



X10DGQ

USER'S MANUAL

Revision 1.1a

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Manual Revision 1.1a

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Preface

This manual is written for system integrators, IT professionals, and knowledgeable end users. It provides information for the installation and use of the X10DGQ motherboard.

About This Motherboard

The Super X10DGQ motherboard supports dual Intel® E5-2600(v3/v4) series processors (Socket R3) that offer Intel® QPI (QuickPath Interface) technology, providing point-to-point connections with a transfer speed of up to 9.6 GT/s. With the PCH C612 built in, the X10DGQ motherboard supports the Intel® Manageability Engine, Intel RSTe (Rapid Storage Technology Enterprise), the Digital Media Interface (DMI/DMI2), PCI-E Gen. 3.0, and up to 2400 MHz DDR4 memory. This motherboard is optimized for high-performance computing (HPC) and is ideal for scientific visualization platforms and optimized GPU servers. Please refer to our website (<http://www.supermicro.com>) for processor and memory support updates.

Manual Organization

Chapter 1 describes the features, specifications, and performance of the motherboard. It also provides detailed information about the Intel PCH C612 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 how to run the BIOS setup utility.

Appendix A lists BIOS POST error beep codes.

Appendix B provides software installation instructions.

Appendix C details instructions on how to recover your BIOS after a crisis.

Conventions Used in the Manual

Pay special attention to the following symbols to properly install the system and to prevent damage to the system or injury to yourself.

Warning: Important information given to ensure proper system installation or to prevent damage to the components.



Note: Additional information given to differentiate between various models or provide information for proper system setup.

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Chapter 1

Overview

1-1 Overview

Checklist

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

The X10DGQ motherboard was designed to be used with a Supermicro-proprietary chassis as an integrated GPU server platform. It is not to be used as a standalone product and will not be shipped independently in a retail box. No motherboard shipping package will be provided in your shipment.



Note 1: For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your motherboard.

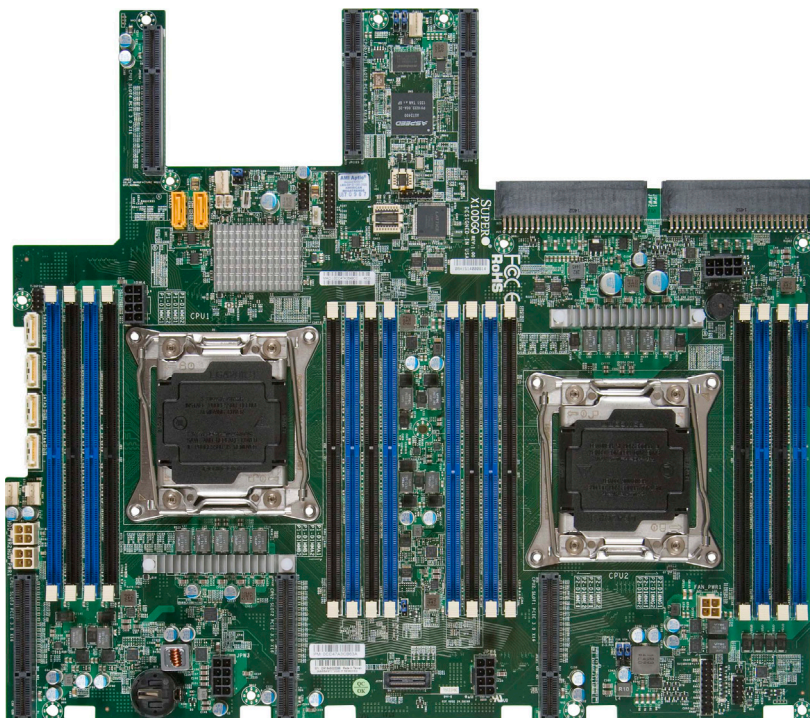
- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: <http://www.supermicro.com/wftp>




Note 2: For safety considerations, please refer to the complete list of safety warnings posted on the Supermicro website at http://www.supermicro.com/about/policies/safety_information.cfm.

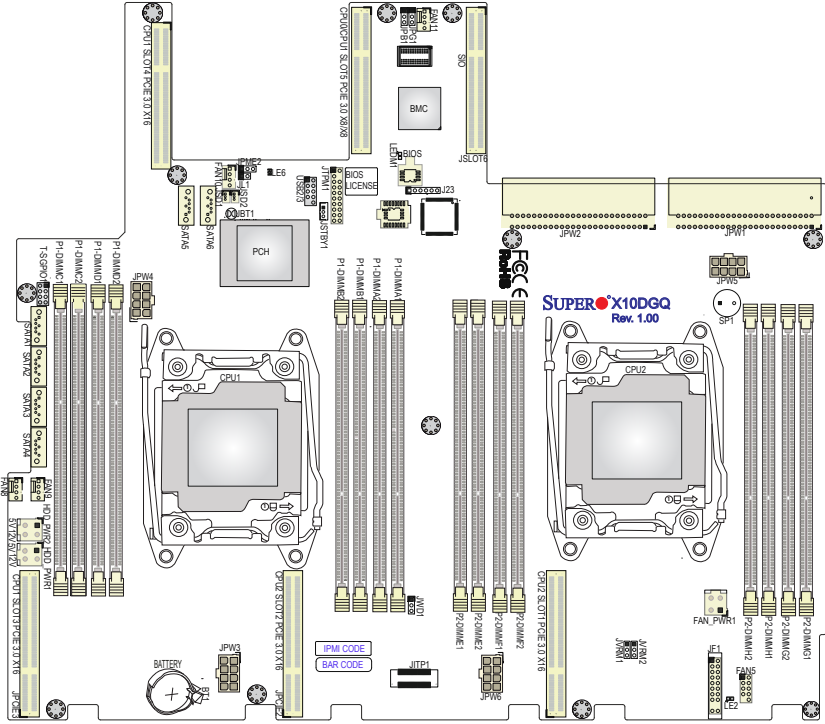
If you have any questions, please contact our support team at support@supermicro.com.

Motherboard Image



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

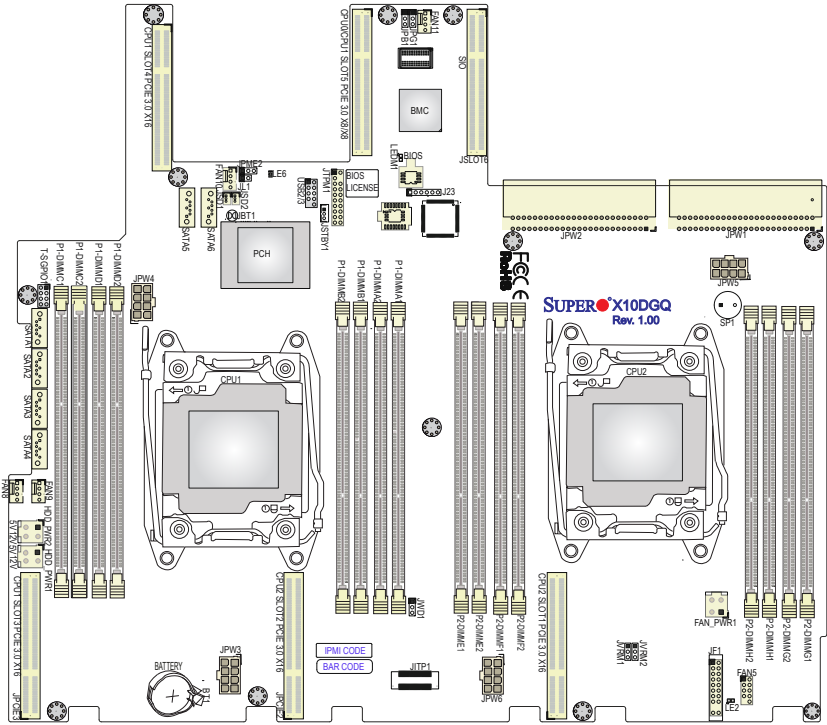
Motherboard Layout




 **Notes:**

- 1. For the latest CPU/memory updates, please refer to our website at <http://www.supermicro.com/products/motherboard/> for details.
- 2. Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion.

X10DGQ Motherboard Quick Reference



 **Notes:**

- See Chapter 2 for detailed information jumpers, I/O ports, connectors, and expansion slots. ■ indicates the location of pin 1.
- Components/jumpers/LED indicators that are not documented in this manual are reserved for internal testing only.

X10DGQ Motherboard Jumpers

Jumper	Description	Default Setting
JBT1	Clear CMOS/Reset BIOS Configuration	See Chapter 2
JPB1	BMC Enable	Pins 1-2 (Enabled)
JPG1	VGA Enable	Pins 1-2 (Enabled)
JPME2	Manufacture Mode (ME) Select	Pins 1-2 (Normal)
JWD1	Watch Dog	Pins 1-2 (Reset)

X10DGQ Motherboard Connectors

Connectors	Description
FAN5	9-pin fan header
FAN8-FAN11	CPU/system 4-pin cooling fan headers 8-11
HDD_PWR 1/2	HDD power headers 1/2
FAN_PWR1	Fan power connector
JF1	Front control panel header
JL1	Chassis intrusion header
JSD1/2	SATA DOM (Device-On-Module) power connectors 1/2
JPTM1	TPM (Trusted Platform Module)/Port 80
JPW3/4/5/6	8-pin power connectors for GPU devices
JPW1/JPW2	SMCI proprietary 50-pin power connectors 1/2
JSTBY1	Standby power header
SATA1-6	SATA connectors 1-6 supported by Intel PCH (SATA5/6: support Supermicro SuperDOM with power pins built-in)
(CPU1) Slot3/4	PCI-E 3.0 x16 slots 3/4
(CPU2) Slot1/2	PCI-E 3.0 x16 slots 1/2
(CPU0/1) Slot5	PCI-E 3.0 x8/x8 slot 5
SIO Slot	Supporting Supermicro AOM-PIO-i2G or AOM-PIO-i2XT I/O card
SP1	Internal speaker/buzzer
T-SGPIO1	Serial_link General Purpose I/O header 1 (for SATA1-2)
USB2/3	USB 2.0 header w/support of two connections USB 2/3



X10DGQ Motherboard LED Indicators

LED	Description	State
LE2	System Power LED	On: System power on
LE6	Power Health LED	Green: System power on
LEDM1	BMC Heartbeat LED	Green (blinking): BMC normal

Notes


Warning: Do not install the onboard battery upside down to avoid damaging the components or the motherboard. Also, be sure to follow the instructions given by your local hazardous materials management agency to properly dispose of the used battery for your safety.

Motherboard Features

CPU	<ul style="list-style-type: none"> Dual Intel® E5-2600(v3/v4) series processors (Socket R3 LGA 2011); each processor supports Intel QuickPath Interconnect (QPI) links (with a Data Transfer Rate of up to 9.6 GT/s per QPI) <p> Note: E5-2600v4 requires Revision 2.0 BIOS (or higher).</p>
Memory	<ul style="list-style-type: none"> Integrated memory controller supports up to 2048 GB of Load-Reduced (LRDIMM) and up to 512 GB of Registered (RDIMM) DDR4 (288-pin) ECC 2400/2133/1866/1600 MHz memory in 16 slots <p> Note: Memory speed support depends on the processors installed in the system. For the latest CPU/memory updates, please refer to our website at http://www.supermicro.com/products/motherboard.</p>
	DIMM Sizes
	128GB @ 1.20V
Chipset	<ul style="list-style-type: none"> Intel® PCH C612
Expansion Slots	<ul style="list-style-type: none"> Two (2) PCI-Exp 3.0 x16 slots supported by CPU1 (CPU1 Slots 3/4) Two (2) PCI-Exp 3.0 x16 slots supported by CPU2 (CPU2 Slots 1/2) One (1) PCI-Exp 3.0 x8/x8 slot (Slot 5)
Graphics	<ul style="list-style-type: none"> ASpeed AST2400 BMC Controller
Network	<ul style="list-style-type: none"> One Intel i350 Gigabit (10/100/1000 Mb/s) Ethernet Dual-Channel Controller for GLAN 1/GLAN 2 ports (via AOM-PIO-i2G, if applicable to your server) One Intel X540 10-Gigabit Ethernet Dual-Channel Controller for 10G-LAN (TLAN) 1/10G-LAN (TLAN) 2 ports (via AOM-PIO-i2XT, if applicable to your server) One IPMI-dedicated LAN supported by the AST2400 BMC

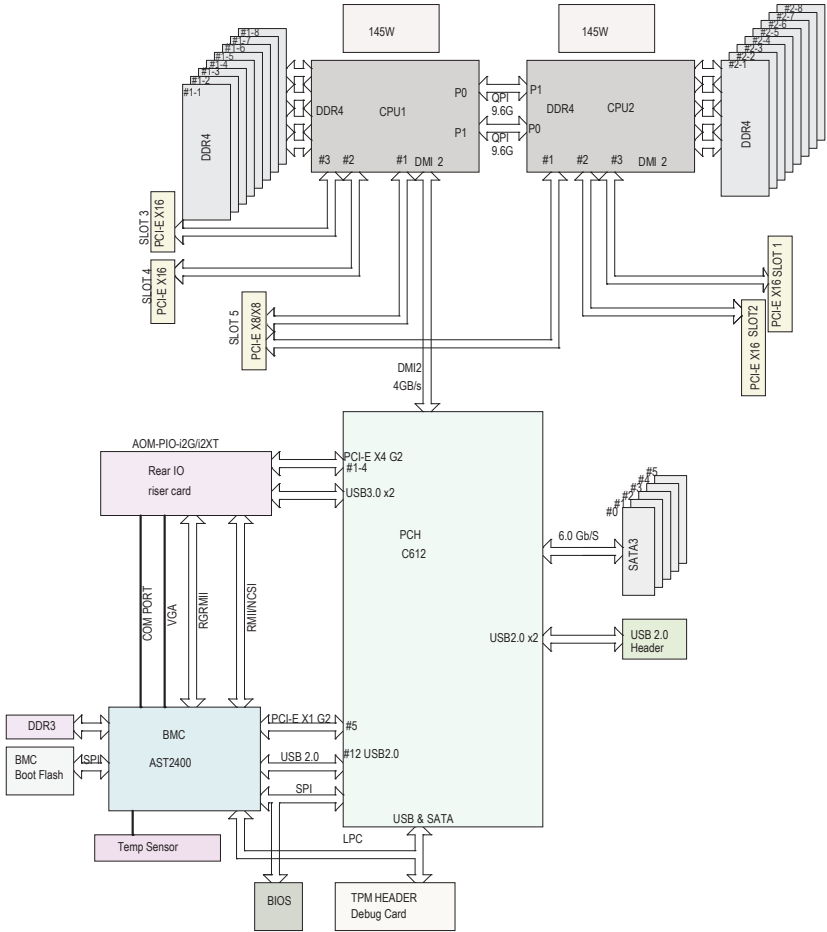
I/O Devices	SATA Connections	
	<ul style="list-style-type: none"> • SATA 3.0 	Six (6) SATA 3.0 connections from Intel PCH (SATA1-6) with two SATA ports used for SuperDOMs (Device-on-Module) with power supply built in
	<ul style="list-style-type: none"> • RAID 	RAID 0, 1, 5, 10 (from Intel PCH)
	IPMI 2.0	
	<ul style="list-style-type: none"> • IPMI 2.0 supported by the ASpeed 2400 BMC 	
Peripheral Devices	USB Devices	
	<ul style="list-style-type: none"> • One (1) USB 2.0 header w/support of two USB 2.0 connections (USB2/USB3) • Two (2) USB 3.0 ports on rear I/O via AOM-PIO-i2G or AOM-PIO-i2XT, depending on your server 	
BIOS	<ul style="list-style-type: none"> • 16 MB AMI SPI BIOS Flash ROM 	
	<ul style="list-style-type: none"> • DMI/DMI2 2.3, PCI 2.3, ACPI 3.0/4.0, USB Keyboard, Plug & Play (PnP), UEFI 2.3.1, and SMBIOS 2.7 or later 	
Power Config.	<ul style="list-style-type: none"> • ACPI Power Management 	
	<ul style="list-style-type: none"> • Main switch override mechanism 	
	<ul style="list-style-type: none"> • Power-on mode for AC power recovery 	
	<ul style="list-style-type: none"> • Intel® Intelligent Power Node Manager (available when the Supermicro Power Manager [SPM] is installed) 	
	<ul style="list-style-type: none"> • Management Engine 	
	<ul style="list-style-type: none"> • Riser Card auto-detection 	

System Health Monitoring	System Health Monitoring
	<ul style="list-style-type: none"> Onboard system health monitors for +3.3V, 3.3V standby, +5V, +12V, +12V standby, BMC, CPU, chipset (PCH), memory, and battery voltage.
	<ul style="list-style-type: none"> CPU 5-Phase switching voltage regulator
	<ul style="list-style-type: none"> CPU/System overheat LED and control
	<ul style="list-style-type: none"> CPU Thermal Trip support
	<ul style="list-style-type: none"> Thermal Monitor 2 (TM2) support
	Fan Control
	<ul style="list-style-type: none"> Fan status monitoring with firmware 4-pin fan speed control
	<ul style="list-style-type: none"> Multi-speed fan control via onboard BMC
	LED Indicators
<ul style="list-style-type: none"> System/CPU Overheat LED 	
<ul style="list-style-type: none"> Suspend-state LED 	
System Management	<ul style="list-style-type: none"> PECI (Platform Environment Configuration Interface) 2.0 support
	<ul style="list-style-type: none"> System resource alert via SuperDoctor® 5
	<ul style="list-style-type: none"> Thermal Monitor 2 (TM2) support
	<ul style="list-style-type: none"> SuperDoctor® 5, Watch Dog, NMI
Dimensions	<ul style="list-style-type: none"> Chassis intrusion header and detection
	<ul style="list-style-type: none"> 13.16" (L) x 14.73" (W) x (334.26 mm x 374.14 mm)

 **Note 1:** The CPU maximum thermal design power (TDP) is subject to chassis and heatsink cooling restrictions. For proper thermal management, please check the chassis and heatsink specifications for proper CPU TDP sizing.

Note 2: For IPMI configuration instructions, please refer to the Embedded IPMI Configuration User's Guide available @ <http://www.supermicro.com/support/manuals/>.

Note 3: It is strongly recommended that you change BMC log-in information upon initial system power-on. The manufacturer default username is ADMIN and the password is ADMIN. For proper BMC configuration, please refer to http://www.supermicro.com/products/info/files/IPMI/Best_Practices_BMC_Security.pdf



System Block Diagram



Notes: 1. This is a general block diagram and may not exactly represent the features on your motherboard. See the Motherboard Features pages for the actual specifications of each motherboard. 2. This block diagram is provided for your reference only.

1-2 Processor and Chipset Overview

Built upon the functionality and capability of the Intel E5-2600(v3/v4) series processors (Socket R3) and the Intel C612 PCH, the X10DGQ motherboard is optimized for high-performance computing (HPC) and is ideal for scientific visualization platforms.

With support of new Intel Microarchitecture 22nm (E5-2600v3)/14nm (E5-2600v4) process technology built in, the X10DGQ motherboard dramatically increases system performance.

The PCH C612 chip provides Enterprise SMBus and MCTP support, including the following features:

- DDR4 288-pin memory support on Socket R3
- Support for MCTP Protocol and ME
- Support of SMBus speeds of up to 1 MHz for BMC connectivity
- Improved I/O capabilities to high-storage-capacity configurations
- Embedded platform
- BMC supports remote management, virtualization, and the security package for enterprise platforms



Note: E5-2600v4 requires Revision 2.0 BIOS (or higher).

1-3 Special Features

Recovery from AC Power Loss

The Basic I/O System (BIOS) provides a setting that determines 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 the power-on state. See the Advanced BIOS Setup section for this setting. The default setting is **Last State**.

1-4 System Health Monitoring

This section describes the features of system health monitoring of the motherboard. This motherboard has an onboard baseboard management controller (BMC) chip that supports system health monitoring. An onboard voltage monitor will scan the following onboard voltages continuously: +3.3V, 3.3V standby, +5V, +5V standby, +12V, BMC, CPU, memory, chipset, and battery voltages. Once a voltage becomes unstable, a warning or an error message is given. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

The system health monitoring support provided by the BMC controller can check the RPM status of a cooling fan. The onboard CPU and chassis fans are controlled by the thermal management via the onboard BMC.

Environmental Temperature Control

System-health sensors monitor the temperatures and voltage settings of the on-board processors and the system in real time via the IPMI interface. Whenever the temperature of the CPU or system exceeds a user-defined threshold, system/CPU cooling fans will be turned on to prevent the CPU or system from overheating.



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

System Resource Alert

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

1-5 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a computer system, including its hardware, operating system, and application software. This enables the system to automatically turn on and off peripherals such as 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 interface independent of the operating system for configuration control. ACPI leverages the Plug-and-Play BIOS data structures, while providing an implementation that is independent of the processor architecture and compatible with Windows 7, Windows 8/R2, and Windows 2012/R2 operating systems.

1-6 Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates. In areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

1-7 Advanced Power Management

The following advanced power management features are supported by the motherboard.

Intel® Intelligent Power Node Manager (NM) (Available when the Supermicro Power Manager [SPM] is installed)

The Intel® Intelligent Power Node Manager (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM Specification Version 1.5/2.0 is supported by the BMC (Baseboard Management Controller), your system must also have an IPNM-compatible Management Engine (ME) firmware installed to use this feature.



Note: Support for IPNM Specification Version 1.5 or Vision 2.0 depends on the power supply used in the system.

Management Engine (ME)

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

Chapter 2

Installation

2-1 Standardized Warning Statements

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

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

Battery Handling



Warning!

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

電池の取り扱い

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

警告

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

警告

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

Warnung

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

Attention

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

¡Advertencia!

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

אזהרה!

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

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

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

경고!

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

Waarschuwing

Er is 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.

¡Advertencia!

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

Attention

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

2-2 Static-Sensitive Devices

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

Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the motherboard from the antistatic bag.
- Handle the motherboard by its edges only; do not touch its components, peripheral chips, memory modules, or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure that your system chassis provides excellent conductivity between the power supply, case, mounting fasteners, and motherboard.

Unpacking

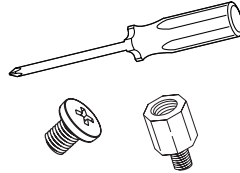
The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure that the person handling it is static-protected.

2-3 Motherboard Installation

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

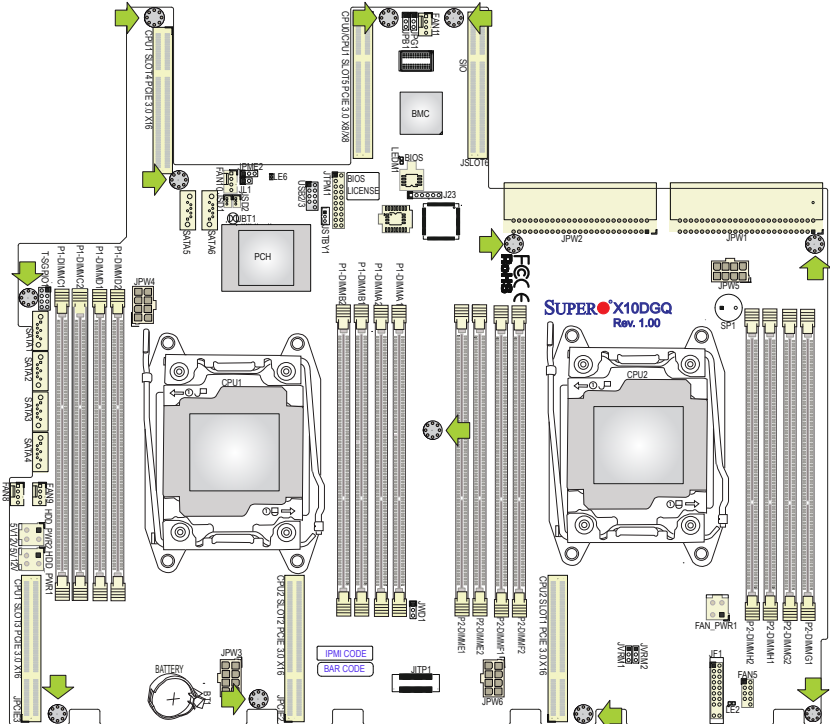
Tools Needed

- Phillips screwdriver
- Pan-head screws (12 pieces)




Location of Mounting Holes

There are twelve (12) mounting holes on this motherboard indicated by the arrows.

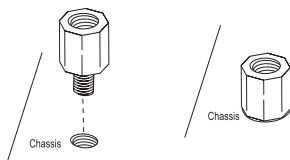


Caution: 1) To avoid damaging the motherboard and its components, please do not use a force greater than 8 lb/inch on each mounting screw during motherboard installation. 2) Some components are very close to the mounting holes. Please take precautionary measures to prevent damage to these components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

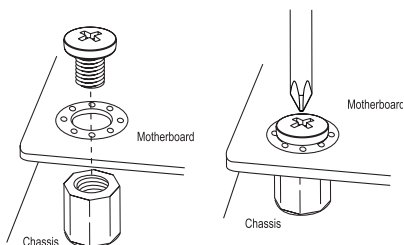
Installing the Motherboard

 **Note:** Always connect the power cord last, and always remove it before adding, removing, or changing any hardware components. Install the I/O shield into the chassis.


1. Locate the mounting holes on the motherboard.
2. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.
3. Install standoffs in the chassis as needed.



4. Install the motherboard into the chassis carefully to avoid damaging motherboard components.
5. Using the Phillips screwdriver, insert a pan-head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.




6. Repeat Step 5 to insert #6 screws into all mounting holes.
7. Make sure that the motherboard is securely placed in the chassis.

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

2-4 Processor and Heatsink Installation

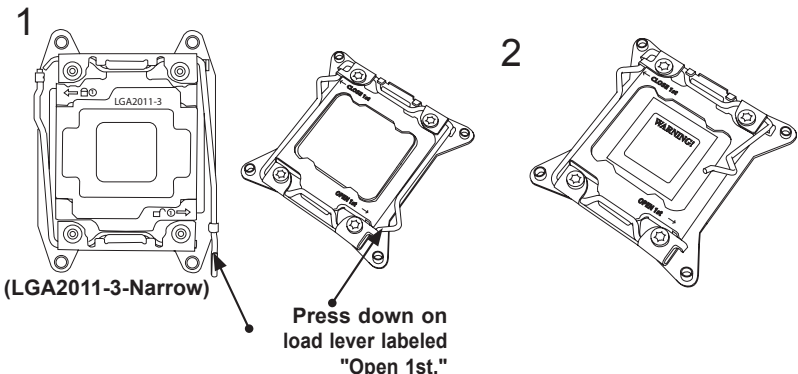
Warning: When handling the processor package, avoid placing direct pressure on the label area. Also, improper CPU installation or socket/pin misalignment can cause serious damage to the CPU or the motherboard that will require RMA repairs. Be sure to read and follow all instructions thoroughly before installing your CPU and heatsink.


 **Notes:**

- 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 motherboard into the chassis before you install the CPU heatsink.
- When receiving a motherboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and that none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro website for updates on CPU support.

Installing the LGA2011 Processor

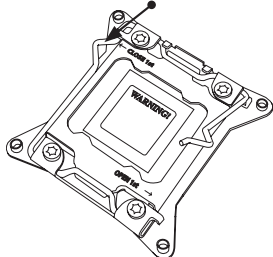
1. There are two load levers on the LGA2011 socket. To open the socket cover, first press and release the load lever labeled "Open 1st."



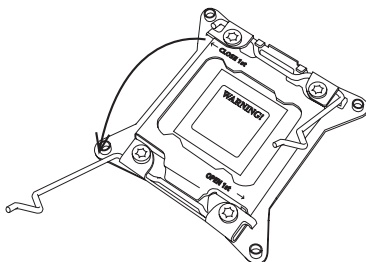
 **Note:** The graphics provided in the manual are for illustration only. Your components may or may not look the same as the ones shown in this manual.

2. Press the second load lever labeled "Close 1st" to release the load plate that covers the CPU socket from its locking position.

1 Press down on the load lever labeled "Close 1st."



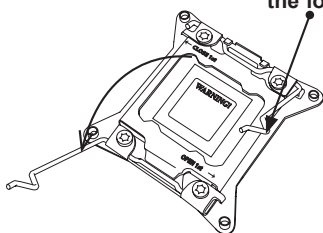
2 Pull the lever away from the socket.



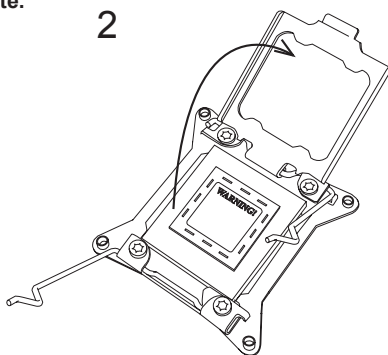
3. With the "Close 1st" lever fully retracted, gently push down on the lever labeled "Open 1st" to open the load plate. Lift the load plate to open it completely.

Gently push down the load lever to pop open the load plate.

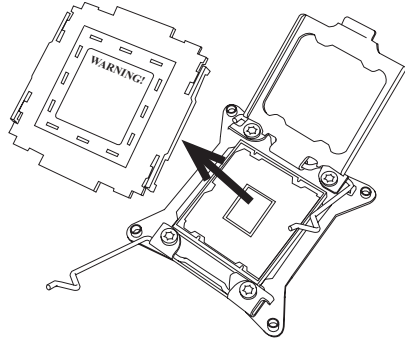
1



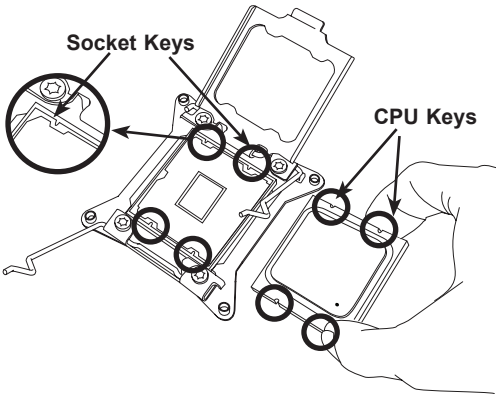
2



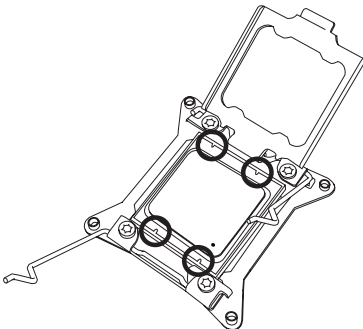
- Using your thumb and the index finger, remove from the socket the plastic cap with the warning label.



- Use your thumb and index finger to hold the CPU on its edges. Align the CPU keys, which are semicircle cutouts, against the socket keys.



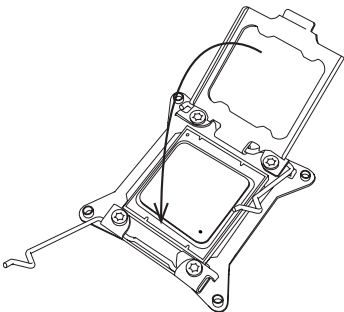
- Once they are aligned, carefully lower the CPU straight down into the socket. (Do not drop the CPU on the socket. Do not move the CPU horizontally or vertically. Do not rub the CPU against the surface or against any pins of the socket to avoid damaging the CPU or the socket.)



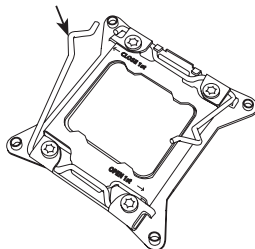
Warning: You can only install the CPU inside the socket in one direction. Make sure that it is properly inserted into the CPU socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU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

7. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.
8. Close the load plate with the CPU inside the socket. Lock the lever labeled "Close 1st" first, then lock the lever labeled "Open 1st" lever second. Use your thumb to gently push the load levers down to the lever locks.

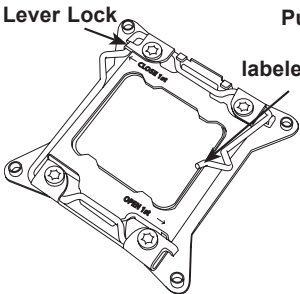
1 Gently close the load plate.



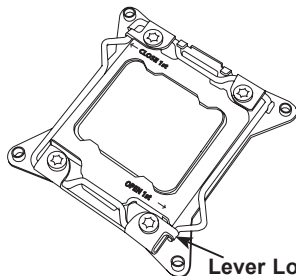
2 Push down and lock lever labeled "Close 1st."



3
Lever Lock
Push down and lock the lever labeled "Open 1st."

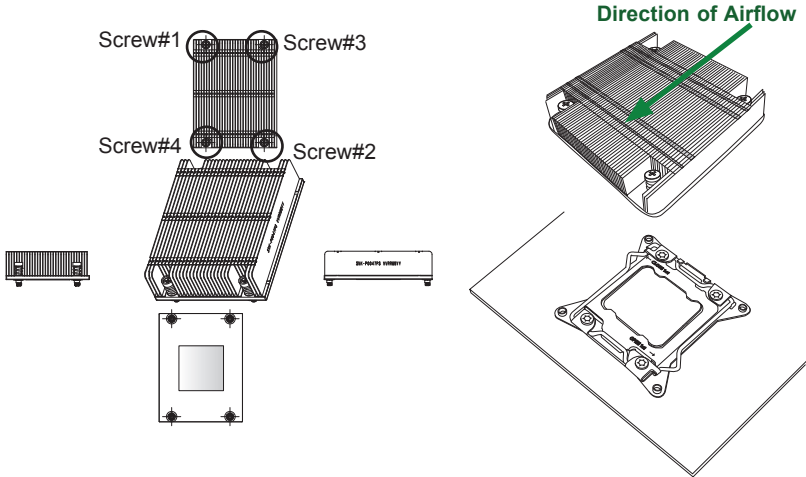



4
Lever Lock



Installing a Passive Heatsink

1. Apply the proper amount of thermal grease to the heatsink.
2. Place the heatsink on top of the CPU so that the two mounting holes on the heatsink are aligned with those on the retention mechanism.
3. Insert two push-pins on the sides of the heatsink through the mounting holes on the motherboard, and turn the push-pins clockwise to lock them.

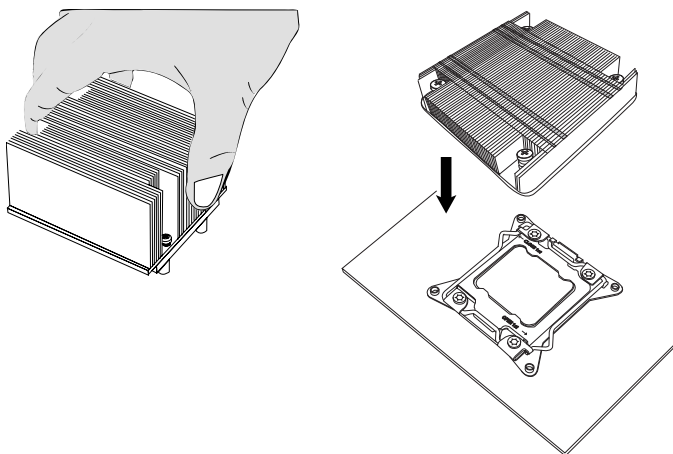


 **Note:** For optimized airflow, please follow your chassis airflow direction to properly install the heatsink. Graphics included in this manual are for reference only. They might look different from the components installed in your system.

Removing the Passive Heatsink

Warning: 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 uninstall the heatsink to avoid damaging the CPU or other components.

1. Unplug the power cord from the power supply.
2. Press down the push-pin on the heatsink, and turn counterclockwise to loosen it. Repeat the same step to loosen the second push-pin.
3. Hold the heatsink as shown in the picture below, and gently wriggle the heatsink to loosen it. (Do not use excessive force when wriggling the heatsink.)



4. Once the heatsink is loosened, remove it from the motherboard.

2-5 Installing and Removing the Memory Modules

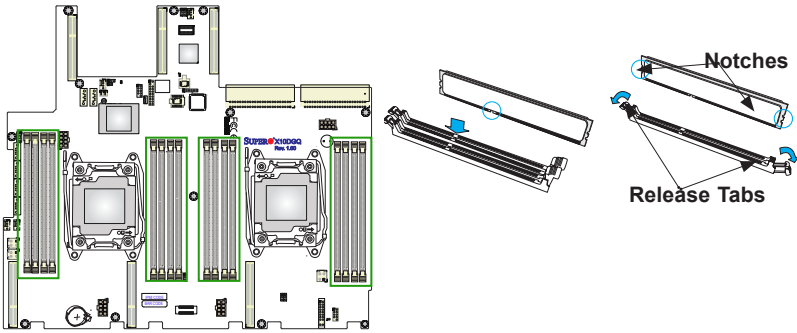
 **Note:** Check Supermicro's website for recommended memory modules.

CAUTION

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

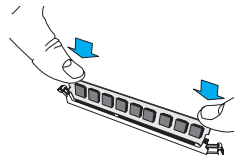
Installing & Removing DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMMA1. (For best performance, please use the memory modules of the same type and speed in the same bank.)
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 locking positions to secure the DIMM module into the slot.

Press both notches straight down into the memory slot at the same time.




Removing Memory Modules

Press the release tabs on both ends of the memory module to unlock it. Once it is loosened, remove the DIMM module from the memory slot.

Memory Support for the X10DGQ Motherboard

The X10DGQ motherboard supports up to 2048 GB of Load Reduced (LRDIMM) and up to 512 GB of Registered (RDIMM) DDR4 (288-pin) ECC 2400/2133/1866/1600 MHz memory in 16 slots

 **Note:** Memory speed support depends on the processors installed in the system. For the latest CPU/memory updates, please refer to our website at <http://www.supermicro.com/products/motherboard>.

Processor & Memory Module Population Configuration

For memory to work properly, follow the tables below for memory installation.

Processors and their Corresponding Memory Modules								
CPU#	Corresponding DIMM Modules							
CPU 1	P1-DIMMA1	P1-DIMMB1	P1-DIMMC1	P1-DIMMD1	P1-DIMMA2	P1-DIMMB2	P1-DIMMC2	P1-DIMMD2
CPU2	P2-DIMME1	P2-DIMMF1	P2-DIMMG1	P2-DIMMH1	P2-DIMME2	P2-DIMMF2	P2-DIMMG2	P2-DIMMH2

Processor and Memory Module Population for Optimal Performance	
Number of CPUs+DIMMs	CPU and Memory Population Configuration Table (For memory to work properly, please follow the instructions below.)
1 CPU & 2 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1
1 CPU & 4 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1
1 CPU & 5-8 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1 + Any memory pairs in P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2 slots
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1
2 CPUs & 8 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1
2 CPUs & 8-16 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1 + Any memory pairs in P1, P2 DIMM slots
2 CPUs & 16 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1, P1-DIMMA2/P1-DIMMB2/P1-DIMMC2/P1-DIMMD2, P2-DIMME2/P2-DIMMF2/P2-DIMMG2/P2-DIMMH2

Populating RDIMM/LRDIMM DDR4 Memory Modules for the E5-2600v3-based Motherboard

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)		
				1 Slot Per Channel	2 Slots Per Channel	
		4Gb	8Gb	1DPC	1DPC	2DPC
				1.2V	1.2V	1.2V
RDIMM	SRx4	8GB	16GB	2133	2133	1866
RDIMM	SRx8	4GB	8GB	2133	2133	1866
RDIMM	DRx8	8GB	16GB	2133	2133	1866
RDIMM	DRx4	16GB	32GB	2133	2133	1866
LRDIMM	QRx4	32GB	64GB	2133	2133	2133
LRDIMM 3DS	8Rx4	64GB	128GB	2133	2133	2133

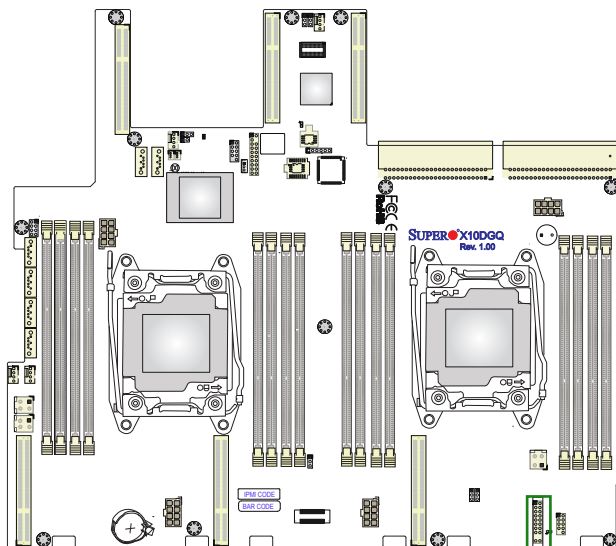
Populating RDIMM/LRDIMM DDR4 Memory Modules for the E5-2600v4-based Motherboard

Type	Ranks Per DIMM and Data Width	DIMM Capacity (GB)		Speed (MT/s); Voltage (V); Slot Per Channel (SPC) and DIMM Per Channel (DPC)		
				1 Slot Per Channel	2 Slots Per Channel	
		4Gb	8Gb	1DPC	1DPC	2DPC
				1.2V	1.2V	1.2V
RDIMM	SRx4	8GB	16GB	2400	2400	2133
RDIMM	SRx8	4GB	8GB	2400	2400	2133
RDIMM	DRx8	8GB	16GB	2400	2400	2133
RDIMM	DRx4	16GB	32GB	2400	2400	2133
LRDIMM	QRx4	32GB	64GB	2400	2400	2400
LRDIMM 3DS	8Rx4	64GB	128GB	2400	2400	2400

2-6 Front Control Panel

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's chassis. See the figure below for the descriptions of the control panel buttons and LED indicators. Refer to the following section for descriptions and pin definitions.



JF1 Header Pins

	20	19	
Ground	○	○	NMI
X	○	○	X
FP PWRLED	○	○	3.3 V
HDD LED	○	○	UID Switch
NIC1 Link LED	○	○	NIC1 Activity LED
NIC2 Link LED	○	○	NIC2 Activity LED
OH/Fan Fail/ PWR Fail LED	○	○	UID LED
Power Fail LED	○	○	3.3V
Ground	○	○	Reset
Ground	○	○	PWR
	2	1	Reset Button
			Power Button

Front Control Panel Pin Definitions

NMI Button

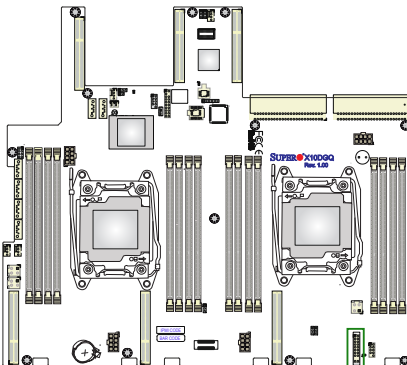
The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

Power LED

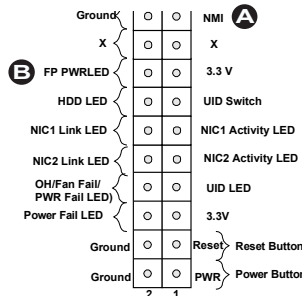
The Power LED connection is located on pins 15 and 16 of JF1. Refer to the table on the right for pin definitions.

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



A. NMI

B. PWR LED



HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable here to indicate HDD activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	UID Switch
14	HD Active

NIC1/NIC2 LED Indicators

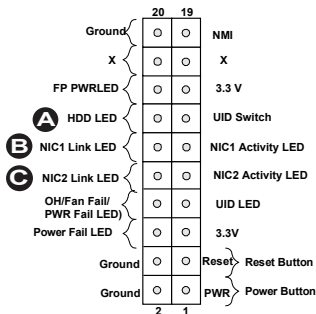
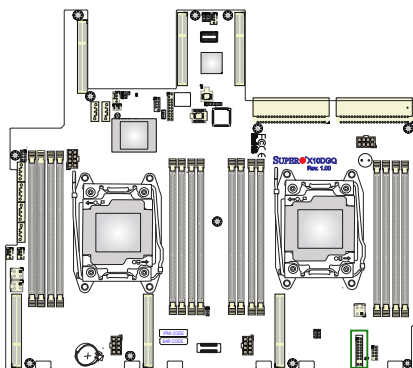
The NIC (Network Interface Controller) LED connection for LAN Port 1 is located on pins 11 and 12 of JF1, and for LAN Port 2 is on pins 9 and 10. Attach the NIC LED cables here to display network activity. Refer to the table on the right for pin definitions.

GLAN1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9	NIC 2 Activity LED
10	NIC 2 Link LED
11	NIC 1 Activity LED
12	NIC 1 Link LED

A. HDD/UID LED

B. NIC1 LED

C. NIC2 LED



Overheat (OH)/Fan Fail/PWR Fail

Connect an LED cable to pins 7 and 8 of the front control panel to use the Overheat/Fan Fail/Power Fail LED connections. Pin 7 designates the UID LED. The red LED on pin 8 provides warnings of overheating, fan failure, or power failure. Refer to the tables on the right for pin definitions.

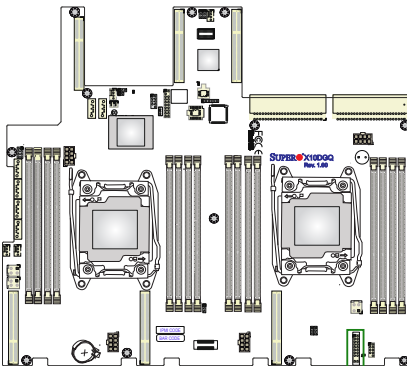
OH/Fan Fail/ PWR Fail/Blue UID LED Pin Definitions (JF1)	
Pin#	Definition
7	UID LED
8	OH/Fan Fail/Power Fail

OH/Fan Fail/PWR Fail LED Status (Red LED)	
State	Definition
Off	Normal
On	Overheat
Flashing	Fan Fail

Power Fail LED

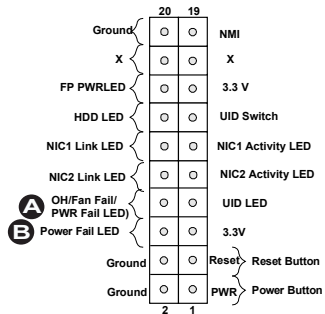
The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)	
Pin#	Definition
5	3.3V
6	PWR Supply Fail



A. OH/Fail/PWR Fail LED

B. PWR Supply 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. Refer to the table on the right for pin definitions.

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

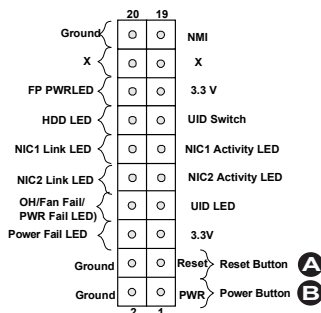
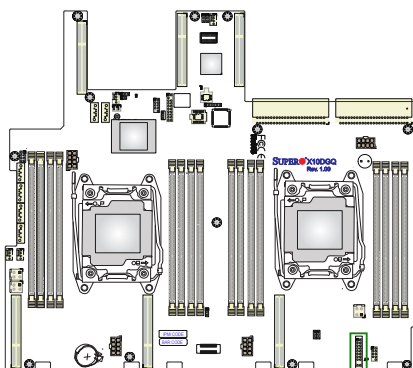
Power Button

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 when the system is in suspend mode, press the button for 4 seconds or longer. Refer to the table on the right for pin definitions.

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

A. Reset Button

B. PWR Button



2-7 Connecting Cables

Power Connectors

Two 50-pin SMCI-proprietary power connectors (JPW1/JPW2) are used to provide main power to your system. Four 8-pin power connectors, located at JPW3/JPW4/JPW5/JPW6, provide power to the GPU devices installed on the PCI-E slots. In addition, two 4-pin power connectors (HDD_PWR1/HDD_PWR2) are used for onboard HDDs, while another 4-pin power connector (FAN_PWR1) powers the fan board AOM-QG-FAN. See the layout below for the locations of the power connectors.

12V 8-pin Power Connector Pin Definitions	
Pins	Definition
1 through 3	+12V
4 through 8	Ground

(Required)

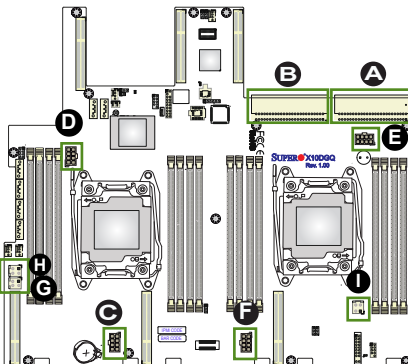
HDD_PWR1/HDD_PWR2 Pin Definitions	
Pins	Definition
1-2	Ground
3	+5V
4	+12V

(Required)

FAN_PWR1 Pin Definitions	
Pins	Definition
1-2	Ground
3-4	+12V

(Required)

Warning: To ensure adequate power supply to your motherboard and for proper system operation, be sure to connect all the power connectors mentioned above to your power supply.



A. JPW1: 50-pin SMCI-proprietary main power (Req'd)

B. JPW2: 50-pin SMCI-proprietary main power (Req'd)

C. JPW3: 8-pin GPU power (Req'd)

D. JPW4: 8-pin GPU power (Req'd)

E. JPW5: 8-pin GPU power (Req'd)

F. JPW6: 8-pin GPU power (Req'd)

G. HDD_PWR1: 4-pin HDD power (Req'd)

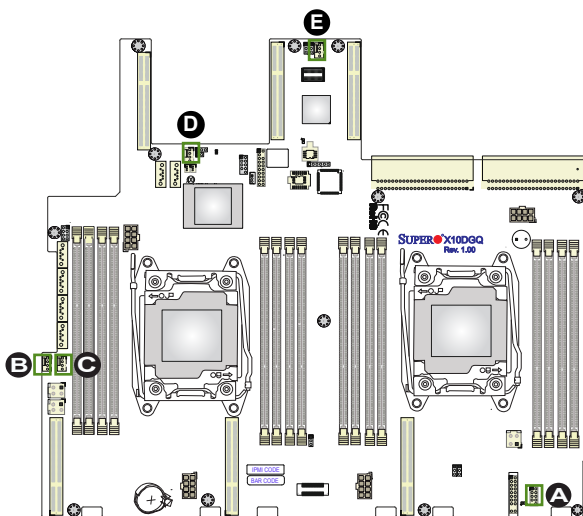
H. HDD_PWR2: 4-pin HDD power (Req'd)

I. Fan_PWR1: 4-pin FAN power (Req'd)

Fan Headers

A four-pin fan (FAN8-FAN11) is located on the motherboard for system cooling. The 4-pin fans headers are backward compatible with the traditional 3-pin fans. However, fan-speed control is available for 4-pin fans only and is controlled by thermal management via the IPMI 2.0 interface. See the table on the right for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWM (Pulse-Width Modulation)



- A. FAN5
- B. FAN8
- C. FAN9
- D. FAN10
- E. FAN11

TPM Header/Port 80

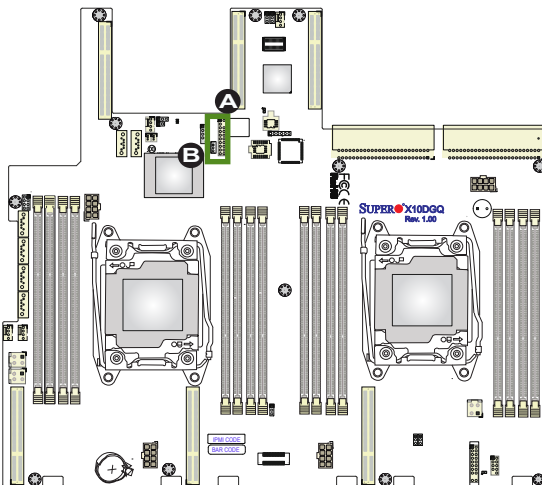
A Trusted Platform Module/Port 80 header is located at JTPM1 to provide TPM support and Port 80 connection. Use this header to enhance system performance and data security. See the table on the right for pin definitions.

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

Standby Power Header

The onboard standby power header is located at JSTBY1 on the motherboard. See the table on the right for pin definitions. (You must also have a card with the standby power connector and a cable to use this feature.)

Standby PWR Pin Definitions	
Pin#	Definition
1	+5V Standby
2	Ground
3	No Connection



A. TPM/Port80

B. Standby Power

T-SGPIO Header

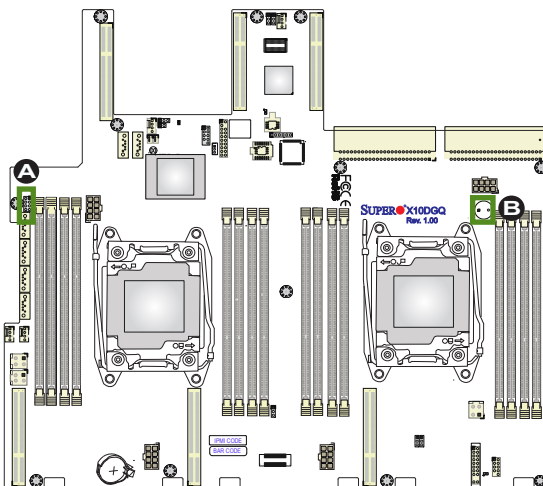
One SGPIO (Serial-Link General-Purpose Input/Output) header (T-SGPIO1) is located on the motherboard. This header supports a serial-link interface for onboard SATA connections. See the table on the right for pin definitions.

T-SGPIO Pin Definitions			
Pin#	Definition	Pin#	Definition
1	NC	2	NC
3	Ground	4	Data
5	Load	6	Ground
7	Clock	8	NC

Internal Speaker

The internal speaker (SP1) provides audible indications for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the location of the internal speaker.

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



A. T-SGPIO1
B. Internal Speaker

Chassis Intrusion

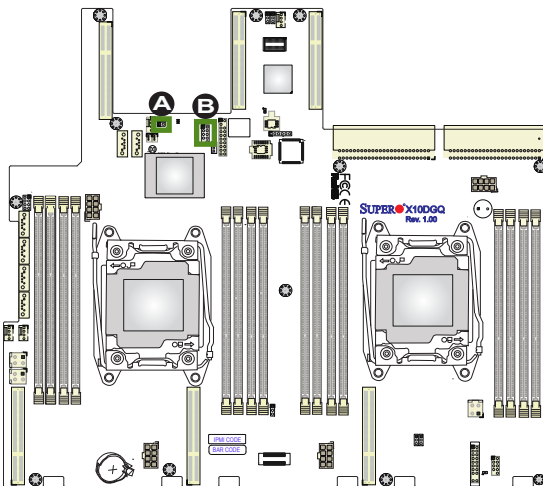
A Chassis Intrusion header is located at JL1 on the motherboard. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened.

Chassis Intrusion Pin Definitions	
Pin#	Definition
1	Intrusion Input
2	Ground

Universal Serial Bus (USB)

A USB 2.0 header, located next to the PCH chip, provides two USB 2.0 connections (USB 2/3) for front panel access. (Cables are not included.) See the table on the right for pin definitions.

Front Panel USB (2.0) 2/3 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	No Connection



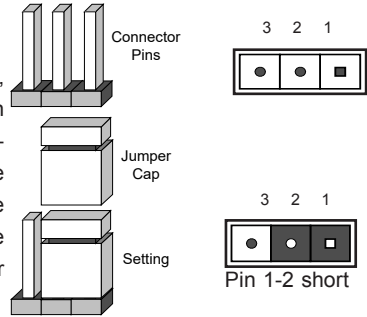
A. Chassis Intrusion


B. USB 2/3

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. See the motherboard layout pages for jumper locations.

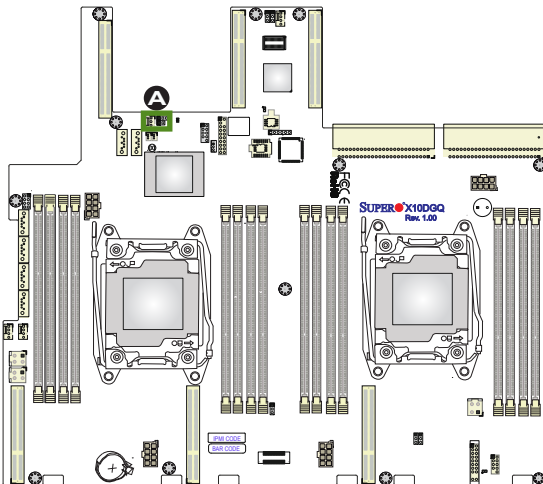


 **Note:** On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

Manufacturer Mode Select

Close pin 2 and pin 3 of Jumper JPME2 to bypass SPI flash security and force the system to operate in the Manufacturer 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.


ME Mode Select Jumper Settings	
Jumper Setting	Definition
1-2	Normal (Default)
2-3	Manufacturer Mode



A. ME Mode Select

CMOS Clear

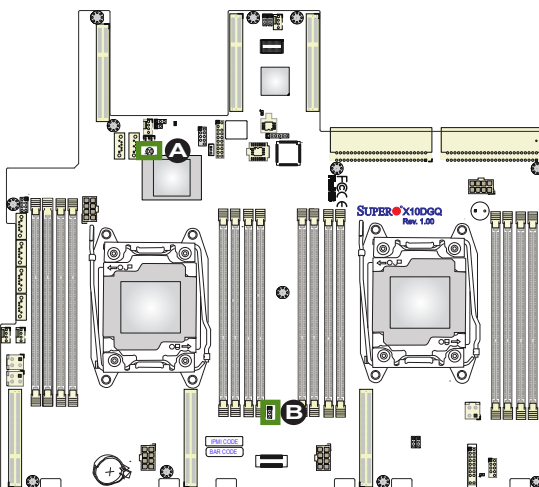
JBT1 is used to clear the CMOS. Instead of pins, this "jumper" consists of contact pads to prevent accidental clearing of the CMOS. To clear the CMOS, use a metal object such as a small screwdriver to touch both pads at the same time to short the connection. Always remove the AC power cord from the system before clearing the CMOS. 🕒

 **Note:** Be sure to completely power off the system and remove the power cords and onboard CMOS battery before you short JBT1 to clear the CMOS.

Watch Dog Enable/Disable

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

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



A. Clear CMOS

B. Watch Dog Enable

VGA Enable

Jumper JPG1 allows the user to enable the onboard VGA connector. The default setting is on pins 1/2 to enable the connection. See the table on the right for jumper settings.

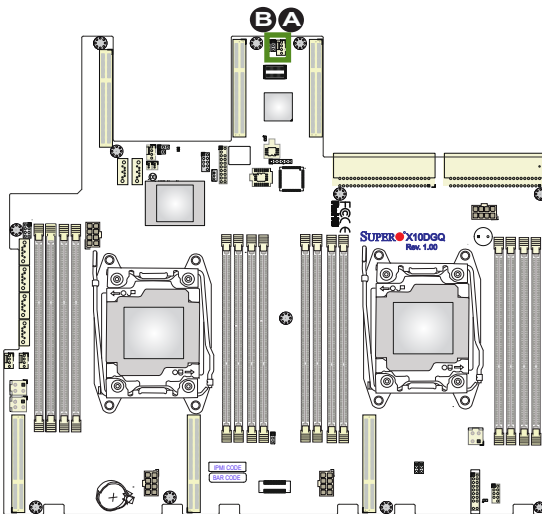
VGA Enable Jumper Settings	
Jumper Setting	Definition
1-2	Enabled (Default)
2-3	Disabled

BMC Enable

Use Jumper JPB1 to enable the Baseboard Management Controller (BMC) installed on the motherboard to provide IPMI 2.0/KVM support. See the table on the right for jumper settings.

BMC Enable Jumper Settings	
Jumper Setting	Definition
Pins 1-2	BMC Enable (Default)
Pins 2-3	Disable (Do not use this setting!)

Warning! Jumper JPB1 (BMC Enable) is for engineering debugging use only. The manufacturer's default setting is on pins 1-2 to enable the BMC. Disabling the BMC will disable the server's onboard graphics controller, hardware monitoring, and system health management.



- A. VGA Enable
- B. BMC Enable

2-9 Onboard LED Indicators

System_Power Good LED

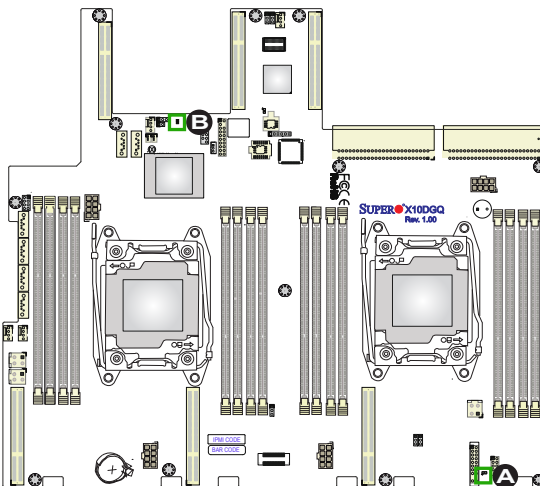
The System_Power Good LED is located at LE2 on the motherboard. When LE2 is on, system power is normal. See the table at right for more information.

System PWR LED Status	
State	Description
On	System PWR Normal

Power Health LED

An onboard Power Health LED is located at LE6 on the motherboard. See the table at right for more information.

Power Health LED Status	
State	Description
Green	System power on
Amber	Standby power only
Red	System power failure



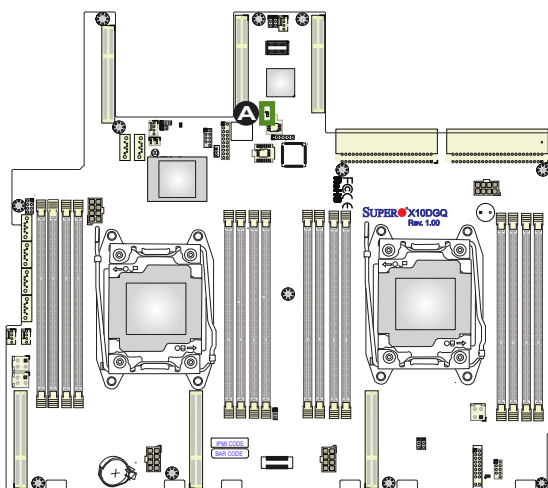
A. System PWR LED

B. Power Health LED

BMC Heartbeat LED

A BMCHeartbeat LED is located at LEDM1 on the motherboard. When LEDM1 is blinking, BMC functions normally. See the table at right for more information.

BMC Heartbeat LED Status	
Color/State	Definition
Green: Blinking	BMC: Normal




A. BMC LED

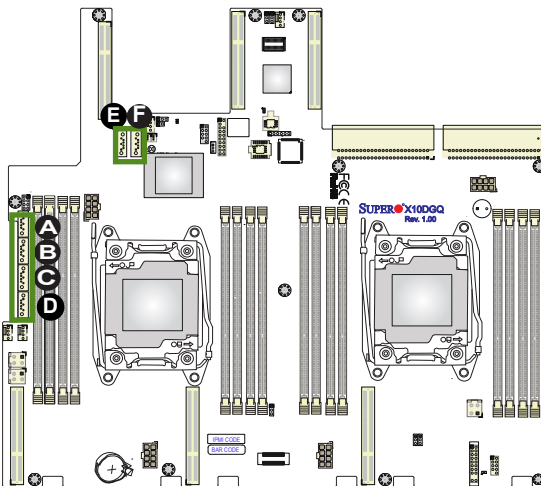
2-10 Serial ATA Connections

Serial ATA 3.0 Ports

Six Serial ATA ports (SATA1-SATA6), supported by the Intel PCH, are located on the motherboard. SATA5/6, colored in yellow, are used with Supermicro SuperDOM (Disk-on-Module) connectors with power pins built in. Supermicro SuperDOM connectors are backward-compatible with regular SATA HDDs and SATA DOMs that require power cables. All SATA ports provide serial-link signal connections, which are faster than the connections of Parallel ATA. See the table on the right for pin definitions.

SATA 3.0 Pin Definitions	
Pin#	Definition
1	Ground
2	TX_P
3	TX_N
4	Ground
5	RX_N
6	RX_P
7	Ground

 **Note:** Please refer to the Intel SATA HostRAID User's Guide posted on our website @ <http://www.supermicro.com> for more information on the SATA.



- A. SATA1
- B. SATA2
- C. SATA3
- D. SATA4
- E. SATA5 (Yellow: SuperDOM)
- F. SATA6 (Yellow: SuperDOM)

Notes

Chapter 3

Troubleshooting

3-1 Troubleshooting Procedures

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

Before Power On

1. Make sure that there are no short circuits between the motherboard and chassis.
2. Disconnect all ribbon/wire cables from the motherboard, including those for the keyboard and mouse.
3. Remove all add-on cards.
4. Install CPU 1 first (making sure that it is fully seated) and connect the front panel connectors to the motherboard.

No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. Make sure that all power connectors are properly connected.
3. Check that the 115V/230V switch on the power supply is properly set, if available.
4. Turn the power switch on and off to test the system, if applicable.
5. 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.

No Video

1. If the power is on but you do not have video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to Appendix A for details on beep codes.

System Boot Failure

If the system does not display POST or does not respond after the power is turned on, check the following:

1. Check for any error beep from the motherboard speaker.
 - If there is no error beep, try to turn on the system without DIMM modules installed. If there is still no error beep, try to turn on the system again with only one processor installed in CPU Socket#1. If there is still no error beep, replace the motherboard.
 - If there are error beeps, clear the CMOS settings by unplugging the power cord and contracting both pads on the CMOS Clear Jumper (JB1). (Refer to Section 2-8 in Chapter 2.)
2. Remove all components from the motherboard, especially the DIMM modules. Make sure that the system power is on and that memory error beeps are activated.
3. Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this chapter.

Losing the System's Setup Configuration

1. Make sure that you are using a high-quality power supply. A poor-quality power supply may cause the system to lose the CMOS setup information. Refer to Section 2-7 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 steps indicated above do not fix the setup configuration problem, contact your vendor for repairs.

Memory Errors

If a "no memory" beep code is issued by the system, check the following:

1. Make sure that the memory modules are compatible with the system and that the DIMM modules are properly and fully installed. (For memory compatibility, refer to the Memory Compatibility Chart posted on our website @ <http://www.supermicro.com>.)
2. Check if DIMM modules with different speeds have been installed. It is strongly recommended that you use the same RAM speed for all DIMMs in the system.
3. Make sure that you are using the correct type of Registered (RDIMM)/Load-Reduced (LRDIMM) ECC DDR4 memory modules as recommended by the manufacturer.
4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and checking the results.
5. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in section 2-5 in chapter 2.
6. Please follow the instructions given in the DIMM population tables listed in section 2-5 to install your memory modules.

When the System Becomes Unstable

A. When the system becomes unstable during or after OS installation, check the following:

1. CPU/BIOS support: Make sure that your processors are supported and that you have the latest BIOS installed in your system.
2. Memory support: Make sure that the memory modules are supported by testing the modules using memtest86 or a similar utility.



Note: Refer to the product page on our website <http://www.supermicro.com> for memory and CPU support and updates.

3. HDD support: Make sure that all hard disk drives (HDDs) work properly. Replace the bad HDDs with good ones.
4. System cooling: Check system cooling to make sure that all heatsink fans, CPU fans, and system fans work properly. Check the hardware monitoring

settings in the IPMI to make sure that the CPU and system temperatures are within the normal range. Also check the front-panel Overheat LED and make sure that the Overheat LED is not on.

5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected to your power supply. Please refer to our website for more information on minimum power requirement.
6. Proper software support: Make sure that the correct drivers are used.

B. When the system becomes unstable before or during OS installation, check the following:

1. Installation Devices: Make sure that the devices used for installation are working properly, including boot devices such as CD/DVD disc.
2. Cable connection: Check to make sure that all cables are connected and working properly.
3. Using minimum configuration for troubleshooting: Remove all unnecessary components (starting with add-on cards first), and use the minimum configuration (with a CPU and a memory module installed) to identify the trouble areas. Refer to the steps listed in Section A above for proper troubleshooting procedures.
4. Identifying bad components by isolating them: If necessary, remove a component in question from the chassis and test it in isolation to make sure that it works properly. Replace any non-functioning components with functioning ones.
5. Check and change one component at a time instead of changing several items at the same time. This will help isolate and identify the problem.
6. To find out if a component is good, swap this component with a new one to see if the system will work properly. If so, then the old component is bad. You can also install the component in question in another system. If the new system works, the component is good and the old system has problems.

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, please note that as a motherboard manufacturer, Supermicro also sells motherboards through its channels, 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/>) before contacting Technical Support.
 2. BIOS upgrades can be downloaded from our website (<http://www.supermicro.com>).
 3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:
 - 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
 4. An example of a Technical Support form is on our website at (<http://www.supermicro.com/RmaForm/>).
- 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.

3-3 Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps below:

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

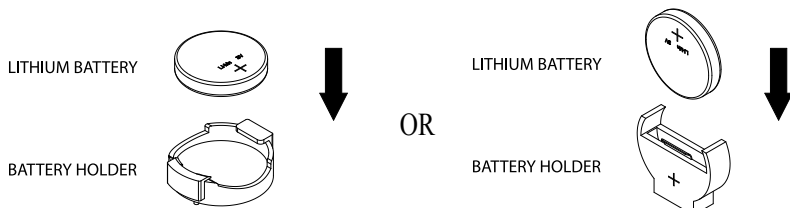
Proper Battery Disposal

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

Battery Installation

To install an 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. Identify the battery's polarity. The positive (+) side should be facing up.
4. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.



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

3-4 Frequently Asked Questions

Question: What are the various types of memory that my motherboard can support?

Answer: The motherboard supports DDR4 RDIMM/LRDIMM ECC modules. To enhance memory performance, do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on section 2-5 in chapter 2.

Question: How do I update my BIOS under DOS?

It is recommended that you **do not** upgrade your BIOS if you are not experiencing any problems with your system. Updated BIOS files are located on our website at <http://www.supermicro.com>. Please check our BIOS warning message and the information on how to update your BIOS on our website. Select your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision to make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable USB device. Run the batch file using the format FLASH.BAT filename.rom from your bootable USB device to flash the BIOS. Then your system will automatically reboot.

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



Note: The SPI BIOS chip used on this motherboard cannot be removed. Send your motherboard back to our RMA Department at Supermicro for repair. For BIOS recovery instructions, please refer to the AMI BIOS Recovery Instructions posted at <http://www.supermicro.com>.

Question: How do I update my BIOS under UEFI Shell?



Note: We do not recommend that you update your BIOS if you are not experiencing a BIOS-related problem. If you need to update your BIOS, please follow the steps below to properly update your BIOS under UEFI Shell.

1. Download and save the BIOS update package to your computer.
2. Extract the files from the UEFI folder of the BIOS package to a USB stick.



Note: The USB stick doesn't have to be bootable; however, it has to be formatted with the FAT/FAT32 file system.

3. Insert the USB stick into a USB port, boot to the Build-In UEFI Shell, and type `FLASH.nsh BIOSname#.###` to start the BIOS update.

4. Enter the following commands:

```
Shell> fs0:
```

```
fs0:\> cd UEFI
```

```
fs0:\UEFI> flash.nsh X11DPDx-xx.xxx
```

5. The FLASH.NSH script will compare the Flash Descriptor Table (FDT) code in the new BIOS with the existing one in the motherboard:

a. If a different FDT is found

- A new file, STARTUP.NSH, will be created, and the system will automatically reboot in 10 seconds without you pressing any key. BIOS will be updated after the system reboots.
- You can also press <Y> to force an immediate system reboot to shorten the process. During system reboot, press the <F11> key to invoke the boot menu and boot into the build-in UEFI Shell. Your BIOS will be updated automatically.

b. If the FDT is the same

- BIOS update will be immediately performed without a system reboot initiated.

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

6. Perform an A/C power cycle after the message indicating the BIOS update has completed.

7. Go to the BIOS setup utility, and restore the BIOS settings.

Question: How do I handle the used battery?

Answer: 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. Refer to section 3-3 on page 3-6.

3-5 Returning Merchandise for Service

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

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, 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 X10DGQ motherboard. It also provides the instructions on how to navigate the AMI BIOS setup utility screens. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated.

Starting BIOS Setup Utility


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

 **Note:** In most cases, the key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F3>, <F4>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for informational text. When an option is selected in the left frame, it is highlighted in white. Often informational text will accompany it.

 **Note:** The AMI BIOS has default informational messages built in. The manufacturer retains the option to include, omit, or change any of these informational messages.


The AMI BIOS setup utility uses a key-based navigation system called "hot keys." Most of the AMI BIOS setup utility "hot keys" can be used at any time during setup navigation. These keys include <F3>, <F4>, <Enter>, <ESC>, arrow keys, etc.

 **Note 1:** Options printed in **Bold** are default settings.

Note 2: <F3> is used to load optimal default settings. <F4> is used to save the settings and exit the setup utility.

How To Change the Configuration Data

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

 **Note:** For AMI UEFI BIOS Recovery, please refer to the UEFI BIOS Recovery User Guide posted @ <http://www.supermicro.com/support/manuals/>.

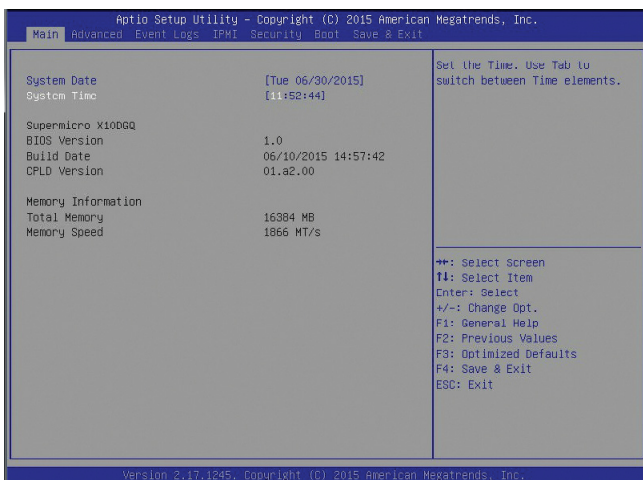
Starting the Setup Utility

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

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

4-2 Main Setup

When you first enter the AMI BIOS setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.



The AMI BIOS Main menu displays the following information:

System Date/System Time

Use this item to change the system date and time using the arrow keys. Enter new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YYYY format. The time is entered in HH:MM:SS format. (**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.).

Supermicro X10DGQ**BIOS Version**

This item displays the SMC version of the BIOS ROM used in this system.

Build Date

This item displays the date that the BIOS setup utility was built.

CPLD Version

This item displays the version of 'Complex Programmable Logic Device' (CPLD) used in this system.

Memory Information**Total Memory**

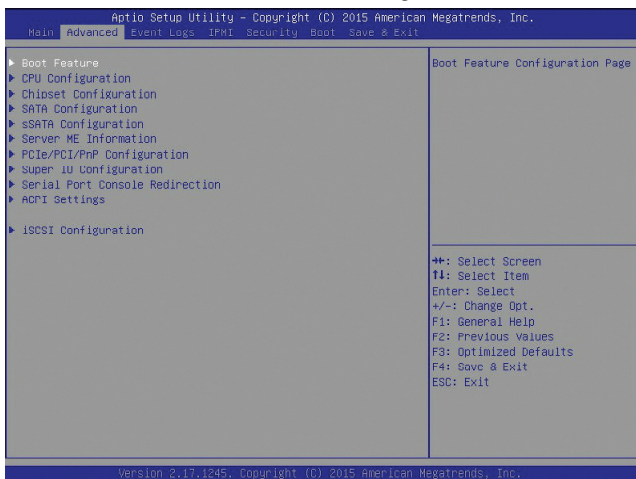
This item displays the amount of memory that is available in the system.

Memory Speed

This item displays the speed of memory modules installed in the system.

4-3 Advanced Setup Configurations

Select the Advanced tab to access the following submenu items.



► Boot Features

Boot Configuration

Quiet Boot

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

CSM (Compatibility Support Module) Support

Select Enabled to enable CSM booting support which will allow a UEFI-compatible device to boot from a system that uses a legacy BIOS ROM. The options are **Enabled** and Disabled.

AddOn ROM Display Mode

Use this item to set the display mode for the Option ROM. Select Keep Current to use the current AddOn ROM Display setting. Select Force BIOS to use the Option ROM display set by the system BIOS. The options are **Force BIOS** and Keep Current.

Bootup Num-Lock

Use this item to set the power-on state for the Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

Select Enabled to force the system to wait until the 'F1' key is pressed when an error occurs. The options are Disabled and **Enabled**.

Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot disk function. When this item is set to Immediate, the BIOS ROM of the host adaptors will immediately capture Interrupt 19 at bootup and allow the drives that are attached to these host adaptors to function as bootable disks. If this item is set to Postponed, the BIOS ROM of the host adaptors will only capture Interrupt 19 during bootup from a legacy device. The options are **Immediate** and Postponed.

Re-try Boot

If this item is set to Enabled, the system BIOS will continuously try to boot from the selected boot drive. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration**Watch Dog Function**

If enabled, the Watch Dog timer will allow the system to automatically reboot when a non-recoverable error that lasts for more than five minutes occurs. The options are Enabled and **Disabled**.

Power Button Function

If this item is set to Instant Off, the system will power off immediately as soon as the user presses the power button. If this item is set to 4 Seconds Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant Off** and 4 Seconds Override.

Restore on AC Power Loss

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

►CPU Configuration

This submenu displays the following CPU information as detected by the BIOS. It also allows the user to configure CPU settings.

►Processor 0/Processor 1

This submenu displays the following information of the CPU installed in Socket 0, and Socket 1.

- Processor Socket
- Processor ID
- Processor Frequency
- Processor Max Ratio
- Processor Min Ratio
- Microcode Revision
- L1 Cache RAM
- L2 Cache RAM
- L3 Cache RAM
- Processor 0 Version
- Processor 1 Version

Clock Spread Spectrum

Select Enable to allow the BIOS to attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disable** and Enable.

Hyper-Threading (All)

Select Enable to support Intel's Hyper-threading Technology to enhance CPU performance. The options are **Enable** and Disable.

Cores Enabled

Use this item to set the number of CPU cores to be enabled in your system. Enter "0" to enable all cores. The default setting is **0**.

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

Select Enable for Execute Disable Bit Technology support, which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack.

The options are **Enable** and Disable. (Refer to Intel and Microsoft websites for more information.)

PPIN Control

Select Unlock/Enable to use the Protected-Processor Inventory Number (PPIN) in the system. The options are **Unlock/Enable** and Unlock/Disable.

Hardware Prefetcher (Available when supported by the CPU)

If set to Enable, 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 Disable and **Enable**.

Adjacent Cache Line Prefetch (Available when supported by the CPU)

Select Enable for the CPU to prefetch both cache lines for 128 bytes as comprised. Select Disable for the CPU to prefetch both cache lines for 64 bytes. The options are Disable and **Enable**.



Note: Please reboot the system for changes on this setting to take effect. Please refer to Intel's web site for detailed information.

DCU (Data Cache Unit) Streamer Prefetcher (Available when supported by the CPU)

If set to Enable, the DCU Streamer Prefetcher will prefetch data streams from the cache memory to the DCU to speed up data accessing and processing to enhance CPU performance. The options are Disable and **Enable**.

DCU IP Prefetcher

If set to Enable, the IP prefetcher in the DCU (Data Cache Unit) will prefetch IP addresses to improve network connectivity and system performance. The options are **Enable** and Disable.

Direct Cache Access (DCA)

Select Enable to use Intel DCA (Direct Cache Access) Technology to improve the efficiency of data transferring and accessing. The options are **Enable** and Disable.

X2 APIC (Advanced Programmable Interrupt Controller)

Based on Intel's Hyper-Threading architecture, each logical processor (thread) is assigned 256 APIC IDs (APIDs) in 8-bit bandwidth. When this feature is set to Enable, the APIC ID will expand from 8 bits (X2) to 16 bits to provide 512 APIDs to each thread for CPU performance enhancement. The options are **Disable** and Enable.

AES-NI

Select Enable to use the Intel Advanced Encryption Standard (AES) New Instructions (NI) to ensure data security. The options are **Enable** and Disable.

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

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



Note: If there is a change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's website for detailed information.)

► Advanced Power Management Configuration

Advanced Power Management Configuration

Power Technology

Select **Energy Efficient** to support power-saving mode. Select **Custom** to customize system power settings. Select **Disable** to disable power-saving settings. The options are **Disable**, **Energy Efficient**, and **Custom**.

**If the option is set to Custom or Energy Efficient, the following items will display:*

Energy Performance Tuning (Available when Power Technology is set to Custom or Energy Efficient)

Select **Enable** for energy-performance tuning support to enhance energy efficiency, which might compromise system performance. The options are **Enable** and **Disable**.

Energy Efficiency Turbo (Available when Power Technology is set to Custom or Energy Efficient)

Select **Enable** for the system to operate at turbo mode with reduced power consumption so that your machine can achieve maximum system performance with the maximum power efficiency possible. The options are **Enable** and **Disable**.

**If the option is set to Custom, the following items will display:*

► CPU P State Control (Available when Power Technology is set to Custom)

EIST (P-states)

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are **Disable** and **Enable**.

Turbo Mode

Select Enable to use the Turbo Mode to boost system performance. The options are Disable and **Enable**.

P-state Coordination

This item is used to change the P-state (Power-Performance State) coordination type. P-state is also known as "SpeedStep" for Intel processors. Select HW_ALL to change the P-state coordination type for hardware components only. Select SW_ALL to change the P-state coordination type for all software installed in the system. Select SW_ANY to change the P-state coordination type for a software program in the system. The options are **HW_ALL**, SW_ALL, and SW_ANY.

► CPU C State Control (Available when Power Technology is set to Custom)

Package C State limit

Use this item to set the limit on the C-State package register. The options are C0/C1 state, C2 state, C6(non Retention) state, **C6 (Retention) state**, and No Limit.

CPU C3 Report

Select Enable to allow the BIOS to report the CPU C3 state (ACPI C2) to the operating system. During the CPU C3 state, the CPU clock generator is turned off. The options are **Disable** and Enable.

CPU C6 Report (Available when Power Technology is set to Custom)

Select Enable to allow the BIOS to report the CPU C6 state (ACPI C3) to the operating system. During the CPU C6 state, power to all cache is turned off. The options are Disable and **Enable**.

Enhanced Halt State (C1E)

Select Enable to use the "Enhanced Halt State" feature, which will significantly reduce the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disable and **Enable**.

► CPU T State Control (Available when Power Technology is set to Custom)

ACPI (Advanced Configuration Power Interface) T-States

If this item is set to Enable, CPU throttling will be supported by the operating system to reduce power consumption. The options are Disable and **Enable**.

► Chipset Configuration

► North Bridge

This feature is used to configure Intel North Bridge settings.

► IIO (Integrated IO) Configuration

EV DFX (Device Function On-Hide) Features

When this item is set to Enable, the EV_DFX Lock Bits that are located on a processor will always remain clear during electric tuning. The options are **Disable** and **Enable**.

► IIO0 Configuration

IOU2 (IIO PCIe Port 1)

This feature allows the user to set the bus speed between the IOU2 and the PCI-Exp port specified above. The options are x4x4, x8, and **Auto**.

IOU0 (IIO PCIe Port 2)

This feature allows the user to set the bus speed between the IOU0 and the PCI-Exp port specified above. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU1 (IIO PCIe Port 3)

This feature allows the user to set the bus speed between the IOU1 and the PCI-Exp port specified above. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

No PCIe Port Active ECO

Use this feature to select a workaround setting to implement the engineering-change order (ECO) on the system when the PCI ports specified by the user are not active. The options are **PCU Squelch exit ignore option** and **Reset the SQ FLOP by CSR option**.

► Socket 0 PCIeD00F0-Port 0/DMI

Use the items below to configure the PCI-E settings for a PCI-E port specified by the user.

Link Speed

Use this item to select the PCI-E link speed for the PCI-E port specified by the user. The options for CPU-PCH DMI port and are GEN1 (2.5 GT/s), GEN2 (5 GT/s), and **Auto**. The options for Onboard LAN port, CPU1 Slot1 x8 port, and CPU1 Slot2 x16 port are GEN1 (2.5 GT/s), GEN2 (5 GT/s), GEN3 (8 GT/s), and **Auto**.

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port L0s Exit Latency

Use this feature to set the length of time required for the port specified by the user to complete the transition from L0s to L0. The default setting is **4uS - 8uS**.

PCI-E Port L1 Exit Latency

Use this feature to set the length of time required for the port specified by the user to complete the transition from L1 to L0. The default setting is <1uS, 1uS - 2uS, 2uS - 4uS, 4uS - 8uS, **8uS - 16uS**, 16uS - 32uS, 32uS - 64uS, and >64uS.

Fatal Err (Error) Over

Select Enable to force fatal error prorogation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force non-fatal error prorogation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

Corr Err (Correctable Error) Over

Select Enable to force correctable error prorogation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, IIO will not put its transmitter in the L0s state. The default setting is **Disable**.

► Socket 0 PCIeD01F0 - Port 1A/Socket 0 PCIeD02F0 - Port 2A/Socket 0 PCIeD03F2 - Port 3A

PCI-E Port

Select Enable to enable the PCI-E port specified by the user. The options are **Auto**, Enable, and Disable.

Hot Plug Capable

Select Enable to enable hot-plugging support for the PCI-E port specified by the user to allow the user to replace the device installed on the port without shutting down the system. The options are **Disable** and Enable.

PCI-E Port Link

Select Disable to disable the link that is not involved in training activities, but its CFG is still active. The options are **Enable** and Disable.

Link Speed

Use this item to select the link speed for the PCI-E port specified by the user. The options are **Auto**, GEN1 (2.5 GT/s), GEN2 (5 GT/s), and GEN3 (8 GT/s).

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port L0s Exit Latency

Use this feature to set the length of time required for the port specified by the user to complete the transition from L0s to L0. The default setting is **4uS - 8uS**.

PCI-E Port L1 Exit Latency

Use this feature to set the length of time required for the port specified by the user to complete the transition from L1 to L0. The default setting is <1uS, 1uS - 2uS, 2uS - 4uS, 4uS - 8uS, **8uS - 16uS**, 16uS - 32uS, 32uS - 64uS, and >64uS.

Fatal Err (Error) Over

Select Enable to force fatal error prorogation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force non-fatal error prorogation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

Corr Err (Correctable Error) Over

Select Enable to force correctable error prorogation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, IIO will not put its transmitter in the L0s state. The default option is **Disable**.

PM ACPI Support

Select Enable to generate an _HPGPE message on a PM ACPI event. Select Disable to generate an MSI message. The options are **Disable** and Enable.

Gen3 (Generation 3) Eq (Equalization) Mode

Use this item to set the "Adaptive Equalization" mode for PCI-E Generation 3 devices. The options are **Auto**; Enable Phase 0, 1, 2, 3; Disable Phase 0, 1, 2, 3; Enable Phase 1 Only; Enable Phase 0, 1 Only; Advanced; and Enable MMM Offset West.

Gen3 (Generation 3) Spec (Specifics) Mode

Use this item to set the Specifics mode for PCI-E Generation 3 devices. The options are **Auto**, 0.70 July, 0.70 Sept and 0.71 Sept.

Gen3 (Generation 3) Phase2 Mode

Use this item to set the PCI-E Generation 3 Phase 2 mode. The options are **Hardware Adaptive** and Manual.

Gen3 (Generation 3) DN TX Preset

Use this item to set the Preset mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0 /3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Gen3 (Generation 3) DN RX Preset Hint

Use this item to set the Preset Hint mode for PCI-E Gen3 downstream reception (from a slave device to the master device). The options are **Auto**, P0 (-6.0 dB), P1 (-7.0 dB), P2 (-8.0 dB), P3 (-9.0 dB), P4 (-10.0 dB), P5 (-11.0 dB), and P6 (-12.0 dB).

Gen3 (Generation 3) Up TX Preset

Use this item to set the Preset mode for PCI-E Gen3 upstream transactions (from a slave device to the master device). The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0/3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Non-Transparent Bridge PCIe Port Definition (Port 3A only)

Select Transparent Bridge to configure the device installed on a PCI slot specified by the user as a transparent bridge (TB) device. Select NTB (Non-Transparent Bridge) to NTB to configure the device installed on a PCI slot specified by the user as a non-transparent bridge (NTB) device used to connect to another NTB device. The options are **Transparent Bridge**, NTB to NTB, and NTB to RP.

Hide Port?

Select Yes to hide the PCI-E port specified from the OS. The options are **No** and Yes.

► IIO1 Configuration

IOU2 (IIO PCIe Port 1)

This feature allows the user to set the bus speed between the IOU2 and the PCI-Exp port specified above. The options are x4x4, x8, and **Auto**.

IOU0 (IIO PCIE Port 2)

This feature allows the user to set the bus speed between the IOU0 and the PCI-Exp port specified above. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

IOU1 (IIO PCIE Port 3)

This feature allows the user to set the bus speed between the IOU1 and the PCI-Exp port specified above. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

No PCIe Port Active ECO

Use this feature to select a workaround setting to implement the engineering-change order (ECO) on the system when the PCI ports specified by the user are not active. The options are **PCU Squelch exit ignore option** and Reset the SQ FLOP by CSR option.

►Socket 1 PCIeD00F0-Port 0/DMI/Socket 1 PCIeD01F0 - Port 1A/Socket 1 PCIeD02F0 - Port 2A/Socket 1 PCIeD03F0 - Port 3A**PCI-E Port**

Select Enable to enable the PCI-E port specified by the user. The options are **Auto**, Enable, and Disable.

Hot Plug Capable

Select Enable to enable hot-plugging support for the PCI-E port specified by the user to allow the user to replace the device installed on the port without shutting down the system. The options are **Disable** and Enable.

PCI-E Port Link

Select Disable to disable the link that is not involved in training activities, but its CFG is still active. The options are **Enable** and Disable.

Link Speed

Use this item to select the link speed for the PCI-E port specified by the user. The options are **Auto**, GEN1 (2.5 GT/s), GEN2 (5 GT/s), and GEN3 (8 GT/s).

PCI-E Port DeEmphasis

Use this item to select the De-Emphasis control setting for a PCI-E port specified by the user. The options are **-6.0 dB** and -3.5 dB.

The following items will display:

- PCI-E Port Link Status
- PCI-E Port Link Max
- PCI-E Port Link Speed

PCI-E Port L0s Exit Latency

Use this feature to set the length of time required for the port specified by the user to complete the transition from L0s to L0. The default setting is **4uS - 8uS**.

PCI-E Port L1 Exit Latency

Use this feature to set the length of time required for the port specified by the user to complete the transition from L1 to L0. The default setting is <1uS, 1uS - 2uS, 2uS - 4uS, 4uS - 8uS, **8uS - 16uS**, 16uS - 32uS, 32uS - 64uS, and >64uS.

Fatal Err (Error) Over

Select Enable to force fatal error prorogation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

Non-Fatal Err (Error) Over

Select Enable to force non-fatal error prorogation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

Corr Err (Correctable Error) Over

Select Enable to force correctable error prorogation to the IIO core error logic for the port specified by the user. The options are **Disable** and Enable.

L0s Support

When this item is set to Disable, IIO will not put its transmitter in the L0s state. The default option is **Disable**.

PM ACPI Mode

Select Enable to generate an _HPGPE message on a PM ACPI event. Select Disable to generate an MSI message. The options are **Disable** and Enable.

Gen3 (Generation 3) Eq (Equalization) Mode

Use this item to set the "Adaptive Equalization" mode for PCI-E Generation 3 devices. The options are **Auto**; Enable Phase 0, 1, 2, 3; Disable Phase 0, 1, 2, 3; Enable Phase 1 Only; Enable Phase 0, 1 Only; Advanced; and Enable MMM Offset West.

Gen3 (Generation 3) Spec (Specifics) Mode

Use this item to set the Specifics mode for PCI-E Generation 3 devices. The options are **Auto**, 0.70 July, 0.70 Sept, and 0.71 Sept.

Gen3 (Generation 3) Phase2 Mode

Use this item to set the PCI-E Generation 3 Phase 2 mode. The options are **Hardware Adaptive** and Manual.

Gen3 (Generation 3) DN TX Preset

Use this item to set the Preset mode for PCI-E Gen3 downstream transactions (from the master device to a slave device). The options are **Auto**, P0 (-6.0/0.0

dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0 /3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Gen3 (Generation 3) DN RX Preset Hint

Use this item to set the Preset Hint mode for PCI-E Gen3 downstream reception (from a slave device to the master device). The options are **Auto**, P0 (-6.0 dB), P1 (-7.0 dB), P2 (-8.0 dB), P3 (-9.0 dB), P4 (-10.0 dB), P5 (-11.0 dB), and P6 (-12.0 dB).

Gen3 (Generation 3) Up TX Preset

Use this item to set the Preset mode for PCI-E Gen3 upstream transactions (from a slave device to the master device). The options are **Auto**, P0 (-6.0/0.0 dB), P1 (-3.5/0.0 dB), P2 (-4.5/0.0 dB), P3 (-2.5/0.0 dB), P4 (0.0/0.0 dB), P5 (0.0/2.0 dB), P6 (0.0/2.5 dB), P7 (-6.0/3.5 dB), P8 (-3.5/3.5 dB), and P9 (0.0/3.5 dB).

Non-Transparent Bridge PCIe Port Definition (Port 3A only)

Select Transparent Bridge to configure the device installed on a PCI slot specified by the user as a transparent bridge (TB) device. Select NTB (Non-Transparent Bridge) to NTB to configure the device installed on a PCI slot specified by the user as a non-transparent bridge (NTB) device used to connect to another NTB device. The options are **Transparent Bridge**, NTB to NTB, and NTB to RP.

Hide Port?

Select Yes to hide the PCI-E port specified from the OS. The options are **No** and Yes.

► IOAT Configuration

Enable IOAT

Select Enable to enable Intel I/OAT (I/O Acceleration Technology), which significantly reduces CPU overhead by leveraging CPU architectural improvements and freeing the system resource for other tasks. The options are Disable and **Enable**.

No Snoop

Select Enable to support no-snoop mode for each CB device. The options are **Disable** and Enable.

Relaxed Ordering

Select Enable for relaxed ordering support, which will allow certain transactions to be processed and completed prior to other transactions that have already been queued and that violate the strict ordering rules of PCI processing. The options are **Disable** and Enable.

► Intel VT for Directed I/O (VT-d)

Intel® VT for Directed I/O (VT-d)

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

Interrupt Remapping

Select Enable to support Interrupt Remapping to enhance system performance. The options are **Enable** and Disable.

► QPI (Quick Path Interconnect) Configuration

QPI Status

The following information will display:

- Number of CPU
- Number of IIO
- Current QPI Link Speed
- Current QPI Link Frequency
- QPI Global MMIO Low Base/Limit
- QPI Global MMIO High Base/Limit
- QPI PCI-E Configuration Base/Siz (Size)

Link Frequency Select

Use this feature to select the desired frequency for QPI Link connections. The options are 6.4GB/s, 8.0GB/s, 9.6GB/s, **Auto**, and Auto Limited.

Link L0p Enable

Select Enable for Link L0p support. The options are Disable and **Enable**.

Link L1 Enable

Select Enable for Link L1 support. The options are Disable and **Enable**.

Early Snoop

Select Enable to support Early Snoop mode for the QPI link. The options are Disable, Enable, and **Auto**.

Isoc

Select Enable to enable Isochronous support to meet QoS (Quality of Service) requirements. This feature is especially important for virtualization technology. The options are **Disable** and Enable.

► Memory Configuration**Enforce POR**

Select Enable to enforce POR restrictions on DDR4 frequency and voltage programming. The options are **Enabled** and Disabled.

Memory Frequency

Use this item to set the maximum memory frequency for onboard memory modules. The options are **Auto**, 1333, 1400, 1600, 1800, 1867, 2000, 2133, 2200, 2400, 2600, 2667, 2800, 2993, 3000, 3200, and Reserved.

Data Scrambling

Select Enabled to enable data scrambling to enhance system performance and data integrity. The options are **Auto**, Disabled, and Enabled.

Enable ADR

Use this item to configure Automatic Diagnostic Repository (ADR) settings to enhance memory performance. The options are **Disabled** and Enabled.

DRAM RAPL (Running Average Power Limit) Baseline

Use this item to set the run-time power-limit baseline for the DRAM modules. The options are Disable, DRAM RAPL Mode 0, and **DRAM RAPL Mode 1**.

Set Throttling Mode

Throttling improves reliability and reduces power consumption in processors via automatic voltage control during processor idle states. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

A7 Mode

Select Enabled to support the A7 (Addressing) mode to improve memory performance. The options are Disable and **Enable**.

►DIMM Information

This item displays the status of a DIMM module as detected by the BIOS.

P1-DIMMA1-A3/P1-DIMMB1-B3/P1-DIMMC1-C3/P1-DIMMD1-D3/P2-DIMME1-E3/P2-DIMMF1-F3/P2-DIMMG1-G3/P2-DIMMH1-H3

►Memory RAS (Reliability/Availability/Serviceability) Configuration

Use this submenu to configure the following Memory RAS settings.

RAS Mode

When Disable is selected, RAS is not supported. When Replaced Appendix B. Mirror is selected, the motherboard maintains two identical copies of all data in memory for data backup. When Lockstep is selected, the motherboard uses two areas of memory to run the same set of operations in parallel to boost performance. The options are **Disable**, Mirror, and Lockstep Mode.

Memory Rank Sparing

Select Enable to enable memory-sparing support for memory ranks to improve memory performance. The options are **Disabled** and Enabled.

Patrol Scrub

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

Patrol Scrub Interval

This feature allows you to decide how many hours the system should wait before the next complete patrol scrub is performed. Use the keyboard to enter a value from 0-24. The default setting is **24**.

Demand Scrub

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

Device Tagging

Select Enable to support device tagging. The options are **Disable** and Enable.

►South Bridge Configuration

The following South Bridge information will display:

►USB Configuration

- USB Module Version
- USB Devices

Legacy USB Support

Select Enabled to support onboard legacy USB devices. Select Auto to disable legacy support if there are no legacy USB devices present. Select Disable to have all USB devices available for EFI applications only. The options are **Enabled**, Disabled, and Auto.

XHCI (Extensible Host Controller Interface) Hand-Off

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

EHCI Hand-Off

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

Port 60/64 Emulation

Select Enabled for I/O port 60h/64h emulation support which will provide complete USB keyboard legacy support for the operating system that does not support Legacy USB devices. The options are Disabled and **Enabled**.

USB 3.0 Support

Select Enabled for USB 3.0 support. The options are Smart Auto, **Auto**, Enabled, and Disabled.

►SATA Configuration

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

SATA Controller

This item enables or disables the onboard SATA controller supported by the Intel PCH chip. The options are Disabled and **Enabled**.

Configure SATA as

Select IDE to configure a SATA drive specified by the user as an IDE drive. Select AHCI to configure a SATA drive specified by the user as an AHCI drive. Select RAID to configure a SATA drive specified by the user as a RAID drive. The options are IDE, **AHCI**, and RAID.

**If the item above "Configure SATA as" is set to AHCI, the following items will display:*

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are Disabled and **Enabled**.

SATA Port 0-Port 5

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

- Model number of drive and capacity
- Software Preserve Support

SATA Port 0-Port 5

Select Enabled to enable a SATA port specified by the user. The options are Disabled and **Enabled**.

SATA Port 0-Port 5 Hot Plug

Select Enabled to enable hot-plugging support for a port specified by the user, which will allow the user to replace a SATA disk drive installed on this port without shutting down the system. The options are Disabled and **Enabled**.

SATA Port 0-Port 5 Spin Up Device

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

SATA Port 0-Port 5 SATA Device Type

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

**If the item above "Configure SATA as" is set to IDE, the following items will display:*

Serial ATA Port 0-Port 5

This item indicates that a SATA port specified by the user is installed (present) or not.

SATA Port 0-Port 5 SATA Device Type (Available when a SATA port is detected)

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

**If the item above "Configure SATA as" is set to RAID, the following items will display:*

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are Disabled and **Enabled**.

SATA RAID Option ROM/UEFI Driver

Select EFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are **Legacy**, EFI, and Disabled.

SATA/sSATA RAID Boot Select

Select SATA Controller to boot the system from a SATA RAID device. Select sSATA Controller to boot the system from a S-SATA RAID device. Select Both to boot the system either from a SATA RAID device or from an sSATA RAID device. Please note that the option-Both is not supported by the Windows Server 2012/R2 OS. The options are None, SATA Controller, **sSATA Controller**, and Both.

Serial ATA Port 0-Port 5

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

- Model number of drive and capacity
- Software Preserve Support

Serial ATA Port 0-Port 5

Select Enabled to enable a SATA port specified by the user. The options are Disabled and **Enabled**.

Serial ATA Port 0Port 5 Hot Plug

Select Enabled to enable hot-plugging support for a port specified by the user, which will allow the user to replace a SATA disk drive installed on this port without shutting down the system. The options are Disabled and **Enabled**.

Serial ATA Port 0-Port 5 Spin Up Device

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

Serial ATA Port 0-Port 5 SATA Device Type

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

►sSATA Configuration

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

sSATA Controller

This item enables or disables the onboard SATA controller supported by the Intel PCH-sSATA controller. The options are **Enabled** and Disabled.

Configure sSATA as

Select IDE to configure an sSATA drive specified by the user as an IDE drive. Select AHCI to configure an sSATA drive specified by the user as an AHCI drive. Select RAID to configure an sSATA drive specified by the user as a RAID drive. The options are IDE, **AHCI**, and RAID.

**If the item above "Configure sSATA as" is set to AHCI, the following items will display:*

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are Disabled and **Enabled**.

sSATA Port 0-Port 3

This item displays the information detected on the installed on the sSATA port. specified by the user.

- Model number of drive and capacity
- Software Preserve Support

sSATA Port 0-Port 3

Select Enabled to enable an sSATA port specified by the user. The options are Disabled and Enabled.

sSATA Port 0-Port 3 Hot Plug

Select Enabled to enable hot-plugging support for a port specified by the user, which will allow the user to replace a sSATA disk drive installed on this port without shutting down the system. The options are Disabled and **Enabled**.

sSATA Port 0-Port 3 Spin Up Device

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

sSATA Port 0-Port 3 sSATA Device Type

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

**If the item above "Configure sSATA as" is set to IDE, the following items will display:*

sSATA Port 0-Port 3

This item indicates that an sSATA port specified by the user is installed (present) or not.

sSATA Port 0 ~ Port 3 sSATA Device Type (Available when a SATA port is detected)

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

**If the item above "Configure sSATA as" is set to RAID, the following items will display:*

Support Aggressive Link Power Management

When this item is set to Enabled, the SATA AHCI controller manages the power usage of the SATA link. The controller will put the link to a low power state when the I/O is inactive for an extended period of time, and the power state will return to normal when the I/O becomes active. The options are Disabled and **Enabled**.

sSATA RAID Option ROM/UEFI Driver

Select EFI to load the EFI driver for system boot. Select Legacy to load a legacy driver for system boot. The options are **Legacy**, EFI, and Disabled.

SATA/sSATA RAID Boot Select

Select SATA Controller to use a device supported by the SATA connector for system boot. Select sSATA Controller to use a device supported by the sSATA connector for system boot. The options are None, SATA Controller, **sSATA Controller**, and Both.

sSATA Port 0-Port 3

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

- Model number of drive and capacity
- Software Preserve Support

sSATA Port 0-Port 3

Select Enabled to enable an sSATA port specified by the user. The options are Disabled and Enabled.

sSATA Port 0-Port 3 Hot Plug

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

sSATA Port 0-Port 3 Spin Up Device

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

sSATA Port 0-Port 3 sSATA Device Type

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

► Server ME (Management Engine) Configuration

This feature displays the following system ME configuration settings.

- General ME Configuration
- Operational Firmware Version
- Recovery Firmware Version
- ME Firmware Features
- ME Firmware Status #1
- ME Firmware Status #2
 - Current State
 - Error Code

Altitude

This feature indicates the altitude of the platform this machine is located above the sea level. The value is shown in meters. If the value is unknown, enter the number "80000000."

MCTP (Management Component Transport Protocol) Bus Owner

This feature indicates the location of the MCTP Bus owner. Enter 0s to all fields to disable the MCTP Bus owner.

► PCIe/PCI/PnP Configuration

The following PCI information will be displayed:

PCI Latency Timer

Use this item to configure the PCI latency timer for a device installed on a PCI bus. Select 32 to set the PCI latency timer to 32 PCI clock cycles. The options are **32**, 64, 96, 128, 160, 192, 224, and 248 (PCI Bus Clocks).

PERR# Generation

Select Enabled to allow a PCI device to generate a PERR (PCI/PCI-E Parity Error) number for a PCI bus error event. The options are **Disabled** and Enabled.

SERR# Generation

Select Enabled to allow a PCI device to generate an SERR (System Error) number for a PCI bus error event. The options are **Disabled** and Enabled.

PCI PERR/SERR Support

Select Enabled to allow a PCI device to generate a PERR (PCI/PCI-E Parity Error) or an SERR (System Error) number for a PCI bus error event. The options are **Disabled** and Enabled.

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

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

SR-IOV (Available if the system supports Single-Root Virtualization)

Select Enabled for Single-Root IO Virtualization support. The options are **Disabled** and Enabled.

Maximum Payload

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

Maximum Read Request

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

ASPM Support

Use this item to set the Active State Power Management (ASPM) level for a PCI-E device. Select Auto for the system BIOS to automatically set the ASPM level based on the system configuration. Select Disabled to disable ASPM support. The options are **Disabled** and Auto.

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

MMIOHBase

Use this item to select the base memory size according to memory-address mapping for the PCH. The base memory size must be between 4032G to 4078G. The options are **56T**, 48T, 24T, 2T, 512G, and 256G.

MMIO High Size

Use this item to select the high memory size according to memory-address mapping for the PCH. The options are **256G**, 128G, 512G, and 1024G.

PC Devices Option ROM Settings

RSC-G-6/CPU2 Slot1 PCI-E x16 OPROM

RSC-G-6/CPU2 Slot2 PCI-E x16 OPROM

RSC-G-6/CPU1 Slot3 PCI-E x16 OPROM

RSC-GR-6/CPU1 Slot4 PCI-E x16 OPROM

RSC-GR-A88 upper/CPU1 Slot5 PCI-E x8 OPROM

RSC-GR-A88 lower/CPU2 Slot6 PCI-E x8 OPROM

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

Onboard Video Option ROM

Use this option to select the type of device installed in the onboard video device used for system boot. The options are Disabled, **Legacy**, and EFI.

VGA Priority

Use this item to select the graphics device to be used as the primary video display for system boot. The options are **Onboard** and Offboard.

Onboard LAN Option ROM Type

Select Legacy to boot the computer using a Legacy device installed on the motherboard. The options are **Legacy** and EFI.

Onboard LAN 1 Option ROM/Onboard LAN 2 Option ROM

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

► Super IO Configuration

Super IO Chip AST2400

► Serial Port 1 Configuration/Serial Port 2 Configuration

Serial Port 1/Serial Port 2

Select Enabled to enable the onboard serial port specified by the user. The options are Disabled and **Enabled**.

Device Settings

This item displays the base I/O port address and the Interrupt Request address of a serial port specified by the user.

Change Port 1 Settings/Change Port 2 Settings

This feature specifies the base I/O port address and the Interrupt Request address of Serial Port 1 or Serial Port 2. Select **Auto** for the BIOS to automatically assign the base I/O and IRQ address to a serial port specified.

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

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

Device Mode

Use this feature to configure SUART clock source settings. The options are **24MHz/13** and 24MHz.

Serial Port 2 Attribute

Select SOL to use COM Port 2 as a Serial_Over_LAN (SOL) port for console redirection. The options are **SOL** and COM.

► Serial Port Console Redirection

COM 1 Console Redirection (Available when COM1 port is detected)

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** and Enabled.

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

►COM1 Console Redirection Settings (Available when COM1 port is detected)

Terminal Type

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

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 Disabled and **Enabled**.

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

Use this 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 item 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 item 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 Always Enable is selected, legacy Console Redirection remains enabled upon OS bootup. The options are **Always Enable** and Bootloader.

COM2/SOL

COM2/SOL Console Redirection

Select Enabled to use the SOL/COM2 port for Console Redirection. The options are Disabled and **Enabled**.

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

►COM2/SOL Console Redirection Settings

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

Terminal Type

Use this feature to select the target terminal emulation type for Console Redirection. Select VT100 to use the ASCII Character set. Select VT100+ to add color and function key support. Select ANSI to use the Extended ASCII Character Set.

Select VT-UTF8 to use UTF8 encoding to map Unicode characters into one or more bytes. The options are VT100, **VT100+**, VT-UTF8, and ANSI.

Bits per second

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

Data Bits

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

Parity

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

Stop Bits

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

Flow Control

Use this feature to set the flow control for Console Redirection to prevent data loss caused by buffer overflow. Send a "Stop" signal to stop sending data when the receiving buffer is full. Send a "Start" signal to start data-sending 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 Disabled and **Enabled**.

Recorder Mode

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

Resolution 100x31

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

Legacy OS Redirection Resolution

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

Putty KeyPad

This feature selects 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 (Power-On Self-Test). When this feature is set to Bootloader, legacy Console Redirection is disabled before booting the OS. When this feature is set to Always Enable, legacy Console Redirection remains enabled upon OS boot. The options are **Always Enable** and Bootloader.

Legacy Console Redirection

► Legacy Console Redirection Settings

Legacy Serial Redirection Port

Use this feature to select the redirection of legacy OS or OPRM messages. The options are **COM1 Console Redirection** and COM2/SOL Console Redirection.

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.

EMS Console Redirection

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

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

►EMS Console Redirection Settings (Available when EMS Console Redirection is enabled)

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

Out-of-Band Management Port

The feature selects a serial port in a client server to be used by the Windows Emergency Management Services (EMS) to communicate with a remote host server. The options are **COM1 Console Redirection** and **SOL/COM2 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 VT100, VT100+, **VT-UTF8**, and ANSI.

Bits Per Second

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

Flow Control

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

The setting for each these features is displayed: Data Bits, Parity, and Stop Bits.

►ACPI Settings

WHEA Support

Select Enabled to support the Windows Hardware Error Architecture (WHEA) platform and provide a common infrastructure for the system to handle hardware errors within the Windows OS environment to reduce system crashes and to enhance system recovery and health monitoring. The options are Disabled and **Enabled**.

High Precision Timer

Select Enabled to activate the High Precision Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are Disabled and **Enabled**.

NUMA (Available when the OS supports this feature)

Select Enabled to enable Non-Uniform Memory Access support to enhance system performance. The options are Disabled and **Enabled**.

► Trusted Computing (Available when a TPM device is installed)

Configuration

Security Device Support

If this feature and the TPM jumper on the motherboard are both set to Enabled, onboard security devices will be enabled for TPM (Trusted Platform Module) support to enhance data integrity and network security. Please reboot the system for a change on this setting to take effect. The options are **Enabled** and Disabled.

TPM State

Select Enabled to use TPM (Trusted Platform Module) settings to enhance system data security. Please reboot your system for any change on the TPM state to take effect. The options are **Disabled** and Enabled.

Pending Operation

Use this item to schedule a TPM-related operation to be performed by a security device for system data integrity. Your system will reboot to carry out a pending TPM operation. The options are **0**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.



Note: Your system will reboot to carry out a pending TPM operation. For more information on TPM, please refer to the TPM manual at <http://www.supermicro.com/manuals/other/TPM.pdf>.

Current Status Information

This item displays the status of the TPM support on this motherboard.

TXT Support

Select Enabled to use Intel Trusted Execution Technology to enhance system security and data integrity. The options are **Enabled** and Disabled.

▶ iSCSI Configuration

This item displays iSCSI configuration information:

iSCSI Initiator Name

This item displays the name of the iSCSI Initiator, which is a unique name used in the world. The name must use the IQN format. The following actions can also be performed:

▶ Add an Attempt

▶ Delete Attempts

▶ Change Attempt Order

4-4 Event Logs

Use this feature to configure Event Log settings.



► Change Smbios Event Log Settings

Enabling/Disabling Options

SMBIOS Event Log

Select Enabled to enable SMBIOS (System Management BIOS) Event Logging during system boot. The options are Disabled and **Enabled**.

Runtime Error Logging Support

Select Enabled to support Runtime Error Logging. The options are Disabled and **Enabled**.

Erasing Settings

Erase Event Log

Select Enabled to erase all error events in the SMBIOS (System Management BIOS) log before an event logging is initialized at bootup. The options are **No**; Yes, Next reset; and Yes, Every reset.

When Log is Full

Select Erase Immediately to immediately erase all errors in the SMBIOS event log when the event log is full. Select Do Nothing for the system to do nothing when the SMBIOS event log is full. The options are **Do Nothing** and Erase Immediately.

SMBIOS Event Log Standard Settings**Log System Boot Event**

Select Enabled to log system boot events. The options are Enabled and **Disabled**.

MECI (Multiple Event Count Increment)

Enter the increment value for the multiple event counter. Enter a number between 1 to 255. The default setting is **1**.

METW (Multiple Event Count Time Window)

This item is used to determine how long (in minutes) the multiple event counter should wait before generating a new event log. Enter a number between 0 to 99. The default setting is **60**.



Note: Please reboot the system for the changes to take effect.

►View SMBIOS Event Log

This item allows the user to view the event in the SMBIOS event log. Select this item and press <Enter> to view the status of an event in the log. The following categories are displayed:

Date/Time/Error Code/Severity

4-5 IPMI

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



IPMI Firmware Revision

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

Status of BMC (Baseboard Management Controller)

This item indicates the status of the BMC installed in your system.

► System Event Log

Enabling/Disabling Options

SEL Components

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

Erasing Settings

Erase SEL

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

When SEL is Full

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

Custom EFI Logging Options

Log EFI Status Codes

Select Error Code to log EFI error codes. Select Progress Code to log EFI progress codes. Select Both to log both error codes and progress codes. The options are Disabled, Both, **Error Code**, and Progress Code.



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

► BMC Network Configuration

The following items will be displayed:

Update IPMI LAN Configuration

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

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

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

Station IP Address

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

Subnet Mask

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

Station MAC Address

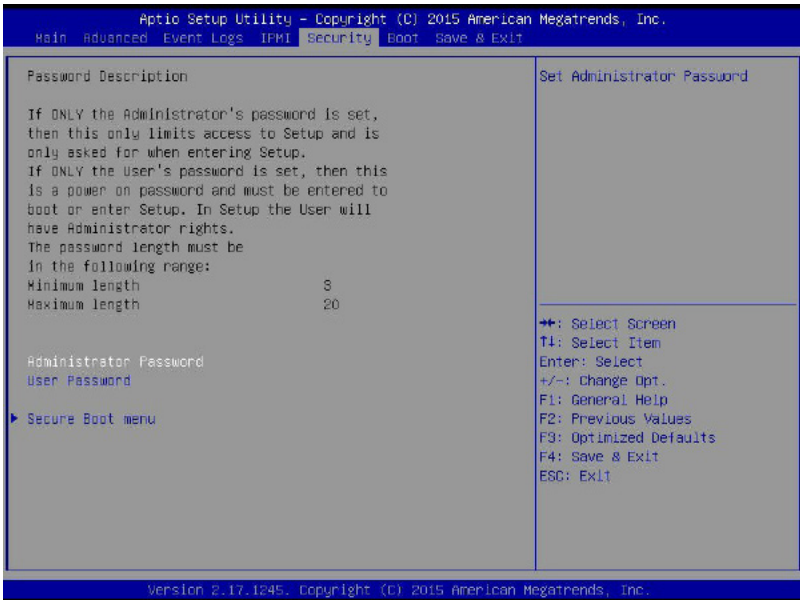
This item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

Router IP Address

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

4-6 Security Settings

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



Administrator Password

Use this feature to set the administrator password which is required before the user entering 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 to enter the BIOS setup utility. The length of the password should be from 3 characters to 20 characters long.

► Secure Boot Menu

The following items will display:

- System Mode
- Secure Boot

Secure Boot

Select Enable for secure boot support to ensure system security at bootup. The options are **Disabled** and Enabled.

Secure Boot Mode

This item allows the user to select the desired secure boot mode for the system. The options are Standard and **Custom**.

►Key Management

Default Keys Provision

Select Enable to install all manufacturer defaults for the following system security settings. The options are **Disabled** and Enabled.

►Enroll All Factory Default Keys

Select Enable to install all manufacturer defaults for the following system security settings. The options are **Yes** and No.

►Save All Secure Boot Variables

This feature allows the user to save the secure boot settings specified by the user.

Platform Key (PK)

►Delete PK

Select <Yes> to confirm deletion of the Platform Key (PK) from the NVRAM (Non-Volatile RAM).

►Set New PK

Select <Yes> to load the manufacture_default platform keys for your system. Select No to load the default settings from other sources.

Key Exchange Key (KEK)

Select <Yes> to confirm KEK support to enhance system security.

►Delete KEK (Key Exchange Key)

Select <Yes> to confirm deletion of the KEK from the NVRAM (Non-Volatile RAM).

►Set New KEK (Key Exchange Key)

Select <Yes> to confirm that a new KEK will be set in the NVRAM (Non-Volatile RAM).

►Append KEK (Key Exchange Key)

Select <Yes> to load the new KEK from the manufacturer defaults. Select <No> to load the new KEK from other sources.

Authorized Signatures**►Delete DB (DataBase)**

Select <Yes> to confirm deletion of a database from the NVRAM (Non-Volatile RAM).

►Set New DB (DataBase)

Select <Yes> to confirm that a new database will be set in the NVRAM (Non-Volatile RAM).

►Append DB (DataBase)

Select <Yes> to load the new database from the manufacturer defaults. Select <No> to load the new database from other sources

Authorized TimeStamps**►Delete DBT (DataBase Timer)**

Select <Yes> to confirm deletion of the database timer from the NVRAM (Non-Volatile RAM).

►Set New DBT (DataBase Timer)

Select <Yes> to confirm that the new database timer will be set in the NVRAM (Non-Volatile RAM).

►Append DBT (DataBase Timer)

Select <Yes> to load the new database timer from the manufacturer defaults. Select <No> to load the new database timer from other sources

Forbidden Signatures

▶Delete DBX

Select <Yes> to confirm deletion of the DBX files from the Non-Volatile RAM (NVRAM).

▶Set New DBX

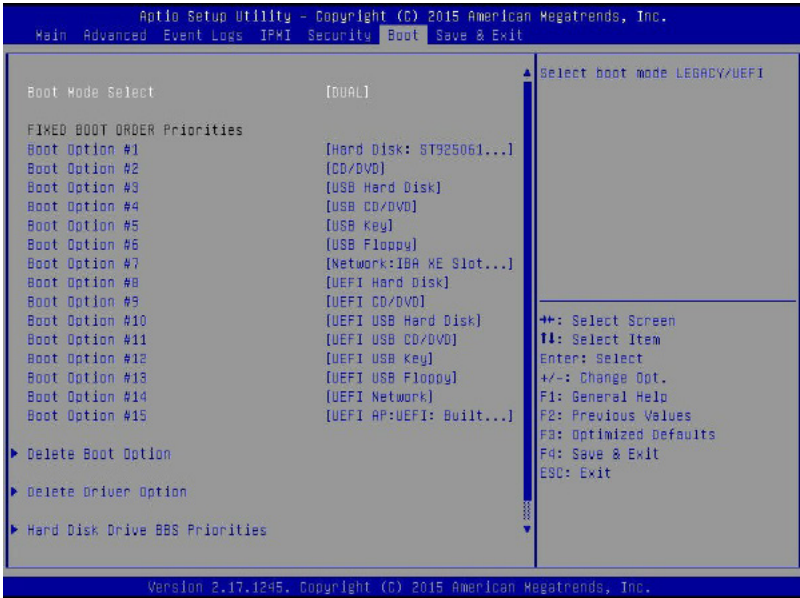
Select <Yes> to confirm that the new DBX files will be downloaded to the Non-Volatile RAM (NVRAM).

▶Append DBX (DataBase Timer)

Select <Yes> to load the new DBX files from the manufacturer defaults. Select <No> to load the new DBX files from other sources.

4-7 Boot Settings

Use this feature to configure Boot settings:



Boot Configuration

Boot Mode Select

Use this item to select the type of device to be used for system boot. The options are Legacy, UEFI, and **Dual**.

Fixed Boot Order Priorities

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

- Boot Option #1
- Boot Option #2
- Boot Option #3
- Boot Option #4
- Boot Option #5
- Boot Option #6

- Boot Option #7
- Boot Option #8
- Boot Option #9
- Boot Option #10
- Boot Option #11
- Boot Option #12
- Boot Option #13
- Boot Option #14
- Boot Option #15

▶ **Delete Boot Option**

Use this item to select a boot device to delete from the boot priority list.

Delete Boot Option

Select the target boot device to delete.

▶ **Delete Driver Option**

Use this item to select a boot driver to delete from the boot priority list.

Delete Driver Option

Select the target boot driver to delete.

▶ **Hard Disk Drive BBS Priorities**

- Boot Option #1
- Boot Option #2

▶ **Network Drive BBS Priorities**

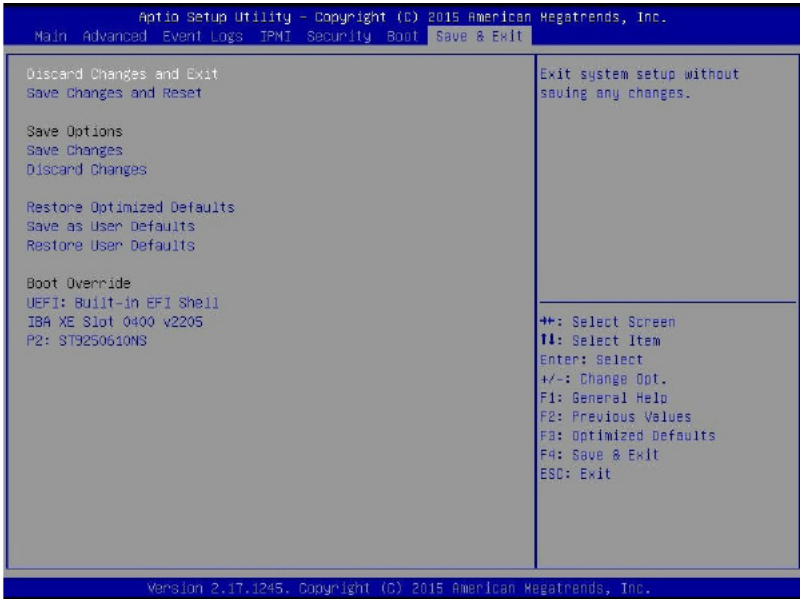
- Boot Option #1

▶ **UEFI Application Boot Priorities**

- Boot Option #1

4-8 Save & Exit

Select the Save & Exit tab from the BIOS setup screen to configure the settings below.



Discard Changes and Exit

Select this option and press <Enter> to quit the BIOS setup without making any permanent changes to the system configuration, and reboot the computer.

Save Changes and Reset

When you have completed the system configuration changes, select this option and press <Enter> to leave the BIOS setup utility and reboot the computer for the new system configuration parameters to take effect.

Save Options

Save Changes

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

Discard Changes

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

Restore Optimized Defaults

To set this feature, select this option and press <Enter> to reload the manufacturer default settings that are designed for maximum system performance but not for maximum stability.

Save as User Defaults

To set this feature, select this option and press <Enter> to save current default settings for future use.

Restore User Defaults

To set this feature, select this option and press <Enter> to retrieve user-defined settings that were previously saved.

Boot Override

This feature allows the user to override the Boot priorities sequence in the Boot menu, and immediately boot the system with a new device specified by the user. This is a one-time override.

Appendix A

BIOS POST Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed at each system boot, errors may occur.

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

Fatal errors will not allow the system to continue with bootup procedure. 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 POST 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 long beeps + 2 short beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep	System OH	System overheat

Notes

Appendix B

Software Installation


B.1 Installing Software Programs

The Supermicro website that contains drivers and utilities for your system is located at <http://www.supermicro.com/wftp>. Some of these must be installed, such as the chipset driver.

After accessing the product drivers and utilities page, go into the CDR_Images directory and locate the ISO file for your motherboard. Download this file to create a DVD of the drivers and utilities it contains. (You may also use a utility to extract the ISO file if preferred.)

After creating a DVD with the ISO files, insert the disk into the DVD drive on your system and the display shown in Figure B-1 should appear.

Another option is to go to the Supermicro website at <http://www.supermicro.com/products/>. Find the product page for your motherboard here, where you may download individual drivers and utilities to your hard drive or a USB flash drive and install from there.

 **Note:** Please refer to the documents posted on our website at <http://www.supermicro.com/support/manuals/> for additional instructions that may be applicable to your system.

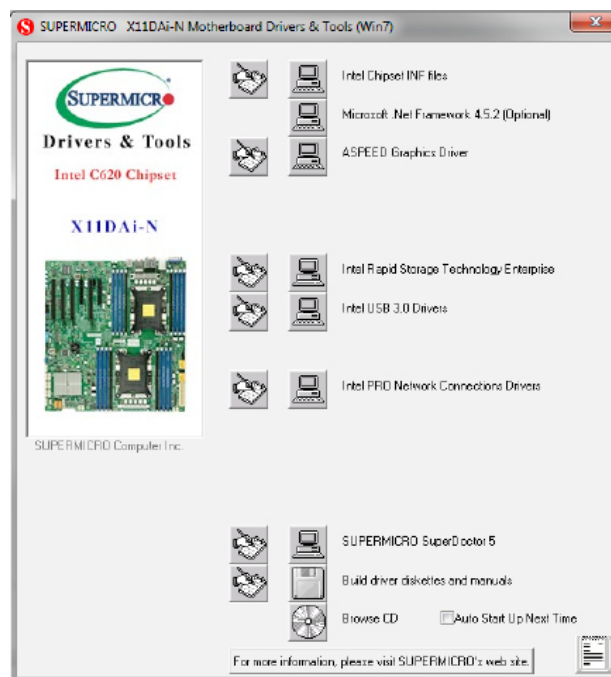


Figure B-1. Driver/Tool Installation Display Screen

Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon to the right of an item to install an 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.

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 SuperDoctor® 5


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

SuperDoctor 5 comes in local and remote management versions and can be used with Nagios to maximize your system monitoring needs. With SuperDoctor 5 Management Server (SSM Server), you can remotely control power on/off and reset chassis intrusion for multiple systems with SuperDoctor 5 or IPMI. SD5 Management Server monitors HTTP and SMTP services to optimize the efficiency of your operation.

 **Note:** The default Username and Password for SuperDoctor 5 is ADMIN / ADMIN.

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



 **Note:** The SuperDoctor 5 program and user's manual can be downloaded from the Supermicro website at http://www.supermicro.com/products/info/sms_sd5.cfm.

B.3 Logging into the BMC (Baseboard Management Controller)

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

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

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

Appendix C

UEFI BIOS Recovery Instructions

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

C-1 An Overview to the UEFI BIOS

The Unified Extensible Firmware Interface (UEFI) 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 the system. The 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 and a main BIOS block (a main BIOS image). The boot block contains critical BIOS codes, including memory detection and recovery codes for the user to flash a new BIOS image if the original main BIOS image is corrupted. When the system power is on, the boot block codes execute first. Once it is completed, the main BIOS code will continue with system initialization and 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 below for BIOS recovery.


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.

The file system supported by UEFI is FAT (including FAT12, FAT16, and FAT32) installed on a bootable or non-bootable USB-attached device. However, the BIOS might need several minutes to locate the SUPER.ROM file if the media size becomes too large because it contains too many folders and files.

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


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

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

2. Insert the USB device that contains the new BIOS image ("Super.ROM") into your USB drive and power on the system
3. While powering on the system, please keep pressing <Ctrl> and <Home> simultaneously on your keyboard *until the following screen (or a screen similar to the one below) displays.*

Warning!! Please **stop** pressing the <Ctrl> and <Home> keys immediately when you see the screen (or a similar screen) below; otherwise, it will trigger a system reboot.



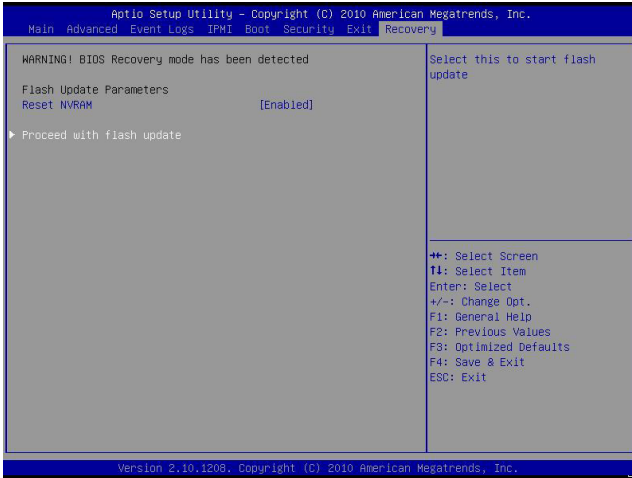
 **Note:** On the other hand, if the following screen displays, please load the "Super.ROM" file to the root folder and connect this folder to the system. (You can do so by inserting a USB device that contains the new "Super.ROM" image to your machine for BIOS recovery.)



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



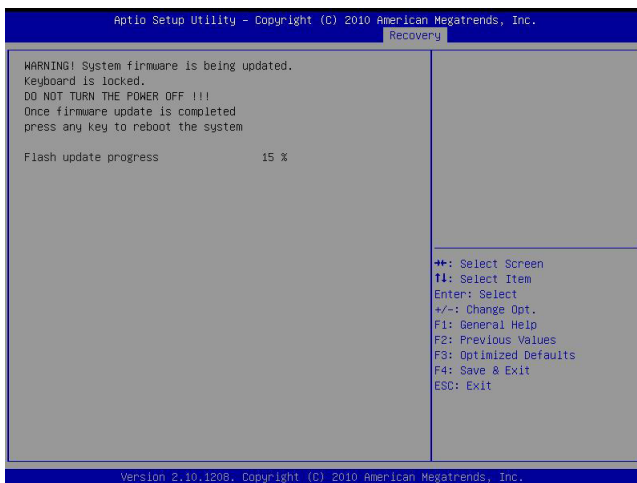
Note: At this point, you may decide if you want to start with BIOS recovery. If you decide to proceed with BIOS recovery, follow the procedures below.



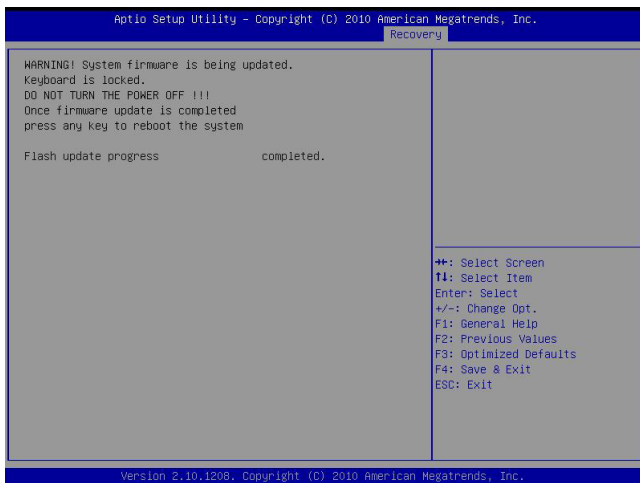
- When the screen as shown above displays, using the arrow key, select the item "Proceed with flash update" and press the <Enter> key. You will see the progress of BIOS recovery as shown in the screen below.



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



6. After the process of BIOS recovery is completed, press any key to reboot the system.



7. Using a different system, extract the BIOS package into a bootable USB flash drive.
8. When a DOS prompt appears, enter FLASH.BAT BIOSName.### at the prompt.



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

9. After seeing the message that BIOS update is completed, unplug the AC power cable from the power supply to clear the CMOS, and then plug the AC power cable into the power supply again to power on the system.
10. Press continuously to enter the BIOS Setup utility.
11. Press <F3> to load default settings.
12. After loading default settings, press <F4> to save the settings and exit the BIOS Setup utility.

(Disclaimer Continued)

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