

SUPER  [®]

X9DRG-OF Platform
including:

X9DRG-OF-CPU
X9DRG-OTF-CPU
X9DRG-O-PCIE

USER'S MANUAL

Revision 1.0

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

Manual Revision 1.0

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Preface

This manual is written for system integrators, IT professionals, and knowledgeable end-users. It provides information for the installation and use of the X9DRG-O(T)F-CPU/X9DRG-O-PCIE Platform, which includes the X9DRG-O(T)F-CPU board and the X9DRG-O-PCIE card.

About the X9DRG-O(T)F Platform

The Super X9DRG-O(T)F-CPU/X9DRG-O-PCIE Platform supports dual Intel® E5-2600 Series Processors (Socket R) which offer QPI (Intel QuickPath Interface) Technology (V.1.1) providing point-to-point connection with a transfer speed of up to 8.0 GT/s. With the PCH C602 chipset built in, the X9DRG-OF Platform supports Intel® Intelligent Power Node Manager, Management Engine (ME), Rapid Storage Technology, Digital Media Interface (DMI), PCI-E Gen. 3.0 and up to 1600 MHz DDR3 memory. This motherboard is ideal for GPU (Graphics Processing Unit) server platforms. Please refer to our website (<http://www.supermicro.com>) for CPU and memory support updates.

Manual Organization

Chapter 1 describes the features, specifications and performance of the motherboard, and provides detailed information about the Intel PCH C602 chipset.

Chapter 2 provides hardware installation instructions. Read this chapter when installing the processor, memory modules and other hardware components into the system. If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for video, memory, and system setup stored in CMOS.

Chapter 4 includes an introduction to the BIOS, and provides detailed information on running the CMOS Setup utility.

Appendix A provides BIOS Error Beep Codes.

Appendix B lists Software Installation Instructions.

Conventions Used in the Manual

Pay special attention to the following symbols to ensure proper system installation and to prevent damage to the system or injury to yourself:

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



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

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Table of Contents

Preface

Chapter 1 Overview

1-1	Overview	1-1
1-2	Processor and Chipset Overview.....	1-17
1-3	Special Features	1-18
1-4	PC Health Monitoring.....	1-18
1-5	ACPI Features.....	1-19
1-6	Power Supply	1-19
1-7	UART.....	1-19
1-8	Advanced Power Management	1-20
	Intel® Intelligent Power Node Manager (NM).....	1-20
	Management Engine (ME)	1-20
1-9	Overview of the Nuvoton WPCM450 Controller	1-20
	WPCM450R DDR2 Memory Interface	1-21
	WPCM450R PCI System Interface.....	1-21
	Other Features Supported by the WPCM BMC Controller.....	1-21

Chapter 2 Installation

2-1	Standardized Warning Statements	2-1
	Battery Handling.....	2-1
	Product Disposal	2-3
2-2	Static-Sensitive Devices.....	2-4
	Precautions	2-4
	Unpacking	2-4
2-3	System Overview	2-5
	Removing and Installing the PCIE Card	2-6
2-4	Processor and Heatsink Installation.....	2-7
	Installing the LGA2011 Processor	2-7
	Installing a Passive CPU Heatsink	2-11
	Removing the Heatsink.....	2-12
2-5	Installing and Removing the Memory Modules.....	2-13
	Installing & Removing DIMMs.....	2-13
	Removing Memory Modules	2-13
2-6	Control Panel Connectors and I/O Ports	2-18
	Back Panel Connectors and I/O Ports.....	2-18
	Back Panel I/O Port Locations and Definitions	2-18
	Universal Serial Bus (USB).....	2-19

	Video Connection	2-19
	Ethernet Ports	2-20
	Unit Identifier Switch	2-21
	Front Control Panel	2-22
	Front Control Panel Pin Definitions	2-23
	NMI Button	2-23
	Power LED	2-23
	HDD LED/UID Switch	2-24
	NIC1/NIC2 LED Indicators	2-24
	Overheat (OH)/Fan Fail/PWR Fail/UID LED	2-25
	Power Fail LED	2-25
	Reset Button	2-26
	Power Button	2-26
2-7	Connecting Cables	2-27
	Power Connectors	2-27
	Fan Headers	2-28
	Chassis Intrusion	2-28
	Serial Ports	2-29
	TPM Header/Port 80	2-30
	Overheat LED/Fan Fail	2-30
	T-SGPIO1/2/-S1 Headers	2-31
	Speaker Header	2-32
	DOM Power Connector	2-32
2-8	Jumper Settings	2-33
	Explanation of Jumpers	2-33
	GLAN Enable/Disable	2-33
	CMOS Clear	2-34
	Watch Dog Enable/Disable	2-34
	VGA Enable	2-35
	BMC Enable	2-35
	Management Engine (ME) Recovery	2-36
	Manufacture Mode Select	2-36
2-9	Onboard LED Indicators	2-37
	LAN LEDs	2-37
	IPMI Dedicated LAN LEDs	2-37
	Onboard Power LED	2-38
	BMC Heartbeat LED	2-38
2-10	Serial ATA Connections	2-39
	Serial ATA Ports	2-39

Chapter 3 Troubleshooting

3-1	Troubleshooting Procedures	3-1
3-2	Technical Support Procedures	3-5
3-3	Battery Removal and Installation	3-6
3-4	Frequently Asked Questions	3-7
3-5	Returning Merchandise for Service.....	3-8

Chapter 4 BIOS

4-1	Introduction.....	4-1
4-2	Main Setup.....	4-2
4-3	Advanced Setup Configurations.....	4-4
4-4	Event Logs.....	4-25
4-5	IPMI.....	4-27
4-6	Boot.....	4-29
4-7	Security.....	4-31
4-8	Save & Exit.....	4-32

Appendix A BIOS Error Beep Codes

A-1	BIOS Error Beep Codes	A-1
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Appendix B Software Installation Instructions

B-1	Installing Software Programs	B-1
B-2	Installing SuperDoctor® 5.....	B-2

Chapter 1

Overview

1-1 Overview

Checklist

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

This motherboard was designed to be used in an SMC-proprietary server as a part of an integrated system platform.

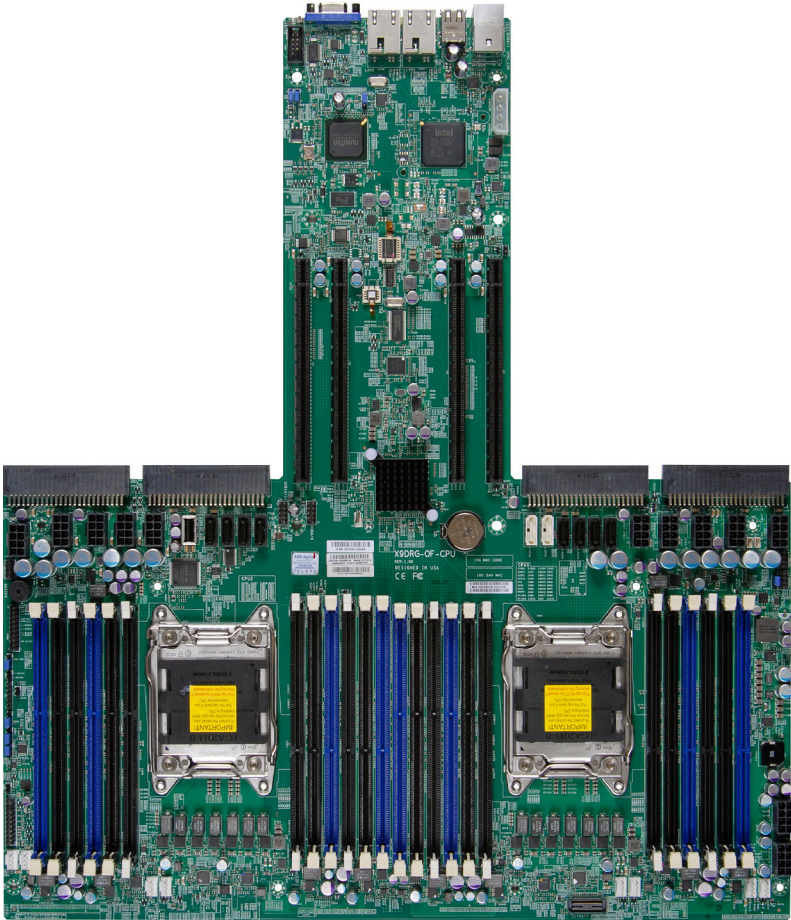



Note: For your system to work properly, please follow the links below to download all necessary drivers/utilities and the user's manual for your motherboard.

- Supermicro product manuals: <http://www.supermicro.com/support/manuals/>
- Product Drivers and utilities: <ftp://ftp.supermicro.com/>
- If you have any questions, please contact our support team at support@supermicro.com.

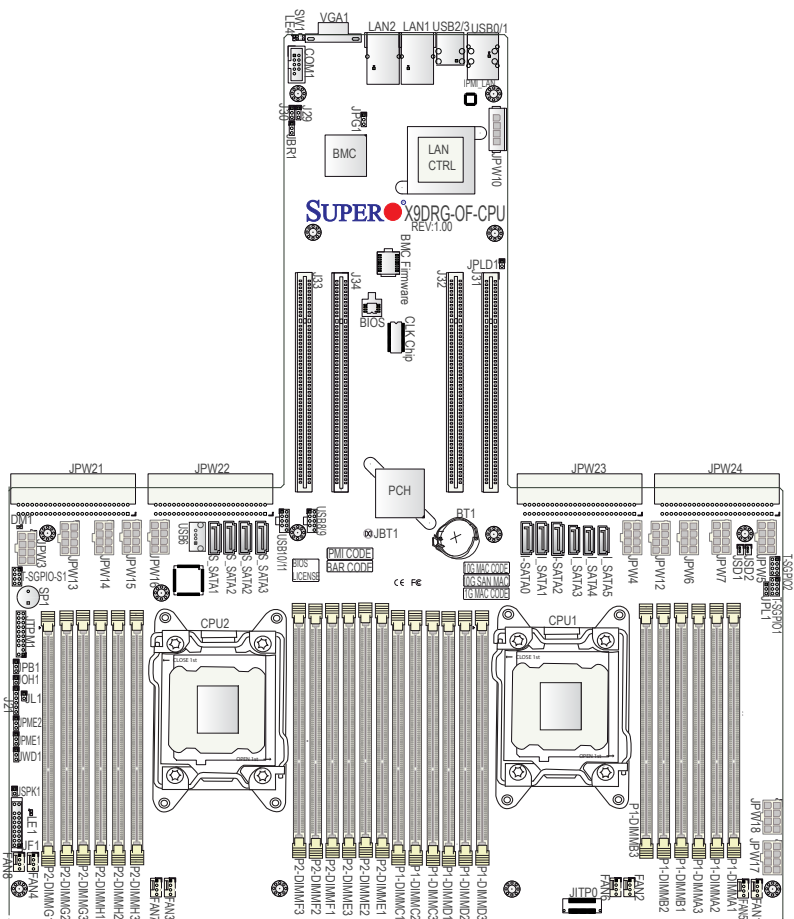
Warning: For safety considerations, please refer to the complete list of safety warnings posted on the Supermicro website at http://www.supermicro.com/about/policies/safety_information.cfm.


SUPER® X9DRG-O(T)F-CPU Board Image



 **Note:** All graphics shown in this manual were based upon the latest PCB Revision available at the time of publishing of the manual. The CPU board and the PCI-E card you've received may or may not look exactly the same as the graphics shown in this manual.

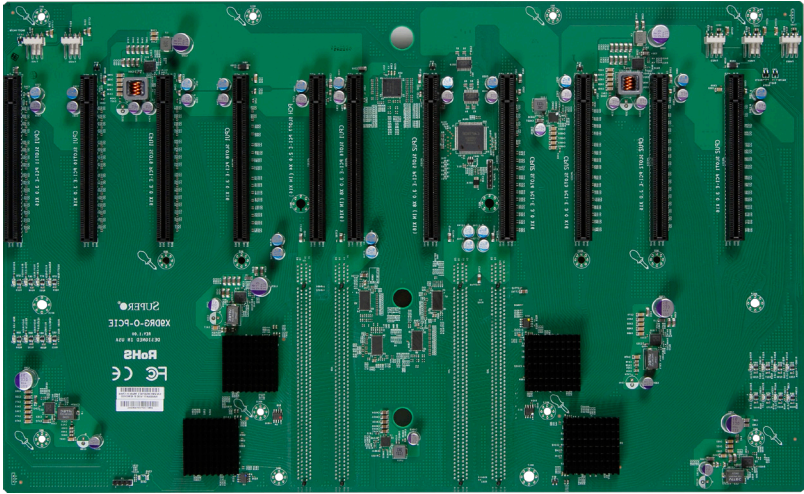
SUPER[®] X9DRG-O(T)F-CPU Board Layout



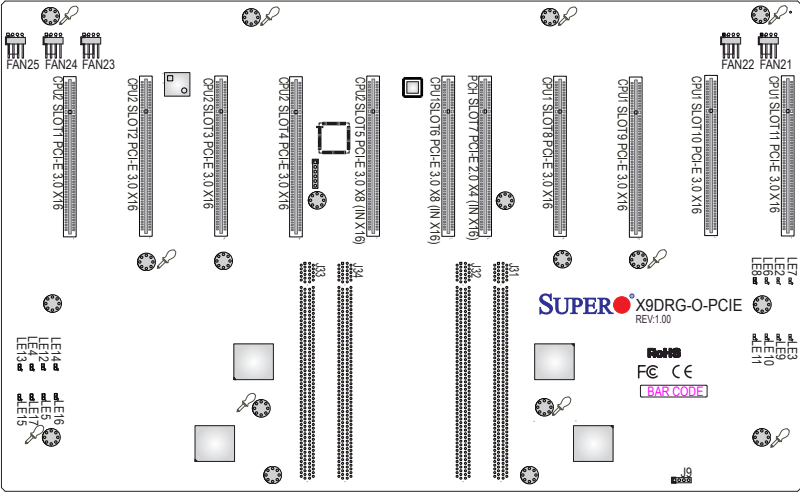
 **Note 1:** For the latest CPU/Memory updates, please refer to our website at <http://www.supermicro.com/products/motherboard/> for details.

Note 2: Changing BMC log-in information is recommended during initial system power-on. The default username is ADMIN and password is ADMIN. For BMC best practices, please refer to: http://www.supermicro.com/products/nfo/files/IPMI/Best_Practices_BMC_Security.pdf.

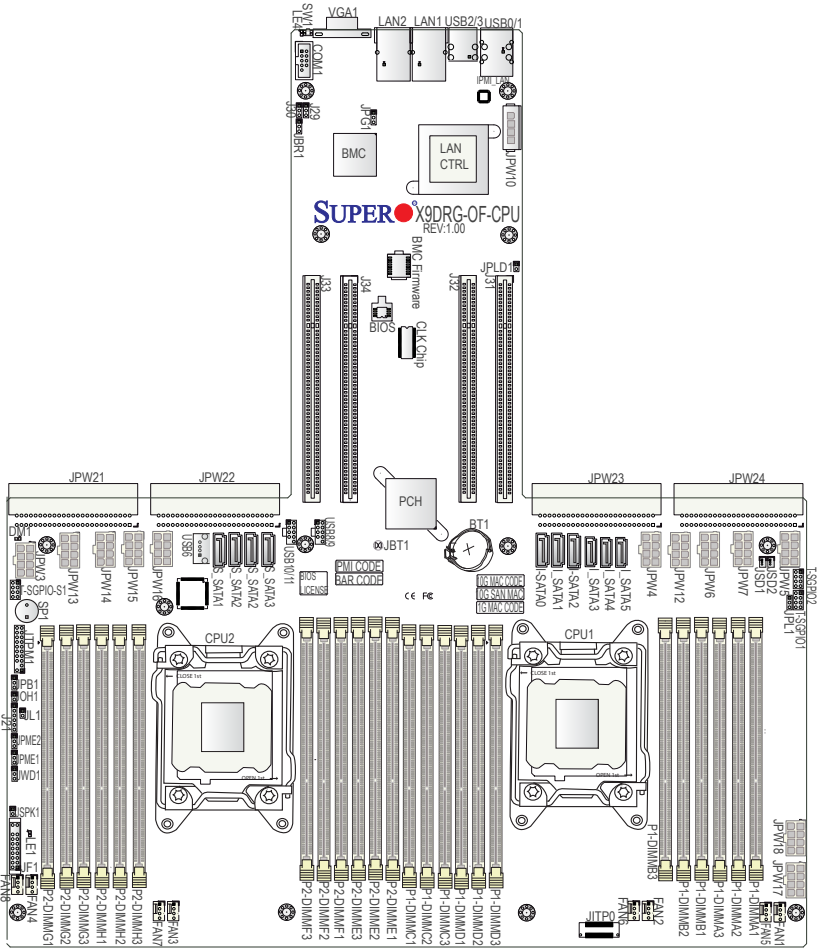
SUPER X9DRG-O-PCI-E Card Image




SUPER X9DRG-O-PCI-E Card Layout



X9DRG-O(T)F-CPU Quick Reference



 **Note 1:** See Chapter 2 for detailed information on jumpers, I/O ports and JF1 front panel connections.

Note 2: "■" indicates the location of "Pin 1".

Note 3: Jumpers/LED Indicators not indicated are for testing only.

Note 4: Use only the correct type of onboard CMOS battery as specified by the manufacturer. Do not install the onboard battery upside down to avoid possible explosion

X9DRG-O(T)F-CPU Board Jumpers

Jumper	Description	Default Setting
JBR1	BIOS Recovery	Pins 1-2 (Normal)
JBT1	Clear CMOS	See Chapter 2
JPB1	BMC Enabled	Pins 1-2 (Enabled)
JPG1	VGA Enabled	Pins 1-2 (Enabled)
JPL1	GLAN1/GLAN2 Enable	Pins 1-2 (Enabled)
JPME1	Management Engine (ME) Recovery Mode	Pins 1-2 (Normal)
JPME2	Management Engine (ME) Manufacture Mode	Pins 1-2 (Normal)
JWD1	Watch Dog Timer Enable	Pins 1-2 (Reset)

X9DRG-O(T)F-CPU Connectors

Connectors	Description
BT1	Onboard CMOS Battery (See Chpt. 3 for Used Battery Disposal)
COM1	Serial Port (COM1) Header
FAN1-8	CPU/System Cooling Fans
J21	X9DRG-O(T)F-CPU CPLD Programming
J31/32/33/34	Slot for Riser Card (RSC-X9DRG-O)
JF1	Front Panel Control Header
JL1	Chassis Intrusion
JOH1	Overheat LED Header
JPW3-JPW7, JPW12-JPW16	PCIe Add-on Card AUX Power Connector
JPW17-JPW18	HDD Backplane Power Connector (See warning on next page)
JPW21/22/23/24	Power Supply Power Connector
JSD1/JSD2	SATA DOM (Devices on Module) Power Connectors
JTPM1	TPM (Trusted Platform Module)/Port 80
LAN1/LAN2	X540_based 10G Ethernet LAN Ports 1/2 (X9DRG-OTF-CPU); I350_based 1G LAN Ports 1/2 (X9DRG-OF-CPU)
(IPMI) LAN	IPMI_Dedicated LAN
I-SATA 0-5	SATA 3.0 Connectors (I-SATA 0/1), SATA 2.0 Connectors (I-SATA 2-5) from AHCI
S-SATA 1-4	SATA 2.0 connectors from SCU (S-SATA 1-4)
SP1	Onboard Speaker Header
SW1	UID Switch
T-SGPIO1/2	Serial_Link General Purpose I/O Header 1 for I-SATA Ports 0~3 Serial_Link General Purpose I/O Header 2 for I-SATA Ports 4~5

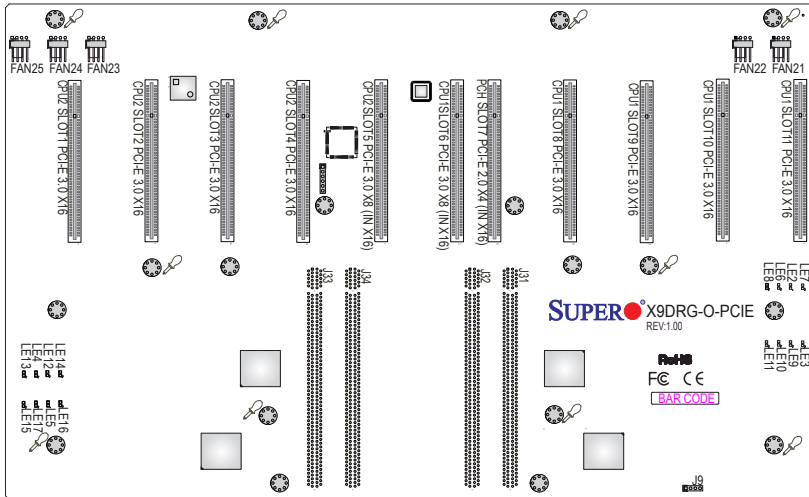
T-SGPIO-S1	Serial_Link General Purpose I/O Header for S-SATA Ports 1-4
USB 0/1, 2/3	Back Panel USB 0/1, 2/3
USB 6	USB Internal Type A connector
USB 8/9	USB x2 Header
USB 10/11	USB x2 Header
VGA1	VGA output port


X9DRG-O(T)F-CPU LED Indicators

LED	Description	State	Status
DM1	BMC Heartbeat LED	Green	BMC Normal
LE1	Standby PWR LED	Green: On	SB Power On
LE4	UID Switch LED	Blue: On	Unit Identified

Warning: To provide adequate power supply to the system, be sure to connect all onboard power connectors to the power supply.

X9DRG-O-PCIE Quick Reference



 **Note:** Jumpers/LED Indicators not indicated are for testing only.

X9DRG-O-PCIE Connectors



Connector	Description
JPCIE1	CPU2 Slot1 3.0 x16
JPCIE2	CPU2 Slot2 3.0 x16
JPCIE3	CPU2 Slot3 3.0 x16
JPCIE4	CPU2 Slot4 3.0 x16
JPCIE5	CPU2 Slot5 3.0 x8 (in x16)
JPCIE6	CPU1 Slot6 3.0 x8 (in x16)
JPCIE7	PCH Slot7 2.0 x4 (in x16)
JPCIE8	CPU1 Slot8 3.0 x8 (in x16)
JPCIE9	CPU1 Slot9 3.0 x16
JPCIE10	CPU1 Slot10 3.0 x16
JPCIE11	CPU1 Slot11 3.0 x16

X9DRG-O-PCIE LED Indicators

LED	Description	State	Status
LE2	CPU1 Port2 Fatal Error Indicator	Static Red	Fatal error
LE3	CPU1 Port3 Fatal Error Indicator	Static Red	Fatal error
LE4	CPU2 Port2 Fatal Error Indicator	Static Red	Fatal error
LE5	CPU2 Port3 Fatal Error Indicator	Static Red	Fatal error
LE6	CPU1 Port2 Link Error Indicator (Upstream port status of CPU1 Slot 8/9)	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE7	CPU1 Slot8 Link Status Indicator	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE8	CPU1 Slot9 Link Status Indicator	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE9	CPU1 Port3 Link Status Indicator (Upstream port status of CPU1 Slot 10/11)	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s


LED	Description	State	Status
LE10	CPU1 Slot10 Link Status Indicator	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE11	CPU1 Slot11 Link Status Indicator	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE12	CPU2 Port2 Link Status Indicator (Upstream port status of CPU2 Slot 3/4)	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE13	CPU2 Slot3 Link Status Indicator	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE14	CPU2 Slot4 Link Status Indicator	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE15	CPU2 Port3 Link Status Indicator (Upstream port status of CPU2 Slot 1/2)	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE16	CPU2 Slot1 Link Status Indicator	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s
LE17	CPU2 Slot2 Link Status Indicator	Off	Link is down
		1HZ Green Blinking	2.5GT/s
		2HZ Green Blinking	5GT/s
		Static Green On	8GT/s

Motherboard Features

<p>CPU</p>	<ul style="list-style-type: none"> Dual Intel[®] E5-2600(V2) Series (Socket R LGA 2011) processors; each processor supports two full-width Intel QuickPath Interconnect (QPI) links (with Data Transfer Rate of up to 8.0 GT/s per QPI). <p> Note: For Intel E5-2600(v2) processor support, BIOS version 3.0 or above is required.</p>
<p>Memory</p>	<ul style="list-style-type: none"> Integrated memory controller supports up to 1.5 TB of LRDIMM, 768 GB of RDIMM, or 128 GB of UDIMM ECC/Non-ECC DDR3 800/1066/1333/1600/1866 MHz 240-pin 4-channel memory modules in 24 DIMM slots. <p> Note 1: 1866 MHz memory speed is dependent on Intel E5-2600v2 CPUs.</p> <p>Note 2: For the latest memory updates, please refer to the Tested Memory List posted on our website (http://www.supermicro.com/products/motherboard).</p>
<p>Chipset</p>	<ul style="list-style-type: none"> Intel[®] C602 PCH
<p>Expansion Slots</p>	<ul style="list-style-type: none"> Ten (10) PCI-E 2.0/3.0 slots: eight (8) x16, two (2) x8 (all in x16 slot) One (1) PCI-E 2.0 x4 in x16 slot (from PCH)
<p>Graphics</p>	<ul style="list-style-type: none"> Nuvoton BMC Video Controller (Matrox G200)
<p>Network</p>	<ul style="list-style-type: none"> One Intel I350 Gigabit (10/100/1000 Mb/s) Ethernet Dual-Channel Controller for LAN 1/LAN 2 ports (for X9DRG-OF-CPU) One Intel X540 Dual-Channel Controller for 10G-based-T LAN 1/LAN 2 ports (for X9DRG-OTF-CPU)

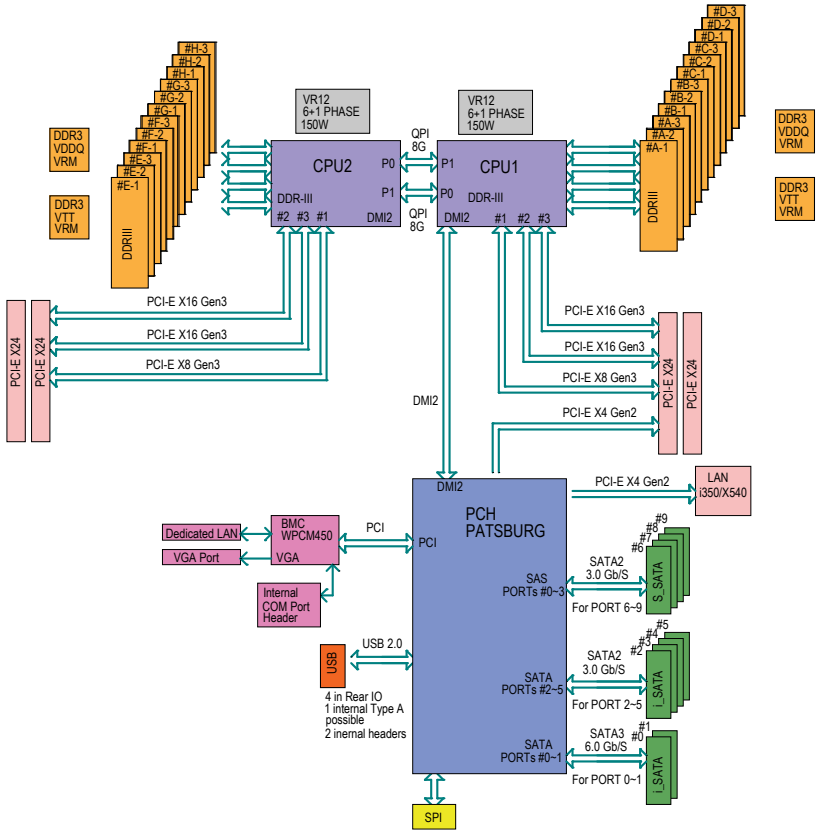
I/O Devices	SATA Connections	
	<ul style="list-style-type: none"> SATA Ports 	<p>Two (2): SATA 3.0 Ports (I-SATA0/1)</p> <p>Eight (8) SATA 2.0 Ports (I-SATA2~5 from AHCI, S-SATA1-4 from SCU)</p>
	<ul style="list-style-type: none"> RAID 	RAID 0, 1, 5, 10
	IPMI 2.0	
	<ul style="list-style-type: none"> IPMI 2.0 supported by the Nuvoton WPCM450R BMC 	
	Serial (COM) Port	
	<ul style="list-style-type: none"> One (1) Fast UART 16550 Connection: 9-pin RS-232 Header 	
	VGA Port	
<ul style="list-style-type: none"> One (1) VGA output port 		
Peripheral Devices	USB Devices	
	<ul style="list-style-type: none"> Four (4) USB 2.0 ports on the rear I/O panel One (1) USB Internal Type A. Two (2) USB 2.0 header, two ports/header 	
BIOS	<ul style="list-style-type: none"> 16MB SPI AMI BIOS® SM Flash BIOS 	
	<ul style="list-style-type: none"> APM 1.2, PCI 2.3, ACPI 1.0/2.0/3.0, USB Keyboard, Plug & Play (PnP) and SMBIOS 2.5 	
Power Management	<ul style="list-style-type: none"> ACPI/ACPM Power Management 	
	<ul style="list-style-type: none"> Main switch override mechanism 	
	<ul style="list-style-type: none"> Keyboard Wake-up from Soft-Off 	
	<ul style="list-style-type: none"> Power-on mode for AC power recovery 	
	<ul style="list-style-type: none"> Intel® Intelligent Power Node Manager (Available when the supporting firmware and the power supply cable are installed on the motherboard.) 	
	<ul style="list-style-type: none"> Management Engine 	
PC Health Monitoring	CPU Monitoring	
	<ul style="list-style-type: none"> Onboard voltage monitors for CPU Cores, +1.1V, +1.5V, +3.3V, +5V, +12V, +3.3V Standby, +5V Standby, VBAT, and Memory Voltages. 	
	<ul style="list-style-type: none"> CPU Thermal Design Power (TDP): support up to 150W (See Note 1 on the next page). 	

	<ul style="list-style-type: none"> • CPU 6+1 Phase switching voltage regulator • CPU/System overheat LED and control • CPU Thermal Trip support • Thermal Monitor 2 (TM2) support
	Fan Control
	<ul style="list-style-type: none"> • Fan status monitoring with firmware thermal management via IPMI interface • Low noise fan speed control
System Management	<ul style="list-style-type: none"> • PECI (Platform Environment Configuration Interface) 2.0 support • System resource alert via SuperDoctor5 • SuperDoctor5, Watch Dog, NMI • Chassis Intrusion Header and Detection
Dimensions	<ul style="list-style-type: none"> • 17" x 19" (431.8mm x 482.6mm)


 **Note 1:** CPU Maximum Thermal Design Power (TDP) is subject to chassis and heatsink cooling restrictions. For proper thermal management, please check the chassis and heatsink specifications for proper CPU TDP sizing.

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

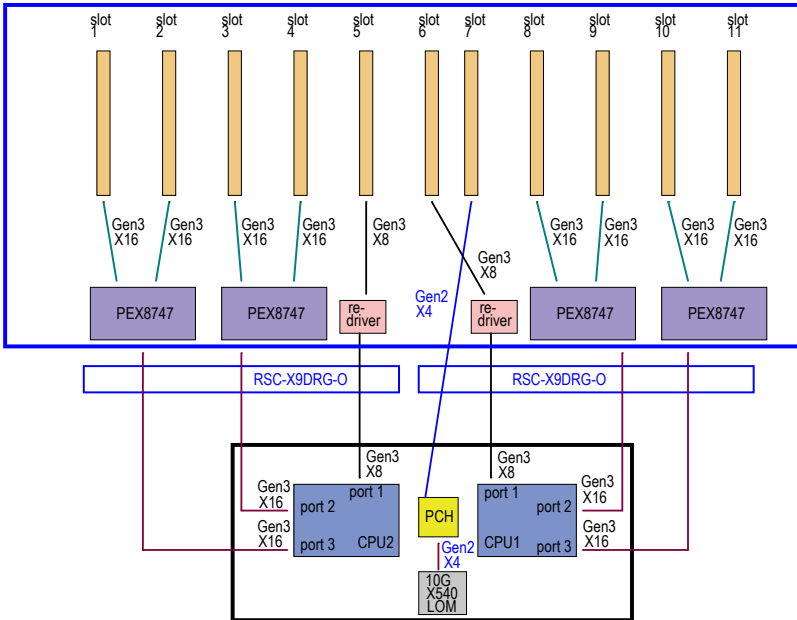
CPU Board Block Diagram




System Block Diagram

 **Note:** This is a general block diagram and may not exactly represent the features on your motherboard. See the Motherboard Features pages for the actual specifications of each motherboard.

PCIE Card Block Diagram



PCIE Card Block Diagram

 **Note:** This is a PCIE Card block diagram and may not exactly represent the features on your card.

1-2 Processor and Chipset Overview

Built upon the functionality and the capability of Intel® E5-2600 Series Processors (Socket R) and the C602 chipset, the X9DRG-O(T)F-CPU/X9DRG-O-PCIE Platform provides the performance and feature sets required for dual_processor-based 4U GPU server platforms.

With support of Intel QuickPath interconnect (QPI) Technology, the X9DRG-O(T) F-CPU/X9DRG-O-PCIE Platform offers point-to-point serial interconnect interface with a transfer speed of up to 8.0 GT/s, providing superb system performance.

The PCH chipset provides extensive IO support, including the following functions and capabilities:

- PCI-Express Rev. 2.0 support
- ACPI Power Management Logic Support Rev. 3.0b or Rev. 4.0
- USB host interface backplane and front access support
- Intel Rapid Storage Technology supported
- Intel Virtualization Technology for Directed I/O (Intel VT-d) supported
- Intel Trusted Execution Technology supported
- Serial Peripheral Interface (SPI) Supported
- Digital Media Interface (DMI) supported
- Advanced Host Controller Interface (AHCI) supported



Note: For Intel E5-2600(v2) processor support, BIOS version 3.0 or above is required.

1-3 Special Features

Recovery from AC Power Loss

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

1-4 PC Health Monitoring

This section describes the features of PC health monitoring of the motherboard. This motherboard has an onboard System_Hardware_Monitor chip that supports PC health monitoring. An onboard voltage monitor will scan the following onboard voltages continuously: Onboard voltage monitors for +3.3V, 3.3VSB, +5V, +5V Dual, +12V, HT, CPU Core, Memory, and Battery Voltages. Once a voltage becomes unstable, a warning is given, or an error message is sent to the screen. The user can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Environmental Temperature Control

A thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent the CPU from overheating. The onboard chassis thermal circuitry can monitor the overall system temperature and alert the user when the chassis temperature is too high.



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

System Resource Alert

This feature is available when used with SuperDoctor® III in the Windows OS environment or used with SuperDoctor II in Linux. SuperDoctor is used to notify the user of certain system events. For example, you can configure SuperDoctor to provide you with warnings when the system temperature, CPU temperatures, voltages, and fan speeds go beyond a predefined range.

1-5 ACPI Features

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

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

Slow Blinking LED for Suspend-State Indicator

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

1-6 Power Supply

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

The X9DRG-O(T)F-CPU/X9DRG-O-PCIE Platform supports SMC-Proprietary power connectors. In areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.



Note: Please use SMC-proprietary power supply as specified as above. This motherboard does not support any power supply manufactured by other manufacturer.

1-7 UART

The COM port is a 16550 compatible serial communication header (UART). The UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability, and a processor interrupt system. The UART provides legacy speed with baud rate of up to 115.2 Kbps.

1-8 Advanced Power Management

The new advanced power management features supported by this motherboard include IPNM and ME. Please note that you will need to do the following to use these two new features:

- Use a power supply that supports PMBus 1.1 or 1.2,
- Install the NMView software in your system. NMView is optional and can be purchased from Supermicro.

Intel® Intelligent Power Node Manager (NM)

The Intel® Intelligent Power Node Manager (IPNM) provides your system with real-time thermal control and power management for maximum energy efficiency. Although IPNM is supported by the BMC (Baseboard Management Controller), your system must also have IPNM-compatible Management Engine (ME) firmware installed in your system for IPNM support.



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

Management Engine (ME)

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

1-9 Overview of the Nuvoton WPCM450 Controller

The Nuvoton WPCM450R Controller, a Baseboard Management Controller (BMC), supports 2D/VGA-compatible Graphic Cores with PCI interface, creating multi-media virtualization via Keyboard/Video/Mouse Redirection (KVMR). The WPCM450R Controller is ideal for remote system management.

The WPCM450R Controller interfaces with the host system via PCI connections to communicate with the graphics cores. It supports USB 2.0 and 1.1 for remote keyboard/mouse/virtual media emulation. It also provides LPC interface support to communicate with the BMC. The WPCM450R Controller is connected to the network via an external Ethernet PHY module or shared NCSI connections.

The WPCM450R communicates with onboard components via six SMBus interfaces, PECL (Platform Environment Control Interface) buses, and General Purpose I/O ports.

WPCM450R DDR2 Memory Interface

The WPCM450R supports a 16-bit DDR2 memory module with a speed of up to 220 MHz. For best signal integrity, the WPCM450R provides point-to-point connection.

WPCM450R PCI System Interface

The WPCM450R provides 32-bit, 33 MHz 3.3V PCI interface, which is compliant with the PCI Local Bus Specification Rev. 2.3. The PCI system interface connects to the onboard PCI Bridge used by the graphics controller.

Other Features Supported by the WPCM BMC Controller

The WPCM450R supports the following features:

- IPMI 2.0
- Serial over LAN
- KVM over LAN
- LAN Alerting-SNMP Trap
- Event Log
- X-Bus parallel interface for I/O expansion
- Multiple ADC inputs, Analog and Digital Video outputs
- SPI Flash Host BIOS and firmware bootstrap program supported
- Reduced Media Independent Interface (RMII)
- OS (Operating System) Independency
- Provides remote Hardware Health Monitoring via IPMI.
- Provides Network Management Security via remote access/console redirection.
- Supports the following Management tools: IPMIView, CLI (Command Line Interface)
- RMCP+ protocol supported



Note 1: For more information on IPMI configuration, please refer to the IPMI User's Guide posted on our website at <http://www.supermicro.com/support/manuals/>.

Note 2: The term "IPMI controller" and the term "BMC controller" can be used interchangeably in this section.

Chapter 2

Installation

2-1 Standardized Warning Statements

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

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

Battery Handling



Warning! There is a danger of explosion if the battery is replaced incorrectly. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions. (Refer to Chapter 3 for more information on used battery disposal.)

警告

**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

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

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.

¡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.

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.

תקנון הצהרות אזהרה

הצהרות 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 במארוי סופרמיקרו.

تحذير

كذلك عفاً عن حيص ريغ قق ي رطب ةي راطبلا لادبتسا قلا ح ي ف راجفنا نم رطخ كانه ةي راطبلا لادبتسا

ةعن صملا ةكشرشلا هب تصوا امك اهلدا عي ام وأ عونلا س فن ب طقف ةعن اصل ةكشرشلا تاميل عتل اقفو ةلم عتسملا تاي راطبلا نم صلخت

주의

건전지가 부정확하게 대체되는 경우에 폭발의 위험이 있다. 제조자에 의해 추천된 동일한 것 또는 동등한 유형으로서만 건전지를 교환하십시오. 제조자 지시에 따라 사용한 건전지를 처분하십시오

Waarschuwing

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

Product Disposal



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

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

この製品を廃棄処分する際は、各国の法律および規制に従って取り扱ってください。

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.

תאריך

קיימה סכנת פיצוץ של המכללה בתנאי החולפה בדרך לא תקינה. יש להחליף את המכללה במצב המצוי בתנאי יצרן המכללה.

טיפול המכללות המסומנות יש לבצע לפי הוראות היצרן.

تعليمات

نظراً لوجود خطر انفجار للمصفاة في ظل ظروف التشغيل غير الصحيحة. يجب استبدال المصفاة بحالة المصفاة كما هي من قبل الشركة المصنعة.
معالجة المصفاة المصنفة يجب أن تتم وفقاً لتعليمات الشركة.

주의

해당 국가의 관련 법규 및 규정에 따라 이 장치를 폐기해야 합니다.

Waarschuwing

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

2-2 Static-Sensitive Devices

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

Precautions

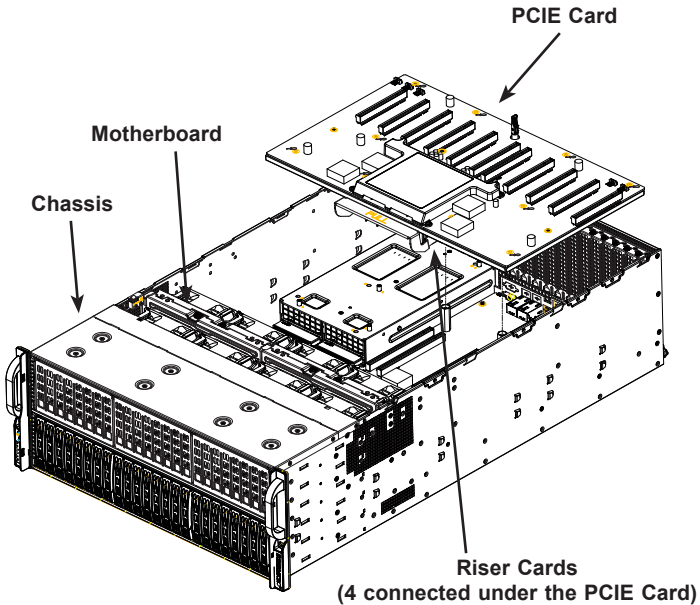
- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules,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


Unpacking

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

2-3 System Overview

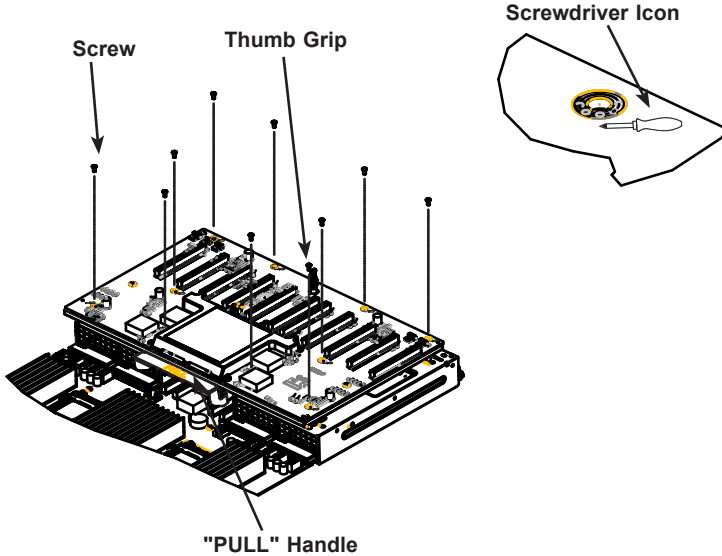
The bare bone system you purchased comes with the X9DRG-O(T)F CPU board, X9DRG-PCIE Card, and four Riser cards preinstalled in the chassis. You will need to install the processors, memory modules, and other components on your own. To install any components on the CPU board, you need to remove the PCIE Card from the CPU board.



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

Removing and Installing the PCIE Card

1. Locate the 10 screws with the screwdriver icon next to them and unscrew them.



2. To remove the PCIE Card, place one hand on the "PULL" handle and the other hand on the thumb grip and pull the card up until it is detached from the board.
3. Install components on the CPU board. Refer to section 2-4 for processor installation and section 2-5 for memory installation. After you are finished installing the components, install the PCIE Card back on the CPU board.

2-4 Processor and Heatsink Installation

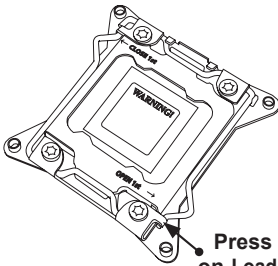
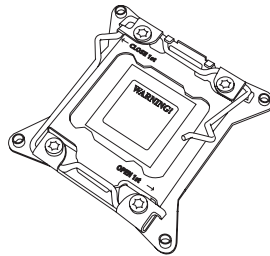
Warning: When handling the processor package, avoid placing direct pressure on the label area.

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

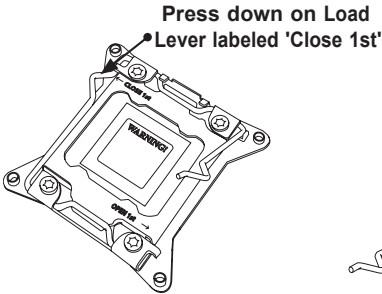
Installing the LGA2011 Processor

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

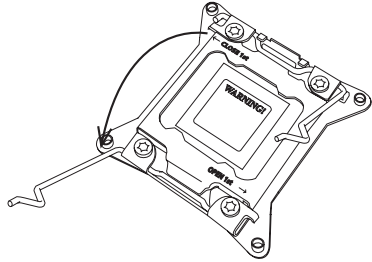
1**2**

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

1

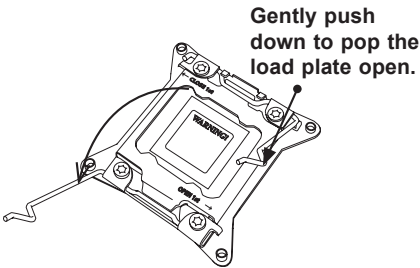


2 Pull lever away from the socket

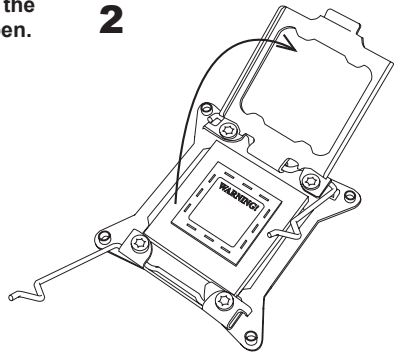


3. With the lever labeled 'Close 1st' fully retracted, gently push down on the lever labeled 'Open 1st' to open the load plate. Lift the load plate to open it completely.

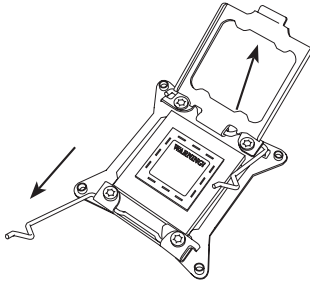
1



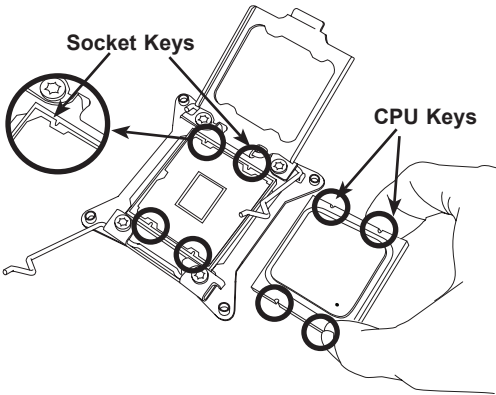
2



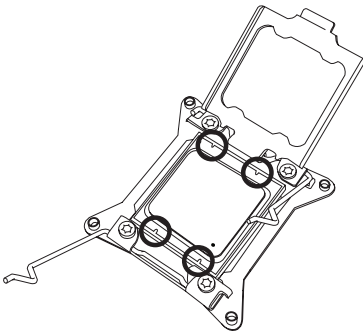
1. Use your index finger and your thumb to loosen the lever and open the load plate.



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



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

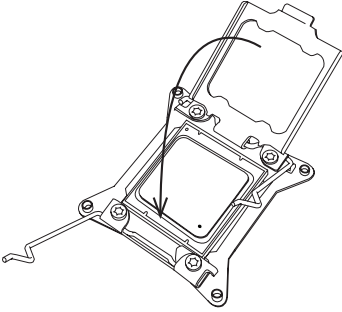


Warning: You can only install the CPU inside the socket in one direction. Make sure that it is properly inserted into the CPU socket before closing the load plate. If it doesn't close properly, do not force it as it may damage your CPU. Instead, open the load plate again and double-check that the CPU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

4. With the CPU inside the socket, inspect the four corners of the CPU to make sure that the CPU is properly installed.

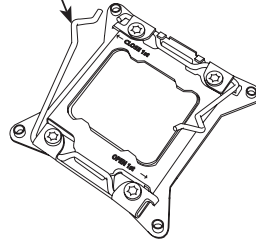
1

Gently close the load plate.



2

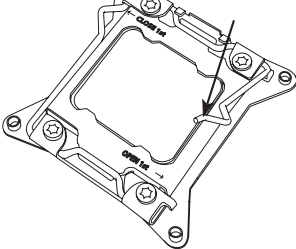
Push down and lock the lever labeled 'Close 1st'.



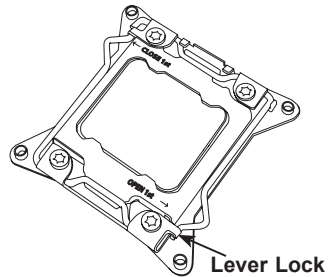
5. Close the load plate with the CPU inside the socket. Lock the lever labeled 'Close 1st' first, then lock the lever labeled 'Open 1st' second. Use your thumb to gently push the load levers down to the lever locks.

3

Lever Lock Push down and lock the lever labeled 'Open 1st'

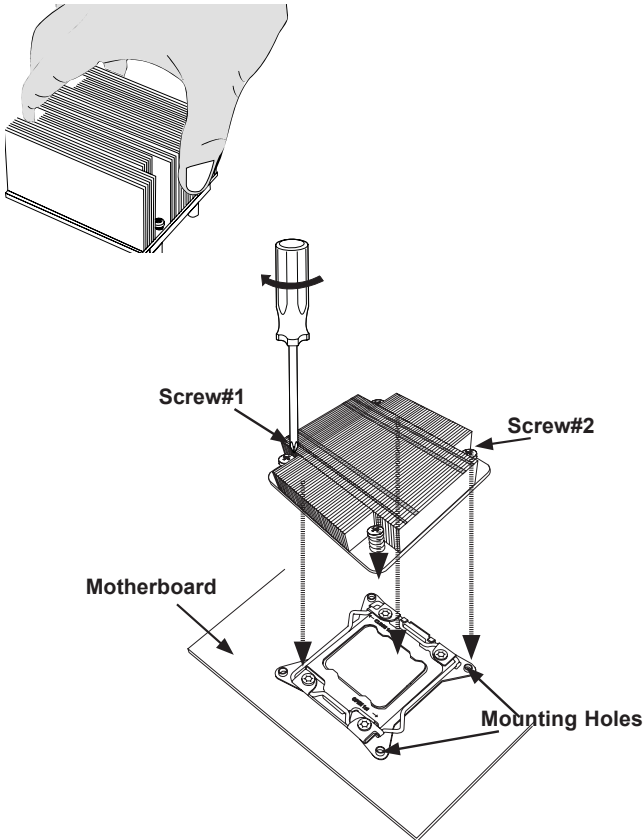



4



Installing a Passive CPU Heatsink

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

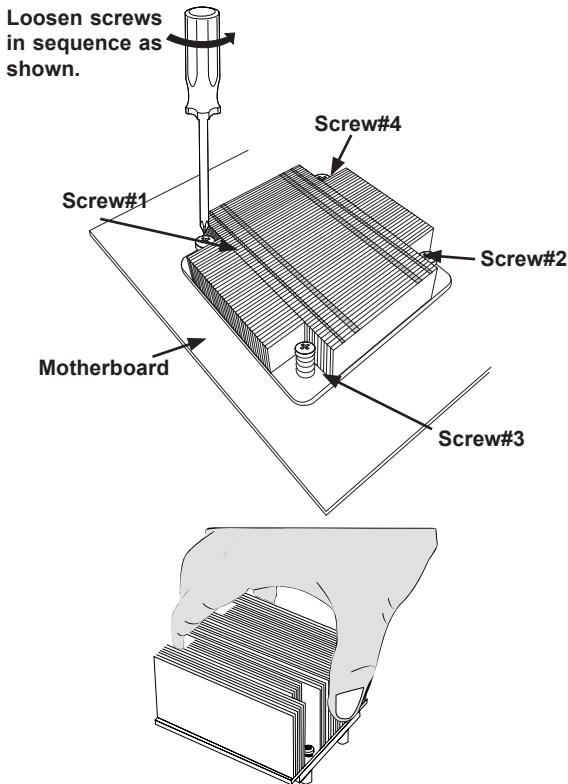


 **Notes:** 1. For optimized airflow, please follow your chassis airflow direction to install the correct CPU heatsink direction. 2. Graphic drawings included in this manual are for reference only. They might look different from the components installed in your system.

Removing the Heatsink

Warning: We do not recommend that the CPU or the heatsink be removed. However, if you do need to uninstall the heatsink, please follow the instructions below to uninstall the heatsink to prevent damage done to the CPU or the CPU socket.

1. Unscrew the heatsink screws from the motherboard in the sequence as shown in the illustration below.
2. Gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink!)
3. Once the CPU is loosened, remove the CPU from the CPU socket.
4. Remove the used thermal grease and clean the surface of the CPU and the heatsink, Reapply the proper amount of thermal grease on the surface before reinstalling the CPU and the heatsink. (Do not reuse old thermal grease.)



2-5 Installing and Removing the Memory Modules

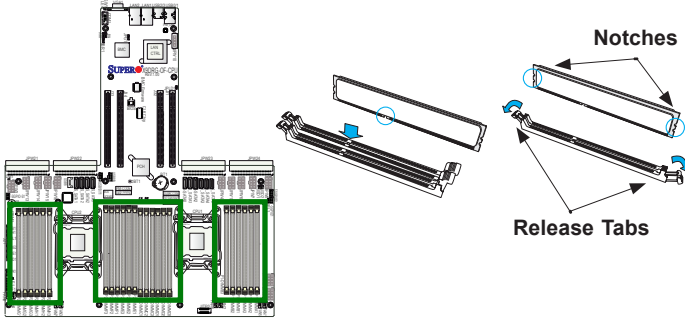
 **Note:** Check Supermicro's website for recommended memory modules.

CAUTION

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

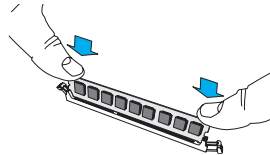
Installing & Removing DIMMs

1. Insert the desired number of DIMMs into the memory slots, starting with P1-DIMMA1. (*For best performance, please use the memory modules of the same type and speed in the same bank.*)
2. Push the release tabs outwards on both ends of the DIMM slot to unlock it.



3. Align the key of the DIMM module with the receptive point on the memory slot.
4. Align the notches on both ends of the module against the receptive points on the ends of the slot.
5. Use two thumbs together to press the notches on both ends of the module straight down into the slot until the module snaps into place.
6. Press the release tabs to the locking positions to secure the DIMM module into the slot.

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



Removing Memory Modules

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

Memory Support for the X9DRG-O(T)F Motherboard

The X9DRG-O(T)F-CPU/X9DRG-O-PCIE motherboard supports up to 1.5 TB of Load Reduced (LRDIMM), 768 Gb of Registered (RDIMM) or 128 GB of Unbuffered (UDIMM) ECC/Non-ECC DDR3 800/1066/1333/1600/1866 MHz of 240-pin 4-channel memory in 24 DIMM slots.



Note: For the latest memory updates, please refer to the Tested Memory List posted on our website (<http://www.supermicro.com/products/motherboard>).

Processor & Memory Module Population Configuration

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

Processors and their Corresponding Memory Modules												
CPU#	Corresponding DIMM Modules											
CPU 1 P1-DIMM	A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3
CPU2 P2-DIMM	E1	E2	E3	F1	F2	F3	G1	G2	G3	H1	H2	H3

Processor and Memory Module Population	
Number of CPUs+DIMMs	CPU and Memory Population Configuration Table (*For memory to work properly, please follow the instructions below.)
1 CPU & 2 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1
1 CPU & 4 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1
1 CPU & 5-8 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1, P1-DIMMA2/P1-DIMMB2, P1-DIMMC2/P1-DIMMD2
1 CPU & 9-12 DIMMs	CPU1 P1-DIMMA1/P1-DIMMB1, P1-DIMMC1/P1-DIMMD1, P1-DIMMA2/P1-DIMMB2, P1-DIMMC2/P1-DIMMD2, P1-DIMMA3/P1-DIMMB3, P1-DIMMC3/P1-DIMMD3
2 CPUs & 4 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1
2 CPUs & 6 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1, P1-DIMMC1/P1-DIMMD1
2 CPUs & 8 DIMMs	CPU1 + CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1, P1-DIMMC1/P1-DIMMD1, P2-DIMMG1/P2-DIMMH1
2 CPUs & 9-12 DIMMs	CPU1/CPU2 P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1, P1-DIMMC1/P1-DIMMD1, P2-DIMMG1/P2-DIMMH1, P1-DIMMA2/P1-DIMMB2, P2-DIMME2/P2-DIMMF2
2 CPUs & 13 DIMMs-24 DIMMs	CPU1/CPU P1-DIMMA1/P1-DIMMB1, P2-DIMME1/P2-DIMMF1, P1-DIMMC1/P1-DIMMD1, P2-DIMMG1/P2-DIMMH1, P1-DIMMA2/P1-DIMMB2, P2-DIMME2/P2-DIMMF2, P1-DIMMC2/P1-DIMMD2, P2-DIMMG2/P2-DIMMH2, P1-DIMMA3/P1-DIMMB3, P2-DIMME3/P2-DIMMF3, P1-DIMMC3/P1-DIMMD3, P2-DIMMG3/P2-DIMMH3

Populating UDIMM (ECC/Non-ECC) Memory Modules

Intel E5-2600(v2) Series Processor UDIMM Memory Support											
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)							
				2 Slots Per Channel				3 Slots Per Channel			
	1DPC		2DPC		1DPC		2DPC				
	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V			
SRx8 Non-ECC	1GB	2GB	4GB	NA	1066, 1333, 1600, 1866	NA	1066, 1333, 1600	N/A	1066, 1333, 1600, 1866	N/A	1066, 1333, 1600
DRx8 Non-ECC	2GB	4GB	8GB	NA	1066, 1333, 1600, 1866	NA	1066, 1333, 1600	N/A	1066, 1333, 1600, 1866	N/A	1066, 1333, 1600
SRx16 Non-ECC	512MB	1GB	2GB	NA	1066, 1333, 1600, 1866	NA	1066, 1333, 1600	N/A	1066, 1333, 1600, 1866	N/A	1066, 1333, 1600
SRx8 ECC	1GB	2GB	4GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600
DRx8 ECC	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Populating UDIMM (ECC/Non-ECC) Memory Modules

Intel E5-2600 Series Processor UDIMM Memory Support											
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)							
				2 Slots Per Channel				3 Slots Per Channel			
	1DPC		2DPC		1DPC		2DPC				
	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V			
SRx8 Non-ECC	1GB	2GB	4GB	NA	1066, 1333	NA	1066, 1333	N/A	1066, 1333	N/A	1066, 1333
DRx8 Non-ECC	2GB	4GB	8GB	NA	1066, 1333	NA	1066, 1333	N/A	1066, 1333	N/A	1066, 1333
SRx16 Non-ECC	512MB	1GB	2GB	NA	1066, 1333	NA	1066, 1333	N/A	1066, 1333	N/A	1066, 1333
SRx8 ECC	1GB	2GB	4GB	1066, 1333	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066, 1333	1066, 1333
DRx8 ECC	2GB	4GB	8GB	1066, 1333	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066, 1333	1066, 1333

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.



Notes: 1866 MHz memory speed is dependent on Intel E5-2600v2 CPUs. For Intel E5-2600(v2) processor support, BIOS version 3.0 or above is required.

Populating RDIMM (ECC) Memory Modules

Intel E5-2600 Series Processor RDIMM Memory Support													
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note Below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)									
				2 Slots Per Channel				3 Slots Per Channel					
				1DPC		2DPC		1 DPC		2DPC		3DPC	
				1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5v
SRx8	1GB	2GB	4GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	N/A	800, 1066
DRx8	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	N/A	800, 1066
SRx4	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	N/A	800, 1066
DRx4	4GB	8GB	16GB	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	N/A	800, 1066
QRx4	8GB	16GB	32GB	800	1066	800	800	800	1066	800	800	N/A	N/A
QRx8	4GB	8GB	16GB	800	1066	800	800	800	1066	800	800	N/A	N/A

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Populating RDIMM (ECC) Memory Modules

Intel E5-2600(v2) Series Processor RDIMM Memory Support													
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note Below)			Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)									
				2 Slots Per Channel				3 Slots Per Channel					
				1DPC		2DPC		1 DPC		2DPC		3DPC	
				1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5v
SRx8	1GB	2GB	4GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	800	800, 1066
DRx8	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333, 1600	1066, 1333, 1600	800	800, 1066
SRx4	2GB	4GB	8GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	800	800, 1066
DRx4	4GB	8GB	16GB	1066, 1333	1066, 1333, 1600, 1866	1066, 1333	1066, 1333, 1600	1066, 1333	1066, 1333, 1600, 1866	1066, 1333, 1600	1066, 1333, 1600	800	800, 1066
QRx4	8GB	16GB	32GB	800	800, 1066	800	800	800	800, 1066	800	800	N/A	N/A
QRx8	4GB	8GB	16GB	800	800, 1066	800	800	800	800, 1066	800	800	N/A	N/A

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Populating LRDIMM (ECC) Memory Modules

Intel E5-2600(v2) Series Processor LRDIMM Memory Support												
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note Below)		Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)									
			2 Slots Per Channel					3 Slots Per Channel				
			1DPC		2DPC		1DPC		2DPC		3DPC	
			1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V
QRx4 (DDP)	16GB	32GB	1066, 1333, 1600	1066, 1333, 1600, 1866	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600	1066, 1333, 1600, 1866	1066, 1333, 1600	1066, 1333, 1600	1066	1066
8Rx4 (QDP)	32GB	64GB	1066	1066	1066	1066	1066	1066	1066	1066	1066	1066

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.

Intel E5-2600 Series Processor LRDIMM Memory Support												
Ranks Per DIMM & Data Width	Memory Capacity Per DIMM (See the Note Below)		Speed (MT/s) and Voltage Validated by Slot per Channel (SPC) and DIMM Per Channel (DPC)									
			2 Slots Per Channel					3 Slots Per Channel				
			1DPC		2DPC		1DPC		2DPC		3DPC	
			1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V	1.35V	1.5V
QRx4 (DDP)	16GB	32GB	1066	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066	1066, 1333	1066	1066
QRx8 (QDP)	8GB	16GB	1066	1066, 1333	1066	1066, 1333	1066	1066	1066	1066	1066	1066

Note: For detailed information on memory support and updates, please refer to the SMC Recommended Memory List posted on our website at <http://www.supermicro.com/support/resources/mem.cfm>.



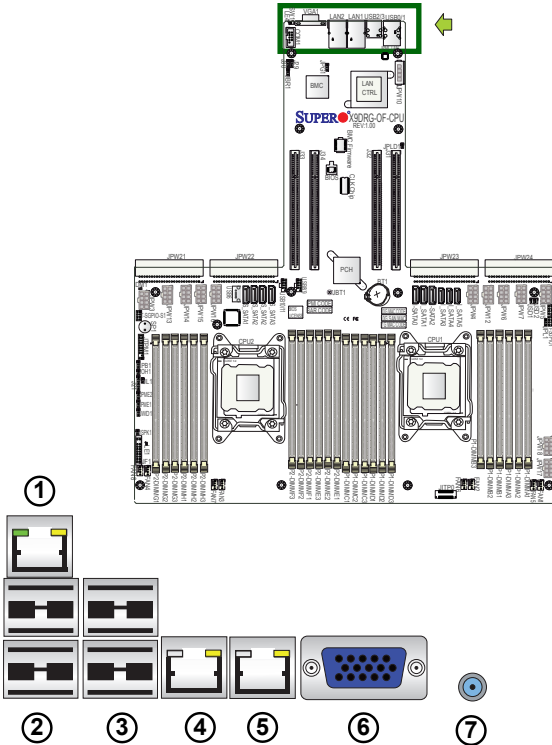
Other Important Notes and Restrictions

- For the memory modules to work properly, please install DIMM modules of the same type, same speed and same operating frequency on the motherboard. Mixing of RDIMMs, UDIMMs or LRDIMMs is not allowed. Do not install both ECC and Non-ECC memory modules on the same motherboard.
- Using DDR3 DIMMs with different operating frequencies is not allowed. All channels in a system will run at the lowest common frequency.

2-6 Control Panel Connectors and I/O Ports

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

Back Panel Connectors and I/O Ports



Back Panel I/O Port Locations and Definitions

1.	IPMI LAN
2.	Back Panel USB Port 0/1
3.	Back Panel USB Port 2/3
4.	LAN1
5.	LAN2
6.	VGA port (Blue)
7.	UID Switch

Universal Serial Bus (USB)

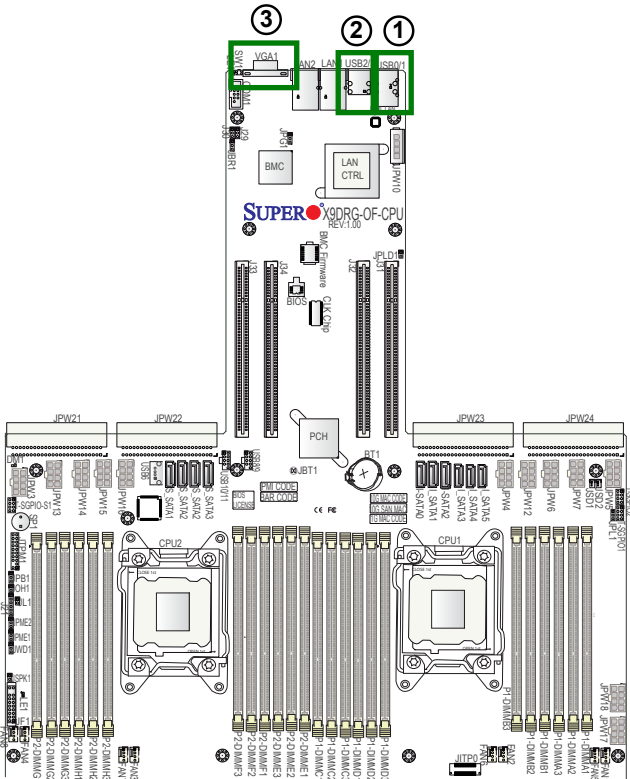
Four Universal Serial Bus ports (USB 0/1, 2/3) are located on the I/O backplane to provide USB connections. (Cables are not included). See the tables on the right for pin definitions.

Backplane USB Pin Definitions	
Pin#	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	NA

Video Connection

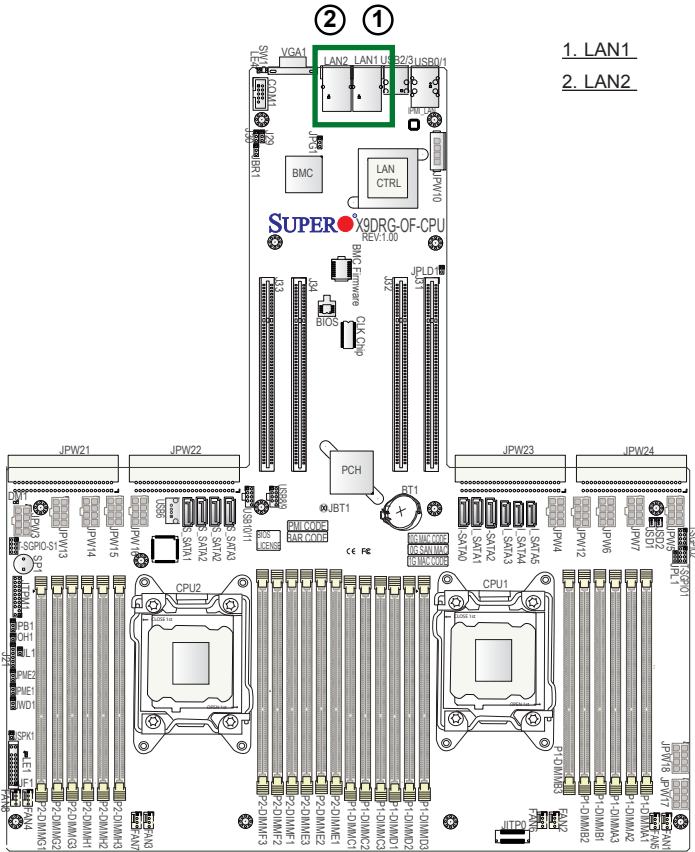
A Video (VGA1) port is located next to LAN2 on the I/O backplane. Refer to the board layout below for the location.

1. BP USB0/1
2. BP USB2/3
3. VGA port



Ethernet Ports


Two Ethernet ports (LAN1, LAN2) are located on the I/O backplane on the motherboard. These LAN ports support 10G LAN (for X9DRG-OTF-CPU) or 1G LAN (for X9DRG-OF-CPU). These ports accept RJ45 type cables. Please refer to the LED Indicator Section for LAN LED information.

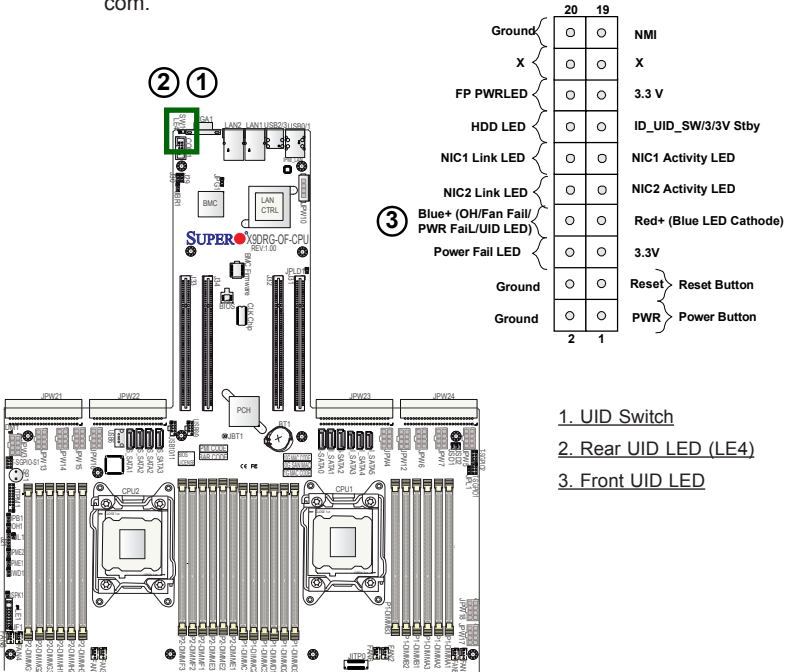


Unit Identifier Switch

A Unit Identifier (UID) Switch and two LED Indicators are located on the motherboard. The UID Switch is located next to LAN2 port on the backplane. The Rear UID LED (LE4) is located next to the UID Switch. The Front Panel UID LED is located at pins 7/8 of the Front Control Panel at JF1. Connect a cable to pin 8 on JF1 for Front Panel UID LED indication. When you press the UID switch, both Rear UID LED and Front Panel UID LED Indicators will be turned on. Press the UID switch again to turn off both LED Indicators. These UID Indicators provide easy identification of a system unit that may be in need of service.

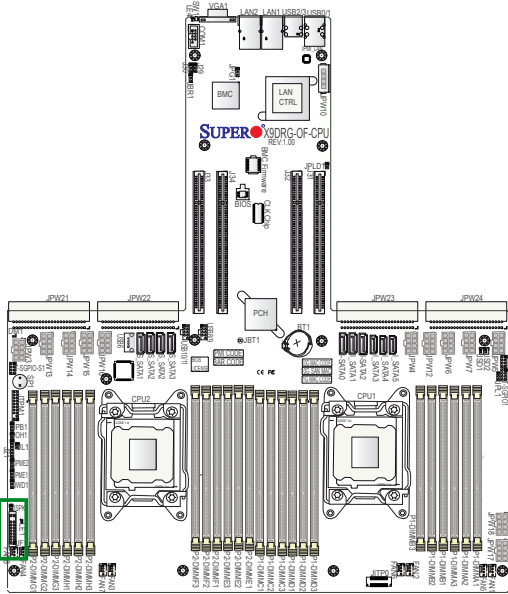
UID LED (LE) Status		
Color/State	OS	Status
Blue: On	Windows OS	Unit Identified
Blue: Blinking	Linux OS	Unit Identified

 **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 @ <http://www.supermicro.com>.

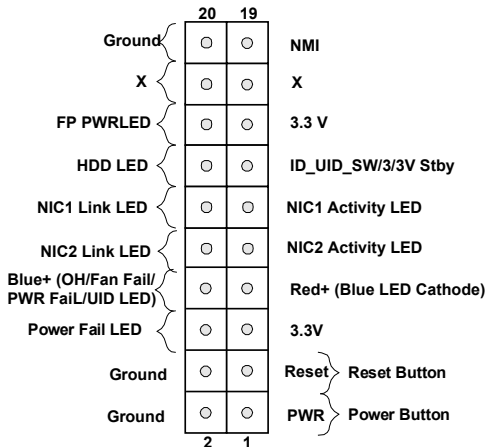


Front Control Panel

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



JF1 Header Pins



Front Control Panel Pin Definitions

NMI Button

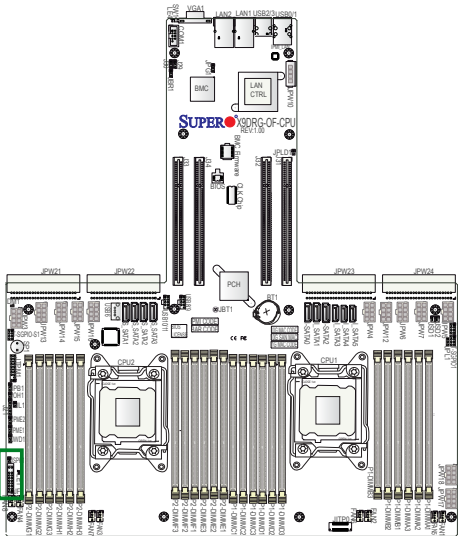
The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

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

Power LED

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

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



A. NMI

B. PWR LED

	20	19	
Ground	○	○	NMI A
X	○	○	X
B FP PWRLED	○	○	3.3 V
HDD LED	○	○	ID_UID_SW/3/3V Stby
NIC1 Link LED	○	○	NIC1 Activity LED
NIC2 Link LED	○	○	NIC2 Activity LED
Blue+ (OH/Fan Fail/ PWR Fail/UID LED)	○	○	Red+ (Blue LED Cathode)
Power Fail LED	○	○	3.3V
Ground	○	○	Reset } Reset Button
Ground	○	○	PWR } Power Button
	2	1	

HDD LED/UID Switch

The HDD/UID Switch connection is located on pins 13 and 14 of JF1. Attach a hard drive LED cable here to display HDD activities, including Serial ATA activities. Connect a UID switch cable to use UID switch connection. The front UID switch works in conjunction with UID LED located at pins 7/8 and rear UID LED (LE4). Also refer to page 2-21 for more UID switch/LED information. See the table on the right for pin definitions.

HDD LED/UID Switch Pin Definitions (JF1)	
Pin#	Definition
13	UID Switch/3,3V
14	HDD Active

NIC1/NIC2 LED Indicators

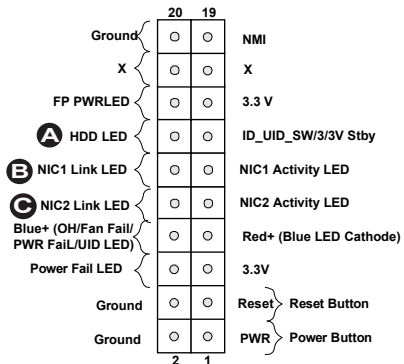
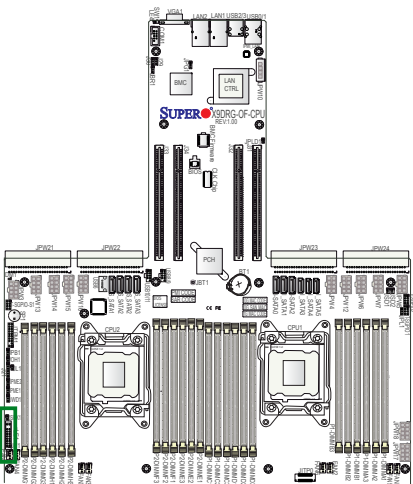
The NIC (Network Interface Controller) LED connection for LAN port 1 is located on pins 11 and 12 of JF1, and the LED connection for LAN Port 2 is located on pins 9 and 10. Attach the NIC LED cables here to display network activity. Refer to the table on the right for pin definitions.

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

A. HDD LED/UID Switch

B. NIC1 LED

C. NIC2 LED



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 7 provides warnings of overheat, fan failure or power failure. The Blue LED on pin 8 works as the front panel UID LED indicator. The Red LED takes precedence over the Blue LED by default. Refer to the tables on the right for pin definitions.

OH/Fan Fail/ PWR Fail/Blue_UID LED Pin Definitions (JF1)	
Pin#	Definition
7	Red_LED-Cathode/OH/Fan Fail/ Power Fail
8	Blue_UID LED

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

Power Fail LED

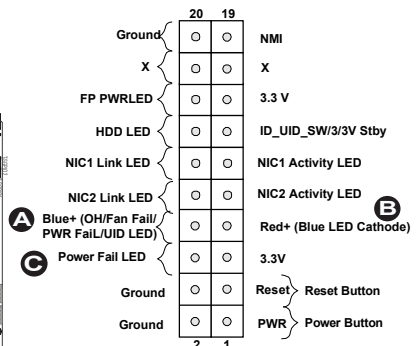
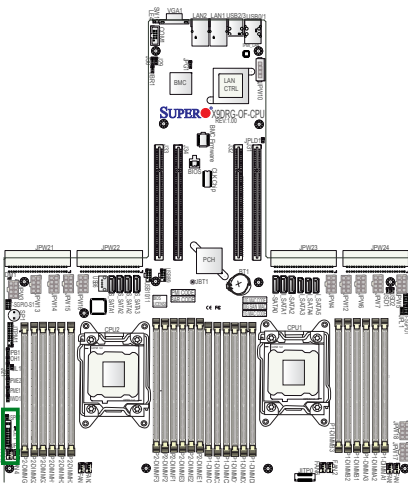
The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

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

A. OH/Fail/PWR Fail LED/UID LED

B. Blue LED Cathode

C. PWR Supply Fail



Reset Button

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

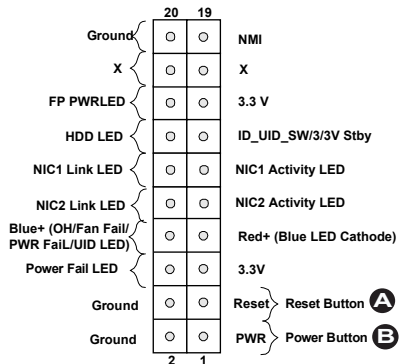
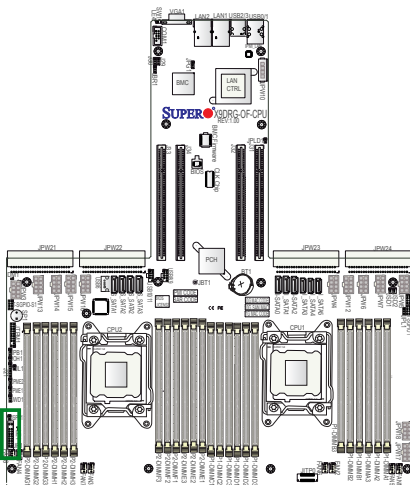
Reset Button Pin Definitions (JF1)	
Pin#	Definition
3	Reset
4	Ground

Power Button

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

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

- A. Reset Button
- B. PWR Button



2-7 Connecting Cables

Power Connectors

To provide adequate power supply to the motherboard, the X9DRG-O(T)F-CPU/ X9DRG-O-PCIE platform contains the following components. See the tables below for 8-pin power connector pin definitions.

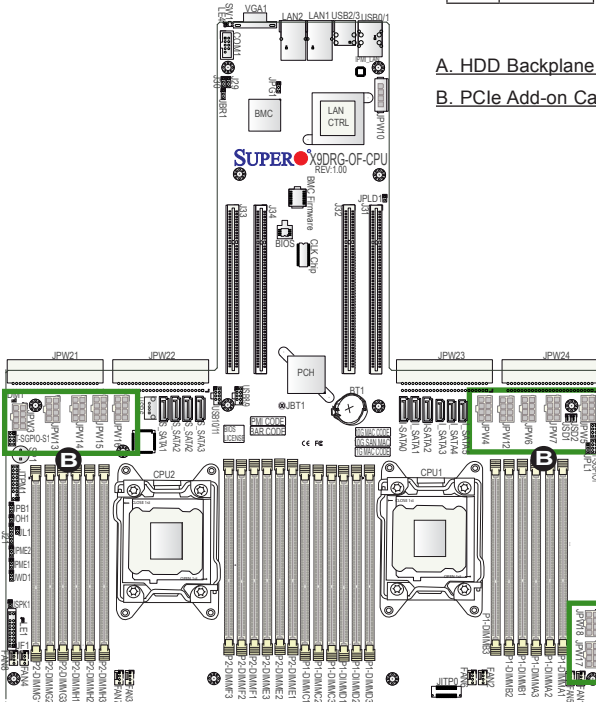
- Two (2) HDD Backplane Power Connectors (JPW17, JPW18)
- Ten (10) PCIe Add-on Card AUX Power Connectors (JPW3-JPW7, JPW12-JPW16)

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

8-Pin PCIe AUX Power Connector Pin Definitions		8-pin HDD backplane Power Connector Pin Definitions	
Pins	Definition	Pins	Definition
1~3	+12V	1~4	Ground
4~8	Ground	5~6	+12V
		7~8	+5V

A. HDD Backplane Power Connectors

B. PCIe Add-on Card AUX Power Connectors



Fan Headers

This motherboard has eight fan headers for CPU/system use. All these 4-pin fans headers are backward compatible with the traditional 3-pin fans. However, fan speed control is only available for 4-pin fans via IPMI thermal management. See the table on the right for pin definitions.

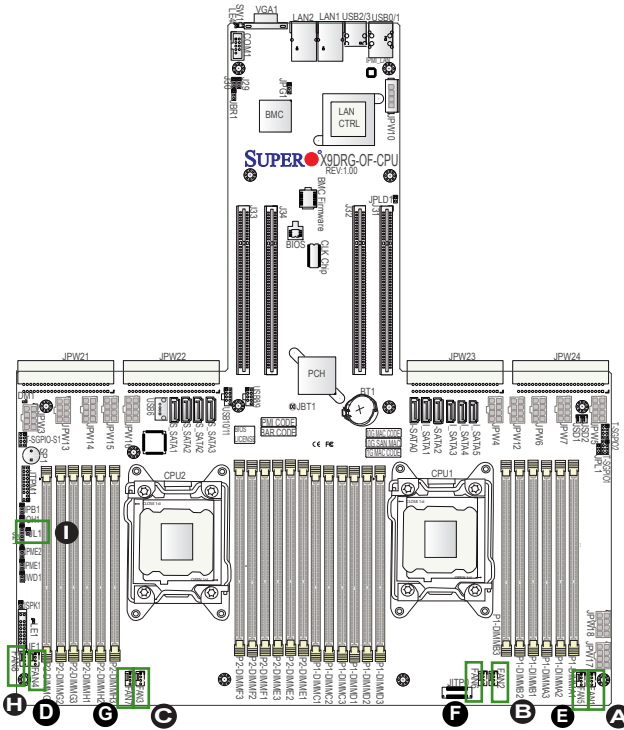
Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	Pulse Width Modulation

Chassis Intrusion

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

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

- A. Fan 1
- B. Fan 2
- C. Fan 3
- D. Fan 4
- E. Fan 5
- F. Fan 6
- G. Fan 7
- H. Fan 8
- I. Chassis Intrusion

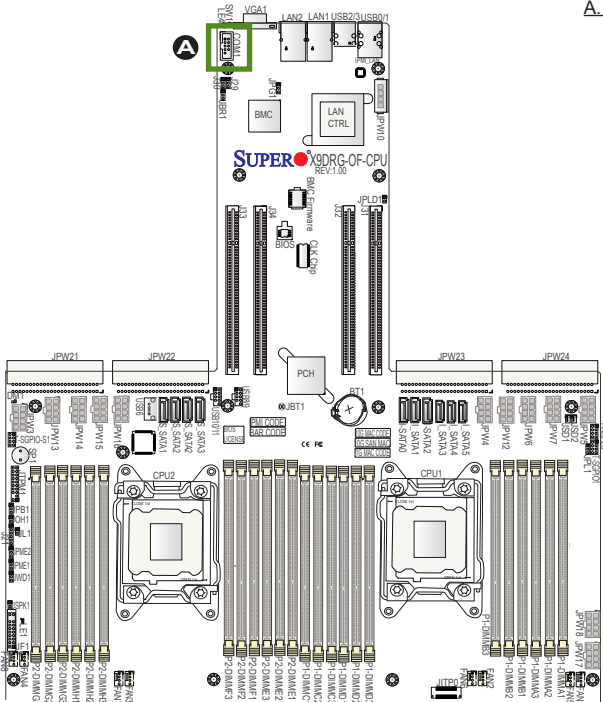


Serial Ports

A COM port header is located next to the BMC controller on the motherboard. See the table on the right for pin definitions.

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

A. COM1



TPM Header/Port 80

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

TPM/Port 80 Header Pin Definitions			
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD3	8	LAD2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_CLK(X)	14	SMB_DAT(X)
15	+3V_DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#(X)	20	LDRQ# (X)

Overheat LED/Fan Fail

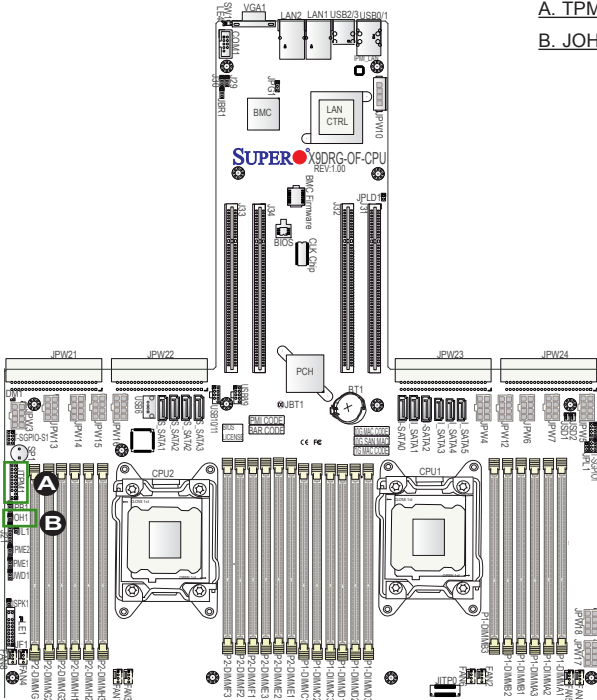
The JOH1 header is used to connect an LED indicator to provide warnings of chassis overheating and fan failure. This LED will blink when a fan failure occurs. Refer to the tables on right for pin definitions.

Overheat LED Pin Definitions	
Pin#	Definition
1	P3V3
2	OH Active Low Signal

OH/Fan Fail LED Status	
State	Message
Solid	Overheat
Blinking (1Hz)	Fan Fail
Blinking (0.25Hz)	PWRFail

A. TPM/Port 80 Header

B. JOH1

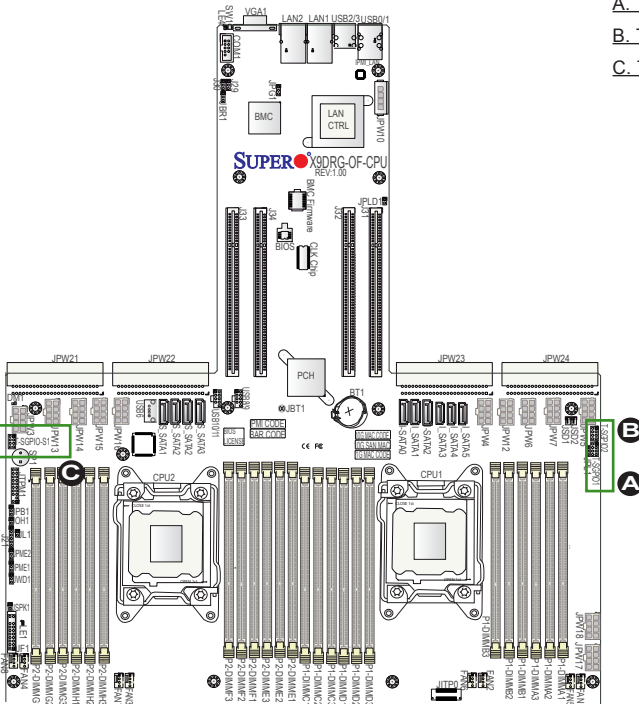


T-SGPIO1/2/-S1 Headers

Two T-SGPIO (Serial-Link General Purpose Input/Output) headers (T-SGPIO1/2/-S1) are located on the motherboard. These headers support Serial_Link interface for onboard SATA connections. See the table on the right for pin definitions.

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

Note: NC= No Connection



- A. T-SGPIO1
- B. T-SGPIO2
- C. T-SGPIO-S1

Speaker Header

The speaker header (JSPK1) for a buzzer can be used to provide audible indications for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the locations of the speaker header.

Speaker Header Pin Definition		
Pin#	Definitions	
Pin 1	Pos. (+)	5V
Pin 2	Neg. (-)	Alarm Speaker

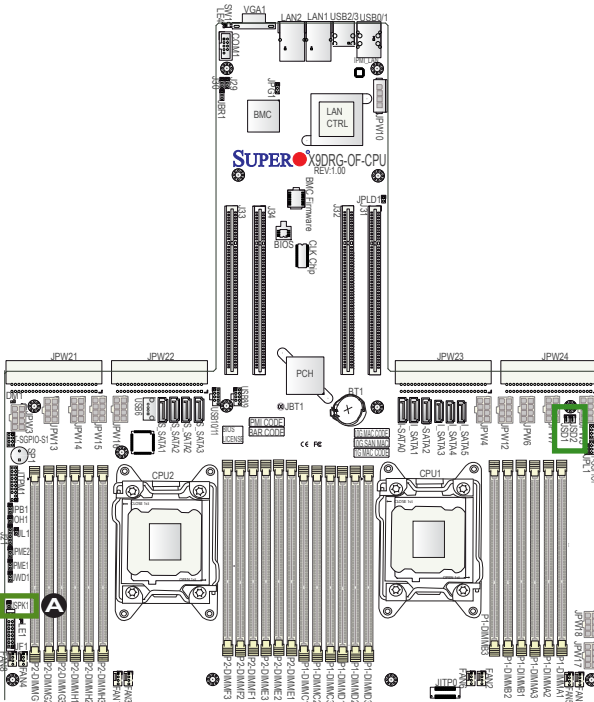
DOM Power Connector

The power connectors for SATA DOM (Disk_On_Module) devices are located at JSD1 and JSD2. Connect an appropriate cable here to provide backup power support for your SATA DOM devices to retain cache data during power outage. See the table on the right for pin definitions.

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

A. Onboard Speaker Header


B. SATA DOM PWR

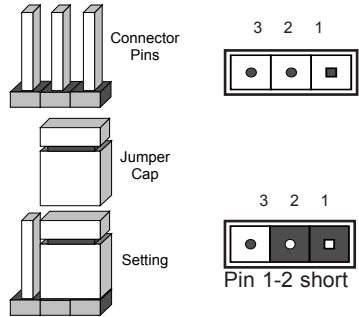


2-8 Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.

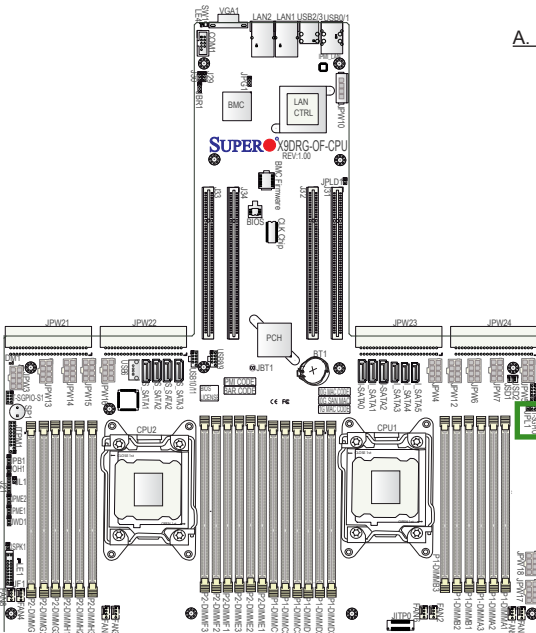
 **Note:** On two-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



GLAN Enable/Disable

JPL1 enables or disables the LAN Port1/ LAN Port2 on the motherboard. See the table on the right for jumper settings. The default setting is Enabled.


LAN Enable Jumper Settings	
Jumper Setting	Definition
1-2	Enabled (default)
2-3	Disabled



A. GLAN1/GLAN2 Enable

CMOS Clear

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

 **Note 1:** For an ATX power supply, you must completely shut down the system, remove the AC power cord, and then short JBT1 to clear CMOS.

Note 2: Be sure to remove the onboard CMOS Battery before you short JBT1 to clear CMOS.

Note 3: Clearing CMOS will also clear all passwords.

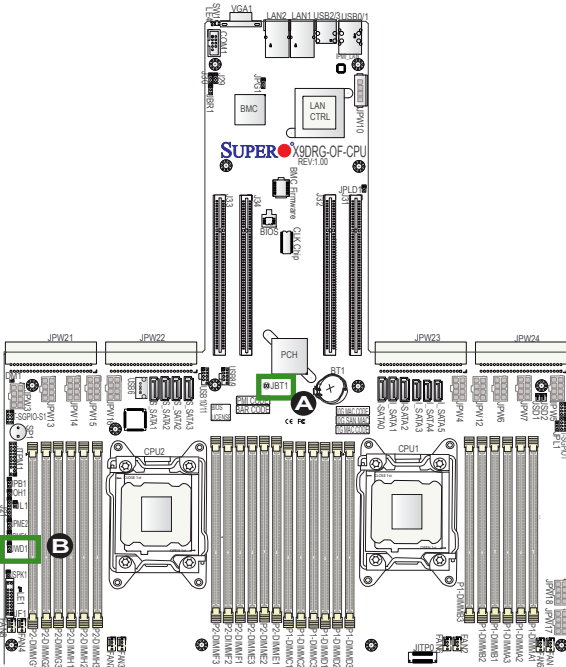
Watch Dog Enable/Disable

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

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

A. Clear CMOS

B. Watch Dog Enable



VGA Enable

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

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

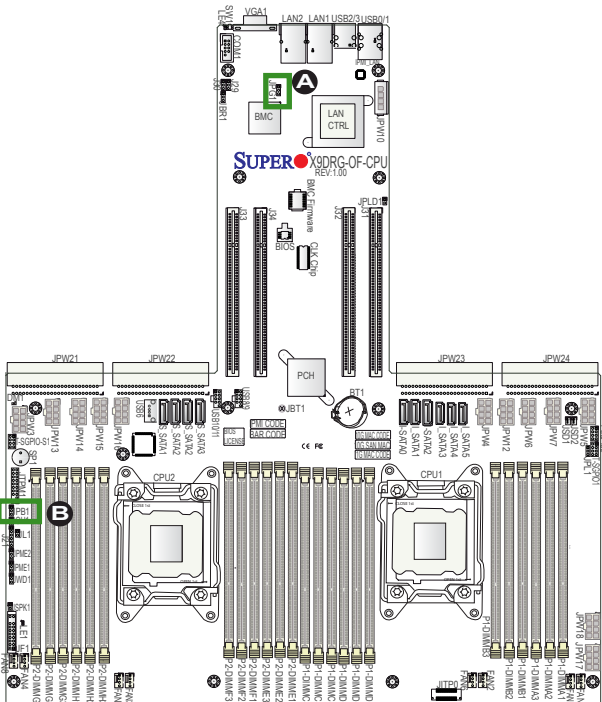
BMC Enable

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

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

[A. VGA Enabled](#)

[B. BMC Enabled](#)



Management Engine (ME) Recovery

Use Jumper JPME1 to select ME Firmware Recovery mode, which will limit resource allocation for essential system operation only in order to maintain normal power operation and management. In the single operation mode, online upgrade will be available via Recovery mode. See the table on the right for jumper settings.

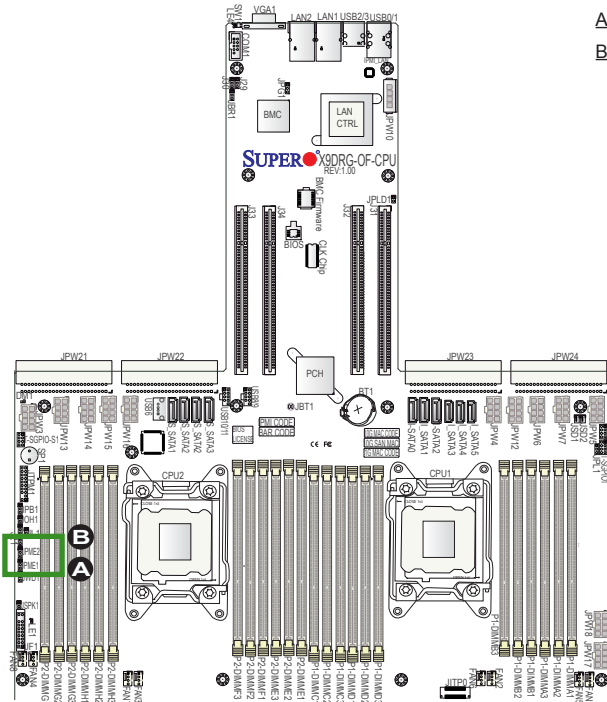
ME Recovery Jumper Settings	
Jumper Setting	Definition
1-2	Normal (Default)
2-3	ME Recovery

Manufacture Mode Select

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

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

- A. JPME1
- B. JPME2



2-9 Onboard LED Indicators

LAN LEDs

There are two LAN ports on the motherboard. Each Ethernet LAN port has two LEDs. The Yellow LED on the right indicates activity. The LED on the left is the Link LED, which can be green, amber or off to indicate the speed of the connection. See the tables below for more information.



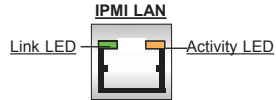
Rear View (when facing the rear side of the chassis)

GLAN/10G LAN (TLAN) Activity LED Settings (Right)		
Color	Status	Definition
Green	Flashing	Active

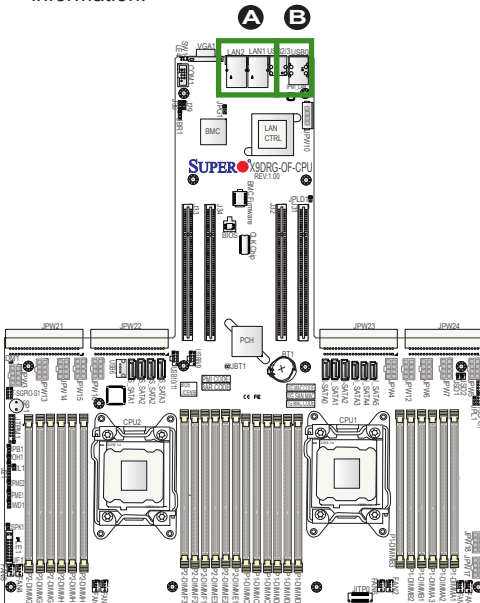
LAN 1/LAN 2 Link LED (Left) LED State	
LED Color	Definition
Off	10 Mbps, 100 Mbps, or No Connection
Amber	1 Gbps
Green	10 Gbps

IPMI Dedicated LAN LEDs

In addition to LAN 1/LAN 2, an IPMI Dedicated LAN is also located on the I/O Backplane of the motherboard. The amber LED on the right indicates activity, while the green LED on the left indicates the speed of the connection. See the table on the right for more information.



IPMI LAN Link LED (Left) & Activity LED (Right)		
	Color/State	Definition
Link (Left)	Green: Solid	100 Mbps
Activity (Right)	Amber: Blinking	Active



A. LAN1/2 LEDs

B. IPMI LAN LEDs

Onboard Power LED

An Onboard Power LED is located at LE1 on the motherboard. When this LED is on, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the table on the right for more information.

Onboard PWR LED Indicator (LE1) LED Settings	
LED Color	Definition
Off	System Off (PWR cable not connected)
Green	System On
Green: Flashing Quickly	ACPI S1 State
Green: Flashing Slowly	ACPI S3 (STR) State

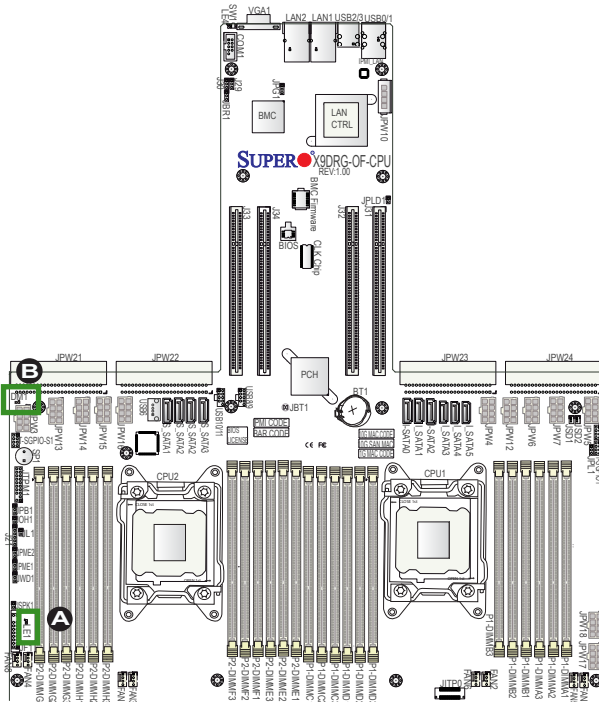
BMC Heartbeat LED

A BMC Heartbeat LED is located at DM1 on the motherboard. When DM1 is blinking, BMC functions normally. See the table on the right for more information.

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

A. PWR LED

B. BMC Heartbeat LED




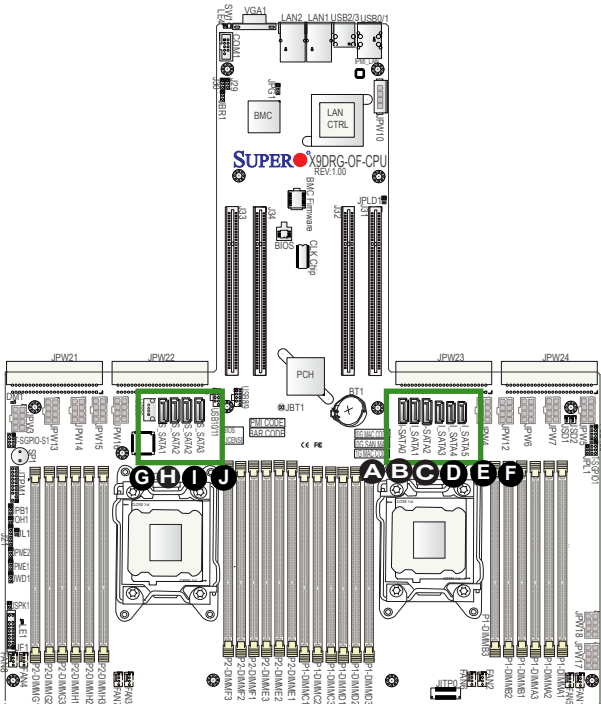
2-10 Serial ATA Connections

Serial ATA Ports

There are two SATA 3.0 Ports (I-SATA0/1) and four SATA 2.0 ports (I-SATA2-I-SATA5) on the motherboard. There are also four S-SATA 2.0 ports (S-SATA1-S-SATA4). These ports provide serial-link signal connections, which are faster than the connections of Parallel ATA. See the table on the right for pin definitions.

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

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



- A. I-SATA0
- B. I-SATA1
- C. I-SATA2
- D. I-SATA3
- E. I-SATA4
- F. I-SATA5
- G. S-SATA1
- H. S-SATA2
- I. S-SATA3
- J. S-SATA4

Notes

Chapter 3

Troubleshooting

3-1 Troubleshooting Procedures

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

Before Power On

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

No Power

1. Make sure that there are no short circuits between the motherboard and the chassis.
2. Make sure that the ATX power connectors are properly connected
3. Check that the 115V/230V switch on the power supply is properly set, if available.
4. Turn the power switch on and off to test the system, if applicable.
5. The battery on your motherboard may be old. Check to verify that it still supplies ~3VDC. If it does not, replace it with a new one.

No Video

1. If the power is on, but you have no video, remove all the add-on cards and cables.
2. Use the speaker to determine if any beep codes exist. Refer to Appendix A for details on beep codes.

System Boot Failure

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

1. Check for any error beep from the motherboard speaker.
 - If there is no error beep, try to turn on the system without DIMM modules installed. If there is still no error beep, try to turn on the system again with only one processor installed in CPU Socket#1. If there is still no error beep, replace the motherboard.
 - If there are error beeps, clear the CMOS settings by unplugging the power cord and contacting both pads on the CMOS Clear Jumper (JBT1). (Refer to Chapter 2.)
2. Remove all components from the motherboard, especially the DIMM modules. Make sure that the system's power is on, and memory error beeps are activated.
3. Turn on the system with only one DIMM module installed. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this Chapter.

Losing the System's Setup Configuration

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

Memory Errors

When a No-Memory Beep Code is issued by the system, check the following:

1. Make sure that the memory modules are compatible with the system and that the DIMM modules are properly and fully installed. (For memory compatibility, refer to the Memory Compatibility Chart posted on our website @ <http://www.supermicro.com>.)
2. Check if different speeds of DIMMs have been installed. It is strongly recommended that you use the same RAM speed for all DIMMs in the system.
3. Make sure that you are using the correct type of Registered (RDIMM)/Load Reduced (LRDIMM) ECC or Unbuffered (UDIMM) ECC/Non-ECC DDR3 800/1066/1333/1600/1600 MHz 4-channel memory modules recommended by the manufacturer.
4. modules recommended by the manufacturer.
5. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.
6. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in section 2-5 of Chapter 2.
7. Please follow the instructions given in the DIMM Population Tables listed in Section 2-5 to install your memory modules.

When the System Becomes Unstable

A. The system becomes unstable during or after OS installation

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

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



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

3. HDD support: Make sure that all hard disk drives (HDDs) work properly. Replace the bad HDDs with good ones.

4. System cooling: Check system cooling to make sure that all heatsink fans, and CPU/system fans, etc., work properly. Check Hardware Monitoring settings in the BIOS to make sure that the CPU and System temperatures are within the normal range. Also check the front panel Overheat LED, and make sure that the Overheat LED is not on.
5. Adequate power supply: Make sure that the power supply provides adequate power to the system. Make sure that all power connectors are connected. Please refer to our website for more information on minimum power requirement.
6. Proper software support: Make sure that the correct drivers are used.

B. The system becomes unstable before or during OS installation

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

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

3-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, please note that as a motherboard manufacturer, Supermicro also sells motherboards through its channels, so it is best to first check with your distributor or reseller for troubleshooting services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our website (<http://www.supermicro.com/>) before contacting Technical Support.
 2. BIOS upgrades can be downloaded from our website (<http://www.supermicro.com>).
 3. If you still cannot resolve the problem, include the following information when contacting Supermicro for technical support:
 - Motherboard model and PCB revision number
 - BIOS release date/version (This can be seen on the initial display when your system first boots up.)
 - System configuration
 4. An example of a Technical Support form is on our website at (<http://www.supermicro.com>).
- Distributors: For immediate assistance, please have your account number ready when placing a call to our technical support department. We can be reached by e-mail at support@supermicro.com.

3-3 Battery Removal and Installation

Battery Removal

To remove the onboard battery, follow the steps below:

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

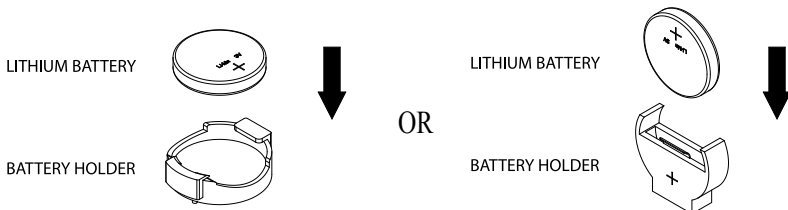
Proper Battery Disposal

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

Battery Installation

1. To install an onboard battery, follow the steps 1 & 2 above and continue below:
2. Identify the battery's polarity. The positive (+) side should be facing up.
3. Insert the battery into the battery holder and push it down until you hear a click to ensure that the battery is securely locked.

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



3-4 Frequently Asked Questions

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

Answer: The motherboard supports Registered (RDIMM)/Load Reduced (LRDIMM) ECC or Unbuffered (UDIMM) ECC/Non-ECC DDR3 4-channel memory. To enhance memory performance, do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on Section 2-4 in Chapter 2.

Question: How do I update my BIOS?

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

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



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

Question: How do I handle the used battery?

Answer: Please handle used batteries carefully. Do not damage the battery in any way; a damaged battery may release hazardous materials into the environment. Do not discard a used battery in the garbage or a public landfill. Please comply with the regulations set up by your local hazardous waste management agency to dispose of your used battery properly. (Refer to Section 3-3 on Page 3-6.)

3-5 Returning Merchandise for Service

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

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alternation, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Chapter 4


BIOS

4-1 Introduction


This chapter describes the AMI BIOS setup utility for the X9DRG-O(T)F-CPU/X9DRG-O-PCIE Platform. It also provides the instructions on how to navigate the AMI BIOS setup utility screens. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated.

Starting BIOS Setup Utility


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

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

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

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


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

 **Note 1:** In this section, options printed in **Bold** are default settings.

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

How To Change the Configuration Data

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

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

Starting the Setup Utility

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

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

4-2 Main Setup

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



The AMI BIOS main menu displays the following information:

System Date

This item displays the system date in Day MM/DD/YYYY format (e.g. Wed 01/15/2014).

System Time

This item displays the system time in HH:MM:SS format (e.g. 15:32:52).

Supermicro X9DRG-O(T)F

Version

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

Build Date

This item displays the date that the BIOS ROM was built.

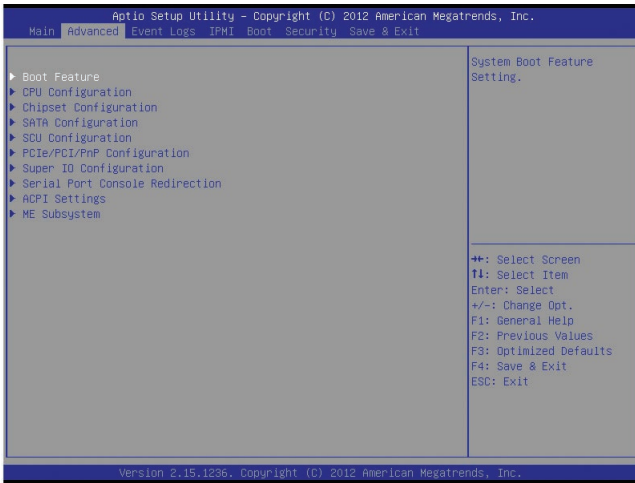
Memory Information

Total Memory

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

4-3 Advanced Setup Configurations

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



► Boot Feature

Quiet Boot

This feature allows the user to select the bootup screen display between POST messages and the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

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 Num Lock key. The options are Off and **On**.

Wait For 'F1' If Error

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

Interrupt 19 Capture

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

Re-try Boot

Use this item to select the type of the bootable device that the BIOS will continuously try to boot the system from. The options are **Disabled**, Legacy Boot, and EFI Boot.

Power Configuration

Watch Dog Function

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

Power Button Function

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

Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Stay 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 state before a power loss. The options are Power On, Stay Off, and **Last State**.

► CPU Configuration

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

► Socket 1 CPU Information/Socket 2 CPU Information

This submenu displays the following information regarding the CPU installed in Socket 1 or Socket 2.

- Type of CPU

- CPU Signature
- Microcode Patch
- CPU Stepping
- Max (Maximum) CPU Speed
- Min (Minimum) CPU Speed
- Processor Cores
- Intel HT (Hyper-Threading) Technology
- Intel VT-x Technology
- Intel SMX Technology
- L1 Data Cache
- L1 Code Cache
- L2 Cache
- L3 Cache

CPU Speed

This item displays the speed of the CPU installed in the Socket selected.

64-bit

This item indicates if 64-bit technology is supported by the CPU installed in the socket specified.

Clock Spread Spectrum

Select Enable to enable Clock Spread Spectrum support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components when needed. The options are **Disabled** and Enabled.

RTID (Record Types IDs)

Use this item to configure the RTID setting which determines how the system memory should be accessed. Select Optimal for all normal applications and benchmarking operations. Select Alternate for I/O-intensive applications that require direct access to the system memory. The options are **Optimal** and Alternate.

Hyper-threading

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

Active Processor Cores

Set to Enabled to use a processor's second core and above. (Please refer to Intel's website for more information.) The options are **All**, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11.

Limit CPUID Maximum

This feature allows the user to set the maximum CPU ID value. Enable this function to boot the legacy operating systems that cannot support processors with extended CPUID functions. The options are Enabled and **Disabled** (for the Windows OS).

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

Select Enabled to enable the Execute Disable Bit which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web sites for more information.)

Intel® AES-NI

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

MLC Streamer Prefetcher (Available when supported by the CPU)

If set to Enabled, the prefetcher for the MLC (mid-level cache) streamer will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

MLC Spatial Prefetcher (Available when supported by the CPU)

If this feature is set to Disabled, the CPU prefetches the cache line for 64 bytes. If this feature is set to Enabled the CPU fetches both cache lines for 128 bytes as comprised. The options are Disabled and **Enabled**.

DCU Streamer Prefetcher (Available when supported by the CPU)

Select Enabled for the Data Cache Unit (DCU) prefetcher to prefetch L1 data for CPU use in an effort to speed up data accessing and processing in the DCU. The options are Disabled and **Enabled**.

DCU IP Prefetcher

Select Enabled to activate the DCU (Data Cache Unit) IP prefetcher so that it will prefetch IP addresses to improve network connectivity and system performance. The options are **Enabled** and Disabled.

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

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



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

PPIN Support (Available when supported by the CPU)

Select Enabled to enable Protected Processor Inventory Number (PPIN) support, which will allow the Ivy Bridge server processors to return 64-bit ID numbers. The options are **Enabled** and Disabled.

► CPU Power Management Configuration

This submenu allows the user to configure the following CPU Power Management settings.

Power Technology

Select Energy Efficiency to support power-saving mode. Select Custom to customize system power settings. Select Disabled to disable power-saving features. Select Max Performance to configure power mode to allow for maximum system performance. The options are Disabled, **Energy Efficient**, Custom and Max Performance. If the option is set to Custom, the following items will display:

EIST (Available when Power Technology is set to Custom)

Select Enabled to support EIST (Enhanced Intel SpeedStep Technology) which will allow the system to automatically adjust processor voltage and core frequency to reduce power consumption and heat dissipation. The options are Disabled and **Enabled**.

Turbo Mode (Available when Power Technology is set to Custom and EIST is enabled)

This feature allows processor cores to run faster than marked frequency in specific conditions. The options are Disabled and **Enabled**.

C1E Support (Available when Power Technology is set to Custom)

Select Enabled to enable Enhanced C1 Power State to boost system performance. The options are **Enabled** and Disabled.

CPU C3 Report (Available when Power Technology is set to Custom)

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

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

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

Package C State limit (Available when Power Technology is set to Custom)

This feature allows the user to set the limit on the C-State package register. The options are C0, C2, **C6**, and No Limit.

Energy/Performance Bias

Use this feature to select an appropriate fan setting to achieve maximum system performance (with maximum cooling) or maximum energy efficiency (with maximum power saving). The fan speeds are controlled by the firmware management via IPMI 2.0. The options are Performance, **Balanced Performance**, Balanced Energy, and Energy Efficient.

Factory Long Duration Power Limit

This item displays the power limit (in watts) set by the manufacturer during which long duration power is maintained.

Long Duration Power Limit

This item displays the power limit (in watts) set by the user during which long duration power is maintained. The default setting is **0**.

Factory Long Duration Maintained

This item displays the period of time (in seconds) set by the manufacturer during which long duration power is maintained.

Long Duration Maintained

This item displays the period of time (in seconds) during which long duration power is maintained. The default setting is **0**.

Recommended Short Duration Power Limit

This item displays the short duration power settings (in watts) recommended by the manufacturer.

Short Duration Power Limit

This item displays the time period during which short duration power (in watts) is maintained. The default setting is **0**.

► Chipset Configuration

► North Bridge

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

► Integrated IO Configuration

Intel® VT-d

Select Enabled to enable Intel Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to the 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 **Enabled** and **Disabled**.

Ageing Timer Rollover

Use this feature to determine how long the Ageing timer should be. The Ageing timer is used to break the deadlock of PCI-E bus transactions to resume normal system operations. The options are Disabled, 32 us, **128 us**, and 512 us.

Intel® I/OAT

Select Enabled to enable Intel I/OAT (I/O Acceleration Technology), which significantly reduces CPU overhead by leveraging CPU architectural capabilities and freeing up system resources for use of other tasks. The options are Disabled and **Enabled**.

DCA Support

When set to Enabled, this feature uses Intel's DCA (Direct Cache Access) Technology to improve data transfer efficiency. The options are **Enabled** and **Disabled**.

MMCFG BASE

This feature determines the lowest base address that can be assigned to PCI devices. The lower the address, the less system memory is available (for a 32-bit OS). The higher the address, the less resources are allocated to PCI devices. The options are 0x80000000, 0xA0000000, and **0xC0000000**.

IIO 1 PCIe Port Bifurcation Control (Available when a PCI-E device is installed)

This submenu configures the following Port-Bifurcation control settings which will determine how the PCI-Express lanes will be distributed between PCI-E ports.

CPU1 Slot6 PCI-E 3.0 x8 Link Speed

Use this item to select the desired type of PCI-Exp Generation support for the slot indicated above. The options are GEN1, GEN2, and **GEN3**.

CPU1 Slot8/9 PCI-E 3.0 x16 Link Speed

Use this item to select the desired type of PCI-Exp Generation support for the slot indicated above. The options are GEN1, GEN2, and **GEN3**.

CPU1 Slot10/11 PCI-E 3.0 x16 Link Speed

Use this item to select the desired type of PCI-Exp Generation support for the slot indicated above. The options are GEN1, GEN2, and **GEN3**.

IIO 2 PCIe Port Bifurcation Control (Available when a PCI-E device is installed)

This submenu configures the following Port-Bifurcation control settings which will determine how the PCI-Express lanes will be distributed between PCI-E ports..

CPU2 Slot5 PCI-E 3.0 x8 Link Speed

Use this item to select the desired type of PCI-Exp Generation support for the slot indicated above. The options are GEN1, GEN2, and **GEN3**.

CPU2 Slot3/4 PCI-E 3.0 x16 Link Speed

Use this item to select the desired type of PCI-Exp Generation support for the slot indicated above. The options are GEN1, GEN2, and **GEN3**.

CPU2 Slot1/2 PCI-E 3.0 x16 Link Speed

Use this item to select the desired type of PCI-Exp Generation support for the slot indicated above. The options are GEN1, GEN2, and **GEN3**.

► QPI Configuration

Current QPI Link Speed

This item displays the speed of the QPI Link.

Current QPI Link Frequency

This item displays the frequency of the QPI Link.

Isoc

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

QPI (Quick Path Interconnect) Link Speed Mode

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

QPI Link Frequency Select

Use this feature to set QPI Link frequency. The options are **Auto**, 6.4 GT/s, 7.2 GT/s, and 8.0 GT/s.

► DIMM Configuration

This section displays the following DIMM information.

Memory Mode

This item displays the current memory mode.

Current Memory Speed

This item displays the current memory speed.

Mirroring

This item displays if memory mirroring is supported by the motherboard. Memory mirroring creates a duplicate copy of the data stored in the memory to enhance data security.

Sparing

This item displays if memory sparing is supported by the motherboard. Memory sparing enhances system performance.

► DIMM Information

The status of a memory module is displayed as detected by the BIOS.

Memory Mode

When Independent is selected, all DIMMs are available to the operating system. When Mirroring 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. The options are **Independent**, Mirroring, and Lockstep.

DRAM RAPL Mode

RAPL (Running Average Power Limit) is used to set the power consumption limit for a processor⁴. The options are DRAM RAPL MODE0, **DRAM RAPL MODE1**, and Disabled.

DDR Speed

Use this feature to force a DDR3 memory module to run at a frequency other than what is specified by the manufacturer. The options are **Auto**, Force DDR3 800, Force DDR3 1066, Force DDR3 1333, Force DDR3 1600 and Force SPD.

Channel Interleaving

Use this feature to select channel-interleaving mode for system memory modules. The options are **Auto**, 1 Way, 2 Way, 3, Way, and 4 Way.

Rank Interleaving

Use this feature to select rank-interleaving mode for system memory modules. The options are **Auto**, 1 Way, 2 Way, 4, Way, and 8 Way.

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, read-and-write will be performed every 16K cycles per cache line if there is no delay caused by internal processing. The options are **Enabled** and Disabled.

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 Enabled to use Demand Scrubbing for ECC memory correction. The options are **Enabled** and Disabled.

Data Scrambling

Select Enabled to enable data scrambling to ensure data security and integrity. The options are Disabled and **Enabled**.

Device Tagging

Select Enabled to support device tagging which will allow the BIOS to tag a memory device that generates a stuck-bit or a hard error. The options are **Disabled** and Enabled.

Thermal Throttling

Throttling improves system reliability, availability and serviceability (RAS), and reduces CPU power consumption via automatic voltage control when the processor is idle. The options are Disabled and **CLTT** (Closed Loop Thermal Throttling).

Double Refresh

Select Enabled to support memory double-refreshing under high temperatures to ensure memory stability. The options are Disabled, **Auto**, and Enabled.

► South Bridge

This feature allows the user to configure the settings for the Intel PCH chip.

PCH Information

This feature displays the following PCH information.

Name: This item displays the name of the PCH chip.

Stepping: This item displays the PCH stepping.

USB Devices: This item displays the USB devices detected by the BIOS.

All USB Devices

Select Enabled to enable all USB ports and devices. The options are Disabled and **Enabled**.

EHCI Controller 1, EHCI Controller 2 (Available when All USB Devices are set to Enabled)

Select Enabled to enable EHCI (Enhanced Host Controller Interface) Controller 1 or Controller 2. The options are Disabled and **Enabled**.

Legacy USB Support (Available when USB Functions is not Disabled)

Select Enabled to support legacy USB devices. Select Auto to disable legacy support when legacy USB devices are not present. Select Disabled to make all USB

devices available for EFI (Extensive Firmware Interface) applications only. The settings are Disabled, **Enabled** and Auto.

Port 60/64 Emulation

Select Enabled to enable I/O port 60h/64h emulation support for a legacy USB keyboard to be supported by the operating system that does not recognize a legacy USB device. The options are Disabled and **Enabled**.

EHCI Hand-Off

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

► SATA Configuration

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

SATA Port0~SATA Port5: The AMI BIOS displays the status of each SATA port as detected by the BIOS.

SATA Mode

Use this feature to configure SATA mode for a selected SATA port. The options are Disabled, IDE Mode, **AHCI Mode**, and RAID Mode. The following items will be displayed pending on your selection:

IDE Mode

The following items are displayed when IDE Mode is selected:

Serial-ATA (SATA) Controller 0~1

Use this feature to activate or deactivate the SATA controller, and set the compatibility mode. The options are Disabled, Enhanced, and Compatible. The default for SATA Controller 0 is **Compatible**. The default of SATA Controller 1 is **Enhanced**.

AHCI Mode

The following items are displayed when the AHCI Mode is selected.

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 in a low power mode during extended periods of I/O inactivity, and will return the link to

an active state when I/O activity resumes. The options are **Enabled** and **Disabled**.

Port 0~5 Hot Plug

Select **Enabled** to enable hot-plugging support for a particular port, which will allow the user to change a hardware component or device without shutting down the system. The options are **Enabled** and **Disabled**.

Port 0~5 Staggered Spin Up

Select **Enabled** to enable Staggered Spin-up support to prevent excessive power consumption caused by spinning-up of multiple devices simultaneously. The options are **Enabled** and **Disabled**.

RAID Mode

The following items are displayed when RAID Mode is selected:

SATA RAID Option ROM/UEFI Driver

Use this feature to enable the onboard SATA Option ROM or EFI driver. The options are **Enabled** and **Disabled**.

Port 0~5 Hot Plug

Select **Enabled** to enable hot-plugging support for the particular port which will allow the user to replace a device without shutting down the system. The options are **Disabled** and **Enabled**.

► SCU (Storage Control Unit) Configuration

Storage Controller Unit

Select **Enabled** to support SCU storage devices. The options are **Disabled** and **Enabled**.

SCU RAID Option ROM/UEFI Driver

Select **Enabled** to support the onboard SCU Option ROM to boot up the system via a storage device or from the UEFI driver. The options are **Disabled** and **Enabled**.

SCU Port 0-SCU Port 3: The AMI BIOS will automatically detect the onboard SCU devices and display the status of each SCU device as detected.

► PCIe/PCI/PnP Configuration

Launch Storage OpROM Policy

Use this feature to select the Option ROM to boot the system when there are multiple Option ROMs available in the system. The options are UEFI only and **Legacy only**.

PCI Latency Timer

Use this feature to set the latency timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, 64, **96**, 128, 160, 192, 224 and 248.

PERR# Generation

Select Enabled to allow a PCI device to generate a PERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

SERR# Generation

Select Enabled to allow a PCI device to generate an SERR number for a PCI Bus Signal Error Event. The options are Enabled and **Disabled**.

Maximum Payload

Select Auto to allow 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 to allow the system BIOS to automatically set the maximum Read Request size 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

This feature allows the user to set the Active State Power Management (ASPM) level for a PCI-E device. Select Auto to allow the system BIOS to automatically set the ASPM level for the system. Select Disabled to disable ASPM support. The options are **Disabled** and Auto.

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

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.

CPU2 Slot1 PCI-E 3.0 x16 OPROM, CPU2 Slot2 PCI-E 3.0 x16 OPROM, CPU2 Slot3 PCI-E 3.0 x16 OPROM, CPU2 Slot4 PCI-E 3.0 x16 OPROM, CPU2 Slot5 PCI-E 3.0 x8 OPROM, CPU1 Slot6 PCI-E 3.0 x8 OPROM, PCI/PCIX/PCIe Slot7 OPROM, CPU1 Slot8 PCI-E 3.0 x16 OPROM, CPU1 Slot9 PCI-E 3.0 x16 OPROM, CPU1 Slot9 PCI-E 3.0 x16 OPROM, CPU1 Slot10 PCI-E 3.0 x16 OPROM, CPU1 Slot11 PCI-E 3.0 x16 OPROM,

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

Onboard LAN Option ROM Select

Select iSCSI to use the iSCSI Option ROM to boot the computer from a SCSI drive. Select PXE (Preboot Execution Environment) to use an PXE Option ROM to boot the computer from a SCSI PXE drive. The options are iSCSI, FCoE, and **PXE**.

Load Onboard LAN1 Option ROM, Load Onboard LAN2 Option ROM

Select Enabled to enable the onboard LAN1/LAN2 Option ROM. This is to boot the computer using a network device installed in a LAN port specified. The default setting for LAN1 Option ROM is **Enabled**, and the default setting for LAN2 Option ROM is **Disabled**.

VGA Priority

This feature allows the user to select the graphics adapter to be used as the primary boot device. The options are **Onboard** and Offboard.

Network Stack

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

IPv4 PXE Support (Available when the item above-Network Stack is set to Enabled)

Set this item to Enabled to activate IPv4 PXE Support. The options are **Enabled** and Disabled.

► Super IO Configuration

Super IO Chip: This item displays the Super IO chip used in the motherboard.

WPCM450 Serial Port Attribute

If this item is set to COM/SOL, the port specified above will be used for normal operation. Select BMC for the port specified above to be used for system debugging only. The options are **COM/SOL** and BMC.

► Serial Port 1 Configuration

Serial Port

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

Device Settings

This item displays the settings of Serial Port 1.

Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, IO=3F8h, IRQ=4, IO=3F8h, IRQ=3; IO=2F8h, IRQ=3; IO=3E8h, IRQ=5; IO=2E8h, IRQ=7; 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; IO=2E8h, IRQ=3, 4, 5, 6, 7, 10, 11, 12.

Device Mode

Use this feature to select the desired mode for a serial port specified. The options are **Normal** and High Speed.

► Serial Port 2 Configuration

SOL (Serial-Over-LAN) Serial Port

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

Device Settings

This item displays the settings of Serial Port 2.

SOL Change Settings

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port becomes unavailable. The options are **Auto**, IO=3F8h, IRQ=4; IO=3F8h, IRQ=3; IO=2F8h, IRQ=3; IO=3E8h, IRQ=5; IO=2E8h, IRQ=7; 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; IO=2E8h, IRQ=3, 4, 5, 6, 7, 10, 11, 12.

SOL Device Mode

Use this feature to select the desired mode for a serial port specified. The options are **Normal** and **High Speed**.

► Serial Port Console Redirection

COM1/SOL

These two submenus allow the user to configure the following console redirection settings for a COM Port specified by the user.

COM1/SOL Console Redirection

Select **Enabled** to use a COM Port selected by the user for console redirection. The options are **Enabled** and **Disabled**. The default setting for COM1 is **Disabled**, and for COM2 is **Enabled**.

► Console Redirection Settings

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

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 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

This feature allows the user 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 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 set to **Bootloader**, legacy console redirection is disabled before booting the OS. When set to **Always Enable**, legacy console redirection remains enabled when booting the OS. 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 console redirection. The options are Enabled and **Disabled**.

► Console Redirection Settings (for EMS)

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

Out-of-Band Management Port

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

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

This item sets 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, 57600, and **115200** (bits per second).

Flow Control

This feature allows the user 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**, Hardware RTS/CTS, and Software Xon/Xoff.

Data Bits, Parity, Stop Bits

The setting for each of these items is displayed.

► ACPI Settings

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

ACPI Sleep State

Use this feature to select the ACPI State when the system is in the sleep mode. Select S1 (CPU Stop Clock) to erase all CPU caches and stop executing instructions. Power to the CPU(s) and RAM is maintained, and RAM is refreshed. Select Suspend Disabled to use power-reduced mode. Power will only be supplied to limited components (such as RAMs) to maintain the most critical functions of the system. The options are **S1 (CPU Stop Clock)**, and Suspend Disabled.

NUMA (NON-Uniform Memory Access)

This feature enables the Non-Uniform Memory Access ACPI support. The options are **Enabled** and Disabled.

High Precision Event 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, reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Precision Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

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

Configuration

TPM Support

Select Enabled on this item and enable the TPM jumper on the motherboard to enable TPM support to improve data integrity and network security. The options are **Enabled** and Disabled.

TPM State

Select Enabled to enable TPM security settings to improve data integrity and network security. The options are Disabled and **Enabled**.

Pending Operation

Use this item to schedule an operation for the security device. The options are **None**, Enable Take Ownership, Disable Take Ownership, and TPM Clear.



Note: During restart, the computer will reboot in order to execute the pending operation and change the state of the security device.

Current Status Information: This item displays the information regarding the current TPM status.

TPM Enable Status

This item displays the status of TPM Support to indicate if TPM is currently enabled or disabled.

TPM Active Status

This item displays the status of TPM Support to indicate if TPM is currently active or deactivated.

TPM Owner Status

This item displays the status of TPM Ownership.

► Intel TXT (LT-SX) Configuration

Intel TXT (LT-SX) Hardware Support

This feature indicates if the following hardware components support the Intel Trusted Execution Technology.

CPU: TXT (Trusted Execution Technology) Feature

Chipset: TXT (Trusted Execution Technology) Feature

Intel TXT (LT-SX) Configuration

This feature displays the following TXT configuration setting.

TXT (LT-SX) Support: This item indicates if the Intel TXT support is enabled or disabled. The default setting is **Disabled**.

Note: Be sure to format your TPM module before enabling TXT (LT-SX) support for this feature to work properly.

Intel TXT (LT-SX) Dependencies

For Trusted Execution Technology to work properly, be sure to enable the features displayed below:

VT-d Support: Intel Virtualization Technology with Direct I/O support

VT Support: Intel Virtualization Technology support

TPM Support: Trusted Platform support

TPM State: Trusted Platform state

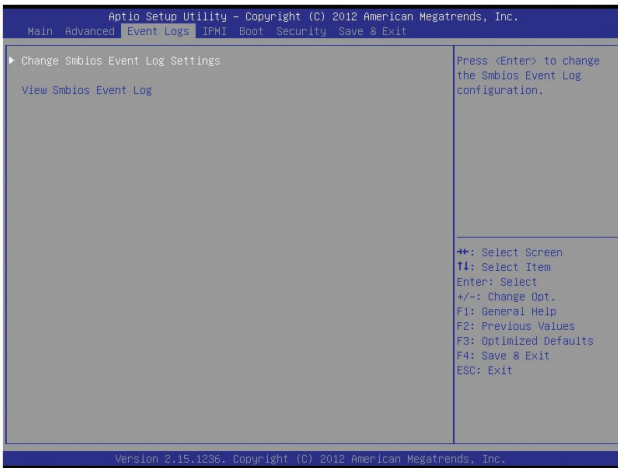
► ME Subsystem

This feature displays the following ME Subsystem Configuration settings.

- **ME BIOS Interface Version**
- **ME Version**

4-4 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.

Memory Correctable Error Threshold

This feature allows the user to enter the threshold value for correctable memory errors. The default setting is **10**.

PCI Error Logging Support

Select Enabled to support error event logging for PCI slots. The options are Enabled and **Disabled**.

Erasing Settings

Erase Event Log

Select Enabled to erase the SMBIOS (System Management BIOS) Event Log, which is completed before an event logging is initialized upon system reboot. The options are **No**, Yes, next reset, and Yes, every reset.

When Log is Full

Select Erase Immediately to immediately erase SMBIOS error event logs that exceed the limit when the SMBIOS 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 allows the user to decide 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**.

View SMBIOS Event Log

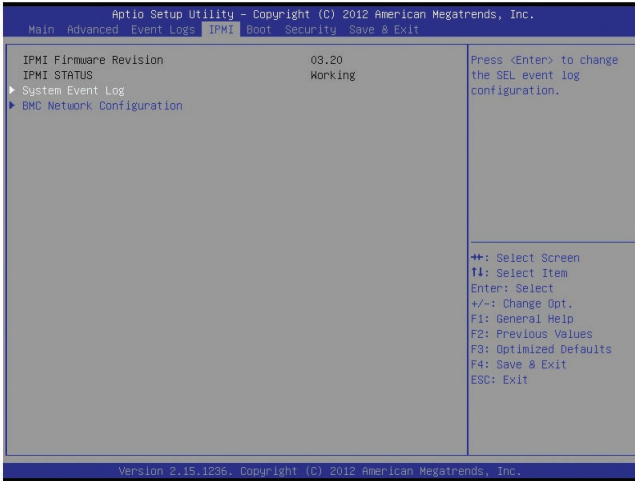
This item allows the user to view the event in the SMBIOS event log. Select this item and press <Enter> to view the status of an event in the log.

- Date
- Time
- Error Code

- Severity

4-5 IPMI

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



IPMI Firmware Revision

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

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 for all system event logging 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 decide 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.

►BMC Network Configuration

The following information will be displayed.

LAN Channel 1

IPMI LAN Selection

IPMI Network Link Status

Update IPMI LAN Configuration

This feature allows the BIOS to implement any IP/MAC address changes at the next system boot. If the option is set to Yes, any changes made to the settings below will take effect when the system is rebooted. The options are **No** and Yes.

Configuration Address Source

This feature allows the user to select the source of the IP address 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, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that it is attached to and request the next available IP address for this computer. The options for are **DHCP** and Static. The following items are assigned IP addresses automatically if DHCP is selected, or can be configured manually if Static is selected.

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 separated by dots should not exceed 255.

Station MAC Address

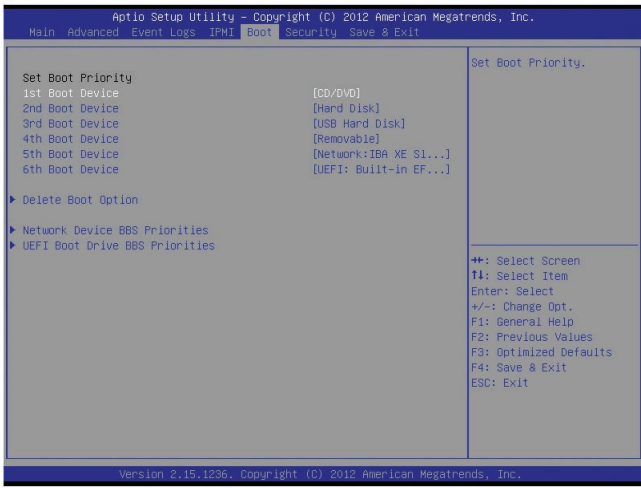
This item displays the Station MAC address for this computer. Mac addresses are 6 two-digit hexadecimal numbers.

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).

4-6 Boot

This submenu allows the user to configure the following boot settings for the system.



Boot Option Priority

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

Use these items to specify the sequence of boot device priority.

►Delete Driver Option

This feature allows the user to delete a previously defined boot device from which the systems boots during startup.

Delete Boot Drive Option

Select a bootable drive to remove it from the boot drive list so that the system can no longer boot from this drive.

►Network Device BBS Priorities

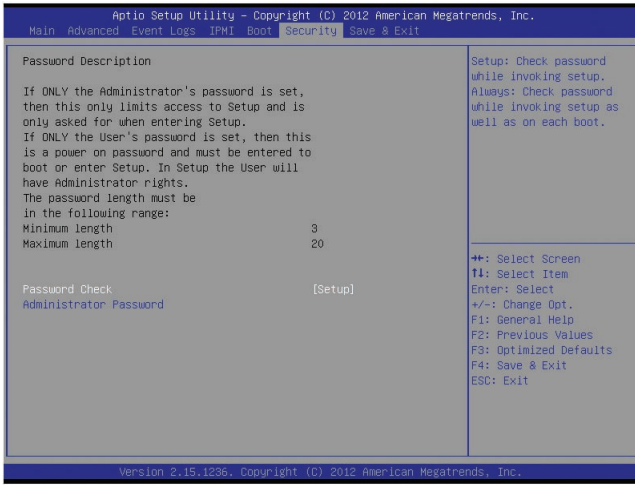
- 1st Device

▶ **UEFI OS Boot Priorities**

- 1st Device

4-7 Security

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



Password Check

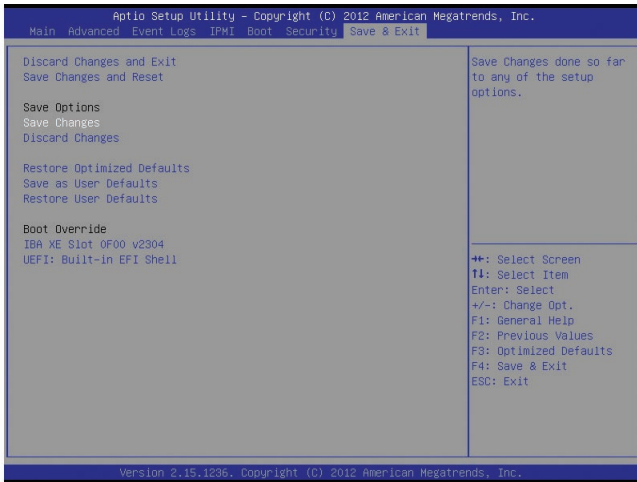
Use this feature to determine when a password entry is required. Select Setup for the user to enter a password only when entering setup. Select Always for the user to enter a password upon entering setup and at each system boot. The options are **Setup** and Always.

Administrator Password

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

4-8 Save & Exit

This submenu allows the user to configure the Save and Exit settings for the system.



Discard Changes and Exit

Select this option to quit the BIOS setup menu without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes, or select No to quit the BIOS and save changes.

Save Changes and Reset

When you have completed the system setup changes, select this option to save the changes and reboot the computer so that the new system configuration settings can take effect. Select Save Changes and Exit, and press <Enter>. When the dialog box appears, asking you if you want to exit the BIOS setup without saving, select **Yes** to quit BIOS without saving the changes, or select No to quit the BIOS and save changes.

Save Options

Save Changes

Select this option and press <Enter> to save all changes you've done so far and return to the AMI BIOS utility Program. When the dialog box appears, asking you if you want to save configuration, select **Yes** to save the changes, or select No to return to the BIOS without making changes.

Discard Changes

Select this feature and press <Enter> to discard all the changes and return to the BIOS setup. When the dialog box appears, asking you if you want to load previous values, select **Yes** to load the values previous saved, or select No to keep the changes you've made so far.

Restore Optimized Defaults

Select this feature and press <Enter> to load the optimized default settings that help optimize system performance. When the dialog box appears, asking you if you want to load optimized defaults, select **Yes** to load the optimized default settings, or select No to abandon optimized defaults.

Save as User Defaults

Select this feature and press <Enter> to save the current settings as the user's defaults. When the dialog box appears, asking you if you want to save values as user's defaults, click **Yes** to save the current values as user's default settings, or click No to keep the defaults previously saved as the user's defaults.

Restore User Defaults

Select this feature and press <Enter> to load the user's defaults previously saved in the system. When the dialog box appears, asking you if you want to restore user's defaults, select **Yes** to restore the user's defaults previously saved in the system, or select No to abandon the user's defaults that were previously saved.

Boot Override

This feature allows the user to override the Boot Option Priorities setting in the Boot menu, and instead immediately boot the system with one of the listed devices. This is a one-time override.

IBA XE Slot 0F00 v2304

UEFI: Built-in EFI Shell

Notes

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.

A-1 BIOS Error Beep Codes

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: USB or PS/2 keyboard, PCI or Serial Console Redirection, IPMI KVM or SOL Con-Out: Video Controller, PCI or Serial Console Redirection, IPMI SOL
1 beep per device	Refresh	1 beep for each USB device
X9 IPMI Error Codes		
1 Continuous Beep	System OH	System Overheat

Notes

Appendix B

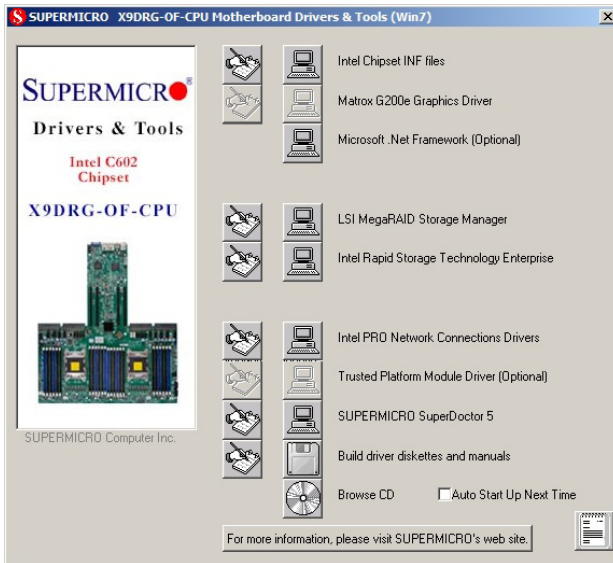
Software Installation Instructions

B-1 Installing Software Programs

After you've installed the operating system, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these programs, click the icons to the right of these items.



Note: To install the Windows OS, please refer to the instructions posted on our Website at <http://www.supermicro.com/support/manuals/>.



Driver/Tool Installation Display Screen



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

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

Note 3: Changing BMC log-in information is recommended during initial system power-on. The default username is ADMIN and password is ADMIN. For BMC best practices, please refer to: http://www.supernmicro.com/products/info/files/IPMI/Best_Practices_BMC_Security.pdf

B-2 Installing SuperDoctor5

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

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



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

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/nfo/sms_sd5.cfm.

Notes

(Disclaimer Continued)

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