port

Use this feature to enable or disable the PCI Express Graphics (PEG) device in the port specified by the user. The options are Disabled and **Enabled**.

Max Link Speed

Use this feature to select PCIe support for the device installed in the M.2 slot. The options are **Auto**, Gen1, Gen2, Gen3, and Gen4.

CPU SLOT7 PCIe 5.0 X16

Enable Root Port

Use this feature to enable or disable the PCI Express Graphics (PEG) device in the port specified by the user. The options are Disabled and **Enabled**.

Max Link Speed

Use this feature to select PCIe support for the device installed on SLOT7. The options are **Auto**, Gen1, Gen2, Gen3, Gen4, and Gen5.

▶GT - Power Management Control

RC6 (Render Standby)

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

Maximum GT frequency

Use this feature to define the Maximum GT frequency. Choose between 33MHz (RPN) and 1200Mhz (RP0). Any value beyond this range will be clipped to its min/max supported by the CPU. The options are **Default Max Frequency,** 100Mhz, 150Mhz, 200Mhz, 250Mhz, 300Mhz, 350Mhz, 400Mhz, 450Mhz, 500Mhz, 550Mhz, 600Mhz, 650Mhz, 700Mhz, 750Mhz, 800Mhz, 850Mhz, 900Mhz, 950Mhz, 1000Mhz, 1050Mhz, 1100Mhz, 1150Mhz, and 1200Mhz.

Disable Turbo GT frequency

Use this feature to disable Turbo GT frequency. If set to Enabled, Turbo GT frequency becomes disabled. If set to Disabled, GT frequency limiters will be removed. The options are Enabled and **Disabled**.

VT-d

Select Enabled to activate Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The options are **Enabled** and Disabled.

GNA Device (B0:D8:F0)

Use this feature to enable SA GNA device. The options are **Enabled** and Disabled.

▶PCH-IO Configuration

PCH-IO Configuration

- PCH SKU Name
- Stepping

▶PCI Express Configuration

▶PCH SLOT6 PCIe 3.0 X4
▶PCH SLOT4 PCIe 3.0 X2(IN X4)
▶PCH SLOT5 PCIe 4.0 X4(IN X8)
▶SLIMSAS

ASPM

Use this feature to activate the Active State Power Management (ASPM) level for a PCIe device. Select Auto for the system BIOS to automatically set the ASPM level based on the system configuration. Select Disabled to disable ASPM support. The options are Disabled, **L1**, and Auto.

L1 Substates

Use this feature to set the PCI Express L1 Substates. The options are Disabled, L1.1, and **L1.1 & L1.2.**

PCIe Speed

Use this feature to select the PCI Express port speed. The options are **Auto,** Gen1, Gen2, Gen3, and Gen4.

Peer Memory Write Enable

Use this feature to enable or disable Peer Memory Write. The options are **Disabled** and Enabled.

Frontside Audio Mode

Use this feature to select the frontside audio mode. The options are **HD Audio** and AC'97.

▶HTTP Boot Configuration

HTTP BOOT Configuration

HTTP Boot Policy

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

HTTP Boot Checks Hostname

Use this feature to check if the hostname of the TLS certificate 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:

Enter a value to set the rank target port. The default is **1**.

Select IPv4 or IPv6

Use this feature to select the targeted LAN port to boot from. The options are **IPv4** and IPv6.

Boot Description

Highlight the feature and press enter to create a description.

Boot URI

Highlight the feature and press enter to create a boot URI.

Instance of Priority 2:

Enter a value to set the rank target port. The default is **0**.

▶NCT6126D Super IO Configuration

The following Super IO information will display:

- Super IO Chip NCT6126D

▶Serial Port 1 Configuration

Serial Port 1

Use this feature to enable or disable serial port 1. The options are Disabled and **Enabled**.

Device Settings

The I/O and IRQ address for serial port 1 is IO=3F8h; IRQ=4;.

▶Serial Port 2 Configuration

Serial Port 2

Use this feature to enable or disable serial port 2. The options are Disabled and **Enabled**.

Device Settings

The I/O and IRQ address for serial port 2 is IO=2F8h; IRQ=3;.

▶Serial Port 3 Configuration

Serial Port 3

Use this feature to enable or disable serial port 3. The options are Disabled and **Enabled**.

Device Settings

The I/O and IRQ address for serial port 3 is IO=3E8h; IRQ=6;.

▶Serial Port 4 Configuration

Serial Port 4

Use this feature to enable or disable serial port 4. The options are Disabled and **Enabled**.

Device Settings

The I/O and IRQ address for serial port 4 is IO=2E8h; IRQ=7;.

▶Serial Port 5 Configuration

Serial Port 5

Use this feature to enable or disable serial port 5. The options are Disabled and **Enabled**.

Device Settings

The I/O and IRQ address for serial port 5 is IO=220h; IRQ=11;.

▶Serial Port 6 Configuration

Serial Port 6

Use this feature to enable or disable serial port 6. The options are Disabled and **Enabled**.

Device Settings

The I/O and IRQ address for serial port 6 is IO=228h; IRQ=10;.

▶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

Select Enabled to enable IPv4 PXE boot support. The options are Disabled and **Enabled**.

IPv4 HTTP Support

Select Enabled to enable IPv4 HTTP boot support. The options are **Disabled** and Enabled.

IPv6 PXE Support

Select Enabled to enable IPv6 PXE boot support. The options are Disabled and **Enabled**.

IPv6 HTTP Support

Select Enabled to enable IPv6 HTTP boot support. The options are **Disabled** and Enabled.

PXE Boot Wait Time

Use this option to specify the wait time to press the ESC key to abort the PXE boot. Press "+" or "-" on your keyboard to change the value. The default setting is **0**.

Media Detect Count

Use this option to specify the number of times media will be checked. Press "+" or "-" on your keyboard to change the value. The default setting is **1**.

▶MAC:xxxxxxxxxxx-IPv4 Network Configuration
▶MAC:xxxxxxxxxxx-IPv4 Network Configuration

Configured

Use this feature to specify whether the network address is configured successfully or not. The options are **Disabled** and Enabled.

Save Changes And Exit

Use this feature to save changes and exit.

▶MAC:xxxxxxxxxxx-IPv6 Network Configuration
▶MAC:xxxxxxxxxxx-IPv6 Network Configuration

▶Enter Configuration Menu

Interface Name

Interface Type

MAC address

Host addresses

Route Table

Gateway addresses

DNS addresses

Interface ID

This feature shows the interface ID for the specified network device.

DAD Transmit Count

This feature sends Neighbor Solicitation messages while performing a Duplicate Address Detection (DAD) to make sure there is no IP address duplication. A value of zero means a DAD has not been performed.

Policy

Use this feature to select an automatic or manual policy. The options are **Automatic** and Manual.

Save Changes And Exit

When you have completed the changes for this section, select this option to save all changes made and exit.

▶PCH-FW Configuration

ME Firmware Version: 16.0.15.1662

ME Firmware Mode: Normal Mode

ME Firmware SKU: Corporate SKU

ME FW Image Re-Flash

Use this feature to update the Management Engine firmware. The options are **Disabled** and Enabled.

TPM Device Selection

Use this feature to select dTPM or PTT for the TPM device. dTPM is discrete Trusted Platform Module and PTT is Platform Trusted Technology. The options are **dTPM** and PTT.

▶AMT Configuration

USB Provisioning of AMT

Use this feature to enable or disable USB provisioning. The options are **Disabled** and Enabled.

MAC Pass Through

Use this feature to enable or disable the MAC Pass Through function. The options are **Disabled** and Enabled.

Activate Remote Assistance Process

Use this feature to activate Remote Assistance. Enabling this feature will also trigger the Client Initiated Remote Access (CIRA) boot. The options are **Disabled** and Enabled.

Unconfigure ME

Use this feature to unconfigure ME with resetting the MEBx password to default on next boot. The options are **Disabled** and Enabled.

▶ASF Configuration

PET Progress

Use this feature to enable or disable PET Events Progress to receive PET Events alerts. The options are Disabled and **Enabled**.

WatchDog

Select Enabled to allow AMT to reset or power down the system if the operating system or BIOS hangs or crashes. The options are **Disabled** and Enabled.

OS Timer / BIOS Timer

These options appear if Watch Dog (above) is enabled. This is a timed delay in seconds, before a system power down or reset after a BIOS or operating system failure is detected. Enter the value in seconds.

ASF Sensors Table

Enable this feature for the ASF Sensor Table to be added into the ASF! ACPI table. The options are **Disabled** and Enabled.

▶Secure Erase Configuration

Secure Erase mode

Select Real to securely erase a solid state drive. The options are **Simulated** and Real.

Force Secure Erase

Select Enabled to force a secure erase of the solid state drive on the next boot. The options are **Disabled** and Enabled.

▶One Click Recovery (OCR) Configuration

OCR Https Boot

Use this feature to enable or disable One Click Recovery Https Boot. One Click Recovery is a recovery process that lets you restore your computer to its last known good state with a single command. The options are Disabled and **Enabled**.

OCR PBA Boot

Use this feature to enable or disable One Click Recovery PBA Boot. The options are Disabled and **Enabled**.

OCR Windows Recovery Boot

Use this feature to enable or disable One Click Recovery Windows Boot. The options are Disabled and **Enabled**.

OCR Disable Secure Boot

Use this feature to allow CSME to request Secure Boot to be disabled for One Click Recovery. The options are Disabled and **Enabled**.

▶PCIe/PCI/PnP Configuration

Option ROM execution

Video

Use this feature to select the execution of the video OpROM. The options are Do not launch and **EFI**.

PCI PERR/SERR Support

Use this feature to enable or disable the runtime event for PCI errors. The options are **Disabled** and Enabled.

Above 4G MMIO BIOS Assignment (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**.

SR-IOV Support

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

BME DMA Mitigation

Enable this feature to help block DMA attacks. The options are **Disabled** and Enabled.

NVMe Firmware Source

The feature determines which type of NVMe firmware should be used in your system. The options are **Vendor Defined Firmware** and AMI Native Support.

Consistent Device Name Support

This feature controls the device naming for network devices and slots. The options are **Disabled** and Enabled.

PCIe/PCI/PnP Configuration

CPU SLOT4 PCIe 3.0 X2 (IN X4) OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

CPU SLOT5 PCIe 4.0 X4 (IN X8) OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

CPU SLOT6 PCIe 3.0 X4 OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

CPU SLOT7 PCIe 5.0 X16 OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

PCIe M.2-C OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

SLIMSAS OPROM

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **EFI**.

Onboard LAN1 Option ROM

Use this feature to select which firmware function to be loaded for LAN 1 used for system boot. The options are Disabled and **EFI**.

▶SATA And RST Configuration

SATA Controller(s)

Use this feature to enable or disable the onboard SATA controller supported by the Intel PCH chip. The options are **Enabled** and Disabled.

Storage Option ROM/UEFI Driver

Select UEFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are Do not Launch and **EFI**.

Aggressive LPM Support

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

SATA0 - SATA7

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

- Software Preserve Support

Hot Plug

Set this feature to Enable for hot plug support, which allows you to replace a SATA drive without shutting down the system. The options are Disabled and **Enabled**.

Spin Up Device

Set this feature to enable or disable the PCH to initialize the device. The options are **Disabled** and Enabled.

SATA Device Type

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

▶VMD Setup Menu

VMD Configuration

Enable VMD Controller

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

If the feature above is set to Enabled, the following feature is available for configuration:

Enable VMD Global Mapping

Use this feature to enable or disable VMD global mapping. The options are Disabled and **Enabled**.

▶Serial Port Console Redirection

COM1/2/3/4/5/6 Console Redirection

Select Enabled to enable console redirection support for a serial port. The options are Enabled and **Disabled**.

If the feature above is set to Enabled, the following features are available for configuration:

▶COM1 Console Redirection Settings

Use this feature to specify how the host computer will exchange data with the client computer, which is the remote computer.

COM1/2/3/4/5/6 Terminal Type

This feature allows you 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.

COM1/2/3/4/5/6 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).

COM1/2/3/4/5/6 Data Bits

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

COM1/2/3/4/5/6 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.

COM1/2/3/4/5/6 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.

COM1/2/3/4/5/6 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.

COM1/2/3/4/5/6 VT-UTF8 Combo Key Support

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

COM1/2/3/4/5/6 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.

COM1/2/3/4/5/6 Resolution 100x31

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

COM1/2/3/4/5/6 Putty KeyPad

This feature selects the settings for Function Keys and KeyPad used for Putty, which is a terminal emulator designed for the Windows OS. The options are **VT100**, LINUX, XTERMR6, SC0, ESCN, and VT400.

COM1/2/3/4/5/6 Redirection After BIOS POST

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

AMT SOL Console Redirection

Select Enabled to enable console redirection support for the specified serial port. The options are Disabled and **Enabled.**

If the feature above is set to Enabled, the following features are available for configuration:

▶AMT SOL Console Redirection Settings

AMT SOL 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.

AMT SOL 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).

AMT SOL Data Bits

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

AMT SOL 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.

AMT SOL 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.

AMT SOL 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.

AMT SOL VT-UTF8 Combo Key Support

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

AMT SOL 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.

AMT SOL Resolution 100x31

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

AMT SOL 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.

AMT SOL Redirection After BIOS POST

Use this feature to enable or disable legacy Console Redirection after BIOS POST. When set to Bootloader, legacy Console Redirection is disabled before booting the OS. When set to Always Enable, legacy Console Redirection remains enabled when booting the OS. The options are **Always Enable** and Bootloader.

Emergency Management Services (EMS) Console Redirection

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

If the feature above is set to Enabled, the following features are available for configuration:

▶Console Redirection Settings

This feature allows you to specify how the host computer will exchange data with the client computer, which is the remote computer.

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 AMT SOL.

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

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

Flow Control

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.

Data Bits, Parity, Stop Bits

▶Trusted Computing

The motherboard supports TPM 1.2 and 2.0. The following Trusted Platform Module (TPM) information displays if a TPM 2.0 module is detected:

- Vendor
- Firmware Version

Security Device Support

If this feature and the TPM jumper on the motherboard are both set to Enabled, onboard security devices will be enabled for Trusted Platform Module (TPM) support to enhance data integrity and network security. Please reboot the system for a change on this setting to take effect. The options are Disabled and **Enabled**.

- Active PCR Banks
- Available PCR Banks

If the feature above is set to Enabled, the next five features are available for configuration:

SHA256 PCR Bank

Use this feature to disable or enable the SHA256 Platform Configuration Register (PCR) bank for the installed TPM device. The options are Disabled and **Enabled**.

Pending Operation

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

Platform Hierarchy

Use this feature to disable or enable platform hierarchy for platform protection. The options are Disabled and **Enabled**.

Storage Hierarchy

Use this feature to disable or enable storage hieararchy for cryptographic protection. The options are Disabled and **Enabled**.

Endorsement Hierarchy

Use this feature to disable or enable endorsement hierarchy for privacy control. The options are Disabled and **Enabled**.

PH Randomization

Use this feature to disable or enable Platform Hiearchy (PH) Randomization. The options are **Disabled** and Enabled.

Intel Trusted Execution Technology

Intel Trusted Execution Technology (TXT) helps protect against software-based attacks and ensures protection, confidentiality, and integrity of data stored or created on the system. Use this feature to enable or disable TXT Suppport. The options are **Disabled** and Enabled.

▶USB Configuration

USB Configuration

USB Module Version

USB Controllers

USB Devices

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 settings are **Enabled** and Disabled.

USB Mass Storage Driver Support

Select Enabled for USB mass storage device support. The options are Disabled and **Enabled**.

USB S5 Wakeup Support

Use this feature to enable or disable USB S5 Wakeup support. The options are Disabled and **Enabled**.

▶Intel(R) Ethernet Controller (3) I225-LM - xx:xx:xx:xx:xx:xx

UEFI Driver

Device Name

PCI Device ID

Link Status

MAC Address

▶Intel(R) Ethernet Connection (3) I225-LM - xx:xx:xx:xx:xx:xx

UEFI Driver

Device Name

PCI Device ID

Link Status

MAC Address

▶TLS Authentication Configuration

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

▶Server CA Configuration

▶Enroll Certification

Enroll Certification Using File

Use this feature to enroll certification from a file.

Certification GUID

Use this feature to input the certification GUID.

Commit Changes and Exit

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

Discard Changes and Exit

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

▶Delete Certification

Use this feature to delete certification.

▶Driver Health

This feature provides the health status for the network drivers and controllers.

▶Intel(R) Gigabit 0.9.02

Controller 6CE67498 Child 0

Intel(R) Ethernet Controller (3) I225-LM

▶Intel(R) Gigabit 0.9.02

Controller 6CE66A98 Child 0

Intel(R) Ethernet Controller (3) I225-LM

▶Board Additional Control

COM1 Mode

The COM1 interface is selectable in the BIOS. The settings are RS-422 1T/1R Full Duplex, RS-422 1T/1R Full Duplex with termination and bias resistor, RS-485 1T/1R Half Duplex Tx Enabled Low-Active, RS-485 1T/1R Half Duplex with termination and bias resister TX ENABLE Low Active, RS-232 3T/5R, RS-232 1T/1R, RS-485 1T/1R Half Duplex Tx Enabled High-Active, and Low Power Shutdown.

COM1 Slew Rate

The COM1 slew rate is selectable in the BIOS. Slew rate is the change of voltage. The settings are 250 Kbps for RS-232/422/485, and 1.5 Mbps for RS-232; 10Mbps for RS-422/485.

COM2 Mode

The COM2 interface is selectable in the BIOS. The settings are RS-422 1T/1R Full Duplex, RS-422 1T/1R Full Duplex with termination and bias resistor, RS-485 1T/1R Half Duplex Tx Enabled Low-Active, RS-485 1T/1R Half Duplex with termination and bias resister TX ENABLE Low Active, RS-232 3T/5R, RS-232 1T/1R, RS-485 1T/1R Half Duplex Tx Enabled High-Active, and Low Power Shutdown.

COM2 Slew Rate

The COM2 slew rate is selectable in the BIOS. Slew rate is the change of voltage. The settings are 250 Kbps for RS-232/422/485, and 1.5 Mbps for RS-232; 10Mbps for RS-422/485.

GPIO Header

GP0 Direction

Use this feature to select the signal for GP0. The options are **Input** and Output.

If the feature above is set to Output, the feature below is available for configuration:

GP0 Outgoing Logical Level

Use this feature to select the outgoing logical level for GP0. The options are **Low** and High.

GP1 Direction

Use this feature to select the signal for GP1. The options are **Input** and Output.

If the feature above is set to Output, the feature below is available for configuration:

GP1 Outgoing Logical Level

Use this feature to select the outgoing logical level for GP1. The options are **Low** and High.

GP2 Direction

Use this feature to select the signal for GP2. The options are **Input** and Output.

If the feature above is set to Output, the feature below is available for configuration:

GP2 Outgoing Logical Level

Use this feature to select the outgoing logical level for GP2. The options are **Low** and High.

GP3 Direction

Use this feature to select the signal for GP3. The options are **Input** and Output.

If the feature above is set to Output, the feature below is available for configuration:

GP3 Outgoing Logical Level

Use this feature to select the outgoing logical level for GP3. The options are **Low** and High.

GP4 Direction

Use this feature to select the signal for GP4. The options are **Input** and Output.

If the feature above is set to Output, the feature below is available for configuration:

GP4 Outgoing Logical Level

Use this feature to select the outgoing logical level for GP4. The options are **Low** and High.

GP5 Direction

Use this feature to select the signal for GP5. The options are **Input** and Output.

If the feature above is set to Output, the feature below is available for configuration:

GP5 Outgoing Logical Level

Use this feature to select the outgoing logical level for GP5. The options are **Low** and High.

GP6 Direction

Use this feature to select the signal for GP6. The options are **Input** and Output.

If the feature above is set to Output, the feature below is available for configuration:

GP6 Outgoing Logical Level

Use this feature to select the outgoing logical level for GP6. The options are **Low** and High.

GP7 Direction

Use this feature to select the signal for GP7. The options are **Input** and Output.

If the feature above is set to Output, the feature below is available for configuration:

GP7 Outgoing Logical Level

Use this feature to select the outgoing logical level for GP7. The options are **Low** and High.

4.4 Event Logs

Use this menu to configure Event Log settings.

▶Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Change this feature to enable or disable all features of the SMBIOS Event Logging during system boot. The options are Disabled and **Enabled**.

Erasing Settings

Erase Event Log

If No is selected, data stored in the event log will not be erased. Select Yes, Next Reset, data in the event log will be erased upon next system reboot. Select Yes, Every Reset, data in the event log will be erased upon every system reboot. The options are **No**, Yes, Next reset, and Yes, Every reset.

When Log is Full

Select Erase Immediately for all messages to be automatically erased from the event log when the event log memory is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings

Log System Boot Event

This option toggles the System Boot Event logging to enabled or disabled. The options are **Disabled** and Enabled.

MECI

The Multiple Event Count Increment (MECI) counter counts the number of occurences that a duplicate event must happen before the MECI counter is incremented. This is a numeric value. The default value is **1**.

METW

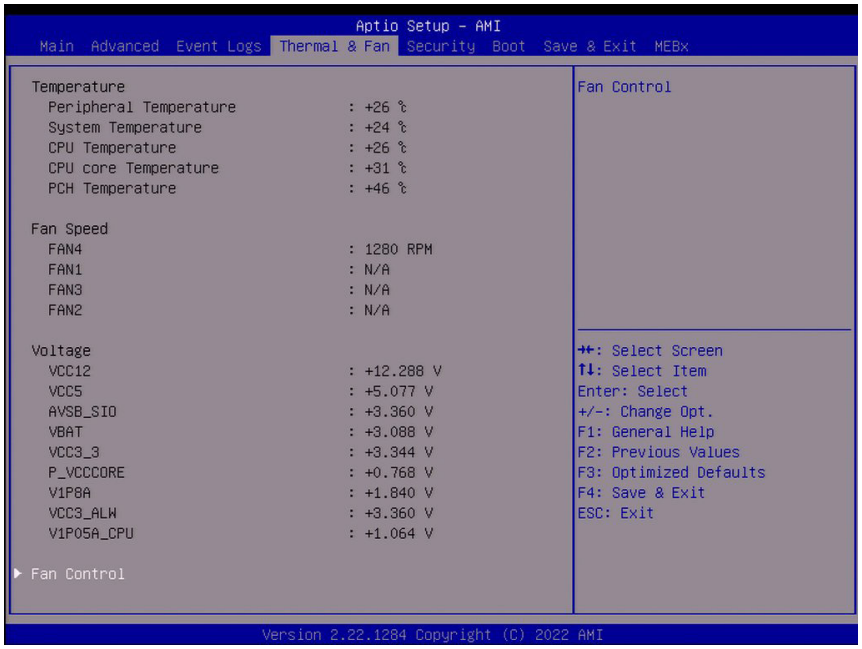
The Multiple Event Time Window (METW) defines the number of minutes that must pass between duplicate log events before MECI is incremented. This is in minutes, from 0 to 99. The default value is **60**.

▶View SMBIOS Event Log

Select this submenu and press enter to see the contents of the SMBIOS event log. The following categories will be displayed: Date/Time/Error Codes/Severity.

4.5 Thermal & Fan

Use this menu to view System Health settings.



Temperature

- Peripheral Temperature
- System Temperature
- CPU Temperature
- CPU core Temperature
- PCH Temperature

Fan Speed

- FAN4
- FAN1
- FAN3
- FAN2

Voltage

- VCC12

- VCC5
- AVSB_SIO
- VBAT
- VCC3_3
- P_VCCCORE
- V1P8A
- VCC3_ALW
- V1P05A_CPU

▶Fan Control

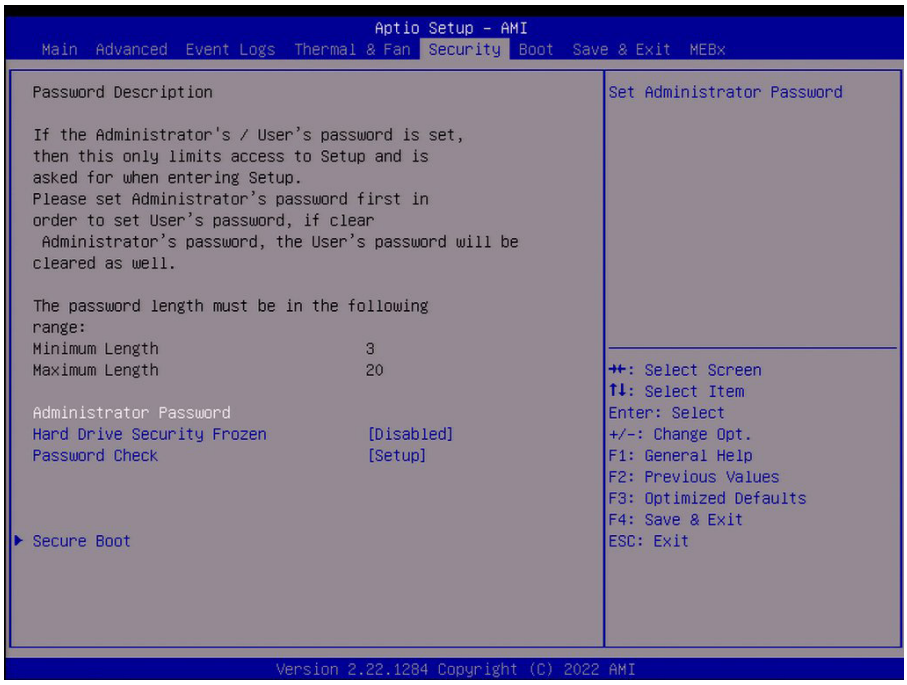
Fan Control Setting

Fan Speed Control Mode

Use this feature to select the fan speed control mode. The options are **Standard** and Full Speed.

4.6 Security

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



Administrator Password

Press Enter to create a new, or change an existing, Administrator password.

Hard Drive Security Frozen

Use this feature to enable or disable the BIOS security frozen command for SATA and NVMe devices. The options are Enabled and **Disabled**.

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 boot up or upon entering the BIOS Setup utility. The options are **Setup** and Always.

▶Secure Boot

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

- System Mode
- Secure Boot

Secure Boot

Use this feature to enable secure boot. The options are **Disabled** and Enabled.

Secure Boot Mode

Use this feature to configure Secure Boot variables without authentication. The options are Standard and **Custom**.

Enter Audit Mode

Select this feature to enter the audit mode to configure PK.

▶Key Management

This submenu allows you to configure the following Key Management settings.

▶Restore Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases. The options are **Yes** and No.

▶Reset to Setup Mode

This feature deletes all Secure Boot key databases from NVRAM. The options are **Yes** and No.

Secure Boot Variable

▶Platform Key (PK)

Update

Select Yes to load the new Platform Keys (PK) from the manufacturer's defaults. Select No to load the Platform Keys from a file. The options are Yes and No.

▶Key Exchange Key

Update

Select Yes to load the KEK from the manufacturer's defaults. Select No to load the KEK from a file. The options are Yes and No.

Append

Select Yes to add the KEK from the manufacturer's defaults list to the existing KEK. Select No to load the KEK from a file. The options are Yes and No.

▶Authorized Signatures

Update

Select Yes to load the factory default db. Select No to load the db from a external file. The options are Yes and No.

Append

Select Yes to add the database from the manufacturer's defaults to the existing db. Select No to load the db from a file. The options are Yes and No.

▶Forbidden Signatures

Update

Select Yes to load the dbx factory default dbx. Select No to load it from an external file. The options are Yes and No.

Append

Select Yes to add the dbx from the manufacturer's defaults to the existing dbx. Select No to load the dbx from a file. The options are Yes and No.

▶Authorized TimeStamps

Update

Select Yes to load the dbt from the manufacturer's defaults. Select No to load the dbt from a file. The options are Yes and No.

Append

Select Yes to add the dbt from the manufacturer's defaults list to the existing dbt. Select No to load the dbt from a file. The options are Yes and No.

▶OsRecovery Signature

Update

Select Yes to load a factory default dbr or No to load from a file on an external media.

Append

Select Yes to add the dbr from the manufacturer's defaults list to the existing dbr. Select No to load the dbr from a file. The options are Yes and No.

▶Export Secure Boot variables

This feature allows you to copy NVRAM content of Secure boot variables to files in a root folder on a file system device. The options are **Yes** and No.

▶Enroll EFI Image

This feature allows the image to run in Secure Boot Mode. Enroll SHA256 Hash Certicate of the image into the Authorized Signature Database.

Device Guard Ready

▶Remove 'UEFI CA' from DB

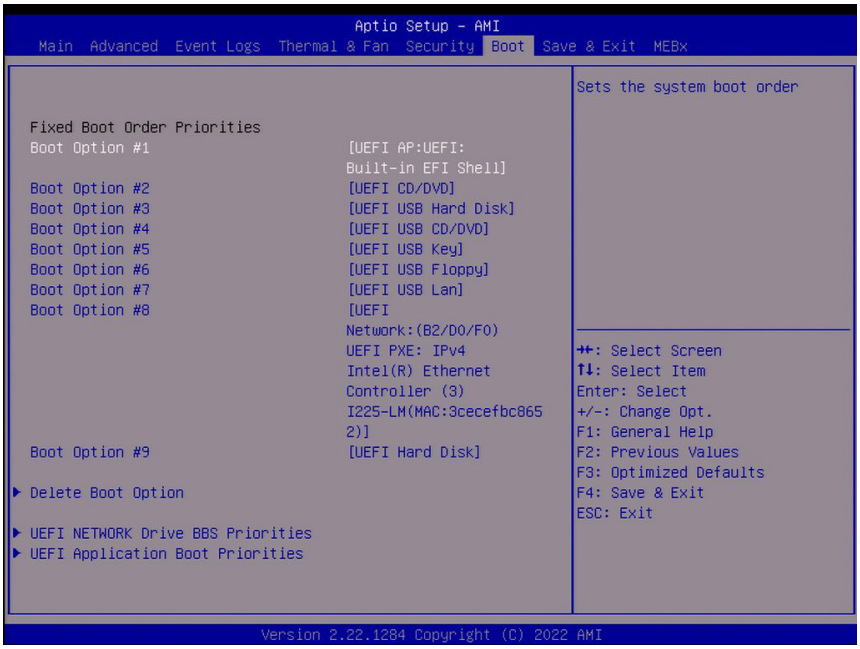
This feature allows you to decide if all secure boot variables should be saved.

▶Restore DB defaults

Select Yes to restore the DB defaults.

4.7 Boot

Use this menu to configure Boot settings.



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

▶Delete Boot Option

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

Delete Boot Option

Use this item to remove an EFI boot option from the boot priority list.

▶UEFI NETWORK Drive BBS Priorities

This feature sets the system boot order of detected devices.

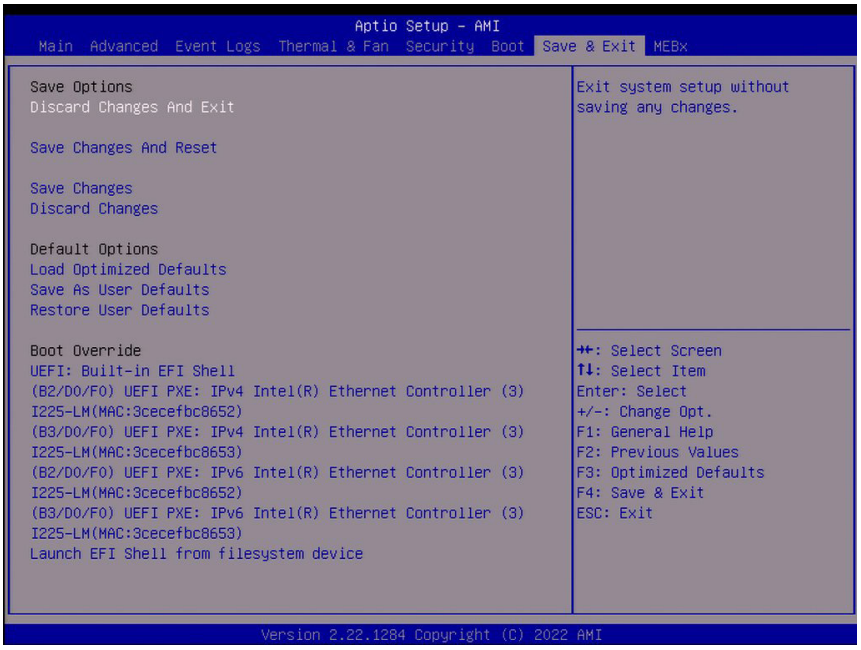
▶UEFI Application Boot Priorities

This feature sets the system boot order of detected devices.

- Boot Option #1

4.8 Save & Exit

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



Save Options

Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>.

Save Changes and Reset

After completing the system configuration changes, select this option to save the changes you have made. This will not reset (reboot) the system.

Save Changes

When you have completed the system configuration changes, select this option to leave the BIOS setup utility and reboot the computer for the new system configuration parameters to take effect. Select Save Changes from the Save & Exit menu and press <Enter>.

Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS utility program.

Default Options

Load Optimized Default

To set this feature, select Restore Defaults from the Save & Exit menu and press <Enter>. These are factory settings designed for maximum system stability, but not for maximum performance.

Save As User Defaults

To set this feature, select Save as User Defaults from the Save & Exit menu and press <Enter>. This enables the user to save any changes to the BIOS setup for future use.

Restore User Defaults

To set this feature, select Restore User Defaults from the Save & Exit menu and press <Enter>. Use this feature to retrieve user-defined settings that were saved previously.

Boot Override

Listed in this section are other boot options for the system (i.e., Built-in EFI shell). The options may vary on each system. Select an option, press <Enter>, and your system will boot to the selected boot option.

(B2/D0/F0) UEFI PXE IPv4 Intel(R) I210 Gigabit Network Connection (MAC:xxxxxxxxxxxx)

(B2/D0/F1) UEFI PXE IPv4 Intel(R) Ethernet Controller (3) I225-LM (MAC:xxxxxxxxxxxx)

(B2/D0/F0) UEFI PXE IPv6 Intel(R) I210 Gigabit Network Connection (MAC:xxxxxxxxxxxx)

(B2/D0/F1) UEFI PXE IPv6 Intel(R) Ethernet Controller (3) I225-LM (MAC:xxxxxxxxxxxx)

UEFI: Built-in EFI Shell

Launch EFI Shell from filesystem device

4.9 MEBx

Use this menu to create a password for MEBx.

Intel(R) ME Password

Use this feature to create a password for the Intel Management Engine BIOS Extention.

Appendix A

BIOS Codes

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").

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

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

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.

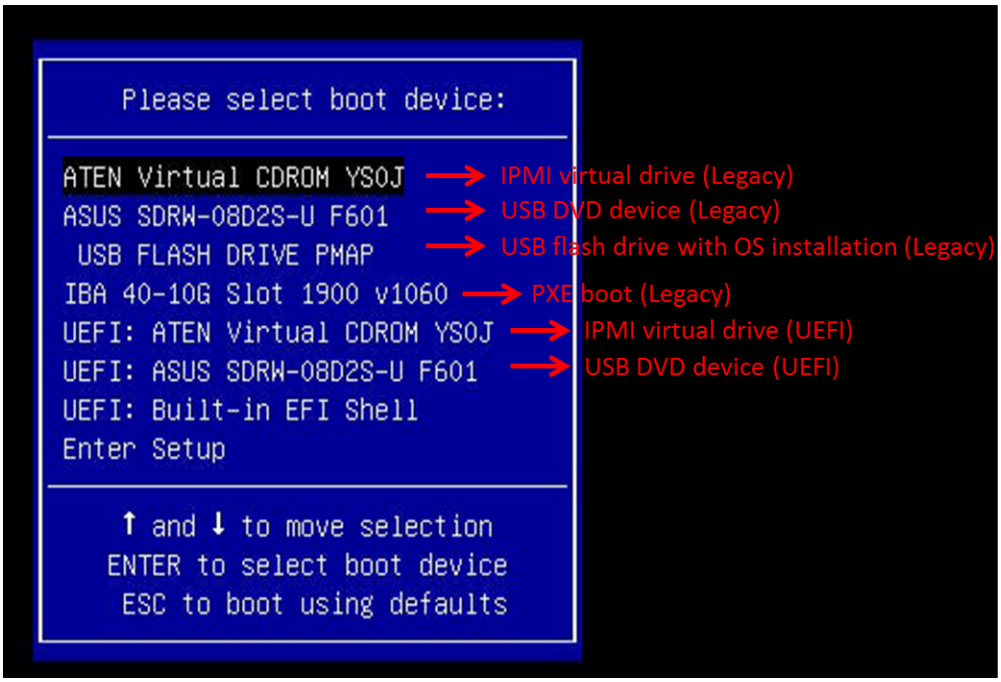


Figure B-1. Select Boot Device

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.

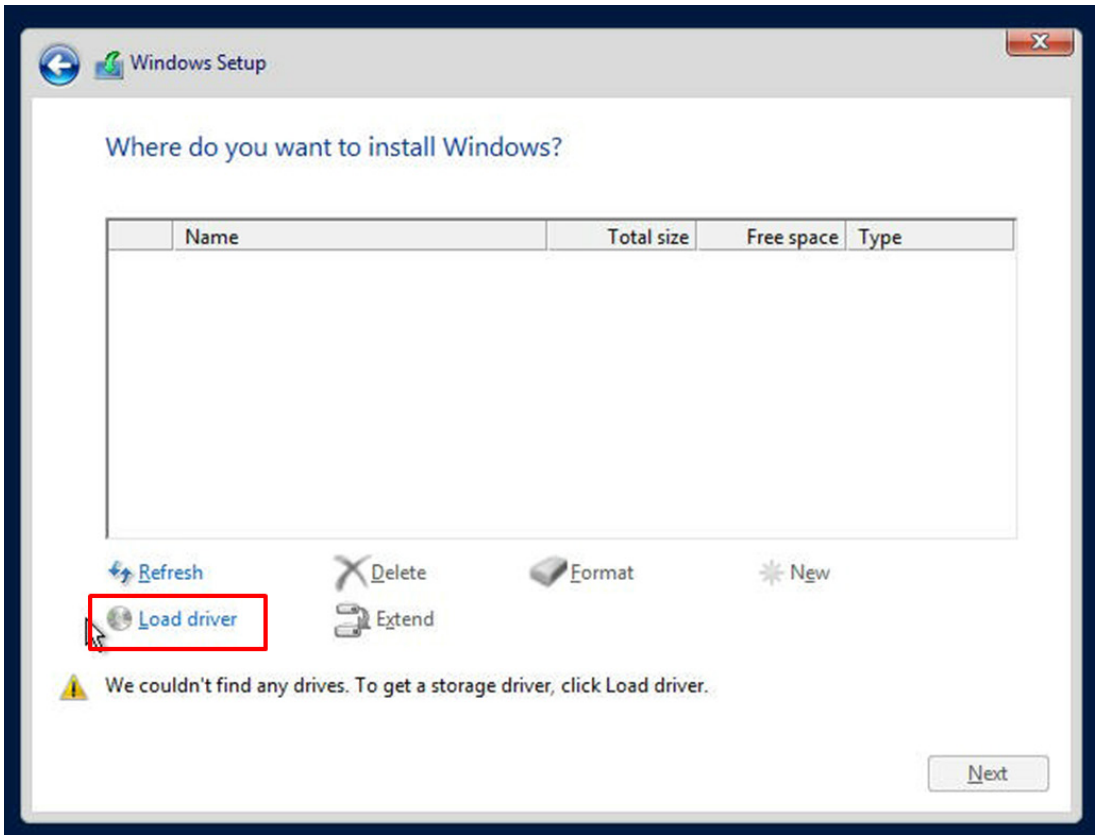


Figure B-2. Load Driver Link

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

After accessing the website, 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 and search for the motherboard. Find the product page for your motherboard and download the latest drivers and utilities.

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

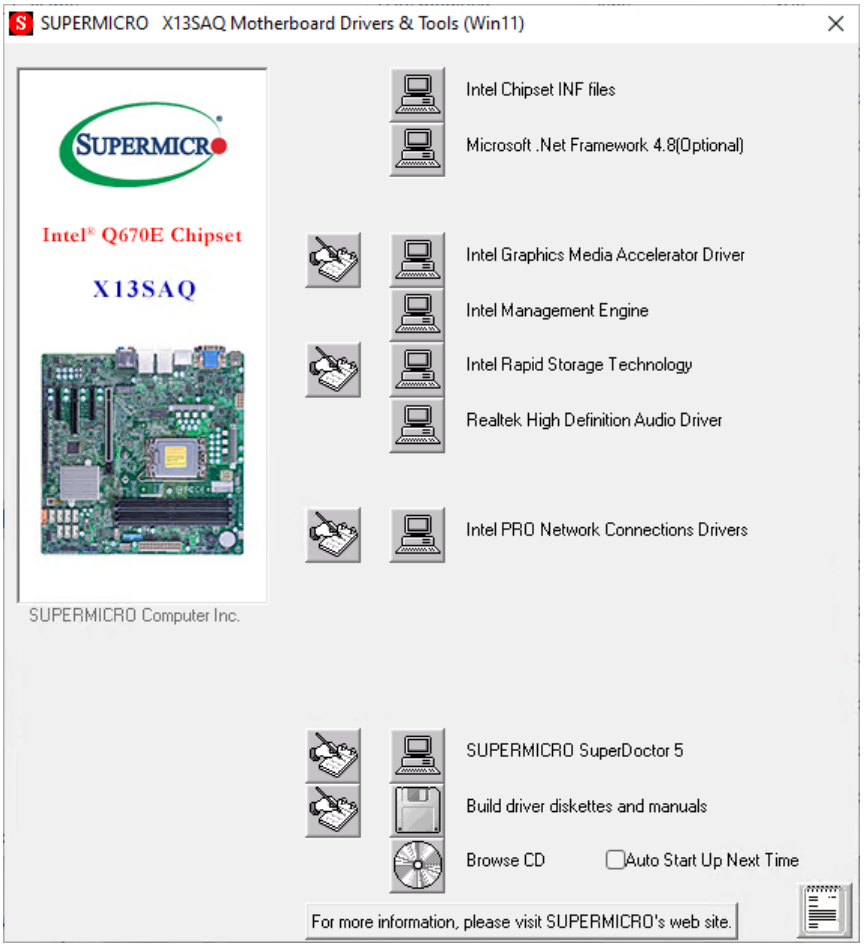


Figure B-3. Driver & Tool Installation Screen

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.

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

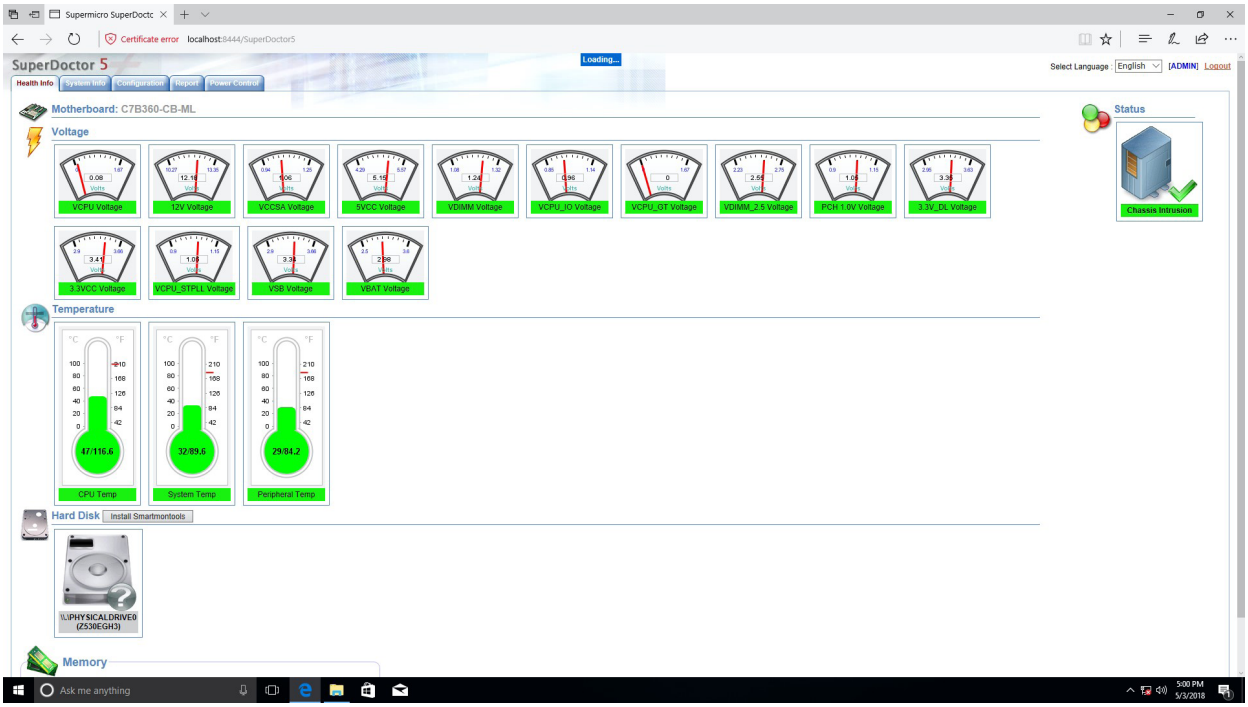


Figure B-4. SuperDoctor 5 Interface Display Screen (Health Information)

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 the user 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:

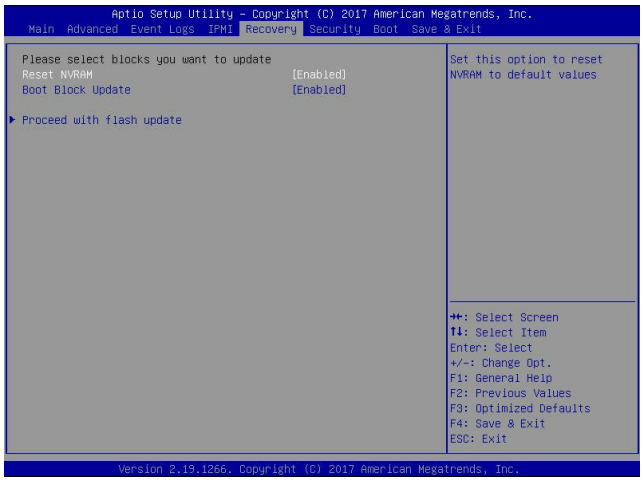
1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\" directory of a USB flash or media drive.

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:

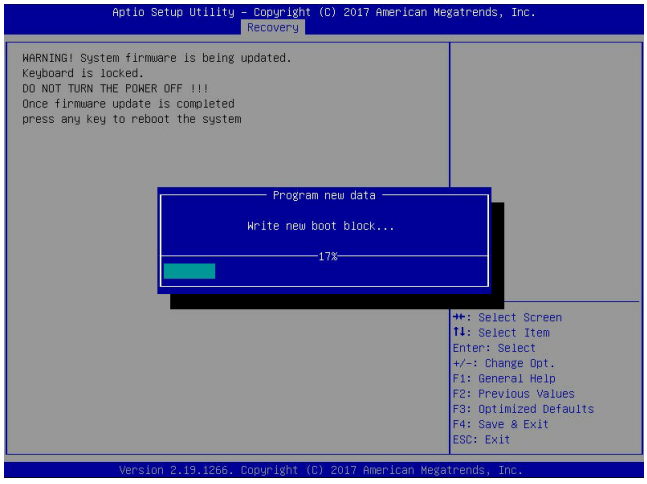
3. After locating the new BIOS binary image, the system will enter the BIOS Recovery menu as shown below:



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.

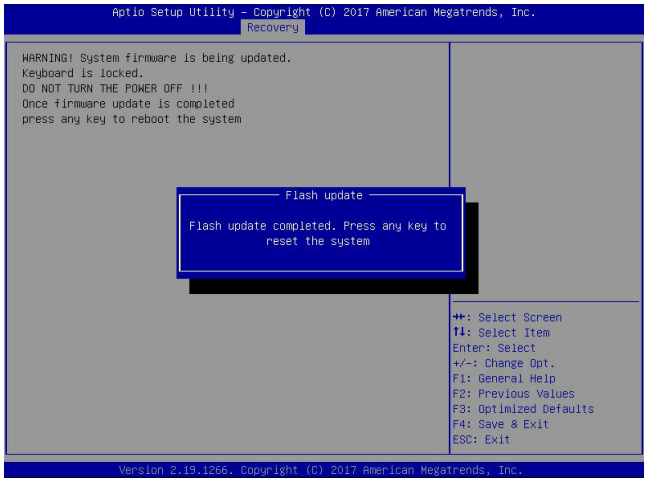
4. When the screen as shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below:

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

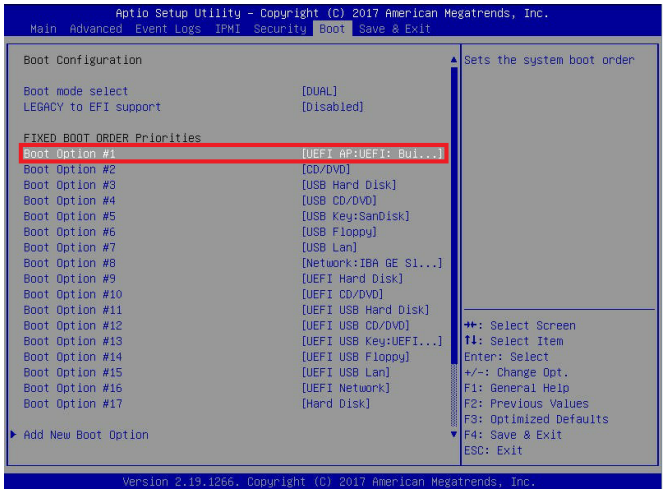


5. After the BIOS recovery process is completed, press any key to reboot the system.

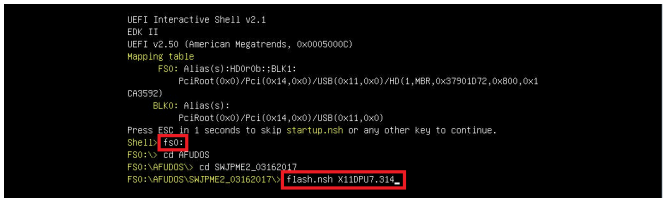
6. Using a different system, extract the BIOS package into a USB flash drive.



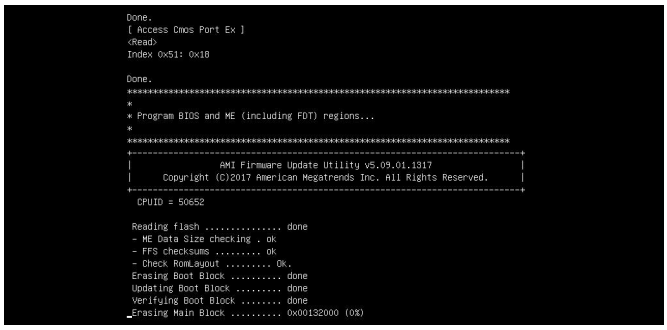
7. Press <Del> during system boot to enter the BIOS Setup utility. From the top of the tool bar, select Boot to enter the submenu. From the submenu list, select Boot Option #1 as shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press <F4> to save the settings and exit the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

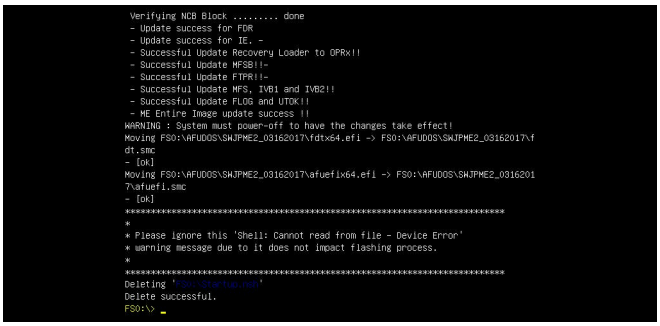


8. When the UEFI Shell prompt appears, type fs# to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter flash.nsh BIOSname.### at the prompt to start the BIOS update process.



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





9. The screen above indicates that the BIOS update process is complete. When you see the screen above, unplug the AC power cable from the power supply, clear CMOS, and plug the AC power cable in the power supply again to power on the system.

10. Press <Del> 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.