

SUPER●<sup>®</sup>

**X11SAE**  
**X11SAE-F**

**USER'S MANUAL**

**Revision 1.1**

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Manual Revision 1.1

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## Preface

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the **SUPER** X11SAE/X11SAE-F motherboard.

### Manual Organization

**Chapter 1** describes the features, specifications and performance of the motherboard, and provides detailed information on the Intel C236 Express chipset.

**Chapter 2** provides hardware installation instructions. Read this chapter when installing the processor, memory modules and other hardware components into the system.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory and system setup stored in the CMOS.

**Chapter 4** includes an introduction to the BIOS, and provides detailed information on running the CMOS Setup utility.

**Appendix A** provides BIOS Error Beep Codes.

**Appendix B** lists software program installation instructions.

**Appendix C** contains UEFI BIOS Recovery instructions.

## Checklist

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

Please check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

Model	SATA Cables	I/O Shield	Quick Reference Guide	Driver CD
<b>SINGLE PACK</b>				
X11SAE	6	Yes	Yes	Not Included
X11SAE-F	6	Yes	Yes	Not Included
X11SAE-M	4	Yes	Yes	Not Included
<b>BULK PACK</b>				
X11SAE	2	Yes	Not Included	Not Included
X11SAE-F	2	Yes	Not Included	Not Included
X11SAE-M	2	Yes	Not Included	Not Included

## 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:



**Attention!** Critical information to prevent damage to the components or injury to yourself.



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



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

## Standardized Warning Statements

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

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

### Battery Handling



#### Warning!

There is a 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

電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 استبدال البطارية بطريقة غير صحيحة فعليك استبدال البطارية فقط بنفس النوع أو ما يعادلها كما أوصت به الشركة المصنعة تخلص من البطاريات المستعملة وفقا لتعليمات الشركة 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 ontplofingsgevaar 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

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#### Warnung

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

#### iAdvertencia!

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 القوانين واللوائح الوطنية

#### 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.

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Web Site: [www.supermicro.com.tw](http://www.supermicro.com.tw)



## **Where to Find More Information**

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

Supermicro product manuals: <http://www.supermicro.com/support/manuals/>.

Product Drivers and utilities: <https://www.supermicro.com/wdl/driver/>

A secure data deletion tool designed to fully erase all data from storage devices can be found at our website: [https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9\\_Secure\\_Data\\_Deletion\\_Utility/](https://www.supermicro.com/about/policies/disclaimer.cfm?url=/wdl/utility/Lot9_Secure_Data_Deletion_Utility/)

If you have any questions, please contact our support team at [support@supermicro.com](mailto:support@supermicro.com).

# Table of Contents

## Preface

## Chapter 1 Introduction

1-1	Overview .....	1-1
1-2	Chipset Overview .....	1-1
1-3	Motherboard Features .....	1-2
1-4	Special Features .....	1-4
1-5	PC Health Monitoring.....	1-4
1-6	ACPI Features .....	1-5
1-7	Power Supply .....	1-6
1-8	Super I/O .....	1-6

## Chapter 2 Installation

2-1	Installation Components and Tools Needed .....	2-1
2-2	Static-Sensitive Devices.....	2-2
2-3	Processor and Heatsink Installation.....	2-3
2-4	Installing DDR4 Memory .....	2-9
2-5	Motherboard Installation.....	2-12
2-6	Connectors/IO Ports.....	2-14
2-7	Connecting Cables .....	2-21
2-8	Jumper Settings .....	2-29
2-9	Onboard Indicators .....	2-34
2-10	SATA Connections.....	2-36

## Chapter 3 Troubleshooting

3-1	Troubleshooting Procedures.....	3-1
3-2	Technical Support Procedures .....	3-3
3-3	Frequently Asked Questions .....	3-4
3-4	Battery Removal and Installation .....	3-5
3-5	Returning Motherboard for Service.....	3-6

## Chapter 4 UEFI BIOS

4-1	Introduction .....	4-1
4-2	Main Setup .....	4-2
4-3	Advanced Setup Configurations .....	4-4
4-4	Event Logs.....	4-34
4-5	IPMI.....	4-36
4-6	Security.....	4-39
4-7	Boot.....	4-42
4-8	Save & Exit.....	4-44

**Appendix A BIOS Error Beep Codes****Appendix B Software**

B-1 Driver Installation ..... B-1

B-2 SuperDoctor 5 ..... B-2

**Appendix C UEFI BIOS Recovery Instructions**

C-1 Overview ..... C-1

C-2 Recovering the UEFI BIOS Image ..... C-1

C-3 Recovering the Main BIOS Block with a USB Device ..... C-2

## Notes

# Chapter 1

## Introduction

### 1-1 Overview

#### About this Motherboard

The X11SAE/X11SAE-F motherboard supports a single Intel® E3-v5-Family series, 6th Generation Intel Core™ i7/i5/i3 series, Pentium® and Celeron® series processor, in an LGA 1151 (H4) socket. With the Intel C236 Express chipset built in, the X11SAE/X11SAE-F motherboard offers exceptional performance and storage capability for workstation platforms. Please refer to our website (<http://www.supermicro.com/products/>) for processor and memory support updates.

### 1-2 Chipset Overview

#### Intel C236 Express Chipset Features

- Direct Media Interface (up to 10 Gb/s transfer, Full Duplex)
- Intel Matrix Storage Technology and Intel Rapid Storage Technology
- Dual NAND Interface
- Intel I/O Virtualization (VT-d) Support
- Intel Trusted Execution Technology Support
- PCI Express 3.0 Interface (up to 8 GT/s)
- SATA Controller (up to 6Gb/sec)
- Advanced Host Controller Interface (AHCI)

## 1-3 Motherboard Features

<b>CPU</b>	Supports a single Intel E3-v5-Family series, 6th Generation Intel Core i7/i5/i3 series, Pentium and Celeron series processor, in an LGA 1151 (H4) socket	
<b>Memory</b>	Four (4) slots support up to 64GB of unbuffered, ECC/non-ECC, 2133MHz DDR4 memory	
	Dual-channel memory	
	<b>DIMM sizes</b>	
	UDIMM	4GB, 8GB, 16GB
<b>Chipset</b>	Intel C236 Express	
<b>Expansion Slots</b>	Two CPU PCIe 3.0 x16 slots (x16/NA or x8/x8)	
	Three PCH PCIe 3.0 x1 (open edge) slots on the X11SAE and two on the X11SAE-F	
	Two PCI 33MHz slots	
	One M.2 socket (32Mb/s)	
<b>Network Connections</b>	Two Gigabit Ethernet Controllers, with LAN2 shared with IPMI on the X11SAE-F	
	Two RJ-45 rear I/O panel connectors with Link and Activity LEDs	
<b>I/O Devices</b>	<b>SATA Connections</b>	
	SATA 3.0 (6Gb/s)	Eight I-SATA 0~7, via Intel C236
		RAID 0, 1, 5, 10
	<b>USB Devices</b>	
	Two USB 2.0, two USB 3.0, two 10Gb/s USB 3.1 Type A ports on the rear I/O panel	
	Six Front-Accessible USB 2.0 connections via three headers on the X11SAE, four front accessible USB 2.0 connections via two headers on the X11SAE-F, and four front accessible USB 3.0 connections via two headers on both models	
	<b>Other I/O Ports</b>	
	One DisplayPort 1.2, One DVI-D Port, One HDMI 1.4 Port, One VGA Port (X11SAE-F only), IPMI Port (shared with LAN2 on the X11SAE-F only)	
	SATA DOM Power Connector	
	Two Serial Port headers (COM1 & COM2)	

	<b>Audio</b>
	One High Definition Audio 7.1 channel connector supported by Realtek ALC888S on the back panel
	One Front Panel Audio Header
	<b>Super I/O</b>
	Nuvoton NCT6776D
<b>BIOS</b>	128 Mb AMI BIOS® SPI Flash BIOS
	Plug and Play (PnP), DMI 2.8, PCI 2.3, ACPI 1.0/2.0/3.0, and USB Keyboard
<b>Power Configuration</b>	ACPI/ASPM Power Management
	Main Switch Override Mechanism
	Internal/External Modem Ring-On
	Power-on mode for AC power recovery
<b>Health Monitoring</b>	<b>CPU Monitoring</b>
	Onboard monitors: +3.3V, +5V, +12V, +3.3V Stby, +5V Stdbby, VBAT, Memory, PCH Temp, System Temp, Memory Temp (ECC UDIMM only)
	CPU 3+2 phase switching voltage regulator
	CPU Thermal Trip support
	Thermal Monitor support
	<b>Fan Control</b>
	Fan status monitoring with firmware 4-pin fan speed control
	Low noise fan speed control
<b>System Management</b>	PCIe (Platform Environment Configuration Interface) 2.0 support
	System resource alert vi SuperDoctor® 5
	SuperDoctor 5, NMI
	Chassis Intrusion header and detection
<b>CD Utilities</b>	BIOS flash upgrade utility
	Drivers and software for Intel C236 Express chipset utilities
<b>Other</b>	ROHS 6/6 (Full Compliant, Lead Free)
<b>Dimensions</b>	ATX form factor (12.0" x 9.6") (304.8 mm x 243.84 mm)

## 1-4 Special Features

### Recovery from AC Power Loss

Basic I/O System (BIOS) provides a setting for you to determine 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 a power-on state. See the [Advanced BIOS Setup](#) section to change this setting. The default setting is **Last State**.

## 1-5 PC Health Monitoring

This section describes the PC health monitoring features of the motherboard. All have an onboard System Hardware Monitoring chip that supports PC health monitoring. An onboard voltage monitor will scan these onboard voltages continuously: +3.3V, +5V, +12V, +3.3V Stby, +5V Stdby, VBAT, Memory, PCH Temp, System Temp, Memory Temp (ECC UDIMM only). Once a voltage becomes unstable, a warning is given, or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

### Fan Status Monitor with Firmware Control

PC health monitoring in the BIOS can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management via SIO (X11SAE) or BMC (X11SAE-F).

### Environmental Temperature Control

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



**Note:** To avoid possible system overheating, please be sure to provide adequate airflow to your system.



## **System Resource Alert**

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

## **1-6 ACPI Features**

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, hard disk drives and printers.

In addition to enabling operating system-directed power management, ACPI also provides a generic system event mechanism for Plug and Play, and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures, while providing a processor architecture-independent implementation that is compatible with Windows 7, Windows 8, and Windows 2008 Operating Systems.

### **Slow Blinking LED for Suspend-State Indicator**

When the CPU goes into a suspend state, the chassis power LED will start to blink to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will "wake up", and the LED will automatically stop blinking and remain on.

## 1-7 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.

This motherboard accommodates 24-pin ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. In addition, the 12V 8-pin power connector located at JPW2 is also required to ensure adequate power supply to the system. Also your power supply must supply 1.5A for the Ethernet ports.

**! Attention!** To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and a 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the 8-pin (JPW2) power connectors on the motherboard.

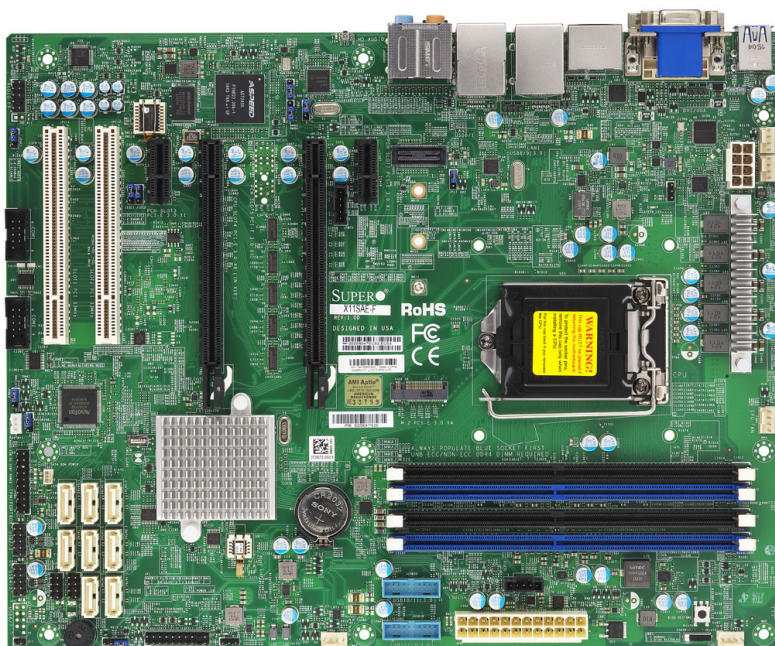
It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant. (For more information, please refer to the web site at <http://www.ssiforum.org/>.) Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

## 1-8 Super I/O

The Super I/O supports two high-speed, 16550 compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide 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, which support higher speed modems.

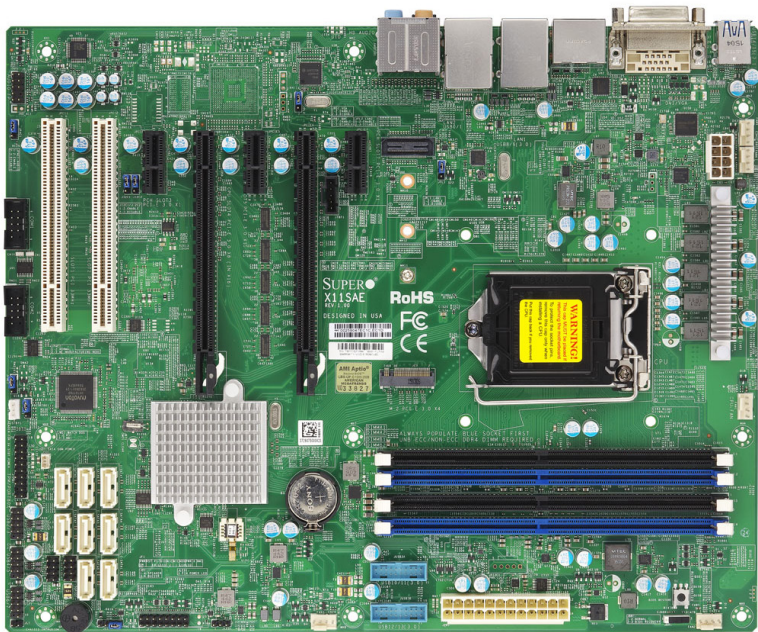
The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

## X11SAE-F Motherboard Image



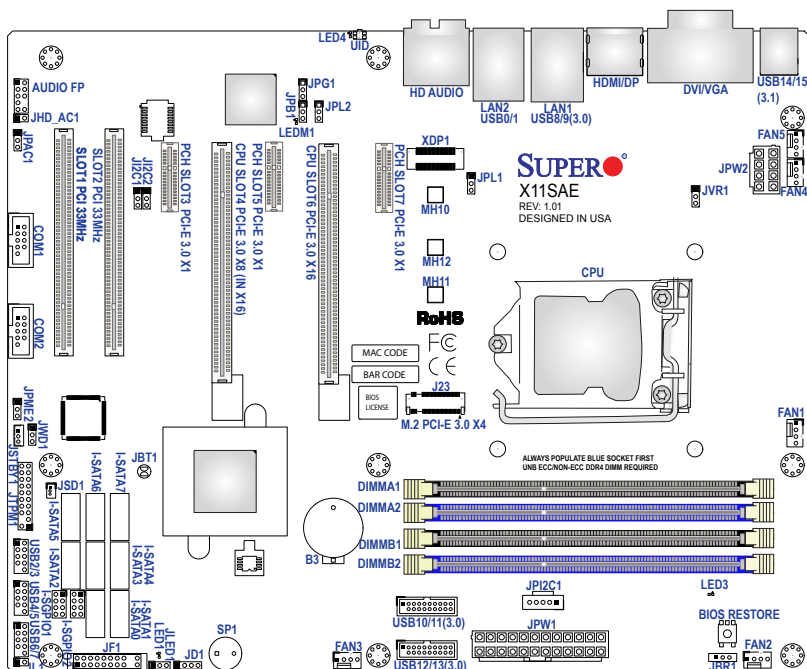
**Note:** All graphics shown in this manual were based upon the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in this manual.

X11SAE Motherboard Image



**Note:** All graphics shown in this manual were based upon the latest PCB Revision available at the time of publishing of the manual. The motherboard you've received may or may not look exactly the same as the graphics shown in this manual.

## X11SAE/X11SAE-F Motherboard Layout

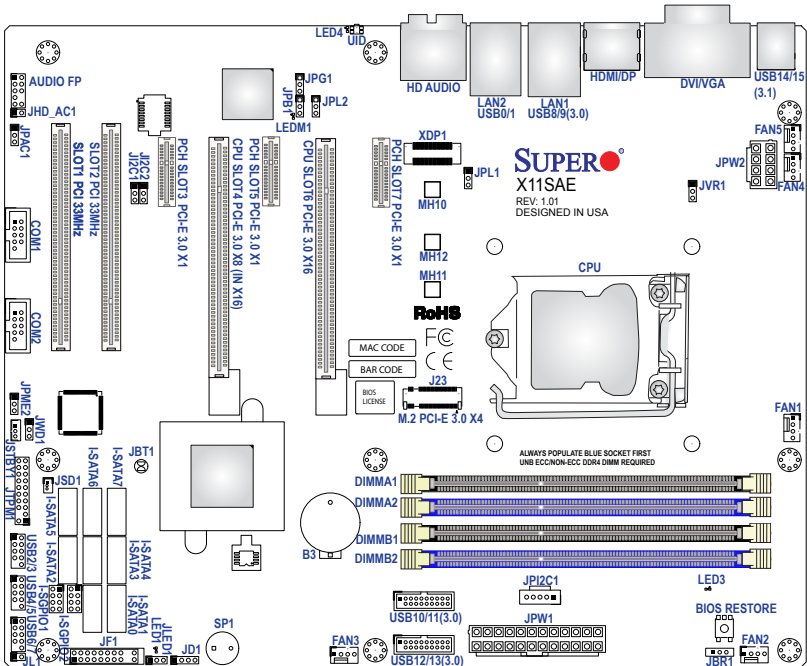


## Important Notes to the User

- See [Chapter 2](#) for detailed information on jumpers, I/O ports and JF1 front panel connections.
- " ■ " indicates the location of "Pin 1".
- Jumpers not indicated are for testing only.
- When LED1 (Onboard Power LED Indicator) is on, system power is on. Unplug the power cable before installing or removing any components.



## X11SAE/X11SAE-F Quick Reference



Jumper	Description	Default Setting
JBR1	BIOS Recovery	Pins 1-2 (Normal)
JBT1	CMOS Clear	Open (Normal)
JHD_AC1	High Definition Audio Enable	Open (Enabled)
J12C1/J12C2	SMB to PCIe Slots Enable/Disable	Both Pins 2-3 (Disabled)
JPAC1	Audio Enable	Pins 1-2 (Enabled)
JPB1	BMC Enable	Pins 1-2 (Enabled) (X11SAE-F only)
JPG1	Onboard VGA Enable	Pins 1-2 (Enabled) (X11SAE-F only)
JPL1/JPL2	LAN1/LAN2 Enable/Disable	Pins 1-2 (Enabled)
JPME2	ME Recovery	Pins 1-2 (Normal)
JWD1	Watch Dog	Pins 1-2 (Reset)

<b>Connector</b>	<b>Description</b>
AUDIO FP	Front Panel Audio Header
B3	Onboard Battery
BIOS RESTORE	BIOS Restore Button
COM1/COM2	Serial COM Headers
DVI/VGA	Digital Visual Interface/VGA Ports (X11SAE-F only)
FAN1 - FAN5	System/CPU Fan Headers (FAN1: CPU Fan)
HD AUDIO	High Definition Audio Connector
HDMI/DP	High Definition Multimedia Interface/DisplayPort Ports
J23	M.2 PCIe 3.0 x4 Socket
JD1	Speaker/Buzzer (Pins 1-4: Speaker, Pins 3-4: Buzzer)
JF1	Front Control Panel Connector
JL1	Chassis Intrusion Header
JLED1	3-Pin Power LED
JPI2C1	Power I2C System Management Bus (Power SMB) Header (X11SAE-F only)
JPW1	24-pin ATX Power Connector
JPW2	8-pin 12V DC Power Connector
JSD1	SATA DOM Power
JSTBY1	Standby Power Header
JTPM1	Trusted Platform Module/Port 80 Connector
LAN1/LAN2	Gb LAN (RJ45) Ports
I-SATA0 - I-SATA7	Intel SATA Ports
SLOT1/SLOT2	PCI 33MHz Slots
SLOT3/SLOT5/SLOT7	PCH PCIe 3.0 x1 Slots
SLOT4	CPU PCIe 3.0 x8 (IN x16) Slot
SLOT6	CPU PCIe 3.0 x16 Slot
SP1	Internal Speaker/Buzzer
I-SGPIO1 - I-SGPIO2	Serial General Purpose I/O Headers
UID	Unit Identification Switch
USB 0/1, 8/9, 14/15	Back panel USB Ports (Ports 0/1: USB 2.0, Ports 8/9: USB 3.0, Ports 14/15: USB 3.1) The USB wake up function is supported by USB0/1
USB 2/3, 4/5, 6/7 USB 10/11, 12/13	Front Access USB Headers (Headers 2/3, 4/5, 6/7: USB 2.0, Headers 10/11 and 12/13: USB 3.0) The USB wake up function is supported by USB0/3



<b>LED</b>	<b>Description</b>	<b>Status</b>
LED1	Power LED	Green: Power On
LED3	Standby Power LED	Green: Standby Power On
LED4	UID LED	Blue On: Unit Identified (X11SAE-F only)
LEDM1	BMC HeartBeat LED	Green Blinking: BMC Normal (X11SAE-F only)

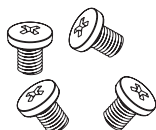
## Notes

## Chapter 2

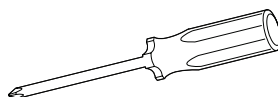
### Installation

#### 2-1 Installation Components and Tools Needed

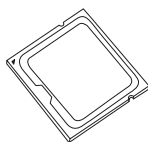
Screws



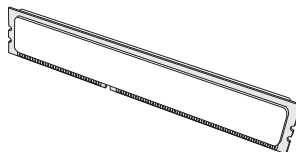
Phillips-Head Screwdriver



Intel LGA 1151 Processor



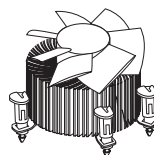
DDR4 DIMMs



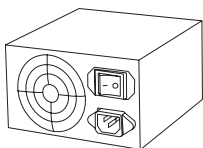
PC Chassis



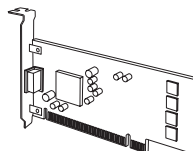
Heatsink with Fan



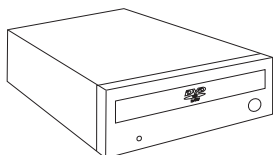
Power Supply



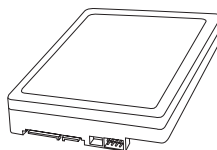
Video Card (Optional)



SATA/USB Optical Drive (Optional)



SATA Hard Disk Drive



## 2-2 Static-Sensitive Devices

Electrostatic-Discharge (ESD) can damage electronic components. To avoid damaging your system motherboard, 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 motherboard 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 your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.
- Use only the correct type of onboard CMOS battery. Do not install the onboard battery upside down to avoid possible explosion.

### Unpacking

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

## 2-3 Processor and Heatsink Installation

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



### Important:

Always connect the power cord last, and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.

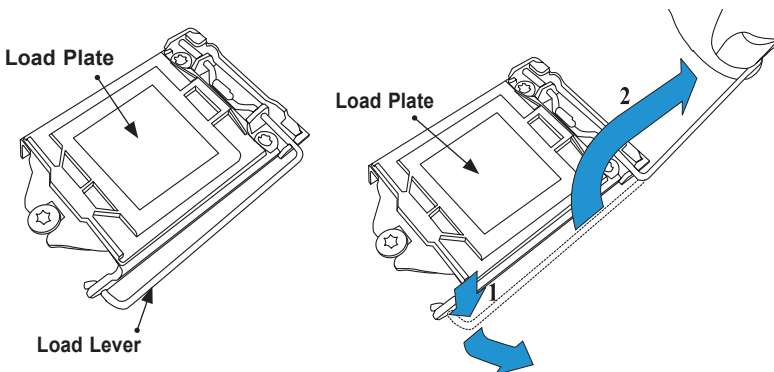
Make sure to install the system motherboard into the chassis before you install the CPU heatsink.

When receiving a server motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.

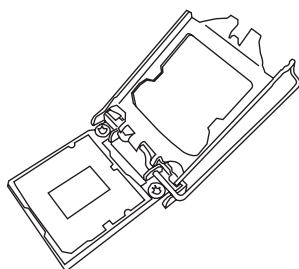
Refer to the Supermicro website for updates on CPU support.

### Installing the LGA1151 Processor

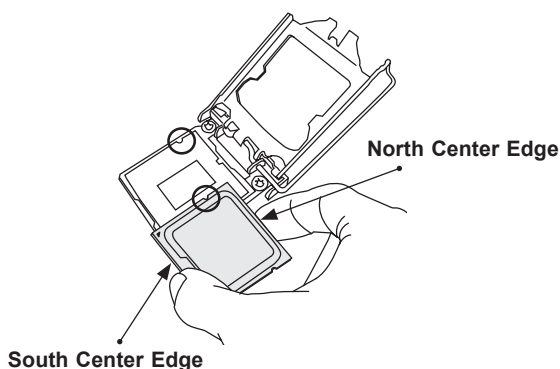
1. Press the load lever to release the load plate, which covers the CPU socket, from its locking position.



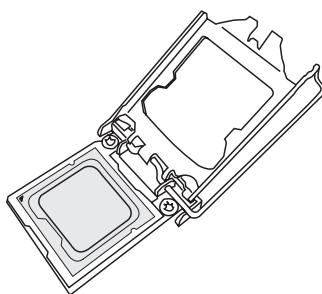
2. Gently lift the load lever to open the load plate. Remove the plastic cap.



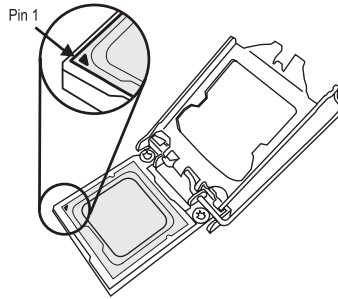
3. Use your thumb and your index finger to hold the CPU at the North center edge and the South center edge of the CPU.



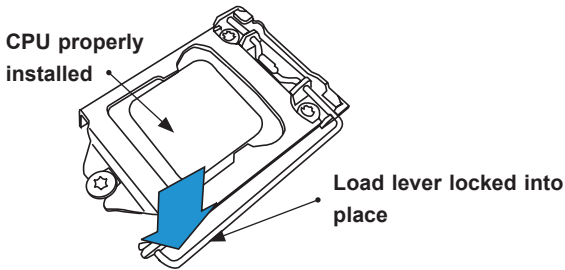
4. Align the CPU key that is the semi-circle cutouts against the socket keys. Once it is aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically.)



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



6. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.
7. Use your thumb to gently push the load lever down to the lever lock.



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

## Installing an Active CPU Heatsink with Fan

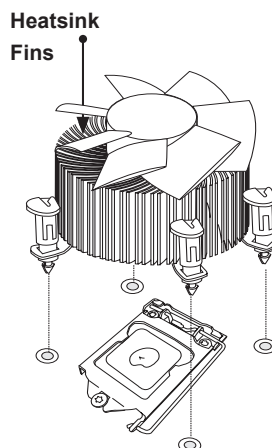
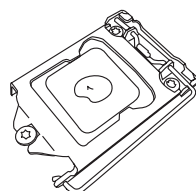
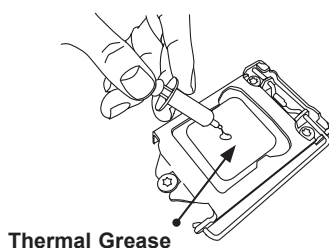
1. Locate the CPU Fan power connector on the motherboard.
2. Position the heatsink so that the heatsink fan wires are closest to the CPU fan power connector and are not interfered with other components.
3. Inspect the CPU Fan wires to make sure that the wires are routed through the bottom of the heatsink.
4. Remove the thin layer of the protective film from the heatsink.

**! Attention!** 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.

**Note:** If the heatsink came with a thermal pad, please ignore this step.

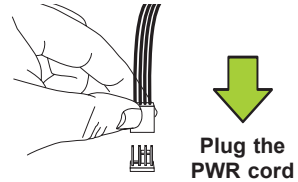
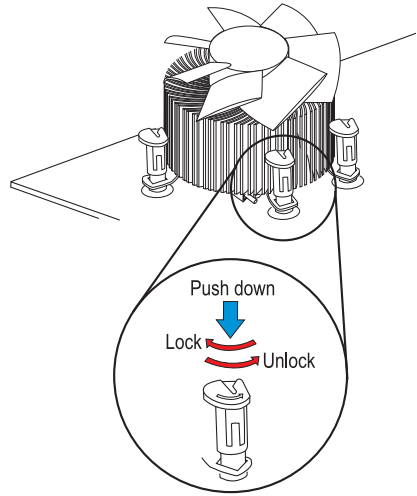
6. If necessary, rearrange the wires to make sure that the wires are not pinched between the heatsink and the CPU. Also make sure to keep clearance between the fan wires and the fins of the heatsink.



**Recommended Supermicro heatsink:  
SNK-P0046A4 active heatsink**



7. Align the four heatsink fasteners with the mounting holes on the motherboard. Gently push the pairs of diagonal fasteners (#1 & #2, and #3 & #4) into the mounting holes until you hear a click. Also, make sure to orient each fastener so that the narrow end of the groove is pointing outward.
8. Repeat Step 7 to insert all four heatsink fasteners into the mounting holes.
9. Once all four fasteners are securely inserted into the mounting holes, and the heatsink is properly installed on the motherboard, connect the heatsink fan wires to the CPU Fan connector.

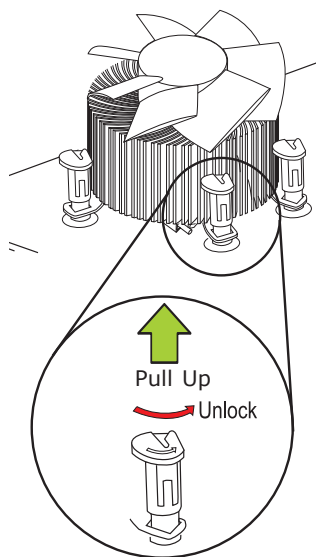
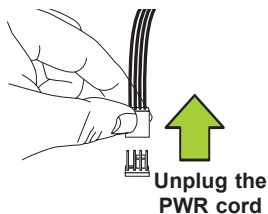


## Removing the Heatsink

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

### Active Heatsink Removal

1. Unplug the power cord from the power supply.
2. Disconnect the heatsink fan wires from the CPU fan header.
3. Use your finger tips to gently press on the fastener cap and turn it counterclockwise to make a 1/4 (90°) turn, and pull the fastener upward to loosen it.
4. Repeat Step 3 to loosen all fasteners from the mounting holes.
5. With all fasteners loosened, remove the heatsink from the CPU.



## 2-4 Installing DDR4 Memory



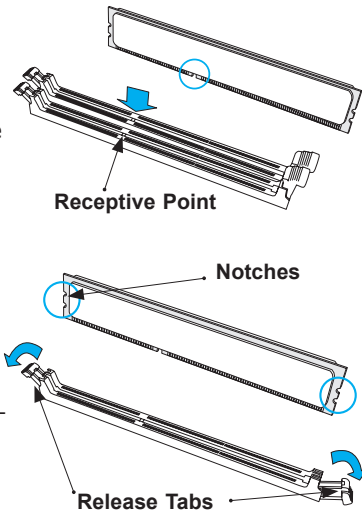
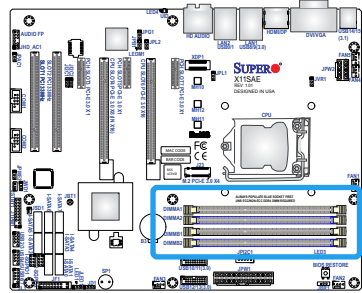
**Note:** Check the Supermicro website for recommended memory modules.



**Attention!** Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

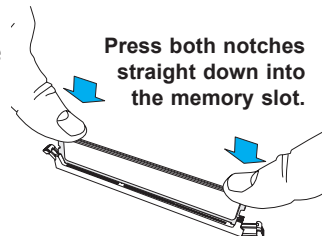
### DIMM Installation

1. Insert the desired number of DIMMs into the memory slots, starting with DIMMA2. For the system to work properly, please use the memory modules of the same type and speed in the same motherboard.
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.
3. Align the key of the DIMM module with the receptive point on the memory slot.
4. Use two thumbs together to press the notches on both ends of the module straight down into the slot until the module snaps into place.
5. Press the release tabs to the lock positions to secure the DIMM module into the slot.

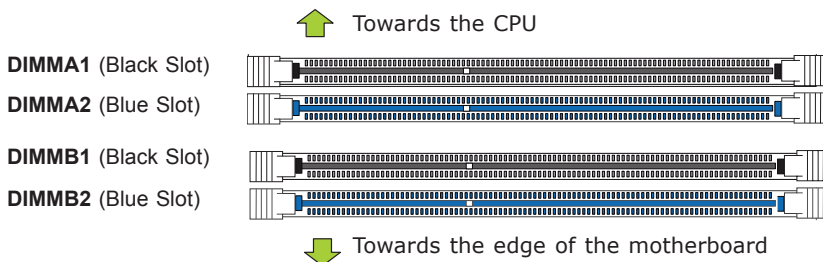


### Removing Memory Modules

Reverse the steps above to remove the DIMM modules from the motherboard.



## Memory Support



The X11SAE/X11SAE-F supports up to 64GB of Unbuffered (UDIMM) ECC/non-ECC DDR4 memory, up to 2133 MHz in four memory slots. Populating these DIMM modules with a pair of memory modules of the same type and same size will result in interleaved memory, which will improve memory performance.



### Notes

Be sure to use memory modules of the same type, same speed, same frequency on the same motherboard. Mixing of memory modules of different types and speeds is not allowed.

Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. Refer to the following table for details.

For Microsoft Windows users: Microsoft implemented a design change in the Windows XP with Service Pack 2 (SP2) and Windows Vista. This change is specific to the behavior of Physical Address Extension (PAE) mode which improves driver compatibility. For more information, please read the following article at Microsoft's Knowledge Base website at: <http://support.microsoft.com/kb/888137>.

Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Remaining (-Available) (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99
Local APIC	4 KB	3.99
Area Reserved for the chipset	2 MB	3.99
I/O APIC (4 Kbytes)	4 KB	3.99
PCI Enumeration Area 1	256 MB	3.76
PCI Express (256 MB)	256 MB	3.51
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.01
VGA Memory	16 MB	2.85
TSEG	1 MB	2.84
Memory available to OS and other applications		2.84

Memory Population Guidelines

When installing memory modules, the DIMM slots should be populated in the following order: DIMMA2, DIMMB2, then DIMMA1, DIMMB1.

- Always use DDR4 DIMM modules of the same size, type, and speed.
- Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.

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

## 2-5 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 motherboard and 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. Then use a screwdriver to secure the motherboard onto the motherboard tray.

### Tools Needed



Phillips Screwdriver  
(1)

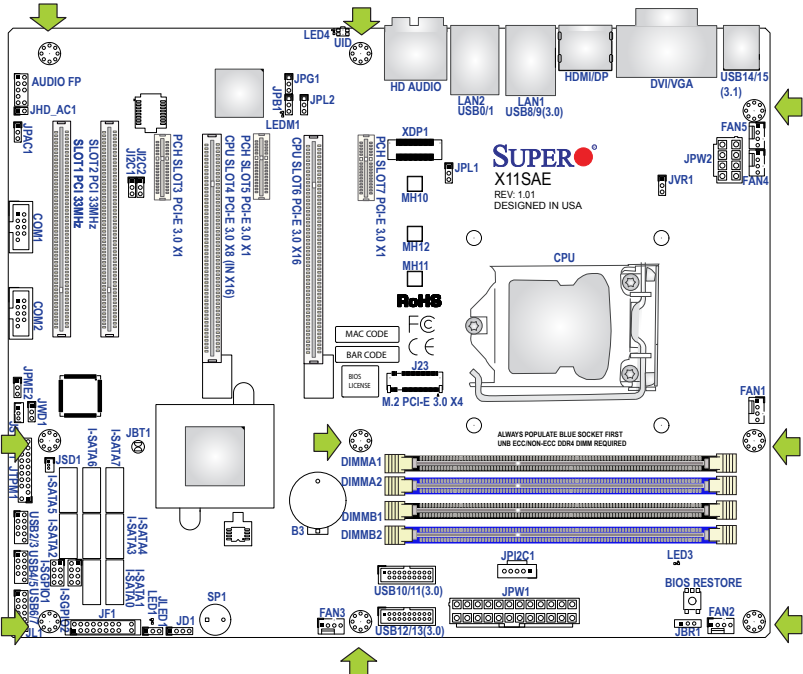


Phillips Screws (9)



Standoffs (9)  
Only if Needed

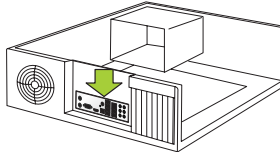
### Location of Mounting Holes



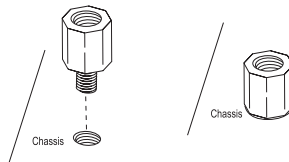
**! Attention!** 1) To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to avoid damaging these components when installing the motherboard to the chassis.

## Installing the Motherboard

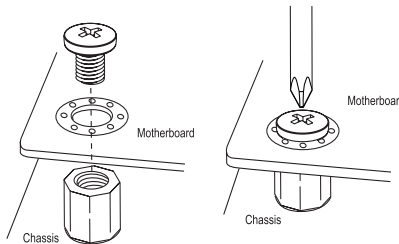
1. Install the I/O shield into the back of the chassis.



2. Locate the mounting holes on the motherboard. (Refer to the previous page.)
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.



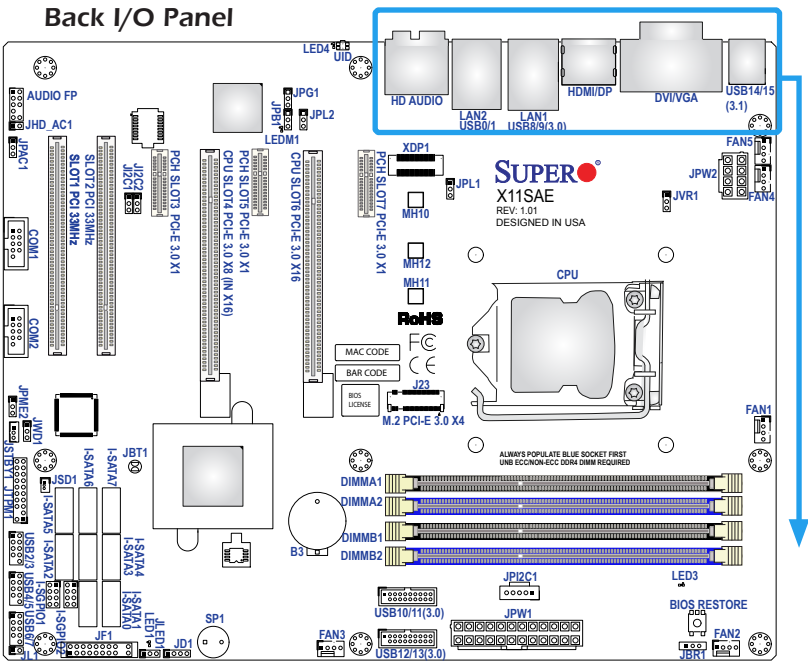
6. Using the Phillips screwdriver, insert a Phillips head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.
7. Repeat Step 6 to insert #6 screws into all mounting holes.
8. Make sure that the motherboard is securely placed in the chassis.



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

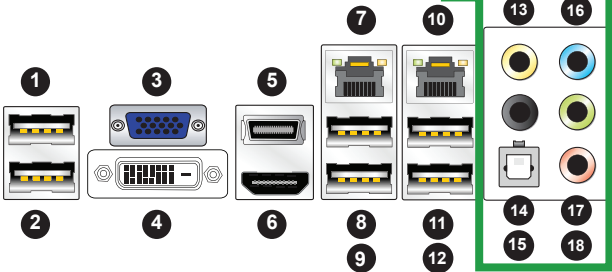
## 2-6 Connectors/IO Ports

The I/O ports are color coded in conformance with the industry standards. Refer to the figure below for the colors and locations of the various I/O ports.



1. USB 3.1 Port 14	7. LAN Port 1	13. Center/LFE Out
2. USB 3.1 Port 15	8. USB 3.0 Port 8	14. Surround Out
3. VGA Port	9. USB 3.0 Port 9	15. SPDIF Out
4. DVI Port	10. LAN Port 2	16. Line In
5. DisplayPort	11. USB 2.0 Port 0	17. Line Out
6. HDMI Port	12. USB 2.0 Port 1	18. Mic In

### HD Audio





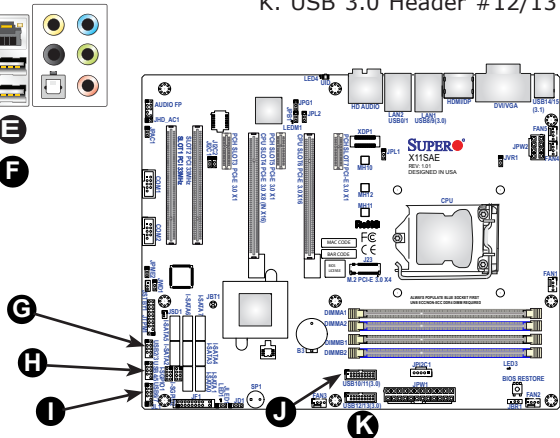
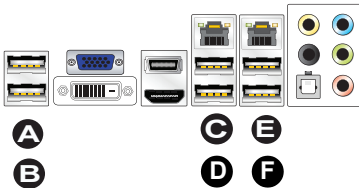
## Universal Serial Bus (USB)

Two Universal Serial Bus 2.0 ports (#0/1), two USB 3.0 ports (#8/9) and Two USB 3.1 'Type A' ports (#14/15) are located on the I/O back panel. In addition, two USB 3.0 headers (#10/11, 12/13), and three USB 2.0 headers (#2/3, 4/5, 6/7) are also located on the motherboard to provide front chassis access using USB cables (not included). The USB wake up function is only supported by USB0/1 and USB2/3.

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

Front Panel USB (3.0) Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	VBUS	11	IntA_P2_D+
2	IntA_P1_SSRX-	12	IntA_P2_D-
3	IntA_P1_SSRX+	13	Ground
4	Ground	14	IntA_P2_SSTX+
5	IntA_P1_SSTX-	15	IntA_P2_SSTX-
6	IntA_P1_SSTX+	16	Ground
7	Ground	17	IntA_P2_SSRX+
8	IntA_P1_D-	18	IntA_P2_SSRX-
9	IntA_P1_D+	19	VBUS
10	ID		

- A. Back panel USB 3.1 #14
- B. Back panel USB 3.1 #15
- C. Back panel USB 3.0 #8
- D. Back panel USB 3.0 #9
- E. Back panel USB 2.0 #0
- F. Back panel USB 2.0 #1
- G. USB 2.0 Header #2/3
- H. USB 2.0 Header #4/5
- I. USB 2.0 Header #6/7
- J. USB 3.0 Header #10/11
- K. USB 3.0 Header #12/13



Ethernet Port / IPMI Port

Two Gigabit Ethernet ports (LAN) are located on the I/O back panel to provide network connections. This port will accept RJ45 type cables. LAN2 is shared with an IPMI port on the X11SAE-F.



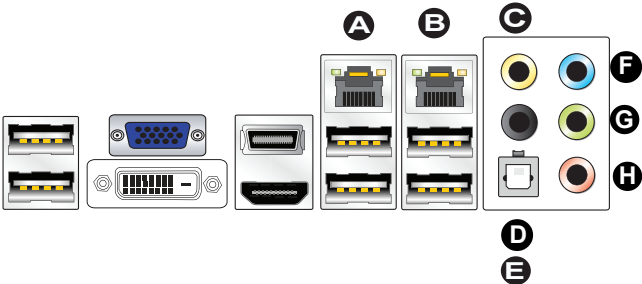
**Note:** Please refer to the [LED Indicator Section](#) for LAN LED information.

LAN Port Pin Definitions			
Pin #	Definition	Pin #	Definition
1	P2V5SB	10	SGND
2	TD0+	11	Act LED
3	TD0-	12	P3V3SB
4	TD1+	13	Link 100 LED (Green, +3V3SB)
5	TD1-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD2-	16	Ground
8	TD3+	17	Ground
9	TD3-	18	Ground

Back Panel High Definition Audio (HD Audio)

This motherboard features a 7.1+2 Channel High Definition Audio (HDA) codec that provides 10 DAC channels. The HD Audio connections simultaneously supports multiple-streaming 7.1 sound playback with 2 channels of independent stereo output through the front panel stereo out for front, rear, center and subwoofer speakers. Use the Advanced software included in the CD-ROM with your motherboard to enable this function.

- A. LAN1
- B. LAN2
- C. Center/LFE Out
- D. Surround Out
- E. SPDIF Out
- F. Line In
- G. Line Out
- H. Mic In



## VGA Port

A legacy 15-pin VGA port is located on the I/O back panel to provide backward compatibility. Use this port to connect to a compatible VGA monitor. Supported on the X11SAE-F only.

## DVI-D Port

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

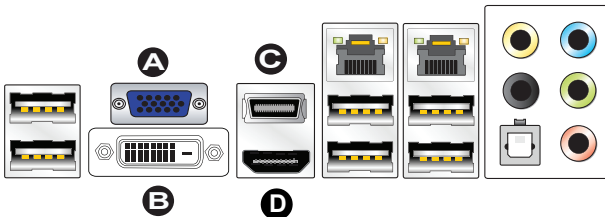
## VESA® DisplayPort™

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

## HDMI Port

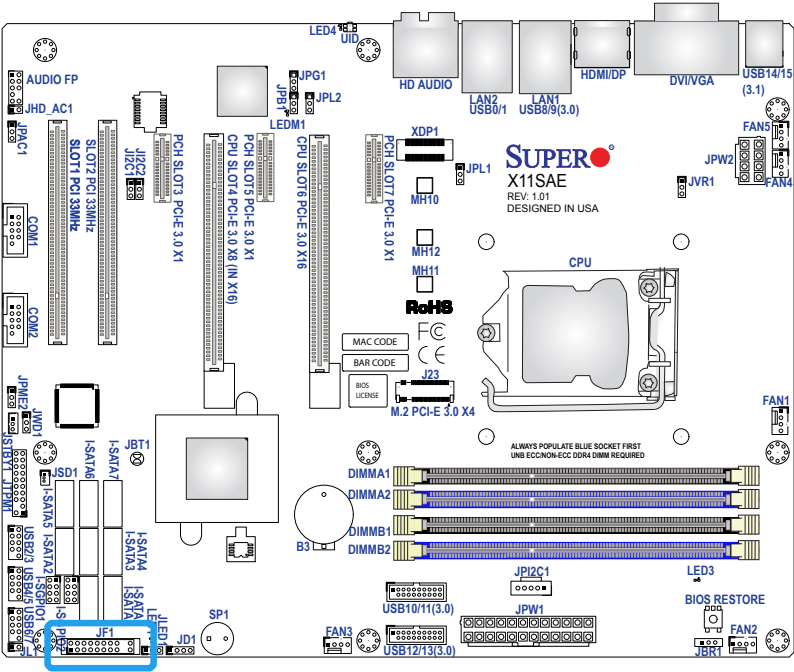
One HDMI (High-Definition Multimedia Interface) is located on the I/O back panel. This connector is used to display both high definition video and digital sound through an HDMI capable display, using a single HDMI cable (not included).

- A. VGA Port
- B. DVI-D Port
- C. VESA DisplayPort 1.2
- D. HDMI 1.4 Port

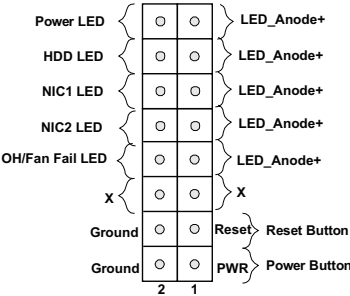


Front Control Panel

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. Refer to the figure below for the descriptions of the front control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.



Pin 16 Pin 15



JF1 Header Pins

Pin 2 Pin 1

## Front Control Panel Pin Definitions

### Power LED

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

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	+3.3V Stby
16	Power LED

### HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to indicate the status of HDD-related activities, including IDE, SATA activities. Refer to the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	+3.3V Stby
14	HD Active

### NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 2 and LAN port 1 are located on pins 9/10 and 11/12 of JF1 respectively. Attach an LED indicator to this header to display network activity. Refer to the table on the right for pin definitions.

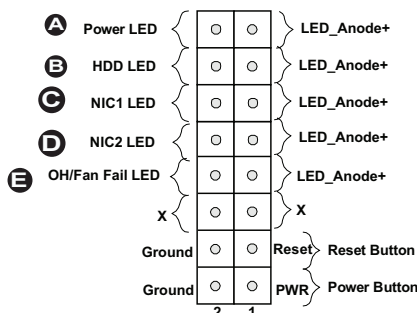
LAN LED Pin Definitions (JF1)	
Pin#	Definition
9/11	+3.3V Stby
10/12	NIC2/NIC1 Active

### Overheat (OH)/Fan Fail

Connect an LED cable to OH/Fan Fail connections on pins 7 and 8 of JF1 to provide warnings for chassis overheat/fan failure. Refer to the table on the right for pin definitions.

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

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



- A. PWR LED
- B. HDD LED
- C. NIC1 LED
- D. NIC2 LED
- E. OH/Fan Fail

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 on the right for pin definitions.

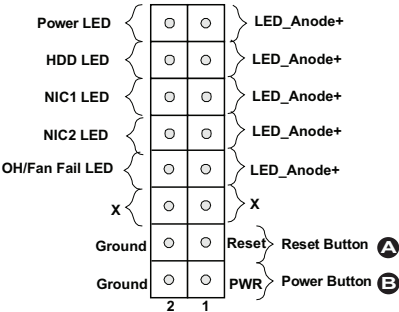
Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Button

The Power Button connection is located on pins1 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 - Refer to [Chapter 4](#)). To turn off the power in the suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

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

- A. Reset Button
- B. PWR Button



2-7 Connecting Cables

This section provides brief descriptions and pin-out definitions for on-board headers and connectors. Be sure to use the correct cable for each header or connector.

ATX Main PWR & CPU PWR Connectors (JPW1 & JPW2)

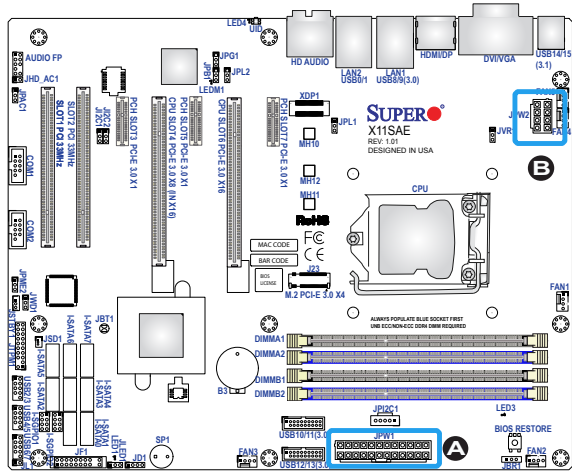
The 24-pin main power connector (JPW1) is used to provide power to the motherboard. The 8-pin CPU PWR connector (JPW2) is also required for the processor. These power connectors meet the SSI EPS 12V specification. Refer to the tables on the right and below for pin definitions.

12V 8-pin Power Connector Pin Definitions	
Pins	Definition
1 through 4	Ground
5 through 8	+12V

(Required)

ATX Power 24-pin Connector Pin Definitions			
Pin #	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	P3V3SB
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

- A. 24-Pin ATX Main PWR
- B. 8-Pin PWR



Fan Headers (Fan 1 ~ Fan 5)

The X11SAE/X11SAE-F has five fan headers (Fan 1 ~ Fan 5). These fans are 4-pin fan headers. Although pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans, we recommend the use 4-pin fans to take advantage of the fan speed control. This allows the fan speeds to be automatically adjusted based on the motherboard temperature. Refer to the table on the right for pin definitions.

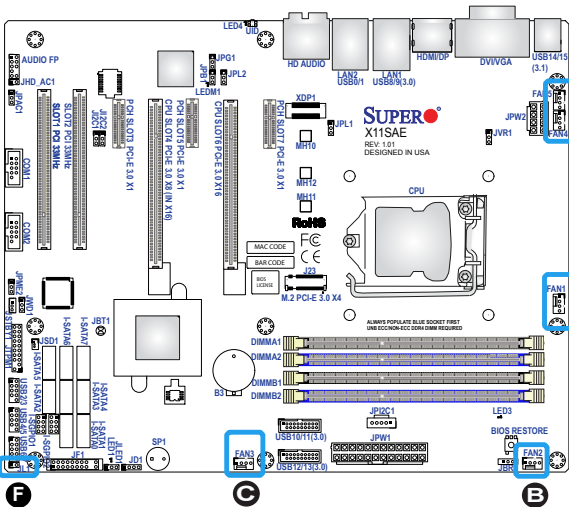
Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	2.5A/+12V (Red)
3	Tachometer
4	PWM_Control

Chassis Intrusion (JL1)

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

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

- A. Fan 1 (CPU Fan)
- B. Fan 2
- C. Fan 3
- D. Fan 4
- E. Fan 5
- F. Chassis Intrusion





Internal Buzzer (SP1)

The Internal Buzzer (SP1) can be used to provide audible indications for various beep codes. Refer to the table on the right for pin definitions.

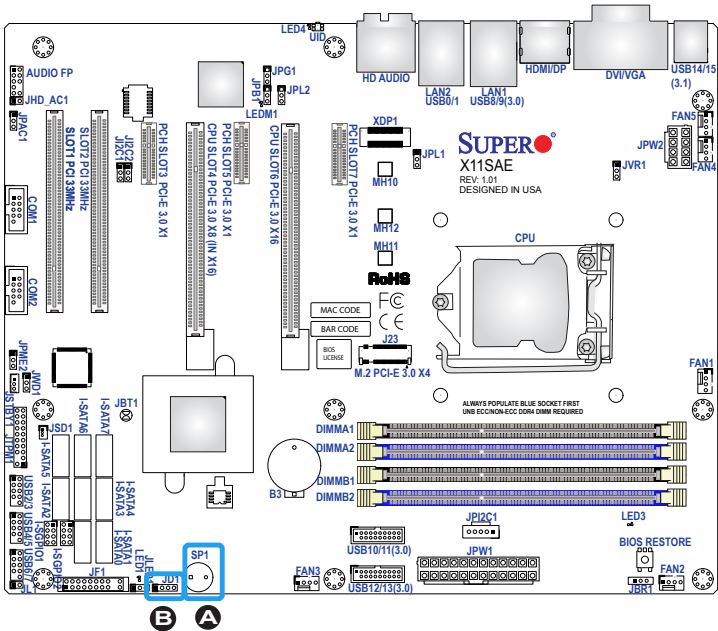
Internal Buzzer Pin Definition		
Pin#	Definitions	
Pin 1	Pos. (+)	Beep In
Pin 2	Neg. (-)	Alarm Speaker

Speaker (JD1)

On the JD1 header, pins 3-4 are used for internal speaker. Close pins 3-4 with a jumper to use the onboard speaker. If you wish to use an external speaker, close pins 1-4 with a cable. Refer to the table on the right for pin definitions.

Speaker Connector Pin Definitions	
Pin Setting	Definition
Pins 3~4	Internal Speaker
Pins1~4	External Speaker

- A. Internal Buzzer
- B. Speaker Header



Onboard Power LED (JLED1)

An onboard Power LED header is located at JLED1. This Power LED header is connected to Front Control Panel located at JF1 to indicate the status of system power. Refer to the table on the right for pin definitions.

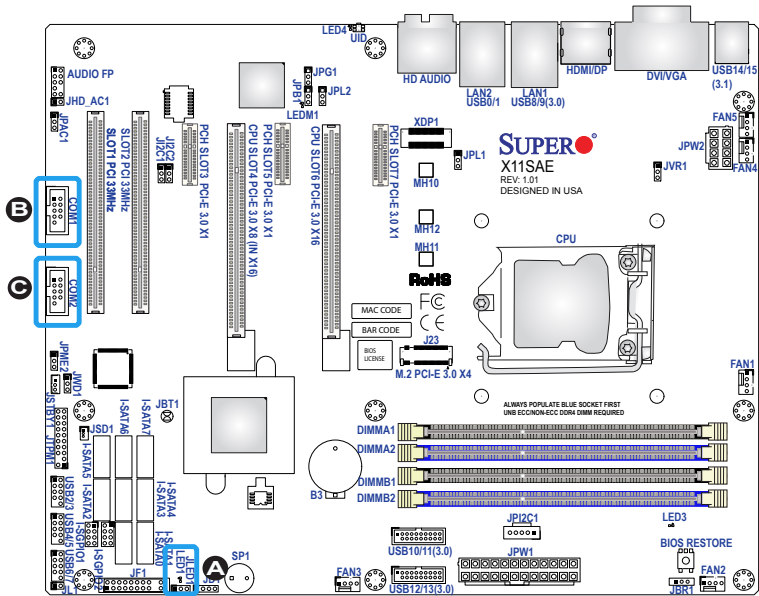
Onboard PWR LED Pin Definitions	
Pin#	Definition
1	VCC
2	No Connection
3	Connection to PWR LED in JF1

Serial Port Headers (COM1/COM2)

There are two serial (COM) port headers on the motherboard. Both ports are located next to expansion Slot #1 (PCI 33MHz). Refer to the table on the right for pin definitions.

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

- A. PWR LED
- B. COM1
- C. COM2



DOM PWR Connector (JSD1)

The Disk-On-Module (DOM) power connector, located at JSD1, provides 5V power to a solid state DOM storage device connected to one of the SATA ports. Refer to the table on the right for pin definitions.

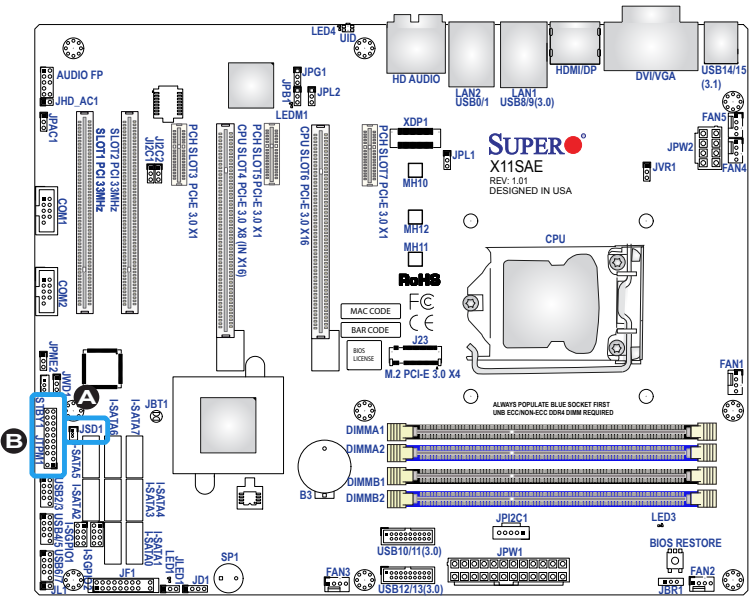
DOM PWR Pin Definitions	
Pin#	Definition
1	5V
2	Ground
3	Ground

TPM Header/Port 80

A Trusted Platform Module/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 on the right for pin definitions.

- A. DOM PWR
- B. TPM Header

TPM/Port 80 Header Pin Definitions			
Pin #		Definition	
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK4	14	SMB_DAT4
15	+3V_DUAL	16	SERRIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)



Standby Power Header (JSTBY1)

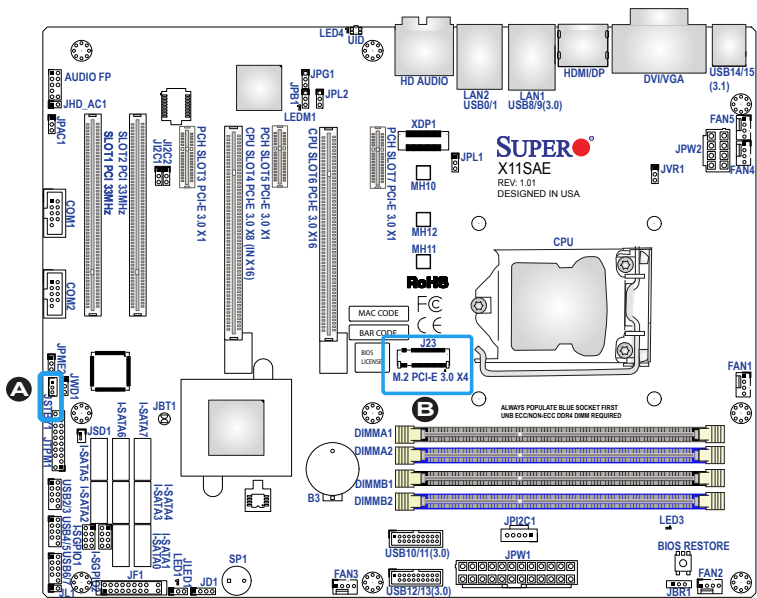
The Standby Power header is located at JSTBY1 on the motherboard. Refer to the table on the right for pin definitions.

Standby Power Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	N/A

M.2 Socket

The PCIe M.2 socket is for devices such as memory cards, wireless adapters, etc. These devices must conform to the PCIe M.2 specifications (formerly known as NGFF). This particular PCIe M.2 supports M-Key (PCIe3.0 x4) storage card only.

- A. STBY PWR
- B. M.2 Socket



## Front Panel Audio Header (AUDIO FP)

A 10-pin Audio header is supported on the motherboard. This header allows you to connect the motherboard to a front audio control panel, if needed. Connect an audio cable to the audio header to use this feature (not supplied). Refer to the table on the right for pin definitions for the header.

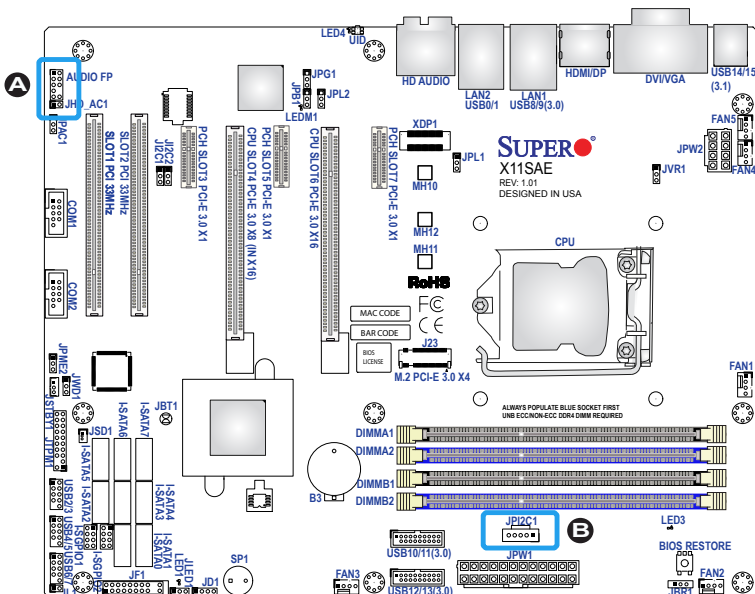
Front Panel Audio Pin Definitions	
Pin#	Signal
1	Microphone_Left
2	Audio_Ground
3	Microphone_Right
4	Audio_Detect
5	Line_2_Right
6	Ground
7	Jack_Detect
8	Key
9	Line_2_Left
10	Ground

### Power Supply I2C (JPI2C1)

The Power Supply I2C Connector, located at JPI2C1, monitors the status of the power supply. Refer to the table on the right for pin definitions. This feature is supported on the X11SAE-F only.

Power Supply I2C Pin Definitions	
Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	3.3V

- A. AUDIO FP
- B. JPI2C1



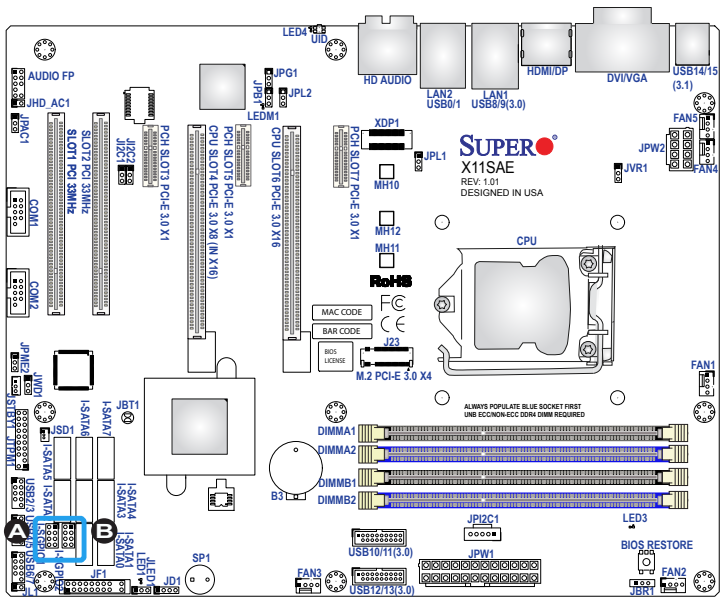
I-SGPIO1/ I-SGPIO2 Headers

Two I-SGPIO (Serial-Link General Purpose Input/Output) headers are located next to the I-SATA Ports on the motherboard. These headers are used to communicate with the enclosure management chip in the system. Refer to the table on the right for pin definitions. Refer to the motherboard layout below for the locations of the headers.

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

A. I-SGPIO1

B. I-SGPIO2



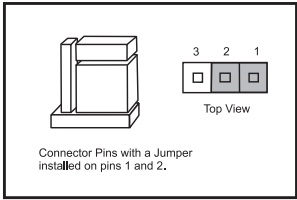
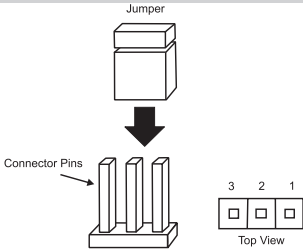
## 2-8 Jumper Settings

### Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board.



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



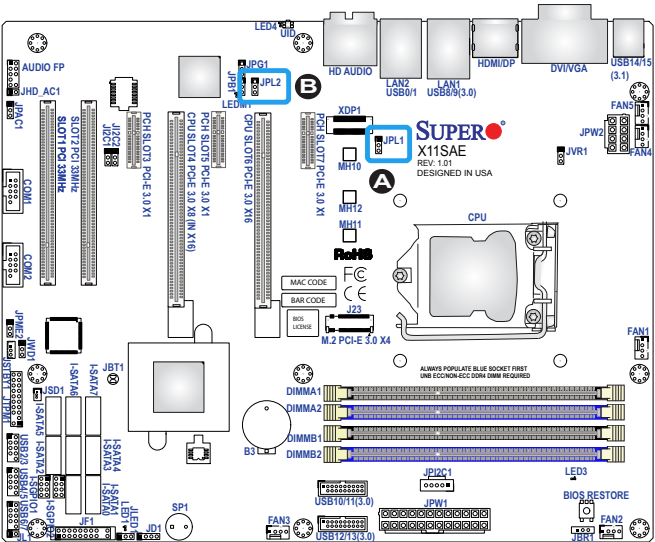
Connector Pins with a Jumper installed on pins 1 and 2.

### LAN Enable/Disable

Jumper JPL1/JPL2 will enable or disable the LAN1 and LAN2 ports on the motherboard. Refer to the table on the right for jumper settings. The default setting is enabled.

LAN Enable/Disable Jumper Settings	
Pin#	Definition
1-2	Enabled (default)
2-3	Disabled

- A. JPL1: LAN1 Enable
- B. JPL2: LAN2 Enable



Clear CMOS

Clear CMOS (JBT1) is used to clear the saved system setup configuration stored in the CMOS chip. To clear the contents of the CMOS using JBT1, short the two pads of JBT1 with metallic conductor such as a flathead screwdriver. This will erase all user settings and revert everything to their factory-set defaults.

PCI Slot SMB Enable (JI2C1/JI2C2)

Use Jumpers JI2C1/JI2C2 to enable PCI SMB (System Management Bus) support to improve system management for the PCI slots. Refer to the table on the right for jumper settings.

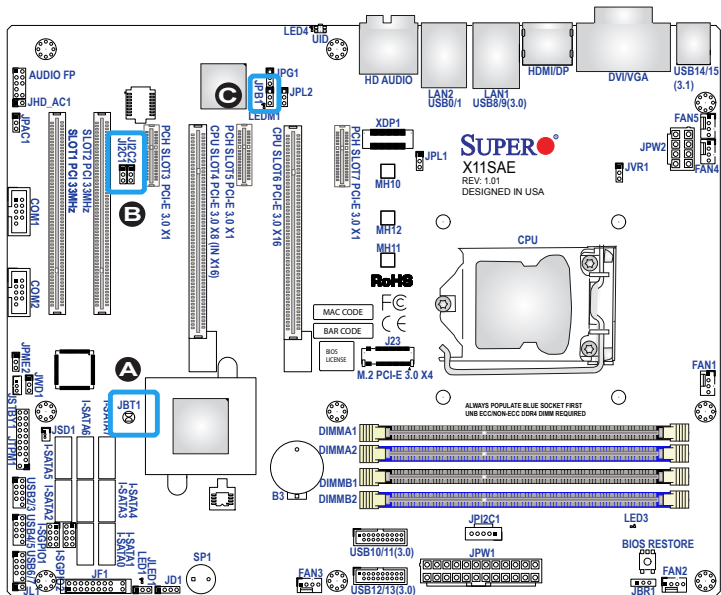
PCI Slot_SMB Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled (Default)

BMC Enable (JPB1)

JPB1 is used to enable or disable the BMC (Baseboard Management Control) chip and the onboard IPMI connection. This jumper is used together with the IPMI settings in the BIOS. Refer to the table on the right for jumper settings. Supported on the X11SAE-F only.

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

- A. Clear CMOS
- B. PCI Slot SMB Enable
- C. BMC Enable







### Onboard VGA Enable/Disable (JPG1)

Close pins 1-2 of jumper JPG1 to enable to the onboard graphics controller, close pins 2-3 to disable. Refer to the table on the right for jumper settings. Supported on the X11SAE-F only.

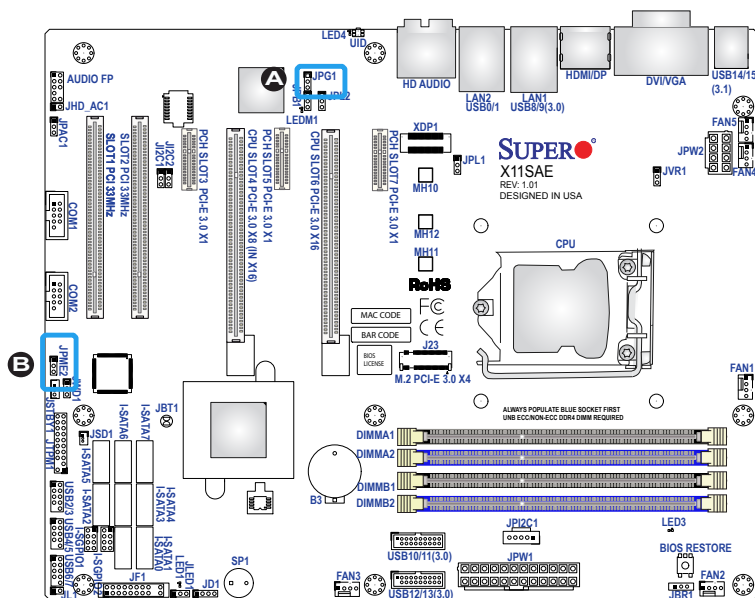
VGA Enable/Disable (JPG1) Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled (Default)
Pins 2-3	Disabled

### Manufacturing Mode (JPME2)

Close pins 2-3 of JPME2 to bypass SPI flash security and force the system to operate in Manufacturing Mode, allowing the user to flash the system firmware from a host server for system setting modifications. Refer to the table on the right for jumper settings.

Manufacturing Mode (JPME2) Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Normal (Default)
Pins 2-3	Manufacturing Mode

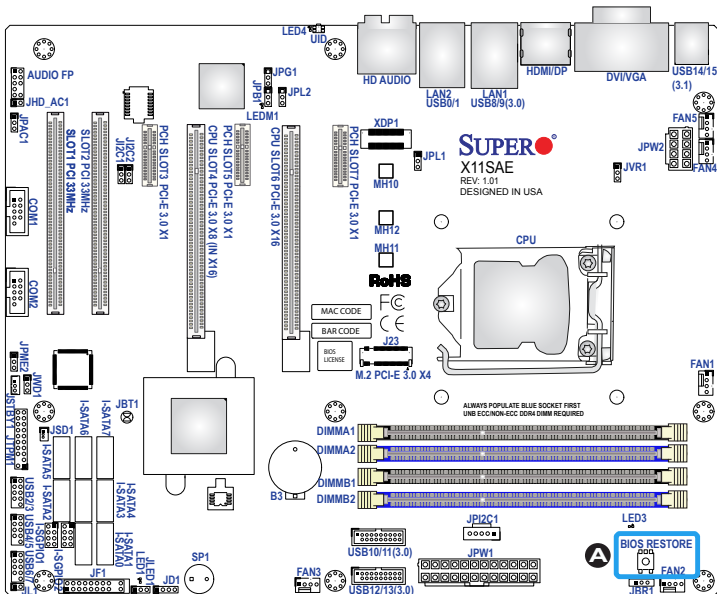
- A. VGA Enable  
B. Manufacturing Mode



## BIOS Restore (BIOS RESTORE)

When pressed, the BIOS Restore Button will look for, and load a file named 'SUPER.ROM' from an installed USB memory device, in any of the USB ports. It will then proceed to update the BIOS. Do NOT turn off the system when the BIOS is updating.

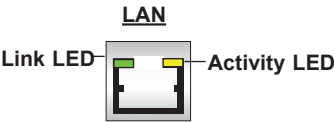
### A. BIOS Restore



2-9 Onboard Indicators

LAN LEDs

The Ethernet ports have two LEDs. On each port, one LED indicates activity when flashing while the other LED may be green, amber, or off to indicate the speed of the connection. Refer to the tables on the right for more information.



GLAN Activity Indicator LED Settings		
Color	Status	Definition
Yellow	Flashing	Active

GLAN Link Indicator LED Settings	
LED Color	Definition
Off	10 Mbps
Green	100 Mb/s
Amber	1 Gb/s

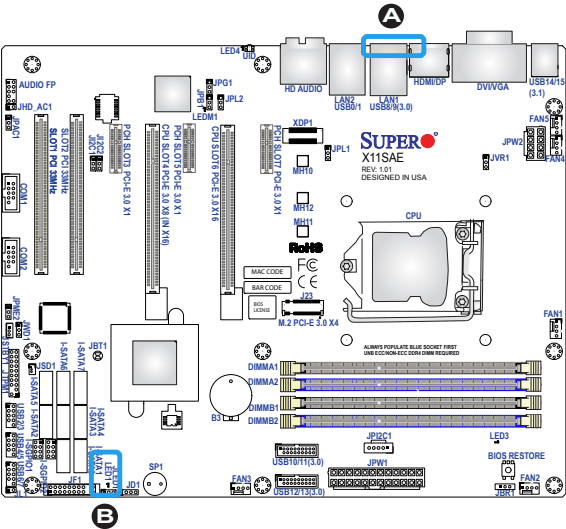
Onboard Power LED (LED1)

An Onboard Power LED is located at LED1 on the motherboard. When LED1 is on, the AC power cable is connected. Make sure to disconnect the power cable before removing or installing any component. Refer to the layout below for the LED location.

Onboard PWR LED Indicator LED Status	
Status	Definition
Off	System Off
On	System on

A. LAN1/LAN2 LEDs

B. PWR LED



**Onboard Standby Power LED (LED3)**

An onboard Standby Power LED is located at LED3. When LED3 is on, the AC power cable is connected and the power supply hard switch is on. Make sure to disconnect the power cable before removing or installing any component.

Onboard Standby PWR LED (LED3) LED Status	
Status	Definition
Off	Power Supply is Off (Hard Switch)
On	Power Supply is On (Hard Switch).

**BMC/IPMI Heartbeat LED (LED1)**

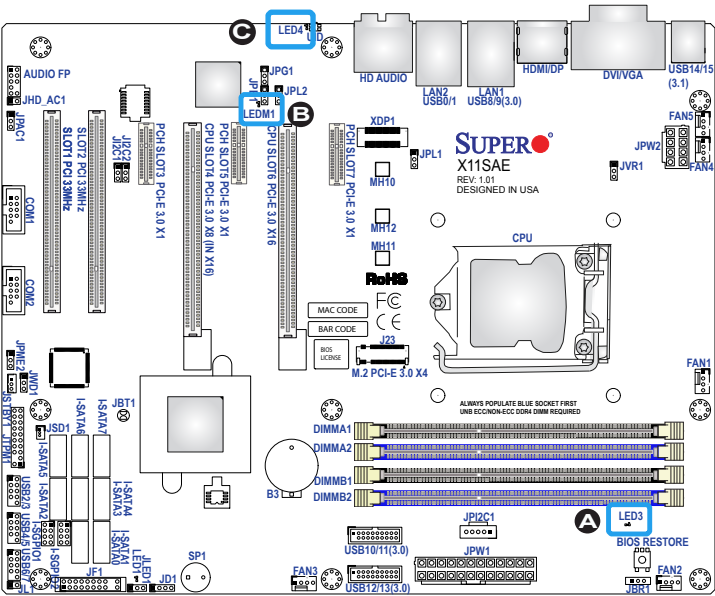
An IPMI Heartbeat LED is located at LED1. When LED1 blinks, the IPMI functions properly. Refer to the table on the right for details. Supported on the X11SAE-F only.

BMC/IPMI Heartbeat LED (LED1) LED Settings	
Green: Blinking	IPMI is ready for use

**UID LED (LED4)**

The Unit Identifier Switch (UID) is controlled by the BMC. This feature is supported on the X11SAE-F only.

- A. Standby Power LED
- B. BMC Heartbeat LED
- C. UID LED



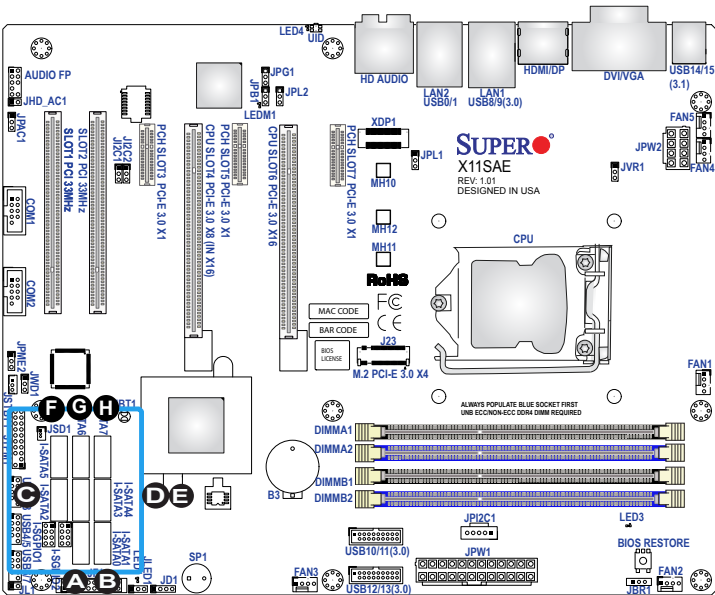
2-10 SATA Connections

SATA Connections (I-SATA0~I-SATA7)

Eight Serial ATA (SATA) 3.0 connectors (I-SATA 0~7) are supported on the board. These I-SATA 3.0 ports are supported by the Intel® C236 Express PCH chip (supports RAID 0, 1, 5, 10). Refer to the table below for pin definitions.

SATA 3.0 Connectors Pin Definitions	
Pin#	Signal
1	Ground
2	SATA_TXP
3	SATA_TXN
4	Ground
5	SATA_RXN
6	SATA_RXP
7	Ground

- A. I-SATA 3.0 #0
- B. I-SATA 3.0 #1
- C. I-SATA 3.0 #2
- D. I-SATA 3.0 #3
- E. I-SATA 3.0 #4
- F. I-SATA 3.0 #5
- G. I-SATA 3.0 #6
- H. I-SATA 3.0 #7



## Chapter 3

# Troubleshooting

### 3-1 Troubleshooting Procedures

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

#### Before Power On

1. Make sure that the Standby PWR LED is not on. (**Note:** If it is on, the onboard power is on. Be sure to unplug the power cable before installing or removing the components.)
2. Make sure that there are no short circuits between the motherboard and chassis.
3. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse. Also, be sure to remove all add-on cards.
4. Install a CPU and heatsink (be sure that it is fully seated) and then connect the chassis speaker and the power LED to the motherboard. Check all jumper settings as well.

#### No Power

1. Make sure that there are no short circuits between the motherboard and chassis.
2. Make sure that all jumpers are set to their default positions.
3. Check if the 115V/230V switch on the power supply is properly set.
4. Turn the power switch on and off to test the system.

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

## No Video

1. If the power is on, but you have no video--in this case, you will need to remove all the add-on cards and cables first.
2. Use the speaker to determine if any beep codes exist. (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 specifications of memory modules, reset the memory or try a different one.)

## Memory Errors

1. Make sure that the DIMM modules are properly installed and fully seated in the slots.
2. You should be using unbuffered ECC/Non-ECC DDR4 (up to 2133 MHz) memory recommended by the manufacturer. Also, it is recommended that you use the memory modules of the same type and speed for all DIMMs in the system. Do not use memory modules of different sizes, different speeds and different types on the same motherboard.
3. Check for bad DIMM modules or slots by swapping modules between slots to see if you can locate the faulty ones.
4. Check the switch of 115V/230V power supply.

## When the System is Losing the Setup Configuration

1. Please be sure to use a high quality power supply. A poor quality power supply may cause the system to lose CMOS setup information. Refer to [Section 1-5](#) for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.



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

## 3-2 Technical Support Procedures

Before contacting Technical Support, please make sure that you have followed all the steps listed below. Also, Note that as a motherboard manufacturer, Supermicro does not sell directly to end users, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our website (<http://www.supermicro.com/support/faqs/>) before contacting Technical Support.
2. BIOS upgrades can be downloaded from our website at <http://www.supermicro.com/support/bios/>.



**Note:** Not all BIOS can be flashed. Some cannot be flashed; it depends on the boot block code of the BIOS.

3. If you've followed the instructions above to troubleshoot your system, and still cannot resolve the problem, then contact Supermicro's technical support and provide them with the following information:
  - 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
  - An example of a Technical Support form is on our website at <http://www.supermicro.com/support/contact.cfm>.
4. Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at [support@supermicro.com](mailto:support@supermicro.com), by phone at: (408) 503-8000, option 2, or by fax at (408)503-8019.

## 3-3 Frequently Asked Questions

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

**Answer:** The X11SAE/X11SAE-F supports up to 64GB of unbuffered ECC/Non-ECC DDR4. See [Section 2-4](#) for details on installing memory.

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

**Answer:** It is recommended that you do not upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at [http://www.supermicro.com/ResourceApps/BIOS\\_IPMI\\_Intel.html](http://www.supermicro.com/ResourceApps/BIOS_IPMI_Intel.html). Please check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. To update the BIOS under Disk Operating System (DOS), please unzip the BIOS file onto a DOS bootable device. Run the batch file by entering `flash.bat BIOSname#.###` when the DOS prompt appears. After seeing the message that BIOS update has completed, reboot the system. Refer to the readme file and/or [Appendix C](#) UEFI BIOS Recovery for more information.

**Question:** I think my BIOS is corrupted. How can I recover my BIOS?

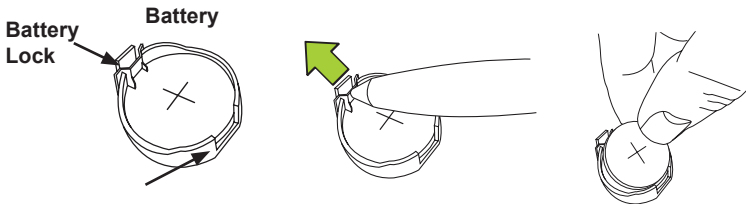
**Answer:** Please see [Appendix C](#)-BIOS Recovery for detailed instructions.

## 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

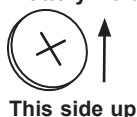
**Attention!** Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste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

## Battery Installation

1. To install an onboard battery, follow the steps 1 and 2 on Section 3-4 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.

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

### Battery Holder



## 3-5 Returning Motherboard for Service

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

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

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

## Chapter 4

### UEFI BIOS

#### 4-1 Introduction

This chapter describes the AMIBIOS™ Setup utility for the X11SAE/X11SAE-F 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 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.

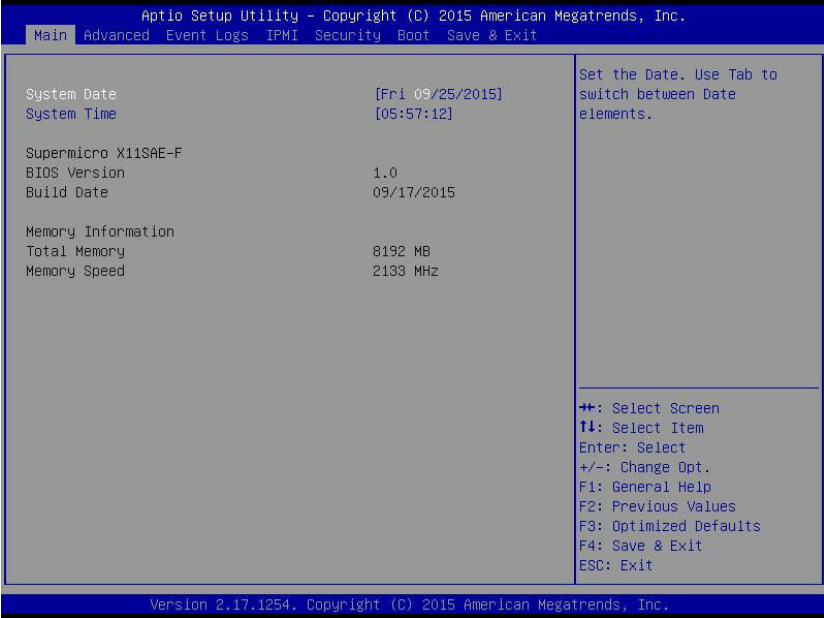
The Main BIOS screen has two main frames. The left frame displays all the options that can be configured. "Grayed-out" options cannot be configured. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (Note that 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. The following Main menu features 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 Day 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 01/01/2015 after RTC reset.

### Supermicro X11SAE/X11SAE-F

#### 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.

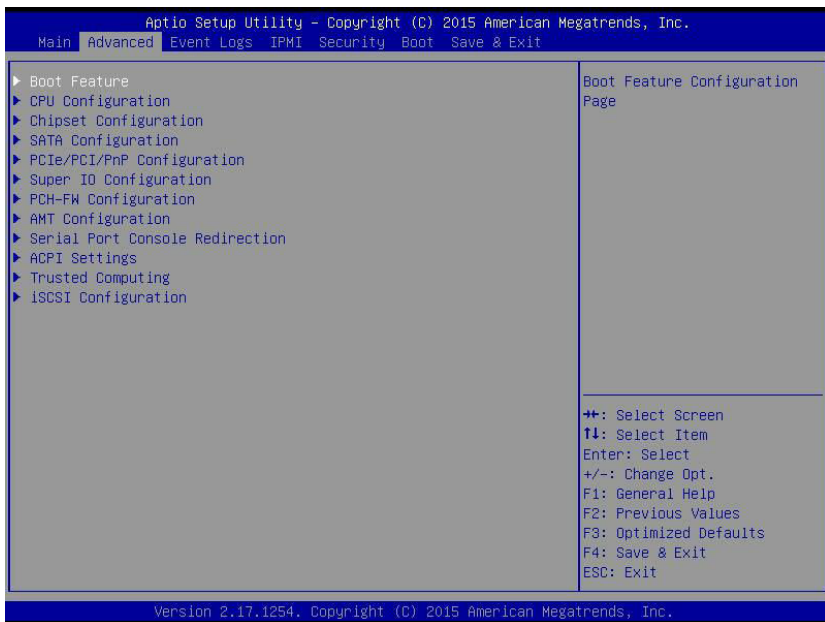
**Memory Speed**

This feature displays the memory speed.

## 4-3 Advanced Setup Configurations

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

**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 the default to the manufacture default settings.



### ► Boot Feature

#### Quiet Boot

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

#### AddOn ROM Display Mode

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 Off and **On**.

### **Wait For 'F1' If Error**

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

### **INT19 (Interrupt 19) Trap Response**

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

### **Re-try Boot**

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

## **►Power Configuration**

### **Watch Dog Function**

If enabled, the Watch Dog Timer will allow the system to reset or generate NMI based on jumper settings when it is expired for more than 5 minutes. The options are Enabled and **Disabled**.

### **Power Button Function**

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

## 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**.

## ►CPU Configuration

The following CPU information is displayed:

- CPU Signature
- Microcode Patch
- Max CPU Speed
- Min CPU Speed
- CPU Speed
- Processor Cores
- Hyper Threading Technology
- Intel VT-x Technology
- Intel SMX Technology
- 64-bit
- EIST Technology
- CPU C3 State
- CPU C6 State
- CPU C7 State
- L1 Data Cache
- L1 Code Cache
- L2 Cache

- L3 Cache
- L4 Cache

### **Hyper-threading (Available when supported by the CPU)**

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

### **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. (Please refer to Intel's website for more information.) The options are **All** and 1, 2, and 3.

### **Intel® Virtualization Technology**

Select Enable to use Intel Virtualization Technology so that I/O device assignments will be reported directly to the VMM (Virtual Memory Management) through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The options are Disabled and **Enabled**.

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

If set to Enabled, 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 **Enabled**.

### **CPU AES**

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

### **Boot Performance Mode**

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

## HardWare P-States (HWP)

Use this feature to enable or disable hardware P-States support. The options are **Disabled** and Enabled.

## 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**.

## Turbo Mode

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

## Package Power Limit MSR Lock

Select Enabled to lock the package power limit for the model specific registers. The options are **Disabled** and Enabled.

## Power Limit 1 Override

Select Enabled to support average power limit (PL1) override. The default setting is **Disabled**.

## Power Limit 2 Override

Select Enabled to support rapid power limit (PL2) override. The default setting is **Enabled**.

## 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. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting. If the value is 0, the BIOS will set PL2 as 1.25\* TDP.

## 1-Core Ratio Limit Override

This increases (multiplies) 1 clock speed in the CPU core in relation to the bus speed when one CPU core is active. Press "+" or "-" on your keyboard to change the value. Enter 0 to use the manufacture default setting.

## 2-Core Ratio Limit Override

This increases (multiplies) 2 clock speeds in the CPU core in relation to the bus speed when two CPU cores are active. Press "+" or "-" on your keyboard to change the value. Enter 0 to use the manufacture default setting.

### 3-Core Ratio Limit Override

This increases (multiplies) 3 clock speeds in the CPU core in relation to the bus speed when three CPU cores are active. Press "+" or "-" on your keyboard to change the value. Enter 0 to use the manufacture default setting.

### 4-Core Ratio Limit Override

This increases (multiplies) 4 clock speeds in the CPU core in relation to the bus speed when three CPU cores are active. Press "+" or "-" on your keyboard to change the value. Enter 0 to use the manufacture default setting.

### CPU 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 the user 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 the user 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, and **AUTO**.

## ►CPU Thermal Configuration

### CPU DTS

Select Enabled for the ACPI thermal management to use the DTS SMM mechanism to obtain CPU temperature values. Select Disabled for EC to report the CPU temperature values. The options are **Disabled** and Enabled.

### ACPI 3.0 T-States

Select Enabled to support CPU throttling by the operating system to reduce power consumption. The options are **Disabled** and Enabled.

## ►Chipset Configuration

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

## ►System Agent (SA) Configuration

The following System Agent information is displayed:

- System Agent Bridge Name
- SA PCIe Code Version
- VT-d

### VT-d

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

### Gaussian Mixture Model

This feature is to enable or disable the System Agent Gaussian Mixture Model device. The options are **Enabled** and Disabled.

## ►Graphics Configuration

The following graphics information is displayed:

- IGFX VBIOS Version

### Graphics Turbo IMON Current

Use this feature to set the limit on the current voltage regulator. Press "+" or "-" on your keyboard to change this value. The default setting is **31**.

### Primary Display

Use this feature to select the graphics device to be used as the primary display. The options are Auto, IGFX, PEG, and **PCIE**.

### Primary PEG

This feature allows the user to select the primary PCI Express Graphics (PEG) slot. The options are **Auto**, CPU SLOT6 PCI-E 3.0 X16, and CPU SLOT4 PCI-E 3.0 X8 (IN X16).

### Primary PCIE (PCI-Express Graphics)

This feature allows the user to specify which graphics card to be used as the primary graphics card. The options are Auto, **Onboard**, PCH Slot3 PCI-E 3.0 X1, and PCH Slot7 PCI-E 3.0 X1.

### 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**, 512 MB, 1024MB, 2048MB, and 4096MB.

### 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 16M, **32M**, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M, 1024M, 1536M, 2048M, 4M, 8M, 12M, 20M, 24M, 28M, 32M/F7, 36M, 40M, 44M, 48M, 52M, 56M, and 60M.

### DVMT Total IGFX Memory

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.

### IGFX (Graphics) Low Power Mode

Select Enabled to use the low power mode for internal graphics devices installed in a small form factor (SFF) computer. The options are **Enabled** and Disabled.

### PM Support

Use this feature to enable the IGFX Power Management function. The options are **Enabled** and Disabled.

### PAVP Enable

Use this feature to enable or disable the protected audio video path (PAVP). The options are Disabled or **Enabled**.

## ►DMI/OPI Configuration

The following DMI information is displayed:

- DMI

### DMI VC1 Control

Use this feature to enable or disable DMI Virtual Channel 1. The options are Enabled and **Disabled**.

### DMI VCm Control

Use this feature to enable or disable the DMI Virtual Channel map. The options are **Enabled** and Disabled.

### 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 and **L1**.

### DMI Extended Sync Control

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

### DMI De-Emphasis Control

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

---



## ► PEG Port Configuration

### CPU SLOT6 PCI-E 3.0 X16

#### SLOT6 Max Link Speed

Use this feature to configure the link speed of a PCIe port specified by the user. The options are **Auto**, Gen1, Gen2, and Gen3.

#### SLOT6 Max Payload Size

Select Auto for the system BIOS to automatically set the maximum payload value for a PCIe device to enhance system performance. The options are **Auto**, 128 TLP, and 256 TLP.

#### SLOT6 Slot Power Limit Value

Use this feature to set the upper limit on the power supplied by the PCIe slot. Press "+" or "-" on your keyboard to change this value. The default setting is **75**.

#### SLOT6 Slot Power Limit Scale

Use this feature to select the scale used for the slot power limit value. The options are **1.0x**, 0.1x, 0.01x, and 0.001x.

### CPU SLOT4 PCI-E 3.0 X8 (IN X16)

#### SLOT4 Max Link Speed

Use this feature to configure the link speed of a PCIe port specified by the user. The options are **Auto**, Gen1, Gen2, and Gen3.

#### SLOT4 Max Payload Size

Select Auto for the system BIOS to automatically set the maximum payload value for a PCIe device to enhance system performance. The options are **Auto**, 128 TLP, and 256 TLP.

#### SLOT4 Slot Power Limit Value

Use this feature to set the upper limit on the power supplied by the PCIe slot. Press "+" or "-" on your keyboard to change this value. The default setting is **75**.

#### SLOT4 Slot Power Limit Scale

Use this feature to select the scale used for the slot power limit value. The options are **1.0x**, 0.1x, 0.01x, and 0.001x.

## Program PCIe ASPM After OPRM

Enable this feature to program the PCIe ASPM after the OPRM. The options are **Disabled**, and Enabled.

## ►Memory Configuration

The following memory information is displayed:

- Memory RC Version
- Memory Frequency
- Total Memory
- VDD
- DIMMA1
- DIMMA2
- DIMMB1
- DIMMB2
- Memory Timings (tCL-tRCD-tRP-tRAS)

## 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, and 2400.

## 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.

## Energy Performance Gain

Use this feature to enable or disable the energy performance gain. The options are **Disabled** and Enabled.

### Memory Scrambler

Select Enabled to enable memory scrambler support. The options are Disabled and **Enabled**.

### Fast Boot

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

### REFRESH\_2X\_MODE

Use this feature to select the refresh mode. The options are **Disabled**, 1-Enabled for WARM or HOT, and 2-Enabled HOT only.

### Closed Loop Thermal Management

Use this feature to monitor the power consumption and temperature of the system to predict a thermal trend. The options are Disabled and **Enabled**.

## ►GT - Power Management Control

The following GT - Power Management Control information is displayed:

- GT Info

### RC6 (Render Standby)

Select Enabled to enable render standby support. The options are Disabled and **Enabled**.

## ►PCH-IO Configuration

The following PCH-IO information is displayed:

- Intel PCH RC Version
- Intel PCH SKU Name
- Intel PCH Rev ID

## ►PCI Express Configuration

### 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 and **Enabled**.

### Peer Memory Write Enable

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

## ►PCH SLOT3 PCI-E 3.0 X1

### Port 7 PCIe Speed

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

### Port 7 Detect Non-Compliant Device

Select **Enabled** for the AMI BIOS to automatically detect a PCIe device that is not compliant with the PCIe standards. The options are **Disabled** and **Enabled**.

## ►PCH SLOT7 PCI-E 3.0 X1

### Port 8 PCIe Speed

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

### Port 8 Detect Non-Compliant Device

Select **Enabled** for the AMI BIOS to automatically detect a PCIe device that is not compliant with the PCIe standards. The options are **Disabled** and **Enabled**.

### Port 61h bit-4 Emulation

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

### PCIe PLL SSC

Enable this feature to reduce EMI interference by down spreading clock 0.5%. Disable this feature to centralize the clock without spreading. The options are **Disabled** and **Enabled**.

### USB 3.1 Device

This setup feature is used to **Enable** or **Disable** the onboard USB 3.1 device. The options are **Disabled** and **Enabled**.

## ►SATA Configuration

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

### 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 mode for the installed SATA drives. The options are **AHCI** and RAID.

### SATA Frozen

Use this feature to enable the HDD Security Frozen Mode. The options are Enabled and **Disabled**.

***\*If the feature above "SATA Mode Selection" is set to RAID, the following items will display:***

#### SATA RAID 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 **Legacy ROM** and UEFI Driver.

#### SATA Port 0 ~ Port 7

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

- Model number of drive and capacity
- Software Preserve Support Information

#### Port 0 ~ Port 7 Spin Up Device

On an edge detect from 0 to 1, set this feature to allow the PCH to initialize the device. The options are Enabled and **Disabled**.

#### Port 0 ~ Port 7 SATA Device Type

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

## ► PCIe/PCI/PnP Configuration

The following information is displayed:

- PCI Bus Driver Version
- PCI Devices Common Settings:

### PCI Latency Timer

Enter the value to be programmed into the PCI Latency Timer Register. The options are **32 PCI Bus Clocks**, 64 PCI Bus Clocks, 96 PCI Bus Clocks, 128 PCI Bus Clocks, 160 PCI Bus Clocks, 192 PCI Bus Clocks, 224 PCI Bus Clocks, and 248 PCI Bus Clocks,.

### PCI PERR/SERR Support

Select Enabled to allow a PCI device to generate a PERR/SERR number for a PCI Bus Signal Error Event. The options are **Disabled** and Enabled.

### Above 4G Decoding (Available if the system supports 64-bit PCI decoding)

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

### SLOT1 PCI 33MHz OPROM

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

### SLOT2 PCI 33MHz OPROM

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

### PCH SLOT3 PCI-E 3.0 X1 OPROM

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

### CPU SLOT4 PCI-E 3.0 X8 (IN 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, **Legacy**, and EFI.

### CPU SLOT6 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, **Legacy**, and EFI.

### **PCH SLOT7 PCI-E 3.0 X1 OPROM**

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

### **Onboard LAN Option ROM Type**

Select Enabled to enable Option ROM support to boot the computer using a network device specified by the user. The options are **Legacy** and EFI.

### **Onboard LAN1 Option ROM**

Use this option to select the type of device installed in LAN Port1 used for system boot. The default setting for LAN1 Option ROM is **PXE**.

### **Onboard LAN2 Option ROM**

Use this option to select the type of device installed in LAN Port2 used for system boot. The default setting for LAN2 Option ROM is **Disabled**.

### **Onboard Video Option ROM**

Use this feature to select the Onboard Video Option ROM type. The options are Disabled, **Legacy**, and EFI.

### **Network Stack**

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

### **IPv4 PXE Support**

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

### **IPv6 PXE Support**

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

### **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**.

## ► Super IO Configuration

The following Super IO information is displayed:

- AMI SIO Driver Version

## Super IO Chip Logical Device(s) Configuration

### ► Serial Port 1

#### Serial Port 1 Configuration

This submenu allows the user the configure settings of Serial Port 1.

#### Serial Port 1

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

#### Logical Device Settings

This feature displays the status of a serial part specified by the user.

#### Serial Port 1 Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of a serial port specified by the user. Select Auto to allow the BIOS to automatically assign the base I/O and IRQ address.

The options for Serial Port 1 are **Use Automatic Settings**, (IO=3F8h; IRQ=4; DMA), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA), (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA).

### ► Serial Port 2

#### Serial Port 2 Configuration

This submenu allows the user the configure settings of Serial Port 1.

#### Serial Port 2

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

#### Logical Device Settings

This feature displays the status of a serial part specified by the user.



## Serial Port 2 Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of a serial port specified by the user. Select Auto to allow the BIOS to automatically assign the base I/O and IRQ address. The options for Serial Port 2 are **Use Automatic Settings**, (IO=2F8h; IRQ=3; DMA), (IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA), (IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA), (IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA), and (IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA).

## ►Serial Port 3

### Serial Port 3 Configuration

This submenu allows the user the configure settings of Serial Port 1.

### Serial Port 3

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

### Logical Device Settings

This feature displays the status of a serial part specified by the user.

## Serial Port 3 Change Settings

This feature specifies the base I/O port address and the Interrupt Request address of a serial port specified by the user. Select Auto to allow the BIOS to automatically assign the base I/O and IRQ address. The options for Serial Port 2 are **Use Automatic Settings**, (IO=248h; IRQ=7; DMA), (IO=240h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA), (IO=248h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA), (IO=250h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA), and (IO=258h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12; DMA).

## ►PCH-FW Configuration

The following Intel Server Platform Services information is displayed:

- ME Firmware Version Information
- ME Firmware Mode Information
- ME Firmware Type Information
- ME FW SKU Information

## ME FW Image Re-Flash

Use this feature to enable or disable the ME Firmware image re-flash capability. The options are **Disabled** and Enabled.

## ►AMT Configuration

### Intel AMT

Select Enabled to use Intel AMT (Active Management Technology) to enhance system performance. The options are **Enabled** and Disabled.

### BIOS Hotkey Pressed

Select Enabled to use the BIOS Hotkey feature. The options are Enabled and **Disabled**.

### Watch Dog

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

### OS Timer / BIOS Timer

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

## ►Serial Port Console Redirection

### COM1 Console Redirection

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

***\*If the feature above is set to Enabled, the following items will become available for user's configuration:***

### ►COM1 Console Redirection Settings

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

### COM1 Terminal Type

This feature allows the user 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 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 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 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.

## COM2

### COM2 Console Redirection

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

***\*If the feature above is set to Enabled, the following items will become available for user's configuration:***

### ►COM2 Console Redirection Settings

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

### 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 ANSI, VT100, **VT100+**, and VT-UTF8.

### COM2 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).

### COM2 Data Bits

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

### COM2 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.

### COM2 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.

### COM2 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.

## COM2 VT-UTF8 Combo Key Support

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

## COM2 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.

## COM2 Resolution 100x31

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

## COM2 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**.

## COM2 Putty KeyPad

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

## COM2 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.

## BMC SOL

### COM3 Console Redirection

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

***\*If the feature above is set to Enabled, the following items will become available for user's configuration:***

### ►COM3 Console Redirection Settings

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

### COM3 Terminal Type

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

### COM3 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).

### COM3 Data Bits

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

### COM3 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.

### COM3 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.

### COM3 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.

### COM3 VT-UTF8 Combo Key Support

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

### COM3 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.

### COM3 Resolution 100x31

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

### COM3 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**.

### COM3 Putty KeyPad

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

### COM3 Redirection After BIOS Post

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

### EMS (Emergency Management Services) Console Redirection

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

### AMT SOL

#### Console Redirection

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



## ►EMS Console Redirection Settings

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

### Out-of-Band Management 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**, COM2, BMC SOL and AMT SOL.

### Terminal Type

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

### Bits Per Second

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

### Flow Control

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

### Data Bits

### Parity

### Stop Bits

## ►ACPI Settings

### ACPI Sleep State

This feature selects 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)**.

### High Precision Event Timer

Select Enabled to activate the High Performance 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 **Enabled** and Disabled.

### WHEA Support

This feature Enables the Windows Hardware Error Architecture (WHEA) support for the Windows 2008 (or a later version) operating system. The options are **Enabled** and Disabled.

## ►Trusted Computing Configuration

### Security Device Support

This feature enables BIOS support for security devices. The options are Disabled and **Enabled**.

### TPM State

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

### Pending TPM 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.

### Device Select

Use this feature to select the TPM version. TPM 1.2 will restrict support to TPM 1.2 devices. TPM 2.0 will restrict support for TPM 2.0 devices. Select Auto to enable support for both versions. The default setting is **Auto**.

The following are informational status messages that indicate the current TPM State:

**TPM Enabled Status**

**TPM Active Status**

**TPM Owner Status**

**TXT Support**

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

► **iSCSI Configuration**

**iSCSI Initiator Name**

This feature allows the user 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) I210 Gigabit Network Connection**

► **NIC Configuration**

**Link Speed**

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

**Wake On LAN**

Select **Enabled** for Wake\_On\_LAN support, which will allow the system to "wake up" when an onboard device receives an incoming signal. The options are **Disabled** and **Enabled**.

### **Blink LEDs**

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

### **UEFI Driver**

This feature displays the UEFI driver version.

### **Adapter PBA**

This feature displays the Processor Bus Adapter (PBA) model number. The PBA number is a nine digit number (i.e., 010B00-000) located near the serial number.

### **Device Name**

This feature displays the adapter device name.

### **Chip Type**

This feature displays the network adapter chipset name.

### **PCI Device ID**

This feature displays the device ID number.

### **PCI Address**

This feature displays the PCI address for this computer. PCI addresses are three two-digit hexadecimal numbers.

### **Link Status**

This feature displays the connection status.

### **MAC Address**

This feature displays the MAC address for this computer. Mac addresses are six two-digit hexadecimal numbers.

### **Virtual MAC Address**

This feature displays the Virtual MAC address for this computer. Mac addresses are six two-digit hexadecimal numbers.

## ► Intel I219 Gigabit Network Connection

### ► NIC Configuration

#### **Link Speed**

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

#### **Wake On LAN**

This feature displays the status of Wake on LAN.

#### **Blink LEDs**

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

#### **UEFI Driver**

This feature displays the UEFI driver version.

#### **Adapter PBA**

This feature displays the Processor Bus Adapter (PBA) model number. The PBA number is a nine digit number (i.e., 010B00-000) located near the serial number.

#### **Chip Type**

This feature displays the network adapter chipset name.

#### **PCI Device ID**

This feature displays the device ID number.

#### **PCI Address**

This feature displays the PCI address for this computer. PCI addresses are three two-digit hexadecimal numbers.

#### **Link Status**

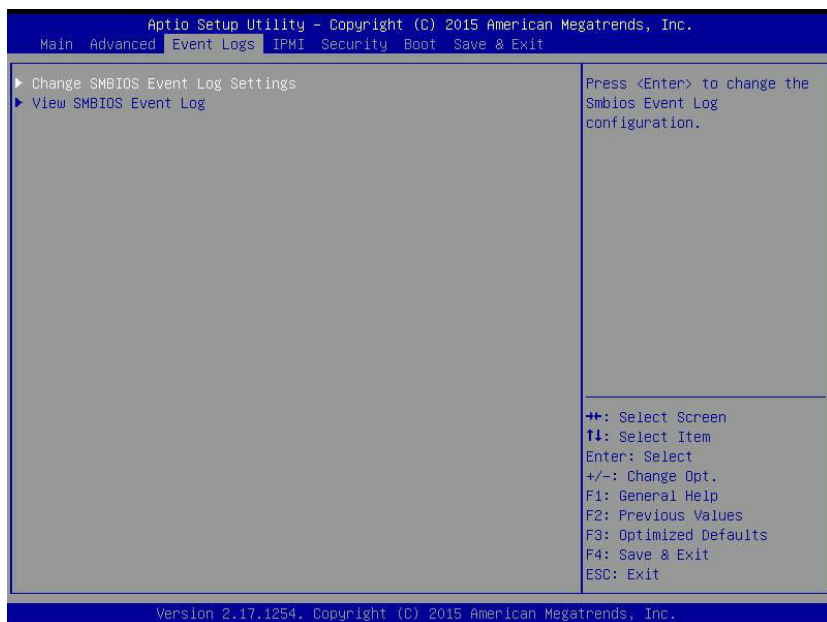
This feature displays the connection status.

#### **MAC Address**

This feature displays the MAC address for this computer. Mac addresses are six two-digit hexadecimal numbers.

## 4-4 Event Logs

Use this feature 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 **Enabled** and Disabled.

#### 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 Long Standard Settings

#### Log System Boot Event

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

#### MECI

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

#### METW

The Multiple Event Time Window (METW) defines number of minutes 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, be sure to reboot the system for the changes to take effect.

### ►View SMBIOS Event Log

This section displays the contents of the SMBIOS Event Log.

## 4-5 IPMI

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



### BMC Firmware Revision

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

### IPMI Status (Baseboard Management Controller)

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

### ►System Event Log

#### Enabling/Disabling Options

#### SEL Components

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



## Erasing Settings

### Erase SEL

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

### When SEL is Full

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



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

## ►BMC Network Configuration

### BMC Network Configuration

#### IPMI LAN Selection

This feature displays the IPMI LAN setting. The default setting is **Failover**.

#### IPMI Network Link Status

This feature displays the IPMI Network Link status. The default setting is **Shared LAN**.

#### Update IPMI LAN Configuration

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

***\*If the feature above is set to Yes, the following item will become available for user's configuration:***

#### Configuration Address Source

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

## **Configuration Address Source**

This feature displays the current configuration address for this computer.

## **Station IP Address**

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

## **Subnet Mask**

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

## **Station MAC Address**

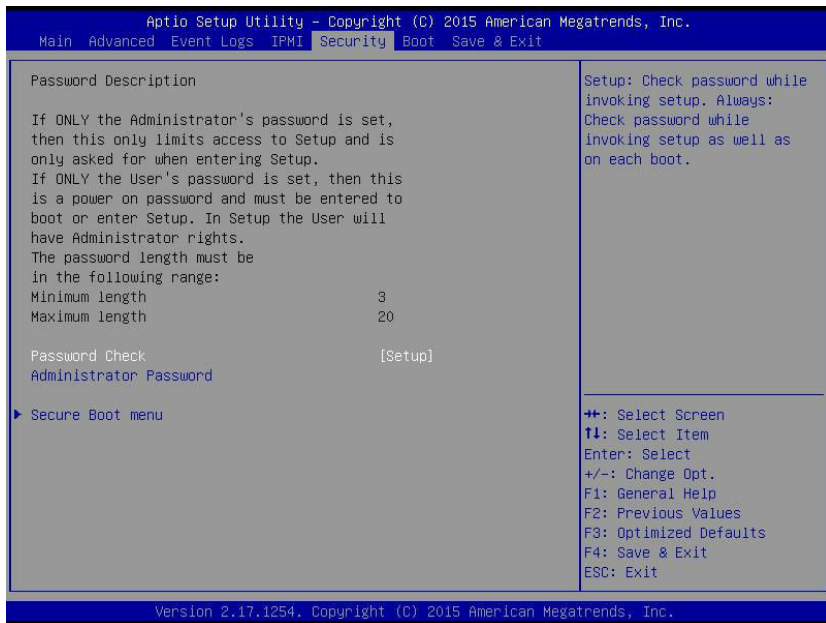
This feature displays the Station MAC address for this computer. Mac addresses are six two-digit hexadecimal numbers.

## **Gateway IP Address**

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

## 4-6 Security

This menu allows the user to configure the following security settings for the system.



### 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.

### Administrator Password

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

### ► Secure Boot Menu

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

- System Mode
- Secure Boot
- Vendor Keys

## Secure Boot

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

## Secure Boot Mode

Use this feature to select the secure boot mode. The options are **Standard** and **Custom**.

## CSM Support

Select **Enabled** to support the EFI Compatibility Support Module (CSM), which provides compatibility support for traditional legacy BIOS for system boot. The options are **Enabled** and **Disabled**.

## ►Key Management

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

### Provision Factory Default Keys

Select **Enabled** to install the default Secure-Boot keys set by the manufacturer. The options are **Disabled** and **Enabled**.

### ►Enroll All Factory Default Keys

Select **Yes** to install all default secure keys set by the manufacturer. The options are **Yes** and **No**.

### Save All Secure Boot Variables

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

## ►Platform Key (PK)

This feature allows the user to configure the settings of the platform keys.

### Set New Key

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

## ►Key Exchange Key

### Set New Key

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

**Append Key**

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

**► Authorized Signatures****Set New Key**

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

**Append Key**

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

**► Forbidden Signatures****Set New Key**

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

**Append Key**

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

**► Authorized TimeStamps****Set New Key**

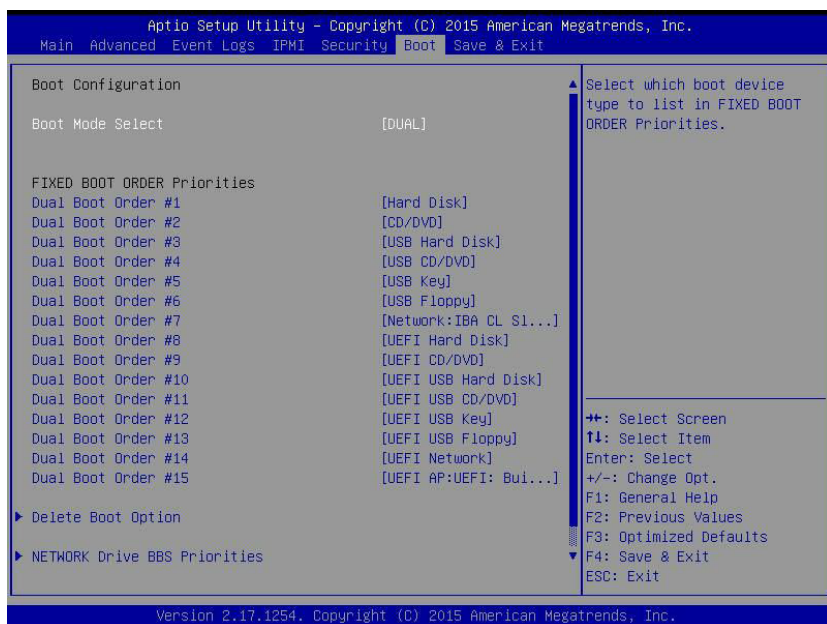
Select Yes to load the DBT from the manufacturer's defaults. Select No to load the DBT from a file. The options are Yes and No.

**Append Key**

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.

## 4-7 Boot

Use this feature to configure Boot Settings:



### Boot Mode Select

Use this feature to select the type of device that the system is going to boot from. The options are Legacy, UEFI, and **Dual**. The default setting is Dual.

### Fixed Boot Order Priorities

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

***\*If the feature above is set to Legacy, UEFI/Dual the following items will be displayed:***

- Legacy/UEFI/Dual/Boot Order #1
- Legacy/UEFI/Dual/Boot Order #2
- Legacy/UEFI/Dual/Boot Order #3
- Legacy/UEFI/Dual/Boot Order #4
- Legacy/UEFI/Dual/Boot Order #5

- Legacy/UEFI/Dual/Boot Order #6
- Legacy/UEFI/Dual/Boot Order #7
- Legacy/UEFI/Dual/Boot Order #8
- Legacy/UEFI/Dual/Boot Order #9
- Legacy/UEFI/Dual/Boot Order #10
- Legacy/UEFI/Dual/Boot Order #11
- Legacy/UEFI/Dual/Boot Order #12
- Legacy/UEFI/Dual/Boot Order #13
- Legacy/UEFI/Dual/Boot Order #14
- Legacy/UEFI/Dual/Boot Order #15

#### ►Delete Boot Option

Use this feature to remove a pre-defined boot device from which the system will boot during startup.

The settings are [any pre-defined boot device].

#### ►NETWORK Drive BBS Priorities

This feature allows the user to specify which UEFI network drive devices are boot devices.

- UEFI Boot Order #1
- UEFI Boot Order #2

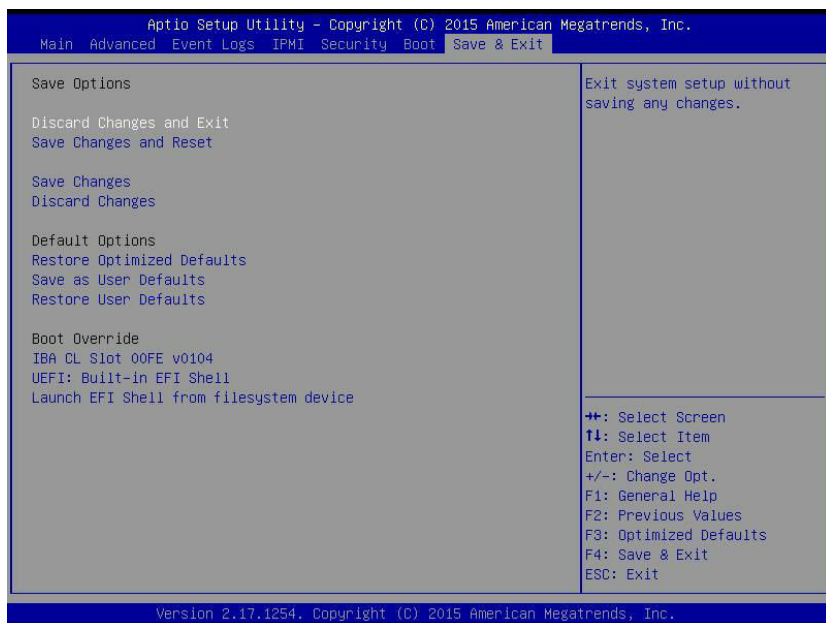
#### ►UEFI Application Boot Priorities

This feature allows the user to specify which UEFI devices are boot devices.

- UEFI Boot Order #1

## 4-8 Save & Exit

Select the Exit tab from the BIOS setup utility screen to enter the Exit BIOS Setup screen.



### 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 Exit menu and press <Enter>.

### Save Changes and Reset

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

### Save Changes

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

### Discard Changes

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



## **Default Options**

### **Restore Optimized Defaults**

To set this feature, select Restore Optimized 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 Exit menu and press <Enter>. This enables the user to save any changes to the BIOS setup for future use.

### **Restore User Defaults**

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

### **Boot Override**

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

## Notes

## Appendix A

### BIOS Error Beep Codes

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

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

**Fatal errors** will not allow the system to continue to bootup. 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 numbers on the fatal error list correspond to the number of beeps for the corresponding error.

#### A-1 BIOS Error Beep Codes

BIOS Error Beep Codes		
Beep Code/LED	Error Message	Description
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
5 short beeps	Display error	System display error
OH LED On	System OH	System Overheat

## Notes

## Appendix B

### Software

#### B-1 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 drive or a DVD. (You may also use a utility to extract the ISO file if preferred.)

Another option is to go to the Supermicro website at <http://www.supermicro.com/products/>. Find the product page for your motherboard, and "Download the Latest Drivers and Utilities".

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

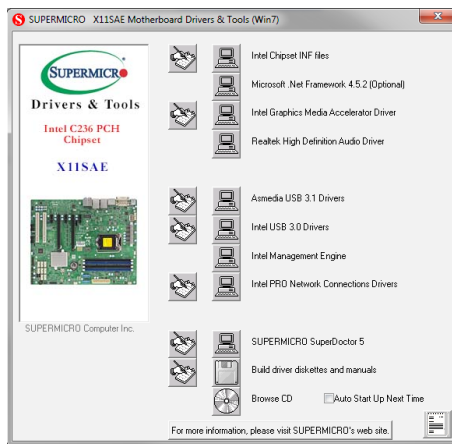


Figure B-1. Driver/Tool Installation Screen



**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-2 SuperDoctor 5

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

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

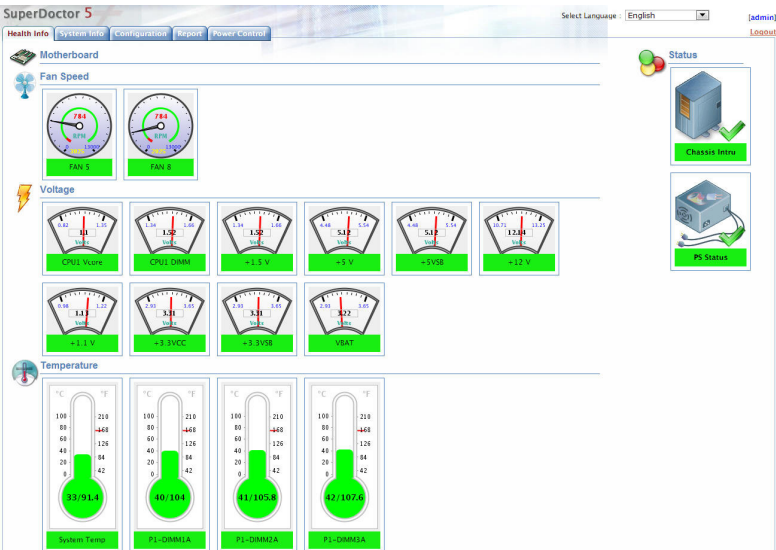


Figure B-2. SuperDoctor 5 Interface Display Screen (Health Information)

### **B-3 IPMI**

The X11SAE-F supports 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.

For general documentation and information on IPMI, please visit our website at <http://www.supermicro.com/products/nfo/IPMI.cfm>.

### **B-4 Logging into the BMC (Baseboard Management Controller)**

Supermicro ships standard products with a unique password for the BMC user. This password can be found on a label on the motherboard.

When logging in to the BMC for the first time, please use the unique password provided by Supermicro to log in. You can change the unique password to a user name and password of your choice for subsequent logins.

For more information regarding BMC passwords, please visit our website at <http://www.supermicro.com/bmcpassword>.

## Notes



## Appendix C

### 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. Doing so may cause a boot failure.

#### C-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 for an external storage device initialization to allow the UEFI OS loader, which is stored in the external storage device, to boot the system. The UEFI offers clean, hands-off control to a computer system at startup.

#### C-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 boot block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a new BIOS image if the original main BIOS image is corrupted. When the system power is on, the boot block codes execute first. Once it is completed, the main BIOS code will continue with system initialization and startup.



**Note:** Follow the BIOS recovery instructions below for BIOS recovery when the main BIOS boot crashes. However, if the BIOS boot block crashes, you will need to follow the procedures below for BIOS recovery.

### C-3 Recovering the BIOS Block with a USB Device

This feature allows the user to recover a BIOS image using a USB-attached device without the need for additional utilities. A USB flash device such as a USB flash drive or a USB CD/DVD device can be used for this purpose. A USB hard disk drive cannot be used for BIOS recovery at this time. The file system supported by UEFI is FAT (including FAT12, FAT16, and FAT32) installed on a bootable or non-bootable USB-attached device.

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

1. If you have the SUPER.ROM file in your drive disk, the BIOS might need several minutes to locate the SUPER.ROM file if the media size becomes too large due to the huge volumes of folders and files stored in the device. You can also use a different machine and visit our website at [www.supermicro.com](http://www.supermicro.com) to download the BIOS package. Extract the BIOS package to a DOS bootable device. Use the same or another USB-attached device to make a copy of the standard BIOS binary image file and rename it to SUPER.ROM (not case sensitive) for the BIOS recovery use. Copy the SUPER.ROM file into the Root "\" directory of a USB device or a writable CD/DVD.

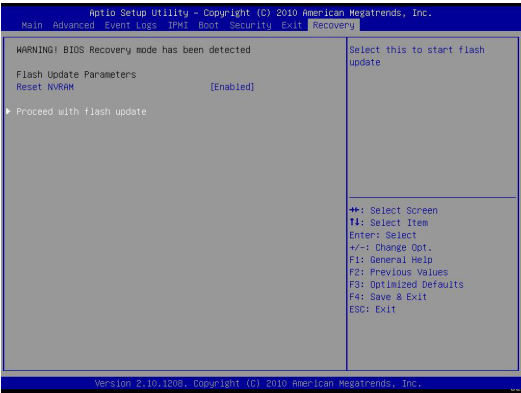


**Note:** Before recovering the main BIOS image, confirm that the SUPER.ROM file you have is the same version or a close version meant for your motherboard.

2. Insert the USB device that contains the SUPER.ROM file and power on the system.
3. While powering on the system, please keep pressing <Ctrl> and <Home> simultaneously until you hear the beep sound.

**Warning:** Please stop pressing the <Ctrl> and <Home> keys immediately when you hear the beep sound; otherwise, it will trigger a system reboot.

4. After locating the SUPER.ROM file, the system will enter the BIOS Recovery menu as shown below.

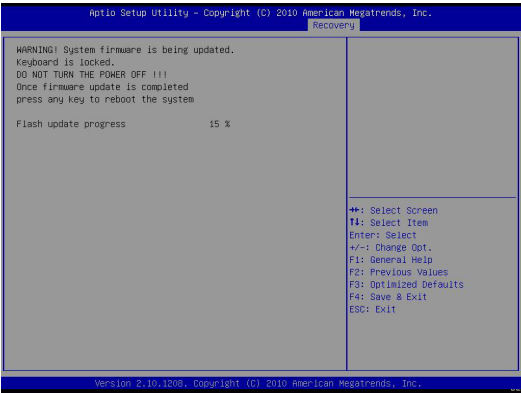


**Note:** At this point, you may decide if you want to start the BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.

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



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



- After the BIOS recovery process has completed, press any key to reboot the system.



**Note:** Before rebooting the system, be sure to insert the DOS bootable device that contains the BIOS package you extracted earlier from Step 1.

- When the DOS prompt appears, enter flash.bat BIOSname#.#.# at the prompt.



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

- After seeing the message that BIOS update has completed (refer to the screen below), reboot the system.

```

AMI Firmware Update Utility v5.06.00
Copyright (C)2014 American Megatrends Inc. All Rights Reserved.
-----
Reading flash ..... done
- ME Data Size checking . ok
- FFS checksums ..... ok
Erasing Boot Block ..... done
Updating Boot Block ..... done
Verifying Boot Block ..... done
Erasing Main Block ..... done
Updating Main Block ..... done
Verifying Main Block ..... done
Erasing NVRAM Block ..... done
Updating NVRAM Block ..... done
Verifying NVRAM Block ..... done
Erasing MCB Block ..... done
Updating MCB Block ..... done
Verifying MCB Block ..... done
- FDT won't be updated when ME is not in Manufacturing mode!!
BIOS upgrade continues...
- Successful Update Recovery Loader to OPRx!!
- Successful Update FPT, MFSB, FTFR and MFS!!
- ME Entire Image update success !!
WARNING : System must power-off to have the changes take effect!
G:\X116DL\DOS>

```

(Disclaimer Continued)

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