# X12SCV-W

USER'S MANUAL

Revision 1.0c

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Manual Revision 1.0c

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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 Supermicro X12SCV-W motherboard.

## About This Motherboard

The Supermicro X12SCV-W supports the Intel® Xeon and Core i9/i7/i5/i3 series processor with up to 10 cores and a TDP of 65W in an LGA1200 socket. The motherboard comes in a mini-ITX form factor and supports both DC12V and ATX power input. Built with the Intel W480E chipset, the X12SCV-W supports 64GB of Non-ECC/ECC SODIMM with speeds of up to 2933MHz, SATA 3.0 ports, M.2 M-Key, and a Trusted Platform Module (TPM) header. The X12SCV-W is optimized for high-performance, high-end computing platforms that address the needs of that require small form factor hardware. Note that this motherboard is intended to be installed and serviced by professional technicians only. For processor/memory updates, refer to https://www.supermicro.com/products/.

## Conventions Used in the Manual

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

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

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

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

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

# Contacting Supermicro


**Headquarters**

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| Email: | Sales-Asia@supermicro.com.tw (Sales Inquiry)<br>Support@supermicro.com.tw (Technical Support)<br>RMA@supermicro.com.tw (RMA Support) |
| Website: | www.supermicro.com.tw |

# Table of Contents

# Chapter 1

# Introduction

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

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

## 1.1 Checklist

| Main Parts List | | |
|---|---|---|
| **Description** | **Part Number** | **Quantity** |
| Supermicro Motherboard | X12SCV-W | 1 |
| I/O Shield | MCP-260-00158-0N | 1 |
| SATA Cables | CBL-0044L | 2 |
| Quick Reference Guide | MNL-2357-QRG | 1 |

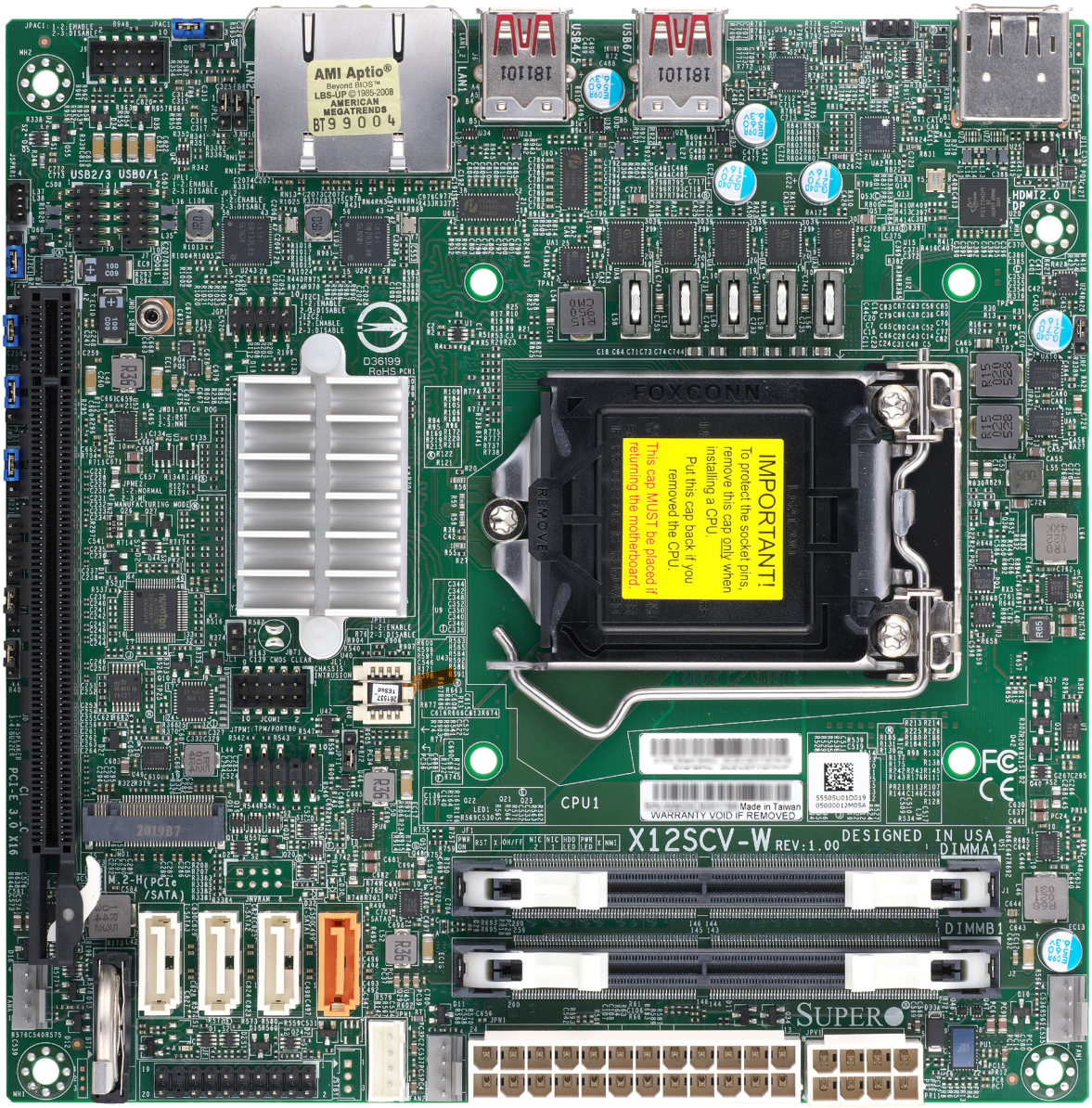
## Important Links

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

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

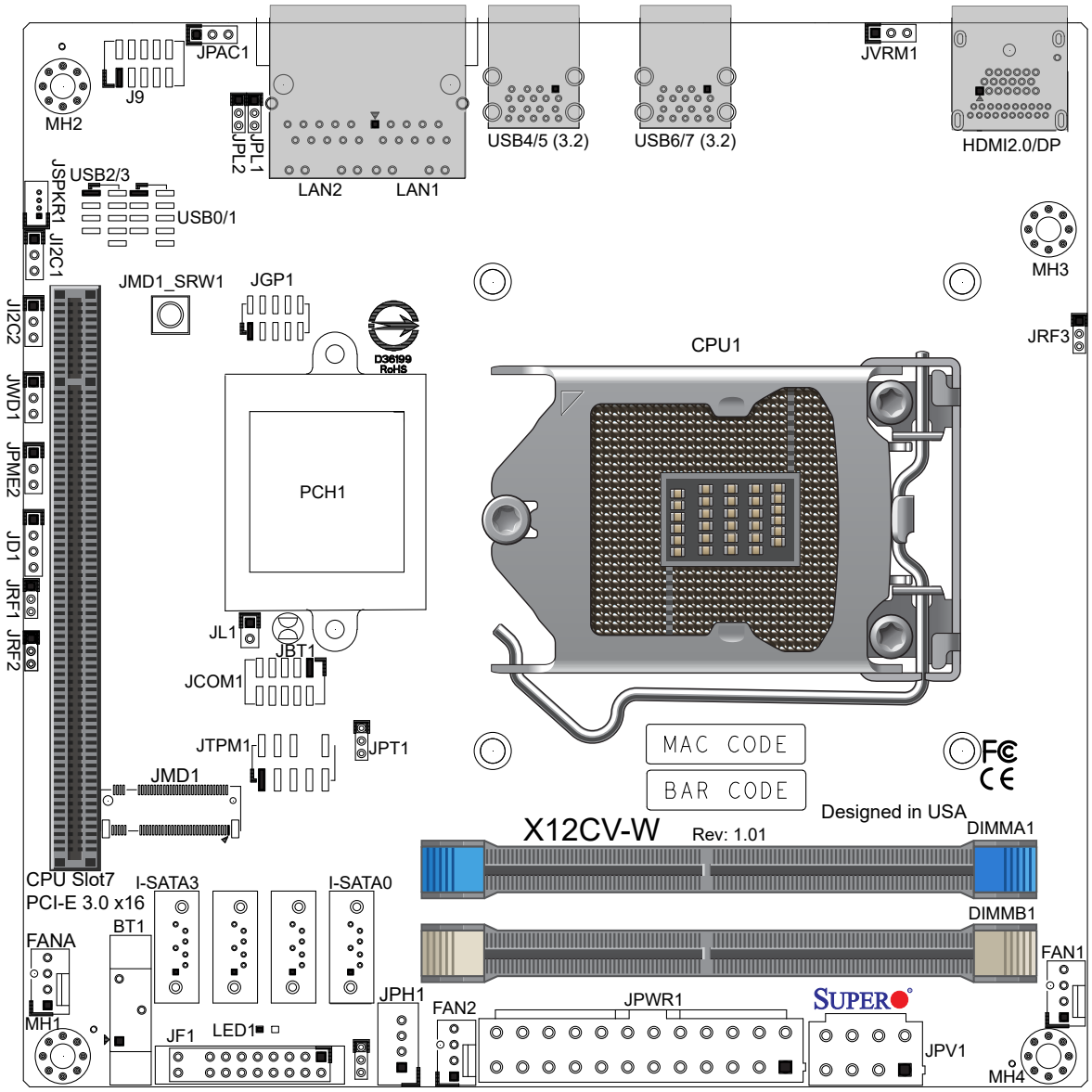
This manual may be periodically updated without notice. Check the Supermicro website for possible updates to the manual revision level.

**Figure 1-1. X12SCV-W Motherboard Image**



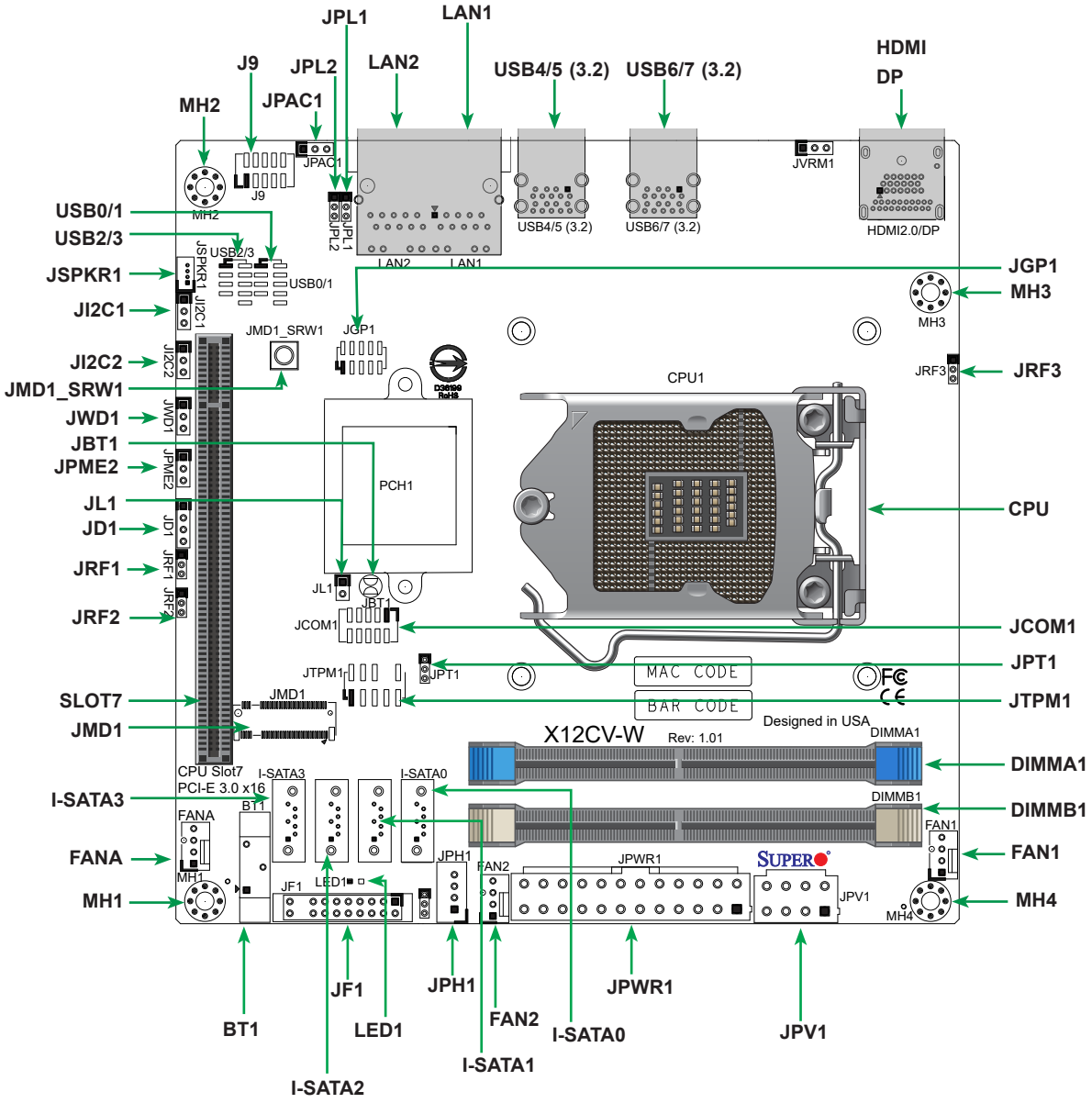

**Note:** All graphics shown in this manual were based upon the latest PCB revision available at the time of publication of the manual. The motherboard you received may not look the same as shown in this manual.

**Figure 1-2. X12SCV-W Motherboard Layout**
(not drawn to scale)




**Note:** Components not documented are for internal testing only.

## Quick Reference




**Notes:**

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

## Quick Reference Table

| Jumper | Description | Default Setting | | |
|---|---|---|---|---|
| JBT1 | CMOS Clear | Open (Normal) | | |
| JI²C1, JI2C2 | I²C System Management Bus (SMB) | Pins 2-3 (Disabled) | | |
| JPAC1 | Front Panel Audio Enable | Pins 1-2 (Enabled) | | |
| JPL1 | LAN1 Enable/Disable | Pins 1-2 (Enabled) | | |
| JPL2 | LAN2 Enable/Disable | Pins 1-2 (Enabled) | | |
| JPME2 | Manufacturing Mode | Pins 1-2 (Normal) | | |
| JPT1 | Onboard TPM Enable/Disable | Pins 2-3 (Disabled) | | |
| JRF1, JRF2 | SLOT7 PCIe Bifurcation | JRF1 | JRF2 | PEG |
| | | Pins 1-2 | Pins 1-2 | x16 |
| | | Pins 2-3 | Pins 1-2 | x8x8 |
| | | Pins 2-3 | Pins 2-3 | x8x4x4 |
| JRF3 | PCIe Lane Reversal | Pins 1-2 x16 (Default)<br>Pins 2-3 Lane Reversal | | |
| JWD1 | Watch Dog Timer | Pins 1-2 (Reset) | | |

| LED | Description | Status |
|---|---|---|
| LED1 | Onboard Power LED | Solid Green: Power On |

| Connector | Description |
|---|---|
| BT1 | Onboard CMOS Battery |
| FAN1, FAN2, FANA | CPU/System Fan Headers (FAN1: CPU Fan) |
| HDMI / DP | High Definition Multimedia Interface 2.0, DisplayPort |
| I-SATA0 - I-SATA3 | SATA 3.0 Ports |
| J9 | Front Panel Audio Header |
| JCOM1 | COM Header |
| JD1 | Speaker Header (Pins 1-4: Speaker, Pins 3-4: Buzzer) |
| JF1 | Front Control Panel Header |
| JGP1 | General Purpose I/O Header |
| JL1 | Chassis Intrusion Header |
| JMD1 | M.2 M-Key 2242/2280 (PCIe x4) Slot |
| JMD1_SRW1 | M.2 Mounting Hole |
| JPH1 | 4-pin HDD Power Connector |
| JPWR1 | 24-pin ATX Power Connector (Required) |
| JPV1 | 8-pin CPU Power Connector (Required) |
| JSPKR1 | Internal Speaker Header |
| JTPM1 | Trusted Platform Module/Port 80 Connector |
| LAN1, LAN2 | LAN RJ45 Ports |
| MH1 - MH4 | Mounting Holes |

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

| Connector | Description |
|---|---|
| SLOT7 | PCIe 3.0 x16 Slot |
| USB0/1, USB2/3 | Front Accessible USB 2.0 Headers |
| USB4/5, USB6/7 | Back Panel USB 3.2 Ports |

## Motherboard Features

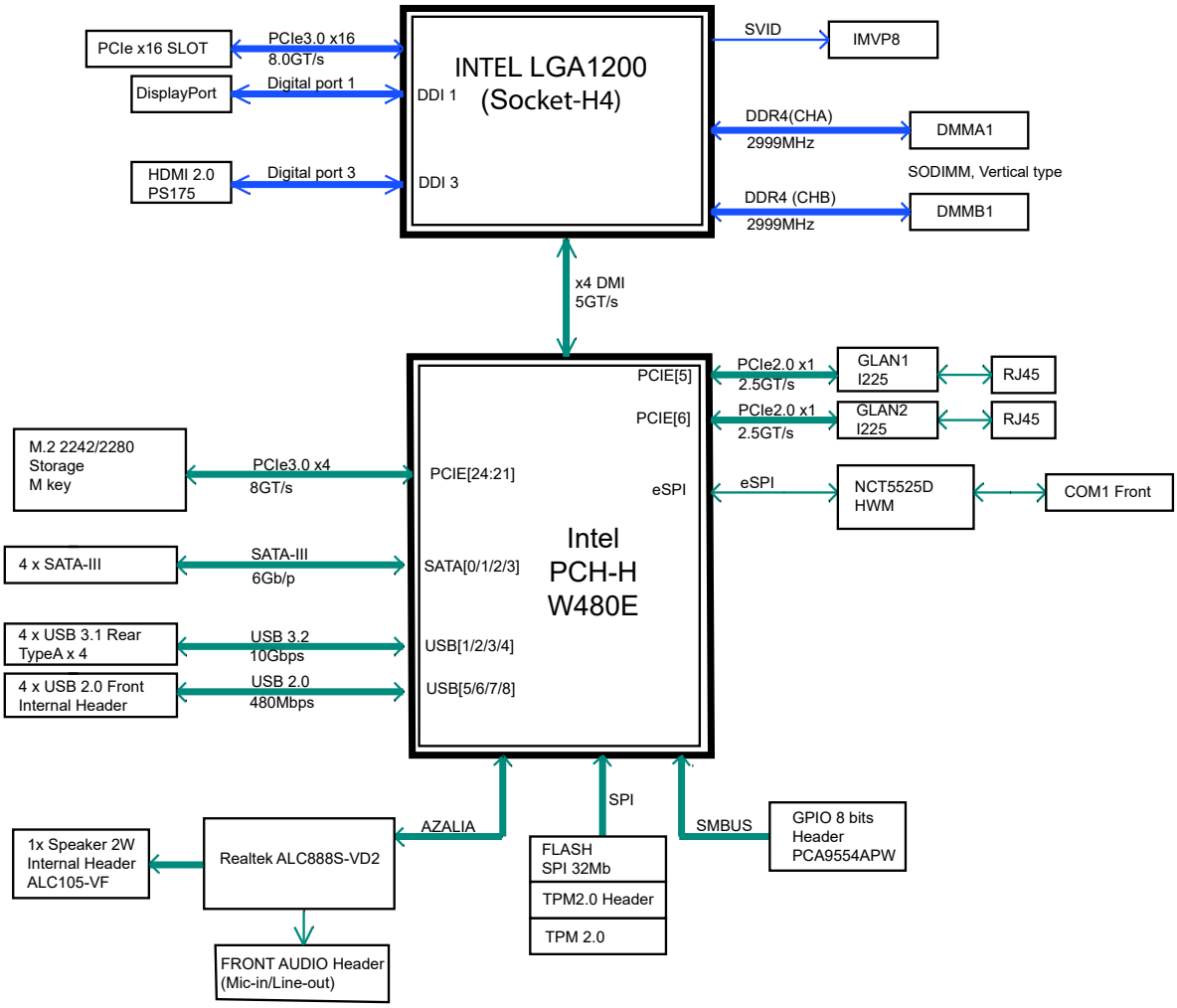
| |
|---|
| **CPU** |
| • Intel Xeon and Core i9/i7/i5/i3 series processor with up to 10 cores<br>**Note:** The X12SCV-W does not support the Intel 10th/11th generation processor 2M cache SKUs. These processors will not boot with the latest BIOS version. |
| **Memory** |
| • Up to 64GB of Non-ECC/ECC SODIMM memory with speeds of up to 2933MHz in two memory slots |
| **DIMM Size** |
| • Up to 64GB<br>**Note:** For the latest CPU/memory updates, refer to https://www.supermicro.com/products/motherboard. |
| **Chipset** |
| • Intel W480E |
| **Expansion Slots** |
| • One PCIe 3.0 x16 (Slot 7) |
| **Network** |
| • Intel 2.5Gb Ethernet Controller I225-LM<br>• Intel 2.5Gb Ethernet Controller I225-V |
| **Graphics** |
| • Intel UHD Graphics |
| **I/O Devices** |
| • One serial header<br>• Four SATA 3.0 ports<br>• HDMI<br>• DisplayPort<br>• Audio<br>• One front accessible serial header (COM1)<br>• Four SATA 3.0 ports (I-SATA0 - I-SATA3)<br>• One HDMI 2.0 port<br>• One DisplayPort<br>• Internal Speaker Header (supports up to 2W audio amplifier) |
| **Peripheral Devices** |
| • Two front accessible USB 2.0 headers with four USB connections (USB0/1, USB2/3)<br>• Four USB 3.2 ports on the rear panel with two connections each (USB4/5, USB6/7) |
| **BIOS** |
| • 128Mb SPI Flash AMI BIOS®<br>• ACPI 6.0, Plug and Play (PnP), SPI dual/quad speed support, and Real Time Clock (RTC) wake up |

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

| Power Management |
|---|
| • ACPI power management<br>• S3, S4, S5<br>• Power button override mechanism<br>• Power-on mode for AC power recovery<br>• Power supply monitoring |
| **System Health Monitoring** |
| • Onboard voltage monitoring for +12V, +5V, +3.3V, +5V stdby, +3.3V stdby, CPU temperature, PCH temperature, system temperature, and memory temperature<br>• 5 CPU switch phase voltage regulator<br>• CPU thermal trip support<br>• Platform Environment Control Interface (PECI)/TSI |
| **Fan Control** |
| • Low-noise fan speed control<br>• Three 4-pin fan headers |
| **System Management** |
| • Trusted Platform Module (TPM) support<br>• SuperDoctor® 5<br>• System resource alert via SuperDoctor®5<br>• Platform Environment Control Interface (PECI) 3.0 support<br>• Watch Dog, NMI<br>• Chassis intrusion header and detection |
| **LED Indicator** |
| • Power Indicator LED |
| **Dimensions** |
| • 6.7" (W) x 6.7 " (L) (170.18mm x 170.18mm) |

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

**Figure 1-3.**
**System Block Diagram**




**Note 1:** This is a general block diagram and may not exactly represent the features on your motherboard. See the previous pages for the actual specifications of your motherboard.

## 1.2 Processor and Chipset Overview

Built upon the functionality and capability of the Intel Xeon and Core i9/i7/i5/i3 series processor and the Intel W480E chipset, the X12SCV-W motherboard provides system performance, power efficiency, and feature sets to address the needs of next-generation computer users.

With the support of the new Intel Microarchitecture 14nm Process Technology, the X12SCV-W dramatically increases system performance for a multitude of medical and automation applications.

The Intel W480E chipset supports the following features:

- Intel TXT
- Intel TSX-NI, AES, and SGX Technologies
- Intel Turbo Boost and Rapid Storage Technology
- Increased platform security with Intel Boot Guard for hardware-based boot integrity protection and prevention of buffer overflow class security threads
- Intel Rapid Storage Technology enterprise (Intel RSTe)
- Two independent Graphics Displays and Intel Quick Sync Video Technology
- Intel Hyper-Threading, Intel VT-d, and VT-x
- Intel 64 Architecture, Execute Disable Bit, Turbo Boost Technology 2.0, Hyper-Threading Technology (Intel HT Technology)
- PCI Express 3.0, SATA 3.0, USB 3.2, USB 2.0, SATA 3.0
- 64GB Non-ECC/ECC SODIMM memory with speeds of up to 2933MHz

**Note**: Note Manager support depends on the power supply used in your system.

## 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

The X12SCV-W 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. If a voltage becomes unstable, a warning is given, or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

### Fan Status Monitor with Firmware Control

PC health monitoring in the BIOS can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management.

### Environmental Temperature Control

System Health sensors monitor temperatures and voltage settings of onboard processors and the system in real time via the IPMI interface. Whenever the temperature of the CPU or the system exceeds a user-defined threshold, system/CPU cooling fans will be turned on to prevent the CPU or the system from overheating.

**Note**: To avoid possible system overheating, be sure to 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. ACPI enables the system to automatically turn on or 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 Windows operating systems. For detailed information regarding OS support, refer to the Supermicro website.

## 1.6 Power Supply

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

The X12SCV-W 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 required to ensure adequate power 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. Connect the power supplies to the 24-pin (JPWR1), and the 8-pin (JPV1) power connectors 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.

## 1.7 Serial Port

The Super I/O provides high-speed, 16550 compatible universal asynchronous receiver-transmitter (UART) serial communication ports, which support serial infrared communication. The UART includes send/receive FIFO, a programmable baud rate generator, complete modem control capability, and a processor interrupt system. The UART provides legacy speed with 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, supporting higher speed modems.

The Super I/O provides functions that comply with ACPI, which includes support of legacy and ACPI power management through a SMI or SCI function pin. It also features auto power management to reduce power consumption.

# Chapter 2

# Installation

## 2.1 Static-Sensitive Devices

Electrostatic Discharge (ESD) can damage electronic components. To avoid damaging the 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, the person handling it should be static protected.

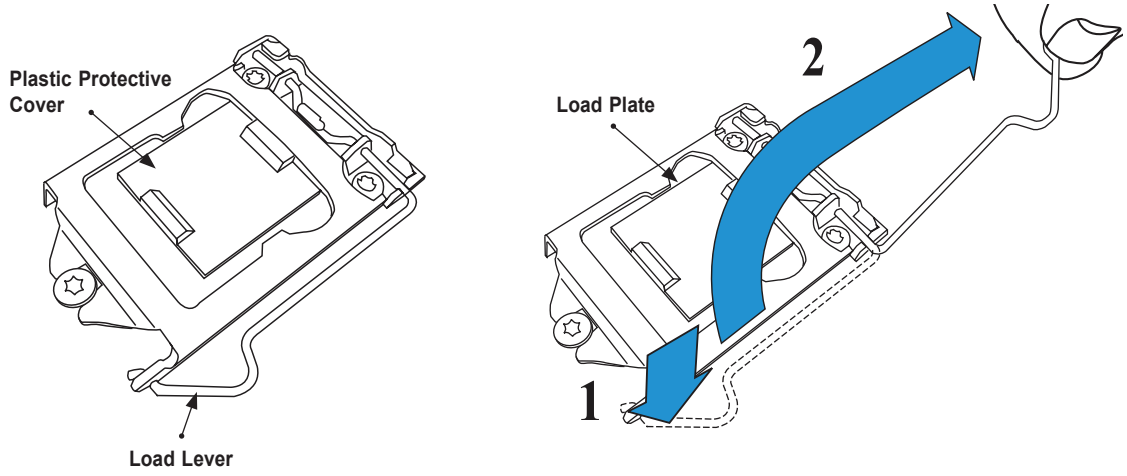
## 2.2 Processor and Heatsink Installation

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

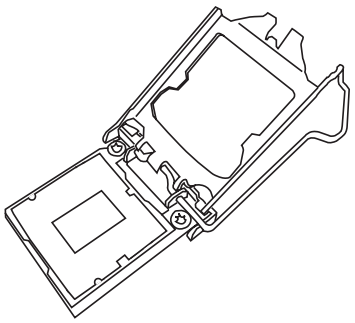
- Use ESD protection.
- Unplug the AC power cord from all power supplies after shutting down the system.
- Check that the plastic protective cover is on the CPU socket and none of the socket pins are bent. If they are, contact your retailer.
- When handling the processor, avoid touching or placing direct 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

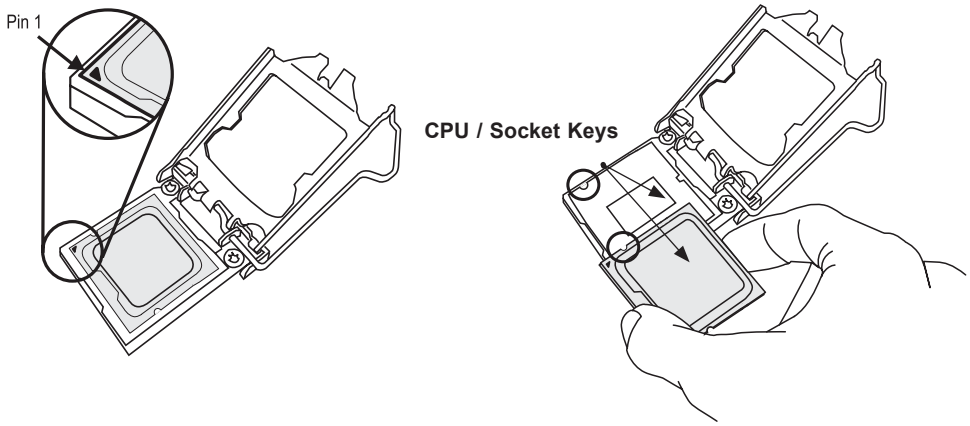
1. Press the load lever down to release the load plate from its locking position.



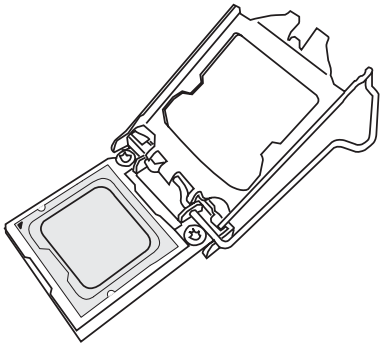
2. Gently lift the load lever to open the load plate. Remove the plastic protective cover. Do not touch the CPU socket contacts.



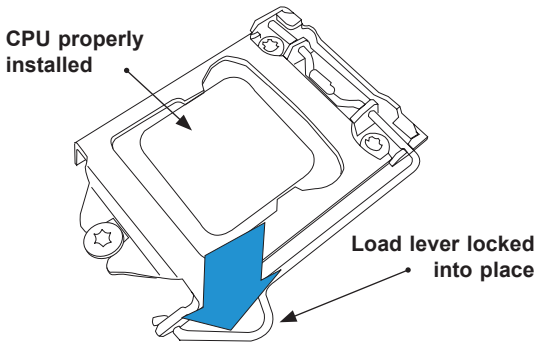
3. Locate the triangle on the CPU and CPU socket, which indicates the location of Pin 1. Holding the CPU by the edges with your thumb and index finger, align the triangle on the CPU with the triangle on the socket. The CPU keys (the semi-circle cutouts) may also be aligned against the socket keys as a guide.




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.



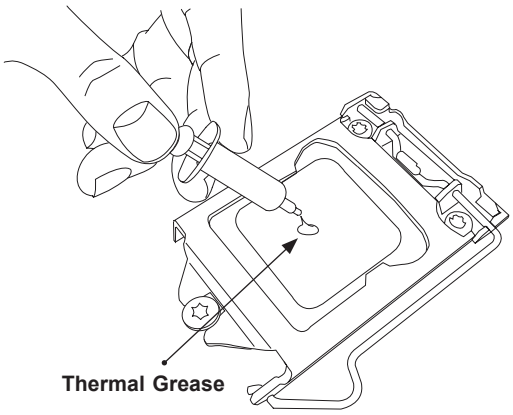
5. Close the load plate, then gently push down the load lever into its locking position.

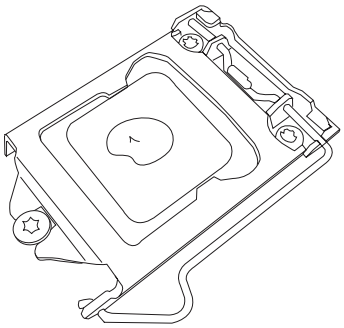



**Note:** You can only install the CPU in one direction. Make sure it is properly inserted into the socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate and double-check that the CPU is properly aligned.

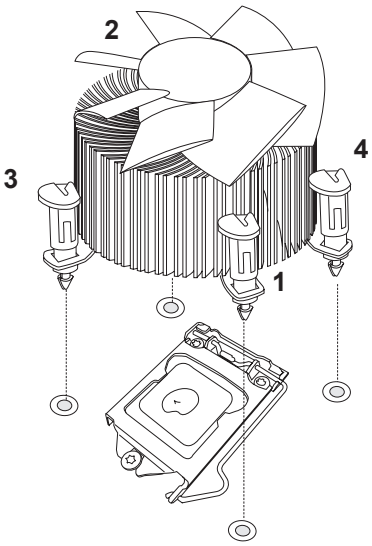
## Installing an Active CPU Heatsink with Fan

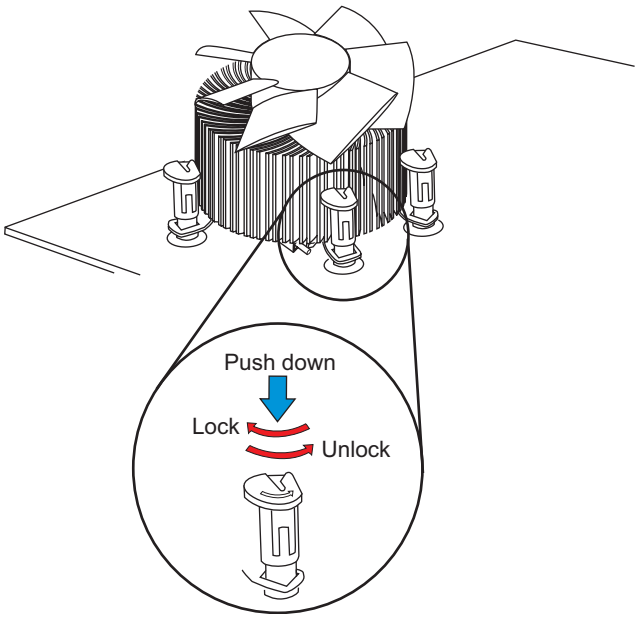
1. Locate the CPU fan header on the motherboard (FAN1).
2. Position the heatsink so that the heatsink fan wires are closest to the CPU fan header and are not interfering with other components.
3. Inspect the CPU fan wires to make sure they are routed through the bottom of the heatsink.
4. Remove the 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, ignore this step.



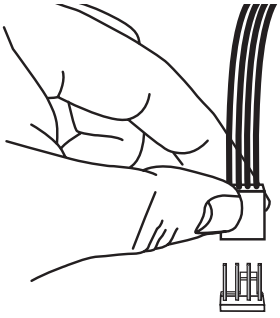



5. Align the four heatsink fasteners with the mounting holes on the motherboard. Gently push down the fasteners in a diagonal order (Example: #1 and #2, then #3 and #4) into the mounting holes until you hear a click. Then lock the fasteners by turning each one 90° clockwise.



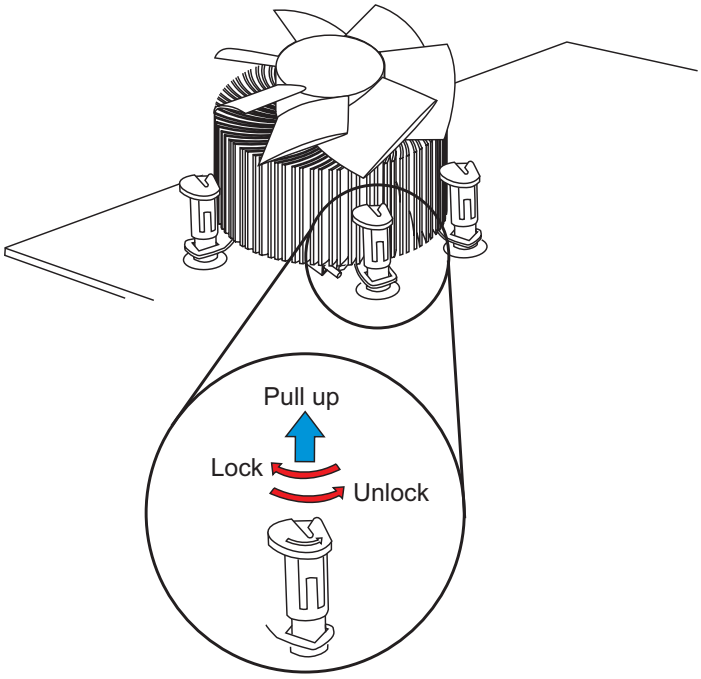

6. Once all four fasteners are secured, connect the heatsink fan wire connector to the CPU fan header.



## Removing the Heatsink

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

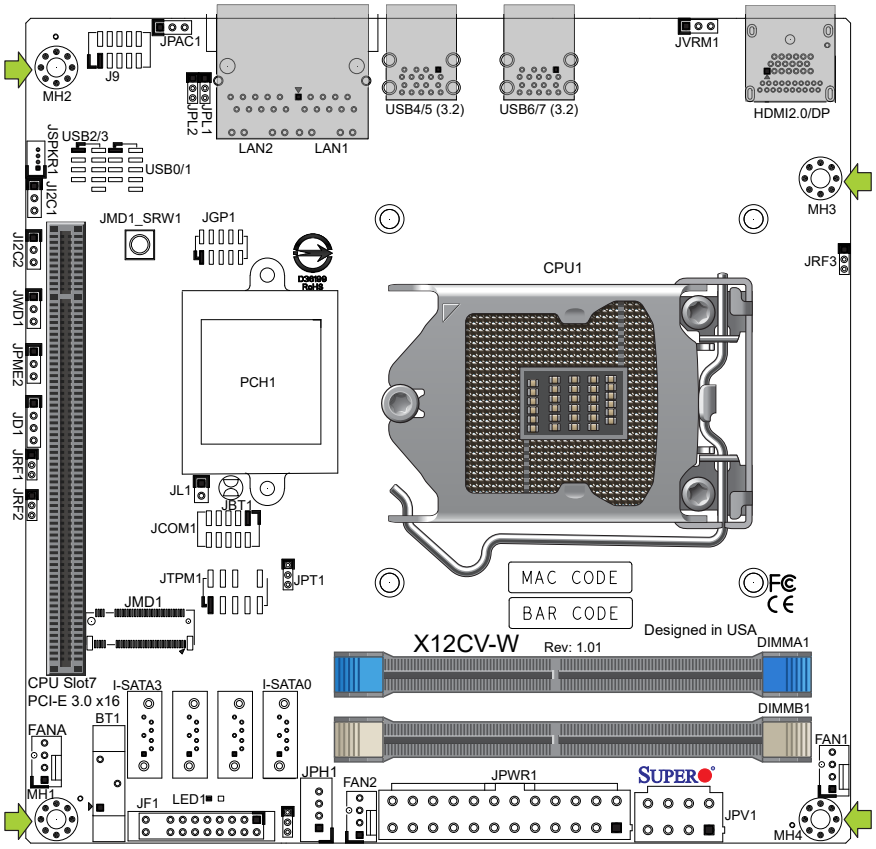
All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they 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 (4)**

**Standoffs (4) Only if Needed**

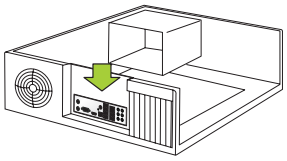



## Location of Mounting Holes

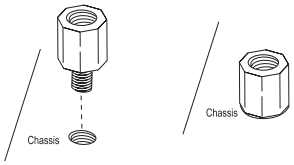
**Note:** 1) To avoid damaging the motherboard and its components, do not use a force greater than 8 lbf-in on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Take precautionary measures to avoid damaging these components when installing the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

## Installing the Motherboard

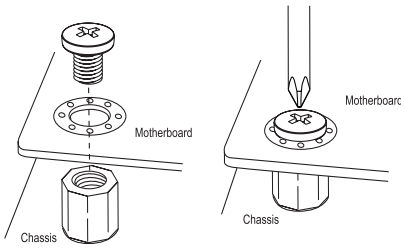
1. Install the I/O shield into the back of the chassis, if applicable.



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




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




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

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

# 2.4 Memory Support and Installation

**Note**: Check the Supermicro website for recommended memory modules.

**Important:** Exercise extreme care when installing or removing SODIMM modules to prevent possible damage.

## Memory Support

The X12SCV-W supports up to 64GB of Non-ECC/ECC SODIMM memory with speeds of up to 2933MHz in two memory slots. Refer to the table below for the recommended SODIMM population order.

| 1 CPU, 2 SODIMM Slots | |
|---|---|
| **Number of SODIMMs** | **Memory Population Sequence** |
| 1 | DIMMA1 |
| 2 | DIMMA1 / DIMMB1 |

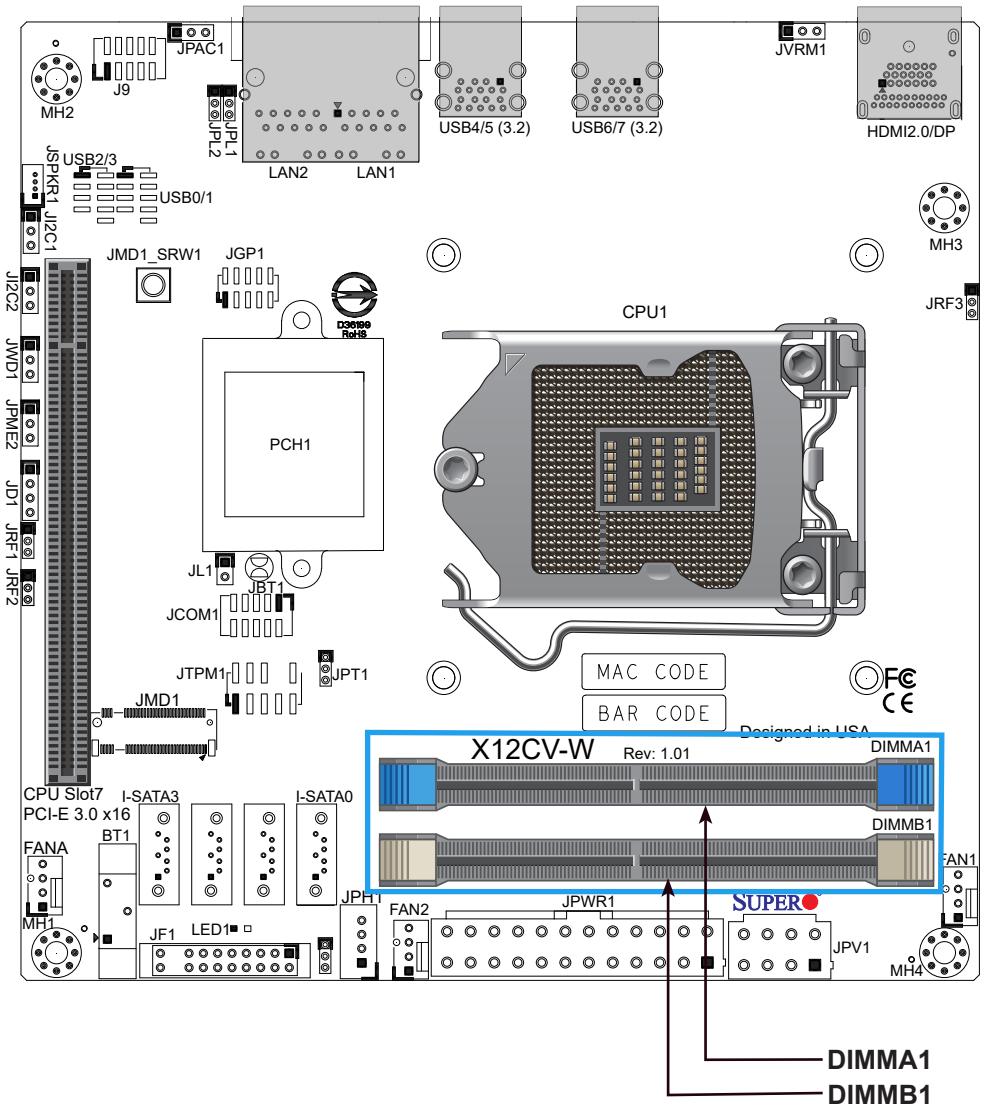
## DIMM Module Population Configuration

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

| Recommended Population (Balanced) | | |
|---|---|---|
| **DIMMA1** | **DIMMB1** | **Total System Memory** |
| 2GB | 2GB | 4GB |
| 4GB | 4GB | 8GB |
| 8GB | | 8GB |
| 8GB | 8GB | 16GB |
| 16GB | | 16GB |
| 16GB | 16GB | 32GB |
| 32GB | | 32GB |
| 32GB | 32GB | 64GB |

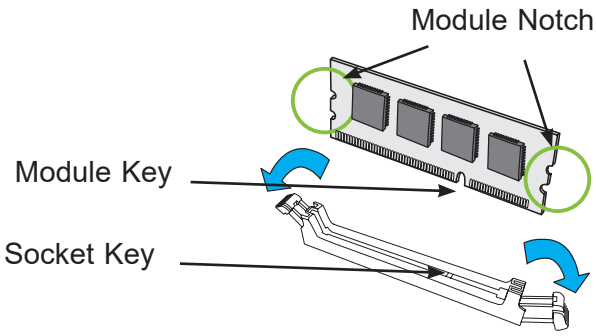
## General Guidelines for Optimizing Memory Performance

- The blue slot must be populated first
- It is recommended to use DDR4 memory of the same type, size, and speed.
- Mixed SODIMM speeds can be installed. However, all SODIMMs will run at the speed of the slowest SODIMM.
- To achieve the best memory performance, a balanced memory population is recommended.

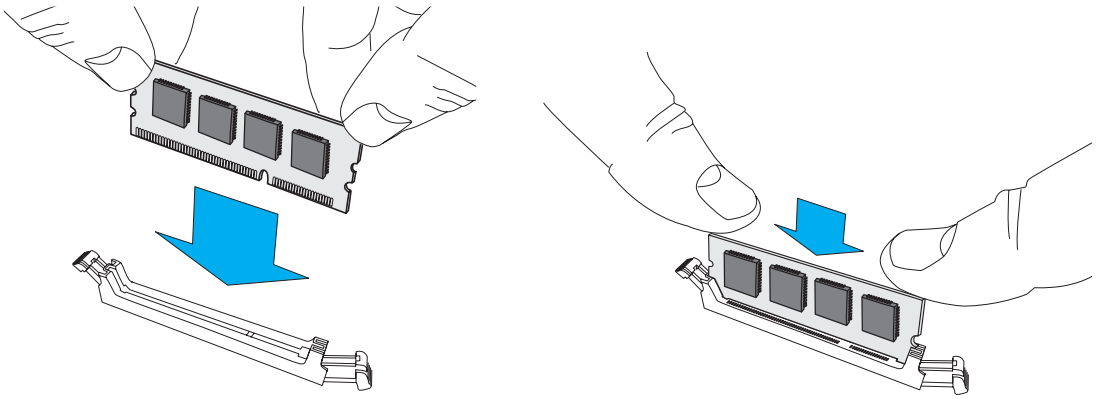


## DIMM Installation

1. Install the desired number of SODIMMs into the memory slots, starting with DIMMA1 and then DIMMB1.
2. Align the key on the bottom of the SODIMM module against the receptive point on the memory slot. Take note of the notches on the side of the DIMM module and of the locking clips on the socket to avoid causing damage.




3. Press the SODIMM module straight down into the socket with both hands until it is securely seated in the socket. The side clips will automatically lock the module into place.



## DIMM Removal

Push the side clips away from the module to release it from the socket.

## 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.

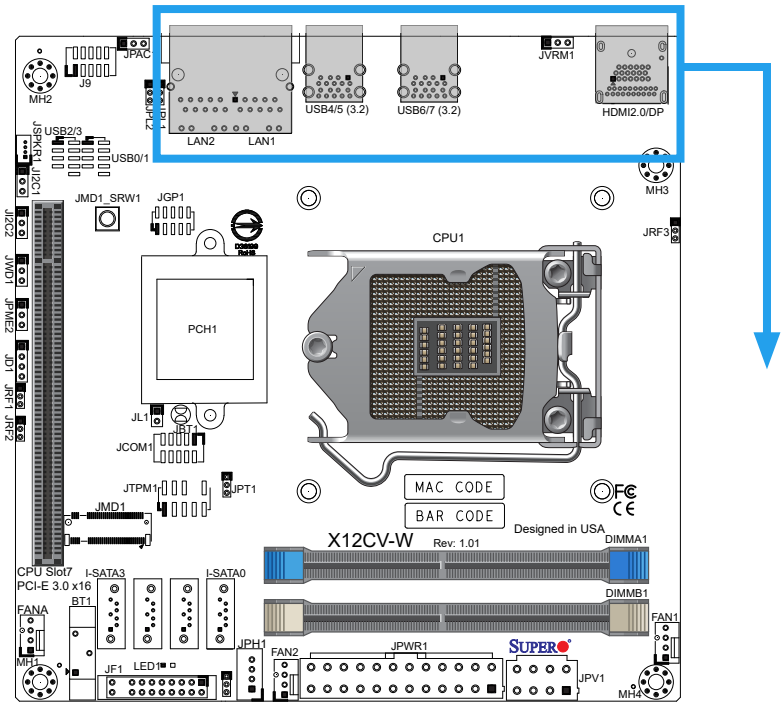
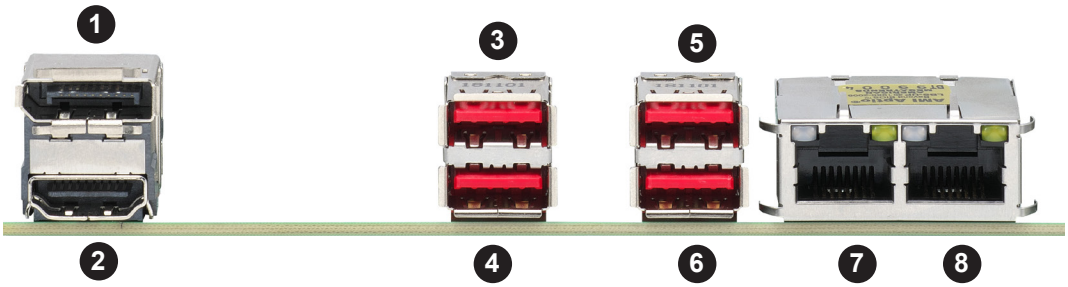



**Figure 2-1. I/O Port Locations and Definitions**




| Rear I/O Ports | | | |
|---|---|---|---|
| # | Description | # | Description |
| 1 | DisplayPort | 5 | USB4 (3.2) |
| 2 | HDMI 2.0 | 6 | USB5 (3.2) |
| 3 | USB6 (3.2) | 7 | LAN1 |
| 4 | USB7 (3.2) | 8 | LAN2 |

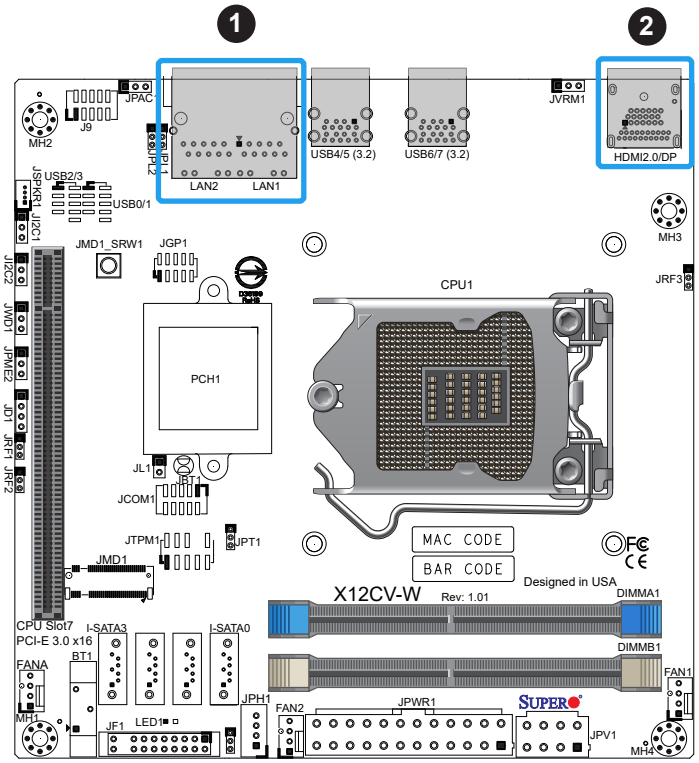
### DisplayPort and HDMI Port

One High Definition Multimedia Interface (HDMI) 2.0 port is on the I/O back panel. This connector is used to display both high definition video and digital sound through an HDMI-capable display, using a single HDMI cable (not included). HDMI 2.0 allows faster frame rates and is backward compatbile with previous HDMI versions. This port provides Intel HD Graphics digital output with resolution up to 4096x2160 at 60Hz Refresh Rate with HDR.

There is also one DisplayPort on the I/O back panel. DisplayPort, developed by the VESA consortium, delivers digital display and fast refresh rate. It can connect to virtually any display using a DisplayPort adaptor for devices such as VGA, DVI, or HDMI. This port provides Intel HD Graphics digital output with resolution up to 4096x2304 at 60Hz Refresh Rate.

### LAN Ports

The motherboard has two 1GbE LAN ports (LAN1, LAN2) located on the I/O back panel. The LAN ports accept RJ45 cables.




1. LAN Ports
2. HDMI / DisplayPort

### Universal Serial Bus (USB) Ports

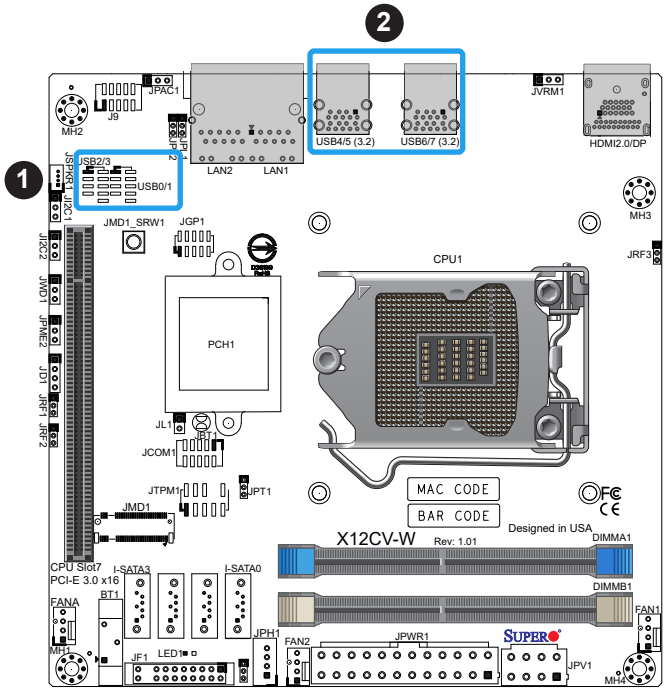
There are four USB 3.2 ports (USB4/5 and USB 6/7) on the I/O back panel and four USB 2.0 headers (USB0/1 and USB2/3) on the motherboard. The onboard headers can be used to provide front side USB access with a cable (not included).

**Front Panel USB0/1, 2/3 (2.0) Headers Pin Definitions**

| Pin# | Definition | Pin# | Definition |
|---|---|---|---|
| 1 | +5V | 2 | +5V |
| 3 | USB_N | 4 | USB_N |
| 5 | USB_P | 6 | USB_P |
| 7 | Ground | 8 | Ground |
| 9 | Key | 10 | NC |

**Back Panel USB (3.2) Header Pin Definitions**

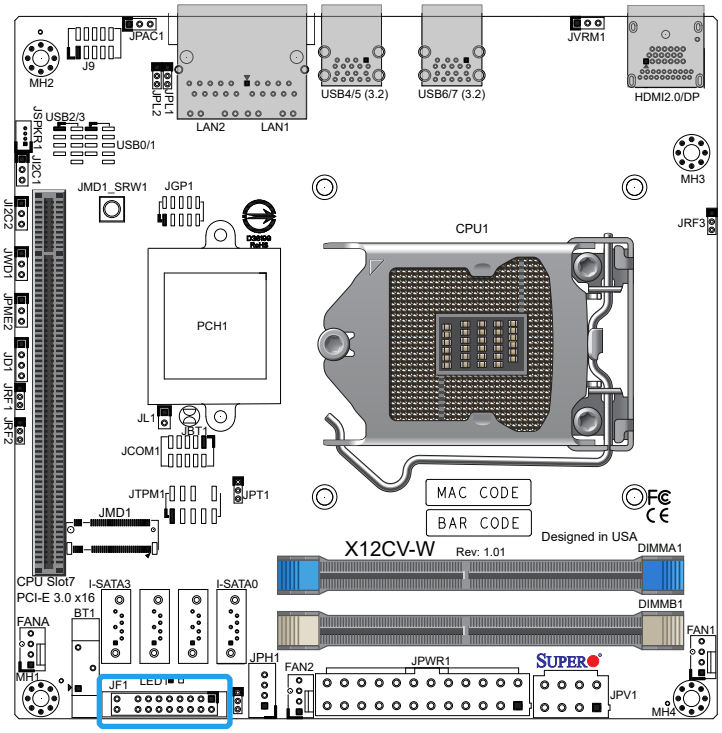
| Pin# | Definition | Pin# | Definition |
|---|---|---|---|
| 1 | GND | 11 | GND |
| 2 | TX1+ | 12 | TX2- |
| 3 | TX1- | 13 | TX2+ |
| 4 | GND | 14 | GND |
| 5 | RX1+ | 15 | RX2- |
| 6 | RX1- | 16 | RX2+ |
| 7 | GND | 17 | GND |
| 8 | D1+ | 18 | D2+ |
| 9 | D1- | 19 | D2- |
| 10 | VBUS1 | 20 | VBUS2 |




1. USB01, USB2/3
2. USB4/5, USB6/7

## 2.6 Front Control Panel

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



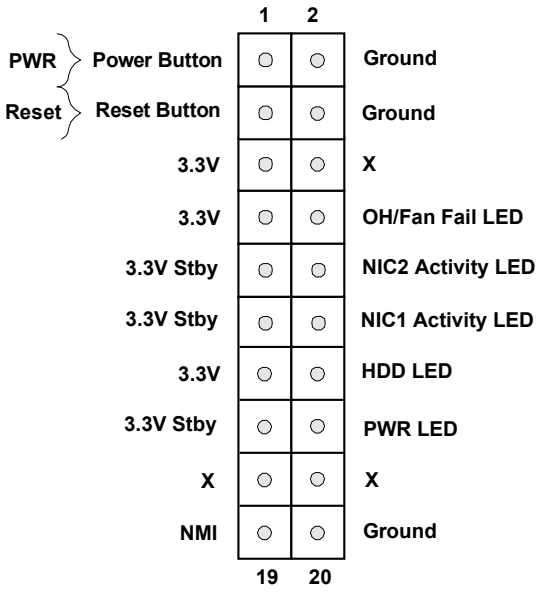




**Figure 2-2. JF1 Header Pins**

### Power Button

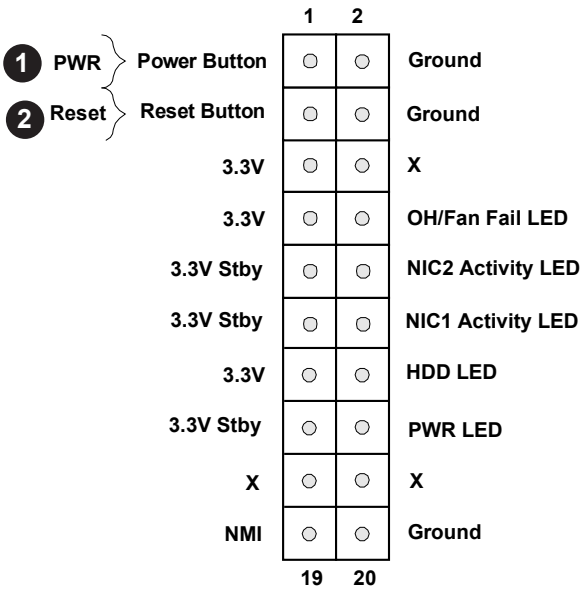
The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 4). To turn off the power when the system is in suspend mode, press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

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

### Reset Button

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

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




1. PWR Button
2. Reset Button

### Information LED (OH/Fan Fail/UID LED)

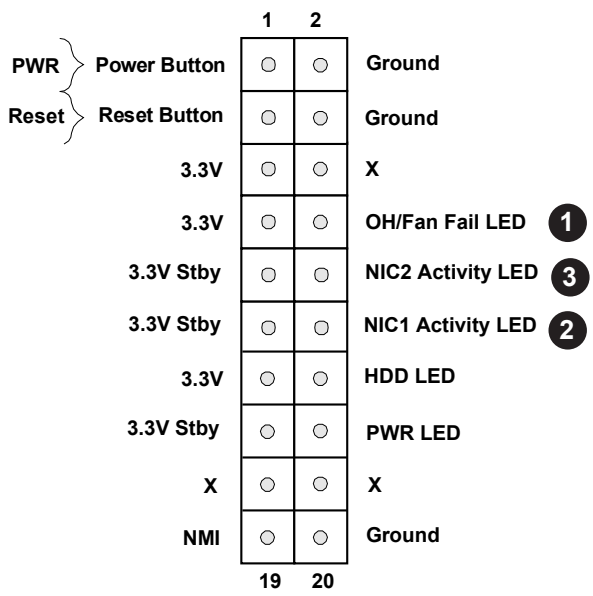
The Information LED (OH/Fan Fail) connection is located on pins 7 and 8 of JF1. The LED on pin 8 provides warnings of overheat, power failure, or fan failure. Refer to the table below for more information.

| Overheat Fan Fail Indicator Status Pin Definitions (JF1) | |
|---|---|
| **State** | **Definition** |
| Off | Normal |
| On | Overheat |
| Flashing | Fan Fail |

### 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.

| LAN1/LAN2 LED Pin Definitions (JF1) | |
|---|---|
| **Pin#** | **Definition** |
| 9 | NIC 2 Activity LED+ |
| **10** | NIC 2 Activity LED- |
| **11** | NIC 1 Activity LED+ |
| 12 | NIC 1 Activity LED- |




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

### HDD LED

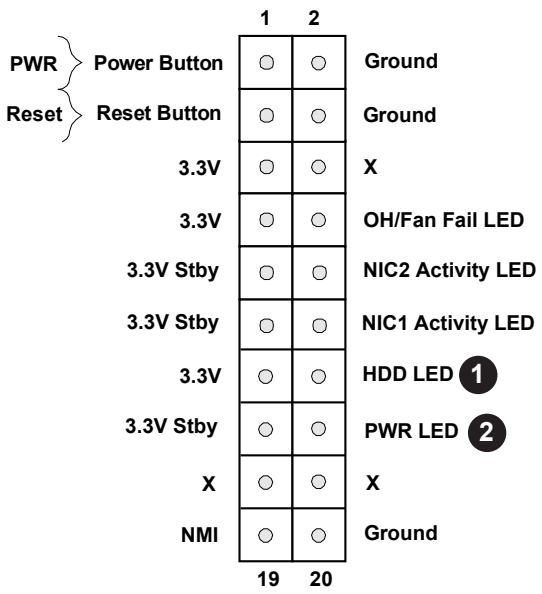
The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable to pin 14 to show hard drive activity status. Refer to the table below for pin definitions.

| HDD LED Pin Definitions (JF1) | |
|---|---|
| Pins | Definition |
| 13 | 3.3V Stdby |
| 14 | HDD Active |

### Power LED

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

| Power LED Pin Definitions (JF1) | |
|---|---|
| Pins | Definition |
| 15 | +3.3V Stby |
| 16 | PWR LED |

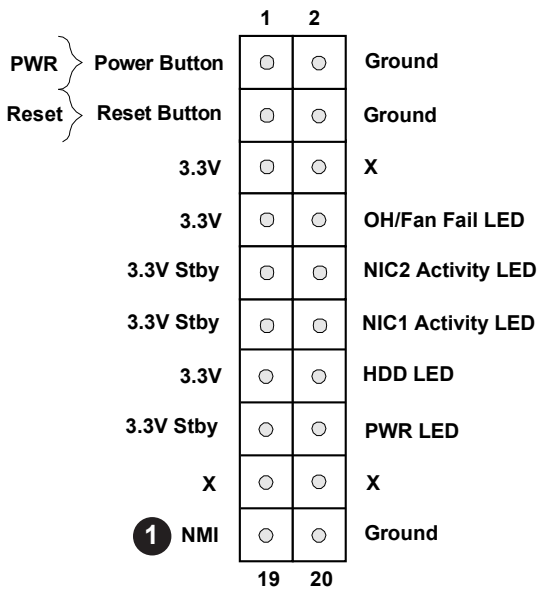



1. HDD LED
2. Power LED

### NMI Button

The non-maskable interrupt 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. NMI Button

# 2.7 Connectors

## Power Connections

### Power Connectors

JPWR1 is the 24-pin power connector for an ATX power source. JPV1 is the 12V DC power connector that provides power to the CPU in conjunction with JPWR1 or it can be used as the sole 12V DC power input when JPWR1 is not in use. JPH1 is a 4-pin HDD power connector that provides power to onboard HDD devices.

**ATX Power 24-pin Connector Pin Definitions**

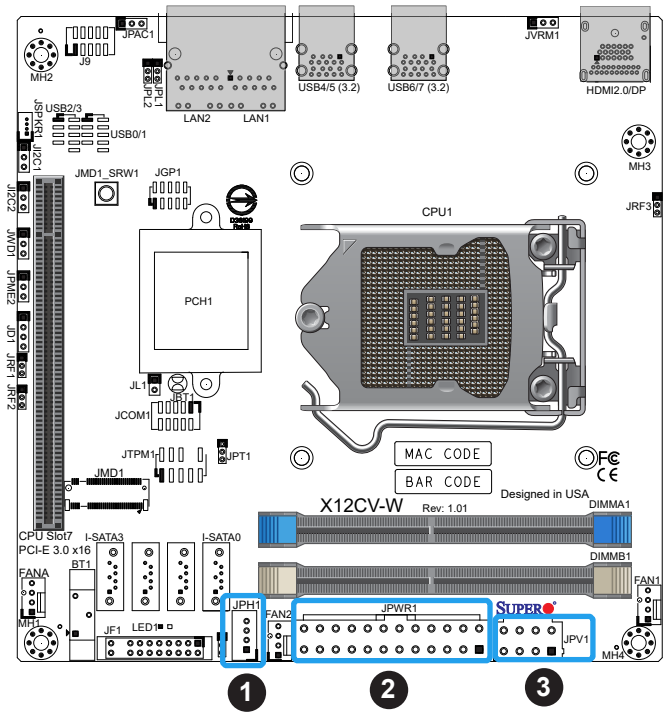
| Pin# | Definition | Pin# | Definition |
|---|---|---|---|
| 13 | +3.3V | 1 | +3.3V |
| 14 | -12V | 2 | +3.3V |
| 15 | Ground | 3 | Ground |
| 16 | PS_ON | 4 | +5V |
| 17 | Ground | 5 | Ground |
| 18 | Ground | 6 | +5V |
| 19 | Ground | 7 | Ground |
| 20 | Res (NC) | 8 | PWR_OK |
| 21 | +5V | 9 | 5VSB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

**8-pin CPU Power Pin Definitions**

| Pin# | Definition |
|---|---|
| 1-4 | GND |
| 5-8 | 12V |

**4-pin HDD Power Pin Definitions**

| Pin# | Definition |
|---|---|
| 1 | 12V |
| 2-3 | Ground |
| 4 | 5V |



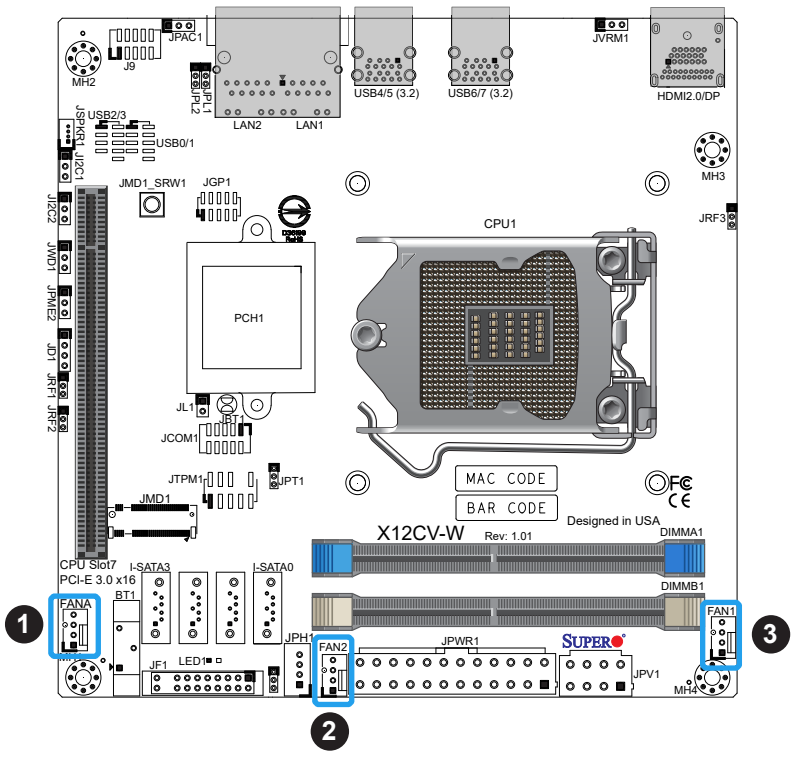

1. 4-pin HDD Power
2. 24-Pin ATX Power
3. 8-Pin CPU Power

# Headers

## Fan Headers

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

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




1. FANA
2. FAN2
3. FAN1

## COM Header

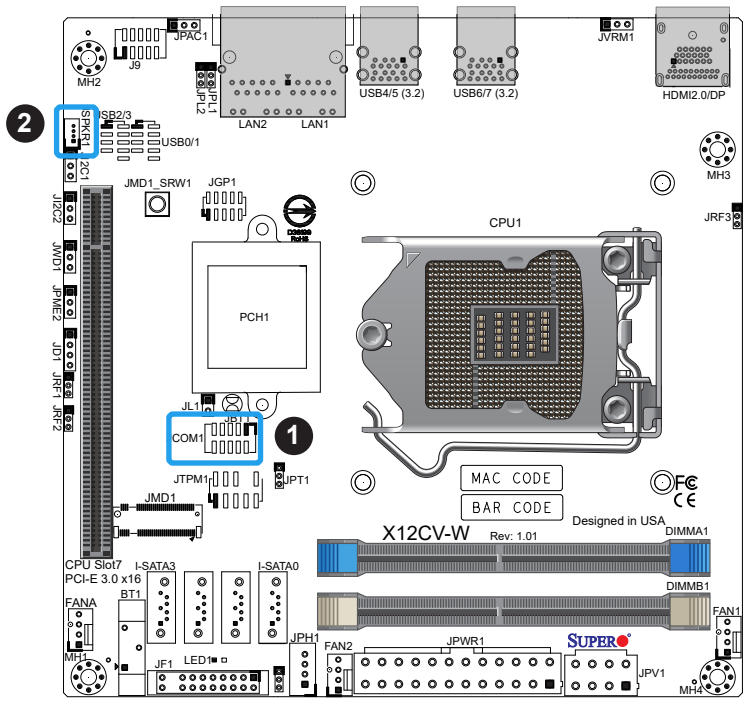
The motherboard has one COM header (JCOM1) that provides a serial port connection. Refer to the table below for pin definitions

| COM Header (JCOM1) Pin Definitions | | | |
|---|---|---|---|
| **Pin#** | **Definition** | **Pin#** | **Definition** |
| 1 | DCD | 2 | DSR |
| 3 | RXD | 4 | RTS |
| 5 | TXD | 6 | CTS |
| 7 | DTR | 8 | RI |
| 9 | Ground | 10 | N/A |

## Internal Speaker

The Internal Speaker (JSPKR1) is used to provide audible indications for various beep codes. Refer to the table below for pin definitions.

| Internal Speaker JSPKR1 Pin Definitions | |
|---|---|
| **Pin#** | **Definition** |
| 1 | SPEAKER_LN_OUT |
| 2 | SPEAKER_LP_OUT |
| 3 | SPEAKER_RN_OUT |
| 4 | SPEAKER_RP_OUT |

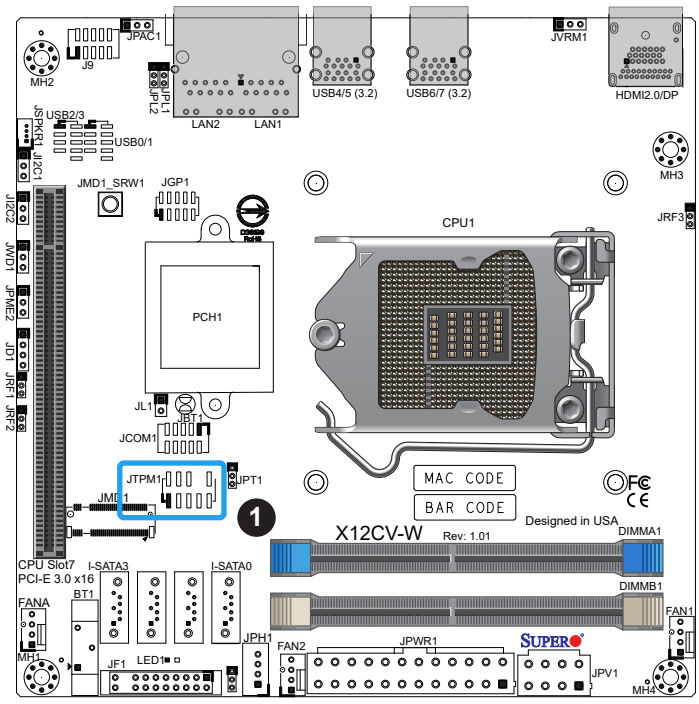



1. COM Header
2. Internal Speaker

### 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. For more information on the TPM go to: https://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 Module

### Chassis Intrusion

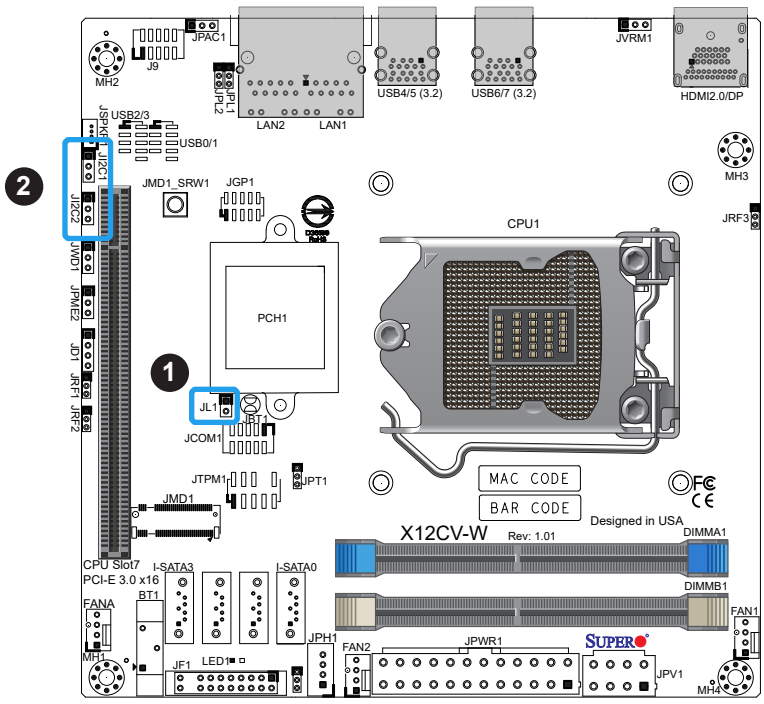
A Chassis Intrusion header is located at JL1 on the motherboard. Attach the appropriate cable from the chassis to inform if the chassis is opened. Refer to the table below for pin definitions.

| Chassis Intrusion Pin Definitions | |
|---|---|
| **Pin#** | **Definition** |
| 1 | Intrusion Input |
| 2 | Ground |

### Power SMB (I²C) Headers

Power System Management Bus (I²C) headers at JI²C1 and JI2C2 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 | Power Fail |
| 4 | Ground |
| 5 | +3.3V |




1. Chassis Intrusion
2. Power SMB Headers

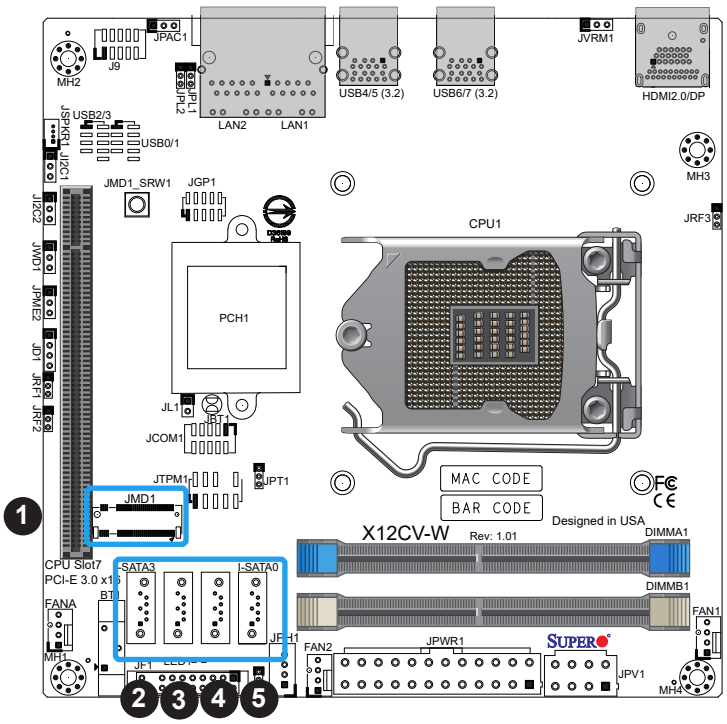
### SATA 3.0 Ports

There are four SATA 3.0 ports (I-SATA0 - I-SATA3) supported by the Intel W480E chipset. SATA ports provide serial-link signal connections, which are faster than legacy Parallel ATA.

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

### M.2 Slot

This motherboard has one M.2 slot (JMD1), formerly known as Next Generation Form Factor (NGFF) and serves to replace mini PCIe. M.2 allows for a variety of card sizes, increased functionality, and spatial efficiency. The M.2 slot on the motherboard supports PCIe 3.0 x4 SSD cards in the 2280 form factors.




1. M.2 Slot
2. I-SATA3 Port
3. I-SATA2 Port
4. I-SATA1 Port
5. I-SATA0 Port

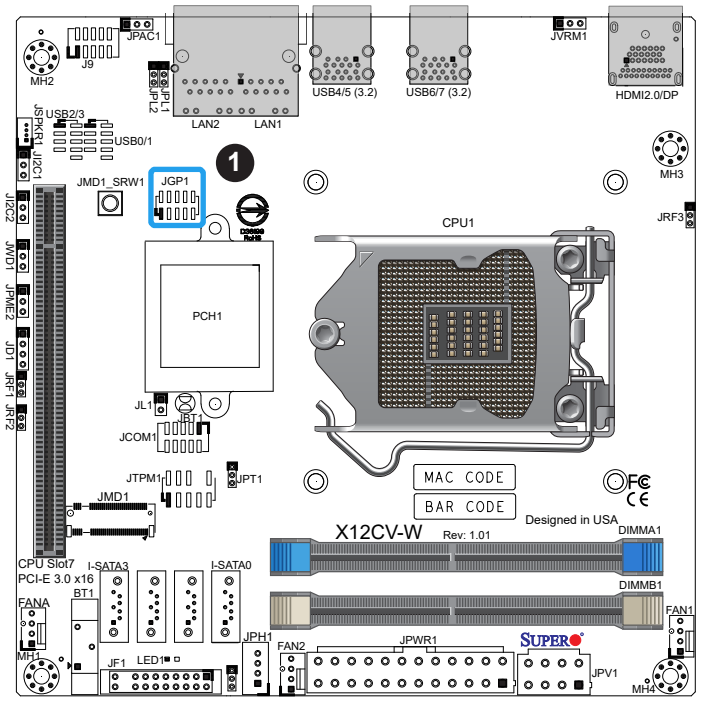
## General Purpose I/O Header

The JGP1 (General Purpose Input/Output) header is a general purpose I/O expander on a pin header via the SMBus. Refer to the table below for pin definitions.

**JGP1 Header Pin Definitions**

| Pin# | Definition | GPIO Pin | Memory Address |
|---|---|---|---|
| 1 | +3.3V Stby | | |
| 2 | Ground | | |
| 3 | GP0 | GPP_G0 | 0xFD6D0900 |
| 4 | GP1 | GPP_G1 | 0xFD6D0910 |
| 5 | GP2 | GPP_G2 | 0xFD6D0920 |
| 6 | GP3 | GPP_G3 | 0xFD6D0930 |
| 7 | GP4 | GPP_G4 | 0xFD6D0940 |
| 8 | GP5 | GPP_G5 | 0xFD6D0950 |
| 9 | GP6 | GPP_G6 | 0xFD6D0960 |
| 10 | GP7 | GPP_G7 | 0xFD6D0970 |

1. General Purpose Header

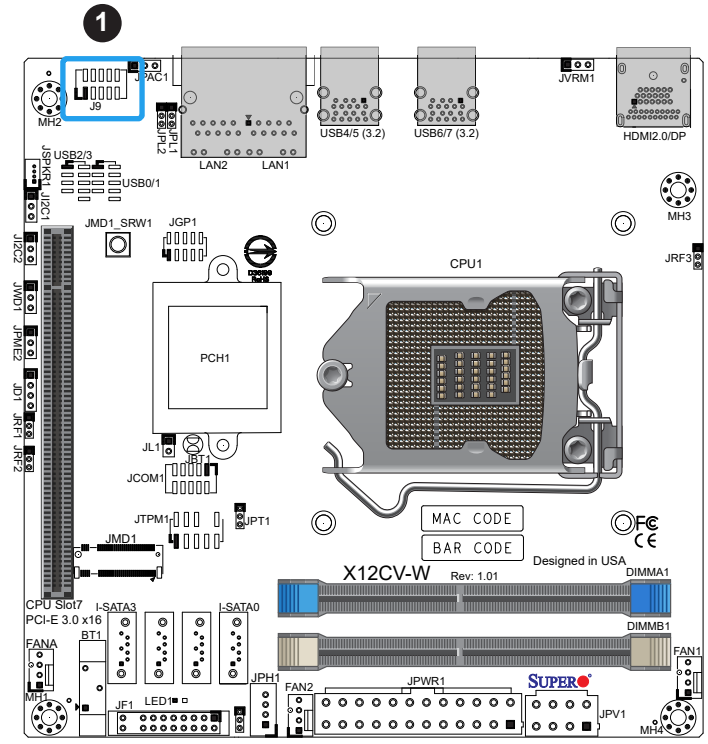


### Front Panel Audio Header

A 10-pin audio header located at J9 is for audio playback. Connect an audio cable to this header to use this feature. Refer to the table below for pin defintions.

**Audio Header Pin Definitions**

| Pin# | Definition | Pin# | Definition |
|---|---|---|---|
| 1 | Mic_2_Left | 2 | Audio_Ground |
| 3 | Mic_2_Right | 4 | Audio_Ground |
| 5 | Line_2_Right | 6 | Mic_2_JD |
| 7 | Jack_Detect | 8 | Key |
| 9 | Line_2_left | 10 | Line_2_JD |



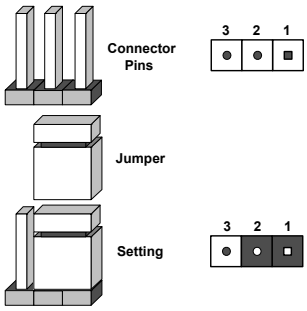

1. Front Panel Audio Header

# 2.8 Jumper Settings

## How Jumpers Work

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

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




### CMOS Clear

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

***To Clear CMOS***

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

**Note:** Clearing CMOS will also clear all passwords.

*Do not use the PW_ON connector to clear CMOS.*

**JBT1 contact pads**

### LAN Port Enable/Disable

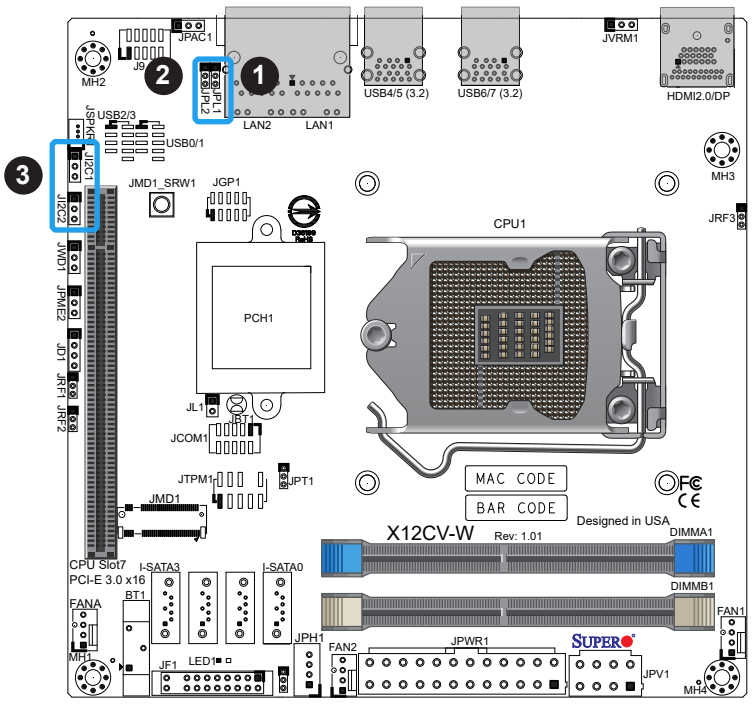
Use JPL1 to enable or disable LAN1 and JPL2 to enable or disable LAN2. The default setting is Enabled.

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

### SMBus to PCIe Slots

Use jumpers JI2C1 and JI2C2 to enable the PCIe System Management Bus (SMB) support to improve system management for the onboard PCIe slot.

| SMBus to PCIe Slot Jumper Settings | |
|---|---|
| **Jumper Setting** | **Definition** |
| Pins 1-2 | Enabled |
| Pins 2-3 | Disabled (Default) |




1. JPL1
2. JPL2
2. SMBus to PCIe

### Front Panel Audio Enable

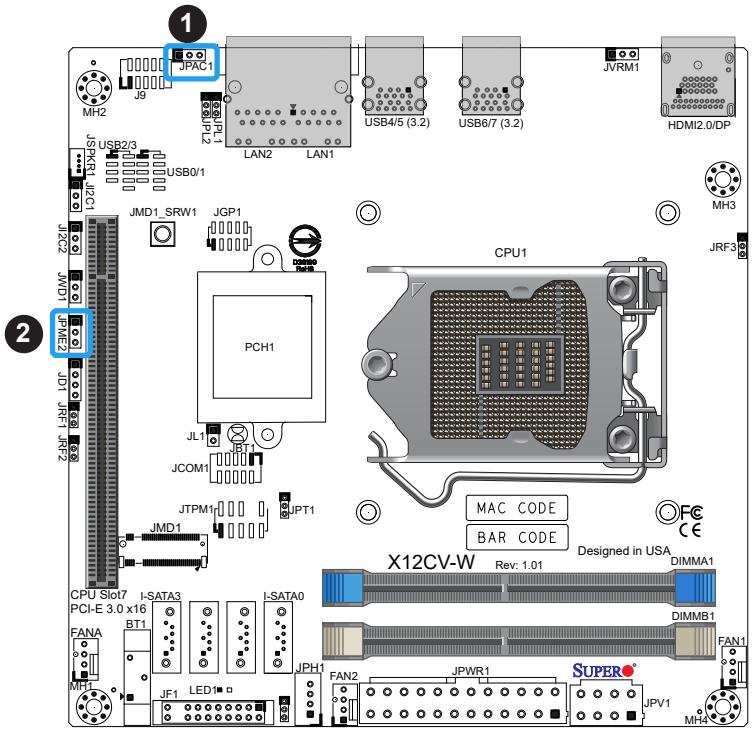
JPAC1 enables or disables the onboard audio support. The default position is on pins 1 and 2 to enable onboard audio connections. Refer to the table below for jumper settings.

| JPAC1 Front Panel Audio Jumper Settings | |
|---|---|
| **Jumper Setting** | **Definition** |
| Pins 1-2 | Enabled (Default) |
| Pins 2-3 | Disabled |

### ME Manufacturing Mode

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

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




1. Front Panel Audio Disable
2. Manufacturing Mode

### Onboard TPM Enable/Disable

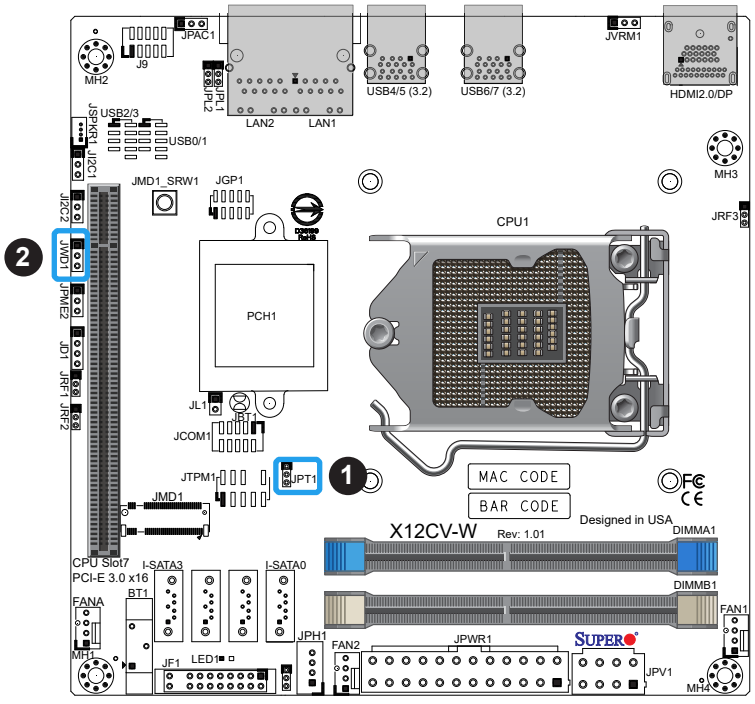
Use JPT1 to enable or disable the onboard TPM.

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

### 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. **Note:** The Watchdog timer must also be enabled in the BIOS.

| JWD1 Watch Dog Jumper Settings | |
|---|---|
| **Jumper Setting** | **Definition** |
| Pins 1-2 | Reset |
| Pins 2-3 | NMI |
| Open | Disabled |




1. TPM Enable/Disable
2. Watch Dog Timer

### Slot7 PCIe Bifurcation

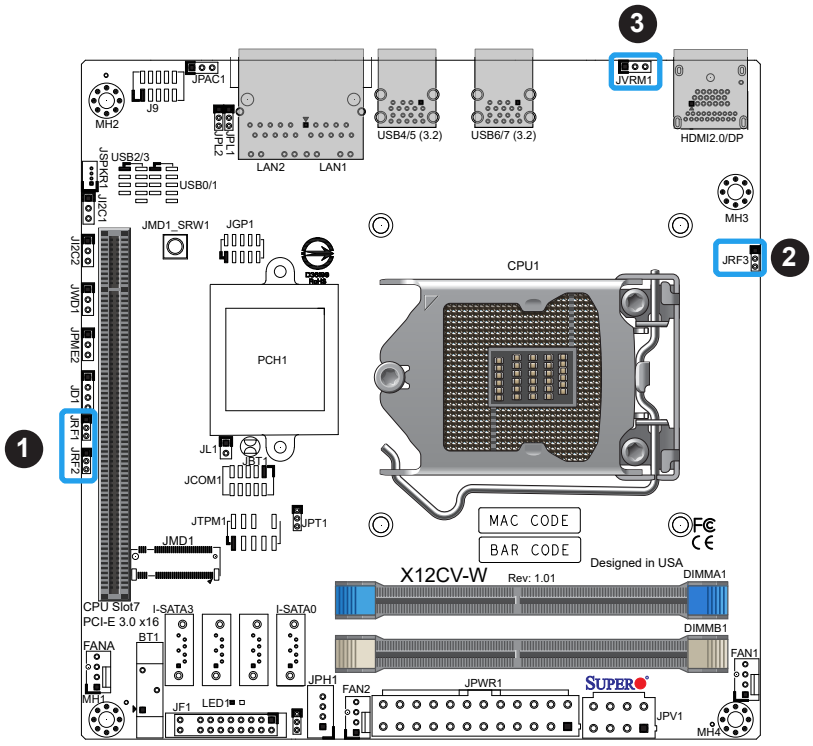
Use JRF1 and JRF2 to adjust the PCIe lane options on Slot 7 expansion slot. The options are x16, x8x8, or x8x4x4.

| PCIe Bifuracation Jumper Settings | | |
|---|---|---|
| **JRF1** | **JRF2** | **PEG** |
| Pins 1-2 | Pins 1-2 | x16 (Default) |
| Pins 2-3 | Pins 1-2 | x8x8 |
| Pins 2-3 | Pins 2-3 | x8x4x4 |

### PCIe Lane Reversal

Use JRF3 to set the lane reversal feature. Refer to the table below for jumper settings.

| PCIe Lane Reversal Jumper Settings | |
|---|---|
| **JRF1** | **PEG** |
| Pins 1-2 | x16 (Default) |
| Pins 2-3 | Lane Reversal |




1. JRF1, JRF2
2. JRF3
3. JVRM1

# 2.9 LED Indicators

### Onboard Power LED

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

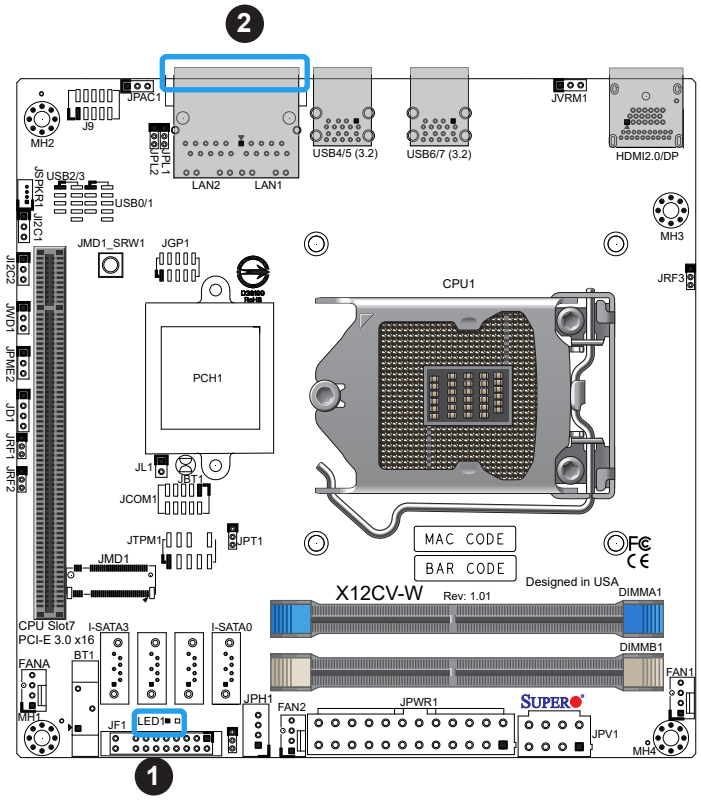
| Power LED Indicator | |
|---|---|
| **LED1** | **Definition** |
| Off | System Off (power cable not connected) |
| On | System On |

### LAN LEDs

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

| LAN Activity LED (Right) Jumper Settings | | |
|---|---|---|
| **Color** | **Status** | **Definition** |
| Green | Flashing | Active |

| LAN Link LED (Left) LED State | |
|---|---|
| **LED Color** | **Definition** |
| Off | 100/10Mbps |
| Orange | 1Gbps |
| Green | 2.5Gbps |




1. Onboard Power LED
2. LAN Port LEDs

# Chapter 3

# Troubleshooting

## 3.1 Troubleshooting Procedures

Use the following procedures to troubleshoot your system. If you have followed all of the procedures below and still need assistance, refer to '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. Check that there are no short circuits between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install the CPU (making sure it is fully seated) and connect the front panel connectors to the motherboard.

### No Power

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

### No Video

If the power is on, but there is no video:

1. Remove all add-on cards and cables.
2. Use the speaker to determine if any beep codes are present. Refer to Appendix A for details on beep codes.
3. Remove all memory modules and turn on the system (if the alarm is on, check the specs of memory modules, reset the memory or try a different one).

## System Boot Failure

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

1. Check for any error beep from the motherboard speaker.
   - If there is no error beep, try to turn on the system without DIMM modules installed. If there is still no error beep, replace the motherboard.
   - If there are error beeps, clear the CMOS settings by unplugging the power cord and contacting both pads on the CMOS clear jumper (JBT1). Refer to Section 2-8.
2. Remove all components from the motherboard, especially the SODIMM modules. Make sure that system power is on and that memory error beeps are activated.
3. Turn on the system with only one SODIMM module installed. If the system boots, check for bad SODIMM 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 SODIMMs have been installed. It is strongly recommended that you use the same RAM type and speed for all SODIMMs 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 SODIMM modules or slots by swapping a single module among all memory slots and check the results.

## Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose the CMOS setup information. Refer to Chapter 2 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies approximately 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. System cooling: Check the system cooling to make sure that all heatsink fans and CPU/system fans, etc., work properly. Check the hardware monitoring settings in the IPMI to make sure that the CPU and system temperatures are within the normal range. Also check the front panel Overheat LED and make sure that it is not on.
5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Refer to our website for more information on the minimum power requirements.
6. Proper software support: Make sure that the correct drivers are used.

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

1. Source of installation: Make sure that the devices used for installation are working properly, including boot devices such as USB flash or media drives.
2. Cable connection: Check to make sure that all cables are connected and working properly.
3. Use the minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use the minimum configuration (but with the CPU and a memory module installed) to identify the trouble areas. Refer to the steps listed in Section A above for proper troubleshooting procedures.
4. Identify bad components by isolating them: If necessary, remove a component in question from the chassis, and test it in isolation to make sure that it works properly. Replace a bad component with a good one.
5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.
6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

## 3.2 Technical Support Procedures

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

1. Go through the Troubleshooting Procedures and Frequently Asked Questions (FAQ) sections in this chapter or see the FAQs on our website (https://www.supermicro.com/FAQ/index.php) before contacting Technical Support.
2. BIOS upgrades can be downloaded from https://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

1. An example of a Technical Support form is on https://www.supermicro.com/RmaForm/.
2. Distributors: For immediate assistance, Have your account number ready when placing a call to our Technical Support department. We can be reached by email at support@supermicro.com.

## 3.3 Frequently Asked Questions

**Question: What type of memory does my motherboard support?**

**Answer:** The motherboard supports up to 64GB of non-ECC or ECC SODIMM DDR4 memory with speeds of up to 2933MHz in two memory slots. To enhance memory performance, do not mix memory modules of different speeds and sizes. Follow all memory installation instructions given on Section 2-4 in Chapter 2.

**Question: How do I update my BIOS?**

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

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

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

# 3.4 Battery Removal and Installation

## Battery Removal

To remove the onboard battery, follow the steps below:

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

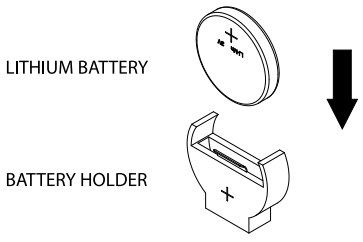
## Proper Battery Disposal

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

## Battery Installation

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

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



## 3.5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. 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 (https://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 for any product problems.

# Chapter 4

# UEFI BIOS

## 4.1 Introduction

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

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

### Starting the Setup Utility

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

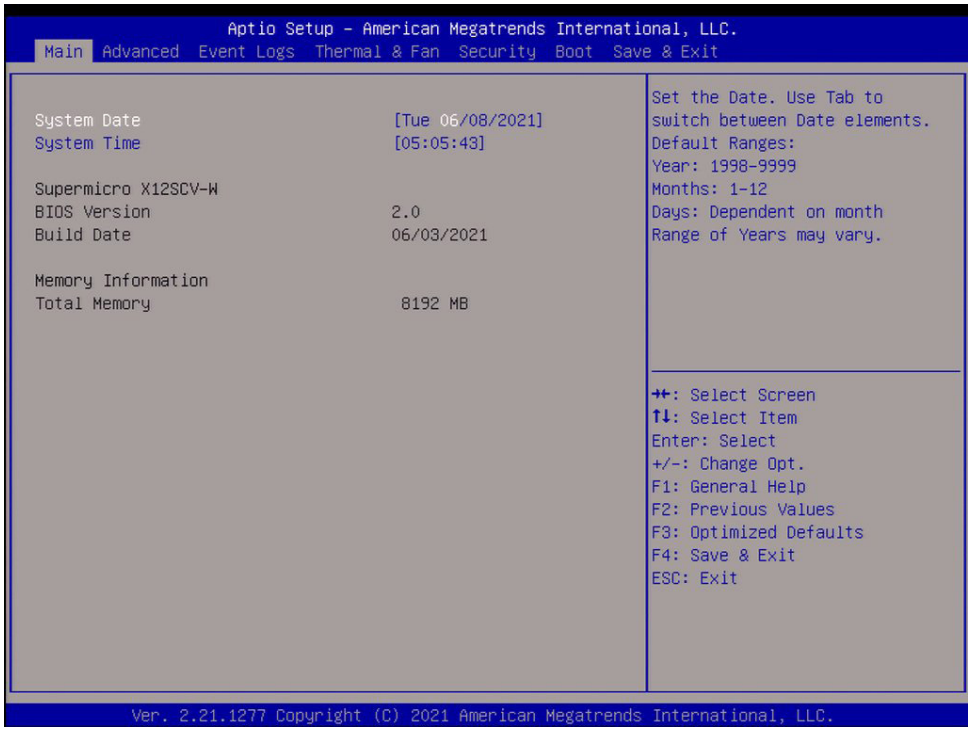
The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is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

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

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

## 4.2 Main Setup

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




### 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 X12SCV-W

### BIOS Version

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

### Build Date

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

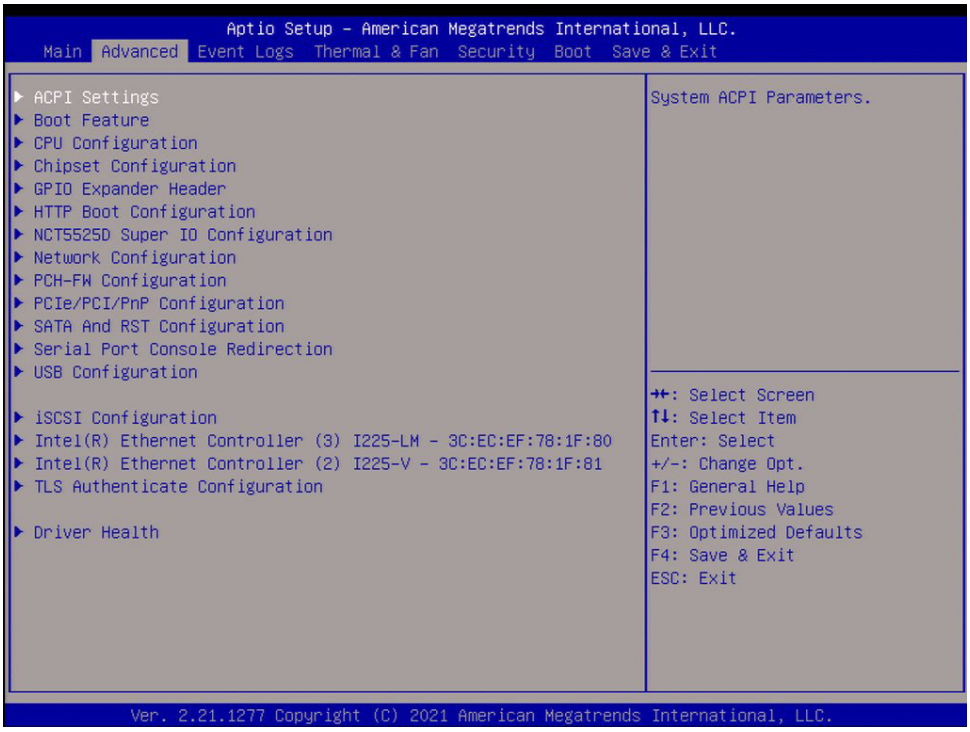
### Memory Information

#### Total Memory

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

## 4.3 Advanced

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




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

### ▶ACPI Settings

#### ACPI Sleep State

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

#### WHEA Support

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

**High Precision Event Timer**

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

**Native PCIE Enable**

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

**Native ASPM**

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

## ▶Boot Feature

**Fast Boot**

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

**Quiet Boot**

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

**Option ROM Messages**

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

**Bootup NumLock State**

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

**Wait For "F1" If Error**

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

**Re-try Boot**

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

**Power Configuration**

**Watch Dog Function**

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

**Restore on AC Power Loss**

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

**Power Button Function**

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

## ▶CPU Configuration

The following CPU information will display:

- CPU Signature
- Microcode Patch
- Max CPU Speed
- Min CPU Speed
- CPU Speed
- Processor Cores
- Hyper Threading Technology
- VMX
- SMX/TXT

- 64-bit
- EIST Technology
- CPU C3 state
- CPU C6 state
- CPU C7 state
- CPU C8 state
- CPU C9 state
- CPU C10 state
- L1 Data Cache
- L1 Instruction Cache
- L2 Cache
- L3 Cache
- L4 Cache

**C6DRAM**

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

**Hardware Prefetcher (Available when supported by the CPU)**

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

**Adjacent Cache Line Prefetch (Available when supported by the CPU)**

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

**Intel (VMX) Virtualization Technology**

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

**Active Processor Cores**

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

**Hyper-Threading (Available when supported by the CPU)**

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

**AES**

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

**Boot Performance Mode**

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

**Intel® SpeedStep™**

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

**Intel® Speed Shift Technology**

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

**Turbo Mode**

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

**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, C1, C3, and **C1 and C3**.

**C-State Un-Demotion**

This feature allows you to enable or disable the un-demotion of C-State. The options are Disabled, C1, C3, and **C1 and C3**

**Package C-State Demotion**

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

**Package C-State Un-Demotion**

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

**C-State Pre-Wake**

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

**Package C-State Limit**

Use this feature to set the Package C-State limit. The options are C0/C1, C2, C3, C6, C7, C7S, C8, C9, C10, Cpu Default, and **Auto**.

**MonitorMWait**

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

## ▶Config TDP Configuration

**Power Limit 1**

Use this feature to configure the value for Power Limit 1. The value is in milli watts and the step size is 125mW. Enter 0 to use the manufacture default setting.

**Power Limit 2**

Use this feature to configure the value for Power Limit 2. The value is in milli watts and the step size is 125mW. Enter 0 to use the manufacture default setting.

**Power Limit 1 Time Window**

Use this feature to configure the value for Power Limit 1 Time Window. The value is in milli watts and the step size is 125mW. Enter 0 to use the manufacture default setting.

**Custom Settings Down**

**ConfigTDP Level1**

This feature displays the TDP Level 1 status.

**Power Limit 1**

Use this feature to configure the value for Power Limit 1. The value is in milli watts and the step size is 125mW. Enter 0 to use the manufacture default setting.

**Power Limit 2**

Use this feature to configure the value for Power Limit 2. The value is in milli watts and the step size is 125mW. Enter 0 to use the manufacture default setting.

**Power Limit 1 Time Window**

Use this feature to configure the value for Power Limit 1 Time Window. The value is in milli watts and the step size is 125mW. Enter 0 to use the manufacture default setting.

## ▶Chipset Configuration

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

### ▶System Agent (SA) Configuration

The following information will display:

- VT-d

#### ▶Memory Configuration

**Memory Configuration**

- Memory RC Version
- Memory Frequency
- Memory Timings (tCL-tRCD-tRP-tRAS)
- DIMMA1
- DIMMB1

**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, and 2933.

**Max TOLUD**

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

**Memory Scrambler**

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

**Force ColdReset**

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

**Force Single Rank**

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

**Memory Remap**

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

**MRC Fast Boot**

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

**Enable RH Prevention**

Use this feature to prevent row hammer. The options are Disabled and **Enabled**.

**Row Hammer Solution**

Use this feature to choose the method used to prevent row hammer. The options are **Hardware RHP** and 2x Refresh.

**Refresh Watermarks**

Use this feature to set the Refresh Panic Watermark and Refresh High-Profile Watermark to High or Low values. The options are **High** and Low.

## ▶Graphics Configuration

**Graphics Configuration**

- IGFX VBIOS Version
- IGFX GOP Version

**Graphics Turbo IMON Current**

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

**Skip Scanning of External Gfx Card**

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

**Primary Display**

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

**Internal Graphics**

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

**GTT Size**

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

**Aperture Size**

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

**DVMT Pre-Allocated**

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

**DVMT Total Gfx Mem**

Use this feature to set the total memory size to be used by internal graphics devices based on the DVMT 5.0 platform. The options are 128MB, **256MB,** and Max.

**PM Support**

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

**PAVP Enable**

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

**Cdynmax Clamping Enable**

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

**Graphics Clock Frequency**

Use this feature to set the internal graphics clock frequency. The options are 192Mhz, 312Mhz, 324Mhz, 552Mhz, 648Mhz, an Max CdClock freq based on Reference Clk.

**Skip CD Clock Init In S3 Resume**

Use this feature to enable skipping of the full CD initialization. If set to Disabled, the full CD clock will initialize. The options are Enabled and **Disabled**.

## ▶DMI/OPI Configuration

The following DMI information will display:

- DMI: X4 Gen3

**DMI Link ASPM Control**

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

**DMI Extended Sync Control**

Use this feature to enable or disable the DMI extended synchronization. The options are Enabled and **Disabled**.

## ▶PEG Port Configuration

**CPU SLOT7 PCI-E 3.0 X16**

**Enable Root Port**

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

**Max Link Speed**

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

## ▶GT - Power Management Control

### RC6 (Render Standby)

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

### Maximum GT frequency

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

### Disable Turbo GT frequency

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

### VT-d

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

### GNA Device (B0:D8:F0)

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

## ▶PCH-IO Configuration

### PCH-IO Configuration

- PCH SKU Name
- Stepping

## ▶PCI Express Configuration

### DMI Link ASPM Control

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

**Peer Memory Write Enable**

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

### ▶PCIe/SATA M.2-H

**PCIe/SATA M.2-H ASPM**

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

**PCIe/SATA M.2-H Substates**

Use this feature to set the PCIe L1 substate settings. The options are Disabled, L1.1, and **L1.1 & L1.2**.

**PCIe Speed**

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

**PCIe PLL SSC**

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

## ▶GPIO Expander Header

**GPIO Expander Header Control**

Use this feature enable or disable the General Purpose I/O expander header. The options are **Disabled** and Enabled.

## ▶HTTP Boot Configuration

**HTTP BOOT Configuration**

**HTTP Boot Policy**

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

**HTTPS Boot Checks Hostname**

Use this feature to select whether HTTPS Boot checks the hosname of TLS certificates matches the hosname provided by the remote server. The options are Enabled and Disabled (WARNING: Security Risk!!).

**Priority of HTTP Boot**

**Instance of Priority 1:**

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

**Select IPv4 or IPv6**

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

**Boot Description**

Highlight the feature and press enter to create a description.

**Boot URI**

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

**Instance of Priority 2:**

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

## ▶NCT5525D Super IO Configuration

The following Super IO information will display:

- Super IO Chip NCT5525D

### ▶Serial Port 1 Configuration

**Serial Port 1**

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=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;), (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;).

## ▶Network Configuration

### ▶MAC:3CECEF781F80-IPv4 Network Configuration
### ▶MAC:3CECEF781F81-IPv4 Network Configuration

**Configured**

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

**Save Changes And Exit**

Use this feature to save changes and exit.

### ▶MAC:3CECEF781F80-IPv6 Network Configuration
### ▶MAC:3CECEF781F81-IPv6 Network Configuration

### ▶Enter Configuration Menu

**Interface Name**

**Interface Type**

**MAC address**

**Host addresses**

**Route Table**

**Gateway addresses**

**DNS addresses**

**Interface ID**

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

**DAD Transmit Count**

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

**Policy**

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

**Save Changes And Exit**

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

## ▶PCH-FW Configuration

**ME Firmware Version: 14.**

**ME Firmware Mode: Normal Mode**

**ME Firmware SKU: Corporate SKU**

**ME FW Image Re-Flash**

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

## ▶PCIe/PCI/PnP Configuration

**Option ROM execution**

**Video**

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

**PCI PERR/SERR Support**

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

**Above 4G MMIO BIOS Assignment (Available if the system supports 64-bit PCI decoding)**

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

**SR-IOV Support**

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

**BME DMA Mitigation**

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

**NVMe Firmware Source**

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

**Consistent Device Name Support**

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

**PCIe/PCI/PnP Configuration**

**CPU SLOT7 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 **EFI**.

**PCIe/SATA M.2-H OPROM**

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

**Onboard LAN1 Option ROM**

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

**Network Stack**

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

**IPv4 PXE Support**

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

**IPv4 HTTP Support**

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

**IPv6 PXE Support**

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

**IPv6 HTTP Support**

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

**PXE Boot Wait Time**

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

**Media Detect Count**

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

## ▶SATA And RST Configuration

**SATA Controller(s)**

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

**SATA Mode Selection**

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

***If the feature above is set to Intel RST Premium With Intel Optane System Acceleration, the next four features will be available for configuration. If the feature is set to AHCI, then only Aggressive LPM Support will be available for configuration.***

**SATA Interrupt Selection**

Use this feature to select the SATA interrupt. The options are **Msix**, Msi, and Legacy.

**RAID Device ID**

Use this feature to select the RAID device ID. The options are iRST Mode and **Alternate**.

**Storage Option ROM/UEFI Driver**

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

**Aggressive LPM Support**

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

**Serial ATA Port 0-3**

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

- Software Preserve Support

**SATA Port 0-3 Hot Plug**

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

**SATA Port 0-3 Spin Up Device**

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

**SATA Port 0-3 SATA Device Type**

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

**PCIe/SATA M.2-H**

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

- Software Preserve Support

**Hot Plug**

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

**Spin Up Device**

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

**SATA Device Type**

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

## ▶Serial Port Console Redirection

**COM1 Console Redirection**

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

***If the feature above is set to Enabled, the following features will be available for configuration:***

### ▶COM1 Console Redirection Settings

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

**COM1 Terminal Type**

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

**COM1 Bits Per Second**

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

**COM1 Data Bits**

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

**COM1 Parity**

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

**COM1 Stop Bits**

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

**COM1 Flow Control**

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

**COM1 VT-UTF8 Combo Key Support**

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

**COM1 Recorder Mode**

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

**COM1 Resolution 100x31**

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

**COM1 Putty KeyPad**

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

**COM1 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**.

**COM1 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.

## ▶Legacy Console Redirection Settings

**Redirection COM Port**

Use this feature to select a COM port to display redirection of Legacy OS and Legacy OPROM messages. The default option is **COM1**..

**EMS (Emergency Management Services) Console Redirection**

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

***If the feature above is set to Enabled, the following features will become available for configuration:***

## ▶EMS Console Redirection Settings

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

**Out-of-Band Mgmt Port**

The feature selects a serial port in a client server to be used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1** and COM2.

**Terminal Type**

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

**Bits Per Second**

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

**Flow Control**

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

**Data Bits, Parity, Stop Bits**

## ▶Trusted Computing

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

- Vendor Name
- Firmware Version

**Security Device Support**

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

- Active PCR Banks
- Available PCR Banks

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

**SHA-1 PCR Bank**

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

**SHA256 PCR Bank**

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

**Pending Operation**

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

**Platform Hierarchy**

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

**Storage Hierarchy**

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

**Endorsement Hierarchy**

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

**PH Randomization**

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

**Intel Trusted Execution Technology**

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

## ▶USB Configuration

**USB Configuration**

**USB Module Version**

**USB Controllers**

**USB Devices**

**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**.

## ▶iSCSI Configuration

### ▶Host iSCSI Configuration

**iSCSI Initiator Name**

This feature allows you to enter the unique name of the iSCSI Initiator in IQN format. Once the name of the iSCSI Initiator is entered into the system, configure the proper settings for the following items.

**▶Add an Attempt**

**▶Delete Attempts**

**▶Change Attempt Order**

## ▶Intel(R) Ethernet Controller (3) I225-LM - 3C:EC:EF:78:1F:80

**UEFI Driver**

**Device Name**

**PCI Device ID**

**Link Status**

**MAC Address**

## ▶Intel(R) Ethernet Connection (2) I225-V - 3C:EC:EF:78:1F:81

**UEFI Driver**

**Device Name**

**PCI Device ID**

**Link Status**

**MAC Address**

## ▶TLS Authentication Configuration

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

### ▶Server CA Configuration

#### ▶Enroll Certification

**Enroll Certification Using File**

Use this feature to enroll certification from a file.

**Certification GUID**

Use this feature to input the certification GUID.

**Commit Changes and Exit**

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

**Discard Changes and Exit**

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

#### ▶Delete Certification

Use this feature to delete certification.

## ▶Driver Health

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

#### ▶Intel(R) Gigabit 0.0.29

#### ▶Intel(R) Gigabit 0.9.02

**Controller 963fb898 Child 0**

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

**Controller 963fb418 Child 0**

**Intel(R) Ethernet Controller (2) I225-V**

# 4.4 Event Logs

Use this menu to configure Event Log settings.


## ▶Change SMBIOS Event Log Settings

### Enabling/Disabling Options

### SMBIOS Event Log

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

### Erasing Settings

### Erase Event Log

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

### When Log is Full

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

**SMBIOS Event Log Standard Settings**

**Log System Boot Event**

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

**MECI**

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

**METW**

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

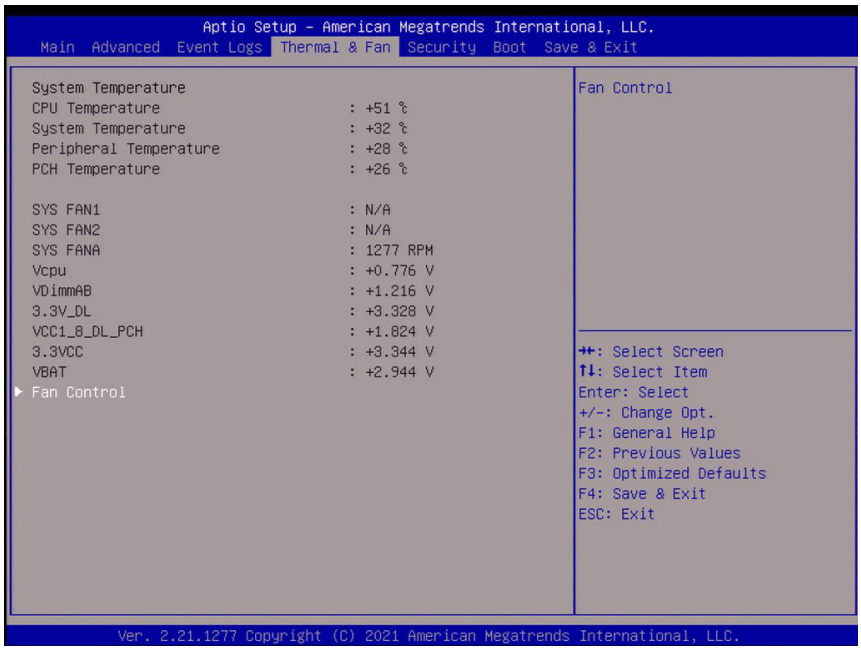
**Note**: After making changes on a setting, reboot the system for the changes to take effect.

## ▶View SMBIOS Event Log

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

# 4.5 Thermal & Fan

Use this menu to view System Temperature settings.




**System Health**

- System Temperature
- CPU Temperature
- System Temperature
- Peripheral Temperature
- PCH Temperature
- SYS FAN1
- SYS FAN2
- SYS FANA
- Vcpu
- VDimmAB
- 3.3V_DL
- VCC1_8_DL_PCH

- 3.3VCC
- VBAT

## ▶Fan Control

Fan Control Setting

**Fan Speed Control**

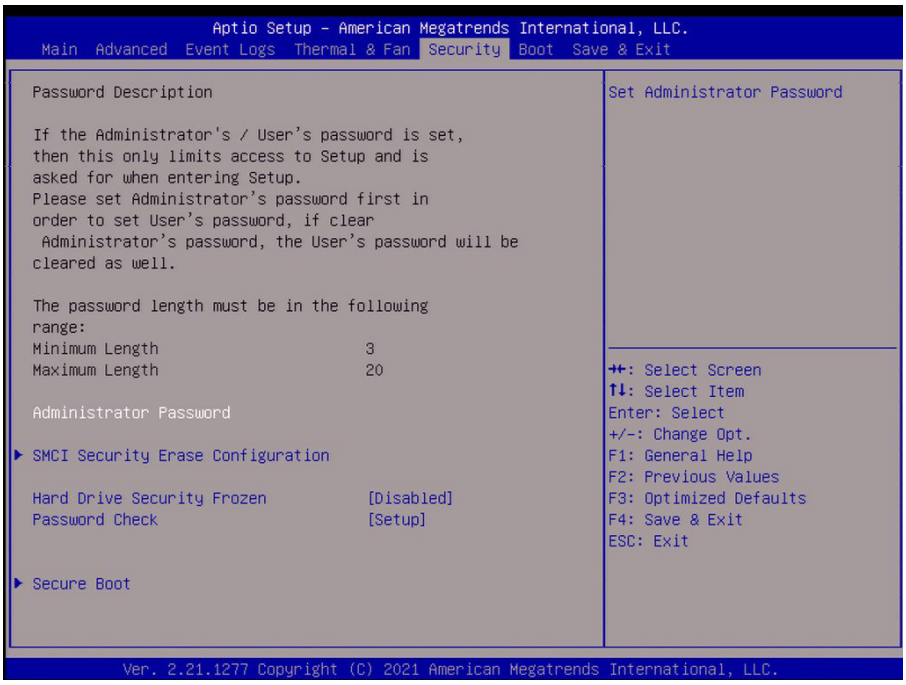
Use this feature to select the fan speed control mode. The options are **Quiet**, Stable, Full Speed, and Customize.

- SYS FAN1 and SYS FAN2 CONTROL
- SYS FAN1 and SYS FAN2 Reference sensor
- Temperature 1
- PWM1
- Temperature 2
- PWM2
- Temperature 3
- PWM3
- Temperature 4
- PWM4
- SYS FANA Control
- SYS FANA Reference sensor
- Temperature 1
- PWM1
- Temperature 2
- PWM2
- Temperature 3
- PWM3

- Temperature 4
- PWM4

# 4.6 Security

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




**Administrator Password**

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

## ▶SMC Security Erase Configuration

The following information will display if a HDD or an M.2 device is detected:

**HDD Name**

**HDD Serial Number**

**Security Mode**

**Estimated Time**

**HDD User Pwd Status**

**Security Function**

Use this feature to set a password for the HDD or M.2 device. 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.

**Hard Drive Security Frozen**

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

**Password Check**

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

## ▶Secure Boot

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

- System Mode
- Secure Boot

**Secure Boot**

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

**Secure Boot Mode**

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

**Enter Audit Mode**

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

### ▶Key Management

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

### ▶Restore Factory Keys

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

### ▶Reset to Setup Mode

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

### ▶Export Secure Boot variables

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

### ▶Enroll EFI Image

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

**Device Guard Ready**

### ▶Remove 'UEFI CA' from DB

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

### ▶Restore DB Defaults

Select Yes to restore the DB defaults.

**Secure Boot Variable**

### ▶Platform Key (PK)

**Details**

Select this feature to view the details of the Platform Key.

**Export**

Select Yes to export a PK from a file on an external media.

**Update**

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

**Append**

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

**Delete**

Select Ok to remove the PK and then the system will reset to Setup/Audit Mode.

## ▶Key Exchange Key

**Details**

Select this feature to view the details of the Key Exchange Key.

**Export**

Select Yes to export a KEK from a file on an external media.

**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.

**Delete**

Select Ok to remove the KEK and then the system will reset to Setup/Audit Mode.

## ▶Authorized Signatures

**Details**

Select this feature to view the details of the db.

**Export**

Select Yes to export a db from a file on an external media.

**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.

**Delete**

Select Ok to remove the db and then the system will reset to Setup/Audit Mode.

## ▶Forbidden Signatures

**Details**

Select this feature to view the details of the dbx.

**Export**

Select Yes to export a dbx from a file on an external media.

**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.

**Delete**

Select Ok to remove the dbx and then the system will reset to Setup/Audit Mode.

## ▶Authorized TimeStamps

**Details**

Select this feature to view the details of the dbt.

**Export**

Select Yes to export a dbt from a file on an external media.

**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.

**Delete**

Select Ok to remove the dbt and then the system will reset to Setup/Audit Mode.

## ▶OsRecovery Signature

**Details**

Select this feature to view the details of the dbr.

**Export**

Select Yes to export a dbr from a file on an external media.

**Update**

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

**Append**

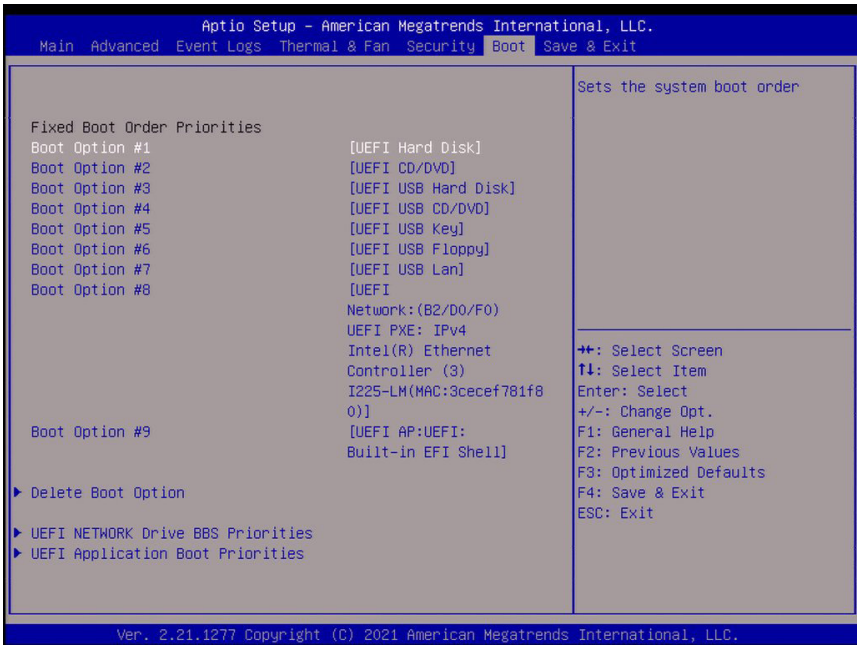
Select Yes to add the dbr from the manufacturer's defaults list to the existing dbr. Select No to load the dbr from a file. The options are Yes and No.

**Delete**

Select Ok to remove the dbr and then the system will reset to Setup/Audit Mode.

# 4.7 Boot

Use this menu to configure Boot settings.




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

## ▶Delete Boot Option

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

**Delete Boot Option**

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

## ▶UEFI NETWORK Drive BBS Priorities

This feature sets the system boot order of detected devices.

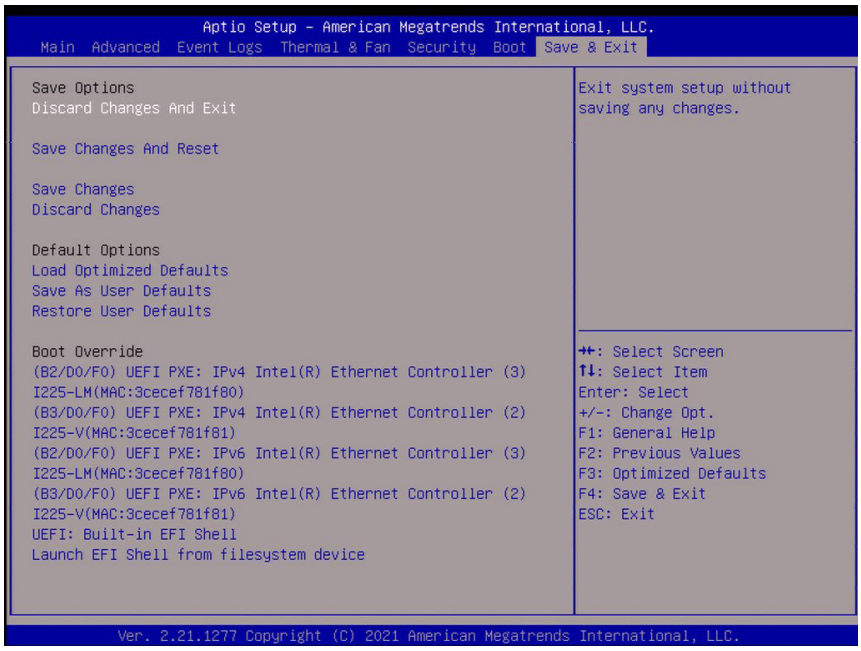
## ▶UEFI Application Boot Priorities

This feature sets the system boot order of detected devices.

- Boot Option #1

# 4.8 Save & Exit

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




### Save Options

### Discard Changes and Exit

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

### Save Changes and Reset

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

### Save Changes

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

### Discard Changes

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

### Default Options

**Load Optimized Default**

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

**Save As User Defaults**

To set this feature, select Save as User Defaults from the Save & Exit menu and press <Enter>. This enables 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**

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

**(B2/D0/F0) UEFI PXE: IPv4 Intel (R) Ethernet Controller (3) I225-LM (MAC:3cecef781f80)**

**(B2/D0/F0) UEFI PXE: IPv4 Intel (R) Ethernet Controller (2) I225-V (MAC:3cecef781f81)**

**(B2/D0/F0) UEFI PXE: IPv6 Intel (R) Ethernet Controller (3) I225-LM (MAC:3cecef781f80)**

**(B2/D0/F0) UEFI PXE: IPv6 Intel (R) Ethernet Controller (3) I225-V (MAC:3cecef781f81)**

**UEFI: Built-in EFI Shell**

**Launch EFI Shell from filesystem device**

# Appendix A

# BIOS Codes

## A.1 BIOS Error POST (Beep) Codes

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

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

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

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

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

## A.2 Additional BIOS POST Codes

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

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

# Appendix B

# Software

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

## B.1 Microsoft Windows OS Installation

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

***Installing the OS***

1. Create a method to access the MS Windows installation ISO file. That can be a USB flash or media drive.
2. Retrieve the proper RST/RSTe driver. Go to the Supermicro web page for your motherboard and click on "Download the Latest Drivers and Utilities", select the proper driver, and copy it to a USB flash drive.
3. Boot from a bootable device with Windows OS installation. You can see a bootable device list by pressing **F11** during the system startup.

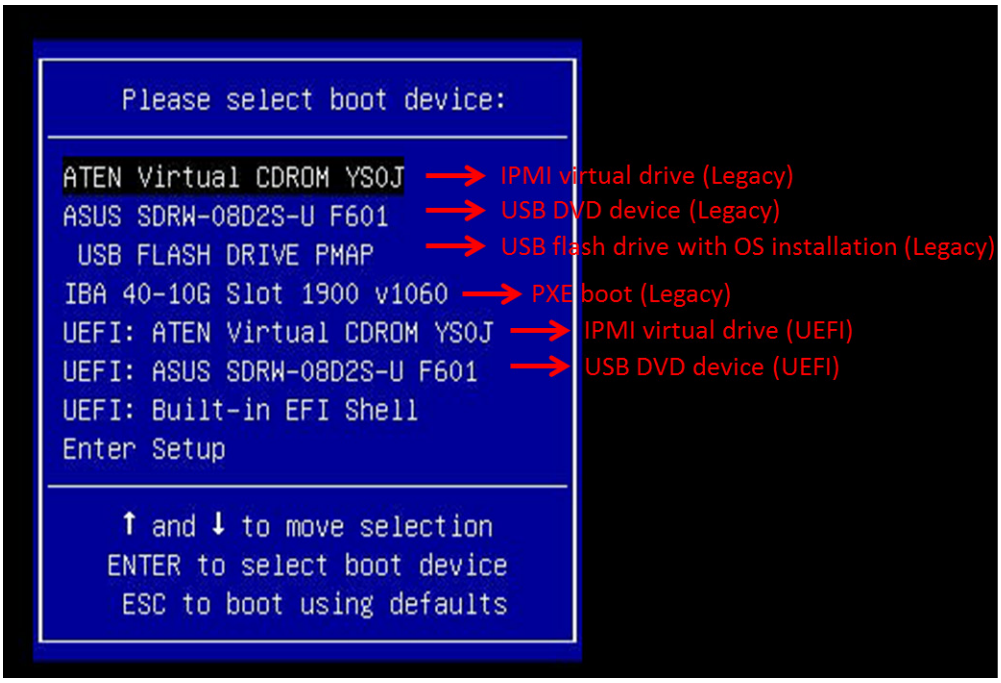



**Figure B-1. Select Boot Device**

4. During Windows Setup, continue to the dialog where you select the drives on which to install Windows. If the disk you want to use is not listed, click on “Load driver” link at the bottom left corner.

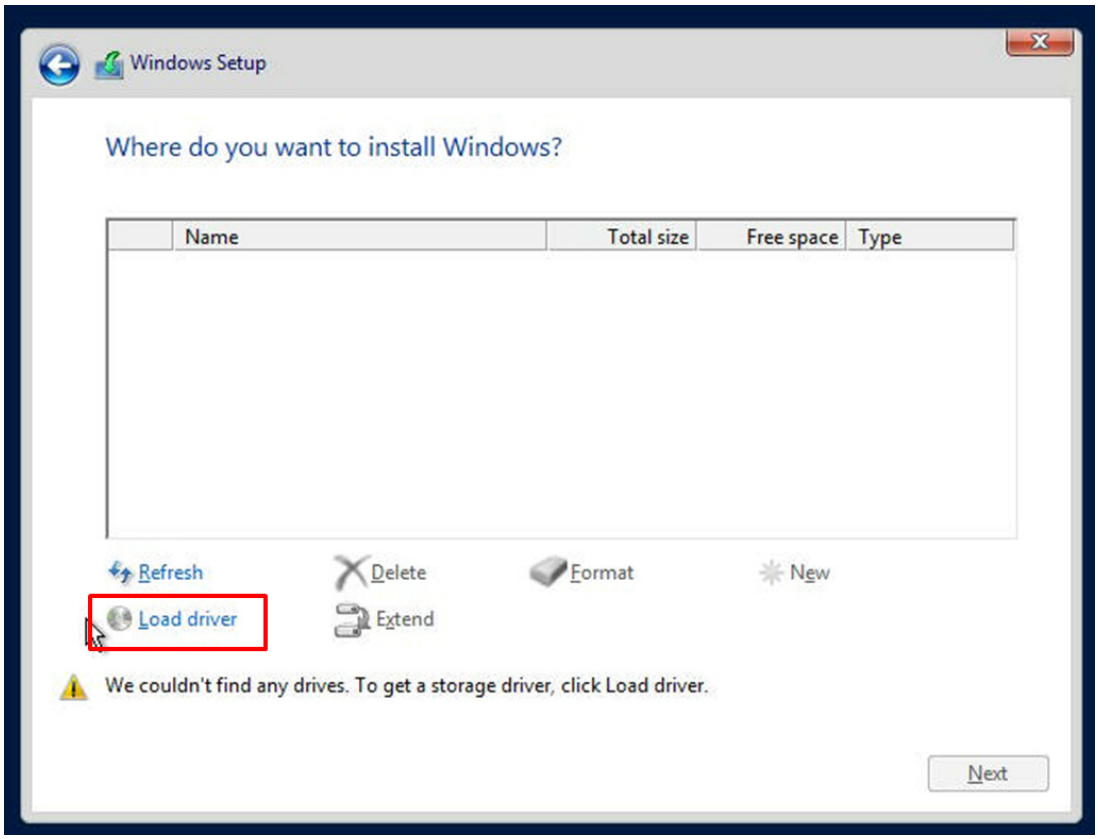



**Figure B-2. Load Driver Link**

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

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

5. Once all devices are specified, continue with the installation.
6. After the Windows OS installation has completed, the system will automatically reboot multiple times.

## B.2 Driver Installation

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

After accessing the website, go into the CDR_Images (in the parent directory of the above link) and locate the ISO file for your motherboard. Download this file to a USB flash or media drive. You may also use a utility to extract the ISO file if preferred.

Another option is to go to the Supermicro website at https://www.supermicro.com/products/. Find the product page for your motherboard and download the latest drivers and utilities.

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

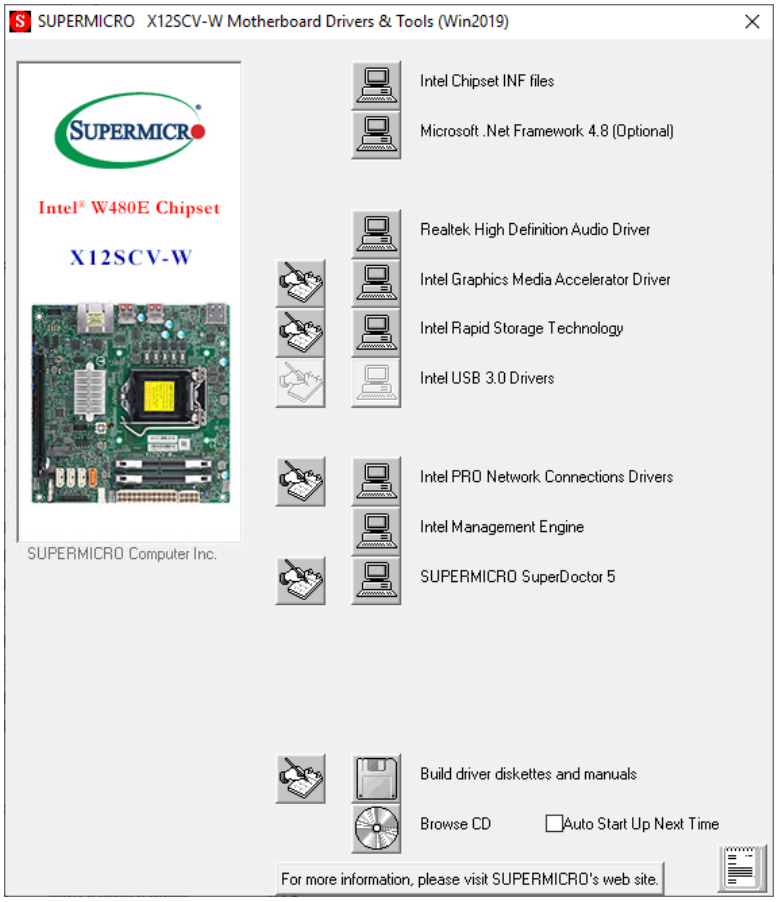



**Figure B-3. Driver & Tool Installation Screen**

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

## B.3 SuperDoctor® 5

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.

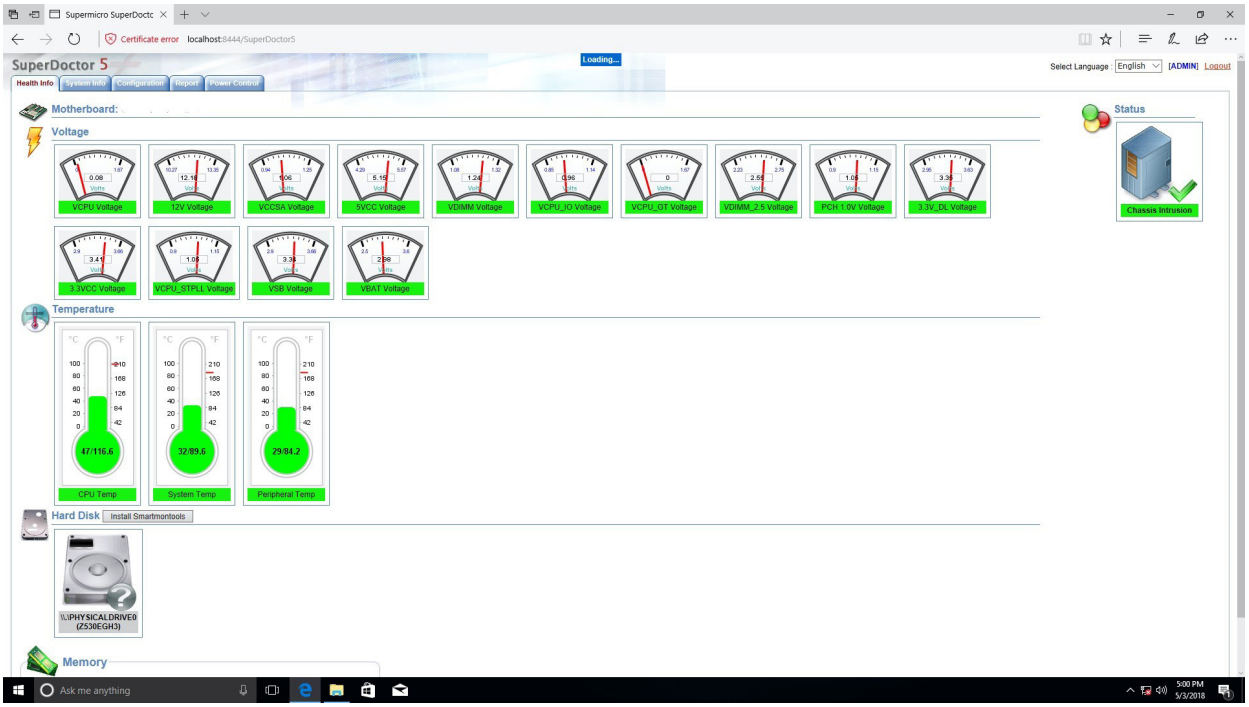



**Figure B-4. SuperDoctor 5 Interface Display Screen (Health Information)**

## B.4 IPMI

The Intel Xeon and Core™ i9/i7/i5i3 series processor support the Intelligent Platform Management Interface (IPMI). IPMI is used to provide remote access, monitoring and management. There are several BIOS settings that are related to IPMI.

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 industry-standard warnings are 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 at https://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 allows 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 turned on, the boot block code executes first. Once completed, the main BIOS code continues 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:** If the BIOS recovery block crashes, you will need to make a Returned Merchandise Authorization (RMA) request. (For more information about a RMA request, see section 3.5). 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. A USB device such as a USB flash or media drive can be used for this purpose. **Note:** a USB Hard Disk drive cannot be used for BIOS recovery at this time.

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

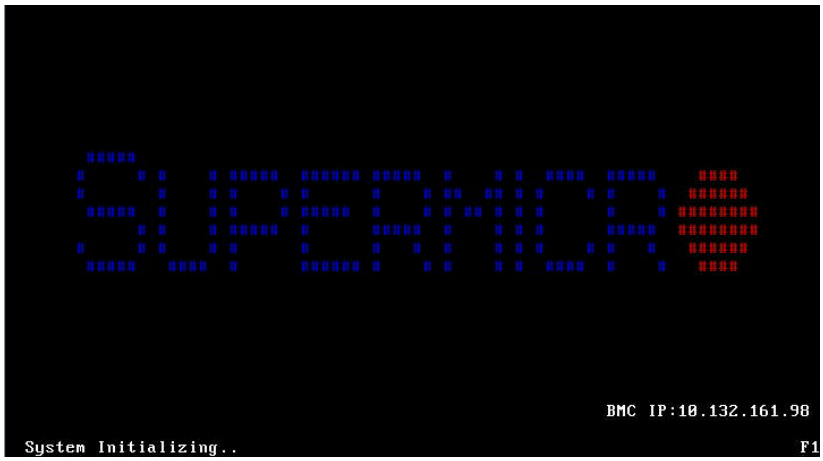
To perform UEFI BIOS recovery using a USB-attached device, follow the instructions below:

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

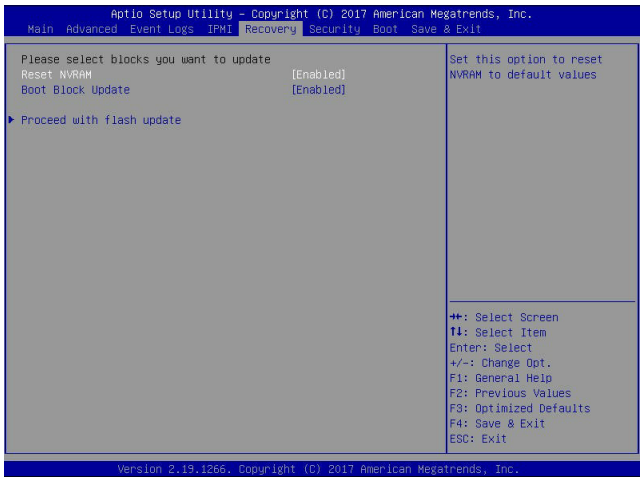
   **Note 1:** If you cannot locate the "Super.ROM" file in your driver disk, visit www.supermicro.com to download the BIOS package. Extract the BIOS binary image into a USB flash device and rename it "Super.ROM" for the BIOS recovery use.

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

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB port and reset the system until the following screen appears:
3. After locating the new BIOS binary image, the system will enter the BIOS Recovery menu as shown below:



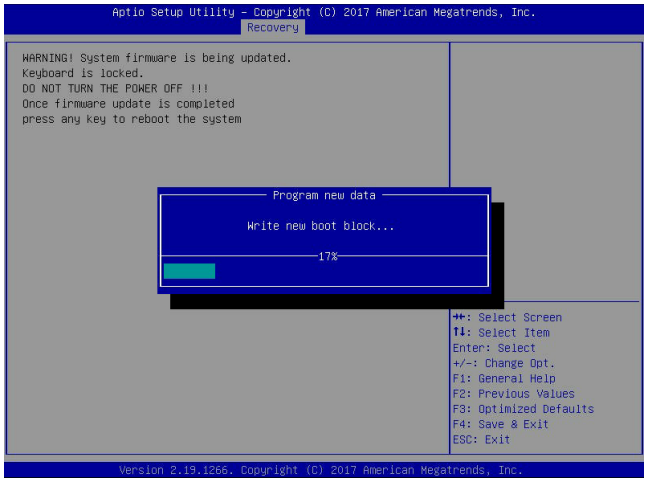
**Note**: At this point, you may decide you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.



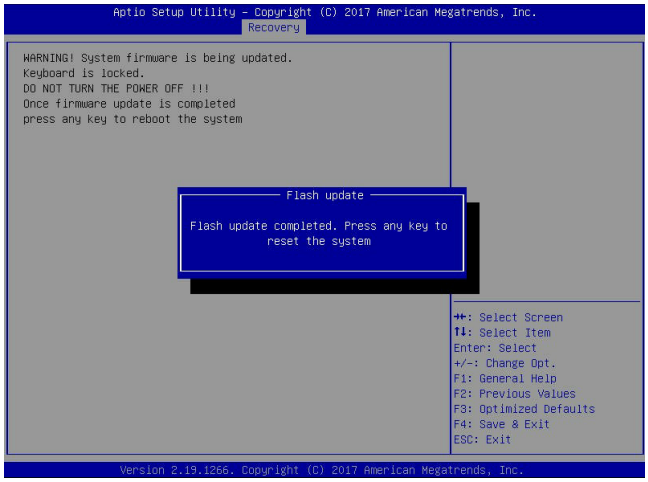

4. When the screen shown above displays, use the arrow keys to select the item "Proceed with flash update" and press the <Enter> key. You will see the BIOS recovery progress as shown in the screen below:

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

5. When the BIOS recovery process completes, press any key to reboot the system.
6. Using a different system, extract the BIOS package into a USB flash drive.



7. Press <Del> during system boot to enter the BIOS Setup utility. From the top of the tool bar, select Boot to enter the submenu. From the submenu list, select Boot Option #1 as

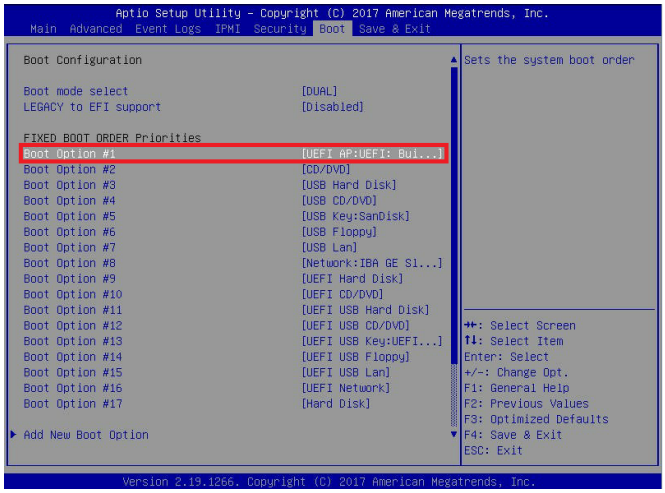



shown below. Then, set Boot Option #1 to [UEFI AP:UEFI: Built-in EFI Shell]. Press <F4> to save the settings and exit the BIOS Setup utility.

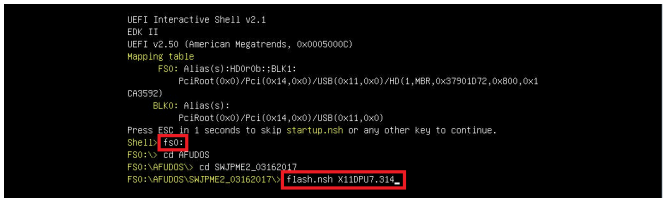
8. When the UEFI Shell prompt appears, type fs# to change the device directory path. Go to the directory that contains the BIOS package you extracted earlier from Step 6. Enter flash.nsh BIOSname.### at the prompt to start the BIOS update process.

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

9. The screen above indicates 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 repower 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.