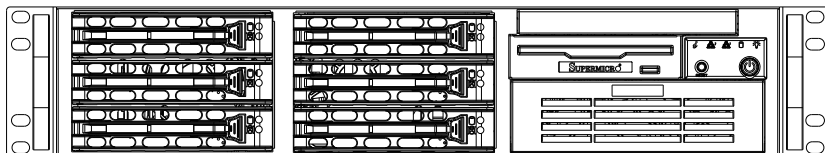




SUPERSERVER®

6028R-T  
6028R-TT



USER'S MANUAL

1.0a

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## Preface

### About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 6028R-T/TT. Installation and maintenance should be performed by experienced technicians only.

The SuperServer 6028R-T/TT is a high-end server based on the SC823TQ-653LPB 2U rackmount chassis and the Super X10DRi/X10DRi-T dual processor serverboard.

### Manual Organization

#### Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X10DRi/X10DRi-T serverboard and the SC823TQ-653LPB chassis.

#### Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 6028R-T/TT into a rack and check out the server configuration prior to powering up the system.

#### Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

#### Chapter 4: Standardized Warning Statements

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 6028R-T/TT.

#### Chapter 5: Advanced Serverboard Setup

Chapter 5 provides detailed information on the X10DRi/X10DRi-T serverboard, including the locations and functions of connections, headers and jumpers. Refer

to this chapter when adding or removing processors or main memory and when reconfiguring the serverboard.

## **Chapter 6: Advanced Chassis Setup**

Refer to Chapter 6 for detailed information on the SC823TQ-653LPB server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing system power supply modules and cooling fans.

## **Chapter 7: BIOS**

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

## **Appendix A: POST Error Beep Codes**

## **Appendix B: System Specifications**

## **Notes**

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## **Appendix A BIOS Error Beep Codes**

## **Appendix B System Specifications**

# Chapter 1

## Introduction

### 1-1 Overview

The SuperServer 6028R-T/TT is a high-end server comprised of two main sub-systems: the SC823T-653LPB 2U server chassis and the X10DRi/X10DRi-T dual processor serverboard. Please refer to our web site for information on operating systems that have been certified for use with the system ([www.supermicro.com](http://www.supermicro.com)).

In addition to the serverboard and chassis, various hardware components have been included with the 6028R-T/TT, as listed below:

- Four 8-cm fans (FAN-0126L4)
- Two passive CPU heatsinks (SNK-P0048PS)
- One air shroud (MCP-310-29016-0N)
- SATA Accessories
  - One SATA backplane (BPN-SAS-823TQ)
  - Six 3.5" hard drive carriers (MCP-220-00092-0B)
- One rackmount kit (CSE-PT25)

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

- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product drivers and utilities: <ftp://ftp.supermicro.com>
- Product safety info: [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm)
- If you have any questions, please contact our support team at: [support@supermicro.com](mailto:support@supermicro.com)

## 1-2 Serverboard Features

At the heart of the SuperServer 6028R-T/TT lies the X10DRi/X10DRi-T, a dual processor serverboard based on Intel's PCH C612 chipset. Below are the main features of the X10DRi/X10DRi-T (see Figure 1-1 for a block diagram of the chipset).

### Processors

The X10DRi/X10DRi-T supports single or dual Intel E5-2600 (v3/v4) Series (Socket R3) processors in LGA 2011 sockets. Please refer to our website for a complete listing of supported processors ([www.supermicro.com](http://www.supermicro.com)). Note that with only a single processor installed (into the CPU1 socket), PCI-E slots 4~6 will not function.

### Memory

The X10DRi/X10DRi-T has sixteen DIMM slots that can support up to 1 TB of ECC LRDIMM or ECC RDIMM DDR4-2400/2133/1866/1600 memory. Please refer to Chapter 5 for details on installing memory.

### SATA

A SATA controller is integrated into the chipset to provide a ten-port SATA 3.0 subsystem, which is RAID 0, 1, 10 and 5 capable. Six ports are supported by the Intel PCH: I-SATA0-5 (I-SATA 4 and 5 are colored yellow to indicate that they have embedded power to support SATA DOMs) and four are supported by the Intel SCU (S-SATA0-3).

### PCI Expansion Slots

The X10DRi/X10DRi-T has three PCI-E 3.0 x16 and three PCI-E 3.0 x8 expansion slots. Note that the PCI slots are controlled by the CPU so some slots may not be available when two CPUs are not installed on the board at the same time. See the serverboard layout in Chapter 5 for details.

### I/O Ports

The color-coded I/O ports include one COM port, a VGA (monitor) port, four USB ports, two Ethernet LAN ports (10 Gb ports on the X10DRi-T and 1 Gb ports on the X10DRi) and a dedicated IPMI LAN port.

### Graphics Controller

The X10DRi/X10DRi-T features an integrated Aspeed 2400 controller.

## 1-3 Server Chassis Features

The SC823T-653LPB is a 2U chassis that features six 3.5" hot-swap hard drive bays and a high-efficiency power supply. The following is a general outline of the main features of the SC823T-653LPB chassis.

### System Power

When configured as the SuperServer 6028R-T/TT, the SC823T-653LPB chassis includes a single 650W high-efficiency power supply.

### Control Panel

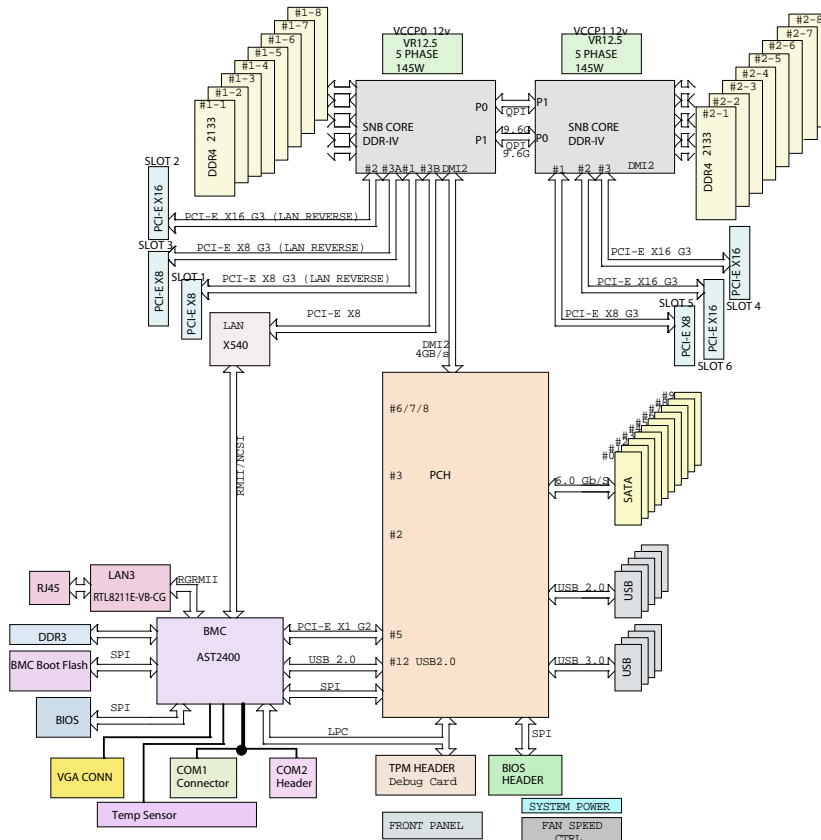
The control panel on the SC823T-653LPB provides important system monitoring and control information. LEDs indicate power on, network activity and hard disk drive activity. Also present are a main power button and a system reset button.

### Cooling Fans

The chassis' cooling design has been optimized to provide sufficient cooling for dual CPU configurations. Four 8-cm PWM (Pulse Width Modulated) fans are located in the middle of the chassis.

**Figure 1-1. Chipset Block Diagram**

Note: This is a general block diagram. Please see Chapter 5 for details.



## 1-4 Contacting Supermicro

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Web Site: [www.supermicro.com.tw](http://www.supermicro.com.tw)



**Notes**

## Chapter 2

### Server Installation

#### 2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 6028R-T/TT up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your system has come to you with the processors and memory preinstalled.

#### 2-2 Unpacking the System

You should inspect the box the SuperServer 6028R-T/TT was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 6028R-T/TT. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

#### 2-3 Preparing for Setup

The box the SuperServer 6028R-T/TT was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

##### Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices according to §2 of the the German Ordinance for Work with Visual Display Units.

## 2-4 Warnings and Precautions

### Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

### Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow any hot plug drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

## Rack Mounting Considerations

### Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Thus, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (TMRA).

### Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

### Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

### Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

### Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).



**Warning!** To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

## 2-5 Installing the System into a Rack

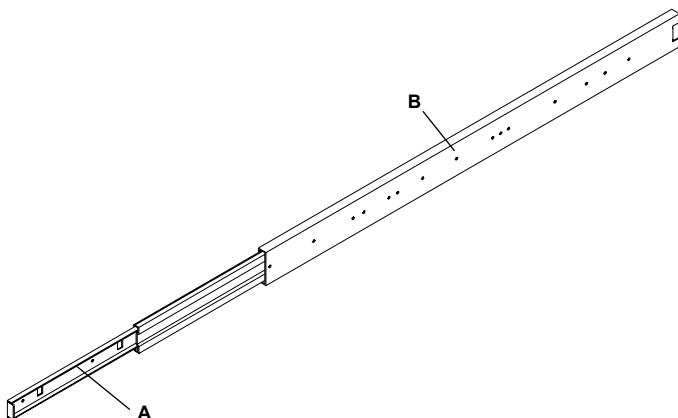
This section provides information on installing the SuperServer 6028R-T/TT into a rack unit. If the 6028R-T/TT has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the 6028R-T/TT into a rack with the rack rails provided. You should also refer to the installation instructions that came with the rack unit you are using.

### Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies with the SuperServer 6028R-T/TT. Each of these assemblies consist of three sections: an inner fixed chassis rail that secures to the 6028R-T/TT (A) and an outer fixed rack rail that secures directly to the rack itself (B). A sliding rail guide sandwiched between the two should remain attached to the fixed rack rail (see Figure 2-1). The A and B rails must be detached from each other to install.

To remove the fixed chassis rail (A), pull it out as far as possible - you should hear a "click" sound as a locking tab emerges from inside the rail assembly and locks the inner rail. Then depress the locking tab to pull the inner rail completely out. Do this for both the left and right side rack rail assemblies.

Figure 2-1. Identifying the Sections of the Rack Rails



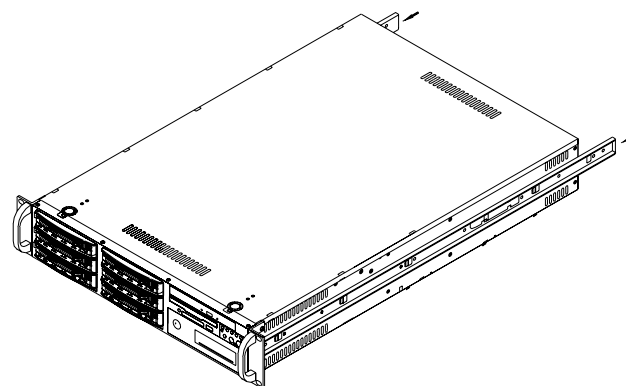
## Installing the Chassis Rails

Position one of the fixed chassis rail sections you just removed along the side of the 6028R-T/TT. Note that these two rails are left/right specific. Slide the rail toward the front of the chassis (see arrows in Figure 2-2) until you hear them click into place with the retention hooks on the chassis. The screw holes should now be aligned - screw the rail securely to the side of the chassis (see Figure 2-2).

Repeat this procedure for the other rail on the other side of the chassis. You will also need to attach the rail brackets when installing into a telco rack.

**Locking Tabs:** As you have seen, both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-2. Installing Chassis Rails



## Installing the Rack Rails

Determine where you want to place the SuperServer 6028R-T/TT in the rack. ([See Rack and Server Precautions in Section 2-3.](#)) Position the fixed rack rail/sliding rail guide assemblies at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly securely to the rack using the brackets provided. Attach the other assembly to the other side of the rack, making sure both are at the exact same height and with the rail guides facing inward.



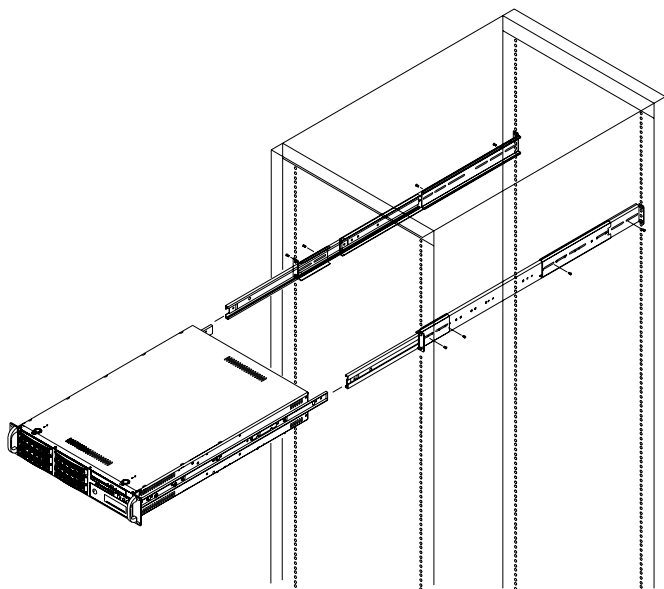
Warning: do not pick up the server by the front handles. They are designed to pull the system from a rack only.

## Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack.

**Figure 2-3. Installing the Server into a Rack**

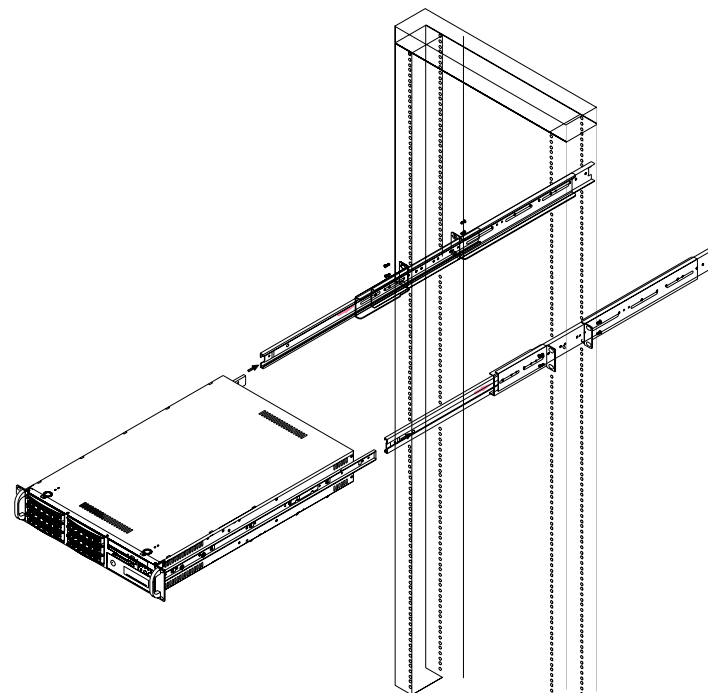


**Note:** figures are for illustrative purposes only. Servers should always be installed in racks from the bottom up.

## Installing the Server into a Telco Rack

If you are installing the SuperServer 6028R-T/TT into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accommodate the width of the telco rack.

**Figure 2-4. Installing the Server into a Telco Rack**



**Note:** figures are for illustrative purposes only. Servers should always be installed in racks from the bottom up.



Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.

## Notes

## Chapter 3

# System Interface

### 3-1 Overview

There are several LEDs on the control panel as well as others on the drive carriers to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel.

### 3-2 Control Panel Buttons

There are two buttons located on the front of the chassis: a reset button and a power on/off button.

RESET



**Reset**

Use the reset button to reboot the system.



**Power**

This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system. For this reason you should also unplug the AC power cord prior to servicing the system.

### 3-3 Control Panel LEDs

The control panel located on the front of the SC823 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



#### Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.



#### HDD

Indicates SATA drive and/or DVD-ROM drive activity when flashing.



#### NIC1

Indicates network activity on LAN1 when flashing.



#### NIC2

Indicates network activity on LAN2 when flashing.



#### Information LED

This LED will be solid blue when the UID function has been activated.

When this LED flashes red, it indicates a fan failure.

When red continuously it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the indicated condition exists.

### 3-4 Drive Carrier LEDs

Each drive carrier has two LEDs:

- **Green:** When illuminated, the green LED on the drive carrier indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed. Please refer to Chapter 6 for instructions on replacing failed SATA drives.
- **Red:** When this LED flashes it indicates the drive is rebuilding. When solid on it indicates a drive failure. If a drive fails, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed drives.



**Notes**

## Chapter 4

### Standardized Warning Statements for AC Systems

#### 4-1 About Standardized Warning Statements

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

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

These warnings may also be found on our web site at [http://www.supermicro.com/about/policies/safety\\_information.cfm](http://www.supermicro.com/about/policies/safety_information.cfm).

#### Warning Definition



##### Warning!

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

##### 警告の定義

この警告サインは危険を意味します。

人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危險。

您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾的声明号码找到此设备的安全性警告说明的翻译文本。

此警告符號代表危險。

您正處於可能身體可能會受損傷的工作環境中。在您使用任何設備之前，請注意觸電的危險，並且要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。

## Warnung

## WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

## INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES.

## IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS.

## תקנון הזהרות אזהרה

הזהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים.

יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

تحذير! هذا الرمز يعني خطر انك في حالة يمكن أن تتسبب في اصابة جسدية .  
قبل أن تعمل على أي معدات، كن على علم بالمخاطر الناجمة عن الدوائر  
الكهربائية  
وكن على دراية بالممارسات الوقائية لمنع وقوع أي حوادث  
استخدم رقم البيان المنصوص في نهاية كل تحذير للعثور ترجمتها

안전을 위한 주의사항

경고!

이 경고 기호는 위험이 있음을 알려 줍니다. 작업자의 신체에 부상을 야기 할 수 있는 상태에 있게 됩니다. 모든 장비에 대한 작업을 수행하기 전에 전기회로와 관련된 위험요소들을 확인하시고 사전에 사고를 방지할 수 있도록 표준 작업절차를 준수해 주시기 바랍니다.

해당 번역문을 찾기 위해 각 경고의 마지막 부분에 제공된 경고문 번호를 참조하십시오.

## BELANGRIJKE VEILIGHEIDSLINSTRUCTIES

Dit waarschuwings symbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij een elektrische installatie betrokken risico's en dient u op de hoogte te zijn van de standaard procedures om ongelukken te voorkomen. Gebruik de nummers aan het eind van elke waarschuwing om deze te herleiden naar de desbetreffende locatie.

BEWAAR DEZE INSTRUCTIES

## Installation Instructions



### Warning!

Read the installation instructions before connecting the system to the power source.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告

将此系统连接电源前, 请先阅读安装说明。

警告

將系統與電源連接前，請先閱讀安裝說明。

Warnung

Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

¡Advertencia!

Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Attention

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقرأ إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주시시오.

Waarschuwing

Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.

## Circuit Breaker



### Warning!

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 20 A.

サーキット・ブレーカー

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

警告

此产品的短路(过载电流)保护由建筑物的供电系统提供, 确保短路保护设备的额定电流不大于250V, 20A。

警告

此產品的短路(過載電流)保護由建築物的供電系統提供, 確保短路保護設備的額定電流不大於250V, 20A。

Warnung

Dieses Produkt ist darauf angewiesen, dass im Gebäude ein Kurzschluss- bzw. Überstromschutz installiert ist. Stellen Sie sicher, dass der Nennwert der Schutzvorrichtung nicht mehr als: 250 V, 20 A beträgt.

¡Advertencia!

Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) del edificio. Asegúrese de que el dispositivo de protección no sea superior a: 250 V, 20 A.

Attention

Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifiez que le courant nominal du dispositif de protection n'est pas supérieur à : 250 V, 20 A.

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-60VDC, 20A

هذا المنتج يعتمد على معدات الحماية من الدوائر القصيرة التي تم تثبيتها في المبنى

تأكد من أن تقيم الجهاز الوقائي ليس أكثر من: 20A, 250VDC

경고!

이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에 의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지 않도록 해야 합니다.

Waarschuwing

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van uw elektrische installatie. Controleer of het beveiligde apparaat niet groter gedimensioneerd is dan 220V, 20A.

### Power Disconnection Warning



**Warning!**

The system must be disconnected from all sources of power and the power cord removed from the power supply module(s) before accessing the chassis interior to install or remove system components.

電源切断の警告

システムコンポーネントの取り付けまたは取り外しのために、シャーシー内部にアクセスするには、

システムの電源はすべてのソースから切断され、電源コードは電源モジュールから取り外す必要があります。

警告

在你打开机箱并安装或移除内部器件前，必须将系统完全断电，并移除电源线。

警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

Warnung

Das System muss von allen Quellen der Energie und vom Netzanschlusskabel getrennt sein, das von den Spg.Versorgungsteilmodulen entfernt wird, bevor es auf den Chassisinnenraum zurückgreift, um Systemsbestandteile anzubringen oder zu entfernen.

¡Advertencia!

El sistema debe ser disconnected de todas las fuentes de energía y del cable eléctrico quitado de los módulos de fuente de alimentación antes de tener acceso el interior del chasis para instalar o para quitar componentes de sistema.

Attention

Le système doit être débranché de toutes les sources de puissance ainsi que de son cordon d'alimentation secteur avant d'accéder à l'intérieur du chassis pour installer ou enlever des composants de système.

**אזהרה !**

יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כבל החשמלי מהספק לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים.

يجب فصل النظام من جميع مصادر الطاقة وإزالة سلك الكهرباء من وحدة امداد الطاقة قبل

الوصول إلى المناطق الداخلية للهيكल لتنشيت أو إزالة مكونات الجهاز

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 새시 내부에 접근하기 전에 반드시 전원 공급장치로부터 연결되어있는 모든 전원과 전기코드를 분리해주어야 합니다.

Waarschuwing

Voordat u toegang neemt tot het binnenwerk van de behuizing voor het installeren of verwijderen van systeem onderdelen, dient u alle spanningsbronnen en alle stroomkabels aangesloten op de voeding(en) van de behuizing te verwijderen

## Equipment Installation



### Warning!

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

#### 機器の設置

トレーニングを受け認定された人だけがこの装置の設置、交換、またはサービスを許可されています。

#### 警告

只有经过培训且具有资格的人员才能进行此设备的安装、更换和维修。

#### 警告

只有經過受訓且具資格人員才可安裝、更換與維修此設備。

#### Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

#### ¡Advertencia!

Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.

#### Attention

Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

#### אזהרה !

צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לתת שירות עבור הציוד.

يجب أن يسمح فقط للموظفين المؤهلين والمدربين لتكيب واستبدال أو خدمة هذا الجهاز

#### 경고!

훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.

#### Waarschuwing

Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door geschoold en gekwalificeerd personeel.

## Restricted Area



### Warning!

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. (This warning does not apply to workstations).

#### アクセス制限区域

このユニットは、アクセス制限区域に設置されることを想定しています。

アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

#### 警告

此部件应安装在限制进出的场所，限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全手段进出的场所。

#### 警告

此裝置僅限安裝於進出管制區域，進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

#### Warnung

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

#### ¡Advertencia!

Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

#### Attention

Cet appareil doit être installée dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

## אזור עם גישה מוגבלת

### אזהרה!

יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת כלי אבטחה בלבד (מפתח, מנעול וכד').

تم تخصيص هذه الوحدة لتركيبها في مناطق محظورة .  
يمكن الوصول إلى منطقة محظورة فقط من خلال استخدام أداة خاصة،  
قفل ومفتاح أو أي وسيلة أخرى للأمان

경고!

이 장치는 접근이 제한된 구역에 설치하도록 되어있습니다. 특수도구, 잠금 장치 및 키, 또는 기타 보안 수단을 통해서만 접근 제한 구역에 들어갈 수 있습니다.

### Waarschuwing

Dit apparaat is bedoeld voor installatie in gebieden met een beperkte toegang. Toegang tot dergelijke gebieden kunnen alleen verkregen worden door gebruik te maken van speciaal gereedschap, slot en sleutel of andere veiligheidsmaatregelen.

## Battery Handling



### Warning!

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

### 電池の取り扱い

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

### 警告

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

### 警告

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

### Warnung

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

### Attention

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

### ¡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 ontplofingsgevaar 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.

## Redundant Power Supplies



### Warning!

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.

### 冗長電源装置

このユニットは複数の電源装置が接続されている場合があります。

ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

### 警告

此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。

### 警告

此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

### Warnung

Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein Strom zugeführt wird, müssen alle Verbindungen entfernt werden.

### ¡Advertencia!

Puede que esta unidad tenga más de una conexión para fuentes de alimentación. Para cortar por completo el suministro de energía, deben desconectarse todas las conexiones.

### Attention

Cette unité peut avoir plus d'une connexion d'alimentation. Pour supprimer toute tension et tout courant électrique de l'unité, toutes les connexions d'alimentation doivent être débranchées.

## אם קיים יותר מספק אחד

### אזהרה!

ליחידה יש יותר מחיבור אחד של ספק. יש להסיר את כל החיבורים על מנת לרוקן את היחידה.

قد يكون لهذا الجهاز عدة اتصالات بوحدة امداد الطاقة.  
يجب إزالة كافة الاتصالات لعزل الوحدة عن الكهرباء

### 경고!

이 장치에는 한 개 이상의 전원 공급 단자가 연결되어 있을 수 있습니다. 이 장치에 전원을 차단하기 위해서는 모든 연결 단자를 제거해야만 합니다.

### Waarschuwing

Deze eenheid kan meer dan één stroomtoevoeraansluiting bevatten. Alle aansluitingen dienen verwijderd te worden om het apparaat stroomloos te maken.

## Backplane Voltage



### Warning!

Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing.

### バックプレーンの電圧

システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。

修理するにはご注意ください。

### 警告

当系统正在进行时，背板上有很危险的电压或能量，进行维修时务必小心。

### 警告

當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

### Warnung

Wenn das System in Betrieb ist, treten auf der Rückwandplatine gefährliche Spannungen oder Energien auf. Vorsicht bei der Wartung.

### ¡Advertencia!

Quando el sistema está en funcionamiento, el voltaje del plano trasero es peligroso. Tenga cuidado cuando lo revise.

### Attention

Lorsque le système est en fonctionnement, des tensions électriques circulent sur le fond de panier. Prendre des précautions lors de la maintenance.



**מתח בפנל האחורי****אזהרה !**

קיימת סכנת מתח בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך העבודה.

هناك خطر من التيار الكهربائي أو الطاقة الموجودة على اللوحة عندما يكون النظام يعمل كن حذرا عند خدمة هذا الجهاز

**경고!**

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생 합니다. 서비스 작업 시 주의하십시오.

**Waarschuwing**

Een gevaarlijke spanning of energie is aanwezig op de backplane wanneer het systeem in gebruik is. Voorzichtigheid is geboden tijdens het onderhoud.

**Comply with Local and National Electrical Codes****Warning!**

Installation of the equipment must comply with local and national electrical codes.

地方および国の電気規格に準拠

機器の取り付けはその地方および国の電気規格に準拠する必要があります。

**警告**

设备安装必须符合本地与本国电气法规。

**警告**

設備安裝必須符合本地與本國電氣法規。

**Warnung**

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

**¡Advertencia!**

La instalacion del equipo debe cumplir con las normas de electricidad locales y nacionales.

**Attention**

L'équipement doit être installé conformément aux normes électriques nationales et locales.

**תיאום חוקי החשמל הארצי****אזהרה !**

התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل للقوانين المحلية والوطنية المتعلقة بالكهرباء

**경고!**

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

**Waarschuwing**

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

**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.

## סילוק המוצר

## אזהרה !

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

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

## 경고!

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

## Waarschuwing

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

## Hot Swap Fan Warning



## Warning!

The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

## ファン・ホットスワップの警告

シャーシから冷却ファン装置を取り外した際、ファンがまだ回転している可能性があります。ファンの開口部に、指、ドライバー、およびその他のものを近づけないで下さい。

## 警告

当您从机架移除风扇装置，风扇可能仍在转动。小心不要将手指、螺丝起子和其他物品太靠近风扇

## 警告

當您從機架移除風扇裝置，風扇可能仍在轉動。小心不要將手指、螺絲起子和其他物品太靠近風扇。

## Warnung

Die Lüfter drehen sich u. U. noch, wenn die Lüfterbaugruppe aus dem Chassis genommen wird. Halten Sie Finger, Schraubendreher und andere Gegenstände von den Öffnungen des Lüftergehäuses entfernt.

## ¡Advertencia!

Los ventiladores podran dar vuelta cuando usted quite el montaje del ventilador del chasis. Mantenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

## Attention

Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirerez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

## אזהרה !

כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

من الممكن أن المراوح لا تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء الأصابع ومفكات البراغي وغيرها من الأشياء بعيدا عن الفتحات في كتلة المروحة.

## 경고!

새시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

## Waarschuwing

Het is mogelijk dat de ventilator nog draait tijdens het verwijderen van het ventilatorsamenstel uit het chassis. Houd uw vingers, schroevendraaiers en eventuele andere voorwerpen uit de buurt van de openingen in de ventilatorbehuizing.

## Power Cable and AC Adapter



### Warning!

When installing the product, use the provided or designated connection cables, power cables and AC adaptors. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA -certified cables (that have UL/CSA shown on the code) for any other electrical devices than products designated by Supermicro only.

### 電源コードとACアダプター

製品を設置する場合、提供または指定された接続ケーブル、電源コードとACアダプターを使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。電気用品安全法は、ULまたはCSA認定のケーブル(UL/CSEマークがコードに表記)を Supermicroが指定する製品以外に使用することを禁止しています。

### 警告

安装此产品时,请使用本身提供的或指定的连接线,电源线和电源适配器.使用其它线材或适配器可能会引起故障或火灾。除了Supermicro所指定的产品,电气用品和材料安全法律规定禁止使用未经UL或CSA认证的线材。(线材上会显示UL/CSA符号)。

### 警告

安裝此產品時,請使用本身提供的或指定的連接線,電源線和電源適配器.使用其它線材或適配器可能會引起故障或火災。除了Supermicro所指定的產品,電氣用品和材料安全法律規定禁止使用未經UL或CSA認證的線材。(線材上會顯示UL/CSA符號)。

### Warnung

Bei der Installation des Produkts, die zur Verfügung gestellten oder benannt Anschlusskabel, Stromkabel und Netzteile. Verwendung anderer Kabel und Adapter kann zu einer Fehlfunktion oder ein Brand entstehen. Elektrische Geräte und Material Safety Law verbietet die Verwendung von UL-oder CSA-zertifizierte Kabel, UL oder CSA auf der Code für alle anderen elektrischen Geräte als Produkte von Supermicro nur bezeichnet gezeigt haben.

### ¡Advertencia!

Al instalar el producto, utilice los cables de conexión previstos o designados, los cables y adaptadores de CA. La utilización de otros cables y adaptadores podría ocasionar un mal funcionamiento o un incendio. Aparatos Eléctricos y la Ley de Seguridad del Material prohíbe el uso de UL o CSA cables certificados que tienen UL o CSA se muestra en el código de otros dispositivos eléctricos que los productos designados por Supermicro solamente.

### Attention

Lors de l'installation du produit, utilisez les bables de connection fournis ou désigné. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et de loi sur la sécurité Matériel interdit l'utilisation de UL ou CSA câbles certifiés qui ont UL ou CSA indiqué sur le code pour tous les autres appareils électriques que les produits désignés par Supermicro seulement.

### חשמליים ומתאמי AC

### אזהרה!

כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתאמים AC אשר נועדו וסופקו לשם כך. שימוש בכל כבל או מתאם אחר יכול לגרום לתקלה או קצר חשמלי. על פי חוקי שימוש במכשירי חשמל וחוקי בטיחות, קיים איסור להשתמש בכבלים המוסמכים ב- UL או ב- CSA (כשאר מופיע עליהם קוד של UL/CSA) עבור כל מוצר חשמלי אחר שלא צוין על ידי סופרמיקרו בלבד.

عند تركيب الجهاز يجب استخدام كابلات التوصيل، والكابلات الكهربائية

ومحولات التيار المتردد

التي . أن استخدام أي كابلات ومحولات أخرى يتسبب في حدوث عطل أو حريق.

تم توفيرها لك مع المنتج

الأجهزة الكهربائية ومواد قانون السلامة يحظر استخدام الكابلات CSA أو UL

معتمدة من قبل

لأي أجهزة كهربائية أخرى غير المنتجات المعينة من قبل Supermicro

(التي تحمل علامة UL/CSA)

### 경고!

제품을 설치할 때에는 제공되거나 지정된 연결케이블과 전원케이블, AC어댑터를 사용해야 합니다. 그 밖의 다른 케이블들이나 어댑터들은 고장 또는 화재의 원인이 될 수 있습니다. 전기용품안전법 (Electrical Appliance and Material Safety Law)은 슈퍼마이크로에서 지정한 제품들 외에는 그 밖의 다른 전기 장치들을 위한 UL또는 CSA에서 인증한 케이블 (전선 위에 UL/CSA가 표시)들의 사용을 금지합니다.

### Waarschuwing

Bij het installeren van het product, gebruik de meegeleverde of aangewezen kabels, stroomkabels en adapters. Het gebruik van andere kabels en adapters kan leiden tot een storing of een brand. Elektrisch apparaat en veiligheidsinformatiebladen wet verbiedt het gebruik van UL of CSA gecertificeerde kabels die UL of CSA die op de code voor andere elektrische apparaten dan de producten die door Supermicro alleen.

**Notes**

## Chapter 5

### Advanced Serverboard Setup

This chapter covers the steps required to connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

#### 5-1 Handling the Serverboard

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

##### Precautions

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

Unpacking

The serverboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Connecting Cables

The cables listed below should already be connected to the serverboard. These include the data cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout for connector locations.)

- SATA (S-SATA0-3 , I-SATA0-5) drive cables
- Control Panel cable (JF1)

**Important!** Make sure the cables do not come into contact with the fans.

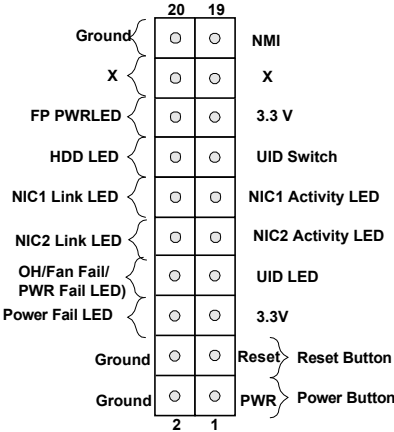
Connecting Power Cables

The X10DRi/X10DRi-T has a 24-pin primary power supply connector (J24) for connection to the ATX power supply. In addition, there are two 8-pin 12V processor power connectors (JPWR1 and JPWR2) that must be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators. All JF1 wires have been bundled into a single cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

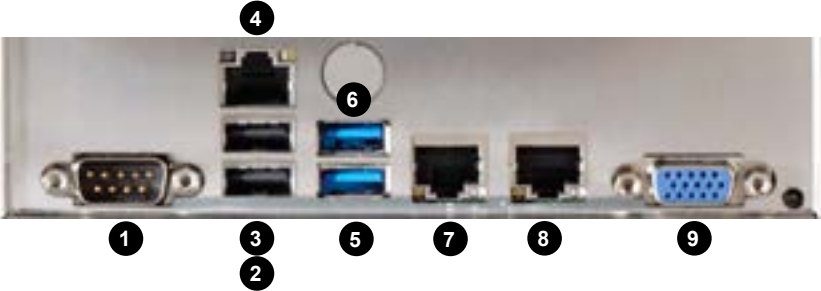
Figure 5-1. Control Panel Header Pins



5-3 I/O Ports

The I/O ports are located on the backplane of the motherboard. See Figure 5-2 below for the descriptions of the various I/O ports.

Figure 5-2. I/O Ports



| IO Ports |                       |   |                       |
|----------|-----------------------|---|-----------------------|
| 1        | COM1 Port             | 6 | USB Port 13 (USB 3.0) |
| 2        | USB Port 0 (USB 2.0)  | 7 | LAN Port 1*           |
| 3        | USB Port 1 (USB 2.0)  | 8 | LAN Port 2*           |
| 4        | IPMI LAN Port         | 9 | VGA Port              |
| 5        | USB Port 12 (USB 3.0) |   |                       |

\* These are Gb LAN ports on the X10DRi-T and 10 Gb LAN ports on the X10DRi.

## 5-4 Installing the Processor and Heatsink

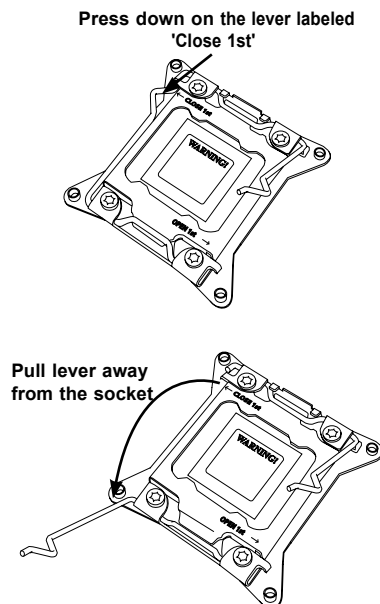
**Warning:** When handling the processor package, avoid placing direct pressure on the label area of the fan.

### Notes

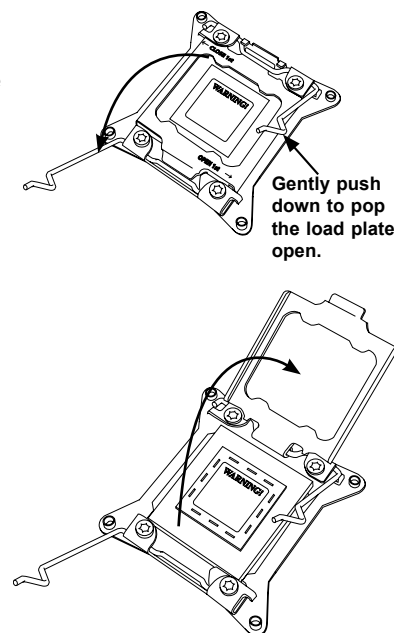
- Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.
- If you buy a CPU separately, make sure that you use an Intel-certified multi-directional heatsink only.
- Make sure to install the serverboard into the chassis before you install the CPU heatsinks.
- When receiving a serverboard without a processor pre-installed, make sure that the plastic CPU socket cap is in place and none of the socket pins are bent; otherwise, contact your retailer immediately.
- Refer to the Supermicro web site for updates on CPU support.

### Installing an LGA2011 Processor

1. There are two levers on the LGA2011 socket. First press and release the load lever labeled 'Open 1st'.
2. Press the second load lever labeled 'Close 1st' to release the load plate from its locked position.

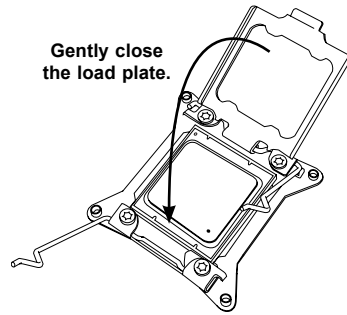


3. With the lever labeled 'Close 1st' fully retracted, gently push down on the 'Open 1st' lever to open the load plate. Lift the load plate to open it completely.
4. Using your thumb and the index finger, remove the 'WARNING' plastic cap from the socket.
5. Use your thumb and index finger to hold the CPU by its edges. Align the CPU keys, which are semi-circle cutouts, against the socket keys.
6. 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 and do not rub the CPU against any pins of the socket, which may damage the CPU or the socket.)

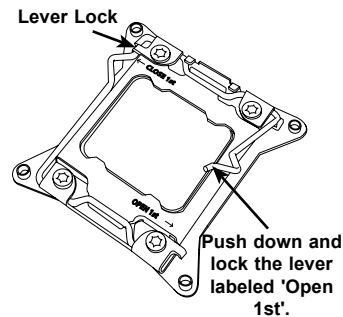
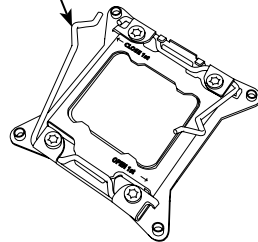


**Warning:** You can only install the CPU to the socket in one direction. Make sure that the CPU is properly inserted into the socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU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

7. With the CPU in the socket, inspect the four corners of the CPU to make sure that they are flush with the socket.
8. Close the load plate. Lock the lever labeled 'Close 1st', then lock the lever labeled 'Open 1st'. Use your thumb to gently push the load levers down until the lever locks.

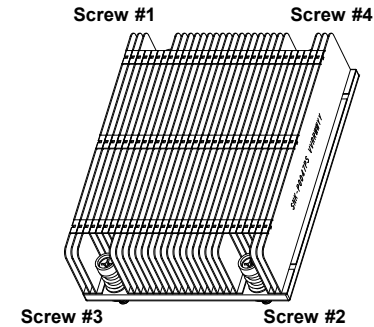


Push down and lock the level labeled 'Close 1st'.



## Installing a CPU Heatsink

1. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.
2. Screw in two diagonal screws (i.e. the #1 and the #2 screws) until just snug (do not over-tighten the screws, which may damage the CPU.)
3. Finish the installation by fully tightening all four screws.



## Removing the Heatsink

**Caution:** We do not recommend removing the CPU or the heatsink. If you do need to remove the heatsink, please follow the instructions below to prevent damage to the CPU or other components.

1. Unplug the power cord from the power supply.
2. Unscrew and remove the heatsink screws in the sequence shown in the picture below.
3. Hold the heatsink and gently wiggle it to loosen it from the CPU. (Do not use excessive force when doing this!)
4. Once the heatsink is loosened, remove it from the CPU.
5. Clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease before you re-install the heatsink.



## 5-5 Installing Memory

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

### Memory Support

The X10DRi/X10DRi-T supports up to 1 TB of ECC LRDIMM or ECC RDIMM DDR4-2400/2133/1866/1600 memory. Use memory modules of the same type and speed. See the following tables for memory installation. Please refer to the Supermicro website for possible updates to supported memory.

### DIMM Installation

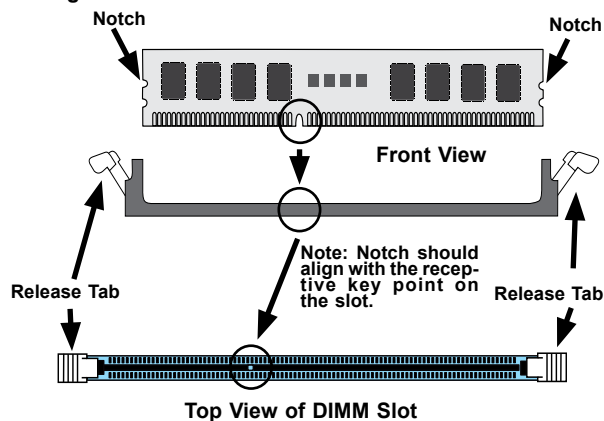
#### Installing Memory Modules

1. Insert the desired number of DIMMs into the memory slots starting with DIMM #P1-DIMMA1. When populating two DIMM modules within a channel, always start with Bank1 first. For optimal memory performance, please install a pair (or pairs) of memory modules of the same type and speed with a maximum of 12 modules (see the Memory Installation Table below).
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to avoid installing incorrectly (see Figure 5-3).
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules.

Figure 5-3. DIMM Installation

**To Install:** Insert module vertically and press down until it snaps into place. Pay attention to the alignment notch at the bottom.

**To Remove:** Use your thumbs to gently push the release tabs near both ends of the module. This should release it from the slot.



### 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<br>(For memory to work properly, please follow the instructions below.)   |
| 1 CPU & 2 DIMMs  | CPU1<br>P1-DIMMA1/P1-DIMMB1   |
| 1 CPU & 4 DIMMs  | CPU1<br>P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1  |
| 1 CPU & 5-8 DIMMs  | CPU1<br>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<br>P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1   |
| 2 CPUs & 6 DIMMs   | CPU1 + CPU2<br>P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1   |
| 2 CPUs & 8 DIMMs   | CPU1 + CPU2<br>P1-DIMMA1/P1-DIMMB1/P1-DIMMC1/P1-DIMMD1, P2-DIMME1/P2-DIMMF1/P2-DIMMG1/P2-DIMMH1   |
| 2 CPUs & 8-16 DIMMs  | CPU1/CPU2<br>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<br>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

| Type       | Ranks Per DIMM and Data Width | DIMM Capacity (GB) |        | Speed (MT/s); Voltage (V); Slots per Channel (SPC) and DIMMs per Channel (DPC) |            |            |            |
|------------|-------------------------------|--------------------|--------|--|------------|------------|------------|
|            |                               |                    |        | 2 Slots per Channel  |            |            |            |
|            |                               |                    |        | 1 DPC  |            | 2 DPC      |            |
|            |                               | 4 Gb               | 8 Gb   | E5-2600 V3   | E5-2600 V4 | E5-2600 V3 | E5-2600 V4 |
| RDIMM      | SRx4                          | 8 GB               | 16 GB  | 2133   | 2400       | 1866       | 2133       |
| RDIMM      | SRx8                          | 4 GB               | 8 GB   | 2133   | 2400       | 1866       | 2133       |
| RDIMM      | DRx8                          | 8 GB               | 16 GB  | 2133   | 2400       | 1866       | 2133       |
| RDIMM      | DRx4                          | 16 GB              | 32 GB  | 2133   | 2400       | 1866       | 2133       |
| LRDIMM     | QRx4                          | 32 GB              | 64 GB  | 2133   | 2400       | 2133       | 2400       |
| LRDIMM 3DS | 8Rx4                          | 64 GB              | 128 GB | 2133   | 2400       | 2133       | 2400       |

## 5-6 Adding PCI Add-On Cards

A total of six PCI expansion (add-on) cards can be installed into the system.

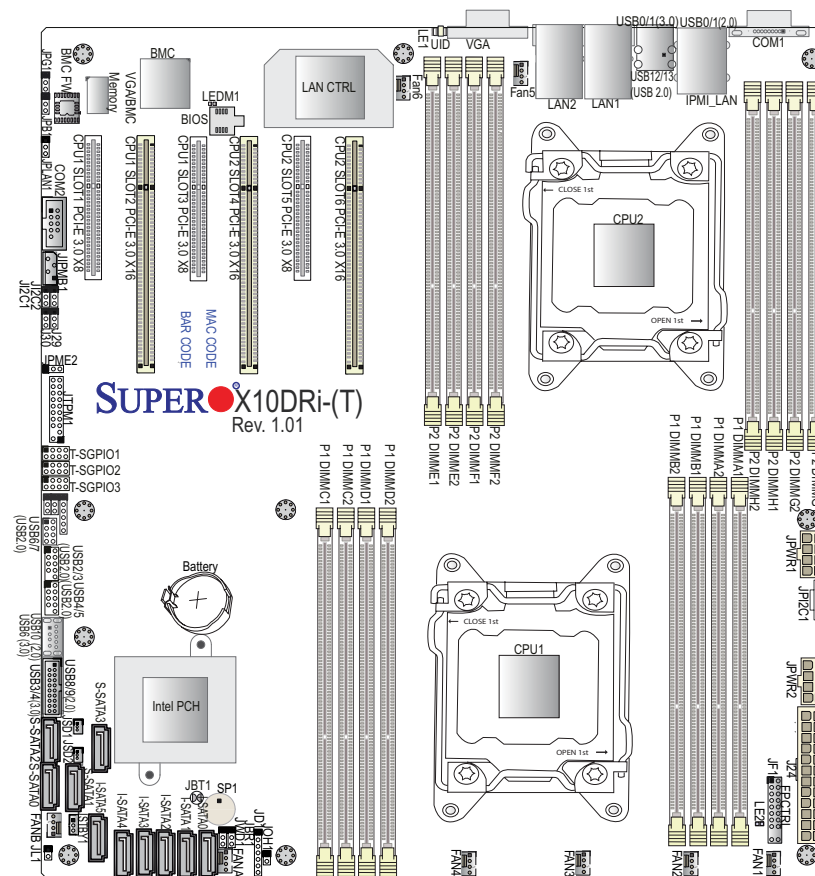
## PCI Card Installation

Before installing a PCI add-on card, make sure it is supported by the slot you are installing it to.

1. Begin by releasing the locking tab that corresponds to the slot you wish to populate.
2. Insert the expansion card into the slot by pushing down with your thumbs evenly on both sides of the card.

## 5-7 Serverboard Details

**Figure 5-4. X10DRi/X10DRi-T Layout  
(not drawn to scale)**



## Notes

- Jumpers not indicated are for test purposes only and should not have their settings changed.
- "■" indicates the location of pin 1.
- LAN1/LAN2 ports support Gigabit LAN connections on the X10DRi and 10G LAN connections on the X10DRi-T.

**X10DRi/X10DRi-T Quick Reference**

| <b>Jumper</b>                         | <b>Description</b>                | <b>Default Setting</b> |
|---------------------------------------|-----------------------------------|------------------------|
| JBR1                                  | BIOS Recovery Enable/Disable      | Pins 1-2 (Normal)      |
| JBT1                                  | Clear CMOS                        | See Section 5-9        |
| J1 <sup>2</sup> C1/J1 <sup>2</sup> C2 | SMB to PCI-E Slots Enable/Disable | Off (Disabled)         |
| JPB1                                  | BMC Enable/Disable                | Pins 1-2 (Enabled)     |
| JPG1                                  | VGA Enable/Disable                | Pins 1-2 (Enabled)     |
| JPL1                                  | LAN1/LAN2 Enable/Disable          | Pins 1-2 (Enabled)     |
| JPME2                                 | Manufacture (ME) Mode Select      | Pins 1-2 (Normal)      |
| JWD1                                  | Watch Dog Timer                   | Pins 1-2 (Reset)       |

| <b>Connector</b>    | <b>Description</b>  |
|---------------------|---|
| COM1/COM2           | Backplane COM Port1/Front Accessible COM2 Header              |
| Fan1-6, FanA-B      | CPU/System Fan Headers  |
| J24                 | 24-pin ATX Main Power Connector                               |
| JD1                 | Speaker/Power LED   |
| JF1                 | Front Panel Control Header                                    |
| JIPMB1              | 4-pin External BMC I <sup>2</sup> C Header (for an IPMI Card) |
| JL1                 | Chassis Intrusion Header                                      |
| JOH1                | Overheat LED Indicator  |
| JPI <sup>2</sup> C1 | Power Supply SMBbus I <sup>2</sup> C Header                   |
| JPWR1/2             | 12V 8-Pin Power Connectors                                    |
| JSD1/JSD2           | SATA DOM (Device on Module) Power Connectors                  |
| JSTBY1              | Standby Power Connector                                       |
| JTPM1               | TPM (Trusted Platform Module)/Port 80 Header                  |
| JUIDB1              | UID (Unit Identification) Button                              |
| (I-)SATA 0-5        | SATA 3.0 Ports supported by Intel PCH                         |
| (S-)SATA 0-3        | SATA 3.0 Ports supported by Intel SCU                         |
| (CPU1) Slot1        | PCI-Express 3.0 x8 Slot from CPU1                             |
| (CPU1) Slot2        | PCI-Express 3.0 x16 Slot from CPU1                            |
| (CPU) Slot3         | PCI-Express 3.0 x8 Slot from CPU1                             |
| (CPU2) Slot4        | PCI-Express 3.0 x16 Slot from CPU2                            |

|                   |   |
|-------------------|---|
| (CPU2) Slot5      | PCI-Express 3.0 x8 Slot from CPU2   |
| (CPU2) Slot6      | PCI-Express 3.0 x16 Slot from CPU2  |
| (T-)SGPIO1/2/3    | Serial Link General Purpose I/O Headers                                   |
| SP1               | Internal Speaker/Buzzer   |
| (BP) USB 0/1      | Backpanel USB 2.0 Ports 0/1   |
| (BP) USB 12/13    | Backpanel USB 2.0 Ports 12/13, or USB 3.0 Ports 0/1                       |
| (FP) USB 2/3, 4/5 | Front Accessible USB 2.0 Connection Headers 2/3, 4/5                      |
| (FP) USB Type A   | Front Panel Accessible Type A Connector USB 3.0 Port 6 or USB 2.0 Port 10 |
| J-USB3-1          | Front Panel Accessible USB 3.0 Ports 3/4, USB 2.0 8/9                     |

| <b>LED</b> | <b>Description</b> | <b>State</b>   | <b>Status</b>   |
|------------|--------------------|----------------|-----------------|
| LE1        | Rear UID LED       | Solid Blue     | Unit Identified |
| LE2        | Onboard PWR LED    | On             | System Power On |
| LEDM1      | BMC Heartbeat LED  | Blinking Green | BMC Normal      |

## 5-8 Connector Definitions

### Power Connectors

A 24-pin main power supply connector (J24) and two 8-pin power connectors (JPWR1/JPWR2) are provided on the serverboard. These power connectors meet the SSI EPS 12V specification. These power connectors must be connected to your power supply. See the table on the right for pin definitions.

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

Required Connection

### Secondary Power Connector

JPWR1 and JPWR2 must also be connected to the power supply. See the table on the right for pin definitions.

| +12V 8-pin Power<br>Pin Definitions |            |
|-------------------------------------|------------|
| Pins                                | Definition |
| 1 - 4                               | Ground     |
| 5 - 8                               | +12V       |

Required Connection

### Power Button

The Power On connection is 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). 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<br>Pin Definitions (JF1) |              |
|---------------------------------------|--------------|
| Pin#                                  | Definition   |
| 1                                     | Power Signal |
| 2                                     | Ground       |

### Reset Button

The Reset Button connection is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

| Reset Button<br>Pin Definitions (JF1) |            |
|---------------------------------------|------------|
| Pin#                                  | Definition |
| 3                                     | Reset      |
| 4                                     | Ground     |

### 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<br>Pin Definitions (JF1) |            |
|---------------------------------------|------------|
| Pin#                                  | Definition |
| 5                                     | 3.3V       |
| 6                                     | Ground     |

### Overheat (OH)/Fan Fail/PWR Fail/UID LED

Connect an LED cable to pins 7 and 8 of Front Control Panel to use the Overheat/Fan Fail/Power Fail and UID LED connections. The red LED on pin 8 provides warnings of overheat, fan failure or power failure. The blue LED on pin 7 works as the front panel UID LED indicator. Refer to the table on the right for pin definitions.

| OH/Fan Fail/ PWR Fail/Blue_UID<br>LED Pin Definitions (JF1) |                        |
|---|------------------------|
| Pin#  | Definition             |
| 7   | Blue_UID LED           |
| 8   | OH/Fan Fail/Power Fail |

| OH/Fan Fail/PWR Fail<br>LED Status (Red LED) |            |
|--|------------|
| State  | Definition |
| Off  | Normal     |
| On   | Overheat   |
| Flashing                                     | Fan Fail   |

### NIC2 (LAN2) LED

The LED connections for LAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

| NIC2 LED<br>Pin Definitions (JF1) |            |
|-----------------------------------|------------|
| Pin#                              | Definition |
| 9                                 | Vcc        |
| 10                                | Ground     |

### NIC1 (LAN1) LED

The LED connections for LAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

| NIC1 LED<br>Pin Definitions (JF1) |            |
|-----------------------------------|------------|
| Pin#                              | Definition |
| 11                                | Vcc        |
| 12                                | Ground     |

### HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. Attach a cable to Pin 14 to show HDD activity status. Attach a cable to Pin 13 to use UID switch. See the table on the right for pin definitions.

| HDD LED<br>Pin Definitions (JF1) |            |
|----------------------------------|------------|
| Pin#                             | Definition |
| 13                               | UID Switch |
| 14                               | HD Active  |

**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<br>Pin Definitions (JF1) |            |
|------------------------------------|------------|
| Pin#                               | Definition |
| 15                                 | 3.3V       |
| 16                                 | PWR LED    |

**Fan Headers**

There are eight fan headers on the serverboard (Fan 1-Fan 6, Fan A, Fan B), all of which are 4-pin fans. Pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans. (Fan speed control is supported with 4-pin fans only.) See the table on the right for pin definitions..

| Fan Header<br>Pin Definitions |                |
|-------------------------------|----------------|
| Pin#                          | Definition     |
| 1                             | Ground         |
| 2                             | +12V           |
| 3                             | Tachometer     |
| 4                             | PWR Modulation |

**Chassis Intrusion**

The Chassis Intrusion header is designated JL1. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened

| Chassis Intrusion<br>Pin Definitions |                 |
|--------------------------------------|-----------------|
| Pin#                                 | Definition      |
| 1                                    | Intrusion Input |
| 2                                    | Ground          |

**T-SGPIO1/2/T-SGPIO-S Headers**

Three SGPIO (Serial Link General Purpose Input/Output) headers are located at T-SGPIO1/2/3 to support the SATA ports. See the table on the right for pin definitions.

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

NC= No Connection

| T-SGPIO/SATA Support |                                |
|----------------------|--------------------------------|
| T-SGPIO#             | I-SATA Ports Supported         |
| T-SGPIO1             | I-SATA Ports 0/1/2/3 Supported |
| T-SGPIO2             | I-SATA Ports 4/5 Supported     |
| T-SGPIO3             | S-SATA Ports 0/1/2/3 Supported |

**Internal Speaker**

The Internal Speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions.

| Internal Buzzer (SP1)<br>Pin Definition |             |               |
|---|-------------|---------------|
| Pin#                                    | Definitions |               |
| Pin 1                                   | Pos. (+)    | Beep In       |
| Pin 2                                   | Neg. (-)    | Alarm Speaker |

**Overheat/Fan Fail LED**

The JOH1 header may be connected to an LED indicator to provide warnings of chassis overheating or fan failure. Refer to the table on right for pin definitions.

| Overheat LED<br>Pin Definitions |            |
|---------------------------------|------------|
| Pin#                            | Definition |
| 1                               | 5vDC       |
| 2                               | OH Active  |

| OH/Fan Fail LED<br>Status |          |
|---------------------------|----------|
| State                     | Message  |
| Solid                     | Overheat |
| Blinking                  | Fan Fail |

**DOM Power Connectors**

Two power connectors for DOM (Disk On Module) devices are located at JSD1/JSD2. Connect appropriate cables here to provide power support for your Serial Link DOM devices.

| DOM PWR<br>Pin Definitions |            |
|----------------------------|------------|
| Pin#                       | Definition |
| 1                          | +5V        |
| 2                          | Ground     |
| 3                          | Ground     |

**TPM Header/Port 80 Header**

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

| TPM/Port 80 Header<br>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

The Standby Power header is located at JSTBY1 on the serverboard. See the table on the right for pin definitions. (You must also have a cable to use this feature.)

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

### Power SMB (I<sup>2</sup>C) Connector

Power System Management Bus (I<sup>2</sup>C) Connector (JPI<sup>2</sup>C1) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

| PWR SMB Pin Definitions |            |
|-------------------------|------------|
| Pin#                    | Definition |
| 1                       | Clock      |
| 2                       | Data       |
| 3                       | PWR Fail   |
| 4                       | Ground     |
| 5                       | +3.3V      |

### IPMB

A System Management Bus header for IPMI 2.0 is located at JIPMB1. Connect the appropriate cable here to use the IPMB I<sup>2</sup>C connection on your system.

| IPMB Header Pin Definitions |               |
|-----------------------------|---------------|
| Pin#                        | Definition    |
| 1                           | Data          |
| 2                           | Ground        |
| 3                           | Clock         |
| 4                           | No Connection |

### Power LED/Speaker

Pins 1-3 of JD1 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. Please note that the speaker connector pins (4-7) are used with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a cap.

| PWR LED Connector Pin Definitions |            |
|-----------------------------------|------------|
| Pin Setting                       | Definition |
| Pin 1                             | JD1_PIN1   |
| Pin 2                             | FP_PWR_LED |
| Pin 3                             | FP_PWR_LED |

| Speaker Connector Pin Settings |            |
|--------------------------------|------------|
| Pin Setting                    | Definition |
| Pin 4                          | P5V        |
| Pin 5                          | Key        |
| Pin 6                          | R_SPKPIN_N |
| Pin 7                          | R_SPKPIN   |

### Universal Serial Bus (USB)

Two USB 2.0 ports (USB 0/1) and two USB 2.0/3.0 ports (USB12/13) are located on the I/O backpanel. (Note that USB ports 12/13 support both USB 2.0 and 3.0.) In addition, two internal USB headers provides a total of four USB 2.0 connections (USB 2/3, 4/5) for front panel support. A Type A USB connector (USB 10 (3.0) and a vertical USB connector (J-USB3-1) support 3.0 connections for front access (cables not included). See the tables for pin definitions.

| Backplane USB (USB 0/1, 2/3) Pin Definitions |            | FP USB (4/5, 6) Pin Definitions |                        |
|--|------------|---------------------------------|------------------------|
| Pin#   | Definition | USB 4, 6 Pin #                  | USB 5 Pin # Definition |
| 1  | +5V        | 1                               | +5V                    |
| 2  | PO-        | 2                               | PO-                    |
| 3  | PO+        | 3                               | PO+                    |
| 4  | Ground     | 4                               | Ground                 |
| 5  | NA         | 5                               | Key                    |

NC= No Connection

| USB (3.0) USB 10, USB 12/13 (3.0), J-USB3-1 Pin Definitions |            |       |            |
|---|------------|-------|------------|
| Pin #   | Definition | Pin # | Definition |
| 1   | VBUS       | 2     | SSRX-      |
| 3   | SSRX+      | 4     | Ground     |
| 5   | SSTX-      | 6     | SSTX+      |
| 7   | GND DRAIN  | 8     | D-         |
| 9   | D+         |       |            |

### Serial Ports

Two COM connections (COM1 & COM2) are located on the serverboard. COM1 is located on the rear I/O panel. COM2, located next to PCI-E Slot1 is used to provide front access support. See the table on the right for pin definitions.

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

### Ethernet Ports

Two Ethernet ports (LAN1/2) are located on the I/O backplane. These are 10 Gb ports on the 6028R-TT and 1 Gb ports on the 6028R-T. In addition, a dedicated IPMI LAN port, located above the USB 0/1 ports on the backplane. All these ports accept RJ45 type cables.

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

| LAN Ports Pin Definitions |            |    |                                |
|---------------------------|------------|----|--------------------------------|
| Pin#                      | Definition |    |                                |
| 1                         | P2V5SB     | 10 | SGND                           |
| 2                         | TD0+       | 11 | Act LED                        |
| 3                         | TD0-       | 12 | P3V3SB                         |
| 4                         | TD1+       | 13 | Link 100 LED (Yellow, +3V3SB)  |
| 5                         | TD1-       | 14 | Link 1000 LED (Yellow, +3V3SB) |
| 6                         | TD2+       | 15 | Ground                         |
| 7                         | TD2-       | 16 | Ground                         |
| 8                         | TD3+       | 17 | Ground                         |
| 9                         | TD3-       | 18 | Ground                         |

### Unit Identifier Switch/UID LED Indicator

A Unit Identifier (UID) switch and an LED indicator are provided on the motherboard. The rear UID switch is located next to the VGA port on the backplane. The front UID switch is located on pin 13 of the JF1 header. The rear UID LED (LE1) is located next to the UID switch and the front UID LED is located on pin 7 on JF1. When you press the UID switch, the UID LED will be turned on. Press the UID switch again to turn off the LED indicator. The UID indicator provides easy identification of a system unit that may be in need of service.

**Note:** UID can also be triggered via IPMI on the motherboard. For more information on IPMI, please refer to the IPMI User's Guide posted on our website.

| UID Switch |            |
|------------|------------|
| Pin#       | Definition |
| 1          | Ground     |
| 2          | Ground     |
| 3          | Button In  |
| 4          | Ground     |

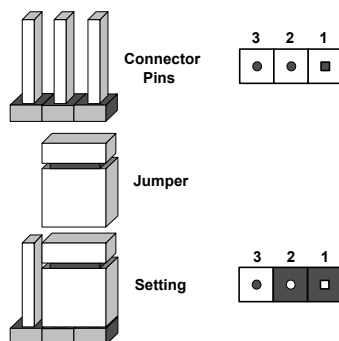
| UID LED Status |                 |
|----------------|-----------------|
| Color/State    | Status          |
| Blue: On       | Unit Identified |

## 5-9 Jumper Settings

### Explanation of Jumpers

To modify the operation of the serverboard, 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 serverboard layout pages for jumper locations.

**Note:** On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



### CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

#### To clear CMOS,

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

**Note:** Do not use the PW\_ON connector to clear CMOS.

### LAN Enable/Disable

Use JPL1 to enable/disable the LAN ports 1/2. See the table on the right for jumper settings. The default setting is Enabled.

| LAN1/2 Enable/Disable Jumper Settings |                   |
|---------------------------------------|-------------------|
| Jumper Setting                        | Definition        |
| Pins 1-2                              | Enabled (default) |
| Pins 2-3                              | Disabled          |

### Watch Dog Enable/Disable

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

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

### VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

| VGA Enable/Disable Jumper Settings |            |
|------------------------------------|------------|
| Jumper Setting                     | Definition |
| Pins 1-2                           | Enabled    |
| Pins 2-3                           | Disabled   |



### Manufacturer Mode Select

Close pins 2 and 3 of jumper JPME2 to bypass SPI flash security and force the system to operate in the Manufacturer Mode, which allows 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       |
| Pins 1-2                       | Normal (Default) |
| Pins 2-3                       | Manufacture Mode |

### BIOS Recovery Enable (JBR1)

Close pins 1 and 2 of jumper JBR1 for BIOS recovery. The default setting is on pins 2 and 3 for normal operation. See the table on the right for jumper settings.

| BIOS Recovery Jumper Settings |            |
|-------------------------------|------------|
| Both Jumpers                  | Definition |
| Pins 1-2                      | Enabled    |
| Pins 2-3                      | Normal     |

### BMC Enable

Jumper JPB1 allows you to enable the embedded Winbond BMC (Baseboard Management Controller) to provide IPMI 2.0/KVM support on the serverboard. See the table on the right for jumper settings.

| BMC Enable Jumper Settings |             |
|----------------------------|-------------|
| Jumper Setting             | Definition  |
| Pins 1-2                   | BMC Enabled |
| Pins 2-3                   | Disabled    |

### I<sup>2</sup>C Bus to PCI-Exp. Slots

Jumpers JI<sup>2</sup>C1 and JI<sup>2</sup>C2 allow you to connect the System Management Bus (I<sup>2</sup>C) to the PCI-Express slots. The default setting is disabled. Both jumpers must be set to the same setting. See the table on the right for jumper settings.

| I <sup>2</sup> C to PCI-E Slots Jumper Settings |            |
|---|------------|
| Jumper Setting                                  | Definition |
| Pins 1-2  | Enabled    |
| Pins 2-3  | Disabled   |

## 5-10 Onboard Indicators

### LAN LEDs

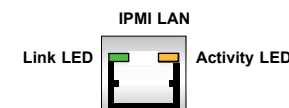
The Ethernet ports (located beside the VGA port) have two LEDs. On each port, one LED flashes to indicate activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.



| JLAN1/2 LED (Connection Speed Indicator) |                                    |
|--|------------------------------------|
| LED Color                                | Definition                         |
| Off                                      | 10 Mb/s, 100 Mb/s or no connection |
| Green                                    | 10 Gb/s (X10DRi-T only)            |
| Amber                                    | 1 Gb/s                             |

### IPMI Dedicated LAN LEDs

An additional Dedicated IPMI LAN is also located on the I/O backplane. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table at right for more information.



| IPMI LAN Link LED (Left) & Activity LED (Right) |                 |            |
|---|-----------------|------------|
| LED   | Status          | Definition |
| Link (Left)                                     | Green: Solid    | 100 Mb/s   |
| Activity (Right)                                | Amber: Blinking | Active     |

### Onboard Power LED (LE1)

An Onboard Power LED is located at LE2. This LED Indicator is lit when the system is on. Be sure to unplug the power cable before removing or adding any components. See the table on the right for more details.

| Onboard PWR LED Indicator LED Settings |                                      |
|--|--------------------------------------|
| LED Color                              | Status                               |
| Off                                    | System Off (PWR cable not connected) |
| Green                                  | System On                            |
| Green: Flashing Quickly                | ACPI S1 State                        |
| Green: Flashing Slowly                 | ACPI S3 (STR) State                  |

### BMC Heartbeat LED

A BMC Heartbeat LED is located at LEDM1 on the serverboard. When D1 is blinking, BMC is functioning normally.

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



5-11 SATA Ports

SATA 3.0 Ports

There are ten Serial ATA Ports, which include six SATA supported by the PCH C612 (I-SATA0~5) and four SATA supported by the Intel SCU (S-SATA0~3). See the table on the right for pin definitions. The system supports a total of six 3.5" hot-swap hard drives.

| SATA Port Pin Definitions |            |     |            |
|---------------------------|------------|-----|------------|
| Pin#                      | Definition | Pin | Definition |
| 1                         | Ground     | 2   | TXP        |
| 3                         | TXN        | 4   | Ground     |
| 5                         | RXN        | 6   | RXP        |
| 7                         | Ground     |     |            |

5-12 Installing Software

The Supermicro FTP site contains drivers and utilities for your system at <ftp://ftp.supermicro.com>. Some of these must be installed, such as the chipset driver.

After accessing the FTP site, go into the CDR\_Images directory and locate the ISO file for your motherboard. Download this file to create a CD/DVD of the drivers and utilities it contains. (You may also use a utility to extract the ISO file if preferred.)

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.

After creating a CD/DVD with the ISO files, insert the disk into the CD/DVD drive on your system and the display shown in Figure 5-5 should appear.



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

**Note:** Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these items to install each item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before moving on to the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

## SuperDoctor® 5

The Supermicro SuperDoctor 5 is a 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, FTP, and SMTP services to optimize the efficiency of your operation.

**Note:** The default User Name and Password for SuperDoctor 5 is admin / admin.

**Figure 5-6. SuperDoctor 5 Interface Display Screen (Health Information)**

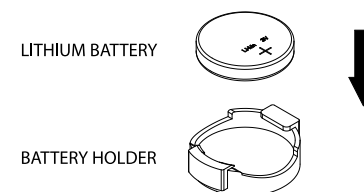


**Note:** The SuperDoctor 5 program and User's Manual can be downloaded from the Supermicro web site at [http://www.supermicro.com/products/info/sms\\_sd5.cfm](http://www.supermicro.com/products/info/sms_sd5.cfm).

## 5-13 Onboard Battery

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.

**Figure 5-7. Installing the Onboard Battery**



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.

## Chapter 6

### Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC823TQ-653LPB chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

**Tools Required:** The only tool you will need to install components and perform maintenance is a Philips screwdriver.

#### 6-1 Static-Sensitive Devices

Electricstatic Discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

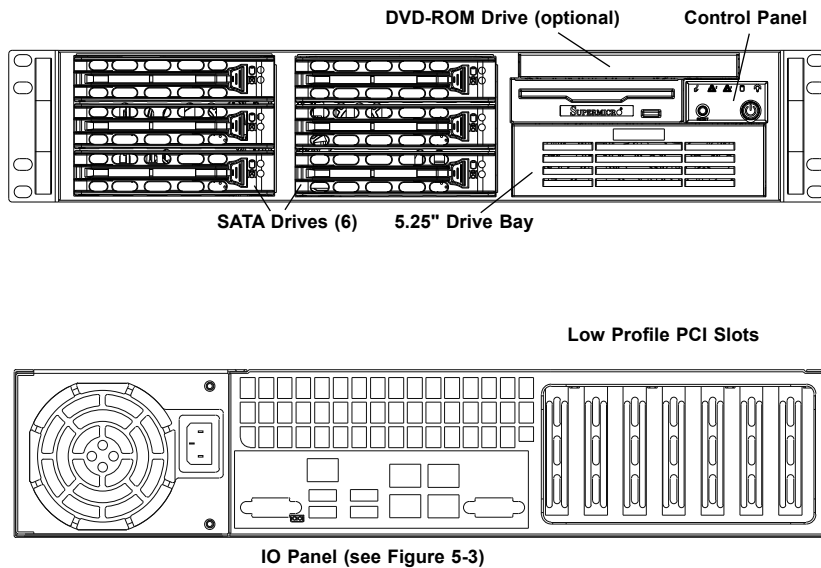
##### Precautions

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

## Unpacking

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

Figure 6-1. Chassis: Front and Rear Views



## 6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the serverboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the serverboard to the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path. The LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF1 can be found in Chapter 5.

## 6-3 System Fans

Four 8-cm fans provide all the cooling needed for the SuperServer 6028R-T/TT. It is very important that the chassis top cover is properly installed and making a good seal for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

### System Fan Failure

Fan speed is controlled by system temperature via IPMI. If a fan fails, the remaining fan will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace the failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the four fans has failed.

### Replacing System Cooling Fans

#### Replacing a Fan

The system power need not be shut down since the fans are all hot-pluggable.

1. Remove the chassis cover.
2. Press the tab on the top of the fan housing of the failed fan and remove the entire housing unit.
3. Replace the failed fan with an identical 8-cm, 12 volt fan (available from Supermicro). Position the new fan at its proper place in the chassis by fitting the fan with its housing onto the fan mounts in the chassis. A "click" can be heard if the fan (in its housing) is properly installed.

- If the system is already powered on, the fan will activate immediately upon being connected to its header on the serverboard.

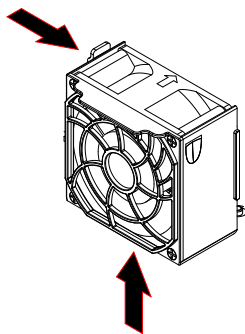


Figure 6-2. System Fan Removal

## 6-4 Drive Bay Installation/Removal

### Accessing the Drive Bays

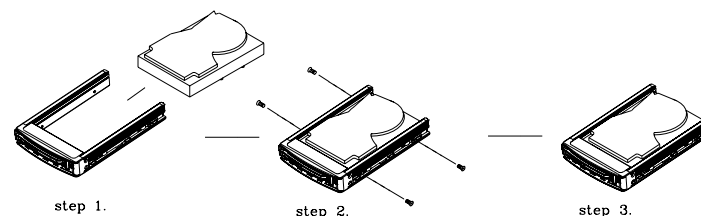
You do not need to access the inside of the chassis to replace or swap SATA drives. Proceed to the next step for instructions. You must use standard SATA drives in the system.

For installing/removing the DVD-ROM, you will need to gain access to the inside of the server by removing the top cover of the chassis. Proceed to the "DVD-ROM Installation" section later in this chapter for instructions.

For installing/removing a component in the 5.25" drive bay, proceed to the "5.25" Drive Bay Installation" section later in this chapter for instructions.

**Caution:** Enterprise level hard disk drives are recommended for use in Supermicro chassis and servers. For information on recommended HDDs, visit the Supermicro Web site at <http://www.supermicro.com/products/nfo/files/storage/SAS-1-ComplList-110909.pdf>

Figure 6-3. Mounting a Drive in a Carrier



**Warning:** Use caution when working around the SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

**Caution:** Regardless of how many hard drives are installed, all drive carriers must remain in the drive bays for proper airflow.

### SATA Drive Installation

The SATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. Since these carriers also help promote proper airflow for the drive bays, even empty carriers without drives installed must remain in the chassis.

#### Mounting a SATA Drive in a Drive Carrier

To add a new hard drive, install a drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier. Secure the drive to the carrier with four screws, as shown in Figure 6-3.

### Installing/Removing Hot-swap SATA Drives

1. Push the release button on the drive carrier.
2. Swing the handle fully out and use it to pull the drive carrier straight out (see Figure 6-4).

**Note:** Your operating system must have RAID support to enable the hot-plug capability of the drives.

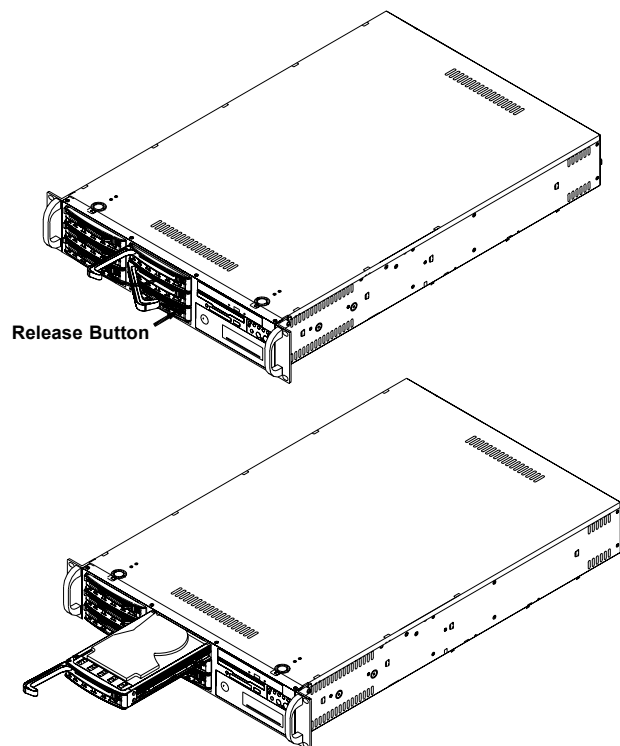


Figure 6-4. Removing SATA Drives

**Caution:** All of the SATA drive carriers must remain in the drive bay to maintain proper cooling airflow.

### Installing a Component in the 5.25" Drive Bay

A single 5.25" drive bay is located in the front of the chassis, making it easily accessible for installation and removal. This component is not hot-swappable, meaning system power must be turned off before installing and/or removing them.

#### Installing/Removing a 5.25" Drive Bay Component

1. First power down the system and then remove the top cover of the chassis.
2. Push the locking latch to the right, then remove the drive carrier from the chassis.
3. Attach the component to the carrier if installing.
4. Push the tray with the drive back into its bay in the chassis.
5. Replace the top cover and restore power to the system when finished.

## DVD-ROM Drive Installation

The top cover of the chassis must be opened to gain full access to the DVD-ROM. The 6028R-T/TT accommodates only slim DVD-ROM drives. Side mounting brackets are typically needed to mount a DVD-ROM drive in the 6028R-T/TT server.

### *Installing a DVD-ROM Drive*

Drives mount on rails and should "click" into place to be correctly and fully installed in their bays. You must power down the system before installing or removing a DVD-ROM drive.

1. Release the screws that secure the server unit to the rack.
2. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").
3. Depress the two buttons on the top of the chassis to release the top cover and at the same time, push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server.

## 6-5 Power Supply

The SuperServer 6028R-T/TT has a single 650 watt power supply. This power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V to 240V input voltage.

### **Power Supply Failure**

If the power supply fails, the system will shut down and you will need to replace the power supply unit. Replacement units can be ordered directly from Supermicro. See contact information in Chapter 1.

### *Removing/Replacing the Power Supply*

Replace the failed power supply module with the same model, which can be ordered directly from Supermicro (see Contact Information in the Preface).

1. First shut down the system, then unplug the AC power cord from the power supply module.
2. Remove the chassis cover by pressing the two release buttons on the top of the chassis (near the front) then push the chassis top rearward about one inch and lift it off.
3. To remove the failed power supply, remove the screws that secure its sides to the bottom of the chassis and then pull it straight out.
4. Replace the failed module with another power supply unit.
5. Install the new power supply module.
6. Secure the power supply with the screws you removed previously and finish by plugging in the AC power cord.

**Notes**



## Chapter 7

### BIOS

#### 7-1 Introduction

This chapter describes the AMI BIOS setup utility for the X10DRI/X10DRI-T. The ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS setup utility screens.

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

#### Starting BIOS Setup Utility

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

**Note:** In most cases, the <Delete> key is used to invoke the AMI BIOS setup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

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

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

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

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

#### How To Change the Configuration Data

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

## How to Start the Setup Utility

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

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

## 7-2 Main Setup

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



The following Main menu items will be displayed:

### System Date/System Time

Use this option to change the system date and time. Highlight *System Date* or *System Time* using the arrow keys. Enter new values using the keyboard. Press the <Tab> key or the arrow keys to move between fields. The date must be entered in Day MM/DD/YYYY format. The time is entered in HH:MM:SS format.

**Note:** The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.

## Supermicro X10DRi

**Version:** This item displays the version of the BIOS ROM used in the system.

**Build Date:** This item displays the date when the version of the BIOS ROM used in the system was built.

### Memory Information

**Total Memory:** This item displays the total size of memory available in the system.

**Memory Speed:** This item displays the default speed of the memory modules installed in the system.

## 7-3 Advanced Setup Configurations

Use the arrow keys to select Advanced setup and press <Enter> to access the submenu items:



**Warning:** Take Caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency or an incorrect BIOS timing setting may cause the system to malfunction. When this occurs, restore the setting to the manufacture default setting.

### ►Boot Feature

#### Quiet Boot

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

#### AddOn ROM Display Mode

Use this 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 mode set by the system BIOS. The options are **Force BIOS** and **Keep Current**.

#### Bootup Num-Lock

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

### Wait For 'F1' If Error

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

### Interrupt 19 Capture

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

### Re-try Boot

When EFI Boot is selected, the system BIOS will automatically reboot the system from an EFI boot device after its initial boot failure. Select Legacy Boot to allow the BIOS to automatically reboot the system from a Legacy boot device after its initial boot failure. The options are **Disabled**, **Legacy Boot**, and **EFI Boot**.

## Power Configuration

### Watch Dog Function

Select Enabled to allow the Watch Dog timer to reboot the system when it is inactive for more than 5 minutes. The options are Enabled and **Disabled**.

### Power Button Function

This feature controls how the system shuts down when the power button is pressed. Select 4 Seconds Override for the user to power off the system after pressing and holding the power button for 4 seconds or longer. Select Instant Off to instantly power off the system as soon as the user presses the power button. The options are 4 Seconds Override and **Instant Off**.

### Restore on AC Power Loss

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

## ►CPU Configuration

### ►North Bridge

This feature allows the user to configure the settings for the Intel North Bridge.

### ►IIO Configuration

#### EV DFX (Device Function On-Hide) Features

When this feature 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 item configures the PCI-E port Bifurcation setting for a PCI-E port specified by the user. The options are x4x4, x8, and **Auto**.

#### IOU0 (IIO PCIe Port 2)

This item configures the PCI-E port Bifurcation setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

#### IOU1 (IIO PCIe Port 3)

This item configures the PCI-E port Bifurcation setting for a PCI-E port specified by the user. 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

#### Link Speed

This item configures the link speed of a PCI-E port specified by the user. The options are Gen 1 (Generation 1) (2.5 GT/s) and **Gen 2 (Generation 2)**.

#### PCI-E Port DeEmphasis

This item configures the De-Emphasis Control (LANCON2 [6]) setting for this computer. The options are **-6.0 dB** and **-3.5 dB**.

The following items will be 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**.

### ►IIO1 Configuration

#### IOU2 (IIO PCIe Port 1)

This item configures the PCI-E port Bifurcation setting for a PCI-E port specified by the user. The options are x4x4, x8, and **Auto**.

#### IOU0 (IIO PCIe Port 2)

This item configures the PCI-E port Bifurcation setting for a PCI-E port specified by the user. The options are x4x4x4x4, x4x4x8, x8x4x4, x8x8, x16, and **Auto**.

#### IOU1 (IIO PCIe Port 3)

This item configures the PCI-E port Bifurcation setting for a PCI-E port specified by the user. 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 PCI ports are not active. The options are **PCU Squelch exit ignore option** and Reset the SQ FLOP by CSR option.

**►IOAT Configuration****Enable I/OAT**

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 Enable and **Disable**.

**No Snoop**

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

**Relaxed Ordering**

Select Enable to enable Relaxed Ordering support which will allow certain transactions to violate the strict-ordering rules of PCI and to be completed prior to other transactions that have already been enqueued. The options are **Disable** and Enable.

**► Intel VT for Directed I/O (VT-d)****Intel VT for Direct I/O (VT-d)****Intel® VT for Directed I/O (VT-d)**

Select Enable to use Intel Virtualization Technology support for Direct I/O VT-d support 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 for Interrupt Remapping support to enhance system performance. The options are **Enable** and **Disable**.

**Coherency Support (Non-Isch)**

Select Enable for the Non-Isch VT-d engine to pass through DMA (Direct Memory Access) to enhance system performance. The options are Enable and **Disable**.

**Coherency Support (Isch)**

Select Enable for the Isch VT-d engine to pass through ATS to enhance system performance. The options are Enable and **Disable**.

**►QPI (Quick Path Interconnect) Configuration**

The following QPI information will be displayed:

- **Number of CPU**
- **Number of IIO**
- **Current QPI Link Speed:** This item displays the current QPI Link speed.
- **Current QPI Link Frequency:** This item displays the frequency of the QPI Link.
- **QPI Global MMIO Low Base / Limit**
- **QPI Global MMIO High Base / Limit**
- **QPI PCI-E Configuration Base / Siz (Size)**

**Link Speed Mode**

Use this feature to select data transfer speed for QPI Link connections. The options are **Fast** and **Slow**.

**Link Frequency Select**

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

**Link L0p Enable**

Select Enable to enable Link L0p. The options are **Disable** and **Enable**.

**Link L1 Enable**

Select Enable to enable Link L1 (Level 1 link). The options are **Disable** and **Enable**.

**Isoc Mode**

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

## ►Memory Configuration

### Enforce POR

Select Enable to enforce POR restrictions on DDR4 frequency and voltage programming. The options are **Auto**, Enforce POR, Disabled and Enforce Stretch Goals.

### Memory Frequency

Use this feature 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, and Reserved (Do not select Reserved).

### ECC Support

Select Enable to enable Error Checking & Correction (ECC) support for onboard memory modules. The options are **Auto**, Enable and Disable.

### Data Scrambling

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

### Enable ADR

Select Enabled for ADR (Automatic Diagnostic Repository) support to enhance memory performance. The options are Enabled and **Disabled**.

### DRAM RAPL (Running Average Power Limit) Baseline

Use this feature to set the run-time power-limit baseline for 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 the processor via automatic voltage control during processor idle states. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

### Socket Interleave Below 4GB

Select Enabled for the memory above the 4G Address space to be split between two sockets. The options are Enable and **Disable**.

### Channel Interleaving

Use this item to set DIMM channel interleaving mood. The options are **Auto**, 1-Way Interleave, 2-Way Interleave, 3-Way Interleave, and 4-Way Interleave.

### Rank Interleaving

Use this item to select a rank memory interleaving method. The options are **Auto**, 1-Way, 2-Way, 4-Way, and 8-Way.

### A7 Mode

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

## ►DIMM Information

This item displays the status of a DIMM module specified by the user.

- P1 DIMMA1
- P1 DIMMB1
- P1 DIMMC1
- P1 DIMMD1

## ►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 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.

### Lockstep x4 DIMMs

Select Enable to enable Lockstep support for x4 DIMM modules. The options are **Auto**, Disabled, and Enabled.

### 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 Enabled, the IO 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 IO hub will be scrubbed every day. The options are **Enable** and **Disable**.

#### 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.

#### 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 **Enable** and **Disable**.

#### 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 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**.

#### USB 3.0 Support

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

#### XHCI 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 **Enabled** and **Disabled**.

#### USB Mass Storage Driver Support

Select **Enabled** for USB mass storage device support. The options are **Disabled** and **Enabled**.

#### Port 60/64 Emulation

Select **Enabled** for I/O port 60h/64h emulation support, which in turn, will provide complete legacy USB keyboard support for the operating systems that do not support legacy USB devices. The options are **Disabled** and **Enabled**.

#### USB Transfer Time-outs:

##### USB Transfer Time-out

This feature is used to set the USB time-out value so that the tasks of USB control, bulk, and interrupt transfer can be performed during the time-out period. The settings are 1 second, 5 seconds, 10 seconds, and **20 Seconds**.

##### Device Reset Time-out

This feature is used to set the time-out value for the USB mass storage device before a start command is issued to this device. This will provide the time needed for the system to detect the presence of the device. The options are 10 Seconds, **20 Seconds**, 30 Seconds and 40 Seconds.

##### Device Power-up Delay

Use this feature to set the maximum time allowed for a USB device to wait before it properly reports itself to the host controller. The options are **Auto** and **Manual**.

## ►SATA Configuration

When this submenu is selected, AMI BIOS automatically detects the presence of the SATA devices that are supported by the Intel PCH chip 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 **Enabled** and Disabled.

### 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 **Enabled** and Disabled.

#### 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

#### Port 0~ Port 5

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

#### 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 **Enabled** and Disabled.

#### Port 0 ~ Port 5 Spin Up Device

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

## 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 not installed or not present.

### 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 **Enabled** and Disabled.

#### 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 Disabled, EFI, and **Legacy**.

### Serial ATA Port 0~ Port 5

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

- Model number of drive and capacity
- Software Preserve Support

#### Port 0~ Port 5

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



**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 Enabled and **Disabled**.

**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 Enabled and **Disabled**.

**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 **Enabled** and Disabled.

**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 **Enabled** and Disabled.

**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 COMRESET initialization to the device. The options are Enabled and **Disabled**.

**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 not installed or not detected.

**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 **Enabled** and Disabled.

**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 Disabled, EFI, and **Legacy**.

**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 Enabled and **Disabled**.

**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 Enabled and **Disabled**.

**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 Bus Driver Version
- PCI Latency Timer

**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).

**VGA Palette Snoop**

Select Enabled to support VGA palette register snooping which will allow a PCI card that does not contain its own VGA color palette to examine a video card palette and mimic it for proper color display. The options are **Disabled** and Enabled.

**PERR# Generation**

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

**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 Enabled and **Disabled**.

**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 **Enabled** and Disabled.

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

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

**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**, Auto and Force L0s.

**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 IO hub. The base memory size must be between 4032G to 4078G. The options are **56T**, 48T, 24T, 512G, and 256G.

**MMIO High Size**

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

**CPU1 Slot 1 PCI-E x8 (OPROM)/CPU1 Slot 2 PCI-E x16 (OPROM)/CPU1 Slot 3 PCI-E x8 (OPROM)/CPU2 Slot 4 PCI-E x16 (OPROM)/CPU2 Slot 5 PCI-E x8 (OPROM)//CPU2 Slot 6 PCI-E x16 (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 LAN Option ROM Type**

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 **Legacy** and EFI.

**Onboard LAN1 Option ROM/Onboard LAN2 Option ROM**

Use this option to select the type of device installed in LAN Port1 or LAN Port2 used for system boot. The default setting for LAN1 Option ROM is **PXE**, and the default setting for LAN2 Option ROM is **Disabled**.

**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.

**Network Stack**

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

**►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 **Enabled** and Disabled.

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

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

## ►Serial Port Console Redirection

### COM 1 Console Redirection

#### Console Redirection

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

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

## ►Console Redirection Settings

### Terminal Type

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

### Bits Per second

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

### Data Bits

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

### Parity

A parity bit can be sent along with regular data bits to detect data transmission errors. Select Even if the parity bit is set to 0, and the number of 1's in data bits is even. Select Odd if the parity bit is set to 0, and the number of 1's in data bits

is odd. Select None if you do not want to send a parity bit with your data bits in transmission. Select Mark to add a mark as a parity bit to be sent along with the data bits. Select Space to add a Space as a parity bit to be sent with your data bits. The options are **None**, Even, Odd, Mark and Space.

## Stop Bits

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

## Flow Control

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

## VT-UTF8 Combo Key Support

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

## Recorder Mode

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

## Resolution 100x31

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

## Legacy OS Redirection Resolution

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

## Putty KeyPad

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

## Redirection After BIOS Post

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

**SOL/COM2****Console Redirection**

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

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

**►SOL/COM2 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 ANSI, VT100, **VT100+**, and VT-UTF8.

**Bits Per second**

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

**Data Bits**

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

**Parity**

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

**Stop Bits**

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

**Flow Control**

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

**Recorder Mode**

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

**Resolution 100x31**

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

**Legacy OS Redirection Resolution**

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

**Putty KeyPad**

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

**Redirection After BIOS Post**

Use this feature to enable or disable legacy Console Redirection after BIOS POST. When 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.

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

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

**Console Redirection**

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

#### 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 **COM2/SOL Console Redirection**.

#### Terminal Type

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

#### Bits Per Second

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

#### Flow Control

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

The setting for each these features is displayed:

#### Data Bits, Parity, Stop Bits

### ► Trusted Computing (Available when a TPM device is installed and detected by the BIOS)

#### 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 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 **None**, **Enable Take Ownership**, **Disable Take Ownership**, and **TPM Clear**.

**Note:** Your system will reboot to carry out a pending TPM operation.

##### Current Status Information

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

►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 Enabled and **Disabled**.

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 **Enabled** and Disabled.

NUMA Support (Available when the OS supports this feature)

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

COD Enable (Available when the OS and the CPU support this feature)

Select Enabled for Cluster-On-Die support to enhance system performance in cloud computing. The options are Enabled, Disabled and **Auto**.

►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

7-4 Event Logs

Use this feature to configure Event Log settings.



►Change SMBIOS Event Log Settings

This feature allows the user to configure SMBIOS Event settings.

Enabling/Disabling Options

SMBIOS Event Log

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

Runtime Error Logging Support

Select Enabled to support Runtime Error Logging. The options are Enabled and **Disabled**. If this item is set to Enable, the following item will be available for configuration:

Memory Corrected Error Enabling (Available when the item above-Runtime Error Logging Support is set to Enable)

Select Enabled for the BIOS to correct a memory error if it is correctable. The options are Enabled and **Disabled**.

PCI-Ex (PCI-Express) Error Enable

Select Enabled for the BIOS to correct errors occurred in the PCI-E slots. The options are Enabled and **Disabled**.

Memory Correctable Error Threshold

Use this item to enter the threshold value for correctable memory errors. The default setting is **10**.

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** and Yes.

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 **Disabled** and Enabled.

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) should the multiple event counter 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

7-5 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.

IPMI Status

This item indicates the status of the IPMI firmware 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 **Enabled** and Disabled.

Erasing Settings

Erase SEL

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



### When SEL is Full

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

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

### Log EFI Status Codes

Select EFI (Extensible Firmware Interface) Status Codes to log EFI status codes. Select Error Codes to log EFI error codes. Select Progress Code to log the EFI progress code. Select both to log both EFI 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:

### LAN Channel 1

#### Configuration Address Source

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

#### Current Configuration Address Source

This item displays the current configuration address source.

#### Station IP Address

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

#### Subnet Mask

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

#### Station MAC Address

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

### Gateway IP Address

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

### Router MAC Address

This item displays the Router MAC address for this computer.

## 7-6 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 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.

### Password Check

Select Setup for the system to prompt for a password at Setup. Select Always for the system to prompt for a password at bootup and upon entering the BIOS Setup utility. The options are **Setup** and Always.

## 7-7 Boot Settings

Use this feature to configure Boot Settings:



### 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**. The default setting is Dual.

### Fixed Boot Order Priorities

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

- Dual Boot Order #1
- Dual Boot Order #2
- Dual Boot Order #3
- Dual Boot Order #4
- Dual Boot Order #5
- Dual Boot Order #6
- Dual Boot Order #7
- Dual Boot Order #8
- Dual Boot Order #9

- Dual Boot Order #10
- Dual Boot Order #11
- Dual Boot Order #12
- Dual Boot Order #13
- Dual Boot Order #14
- Dual Boot Order #15

### Add New Boot Option

This feature allows the user to add a new boot option to system boot features.

## Add Boot Option

Use this item to specify the name of the driver that the new boot option is added to.

### Path for Boot Option

This item is used to specify the path to the driver that the new boot option is added to. The format for the path is "fsx:\path\filename.efi".

### Boot Option File Path

## Create

After the driver option name and the file path are set, press <Enter> to enter to submenu and click OK to create the new boot option drive.

### ► 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 Drive Option

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

## Delete Driver Option

Select the target driver to delete.

### ► Hard Disk Driver BBS Priorities

This item sets the boot sequence of available hard disk drives.

## 7-8 Save & Exit

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



### Discard Changes and Exit

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

### Save Changes and Reset

When you have completed the system configuration changes, select this option to leave the BIOS setup utility and reboot the computer for the new system configuration parameters can take effect. Select **Save Changes and Exit** from the **Exit** menu and press **<Enter>**.

## Save Options

## Save Changes

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

## Discard Changes

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

### **Restore Defaults**

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

### **Save As User Defaults**

To set this feature, select Save as User Defaults from the Exit menu and press <Enter>. This enables the user to save any changes to the BIOS setup for future use.

### **Restore User Defaults**

To set this feature, select Restore User Defaults from the Exit menu and press <Enter>. Use this feature to retrieve user-defined settings that were saved previously.

### **Boot Override**

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

## Appendix A

### BIOS 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.

| Motherboard BIOS Error Beep Codes |                                 |  |
|-----------------------------------|---------------------------------|--|
| Beep Code/LED                     | Error Message                   | Description  |
| 1 beep                            | Refresh                         | Ready to boot  |
| 5 short beeps + 1 long beep       | Memory error                    | No memory detected in the system   |
| 5 beeps                           | No Con-In or No Con-Out devices | Con-In includes USB or PS/2 keyboard, PCI or Serial Console Redirection, IPMI KVM or SOL.<br><br>Con-Out includes Video Controller, PCI or Serial Console Redirection, IPMI SOL. |
| 1 beep per device                 | Refresh                         | 1 beep for each USB device detected  |
| IPMI Error Codes                  |                                 |  |
| 1 Continuous Beep                 | System OH                       | System Overheat  |

**Notes**

## **Appendix B**

### **System Specifications**

#### **Processors**

Single or dual Intel® E5-2600 Series (v3/v4) Socket R3 processors in LGA 2011 sockets (both CPUs must be of the same type)

Note: All PCI-E slots will not be enabled when using only a single processor. See the motherboard layout on page 5-11 for details. Please refer to our web site for a complete listing of supported processors.

#### **Chipset**

Intel C612 chipset

#### **BIOS**

16 Mb AMI® SPI Flash ROM

#### **Memory Capacity**

Sixteen DIMM Slots supporting up to 1 TB of ECC LRDIMM or ECC RDIMM DDR4-2400/2133/1866/1600 memory

Note: See Section 5-5 for details.

#### **SATA**

Intel chipset-based SATA controller for 10 SATA 3.0 ports

#### **SATA Drive Bays**

Six hot-swap drive bays to house 3.5" SATA hard drives

#### **Expansion Slots**

Three PCI-E 3.0 x16 and three PCI-E 3.0 x8 expansion slots

#### **Serverboard**

X10DRI/X10DRI-T

Dimensions: 12.1 x 13.05 in (307 x 331 mm)

**Chassis**

SC823T-653LPB (2U rackmount)

Dimensions: (WxHxD) 16.8 x 3.5 x 25.6 in. (427 x 89 x 650 mm)

**Weight**

Gross Weight: 42 lbs. (19.09 kg.)

**System Cooling**

Four 8-cm PWM fans

**System Input Requirements**

AC Input Voltage: 100-240V AC auto-range

Rated Input Current: 8-5.2A (100-140V), 4.2-3.1A (180-240V)

Rated Input Frequency: 50 to 60 Hz

**Power Supply**

Rated Output Power: 650W single power supply (Part# PWS-653-2H)

Rated Output Voltages: +3.3V (25A), +5V (30A), +12V (49-54A), -12V (0.5A), +5Vsb (4A)

**Operating Environment**

Operating Temperature: 10° to 35° C (40° to 95° F)

Non-operating Temperature: -40° to 60° C (-40° to 140° F)

Operating Relative Humidity: 8% to 90% (non-condensing)

Non-operating Relative Humidity: 5% to 95% (non-condensing)

**Regulatory Compliance**

Electromagnetic Emissions:

FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity:

EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:

EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada), TUV Certified (Germany), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:

This Perchlorate warning applies only to products containing CR (Manganese

Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply.

See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)" California Best Management Practices Regulations for Perchlorate Materials:

This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply.

See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate)"

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## Notes