X12STL-IF

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 motherboard.

About This Motherboard

The Supermicro X12STL-IF supports the Intel® Xeon E-2300 and 10th Generation Pentium processor in an LGA1200 socket. Built with the Intel PCH C252 chipset, the X12STL-IF supports 64GB DDR4 ECC UDIMM memory with speeds of up to 3200MHz, SATA 3.0 ports, M.2, 1G Base-T ports, and a Trusted Platform Module (TPM) header. 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 while performing a procedure.

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

Note: Additional Information given to differentiate various models or to provide information for proper system setup.

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Chapter 3 Troubleshooting

Chapter 4 UEFI BIOS

Chapter 1

Introduction

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

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

1.1 Checklist

Main Parts List		
Description	**Part Number**	**Quantity**
Supermicro Motherboard	X12STL-IF	1
I/O Shield	MCP-260-00042-0N	1
SATA Cables	CBL-0044L	2
Quick Reference Guide	MNL-2368-QRG	1

Important Links

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

- Supermicro product manuals: http://www.supermicro.com/support/manuals/

- Product drivers and utilities: https://www.supermicro.com/wdl/driver

- Product safety info: http://www.supermicro.com/about/policies/safety_information.cfm

- A secure data deletion tool designed to fully erase all data from storage devices can be found at our website: https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility/

- If you have any questions, please contact our support team at: support@supermicro.com

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

Figure 1-1. X12STL-IF 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. X12STL-IF Motherboard Layout
(not drawn to scale)
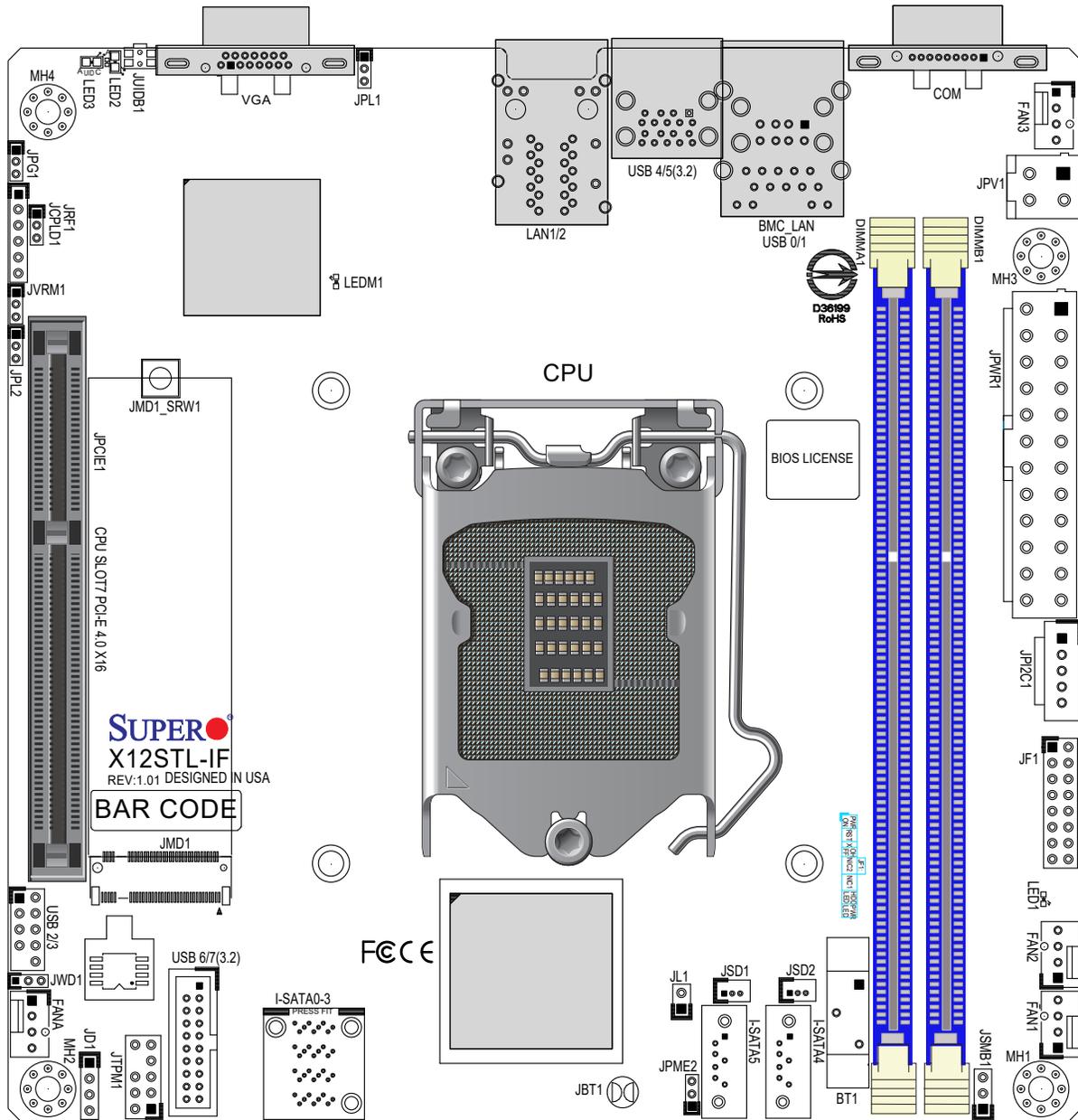
Note: Components not documented are for internal testing only.

Quick Reference
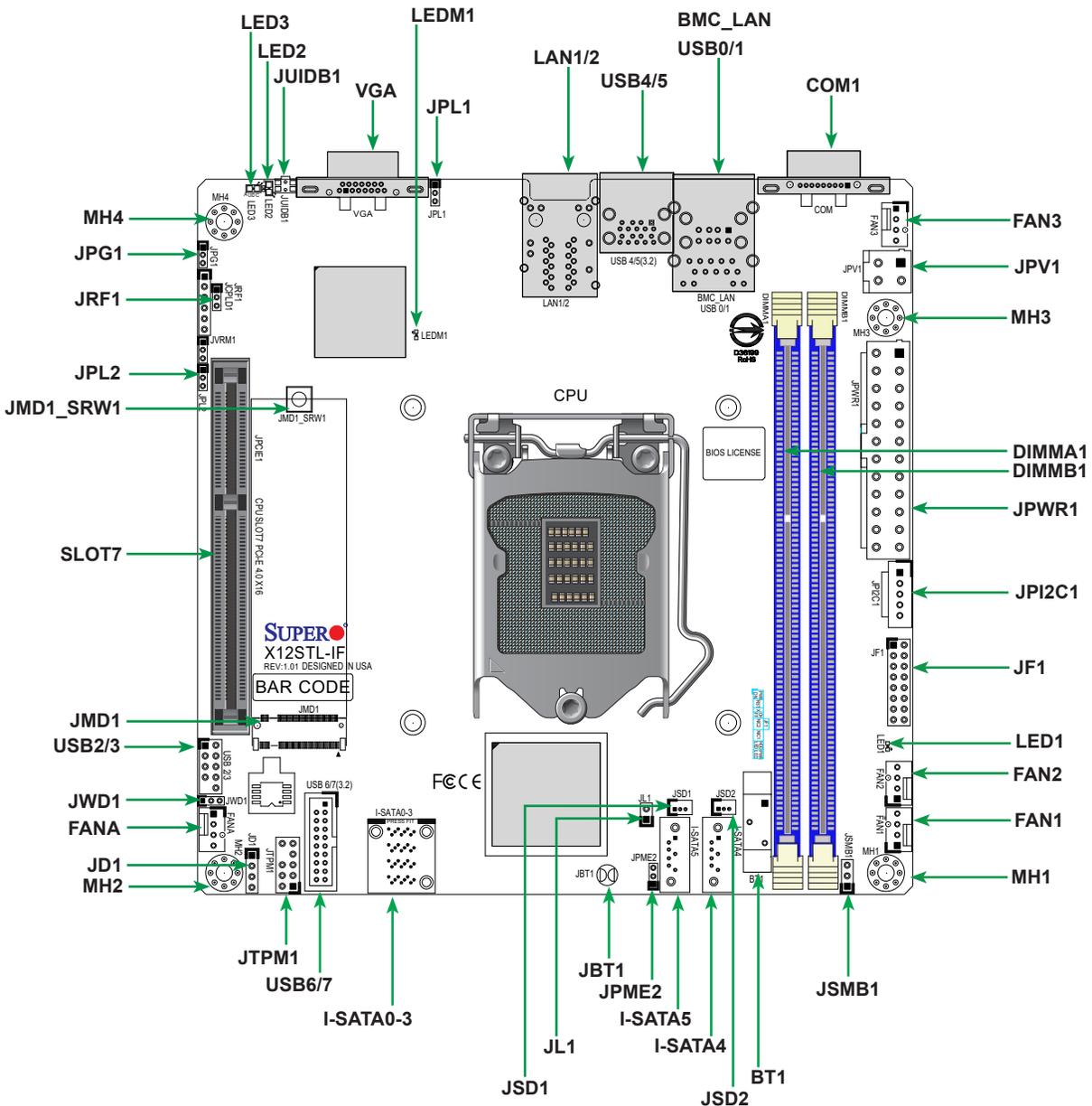
Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports, and JF1 front panel connections.

- "■" indicates the location of Pin 1.

- Jumpers/LED indicators not indicated are used for testing only.

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

Quick Reference Table

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	LAN1 Enable/Disable	Pins 1-2 (Enabled)
JPL2	LAN2 Enable/Disable	Pins 1-2 (Enabled)
JPME2	Manufacturing Mode	Pins 1-2 (Normal)
JRF1	CPU PCIe Bifurcation	Pins 1-2 (JPCIE x16) Pins 2-3 (JPCIE 2 x8)
JWD1	Watch Dog Timer	Pins 1-2 (Reset)

LED	Description	Status
LED1	Onboard Power LED	Solid Green: Power On
LED2	UID LED	Solid Blue: Unit Identified
LED3	OH LED	Solid Red: Overheat
LEDM1	BMC Heartbeat LED	Blinking Green: Device Working

Connector	Description
BMC_LAN	Dedicated BMC LAN Port
BT1	Onboard Battery
COM1	COM Port
FAN1 - FAN3, FANA	System Fan Headers (FAN1: CPU Fan)
I-SATA0-3	Intel PCH SATA 3.0 Ports
I-SATA4, I-SATA5	Intel PCH SATA 3.0 Ports
JD1	Speaker/Buzzer
JF1	Front Control Panel Header
JL1	Chassis Intrusion Header
JMD1	M.2 PCIe 3.0 x4 (supports 2280 form factor)
JMD1_SRW1	M.2 Holding Screw
JPI2C1	Power I²C System Management Bus (Power SMB) Header
JPWR1	24-pin ATX Power Connector
JPV1	4-pin Power Connector
JSD1, JSD2	SATA DOM Power Connectors
JSMB1	System Management Bus Header
JTPM1	Trusted Platform Module/Port 80 Connector
JUIDB1	UID Switch
LAN1/2	Gigabit Ethernet RJ45 Ports
MH1 - MH4	Mounting Holes
SLOT7	PCIe 4.0 x16 Slot (SLOT7 will run at PCIe 3.0 x16 when a Pentium processor is installed)

Note: Table is continued on the next page.

Connector	Description
USB0/1	Back Panel USB 2.0 Ports
USB2/3	Front Accessible USB 2.0 Headers
USB4/5	Back Panel USB 3.2 Ports
USB6/7	Front Accessible USB 3.2 Headers
VGA	VGA Port

Motherboard Features

Motherboard Features
CPU
• Supports an Intel Xeon E-2300 and 10th Generation Pentium (Socket H5 - LGA 1200) series processor with up to eight cores
Memory
• Up to 64GB of DDR4 ECC UDIMM memory with speeds of up to 3200MHz in two memory slots **Note:** Speed support is up to 2666MHz when a Pentium processor is installed. Speed support is up to 2933 MT/s for 2R2R configurations.
DIMM Size
• 4GB, 8GB, 16GB, 32GB at 1.2V **Note:** For the latest CPU/memory updates, please refer to our website at http://www.supermicro.com/products/motherboard.
Chipset
• Intel C252
Expansion Slots
• One PCIe 4.0 x16 Slot (It will run at PCIe 3.0 x16 when a Pentium processor is installed) • One M.2 PCIe 3.0 x4 Slot (supports M-Key 2280)
Network
• Intel I210-AT Gigabit Ethernet Controller
Super I/O
• Aspeed AST2600
I/O Devices
• One COM port (COM1) • Six SATA 3.0 ports at 6 Gb/s • One VGA port on the rear I/O panel
Peripheral Devices
• Two USB 2.0 ports on the rear I/O panel (USB0/1) • One front accessible USB 2.0 header with two USB connections (USB2/3) • Two USB 3.2 ports on the rear I/O panel (USB4/5) • One front accessible USB 3.2 header with two USB connections (USB6/7)
BIOS
• 512Mb AMI BIOS® SPI Flash BIOS • ACPI 6.0, Plug and Play (PnP), BIOS rescue hot-key, and SMBIOS 3.0 or later

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

Motherboard Features
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 +12V, +5V, +3.3V, CPU, Memory, VBAT, +3.3V stdby, CPU temperature, PCH temperature, system temperature • 6 CPU switch phase voltage regulator • CPU thermal trip support • Platform Environment Control Interface (PECI)/TSI
Fan Control
• Fan status monitoring • Dual cooling zone • Four 4-pin fan headers
System Management
• Trusted Platform Module (TPM) support • SuperDoctor® 5 • Chassis intrusion header and detection
LED Indicators
• CPU/System Overheat LED • Power/Suspend state LED • Fan Fail LED • UID/Remote LED • LAN Activity LED • HDD Activity LED
Dimensions
• mini-ITX, 6.7" (W) x 6.7" (L) (193.04mm x 193.04mm)

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

Figure 1-3.
System Block Diagram
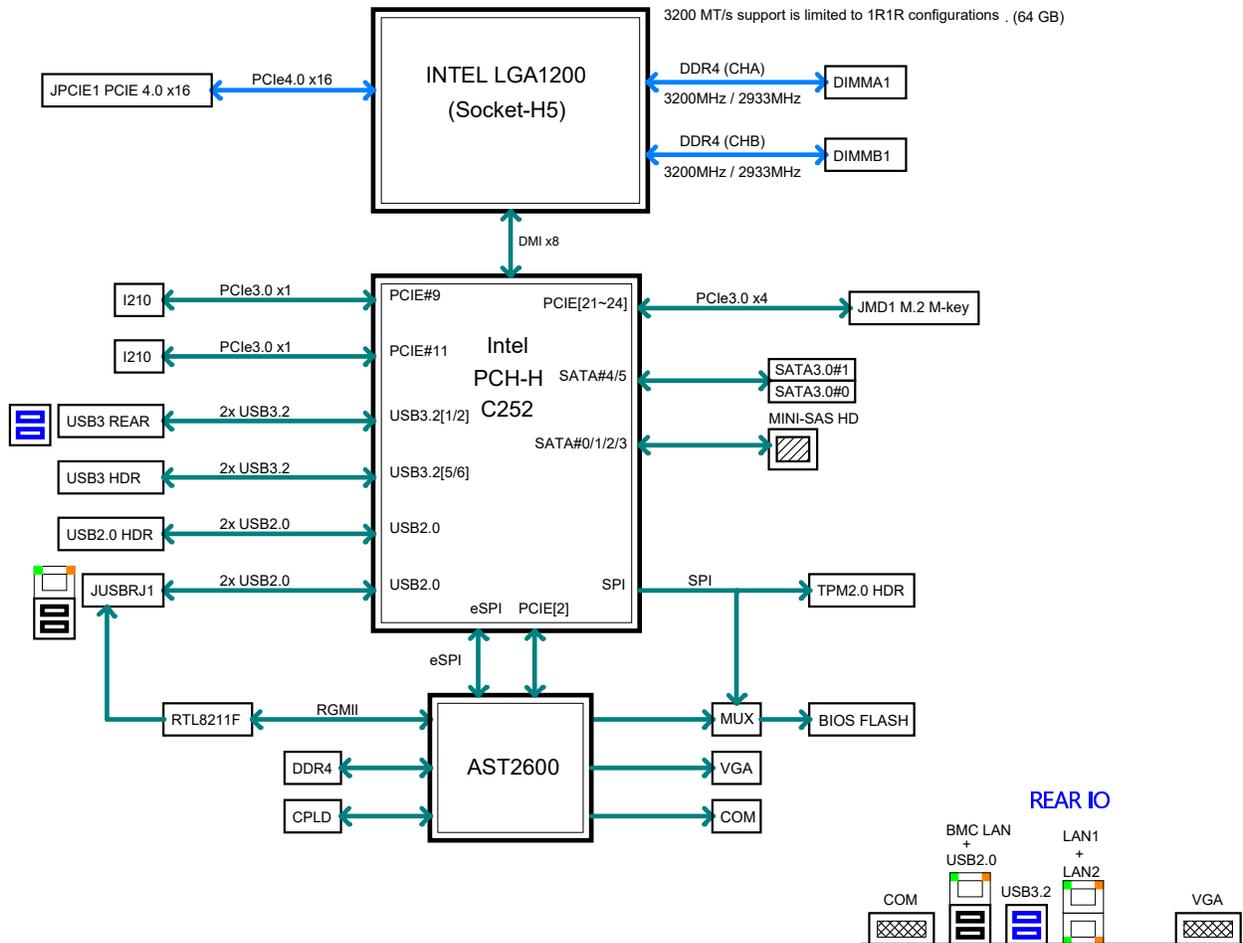
Note: This is a general block diagram and may not exactly represent the features on your motherboard. See the previous pages for the actual specifications of your motherboard.

1.2 Processor and Chipset Overview

Built upon the functionality and capability of the Intel Xeon E-2300 and 10th Generation Pentium (Socket H5 - LGA 1200) series processor and the Intel C252 chipset, the X12STL-IF motherboard provides system performance, power efficiency, and feature sets to address the needs of next-generation computer users.

The X12STL-IF dramatically increases system performance for a multitude of server applications.

The Intel Xeon E-2300, 10th Generation Pentium processor and the C252 chipset support the following features:

- Intel SPS 6.x

- Intel TXT

- Intel Virtual RAID on CPU (SATA RAID)

- IO Flex

- eSPI

> **Note**: Intel TXT is only supported in the UEFI boot mode. Please 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.

Environmental Temperature Control

The CPU fan is always on, not dependent on any user-defined threshold. CPU fan speed is adjusted automatically according to the CPU temperature.

Note: To avoid possible system overheating, please 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, please refer to the Supermicro website.

1.6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates. 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.

1.7 Serial Port

The X12STL-IF motherboard has one serial port on the I/O back panel.

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 you are 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 LGA1200 Processor

1. Press the load lever down to release the load plate from its locking position.
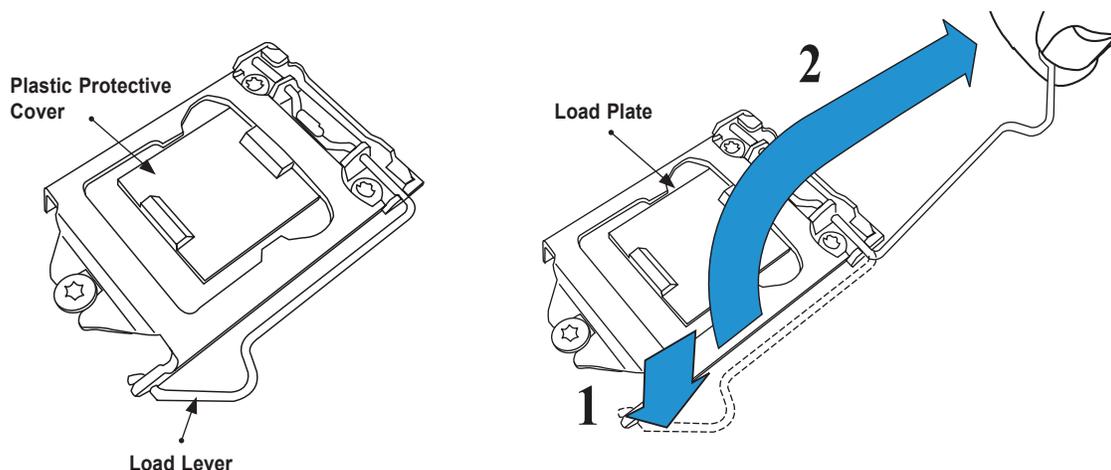
2. Gently lift the load lever to open the load plate. Remove the plastic protective cover. Do not touch the CPU socket contacts.
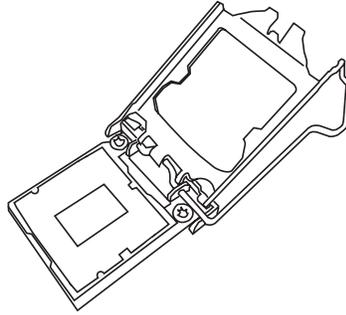
3. Locate the triangle on the CPU and CPU socket, which indicates the location of Pin 1. Holding the CPU by the edges with your thumb and index finger, align the triangle on the CPU with the triangle on the socket. The CPU keys (the semi-circle cutouts) may also be aligned against the socket keys as a guide.

Pin 1

CPU / Socket Keys
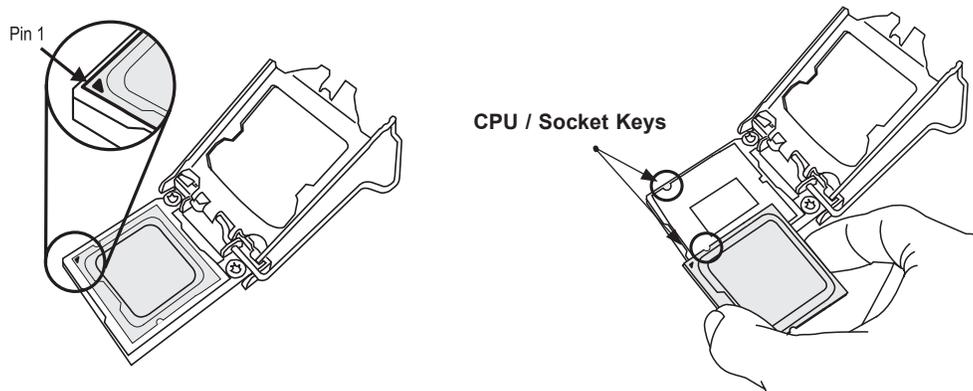
4. Carefully lower the CPU straight down into the socket. Do not drop the CPU on the socket, or move it horizontally or vertically to avoid damaging the CPU or socket. Inspect the four corners of the CPU to make sure that the CPU is properly installed.
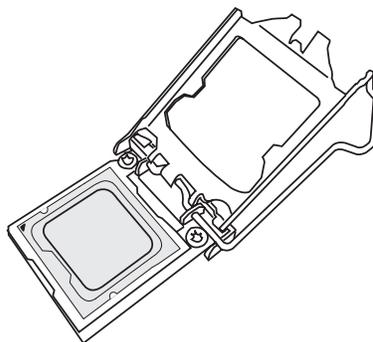
5. Close the load plate, then gently push down the load lever into its locking position.

CPU properly installed

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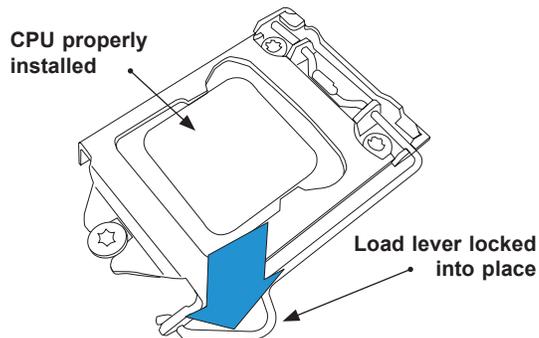
Note: You can only install the CPU in one direction. Make sure it is properly inserted into the socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is properly aligned.

Installing an Active CPU Heatsink with Fan

1. Locate the CPU fan header on the motherboard (FAN1: CPU FAN).

2. Position the heatsink so that the heatsink fan wires are closest to the CPU fan header and are not interfering with other components.

3. Inspect the CPU fan wires to make sure they are routed through the bottom of the heatsink.

4. Remove the thin layer of protective film from the heatsink. CPU overheating may occur if the protective film is not removed from the heatsink.

5. Apply the proper amount of thermal grease on the CPU. If your heatsink came with a thermal pad, please ignore this step.

Thermal Grease
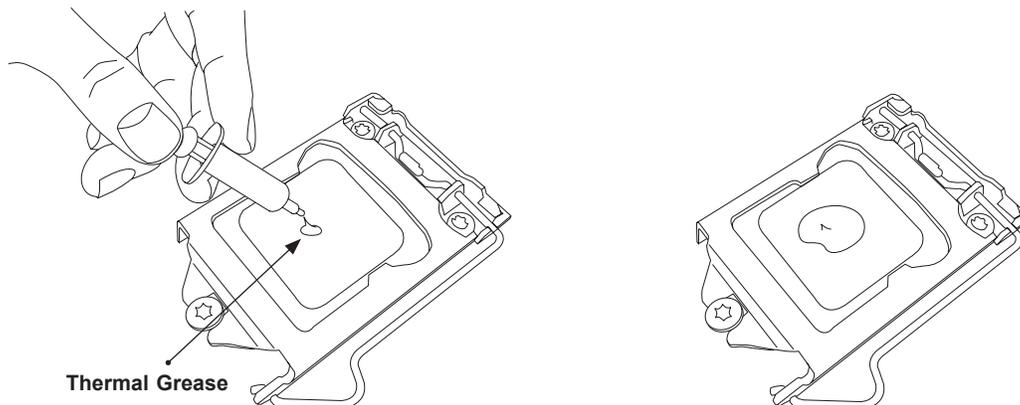
6. Align the four heatsink fasteners with the mounting holes on the motherboard. Gently push down the fasteners in a diagonal order (Example: #1 and #2, then #3 and #4) into the mounting holes until you hear a click, then lock the fasteners by turning each one 90° clockwise.
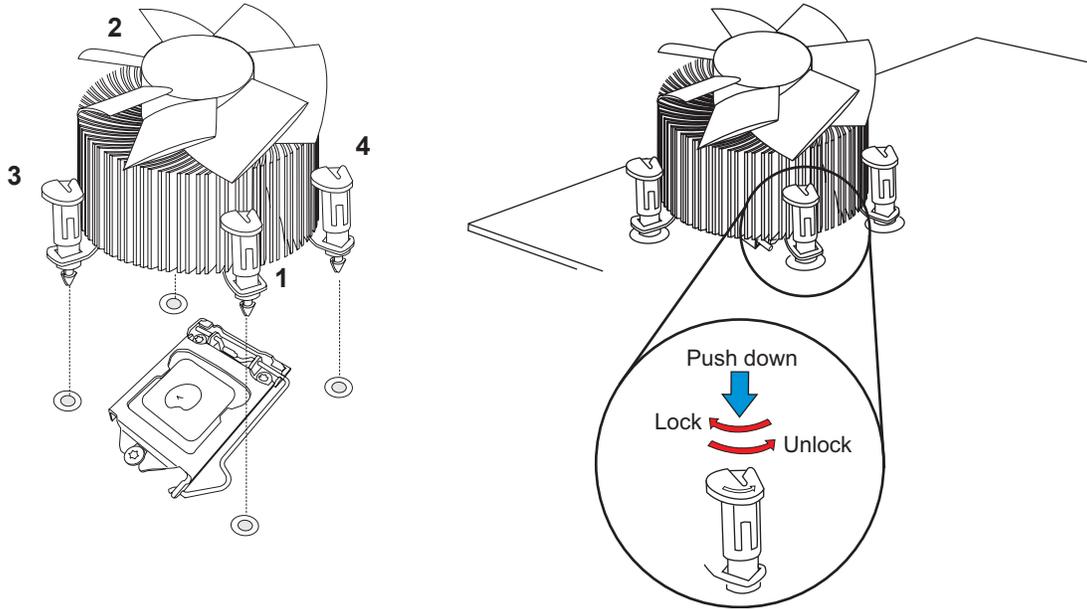
7. Once all four fasteners are secured, connect the heatsink fan wire connector to the CPU fan header.
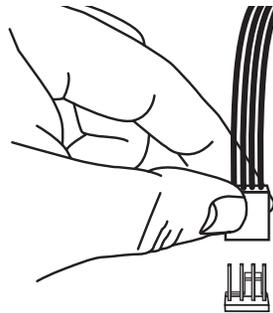
Removing the Heatsink

Note: We do not recommend that the CPU or heatsink be removed. However, if you do need to remove the heatsink, please follow the instructions below to remove the heatsink and prevent damage done to the CPU or other components.

1. Unplug the power connector from the power supply.

2. Disconnect the heatsink fan connector from the CPU fan header.

3. Gently press down each fastener cap and turn them 90°counter clockwise, then pull the fasteners upwards to loosen them.

4. Remove the heatsink from the CPU.

Pull up

Lock

Unlock

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 (4)

Standoffs (4) 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.
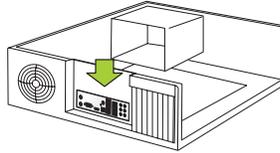
2. Locate the mounting holes on the motherboard. See the previous page for the location.
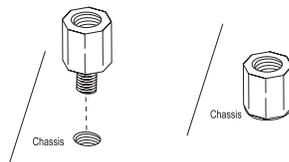
3. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.
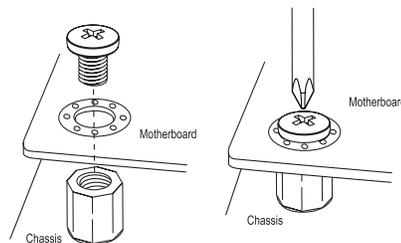
4. Install standoffs in the chassis as needed.

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

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

2.4 Memory Support and Installation

Note: Check the Supermicro website for recommended memory modules.

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

Memory Support

The X12STL-IF supports up to 64GB of DDR4 ECC UDIMM memory with speeds of up to 3200MHz in two memory slots. Speed support is up to 2666MHz when a Pentium processor is installed. Speed support is up to 2933 MT/s for 2R2R configurations. Refer to the table below for the recommended DIMM population order.

Recommended Population (Balanced)		
DIMMA1	**DIMMB1**	**Total System Memory**
4GB	4GB	8GB
8GB	8GB	16GB
16GB	16GB	32GB
32GB	32GB	64GB

General Guidelines for Optimizing Memory Performance

- It is recommended to use DDR4 memory of the same type, size, and speed.

- The motherboard will support odd-numbered modules (one module installed). However, to achieve the best memory performance, a balanced memory population is recommended.
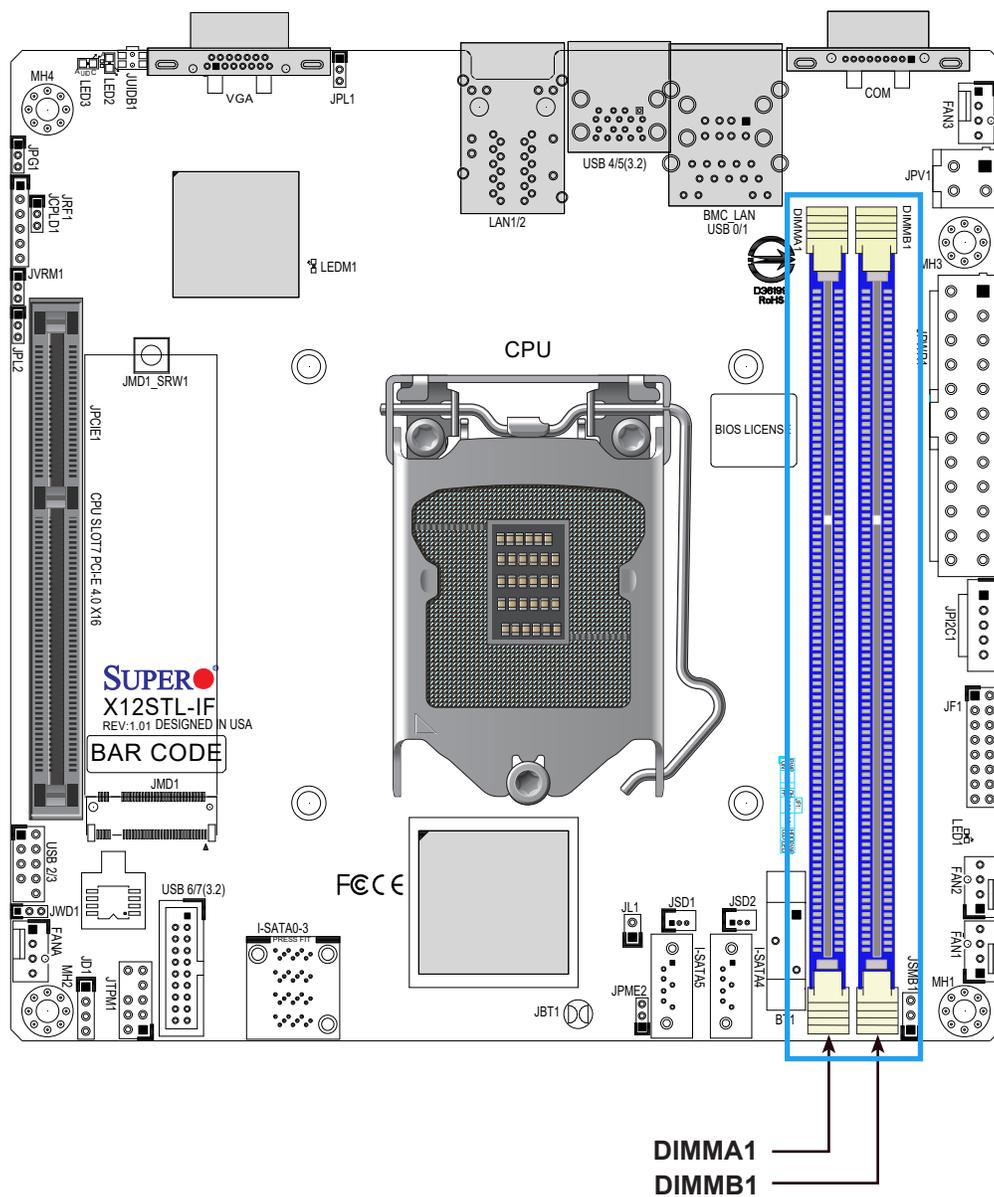
DIMMA1
DIMMB1

DIMM Installation

1. Insert DIMM modules in the following order: DIMMA1 and DIMMB1. For the system to work properly, use memory modules of the same type and speed.

2. Align the DIMM module key with the receptive point on the single-latch DIMM slot.

3. Push the release tab outwards to unlock the slot.

4. Align the notch on the end of the module against the receptive point on the end of the slot.

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

6. Push the release tab to the lock position to secure the module into the slot.
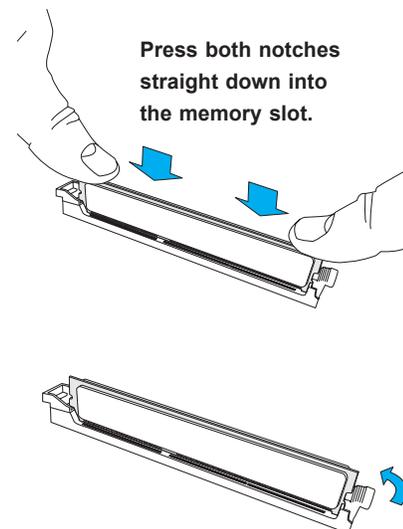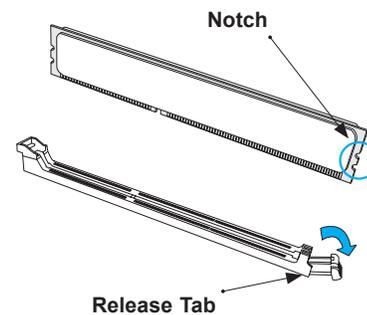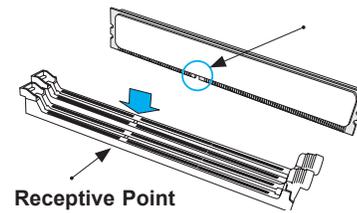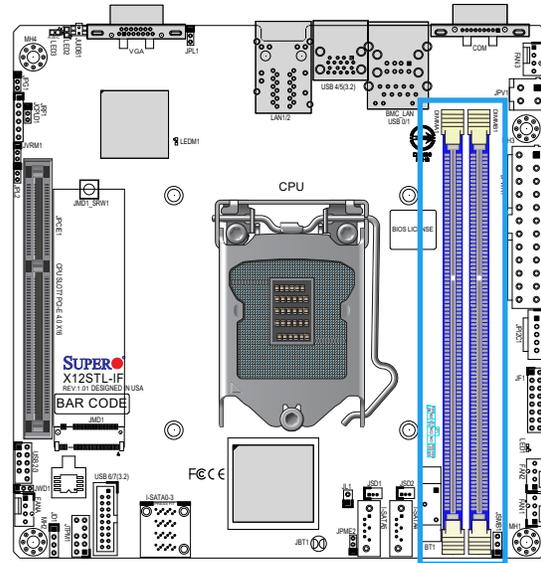
DIMM Removal

Press the release tab on one end of the DIMM module to unlock it. Once the DIMM module is loosened, remove it from the memory slot.

Receptive Point

Notch

Release Tab

Press both notches straight down into the memory slot.

2.5 Rear I/O Ports

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

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

\#	Rear I/O Ports	\#	
\#	**Description**	**\#**	**Description**
1	COM1	6	USB4
2	BMC LAN Port	7	LAN2
3	USB1	8	LAN1
4	USB0	9	VGA
5	USB5	10	UID Switch

LAN Ports

Two Gigabit Ethernet ports (LAN1/2) are located on the I/O back panel. In addition to the LAN ports, a dedicated BMC LAN on the 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
1	TRD1P	11	TRD4N
2	TRD1N	12	TRCT4
3	TRCT1	13	TRD5P
4	TRD2P	14	TRD5N
5	TRD2N	15	L1-GRE-
6	TRCT2	16	L1-GRE+
7	TRD3P	17	L2-YEL-
8	TRD3N	18	COMMON
9	TRCT3	19	L2-GRE-
10	TRD4P	20	CG1
		21	CG2

BMC LAN Pin Definition			
Pin#	Definition	Pin#	Definition
9		19	GND
10	TD0+	20	Act LED (Yellow)
11	TD0-	21	Link 100 LED (Green)
12	TD1+	22	Link 1000 LED (Amber)
13	TD1-	23	SGND
14	TD2+	24	SGND
15	TD2-	25	SGND
16	TD3+	26	SGND
17	TD3-		
18	GND		
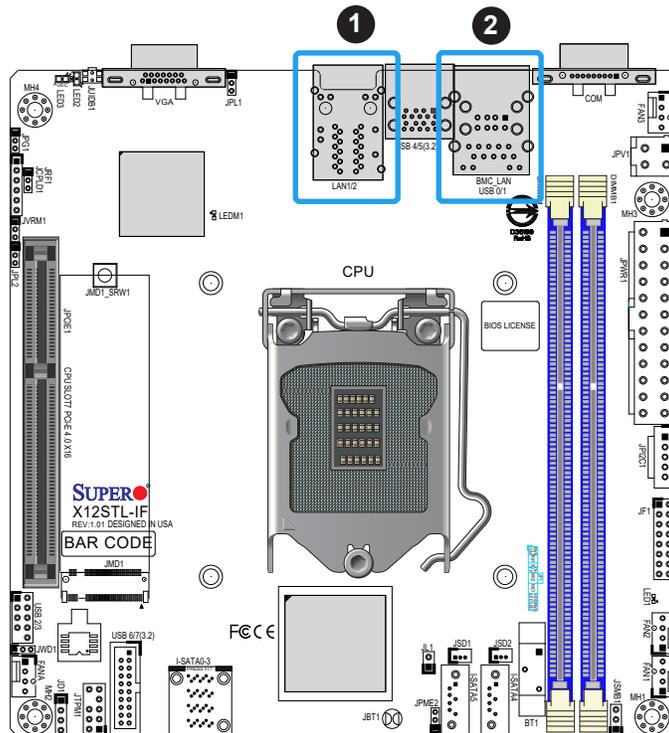
1. LAN1/2
2. BMC LAN

Universal Serial Bus (USB) Ports

There are two USB 2.0 ports (USB0/1) on the I/O back panel and two USB 2.0 headers (USB2/3) on the motherboard. The motherboard also has two USB 3.2 ports (USB4/5) on the I/O back panel and one front access USB 3.2 header (USB6/7). The onboard headers can be used to provide front side USB access with a cable (not included).

Back Panel USB0/1 (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 USB4/5 (3.2 Gen 1) Pin Definitions			
Pin#	Definition	Pin#	Definition
A1	VBUS	B1	Power
A2	D-	B2	USB_N
A3	D+	B3	USB_P
A4	GND	B4	GND
A5	Stda_SSRX-	B5	USB3_RN
A6	Stda_SSRX+	B6	USB3_RP
A7	GND	B7	GND
A8	Stda_SSTX-	B8	USB3_TN
A9	Stda_SSTX+	B9	USB3_TP

Front Panel USB2/3 (2.0) Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+5V	2	+5V
3	USB_PN2	4	USB_PN3
5	USB_PP2	6	USB_PP3
7	Ground	8	Ground
9	Key	10	Ground

Front Panel USB6/7 (3.2 Gen 1) Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	VBUS	19	Power
2	Stda_SSRX-	18	USB3_RN
3	Stda_SSRX+	17	USB3_RP
4	GND	16	GND
5	Stda_SSTX-	15	USB3_TN
6	Stda_SSTX+	14	USB3_TP
7	GND	13	GND
8	D-	12	USB_N
9	D+	11	USB_P
10	GND	x	

1. USB0/1
2. USB2/3
3. USB4/5
4. USB6/7
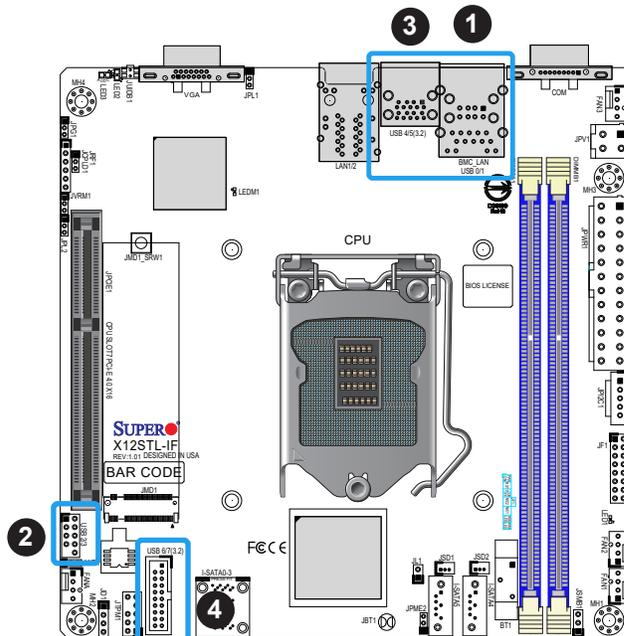
COM Port

There is one COM port on the I/O back panel. Refer to the board layout below for the locations.

COM Port (COM1)			
Pin Definitions			
Pin#	Definition	Pin#	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	N/A

VGA Port

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

1. COM1
2. VGA
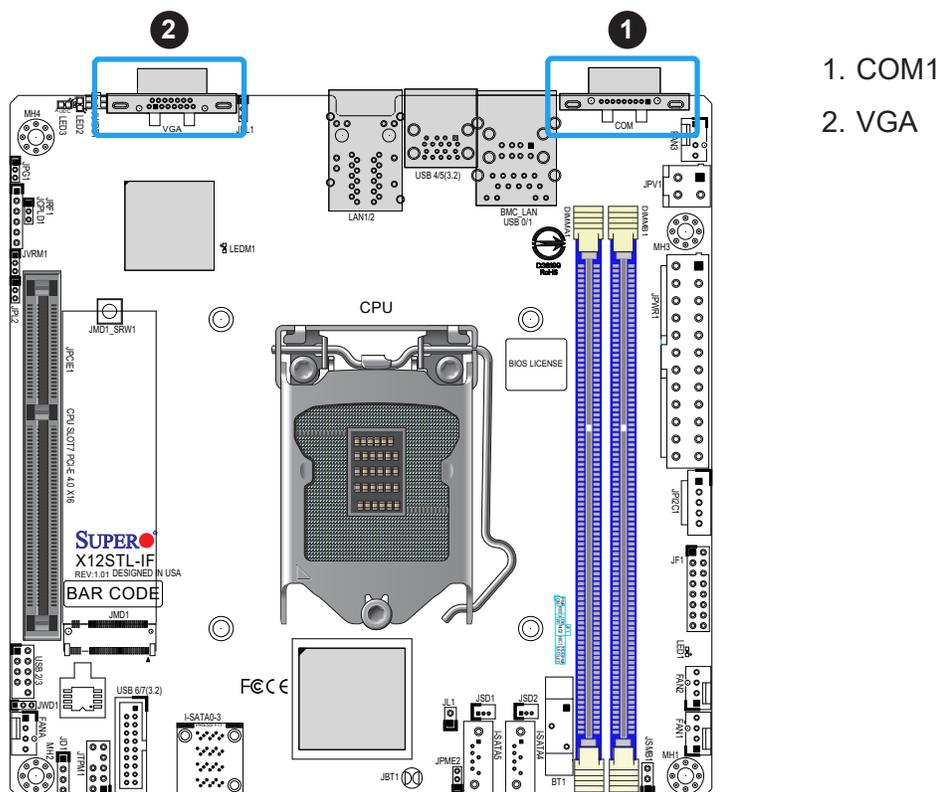
Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch and an LED indicator are located on the motherboard. The UID switch is located at JUIDB1, which is next to the VGA port on the back panel. The UID LED (LED2) is located next to the UID switch. When you press the switch, the LED will be turned on, which provides easy identification of a system unit that may be in need of service. Press the switch again to turn off the LED indicator.

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

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

UID LED Pin Definitions	
Color	Status
Solid Blue	Unit Identified
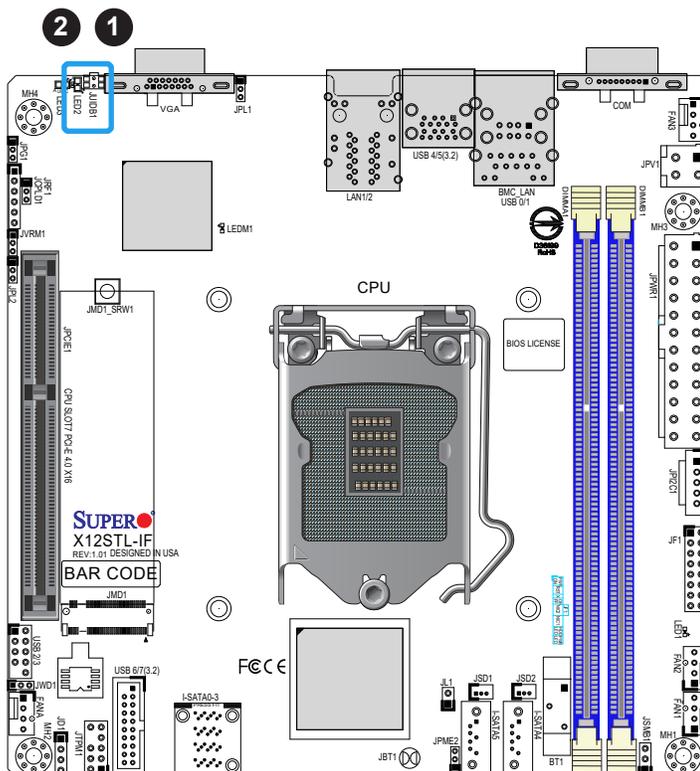
1. UID Switch
2. UID LED

2.6 Front Control Panel

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

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

Figure 2-2. JF1 Header Pins

Power Button

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

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

Reset Button

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

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

1. PWR Button
2. Reset Button

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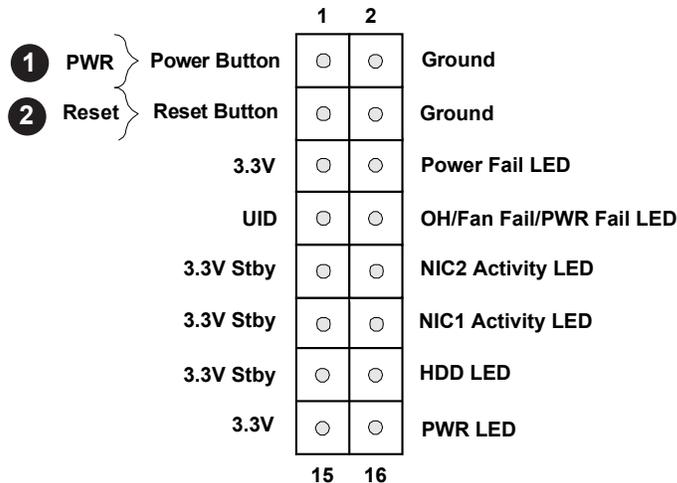
Power Fail LED

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

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

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
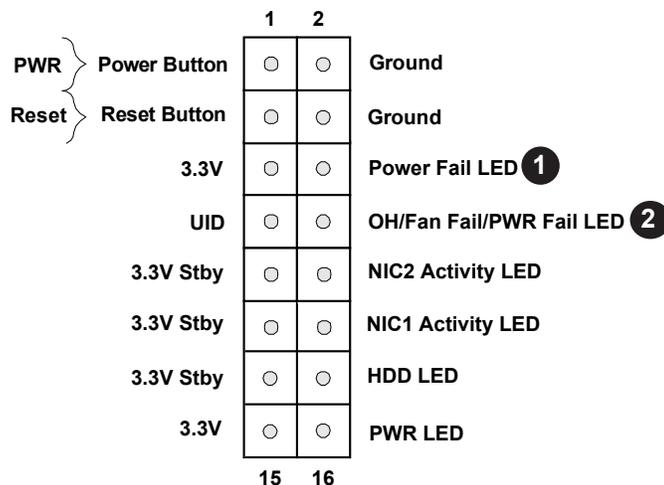
1. Power Fail

2. OH/Fan Fail/PWR Fail LED

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

NIC1/NIC2 (LAN1/LAN2)

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

LAN1/LAN2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	3.3V Stby
10/12	NIC Activity 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 LED
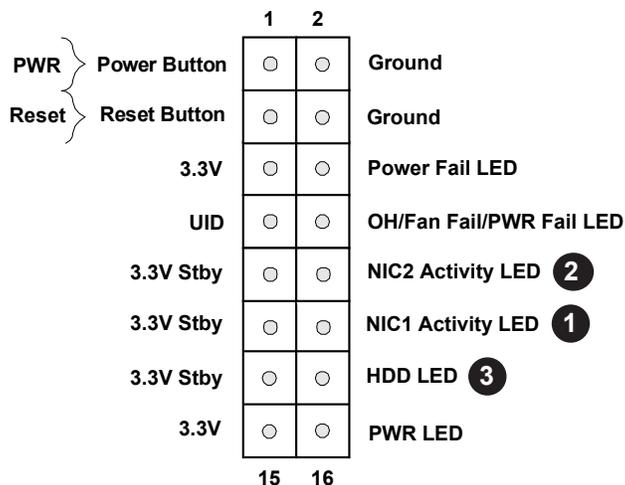
1. NIC1 Activity LED

2. NIC2 Activity LED

3. HDD LED

	1	2	
PWR ⟩ Power Button	○	○	Ground
Reset ⟩ Reset Button	○	○	Ground
3.3V	○	○	Power Fail LED
UID	○	○	OH/Fan Fail/PWR Fail LED
3.3V Stby	○	○	NIC2 Activity LED ❷
3.3V Stby	○	○	NIC1 Activity LED ❶
3.3V Stby	○	○	HDD LED ❸
3.3V	○	○	PWR LED
	15	16	

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	+3.3V Stby
16	PWR LED

1. Power LED

	1	2	
PWR 〉 Power Button	○	○	Ground
Reset 〉 Reset Button	○	○	Ground
3.3V	○	○	Power Fail LED
UID	○	○	OH/Fan Fail/PWR Fail LED
3.3V Stby	○	○	NIC2 Activity LED
3.3V Stby	○	○	NIC1 Activity LED
3.3V Stby	○	○	HDD LED
3.3V	○	○	PWR LED ❶
	15	16	
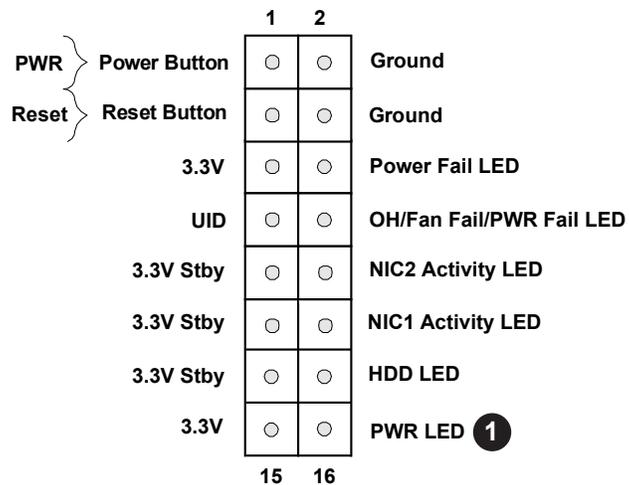
2.7 Connectors

Power Connections

ATX Power Supply Connector

The primary 24-pin power supply connector (JPWR1) meets the ATX SSI EPS 12V specification. The 4-pin (JPV1) processor power connector must also be connected to your 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

4-pin Power Pin Definitions	
Pin#	Definition
1	GND
2	GND
3	+12V
4	+12V
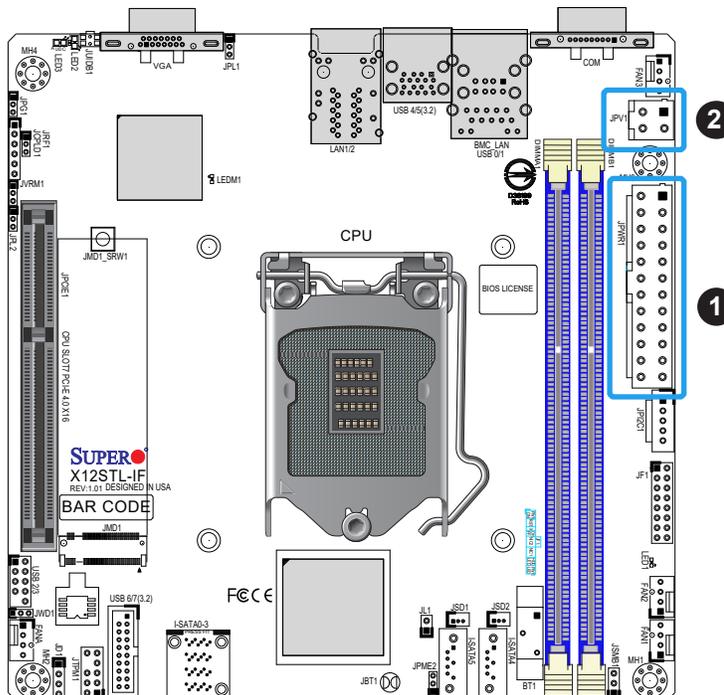
1. 24-Pin ATX Power

2. 4-pin Power Connector

Headers

Fan Headers

There are four 4-pin fan headers (FAN1 - FAN3, FANA) 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 through the BMC. 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
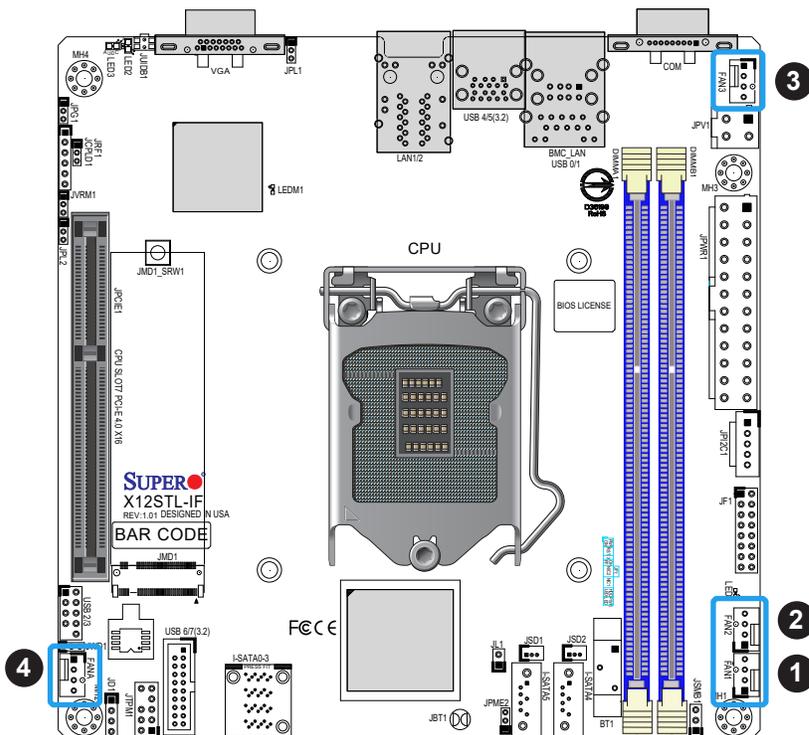
1. FAN1
2. FAN2
3. FAN3
4. FANA

TPM/Port 80 Header

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

Trusted Platform Module/Port80 Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	P3V3	2	SPI_TPM_CS_N
3	TPM_RST_N	4	SPI_TPM_MISO
5	SPI_TPM_CLK	6	GND
7	SPI_TPM_MOSI	8	
9	P3V3_AUX	10	IRQ_JTPM1_SPI_N

1. TPM/Port 80 Module

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

Disk-On-Module Power Connector

Two power connectors for SATA DOM (Disk-On-Module) devices are located at JSD1 and JSD2. Connect appropriate cables here to provide power support for your third party serial DOM devices.

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

1. Chassis Intrusion
2. JSD1
3. JSD2

System Management Bus Header

A System Management Bus header for additional slave devices or sensors is located at JSMB1. Refer to the table below for pin definitions.

SMBus Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock

Power SMB (I²C) Header

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

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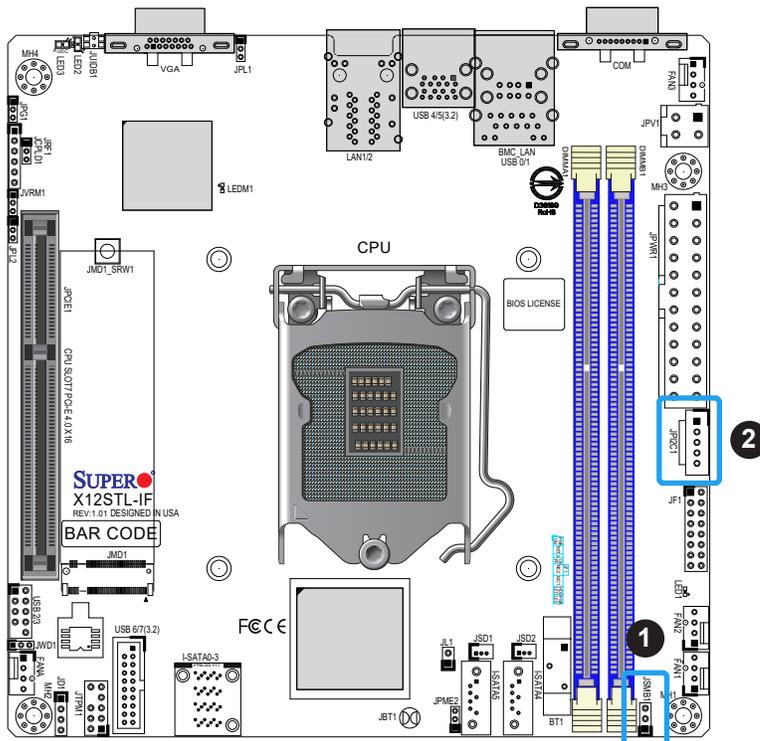
1. SMBus Header
2. Power SMBus Header

SATA 3.0 Ports

This motherboard has six SATA 3.0 ports (I-SATA0-3, I-SATA4, and I-SATA5). I-SATA4/5 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 backwards compatible with regular SATA HDDs or SATA DOMs that need external power cables.

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 increased functionality and spatial efficiency. The M.2 slot on the motherboard supports PCIe 3.0 x4 SSD cards in the 2280 form factor.
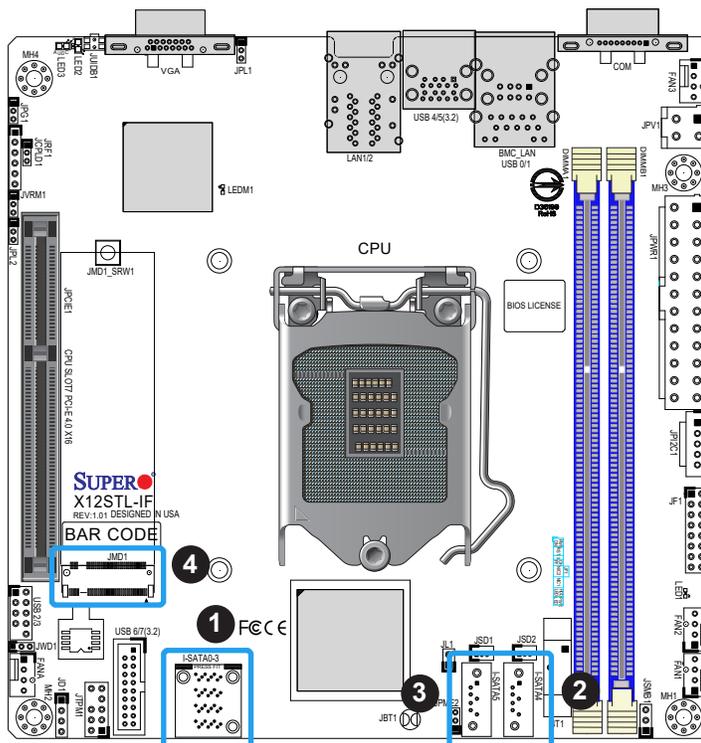
1. I-SATA0-3
2. I-SATA4
3. I-SATA5
4. M.2 Slot

Speaker/Buzzer

On the JD1 header, pins 1-4 are for the speaker and pins 3-4 are for the buzzer. If you wish to use an external speaker, connect its cable to pins 1-4.

Speaker Connector Pin Definitions	
Pin #	Definition
1-4	Speaker
3-4	Buzzer
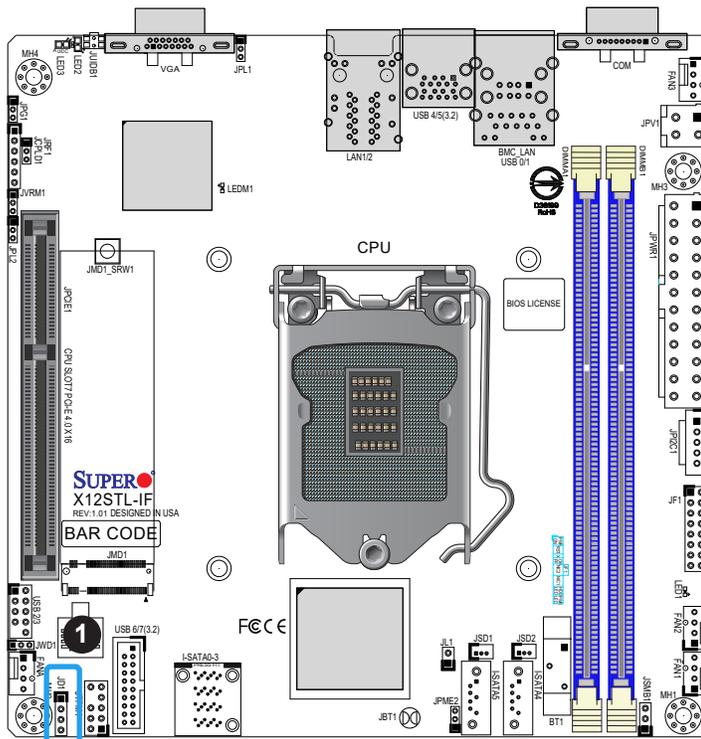
1. Speaker/Buzzer

2.8 Jumper Settings

How Jumpers Work

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

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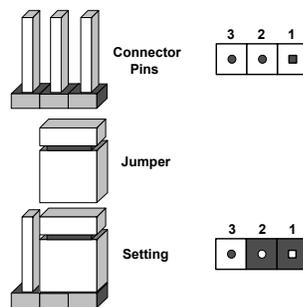
CMOS Clear

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

To Clear CMOS

1. First power down the system and unplug the power cord(s).

2. Remove the cover of the chassis to access the motherboard.

3. Remove the onboard battery from the motherboard.

4. Short the CMOS pads with a metal object such as a small screwdriver for at least four seconds.

5. Remove the screwdriver (or shorting device).

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

Note: Clearing CMOS will also clear all passwords.

JBT1 contact pads

Watch Dog Timer

Watch Dog (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.

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

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port using the onboard graphics controller.

VGA Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled
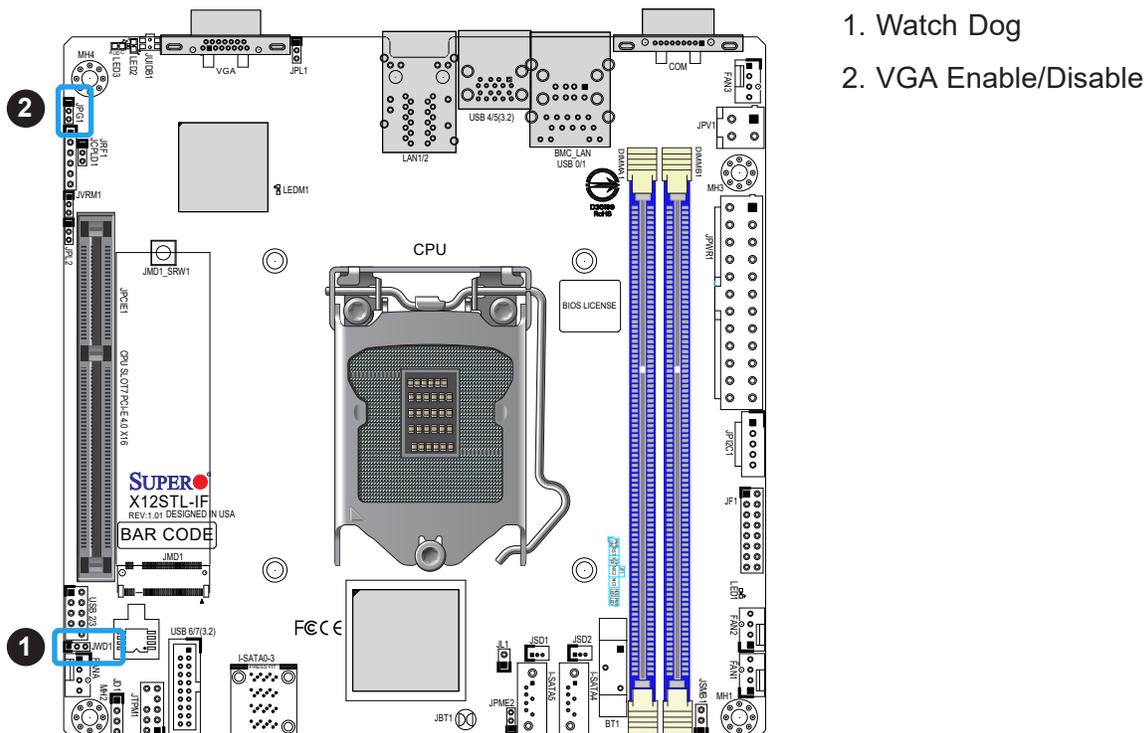
1. Watch Dog
2. VGA Enable/Disable

ME Manufacturing Mode

Close pins 2-3 of jumper JPME2 to bypass SPI flash security and force the system to operate in the manufacturing mode, which allows you to flash the system firmware from a host server for system setting modifications. Refer to the table below for jumper settings.

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

LAN1/LAN2 Enable/Disable

Use jumper JPL1 to enable or disable LAN port 1 and JPL2 to enable or disable LAN port 2.

LAN1/2 Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled
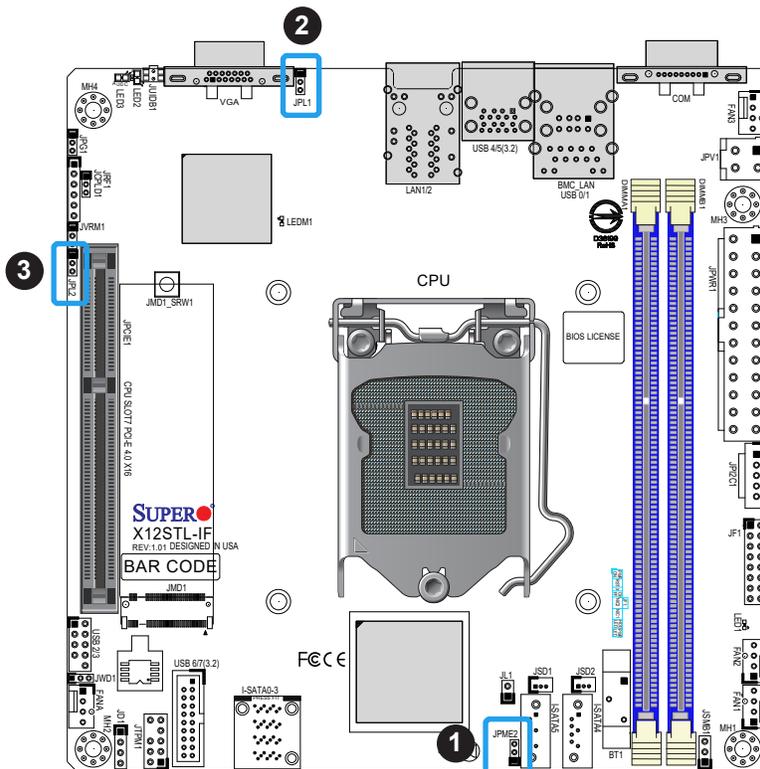
1. Manufacturing Mode
2. LAN1 Enable/Disable
3. LAN2 Enable/Disable

CPU PCIe Bifurcation

Set the JRF1 jumper to set the PCIe lanes to either x16 or 2 x8 for Slot 7.

PCIe Bifurcation Jumper Settings	
Jumper Setting	Definition
Pins 1-2	x16
Pins 2-3	2 x8

1. CPU PCIe Bifurcation

2.9 LED Indicators

Onboard Power LED

The Onboard Power LED is located at LED1. When this LED is on, the system is on. Turn off the system and unplug the power cord before removing or installing components. Refer to the table below for more information.

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

BMC Heartbeat LED

LEDM1 is the BMC Heartbeat LED. When the LED is blinking green, BMC is working. Refer to the table below for the LED status.

BMC Heartbeat LED	
LED Color	Definition
Blinking Green	BMC Normal
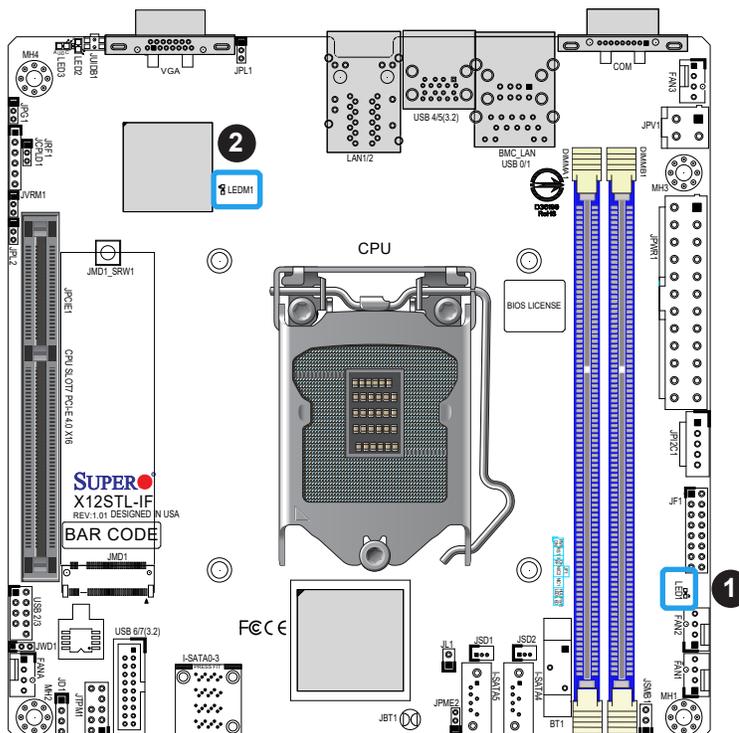
1. Onboard Power LED
2. BMC Heartbeat LED

OH LED

LED3 is the overheat LED. When the LED is solid red, there is a system overheat.

Overheat LED	
LED Color	**Definition**
Solid Red	Overheat
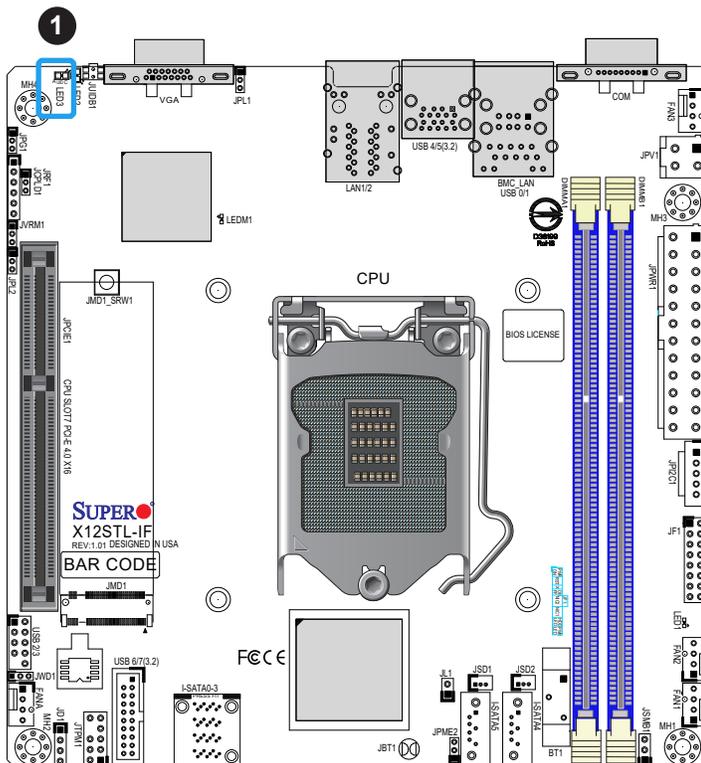
1. OH LED

LAN LEDs

Two LAN ports (LAN1/2) are located on the I/O back panel. Each LAN port has two LEDs. The green LED indicates activity, while the other Link LED may be yellow, amber, or off to indicate the speed of the connection. Refer to the tables below for more information.

LAN Activity LED (Left)		
LED State		
Color	**Status**	**Definition**
Green	Flashing	Active

LAN Link LED (Right)	
LED State	
LED Color	**Definition**
Green	1000 Gbps
Amber/Yellow	100 Gbps
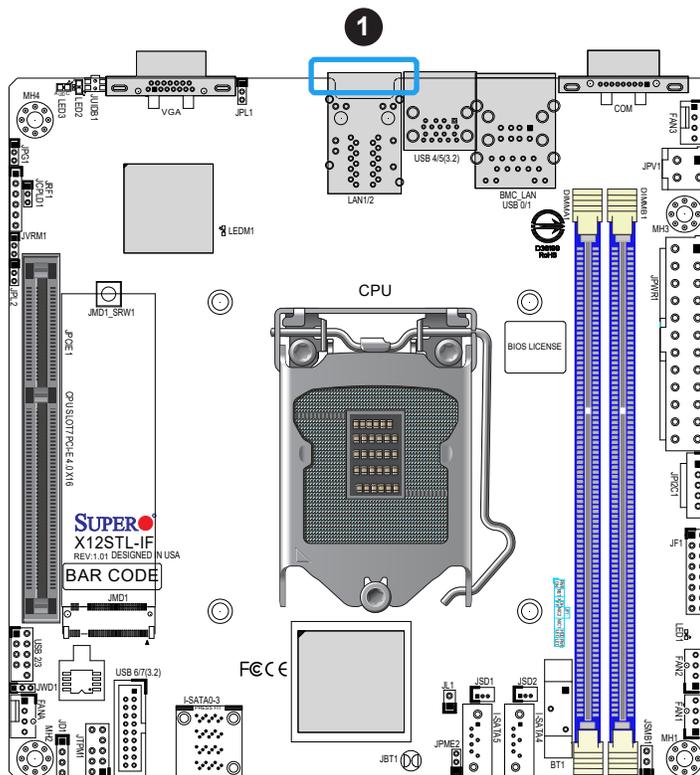
1. LAN Port LED

Chapter 3

Troubleshooting

3.1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to the 'Technical Support Procedures' and/or 'Returning Merchandise for Service' section(s) in this chapter. Always disconnect the AC power cord before adding, changing or installing any non hot-swap hardware components.

Before Power On

1. Inspect the motherboard visually to make sure there is no physical damage such as bent pins in the CPU socket or DIMM slots.

2. Disconnect all components not required to verify the motherboard's power is on.

3. Make sure the CPU, memory, and heatsink are properly installed.

4. Verify the power supply and front panel header connections 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. Verify the onboard Power LED is on and if there is any activity with the fans and BMC heartbeat LED3.

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).

4. Verify JPG1 is on pins 1-2 to enable video.

5. Verify the monitor is on.

System Boot Failure

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

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

- If there is no error beep, try to turn on the system without DIMM modules installed. If there is still no error beep, replace the motherboard.

- If there are error beeps, clear the CMOS settings by unplugging the power cord and contacting both pads on the CMOS clear jumper (JBT1). Refer to Section 2-8 in Chapter 2.

2. Remove all components from the motherboard, especially the DIMM modules. Make sure that system power is on and that memory error beeps are activated.

3. Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this chapter.

Memory Errors

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

1. Make sure that the memory modules are compatible with the system and are properly installed. See Chapter 2 for installation instructions. (For memory compatibility, refer to the "Tested Memory List" link on the motherboard's product page to see a list of supported memory.)

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

3. Make sure that you are using the correct type of ECC DDR4 modules recommended by the manufacturer.

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

Losing the System's Setup Configuration

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

2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

3. If the above steps do not fix the setup configuration problem, contact your vendor for repairs.

When the System Becomes Unstable

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

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

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

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

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

4. Check the hardware monitoring settings in the BMC webpage or with BMC tools to make sure that the CPU and system temperatures are within the normal range.

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

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

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

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such a USB flash or media drive.

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.

7. Check the motherboard webpage for OS compatibility guidance. Verify that the compatible CPU and memory are used in accordance with specifications on the motherboard webpage.

3.2 Technical Support Procedures

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

1. Please go through the Troubleshooting Procedures and Frequently Asked Questions (FAQ) sections in this chapter or see the FAQs on our website (http://www.supermicro.com/FAQ/index.php) before contacting Technical Support.

2. BIOS upgrades can be downloaded from our website (http://www.supermicro.com/ResourceApps/BIOS_IPMI_Intel.html).

3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:

- Motherboard model and PCB revision number

- BIOS release date/version (This can be seen on the initial display when your system first boots up.)

- System configuration

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

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

3.3 Frequently Asked Questions

Question: What type of memory does my motherboard support?

Answer: The motherboard supports up to 64GB of DDR4 ECC UDIMM memory with speeds of up to 3200MHz in four memory slots. To enhance memory performance, do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on Section 2-4 in Chapter 2.

Question: How do I update my BIOS?

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

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

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

3.4 Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps below:

1. Power off your system and unplug your power cable.

2. Locate the onboard battery as shown below.

3. Using a tool such as a pen or a small screwdriver, push the battery lock outwards to unlock it. Once unlocked, the battery will pop out from the holder.

4. Remove the battery.

Proper Battery Disposal

Warning: 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.

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

LITHIUM BATTERY

BATTERY HOLDER

OR

LITHIUM BATTERY

BATTERY HOLDER
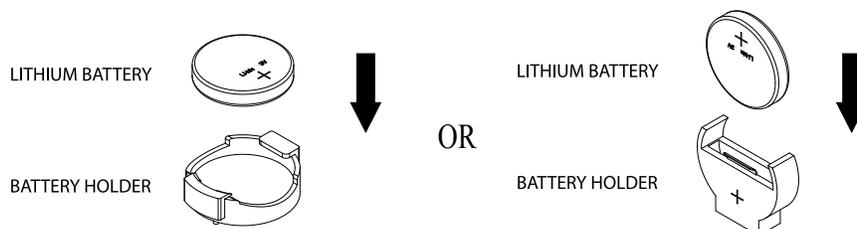
3.5 Returning Merchandise for Service

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

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

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

Chapter 4

UEFI BIOS

4.1 Introduction

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

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

```
                          Aptio Setup – AMI
    Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

                                                  Set the Date. Use Tab to
                                                  switch between Date
    System Date                  [Tue 07/06/2021] elements.
    System Time                  [22:27:55]       Default Ranges:
                                                  Year: 1998–9999
    Supermicro X12STL-IF                          Months: 1–12
    BIOS Version                 T20210706115326  Days: Dependent on month
    Build Date                   07/06/2021       Range of Years may vary.
    CPLD Version                 40.C2.21

    Memory Information
    Total Memory                 16384 MB

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

                  Version 2.21.1280 Copyright (C) 2021 AMI
```

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 X12STL-IF

BIOS Version

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

Build Date

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

Memory Information

Total Memory

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

4.3 Advanced

Use this menu to configure the Advanced settings.

```
                            Aptio Setup - AMI
     Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

  ▶ Boot Feature                                  Boot Feature Configuration
  ▶ CPU Configuration                             Page
  ▶ Chipset Configuration
  ▶ Super IO Configuration
  ▶ Serial Port Console Redirection
  ▶ SATA And RSTe Configuration
  ▶ PCH-FW Configuration
  ▶ ACPI Settings
  ▶ USB Configuration
  ▶ PCIe/PCI/PnP Configuration
  ▶ Network Configuration
  ▶ HTTP Boot Configuration

  ▶ Tls Auth Configuration

  ▶ Intel(R) I210 Gigabit  Network Connection -
  ▶ Intel(R) I210 Gigabit  Network Connection -
                                                  →←: Select Screen
  ▶ Driver Health                                 ↑↓: Select Item
                                                  Enter: Select
                                                  +/-: Change Opt.
                                                  F1: General Help
                                                  F2: Previous Values
                                                  F3: Optimized Defaults
                                                  F4: Save & Exit
                                                  ESC: Exit

            Version 2.21.1280 Copyright (C) 2021 AMI
```

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

▶Boot Feature

Quiet Boot

Use this feature to select the screen display between the POST messages and the OEM logo upon bootup. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are Disabled and **Enabled**.

Option ROM Messages

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

Bootup NumLock State

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

Wait For "F1" If Error

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**.

INT19 Trap Response

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

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**, Legacy Boot, 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**.**

Restore on AC Power Loss

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

Power Button Function

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

▶CPU Configuration

The following CPU information will display:

- CPU Signature

- Microcode Patch

- CPU Speed

- L1 Data Cache

- L1 Instruction Cache

- L2 Cache

- L3 Cache

- VMX

- SMX/TXT

CPU Flex Ratio Override

Use this feature to enable or disable CPU Flex Ratio Prgoramming. The options are **Disabled** and Enabled.

If the feature above is set to Enable, the next feature is available for configuration:

CPU Core Flex Ratio

Use this feature to set the non-turbo mode processor core ratio multiplier. The default value is **37**.

Hardware Prefetcher

If set to Enabled, the hardware prefetcher prefetches 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 Line Prefetch

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**.

PECI

Use this feature to enable or disable Platform Environment Control Interface (PECI). The options are Disabled and **Enabled**.

AVX

Use this feature to enable or disable AVX 2/3 instructions. This application is for Big Core only. The options are **Enabled** and Disabled.

AVX3

Use this feature to enable or disable AVX 3 instructions. This application is for Big Core only. The options are **Enabled** and Disabled.

Active Processor Cores

Use this feature to select the number of cores to enable for each processor. The options are **All,** 1, 2, and 3.

Hyper-Threading

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

BIST

Use this feature to enable or disable the built-in self test during boot up. The options are **Disabled** and Enabled.

AP threads Idle Manner

Use this feature to select the AP threads Idle manner. The options are HALT Loop, **MWAIT Loop,** and RUN Loop.

AES

Use this feature to enable or disable Advanced Encryption Standard. The options are Disabled and **Enabled.**

Machine Check

Use this feature to enable or disable Machine Check. The options are Disabled and **Enabled**.

Monitor MWait

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**.

▶Power & Performance

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 Power Saving, 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**.

Race to Halt (RTH)

Use this feature to enable Race to Halt, which dynamically increases CPU frequency in order to enter the package C-State faster. This will reduce overall power consumption. 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**, Native Mode, and Out of Band Mode.

Per Core P State OS control mode

Use this feature to enable Per Core P State OS control mode. The options are Disabled and **Enable**d.

HwP Autonomous Per Core P State

Use this feature to enable Per Core for P State. The options are Disabled and **Enable**d.

HwP Autonomous EPP Grouping

Use this feature to enable EPP grouping. The options are Disabled and **Enable**d.

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

Use this feature to enable or disable platform power limit 1 programming. The options are **Disabled** and Enabled.

Power Limit 2

Use this feature to enable or disable platform power limit 2 programming. The options are **Disabled** and Enabled.

Power Limit 3 Override

Select Enabled to support average power limit (PL3) override. The options are **Disabled** and Enabled.

Power Limit 4 Override

Select Enabled to support average power limit (PL4) override. The options are **Disabled** and Enabled.

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**.

IO MWait Redirection

This feature maps IO_read instructions sent to the IO registers. 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, C10, Cpu Default, and **Auto**.

ACPI T-States

Use this feature to enable or disable ACPI T-States. The options are Disabled and **Enabled**.

▶SGX settings

Software Guard Extensions (SGX)

Use this feature to enable or disable software guard extensions. The options are **Disabled**, Enabled, and Software Controlled.

If the feature above is set to Software Controlled, the next three features are available for configuration:

Select Owner EPOCH input type

Use this feature to select the EPOCH mode. The options are **No Change is Owner EPOCHs**, Change to New Random Owner EPOCHs, and Manual User Defined Owner EPOCHs.

SGX Launch Control Policy

Use this feature to select the Software Guard Extensions launch control policy. The options are **Unlocked**, Intel Locked, and Locked.

PRMRR Size

The BIOS must reserve a contiguous region of Processor Reserved Memory (PRM) in the Processor Reserved Memory Range Register (PRMRR). The options are 64MB, 128MB, 256MB, and **512MB**.

Enable/Disable SGX Debug Mode

Use this feature to enenable or disable Software Guard Extensions Debug Mode. 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

▶Memory Configuration

Memory Configuration

- Memory RC Version

- Memory Frequency

- Memory Timing (tCL-tRCD-tRP-tRAS)

- DIMMA1

- DIMMA2

- DIMMB1

- DIMMB2

DDR Speed Control

Use this feature to set the DDR speed. The options are **Auto** and Manual.

If the feature above is set to Manual, Maximum Memory Frequency and SA GV High Gear are available for configuration:

Maximum Memory Frequency

Use this feature to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 1067, 1200, 1333, 1400, 1600, 1800, 1867, 2000, 2133, 2200, 2400, 2600, 2667, 2800, 2933, 3000, and 3200.

ECC Support

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

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.

SA GV High Gear

Use this feature to select the high gear for SA GV. The options are Gear1 and **Gear2**.

Restrain on Fast Fall

Use this feature to restart the MRC in cold mode if the software memory test fails during fast flow. The options are Disabled and **Enabled**.

Enable RH Prevention

Use this feature to actively prevent Row Hammer. The options are **Disabled** and Enabled.

Power Down Mode

Use this feature to select the power down mode. The options are **Auto**, No Power Down, APD, and PPD-DLLoff.

Pwr Down Idle Timer

Use this feature to set the power down idle timer. The default value is **0**.

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.

Fast Boot

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

Train on Warm boot

Use this feature to enable or disable training on warm boot. The options are **Disabled** and Enabled.

Memory Test on Warm Boot

Use this feature to enable or disable base memory test run on warm boot. The options are **Disabled** and Enabled.

REFRESH_2X_MODE

Use this feature to enable 2x memory refresh support to enhance memory performance. The options are **Disabled**, 1- Enabled for WARM or HOT, and 2- Enabled HOT only.

▶**DMI Configuration**

DMI Max Link Speed

Use this feature to select DMI Max Link Speed. The options are Gen1, Gen2, and **Gen3**.

▶**DMI Gen3 ASPM**

DMI Max Link Speed

Use this feature to select DMI Max Link Speed. The options are Gen1, Gen2, and **Gen3**.

DMI Gen3 ASPM Control

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

DMI De-emphasis Control

Use this feature to configure the De-emphasis control on DMI. The options are -6 dB and **-3.5 dB**.

▶PEG Configuration

PEG 0:1:0/0:1:1/0:1:2/0:6:0

PCI Express Root Port1/2/3/4

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

ASPM Support

Use this item to set 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. The options are Disabled, L0s, **L1**, and L0sL1.

PCIe Speed

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

Stop Grant Configuration

Use this feature to set the stop grant configuration on automatic or manual. The options are **Auto** and Manual.

VT-d

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

X2APIC Opt Out

Use this feature to enable or disable X2APIC Opt Out bit. The options are Enabled and **Disabled**.

DMA Control Guarantee

Use this feature to enable or disable Direct Memory Access Control Guarantee. The options are Enabled and **Disabled**.

IGD VTD Enable

Use this feature to enable or disable IGD VTD. The options are **Enabled** and Disabled.

IOP VTD Enable

Use this feature to enable or disable IOP VTD. The options are **Enabled** and Disabled.

Thermal Device (B0:D4:F0)

Use this feature to enable or disable SA Thermal Device. The options are Enabled and **Disabled**.

GNA Device (B0:D8:F0)

Use this feature to enable or disable SA GNA Device. The options are **Enabled** and Disabled.

▶PCH-IO Configuration

▶PCI Express Configuration

PCI Express Configuration

Peer Memory Write Enable

Use this feature to enable or disable peer memory write. The options are **Disabled** or Enabled.

▶PCI Express Root port 1 - 24

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. The options are Disabled, L0s, L1, L0sL1, 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, and Gen3.

Port 61h Bit-4 Emulation

Select Enabled to enable the emulation of Port 61h bit-4 toggling in System Management Mode (SMM). The options are **Disabled** and Enabled.

PCIe PLL SSC

Use this feature to enable or disable PCIe PLL SSC. The options are **Enabled** and Disabled.

▶Super IO Configuration

- Super IO Chip AST2600

▶Serial Port 1 Configuration

Serial Port

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

Device Settings

This feature displays the status of the serial port.

Change Settings

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

▶Serial Port Console Configuration

COM1 Console Redirection

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

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

▶COM1 Console Redirection Settings

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.

Bits per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Putty KeyPad

This feature selects 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.

SOL Console Redirection

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

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

▶**SOL Console Redirection Settings**

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

Terminal Type

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

Bits per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

Putty KeyPad

This feature selects 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.

▶Legacy Console Redirection Settings

Redirection COM Port

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

Legacy OS Redirection Resolution

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

Redirection After BIOS POST

Use this feature to enable or disable legacy Console Redirection after BIOS POST. When 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.

EMS (Emergency Management Services) Console Redirection

Select Enabled to use a COM port selected by you 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:

▶EMS Console Redirection Settings

Out-of-Band Mgmt Port

The feature selects a serial port in a client server to be used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1** and SOL.

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 EMS

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

Flow Control EMS

Use this item 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 EMS, Parity EMS, Stop Bits EMS

▶SATA And RSTe Configuration

SATA Controller(s)

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

SATA Mode Selection

Use this feature to select the SATA mode. The options are **AHCI** and Intel RST Premium With Intel Optane System Acceleration.

*If the feature above is set to Intel RST Premium With Intel Optane System Acceleration, the next four features are available for configuration:

SATA Interrupt Selection

Use this feature to select the SATA interrupt. The options are **MSI-x**, MSI, and Legacy.

Aggressive LPM Support

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

SATA Port 0-5

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

SATA Port 0-5 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 Disable and **Enable**.

SATA Port 0-5 Spin Up Device

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

SATA Port 0-5 SATA Device Type

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

▶PCH-FW Configuration

The following firmware information will display:

- General ME Configuration

- Operation Firmware Version

- Backup Firmware Version

- Recovery Firmware Version

- ME Firmware Status #1

- ME Firmware Status #2

- Current State

- Error Code

▶ACPI Settings

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**.

▶USB Configuration

USB Configuration

USB Module Version:

USB Controllers:

USB Devices:

Legacy USB Support

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

XHCI Hand-off

This is a work-around solution for operating systems that do not support Extensible Host Controller Interface (XHCI) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The 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 hardware delays and time-outs:

USB transfer time-out

Use this feature to set the time out value for Control, Bulk, and Interrupt transfers. The options are 1 sec, 5 sec, 10 sec, and **20 sec**.

Device reset time-out

Use this feature to set the USB mass storage device Start Unit command time out. The options are 10 sec, **20 sec**, 30 sec, and 40 sec.

Device power-up delay

Use this feature to set the maximum time the device will take before it reports itself to the host controller. The options are **Auto** and Manual.

▶PCIe/PCI/PnP Configuration

Onboard Video Option ROM

Use this feature to select which firmware function to be loaded for LAN1 used for system boot. The options are Disabled and **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

Above 4GB MMIO BIOS assignment

Select Enabled to decode a PCI device that supports 64-bit in the space above 4G Address. 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.

Storage Option ROM/UEFI Driver

TThis feature controls the execution of UEFI and Legacy storage option ROM. The options are Do not launch, **UEFI,** and Legacy.

PCIe/PCI/PnP Configuration

CPU SLOT7 PCIe 4.0 X16

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

M.2-H

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **Legacy** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, Legacy, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

Onboard LAN1 Option ROM

Use this feature to select a desired firmware function to be loaded for onboard LAN1. The options are Disabled and **PXE** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled and **EFI** (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled, PXE, and **EFI** (if the Boot Mode Select feature under the Boot tab is set to Dual).

Onboard LAN2 Option ROM

Use this feature to select a desired firmware function to be loaded for onboard LAN2. The options are Disabled and **PXE** (if the Boot Mode Select feature under the Boot tab is set to Legacy), Disabled (if the Boot Mode Select feature under the Boot tab is set to UEFI), and Disabled and **PXE** (if the Boot Mode Select feature under the Boot tab is set to Dual).

▶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 is checked. Press "+" or "-" on your keyboard to change the value. The default setting is **1**.

▶**MAC:xxxxxxxxxxxx-IPv4 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv4 Network Configuration**

Configured

Select Enabled to manually enter network addresses. The options are **Disabled** and Enabled.

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

Enable DHCP

Use this feature to enable Dynamic Host Configuration Protocol. If this feature is enabled, then you don't have the option of manually entering the network addresses. The options are **Disabled** and Enabled.

Local IP Address

Use this feature to enter the local IP address.

Local Netmask

Use this feature to enter the local Netmask address.

Local Gateway

Use this feature to enter the local Gateway address.

Local DNS Servers

Use this feature to enter the local DNS Server address.

Save Changes and Exit

Use this feature to save the changes and exit from the menu.

▶**MAC:xxxxxxxxxxxx-IPv6 Network Configuration**
▶**MAC:xxxxxxxxxxxx-IPv6 Network Configuration**

►Enter Configuration Menu

Interface Name

Interface Type

MAC address

Host address

Route Table

Gateway addresses

DNS addresses

Interface ID

This feature displays the interface ID for the network device.

DAD Transmit Count

Use this feature to set the Duplicate Address Detection (DAD) value. The 0 value means no DAD is performed. The default value is **1**.

Policy

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

Save Changes and Exit

Use this feature to save the changes and exit from the menu.

►HTTP Boot Configuration

HTTP Boot Configuration

HTTP Boot Policy

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

HTTPS Boot Checks Hostname

Enable this feature for HTTPS boot to check the hostname of the TLS certificates to see if it matches the hostname provided by the remote server. The options are **Enabled** and Disabled.

Priority of HTTP Boot:

Instance of Priority 1:

Use this feature to set the rank target port. The default value is **1**.

Select IPv4 or IPv6

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

Boot Description

Highlight the feature and press enter to create a boot description. The description cannot be more than 75 characters.

Boot URI

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

Instance of Priority 2

Use this feature to set the rank target port. The default value is **0**.

▶Trusted Computing

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

- Vendor Name

- 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 TPM (Trusted Platform Module) support to enhance data integrity and network security. Please reboot the system for a change on this setting to take effect. The options are Disable and **Enable**.

- Active PCR Bank

- Available PCR banks

- SHA256 PCR Bank

If the feature above is set to Enable, "SHA-1 PCR Bank" and "SHA256 PCR Bank" will become available for configuration:

SHA-1 PCR Bank

Use this feature to disable or enable the SHA-1 Platform Configuration Register (PCR) bank for the installed TPM device. The options are **Disabled** and Enabled.

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 hierarchy 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**.

TPM 2.0 UEFI Spec Version

Use this feature to select the TCG2 spec version. The options are TCG_1_2 and **TCG_2**.

Physical Presence Spec Version

Use this feature to select the Physical Presence Spec version. The options are 1.2 and **1.3**.

PH Randomization

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

TXT Support

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 Support. The options are **Disabled** and Enabled.

Current Status Information

The following information will be displayed:

TPM Enabled Status

TPM Active Status

TPM Owner Status

▶USB Configuration

USB Configuration

USB Module Version: 21

USB Controllers: 2 XHCIs

USB Devices:

Legacy USB Support

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

XHCI Hand-off

This is a work-around solution for operating systems that do not support XHCI (Extensible Host Controller Interface) 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**.

▶Tls Auth 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.

Cert 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.

▶Intel(R) I210 Gigabit Network Connection - xx:xx:xx:xx:xx:xx
▶Intel(R) I210 Gigabit Network Connection - xx:xx:xx:xx:xx:xx

▶NIC Configuration

Link Speed

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

Wake On LAN

Select Enabled for wake on LAN support, which allows the system to wake up when an onboard LAN device receives an incoming signal. The options are Disabled and **Enabled**.

Blink LEDs

Use this feature to identify the physical network port by blinking the associated LED. Use the keyboard to select a value.

UEFI Driver

Adapter PBA

Device Name

Chip Type

PCI Device ID

PCI Address

Link Status

MAC Address

Virtual MAC Address

▶Driver Health

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

▶Intel(R) PRO/1000 6.5.01 PCIe

Controller 95570998 Child 0

Intel(R) I210 Gigabit Network Connection

Controller 95570918 Child 0

Intel(R) I210 Gigabit Network Connection

▶Intel(R) Gigabit 0.0.29

Information is displayed here if a controller is detected by the BIOS.

4.4 Event Logs

Use this menu to configure Event Log settings.

```
                          Aptio Setup - AMI
       Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

 ▶ Change SMBIOS Event Log Settings                    Press <Enter> to change the
 ▶ View SMBIOS Event Log                               SMBIOS Event Log
                                                       configuration.








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

              Version 2.21.1280 Copyright (C) 2021 AMI
```
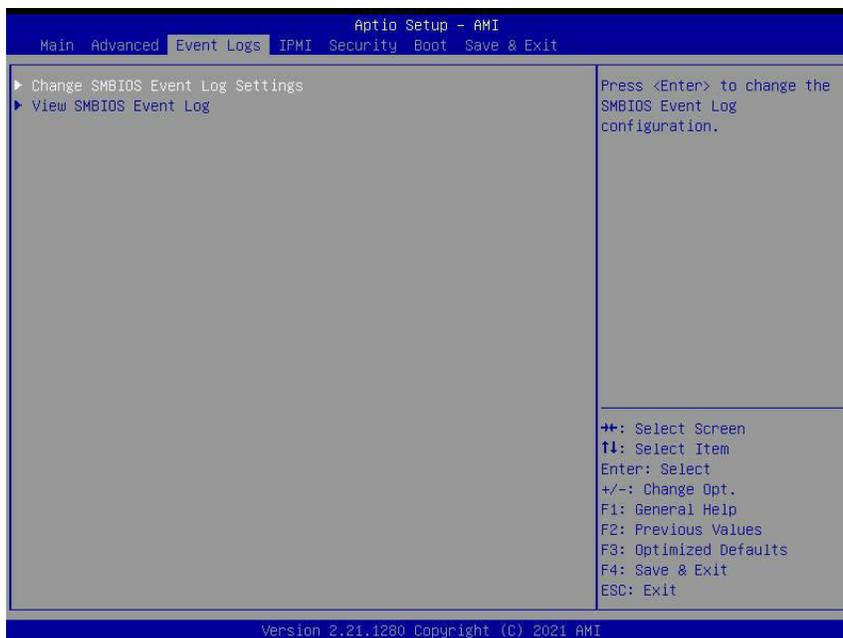
▶Change SMBIOS Event Log Settings

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 occurrences 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**.

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

▶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 IPMI

Use this menu to configure Intelligent Platform Management Interface (IPMI) settings.

```
                        Aptio Setup - AMI
    Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

    BMC Firmware Revision              00.13.06          Press <Enter> to change the
    IPMI STATUS                        Working           SEL event log configuration.

  ▶ System Event Log
  ▶ BMC Network Configuration




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

                Version 2.21.1280 Copyright (C) 2021 AMI
```

BMC Firmware Revision

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

IPMI STATUS (Baseboard Management Controller)

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

▶System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled for all system event logging at bootup. The options are **Enabled** and Disabled.

Erasing Settings

Erase SEL

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

When SEL is Full

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

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

▶BMC Network Configuration

BMC Network Configuration

Update IPMI LAN Configuration

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

If the feature above is set to Yes, Configuration Address Source, VLAN, and IPv6 Support are available for configuration:

Configure IPv4 Support

IPMI LAN Selection

IPMI Network Link Status

Configuration Address Source

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

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

Station IP Address

This features displays the Station IP address for this computer. The address can be manually entered. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

Subnet Mask

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

Station MAC Address

Gateway IP Address

This feature displays the Gateway IP address for this computer. The address can be manually entered. This should be in decimal and in dotted quad form (i.e., 172.31.0.1).

VLAN

This feature displays the virtual LAN settings. The options are **Disable** and Enable.

VLAN ID

This feature is enabled if VLAN is enabled.

Configure IPv6 Support

IPv6 Address Status

IPv6 Support

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

Configuration Address Source

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

4.6 Security

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

```
                            Aptio Setup - AMI
     Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

                                             ▲ Set Administrator Password

     Administrator Password           Not Installed
     User Password                    Not Installed

     Password Description

     If the Administrator's / User's password is set,
     then this only limits access to Setup and is
     asked for when entering Setup.
     Please set Administrator's password first in order
     to set User's password, if clear Administrator's
     password, the User's password will be cleared as well.

     The password length must be
     in the following range:
     Minimum length                  3
     Maximum length                  20        ↔: Select Screen
                                               ↑↓: Select Item
     Administrator Password                    Enter: Select
     Password Check                   [Setup]  +/-: Change Opt.
     Hard Drive Security Frozen       [Disabled] F1: General Help
     Lockdown Mode                    [Disabled] F2: Previous Values
                                               F3: Optimized Defaults
                                             ▼ F4: Save & Exit
                                               ESC: Exit


                    Version 2.21.1280 Copyright (C) 2021 AMI
```

Administrator Password

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

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.

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**.

Lockdown Mode

Use this feature to switch to lockdown mode. The options are **Disabled** and Enabled.

►**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 item to configure Secure Boot variables without authentication. The options are Standard and **Custom**.

CSM Support

This feature is for manufacturing debugging purposes.

▶Restore Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases.

▶Reset to Setup Mode

This feature deletes all Secure Boot key databases from NVRAM.

▶Enter Audit Mode

Use this feature to enter the audit mode workflow.

▶Key Management

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

▶Provision Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases.

▶Restore Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases.

▶Reset to Setup Mode

This feature deletes all Secure Boot key databases from NVRAM.

▶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.

▶Enroll Efi Image

This feature allows the image to run in Secure Boot Mode. Enroll SHA256 Hash Certificate 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.

Secure Boot variable

▶Platform Key (PK)

Update

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

▶Key Exchange Key

Update

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

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 a factory default DB or No to load from a file on an external media.

Append

Select Yes to add the DB from the manufacturer's defaults list 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 a factory default DBX or No to load from a file on an external media.

Append

Select Yes to add the DBX from the manufacturer's defaults list 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 a factory default DBT or No to load from a file on an external media.

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.

4.7 Boot

Use this menu to configure Boot settings.

```
                              Aptio Setup - AMI
        Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

                                                       Specifies the Boot Device
     FIXED BOOT Option Priorities                      Priority sequence from
     Boot Option #1                 [UEFI Hard Disk]   available UEFI Application.
     Boot Option #2                 [UEFI CD/DVD]
     Boot Option #3                 [UEFI USB Hard Disk]
     Boot Option #4                 [UEFI USB CD/DVD]
     Boot Option #5                 [UEFI USB Key]
     Boot Option #6                 [UEFI USB Floppy]
     Boot Option #7                 [UEFI USB Lan]
     Boot Option #8                 [UEFI
                                    Network:(B4/D0/F0)
                                    UEFI PXE IPv4
                                    Intel(R)  I210
                                    Gigabit  Network
                                    Connection(MAC:3cecef
                                    774424)]
     Boot Option #9                 [UEFI AP:UEFI:
                                    Built-in EFI Shell]   ++: Select Screen
                                                          ↑↓: Select Item
                                                          Enter: Select
   ▶ Delete Boot Option                                   +/-: Change Opt.
                                                          F1: General Help
   ▶ Delete Driver Option                                 F2: Previous Values
                                                          F3: Optimized Defaults
   ▶ UEFI NETWORK Drive BBS Priorities                    F4: Save & Exit
   ▶ UEFI Application Boot Priorities                     ESC: Exit

                 Version 2.21.1280 Copyright (C) 2021 AMI
```

Setup Prompt Timeout

Use this feature to select the number of seconds to wait for the setup activation key. The default is **1**.

Boot Mode Select

Use this item to select the type of device that the system is going to boot from. The options are Legacy, **UEFI**, and DUAL.

Legacy to EFI Support

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

Fixed Boot Order Priorities

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

If the feature "Boot Mode Select" is set to Legacy, UEFI, or Dual, the following items will be displayed:

- Boot Option #1

- Boot Option #2

- Boot Option #3

- Boot Option #4

- Boot Option #5

- Boot Option #6

- Boot Option #7

- Boot Option #8

▶Delete Boot Option

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

Delete Boot Option

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

▶Delete Driver Option

This feature allows you to remove an EFI driver option from the driver order.

Delete Driver Option

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

▶UEFI NETWORK Drive BBS Priorities

This feature sets the system boot order of detected devices.

- Boot Option

▶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.

```
                              Aptio Setup - AMI
      Main  Advanced  Event Logs  IPMI  Security  Boot  Save & Exit

   Save Options                                     Exit system setup without
   Discard Changes and Exit                         saving any changes.
   Save Changes and Reset

   Save Changes
   Discard Changes

   Default Options
   Restore Optimized Defaults
   Save as User Defaults
   Restore User Defaults

   Boot Override
   (B4/D0/F0) UEFI PXE IPv4 Intel(R) I210 Gigabit  Network
   Connection(                )
   (B5/D0/F0) UEFI PXE IPv4 Intel(R) I210 Gigabit  Network
   Connection(             5)
   (B4/D0/F0) UEFI PXE IPv6 Intel(R) I210 Gigabit  Network    →←: Select Screen
   Connection(                )                               ↑↓: Select Item
   (B5/D0/F0) UEFI PXE IPv6 Intel(R) I210 Gigabit  Network    Enter: Select
   Connection(             5)                                 +/-: Change Opt.
   UEFI: Built-in EFI Shell                                   F1: General Help
   Launch EFI Shell from filesystem device                   F2: Previous Values
                                                             F3: Optimized Defaults
                                                             F4: Save & Exit
                                                             ESC: Exit

                   Version 2.21.1280 Copyright (C) 2021 AMI
```

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

Restore Optimized Defaults

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 you 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.

(B4/D0/F0) UEFI PXE IPv4 Intel(R) I210 Gigabit Network Connection (MAC:xxxxxxxxxxxx)

(B5/D0/F0) UEFI PXE IPv4 Intel(R) I210 Gigabit Network Connection (MAC:xxxxxxxxxxxx)

(B4/D0/F0) UEFI PXE IPv6 Intel(R) I210 Gigabit Network Connection (MAC:xxxxxxxxxxxx)

(B5/D0/F0) UEFI PXE IPv6 Intel(R) I210 Gigabit Network Connection (MAC:xxxxxxxxxxxx)

UEFI: Built-in EFI Shell

Intel(R) Ethernet Controller X550

Appendix A

BIOS Codes

A.1 BIOS Error POST (Beep) Codes

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

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

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

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

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

A.2 Additional BIOS POST Codes

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

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

Appendix B

Software

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

B.1 Microsoft Windows OS Installation

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

Installing the OS

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

2. Retrieve the proper RST/RSTe driver. Go to the Supermicro web page for your motherboard and click on "Download the Latest Drivers and Utilities", select the proper driver, and copy it to a USB flash drive.

3. Boot from a bootable device with Windows OS installation. You can see a bootable device list by pressing **F11** during the system startup.
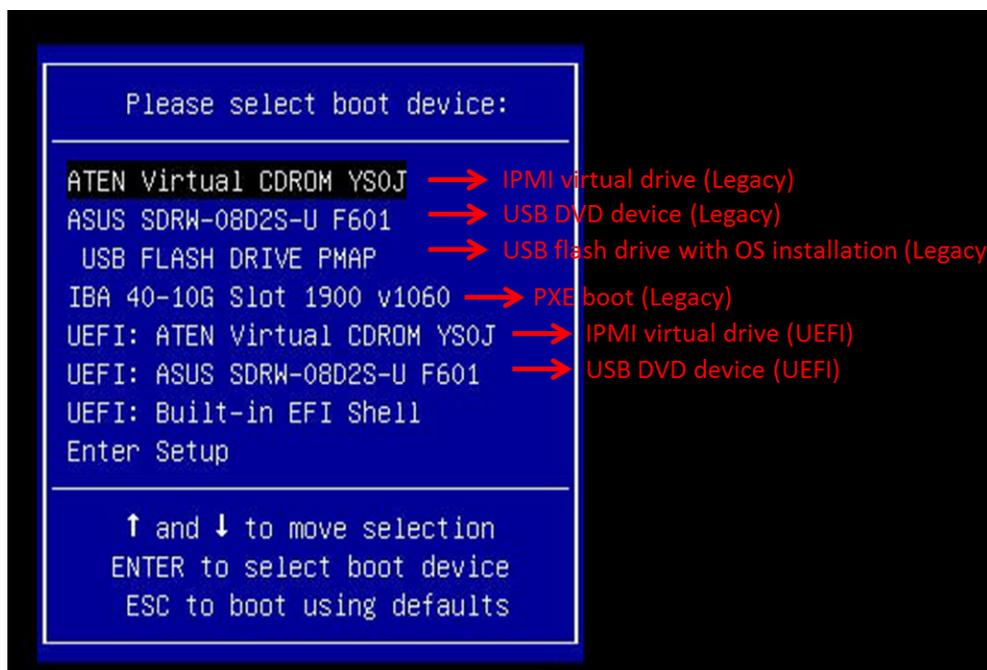
Figure B-1. Select Boot Device

4. During Windows Setup, continue to the dialog where you select the drives on which to install Windows. If the disk you want to use is not listed, click on "Load driver" link at the bottom left corner.
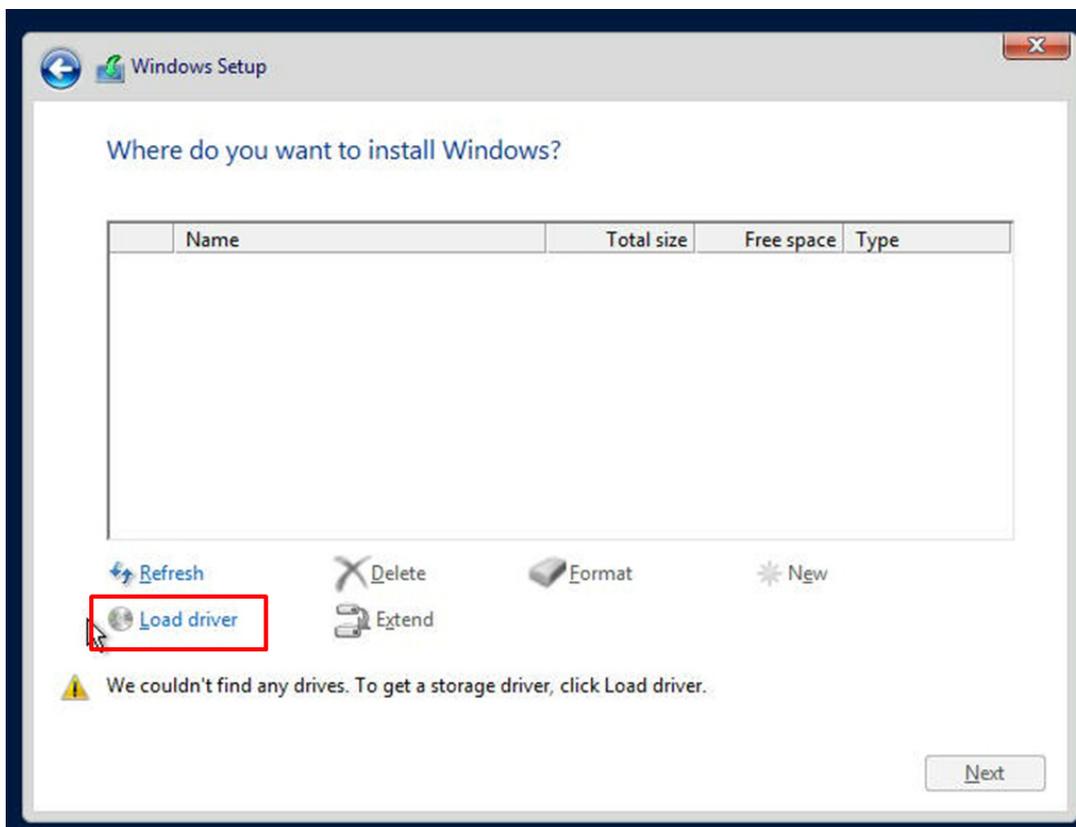
Figure B-2. Load Driver Link

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

- For RAID, choose the SATA/sSATA RAID driver indicated then choose the storage drive on which you want to install it.

- For non-RAID, choose the SATA/sSATA AHCI driver indicated then choose the storage drive on which you want to install it.

5. Once all devices are specified, continue with the installation.

6. After the Windows OS installation has completed, the system will automatically reboot multiple times.

B.2 Driver Installation

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

After accessing the website, go into the https://www.supermicro.com/wdl/CDR_Images/CDR-X12-UP/ and locate the ISO file for your motherboard. Download this file to a USB flash or media drive. You may also use a utility to extract the ISO file if preferred.

Another option is to go to the Supermicro website and search for the motherboard. Find the product page for your motherboard and download the latest drivers and utilities.
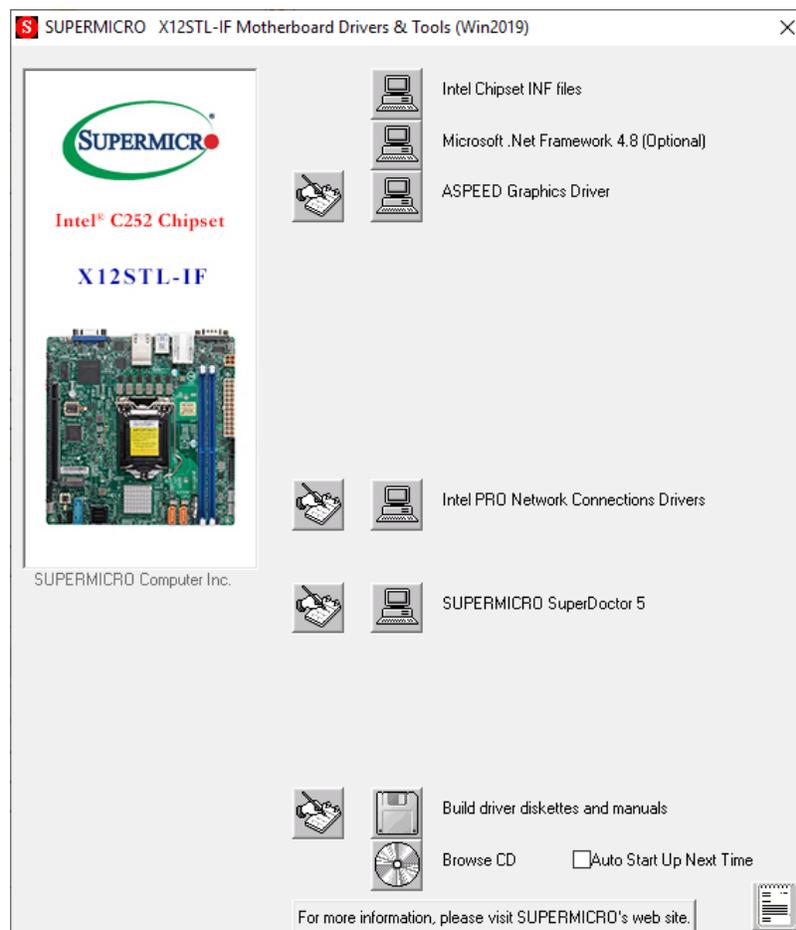
Figure B-3. Driver & Tool Installation Screen

Note: Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to bottom) one at a time. **After installing each item, you must reboot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents.

B.3 SuperDoctor® 5

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

SuperDoctor 5 comes in local and remote management versions and can be used with Nagios to maximize your system monitoring needs. With SuperDoctor 5 Management Server (SSM Server), you can remotely control power on/off and reset chassis intrusion for multiple systems with SuperDoctor 5. SuperDoctor 5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.
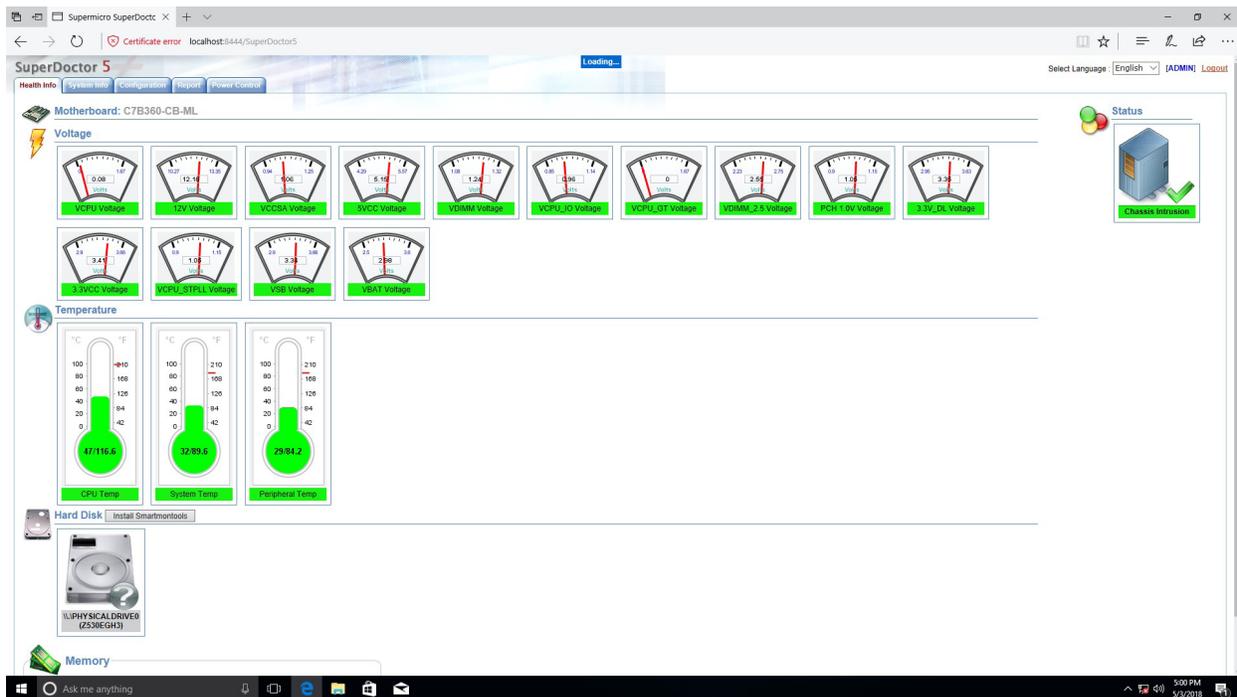
Figure B-4. SuperDoctor 5 Interface Display Screen (Health Information)

Appendix C

Standardized Warning Statements

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

Read this section in its entirety before installing or configuring components.

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

Battery Handling

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

電池の取り扱い

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

警告

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

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

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

את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

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

اسحبذال البطارية

فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة

جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

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

Waarschuwing

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

Product Disposal

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

製品の廃棄

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

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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

¡Advertencia!

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

Attention

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

סילוק המוצר

אזהרה!

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

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

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 POST (Power-On Self-Test) routines.

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

Note 2: When the BIOS recovery block crashes, you will need to follow the procedures to make a Returned Merchandise Authorization (RMA) request. (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: 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" bi-nary image file you download is the same version or a close version meant for your motherboard.

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

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

        ▶ Proceed with flash update




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

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

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.

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

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



                             ┌──────── Program new data ────────┐
                             │                                   │
                             │        Write new boot block...    │
                             │                                   │
                             │              ──17%──              │
                             │   ▓▓▓▓▓                           │
                             └───────────────────────────────────┘

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

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

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:

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

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




                            ── Flash update ──
                    Flash update completed. Press any key to
                               reset the system




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

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

> **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.

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

     Boot Configuration                                  ▲ Sets the system boot order

     Boot mode select                 [DUAL]
     LEGACY to EFI support            [Disabled]

     FIXED BOOT ORDER Priorities
     Boot Option #1                   [UEFI AP:UEFI: Bui...]
     Boot Option #2                   [CD/DVD]
     Boot Option #3                   [USB Hard Disk]
     Boot Option #4                   [USB CD/DVD]
     Boot Option #5                   [USB Key:SanDisk]
     Boot Option #6                   [USB Floppy]
     Boot Option #7                   [USB Lan]
     Boot Option #8                   [Network:IBA GE S1...]
     Boot Option #9                   [UEFI Hard Disk]
     Boot Option #10                  [UEFI CD/DVD]
     Boot Option #11                  [UEFI USB Hard Disk]
     Boot Option #12                  [UEFI USB CD/DVD]       →←: Select Screen
     Boot Option #13                  [UEFI USB Key:UEFI...]  ↑↓: Select Item
     Boot Option #14                  [UEFI USB Floppy]       Enter: Select
     Boot Option #15                  [UEFI USB Lan]          +/-: Change Opt.
     Boot Option #16                  [UEFI Network]          F1: General Help
     Boot Option #17                  [Hard Disk]             F2: Previous Values
                                                              F3: Optimized Defaults
     ▶ Add New Boot Option                                  ▼ F4: Save & Exit
                                                              ESC: Exit

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

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.

```
UEFI Interactive Shell v2.1
EDK II
UEFI v2.50 (American Megatrends, 0x0005000C)
Mapping table
        FS0: Alias(s):HD0r0b::BLK1:
                PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)/HD(1,MBR,0x37901D72,0x800,0x1
CA3592)
        BLK0: Alias(s):
                PciRoot(0x0)/Pci(0x14,0x0)/USB(0x11,0x0)
Press ESC in 1 seconds to skip startup.nsh or any other key to continue.
Shell> fs0:
FS0:\> cd AFUDOS
FS0:\AFUDOS\> cd SWJPME2_03162017
FS0:\AFUDOS\SWJPME2_03162017\> flash.nsh X11DPU7.314_
```

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

```
Done.
[ Access Cmos Port Ex ]
<Read>
Index 0x51: 0x18

Done.
********************************************************************************
*
* Program BIOS and ME (including FDT) regions...
*
********************************************************************************
+------------------------------------------------------------------------+
|              AMI Firmware Update Utility v5.09.01.1317                  |
|       Copyright (C)2017 American Megatrends Inc. All Rights Reserved.   |
+------------------------------------------------------------------------+
  CPUID = 50652

  Reading flash .............. done
  - ME Data Size checking . ok
  - FFS checksums ......... ok
  - Check RomLayout ......... Ok.
  Erasing Boot Block .......... done
  Updating Boot Block ......... done
  Verifying Boot Block ........ done
  Erasing Main Block .......... 0x00132000 (0%)
```

```
  Verifying NCB Block ........ done
  - Update success for FDR
  - Update success for IE. -
  - Successful Update Recovery Loader to OPRx!!
  - Successful Update MFSB!!-
  - Successful Update FTPR!!-
  - Successful Update MFS, IVB1 and IVB2!!
  - Successful Update FLOG and UTOK!!
  - ME Entire Image update success !!
WARNING : System must power-off to have the changes take effect!
Moving FS0:\AFUDOS\SWJPME2_03162017\fdtx64.efi -> FS0:\AFUDOS\SWJPME2_03162017\f
dt.smc
- [ok]
Moving FS0:\AFUDOS\SWJPME2_03162017\afuefix64.efi -> FS0:\AFUDOS\SWJPME2_0316201
7\afuefi.smc
- [ok]
********************************************************************************
*
* Please ignore this 'Shell: Cannot read from file - Device Error'
* warning message due to it does not impact flashing process.
*
********************************************************************************
Deleting 'fs0:\startup.nsh'
Delete successful.
FS0:\> _
```

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.