

SUPER ●[®]

C7Z97-M
C7Z97-MF

USER'S MANUAL

Revision 1.0b

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

Manual Revision 1.0b

Release Date: August 4, 2015

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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** C7Z97-M/MF motherboard.

Manual Organization

Chapter 1 describes the features, specifications and performance of the motherboard, and provides detailed information on the Intel Z97 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 contains an introduction and instructions regarding the Dual Boot Block feature of this motherboard.

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 (C7Z97-M) or
- Two (2) SATA Cables (C7Z97-MF)
- One (1) I/O shield
- One (1) Quick Reference Guide
- One (1) Driver CD (C7Z97-M only)

Conventions Used in the Manual

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



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



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



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

Standardized Warning Statements

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

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

Battery Handling



Warning!

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

電池の取り扱い

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

警告

電池更換不當會有爆炸危險。請只使用同類電池或製造商推薦的功能相當的電池更換原有電池。請按製造商的說明處理廢舊電池。

警告

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

Warnung

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

Attention

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

iAdvertencia!

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

אזהרה!

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة استبدال البطارية بطريقة غير صحيحة فعليك استبدال البطارية فقط بنفس النوع أو ما يعادلها كما أوصت به الشركة المصنعة تخلص من البطاريات المستعملة وفقا لتعليمات الشركة الصانعة

경고!

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

Waarschuwing

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

Product Disposal



Warning!

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

製品の廃棄

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

警告

本产品的废弃处理应根据所有国家的法律和规章进行。

警告

本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

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

iAdvertencia!

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

Attention

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

סילוק המוצר

אזהרה!

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

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية

경고!

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

Waarschuwing

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

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Where to Find More Information

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

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

Product Drivers and utilities: <ftp://ftp.supermicro.com/>

If you have any questions, please contact our support team at support@supermicro.com.

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Chapter 1

Introduction

1-1 Overview

About this Motherboard

The C7Z97-M/MF supports a single 4th Generation Intel® Core™ i7/i5/i3 DT processor, in an LGA 1150 (H3) socket. With the Intel® Z97 Express chipset built in, the C7Z97-M/MF motherboard offers substantial system performance and storage capability for overclocking platforms in a sleek package. Please refer to our website (<http://www.supermicro.com/products/>) for processor and memory support updates.

1-2 Chipset Overview

Intel Z97 Express Chipset Features

- Direct Media Interface (up 10 Gb/s transfer, Full Duplex)
- Intel Rapid Storage Technology
- Intel I/O Virtualization (VT-d) Support
- Intel Trusted Execution Technology Support
- PCI Express 2.0 Interface (up to 5.0 GT/s) and PCI Express 3.0 Interface (up to 8.0 GT/s)
- SATA Controller (up to 6Gb/sec)
- Advanced Host Controller Interface (AHCI)

1-3 Motherboard Features

CPU	Single 4th Generation Intel® Core™ i7/i5/i3 DT processor, LGA1150 socket.	
Memory	Four (4) Memory slots support up to 32 GB of DDR3 Unbuffered, Non-ECC 1066~3000(OC) MHz memory	
	Dual-channel memory	
	DIMM sizes	
	UDIMM	1 GB, 2 GB, 4GB, and 8GB
Chipset	Intel® Z97 Express	
Expansion Slots	One (1) PCI Express 3.0 x8 slot (Slot 1)	
	One (1) PCI Express 2.0 x4 slot (Slot 2)	
	One (1) PCI Express 3.0 x16 slot (Slot 3)	
Network Connections	One (1) Gigabit Ethernet Controller	
	One (1) RJ-45 rear I/O panel connectors with Link and Activity LEDs, shared as an IPMI port on the C7Z97-MF	
I/O Devices	SATA Connections	
	SATA 3.0 (6Gb/s)	Six (6) I-SATA 0~5, via Intel Z97
		RAID 0, 1, 5, 10
	USB Devices	
	Two (2) USB 2.0 ports and Four (4) USB 3.0 ports on the rear I/O panel	
	Four (4) Front-Accessible USB 2.0 ports on Two headers and two (2) Front Accessible USB 3.0 ports on one header.	
	Keyboard/Mouse	
	One shared PS/2 Keyboard/Mouse port on the I/O backpanel	
	Other I/O Ports	
	One (1) DisplayPort (DP)	
	One (1) VGA Port (C7Z97-MF Only)	
	One (1) HDMI Port	
	One (1) Serial Port header (COM1)	
	Audio	
	One (1) High Definition Audio 7.1 channel connector supported by Realtek ALC1150 on the back panel	

	One (1) Front Panel Audio Header
	One (1) SPDIF Out on the rear side of the chassis
	Super I/O
	Nuvoton NCT6776D
BIOS	128 Mb AMI BIOS® SPI Flash BIOS
	Plug and Play (PnP0, DMI 2.8.0, PCI 2.3, ACPI 1.0/2.0/3.0, USB Keyboard)
Power Configuration	ACPI/ASPM Power Management
	Main Switch Override Mechanism
	Power-on mode for AC power recovery
Health Monitoring	CPU Monitoring
	Onboard voltage monitors for +1.8V, +12V, +3.3V, +5V, +5V standby, 3.3V standby
	CPU 6-phase switching voltage regulator
	CPU/System overheat LED and control
	CPU Thermal Trip support
	Thermal Monitor support
	Fan Control
	Fan status monitoring with firmware 4-pin fan speed control
	Low noise fan speed control
System Management	PECI (Platform Environment Configuration Interface) 2.0 support
	System resource alert via SuperDoctor® III
	SuperDoctor III, Watch Dog, NMI
	Chassis Intrusion header and detection
CD Utilities (for C7Z97-M only)	BIOS flash upgrade utility
	Drivers and software for Intel® Z97 Express chipset utilities
Other	ROHS 6/6 (Full Compliance, Lead Free)
Dimensions	Micro ATX form factor (9.6" x 9.6") (243.84 mm x 243.84 mm)

1-4 Special Features

Recovery from AC Power Loss

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

1-5 PC Health Monitoring

This section describes the PC health monitoring features of the board. All have an onboard System Hardware Monitoring chip that supports PC health monitoring. An onboard voltage monitor will scan these onboard voltages continuously: +1.8V, +12V, +3.3V, +5V, +5V standby, and 3.3V standby. Once a voltage becomes unstable, a warning is given, or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

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

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.

1-6 ACPI Features

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

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

Slow Blinking LED for Suspend-State Indicator

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

1-7 Power Supply

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

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

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

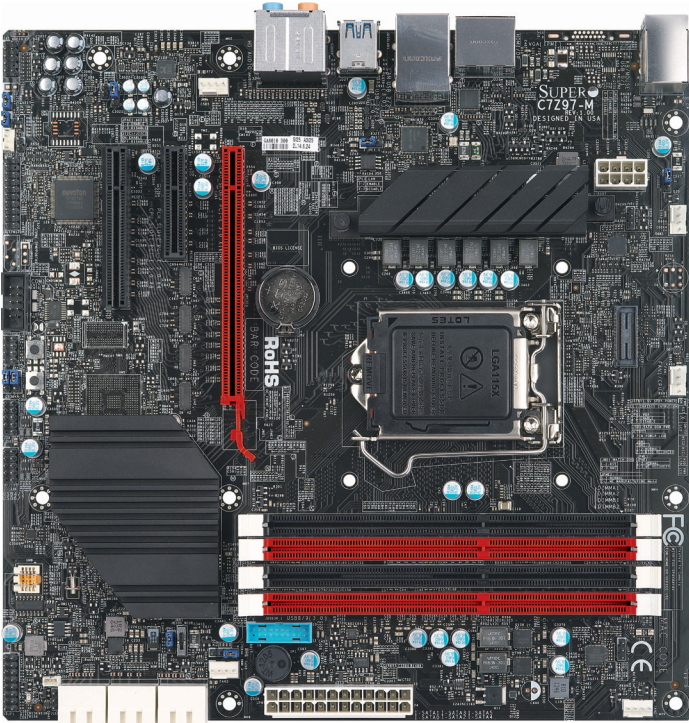
It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant. (For more information, please refer to the web site at <http://www.ssiforum.org/>). Additionally, in areas where noisy power transmission is present,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

1-8 Super I/O

The Super I/O supports a 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.

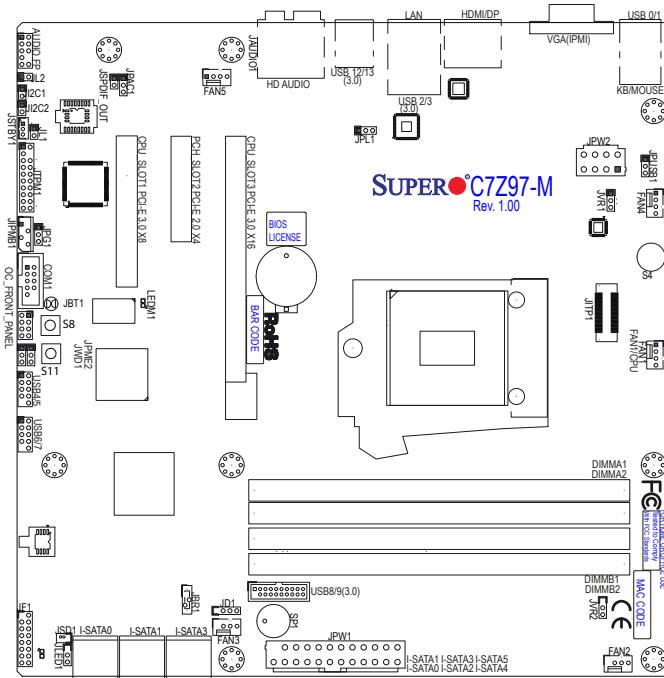
The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

C7Z97-M/C7Z97-MF Motherboard Image



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

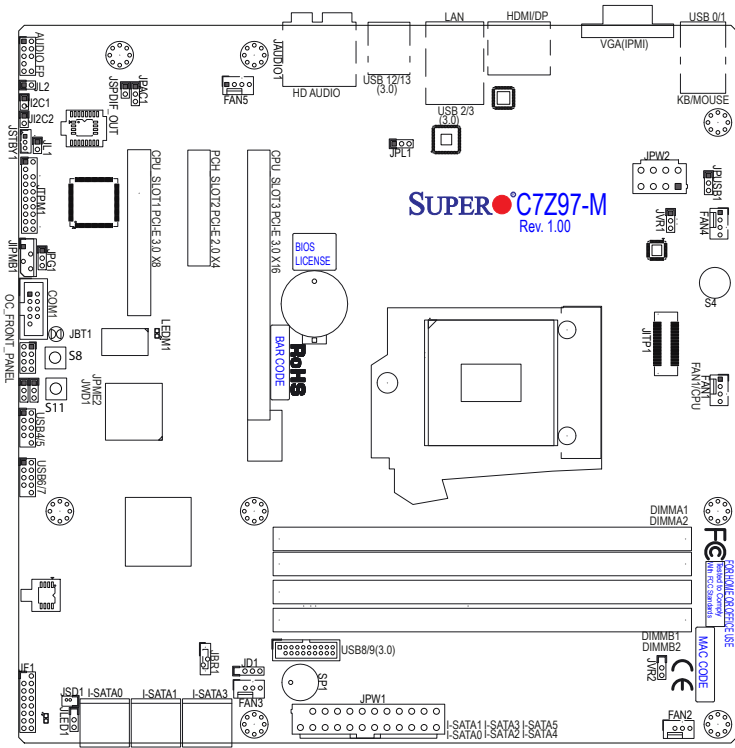
C7Z97-M/C7Z97-MF Motherboard Layout



Important Notes to the User

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

C7Z97-M/C7Z97-MF Quick Reference

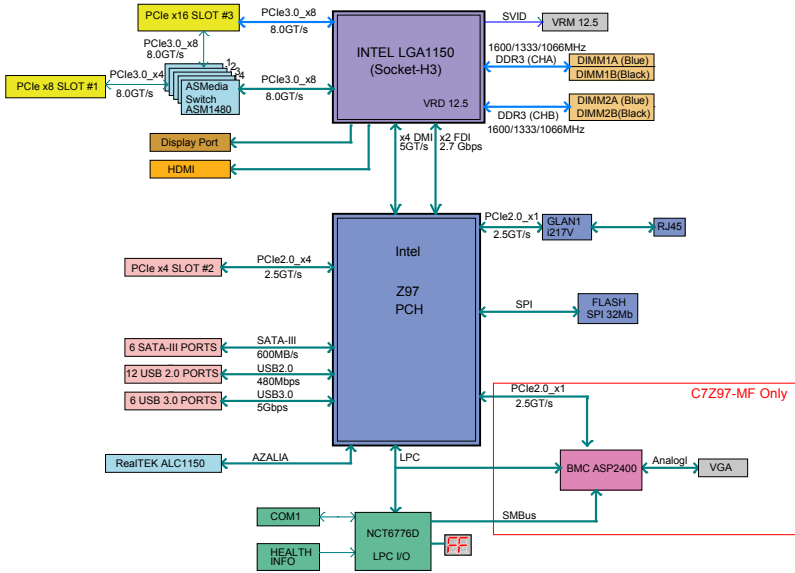


Jumper	Description	Default
JBT1	Clear CMOS (on board)	(See Chpt. 2)
JPC1/JPC2	SMB to PCI Slots	Off (Disabled)
JPAC1	Audio Enable	Pins 1-2 (Enabled)
JPL1	LAN1 Enable	Pins 1-2 (Enabled)
JPME2	Intel Recovery Mode	Pins 2-3 (Disabled)
JBR1	BIOS Recovery Mode	Pins 2-3 (Disabled)
JWD1	Watch Dog Timer Reset Enable	Pins 2-3 (NMI)
JPUSB1	USB Wake Up Enable (Back Panel)	Pins 1-2 (Enabled)
JPG1	BMC VGA Enable/Disable	Pins 1-2 (Enabled)

LED	Description	Color/State	Status
LEDM1	IPMI Heartbeat	Green: Blinking	BMC/IPMI Normal
LED1	Onboard Standby PWR LED	Green: Solid on	Power On

Connector	Description
I/O Back Panel	See Back Panel I/O Connectors, below right
Audio FP	Front Panel Audio Header
Battery	Onboard Battery
COM1	COM1 Port Header
Fan 1,2,3,4,5	System/CPU Fan Headers (Fan1: CPU Fan)
JD1	Speaker/buzzer (Pins 1~4: External Speaker, Pins 3~4: Buzzer)
JF1	Front Panel Control Header
JL2	Chassis Intrusion Header
JLED1	Power LED Indicator Header
JPW1	24-pin ATX Main Power Connector (Required)
JPW2	+12V 8-pin CPU power Connector (Required)
JSD1	SATA DOM (Disk On Module) Power Connector
JSPDIF_OUT	Sony/Philips Digital Interface (S/PDIF) Out Header
JSTBY1	Standby Power Header
SP1	Internal Speaker/Buzzer
I-SATA0~5	(Intel Z97) Serial ATA (SATA 3.0) Ports 0~5 (6Gb/sec)
USB 4/5, 6/7	Front Panel Accessible USB 2.0 Headers 4/5, 6/7
USB 8/9 (3.0)	Front Panel Accessible USB 3.0 Header 8/9
OC FRONT PANEL	Header for the Over-Clocking Control Panel
JTPM1	Trusted Platform Module/Port 80 Connector
S4	Internal Power Button
S8	Clear CMOS Button
S11	BIOS Restore Button

C7Z97-M/C7Z97-MF 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.

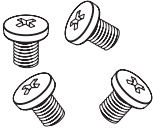
Notes

Chapter 2

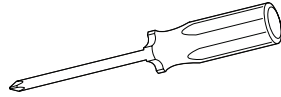
Installation

2-1 Installation Components and Tools Needed

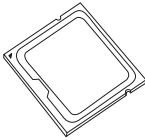
Screws



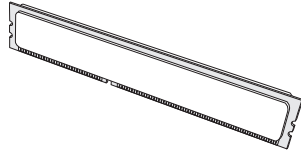
Phillips-Head Screwdriver



Intel LGA 1150 Processor



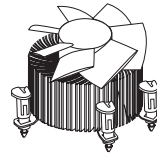
DDR3 DIMMs



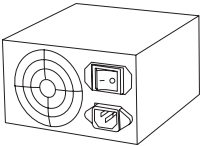
PC Chassis



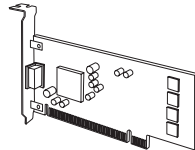
Heatsink with Fan



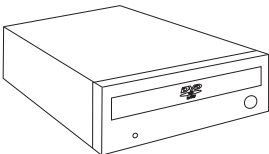
Power Supply



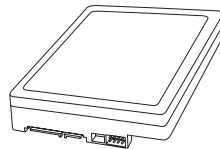
Video Card (Optional)



SATA/USB Optical Drive (Optional)



SATA Hard Disk Drive



2-2 Static-Sensitive Devices

Electrostatic-Discharge (ESD) can damage electronic components. To avoid damaging your system 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

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



Important:

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

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

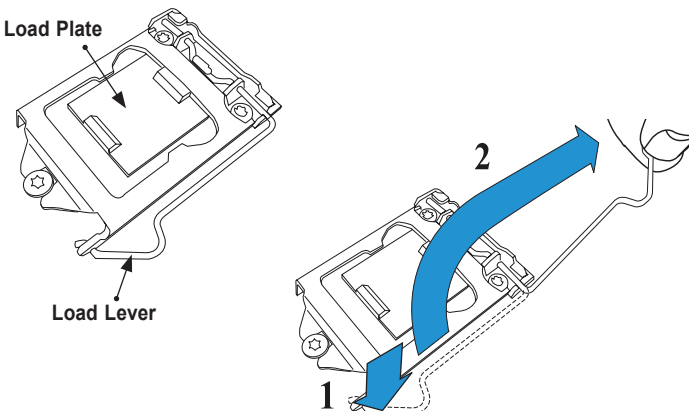
Make sure to install the system board into the chassis before you install the CPU heatsink.

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.

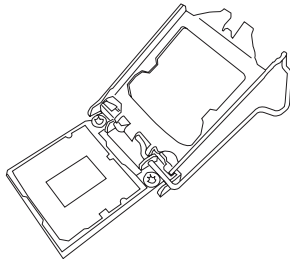
Refer to the Supermicro website for updates on CPU support.

Installing the LGA1150 Processor

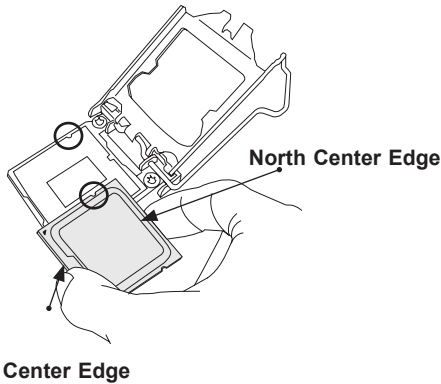
1. Press the load lever to release the load plate, which covers the CPU socket, from its locking position.



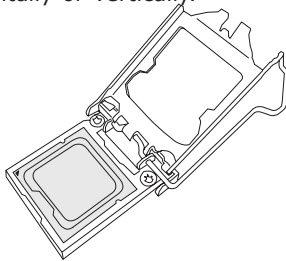
2. Gently lift the load lever to open the load plate. Remove the plastic cap.



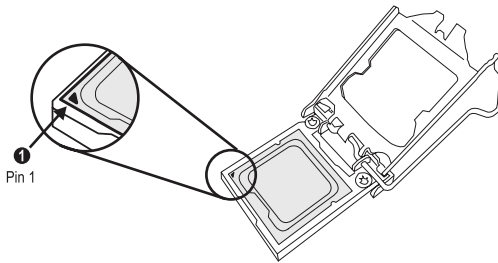
3. Use your thumb and your index finger to hold the CPU at the North center edge and the South center edge of the CPU.



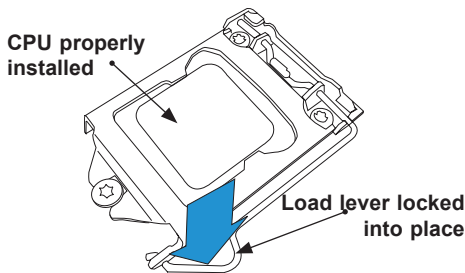
4. Align the CPU key that is the semi-circle cutouts against the socket keys. Once it is aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically.)



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



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



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

Installing an Active CPU Heatsink with Fan

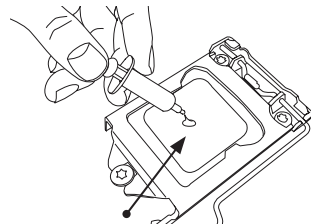
1. Locate the CPU Fan power connector on the motherboard. (Refer to the layout on the right for the CPU Fan location.)
2. Position the heatsink so that the heatsink fan wires are closest to the CPU fan power connector and are not interfered with other components.
3. Inspect the CPU Fan wires to make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

! Attention! CPU overheating may occur if the protective film is not removed from the heatsink.

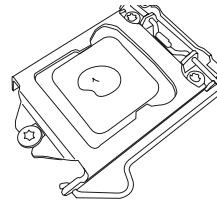
5. Apply the proper amount of thermal grease on the CPU.

Note: if your heatsink came with a thermal pad, please ignore this step.

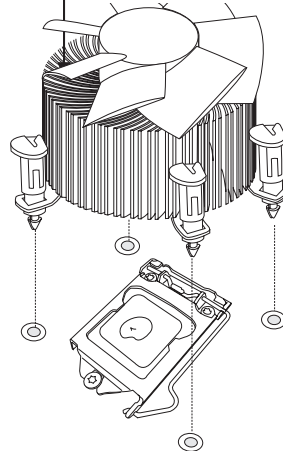
6. If necessary, rearrange the wires to make sure that the wires are not pinched between the heatsink and the CPU. Also make sure to keep clearance



Thermal Grease



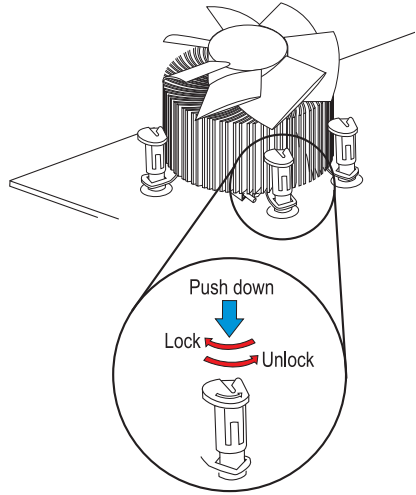
Heatsink Fins



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

between the fan wires and the fins of the heatsink.

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

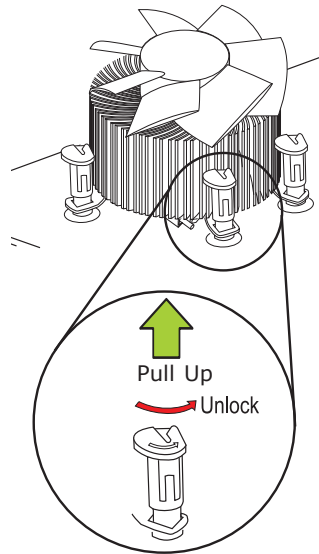
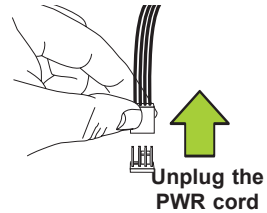


Removing the Heatsink

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

Active Heatsink Removal

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



2-4 Installing DDR3 Memory



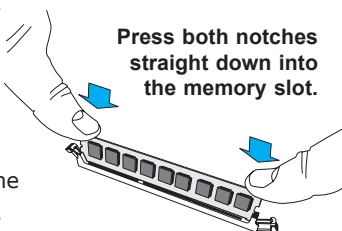
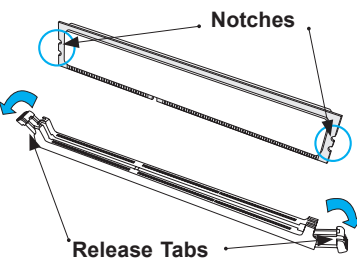
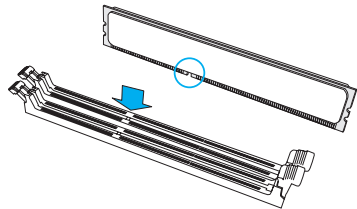
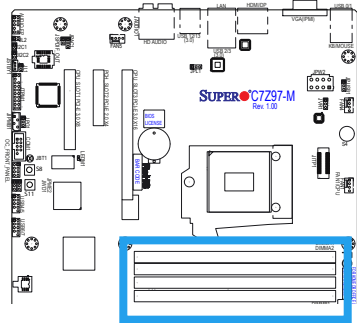
Note: Check the Supermicro website for recommended memory modules.



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

DIMM Installation

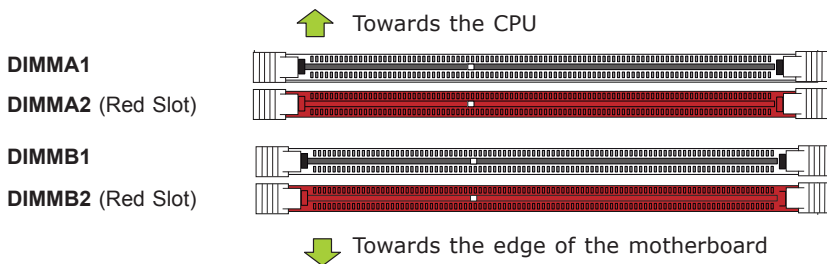
1. Insert the desired number of DIMMs into the memory slots, starting with DIMMA2 (see the next page for the location). For the system to work properly, please use the memory modules of the same type and speed in the same motherboard.
2. Push the release tabs outwards on both ends of the DIMM slot to 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 C7Z97-M/MF supports up to 32GB of Unbuffered (UDIMM) DDR3 Non-ECC 1066~3000(OC) MHz 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:

Memory Population Guidelines

Please follow the table below when populating the C7Z97-M/MF.

DDR3 Unbuffered Non-ECC (UDIMM) Memory				
DIMM Slots per Channel	DIMMs Populated per Channel	DIMM Type	POR Speeds	Ranks per DIMM (any combination)
2	1	Unbuffered DDR3	1066, 1333, 1600, 1866	Single Rank, Dual Rank
2	2	Unbuffered DDR3	1066, 1333, 1600, 1866	Single Rank, Dual Rank



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 re-

duced when 4 GB of RAM is used. The reduction in memory availability is disproportional. See the following table for details.

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

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

Memory Population Guidelines

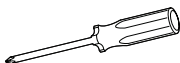
When installing memory modules, the DIMM slots should be populated in the following order: DIMMA2, DIMMB2, then DIMMA1, DIMMB1.

- Always use DDR3 DIMM modules of the same size, type and speed.
- Mixed DIMM speeds can be installed. However, all DIMMs will run at the speed of the slowest DIMM.

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

2-5 Motherboard Installation

All motherboards have standard mounting holes to fit different types of chassis. Make sure that the locations of all the mounting holes for both motherboard and chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure that the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.



Philips Screwdriver (1)

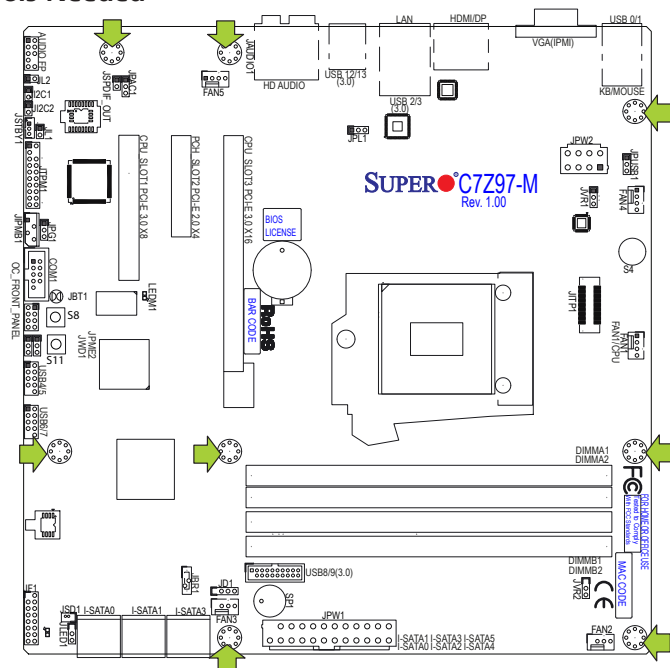


Philips Screws (8)



Standoffs (8)
Only if Needed

Tools Needed



Location of Mounting Holes

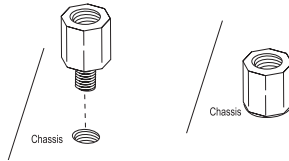
- Attention!** 1) To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to avoid damaging these components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

Installing the Motherboard

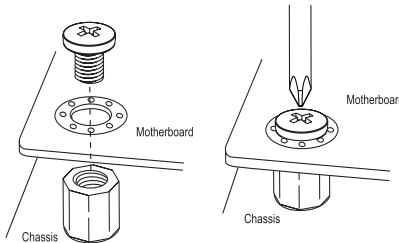
1. Install the I/O shield into the back of the chassis.



2. Locate the mounting holes on the motherboard. (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.

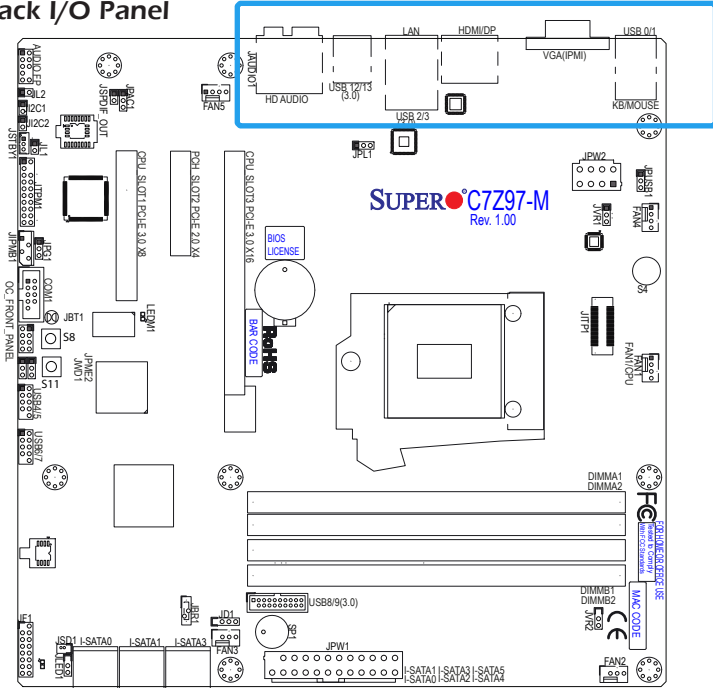


Note: Images displayed are for illustration only. Your chassis or components might look different from those shown in this manual.

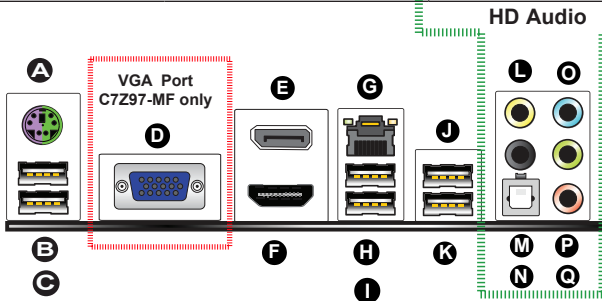
2-6 Connectors/I/O Ports

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.

Back I/O Panel



A. PS/2 Keyboard/Mouse Port	F. HDMI Port	L. Center/LFE Out
B. USB 2.0 Port 0	G. Gb LAN Port 1 / IPMI Port*	M. Surround Out
C. USB 2.0 Port 1	H. USB 3.0 Port 2	N. S/PDIF Out
D. VGA Port*	I. USB 3.0 Port 3	O. Line In
E. VESA DisplayPort	J. USB 3.0 Port 12	P. Line Out
	K. USB 3.0 Port 13	Q. Mic In
** Shared port, LAN1 + IPMI on C7Z97-MF		



Universal Serial Bus (USB)

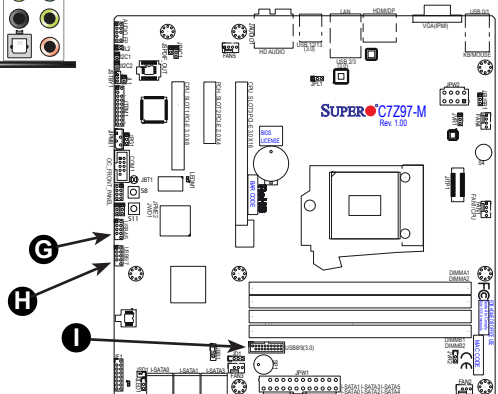
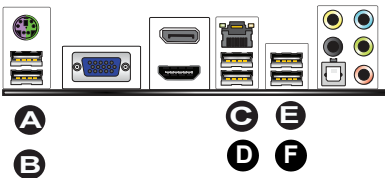
Two Universal Serial Bus 2.0 ports (0/1) and four USB 3.0 ports (2/3,12/13) are located on the I/O back panel. In addition, two USB 2.0 headers (four ports: 4/5, 6/7), and one USB 3.0 header (two ports: 14/15) are also located on the motherboard to provide front chassis access using USB cables (not included).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

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

Back Panel USB (2.0) #0/1, USB (3.0) #2/3, 12/13 Pin Definitions			
Pin#	Definition	Pin#	Definition
1	+5V	5	+5V
2	USB_PN1	6	USB_PN0
3	USB_PP1	7	USB_PP0
4	Ground	8	Ground

Front Panel USB (3.0) Header #14/15 Pin Definitions			
Pin#	Pin#	Signal Name	Description
1	10	VBUS	Power
2	11	D-	USB 2.0 Differential Pair
3	12	D+	
4	13	Ground	Ground of PWR Return
5	14	StdA_SSRX-	SuperSpeed Receiver
6	15	StdA_SSRX+	Differential Pair
7	16	GND_DRAIN	Ground for Signal Return
8	17	StdA_SSTX-	SuperSpeed Transmitter
9	18	StdA_SSTX+	Differential Pair

- A. Backpanel USB 2.0 #0
- B. Backpanel USB 2.0 #1
- C. Backpanel USB 3.0 #2
- D. Backpanel USB 3.0 #3
- E. Backpanel USB 3.0 #12
- F. Backpanel USB 3.0 #13
- G. USB 2.0 Header #4/5
- H. USB 2.0 Header #6/7
- I. USB 3.0 Header #14/15



Ethernet / IPMI Port

One Gigabit Ethernet ports (LAN1) is located next to the HD Audio Connector on the I/O Backpanel to provide network connections. These ports accept RJ45 type cables. On the C7Z97-MF, this is also the same port that supports the IPMI feature.



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

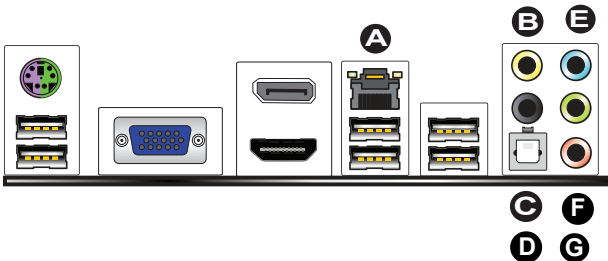
LAN Ports Pin Definition			
Pin#	Definition		
1	P2V5SB	10	SGND
2	TD0+	11	Act LED
3	TD0-	12	P3V3SB
4	TD1+	13	Link 100 LED (Green, +3V3SB)
5	TD1-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD2-	16	Ground
8	TD3+	17	Ground
9	TD3-	88	Ground

(NC: No Connection)

Back Panel High Definition Audio (HD Audio)

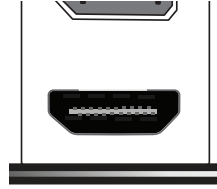
This motherboard features a 7.1+2 Channel High Definition Audio (HDA) codec that provides 10 DAC channels. The HD Audio connections simultaneously supports multiple-streaming 7.1 sound playback with 2 channels of independent stereo output through the front panel stereo out for front, rear, center and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

- A. LAN1 / IPMI
- B. Center/LFE Out
- C. Surround Out
- D. S/PDIF Out
- E. Line In
- F. Line Out
- G. Mic In



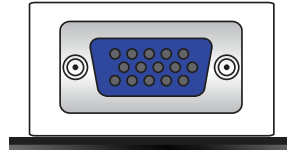
HDMI Port

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



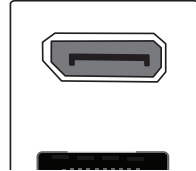
VGA Port

A VGA port is located next to the USB ports 0/1 on the I/O backpanel. Use this port to connect to a compatible VGA display.



VESA® DisplayPort™ (DP)

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

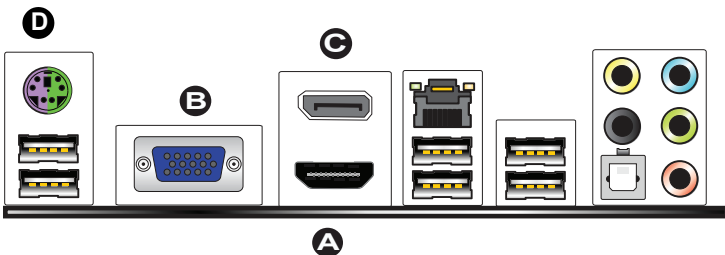


ATX PS/2 Keyboard/Mouse Port

The ATX PS/2 keyboard / PS/2 mouse port is located above Back Panel USB Ports 0/1.

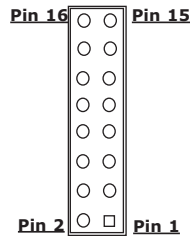
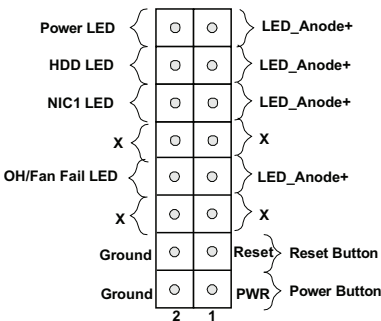
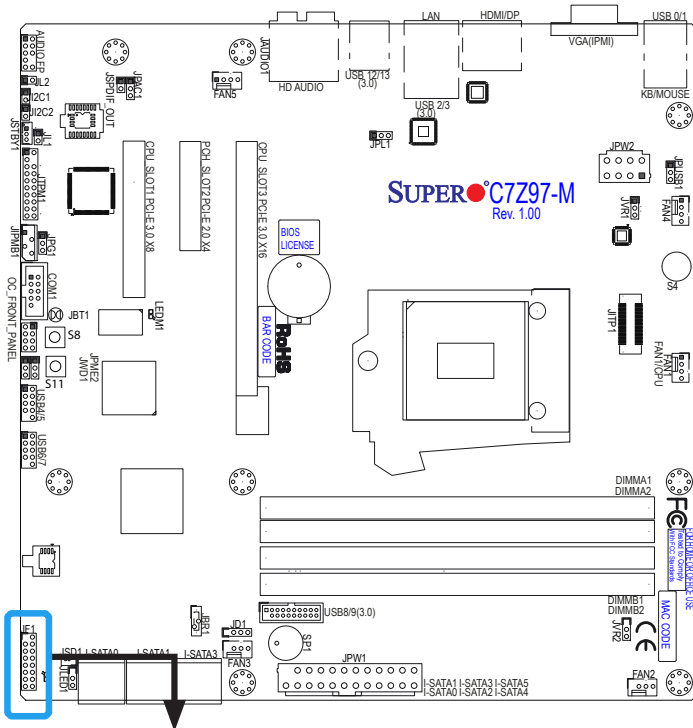


- A. HDMI Port
- B. VGA Port
- C. VESA DisplayPort



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.



JF1 Header Pins

Front Control Panel Pin Definitions

Power LED

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

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	+5V
16	Ground

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.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	+5V
14	HD Active

NIC1 (LAN1)

The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1. NIC1 LED is a 2-pin NIC LED header. Attach a NIC LED cable to the NIC1 indicator to display network activity. Refer to the table on the right for pin definitions.

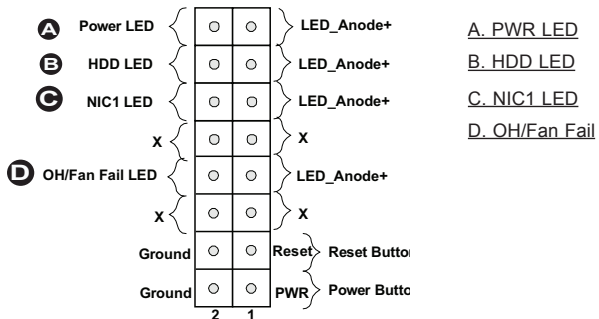
LAN1 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	Ground

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

Overheat (OH)/Fan Fail

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

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



Reset Button

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

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

Power Buttons

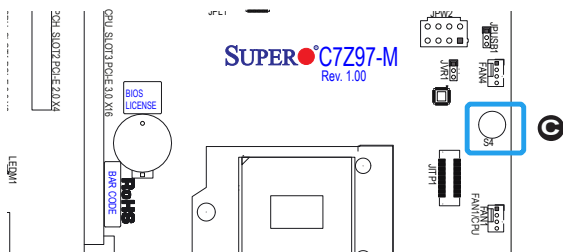
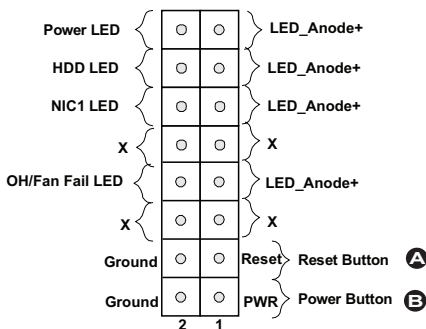
The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 4). To turn off the power in the suspend mode, press the button for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

Power Button Pin Definitions (JF1)	
Pin#	Definition
1	Signal
2	+3V Standby

A. Reset Button

B. PWR Button

C. On Board Power Button



2-7 Connecting Cables

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

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

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

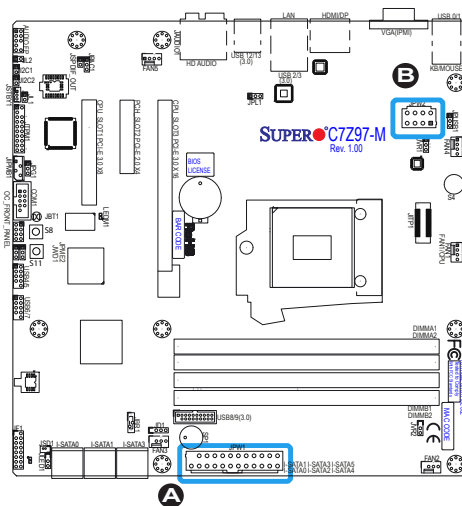
12V 8-pin Power Connector Pin Definitions	
Pins	Definition
1 through 4	Ground
5 through 8	+12V

(Required)

ATX Power 24-pin Connector Pin Definitions (JPW1)			
Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

A. 24-Pin ATX Main PWR

B. 8-Pin PWR



Fan Headers (Fan 1 ~ Fan 5)

The C7Z97-M/MF has five fan headers (Fan 1~Fan 5). These fans are 4-pin fan headers. Although pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans, we recommend the use 4-pin fans to take advantage of the fan speed control. This allows the fan speeds to be automatically adjusted based on the motherboard temperature. Refer to the table on the right for pin definitions.

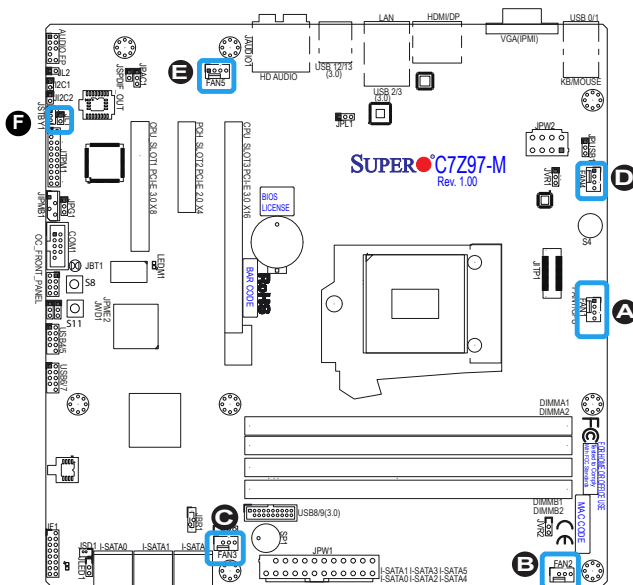
Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	2.5A/+12V (Red)
3	Tachometer
4	PWM_Control

Chassis Intrusion (JL1)

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

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

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



Internal Buzzer (SP1)

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

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

Speaker (JD1)

On the JD1 header, Pins 3~4 are used for internal speaker. Close Pins 3~4 with a 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.

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

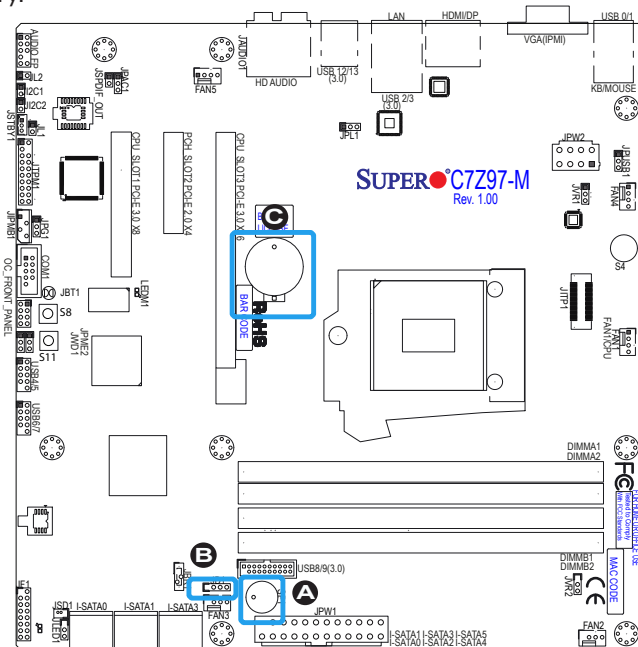
System Backup Battery (BT1)

A system backup battery is provided on the motherboard. This provides backup power to the CMOS when the system is off. This is so the motherboard does not lose its setup configuration. See Chapter 3 for instructions on how to replace the battery.

A. Internal Buzzer

B. Speaker Header

C. Backup Battery



Onboard Power LED (JLED1)

An onboard Power LED header is located at next to the SATA ports. 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.

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

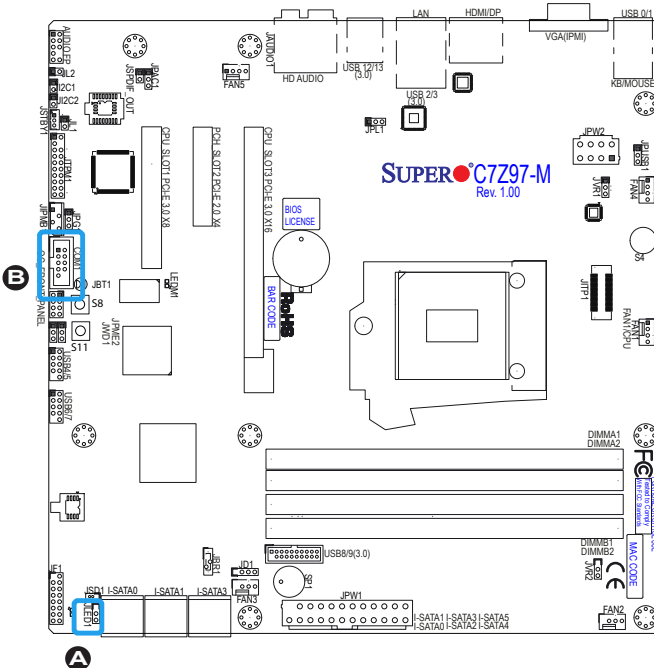
Serial Port (COM1)

There is one serial (COM) port header on the motherboard. COM1 is located next to the JPIMB header. See the table on the right for pin definitions.

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

A. PWR LED

B. COM1



DOM PWR Connector (JSD1)

The Disk-On-Module (DOM) power connector, located next to the SATA ports, 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.

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

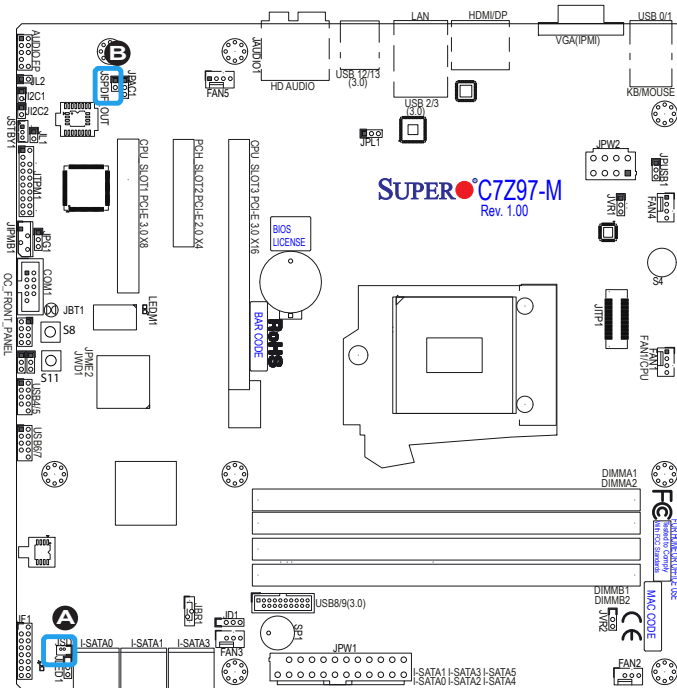
SPDIF OUT (JSPDIF_OUT)

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

SPDIF_OUT Pin Definitions	
Pin#	Definition
1	S/PDIF_Out
2	Ground

A. DOM PWR

B. S/PDIF OUT



Standby Power Header (STBY1)

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

Standby Power Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

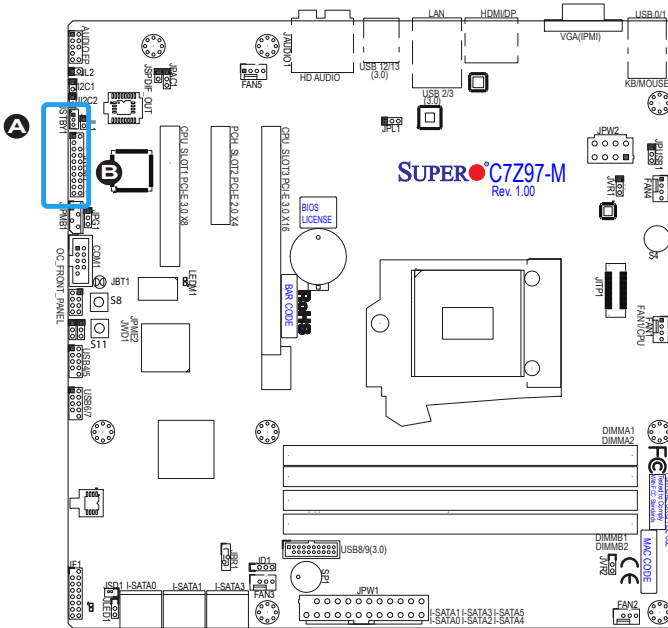
TPM Header/Port 80 Header

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.

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

A. STBY PWR

B. TPM Header



Front Panel Audio Header (AUDIO FP)

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

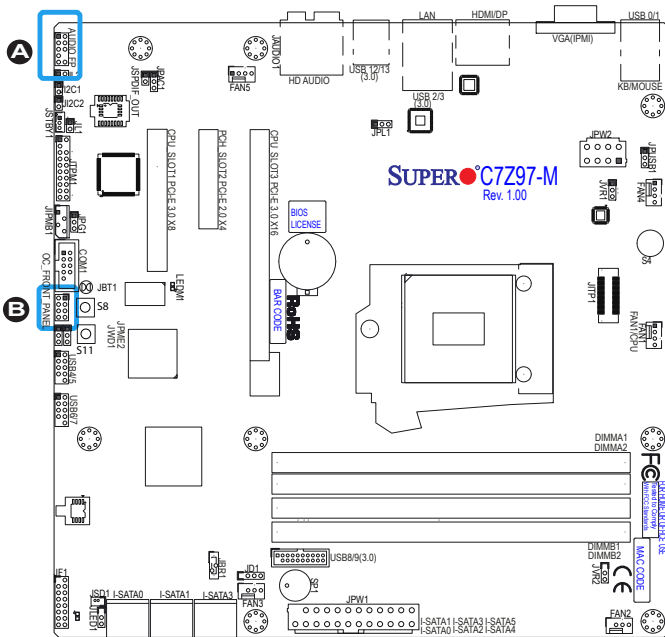
10-In Audio Pin Definitions	
Pin#	Signal
1	Microphone_Left
2	Audio_Ground
3	Microphone_Right
4	Audio_Detect
5	Line_2_Right
6	Ground
7	Jack_Detect
8	Key
9	Line_2_Left
10	Ground

OC Front Panel (OC FRONT PANEL)

This header is for the Over-Clocking (OC) control panel, which is optional with the motherboard. If available, attach the control panel's cable to this header. The OC control panel enables over-clocking control and management from the front of the chassis.

A. AUDIO FP

B. OC FRONT PANEL



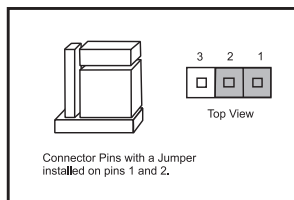
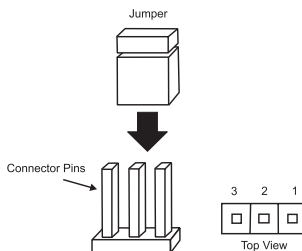
2-8 Jumper Settings

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.

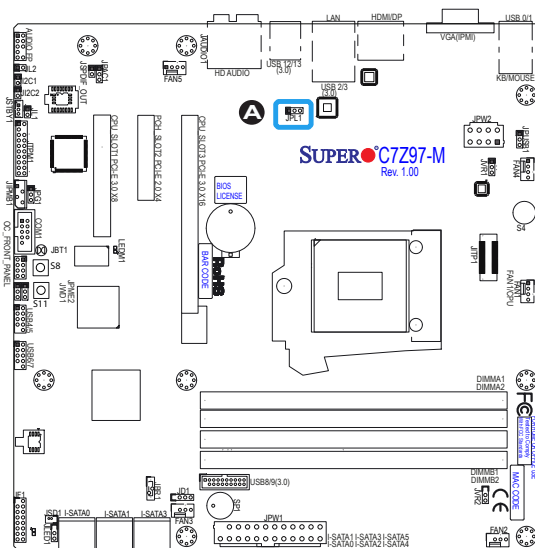


LAN1 Enable/Disable (JPL1)

Jumper JPL1 enables or disables LAN port 1 on the motherboard. See the table on the right for jumper settings. The default setting is enabled.

GLAN Enable Jumper Settings	
Pin#	Definition
1-2	Enabled (default)
2-3	Disabled

A. JPL1: LAN1 Enable



Clear CMOS (JBT1), (S8)

JBT1 and the S8 Button is used to clear the saved system setup configuration stored in the CMOS chip. For JBT1, to clear the contents of the CMOS, completely shut down the system, remove the AC power cord and then short JBT1 with a metallic object such as a screwdriver. For the S8 Button, shut off the system and press this button.

Any of these two will erase all user settings and revert everything to their factory-set defaults.



Note: On the C7Z97-MF, the boot time immediately after clearing the CMOS may take longer due to additional IPMI functions.

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.

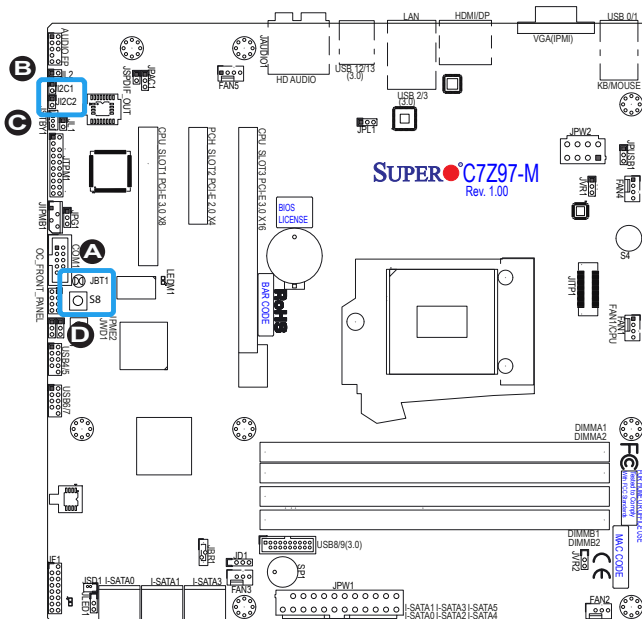
PCI Slot SMB Enable Jumper Settings	
Jumper Setting	Definition
Short	Enabled
Open (Default)	Disabled

A. Clear CMOS

B. JI²C1

C. JI²C2

D. Clear CMOS Button



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.

Audio Enable/Disable Jumper Settings	
Both Jumpers	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

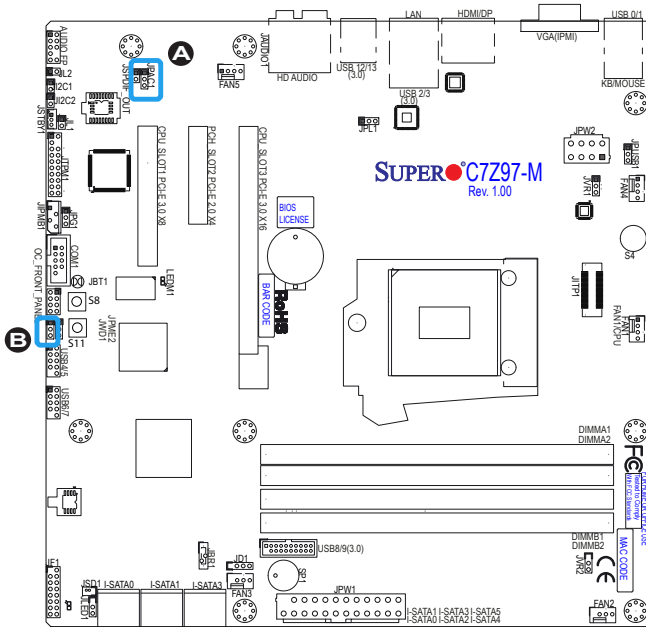
Watch Dog Enable/Disable (JWD1)

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.

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

A. Audio Enable

B. Watch Dog Enable



USB Wake-Up (JPUSB 1/2)

Use jumper JPUSB to activate the "wake-up" function of the USB ports by pressing a key on a USB keyboard or clicking the USB mouse connected. This jumper is used together with a USB Wake-Up feature in the BIOS. Enable this jumper and the USB support in the BIOS to wake up your system via USB devices.



Note: Use JPUSB1 for the USB ports on the back panel, and JPUSB2 for the front panel USB headers.

USB Wake-Up Jumper Settings	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled (Default)

VGA Enable (JPG1)

Use jumper JPG1 to Enable or Disable the onboard video port (C7Z97-MF Only).

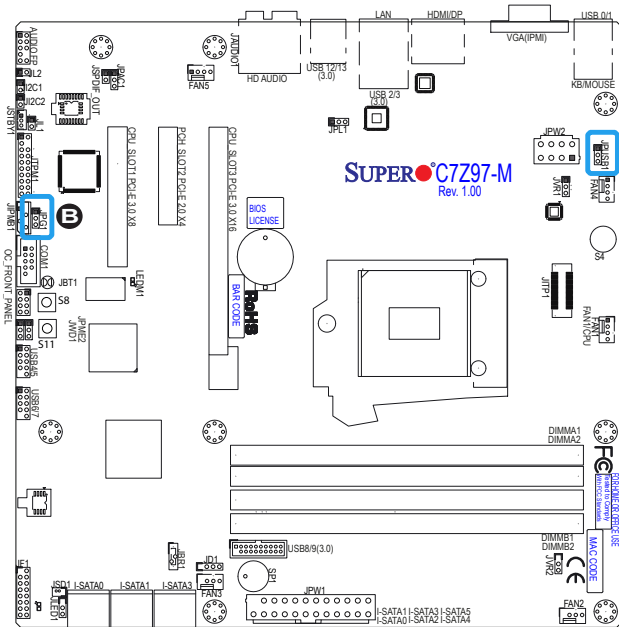


Note: Options in the BIOS also control this feature. Please see "Internal Graphics" on page 4-36.

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

A. USB Wake-Up

B. VGA Enable



Manufacturing Mode (JPME2)

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

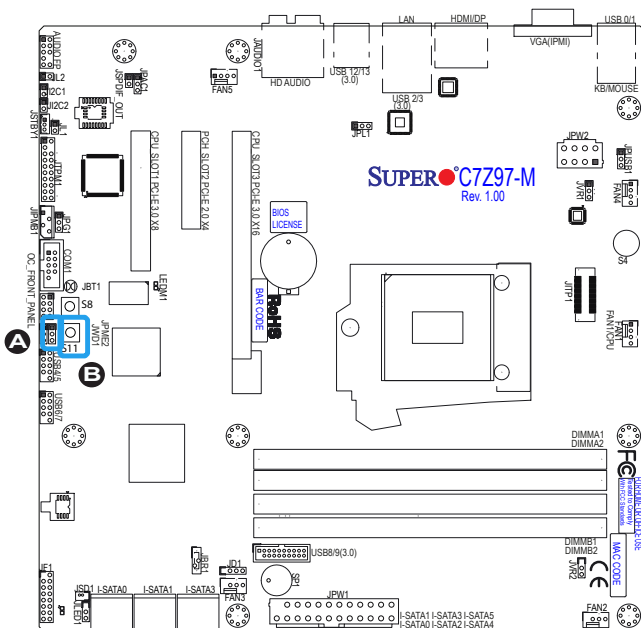
Manufacture Mode (JPME2) Jumper Settings	
Pin#	Definition
1-2	Normal (Default)
2-3	Manufacture Mode

BIOS Restore Button (S11)

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

A. Manufacturing Mode

B. BIOS Restore



BIOS Recovery Switch (JBR1)

The BIOS Recovery Switch (JBR1) is used to enable or disable the BIOS Recovery feature of the motherboard. Slide the switch from the default position to begin the recovery process. See Appendix D for details.

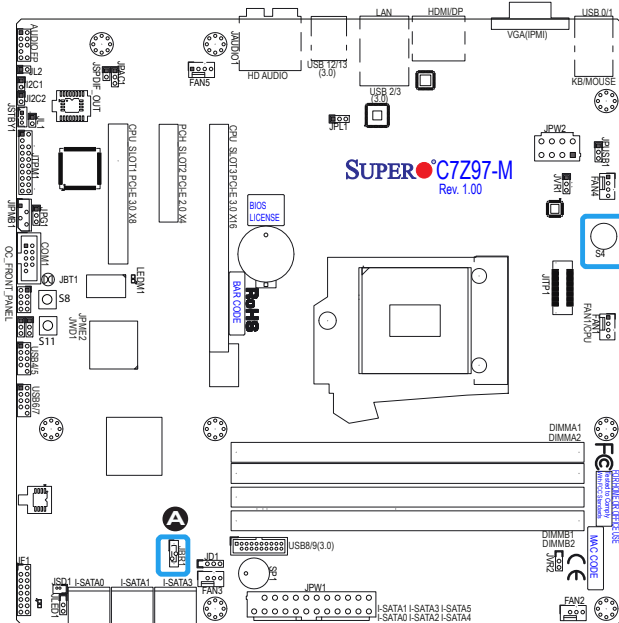
BIOS Recovery (JBR1) Jumper Settings	
State	Definition
Off	Normal (Default)
On	Recover

Power Button (POWER BUTTON)

In addition to the soft power switch provided in JF1, your motherboard is equipped with a 'soft' power button on the motherboard. This switch works the same way as the soft power switch on JF1.

A. BIOS Recovery

B. Power Button



2-9 Onboard Indicators

LAN 1 LEDs

One LAN port (LAN 1) is located on the I/O back panel of the motherboard. This 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.

GLAN 1/2 Activity Indicator LED Settings		
Color	Status	Definition
Yellow	Flashing	Active

GLAN Ports 1/2 Link Indicator LED Settings	
LED Color	Definition
Off	No Connection/10 Mbps/100 Mbps
Amber	1 Gbps
Green	10 Gbps.



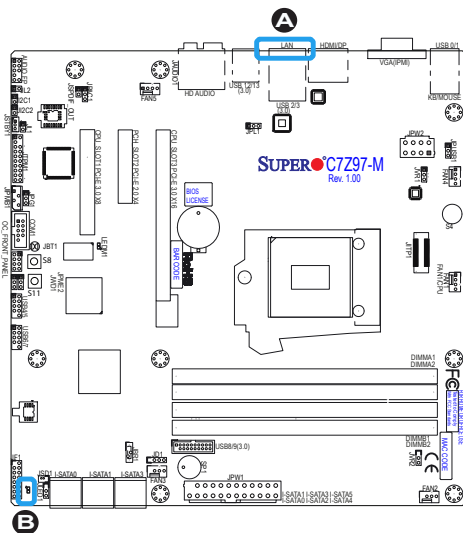
Onboard Power LED (LED1)

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.

Onboard PWR LED Indicator LED Status	
Status	Definition
Off	System Off
On	System on, or System off and PWR Cable Connected

A. LAN 1 LEDs

B. PWR LED

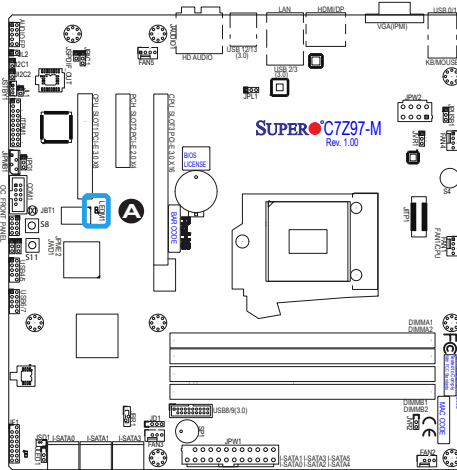


IPMI Heartbeat (LEDM1)

The IPMI Heartbeat LED displays the status of the IPMI / BMC (Baseboard Management Controller).

IPMI Heartbeat LED Status	
Status	Definition
Off	System Off
Blinking	IPMI/BMC is on and working normally

A. IPMI Heartbeat



2-10 SATA Connections

SATA Connections (I-SATA0~I-SATA5)

Six Serial ATA (SATA) 3.0 connectors (I-SATA 0~5) are supported on the board. The I-SATA 3.0 ports are supported by the Intel Z97 PCH chip (supports RAID 0,1,5,10). These Serial Link connections provide faster data transmission than legacy Parallel ATA. See the table below for pin definitions.

SATA 2.0/3.0 Connectors Pin Definitions	
Pin#	Signal
1	Ground
2	SATA_TXP
3	SATA_TXN
4	Ground
5	SATA_RXN
6	SATA_RXP
7	Ground

Top

A. I-SATA 3.0 #1

B. I-SATA 3.0 #3

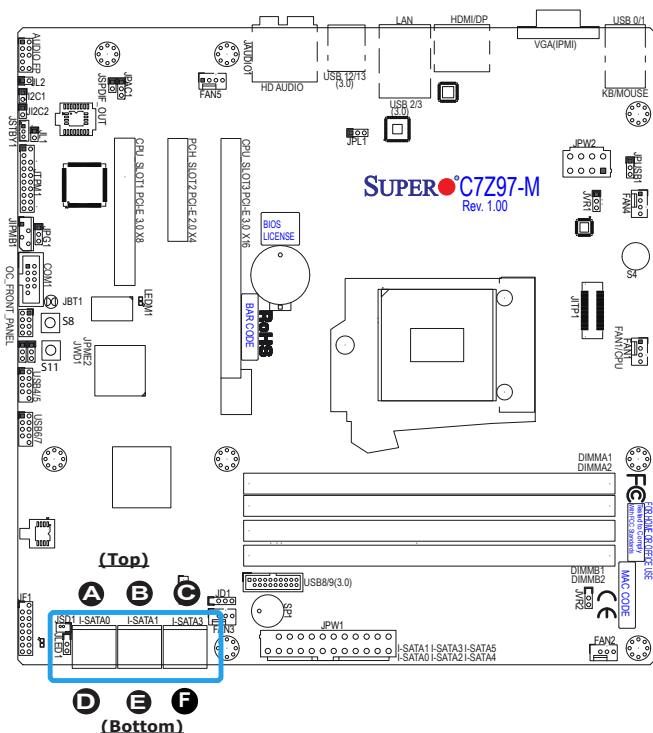
C. I-SATA 3.0 #5

Bottom

D. I-SATA 3.0 #0

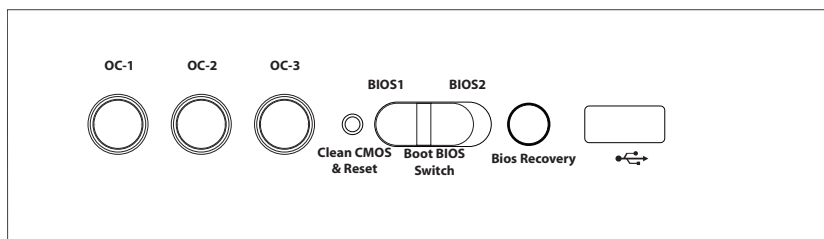
E. I-SATA 3.0 #2

F. I-SATA 3.0 #4



2-10 The OC Front Control Panel (Optional)

The OC (Over-Clocking) Front Control Panel has Six (6) control buttons, switches and one USB port.



Over-Clocking Buttons (OC1, OC2, OC3)

Press these buttons to activate the over-clocking feature of the motherboard. These buttons will allow the CPU to run above its rated speed. This is an advanced feature and should only be used by experienced users. These work the same way as the OC buttons on the motherboard, see Page 2-32 for details.

Clear CMOS and Reset

Use the push-button hardware switch to clear the CMOS memory back to its default values and reset the system. There is also a similar switch on the motherboard (JBT1), but is made up of two contact pads that need to be shorted with a metallic object (i.e., screwdriver, etc).

Boot BIOS Switch

The Boot BIOS Switch is used to select between two boot BIOS blocks that are installed on the motherboard. See Appendix D for details.

BIOS Recovery

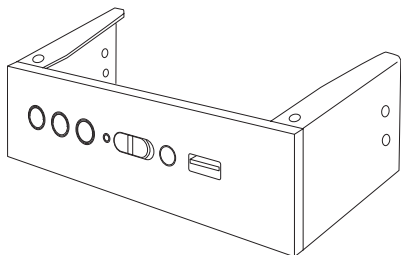
Push the BIOS Recovery button to enable the motherboard to enter the BIOS Recovery process and re-install the BIOS, reverting all settings back to factory default. It looks for a file named "SUPER.ROM" from a memory device attached to any of the USB drives. It functions the same way as the BIOS Restore Button which is installed on the motherboard, see page 2-34.

Front USB Port

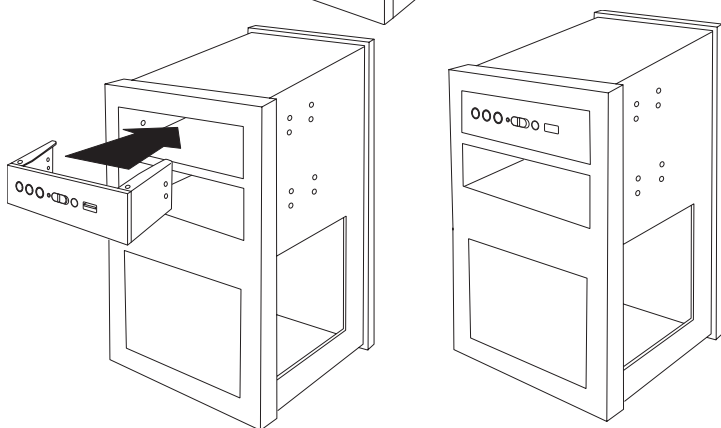
The Front USB Port is defined as USB 3.0 Port# XX on this motherboard. It is conveniently located on the OC panel for quick access for USB memory sticks and other storage devices.

Installing the OC Front Control Panel

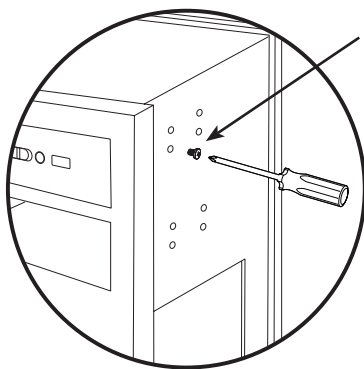
The OC Front Control Panel is designed to fit into an external 5.25-inch external drive bay of a desktop-style or tower-style computer chassis. Make sure that the appropriate type of screws are used.



The OC Front Control panel

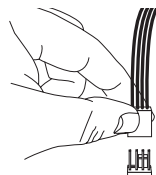


The OC Control panel easily slides into a standard 5.25-inch drive bay on a desktop or tower-style computer chassis.



Make sure to secure the OC Control Panel with the correct screws, but do not over-tighten.

Connect all the OC Control Panel cables to the appropriate headers located on the motherboard.



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) 1800/1600/1333/1066 MHz memory recommended by the manufacturer. Also, it is recommended that you use the memory modules of the same type and speed for all DIMMs in the system. Do not use memory modules of different sizes, different speeds and different types on the same motherboard.
3. Check for bad DIMM modules or slots by swapping modules between slots to see if you can locate the faulty ones.
4. Check the switch of 115V/230V power supply.

When the System is Losing the Setup Configuration

1. Please be sure to use a high quality power supply. A poor quality power supply may cause the system to lose CMOS setup information. Refer to Section 1-5 for details on recommended power supplies.
2. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.
3. If the above steps do not fix the Setup Configuration problem, contact your vendor for repairs.

3-2 Technical Support Procedures

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

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



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

3. If you've followed the instructions above to troubleshoot your system, and still cannot resolve the problem, then contact Supermicro's technical support and provide them with the following information:
 - Motherboard model and PCB revision number
 - BIOS release date/version (this can be seen on the initial display when your system first boots up)
 - System configuration
 - An example of a Technical Support form is on our website at (<http://www.supermicro.com/support/contact.cfm>).
4. Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com, 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 C7Z97-M/MF supports up to 32GB of unbuffered Non-ECC DDR3 SDRAM, 1066~3000 MHz (OC). See Section 2-4 for details on installing memory.

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/>. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Select your motherboard model and download the BIOS ROM file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. 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., C7Z97) and build version as the extension. For example, "C7Z97.115". 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.



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



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

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

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

Question: Why do I get an error message "IASTOR.SYS read error" and "press F6 to install Intel RAID driver" when installing Windows on my motherboard?

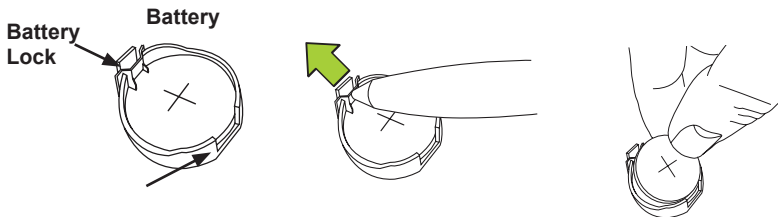
Answer: To solve this issue, disable the IPMI jumper. Another solution is to use a USB floppy drive instead of the onboard floppy drive. For the IPMI jumper location, please check Chapter 1.

3-4 Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps below:

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



Proper Battery Disposal

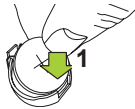
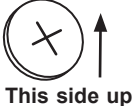
! **Attention!** Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste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

Battery Installation

1. To install an onboard battery, follow the steps 1& 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.

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

Battery Holder



3-5 Returning Motherboard for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. For faster service, you may also obtain RMA authorizations online (<http://www.supermicro.com/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 C7Z97-M/MF. 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 GUI Setup Utility

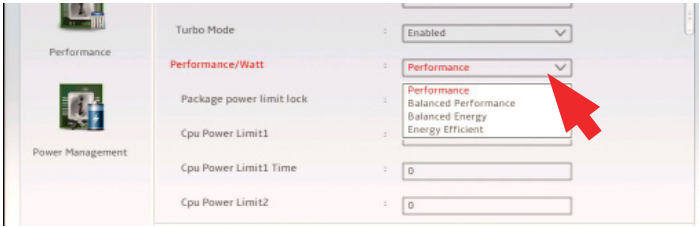
To enter the AMI BIOS GUI Setup Utility screens, press the <Delete> key while the system is booting up.



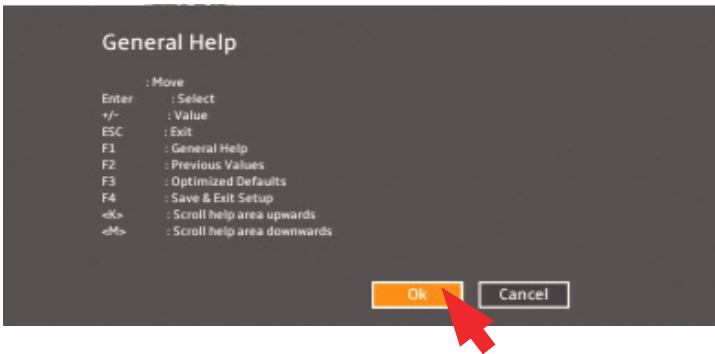
Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen.



Each BIOS menu option is described in this manual. The Main BIOS Setup screen has two main areas. The top area is the Main Navigation, and the main area is for the Setup Section. Icons that do not respond when the mouse pointer is hovering on top are not configurable.



The AMI BIOS GUI Setup Utility uses a mouse pointer navigation system similar to standard graphical user interfaces. Hover and click an icon to select a section, click a down arrow to select from an options list.



Except for the Home screen you may press the <F1> on any screen under the Setup Section to see a list of Hot Keys that are available.

How To Change the Configuration Data

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



Note: For the purposes of this manual, options that are printed in **Bold** are default settings.

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 GUI Setup Utility. From the Setup Home screen, you can access the other Setup Sections.

4-2 Setup Home

The first screen of the AMI BIOS GUI Setup Utility is the Setup Home screen. You can always return to the Setup Home screen by clicking the Home icon on the top of the screen. The Setup Home screen is shown below.



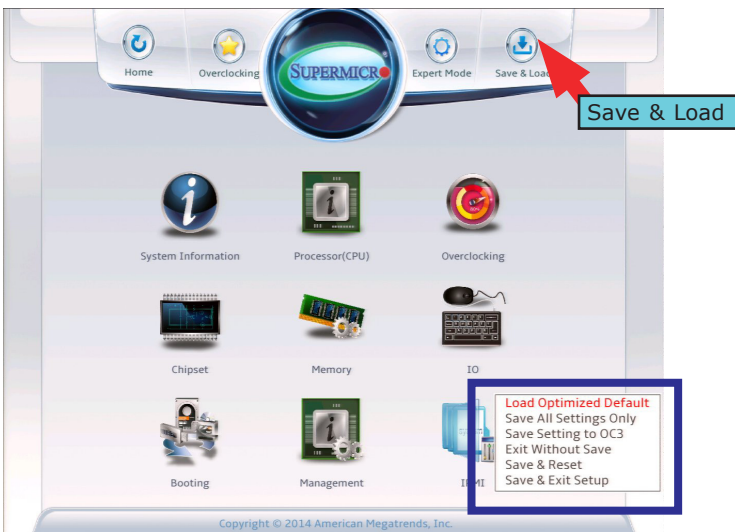
The Overclocking menu item jumps directly to the Setup's Overclocking Section, which is described in detail later in this manual.



By default, some advanced menu options are hidden from display (in the CPU Overclocking section for example). Clicking Expert Mode ON or OFF will display or hide these options from the menu. In this chapter, all Expert Mode option items are **bold and underlined>**.



The Save and Load icon brings up a pop-up menu that enables the user to choose from different saving options at the end of the session.



Load Optimized Defaults

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

Save All Settings Only

When you have completed the system configuration changes, select this option to save all changes made. This will not reset (reboot) the system and will not exit.

Save Settings to OC3

Select this option to save the current settings to the OC3 hardware button.

Exit Without Save

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer.

Save and Reset

When you have completed the system configuration changes, select this option to save the changes, leave the BIOS Setup Utility, and reboot the computer for the new system configuration parameters can take effect.

Save and Exit Setup

When you have completed the system configuration changes, select this option to save the changes, and leave the BIOS Setup Utility.

4-3 System Information

The System Information Screen displays the motherboard's configuration.

Motherboard



The following information are displayed in this section:

- **Motherboard Model Name** - C7Z97-M/MF.
- **BIOS Version** - this item displays the BIOS version number.
- **Build Date** - displays the BIOS build date.
- **ME Version** - indicates the Management Engine version number.

System Date

This item sets and displays the system date. Click the up and down arrows to adjust the date.

System Time

This item sets and displays the system time. Click the up and down arrows to adjust the system time.

CPU



The following information are be displayed in this section:

- **Type and Speed of CPU** - indicates the brand, model name, model number of the CPU and it's rated clock speed.
- **CPU Signature** - displays the unique signature embedded in the CPU.
- **CPU Speed** - this item shows the current CPU speed.
- **Microcode Patch** - displays the CPU's microcode patch version.

Memory



The following information are be displayed in this section:

- **Total Memory** - shows the total detected system memory.
- **Memory Frequency** - displays the system memory's detected speed.

PCH



The following information are be displayed in this section:

- **Name** - displays the name of the PCH chip (if detected).
- **PCH SKU** - this item displays the part number of the PCH chip.
- **Stepping**- shows the PCH chip's stepping number.

4-4 Processor (CPU)

Set all options for the processor in this section.

Information

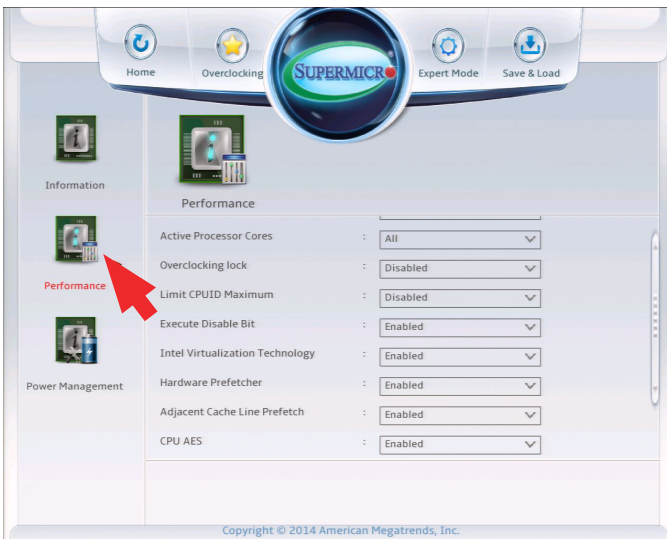
The following CPU information will be displayed:



- **CPU Signature** - displays the unique signature embedded in CPU.
- **Microcode Patch** - displays the CPU's microcode patch version.
- **CPU Speed** - displays the CPU's rated speed.
- **Processor Cores** - displays the number of cores the CPU has.
- **Intel HT(Hyper-Threading) Technology** - indicates if Intel HT is supported.
- **64-bit** - indicates if 64-bit is supported.
- **EIST Technology** - displays whether EIST is supported or not.
- **CPU C3 State** - indicates if ACPI C3 state is supported.
- **CPU C6 State** - shows whether ACPI C6 state is supported or not.
- **CPU C7 State** - indicates if ACPI C7 is supported.

- **L1 Data Cache** - indicates if Level 1 cache is supported.
- **L1 Code Cache** - displays if Level 1 code cache is supported.
- **L2 Cache** - indicates if Level 2 cache is supported.
- **L3 Cache** - displays whether Level 3 cache is supported or not.
- **L4 Cache** - - indicates if Level 4 cache is supported.

Performance



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.

Overclocking Lock

Select Enabled to prevent overclocking. The options are **Enabled** and Disabled.

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.

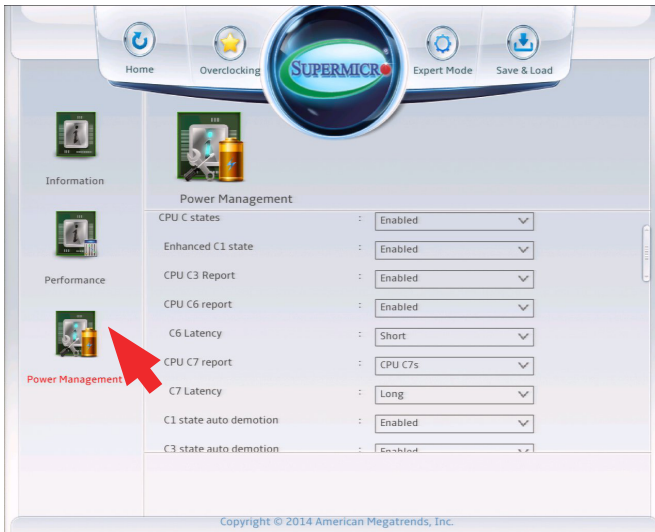
CPU AES

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

Boot Performance Mode

This option enables the selection of the default CPU performance during system boot. The options are **Max Non-Turbo Performance**, Max Battery and Turbo Performance.

Power Management



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:

Package Power Limit Lock

When Enabled, this feature will lock the PACKAGE_POWER_LIMIT MSR and a reset will be needed to unlock the register. The options are **Enabled** and Disabled.

CPU Power Limit1

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 manufacturer's default setting.

CPU Power Limit1 Time

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 manufacturer's default setting.

CPU Power Limit2

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 manufacturer's default setting.

Platform Power Limit Lock

Use this feature to lock the power limit of the motherboard (PLATFORM_POWER_LIMIT MSR). A system reset is required to unlock the register. The options are **Enabled** and Disabled.

CPU Power Limit3

Use this feature to set the power limit for CPU3. Use the number keys on your keyboard to enter the value. Enter 0 to use the manufacturer's default setting.

CPU Power Limit3 Time

This item allows the user to determine how long CPU3 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 manufacturer's default setting.

CPU Power Limit3 Duty Cycle

This item allows the user to determine the percentage of time CPU3 should operate at the power set by the user for the item above (i.e., If Power Limit3 Time is set at 100 secs, a 60% duty cycle means CPU3 will run 60 seconds at the power limit set in Power Limit3 every 100 seconds.). Use the number keys on your keyboard to enter the value between 1~100. Enter 0 to use the manufacturer's default setting.

DDR Power Limit1

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 manufacturer's default setting.

DDR Power Limit1 Time

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 manufacturer's default setting.

DDR Power Limit2

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 manufacturer's default setting.

1-Core Ratio Limit

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 manufacturer's default setting.

2-Core Ratio Limit

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 manufacturer's default setting.

3-Core Ratio Limit

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 manufacturer's default setting.

4-Core Ratio Limit

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 manufacturer's 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.

Package C-State Demotion

This item enables the Package C-State demotion. The options are **Disabled** and Enabled.

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, C2, C3, C6, C7, C7s and **Auto**.

LakeTiny Feature

Select Enabled for LakeTiny feature support for C-State configuration. The options are Enabled and **Disabled**.

4-5 Overclocking

Set all options for the Overclocking in this section.

CPU Overclocking



Load SMC CPU OC Setting

This item has optimized pre-configured overclock settings. Select one to activate. The options are **Manual**, 4.2GHz, 4.3GHz, 4.4GHz, 4.5GHz, 4.6GHz, 4.7GHz, and 4.8GHz.

1-Core Ratio Limit

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 manufacturer's default setting.

2-Core Ratio Limit

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 manufacturer's default setting.

3-Core Ratio Limit

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 manufacturer's default setting.

4-Core Ratio Limit

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 manufacturer's default setting.

BCLK Ratio

This option selects the BCLK clock ratio for the processor. The options are **1.00**, 1.25, 1.67 and 2.50.

BCLK Clock Frequency (1/100 MHz)

Use this item to set the CPU clock override value for the host system. Press "+" or "-" on your keyboard or on-screen keypad to change the value. The default setting is **10000**.

Internal PLL Overvoltage

Enable this option for better stability when overclocking. The options are **Disabled**, and Enabled.

CPU BCLK Filter PLL Frequency

This option selects the speed of the CPU BCLK Filter PLL Frequency for the processor. The options are **High Frequency 3.2GHz**, and Lower Frequency 1.6GHz. CPU BCLK Filter Frequency. Choose 1.6 for better overclocking capabilities

LCPLL or SBPLL Select

This option selects between LCPLL (resonant circuit-based PLL) and SBPLL (Self-Biased PLL). The options are **LCPLL**, and SBPLL.

CPU Non Turbo Ratio Override

Use this item to set CPU ratio override when not in turbo mode. Press "+" or "-" on your keyboard or on-screen keypad to change the value. The default setting is dependent on the type of CPU installed.

CPU Power Setting

Enhanced Intel SpeedStep Technology

Enhanced Intel SpeedStep Technology (EIST) 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 Turbo Setting

Package TDP Lock Enable

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

Long Duration Power Limit (Watt)

This feature configures Package Power Limit 1, in watts. When the limit is exceeded, the CPU ratio is lowered after a period of time (see item below). A lower limit can save power and protect the CPU, while a higher limit improves performance. Use the number keys on your keyboard to enter the value. The default setting is dependent on the CPU.

Long Duration Power Limit Time (Seconds)

This item allows the user to determine how long the CPU should operate at the power limit set by the user for the item above, if the power limit is exceeded. Use the number keys on your keyboard to enter the value. The default setting is **8**.

Short Duration Power Limit Switch

Select Enabled for power limit switch Package Power Limit 2. The settings are Disabled and **Enabled**.

Short Duration Power Limit (Watt)

This feature configures Package Power Limit 2, in watts. When the limit is exceeded, the CPU ratio is lowered immediately. A lower limit can save power and protect the CPU, while a higher limit improves performance.

Use the number keys on your keyboard to enter the value. The default setting is dependent on the CPU. The default setting is dependent on the CPU.

Package Current Lock

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

Processor Current Limit (1/8 Amp)

This feature allows the user to set the maximum electric current value for the Intel CPU cores. The default setting is dependent on the type of CPU installed.

Disable OverClocking Lock

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

Voltage Configuration

CPU Voltage Mode

Use this feature to select the CPU voltage mode. The options are Override, Offset and **Adaptive**.

CPU Adaptive/Override/Offset 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 Override Voltage Target (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 "+".

CPU Cache Voltage Mode

Choose **Adaptive**, which adds voltage to the CPU in cases when the system is under heavy load, Override to manual enter a fixed value and Auto for optimized settings.

CPU Cache Adaptive/Override/Offset 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.

System Agent Voltage Offset (mV)

Use this feature to set the System Agent 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 "+".

CPU IOA 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 "+".

CPU IOD 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 "+".

PCH 1.05V Voltage

Use this feature to trim the 1.05V PCH Voltage. Select from these values: 0.955V, 1.005V, **1.055V**, 1.105V, 1.155V, 1.205V, 1.255V, 1.305V, and 1.355V.

PCH 1.5V Voltage

Use this feature to trim the 1.5V PCH Voltage. Select from these values: 1.366V, 1.416V, 1.466V, **1.516V**, 1.566V, 1.616V, 1.666V, 1.716V, 1.766V and 1.816V.

Overclocking SVID and FIVR Options

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.

CPU Input Voltage

CPU Input Voltage

Warning! Carefully select the CPU input voltage, otherwise the CPU will burn. Alos, increasing the CPU voltage will cause the CPU temperature to rise. This needs to be compensated with an upgrade in the cooling system. The options are **Auto**, 1.85V, 1.90V, 1.95V, 2.00V, 2.05V, 2.10V, 2.15V, 2.20V, 2.25V, 2.30V, 2.35V and 2.40V.

Memory Overclocking



Load Memory Profiles

Use this feature to set Performance Memory Profiles which may cause impact on memory behavior*. 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.

If Automatic is selected, the installed memory will run at 2200MHz if the detected memory is rated at 2400MHz or above, and run at 1867MHz if the memory detected is rated at 1867MHz.

If Manual, XMP Profile 1 or XMP Profile 2 is selected, the following options will be available. These options will only appear if XMP (Extreme Memory Profile) Memory is/are installed:

Memory Clock

This option selects the Memory Clock Multiplier. The options are **133MHz** and 100MHz.

*The C7Z97-M/MF supports memory modules having a frequency of more than 2133MHz (Extreme Memory Profile or XMP Memory). However, XMP memory is not within the JEDEC memory standard. Compatibility and stability of these memory modules depend on varying factors, including the processor's capabilities and other devices installed.

Memory Frequency

This option selects the type/speed of the memory installed. The options are DDR3-1066MHz, DDR3-1333MHz, DDR3-1600MHz, DDR3-1800MHz, DDR3-2000MHz, DDR-2200MHz, DDR-2400MHz, and DDR-2600MHz. **Default speed is auto detected.**

Memory Voltage

This option selects the Memory Voltage. The options are **Auto**, 1.45V, 1.50V, 1.55V, 1.60V, 1.65V, 1.70V, 1.75V, 1.80V, 1.85V, and 1.95V.

Memory Timing Configuration (Expert Mode)

CAS# Latency (tCL)

This option configures the Cas Latency Range. Enter a number between 4-18. The default is **9**.

Row Precharge Time (tRP)

This option selects the Ras Precharge Range. Enter a number between 1-38. The default is **11**.

RAS# to CAS# Delay (tRCD)

This option configures the Row to Col Delay Range. Enter a number between 1-38. The default is **11**.

RAS# Active Time (tRAS)

This option selects the Ras Active Time. Enter a number between 1-586. The default is **28**.

Command Rate (CR)

This option sets the delay between when a memory chip is selected and when the first active command can be issued.

Write Recovery Time (tWR)

This feature sets the amount of delay that must elapse after the completion of a valid write operation, before an active bank can be precharged.

Row Refresh Cycle Time (tRFC)

This feature sets the number of clocks from a Refresh command until the first Activate command to the same rank.

Write to Read Delay (tWR)

This option configures the Minimum Write Recovery Time. Enter a number between 1-38. The default is **12**.

Active to Active Delay (tRRD)

This option selects the Minimum Row Active To Row Active Delay Time. Enter a number between 1-38. The default is **5**.

Read CAS# Precharge (tRTP)

This option configures the Internal Read to Precharge Command Delay Time. Enter a number between 1-38. The default is **6**.

Minimum CAS Write Latency Time (tCWL)

This option selects the Minimum CAS Write Latency Time. Enter a numeric value. The default is **8**.

Maximum tREFI Time (tREFI)

This option configures the Maximum tREFI Time (Average Periodic Refresh Interval). Enter a numeric value. The default is **6240**.

Four Active Window Delay (tFAW)

This option selects the Minimum Four Activate Window Delay Time. Enter a numeric value between 1-586. The default is **24**.

Row Cycle Time (tRC)

This option configures the Minimum Active to Active/Refresh Delay Time (tRCmin). Enter a numeric value between 1-586. The default is **39**.

tCKE

This option configures the period of time the DDR3 initiates a minimum of one refresh command internally once it enters Self-Refresh mode. The default is **7**.

tRDRD

This option configures the between module read to read delay. Enter a numeric value. The default is **7**.

tRDRDDR

This option configures the between module read to read delay from different ranks. Enter a numeric value. The default is **7**.

tRDRDDD

This option configures the DRAM tRWSR settings. Enter a numeric value. The default is **7**.

tWRRD

This option configure between module write to read delay. Enter a numeric value. The default is **27**.

tWRRDDR

This option configure between module write to read delay from different ranks. Enter a numeric value. The default is **8**.

tWRRDDD

This option configure DRAM tRRSR setting. Enter a numeric value. The default is **6**.

tWRWR

This option configures module write to write delay. Enter a numeric value. The default is **6**.

tWRWRDR

This option configures between module write to write delay from different ranks. The default is **7**.

tWRWRDD

This option configures between module write to write delay from different DIMMs. The default is **7**.

tRDWR

This option configures between module read to write delay. The default is **20**.

tRDWRDR

This option configures between module read to write delay from different ranks. The default is **20**.

tRDWRDD

This option configures between module read to write delay from different DIMMs. The default is **20**.

RTL (ChA)

This option configures round trip latency for channel A. The default is **50**.

RTL (ChB)

This option configures round trip latency for channel B. The default is **58**.

IO-L (ChA)

This option configures I/O latency for channel A. The default is **5**.

IO-L (ChB)

This option configures I/O latency for channel B. The default is **12**.

ODT WR (ChA)

This option configures the memory on die termination resistors' WR for channel A. The default is **60**.

ODT WR (ChB)

This option configures the memory on die termination resistors' WR for channel B. The default is **60**.

ODT NOM (ChA)

This option changes the ODT (CHA) Auto/Manual settings. The default is **60**.

ODT NOM (ChB)

This option changes the ODT (CHB) Auto/Manual settings. The default is **60**.

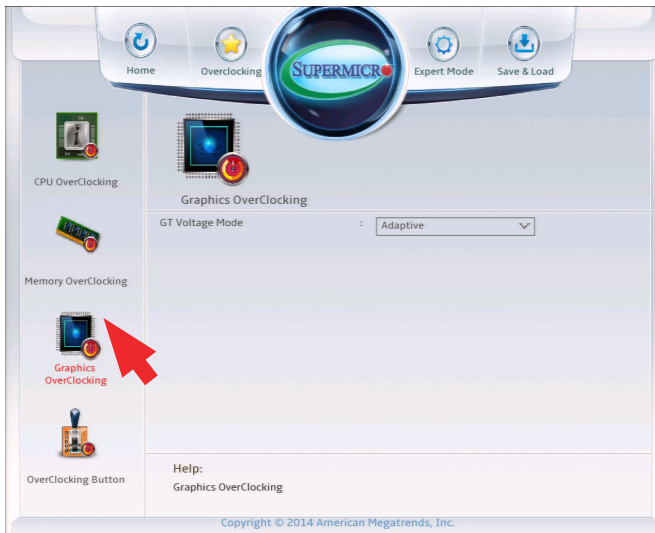
MRC Fast Boot

This option enable Memory Fast Boot to skip DRAM memory training for booting faster. The options are **Enabled** and Disabled.

DIMM Exit Mode

This item specifies the Exit Mode support options. The options are **Auto**, Slow Exit, and Fast Exit.

Graphics OverClocking



Graphics Core Ratio Limit

Use this feature to set graphics core ratio limit. Press "+" or "-" on your keyboard or on-screen keypad to change the value. The default setting is **dependent on the type of CPU installed**.

GT Voltage Mode

Use this feature to select the Overclocking GT mode. The options are Override, Offset and **Adaptive**.

GT Adaptive Voltage Target (mV)

(if Adaptive is selected above) 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 Override Voltage Target (mV)

(if Override is selected above) 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 Offset (mV)

(if Offset is selected above) Use this feature to set the GT Adaptive voltage Target(mV) value from 0mV to 2000mV. 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 Buttons

These are the settings for the OC buttons on the optional OC panel:



Case LED

This item enables or disables the Overclocking LED on the chassis. The options are **Enabled** and Disabled.

OC1 Button Setting Configuration OC2 Button Setting Configuration

The following settings are displayed with their current values. Use the "-" and "+" keys to change values:

- 1 Core Ratio Limit
- 2 Core Ratio Limit
- 3 Core Ratio Limit
- 4 Core Ratio Limit

Processor Current Limit (1/8 Amp)

Long Duration Power Limit (Watts)

Short Duration Power Limit (Watts)

Memory OC Button Setting Configuration

Load Memory Profiles

Use this feature to assign Performance Memory Profiles for the Memory OC Button. Select Automatic to allow the BIOS to automatically set Performance Memory Profiles. Select Manual to manually configure Performance Profiles, see below. Select XMP Profile 1 or XMP Profile 2 to use the XMP Profiles configured under the Memory Overclocking section on Page 4-24. The options are **Automatic**, Manual, XMP Profile1 and XMP Profile2.

The following become available if Manual is selected above:

Memory OC Button Setting Configurations

Memory Clock

This option selects the Memory Clock Multiplier. The options are **1.33** and 1.00.

Memory Frequency

This option selects the type/speed of the memory installed. The options are DDR3-1066MHz, **DDR3-1333MHz**, DDR3-1600MHz, DDR3-1866MHz and DDR3-2133MHz.

CAS# Latency (tCL)

This option configures the Cas Latency Range. Enter a number between 4-18. The default is **9**.

Row Precharge Time (tRP)

This option selects the Ras Precharge Range. Enter a number between 1-38. The default is **11**.

RAS# to CAS# Delay (tRCD)

This option configures the Row to Col Delay Range. Enter a number between 1-38. The default is **11**.

RAS# Active Time (tRAS)

This option selects the Ras Active Time. Enter a number between 1-586. The default is **28**.

Write Recovery Time (tWR)

This option configures the Minimum Write Recovery Time. Enter a number between 1-38. The default is **12**.

Row Refresh Cycle Time (tRFC)

This option selects the Minimum Refresh Recovery Delay Time. Enter a number between 1-9363. The default is **128**.

Write to Read Delay (tWTR)

This option configures the Minimum Internal Write to Read Command Delay Time. Enter a number between 1-38. The default is **6**.

Active to Active Delay (tRRD)

This option selects the Minimum Row Active To Row Active Delay Time. Enter a number between 1-38. The default is **5**.

Read CAS# Precharge (tRTP)

This option configures the Internal Read to Precharge Command Delay Time. Enter a number between 1-38. The default is **6**.

Minimum CAS Write Latency Time (tCWL)

This option selects the Minimum CAS Write Latency Time. Enter a numeric value. The default is **8**.

Maximum tREFI Time (tREFI)

This option configures the Maximum tREFI Time (Average Periodic Refresh Interval). Enter a numeric value. The default is **6240**.

Four Active Window Delay (tFAW)

This option selects the Minimum Four Activate Window Delay Time. Enter a numeric value between 1-586. The default is **24**.

Row Cycle Time (tRC)

This option configures the Minimum Active to Active/Refresh Delay Time (tRCmin). Enter a numeric value between 1-586. The default is **39**.

Memory Voltage

Use this feature to select the Memory Voltage. The options are 1.35V, 1.40V, 1.45V, 1.50V, 1.55V, 1.60V, 1.65V, 1.70V, 1.75V, 1.80V, 1.85V, 1.90V, 1.95V and **Auto**.

4-6 Chipset

Set all options for the Chipset in this section.



System Agent

The following will be displayed:

- **System Agent Bridge Name** - this displays the System Agent bridge name.
- **System Agent RC Version** - indicates the System Agent RC version.
- **VT-d Capability** - this item indicates whether VT-d is supported.

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.

CPU SA Audio Device (B0:D3:F0)

This item enables or disables the CPU System Agent (SA) Audio device. The options are **Enabled** and Disabled.

Above 4GB MMIO BIOS Assignment

This item enables or disables the Above 4GB Memory Mapped IO BIOS Assignment. The options are Enabled and **Disabled**.

Graphics



The following will be displayed:

- **IGFX VBIOS Version** - displays the Integrated Graphics chip VBIOS version number.
- **IGFX Frequency** - indicates the clock speed of the Integrated Graphics chip.

Primary Display

Use this feature to select the graphics device to be used as the primary display. Select from IGFX/PEG/PCI or select SG for switchable GFX. The options are **Auto**, IGFX, PEG, PCIE and SG.

Primary PEG (if PEG is selected above)

This item selects which PEG graphics device should be the primary PEG. The options are **Auto**, PEG11 and PEG12.

Primary PCIE (if PEG or PCIE is selected above)

This item selects which PCIE graphics device should be the primary PEG. The options are **Auto**, PCIE1, PCIE2, PCIE3, PCIE4, PCIE5, PCIE6, and PCIE7.

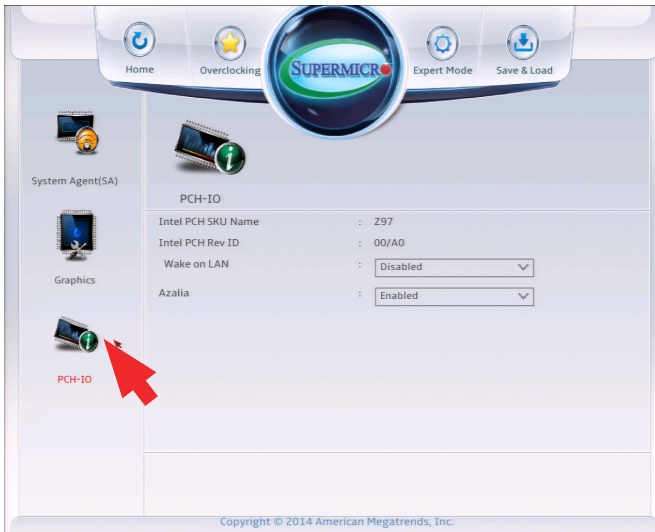
Internal Graphics

This item keeps the IGD (Internal Graphics Device) enabled, based on setup options. The options are **Auto**, Enabled and Disabled.



Note: To prevent an error when installing the Intel Graphics Driver, please set this option to Enabled (C7Z97-MF only).

PCH-IO



The following will be displayed:

- **Intel PCH RC Version** - displays the PCH chip release version.
- **Intel PCH SKU Name** - indicates the PCH chip part number.
- **Intel PCH Rev ID** - displays the PCH chip revision ID.

Wake on LAN

Select Enabled to enable the capability to 'wake-up' the system through the Ethernet port. The settings are **Enabled** and Disabled.

Azalia (HD Audio)

This item controls the detection of the Azalia (HD Audio) device. The settings are **Enabled** and Disabled.

4-7 Memory

Set all options for the System Memory in this section.

Memory Information



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

- **Memory RC Version** - this item displays the memory controller version.
- **Memory Frequency** - this item displays the frequency of the installed memory.
- **Total Memory** - this item displays the total memory size detected.
- **Memory Voltage** - this item displays the current memory voltage.
- **DIMMA1** - displays if a DIMM is installed on this slot, and the DIMM size.
- **DIMMA2** - displays if a DIMM is installed on this slot, and the DIMM size.
- **DIMMB1** - displays if a DIMM is installed on this slot, and the DIMM size.
- **DIMMB2** - displays if a DIMM is installed on this slot, and the DIMM size.

- **CAS Latency (tCL)** - this item displays the Column Address Storage (CAS) latency time, in clock cycles.
- **Minimum Delay Time** - this item displays the Column Address Storage (CAS) minimum delay time, in clock cycles.
- **CAS to RAS (tRCDmin)** - this item displays the Row Address Storage (RAS) to CAS delay time, in clock cycles.
- **Row Precharge (tRPmin)** - this displays the number of clock cycles needed to terminate access to an open row of memory, and open access to the next row.
- **Active to Precharge (tRASmin)** - this item displays the Active to Precharge delay, in clock cycles.

Memory Configuration



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).

Enhanced Interleave Support

This feature enables or disables the motherboard's enhanced interleave support. The settings are **Enabled** and Disabled.

Rank Interlevel Support

This feature enables or disables the motherboard's Rank interlevel support. The settings are **Enabled** and Disabled.

MRC Fast Boot

This feature enables or disables the MRC Fast Boot support. The settings are **Enabled** and Disabled.

4-8 I/O

Set all options for the I/O in this section.

SATA



SATA Mode Selection

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

SATA Controller Speed (AHCI or RAID Mode only)

This item selects the SATA Controller Speed. The options are **Default**, Gen1, Gen2 and Gen3.

Alternate ID (RAID Mode Only)

This item Enables or Disables the RAID ID feature for SATA Ports 0~5. The options are **Enabled** and Disabled.

The information of the installed SATA drives on the particular SATA port are displayed.

- Serial ATA Port # (Status)
- Software Preserve Support

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

Port 0 ~ Port 5

This item Enables or Disables SATA Ports 0~5. The options are **Enabled** and Disabled.

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**.

External SATA

This item Enables or Disables External SATA (eSATA) support. The options are Enabled and **Disabled**.

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.

Spin Up Device

On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization

PCIe/PCI/PnP



NB PCIE Setting

This section displays if a PCIE device is detected on any PCIE slot on the motherboard.

- **PCH_SLOT1 PCI-E 2.0 X1 (IN X4)** - this item displays if a device is installed or not.
- **CPU_SLOT2 PCI-E 3.0 X4 (IN X16)** - this item displays if a device is installed or not.
- **PCH_SLOT3 PCI-E 2.0 X1 (IN X4)** - this item displays if a device is installed or not.

Option ROM Execution

Video

This feature controls which option ROM to execute for the Video device. The options are Do Not Launch, UEFI and **Legacy**.

Storage

This feature controls which option ROM to execute for the storage device. The options are Do Not Launch, UEFI and **Legacy**.

Other PCI Devices

This feature controls which option ROM to execute for the other PCI devices. The options are **UEFI** and Legacy.

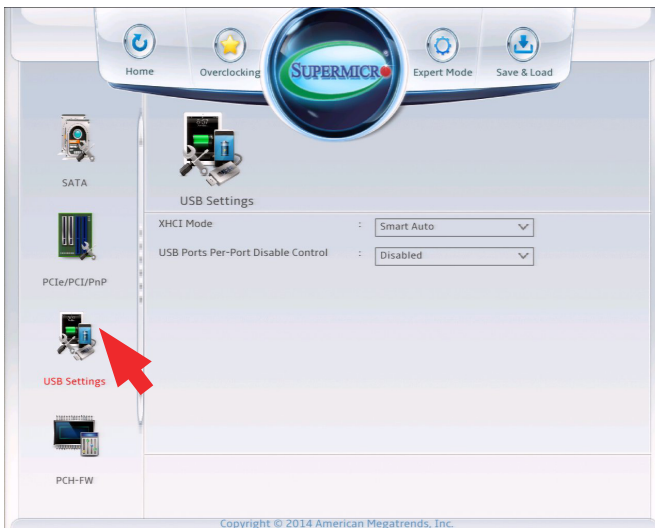
PCH_SLOT1 PCI-E 2.0 X1 (IN X4) OPROM, CPU_SLOT2 PCI-E 3.0 X4 (IN X16) OPROM, PCH_SLOT3 PCI-E 2.0 X1 (IN X4) OPROM

Select Disabled to deactivate the selected slot, Legacy to activate the slot in legacy mode and EFI to activate the slot in EFI mode. The options are Disabled, Legacy, EFI and EFI and Legacy.

Onboard LAN1 Option ROM

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.

USB Settings



XHCI Mode

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

USB Ports Per-Port Disable Control

This item activates the capability of the motherboard to Enable or Disable each USB Port independently. The options are **Enabled** and Disabled.

USB Port #0~Port #13

This item Enables or Disables specified USB Port. The options are **Enabled** and Disabled.

PCH-FW (Firmware)



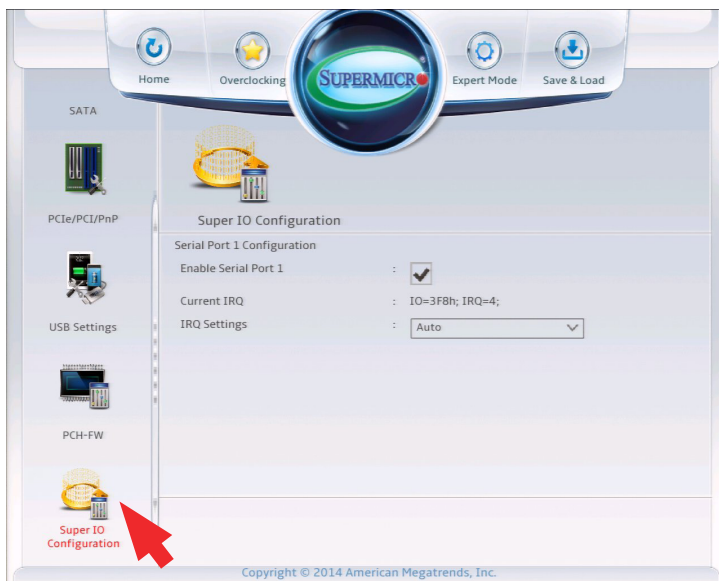
The following information for the PCH Firmware.

- **ME FW Version** - displays the Management Engine version number.
- **ME Firmware Mode** - displays the Management Engine mode.
- **ME Firmware Type** - displays the Management Engine firmware type.
- **ME Firmware SKU** - displays the Management Engine SKU size.

ME FW Image Re-Flash

This item will update the PCH Firmware from an image in a USB Flash-drive attached to a USB port. The options are **Enabled** and Disabled.

Super IO Configuration



Enable Serial Port 1

This item will Enable or Disable Serial Port 1 (COM1). Place a tick mark on the box to enable Serial Port 1. The default is **Enabled**.

Current IRQ

This item displays the current IRQ setting for Serial Port 1 (COM1).

IRQ Settings

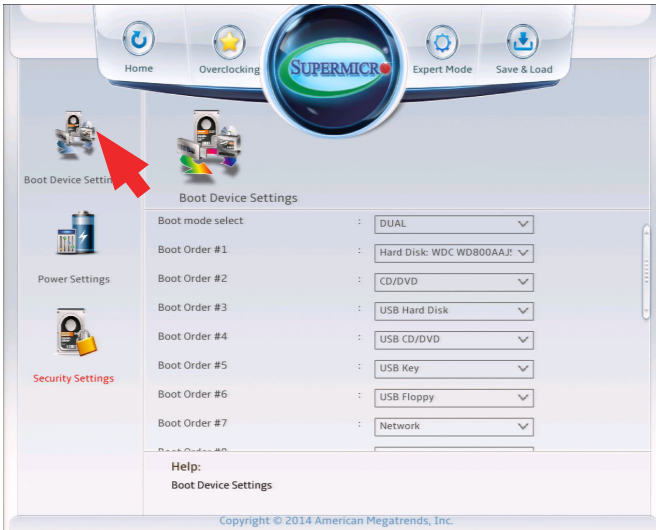
This item configures the IRQ setting for Serial Port 1 (COM1).

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.

4-9 Booting

Set all options for the Boot devices in this section.

Boot Device Settings



Boot Mode Select

This option sets the boot mode between Legacy BIOS, UEFI BIOS or Dual. The options are **Dual**, Legacy and UEFI.

Boot Order #1~#15

This option sets the order of which the system boots from the installed boot devices. The options and defaults are dependent on the boot devices detected.

Power Settings



Bootup Numlock State

This option sets the state to which the NumLock key is configured when booting. The default is **checked (Activated)**.

Quiet Boot

This option sets the state to which the system buzzer is configured when booting. The default is **checked (On)**, the buzzer is silent.

Fast Boot

This option sets fast system boot, quick POST, etc . The default is **unchecked (Off)**.

AddOn ROM Display Mode

This feature sets the display mode for the option ROM. The options are **Force BIOS** and Keep Current.

Wait for "F1" for Error

This option sets whether the system will wait for the user to press "F1" when an error is detected during POST. The default is **checked (On)**.

Interrupt 19 Capture

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

Re-try Boot

In the event the system fails to boot, this will enable the system to retry to boot the system again. The options are Enabled and **Disabled**.

Watch Dog

If enabled, the Watch Dog timer will allow the system to reboot when it is unresponsive for more than 5 minutes. The default is **unchecked (Off)**.

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.

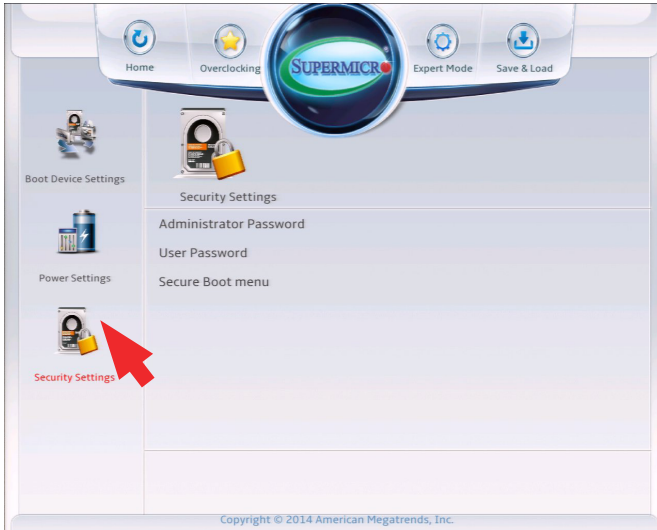
Restore on AC Power Loss

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 **Last State**, Power On, Stay Off.

EUP Support

EuP, or Energy Using Product is a European energy-saving specification that sets a standard on the maximum total power consumption on electrical products. Check the box to activate EUP support, the default is Unchecked (**Disabled**).

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.



User Password

Use this feature to set the User Password, which is required everytime the system boots. The length of the password should be from 3 characters to 20 characters long.

Secure Boot Menu



The following items will be displayed:

- **System Mode** - indicates the current system mode.
- **Secure Boot** - this item indicates if Secure Boot is activated or not.

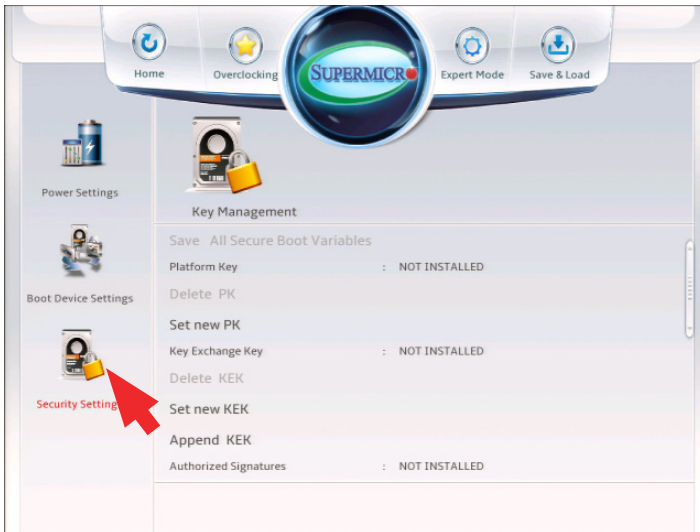
Secure Boot

Select Enabled for Secure Boot flow control. This feature is available when the platform key (PK) is pre-registered, the platform operates in the user mode, and CSM is disabled in the Setup utility. The options are **Disabled** and Enabled.

Secure Boot Mode

This feature allows selection of the Secure Boot Mode between Standard and Custom. Selecting Custom enables users to change the Image Execution Policy and manage Secure Boot Keys. The options are **Custom** and Standard.

Key Management



(if Secure Boot Mode is set to 'Custom')

Key Management allows experienced users to modify Secure Boot Variables.

Platform Key

This item displays the current Platform Key status.

Delete PK

This item deletes a previously installed Platform Key.

Set New PK

This item uploads and installs a secure Platform Key. You may insert a factory default key or load from a file. The file formats accepted are:

1) Public Key Certificate

a. EFI Signature List

b. EFI CERT X509 (DER Encoded)

c. EFI CERT RSA2048 (bin)

d. EFI SERT SHA256 (bin)

2) EFI Time Based Authenticated Variable

When prompted, select "Yes" to load Factory Defaults or "No" to load from a file.

Key Exchange Key

This item displays the current Key Exchange Key status.

Delete KEK

This item deletes a previously installed Key Exchange Key.

Set New KEK

This item uploads and installs a Key Exchange Key. You may insert a factory default key or load from a file. When prompted, select "Yes" to load Factory Defaults or "No" to load from a file.

Append KEK

This item uploads and adds a Key Exchange Key into the Key Management. You may insert a factory default key or load from a file. When prompted, select "Yes" to load Factory Defaults or "No" to load from a file.

Authorized Signatures

This item displays the current Authorized Signatures status.

Delete DBT

This item deletes a previously installed Authorized Signature.

Set New DBT

This item uploads and installs an Authorized Signature . You may insert a factory default key or load from a file. The file formats accepted are:

1) Public Key Certificate

- a. EFI Signature List
- b. EFI CERT X509 (DER Encoded)
- c. EFI CERT RSA2048 (bin)
- d. EFI SERT SHA256 (bin)

2) EFI Time Based Authenticated Variable

When prompted, select "Yes" to load Factory Defaults or "No" to load from a file.

Append DBT

This item uploads and adds an Authorized Signature into the Key Management. You may insert a factory default key or load from a file. When prompted, select "Yes" to load Factory Defaults or "No" to load from a file.

Forbidden Signatures

This item displays the current Forbidden Signatures status.

Delete DBX

This item deletes a previously installed Forbidden Signature.

Set New DBX

This item uploads and installs a Forbidden Signature . You may insert a factory default key or load from a file. The file formats accepted are: 1) Public Key Certificate

- a. EFI Signature List
 - b. EFI CERT X509 (DER Encoded)
 - c. EFI CERT RSA2048 (bin)
 - d. EFI SERT SHA256 (bin)
- 2) EFI Time Based Authenticated Variable

When prompted, select "Yes" to load Factory Defaults or "No" to load from a file.

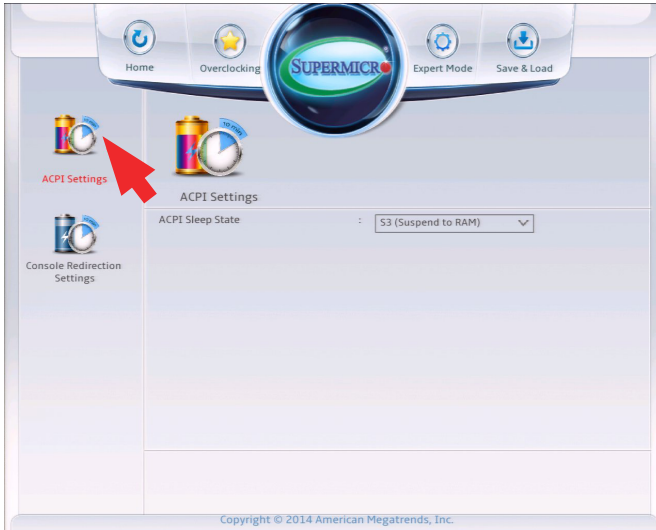
Append DBX

This item uploads and adds an Forbidden Signature into the Key Management. You may insert a factory default key or load from a file. When prompted, select "Yes" to load Factory Defaults or "No" to load from a file.

4-10 Management

Set all options for the Overclocking in this section.

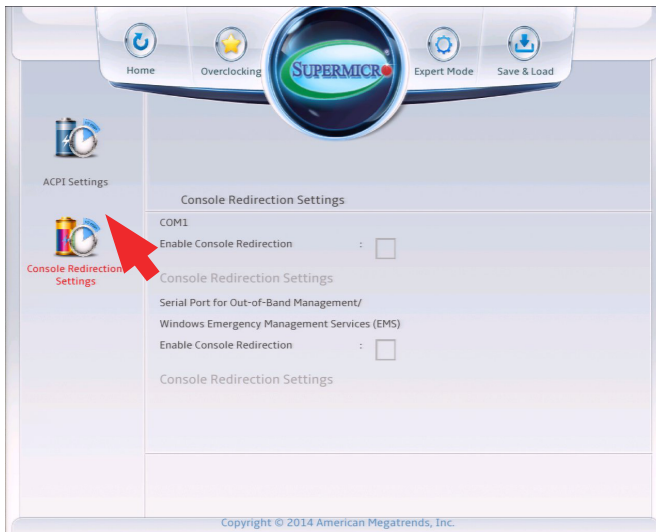
ACPI Settings



ACPI Sleep State

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

Console Redirection Settings



COM1

Enable Console Redirection

This feature enables console redirection for COM1 to support remote management. The default is **unchecked (Off)**.

Console Redirection Settings

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

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

Enable Console Redirection

Check this box to use a COM port selected by the user for Console Redirection. The default is **unchecked (Off)**.

Console Redirection Settings

Out-of-Band Management Port

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

Terminal Type

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

Bits Per Second

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

Flow Control

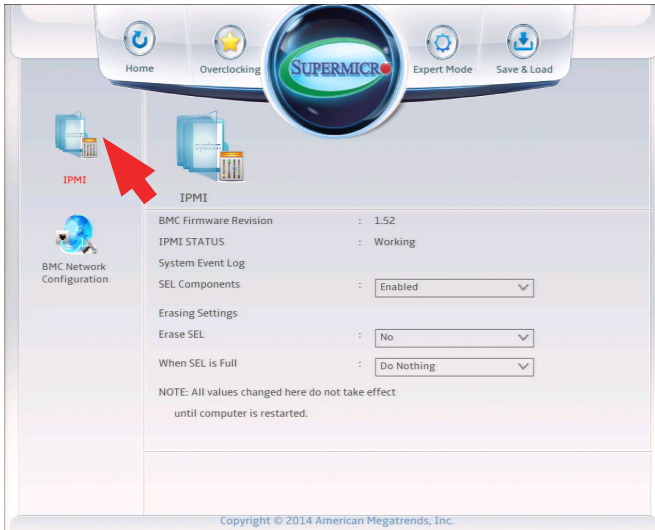
Use this item to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop data-sending when the receiving buffer is full. Send a "Start" signal to start data-sending when the receiving buffer is empty. The options are **None**, Hardware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

The setting for each these features is displayed:

Data Bits, Parity, Stop Bits

4-11 IPMI

IPMI



The following items will be displayed:

- **BMC Firmware Versioin** - indicates the current version of the Baseboard Management Controller.
- **IPMI Status** - this item indicates the current state of the IPMI feature.

System Event Log

Enabling/Disabling Options

SEL Components

Select Enabled to enable all system event logging support at bootup. The options are **Enabled** and Disabled.

Erasing Settings

Erase SEL

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

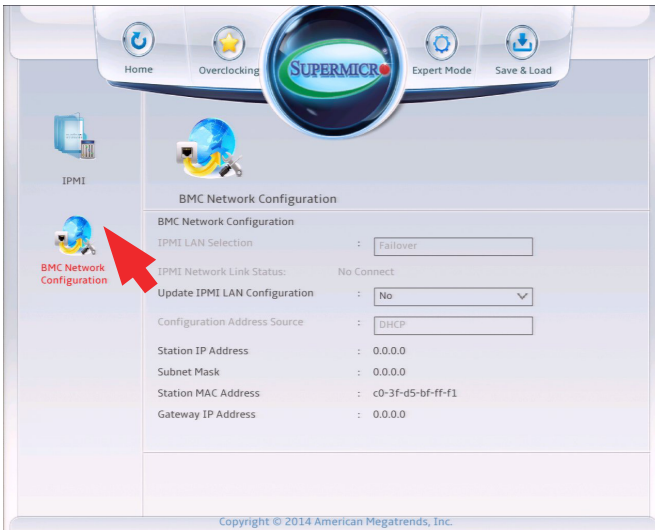
When SEL is Full

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



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

BMC Network Configuration



BMC Network Configuration

Select Yes for the system BIOS to automatically reset the following IPMI settings at next system boot. The options are Yes and **No**.

The following items will be displayed:

- **IPMI Network Status** - Displays the current connection status of the IPMI network.

Update IPMI LAN Configuration

Select Yes for the system to allow following IPMI settings below be changed. The options Yes and **No**.

Configuration Address Source (Available when the item above - Update IPMI LAN Configuration is set to Yes)

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

Station IP Address

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

Subnet Mask

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

Station MAC Address

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

Gateway IP Address

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

Appendix A

BIOS Error Beep Codes

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

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

Fatal errors will not allow the system to continue to bootup. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

A-1 BIOS Error Beep Codes

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

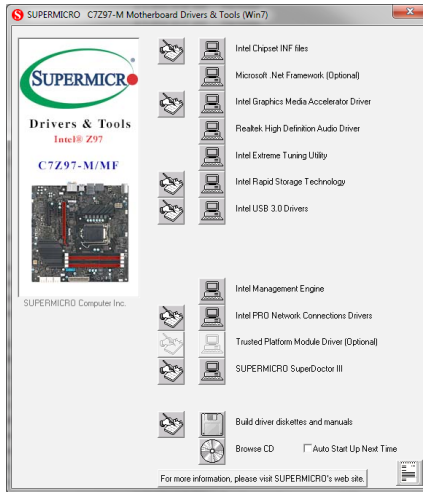
Notes

Appendix B

Software Installation Instructions

B-1 Installing Drivers

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



Driver/Tool Installation Display Screen



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

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

B-2 Configuring SuperDoctor® III

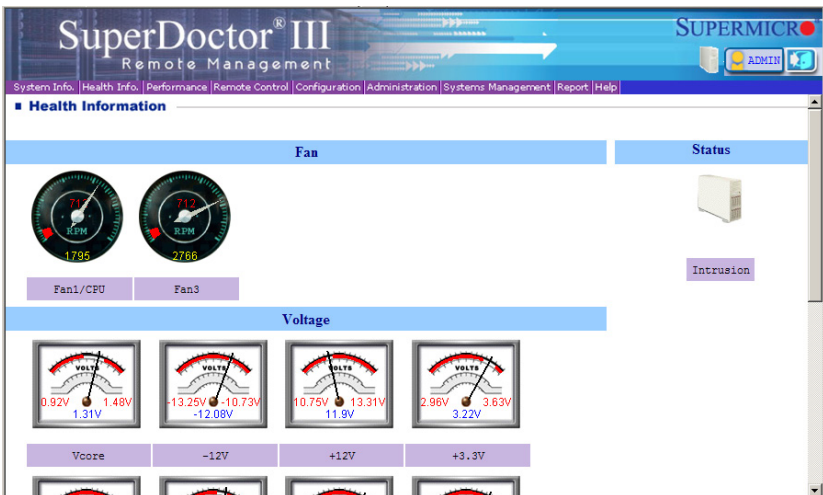
The SuperDoctor III program is a Web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management tool is called the SD III Client. The SuperDoctor III program included on the CDROM that came with your motherboard allows you to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




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

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

SuperDoctor III Interface Display Screen-I (Health Information)



SuperDoctor III Interface Display Screen-II (Remote Control)



Graceful power control (cancelable)

Super Doctor III allows a user to inform the OS to reboot or shut down the system within 30 seconds. On the system console, a pop-up window will appear with a message telling the local user to save his working files. Before the system reboots or shuts down, it's allowed to cancel the action either locally or remotely.

Power control (noncancelable)

Super Doctor III allows a user to inform the OS to reboot or shut down the system right away. The system will reboot or shut down without any warning messages. It's not allowed to cancel the action.



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

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

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

Notes

Appendix C

UEFI BIOS Recovery Instructions

! **Attention!** 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 UEFI 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 any available USB port
3. Set the JBR1 switch on the motherboard to recovery mode and power on the system. If the screen appears as below, press to continue.

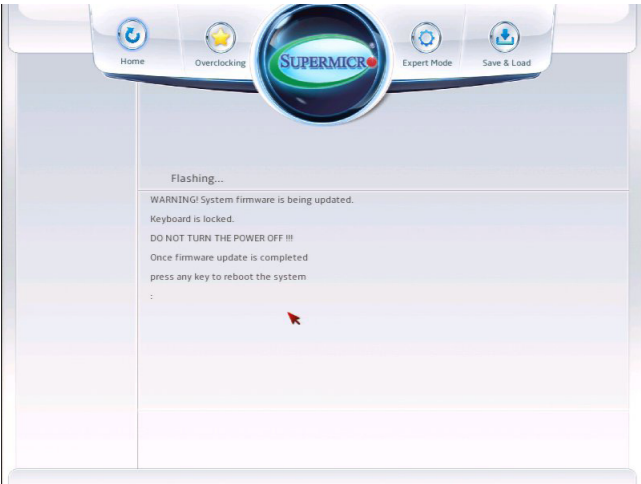
```
Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.  
Supermicro C7Z97-0CE BIOS Date:04/25/2014 Rev:1.0  
CPU : Intel(R) Core(TM) i7-4765T CPU @ 2.00GHz  
Speed : 2.00 GHz  
The IMC is operating with DDR3L 1333 Mhz  
Setup default has been loaded.  
Press <DEL> to run Setup  
Press <F1> to Continue Booting
```

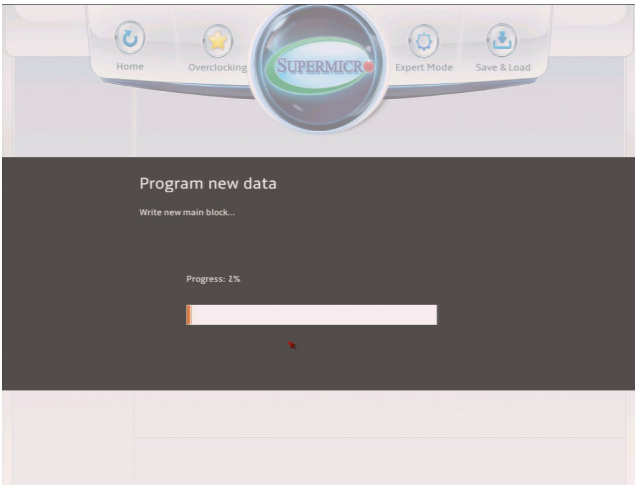
- 4. After locating the new BIOS binary image, the system will enter the BIOS Recovery menu as shown below.



 **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.

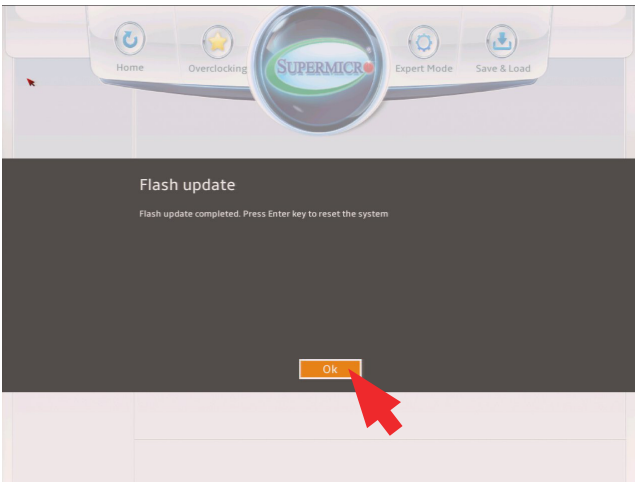
- 5. To continue with BIOS Recovery, select the item- "Proceed with flash update". You will see the progress of BIOS Recovery as shown on the screens below.





Note: *Do not interrupt* the BIOS programming until it is completed.

6. After the BIOS Recovery process is complete, click OK to reboot the system.



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.

```
-----
                AMI Firmware Update Utility vX.XX.XX
                Copyright (C)XXXX American Megatrends Inc. All Rights Reserved.
-----
```

```
Reading flash . . . . . done
-- ME Data Size checking . ok
-- FFS checksums . . . . . ok
Erasing Boot Block . . . . . done
_ Updating Boot Block . . . . . 0x00A91000 (13%)
```

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 activating switch JBR1 on the motherboard. When JBR1 is activated, 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 switch JBR1

1. Power down the system.
2. On switch JBR1 slide switch to ON, 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. Turn OFF switch JBR1, and power on the system.

(Disclaimer Continued)

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