X12STW-F/TF

USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

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Preface

About This Manual

This manual is written for system integrators, IT technicians and knowledgeable end users. It provides information for the installation and use of the X12STW-F/TF motherboard.

About This Motherboard

The Supermicro X12STW-F/TF supports the Intel® Xeon E-2300 and 10th Generation Pentium series processor with up to eight cores in an LGA1200 socket. Built with the Intel PCH C256 chipset, the motherboard supports up to 128GB of DDR4 ECC UDIMM memory in four slots.The X12STW-F/TF is optimized for high-performance, high-end computing platforms that address the needs of next generation server applications. 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 provides information for proper system setup.

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Table of Contents

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	X12STW-F/TF	1
SATA Cables	CBL-0044L	4
Quick Reference Guide	MNL-2354-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/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. X12STW-TF Motherboard Image
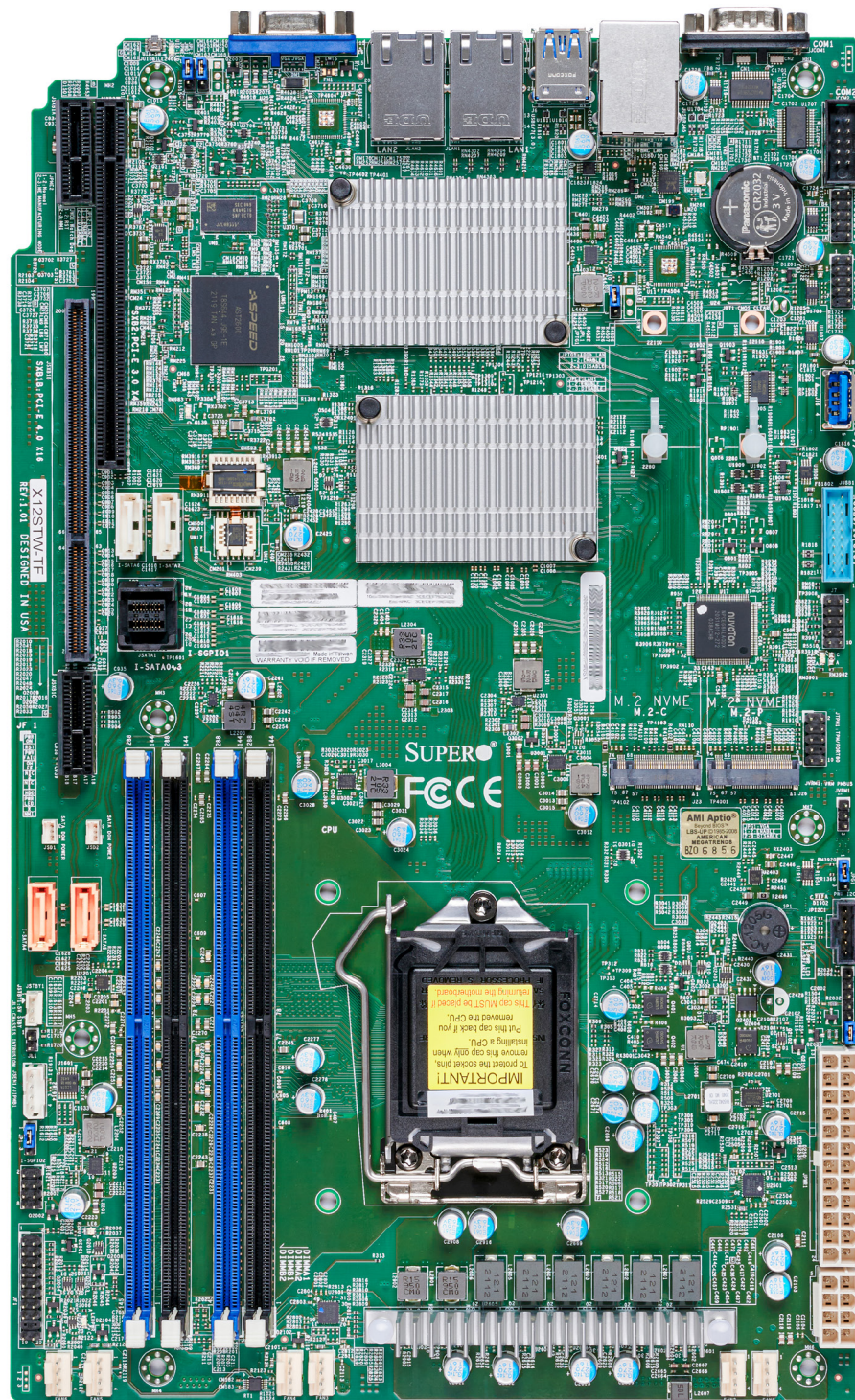
✐ **Note:** All graphics shown in this manual were based upon the latest PCB revision available at the time of publication of the manual. The motherboard you received may or may not look exactly the same as the graphics shown in this manual.

Figure 1-2. X12STW-F Motherboard Image
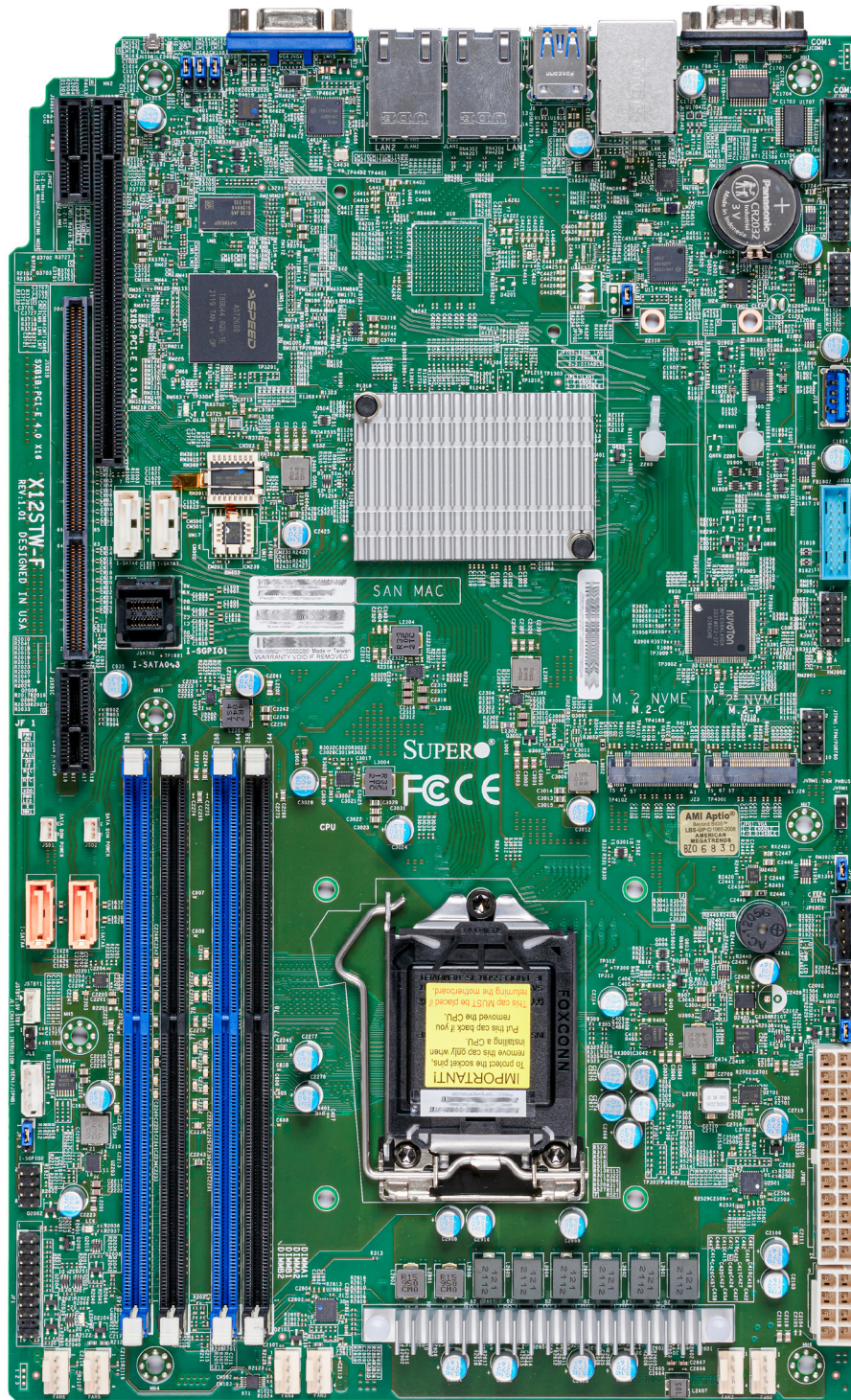
> ✎ **Note:** All graphics shown in this manual were based upon the latest PCB revision available at the time of publication of the manual. The motherboard you received may or may not look exactly the same as the graphics shown in this manual.

Figure 1-3. X12STW-TF Motherboard Layout

(not drawn to scale)
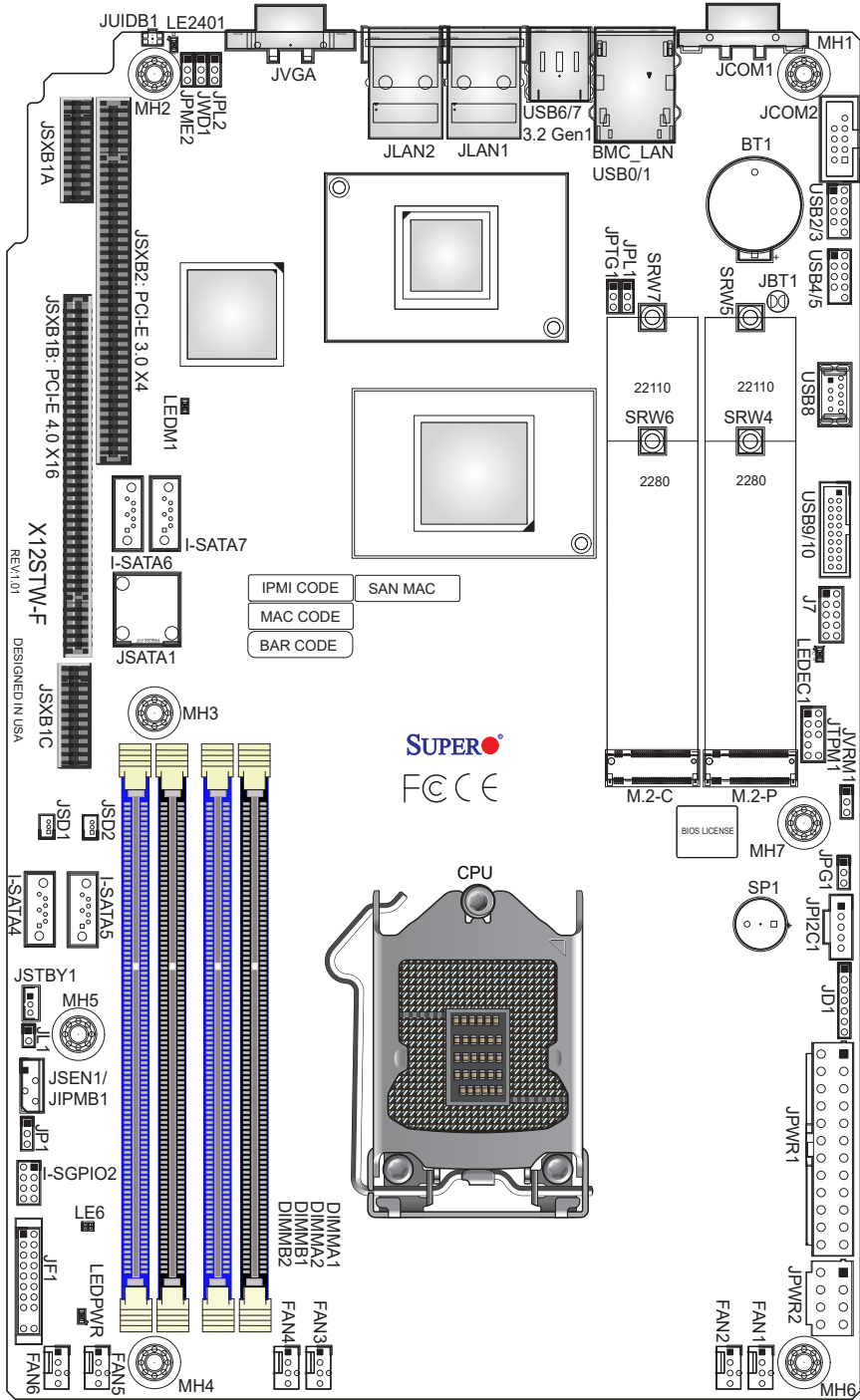
Note: Components not documented are for internal testing only.

Quick Reference
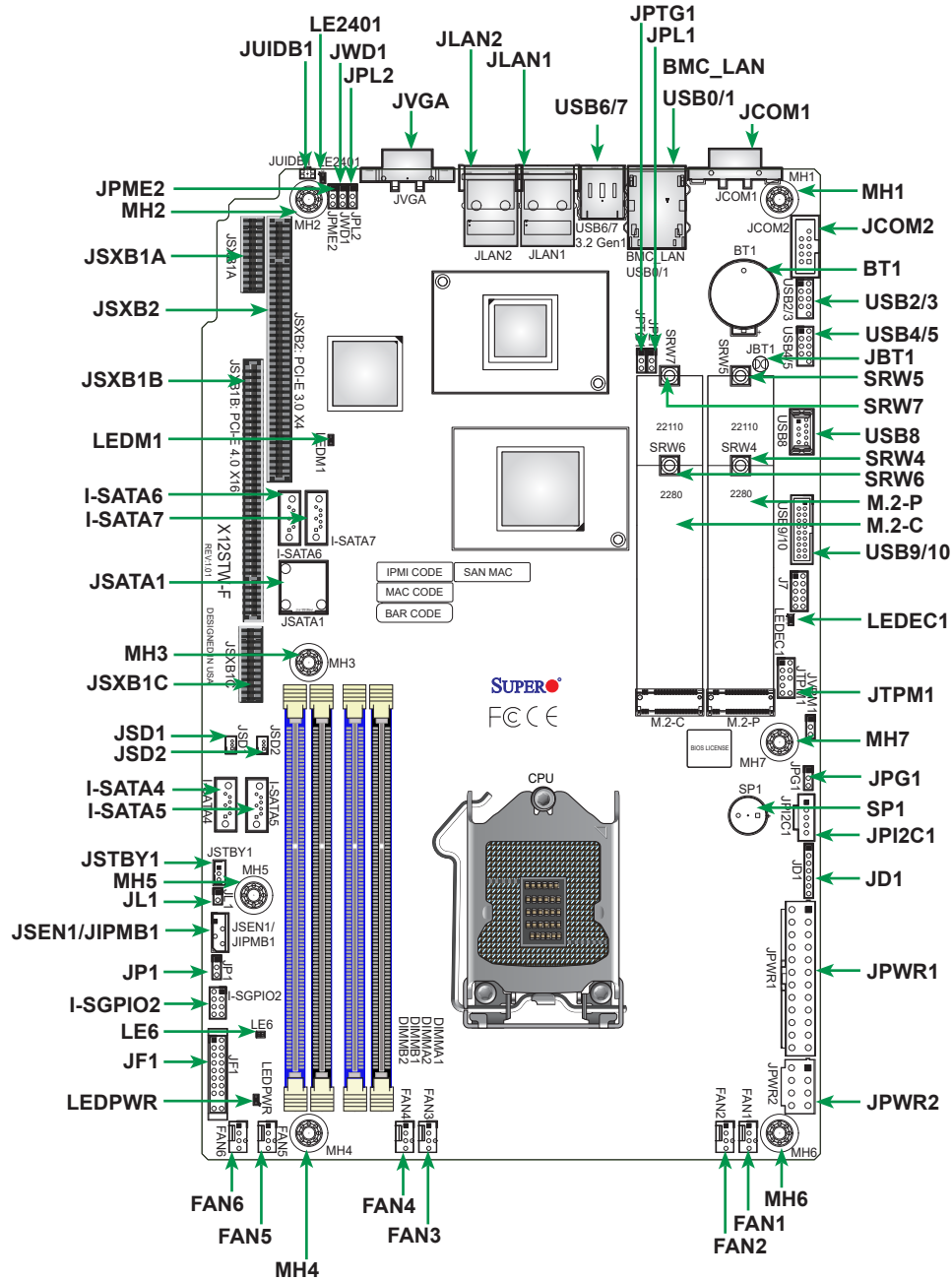
Notes:

- See Chapter 2 for detailed information on jumpers, I/O ports, and JF1 front panel connections. Jumpers and LEDs not indicated are used for testing only.

- "■" indicates the location of Pin 1.

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

Quick Reference Table

Jumper	Description	Default Setting
JBT1	CMOS Clear	Open (Normal)
JP1	JSEN1/JIPMB1 Select	Pins 1-2 (JSEN1)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1	LAN1 Enable/Disable (LAN I210)	Pins 1-2 (Enabled)
JPL2	LAN2 Enable/Disable (LAN I210)	Pins 1-2 (Enabled)
JPME2	Manufacturing Mode Select	Pins 1-2 (Normal)
JPTG1	LAN X550 Enable/Disable	Pins 1-2 (Enabled)
JWD1	Watch Dog Timer	Pins 1-2 (Reset)

LED	Description	Status
LE6	Power Ready LED	Solid Amber: Standby Solid Red: Power Failed Solid Green: Power On
LE2401	Unit Identifier (UID) LED	Solid Blue: Unit Identified
LEDEC1	Embedded Controller (EC) Heartbeat LED	Blinking Green: EC Normal
LEDM1	BMC Heartbeat	Blinking Green: BMC Normal
LEDPWR	Onboard Power LED	Solid Green: Power On

Connector	Description
BMC_LAN	Dedicated BMC LAN Port
BT1	Onboard Battery
FAN1 - FAN6	CPU/System Fan Headers
I-SATA4 - I-SATA7	Intel PCH SATA 3.0 Ports
I-SGPIO2	Serial Link General Purpose I/O Header
JCOM1, JCOM2	COM Port, COM Header
JD1	Speaker/Power LED Header (Pins 1-2: Power LED, Pins 4-7: Speaker)
JF1	Front Control Panel Header
JL1	Chassis Intrusion Header
JLAN1, JLAN2	1G (-F), 10G (-TF) LAN Ports
JPI^{2}C1	Power System Management Bus (SMB) I^{2}C Header
JPWR1	24-pin ATX Power Connector
JPWR2	8-pin Power Connector
JSATA1	Intel PCH SATA 3.0 Port (I-SATA0-3)
JSD1, JSD2	SATA DOM Power Connectors
JSEN1/JIPMB1	System Front Inlet Temperature Sensor/BMC External I2C Header (for an IPMI card) (Set pins 1-2 on JP1 for JSEN1 (Default), or pins 2-3 for JIPMB1)
JSTBY1	Standby Power Header

Note: Table is continued on the next page.

Connector	Description
JSXB1A, JSXB1B, JSXB1C	SMC-Proprietary WIO_L (Left) PCIe 4.0 x16 Add-On Card Slots (WIO-L will run at PCIe 3.0 x16 when a Pentium processor is installed)
JSXB2	SMC-Proprietary WIO_R (Right) PCIe 3.0 x4 Add-On Card Slot
JTPM1	Trusted Platform Module (TPM) Header
JUIDB1	Unit Identifier (UID) Button
JVGA	VGA Connector
M.2-C	M.2 PCIe 4.0 x4 Slot (2280/22110) (M.2-C is not supported when a Pentium processor is installed)
M.2-P	M.2 PCIe 3.0 x4 Slot (2280/22110)
SP1	Internal Speaker/Buzzer
SRW4 - SRW7	M.2 Holding Screws
USB0/1	Back Panel USB 2.0 Ports
USB2/3, USB4/5	Front Accessible USB 2.0 Headers
USB6/7	Back Panel USB 3.2 Gen 1 Ports
USB8	USB 3.2 Gen 2 Type-A Header
USB9/10	Front Accessible USB 3.2 Gen 1 Header

Motherboard Features

Motherboard Features
CPU
• Supports an Intel Xeon E-2300 and 10th Generation Pentium (Socket H5 - LGA 1200) series processor with a thermal design power (TDP) of up to 95W and eight cores
Memory
• Supports up to 128GB of DDR4 ECC UDIMM memory with speeds of up to 3200MHz in four memory slots   **Note:** Speed support is up to 2666MHz when a Pentium processor is installed. Speed support is up to 2933 MHz for 2R2R configurations.
DIMM Size
• Up to 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 PCH C256
Expansion Slots
• One SMC-Proprietary WIO-L PCIe 4.0 x16 Slot (JSXB1A, JSXB1B, JSXB1C) • One SMC-Proprietary WIO-R PCIe 3.0 x4 Slot (JSXB2) • One M.2 slot for PCIe 4.0 x4 (Supports M-Key 2280 / 22110 FF) • One M.2 slot for PCIe 3.0 x4 (Supports M-Key 2280 / 22110 FF)
Network
• Intel i210 (-F SKU) • Intel X550 (-TF SKU)
Baseboard Management Controller (BMC)
• ASpeed AST2600 BMC
Graphics
• Graphics controller via ASpeed AST2600 BMC
I/O Devices
• Serial (COM) Header   • JCOM1: COM Port, JCOM2: COM Header • I-SATA 3.0   • Eight SATA 3.0 ports (JSATA1, I-SATA4 - I-SATA7) (Two SuperDOM) • Video (VGA) Port   • One VGA connection on the I/O back panel

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

Motherboard Features
Peripheral Devices
• Two USB 2.0 ports on the back I/O panel (USB0/1)
• Two front accessible USB 2.0 headers with two USB connections each (USB2/3, USB4/5)
• Two USB 3.2 Gen 1 ports on the back I/O panel (USB6/7)
• One USB 3.2 Gen 2 Type-A header (USB8)
• One front accessible USB 3.2 Gen 1 header with two USB connections (USB9/10)
BIOS
• 256Mb AMI BIOS® SPI Flash BIOS
• ACPI 6.0 or later, PCI F/W 3.0 or later, Plug and Play (PnP), SPI dual speed support, riser card auto detection support, SMBIOS 2.7 or later, real time clock (RTC) wakeup
Power Management
• ACPI power management
• S5
• Power button override mechanism
• Power-on mode for AC power recovery
• Power supply monitoring
System Health Monitoring
• Onboard voltage monitoring for +12V, +5V, +3.3V, +5V stdby, +3.3V stdby, VCPU, VDDQ, VBAT, CPU temperature, PCH temperature, system temperature, M.2 NVMe (M-Key) temperature and memory temperature
• 8 CPU switch phase voltage regulator
• CPU thermal trip support
• Platform Environment Control Interface (PECI)
Fan Control
• Fan status monitoring via IPMI connections
• Single cooling zone
• Multi-fan speed control support through onboard BMC
• Six 4-pin fan headers
System Management
• IPMI View, SMCIPMITOOL, IPMICFG
• Trusted Platform Module (TPM) support
• SuperDoctor® 5
• Chassis intrusion header and detection
LED Indicators
• CPU/system overheat LED
• Power/suspend-state indicator LED
• Fan failed LED
• UID/remote UID
• HDD activity LED
• LAN activity LED
Dimensions
• 8" (W) x 13" (L) (203.2 mm x 330.2mm)

Note 1: 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.

Note 2: For IPMI configuration instructions, please refer to the IPMI Configuration User's Guide available at http://www.supermicro.com/support/manuals/.

Note 3: If you purchase Supermicro Out of Band (OOB) software license key (Supermicro P/N: SFT-OOB-LIC), please DO NOT change IPMI MAC address. Once the MAC address has changed, the OOB license key will be invalid.

Figure 1-4.
System Block Diagram
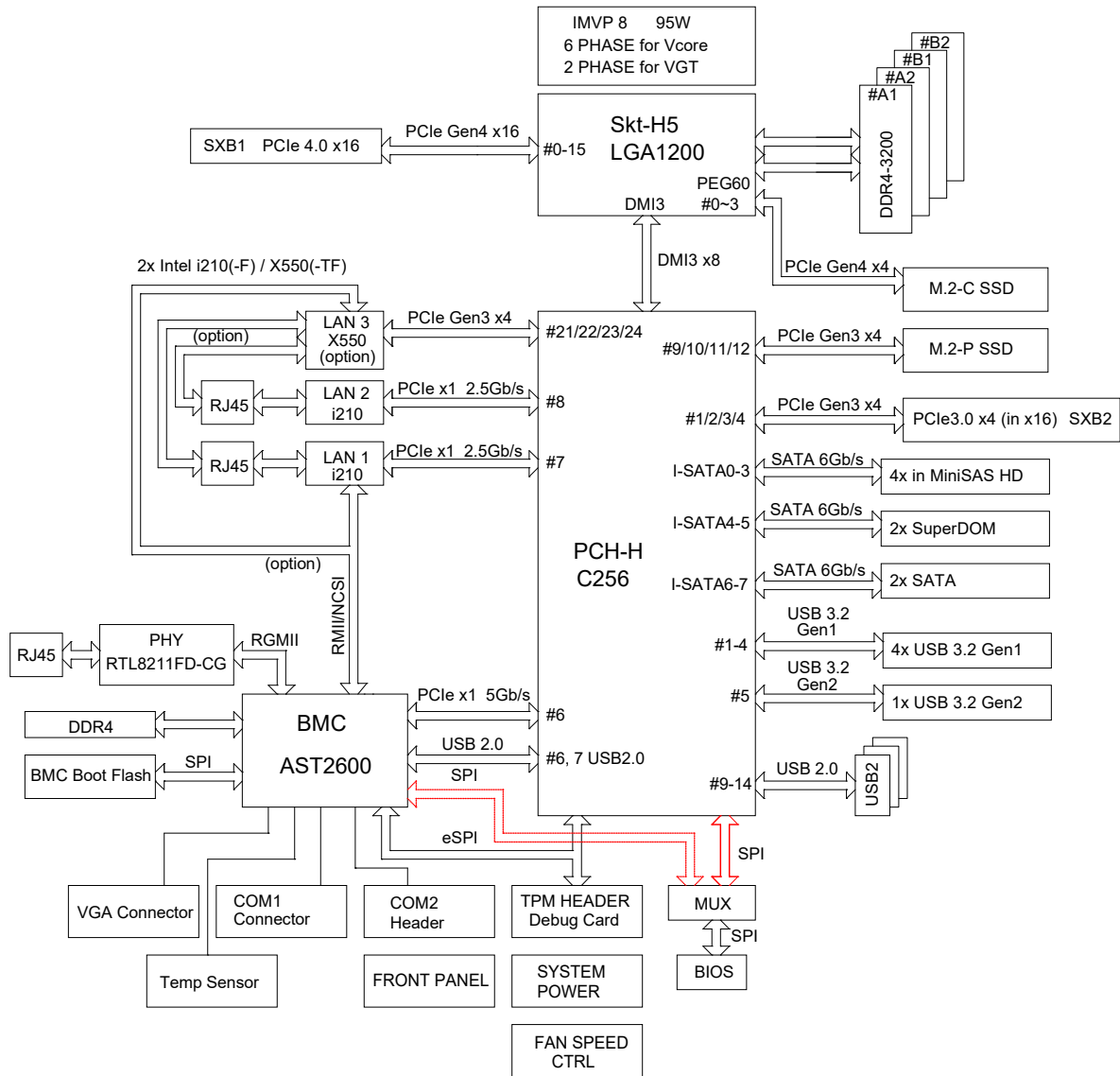
Note: This is a general block diagram and may not exactly represent the features on your motherboard. See the previous pages for the actual specifications of your motherboard.

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 processors and the C256 chipset, the X12STW-F/TF motherboard provides system performance, power efficiency, and feature sets to address the needs of next-generation computer users. The X12STW-F/TF dramatically increases system performance for a multitude of server applications.

The Intel Xeon E-2300, 10th Generation Pentium processor and the C256 chipset support the following features:

- Support for Intel SPS 6.x FW

- Improved I/O capabilities optimized in 1U

- Integrated Graphics

- Intel Node Manager, which provides a suite of tools to control and monitor power, thermal, and resource usage

- PCI Express 3.0/4.0, SATA 3.0, USB 3.2

1.3 Special Features

Recovery from AC Power Loss

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

1.4 System Health Monitoring

This section describes the health monitoring features of the X12STW-F/TF motherboard. The motherboard has an onboard System Hardware Monitoring chip that supports system health monitoring.

Onboard Voltage Monitors

An onboard voltage monitor will scan the voltages of the onboard chipset, memory, CPU, and battery continuously. Once a voltage becomes unstable, a warning is given, or an error message is sent to the screen.

Fan Status Monitor with Firmware Control

The BMC monitors system health and constantly checks the status of the cooling fans for normal operation. Both the CPU and chassis fans are controlled by the BMC.

Environmental Temperature Control

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

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.

1.6 Power Supply

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

This motherboard accommodates a 24-pin ATX power supply. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. In addition, one 12V 8-pin power connection is also required to ensure adequate power supply to the system.

> **Warning:** To avoid damaging the power supply or the motherboard, use a power supply that contains a 24-pin and an 8-pin power connector. Be sure to connect the power supplies to the 24-pin power connector (JPWR1), and the 8-pin power connector (JPWR2) on the motherboard. Failure in doing so may void the manufacturer warranty on your power supply and motherboard.

It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant.

1.7 Serial Port

This motherboard supports two serial communication connections. COM port 1 and COM header 2 can be used for input/output. The UART provides legacy speeds with a baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support high-speed serial communication devices.

Chapter 2

Installation

2.1 Static-Sensitive Devices

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

Precautions

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

- Touch a grounded metal object before removing the board from the antistatic bag.

- Handle the motherboard by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.

- When handling chips or modules, avoid touching their pins.

- Put the motherboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure that your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

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

Unpacking

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

2.2 Processor and Heatsink Installation

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

Important:

- Use ESD protection.

- Unplug the AC power cord from all power supplies after shutting down the system.

- Check that the plastic protective cover is on the CPU socket and none of the socket pins are bent. If they are, contact your retailer.

- When handling the processor, avoid touching or placing direct pressure on the LGA lands (gold contacts). Improper installation or socket misalignment can cause serious damage to the processor or CPU socket, which may require manufacturer repairs.

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

- Refer to the Supermicro website for updates on processor support.

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

Installing the LGA1200 Processor

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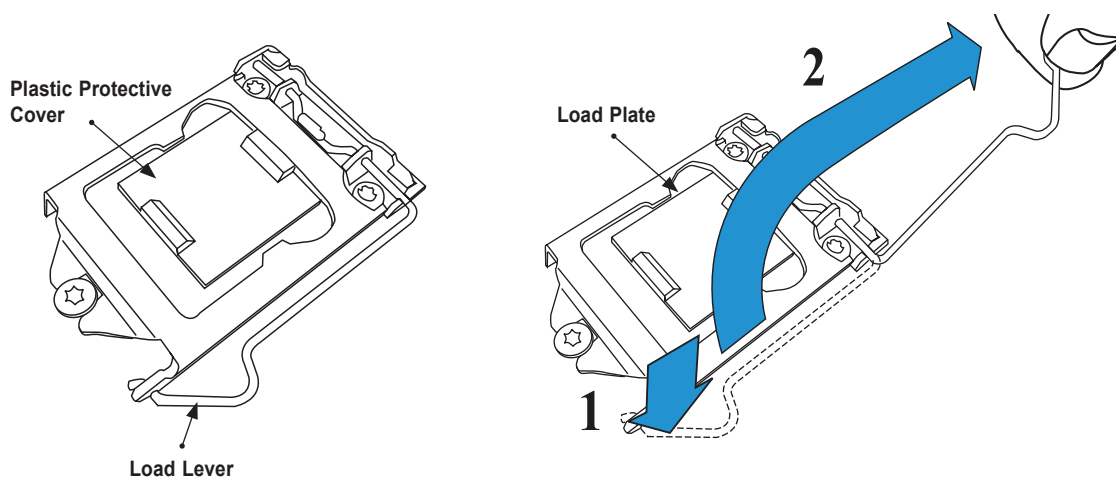
2. Gently lift the load lever to open the load plate. Remove the plastic protective cover. Do not touch the CPU socket contacts.
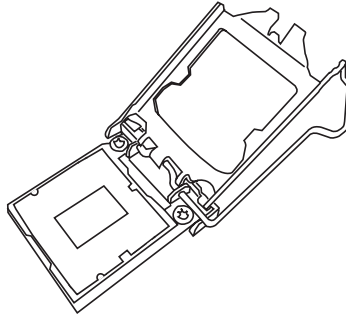
3. Locate the triangle on the CPU and CPU socket, which indicates the location of Pin 1. Holding the CPU by the edges with your thumb and index finger, align the triangle on the CPU with the triangle on the socket. The CPU keys (the semi-circle cutouts) may also be aligned against the socket keys as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

Pin 1

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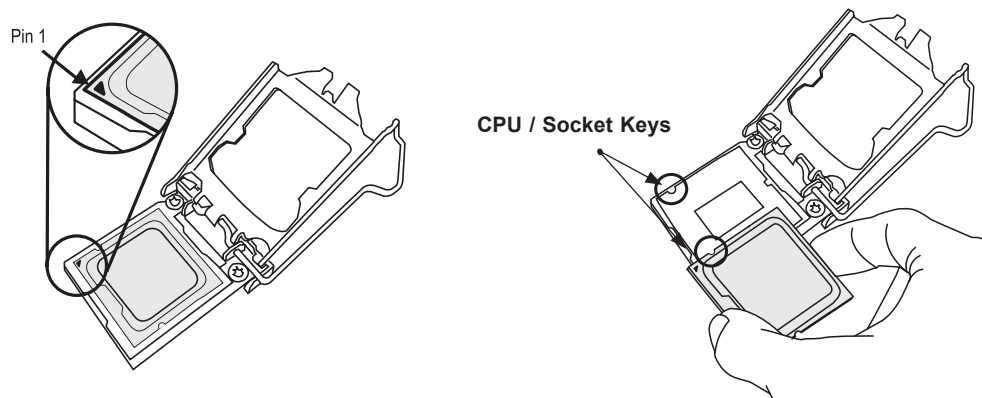
4. Carefully lower the CPU straight down into the socket. Do not drop the CPU on the socket, or move it horizontally or vertically to avoid damaging the CPU or socket. Inspect the four corners of the CPU to make sure that the CPU is properly installed.
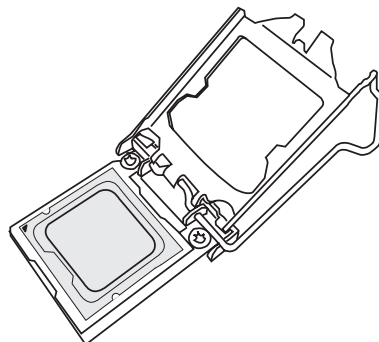
5. Close the load plate, then gently push down the load lever into its locking position.

CPU properly installed

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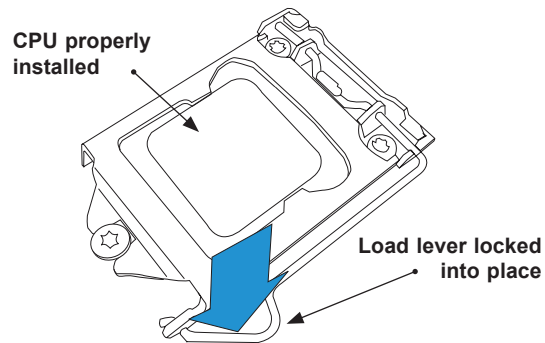
> **Note:** You can only install the CPU in one direction. Make sure it is properly inserted into the socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU is properly aligned.

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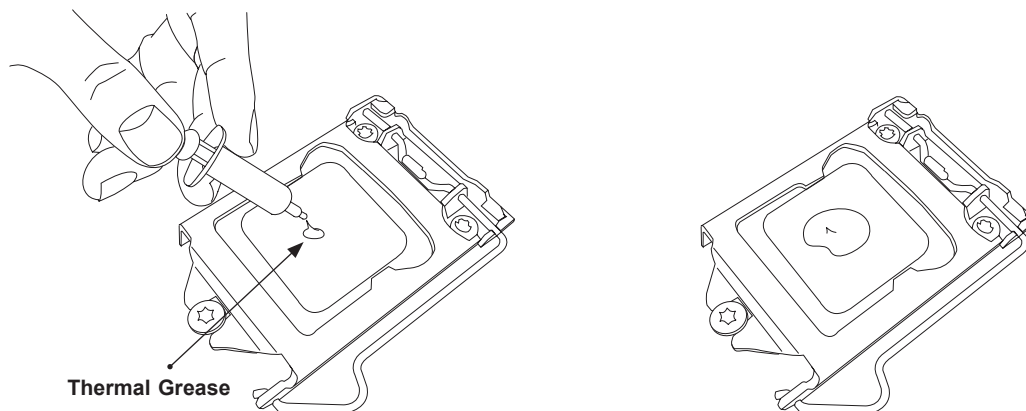
6. Align the four heatsink fasteners with the mounting holes on the motherboard. Gently push down the fasteners in a diagonal order (Example: #1 and #2, then #3 and #4) into the mounting holes until you hear a click, then lock the fasteners by turning each one 90° clockwise.
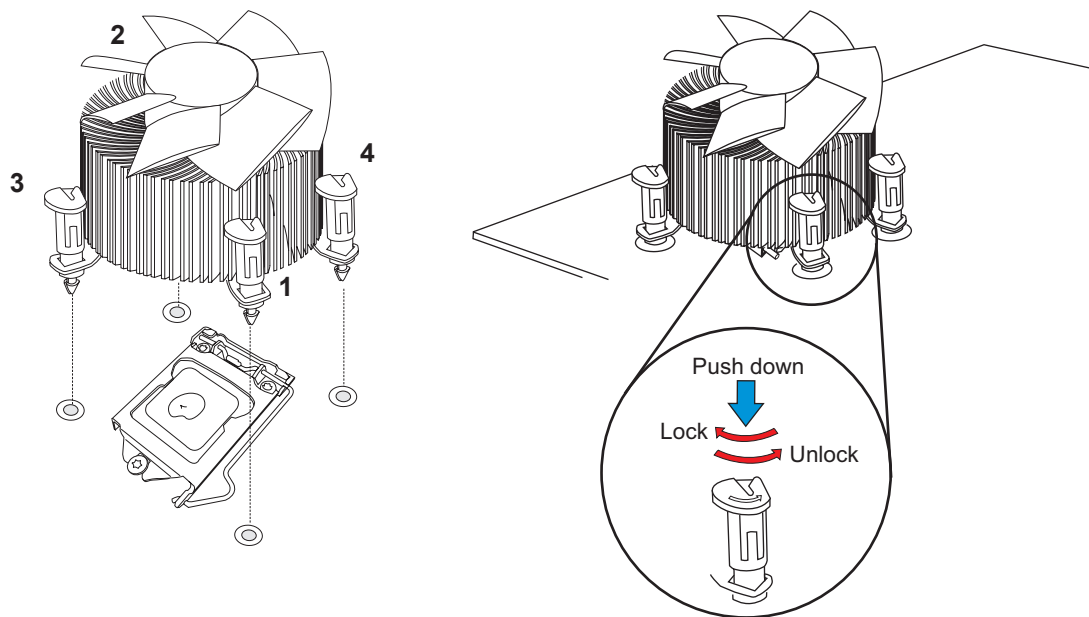
7. Once all four fasteners are secured, connect the heatsink fan wire connector to the CPU fan header.
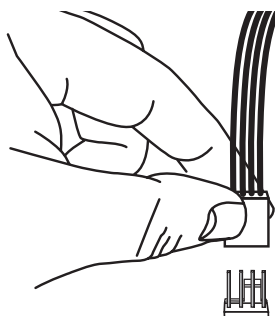
Removing the Heatsink

> **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.
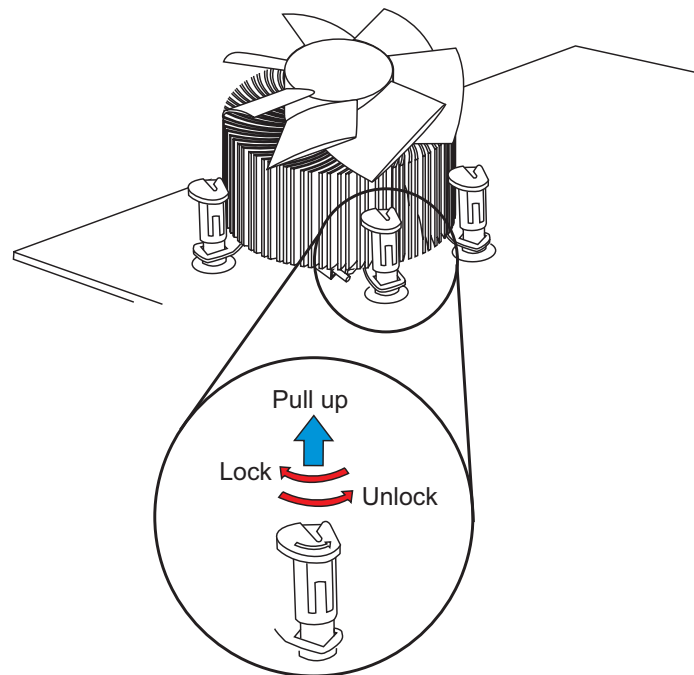
2.3 Motherboard Installation

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 (7)

Standoffs (7) Only if Needed
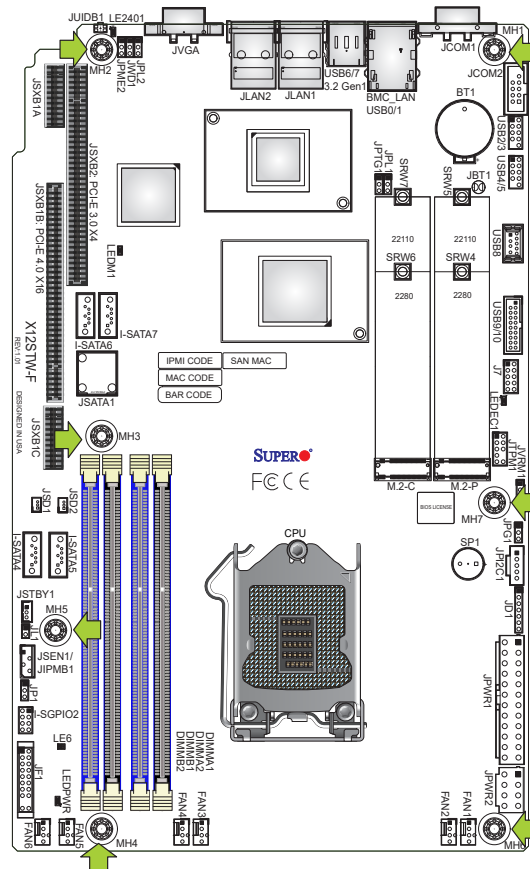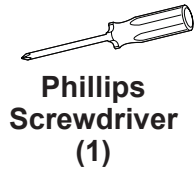
Location of Mounting Holes

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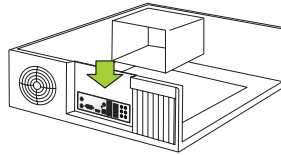
2. Locate the mounting holes on the motherboard. See the previous page for the location.
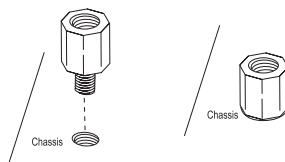
3. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.
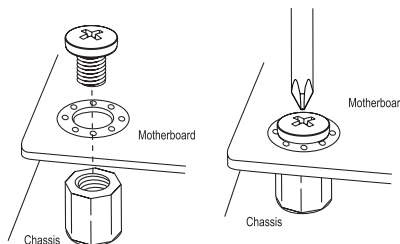
4. Install standoffs in the chassis as needed.

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 X12STW-F/TF supports up to 128GB of DDR4 ECC UDIMM memory with speeds of up to 3200MHz in four 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 tables below for the recommended DIMM population order and additional memory information.

DIMM Module Population Configuration

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

Recommended Population (Balanced)				
DIMMA1	DIMMB1	DIMMA2	DIMMB2	Total System Memory
		2GB	2GB	4GB
2GB	2GB	2GB	2GB	8GB
		4GB	4GB	8GB
4GB	4GB	4GB	4GB	16GB
		8GB	8GB	16GB
8GB	8GB	8GB	8GB	32GB
		16GB	16GB	32GB
16GB	16GB	16GB	16GB	64GB
		32GB	32GB	64GB
32GB	32GB	32GB	32GB	128GB

Max Memory Possible	4 Gb DRAM Technology	8 Gb DRAM Technology	16 Gb DRAM Technology
Single Rank UDIMM	16 GB (4 x 4 GB DIMMs)	32 GB (4 x 8 GB DIMMs)	64 GB (4 x 16 GB DIMMs)
Dual Rank UDIMMs	32 GB (4 x 8 GB DIMMs)	64 GB (4 x 16 GB DIMMs)	128 GB (4 x 32 GB DIMMs)

General Guidelines for Optimizing Memory Performance

• The blue slots must be populated first. DIMM slots must be populated in the following order: DIMMB2, DIMMA2, then DIMMB1, DIMMA1.

• It's recommended to use DDR4 memory of the same type, size, and speed.

• Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.

• The motherboard will support odd-numbered modules (one or three modules installed). However, to achieve the best memory performance, a balanced memory population is recommended.
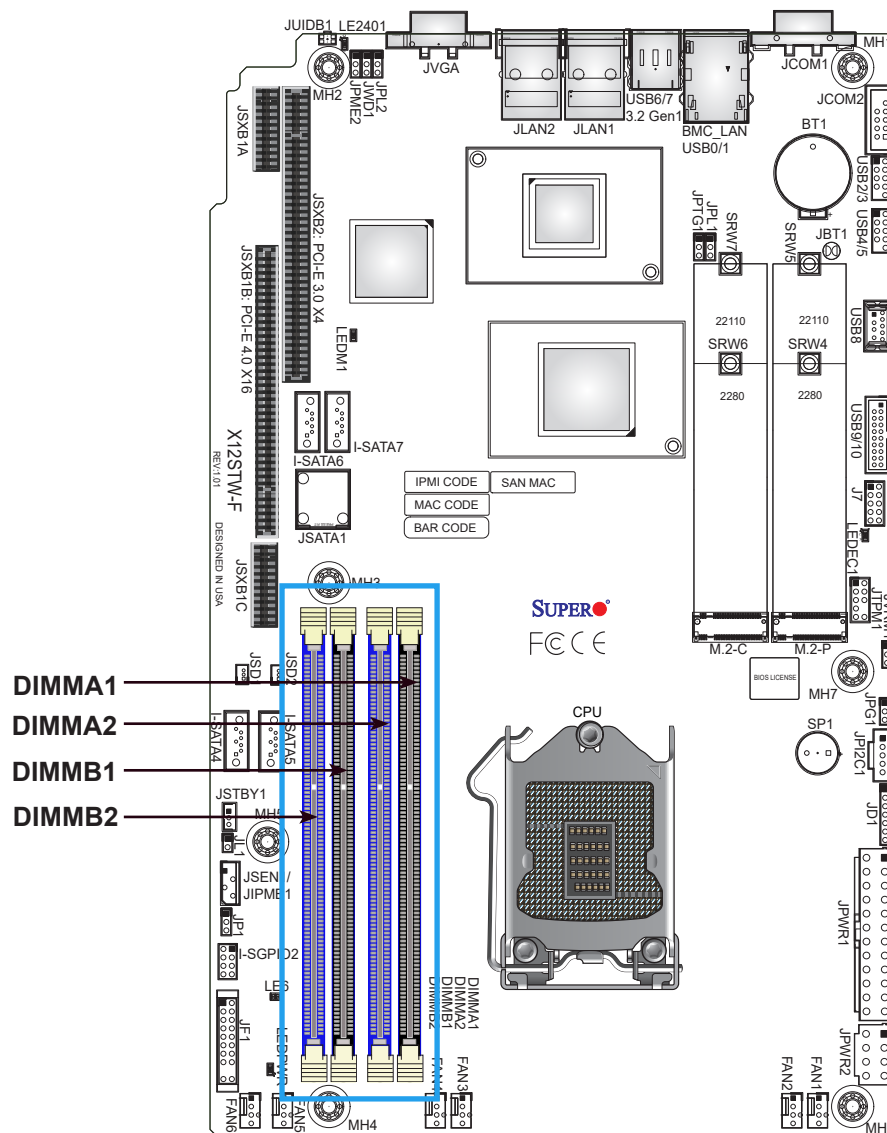
DIMM Installation

1. Insert DIMM modules in the following order: DIMMB2, DIMMA2, then DIMMB1, DIMMA1. For the system to work properly, please use memory modules of the same type and speed.

2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.

3. Align the key of the DIMM module with the receptive point on the memory slot.

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

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

6. Press the release tabs to the lock positions to secure the DIMM module into the slot.
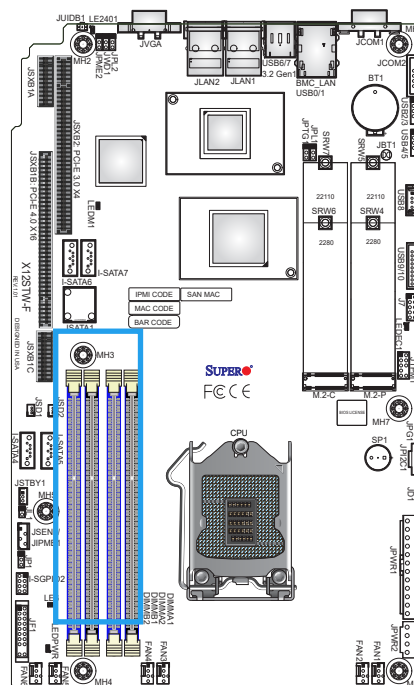
DIMM Removal

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

Notches

Release Tabs

Push both ends straight down into the memory slot.
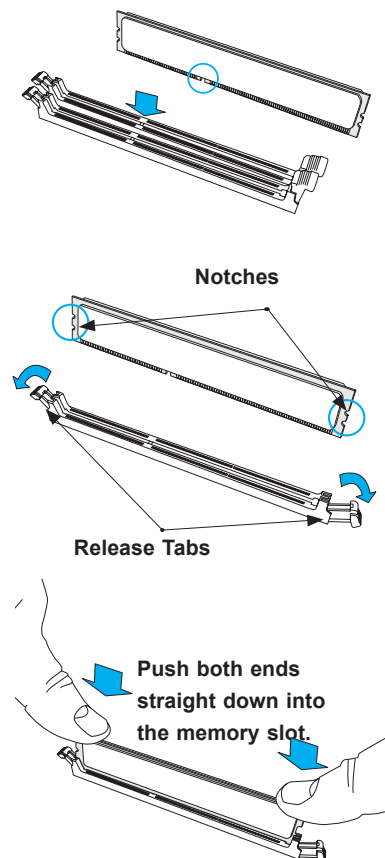
2.5 Rear I/O Ports

See Figure 2-1 below for the locations and descriptions of the various I/O ports on the rear of the motherboard.
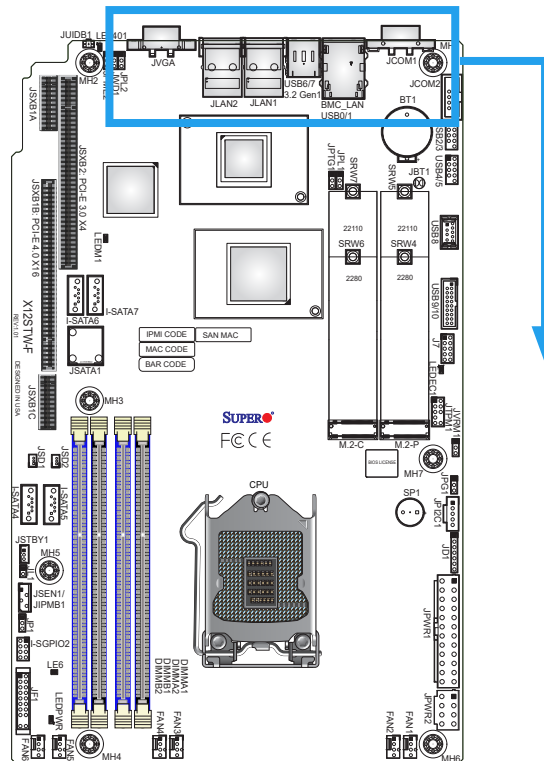
Figure 2-1. I/O Port Locations and Definitions
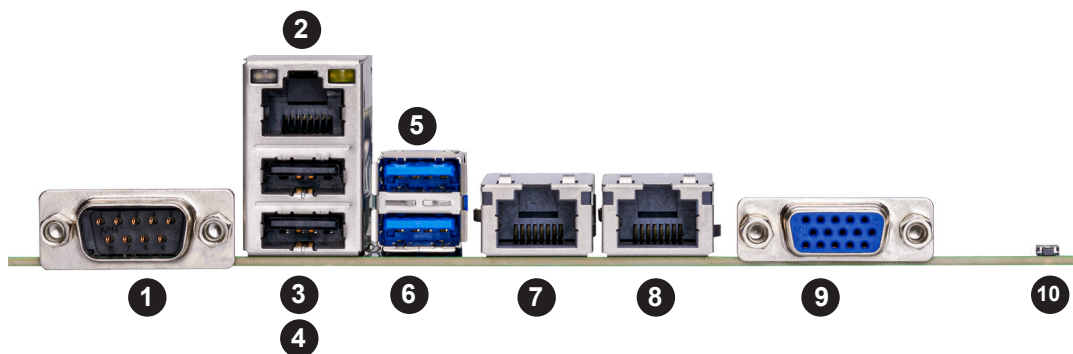
Rear I/O Ports			
#	Description	#	Description
1	COM1	6	USB6 (3.2 Gen 1)
2	Dedicated BMC LAN	7	LAN1 (1G: F; 10G: TF)
3	USB1 (2.0)	8	LAN2 (1G: F; 10G: TF)
4	USB0 (2.0)	9	VGA Port
5	USB7 (3.2 Gen1)	10	UID Switch

VGA Port

A VGA port is located next to LAN2 on the I/O back panel. Use this connection for VGA displays.

COM Port and Header

The motherboard has one COM port (JCOM1) on the back panel and one COM header (JCOM2).

COM Port (JCOM1)			
Pin Definitions			
Pin#	Definition	Pin#	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground		
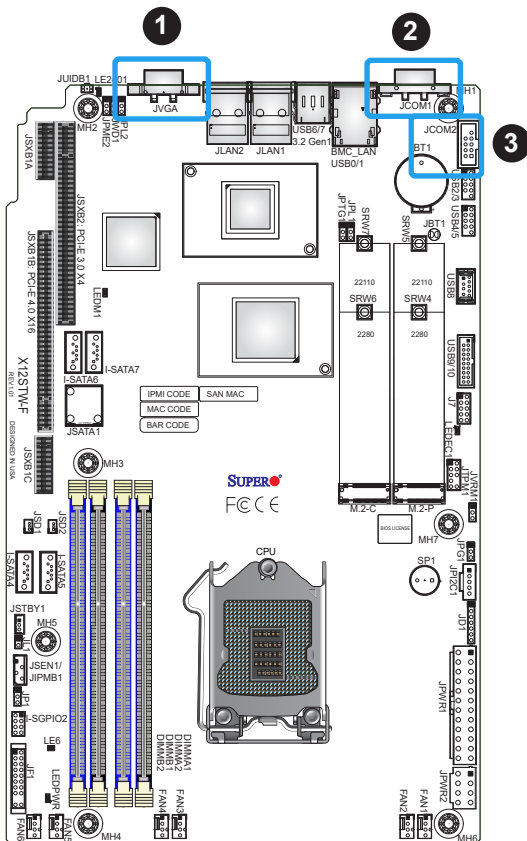
1. VGA Port
2. COM Port
3. COM Header

LAN Ports

Two 1GbE Ethernet (-F) or two 10GbE ports (-TF) (JLAN1/2) are located on the I/O back panel. In addition to the LAN ports, a dedicated BMC LAN is also 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	TRD1+	13	IET+
2	TRD1-	14	IET-
3	TRCT1	15	L1-GRE-
4	TRD2+	16	L1-GRE+
5	TRD2-	17	L2-YEL-
6	TRCT2	18	COMMON
7	TRD3+	19	L2-GRE-
8	TRD3-	20	CG1
9	TRCT3	21	CG2
10	TRD4+		
11	TRD4-		
12	TRCT4		

BMC LAN Pin Definition			
Pin#	Definition	Pin#	Definition
9	VCC	19	YEL-
10	TX1+	20	YEL+
11	TX1-	21	ORG+/GRN-
12	TX2+	22	ORG-/GRN+
13	TX2-	23	SGND
14	TX3+	24	SGND
15	TX3-	25	SGND
16	TX4+	26	SGND
17	TX4-		
18	GND		
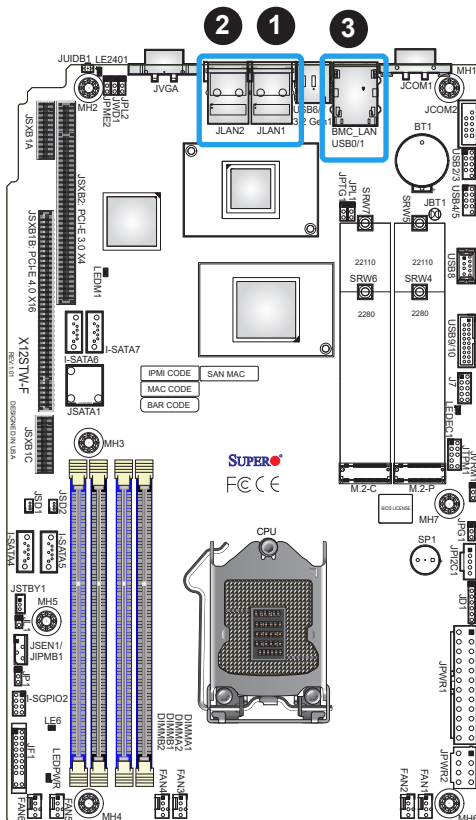
1. LAN1
2. LAN2
3. BMC LAN

Universal Serial Bus (USB) Ports

There are two USB 2.0 ports (USB0/1) and two USB 3.2 Gen 1 ports (USB6/7) located on the back I/O panel. The motherboard also has two front access USB 2.0 headers (USB2/3, USB4/5) and one front access USB 3.2 Gen 1 header (USB9/10). The USB8 header is USB 3.2 Gen 2 Type-A. 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	GND	8	GND

Front Panel USB2/3, 4/5 (2.0) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+5V	2	+5V
3	USB_N	4	USB_N
5	USB_P	6	USB_P
7	GND	8	GND
9	Key	10	NC

Back Panel USB6/7 (USB 3.2 Gen 1) Pin Definitions			
Pin#	Definition	Pin#	Definition
A1	VBUS	B1	VBUS
A2	USB_N	B2	USB_N
A3	USB_P	B3	USB_P
A4	GND	B4	GND
A5	Stda_SSRX-	B5	Stda_SSRX-
A6	Stda_SSRX+	B6	Stda_SSRX+
A7	GND	B7	GND
A8	Stda_SSTX-	B8	Stda_SSTX-
A9	Stda_SSTX+	B9	Stda_SSTX+

Front Panel USB9/10 (USB 3.2 Gen 1) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	VBUS	11	USB_P
2	Stda_SSRX-	12	USB_N
3	Stda_SSRX+	13	GND
4	GND	14	Stda_SSTX+
5	Stda_SSTX-	15	Stda_SSTX-
6	Stda_SSTX+	16	GND
7	GND	17	Stda_SSRX+
8	USB_N	18	Stda_SSRX-
9	USB_P	19	VBUS
10	GND		
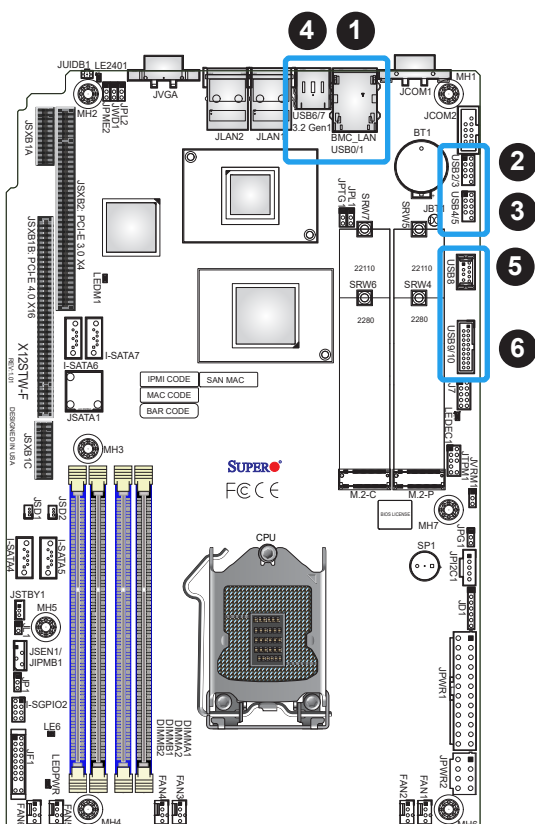
Type A USB8 (USB 3.2 Gen 2) Pin Definitions			
Pin#	Definition	Pin#	Definition
1	VBUS	5	SSRX-
2	USB_N	6	SSRX+
3	USB_P	7	GND
4	GND	8	SSTX-
		9	SSTX+

1. USB0/1
2. USB2/3
3. USB4/5
4. USB6/7
5. USB8
6. USB9/10

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 (LE2401) 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	Ground
2	Ground
3	Button In
4	Button In

UID LED Pin Definitions	
Color	**Status**
Blue: On	Unit Identified
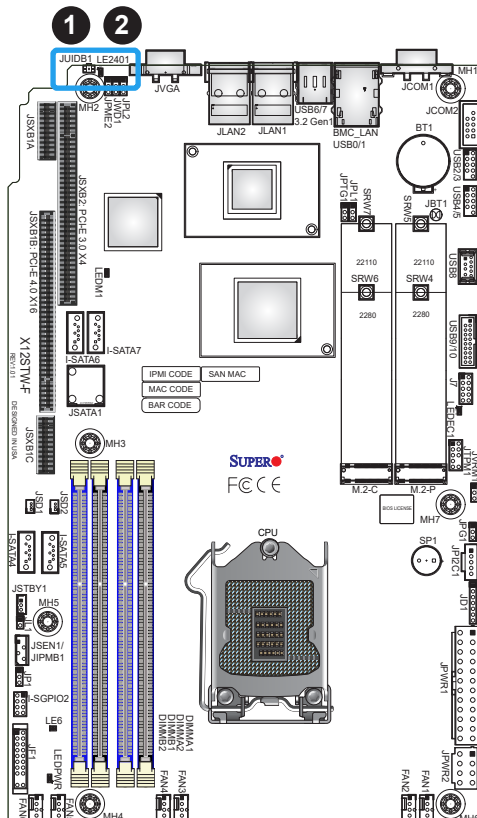
1. UID Switch
2. UID LED

2.6 Front Control Panel

JF1 contains header pins for various buttons and indicators that are normally located on a control panel at the front of the chassis. These connectors are designed specifically for use with Supermicro chassis. See the figure below for the descriptions of the front control panel buttons and LED indicators.
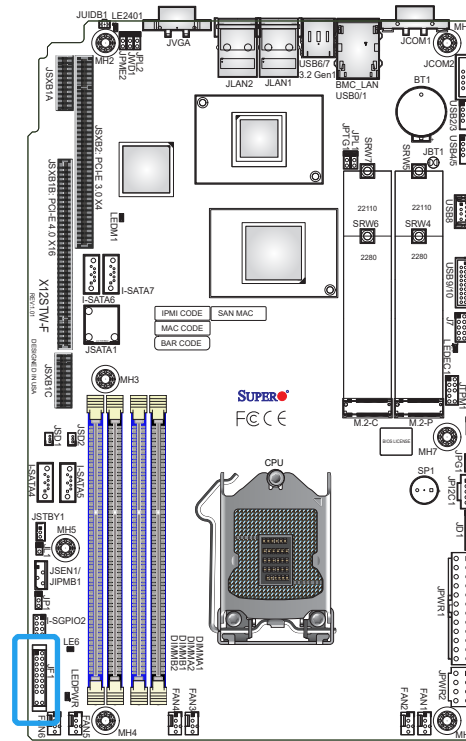
		1	2	
PWR	Power Button	○	○	Ground
Reset	Reset Button	○	○	Ground
3.3V		○	○	Power Fail LED
UID LED		○	○	OH/Fan Fail LED
3.3V Stby		○	○	NIC2 Active LED
3.3V Stby		○	○	NIC1 Active LED
UID SW		○	○	HDD LED
3.3V		○	○	PWR LED
X		○	○	X
NMI		○	○	Ground
		19	20	

Figure 2-2. JF1 Header Pins

Power Button

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

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

Reset Button

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

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

	1	2	
① PWR — Power Button	○	○	Ground
② Reset — Reset Button	○	○	Ground
3.3V	○	○	Power Fail LED
UID LED	○	○	OH/Fan Fail LED
3.3V Stby	○	○	NIC2 Active LED
3.3V Stby	○	○	NIC1 Active LED
UID SW	○	○	HDD LED
3.3V	○	○	PWR LED
X	○	○	X
NMI	○	○	Ground
	19	20	
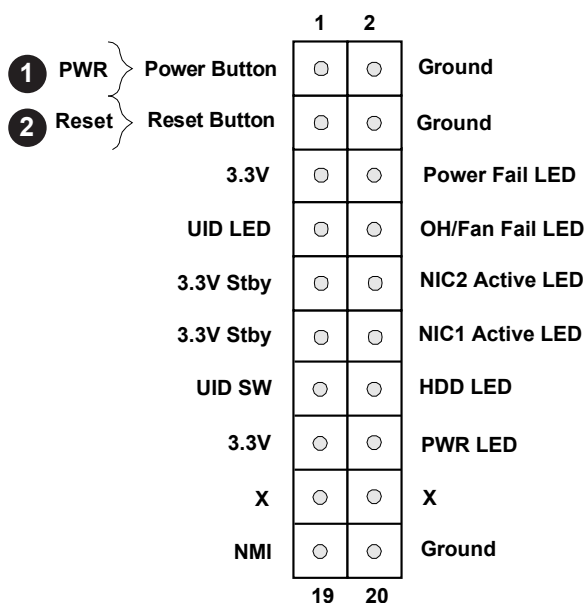
1. PWR Button

2. Reset Button

Power Fail LED

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

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

Overheat (OH)/Fan Fail and UID LED

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

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

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

	1	**2**	
PWR Power Button	○	○	Ground
Reset Reset Button	○	○	Ground
3.3V	○	○	Power Fail LED ❶
❸ UID LED	○	○	OH/Fan Fail LED ❷
3.3V Stby	○	○	NIC2 Active LED
3.3V Stby	○	○	NIC1 Active LED
UID SW	○	○	HDD LED
3.3V	○	○	PWR LED
X	○	○	X
NMI	○	○	Ground
	19	**20**	
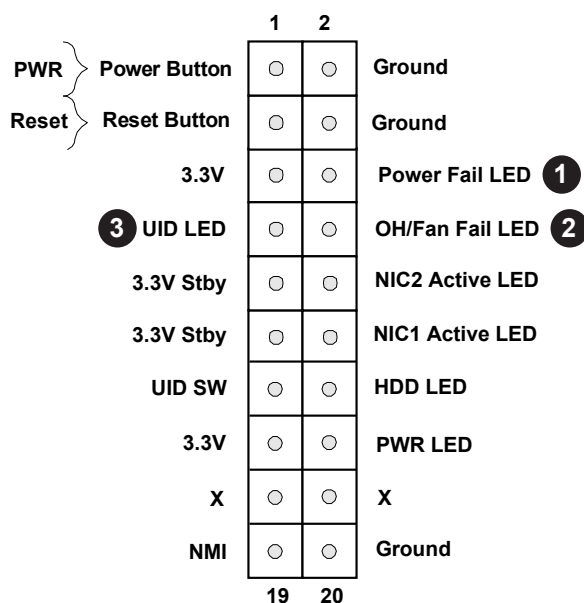
1. Power Fail LED
2. OH/Fan Fail LED
3. UID LED

NIC1/NIC2 (LAN1/LAN2)

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

NIC1/NIC2 LED Pin Definitions (JF1)	
Pin#	Definition
9	VCC
10	NIC 2 Active LED
11	VCC
12	NIC 1 Active LED

HDD LED/UID Switch

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

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

	1	**2**		
PWR — Power Button	○	○	Ground	
Reset — Reset Button	○	○	Ground	
3.3V	○	○	Power Fail LED	
UID LED	○	○	OH/Fan Fail LED	
3.3V Stby	○	○	NIC2 Active LED	**2**
3.3V Stby	○	○	NIC1 Active LED	**1**
4 UID SW	○	○	HDD LED	**3**
3.3V	○	○	PWR LED	
X	○	○	X	
NMI	○	○	Ground	
	19	**20**		

1. NIC1 LED
2. NIC2 LED
3. HDD LED
4. UID Switch
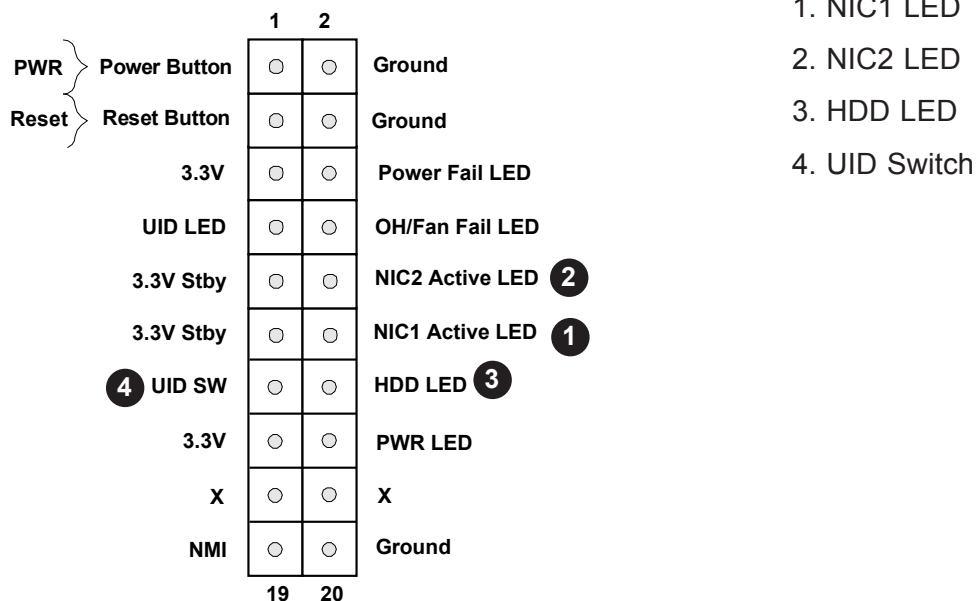
Power LED

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

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

NMI Button

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

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

	1	2	
PWR Power Button	○	○	Ground
Reset Reset Button	○	○	Ground
3.3V	○	○	Power Fail LED
UID LED	○	○	OH/Fan Fail LED
3.3V Stby	○	○	NIC2 Active LED
3.3V Stby	○	○	NIC1 Active LED
UID SW	○	○	HDD LED
3.3V	○	○	PWR LED ❶
X	○	○	X
❷ NMI	○	○	Ground
	19	20	

1. Power LED

2. NMI
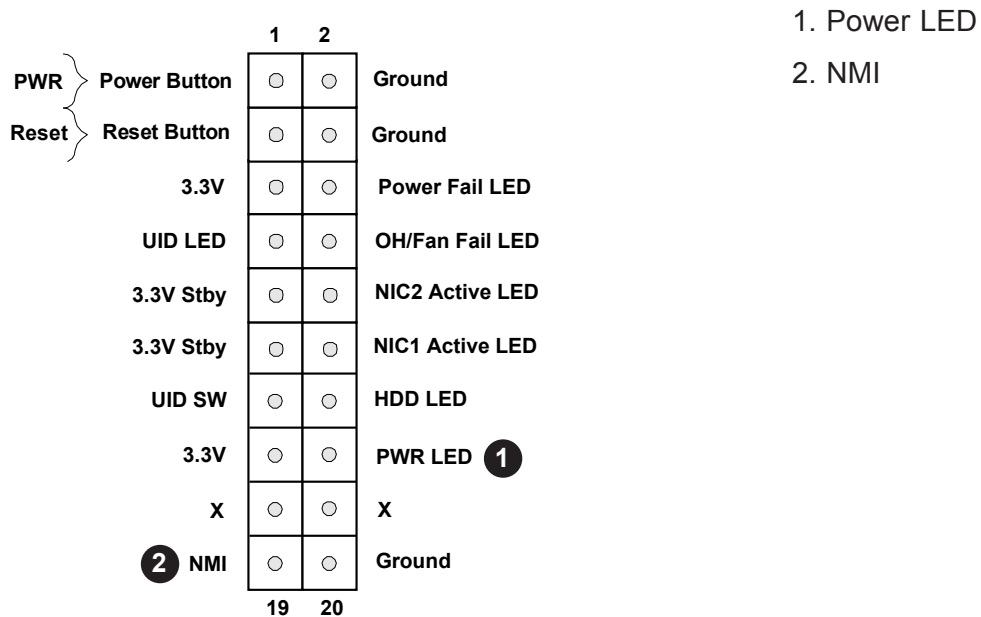
2.7 Connectors

Power Connections

ATX Power Supply Connector

The 24-pin power supply connector (JPWR1) meets the ATX SSI EPS 12V specification. You must also connect the 8-pin (JPWR2) processor power connector to the power supply.

ATX Power 24-pin Connector Pin Definitions			
Pin#	Definition	Pin#	Definition
13	+3.3V	1	+3.3V
14	NC	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

Required Connection

1. 24-pin ATX Power
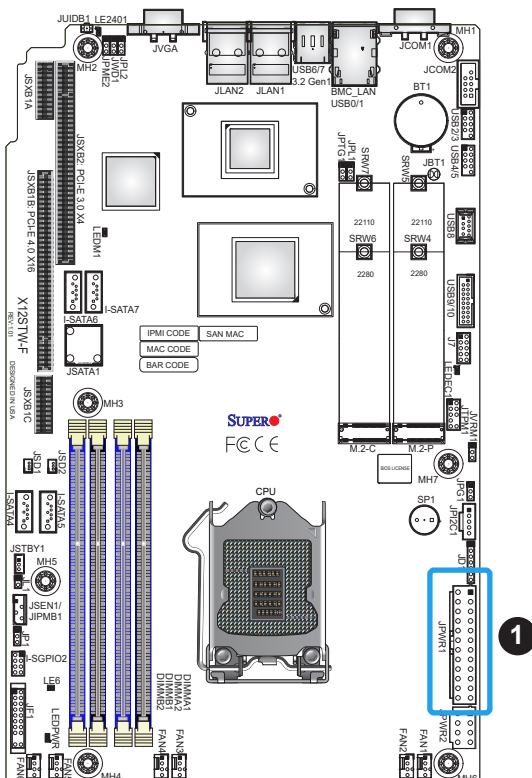
8-Pin Power Connector

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

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

Required Connection

Important: To provide adequate power supply to the motherboard, connect the 24-pin ATX PWR and the 8-pin PWR connectors to the power supply.

1. 8-pin Power
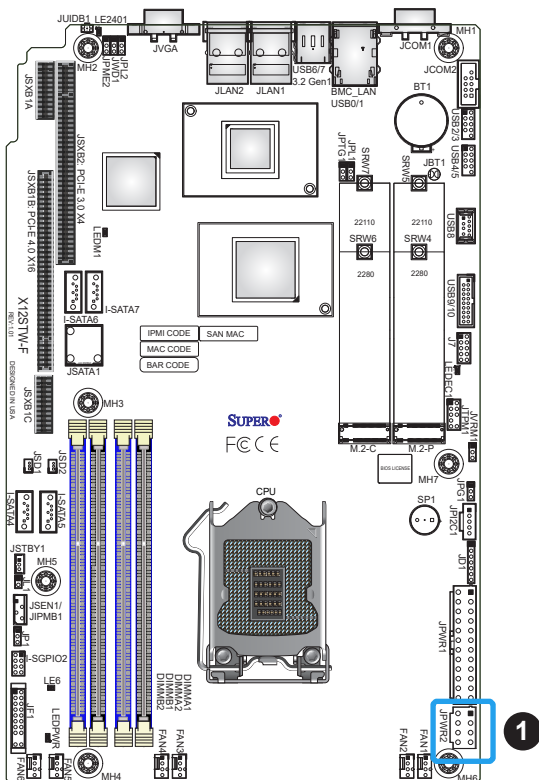
Headers

Fan Headers

There are six 4-pin fan headers (FAN1 - FAN6) 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 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
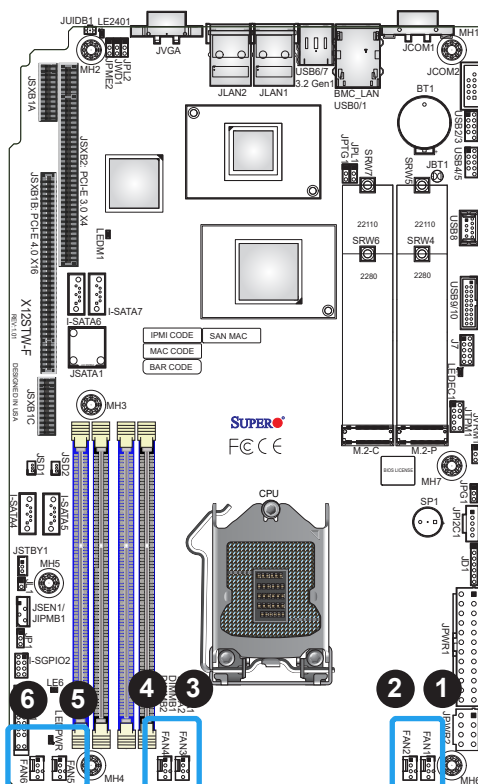
1. FAN1
2. FAN2
3. FAN3
4. FAN4
5. FAN5
6. FAN6

SGPIO Headers

There is one Serial Link General Purpose Input/Output (I-SGPIO2) header located on the motherboard. Refer to the table below for pin definitions.

SGPIO Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	Clock	8	NC

NC = No Connection

Disk-On-Module Power Connectors

The motherboard has two power connectors (JSD1, JSD2) for SATA DOM devices. Connect appropriate cables here to provide power support for your third-party SATA DOM devices.

DOM Power Pin Definitions	
Pin#	Definition
1	5V
2	Ground
3	Ground
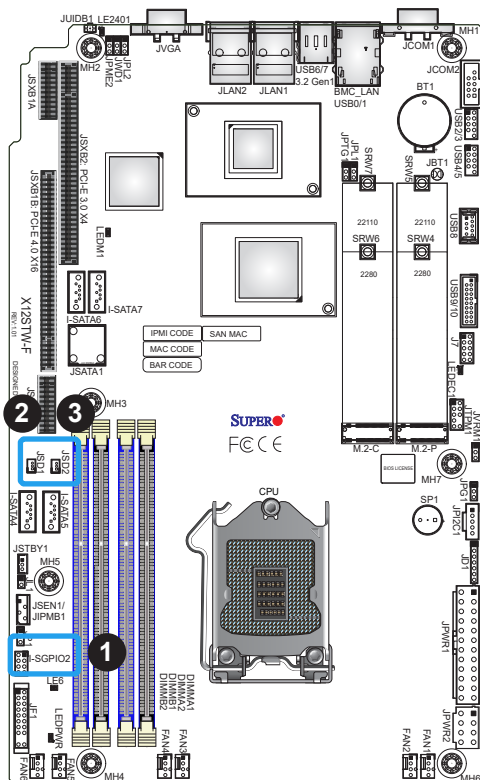
1. SGPIO Header
2. JSD1 (DOM Power)
3. JSD2 (DOM Power)

TPM/Port 80 Header

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

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

1. TPM Header
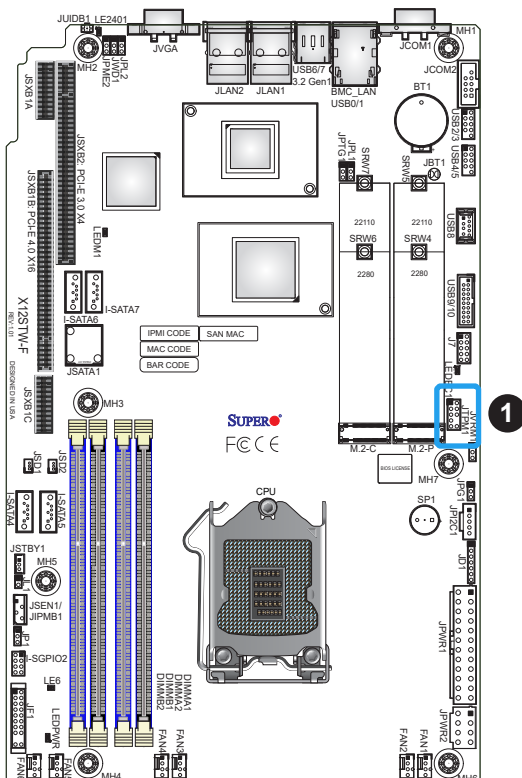
Power SMB (I²C) Header

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

Standby Power

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

Standby Power Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	No Connection
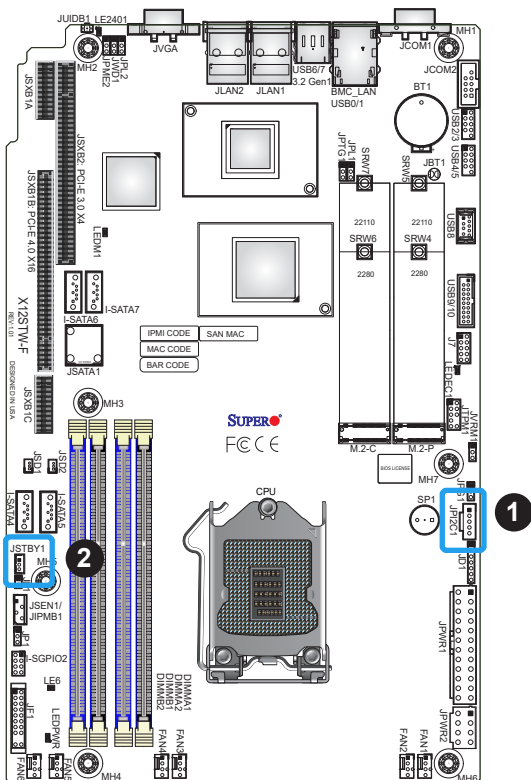
1. Power SMBus Header
2. Standby Power Header

4-pin BMC External I²C Header/System Front Inlet Temperature Sensor

JIPMB1 and JSEN1 share the same header. To switch between the two, set the jumper on JP1. See the JP1 table below for the jumper settings.

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I²C connection on your system. Refer to the table below for pin definitions. JSEN1 is the system front inlet temperature sensor. It represents the ambient air temperature entering the system. The equivalent temperature sensor retrievable by the onboard BMC is RT0.

JSEN1/JIPMB1 Header Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	PWR_RT0 or NC (Selected by JP1 Header)

JP1 Header Jumper Settings	
Pin#	Definition
1-2	JSEN1
2-3	JIPMB1

Chassis Intrusion

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

Chassis Intrusion Pin Definitions	
Pin#	Definition
1	Intrusion Input
2	Ground
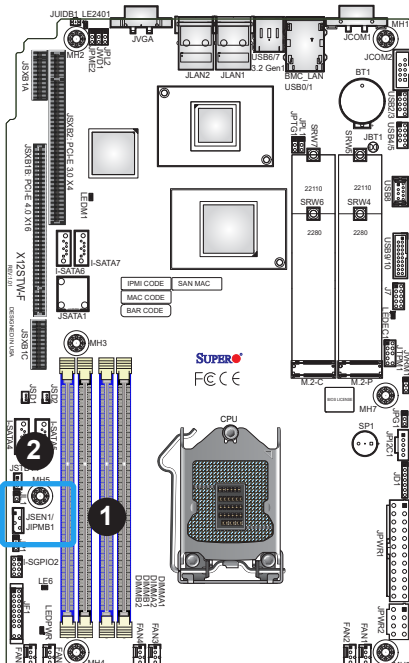
1. JSEN1/JIPMB1 Header

2. Chasis Intrusion

Speaker/Power LED

Pins 1-2 of JD1 are used for power LED indication, and pins 4-7 are for the speaker. Please note that the speaker connector pins are used with an external speaker. Refer to the tables below for pin definitions.

PWR LED Connector Pin Definitions	
Pin#	Signal
1	VCC
2	FP_PWR_LED_N
3	FP_PWR_LED_N

Speaker Connector Pin Definitions	
Pin#	Signal
4	P5V
5	NC
6	R_SPKRIN_N
7	R_SPKRIN

Internal Buzzer

The Internal Buzzer (SP1) is used to provide audible indications for various beep codes. Refer to the table below for pin definitions.

Internal Buzzer Pin Definitions		
Pin#	Definition	
1	Pos (+)	VCC
2	Neg (-)	Beep In

1. Speaker/Power LED
2. Internal Buzzer
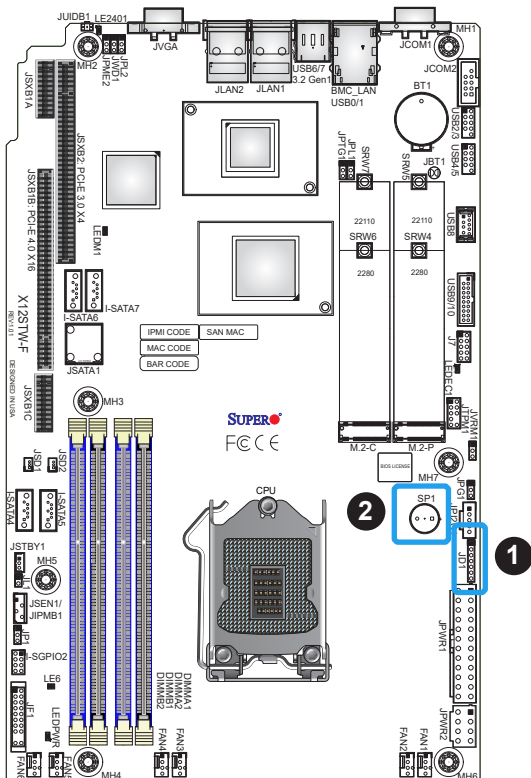
SATA Ports

Eight SATA 3.0 ports are located on the motherboard supported by the C256 chipset. These SATA ports support RAID 0, 1, 5, and 10. SATA ports provide serial-link signal connections, which are faster than the connections of Parallel ATA.

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

M.2 Slot

This motherboard has two M.2 slots (M.2-C and M.2-P). M.2 was formerly known as Next Generation Form Factor (NGFF) and serves to replace mini PCIe. M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2-C slot on the motherboard supports PCIe 4.0 x4 SSD cards in the 2280 and 22110 form factors, while the M.2-P supports PCIe 3.0 x4. M.2-C is not supported when a Pentium processor is installed.
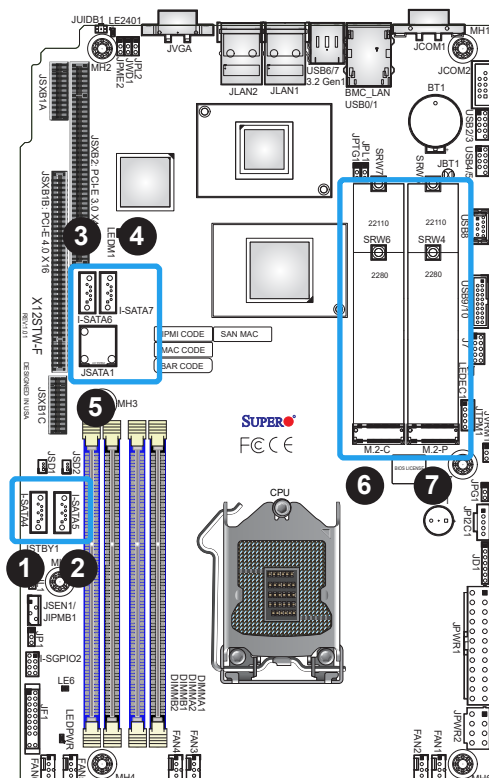
1. I-SATA4
2. I-SATA5
3. I-SATA6
4. I-SATA7
5. JSATA1 (I-SATA0-3)
6. M.2-C
7. M.2-P

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.
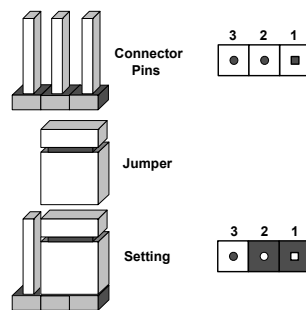
CMOS Clear

JBT1 is used to clear CMOS, which also clears the system BIOS password. 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.

JBT1 contact pads

Watch Dog Timer

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

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

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 will allow you to flash the system firmware from a host server for system setting modifications. Refer to the table below for jumper settings.

ME Manufacturing Mode Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	Manufacturing Mode
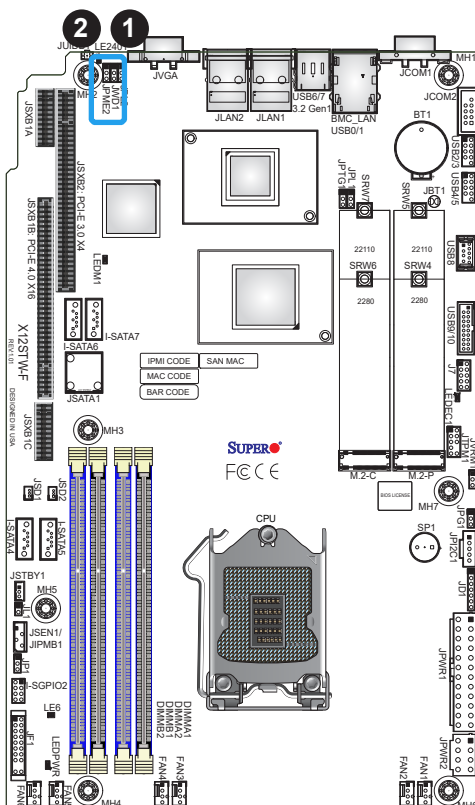
1. Watch Dog Timer
2. ME Manufacturing Mode

LAN1/LAN2 Enable/Disable (LAN I210)

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

LAN X550 Enable/Disable

Use jumper JPTG1 to enable or disable LAN X550.

LAN X550 Enable/Disable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled
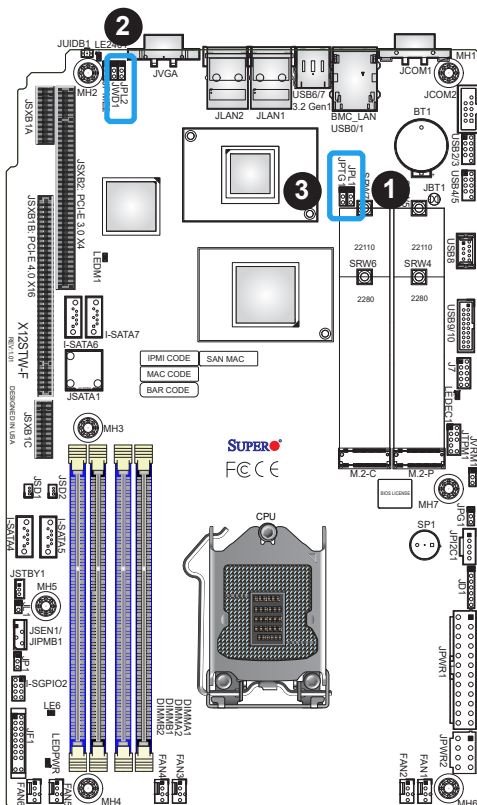
1. LAN1 Enable/Disable (LAN I210)
2. LAN2 Enable/Disable (LAN I210)
3. LAN X550 Enable/Disable

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port using the onboard graphcs controller. Refer to the table below for jumper settings.

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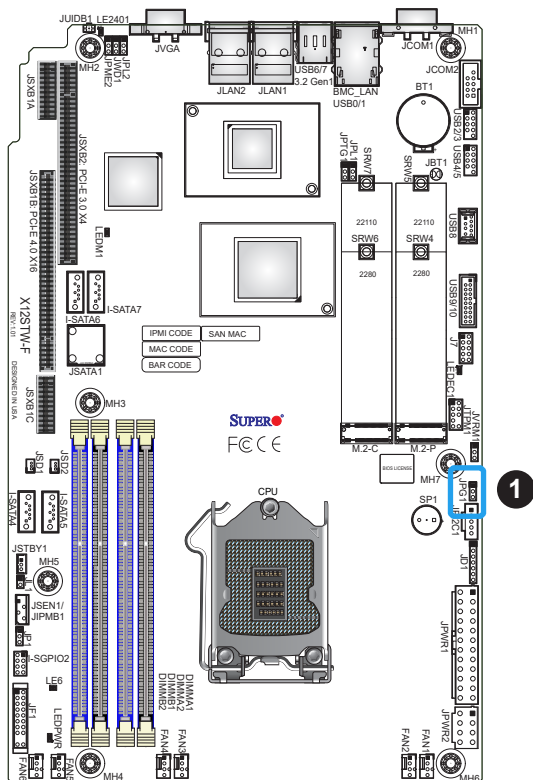
1. VGA Enable/Disable

2.9 LED Indicators

LAN LEDs

Two LAN ports (JLAN1 and JLAN2) are located on the I/O back panel of the motherboard. Each Ethernet LAN port has two LEDs. The green LED indicates activity, while the other Link LED may be green, amber, or off to indicate the speed of the connection. Refer to the tables below for more information.

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

LAN Link LED (Left) LED State (-TF SKU)	
LED Color	Definition
Green	10Gbps
Yellow/Amber	1Gbps

LAN Link LED (Left) LED State (-F SKU)	
LED Color	Definition
Off	No Connection
Amber	1 Gbps
Green	100 Mbps

BMC LAN LEDs

In addition to the two LAN ports, an BMC LAN is also located on the I/O back panel. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. Refer to the table below for more information.

BMC LAN

Link LED   Activity LED
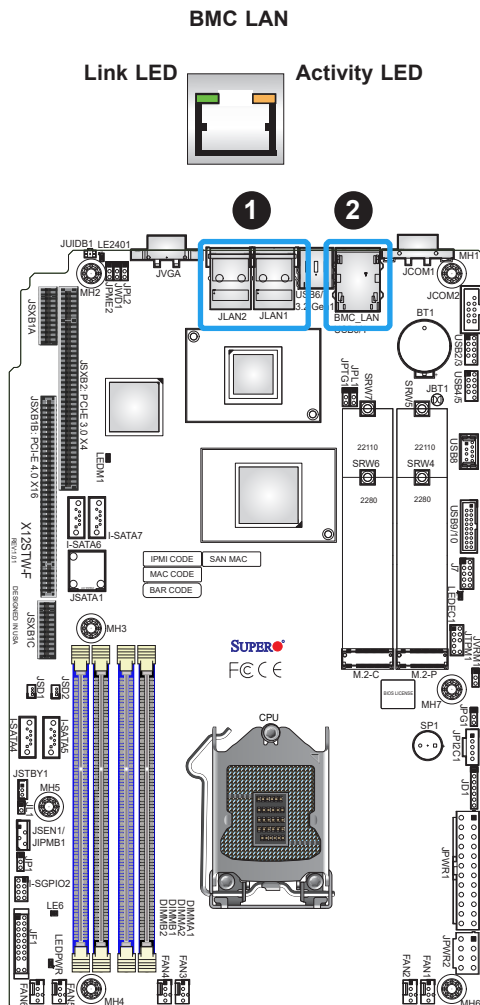
BMC LAN LEDs		
	Color/State	Definition
Link (left)	Green: Solid	100 Mbps
	Amber: Solid	1Gbps
Activity (Right)	Amber: Blinking	Active

1. JLAN1, JLAN2 LED

2. BMC LAN

Power LED

LEDPWR is the Power LED. When this LED is lit, power is present on the motherboard. In suspend mode, this LED will blink on and off. Turn off the system and unplug the power cord before removing or installing components.

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 functioning normally. Refer to the table below for the LED status.

BMC Heartbeat LED Indicator	
LED Color	**Definition**
Green: Blinking	BMC Normal
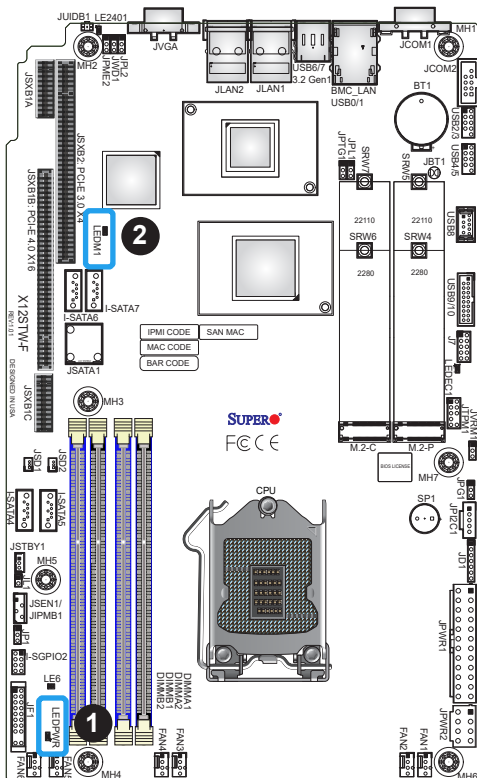
1. Power LED

2. BMC Heartbeat LED

Power Ready LED

A Power Ready LED is located at LE6 on the motherboard. When this LED is green, all onboard power VRMs are normal. See the table below for more information.

Power Ready LED Indicator	
LED Color	**Definition**
Green	All onboard PWR VRMs are normal
Red	One or more PWR VRMs has failed
Amber	System in standby mode

Embedded Controller LED

LEDEC1 is the Embedded Controller Hearbeat LED. When this LED is blinking green, the EC is normal.

EC Heartbeat LED Indicator	
LED Color	**Definition**
Blinking Green	EC normal
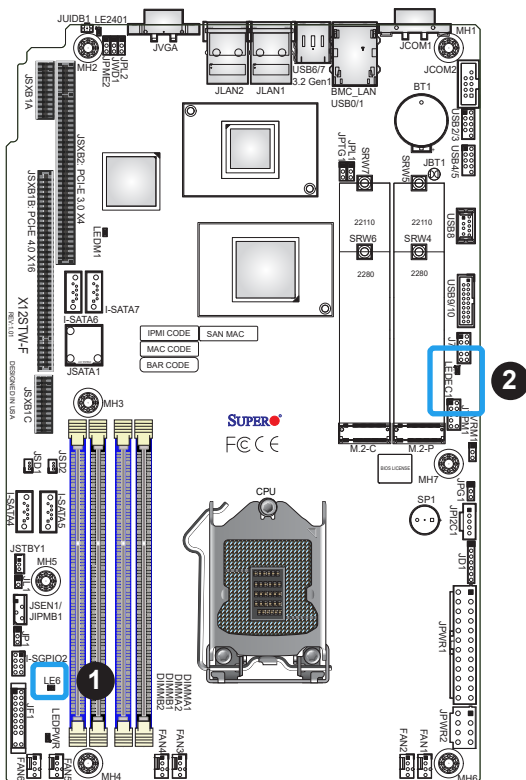
1. Power Ready LED
2. EC Heartbeat LED

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 boards 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 LEDM1.

6. 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.

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 as CD/DVD.

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

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

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

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

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

7. Check the motherboard webpage for OS compatibility guidance. Verify that the compatible CPU and memory are used in accordance with the 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 DDR4 ECC UDIMM modules. 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.

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, use the same type.
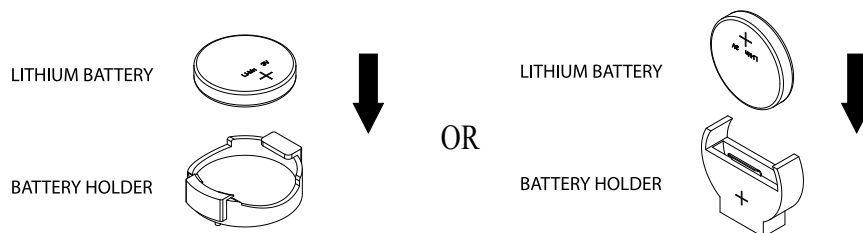
3.5 Returning Merchandise for Service

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

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

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

Chapter 4

UEFI BIOS

4.1 Introduction

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

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

                                              Set the Date. Use Tab to
   System Date                [Thu 07/22/2021]   switch between Date
   System Time                [17:16:06]         elements.
                                              Default Ranges:
   Supermicro X12STW-TF                        Year: 1998-9999
   BIOS Version               T20210702145356  Months: 1-12
   Build Date                 07/02/2021       Days: Dependent on month
   CPLD Version               01.C2.00         Range of Years may vary.

   Memory Information
   Total Memory               131072 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 X12STW-TF

BIOS Version

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

Build Date

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

CPLD Version

This feature displays the CPLD version.

Memory Information

Total Memory

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

4.3 Advanced

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

```
                        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
 ▶ Trusted Computing
 ▶ HTTP Boot Configuration

 ▶ Tls Auth Configuration
 ▶ iSCSI Configuration
 ▶ Intel(R) Ethernet Controller X550 - 3C:EC:EF:79:CA:AC
 ▶ Intel(R) Ethernet Controller X550 - 3C:EC:EF:79:CA:AD    →←: Select Screen
                                                            ↑↓: Select Item
 ▶ Driver Health                                            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 boot up. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are Disabled and **Enabled**.

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 boot up 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 boot up. The options are **Immediate** and Postponed.

Re-try Boot

If this feature is enabled, the BIOS automatically reboots 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 allows 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 is displayed:

- Type

- CPU Signature

- Microcode Revision

- 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 Programming. The options are **Disabled** and Enabled.

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

CPU Flex Ratio Settings

Use this feature to set the non-turbo mode processor core ratio multiplier. Select a value here.

Hardware Prefetcher

If set to Enable, 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, 3, 4, 5, 6, and 7.

Hyper-Threading

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

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 for P State for OS control mode. The options are Disabled and **Enabled**.

HwP Autonomous Per Core P State

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

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 the Platform Power Limit 1 programming. The options are **Disabled** and Enabled.

Power Limit 2

Use this feature to enable or disable the 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, Select Onwer EPOCH input type, SGX Launch Control Policy, and Enable/Disable SGX Debug Mode are available for configuration:

Select Onwer EPOCH input type

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

SGX Launch Control Policy

Use this feature to select the SGX Launch Control Policy. The options are **Unlocked**, Intel Locked, and Locked.

PRMRR Size

This feature is available for configuration if Software Guard Extension is set to Enabled. Use this feature to select the PRMRR size. The options are 64MB, 128MB, 256MB, and **512MB**.

Enable/Disable SGX Debug Mode

Use this feature to enable or disable SGX 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

System Agent (SA) Configuration

- VT-d

▶Memory Configuration

- Memory Configuration

- Memory RC Version

- Memory Frequency

- Memory Timings (tCL-tRCD-TRP-tRAS)

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 Disable and **Enable**.

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 restarts the MRC in cold mode if the software memory test fails during fast flow. The options are Disable and **Enable**.

Enable RH Prevention

Use this feature to actively prevent Row Hammer. The options are **Disable** and Enable.

If the feature above is set Enable, the next two features are available for configuration:

Row Hammer Solution

Use this feature to select the moethod used to prevent Row Hammer. The options are **Hardware RHP** and 2x Refresh.

RH Activation Probability

Use this feature to adjust MC for Hardware RHP. The options are $1/2^1$, $1/2^2$, $1/2^3$, $1/2^4$, $1/2^5$, $1/2^6$, $1/2^7$, $1/2^8$, $1/2^9$, $1/2^{10}$, **$1/2^{11}$**, $1/2^{12}$, $1/2^{13}$, $1/2^{14}$, and $1/2^{15}$.

Power Down Mode

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

Power 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 Disable and **Enable**.

Force ColdReset

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

Force Single Rank

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

Fast Boot

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

Train on Warm Boot

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

Memory Test on Warm Boot

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

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 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 Port Configuration

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 feature 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.

Internal Graphics

Use this feature to keep IGFX enabled or disabled. The options are **Disabled** and Enabled.

Stop Grant Configuration

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

If the feature above is set to Manual, Number of Stop Grant Cycles is available for configuration:

Number of Stop Grant Cycles

Use this feature to select the number of Stop-Grant cycles. The default value is **1**.

VT-d

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

X2APIC Opt Out

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

DMA Control Guarantee

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

IGD VTD Enable

Use this feature to enable or disable IGD VTD. The options are **Enable** and Disable.

IOP VTD Enable

Use this feature to enable or disable IOP VTD. The options are **Enable** and Disable.

Thermal Device (B0:D4:F0)

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

GNA Device (B0:D8:F0)

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

▶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.

▶RSC-R1UW-E8R SLOT1 PCI-E X8

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.

▶**M.2-P**

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 **Enable** and Disable.

▶**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 2 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=3;), (IO=2F8h; IRQ=3;), (IO=3E8h; IRQ=3;), and (IO=2E8h; IRQ=3;).

Serial Port 2 Attribute

Use this feature to select the Serial Port 2 attribute. The options are **SOL** and COM.

▶Serial Port Console Redirection

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.

COM2/SOL Console Redirection

Select Enabled to use the COM2/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:

▶COM2/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 COM2/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

Select AHCI to configure an sSATA drive specified as an AHCI drive. Select RAID to configure an sSATA drive specified as a RAID drive. The options are **AHCI** and Intel RSTe Premium With Intel Optane System Acceleration.

If the feature above is set to Intel RSTe Premium With Intel Optane System Acceleration, the SATA Interrupt Selection is available for configuration:

SATA Interrupt Selection

Use this feature to select the interrupt that will be available to the operating system. 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 0-7

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

SATA Port 0-7 Hot Plug

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

SATA Port 0-7 Spin Up Device

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

SATA Port 0-7 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

RSC-W-68G4 SLOT1 PCI-E 3.0 X16 OPROM

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

RSC-W-68G4 SLOT2 PCI-E 3.0 X8 OPROM

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

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

Use this feature to select which firmware type to be loaded for the add-on card in this slot. The options are Disabled and **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:xxxxxxxxxxxxx-IPv6 Network Configuration**
▶**MAC:xxxxxxxxxxxxx-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.

▶Trusted Computing

Security Device Support

If this feature and the TPM jumper on the motherboard are both set to Enable, onboard security devices are enabled for Trusted Platform Module (TPM) support to enhance data integrity and network security. Reboot the system for changes to take effect. The options are Disable and **Enable**.

TPM State

This feature changes the TPM State. The options are Disabled and **Enabled**. The system will restart to change the TPM State.

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.

Current Status Information

Firmware Version:

Vendor:

TPM Enabled Status:

TPM Active Status:

TPM Owner Status:

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.

▶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 host name 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**.

▶TLS Authentication Configuration

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

▶Server CA Configuration

▶Enroll Certification

Enroll Certification Using File

Use this feature to enroll certification from a file.

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.

▶iSCSI Configuration

▶Add an Attempt

▶Delete Attempts

▶Change Attempt Order

▶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 submenu provides the health status for the network drivers and controllers, and all UEFI drivers detected by the system.

▶Intel(R) PRO/1000 6.5.01 PCI-E

Information is displayed if a controller is detected.

▶Intel(R) Gigabit 0.0.29

Information is displayed if a controller is detected.

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 view the
 ▶ View SMBIOS Event Log                             SMBIOS Event Log records.




                                                    ←→: 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
```
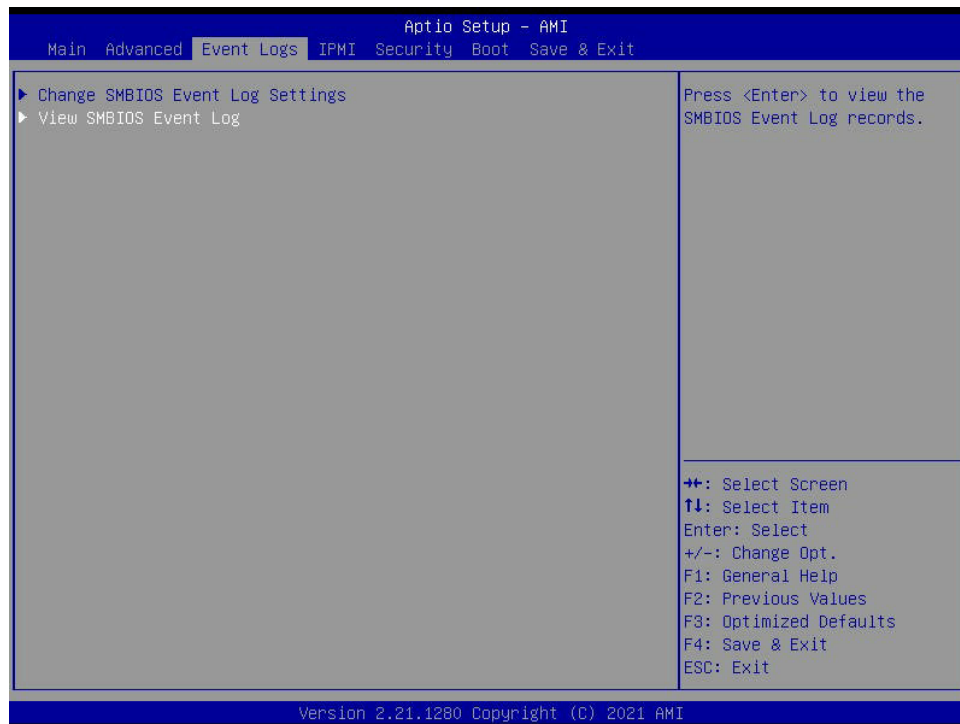
▶Change SMBIOS Event Log Settings

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

▶**View SMBIOS Event Log**

Select this submenu and press enter to see the contents of the SMBIOS event log. The following categories is 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                65.11.66          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

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```

BMC Firmware Revision

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

IPMI STATUS

This feature displays 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 boot up. The options are Disabled and **Enabled**.

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

▶BMC Network Configuration

BMC Network Configuration

Update BMC LAN Configuration

Select Yes for the BIOS to implement all IP/MAC address changes 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

BMC LAN Selection

BMC 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 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 searches for a Dynamic Host Configuration Protocol (DHCP) server in the network that is attached to and request the next available IP address for this computer. The options are **DHCP** and Static.

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

Station IP Address

This feature 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

Use this feature to enable or disable the IPMI VLAN function. The options are **Disable** and Enable.

VLAN ID

This feature is enabled if VLAN is enabled. Enter a VLAN ID. The ID range is from 1 to 4094.

Configure IPv6 Support

IPv6 Address Status

IPv6 Support

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

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      [Disable]        F1: General Help
    Lockdown Mode                   [Disabled]       F2: Previous Values
                                                     F3: Optimized Defaults
  ▶ SMCI Security Erase Configuration              ▼ F4: Save & Exit
                                                     ESC: Exit

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```

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 Enable and **Disable**.

Lockdown Mode

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

▶SMCI Security Erase Configuration

This section displays information if a storage device is detected by the system.

- HDD Name

- HDD Serial Number

- Security Mode

- Estimated Time

- HDD User Pwd Status

Security Function

Use this feature to enable or disable the BIOS security frozen command for SATA and NVMe devices. The options are **Disable**, Set Password, Security Erase - Password, and Security Erase - Without Password.

Password

Use this feature to set a password for the Supermicro HDD Security Function.

▶SP6:HGST HMS5C4040ALE640

This section displays information if a storage device is detected by the system.

- Security Supported

- Security Enabled

- Security Locked

- Security Frozen

- HDD User Pwd Status

- HDD Master Pwd Status

Set User Password

Use this feature to set a user password for the HDD.

Set Master Password

Use this feature to set a master password for the HDD.

▶Secure Boot

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

- System Mode

- Secure Boot

Secure Boot

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

Secure Boot Mode

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

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.
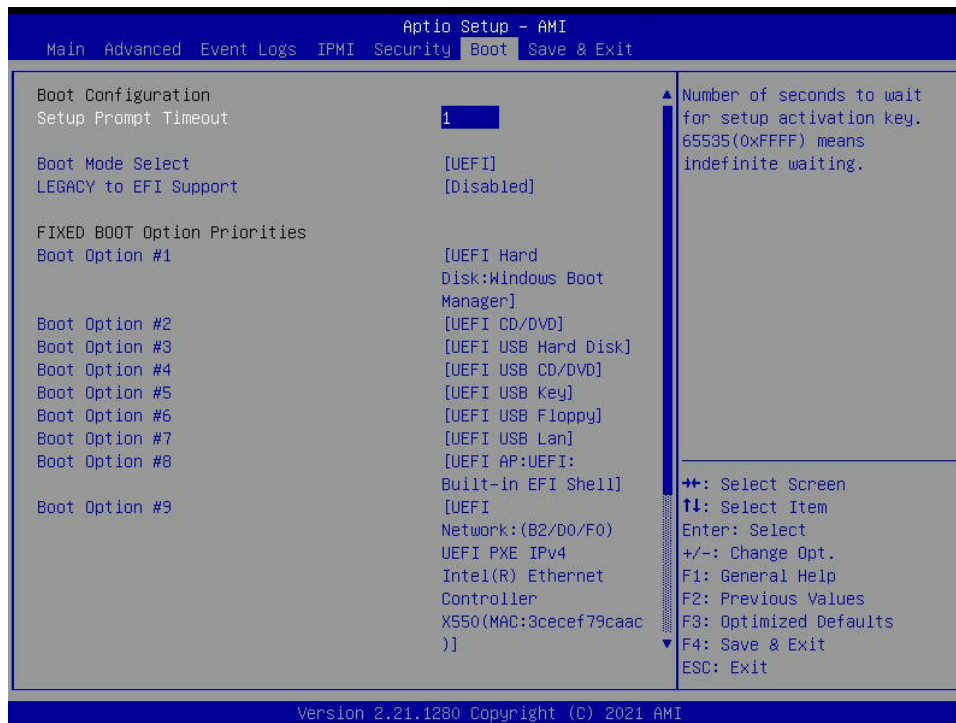
▶OsRecovery Signature

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

 Boot Configuration                              ▲ Number of seconds to wait
 Setup Prompt Timeout                  1         │ for setup activation key.
                                                 │ 65535(0xFFFF) means
 Boot Mode Select                      [UEFI]    │ indefinite waiting.
 LEGACY to EFI Support                 [Disabled]│
                                                 │
 FIXED BOOT Option Priorities                    │
 Boot Option #1                        [UEFI Hard│
                                       Disk:Windows Boot
                                       Manager]  │
 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 AP:UEFI:
                                       Built-in EFI Shell] ┃ →←: Select Screen
 Boot Option #9                        [UEFI     ┃ ↑↓: Select Item
                                       Network:(B2/D0/F0)  Enter: Select
                                       UEFI PXE IPv4       +/-: Change Opt.
                                       Intel(R) Ethernet   F1: General Help
                                       Controller          F2: Previous Values
                                       X550(MAC:3cecef79caac F3: Optimized Defaults
                                       )]        ▼ F4: Save & Exit
                                                   ESC: Exit

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```

Boot Configuration

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 feature 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 feature 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 features are 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

- Boot Option #9

▶Add New Boot Option

This feature allows you to add a new EFI boot option to the boot order.

▶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.

▶Add New Driver Option

This feature allows you to add a new EFI driver option to the driver order.

▶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 Hard Disk Drive BBS Priorities

This feature sets the system boot order of detected devices.

- Boot Option

▶UEFI NETWORK Drive BBS Priorities

This feature sets the system boot order of detected devices.
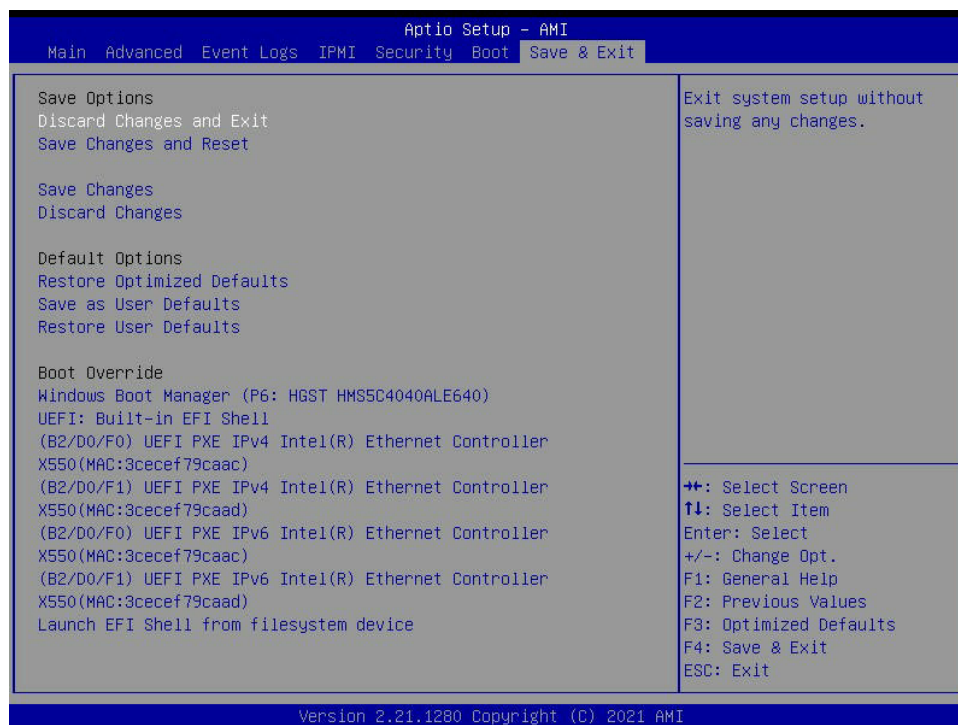
- Boot Option

▶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
  Windows Boot Manager (P6: HGST HMS5C4040ALE640)
  UEFI: Built-in EFI Shell
  (B2/D0/F0) UEFI PXE IPv4 Intel(R) Ethernet Controller
  X550(MAC:3cecef79caac)
  (B2/D0/F1) UEFI PXE IPv4 Intel(R) Ethernet Controller    →←: Select Screen
  X550(MAC:3cecef79caad)                                   ↑↓: Select Item
  (B2/D0/F0) UEFI PXE IPv6 Intel(R) Ethernet Controller    Enter: Select
  X550(MAC:3cecef79caac)                                   +/-: Change Opt.
  (B2/D0/F1) UEFI PXE IPv6 Intel(R) Ethernet Controller    F1: General Help
  X550(MAC:3cecef79caad)                                   F2: Previous Values
  Launch EFI Shell from filesystem device                  F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit

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```

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 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.

Boot Override

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

UEFI: Built-in EFI Shell

(B2/D0/F0) UEFI PXE IPv4 Intel(R) Ethernet Controller X550 (MAC:xxxxxxxxxxxx)

(B2/D0/F1) UEFI PXE IPv4 Intel(R) Ethernet Controller X550 (MAC:xxxxxxxxxxxx)

(B2/D0/F0) UEFI PXE IPv6 Intel(R) Ethernet Controller X550 (MAC:xxxxxxxxxxxx)

(B2/D0/F1) UEFI PXE IPv6 Intel(R) Ethernet Controller X550 (MAC:xxxxxxxxxxxx)

Launch EFI Shell from filesystem device

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 procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

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

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

A.2 Additional BIOS POST Codes

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

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

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

Appendix B

Software

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

B.1 Microsoft Windows OS Installation

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

Installing the OS

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

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

3. Boot from a bootable device with Windows OS installation. You can see a bootable device list by pressing **F11** during the system startup.
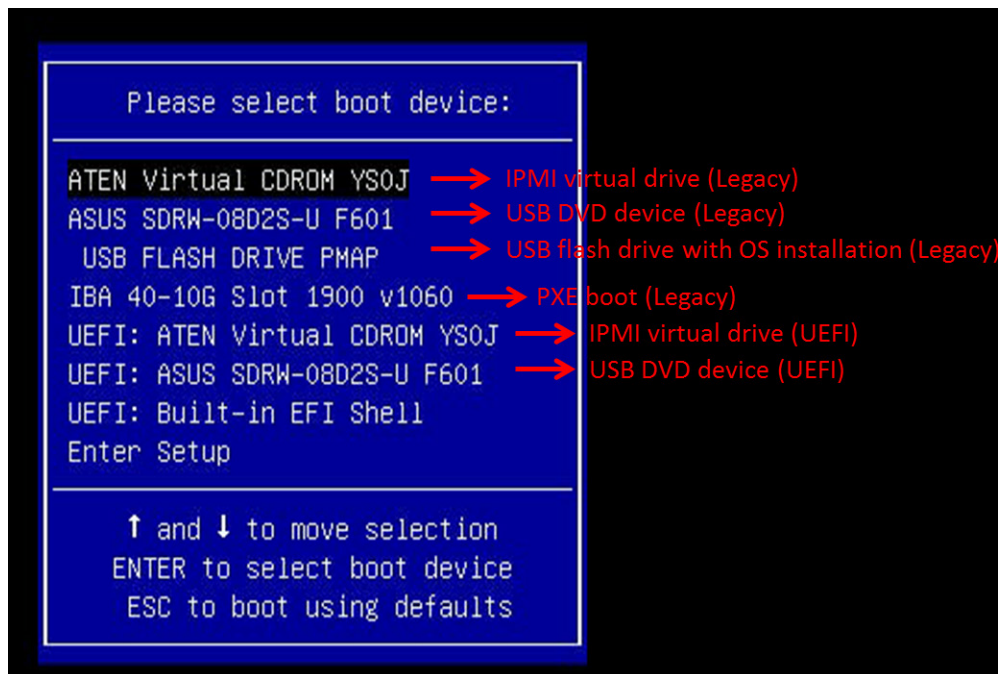

Figure B-1. Select Boot Device

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.
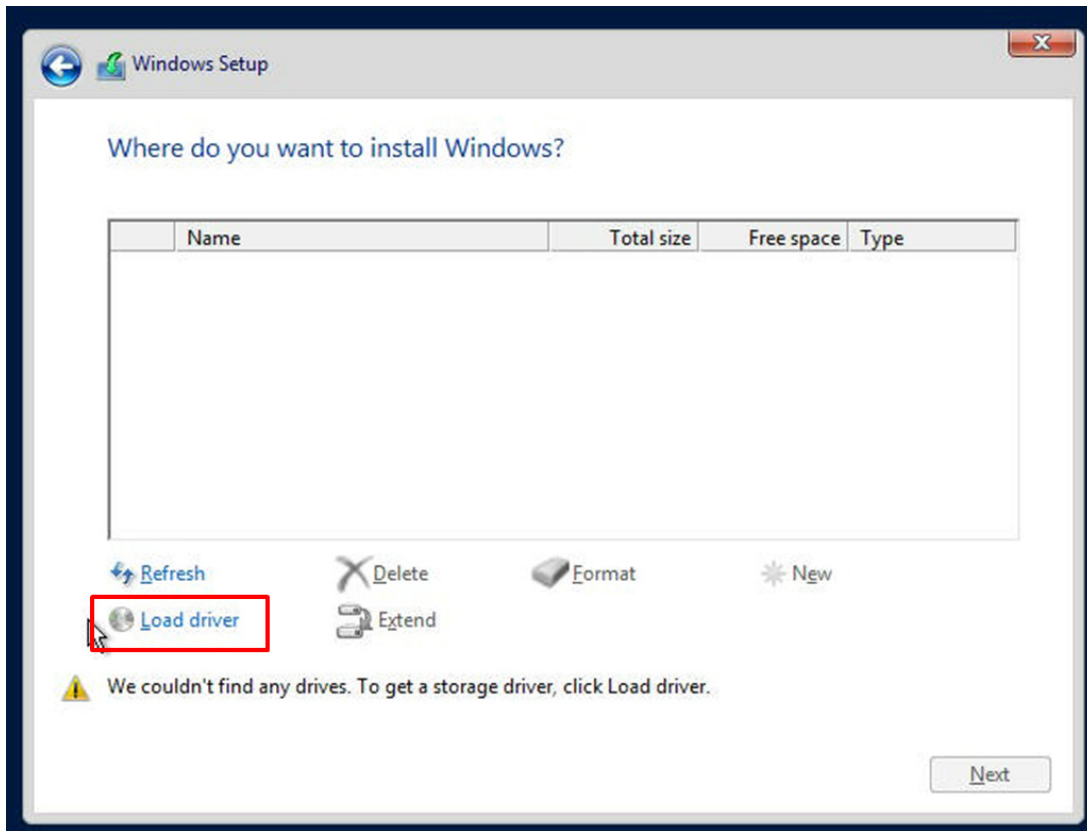

Figure B-2. Load Driver Link

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 drive or a DVD and mount the ISO file as virtual media using the iKVM console for access. 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.
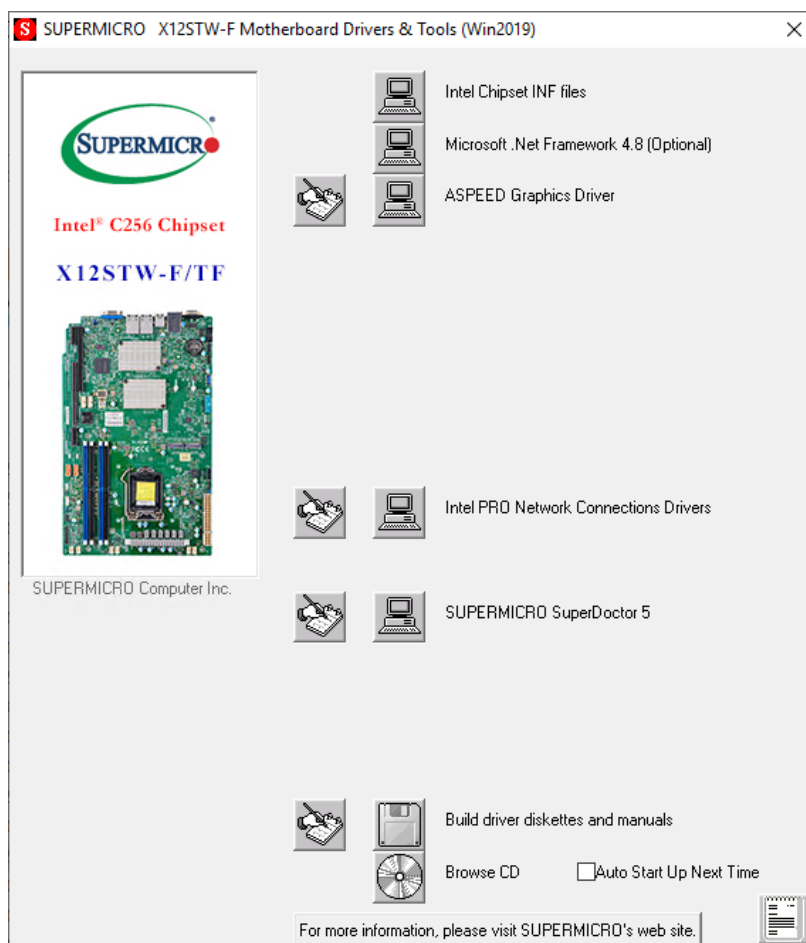

Figure B-3. Driver & Tool Installation Screen

> **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 the 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 or IPMI. SuperDoctor 5 Management Server monitors HTTP, FTP, and SMTP services to optimize the efficiency of your operation.
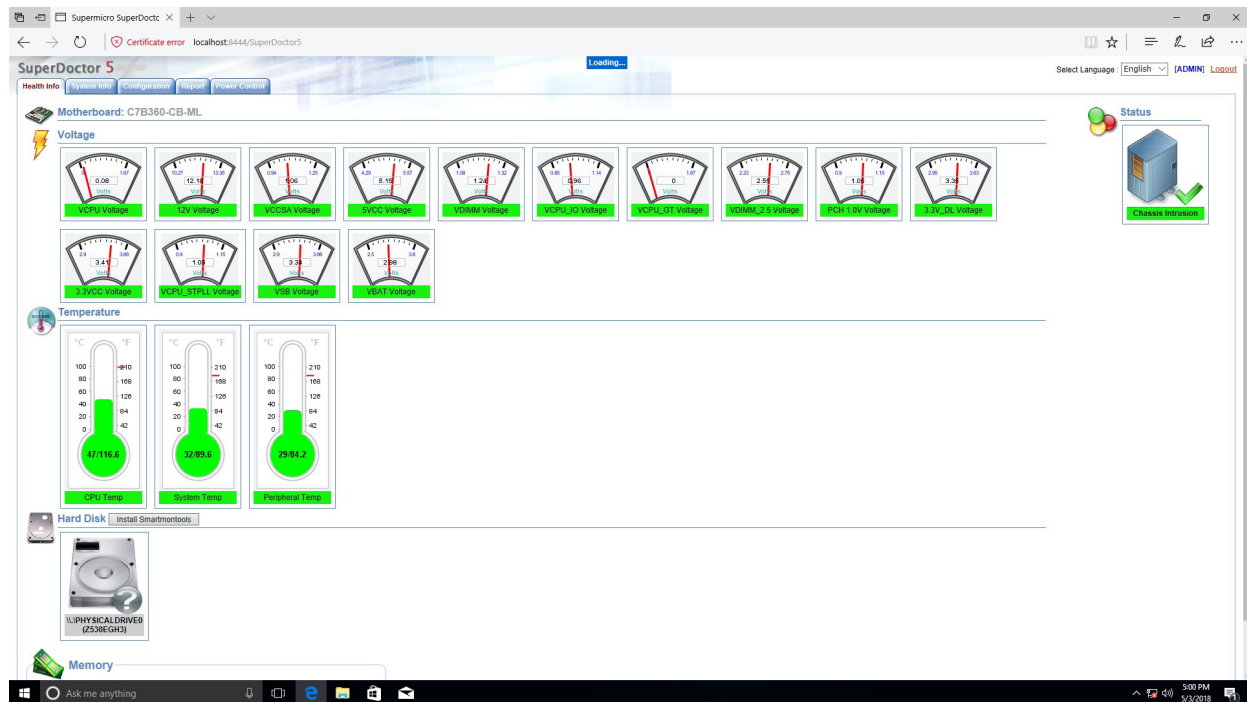

Figure B-4. SuperDoctor 5 Interface Display Screen (Health Information)

B.4 BMC

BMC is used to provide remote access, monitoring, and management. There are several BIOS settings that are related to BMC. Supermicro ships standard products with a unique password for the BMC ADMIN user. This password can be found on a label on the motherboard. For general documentation and information on IPMI, visit https://www.supermicro.com/en/support/BMC_Unique_Password.

Appendix C

Standardized Warning Statements

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

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

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

Battery Handling

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

電池の取り扱い

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

警告

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

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

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

את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

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

اسحبذال البطارية

فقط بنفس النع أو ما يعادلها مما أوصث به الشرمة المصنعة

جخلص من البطاريات المسحعملة وفقا لحعليمات الشرمة الصانعة

경고!

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

Waarschuwing

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

Product Disposal

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

製品の廃棄

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

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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

¡Advertencia!

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

Attention

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

סילוק המוצר

אזהרה!

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

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

경고!

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

Waarschuwing

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

Appendix D

UEFI BIOS Recovery

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

D.1 Overview

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

D.2 Recovering the UEFI BIOS Image

A UEFI BIOS flash chip consists of a recovery BIOS block and a main BIOS block (a main BIOS image). The recovery block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a healthy BIOS image if the original main BIOS image is corrupted. When the system power is first turned on, the boot block codes execute first. Once this process is completed, the main BIOS code will continue with system initialization and the remaining 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). Also, you may use the Supermicro Update Manager (SUM) Out-of-Band (OOB) (https://www.supermicro.com.tw/products/nfo/SMS_SUM.cfm) to reflash the BIOS.

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 device such as a USB Flash Drive, or a USB CD/DVD ROM/RW device can be used for this purpose. However, a USB Hard Disk drive cannot be used for BIOS recovery at this time.

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

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

1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\" directory of a USB device or a writable CD/DVD.

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

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

BMC IP:10.132.161.98

System Initializing..   F1
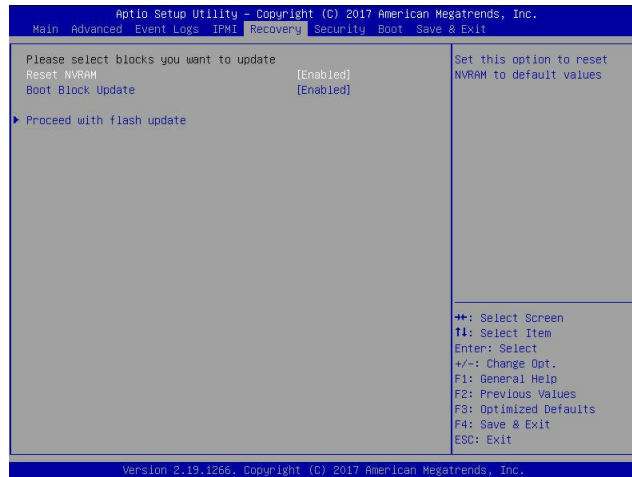
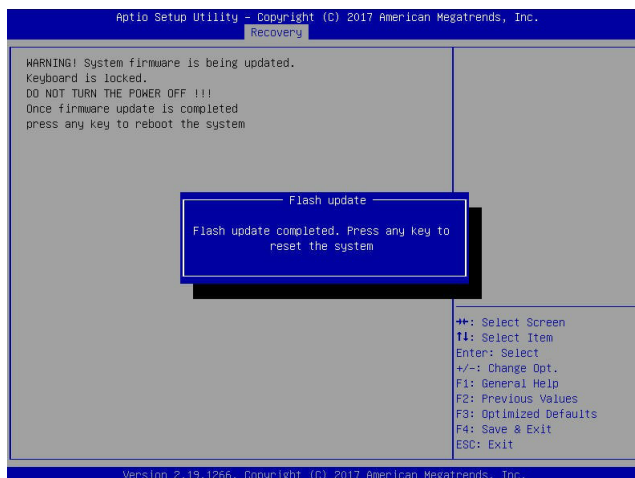2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB port and reset the system until the following screen appears:

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

   Note: At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.
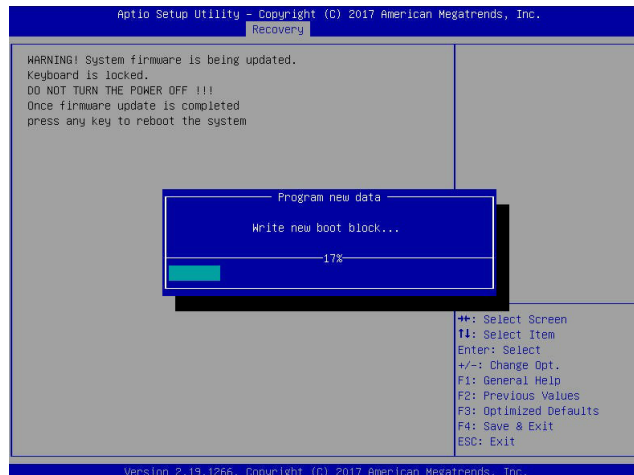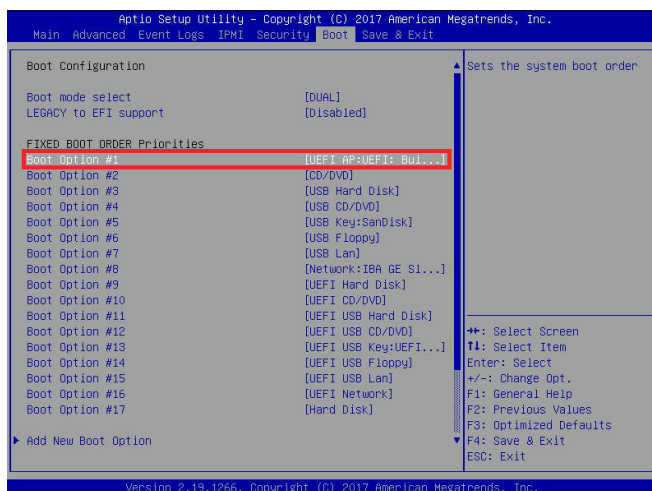
4. When the screen as shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below:

```
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.

Note: _Do not interrupt this process_ until the BIOS flashing is complete.

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

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

11. Press <F3> to load the default settings.

12. After loading the default settings, press <F4> to save the settings and exit the BIOS Setup utility.