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FCC Statement: This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the authorized dealer or an experienced radio/TV technician for help.

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

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 1.0a
Release Date: July 24, 2013

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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 C7Z87 motherboard.

About This Motherboard

The SUPER C7Z87 supports a single 4th Generation Intel® Core™ i7/i5/i3 DT processor in an LGA 1150 (H3) socket. With the Intel® Z87 Express chipset built in, the C7Z87 motherboard offers substantial enhancement in system performance and storage capability for high performance system platforms in a sleek package. 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 Z87 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.

Appendix D lists information on how to recover BIOS using Dual Boot Block scheme.
Conventions Used in the Manual:

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

**Warning:** 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.
Contacting Supermicro

Headquarters
Address: Super Micro Computer, Inc.
980 Rock Ave.
San Jose, CA 95131 U.S.A.
Tel: +1 (408) 503-8000
Fax: +1 (408) 503-8008
Email: marketing@supermicro.com (General Information)
support@supermicro.com (Technical Support)
Web Site: www.supermicro.com

Europe
Address: Super Micro Computer B.V.
Het Sterrenbeeld 28, 5215 ML
's-Hertogenbosch, The Netherlands
Tel: +31 (0) 73-6400390
Fax: +31 (0) 73-6416525
Email: sales@supermicro.nl (General Information)
support@supermicro.nl (Technical Support)
rma@supermicro.nl (Customer Support)

Asia-Pacific
Address: Super Micro Computer, Inc.
3F, No. 150, Jian 1st Rd.
Zhonghe Dist., New Taipei City 23511
Taiwan (R.O.C)
Tel: +886-(2) 8226-3990
Fax: +886-(2) 8226-3992
Web Site: www.supermicro.com.tw
Technical Support:
Email: support@supermicro.com.tw
Tel: +886-(2)-8226-3990
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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 Motherboard
- Six (6) SATA cables (Gift Box)
- One (1) I/O shield
- One (1) Driver CD (Gift Box)
- One (1) Quick Reference Guide

Note: 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.

SMCI product manuals: http://www.supermicro.com/support/manuals/
If you have any questions, please contact our support team at support@supermicro.com.
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.
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.
### C7Z87 Jumpers

<table>
<thead>
<tr>
<th>Jumper</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>JBR1</td>
<td>BIOS Recovery</td>
<td>Pins 1-2 (Normal)</td>
</tr>
<tr>
<td>JBT1</td>
<td>CMOS Clear</td>
<td>(See Chpt. 2)</td>
</tr>
<tr>
<td>JI(^2)/JI(^2)C2</td>
<td>SMB to PCI Slots</td>
<td>Off (Disabled)</td>
</tr>
<tr>
<td>JPAC1</td>
<td>Audio Enable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JP11</td>
<td>1394_1/1394_2 Enable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JPL1/JPL2</td>
<td>LAN1/LAN2 Enable</td>
<td>Pins 1-2 (Enabled)</td>
</tr>
<tr>
<td>JPME2</td>
<td>Management Engine (ME) Manufacture Mode Select</td>
<td>Pins 1-2 (Normal)</td>
</tr>
<tr>
<td>JWD1</td>
<td>Watch Dog Enable</td>
<td>Pins 2-3 (NMI)</td>
</tr>
</tbody>
</table>
# Chapter 1: Introduction

## C7Z87 Headers/Connectors

<table>
<thead>
<tr>
<th>Connector</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1394_1/2</td>
<td>1394 Connectors 1/2</td>
</tr>
<tr>
<td>Audio FP</td>
<td>Front Panel Audio Header</td>
</tr>
<tr>
<td>HD AUDIO</td>
<td>High-Definition Audio Connectors (on the I/O back panel)</td>
</tr>
<tr>
<td>Battery</td>
<td>Onboard Battery</td>
</tr>
<tr>
<td>COM1/COM2</td>
<td>COM1/COM2 Port Headers</td>
</tr>
<tr>
<td>Fan1~Fan5</td>
<td>System/CPU Fan Headers (Fan1: CPU Fan)</td>
</tr>
<tr>
<td>HDMI/DP</td>
<td>Backplane HDMI(High-Definition Multimedia Interface) Connector and Display Port (DP)</td>
</tr>
<tr>
<td>JD1</td>
<td>Speaker/buzzer (Pins 1-2: Buzzer, Pins 1~4: External Speaker)</td>
</tr>
<tr>
<td>JL1</td>
<td>Chassis Intrusion Header</td>
</tr>
<tr>
<td>JLED1</td>
<td>Power LED Indicator Header</td>
</tr>
<tr>
<td>JPW1</td>
<td>24-pin ATX Main Power Connector (Required)</td>
</tr>
<tr>
<td>JPW2</td>
<td>+12V 8-pin CPU power Connector (Required)</td>
</tr>
<tr>
<td>JSD1</td>
<td>SATA DOM (Device_On_Module) Power Connector</td>
</tr>
<tr>
<td>JSPDIF_OUT</td>
<td>Sony/Philips Digital Interface (SPDIF)_Out Header</td>
</tr>
<tr>
<td>JSTBY1</td>
<td>Standby Power Header</td>
</tr>
<tr>
<td>JTPM1</td>
<td>Trusted Platform Module/Port 80 Connector</td>
</tr>
<tr>
<td>JVR1/JVR2</td>
<td>PWM SMB programming headers 1/2(for debugging only)</td>
</tr>
<tr>
<td>JWOR1</td>
<td>Wake_On-Ring Header</td>
</tr>
<tr>
<td>KB/Mouse</td>
<td>Keyboard/Mouse Connectors</td>
</tr>
<tr>
<td>LAN1/LAN2</td>
<td>Gigabit (RJ45) Ports (LAN1/2)</td>
</tr>
<tr>
<td>SP1</td>
<td>Internal Speaker/Buzzer</td>
</tr>
<tr>
<td>A-SATA0/A-SATA1</td>
<td>(ASMedia) Serial ATA (SATA 3.0) Ports 0/1 (6Gb/sec)</td>
</tr>
<tr>
<td>I-SATA0/I-SATA1</td>
<td>(Intel Z87) Serial ATA (SATA 3.0) Ports 0/1 (6Gb/sec)</td>
</tr>
<tr>
<td>I-SATA 2~I-SATA5</td>
<td>(Intel Z87) Serial ATA (SATA 3.0) Ports 2~5 (6Gb/sec)</td>
</tr>
<tr>
<td>Slot 3/Slot 5/Slot 7</td>
<td>PCI-Express 2.0 x1 Slots</td>
</tr>
<tr>
<td>Slot 6</td>
<td>PCI-Express 3.0 x16 Slot</td>
</tr>
</tbody>
</table>

**Note:** If Slot 4 is populated, Slot 6 will work either in x16 or in x8 only.

| Slot 4    | PCI-Express 3.0 x8 in x16 Slot |

**Note:** If Slot 6 is populated, Slot 4 will not work or only works in x8 only.

| Slot 1, Slot 2 | PCI 33MHz Slot (5V) |
| T-SGPIO 1/2    | Serial_Link General Purpose I/O Connection Headers 1/2 |
| USB 0/1, 2/3   | Backpanel USB 2.0 Ports 0/1, 2/3 |
Notes:
1. CPU Overclocking is supported by this motherboard; however, SMCI does not recommend CPU Overclocking and cannot resume any responsibility or liability of out_of_spec overclocking.
2. CATERR_LED is for internal testing only.

<table>
<thead>
<tr>
<th>Port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
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<td>USB 10/11</td>
<td>Backpanel USB 3.0 Ports 10/11</td>
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<tr>
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<td>Front Panel Accessible USB 2.0 Headers 4/5, 6/7, 8/9</td>
</tr>
<tr>
<td>USB 3.0 12/13, 14/15</td>
<td>Front Panel Accessible USB 3.0 Headers 12/13, 14/15</td>
</tr>
<tr>
<td>VGA/DVI</td>
<td>Backpanel VGA and DVI (Digital Video Interface) Connections</td>
</tr>
</tbody>
</table>

### C7Z87 LED Indicators

<table>
<thead>
<tr>
<th>LED</th>
<th>Description</th>
<th>Color/State</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED1</td>
<td>Onboard Standby PWR LED</td>
<td>Green: Solid on</td>
<td>Power On</td>
</tr>
</tbody>
</table>
# Motherboard Features

<table>
<thead>
<tr>
<th><strong>CPU</strong></th>
<th>Single 4th Generation Intel® Core™ i7/i5/i3 DT processor in an LGA1150 socket.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Note:</strong></td>
<td>This motherboard also supports an Intel® Xeon E3-1200 V3 processor. E3-1200 processor support is an added benefit provided by SMC. It is out of specs and out of warranty; user’s discretion is required.</td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>Four (4) SDRAM slots support up to 32 GB of DDR3 Unbuffered, ECC/Non-ECC 1066MHz/1333MHz/1600MHz/2133 MHz(*OC)/2200MHz(*OC)/2400MHz(*OC)/2600MHz(*OC) /2800MHz(*OC)/3000MHz(*OC) memory</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>*OC=Overclocking (not under warranty)</td>
</tr>
<tr>
<td><strong>DIMM sizes</strong></td>
<td>Single-channel memory</td>
</tr>
<tr>
<td><strong>UDIMM</strong></td>
<td>1 GB, 2 GB, 4GB, and 8GB</td>
</tr>
<tr>
<td><strong>Chipset</strong></td>
<td>Intel® Z87 Express</td>
</tr>
<tr>
<td><strong>Expansion Slots</strong></td>
<td>Three (3) PCI Express 2.0 x1 slots (Slot 3/Slot 5/Slot 7)</td>
</tr>
<tr>
<td></td>
<td>One (1) PCI Express 3.0 x8 in x16 slot (Slot 4)</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>If Slot 6 is populated, Slot 4 will not work or only works in x8 only.</td>
</tr>
<tr>
<td></td>
<td>One (1) PCI Express 3.0 x16 slot (Slot 6)</td>
</tr>
<tr>
<td><strong>Note:</strong></td>
<td>If Slot 4 is populated, Slot 6 will work either in x16 or in x8 only.</td>
</tr>
<tr>
<td></td>
<td>Two (2) PCI 33 MHz slots (5 Volts) (Slot 1, Slot 2)</td>
</tr>
<tr>
<td><strong>Network Connections</strong></td>
<td>Two (2) Gigabit Ethernet Controllers: LAN1: Intel i217 gigabit LAN controller, LAN2: Intel i210 gigabit LAN controller</td>
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<tr>
<td></td>
<td>SATA 3.0 (6Gb/s)</td>
</tr>
<tr>
<td></td>
<td>RAID 0, 1, 5, 10</td>
</tr>
<tr>
<td><strong>USB Devices</strong></td>
<td>Four (4) USB 2.0 ports on the rear I/O panel (USB 0/1, 2/3), Two (2) USB 3.0 ports on the rear I/O panel (USB 10/11)</td>
</tr>
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</table>
Six (6) Front Accessible USB 2.0 ports on three headers (USB 4/5, 6/7, 8/9),
Four (2) Front Accessible USB 3.0 ports on two headers (USB 12/13, 14/15)

**Keyboard/Mouse**

One shared PS/2 Keyboard/Mouse port on the I/O backpanel

**Serial (COM) Ports**

Two (2) Serial Port Headers (COM1/COM2)

**Video**

One (1) High Definition Multimedia Interface (HDMI) on the back panel,
One (1) Display Port (DP) on the back panel
One (1) Front Panel Audio Header

**Audio**

One (1) High Definition Audio 7.1 channel connector supported by Realtek ALC1150 on the back panel
One (1) SPDIF_Out on the rear side of the chassis

**Super I/O**

Nuvoton NCT6776D

**BIOS**

128 Mb AMI BIOS® SPI Flash BIOS
Play and Plug (PnP0, DMI 2.3, PCI 2.3, ACPI 1.0/2.0/3.0, USB Keyboard and SMBIOS 2.5

**Power Configuration**

ACPI/ACPM Power Management
Main Switch Override Mechanism
Keyboard Wake-up from Soft-Off
Internal/External Modem Ring-On
Power-on mode for AC power recovery

**PC Health Monitoring**

**CPU Monitoring**

Onboard voltage monitors for CPU core, +3.3V, +5V,-12V, +12V, +3.3V Stdby, +5V Stdby, VBAT, Memory, VCORE for CPU

CPU 6-phase switching voltage regulator
CPU/System overheat LED and control
CPU Thermal Trip support
Thermal Monitor 2 (TM2) support

**Fan Control**

Fan status monitoring via BIOS Health Monitoring
Low noise fan speed control
<table>
<thead>
<tr>
<th><strong>System Management</strong></th>
<th>PECI (Platform Environment Configuration Interface) 2.0 support</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>System resource alert via SuperDoctor® III</td>
</tr>
<tr>
<td></td>
<td>SuperDoctor® III, Watch Dog</td>
</tr>
<tr>
<td></td>
<td>Chassis Intrusion header and detection</td>
</tr>
<tr>
<td><strong>CD Utilities (Gift Box)</strong></td>
<td>BIOS flash upgrade utility</td>
</tr>
<tr>
<td></td>
<td>Drivers and software for Intel® Z87 Express chipset utilities</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>ROHS 6/6 (Full Compliance, Lead Free)</td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>ATX form factor (12.0&quot; x 9.6&quot;) (304.8 mm x 243.84 mm)</td>
</tr>
</tbody>
</table>
**C7Z87 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.
1-2 Chipset Overview

The C7Z87 supports a single 4th Generation Intel® Core i7/i5/i3 DT processor in the LGA 1150 Socket. Built upon the functionality and the capability of the Z87 Express chipset, the motherboard provides substantial enhancement to system performance and storage capability for high performance platforms in a sleek package.

The high-speed Direct Media Interface (DMI) featured in the Intel Z87 Express chipset supports high-speed Direct Media Interface (DMI) for chip-to-chip true isochronous communication, providing up to 10 Gb/s of software-transparent data transfer rate on each read/write direction. In addition, the C7Z87 also features a TCO timer which allows the system to recover from a software/hardware lock and perform tasks, including Function Disable and Intruder Detect.

Intel Z87 Express Chipset Features

- Direct Media Interface (up 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 2.0/3.0 Interface (up to 5.0 GT/s)
- SATA 3.0 Controller (up to 6Gb/sec)
- Advanced Host Controller Interface (AHCI)
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 Vcore, 12V, -12V, 5V, 5VSB, 3.3V, 3.3VSB, and Battery voltages. 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 system firmware.

**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 SuperDoctor® III in the Windows OS environment or used with SuperDoctor® II in Linux. SuperDoctor
is used to notify the user of certain system events. For example, you can also configure SuperDoctor 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 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.

1-6 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 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.

Warning: 1. 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. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.
2. To provide adequate power to SATA devices, please connect the SATA DOM PWR connector (JSD1) to the power supply.

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 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.
Chapter 2

Installation

2-1 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

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

警告

電池更換不當会有爆炸危险。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處理廢棄舊電池。

Warnung

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.

警告！

如果電池的更換方式錯誤，存在爆炸的風險。請僅使用製造商建議的相同型號或等效電池來更換電池。請將用過的電池按照製造商的指示處理。

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 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る。

警告
本产品的废弃处理应根据所有国家的法律和规章进行。

警告
本產品的廢棄處理應根據所有國家的法律和規章進行。

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

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

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

סילוק המוצר
אנדרטיה!
סילוק סופי של מוצר זה תיבב להתייחס להנדסת בטיחות וורכסי המרינה.
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.
2-3 Processor and Heatsink Installation

Warning: 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 board into the chassis before you install the CPU heatsink.

- When receiving a server board 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 LGA1150 Processor

1. Gently press down the load plate handle and push it outward (to the right side) to unlock it.

2. Once the load plate handle is unlocked, gently lift the handle to open the load plate.
3. Once the load plate is open, 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 keys, which are the semicircular cutouts on the sides of the CPU (shown below), against the socket keys, the semicircular notches on the sides of the CPU socket. Align CPU Pin 1, the triangle at the bottom left of the CPU, against Pin 1 of the socket, the triangle marker at the bottom left of the CPU socket.

5. Once they are aligned, carefully lower the CPU straight down into the socket. (To avoid damaging the CPU or the socket, do not drop the CPU on the socket. Do not rub the CPU against the surface or against any pins of the socket.)

6. With the CPU seated inside the socket, inspect the four corners of the CPU to ensure that it is properly installed.
7. Once the CPU is properly installed, use your thumb to gently push the load plate handle down to the handle lock and lock it.

8. When the CPU is securely locked into the CPU socket, the plastic cap will be automatically loosened from the load plate. Use your thumb and index finger to remove the plastic cap from the socket.

**Warning:** You can 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 that may damage your CPU. Instead, open the load plate again and check whether the CPU is properly aligned and securely seated inside the socket.
Installing a Passive CPU Heatsink

1. Do not apply thermal grease to the heatsink or the CPU die; the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the motherboard and the underlying heatsink bracket.

3. Screw in two diagonal screws (the #1 and #2 screws in the figure below) until just snug. To avoid possible damage to the CPU, do not over tighten the screws.

4. Finish the installation by fully tightening all four screws.

Recommended Supermicro heatsink: SNK-P0046P heatsink with BKT-0028L bottom bracket
Removing the Heatsink

*Warning:* We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to remove the heatsink to avoid damaging the CPU or the CPU socket.

1. Unscrew the heatsink screws from the motherboard in the sequence as shown in the figure below.

2. *Gently* wriggle the heatsink to loosen it from the CPU. (Do not use excessive force)

3. Once the CPU is loosened, remove the CPU from the CPU socket.

4. Clean the surface of the CPU and the heatsink, removing any thermal grease. Reapply the proper amount of fresh thermal grease on the surface before reinstalling the CPU and the heatsink.
2-4 Installing DDR3 Memory

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

---

**CAUTION**

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 DIMMA1 (Channel A, Slot 1, see the next page for the location). 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. Align the notches on both ends of the module against the receptive points on the ends of the slot.

5. 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.

6. 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 C7Z87 supports up to 32GB of Unbuffered (UDIMM) DDR3 Non-ECC 1066MHz/1333MHz/1600MHz/2133MHz(*OC)/2200MHz(*OC)/2400MHz(*OC)/2600MHz(*OC)/2800MHz(*OC)/3000MHz(*OC) in 4 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. Please refer to the table below.

Note: *OC=Overclocking (not under warranty)

Memory Population Guidelines

Please follow the table below when populating the C7Z87.

<table>
<thead>
<tr>
<th>DDR3 Unbuffered Non-ECC (UDIMM) Memory</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIMM Slots per Channel</td>
</tr>
<tr>
<td>-------------------------</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>2</td>
</tr>
</tbody>
</table>

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. See the following table for details.

<table>
<thead>
<tr>
<th>System Device</th>
<th>Size</th>
<th>Physical Memory Remaining (-Available) (4 GB Total System Memory)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firmware Hub flash memory (System BIOS)</td>
<td>1 MB</td>
<td>3.99</td>
</tr>
<tr>
<td>Local APIC</td>
<td>4 KB</td>
<td>3.99</td>
</tr>
<tr>
<td>Area Reserved for the chipset</td>
<td>2 MB</td>
<td>3.99</td>
</tr>
<tr>
<td>I/O APIC (4 Kbytes)</td>
<td>4 KB</td>
<td>3.99</td>
</tr>
<tr>
<td>PCI Enumeration Area 1</td>
<td>256 MB</td>
<td>3.76</td>
</tr>
<tr>
<td>PCI Express (256 MB)</td>
<td>256 MB</td>
<td>3.51</td>
</tr>
<tr>
<td>PCI Enumeration Area 2 (if needed) - Aligned on 256-MB boundary-</td>
<td>512 MB</td>
<td>3.01</td>
</tr>
<tr>
<td>VGA Memory</td>
<td>16 MB</td>
<td>2.85</td>
</tr>
<tr>
<td>TSEG</td>
<td>1 MB</td>
<td>2.84</td>
</tr>
<tr>
<td>Memory available to OS and other applications</td>
<td></td>
<td>2.84</td>
</tr>
</tbody>
</table>
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 (1)
- Philips Screws (9)
- Standoffs (9) Only if Needed

**Location of Mounting Holes**

**Caution:**
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. (See 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 5 to insert #6 screws into all mounting holes.

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

Note: Images displayed are is 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 PC 99 specification. See the figure below for the colors and locations of the various I/O ports.

Backplane I/O Panel

<table>
<thead>
<tr>
<th>Port</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>USB 2.0 Port 0</td>
</tr>
<tr>
<td>B</td>
<td>USB 2.0 Port 1</td>
</tr>
<tr>
<td>C</td>
<td>Keyboard/Mouse</td>
</tr>
<tr>
<td>D</td>
<td>DVI Port</td>
</tr>
<tr>
<td>E</td>
<td>HDMI</td>
</tr>
<tr>
<td>F</td>
<td>DP Port</td>
</tr>
<tr>
<td>G</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>USB 3.0 Port 10</td>
</tr>
<tr>
<td>I</td>
<td>USB 3.0 Port 11</td>
</tr>
<tr>
<td>J</td>
<td>Gb LAN Port 1</td>
</tr>
<tr>
<td>K</td>
<td>USB 2.0 Port 2</td>
</tr>
<tr>
<td>L</td>
<td>USB 2.0 Port 3</td>
</tr>
<tr>
<td>M</td>
<td>Gb LAN Port 2</td>
</tr>
<tr>
<td>N</td>
<td>SPDIF Out</td>
</tr>
<tr>
<td>O</td>
<td>Surround Out</td>
</tr>
<tr>
<td>P</td>
<td>Center/LFE Out</td>
</tr>
<tr>
<td>Q</td>
<td>Mic In</td>
</tr>
<tr>
<td>R</td>
<td>Line Out</td>
</tr>
<tr>
<td>S</td>
<td>Line In</td>
</tr>
</tbody>
</table>

HD Audio
ATX PS/2 Keyboard/Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located above Back Panel USB Ports 8/9 on the motherboard. See the table at right for pin definitions.

<table>
<thead>
<tr>
<th>PS/2 Keyboard/Mouse Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS2 Keyboard</td>
</tr>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
</tbody>
</table>

VCC: with 1.5A PTC (current limit)

Note:

This motherboard offers three Keyboard/Mouse connection options as shown in the graphic below.

- **A.** Plug in a PS/2 keyboard or PS/2 Mouse cable to the PS2 Keyboard/Mouse port.
- **B.** Plug in a Y cable that includes a keyboard cable and mouse cable to the PS2 Keyboard/Mouse port.
- **C.** Connect a USB keyboard cable or a USB mouse cable to any USB port.

**Keyboard/Mouse**

(For a PS/2 keyboard cable, a PS/2 Mouse cable or a PS/2 Y cable) (optional)

(For a USB keyboard cable or a USB mouse cable, in any USB port) (optional)
Universal Serial Bus (USB)

Four Universal Serial Bus 2.0 ports (0/1, 2/3) and two USB 3.0 ports (10/11) are located on the I/O back panel. In addition, three USB 2.0 headers (six USB 2.0 connections: 4/5, 6/7, 8/9), and two USB 3.0 headers (four USB 3.0 connections: 12/13, 14/15) are also located on the motherboard to provide front chassis access using USB cables (not included). See the tables below for pin definitions.

### Front Panel USB (2.0) #4/5, 6/7, 8/9 Pin Definitions

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
<td>2</td>
<td>+5V</td>
</tr>
<tr>
<td>3</td>
<td>USB_PP2</td>
<td>4</td>
<td>USB_PP3</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
<td>6</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>Key</td>
<td>8</td>
<td>Ground</td>
</tr>
</tbody>
</table>

### Back Panel USB (2.0) #0/1, 2/3 Pin Definitions

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
<td>5</td>
<td>+5V</td>
</tr>
<tr>
<td>2</td>
<td>USB_PN1</td>
<td>6</td>
<td>USB_PN0</td>
</tr>
<tr>
<td>3</td>
<td>USB_PP1</td>
<td>7</td>
<td>USB_PP0</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
<td>8</td>
<td>Ground</td>
</tr>
</tbody>
</table>

### Front Panel USB (2.0) #10/11, 12/13, 14/15 Pin Definitions

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Signal Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VBUS</td>
<td>Power</td>
</tr>
<tr>
<td>2</td>
<td>D-</td>
<td>USB 2.0 Differential Pair</td>
</tr>
<tr>
<td>3</td>
<td>D+</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
<td>Ground of PWR Return</td>
</tr>
<tr>
<td>5</td>
<td>StdA_SSRX-</td>
<td>SuperSpeed Receiver</td>
</tr>
<tr>
<td>6</td>
<td>StdA_SSRX+</td>
<td>Differential Pair</td>
</tr>
<tr>
<td>7</td>
<td>GND_DRAIN</td>
<td>Ground for Signal Return</td>
</tr>
<tr>
<td>8</td>
<td>StdA_SSTX-</td>
<td>SuperSpeed Transmitter</td>
</tr>
<tr>
<td>9</td>
<td>StdA_SSTX+</td>
<td>Differential Pair</td>
</tr>
</tbody>
</table>

A. Backpanel USB 2.0 #0
B. Backpanel USB 2.0 #1
C. Backpanel USB 3.0 #10
D. Backpanel USB 3.0 #11
E. Backpanel USB 2.0 #2
F. Backpanel USB 2.0 #3
G. Front Panel USB 2.0 #4/5
H. Front Panel USB 2.0 #6/7
I. Front Panel USB 2.0 #8/9
J. Front Panel USB 3.0 #12/13
K. Front Panel USB 3.0 #14/15
Ethernet Ports

Two Gigabit Ethernet ports (LAN1/ LAN2) are located next to the HD Audio Connector on the I/O Backpanel to provide network connections. These ports accept RJ45 type cables.

**Note:** Please refer to the LED Indicator Section for LAN LED information.

<table>
<thead>
<tr>
<th>LAN Ports Pin Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
</tbody>
</table>

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.

<table>
<thead>
<tr>
<th>(BP) HD Audio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conn#</td>
</tr>
<tr>
<td>A</td>
</tr>
<tr>
<td>B</td>
</tr>
<tr>
<td>C</td>
</tr>
<tr>
<td>D</td>
</tr>
<tr>
<td>E</td>
</tr>
<tr>
<td>F</td>
</tr>
</tbody>
</table>
Front Accessible Audio Header

A 10-pin Audio header is also located on the motherboard. This header allows you to use the onboard sound for audio playback. Connect an audio cable to the audio header to use this feature. See the table at right for pin definitions for the header.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Microphone_Left</td>
</tr>
<tr>
<td>2</td>
<td>Audio_Ground</td>
</tr>
<tr>
<td>3</td>
<td>Microphone_Right</td>
</tr>
<tr>
<td>4</td>
<td>Audio_Detect</td>
</tr>
<tr>
<td>5</td>
<td>Line_2_Right</td>
</tr>
<tr>
<td>6</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>Jack_Detect</td>
</tr>
<tr>
<td>8</td>
<td>Key</td>
</tr>
<tr>
<td>9</td>
<td>Line_2_Left</td>
</tr>
<tr>
<td>10</td>
<td>Ground</td>
</tr>
</tbody>
</table>

HDMI and Display Port (DP) Connections

An HDMI (High-Definition Multimedia Interface) and a Display Port are located next to the VGA port on the I/O backpanel. These connections are used to display both high definition video and audio through HDMI/DP-compatible cables. (Cables are not included).
VGA and DVI Connections

A VGA port and a DVI connector are located next to the USB ports 0/1 on the I/O backpanel. Use these connectors for VGA/DVI-compatible display.
Front Control Panel

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

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>+5V</td>
</tr>
<tr>
<td>16</td>
<td>Ground</td>
</tr>
</tbody>
</table>

**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. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>+5V</td>
</tr>
<tr>
<td>14</td>
<td>HD Active</td>
</tr>
</tbody>
</table>
NIC1/NIC2 (LAN1/LAN2)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for LAN Port 2 is on Pins 9 and 10. NIC1 LED and NIC2 LED are 2-pin NIC LED headers. Attach NIC LED cables to NIC1 and NIC2 LED indicators to display network activities. Refer to the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>PIN#</th>
<th>Definition</th>
<th>OH/Fan Fail LED Pin Definitions (JF1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Vcc/Blue UID LED</td>
<td>OH/Fan Fail Indicator Status</td>
</tr>
<tr>
<td>8</td>
<td>OH/Fan Fail LED</td>
<td></td>
</tr>
</tbody>
</table>

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.
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.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Reset</td>
</tr>
<tr>
<td>4</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Power Button

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

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Signal</td>
</tr>
<tr>
<td>2</td>
<td>+3V Standby</td>
</tr>
</tbody>
</table>
2-7 Connecting Cables

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. For information on Backpanel USB and Front Panel USB ports, refer to Page 2-17. For Front Panel Audio, please refer to Page 2-19.

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. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>+3.3V</td>
<td>1</td>
<td>+3.3V</td>
</tr>
<tr>
<td>14</td>
<td>-12V</td>
<td>2</td>
<td>+3.3V</td>
</tr>
<tr>
<td>15</td>
<td>COM</td>
<td>3</td>
<td>COM</td>
</tr>
<tr>
<td>16</td>
<td>PS_ON</td>
<td>4</td>
<td>+5V</td>
</tr>
<tr>
<td>17</td>
<td>COM</td>
<td>5</td>
<td>COM</td>
</tr>
<tr>
<td>18</td>
<td>COM</td>
<td>6</td>
<td>+5V</td>
</tr>
<tr>
<td>19</td>
<td>COM</td>
<td>7</td>
<td>COM</td>
</tr>
<tr>
<td>20</td>
<td>Res (NC)</td>
<td>8</td>
<td>PWR_OK</td>
</tr>
<tr>
<td>21</td>
<td>+5V</td>
<td>9</td>
<td>5VSB</td>
</tr>
<tr>
<td>22</td>
<td>+5V</td>
<td>10</td>
<td>+12V</td>
</tr>
<tr>
<td>23</td>
<td>+5V</td>
<td>11</td>
<td>+12V</td>
</tr>
<tr>
<td>24</td>
<td>COM</td>
<td>12</td>
<td>+3.3V</td>
</tr>
</tbody>
</table>

12V 8-pin Power Connector Pin Definitions:

<table>
<thead>
<tr>
<th>Pins</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 through 4</td>
<td>Ground</td>
</tr>
<tr>
<td>5 through 8</td>
<td>+12V</td>
</tr>
</tbody>
</table>

(Required)

A. 24-Pin ATX Main PWR
B. 8-Pin PWR
Fan Headers (Fan 1 ~ Fan 5)
The C7Z87 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 via IPMI interface. This allows the fan speeds to be automatically adjusted based on the motherboard temperature. Refer to the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Fan Header Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
</tbody>
</table>

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)
<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Intrusion Input</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
</tbody>
</table>

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. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin 1</td>
<td>Pos. (+)</td>
</tr>
<tr>
<td>Pin 2</td>
<td>Neg. (-)</td>
</tr>
</tbody>
</table>

Speaker (JD1)

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

<table>
<thead>
<tr>
<th>Pin Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pins 3~4</td>
<td>Internal Speaker</td>
</tr>
<tr>
<td>Pins 1~4</td>
<td>External Speaker</td>
</tr>
</tbody>
</table>
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. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VCC</td>
</tr>
<tr>
<td>2</td>
<td>No Connection</td>
</tr>
<tr>
<td>3</td>
<td>Connection to PWR LED in JF1</td>
</tr>
</tbody>
</table>

Serial Ports (COM1/COM2)

There are two serial (COM) port headers on the motherboard. COM1/COM2 are located next to the 1394-1 connection header. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin #</th>
<th>Definition</th>
<th>Pin #</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DCD</td>
<td>6</td>
<td>DSR</td>
</tr>
<tr>
<td>2</td>
<td>RXD</td>
<td>7</td>
<td>RTS</td>
</tr>
<tr>
<td>3</td>
<td>TXD</td>
<td>8</td>
<td>CTS</td>
</tr>
<tr>
<td>4</td>
<td>DTR</td>
<td>9</td>
<td>RI</td>
</tr>
<tr>
<td>5</td>
<td>Ground</td>
<td>10</td>
<td>N/A</td>
</tr>
</tbody>
</table>
DOM PWR Connector (JSD1)

The Disk-On-Module (DOM) power connector, located at JSD1, provides 5V (Gen1/Gen) power to a solid state DOM storage device connected to one of the SATA ports. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5V</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
</tr>
</tbody>
</table>

Wake-On-Ring (JWOR1)

The Wake-On-Ring header is located at JWOR1. This feature allows your computer to wake up when receiving an incoming call to the modem while in the suspend state. This header is provided to support legacy devices. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ground</td>
</tr>
<tr>
<td>2</td>
<td>Wake-up</td>
</tr>
</tbody>
</table>
SPDIF_Out (JSPDIF_OUT)

The SPDIF_Out (JSPDIF_OUT) is used for digital audio. You will also need the appropriate cable to use these features.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S/PDIF_Out</td>
</tr>
<tr>
<td>2</td>
<td>Ground</td>
</tr>
</tbody>
</table>

SPDIF_Out Pin Definitions

T-SGPIIO 1/2 Headers

Two Serial-Link General Purpose Input/Output headers (T-SGPIO 1/2) are located on the motherboard to enhance system performance. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NC</td>
<td>2</td>
<td>NC</td>
</tr>
<tr>
<td>3</td>
<td>Ground</td>
<td>4</td>
<td>Data</td>
</tr>
<tr>
<td>5</td>
<td>Load</td>
<td>6</td>
<td>Ground</td>
</tr>
<tr>
<td>7</td>
<td>Clock</td>
<td>8</td>
<td>NC</td>
</tr>
</tbody>
</table>

Note: NC = No Connection

T-SGPIIO Pin Definitions

A. SPDIF_Out
B. T-SGPIIO 1
C. T-SGPIIO 2
TPM Header/Port 80 Header
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. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>TPM/Port 80 Header Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin #</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>11</td>
</tr>
<tr>
<td>13</td>
</tr>
<tr>
<td>15</td>
</tr>
<tr>
<td>17</td>
</tr>
<tr>
<td>19</td>
</tr>
</tbody>
</table>

Standby Power Header
The Standby Power header is located at STBY1 on the motherboard. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>Standby Power Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>

A. TPM/Port 80
B. Standby PWR Header
IEEE 1394_1/1394_2 Connectors

1394_1 and 1394_2 provide IEEE 1394 connections on the motherboard. Connect IEEE 1394 cables to the connectors for IEEE 1394 support. See the tables on the right for pin definitions.

**1394_1 Pin Definitions**

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PTPA0+</td>
<td>2</td>
<td>PTPA0-</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>4</td>
<td>GND</td>
</tr>
<tr>
<td>5</td>
<td>PTPB0+</td>
<td>6</td>
<td>PTPB0-</td>
</tr>
<tr>
<td>7</td>
<td>PWR 1394a</td>
<td>8</td>
<td>PWR 1394a</td>
</tr>
<tr>
<td>10</td>
<td>Shield GND</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**1394_2 Pin Definitions**

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PTPA1+</td>
<td>2</td>
<td>PTPA1-</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
<td>4</td>
<td>GND</td>
</tr>
<tr>
<td>5</td>
<td>PTPB1+</td>
<td>6</td>
<td>PTPB1-</td>
</tr>
<tr>
<td>7</td>
<td>PWR 1394a</td>
<td>8</td>
<td>PWR 1394a</td>
</tr>
<tr>
<td>10</td>
<td>Shield GND</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

LAN1/LAN2 Enable/Disable

Jumpers JPL1/JPL2 enable or disable LAN ports 1/2 on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

<table>
<thead>
<tr>
<th>Pin#</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2</td>
<td>Enabled (default)</td>
</tr>
<tr>
<td>2-3</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

A. JPL1: LAN1 Enable
B. JPL2: LAN2 Enable
CMOS Clear (JBT1)

JBT1 is used to clear the saved system setup configuration stored in the CMOS chip. To clear the contents of the CMOS, completely shut down the system, remove the AC power cord and then short JBT1 with a jumper. Remove the jumper before powering on the system again. This will erase all user settings and revert everything to their factory-set defaults.

PCI Slot SMB Enable (I²C1/I²C2)

Use Jumpers I²C1/I²C2 to enable PCI SMB (System Management Bus) support to improve system management for the PCI slots. See the table on the right for jumper settings.

<table>
<thead>
<tr>
<th>Jumper Setting</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short</td>
<td>Enabled</td>
</tr>
<tr>
<td>Open (Default)</td>
<td>Disabled</td>
</tr>
</tbody>
</table>

A. Clear CMOS
B. I²C1
C. I²C2
Chapter 2: Installation

Audio Enable (JPAC1)

JPAC1 allows you to enable or disable the onboard audio support. The default position is on pins 1 and 2 to enable onboard audio connections. See the table on the right for jumper settings.

<table>
<thead>
<tr>
<th>Audio Enable/Disable Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both Jumpers</td>
</tr>
<tr>
<td>Pins 1-2</td>
</tr>
<tr>
<td>Pins 2-3</td>
</tr>
</tbody>
</table>

IEEE 1394_1/2 Enable

JPI1 allows you to enable or disable the onboard IEEE 1394_1/2 support. The default position is on pins 1 and 2 to use 1394_1 and 1394_2 connections. See the table on the right for jumper settings.

<table>
<thead>
<tr>
<th>1394_1/2 Enable/Disable Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Both Jumpers</td>
</tr>
<tr>
<td>Pins 1-2</td>
</tr>
<tr>
<td>Pins 2-3</td>
</tr>
</tbody>
</table>
Watch Dog Enable/Disable

Watch Dog (JWD1) is a system monitor that can reboot the system when a software application hangs. Close Pins 1-2 to reset the system if an application hangs. Close Pins 2-3 to generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in the BIOS.

<table>
<thead>
<tr>
<th>Watch Dog Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumper Setting</td>
</tr>
<tr>
<td>Pins 1-2</td>
</tr>
<tr>
<td>Pins 2-3</td>
</tr>
<tr>
<td>Open</td>
</tr>
</tbody>
</table>

BIOS Recovery

Use Jumper JBR1 to Reset BIOS settings. Close pins 1-2 for normal operation. See the table on the right for jumper settings.

<table>
<thead>
<tr>
<th>BIOS Reset Jumper Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumper Setting</td>
</tr>
<tr>
<td>Pins 1-2</td>
</tr>
<tr>
<td>Pins 2-3</td>
</tr>
</tbody>
</table>

A. Watch Dog Enable
B. BIOS Recovery
Manufacture Mode Select

Close pins 2-3 of Jumper JPME2 to bypass SPI flash security and force the system to operate in the Manufacture Mode, allowing the user to flash the system firmware from a host server for system setting modifications. See the table on the right for jumper settings.
2-9 Onboard Indicators

LAN 1/LAN 2 LEDs

Two LAN ports (LAN 1/LAN 2) are located on the I/O backplane of the motherboard. Each Ethernet LAN port has two LEDs. The yellow LED indicates activity, while the Link LED may be green, amber, or off to indicate the speed of the connections. See the tables at right for more information.

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. See the layout below for the LED location.
2-10 SATA Connections

SATA Connections (I-SATA0~I-SATA5 & A-SATA 0/1)

Six Serial ATA (SATA) 3.0 connectors (I-SATA 0~5, A-SATA 0/1) are located on the motherboard. I-SATA 3.0 ports are supported by the Intel Z87 PCH chip, and A-SATA 0/1, by the ASMedia SATA Controller. I-SATA ports support RAID 0, 1, 5 and 10. The SATA connections provide faster data transmission than legacy Parallel ATA. See the table on the right for pin definitions.

<table>
<thead>
<tr>
<th>SATA 3.0 Connectors Pin Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pin#</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
</tbody>
</table>

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. A-SATA 3.0 #0
H. A-SATA 3.0 #1
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 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 Non-ECC DDR3 (1.5V) 1066MHz/1333MHz/1600MHz/2133MHz(*OC)/2200MHz(*OC)/2400MHz(*OC)/2600MHz(*OC)/2800MHz(*OC)/3000MHz(*OC) 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.

   **Note:** *OC=Overclocking (not under warranty)

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.

Losing the System’s 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 1-6 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, 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 C7Z87 supports up to 32GB of unbuffered Non-ECC DDR3 SDRAM (1.5V, 1066MHz/1333MHz/1600MHz/2133MHz(*OC)/2200MHz(*OC)/2400MHz(*OC)/2600MHz(*OC)/2800MHz(*OC)/3000MHz(*OC)/3200MHz(*OC)). See Section 2-4 for details on installing memory. **Note:** *OC=Overclocking (not under warranty)**

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

**Answer:** We do NOT recommend that you 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/](http://www.supermicro.com/support/bios/). 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 ROM file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You may choose the zip file or the .exe file. If you choose the zipped BIOS file, 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., C7Z87) and build version as the extension. For example, "C7Z87.115". When completed, your system will automatically reboot.

If you choose the .exe file, please run the .exe file under Windows to create the BIOS flash floppy disk. Insert the floppy disk into the system you wish to flash the BIOS. Then, boot the system to the floppy disk. The BIOS utility will automatically flash the BIOS without any prompts. Please note that this process may take a few minutes to complete. Do not be concerned if the screen is paused for a few minutes.

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!
Chapter 3: Troubleshooting

3-4 Battery Removal and Installation

Battery Removal
To remove the onboard battery, follow the steps below:

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

2. Locate the onboard battery as shown below.

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

4. Remove the battery.

Proper Battery Disposal

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

1. To install an onboard battery, follow the steps 1 & 2 above and continue below:

2. Identify the battery's polarity. The positive (+) side should be facing up.

3. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.

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

3-5 Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. 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.
Chapter 4

BIOS

4-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the C7Z87. 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>, and 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 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 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 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 following BIOS items will also be displayed:

Supermicro C7Z87

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 Advanced 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 cause the system to become unstable. When this occurs, restore the setting to the manufacture default setting.

Boot Feature

Quiet Boot

Use this feature to select the screen display between POST messages or the OEM logo at 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 use the current AddOn ROM display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are Force BIOS and Keep Current.

Bootup Num-Lock

Use this feature to select the Power-on state for the Numlock key. The options are Off and On.
Wait For 'F1' If Error

Select Enabled 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 BIOS ROM 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 BIOS ROM 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 Enabled and Disabled.

Re-try Boot

If this item 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 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 Instant Off and 4 Seconds Override.

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-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 will be displayed:

- Type of CPU
Clock Spread Spectrum

If this feature is set to Enabled, the BIOS 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.

Hyper-threading

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

**Limit CPUID Maximum**

Select Enabled to set the maximum CPU ID value and to boot a legacy OS 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 to 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 or damage the system during an attack. The default is Enabled. (Refer to Intel and Microsoft Web Sites for more information.)

**Intel® Virtualization Technology (Available when supported by the CPU)**

Select Enabled to use the Intel Virtualization Technology to 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.

**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)**

Select Enabled for the CPU to prefetch both cache lines for 128 bytes as comprised. Select Disabled for the CPU to prefetch both cache lines for 64 bytes. The options are Disabled and Enabled.

*Note:* If there is any change to this setting, you will need to power off and reboot the system for the change to take effect. Please refer to Intel's web site for detailed information.

**CPU AES**

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

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. Please refer to Intel’s web site for detailed information. The options are Disabled and Enabled.

Turbo Mode

This feature allows processor cores to run faster than the frequency recommended by the manufacturer. The options are Disabled and Enabled. If this feature is set to Enabled, the following items will display:

**CPU Power Limit1 (Available when "Turbo Mode" is set to Enabled)**
Use this feature to set the power limit for CPU1. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting.

**CPU Power Limit1 Time (Available when "Turbo Mode" is set to Enabled)**
This item allows the user to determine how long CPU1 should operate at the power limit set by the user for the item above. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting.

**CPU Power Limit2 (Available when "Turbo Mode" is set to Enabled)**
Use this feature to set the power limit for CPU2. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting.

**DDR Power Limit1 (Available when "Turbo Mode" is set to Enabled)**
Use this feature to set the power limit for DDR Memory Module 1. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting.

**DDR Power Limit1 Time (Available when "Turbo Mode" is set to Enabled)**
This item allows the user to determine how long Memory Module 1 should operate at the power limit set by the item above. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting.

**DDR Power Limit2 (Available when "Turbo Mode" is set to Enabled)**
Use this feature to set the power limit for Memory Module 2. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacture default setting.

**1-Core Ratio Limit (Available when "Turbo Mode" is set to Enabled)**
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 (Available when "Turbo Mode" is set to Enabled)
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 (Available when "Turbo Mode" is set to Enabled)
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 (Available when "Turbo Mode" is set to Enabled)
This increases (multiplies) 4 clock speeds in the CPU core in relation to the bus speed when four CPU cores are active. Press "+" or "-" on your keyboard to change the value. Enter 0 to use the manufacture default setting.

Energy Performance
Use this feature to select an appropriate fan setting to achieve the maximum system performance (with maximum cooling) or maximum energy efficiency (with maximum power saving). The fan speeds are controlled by the firmware management. The options are Performance, Balanced Performance, Balanced Energy, and Energy Efficient.

VR Current Value
Use this feature to set the limit on the current voltage regulator (VR). Press "+" or "-" on your keyboard to change this value. Enter 0 to use the manufacture default setting.

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 States support. The options are Enabled and Disabled. If this feature is set to Enabled, the following items will display:

Enhanced C1 State (Available when "CPU C States" is set to Enabled)
Select Enabled to enable Enhanced C1 Power State to boost system performance. The options are Enabled and Disabled.

CPU C3 Report (Available when "CPU C States" is set to Enabled)
Select Enabled to allow the BIOS to report the CPU C3 State (ACPI C2) to the operating system. During the CPU C3 State, the CPU clock generator is turned off. The options are Enabled and Disabled.
CPU C6 Report (Available when "CPU C States" is set to Enabled)
Select Enabled to allow the BIOS to report the CPU C6 State (ACPI C3) to the operating system. During the CPU C6 State, the power to all caches is turned off. The options are Enabled and Disabled.

C6 Latency (Available when "CPU C States" is set to Enabled)
Select Short to set a short delay time(period) during which the BIOS reports CPU C6 State (ACPI C3) to the operating system. Select Long to set a long delay time(period) during which the BIOS reports CPU C6 State (ACPI C3) to the operating system. The options are Short and Long.

CPU C7 Report (Available when "CPU C States" is set to Enabled)
Select Enabled to allow the BIOS to report the CPU C7 State (ACPI C3) to the operating system. CPU C7 State is a processor-specific low C-State. The options are Disabled, CPU C7, and CPU C7s.

C7 Latency (Available when "CPU C States" is set to Enabled)
Select Short to set a short delay time(period) during which the BIOS reports CPU C7 State (ACPI C3) to the operating system. Select Long to set a long delay time(period) during which the BIOS reports CPU C7 State (ACPI C3) to the operating system. The options are Short and Long.

C1 State Auto Demotion
When this item is enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 State based on un-cored auto-demote information. The options are Disabled and Enabled.

C3 State Auto Demotion
When this item is enabled, the CPU will conditionally demote C6 or C7 requests to C3 State based on un-cored auto-demote information. The options are Disabled and Enabled.

C State Pre-Wake
Select Enabled to support C State Pre-Wake State features. The options are Enabled and Disabled

Package C-State limit
Select Auto for the AMI BIOS to automatically set the limit on the C-State package register. The options are C0/C1, C2, C3, C6, C7 and Auto.

LakeTiny Feature
Select Enabled for LakeTiny feature support for C-State configuration. The options are Enabled and Disabled.
ACPI T State
Select Enabled to support Advanced Configuration and Power Interface (ACPI) Throttling States (T State), which will lower the power consumption level for the system as to the power consumption level set for CPU Performance State 1 to achieve power efficiency. The options are Enabled and Disabled.

Chipset Configuration
WARNING: Setting the wrong values in the following sections may cause the system to malfunction.

System Agent (SA) Configuration
The following System Agent (SA) information
- System Agent Bridge Name
- VT-d Capability

VT-d
Select Enabled to enable Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to the Virtual Machine Manager (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 settings are Enabled and Disabled.

Graphics Configuration
This item displays the following graphics information:
Graphics Configuration
- IGFX VBIOS Version
- IGfx Frequency

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.

Primary Display
Use this feature to select the graphics device to be used as the primary display. You can select from a device installed on the CPU IGFX, CPU SLOT, or PCH SLOT. The options are Auto, CPU IGFX, CPU SLOT, and PCH SLOT.
CPU SLOT (Available when Primary Display is set to Auto)
Use this item to select the graphics device installed in an expansion slot supported by the CPU to be used as the primary display. The options are Auto, SLOT6, and SLOT4.

PCH SLOT (Available when Primary Display is set to Auto)
Use this item to select the graphics device installed in an expansion slot supported by the PCH to be used as the primary display. The options are Auto, SLOT5, SLOT7, and SLOT1/2.

CPU IGFX
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 1MB and 2MB.

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, and 512 MB.

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 32M, 64M, 96M, 128M, 160M, 192M, 224M, 256M, 288M, 320M, 352M, 384M, 416M, 448M, 480M, 512M, and 1024M.

DVMT (Dynamic Video Memory Technology) Total Gfx Mem
Use this feature to set the total memory size to be used by internal graphics devices based on the DVMT 5.0 platform. The options are 128MB, 256MB, and MAX.

Gfx (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.
PCI-E Configuration
This item displays the information of the (graphics) device installed on a PCI-E slot.

Slot6 PCI-E 3.0 x16

Slot6 PCI-E 3.0 x16 - Gen X
This feature allows the user to select PCI-E support for the device installed on Slot6. The options are Auto, Gen1 (Generation 1), Gen 2 and Gen 3.

Slot4 PCI-E 3.0 x8 (In x16)

Slot4 PCI-E 3.0 x8 (In x16) - Gen X
This feature allows the user to select PCI-E support for the device installed on Slot4. The options are Auto, Gen1 (Generation 1), Gen 2 and Gen 3.

Detect Non-Compliance Device
Select Enabled for the AMI BIOS to automatically detect a PCI-E device that is not compliant with the PCI-E standards. The options are Enabled and Disabled.

Program PCI-E ASPM After OpROM
PCI-E ASPM, the Active State Power Management for PCI-Express slots, is a power management protocol used to manage power consumption of serial-link devices installed on PCI-Exp slots during a prolonged off-peak time. If this item is set to Enabled, PCI-E ASMP will be programmed after OpROM. If this item is set to Disabled, the PCI-E ASPM will be programmed before OpROM. The options are Enabled and Disabled.

Slot6 PCI-E 3.0 x16-ASPM/Slot4 PCI-E 3.0 x8 (In x16)-ASPM
Use this feature to set the ASPM (Active State Power Management) level for the graphics device installed on a PCI-E or PCI slot specified by the user. The options are Disabled, ASPM L0s, ASPM L1, ASPM L0sL1, and Auto.

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

PCH DMI Link ASPM Control
Use this feature to set the ASPM (Active State Power Management) state on the device installed on the DMI Link supported by the PCH chip. The options are Disabled and Enabled.
This feature configures the ASPM (Active State Power Management) settings for the graphics devices installed on PCI-E 2.0 SLOT3, SLOT5, or SLOT7. The options are Disabled, L0s, L1, L0sL1 and **Auto**.

**SLOT1/SLOT2 PCI ASPM**

This feature configures the ASPM (Active State Power Management) settings for the graphics devices installed on PCI 2.0 x1 SLOT1 or SLOT2. The options are Disabled, L0s, L1, L0sL1 and **Auto**.

► **Memory Configuration**

This item displays the following information on the memory modules installed on the motherboard.

- Memory RC Version
- Memory Frequency
- Total Memory
- Memory Voltage
- DIMM A1
- DIMM A2
- DIMM B1
- DIMM B2
- CAS Latency (tCL)
- Minimum Delay Time
  - CAS to RAS (tRCDmin)
  - Row Precharge (tRPmin)
  - Active to Precharge (tRASmin)

**Max TOLUD (Top of Low Usable DRAM)**

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 and 3.25 GB.

**Note:** TSEG is a block of memory that is only accessible by the processor while operating in System Management Mode (SMM).

**Memory Scrambler**

This feature enables or disables memory scrambler support for memory error correction. The settings are **Enabled** and **Disabled**.

## PCH-IO Configuration

This item displays the information for the PCH-IO Chip.

- Intel PCH Rev ID
- USB Configuration
- USB Devices: 1 Keyboard, 1 Mouse, 2 Hubs

**EHCI1**

Select Enabled to enable EHCI (Enhanced Host Controller Interface) Controller 1 for USB 2.0 support. One EHCI controller must always be enabled. The settings are **Enabled** and **Disabled**.

**EHCI2**

Select Enabled to enable EHCI (Enhanced Host Controller Interface) Controller 2 for USB 2.0 support. One EHCI controller must always be enabled. The settings are **Enabled** and **Disabled**.

**Legacy USB Support**

Select Enabled to support legacy USB devices. Select Auto to disable legacy support when legacy USB devices are not present. If Disable is selected, legacy USB devices will not be supported. The options are **Enabled**, **Disabled** and **Auto**.

**Port 60/64 Emulation**

This feature enables or disables I/O port 60h/64h emulation support. This should be enabled for complete USB keyboard legacy support for non-USB-aware operating systems. The options are **Disabled** and **Enabled**.

**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 settings are Enabled and Disabled.

**EHCI Hand-Off**
This item is for 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.

**XHCI Mode**
This feature handles the operation mode for the XHCI (Extensible Host Controller Interface) controller. The settings are Smart Auto, Auto, Enabled, Disabled and Manual.

**Frontside Audio Mode**
This feature selects the type of audio output for the front_side audio header or connection. Select HD Audio for High Definition; otherwise, select AC '97 for legacy audio. The options are HD Audio and AC' 97.

**Deep Sx**
Use this feature to configure the deep sleep state modes for computer systems that are compliant with Advanced Configuration and Power Interface (ACPI) standards. The options are Disabled, Enabled in S5, and Enabled in S4-S5.

**On Board Chip Configuration**
This item displays the On Board Chip options.

**ASMedia 1061 SATA Controller**

**ASMedia 1061 SATA Controller**
Select Enabled to activate the onboard ASMedia SATA controller. The settings are Enabled and Disabled.

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

**SATA Controllers**
This item Enables or Disables the built-in SATA controllers on the motherboard. The options are Enabled and Disabled.
SATA Mode Selection

This item selects the mode for the installed SATA drives. The options are IDE, AHCI and RAID.

SATA RAID Option ROM/UEFI Driver (Available if the item above - SATA Mode Select is set to AHCI or RAID)

Select Enabled to use the SATA RAID Option ROM/UEFI driver for system boot. The options are Enabled and Disabled.

If the item above - SATA Mode Select is set to AHCI, the following items are displayed:

Serial ATA Port 0~ Port 5

This item displays the information detected on the installed SATA drives on the particular SATA port.

- Model number of drive and capacity
- Software Preserve Support

Port 0 ~ Port 5 Hot Plug

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

Port 0 ~ Port 1 SATA Device Type

This feature configures the selected SATA port to support either a solid state drive or hard disk drive. The options are Hard Disk Drive and Solid Sate Drive.

Port 0 ~ Port 5 Spin Up Device

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRE-SET initialization sequence to the device. The options are Enabled and Disabled.

If the item above - SATA Mode Select is set to IDE, the following items are displayed:

Serial ATA Port 0~ Port 5

This item displays the information detected on the installed SATA drives on the particular SATA port.

- Model number of drive and capacity
- Software Preserve Support
If the item above - SATA Mode Select is set to RAID, the following items are displayed:

**Serial ATA Port 0~ Port 5**
This item displays the information detected on the installed SATA drives on the particular SATA port.
- Model number of drive and capacity
- Software Preserve Support

**Port 0 ~ Port 5 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**.

**Port 0 ~ Port 1 SATA Device Type**
This feature configures the selected SATA port to support either a solid state drive or hard disk drive. Set this item to Enabled to enable hot-plugging. The options are **Hard Disk Drive** and **Solid Sate Drive**.

**Port 0 ~ Port 5 Spin Up Device**
On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRE-SET initialization sequence to the device. The options are **Enabled** and **Disabled**.

**PCIe/PCI/PnP Configuration**
This feature allows the user to set the PCI/PnP configurations for the following items:

**Above 4G Decoding**
Select Enabled for 64-bit devices to be decoded above the 4GB address space. If 64bit PCI decoding is supported by the system. The options are **Disabled** and **Enabled**.

**PCI Latency Timer**
This feature sets the latency timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI bus 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 palette to examine the video
cards palette and 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 **Enabled** and **Disabled**.

**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**.

**Slot1 PCI 33 MHz OPROM/Slot2 PCI 33 MHz/Slot3 PCI-E 2.0 x1 OPROM/Slot4 PCI-E 3.0 x8 (In x 16) OPROM/Slot5 PCI-E 2.0 x1 OPROM/Slot6 PCI-E 3.0 x16 OPROM/Slot7 PCI-E 2.0 x1 OPROM**

Use this feature to enable or disable Option ROM support to boot the computer using the device installed on a PCI or a PCI-E slot specified by the user. The options are **Disabled**, **Legacy** and **EFI**.

**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 device installed in a PCI slot. The options are UEFI Only and **Legacy Only**.

**Other PCI Device ROM Priority**
This feature selects a PCI device Option ROM for system boot if this device is not a network, mass storage, or video device. The options are UEFI Only and **Legacy Only**.

**Onboard LAN1 Option ROM/Onboard LAN2 Option ROM**
Select iSCSI to use the iSCSI Option ROM to boot the computer using an iSCSI device installed in a LAN port specified. Select PXE (Preboot Execution Environment) to boot the computer using a PXE device installed in a LAN port specified. Select Disabled to prevent system boot using a device installed in a LAN port. The options for Onboard LAN1 Option ROM/Onboard LAN2 Option ROM are **Disabled** and **PXE**.

**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 (Available when Network Stack is set to Enabled)
Select Enabled to enable Ipv4 PXE (Preboot Execution Environment) for boot support. If this feature is set to Disabled, Ipv4 PXE boot option will not be supported. The options are Enabled and Disabled.

Ipv6 PXE Support (Available when Network Stack is set to Enabled)
Select Enabled to enable Ipv6 PXE (Preboot Execution Environment) for boot support. If this feature is set to Disabled, Ipv6 PXE boot option will not be supported. The options are Enabled and Disabled.

ACPI Settings

High Precision 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.

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, S1 only (CPU Stop Clock), S3 only (Suspend to RAM), and Both S1 and S3 available for OS to choose from.

Trusted Computing Configuration (Available when a TPM Device is Detected)

Configuration

Security Device Support
Select Enable for the AMI BIOS to automatically download the drivers needed to provide Trusted Computing platform support for this machine to ensure date integrity and network security. The options are Disable and Enable.

TPM State
Select Enabled to use TPM (Trusted Platform Module) settings for system data security. The options are Disabled and Enabled.

Note: The system will reboot for the change on TPM State to take effect.
Pending Operation

Use this item to schedule a TPM-related operation to be performed by a security device for TPM support. The options are **None**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.

**Note:** The computer will reboot to carry out a pending TPM operation and change TPM state for a TPM device.

Current Status Information

This feature indicates the status of the following TPM items:

- **TPM Enabled Status**
- **TPM Active Status**
- **TPM Owner Status**

Intel TXT (LT) Support

Intel TXT (Trusted Execution Technology) helps protect against software-based attacks to ensure the security, confidentiality, and integrity of all data stored in the system. The options are Enabled and **Disabled**. **Current Status Information**

This feature indicates the status of the following TPM items:

- **TPM Enabled Status**
- **TPM Active Status**
Performance Tuning Mode (Available when both XMP memory and an Extreme Edition CPU are installed)

This item allows the user to choose the Intel Extreme Memory Profile (XMP) Specification which enables DDR3 memory to operate beyond the standard JEDEC SPD specification. Select XMP for 1600 MHz XMP memory operation for better system performance.

CPU Configuration

The following CPU Configuration submenu items will display:

Non Turbo Ratio Override

This feature allows the user to set the non-turbo override ratio. The default setting is 20.

Package Current Lock

Select Enabled to lock the current CPU package values. The options are Enabled and Disabled.

IA Core Current Max (1/8 Amp)

This feature allows the user to set the maximum electric current value for the Intel CPU cores. The default setting is 384.

Enhanced Intel SpeedStep Technology

Select Enabled to enable Enhanced Intel SpeedStep Technology (EIST) support to allow the system to automatically adjust processor voltage and core frequency to enhance power efficiency. The options are Disabled and Enabled.

Turbo Mode

Select Enabled to use Turbo Mode to boost system performance. The options are Disabled and Enabled.

Package TDP Lock Enable (Available when "Turbo Mode" is set to Enabled)

Select Enabled to lock the Thermal Design Power (TDP) value for the processor. The options are Disabled and Enabled.

Power Limit 1 Value (Watt) (Available when "Turbo Mode" is set to Enabled)

Use this feature to set the power limit for CPU1. Use the number keys on your keyboard to enter the value. The default setting is 35.
Power Limit 1 Time (Available when "Turbo Mode" is set to Enabled)
This item allows the user to determine how long CPU1 should operate at the power limit set by the user for the item above. Use the number keys on your keyboard to enter the value. The default setting is 8.

Power Limit 2 Switch (Available when "Turbo Mode" is set to Enabled)
Select Enabled for power limit switch for CPU2. The settings are Disabled and Enabled.

Power Limit 2 Value (Watt) (Available when "Turbo Mode" is set to Enabled)
Use this feature to set the power limit for CPU2. Use the number keys on your keyboard to enter the value. The default setting is 43.

1 Core Ratio Limit (Available when "Turbo Mode" is set to Enabled)
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. The default setting is 30.

2 Core Ratio Limit (Available when "Turbo Mode" is set to Enabled)
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. The default setting is 29.

3 Core Ratio Limit (Available when "Turbo Mode" is set to Enabled)
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. The default setting is 27.

4 Core Ratio Limit (Available when "Turbo Mode" is set to Enabled)
This increases (multiplies) 4 clock speeds in the CPU core in relation to the bus speed when four CPU cores are active. Press "+" or "-" on your keyboard to change the value. The default setting is 26.

Disable OverClocking Lock
If this feature is set to Enabled, the OverClocking Lock will be deactivated. The options are Disabled and Enabled.

ICC (Intelligent Clock Control) Clock Setting

Host Clock Override (1/100 MHz)
Use this item to set the CPU clock override value for the host system. Press "+" or "-" on your keyboard to change the value. The default setting is 0.
North Bridge Configuration
The following North Bridge Configuration submenu items will display:

Memory Multiplier Configuration

Performance Memory Profiles
Use this feature to set Performance Memory Profiles which may cause impacts on memory behaviors due to different sizes of memory used in the system. Select Automatic to allow the BIOS to automatically set Performance Memory Profiles. Select Manual to manually configure Performance Profiles. The options are Automatic, Manual, XMP Profile 1 and XMP Profile 2.

XMP Profile 1
XMP Profile 2

Intel Graphic Configuration

Graphics Core Ratio Limit
Use this feature to set graphics core ratio limit. The default setting is 24.

Overclocking CPU Option
The following Overclocking CPU Option submenu items will display:

CPU Adaptive Voltage Target (mV)
Use this feature to set the CPU voltage Target(mV) value from 0mV to 2000mV. Enter 0 to use the manufacture default value.

CPU Voltage Mode
Use this feature to select the CPU voltage mode. The options are Override and Adaptive.

CPU Voltage Offset (mV)
Use this feature to set the CPU Voltage Offset value from -1000mV to 998mV. Enter 0 to use the manufacture default value.

Offset Prefix
Use this feature to set the Offset value as a positive (+) number or a negative (-) number. Press "+" or "-" on your keyboard to make a selection. The default setting is "+".
Overclocking RING Option
The following Overclocking RING Option submenu items will display:

RING Adaptive Voltage Target (mV)
Use this feature to set the RING Adaptive Voltage Target (mV) value from 0mV to 2000mV. Enter 0 to use the manufacture default value.

RING Voltage Mode
Use this feature to select the CPU RING Voltage mode. The options are Over-ride and Adaptive.

RING Voltage Offset (mV)
Use this feature to set the RING Voltage Offset value from -1000mV to 998mV. Enter 0 to use the manufacture default value.

Offset Prefix
Use this feature to set the Offset value as a positive (+) number or a negative (-) number. Press "+" or "-" on your keyboard to make a selection. The default setting is "+".

Overclocking SVID and FIVR Option
The following Overclocking SVID and FIVR Option submenu items will display:

SVID Control Enable
Select Enabled to enable SVID control for Intel SVID Protocol support. If this setting is set to Disabled, there will be no change made to SVID until the CPU powers down. The options are Enabled and Disabled.

SVID Override Voltage Target (mV)
Use this feature to set the value for SVID Override Voltage Target (up to 2500 mV). Enter 0 to use the manufacture default value.

FIVR Faults Enable
Select Enabled to enable FIVR Faults support. If this setting is set to Disabled, there will be no change made to FIVR Faults settings until the CPU powers down. The options are Enabled and Disabled.

FIVR Efficiency Enable
Select Enabled to enable FIVR Efficiency support. If this setting is set to Disabled, there will be no change made to FIVR Efficiency status until the CPU powers down. The options are Enabled and Disabled.
➤ Overclocking GT Option
The following Overclocking GT Option submenu items will display:

GT Adaptive Voltage Target (mV)
Use this feature to set the GT Adaptive voltage Target (mV) value from 0mV to 2000mV. Enter 0 to use the manufacture default value.

GT Voltage Mode
Use this feature to select the Overclocking GT mode. The options are Override and Adaptive.

GT Voltage Offset (mV)
Use this feature to set the GT Voltage Offset value between -1000mV and 998mV. Enter 0 to use the default setting.

Offset Prefix
Use this feature to set the GT Voltage Offset value as a positive (+) number or a negative (-) number. Press "+" or "-" on your keyboard to make a selection. The default setting is "+".

➤ Overclocking UNCORE Option
The following Overclocking UNCORE Option submenu items will display:

UNCORE Voltage Offset (mV)
Use this feature to set the UNCORE Voltage Offset value between -1000mV and 998mV. Enter 0 to use the default setting.

Offset Prefix
Use this feature to set the Offset value as a positive (+) number or a negative (-) number. Press "+" or "-" on your keyboard to make a selection. The default setting is "+".

➤ Overclocking IOA and IOD Option
The following Overclocking IOA and IOD Option submenu items will display:

IOA Voltage Offset (mV)
Use this feature to set the IOA Voltage Offset value between -1000mV and 998mV. Enter 0 to use the default setting.
Offset Prefix

Use this feature to set the Offset value as a positive (+) number or a negative (-) number. Press "+" or "-" on your keyboard to make a selection. The default setting is "+".

IOD Voltage Offset (mV)

Use this feature to set the IOD Voltage Offset value between -1000mV and 998mV. Enter 0 to use the default setting.

Offset Prefix

Use this feature to set the Offset value as a positive (+) number or a negative (-) number. Press "+" or "-" on your keyboard to make a selection. The default setting is "+".

PCH-FW Configuration

The following information are displayed:

- ME FW Version
- ME Firmware Mode
- ME Firmware Type
- ME Firmware SKU
- PTT Capability/State

Firmware Update Configuration

ME FW Image Re-Flash

Select Enabled to re-flash the ME (Management Engine) Firmware. The options are Disabled and Enabled.
TPM Owner Status

Intel TXT (LT) Support
Intel TXT (Trusted Execution Technology) helps protect against software-based attacks to ensure security, confidentiality, and integrity of all data stored in the system. The options are Enabled and Disabled.

►Super IO Configuration

Super IO Chip NCT6776F

►Serial Port 1 Configuration/Serial Port 2 Configuration
Select Enabled to enable onboard serial ports. The options are Enabled and Disabled.

Device Settings
This feature displays the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2.

Change Port 1 Settings/Port 2 Settings
This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and 2. Select Auto to let the BIOS 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).

►H/W (Hardware) Monitor

PC Health Status

Fan Speed Control Mode
This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the
CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select "Full Speed" to allow the onboard fans to run at full speed (of 100% Pulse Width Modulation Duty Cycle) for maximum cooling. This setting is recommended for special system configuration or debugging. Select "Standard" for the onboard fans to run at 50% of the Initial PWM Cycle in order to balance the needs between system cooling and power saving. This setting is recommended for regular systems with normal hardware configurations. The options are Full Speed (@100% of PWM Cycle), and **Standard** (@50% of PWM Cycle).

The following items will be displayed:

- CPU Temperature (PECI)
- Front Side Sys. (System) Temperature
- Rear Side Sys. (System) Temperature
- PCH Temperature
- Fan 1 Speed ~ Fan 5 Speed
- VCORE
- 12V
- VDIMM
- 5Vcc
- PCH 1.05V
- AVCC
- 3.3Vcc
- VSB
- VBAT
4-4 Boot Settings

Use this feature to configure Boot Settings:

Set Boot Priority
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.

• 1st Boot Device
• 2nd Boot Device
• 3rd Boot Device
• 4th Boot Device
• 5th Boot Device
• 6th Boot Device

• Hard Disk Drive BBS Priorities
• UEFI Boot Drive BBS Priorities

• Delete Boot Option
• Delete Driver Option

Hard Disk Drive BBS Priorities
• 1st Device
• 2nd Device

UEFI Boot Drive BBS Priorities
• 1st Boot Device

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]
Delete Driver Option

Use this feature to remove a pre-defined driver from which the system will boot during startup. The settings are [any pre-defined boot device]
4-5 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**

Use this feature to set the Administrator Password which is required to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.
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 for the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Save Options

Save Changes

When you have completed the system configuration changes, select this option to save all changes 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 Optimized Defaults

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

<table>
<thead>
<tr>
<th>Beep Code/LED</th>
<th>Error Message</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 beep</td>
<td>Refresh</td>
<td>Circuits have been reset. (Ready to power up)</td>
</tr>
<tr>
<td>5 short beeps + 1 long beep</td>
<td>Memory error</td>
<td>No memory detected in the system</td>
</tr>
<tr>
<td>8 beeps</td>
<td>Display memory read/write error</td>
<td>Video adapter missing or with faulty memory</td>
</tr>
<tr>
<td>OH LED On</td>
<td>System OH</td>
<td>System Overheat</td>
</tr>
</tbody>
</table>
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-II (Remote Control)**

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


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

C-1 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, hands-off control to a computer system at bootup.

C-2 How to Recover the UEFI BIOS Image (the Main BIOS Block)

A UEF BIOS flash chip consists of a recovery BIOS block, comprised of two boot blocks 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 that 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 boot crashes. However, when the BIOS boot block crashes, you will need to follow the procedures in Appendix D.

C-3 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 "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 keyboard until you 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 menu 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, enter 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 from the power supply to clear CMOS, and then plug the AC power cable in the power supply again 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.
Appendix D

Dual Boot Block

D-1 Introduction

This motherboard supports the Dual Boot Block feature, which is the last-ditch mechanism to recover the BIOS boot block. This section provides an introduction to the feature.

BIOS Boot Block

A BIOS boot block is the minimum BIOS loader required to enable necessary hardware components for the BIOS crisis recovery flash that will update the main BIOS block. An on-call BIOS boot-block corruption may occur due to a software tool issue (see image below) or an unexpected power outage during BIOS updates.

BIOS Boot Block Corruption Occurrence

When a BIOS boot block is corrupted due to an unexpected power outage or a software tool malfunctioning during BIOS updates, you can still reboot the system by closing pins 2 and 3 using a cap on Jumper JBR1. When JBR1 is set to pins 2 and 3, the system will boot from a backup boot block pre-loaded in the BIOS by the manufacturer.
D-2 Steps to Reboot the System by Using Jumper JBR1

1. Power down the system.

2. Close pins 2-3 on Jumper JBR1, and power on the system.

3. Follow the BIOS recovery SOP listed in the previous chapter (Appendix C).

4. After completing the steps above, power down the system.

5. Close pins 1-2 on Jumper JBR1, and power on the system.
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