B1SA4-2750F
B1SA4-2550F

USER'S MANUAL

Revision 1.0

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- Reorient or relocate the receiving antenna.
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- Consult the dealer or an experienced radio/television technician for help.

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WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

Manual Revision 1.0

Release Date: March 6, 2014

Preface

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPERO® B1SA4-2750F/B1SA4-2550F Motherboard.

About This Motherboard

The SUPERO® B1SA4-2750F/B1SA4-2550F Motherboard is a micro cloud motherboard optimized for the Supermicro Microblade chassis. The motherboard supports four Intel® ATOM C2750 (8 Cores) or four Intel ATOM C2550 (4 Cores) CPUs.

Each of the four nodes of the B1SA4-2750F/B1SA4-2550F supports up to 32GB of memory, and features two SATA 3.0 ports on the backplane, two Serdes 2.5Gb/s, and an ASPEED BMC on board. The motherboard supports a total of eight SATA 3.0 ports, eight 2.5Gb/s Serdes, and one 1Gb/s Serdes for IPMI support, all connections to the backplane.

Please refer to our website (http://www.supermicro.com/products/) for processor and memory support updates.

*This product is intended to be installed and serviced by professional technicians.

Manual Organization

Chapter 1 describes the features, specifications and performance of the motherboard, and provides detailed information on the Intel Patsburg 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 the UEFI BIOS Recovery instructions.

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:

Danger/Caution: Instructions to be strictly followed to prevent catastrophic system failure or to avoid bodily injury

Warning: Critical information to prevent damage to the components or data loss.

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

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

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Chapter 1

Introduction

1-1 Overview

Checklist

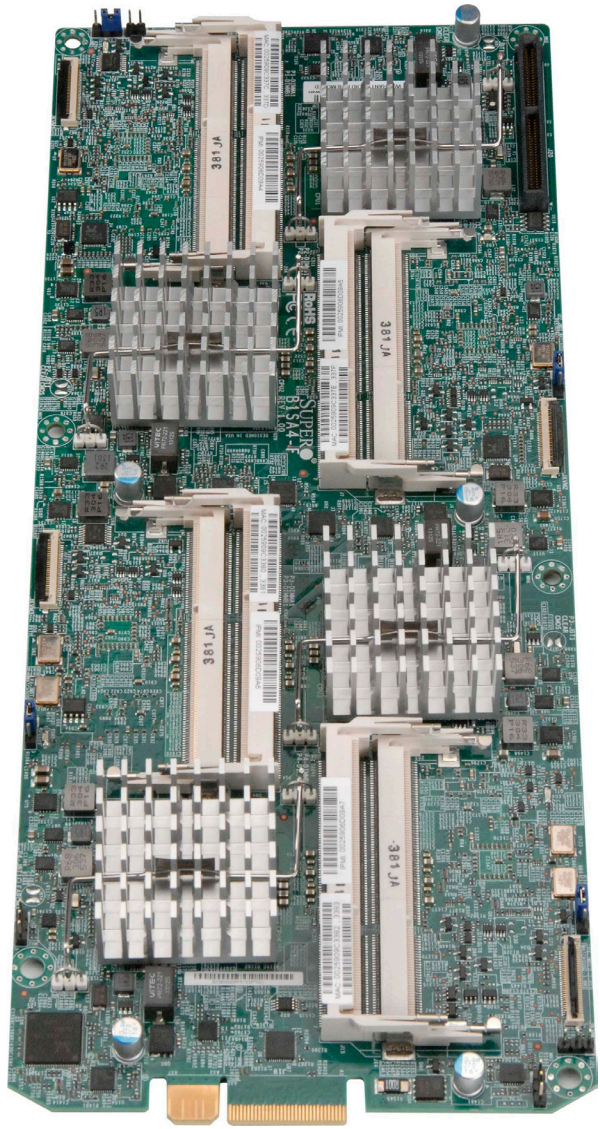
Congratulations on purchasing your computer motherboard from an acknowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

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

The following items are included in the retail box.

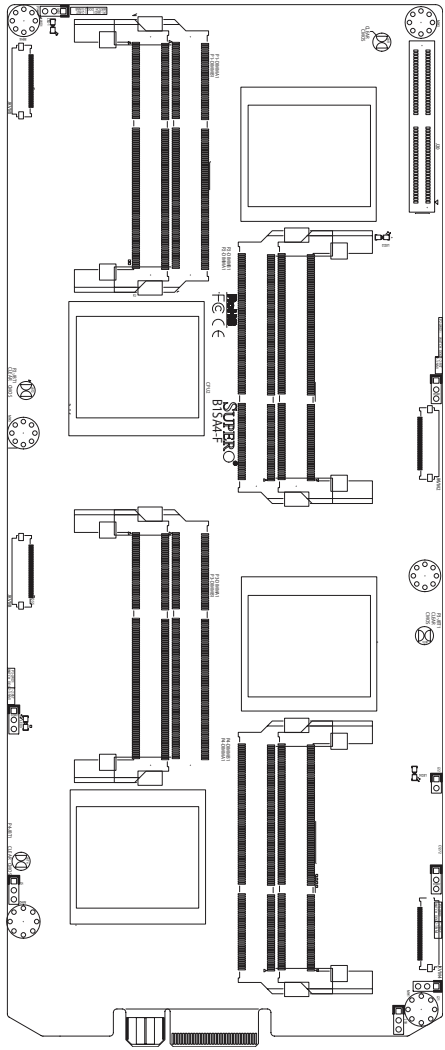
- One (1) Supermicro Mainboard
- Six (6) SATA cables
- One (1) I/O shield
- One (1) Supermicro CD containing drivers and utilities
- One (1) User's Manual

SUPERMICRO 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.

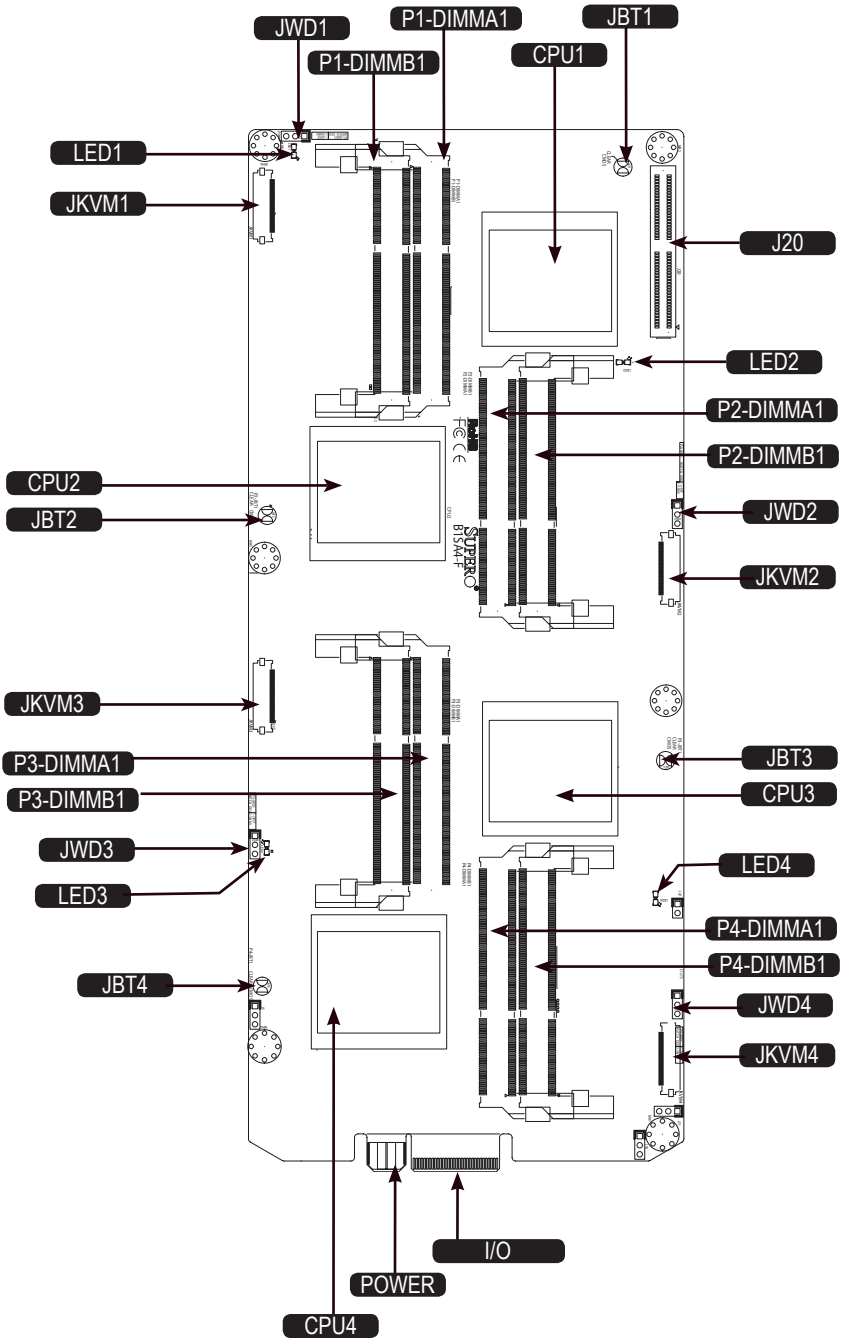
Motherboard Layout



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.

Motherboard Quick Reference



Motherboard Jumpers and Connectors

Jumper Name	Description	Default
JBT1~JBT4	CMOS Clear	(See Chapter 2 in User Manual)
JWD1~JWD4	Watch Dog Timer RST/NMI Selection	Pins 1-2 (Reset)

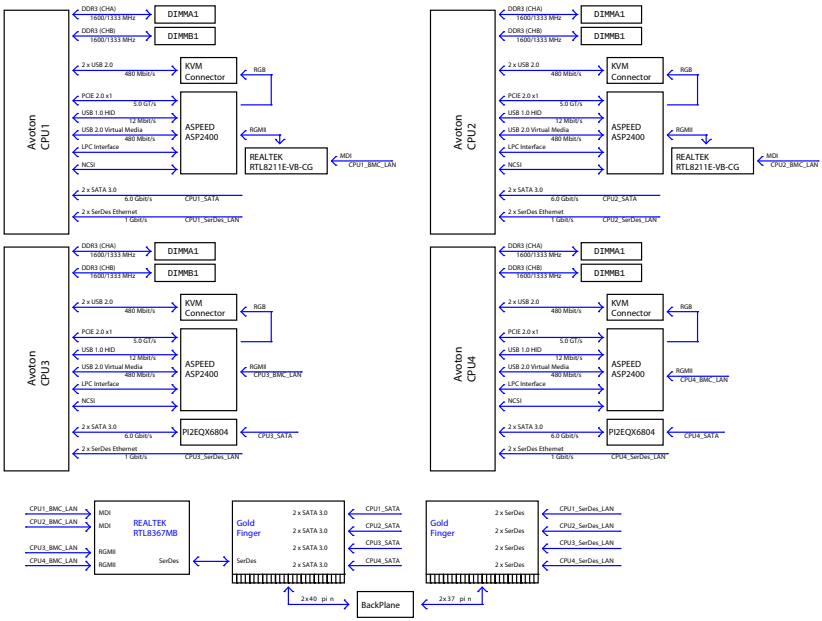
Connector Name	Description
LED1~LED4	BMC Heartbeat LED
JKVM1~JKVM4	USB / VGA / UART Interface
CPU1~CPU4	Onboard CPU
P1~P4 DIMMA1~DIMMB1	SO DIMM Slots
J20	SATA Interface Connector
POWER	Back Panel Edge Connector (SATA/Power)
I/O	Back Panel Edge Connector (I/O, Network)

1-2 Motherboard Features

CPU	One Intel® ATOM C2750 (8 cores) or ATOM C2550 (4 cores) per node, total of four (4) CPUs on board.	
Memory	Two (2) SODIMM slots per node supports up to 32GB of DDR3 Unbuffered, ECC SODIMM memory, up to 1600MHz. The motherboard has eight (8) total memory slots. Supports dual-channel memory bus..	
	DIMM sizes	
	SODIMM	1GB, 2GB, 4GB, 8GB, 16GB
Network Connections		
	Supports networking via edge connector to backplane	
	Supports IPMI (per node) with heartbeat LED indicator	
I/O Devices	**SATA Connections**	
	SATA 2.0 Ports	via onboard SATA interface connector
	USB Devices	
	Support via edge connector to backplane	
	Keyboard/Mouse	
	Supported via (1) KVM port, per node	
	Serial (COM) Ports	
	Support via edge connector to backplane	
BIOS	32 Mb SPI AMI BIOS® SM Flash BIOS	
	Play and Plug APM 1.2, ACPI 1.0/2.0, USB Keyboard and SMBIOS 2.3, RTC Wake-up	
Power Configuration	ACPI/ACPM Power Management	
	Power-on mode for AC power recovery	
PC Health Monitoring	**CPU & Chassis Monitoring**	
	Onboard voltage monitors for CPU cores, +3.3V, +5V, +/-12V, +3.3V Stdby, +5V Stdby, VBAT, CPU Vcore, Memory	
	CPU 1+1 phase switching voltage regulator	
	CPU/System overheat LED and control	
	CPU Thermal Trip support	
System Management	PECI (Platform Environment Configuration Interface) 2.0 support	
	System resource alert via SuperDoctor® III	
	Watch Dog, NMI	

CD Utilities	BIOS flash upgrade utility
	Drivers and software for Intel® C602 chipset utilities
Other	ROHS 6/6 (Full Compliance, Lead Free)
	FCC A, EuP Lot 6, WHQL
Dimensions	ATX form factor (11.50" x 4.7")

Motherboard Block Diagram



System Block Diagram

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

1-3 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**.

1-4 PC Health Monitoring

This section describes the PC health monitoring features of the board. All have an onboard System Hardware Monitoring chip that supports PC health monitoring. An onboard voltage monitor will scan these onboard voltages continuously: CPU cores, +3.3V, +5V, +/-12V, +3.3V Stdby, +5V Stdby, VBAT, CPU Vcore, Memory. 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 BIOS (under the Hardware Monitoring section in the Advanced Setting).

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 the system is used with Supero Doctor III in the Windows OS environment or used with Supero Doctor II in Linux. Supero Doctor is used to notify the user of certain system events. For example, you can also configure Supero Doctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds go beyond predefined thresholds.

1-5 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 XP, Windows Vista 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.

1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates. This motherboard draws power from the backplane. Make sure that power coming from the backplane and chassis is enough to power this motherboard and the other nodes that reside in the same chassis.

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.

1-7 Advanced Power Management

Intel® Intelligent Power Node Manager (NM)

The Intel® Intelligent Power Node Manager (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM Specification Version 1.5 is supported by the BMC (Baseboard Management Controller), your system must also have IPNM-compatible Manageability Engine (ME) firmware installed to use this feature.

Manageability Engine (ME)

The Manageability Engine, which is an ARC controller embedded in the IOH (I/O Hub), provides Server Platform Services (SPS) to your system. The services provided by SPS are different from those proveded by the ME on client platforms.

1-8 Introduction to the BMC (Baseboard Management Controller)

This motherboard incorporates the ASPEED AST2400 Graphics and BMC.

The AST2400 is ASPEED's 5th generation of Advanced PCIe Graphics & Remote Management Processor, with a mainstream double data rate memory migrating from DDR2 to DDR3. The AST2400, provides the motherboard with DDR3 support, with the best cost/performance ratio. The AST2400 is integrated with PCIe 1x support. In addition to the the AST2400's advanced BMC features. The chip's PCIe 2D VGA provides servers with a local display, without the added cost and with minimal pin counts. The embedded ARM9 and DDR3 is clocked at 400MHz to meet the increasing performance requirements of today's server applications.

Notes

Chapter 2

Installation

2-1 Static-Sensitive Devices

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

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board 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 board, make sure that the person handling it is static protected.

2-2 System Memory

CAUTION

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

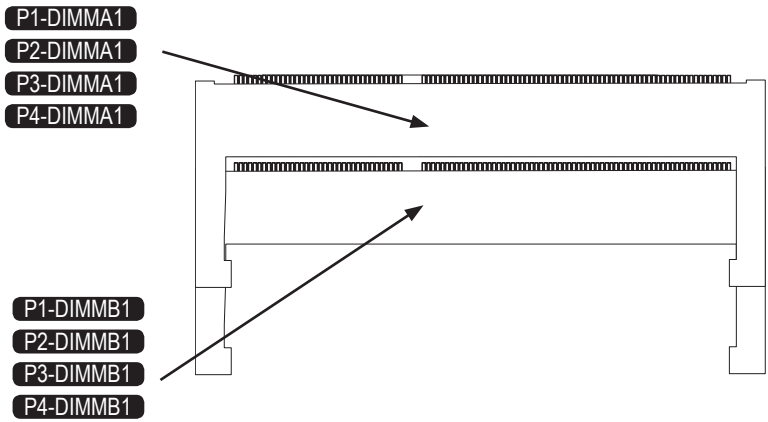
Note: Check the Supermicro website for a list of memory modules that have been validated with the B1SA4-2750F/B1SA4-2550F motherboard.

How to Install SODIMMs

Each of the four nodes has its own memory bank. Populate Channel A first, the Channel B. In this example, Channel A of Node 1 is designated as P1-DIMMA1 and Channel B is P1-DIMMB1. Be sure to populate the sockets with SODIMM memory with the same speed.

Memory Support

Each node on the B1SA4-2750F/B1SA4-2550F Motherboard supports up to 32GB of up to 1600MHz of unbuffered Non-ECC DDR3 SODIMMs in 2 SODIMM slots.



Memory Population Guidelines

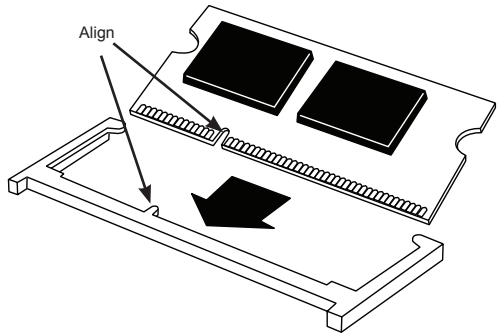
When installing memory modules, the SODIMM slots should be populated in the following order: DIMMA1, DIMMB1.

- Always use DDR3 SODIMM 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.
- The motherboard will support one DIMM module or three DIMM modules installed. For best memory performance, install DIMM modules in pairs.

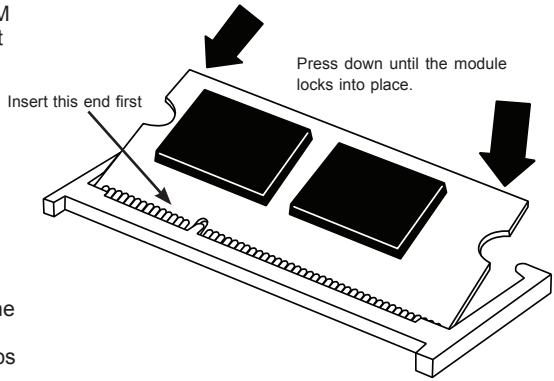
Memory Population Guidelines		
P1/P2/P3/P4-DIMMA1	**P1/P2/P3/P4-DIMMB1**	**Total System Memory**
2GB		2GB
2GB	2GB	4GB
4GB		4GB
4GB	4GB	8GB
8GB		8GB
8GB	8GB	16GB
16GB		16GB
16GB	16GB	32GB

The SO DIMM Socket

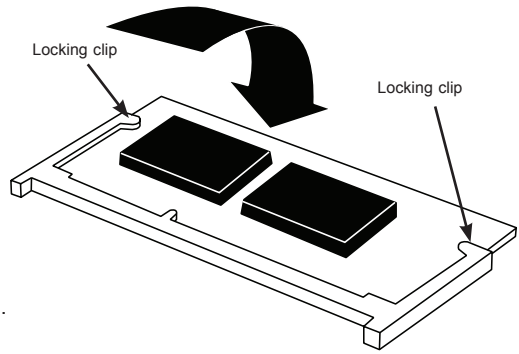
1 Position the SO DIMM module's bottom key so it aligns with the receptive point on the slot.



2 Insert the SO DIMM module vertically at about a 45 degree angle.



3 Press down until the module locks into place. The side clips will automatically secure the SO DIMM module, locking it into place.



4 **To Remove:**
Use your thumbs to gently push the side clips near both ends away from the module. This should release it from the slot. Pull the SO DIMM module upwards.

2-3 Motherboard Installation

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both 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.

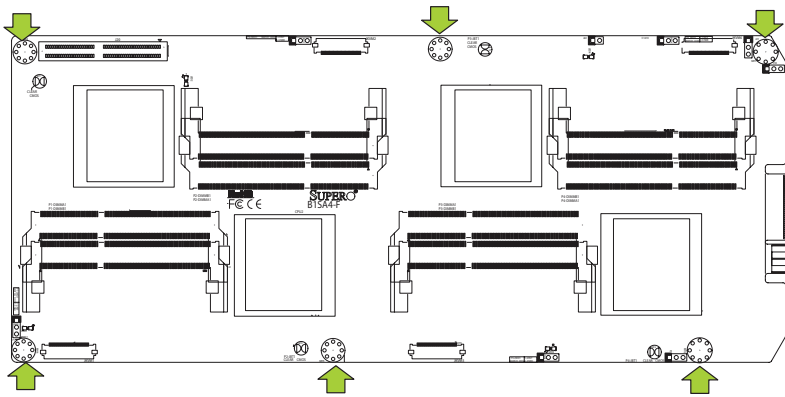
Tools Needed

Philips Screwdriver

Philips Screws

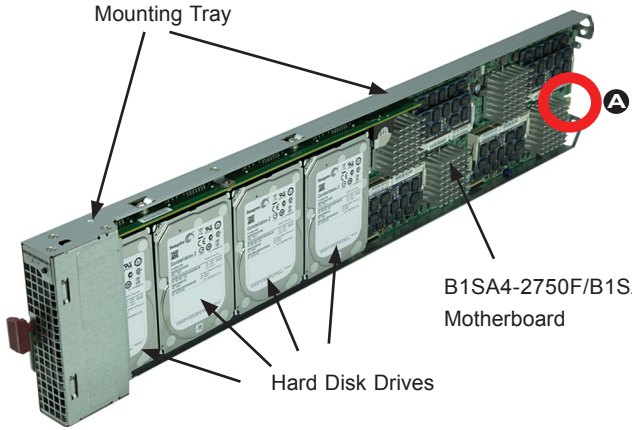
Standoffs

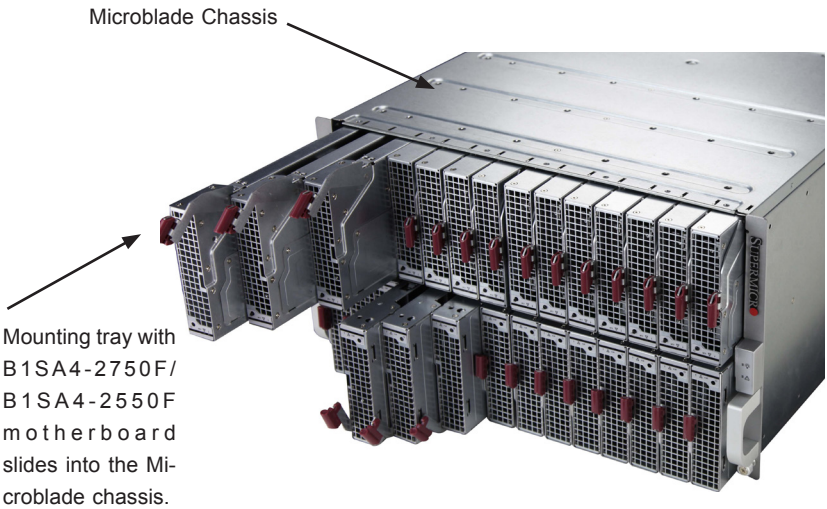
Location of Mounting Holes



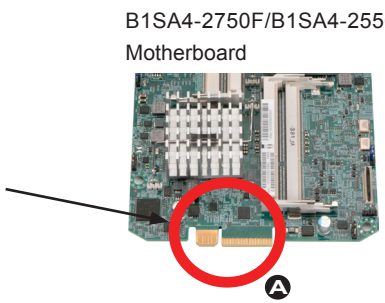
Caution: 1) To prevent damage to the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to avoid damaging these components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

The B1SA4-2750F/B1SA4-2550F motherboard fits into a mounting tray, that also holds the hard drives. See the image below:





Once the mounting tray with the B1SA4-2750F/B1SA4-2550F motherboard is pushed in the Microblade chassis, the motherboard's edge connectors make contact with the chassis' backplane, where it connects electrically with the chassis power, network and other I/O devices.

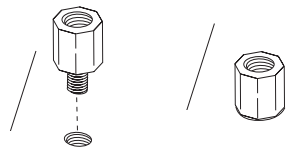


Installing the Motherboard

1. Locate the mounting holes on the motherboard.

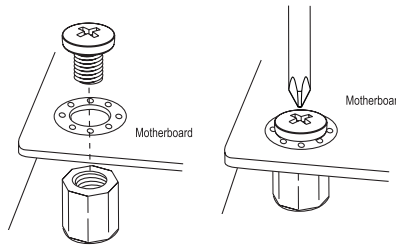
2. Locate the matching mounting holes on the mounting tray. Align the mounting holes on the motherboard against the mounting holes on the mounting tray

3. Install standoffs in the mounting tray as needed.



4. Using a Philips screwdriver, insert a Pan head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the mounting tray.

5. Repeat Step 5 to insert #6 screws into all mounting holes.



6. Make sure that the motherboard is securely placed in the mounting tray.

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

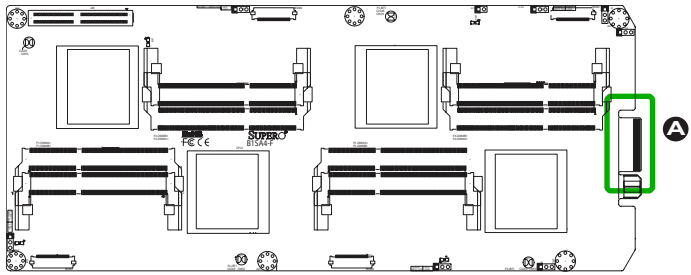
2-4 Connecting Cables & Optional Devices

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

I/O Edge Connector

When the motherboard is installed inside the chassis, the motherboard's edge connectors make contact with the chassis' backplane, where it connects electrically with the chassis network and other I/O devices.

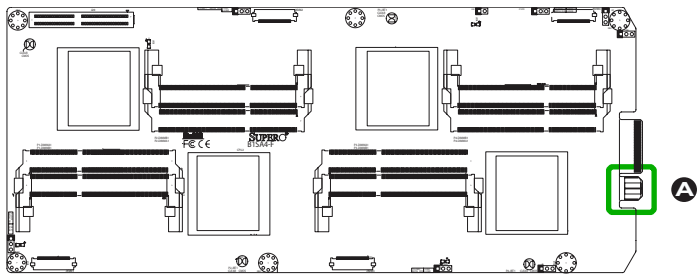
A. I/O Edge Connector



Power Edge Connector

The motherboard draws its power through this edge connector after it is installed inside the chassis. This edge connector makes contact with the chassis' backplane, where it connects electrically with the chassis .

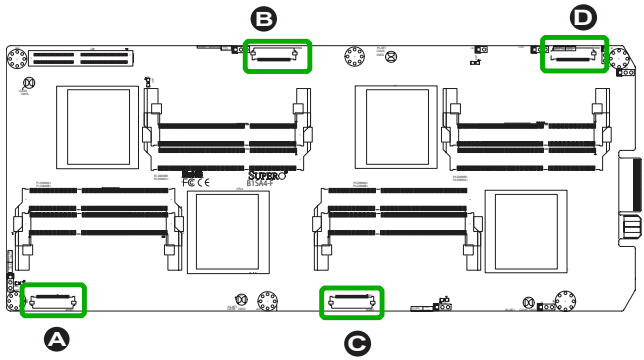
A. Power Edge Connector



KVM Connector (JKVM1~4)

Each of the four nodes in the motherboard has its own KVM (Keyboard, Video, Mouse) connector. Each of these serves as a USB / VGA / UART Interface for each of the nodes to control them independently.

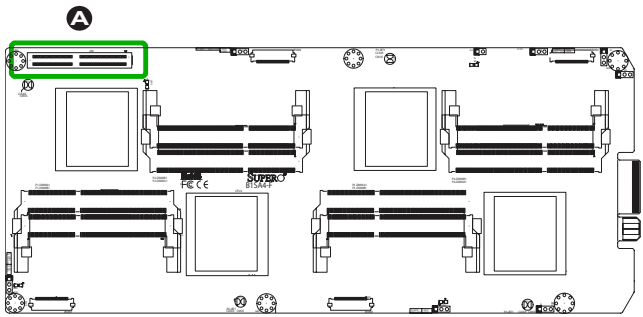
A. JKVM1
B. JKVM2
C. JKVM3
D. JKVM4



SATA Connector (J20)

This connector attaches to the SATA drives mounted on the same mounting tray where the motherboard in installed.

A. SATA Connector

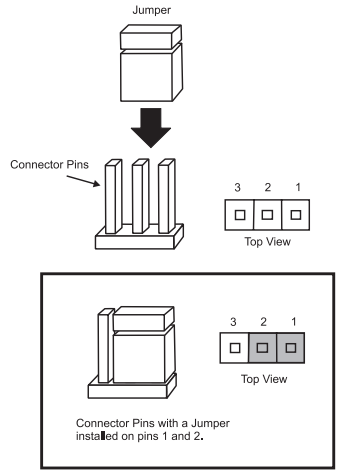


2-5 Jumper Settings

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.

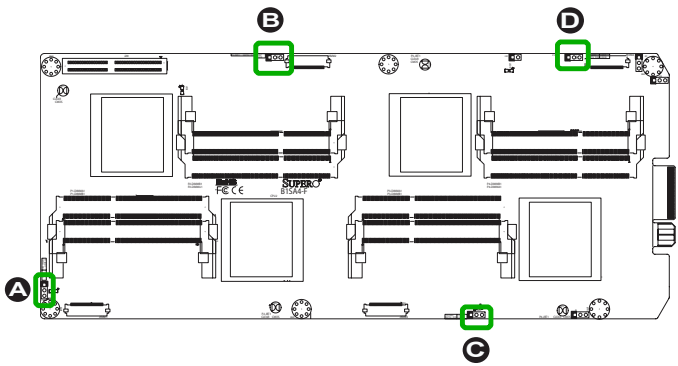


Watch Dog Reset (JWD1~4)

Watch Dog (JWD) is a system monitor that can reboot the system when a software application hangs. Close Pins 1-2 to reset the system if an application hangs. Close Pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

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

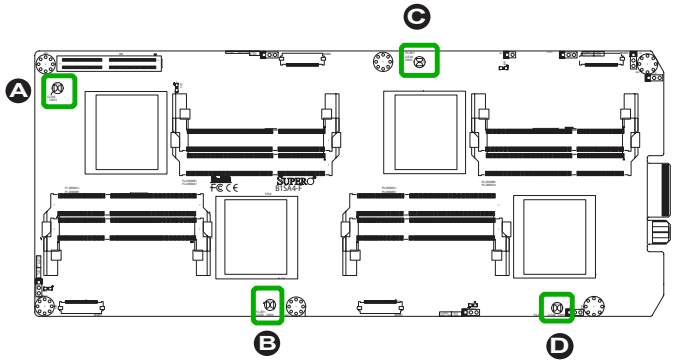
A. JWD1
B. JWD2
C. JWD3
D. JWD4



Clear CMOS (JBT1~4)

JBT is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent accidental clearing of CMOS. To clear CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection.

A. JBT1
B. JBT2
C. JBT3
D. JBT4

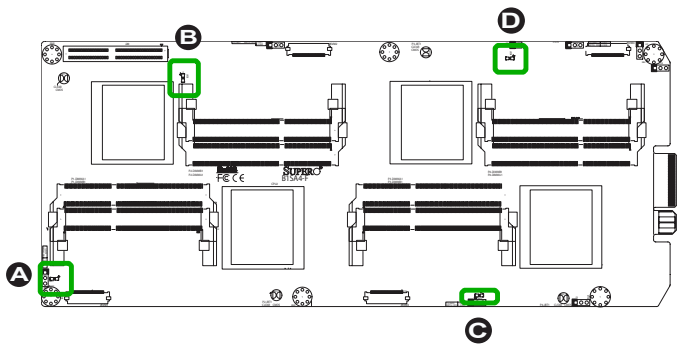


2-6 Onboard Indicators

BMC Heartbeat (LED1~4)

When blinking,the BMC Heartbeat LED is an indicator that the onboard Baseboard Management Controller (BMC) is working normally. There is one LED indicator for each node on the motherboard.

A. LED1
B. LED2
C. LED3
D. LED4



Notes

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 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. Make sure that CPU is fully seated. 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.

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 specs of memory modules, reset the memory or try a different one.)

Memory Errors

1. Make sure that the SODIMM modules are properly installed and fully seated in the slots.

2. You should be using memory recommended by Supermicro. 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 SODIMM 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 Loses 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. 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, 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: Please see Section 2-2 for a comprehensive answer.

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/support/bios/. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Select your motherboard model and download the BIOS ROM file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. Please unzip the BIOS file onto a bootable device or a USB pen/thumb drive. To flash the BIOS, run the batch file named "ami.bat" with the new BIOS ROM file from your bootable device or USB pen/thumb drive. Use the following format:

F:\> ami.bat BIOS-ROM-filename.xxx <Enter>

Note: Always use the file named “ami.bat” to update the BIOS, and insert a space between "ami.bat" and the filename. The BIOS-ROM-filename will bear the motherboard name (i.e., B1SA4) and build date code as the extension. For example, "B1SA41.218". When completed, your system will automatically reboot.

When the BIOS flashing screen is completed, the system will reboot and will show “Press F1 or F2”. At this point, you will need to load the BIOS defaults. Press <F1> to go to the BIOS setup screen, and press <F9> to load the default settings. Next, press <F10> to save and exit. The system will then reboot.

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

Note: The SPI BIOS chip installed on this motherboard is not removable. To repair or replace a damaged BIOS chip, please send your motherboard to RMA at Supermicro for service.

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

Answer: Please see Appendix C-BIOS Recovery for detailed instructions.

3-5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. For faster service, you may also obtain RMA authorizations online (http://www.supermicro.com/support/rma/). 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.

Notes

Chapter 4

BIOS

4-1 Introduction

This chapter describes the AMI BIOS setup utility for the B1SA4-2750F/B1SA4-2550F motherboard. The ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS setup utility setup screens.

Note: For AMI BIOS Recovery, please refer to the UEFI BIOS Recovery Instructions in Appendix C.

Starting BIOS Setup Utility

To enter the AMI BIOS setup utility screens, press the <Delete> key while the system is booting up.

Note: In most cases, the <Delete> key is used to invoke the AMI 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 setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. 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**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS setup utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F4>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in **Bold** are default settings.

How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS setup utility. This setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

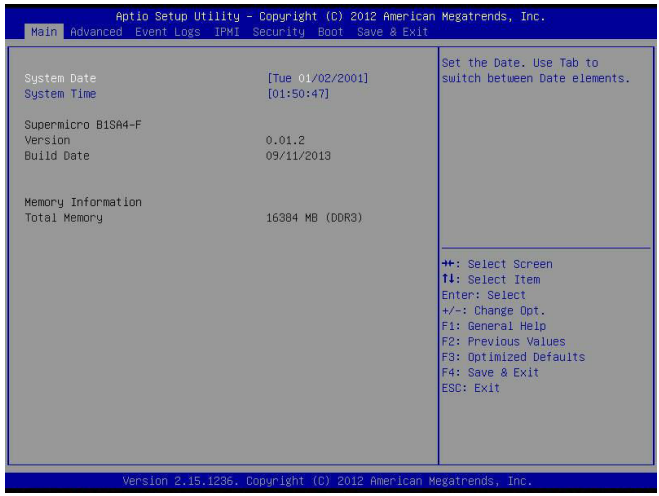
How to Start the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS setup utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen, below the copyright message.

Warning: Do not update 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 have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

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 items will display:

System Date/System Time

Use this feature 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/YY 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 following BIOS items will also be displayed:

Supermicro B1SA4-F

Version

Build Date

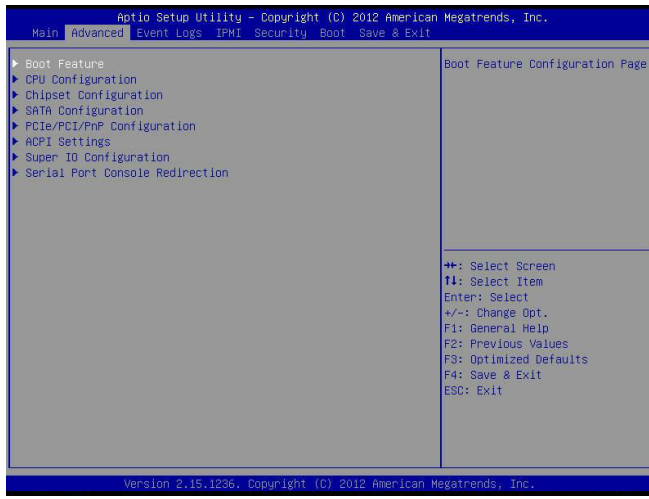
Memory Information

Total Memory

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

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 bootup. 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 Num-Lock

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**.

Interrupt 19 Capture

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

▶Power Configuration

Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive 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 Power-On, Stay-Off and **Last State**.

WOL (Wake-On_LAN) Support

Select Enabled to enable WOL support which will allow the system to "wake-up" when a device connected to a LAN port receives a signal. The options are Disabled and **Enabled.**

▶CPU Configuration

The following CPU information will be displayed:

- Processor ID
- Processor Frequency
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- Processor Version

Clock Spread Spectrum

If this feature is set to Enabled, the BIOS utility will monitor the level of Electromagnetic Interference caused by the components and will attempt to reduce the interference whenever needed. The options are Enabled and **Disabled**.

EIST (GV3)

EIST (Enhanced Intel SpeedStep Technology) GV3 allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Select Auto to enable 80 CPU stepping support automatically and disabled other functions. The options are Disabled, Enabled, and **Auto**. **Please refer to Intel's web site for detailed information.**

P-STATE Coordination

This feature selects the type of coordination for the P-State of the processor. P-State is a processor operational state that reduces the processor's voltage and frequency to enhance CPU energy efficiency. The options are Hardware, **Package**, and Module.

TM1 (Available when supported by the CPU.)

Select Enable to activate TM1 support for system thermal monitoring. TM1 allows the CPU to regulate its power consumption based upon the modulation of the CPU Internal clock when the CPU temperature reaches a pre-defined overheating threshold. The options are Disabled and **Enabled**.

TM2 Mode (Available when supported by the CPU.)

Use this feature to select the throttling mode for TM2. The options are LEM Throttling and Adaptive Throttling.

CPU C-States

C-States architecture, a processor power management platform developed by Intel, can further reduce power consumption from the basic C1 (Halt State) state that blocks clock cycles to the CPU. Select Enabled for CPU C-Sates support. The options are **Enabled** and Disabled. If this feature is set to Enabled, the following items will display:

Package C-State limit

Select Auto for the AMI BIOS to automatically set the limit on the C-State package register. The options are **No Limit**, C1 State, C2 State, C3 State, C4 State, and C6 (Non Retention) State.

Enhanced Halt State (C1E) (Available when "CPU C-States" is set to Enabled)

Select Enabled to support Enhanced C1 Power State to boost system performance. Please reboot the system for the new setting to take effect. The options are **Disabled** and Enabled.

ACPI C2 (Available when "CPU C-States" is set to Enabled)

Select Enabled for ACPI C2 support to determine how the processor will report the CPU-C state to the operating system. The options are Disabled, **C6 NS**, and C6 FS.

Monitor/Mwait

Select Enabled to implement the Mwait instruction along with the Monitor instruction to allow the processor to specify the location for the BIOS to monitor activities and to issue the instruction to put the operation on hold (Mwait).

L1 Prefetcher (Available when supported by the CPU)

If enabled, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L1 cache to improve CPU performance. The options are Disabled and **Enabled**.

L2 Prefetcher (Available when supported by the CPU)

If 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**.

ACPI 3.0 T-States (Available when "CPU C-States" is set to Enabled)

Select Enabled to support ACPI (Advanced Configuration and Power Interface) 3.0 T-States to determine how the processor will report to the operating system during CPU-Throttling states. The options are Enabled and **Disabled**.

Fast String

Select Enabled to enable Fast String support for REP MOVS/STOS, which will carry out Repeat-String Operation instructions to move a string of commands to another location (MOVS) or to add a string of commands to an existing instruction code (STOS). The options are Disabled and **Enabled**.

Machine Check

Select Enabled to use Intel's machine check mechanism to detect and report hardware (machine) errors. The options are Disabled and **Enabled**.

Max CPUID Value Limit

Use this feature to set the maximum CPU ID value. Enable this feature to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and **Disabled** (for the Windows OS.)

Execute Disable Bit (Available if supported by the OS & the CPU)

Set to Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor and damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

VMX (Available when supported by the CPU)

Select Enabled to enable Intel Vanderpool Technology support which will allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled.

BIST Selection (Available when supported by the CPU)

Select Enabled to set a BIST (Built-In-Self-Test) point selection to enhance system performance. The options are **Disabled** and Enabled.

MTRR (Memory Type Range Register) Default as Uncacheable

If this feature is set to Enabled, the default setting will be set to "Uncacheable" in the Memory-Type-Range Table to protect the data stored in the MTRR table from being cached. The options are **Disabled** and Enabled.

Extended APIC

Select Enabled to enable Extended APIC (Advanced Programmable Interrupt Control) support to enhance power management. The options are **Enabled** and Disabled.

AES-NI

Select Enabled to use the Advanced Encryption Standard in the processor. The options are **Enabled** and Disabled**.**

PECI Enable

Select Enabled to enable PECI (Platform Environment Control Interface) support, which will enhance CPU thermal management to achieve power efficiency. The options are **Disabled** and Enabled**.**

PECI Trusted

Select Enabled to support Trusted Platform Environment Control Interface to improve CPU thermal management. The options are **Disabled** and Enabled**.**

PECI SMBus Speed

Use this feature to set the speed for the physical bus to operate. The options are **Standard (80 kHz)**, Standard (100 kHz), Fast Mode (400 kHz), and Fast Mode Plus (1 MHz).

Turbo (Available if Intel® EIST technology is Enabled)

This feature allows processor cores to run faster than marked frequency in specific conditions. The options are Disabled and **Enabled.**

RAPL

Select Enabled to enable RAPL (Running Average Power Limit) support. Use the keyboard to enter your default setting**.**

MSR 606 PKG_POWER_SKU_UNIT

Use the keyboard to enter the number of the computer units that are SKU-specific in terms of power, energy, and time are concerned. .

MSR 610 PKG_TURBO_PWR_LIM

Use this feature to specify the processor power consumption limits during short and long duration.

MSR 670 PKG_TURBO_CFG1

Use this feature to specify various parameters of system components such as Turbo, Minimum Energy, SoC TDP Policy, ICMax Control, and Turbo Mode.

MSR 672_TURBO_WKLD_CFG2

Use this feature to specify ICCMax Throttle Ratio for C6 Exits when the value of PKG_TURBO_CFG1 [4:3] equals to 10Y.

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 web site for more information.) The options are **All,** 1, 2, and 3.

CPU Flex Ratio Override

Select Enabled to support CPU Flex Ratio Programming. The options are **Disabled**, and Enabled.

CPU Core Ratio

Use this feature to set the CPU Core ratio. Use the keyboard to enter the desired value for the CPU core ratio.

▶Chipset Configuration

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

▶North Bridge

The following information will be displayed:

- Memory Information
- MRC Version
- Total Memory
- Memory Frequency

▶Pass Gate Setup

Use the following items to configure Pass Gate settings and tests.

Pass Gate Feature Enable

Select Enabled to support Pass Gate features. The options are **Enabled** and Disabled.

2x Refresh Rate

Select Enabled to force the BIOS setup utility to use the x2 refresh rate in Pass-Gate operation regardless the temperatures of the processor and the motherboard. Refresh Rate is the total number of rows needed to refresh the entire DRAM array. x2 Refresh Rate will take 2000 rows of memory to refresh the entire DRAM array. The options are **Disabled** and Enabled.

Pass Gate Stress Test Configuration

Pass Gate Test

Select Enabled to use the Pass Gate test. The options are **Disabled** and Enabled.

Pass Gate Test Direction

This feature specifies how the BIOS setup utility should perform the Pass Gate test (from the lowest memory to the highest or from the highest memory to the lowest.) The options are **Lowest to Highest** and Highest to Lowest.

Pass Gate Test Repetition

Use this feature to specify how many times the Pass Gate test should be performed over the same memory row (x1000). The default setting is **900**.

Pass Gate Test Iterations

Use this feature to specify how many repetitions the Pass Gate test should be performed over the same memory row (refer to the item above). The default setting is **1**.

Pass Gate Test Swizzle (For Samsung Products)

Select Enabled to use the Pass Gate Test Swizzle mode to support Samsung products. Select Auto for the system to automatically switch to the Pass Gate Test Swizzle mode when a Samsung device is detected. The options are **Auto** and Enabled.

Pass Gate Pattern

Use the keyboard to enter the parameter value of the Pass Gate Pattern used for data input. The options are **0's** and 1's.

Pass Gate Target Pattern

Use the keyboard to enter the target parameter value for the Pass Gate Pattern used for data input. The options are 0's and **1's**.

Pass Gate Speed

Use this feature to set the Pass Gate speed. The options are Auto and **1x Only**.

Channel 0/Channel 1

Rank 0/Rank 1/Rank 2/Rank 3

Select Enabled to allow the Pass Gate test to be performed on a memory module specified by the user. The options are **Enabled** and Disabled.

Pass Gate MonteCarlo

Select Enabled to enable a algorithm search to find the maximum value of the Pass Gate test. The options are **Disabled** and Enabled.

Pass Gate Maximum Failures

Use this feature to specify the maximum number that Pass Gate failures will be counted for.

Pass Gate Maximum Repetition

Use this feature to specify the number that the Pass Gate tests will be repeated.

Fast Boot

Select Enabled to skip the routine memory procedure and attempt to boot the system using the last valid memory configuration settings at bootup. The options are **Disabled**, and Enabled.

Smm Size (MB)

Use the keyboard to enter a value for the size of the SMM/TSEG region where 1 MB is aligned to.

Force Memory Map Ax

Select Enabled to force the BIOS setup utility to specify the total number of Kb (or an error) of memory errors detected by the BIOS upon OS initialization. The options are **Enabled** and Auto.

Memory Frequency

This feature sets the memory frequency limits for the DIMM modules installed on the the motherboard. The options are **Auto,** DDR3-1333 (MHz), and DDR3-1600 (MHz).

Memory Channels

Use this feature to configure the settings for memory channels. The options are **Auto** and Single Channel.

MRC (Maximal Ratio Combining) Debug Messages

Use this feature to set the debug output display in MRC. The options are Disabled, Minimum, **Medium,** and Maximum.

DDR Voltage

Use this feature to set the DDR3 voltage setting. The default option is **100**.

Fine DDR Voltage

Use this feature to set the fine DDR3 voltage setting. The options are **Auto**, 1.25V, 1.35V, and 1.50V.

CKE Power Down

Select Enabled to enable CKE Power Down support which controls the low power mode for RAM in the active power standby mode. The options are **Enabled**, and Disabled.

ECC (Error Correctable Correction)

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

Faulty Part Tracking

Select Enabled to support faulty part tracking for the system to keep track of faulty memory parts. The options are **Disabled** and Enabled.

On Correctable Faulty Part

This feature displays the status of "On Correctable Faulty Part".

Patrol Scrub Enable

Patrol Scrubbing is a process that allows the CPU to correct correctable memory errors detected on a memory module and send the correction to the requestor (the original source). When this item is set to Enabled, North Bridge will read and write back one cache line every 16K cycles, if there is no delay caused by internal processing. By using this method, roughly 64 GB of memory behind North Bridge will be scrubbed every day. The options are Disabled and **Enabled**.

Patrol Scrub Period

Use this item to specify how often Patrol Scrubbing should be performed. Select 24 hours to allow Patrol Scrubbing to be performed every 24 hours. The options are **24 hours,** 10 hours, 4 hours, and 1 hour.

Demand Scrub Enable

Demand Scrubbing is a process that allows the CPU to correct correctable memory errors found on a memory module. When the CPU or I/O issues a demand-read command, and the read data from memory turns out to be a correctable error, the error will be corrected and sent to the requestor (the original source). Memory will be updated at the same time. Select Enabled to use Demand Scrubbing for ECC memory correction. The options are **Enabled** and Disabled.

AB Segments In DRAM

When this feature is set to Enabled, Target A- or B- segments will be routed to DRAM during memory read and write cycles. The options are Enabled and **Disabled**.

E Segment In DRAM

When this feature is set to Enabled, Target E segment will be routed to DRAM during memory read and write cycles. The options are **Enabled** and Disabled.

F Segment In DRAM

When this feature is set to Enabled, Target F segment will be routed to DRAM during memory read and write cycles. The options are **Enabled** and Disabled.

ZQ Calibration

When this feature is set to Enabled, commands to calibrate DRAM output drivers will be issued so that ZQ Calibration will be performed during a system boot or system reset. The options are **Enabled** and Disabled

Rank Margin Tool

Select Enabled to enable Rank Margin Tool support. The options are Enabled and **Disabled**.

CMD Rate (Command Rate)

Use this feature to set the CMD rate, which is the number of clock cycles needed for the memory to send data. The options are **Auto**, 1N, 2N and 3N.

Out-of-Order Memory Processing

Select Enabled to support Out-of-Order Memory Processing, which is a process used by a computer to retrieve instructions from its memory to improve CPU performance. The options are **Enabled** and Disabled.

Out-of-Order Aging Threshold

In a multi-core architecture, the DRAM system in a computer processes multiple threads or streams of requests from the In_Order (FIFO: First_In_First_Out) queue and the Out_of_Order queue in the interleaved/interconnect mode. This feature allows the user to specify the maximum number of requests to be processed for the same order before the system moves on and process the next thread of requests in the "Out_Of_Order" queue while in the "Out_of_Order" cycle. Once the "Out_of_Order" cycle expires, the system will move to the "In_Order" cycle and starts to process the requests in the "In-Order" queue. The default setting is **31**.

New Request Bypass

Select Enabled for the system to skip the process currently in progress and process a new request immediately. The options are **Enabled** and Disabled.

Dynamic Self Refresh

Select Enabled to support Dynamic Self-Refreshing for the onboard memory controller. The options are **Enabled** and Disabled.

PMOP Value for PCO

Use the keyboard to enter the Opcode value for the SPID Power Mode. The default setting is **4**.

PMOP Value for PCX

Use the keyboard to enter the PCX value for the SPID Power Mode. The default setting is **7**.

Per-Bit Margins

Select Enabled to set the "per-bit margins" used in the Maximal Ratio Combining (MRC) technique. The options are **Disabled** and Enabled.

Open Page Policy Timer

Use the feature to set the Page_Closure timer, which will specify how long a DRAM memory page should remain open. The options are Disabled, Immediate, **30-60 ns**, .60-120 ns, 120-240 ns, 240-480 ns, 480-960 ns, and 1-2 us.

Memory Thermal

Select Enabled to support Memory-Thermal-Management. The options are **Disabled** and Enabled.

Scrambler

Select Enabled to enable memory scrambler support for memory error correction. The settings are **Enabled** and Disabled.

Slow Power Down Exit

Select Enabled to use the slow-power-down mode when the system memory exits from the pre-charge state. The settings are **Enabled** and Disabled.

Verf Override Enable

Select Enabled to verify an override command before it is executed. The settings are **Disabled** and Enabled.

▶Timing Configuration

Use the following items to setup the timing for the system memory.

The default for all the items below is **Auto**.

tCL - the options are **Auto**, 5, through 13.

tRCD - the options are **Auto**, 5, through 13.

tRP - the options are **Auto**, 5, through 13.

tRAS - the options are **Auto**, 14 through 31.

tRTP - the options are **Auto**, 4 through 7.

tRRD - the options are **Auto**, 4 through 7.

tFAW - the options are **Auto**, 16 through 33.

tCCD - the options are **Auto**, 4, 12 and 18.

tWTP - the options are **Auto**, 15 through 30.

tWCL - the options are **Auto**, 5 through 9.

▶South Bridge

▶USB Configuration

This submenu displays the following sub-items:

- USB Module Version
- USB Devices

Legacy USB Support

This feature enables support for legacy USB devices. Select Auto to disable legacy support if USB devices are not present. Select Disable to have USB devices available only for EFI applications. The options are **Enabled,** Disabled and Auto.

XHCI Hand-Off

This item is a work-around solution for operating systems that do not support XHCI (Extensible Host Controller Interface) hand-off. The XHCI ownership change should be claimed by the XHCI driver. The options are **Enabled** and Disabled.

EHCI Hand-Off

This item is for the Operating Systems that do not support Enhanced Host Controller Interface (EHCI) hand-off. When this item is enabled, EHCI ownership change will be claimed by the EHCI driver. The settings are Enabled and **Disabled**.

USB Mass Storage Driver Support

Select Enabled for USB Mass Storage Driver support. The options are **Enabled** and Disabled.

Port 60/64 Emulation

This feature enables or disables I/O port 60h/64h emulation support. This feature should be enabled for complete USB keyboard legacy support for operating systems that cannot detect the presence of USB devices. The options are **Disabled** and Enabled.

USB Hardware Delays and Time-Outs

USB Transfer Time-Out

Use the keyboard to enter the time-out value for USB Control/Bulk/Interrupt transfers. The default setting is **20 seconds**.

Device Reset Time-Out

Use the keyboard to enter time-out value during a USB mass_storage_device reset. The options are **Auto** and Manual.

Device Power-Up Delay

Use the feature to set the maximum time a USB device will wait before reporting itself to the host controller. Select Auto to use the manufacturer's default setting. Select Manual to set the default setting manually. The default setting is **20 seconds**.

▶SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the SATA Devices and displays the following items:

SATA 3 Controller

This feature allows the user to configure the settings of SATA 3.0 devices

SATA 3 Controller

Select Enabled to enable the onboard SATA 3.0 controller. The options are **Enabled** and Disabled.

SATA Mode

This item sets SATA device mode. The options are IDE and **AHCI**.

LPM (Link Power Management)

Select Enabled to support Link Power Management to improve system power management. The options are Disabled, and **Enabled**.

ALPM (Aggressive Link Power Management)

Select Enabled to support Aggressive Link Power Management to enhance system power performance. The options are Disabled, and **Enabled**.

Overwrite SIR Values

Select Enabled to overwrite SIR values. The options are Enabled, and **Disabled**.

SATA Port 0/SATA Port 1

The submenu below allows the user to configure the following settings for SATA Port 0 or SATA Port 1.

Spin Up

On an edge detect from 0 to 1, use this feature to set a COMRESET initialization sequence for a device. The options are Enabled and **Disabled**.

Hot Plug

This feature designates this port for hot plugging. Set this item to Enabled for hot-plugging support, which will allow the user to replace a SATA drive without shutting down the system. The options are **Enabled** and Disabled.

External Device

Select Enabled for external SATA device support. The options are **Enabled** and Disabled.

Mechanical Switch

Select Enabled for mechanical switch support. The options are **Disabled** and Enabled.

▶PCIe/PCI/PnP Configuration

PCI Latency Timer

Use this feature to set the latency Timer of each PCI device installed on a PCI bus. Select 32 to set the PCI latency to 32 PCI clock cycles. 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.

VGA Palette Snoop

Select Enabled to support VGA palette register snooping which will allow the PCI cards that do not contain their own VGA color palettes to examine the video cards palette to mimic it for proper color display. The options are **Disabled** and Enabled.

PERR# Generation

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

SERR# Generation

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

System Error Logging

If this item is set to enabled, an error log will be created when a system error occurs. The options are Enabled and **Disabled**.

Maximum Payload

Select Auto to allow the system BIOS to automatically set the maximum payload value for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

Maximum Read Request

Select Auto to allow the system BIOS to automatically set the maximum Read Request size for a PCI-E device to enhance system performance. The options are **Auto**, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, and 4096 Bytes.

ASPM Support

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Force L0 to force all PCI-E links to operate at L0 state. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled**, Force L0, and Auto.

Warning: Enabling ASPM support may cause some PCI-E devices to fail!

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

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

Launch Storage OPROM Policy

This feature controls how the system executes UEFI (Unified Extensible Firmware Interface), and legacy storage OPROM. Select Legacy Only to boot the system

using a legacy storage device. The options are Do Not Use, UEFI Only **Legacy Only**, Legacy First, UEFI First.

PCIe Slot 1 OPROM

Select Enabled to enable Option ROM support to boot the computer using a network interface device install in the slot specified above. The options are **Enabled** and Disabled.

Launch Video OPROM Policy

This feature controls how the system executes UEFI (Unified Extensible Firmware Interface) and video device OPROM. Select Legacy Only to boot the system using a legacy device installed in a video port. The options are Do Not Use, UEFI Only **Legacy Only**, Legacy First, UEFI First.

VGA Priority

This feature allows the user to select the graphics adapter to be used as the primary boot device. The options are **Onboard**, and Offboard.

Launch Network OPROM Policy

This feature controls how the system executes UEFI (Unified Extensible Firmware Interface) and LAN device OPROM. Select Legacy Only to boot the system using a legacy device installed in a LAN port. The options are Do Not Use, UEFI Only **Legacy Only**, Legacy First, UEFI First.

Onboard LAN Option ROM Select

Select iSCSI to use the iSCSI Option ROM to boot the computer using a network device. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer using a network device. The options are iSCSI and **PXE**.

Load Onboard LAN1 OPROM / Load Onboard LAN2 OPROM

Select Enabled to enable the onboard LAN1 Option ROM~LAN4 Option ROM. This is to boot the computer using a network device. The default setting for LAN1 Option ROM is **Enabled**, and the default settings for LAN2 Option ROM/LAN3 Option ROM/LAN4 Option ROM are **Disabled**.

▶ACPI Settings

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 Instruc-

tion 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 vision) operating system. The options are **Enabled** and Disabled.

▶Super IO Configuration

AST2400 Super IO Chip

▶Serial Port 0 Configuration /Serial Port 1 Configuration

This submenu allows the user the configure settings of Serial Port 1 or Serial Port 2.

Serial Port

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

Device Settings

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

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

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

Device Mode

Use this feature to set the optimal setting for a super I/O device. The options are **24MHz/13** and 24MHz.

Serial Port 2 Attribute (Available for Serial Port 1 only)

This feature specifies the attribute of Serial Port 1. The options are **SOL** and COM.

▶Serial Port Console Redirection

COM1 Console Redirection, COM2/SOL Console Redirection

Console Redirection

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

▶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.

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

Bits Per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

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

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**.

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.

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.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

The submenu allows the user to configure Console Redirection settings to support Out-of-Band Serial Port management.

Console Redirection (for EMS)

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

▶Console Redirection Settings (for EMS)

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 used by the Microsoft Windows Emergency Management Services (EMS) to communicate with a remote server. The options are **COM1 Console Redirection** and COM2/SOL Console Redirection.

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

Bits Per Second

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

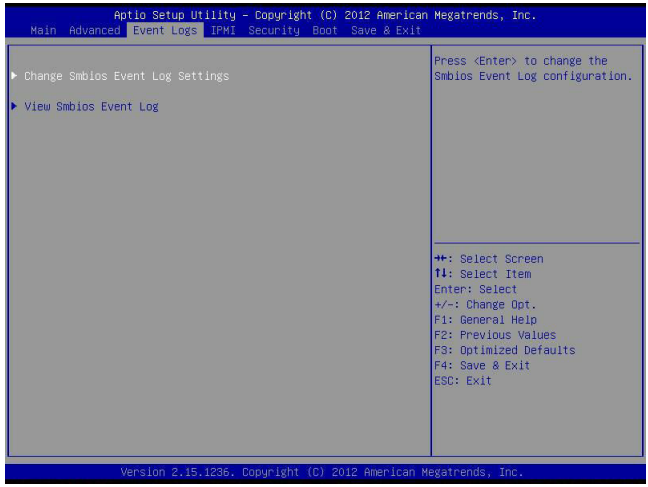
Flow Control

This feature allows the user 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

The status of each item above is displayed.

4-4 Event Logs



▶Change SMBIOS Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Change this item 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 occurences that a duplicate event must happen before the MECI counter is incremented. This is a numeric value. The default value is **1**.

METW

The Multiple Event Time Window (METW) defines 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**.

Customer Options

Log OEM Codes

Select Enabled to log the status of OEM EFI codes. The options are **Enabled** and Disabled.

Convert OEM Codes

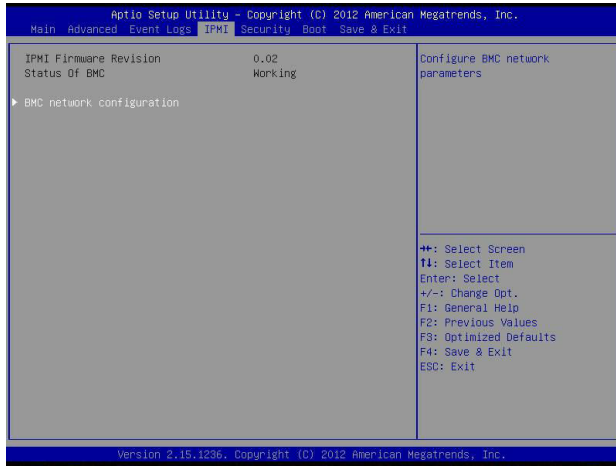
Select Enabled to convert the OEM Status codes to the standard SMBIOS codes. The options are Enabled and **Disabled**.

▶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.



IPMI Firmware Revision

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

Status BMC (Baseboard Management Cont

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

▶BMC Network Configuration

BMC Network Congifuration

LAN Channel 1: This feature allows the user to configure the setting for LAN Port 1.

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. The following items are assigned IP addresses automatically if DHCP is selected.

Station IP Address

This item 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 item 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 item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

Router IP Address

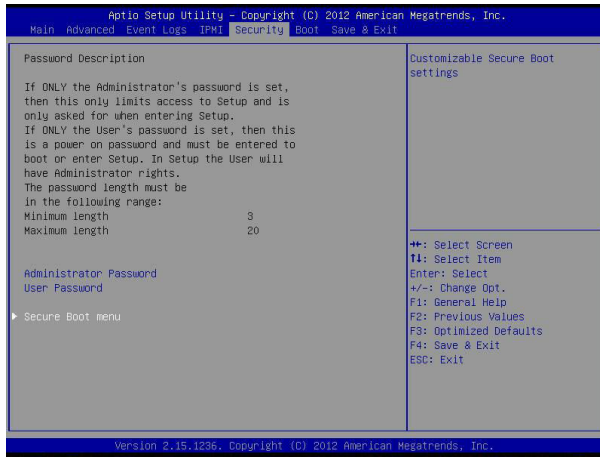
This item displays the Router IP address for this computer. This should be in decimal and in dotted quad form (i.e., 192.168.10.253).

Router MAC Address

This item displays the Router MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

4-6 Security Settings

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



- If the Administrator password is defined ONLY - this controls access to the BIOS setup ONLY.
- If the User's password is defined ONLY - this password will need to be entered upon each system boot, and will also have Administrator rights in the setup.
- Passwords must be at least 3 and up to 20 characters long.

Administrator Password

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

User Password

Use this feature to set a User Password which is required to log into the system and to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

▶Secure Boot Menu

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

- System Mode
- Secure Boot

Secure Boot Mode

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

▶Key Management

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

Factory Default Key Provision

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.

Delete PK (Platform Keys)

This feature allows the user to configure the settings for platform keys deletion.

▶Set New PK (Platform Keys)

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

Key Exchange Key DataBase (KEK)

▶Save Key Exchange Key DataBase (KEK)

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 Exchange Key (KEK)

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 Signature Database (DB)

▶Set New DB

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 DB

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.

Forbiden Signature Database (DBX)

▶Set New DBX

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 DBX

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.

▶Image Execution Policy

This submenu allows the user to configure the following settings for the Image Execution Policy.

Internal FV

This feature allows the user to set the Image Execution policy for each device path when a security violation occurs. The default setting is **Always Execute**.

Option ROM

This feature allows the user to set the Option ROM Execution policy for each device path when a security violation occurs. The default setting is **Deny Execute**.

Removable Media

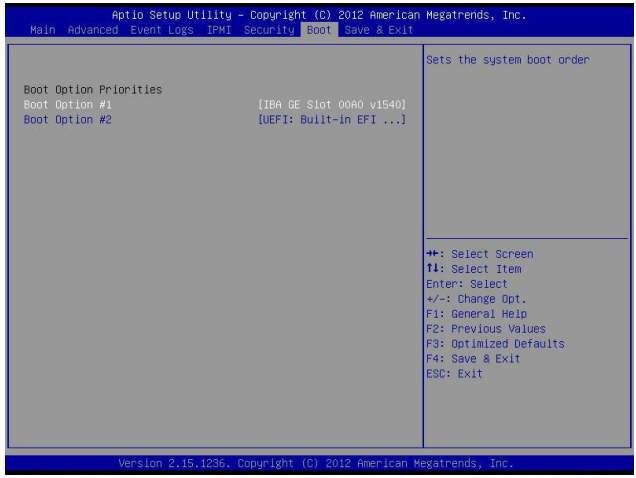
This feature allows the user to set the Removable Media Execution policy for each device path when a security violation occurs. The default setting is **Deny Execute**.

Fixed Media

This feature allows the user to set the Fixed Media Execution policy for each device path when a security violation occurs. The default setting is **Deny Execute**.

4-7 Boot Settings

Use this feature to configure Boot Settings:



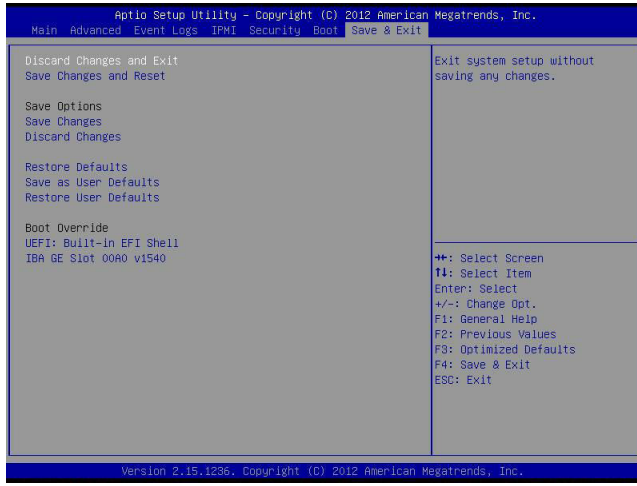
Boot Option Priorities

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.

- Boot Option #1
- Boot Option #2

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 Options

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.

Restore Defaults

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

Save As User Defaults

To set this feature, select Save as User Defaults from the 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.

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 beeps	Display memory read/write error	Video adapter missing or with faulty memory
OH LED On	System OH	System Overheat

Notes

Appendix B

Software Installation Instructions

B-1 Installing Drivers

After you've installed the Windows Operating System, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these software programs and drivers, click the icons to the right of these items. (**Note**: To install the Windows Operating System, please refer to the instructions posted on our website at http://www.supermicro.com/support/manuals/.)

Driver/Tool Installation Display Screen

Note 1. Click the icons showing a hand writing on the paper to view the readme files for each item. Click on a computer icon to the right of an item to install this item (from top to the bottom), one at a time. After installing each item, you must reboot the system before proceeding with the next item on the list. The bottom icon with a CD on it allows you to view the entire contents of the CD.

Note 2. When making a storage driver diskette by booting into a Driver CD, please set the SATA Configuration to "Compatible Mode" and configure SATA as IDE in the BIOS Setup. After making the driver diskette, be sure to change the SATA settings back to your original settings.

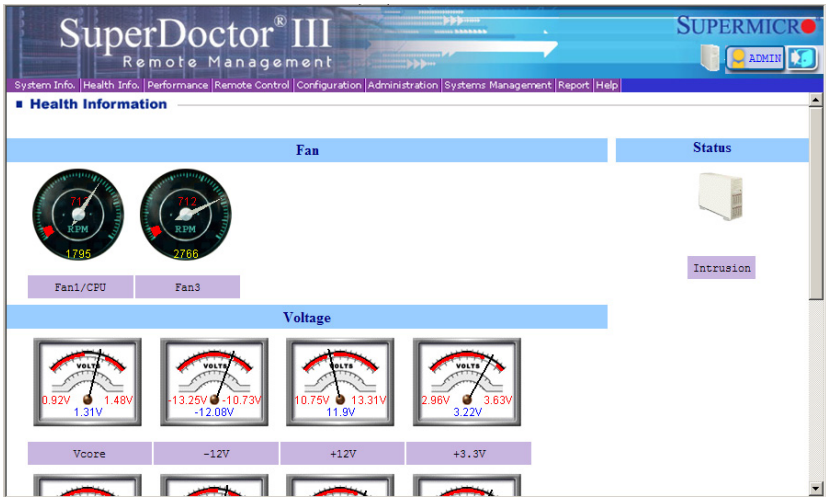
B-2 Configuring SuperDoctor® III

The SuperDoctor III program is a Web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management tool is called the SD III Client. The SuperDoctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. SuperDoctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the SuperDoctor III interface.

Note: 1 The default user name and password are ADMIN.

Note 2: In the Windows OS environment, the SuperDoctor III settings take precedence over the BIOS settings. When first installed, SuperDoctor III adopts the temperature threshold settings previously set in BIOS. Any subsequent changes to these thresholds must be made within SuperDoctor, since the settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SD III Client settings to be the same as those set in BIOS.

SuperDoctor III Interface Display Screen-I (Health Information)



SuperDoctor III Interface Display Screen-II (Remote Control)

Note: The SuperDoctor III software and manual may be downloaded from our Website at:

http://www.supermicro.com/products/accessories/software/SuperDoctorIII.cfm.

For Linux, we still recommend that you use SuperDoctor II, this version is also available for download at the link above.

Notes

Appendix C

UEFI BIOS Recovery Instructions

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

An Overview to the UEFI BIOS

The Unified Extensible Firmware Interface (UEFI) specification 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 add-on card initialization to allow the UEFI OS loader, which is stored in the add-on card, to boot up the system. UEFI offers a clean, hand-off control to a computer system at bootup.

How to Recover the UEFI BIOS Image (-the Main BIOS Block)

An AMIBIOS flash chip consists of a boot sector block and a main BIOS code block (a main BIOS image). The boot sector block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a new BIOS image if the original BIOS image is corrupted. When the system power is on, the boot sector codes execute first. Once it is completed, the main BIOS code will continue with system initialization and bootup.

Note: Follow the BIOS Recovery instructions below for BIOS recovery when the main BIOS block crashes. However, when the BIOS Boot sector crashes, you will need to send the motherboard back to Supermicro for RMA repair.

To Recover the Main BIOS Block Using a USB-Attached Device

This feature allows the user to recover a BIOS image using a USB-attached device without additional utilities used. A USB flash device such as a USB Flash Drive, or

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

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

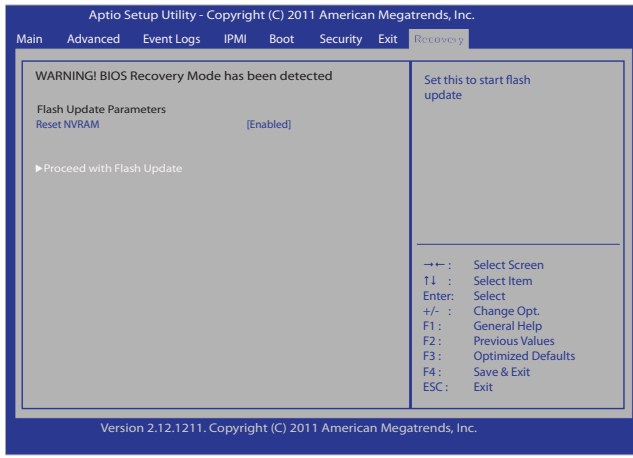
1. Using a different machine, copy the "Super.ROM" binary image file into the disc Root "\" Directory of a USB device or a writeable CD/DVD.

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

2. Insert the USB device that contains the new BIOS image ("Super.Rom") into your USB drive and power on the system

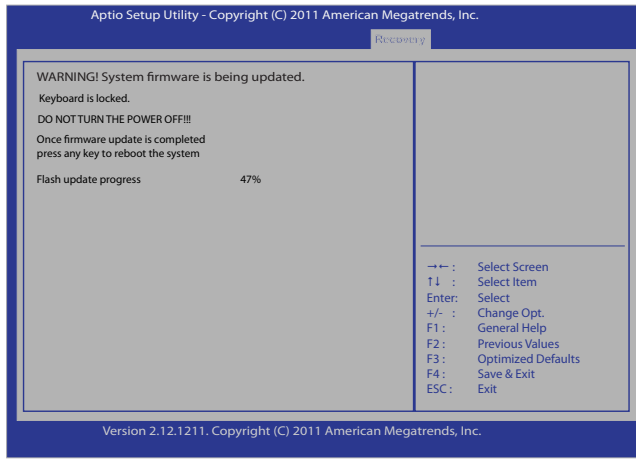
3. While powering on the system, keep pressing <Ctrl> and <Home> simultaneously on your PS2 or USB keyboard until your hear two short beeps. This may take from a few seconds to one minute.

4. After locating the new BIOS binary image, the system will enter the BIOS Recovery page as shown below.

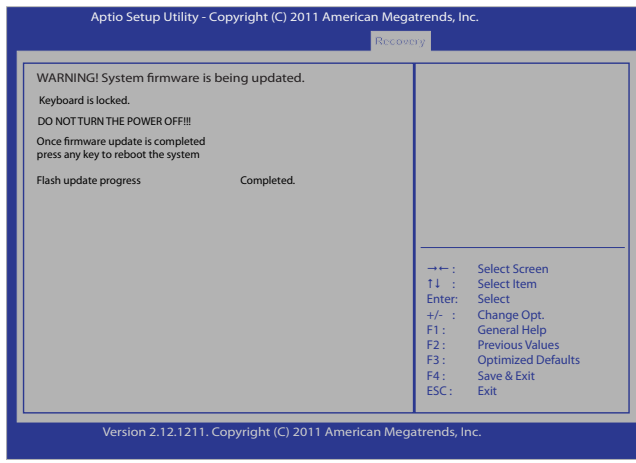


Note: At this point, you may decide if you want to start with BIOS Recovery. If you decide to proceed with BIOS Recovery, follow the procedures below.

5. When the screen as shown above displays, using the arrow key, select the item- "Proceed with flash update" and press the <Enter> key. You will see the progress of BIOS Recovery as shown in the screen below.



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



6. After the process of BIOS Recovery is complete, press any key to reboot the system.

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

8. When a DOS prompt appears, type AMI.BAT BIOSname.### at the prompt.

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

9. After seeing the message that BIOS update is completed, unplug the AC power cable to clear CMOS, and then plug in the AC power cable to power on the system.

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

11. Press <F3> to load default settings.

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

(Disclaimer Continued)

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