

SUPER ●[®]

C7Z170-OCE
USER'S MANUAL

Revision 1.0

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Manual Revision 1.0

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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** C7Z170-OCE motherboard.

Manual Organization

Chapter 1 describes the features, specifications and performance of the motherboard, and provides detailed information on the Intel Z170 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
- One (1) I/O shield
- One (1) Quick Reference Guide
- One (1) Driver CD

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制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

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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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Notes

Chapter 1

Introduction

1-1 Overview

About this Motherboard

The C7Z170-OCE supports a single 6th Generation Intel® Core™ i7/i5/i3 processors in an LGA 1151 (H4) socket. With the Intel® Z170 Express chipset built in, the C7Z170-OCE 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 Z170 Express Chipset Features

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

1-3 Motherboard Features

CPU	Single Intel Core i3/i5/i7 6th generation processor in an LGA1151 type socket.	
Memory	Four (4) slots support up to 64GB of unbuffered, non-ECC, 3000+MHz(OC) DDR4 memory*	
	Dual-channel memory	
	DIMM sizes	
	UDIMM	4GB, 8GB, 16GB
Chipset	Intel® Z170 Express	
Expansion Slots	Two (2) PCH PCI-E 3.0 X1 (in X4) slot	
	Two (2) CPU PCI-E 3.0 X16 slot	
	One (1) CPU PCI-E 3.0 X8 (in X16) slot	
	One (1) M.2 slot	
Network Connections	Two (2) Gigabit Ethernet Controllers	
	Two (2) RJ-45 rear I/O panel connectors with Link and Activity LEDs	
I/O Devices	SATA Connections	
	SATA 3.0 (6Gb/s)	Six (6) I-SATA 0~5, via Intel Z170
		RAID 0, 1, 5, 10
	USB Devices	
	Two (2) USB 2.0, two (2) USB 3.0, and one (1) USB 3.1 'type C' ports on the rear I/O panel	
	Four (4) front accessible USB 2.0 ports on two headers, two (2) front accessible USB 3.0 ports on one header, and two (2) front accessible USB 3.1 ports on one header.	
	Keyboard/Mouse	
	One shared PS/2 Keyboard/Mouse port on the I/O back panel	
	Other I/O Ports	
	One (1) DisplayPort, One (1) DVI-D Port, 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) S/PDIF Out on the rear side of the chassis		

	<p style="text-align: center;">Super I/O</p> <p>Nuvoton NCT6792D-B</p>
BIOS	<p>128 Mb AMI BIOS® SPI Flash BIOS</p> <p>Plug and Play (PnP), DMI 2.8, PCI 2.3, ACPI 1.0/2.0/3.0, and USB Keyboard</p>
Power Configuration	<p>ACPI/ASPM Power Management</p> <p>Main Switch Override Mechanism</p> <p>Internal/External Modem Ring-On</p> <p>Power-on mode for AC power recovery</p>
Health Monitoring	<p style="text-align: center;">CPU Monitoring</p> <p>Onboard monitors: CPU core, +3.3V, +5V, +/- 12V, +3.3V Stby, +5V Stby, VBAT, HT, Memory PCH Temperature, System Temperature, and CPU Temperature</p> <p>CPU 6+1 phase switching voltage regulator</p> <p>CPU/System overheat LED and control</p> <p>CPU Thermal Trip support</p> <p>Thermal Monitor support</p> <p style="text-align: center;">Fan Control</p> <p>Fan status monitoring with firmware 4-pin fan speed control</p> <p>Low noise fan speed control</p>
System Management	<p>PECI (Platform Environment Configuration Interface) 2.0 support</p> <p>System resource alert via SuperDoctor® III</p> <p>SuperDoctor III, NMI</p> <p>Chassis Intrusion header and detection</p>
CD Utilities	<p>BIOS flash upgrade utility</p> <p>Drivers and software for Intel® Z170 Express chipset utilities</p>
Other	ROHS 6/6 (Full Compliance, Lead Free)
Dimensions	ATX form factor (12.0" x 9.6") (304.8 mm x 243.84 mm)

1-4 Special Features

Recovery from AC Power Loss

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

1-5 PC Health Monitoring

This section describes the PC health monitoring features of the board. All have an onboard System Hardware Monitoring chip that supports PC health monitoring. An onboard voltage monitor will scan these onboard voltages continuously: CPU core, +3.3V, +5V, +/- 12V, +3.3V Stby, +5V Stby, VBAT, HT, Memory PCH Temperature, System Temperature, and CPU Temperature. 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.

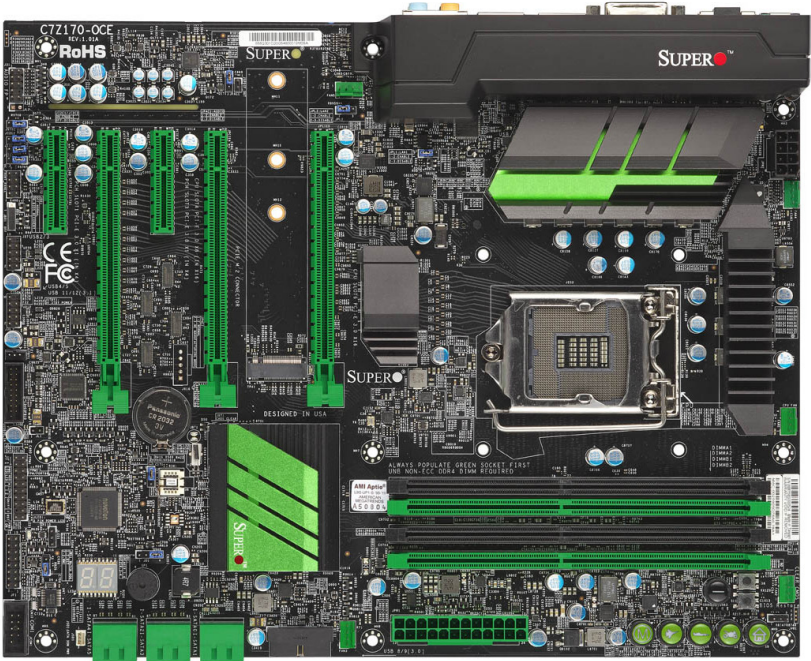
It is strongly recommended that you use a high quality power supply that meets ATX power supply Specification 2.02 or above. It must also be SSI compliant. (For more information, please refer to the website at <http://www.ssiforum.org/>). Additionally, in areas where noisy power transmission is present,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

1-8 Super I/O

The Super I/O supports two high-speed, 16550 compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

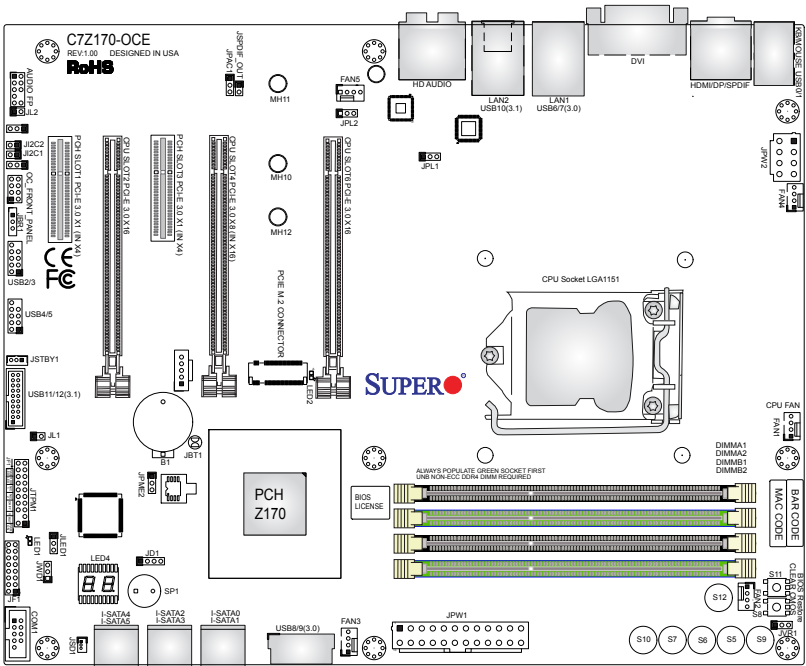
The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

C7Z170-OCE 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.

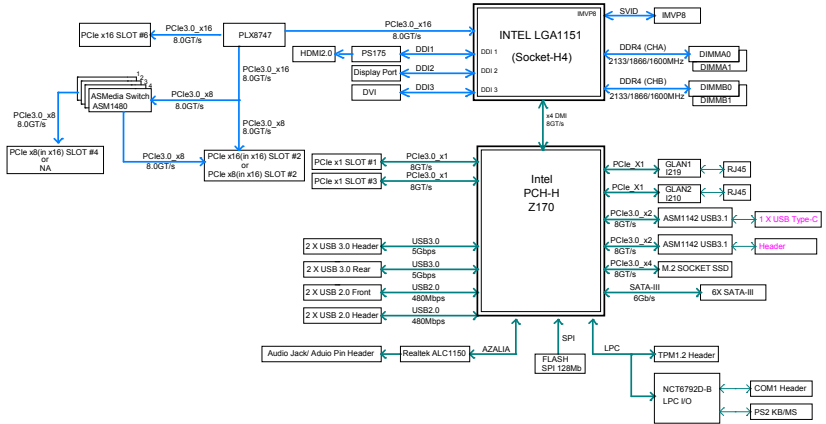
C7Z170-OCE Motherboard Layout



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.

C7Z170-OCE Block Diagram



Connector	Description
Audio FP	Front Panel Audio Header
B1	Onboard Battery
COM1	COM1 Port Header
DVI	Digital Video Interface
Fan 1,2,3,4,5	System/CPU Fan Headers (Fan1: CPU Fan)
HD Audio	High Definition Audio Connector
HDMI/DP	High Definition Multimedia Interface/DisplayPort
I-SATA0~5	(Intel Z170) Serial ATA (SATA 3.0) Ports 0~5 (6Gb/sec)
JD1	Speaker/buzzer (Pins 1~3: External Speaker, Pins 3~4: Buzzer)
JF1	Front Panel Control Header
JL1	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	5V Standby Power Header
JTPM1	Trusted Platform Module/Port80 Connector
KB/Mouse	Keyboard/Mouse Connector
LAN1/LAN2	Gb LAN (RJ45) Ports
M.2	PCI-E M.2 Connector
MH10 ~ MH12	M.2 Mounting Holes
OC FRONT PANEL	Header for the Overclocking Control Panel
S5, S6, S7	Overclocking Button OC1 (15%), OC2 (20-25%), OC3 (User Defined in BIOS)
S9, S10	Home Button, Memory Overclocking Button
S8, S11, S12	Clear CMOS Button, BIOS Restore, Pwer Button
SLOT1/SLOT3	PCH PCI-E 3.0 X1 (IN X4) Slots
SLOT2	CPU PCI-E 3.0 X16 Slot
SLOT4	CPU PCI-E 3.0 X8 (IN X16) Slot
SLOT6	CPU PCI-E 3.0 X16 Slot
SP1	Internal Speaker/Buzzer
USB0/1	Back panel USB 2.0 Ports
USB6/7	Back panel USB 3.0 Ports
USB10	Back panel USB 3.1 Port
USB2/3, 4/5	Front Panel Accessible USB 2.0 Headers

USB8/9	Front Panel Accessible USB 3.0 Headers
USB11/12	Front Panel Accessible USB 3.1 Headers

LED	Description	Color/State	Status
LED1	Onboard Standby PWR LED	Green: Solid on	Power On
LED2	M.2 LED	Green	M.2 on board
LED4	Status Display	Digital Readout	Download the status codes below*

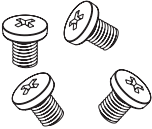
*Download the AMI status codes at http://www.ami.com/support/doc/ami_aptio_4.x_status_codes_pub.pdf

Chapter 2

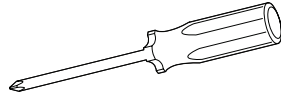
Installation

2-1 Installation Components and Tools Needed

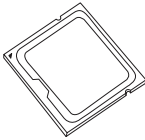
Screws



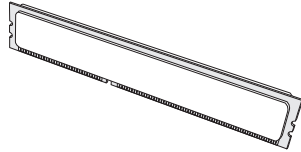
Phillips-Head Screwdriver



Intel LGA 1151 Processor



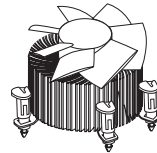
DDR4 DIMMs



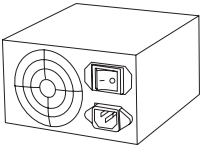
PC Chassis



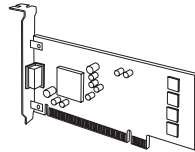
Heatsink with Fan



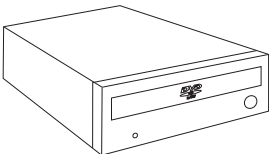
Power Supply



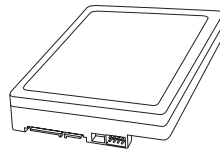
Video Card (Optional)



SATA/USB Optical Drive (Optional)



SATA Hard Disk Drive



2-2 Static-Sensitive Devices

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

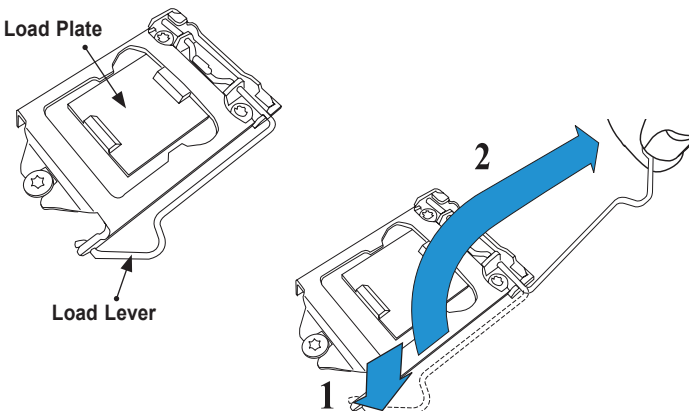
Make sure to install the system board into the chassis before you install the CPU heatsink.

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.

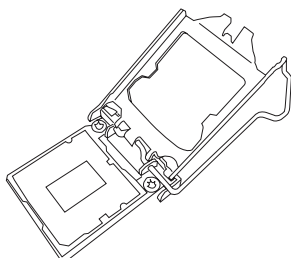
Refer to the Supermicro website for updates on CPU support.

Installing the LGA1151 Processor

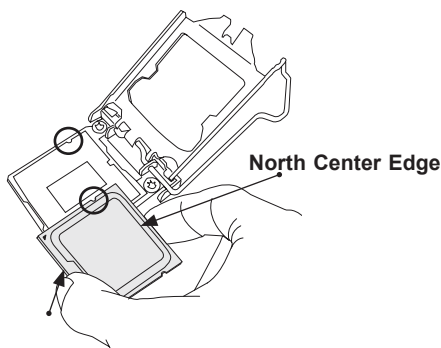
1. Press the load lever to release the load plate, which covers the CPU socket, from its locking position.



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

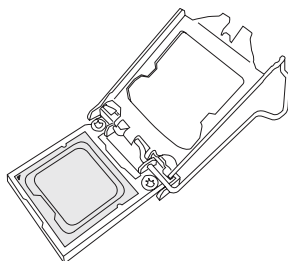


3. Use your thumb and your index finger to hold the CPU at the North center edge and the South center edge of the CPU.

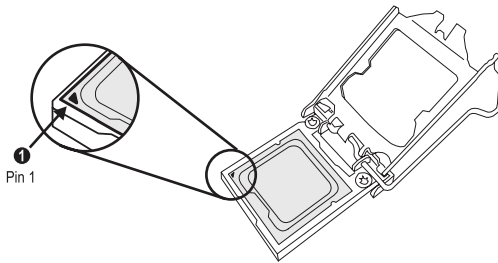


South Center Edge

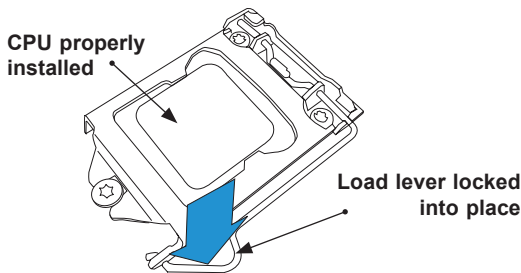
4. Align the CPU key that is the semi-circle cutouts against the socket keys. Once it is aligned, carefully lower the CPU straight down into the socket. Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically.



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

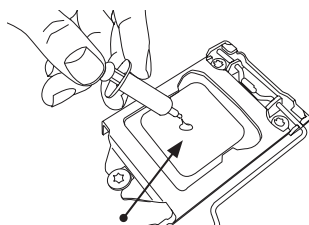
1. Locate the CPU Fan power connector on the motherboard (Fan1: CPU Fan).
2. Position the heatsink so that the heatsink fan wires are closest to the CPU fan power connector and are not interfered with other components.
3. Inspect the CPU Fan wires to make sure that the wires are routed through the bottom 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.

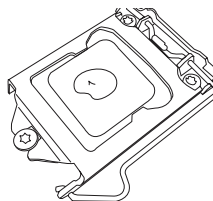
5. Apply the proper amount of thermal grease on the CPU.

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

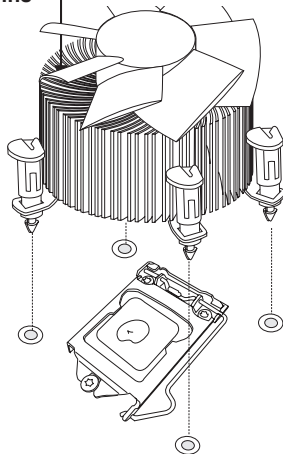
6. If necessary, rearrange the wires to make sure that the wires are not pinched between the heatsink and the CPU. Also make sure to keep clearance between the fan wires and the fins of the heatsink.



Thermal Grease

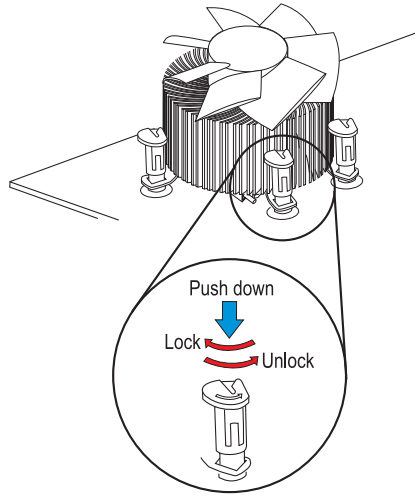


Heatsink Fins



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

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

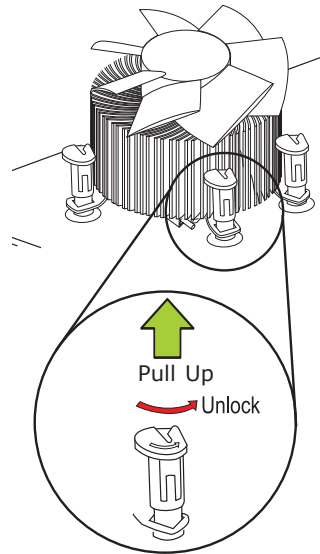
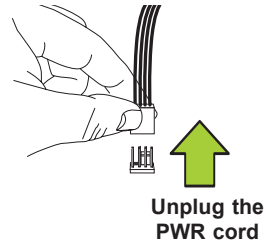


Removing the Heatsink

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

Active Heatsink Removal

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



2-4 Installing DDR4 Memory



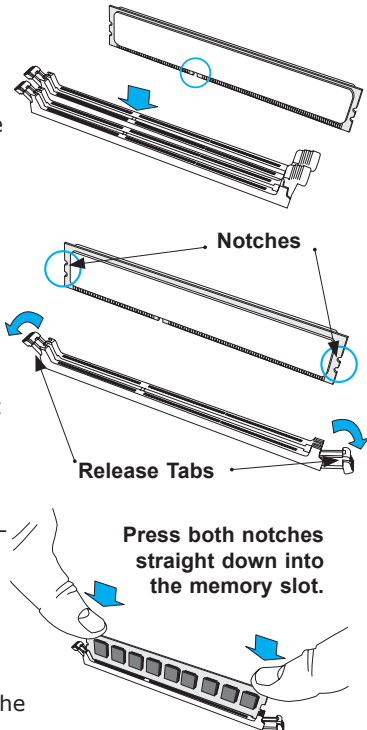
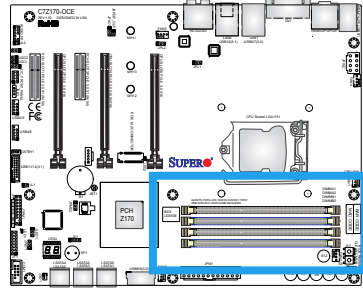
Note: Check the Supermicro website for recommended memory modules.



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

DIMM Installation

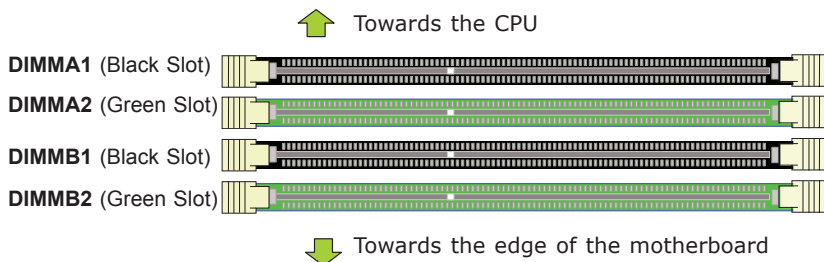
1. Insert the desired number of DIMMs into the memory slots, starting with DIMMB2, DIMMA2, then DIMMB1, DIMMA1 (see the layout for the location). For the system to work properly, please use the memory modules of the same type and speed in the same motherboard.
2. Push the release tabs outwards on both 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 C7Z170-OCE supports up to 64GB of Unbuffered (UDIMM) non-ECC DDR4 memory, up to 3000+MHz (OC) in four 288-pin memory slots. Populating these DIMM modules with a pair of memory modules of the same type and same size will result in interleaved memory, which will improve memory performance.

Notes



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

Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. 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: DIMMB2, DIMMA2, then DIMMB1, DIMMA1.

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

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

2-5 Motherboard Installation

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



Philips Screwdriver (1)

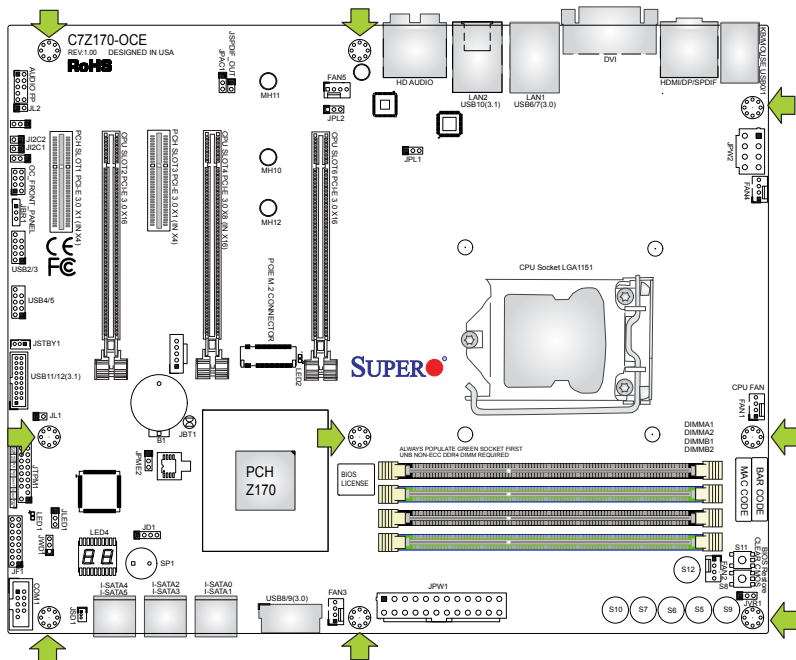


Philips Screws (9)



Standoffs (9) Only if Needed

Tools Needed

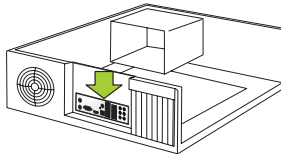


Location of Mounting Holes

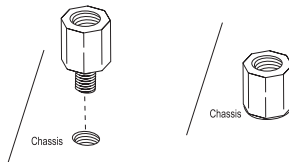
! Attention! 1) To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to avoid damaging these components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

Installing the Motherboard

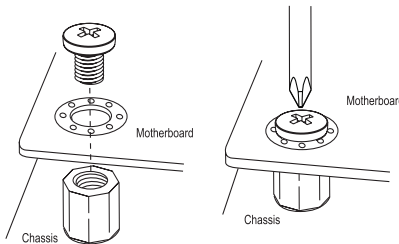
1. Install the I/O shield into the back of the chassis.



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.



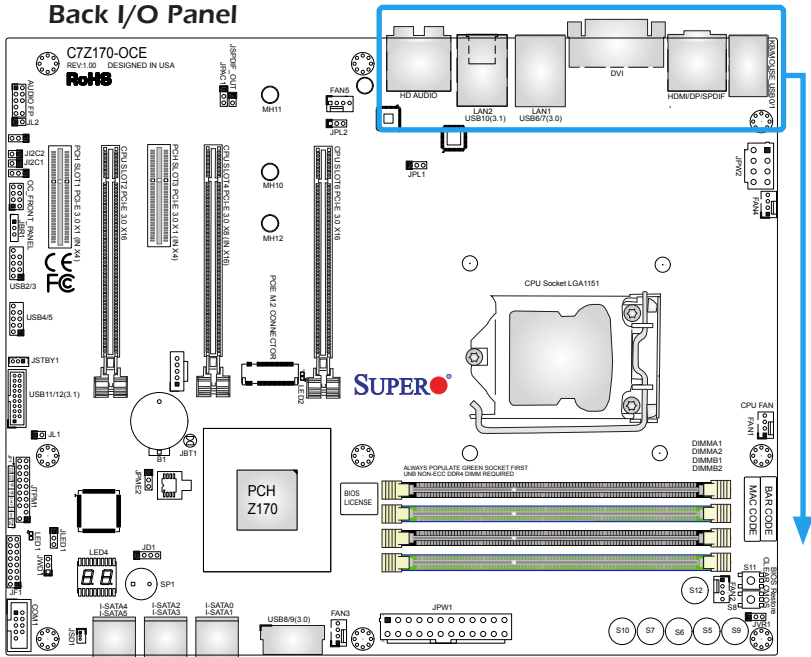
6. Using the Phillips screwdriver, insert a Phillips head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.
7. Repeat Step 5 to insert #6 screws into all mounting holes.
8. Make sure that the motherboard is securely placed in the chassis.



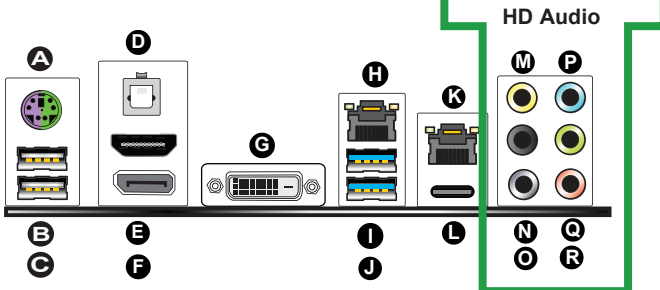
Note: Images displayed are for illustration only. Your chassis or components might look different from those shown in this manual.

2-6 Connectors/IO Ports

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



A. PS/2 Keyboard/Mouse Port	G. DVI-D Port	M. Center/LFE Out
B. USB 2.0 Port 0	H. Gb LAN Port 1	N. Surround Out
C. USB 2.0 Port 1	I. USB 3.0 Port 6	O. S-Surround Out
D. S/PDIF Out	J. USB 3.0 Port 7	P. Line In
E. HDMI Port	K. Gb LAN Port 2	Q. Line Out
F. VESA Display Port	L. USB 3.1 Port 8, Type C	R. Mic In



Universal Serial Bus (USB)

Two Universal Serial Bus 2.0 ports (#0/1), two USB 3.0 ports (#6/7) and one USB 3.1 'type C' port (#8) are located on the I/O back panel. In addition, two USB 3.0 headers (four ports: #9/10, #11/12), and two USB 2.0 headers (#2/3, #4/5) 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 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) #6/7 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 #9/10, #11/12 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. Back panel USB 2.0 #1

B. Back panel USB 2.0 #0

C. Back panel USB 3.0 #7

D. Back panel USB 3.0 #6

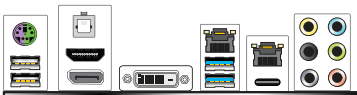
E. Back panel USB 3.1 #10

F. USB 2.0 Header #2/3

G. USB 2.0 Header #4/5

H. USB 3.1 Header #11/12

I. USB 3.0 Header #8/9



A
B

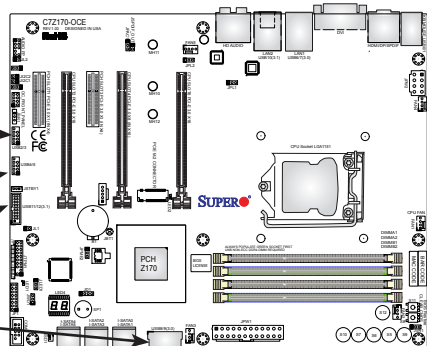
C
D

E

F

G
H

I



Ethernet Port

Two Gigabit Ethernet ports (LAN1/LAN2) are located next to the DVI-D port on the I/O back panel to provide network connections. These ports accept RJ45 type cables.



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

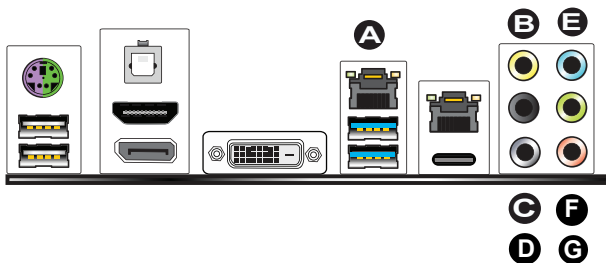
LAN Ports Pin Definition			
Pin#	Definition		
1	P2V5SB	10	SGND
2	TD0+	11	Act LED
3	TD0-	12	P3V3SB
4	TD1+	13	Link 100 LED (Green, +3V3SB)
5	TD1-	14	Link 1000 LED (Yellow, +3V3SB)
6	TD2+	15	Ground
7	TD2-	16	Ground
8	TD3+	17	Ground
9	TD3-	88	Ground

(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
- B. Center/LFE Out
- C. Surround Out
- D. S-Surround
- E. Line In
- F. Line Out
- G. Mic In



S/PDIF Port

A S/PDIF port is located next to the USB ports 0/1 on the I/O back panel. Use this port to connect to a compatible S/PDIF optical audio device.

VESA® DisplayPort™

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

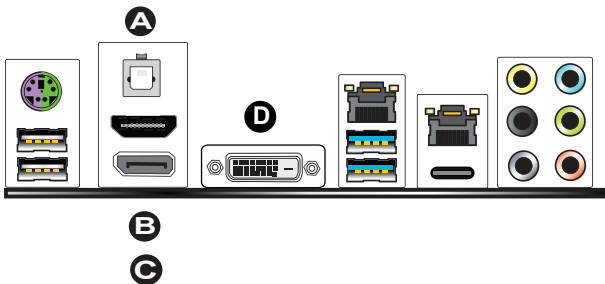
HDMI Port

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

DVI-D Port

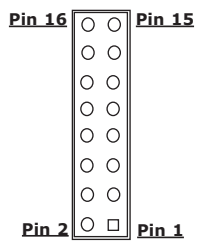
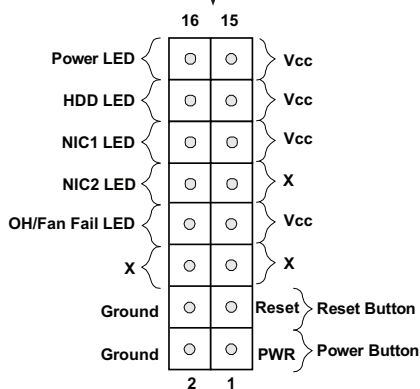
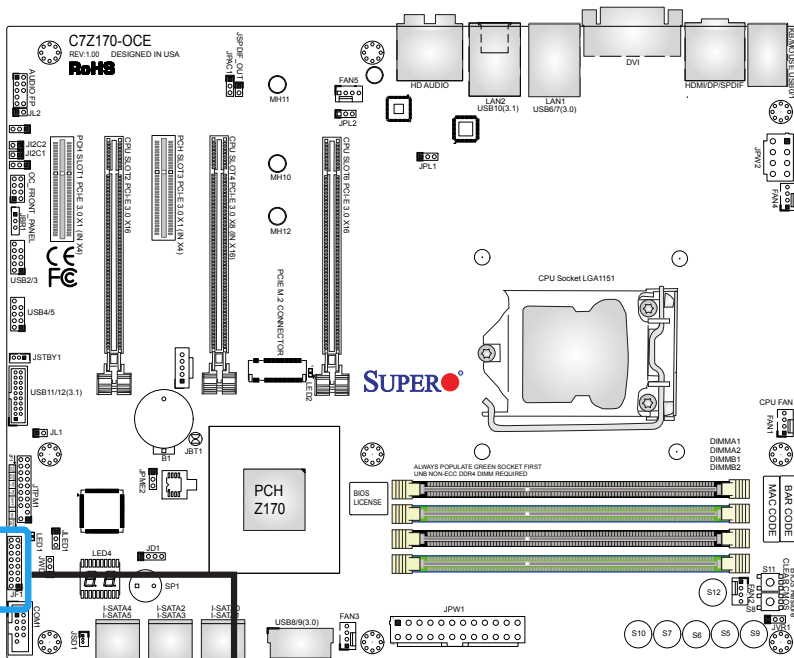
A DVI-D port is located on the I/O back panel. Use this port to connect to a compatible DVI (Digital Visual Interface) display.

- A. S/PDIF Port
- B. HDMI Port
- C. VESA Display Port
- D. DVI-D



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/NIC2 (LAN)

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

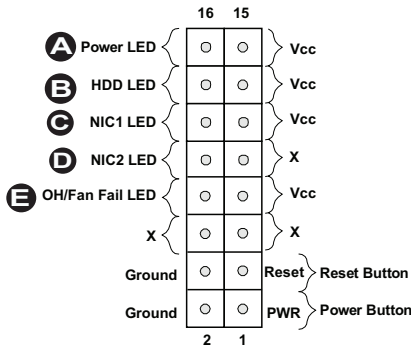
LAN LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	Ground

Overheat (OH)/Fan Fail

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

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

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



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

Reset Button

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

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

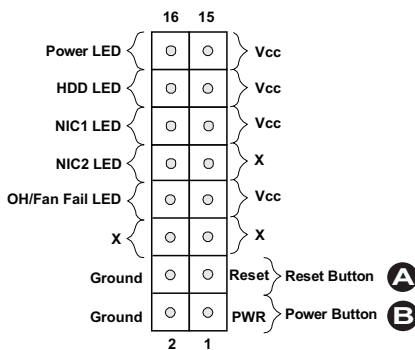
Power Button

The Power Button connection is located on 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.

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

A. Reset Button

B. PWR Button



2-7 Connecting Cables

This section provides brief descriptions and pinout definitions for onboard 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.

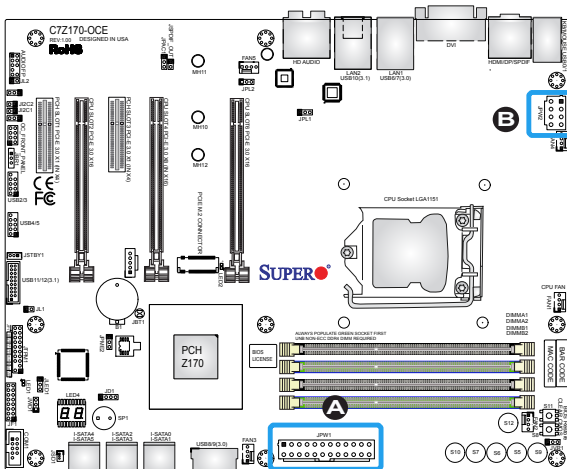
12V 8-pin Power Connector Pin Definitions	
Pins	Definition
1 through 4	Ground
5 through 8	+12V

(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

The C7Z170-OCE has five 4-pin fan headers (Fan 1~Fan 5). Although pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans, we recommend that you 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.

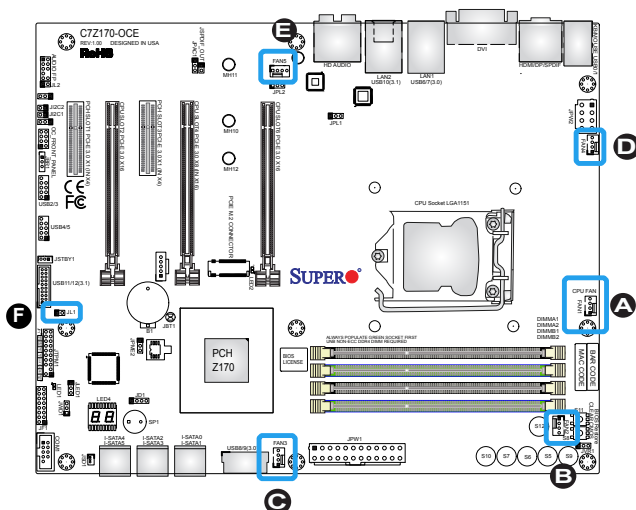
Fan Header Pin Definitions	
Pin#	Definition
1	Ground (Black)
2	2.5A/+12V (Red)
3	Tachometer
4	PWM_Control

Chassis Intrusion

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

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

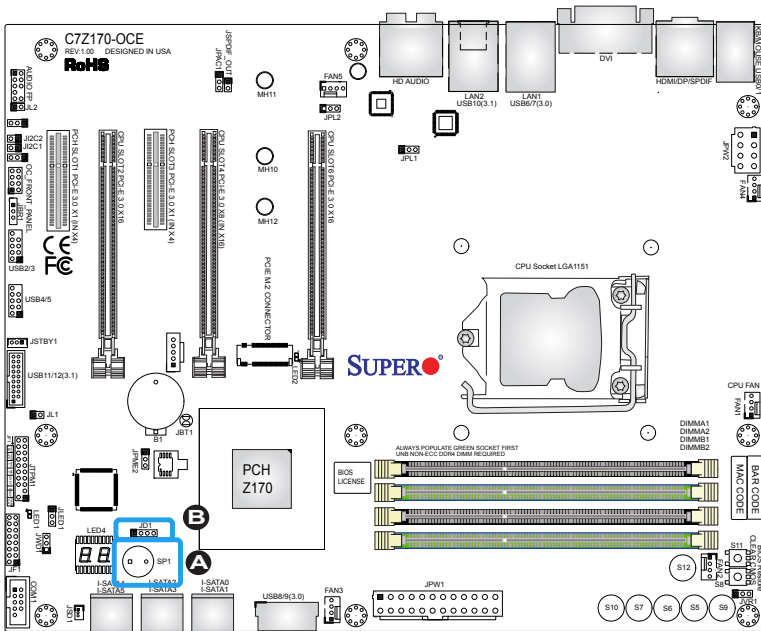
Speaker

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

Speaker Connector Pin Definitions	
Pin #	Definition
Pins 3~4	Buzzer
Pins 1~3	External Speaker

A. Internal Buzzer

B. Speaker Header



Onboard Power LED

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

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

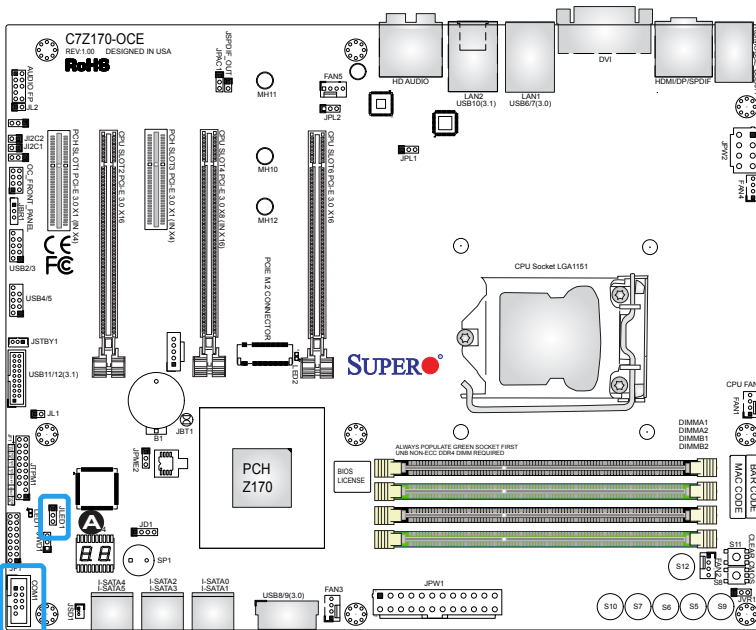
Serial Port

There is one serial (COM1) port header on the motherboard. COM1 is located next to the 1394 connection 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

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

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

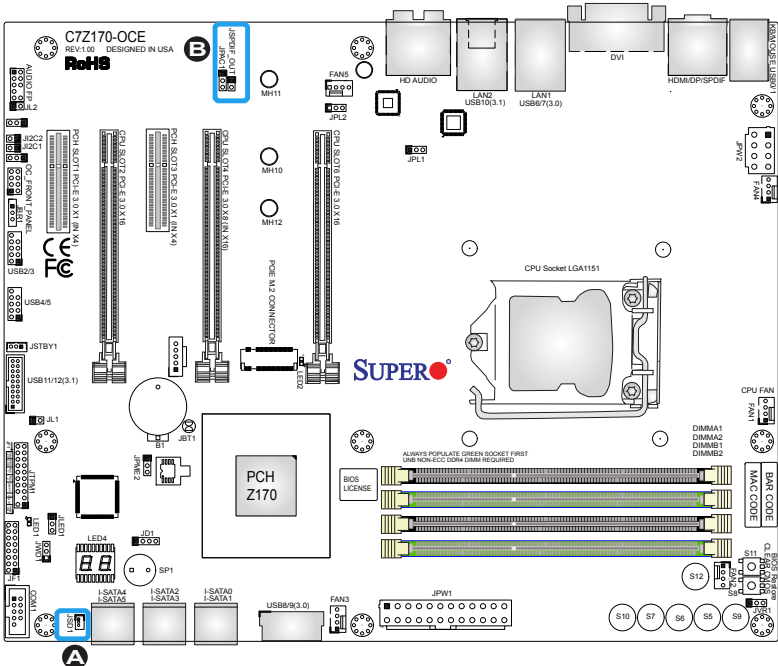
SPDIF OUT

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

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

A. DOM PWR

B. S/PDIF OUT



Standby Power Header

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

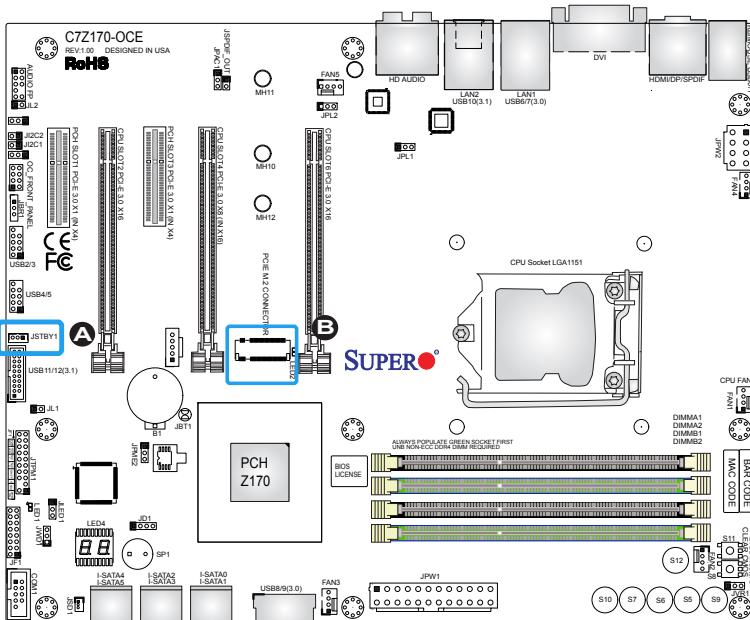
Standby Power Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

M.2 Connector

The PCI-E M.2 connector is for devices such as memory cards, wireless adapters, etc. These devices must conform to the PCIe M.2 specifications (formerly known as NGFF). This particular PCIe M.2 supports M-Key (PCIe 3.0 x4) storage card only.

A. STBY PWR

B. PCI-E M.2 Connector



Front Panel Audio Header

A 10-pin Audio header at AUDIO FP 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.

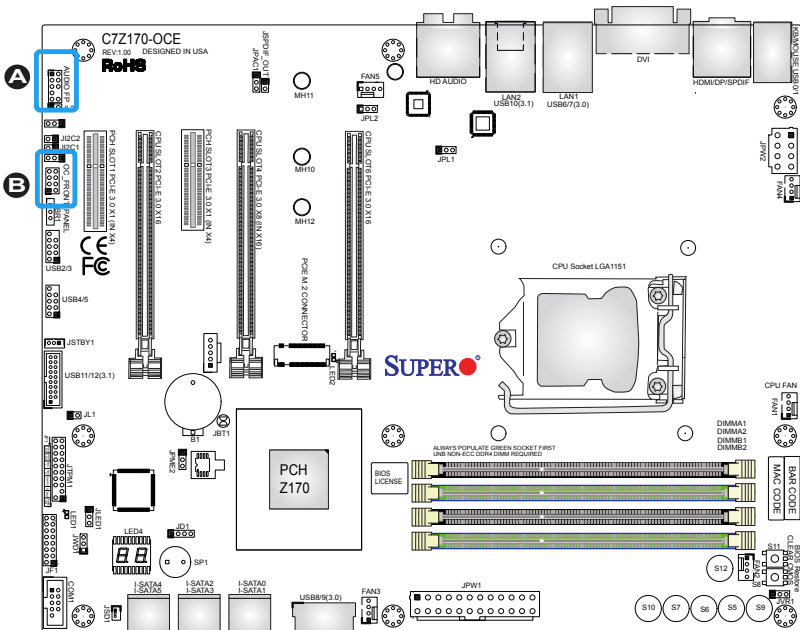
10-in Audio Pin Definitions	
Pin#	Signal
1	Microphone_Left
2	Audio_Ground
3	Microphone_Right
4	Audio_Detect
5	Line_2_Right
6	Ground
7	Jack_Detect
8	Key
9	Line_2_Left
10	Ground

OC Front Panel

This OC FRONT PANEL header is for the optional Overclocking (OC) control panel. Attach the control panel's cable to this header. The OC control panel enables overclocking control and management from the front of the chassis. See Section 2-11 for more details.

A. AUDIO FP

B. OC FRONT PANEL

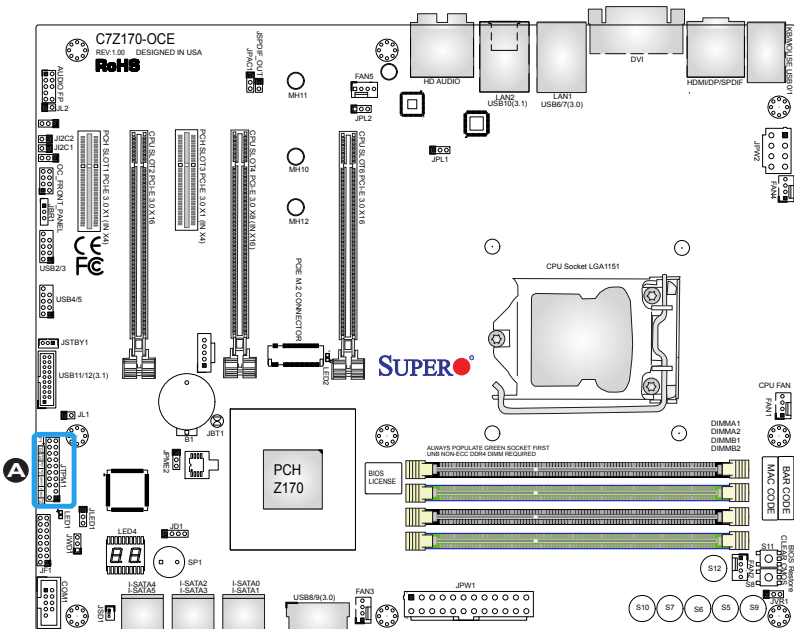


TPM Header

The JTPM1 header is used to connect a Trusted Platform Module (TPM), which is available from a third-party vendor. A TPM is a security device that supports encryption and authentication in hard drives. It enables the motherboard to deny access if the TPM associated with the hard drive is not installed in the system. See the table on the right for pin definitions for the header.

Trusted Platform Module Header Pin Definitions			
Pin#	Definition	Pin#	Definition
1	LCLK	2	GND
3	LFRAME#	4	No Pin
5	LRESET#	6	+5V
7	LAD3	8	LAD2
9	3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK4 (X)	14	SMB_DAT4 (X)
15	P3V3_STBY	16	SERIRQ
17	GND	18	GND
19	P3V3_STBY	20	LDRQ# (X)

A. TPM Header



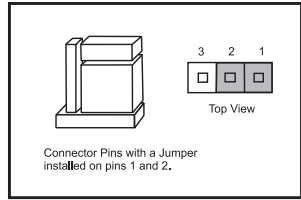
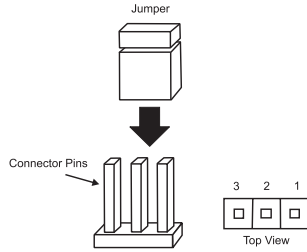
2-8 Jumper Settings

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 the pins, and "Open" means the jumper is off.



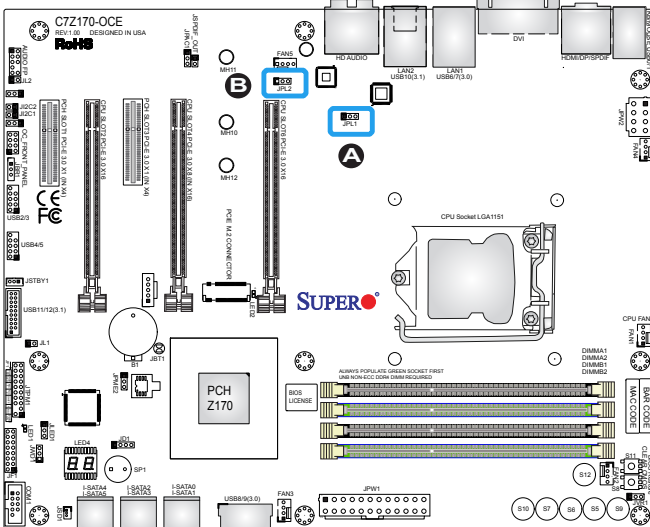
LAN Enable/Disable

Jumpers JPL1 and JPL2 will enable or disable the LAN ports 1 and 2, respectively, 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

B. JPL2



Clear CMOS & JBT1

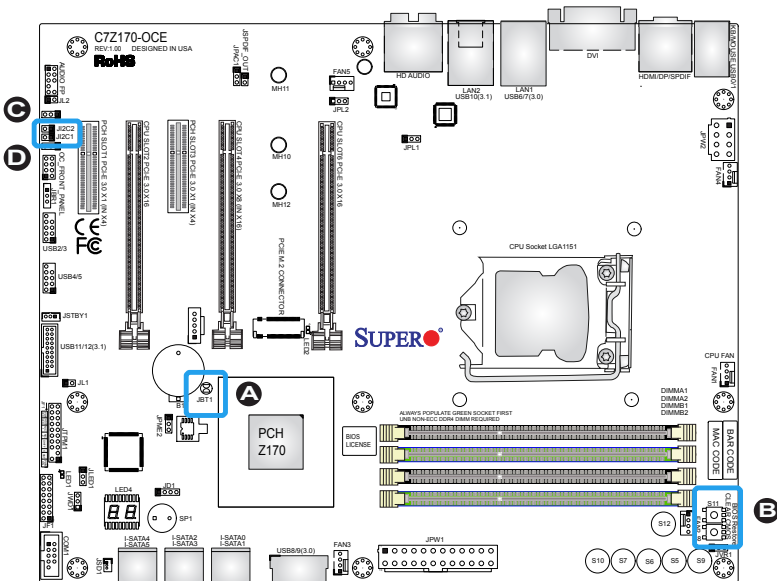
Clear CMOS (S11) and JBT1 are used to clear the saved system setup configuration stored in the CMOS chip. To clear the contents of the CMOS using JBT1, short the two pads of JBT1 with a metallic conductor such as a flathead screwdriver. Clear CMOS works the same way but is a push button switch. This will erase all user settings and revert everything to their factory-set defaults.

PCI Slot SMB Enable

Use Jumpers J²C1/J²C2 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. JBT1
- B. Clear CMOS (S11)
- C. J²C1
- D. J²C2



Audio Enable

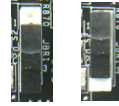
JPAC1 allows you to enable or disable the onboard audio support. The default position is on pins 1 and 2 to enable onboard audio connections. See the table on the right for jumper settings.

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

BIOS Recovery Switch

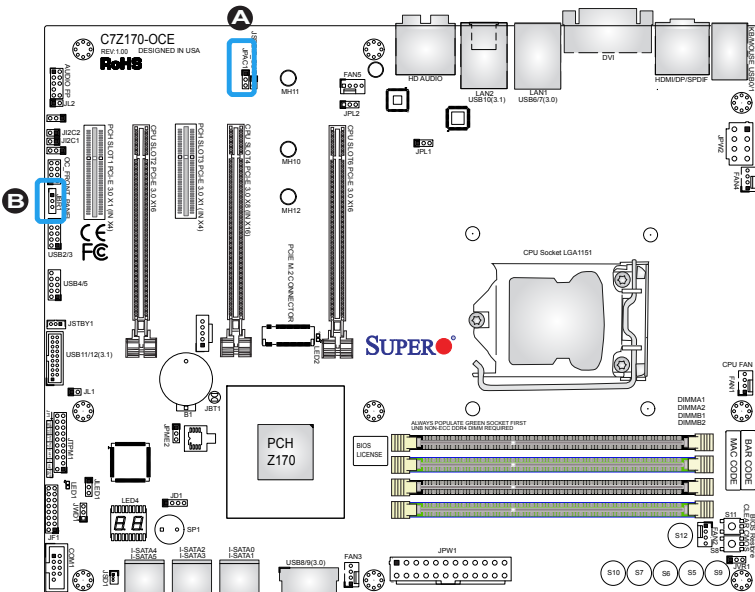
The BIOS Recovery Switch (JBR1) is used to enable or disable the BIOS Recovery feature of the motherboard. Slide the switch from the default position to begin the recovery process. See Appendix D for details.

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



A. Audio Enable

B. BIOS Recovery



Manufacturing Mode

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.

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

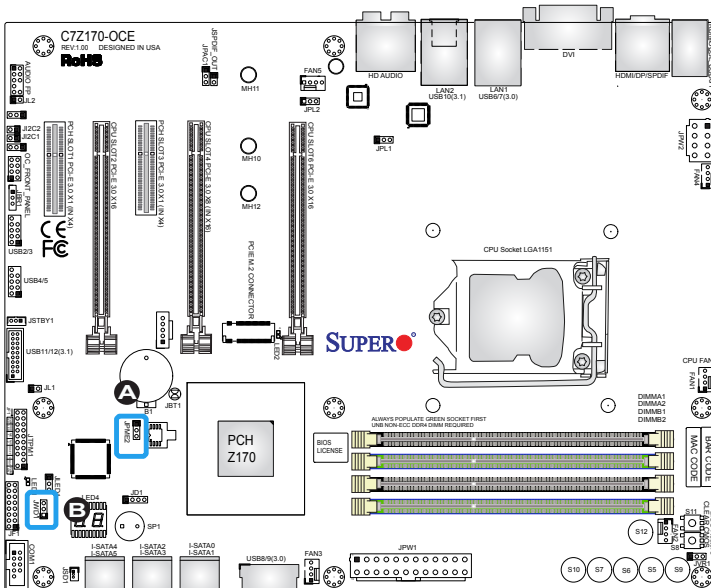
Watch Dog

JWD1 controls the Watch Dog function. Watch Dog is a monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause Watch Dog to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings.

Watch Dog Jumper Settings	
Pin#	Definition
1-2	Reset
2-3	NMI
Open	Disabled

Note: When Watch Dog is enabled, users need to write their own application software to disable it.

- A. Manufacturing Mode
- B. Watch Dog



Power Button (POWER BUTTON)

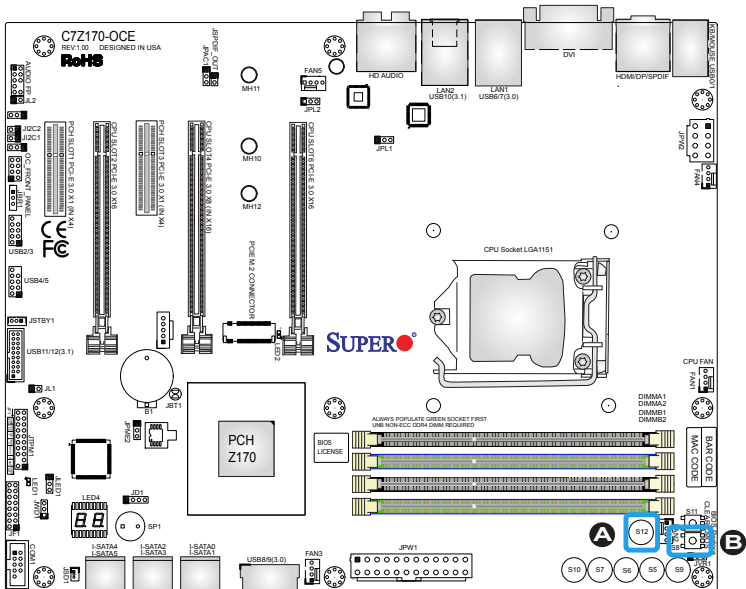
In addition to the soft power switch provided in JF1, your motherboard is equipped with a 'soft' power button (S12) on the motherboard. This switch works the same way as the soft power switch on JF1.

BIOS Restore (BIOS RESTORE)

When pressed, the BIOS Restore Button (S8) 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. Power Button

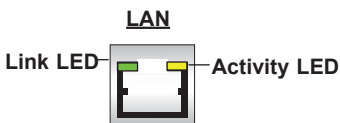
B. BIOS Restore



2-9 Onboard Indicators

LAN LEDs

One LAN port is located on the I/O back panel of the motherboard. This Ethernet LAN port has two LEDs (Light Emitting Diode). 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 on the right for more information.



GLAN Activity Indicator LED Settings		
Color	Status	Definition
Yellow	Flashing	Active

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

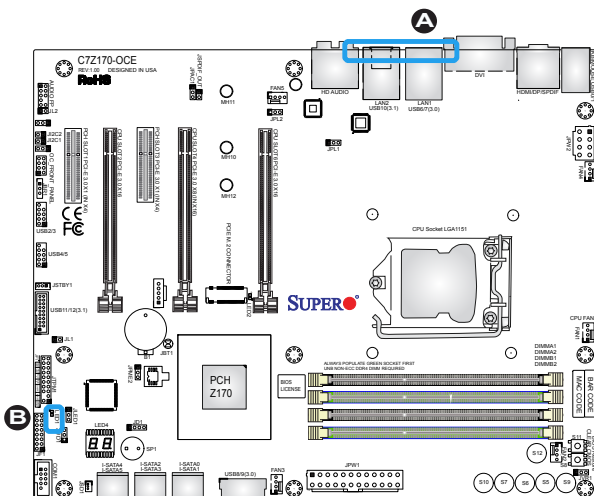
Onboard Power LED

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

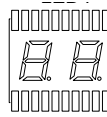
A. LAN LEDs

B. PWR LED



Status Display

LED4 is made up of two alphanumeric displays that will display a status or POST code, when the motherboard is powered on. Please download the following AMI publication for a complete list of POST codes:



http://www.ami.com/support/doc/ami_aptio_4.x_status_codes_pub.pdf

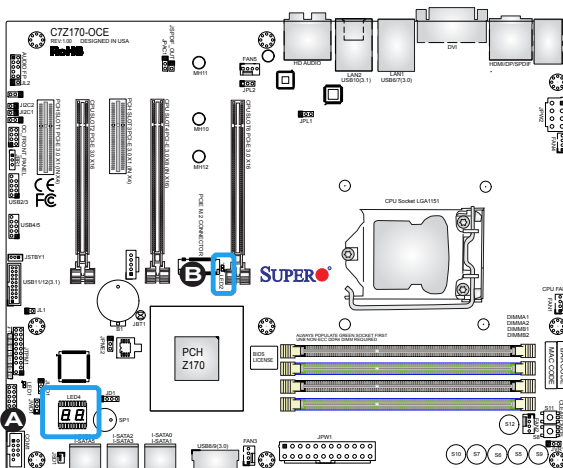
M.2 LED

The M.2 LED is located at LED2. When this LED is on, a device is connected to the M.2 slot. See the table on the right for more information.

M.2 LED Indicator LED Status	
Status	Definition
Off	No Device Connected
On	M.2 On Board

A. Status Display

B. M.2 LED



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. These I-SATA 3.0 ports are supported by the Intel Z170 PCH chip (supports RAID 0,1,5,10). 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 #4

B. I-SATA 3.0 #2

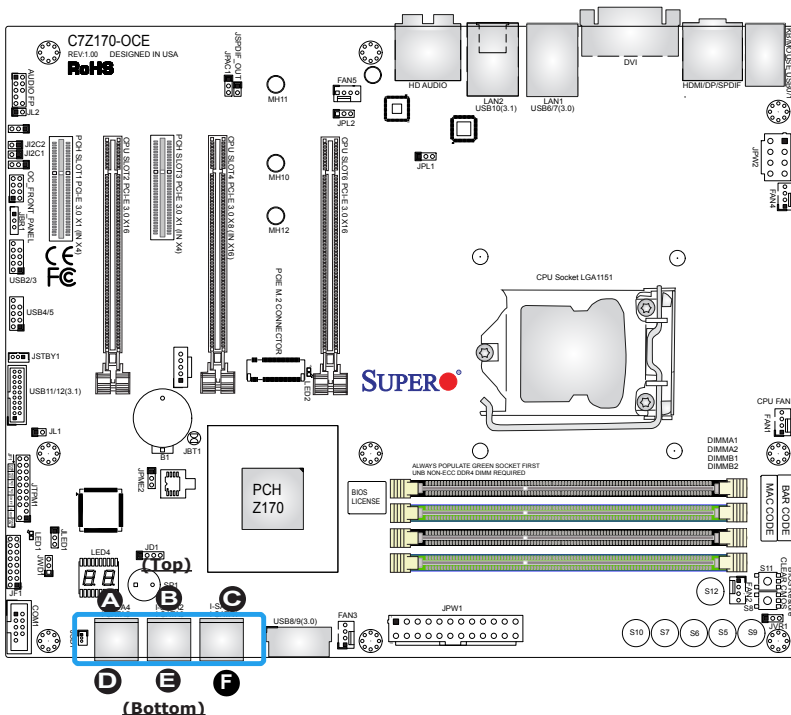
C. I-SATA 3.0 #0

Bottom

D. I-SATA 3.0 #5

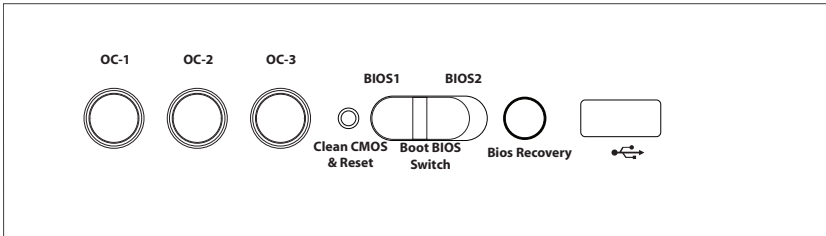
E. I-SATA 3.0 #3

F. I-SATA 3.0 #1



2-11 The OC Front Control Panel (Optional)

The OC (Overclocking) Front Control Panel has six (6) control buttons, switches and one USB port.



Overclocking Buttons (OC1, OC2, OC3)

Press these buttons to activate the overclocking 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.

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

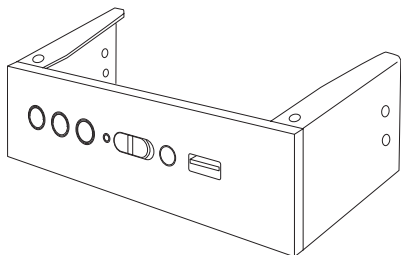
Push the BIOS Recovery button to enable the motherboard to enter the BIOS Recovery process and re-install the BIOS, reverting all settings back to factory default. It looks for a file named "SUPER.ROM" from a memory device attached to any of the USB drives. It functions the same way as the BIOS Restore Button which is installed on the motherboard. See page 2-33 for details.

Front USB Port

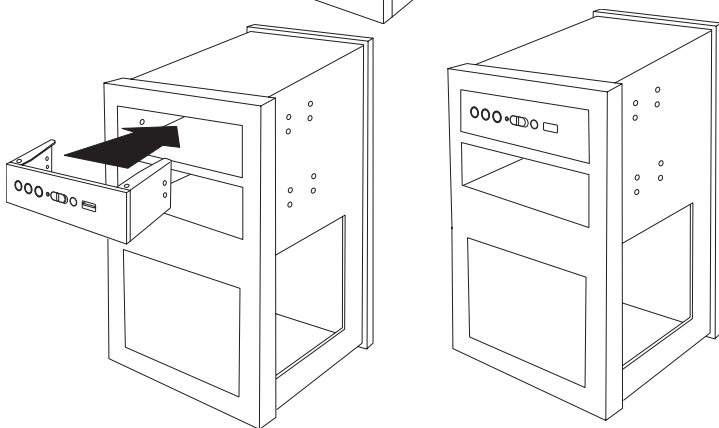
The Front USB Port is defined as USB 3.0 Port# XX on this motherboard. It is conveniently located on the OC panel for quick access for USB memory sticks and other storage devices.

Installing the OC Front Control Panel

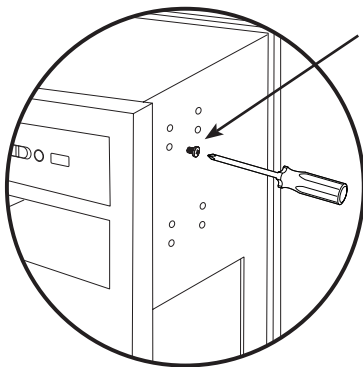
The OC Front Control Panel is designed to fit into an external 5.25-inch external drive bay of a desktop-style or tower-style computer chassis. Make sure that the appropriate type of screws are used.



The OC Front Control panel

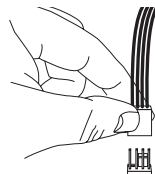


The OC Control panel easily slides into a standard 5.25-inch drive bay on a desktop or tower-style computer chassis.



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 DDR4 (up to 3000) 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 C7ZZ170-OCE supports up to 64GB of unbuffered Non-ECC DDR4. 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 website. Select your motherboard model and download the BIOS ROM file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You may choose the zip file or the .exe file. If you choose the zipped BIOS file, please unzip the BIOS file onto a bootable device or a USB pen/thumb drive. To flash the BIOS, run the batch file named "ami.bat" with the new BIOS ROM file from your bootable device or USB pen/thumb drive. Use the following format:

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



Note: Always use the file named "ami.bat" to update the BIOS, and insert a space between "ami.bat" and the filename. The BIOS-ROM-filename will bear the motherboard name (i.e., C7Z170) and build version as the extension. For example, "C7Z170.115". 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!

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

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

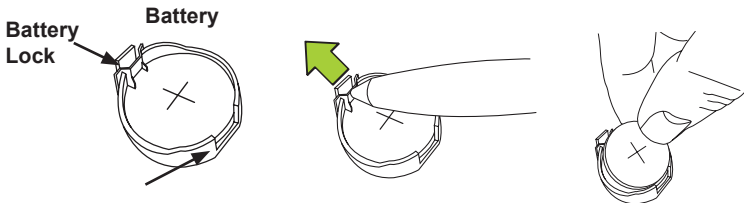
3-4 Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps below:

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

Proper Battery Disposal



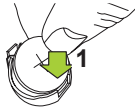
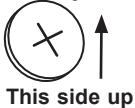
! **Attention!** Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste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

Battery Installation

1. To install an onboard battery, follow the steps 1 & 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 C7Z170-OCE. 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

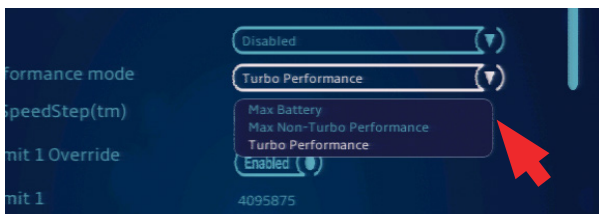
To enter the AMI BIOS GUI Setup Utility screens, press the <Delete> key while the system is booting up.



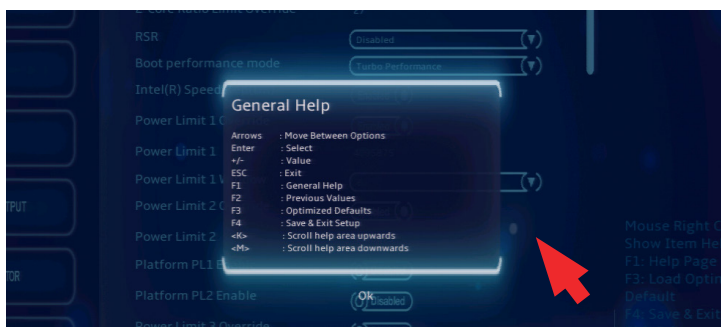
Note: In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen.



Each BIOS menu option is described in this manual. The Main BIOS Setup screen has two main areas. The left 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.

The keyboard's Escape key <ESC> cancels the current screen and will you back to the previous screen.

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: 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 Saving and Loading

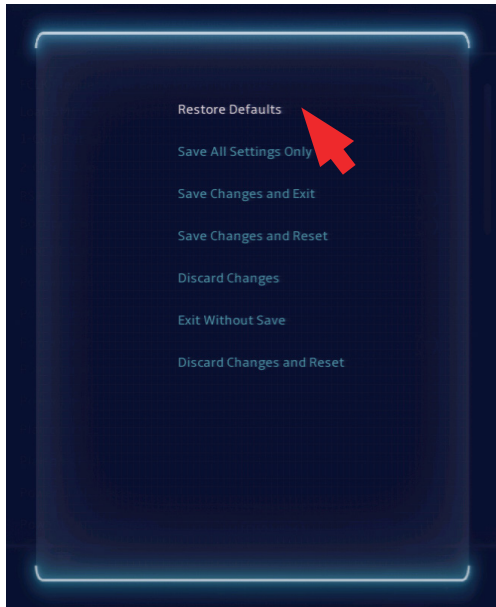
Save and Load

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:



Restore Defaults

To set this feature, select Restore Defaults from the Save & Load menu and click <OK>. These are factory settings designed for maximum system 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 Changes and Exit

Select this option to save the current settings and exit Setup.

Save Changes and Reset

Select this option to save the current settings, exit Setup and reboot.

Discard Changes

Select this option discard any changes and return to Setup.

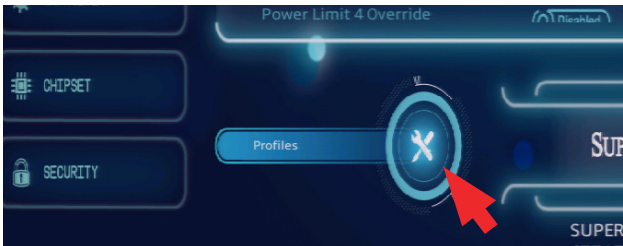
Exit without Save

Select this option to exit Setup without making any permanent changes to the system configuration.

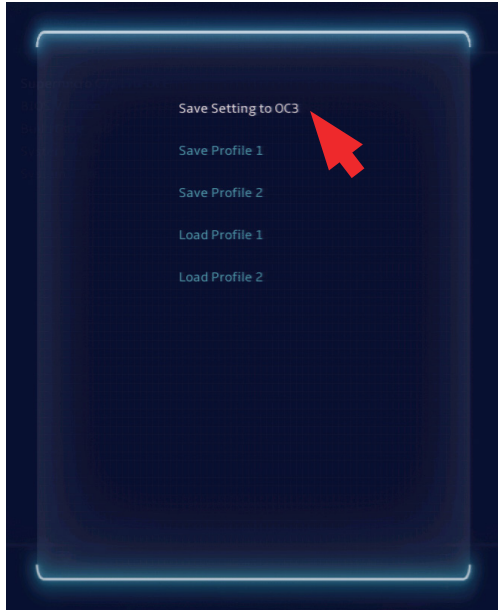
Discard Changes and Reset

Select this option to discard all changes to setup and reboot.

Profiles



The Profiles icon brings up a pop-up menu that enables the user to choose from two saving and loading locations. These locations can be used to store new, or retrieve previously saved overclocking profiles:



Save Setting to OC3

Select this option to save the current overclocking profile to the OC3 location. Click "OK" when prompted, click "Cancel" to go back and not save.

Save Profile 1 / Save Profile 2

Select this option to save the current overclocking profile into either Profile 1 or Profile 2 location. Click "OK" when prompted, click "Cancel" to go back and not save.

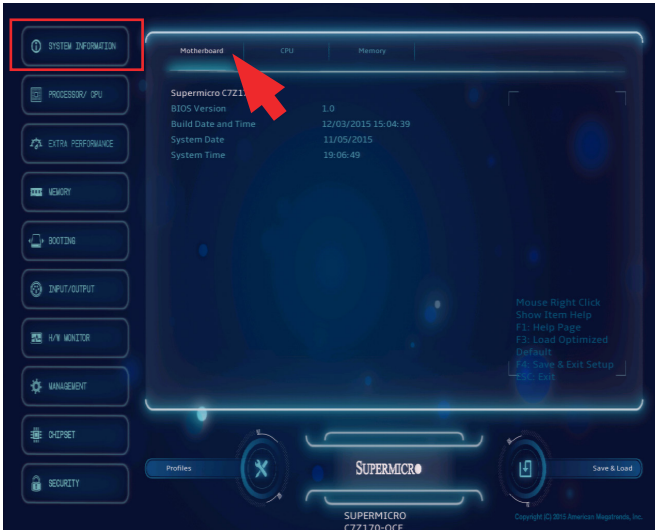
Load Profile 1 / Load Profile 2

Select this option to load a previously saved overclocking profile from either Profile 1 or Profile 2 location. Click "OK" when prompted, click "Cancel" to go back and not load.

4-3 System Information

The System Information Screen displays the motherboard's configuration.

Motherboard



The following information is displayed in this section:

- **Motherboard Model Name** - C7Z170-OCE.
- **BIOS Version** - this item displays the BIOS version number.
- **Build Date and Time** - displays the BIOS build date and Time.

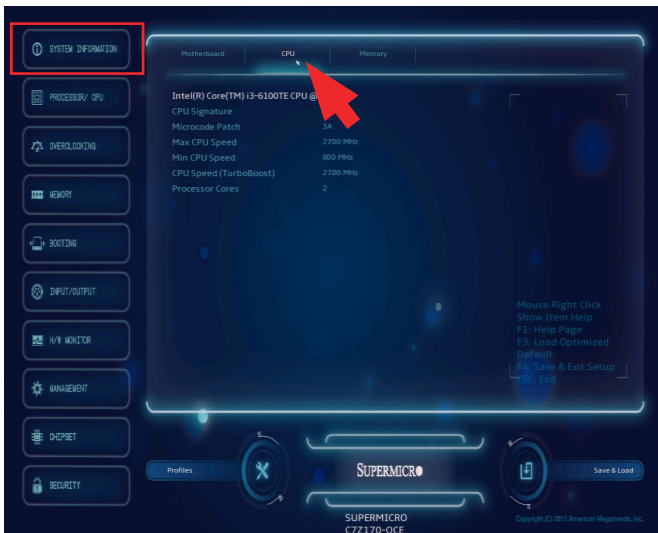
System Date

Click on the date to open the setup fields. This item sets and displays the system date. Click the up and down arrows to adjust the date.

System Time

Click on the time to open the setup fields. This item sets and displays the system time. Click the up and down arrows to adjust the system time.

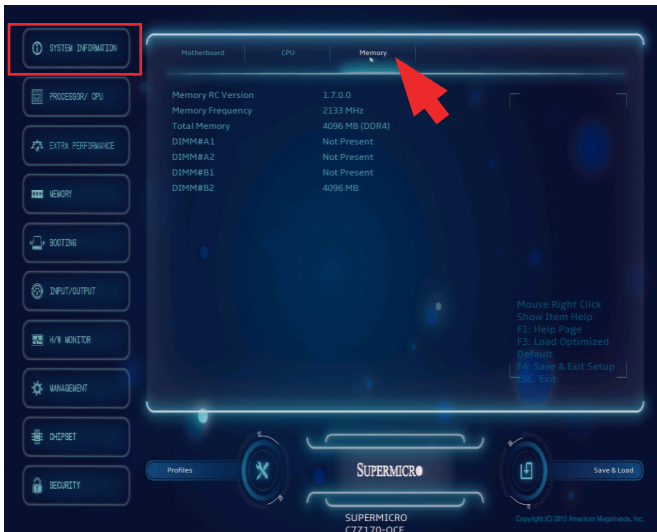
CPU



The following information is 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.
- **Microcode Patch** - displays the CPU's microcode patch version.
- **Max CPU Speed** - this item shows the maximum CPU speed.
- **Min CPU Speed** - this item shows the minimum CPU speed.
- **CPU Speed (TurboBoost)** - this item shows the current CPU speed.
- **Processor Cores** - this item shows the detected number of processor cores.

Memory



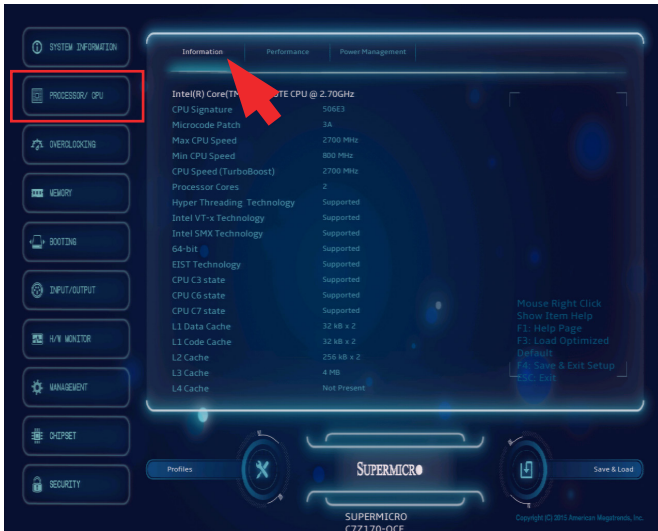
The following information is displayed in this section:

- **Memory RC Version** - displays the memory reference code version.
- **Memory Frequency** - displays the system memory's detected speed.
- **Total Memory** - shows the total detected system memory.
- **DIMM#A1~DIMM#B2** - displays the memory size detected on each memory slot.

4-4 Processor/CPU

Set all options for the processor in this section.

Information

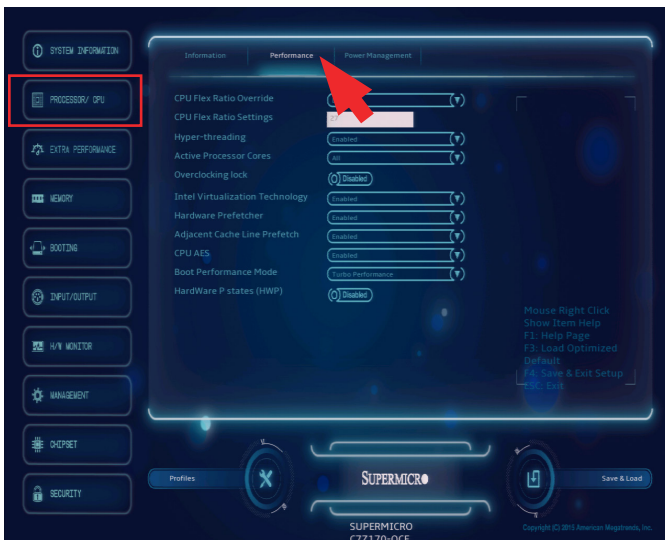


The following CPU information is displayed:

- **CPU Signature** - displays the unique signature embedded in CPU.
- **Microcode Patch** - displays the CPU's microcode patch version.
- **Max CPU Speed** - this item shows the maximum CPU speed.
- **Min CPU Speed** - this item shows the minimum CPU speed.
- **CPU Speed (TurboBoost)** - displays the CPU's rated speed.
- **Processor Cores** - displays the number of cores the CPU has.
- **Hyper-Threading Technology** - indicates if Intel HT is supported.
- **Intel VT-x Technology** - indicates if Intel VT-x is supported.
- **Intel SMX Technology** - indicates if Intel SMX 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



CPU Flex Ratio Override

Select Enabled to activate CPU Flex Ratio programming. The options are **Disabled** and Enabled.

CPU Flex Ratio Settings

When CPU Flex Ratio Override is enabled, this sets the value for the CPU Flex Ratio. The default is **27**. Press "+" or "-" on your keyboard to change the value.

Hyper-threading

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

Active Processor Cores

Use this feature to select the number of active processor cores. The options are **All**, 1, 2, 3 and 4 (These options depend on how many cores are supported by the CPU).

Overclocking lock

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

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 website 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.

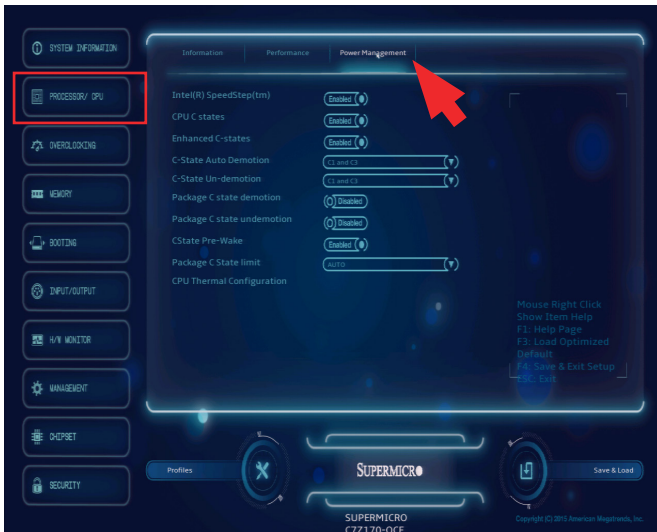
Boot performance mode

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.

HardWare P states (HWP)

This option enables the Hardware P State support. The options are **Disabled** and Enabled.

Power Management



Intel(R) SpeedStep(tm)

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 website for detailed information.** The options are Disabled and **Enabled**.

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 C-states

(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.

C-State Auto Demotion

When this item is enabled, the CPU will conditionally demote C State based on un-cored auto-demote information. The options are Disabled, C1, C3 and **C1 and C3**.

C-State Un-demotion

When this item is enabled, the CPU will conditionally undemote from demoted C3 or C1. The options are Disabled, C1, C3 and **C1 and C3**.

Package C State Demotion

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

Package C State Undemotion

When set, the CPU will conditionally undemote from demoted Packaged Package C-State Un-Demotion. The options are **Disabled** and Enabled.

CState Pre-Wake

When set, this option enables or disables the C-State pre wake. The options are **Enabled** and Disabled.

Package C State limit

Select Auto for the AMI BIOS to automatically set the limit on the C-State package register. The options are C0/C1, C2, C3, C6, C7, C7s, C8 and **Auto**.

CPU Thermal Configuration

This section configures the motherboard's onboard Thermal Management.

CPU DTS

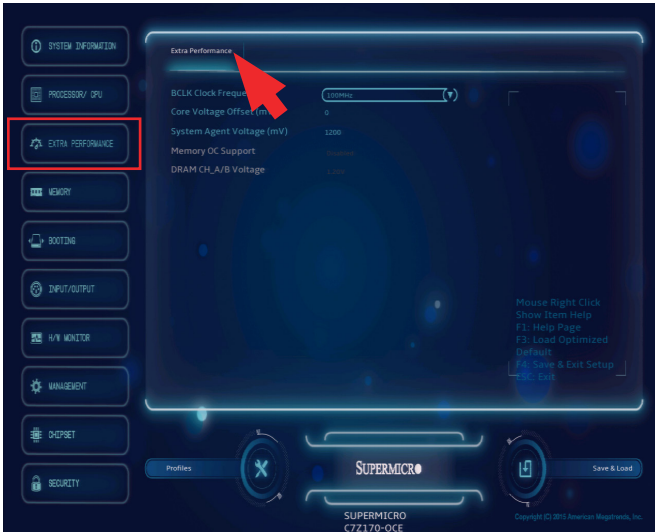
Select Enabled for the ACPI thermal to use the DTS SMM mechanism to obtain CPU temperature values. Select Disabled for EC to report the CPU temperature values. The options are **Disabled** and Enabled.

ACPI 3.0 T-States

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

4-5 Extra Performance

Set all options for Extra Performance in this section.



Extra Performance

BCLK Clock Frequency

Use this feature to set the base clock frequency. The options are **100MHz**, 105MHz, 110MHz, 115MHz, 120MHz, 125MHz, 130MHz, 135MHz, 140MHz and 145MHz.

Core Voltage Offset(mV)

Use this feature to set the CPU Voltage Offset value from -500mV to +500mV. Enter **0** to use the manufacture default value. Press "+" or "-" on your keyboard to change the value.

System Agent Voltage(mV)

This option sets the System Agent Voltage. Enter **1200** to use the manufacture default value. Press "+" or "-" on your keyboard to change the value.

Memory OC Support

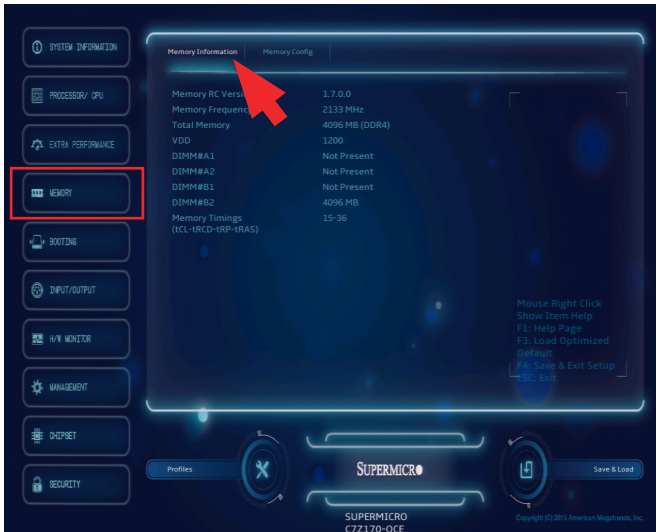
This item displays the memory overclocking support settings.

DRAM CH_A/B Voltage

This item displays the memory voltage.

4-6 Memory

Set all options for the Memory in this section.



Memory Information

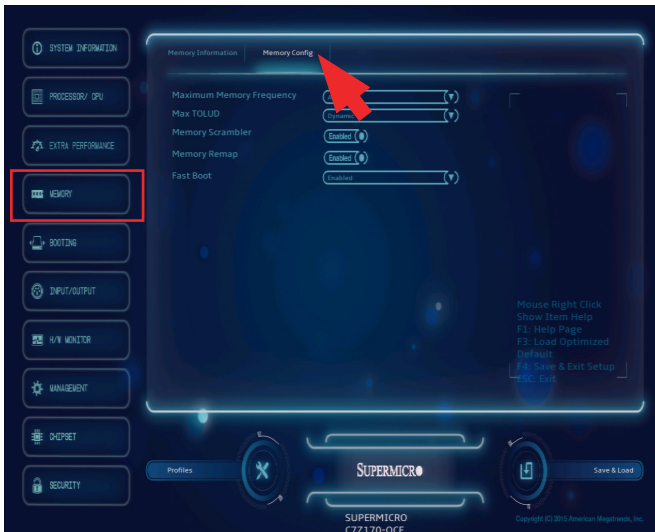
This item displays the following information on the memory modules installed on the motherboard.

- **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.
- **VDD (Memory Voltage)** - this item displays the current memory voltage.
- **DIMM#A1** - displays if a DIMM is installed on this slot and the DIMM size.
- **DIMM#A2** - displays if a DIMM is installed on this slot and the DIMM size.
- **DIMM#B1** - displays if a DIMM is installed on this slot and the DIMM size.

- **DIMM#B2** - displays if a DIMM is installed on this slot and the DIMM size.
- **Memory Timings (tCL-tRCD-tRP-tRAS)** - displays memory timings.

Memory Config

This section is used to configure the memory modules installed on the motherboard.



Maximum Memory Frequency

Use this feature to select the memory frequency. Select Auto for the system to automatically detect the memory frequency. The options are **Auto**, 1067, 1333, 1600, 1867, 2133, 2400, 2667, 2933 and 3200.

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 and 3 GB.



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

Memory Scrambler

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

Memory Remap

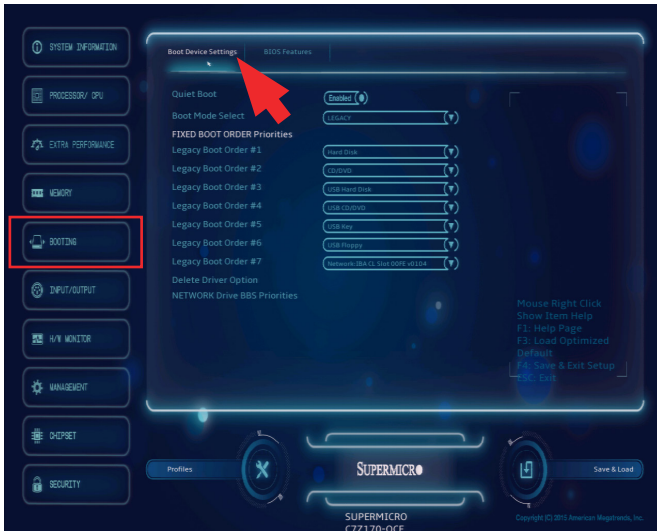
PCI memory resources will overlap with the total physical memory if 4GB of memory or above is installed on the motherboard. When this occurs, **Enable** this function to reallocate the overlapped physical memory to a location above the total physical memory to resolve the memory overlapping situation. The options are **Enabled** and Disabled.

Fast Boot

This option sets fast system boot, quick POST, etc. The options are **Enabled** and Disabled.

4-7 Booting

Set all options for the Boot devices in this section.



Boot Device Settings

Quiet Boot

This option sets the state to which the system buzzer is configured when booting. The options are **Enabled** and Disabled.

Boot Mode Select

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

Legacy Boot Order #1~#7

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.

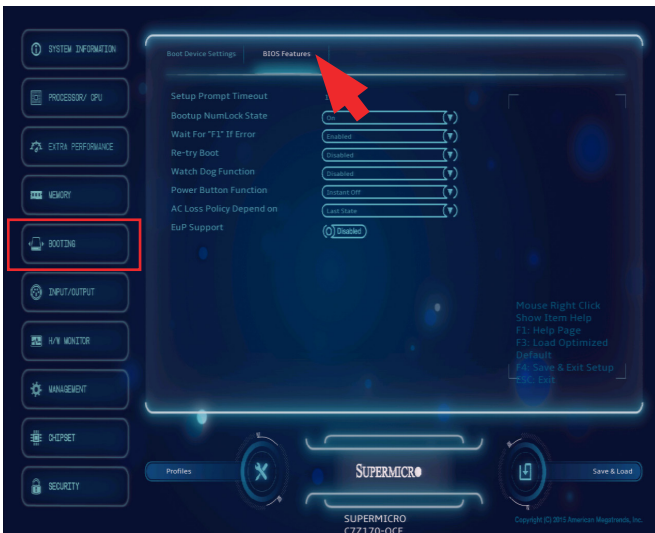
Delete Driver Option

Use this option to delete and EFI driver from the boot order.

NETWORK Drive BBS Priorities

Use this option to specify the boot device priority sequence from available network drives.

BIOS Features



Boot Configuration

Setup Prompt Timeout

Use this feature to set the length of time the BIOS waits for the key to be pressed by the user when entering setup. Enter a value in seconds.

Bootup NumLock State

This option sets the state to which the NumLock key is configured when booting. The options are **Enabled** and Disabled.

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 options are **Enabled** and Disabled.

Re-try Boot

Select Enabled to force the system to reboot when system fails to boot. The options are **Disabled** and Enabled.

Watch Dog Function

If enabled, the Watch Dog timer will allow the system to reboot when it is unresponsive for more than 5 minutes. The options are **Disabled** and Enabled.

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.

AC Loss Policy Depend on

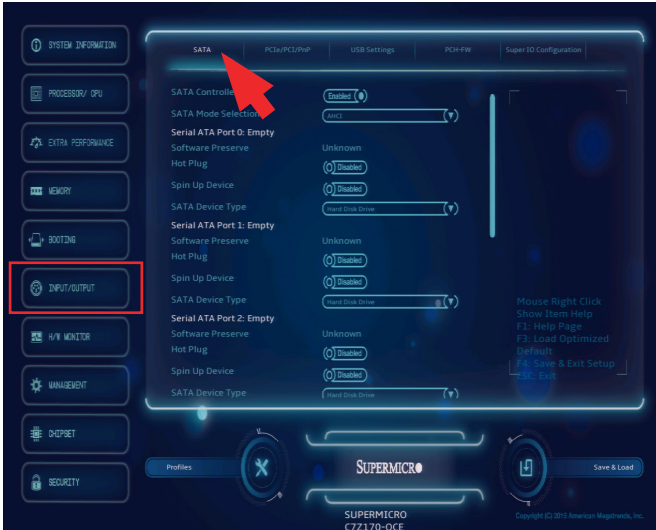
Use this feature to set the power state after a power outage. Select Power-Off for the system power to remain off after a power loss. Select Power-On for the system power to be turned on after a power loss. Select Last State to allow the system to resume its last power state before a power loss. The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

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**).

4-8 Input/Output

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



SATA

SATA Controllers

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

SATA Mode Selection

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

***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 SATA 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 **Disabled** and Enabled.

Spin Up Device

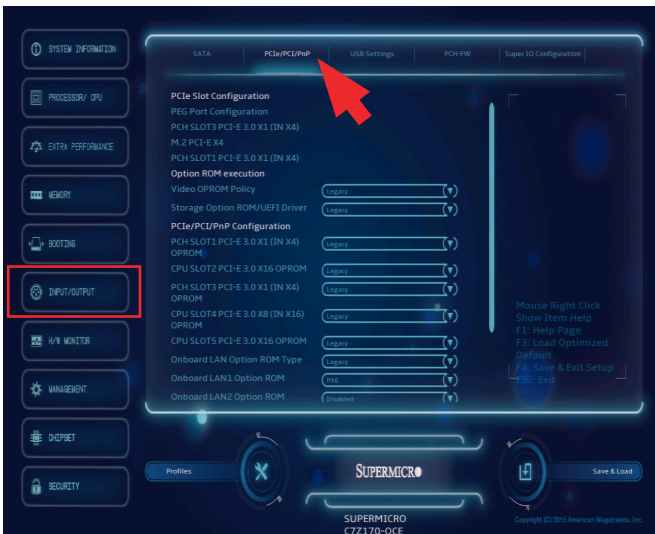
On an edge detect from 0 to 1, set this item to allow the PCH to start a COMRESET initialization

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.

PCIe/PCI/PnP

PCIe Slot Performance



PEG Port Configuration

PEG 0:1:0

Displays the device installed on the specified slot.

Enable Root Port

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

Max Link Speed

This feature allows the user to select PCIe support for the device installed. The options are **Auto**, Gen1, Gen2 and Gen3.

ASPM

Set this option to configure the Active State Power Management (ASPM) of the PEG device on this PCIe slot. The options are Disabled, **Auto**, ASPM L0s, ASPM L1 and ASPM L0sL1.

PEG0 Slot Power Limit Value

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

PEG0 Slot Power Limit Scale

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

PEG0 Max Payload Size

Use this feature to select the PEG0 maximum payload size. The options are **Auto**, 128 TLP and 256 TLP.

Program PCIe ASPM after OPROM

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

PCH SLOT3 PCI-E 3.0 X1 (IN X4)**PCH SLOT3 PCI-E 3.0 X1 (IN X4)**

Use this feature to enable or disable the device installed on the specified port. The options are Disabled and **Enabled**.

ASPM Support

Set this option to configure the Active State Power Management (ASPM) of the PEG device on this PCIe slot. The options are Disabled, L0s, L1, L0sL1 and **Auto**.

L1 Substates

Set this option to configure the PCI Express L1 substate setting. The options are Disabled, L1.1, L1.2 and **L1.1 & L1.2**.

PCIe Speed

Set this option to configure the speed setting of this PCIe slot . The options are **Auto**, Gen1, Gen2 and Gen3.

Detect Non-Compliant Device

Set this option to configure the motherboard to detect any non-compliant PCIe devices installed on any of the PCIe slots. The options are **Disabled** and Enabled.

PCIe LTR Lock

Set this option to configure PCIe LTR Configuration Lock. The options are **Disabled** and Enabled.

default setting is 75.

M.2 PCI-E X4

M.2 PCI-E X4

Use this feature to enable or disable the device installed on the specified port. The options are Disabled and **Enabled**.

ASPM Support

Set this option to configure the Active State Power Management (ASPM) of the PEG device on this PCIe slot. The options are Disabled, L0s, L1, L0sL1 and **Auto**.

L1 Substates

Set this option to configure the PCI Express L1 substate setting. The options are Disabled, L1.1, L1.2 and **L1.1 & L1.2**.

PCIe Speed

Set this option to configure the speed setting of this PCIe slot . The options are **Auto**, Gen1, Gen2 and Gen3.

Detect Non-Compliant Device

Set this option to configure the motherboard to detect any non-compliant PCIe devices installed on any of the PCIe slots. The options are **Disabled** and Enabled.

PCIE LTR Lock

Set this option to configure PCIE LTR Configuration Lock. The options are **Disabled** and Enabled.

PCH SLOT1 PCI-E 3.0 X1 (IN X4)**PCH SLOT1 PCI-E 3.0 X1 (IN X4)**

Use this feature to enable or disable the device installed on the specified port. The options are Disabled and **Enabled**.

ASPM Support

Set this option to configure the Active State Power Management (ASPM) of the PEG device on this PCIE slot. The options are Disabled, L0s, L1, L0sL1 and **Auto**.

L1 Substates

Set this option to configure the PCI Express L1 substate setting. The options are Disabled, L1.1, L1.2 and **L1.1 & L1.2**.

PCIE Speed

Set this option to configure the speed setting of this PCIE slot. The options are **Auto**, Gen1, Gen2 and Gen3.

Detect Non-Compliant Device

Set this option to configure the motherboard to detect any non-compliant PCIE devices installed on any of the PCIE slots. The options are **Disabled** and Enabled.

PCIE LTR Lock

Set this option to configure PCIE LTR Configuration Lock. The options are **Disabled** and Enabled.

Option ROM execution**Video OPROM Policy**

This feature controls which option ROM to execute for the Video device. The options are Disabled, UEFI and **Legacy**.

Storage OPROM ROM/UEFI Driver

This feature controls which option ROM to execute for the Video device. The options are Disabled, UEFI and **Legacy**.

PCIe/PCI/PnP Configuration

**PCH SLOT1 PCI-E 3.0 X1 (IN X4) OPROM,
CPU SLOT2 PCI-E 3.0 X16 OPROM,
PCH SLOT3 PCI-E 3.0 X1 (IN X4) OPROM,
CPU SLOT4 PCI-E 3.0 X8 (IN X16) OPROM,
CPU SLOT5 PCI-E 3.0 X16 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** and EFI.

Onboard LAN Option ROM Type

Select the onboard LAN option ROM type. The options are **Legacy** and EFI.

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 are Disabled and **PXE**.

Onboard LAN2 Option ROM Type

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 are **Disabled** and PXE.

Network Stack

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

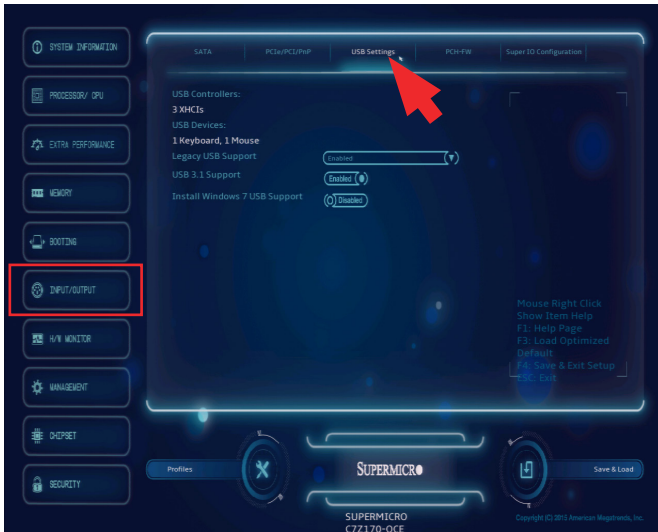
Ipv4 PXE Support (Available when Network Stack is set to Enabled)

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

Ipv6 PXE Support (Available when Network Stack is set to Enabled)

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

USB Settings



- **USB Controllers** - displays the detected USB controllers.
- **USB Devices** - displays the detected USB devices.

Legacy USB Support

This item activates Legacy USB Support. The options are **Enabled** and Disabled and Auto.

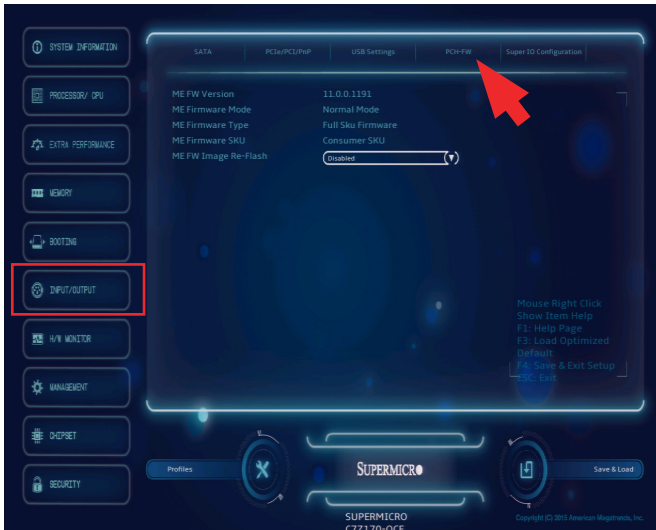
USB 3.1 Support

This item activates USB 3.1 Support. The options are **Enabled** and Disabled.

Install Windows 7 USB Support

Enable this feature to use the USB keyboard and mouse during the Windows 7 installation, since the native XHCI driver support is unavailable. Use a SATA optical drive as a USB drive, and USB CD/DVD drives are not supported. Disable this feature after the XHCI driver has been installed in Windows. The options are **Disabled** and Enabled.

PCH-FW (Firmware)



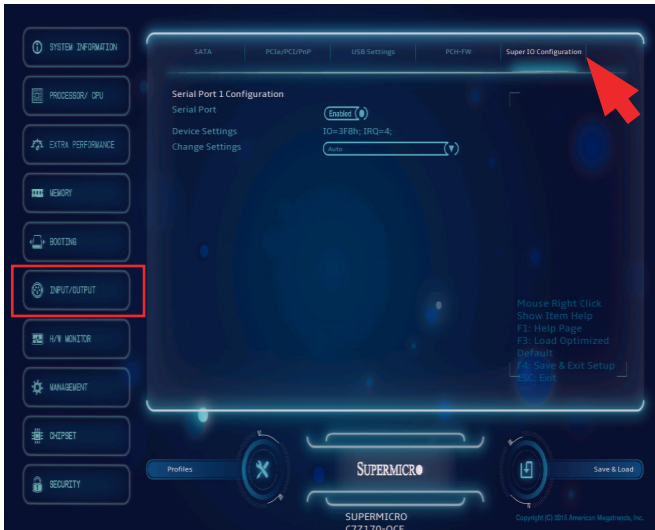
The following information for the PCH Firmware.

- **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

Use this feature to update the Management Engine firmware from an image in a USB flash drive attached to a USB port. The options are **Disabled** and Enabled.

Super IO Configuration



Serial Port 1 Configuration

Serial Port

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**.

Device Settings

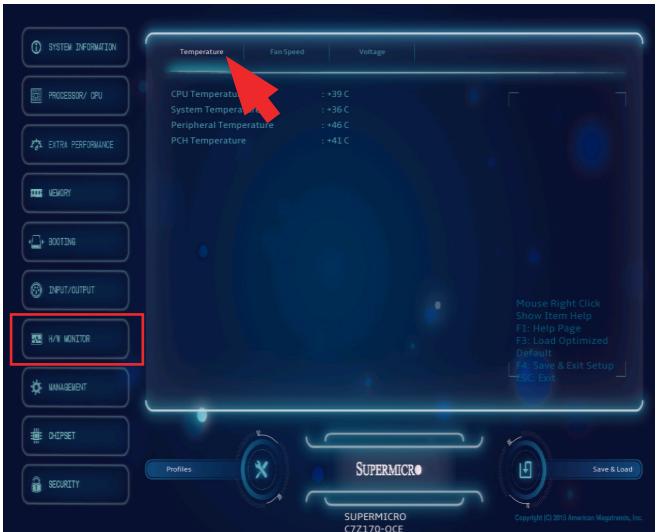
This item displays the current IRQ setting for Serial Port 1 (COM1).

Change 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 Hardware Monitor

Hardware Monitors for various sensors on the motherboard are in this section.

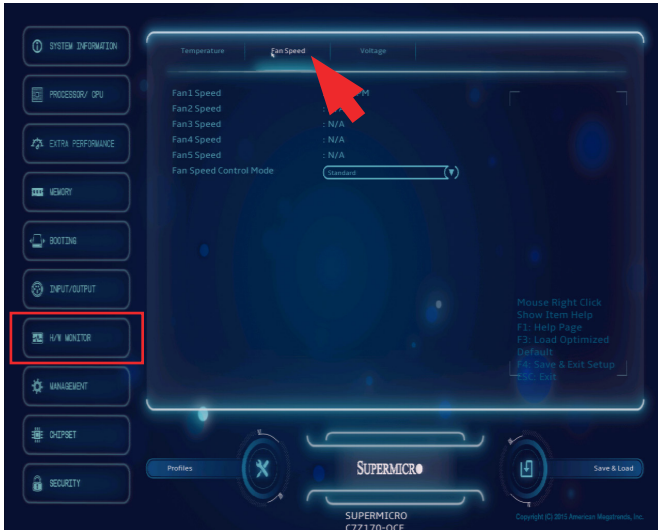


Temperature

The following items will be displayed:

- **CPU Temperature** - displays the CPU temperature detected by PECI.
- **System Temperature** - indicates the system internal temperature.
- **Peripheral Temperature** - displays the detected peripheral device temperature.
- **PCH Temperature** - indicates the detected PCH chip temperature.

Fan Speed



The following items will be displayed:

- Fan 1 Speed ~ Fan 5 Speed

Fan Speed Control Mode

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

Voltage

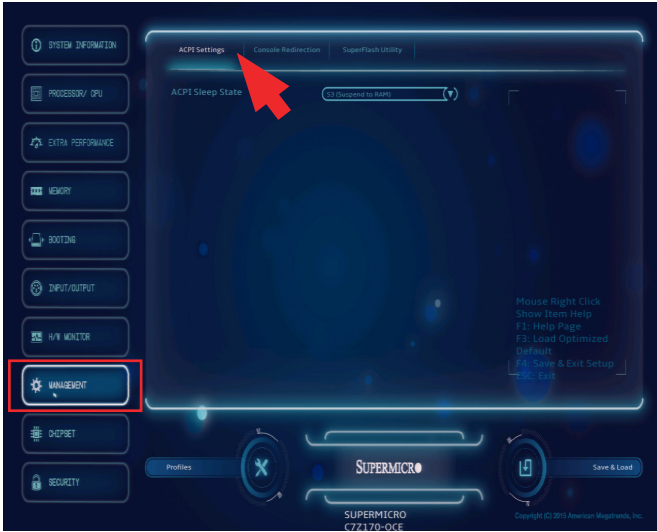


The following items will be displayed:

- **VCPU**
- **12V**
- **VCPU_SA**
- **5VCC**
- **VDIMM**
- **VCPU_IO**
- **VCPU_GT**
- **VDIMM_2.5**
- **PCH 1.0V**
- **3.3V_DL**
- **VSB3**
- **3.3VCC**
- **VBAT**
- **VCPU_STPLL**

4-10 Management

Set all options for the Overclocking in this section.

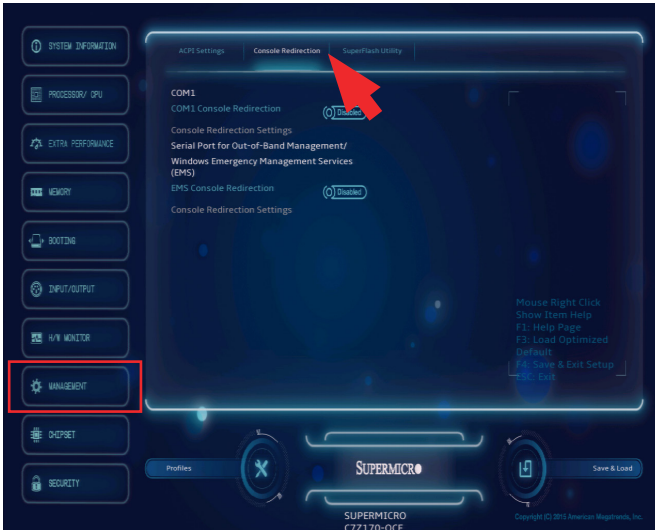


ACPI Settings

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



COM1

Console Redirection

Select Enabled to enable COM Port 1 Console Redirection, which will allow a client machine to be connected to a host machine at a remote site for networking. The options are **Disabled (unchecked)** and Enabled (checked).

****If the item above set to Enabled, the following items will become available for configuration:***

Console Redirection Settings

Terminal Type

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

Bits Per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

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

VT-UTF8 Combo Key Support

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

Recorder Mode

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

Resolution 100x31

Select Enabled for extended-terminal resolution support. The options are **Enabled (checked)** and Disabled (unchecked).

Legacy OS Redirection Resolution

Use this item to select the number of rows and columns used in Console Redirection for legacy OS support. The options are **80x24** and 80x25.

Putty KeyPad

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

Redirection After BIOS Post

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

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

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

Enable Console Redirection

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

****If the item above set to Enabled, the following items will become available for configuration:***

Console Redirection Settings

Out-of-Band Mgmt 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 (Console Redirection)** and SOL (Console Redirection).

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).

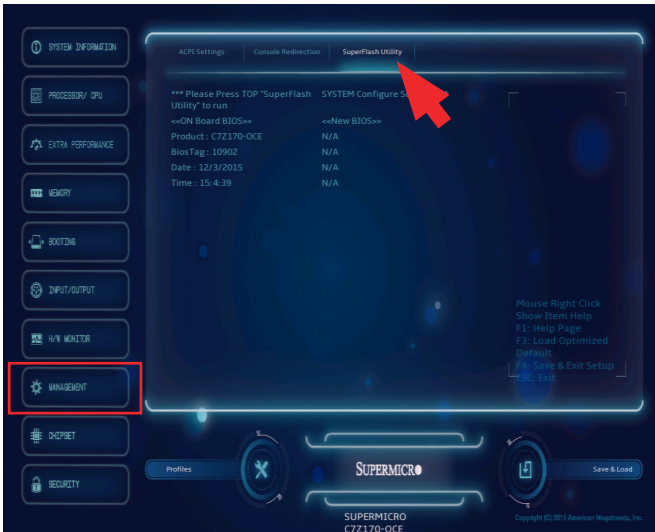
Flow Control

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 settings for these features are displayed:

Data Bits, Parity, Stop Bits

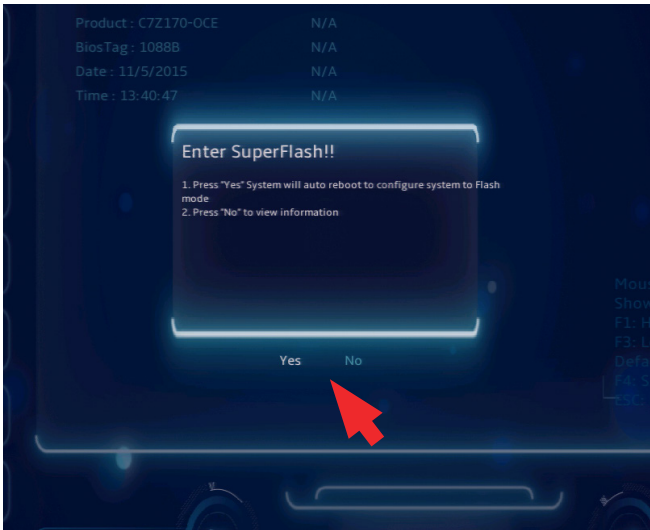
SuperFlash Utility



The following information will be displayed:

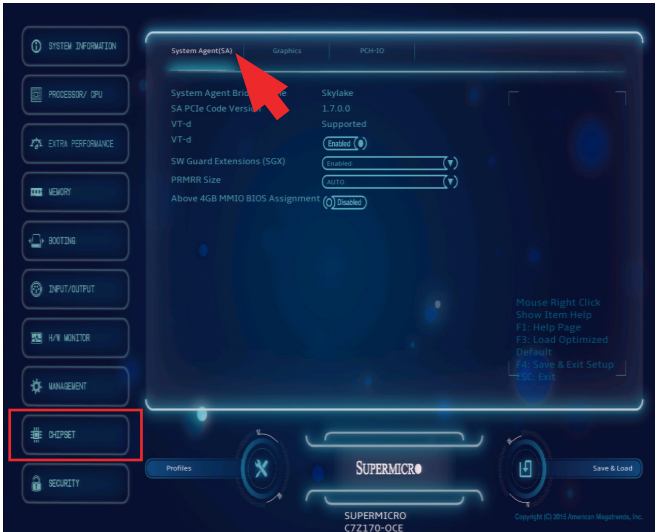
- **ON Board BIOS** - displays the BIOS version.
- **Product** - displays the product name.
- **BiosTag** - displays the BIOS Tag number.
- **Date** - displays the release date of the BIOS.
- **Time** - displays the release time of the BIOS.

1. Click on the SuperFlash Utility feature at the top of the screen to enter the flash utility.
2. At the prompt, select "Yes" to reboot and configure the system to Flash mode. Select "No" to cancel and view the BIOS information.



4-11 Chipset

Set all options for the Chipset in this section.



System Agent

The following will be displayed:

- **System Agent Bridge Name** - displays the System Agent bridge name.
- **SA PCIe Code Version** - indicates the System Agent RC version.
- **VT-d** - 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.

SW Guard Extensions (SGX)

Use this feature to enable or disable the Intel Software Guard Extensions (SGX). SGX is a set of CPU instructions that increases software security. The options are Disabled, **Enabled** and Software Controlled.

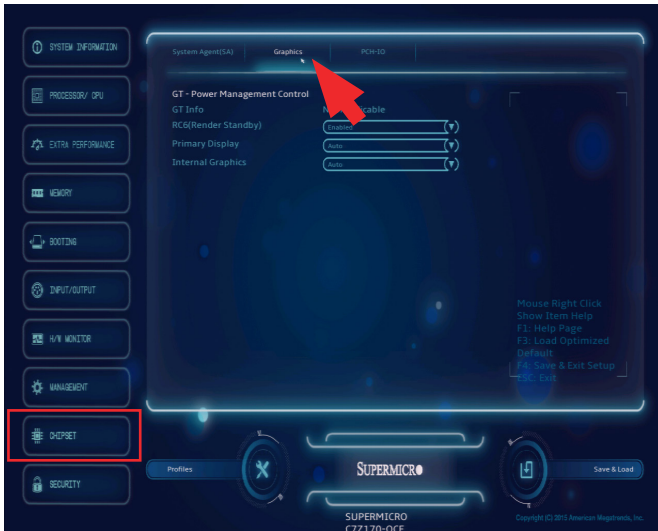
PRMRR Size

The BIOS must reserve a contiguous region of Processor Reserved Memory (PRM) in the Processor Reserved Memory Range Register (PRMRR). This item appears if SW Guard Extensions is enabled. The options are **Auto**, 32MB, 64MB and 128MB.

Above 4GB MMIO BIOS Assignment

Select Enable for remapping of BIOS above 4GB. The options are Enabled and **Disabled**.

Graphics



The following will be displayed:

- **GT Info** - displays the Graphics chip information.

RC6 (Render Standby)

Use this feature enable Render Standby support. The options are Disabled and **Enabled**.

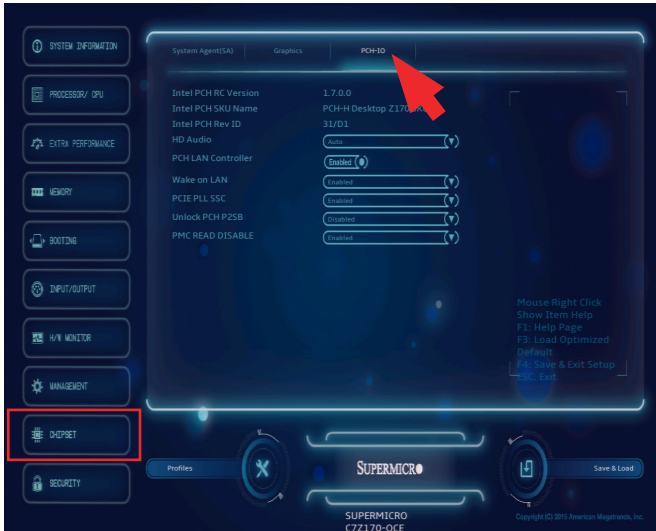
Primary Display

Use this feature to select the graphics device to be used as the primary display. The options are **Auto**, IGFX, PCH SLOT1 PCI-E 3.0 X1 (IN X4), CPU SLOT2 PCI-E 3.0 X16, PCH SLOT3 PCI-E 3.0 X1 (IN X4), CPU SLOT4 PCI-E 3.0 X8 (IN X16) and CPU SLOT5 PCI-E 3.0 X16.

Internal Graphics

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

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.

HD Audio

This item controls the HD Audio device. The settings are **Auto**, Enabled and Disabled.

PCH LAN Controller

This item controls the PCH LAN Controller. The settings are **Enabled** and Disabled.

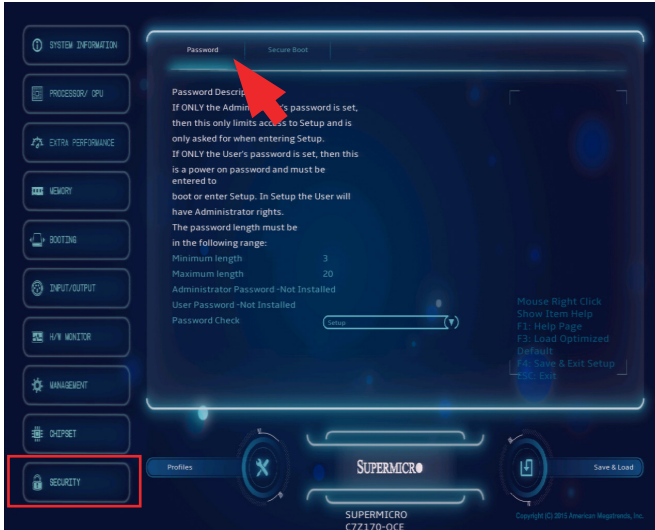
Wake on LAN

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

PCIE PLL SSC

This item enables the PCIE PLL SSC function. The settings are Disabled and **Enabled**.

4-12 Security



Password

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

- If ONLY the Administrator password is defined - 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.

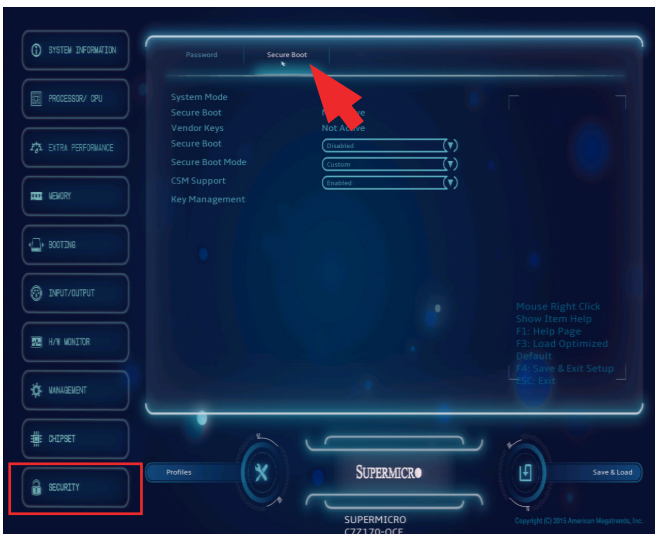
User Password

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

Password Check

Use this feature to select whether the motherboard prompts for a password always or only when entering setup. The options are **Setup** and Always.

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.
- **Vendor Keys** - this item indicates if Vendor Keys are active 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.

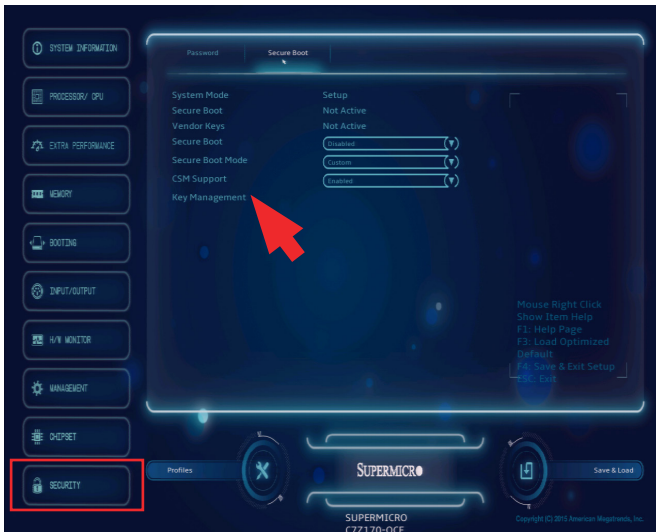
Secure Boot Mode

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.

CSM Support

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

Key Management



If Secure Boot Mode is set to 'Custom,' experienced users can modify Key Management Variables.



Provision Factory Default Keys

Select Enabled to install factory default Secure boot keys. The options are **Disabled** and Enabled.

Enroll Factory Default Keys

This option forces system into user mode, installing all factory default keys (PK, KEK, db, dbt, dbx). Changes will take effect after reboot. Select "Yes" when prompted, otherwise click "No".

Platform Key(PK)

This item displays the current Platform Key status. Clicking this option will bring up the Key Management window.

Set New Key

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.

Delete Key

This item deletes a previously installed Platform Key.

Key Exchange Key

This item displays the current Key Exchange Key status. Clicking this option will bring up the Key Management window.

Set New Key

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 Key

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.

Delete Key

This item deletes a previously installed Key Exchange Key.

Authorized Signatures

This item displays the current Authorized Signatures status. Clicking this option will bring up the Key Management window.

Set New Key

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 Key

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.

Delete Key

This item deletes a previously installed Authorized Signature.

Forbidden Signatures

This item displays the current Forbidden Signatures status. Clicking this option will bring up the Key Management window.

Delete Key

This item deletes a previously installed Forbidden Signature.

Set New Key

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 Key

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.

Authorized TimeStamps

This item displays the current Authorized TimeStamps status. Clicking this option will bring up the Key Management window.

Set New Key

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 Key

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.

Delete Key

This item deletes a previously installed Forbidden Signature.

4-13 Recovery

See Appendix D.

Notes

Appendix A

BIOS Error Beep Codes

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

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

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

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

A-1 BIOS Error Beep Codes

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

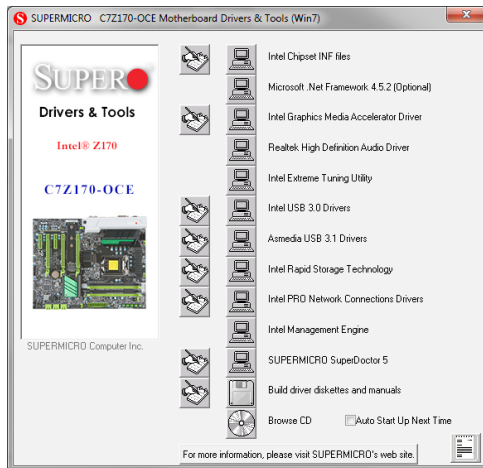
Notes

Appendix B

Software 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/.](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

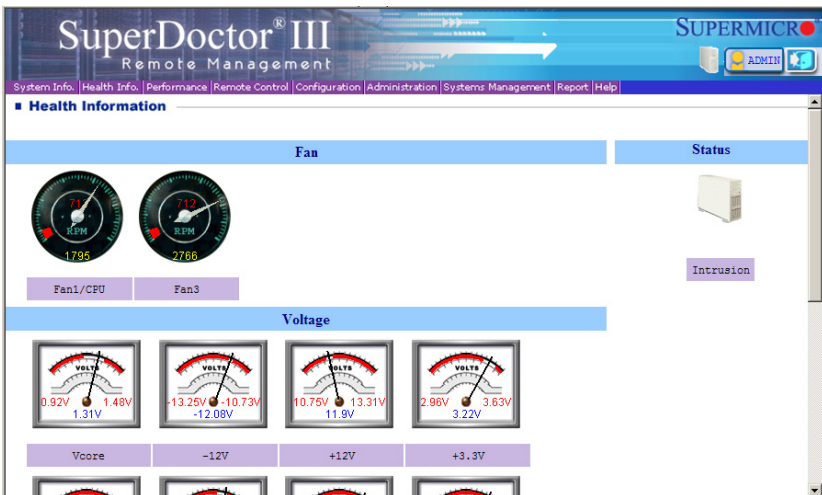
The SuperDoctor III program is a Web-based management tool that supports remote management capability. It includes Remote and Local Management tools. The local management tool is called the SD III Client. The SuperDoctor III program included on the CDROM that came with your motherboard allows you to 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.



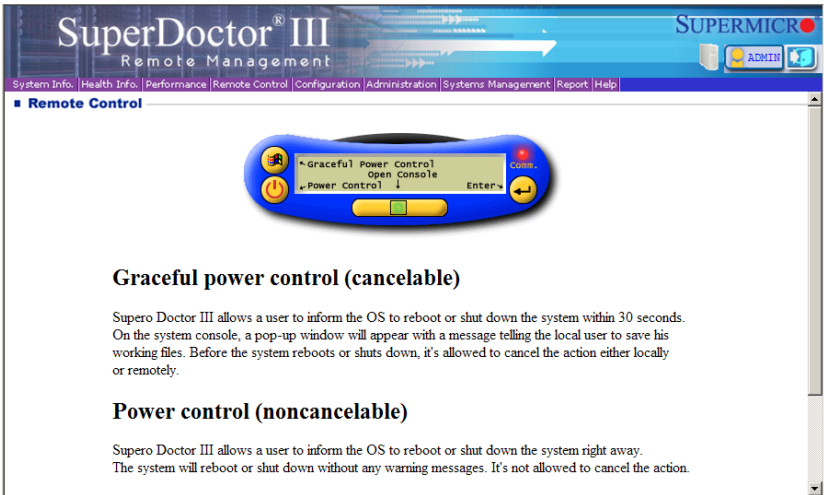
Note: 1 The default user name and password are ADMIN.

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.

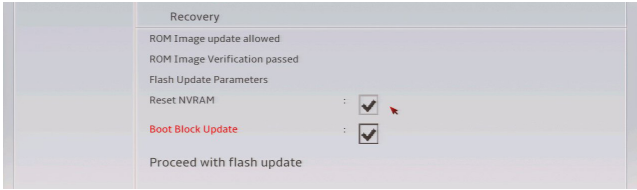


Note: If you cannot locate the "SUPER.ROM" file in your driver disk, visit our website at www.supermicro.com to download the BIOS image into a USB flash device (save in the root folder) and rename it "SUPER.ROM" for BIOS recovery use.

2. Insert the USB device that contains the new BIOS image ("SUPER.ROM") into any available USB port. Be sure the file is saved in the very top (root) folder.
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.

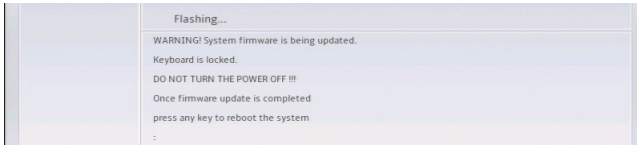
```
Version 2.16.1243. Copyright (C) 2013 American Megatrends, Inc.
Supermicro C7Z170-OCE BIOS Date:04/25/2014 Rev:1.0
CPU : Intel(R) Core(TM) i7-4765T CPU @ 2.00GHz
Speed : 2.00 GHz
The BMC is operating with DDR3L 1333 Mhz
Setup default has been loaded.
Press <DEL> to run Setup
Press <F1> to Continue Booting
```


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



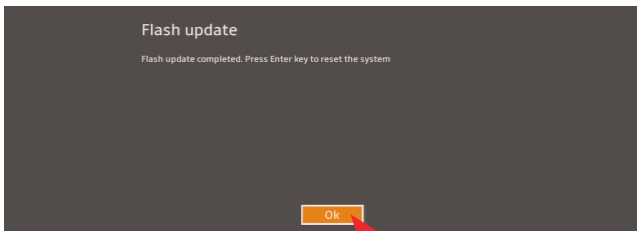
Note: At this point, you may decide if you want to start with BIOS Recovery. If you decide to proceed with BIOS Recovery, follow the procedures below.

- 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.

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



Notes

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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