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X8DTN+-F
X8DTN+-F-LR

USER'S MANUAL

Revision 1.1

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Manual Revision 1.1

Release Date: Oct. 11, 2011

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Preface

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPERMICRO X8DTN+-F/X8DTN+-F-LR motherboard.

About This Motherboard

The SUPERMICRO X8DTN+-F/X8DTN+-F-LR motherboard supports the Intel 5500/5600 Series processors, the first dual-processing platform that supports the Intel Quick-Path Interconnect (QPI) Technology, providing the next generation point-to-point system interface to replace the current Front Side Bus. With the 5500/5600 Series Processor built in, the X8DTN+-F/X8DTN+-F-LR motherboard substantially enhances system performance in server platforms. Please refer to our website (http://www.supermicro.com/products/) for updates on supported processors. This product is intended to be installed and serviced by professional technicians.

Manual Organization

Chapter 1 provides quick installation instructions.

Chapter 2 describes the features, specifications and performance of the motherboard and provides detailed information about the 5520 chipset.

Chapter 3 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 4**, which describes troubleshooting procedures for video, memory and system setup stored in the CMOS.

Chapter 5 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 Other Software Program Installation Instructions**.**

Conventions Used in the Manual

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



Danger/Caution: Instructions to be strictly followed to prevent catastrophic system failure or to avoid bodily injury



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



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

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Appendix A BIOS Error Beep Codes

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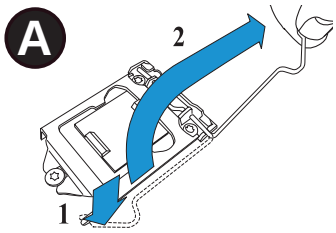
Appendix B Software Installation Instructions

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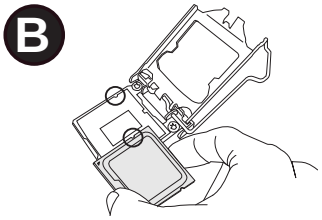
Chapter 1

Quick Installation Guide

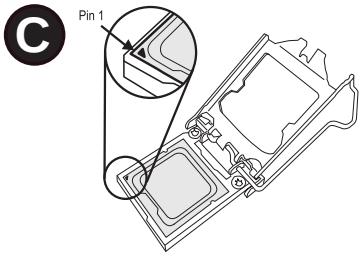
1-1 Installing the CPU



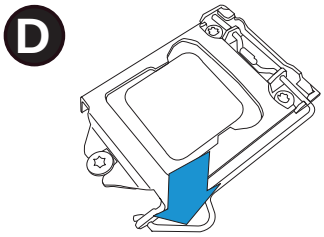
A. Press the socket clip down to unlock it. Gently lift the socket clip to open the load plate.



B. Align the CPU key with the socket key.



C. Align CPU Pin 1 against Socket Pin 1. Once they are aligned, lower the CPU down to the socket.



D. Once the CPU is fully seated on the socket, press the socket clip down to lock it.

⚠ To avoid damage, do not rub the CPU pins against the socket.

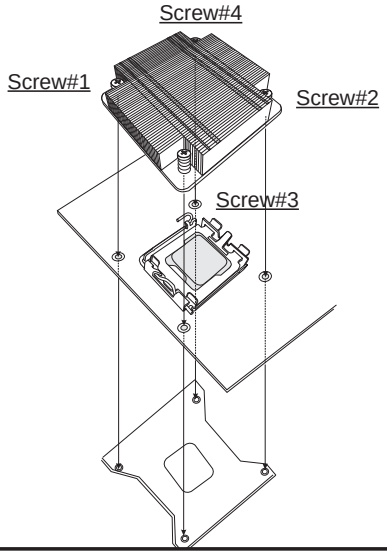
1-2 Installing the CPU Fan and Heatsink

A. Do not apply thermal grease on the CPU or the heatsink; the required amount has been applied.

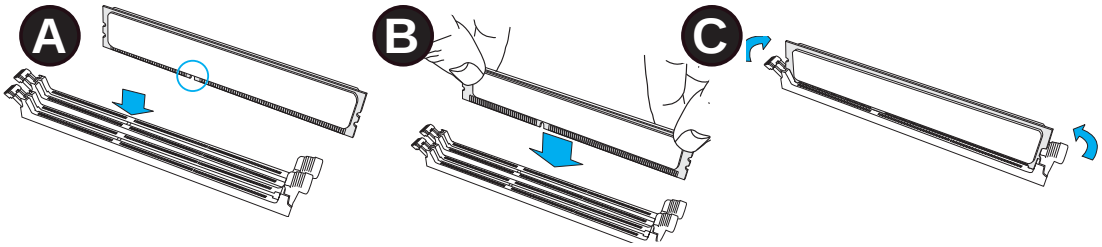
B. Place the heatsink on top of the CPU, making sure that the mounting holes are aligned with those on the retention mechanism on the back side of the CPU.

C. Install two diagonal screws and tighten them until just snug. (Do not fully tighten the screws to avoid damaging the CPU.)

D. Finish the installation by fully installing all screws.



1-3 Installing the Memory Modules

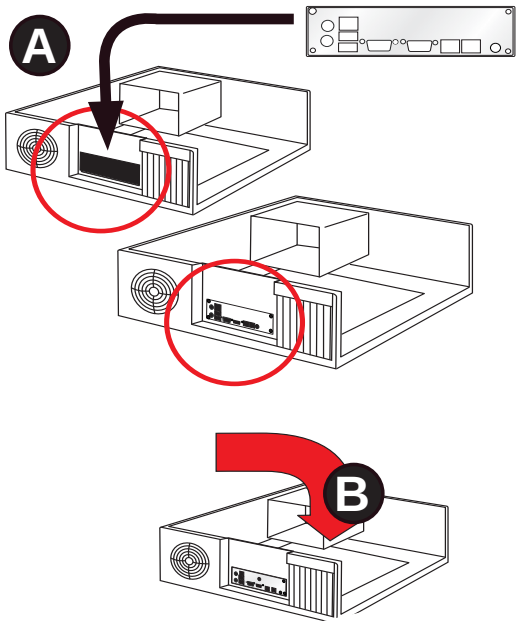


A. Align the key on the DIMM module against that of the DIMM socket.

B. Insert the DIMM module straight down to the DIMM socket.

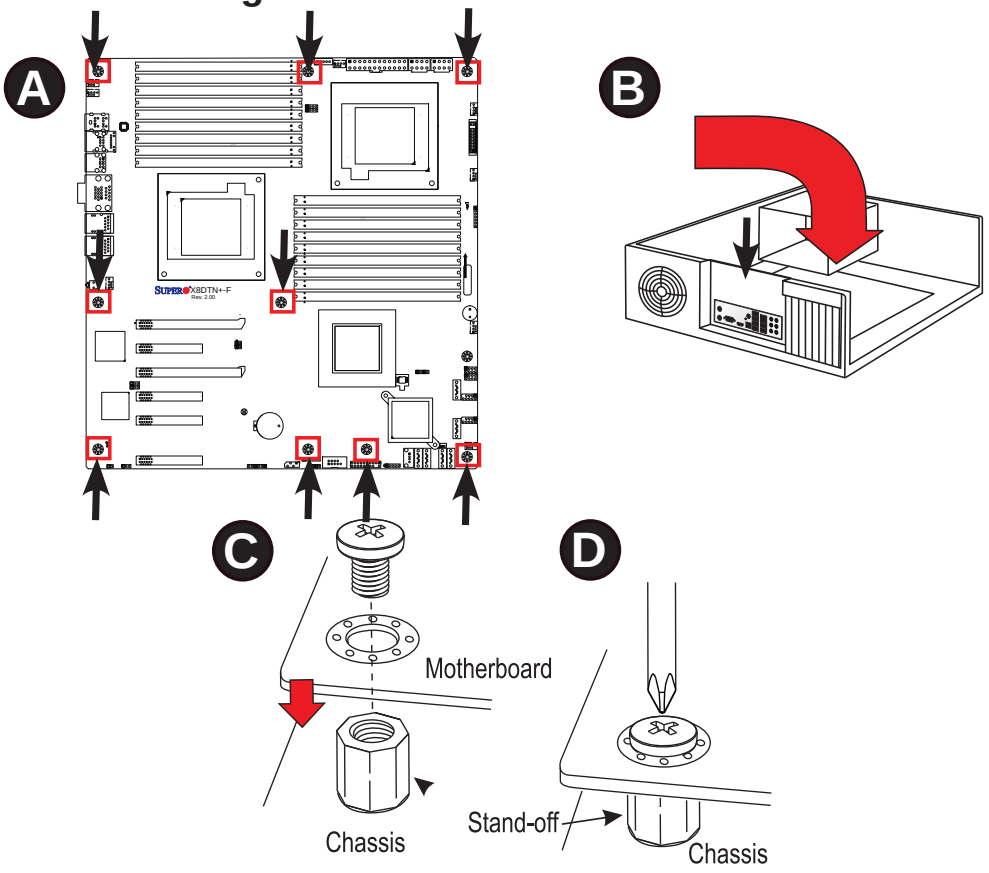
C. Press the notches on the ends of the DIMM module inwards to lock it.

1-4 Installing the I/O Shield

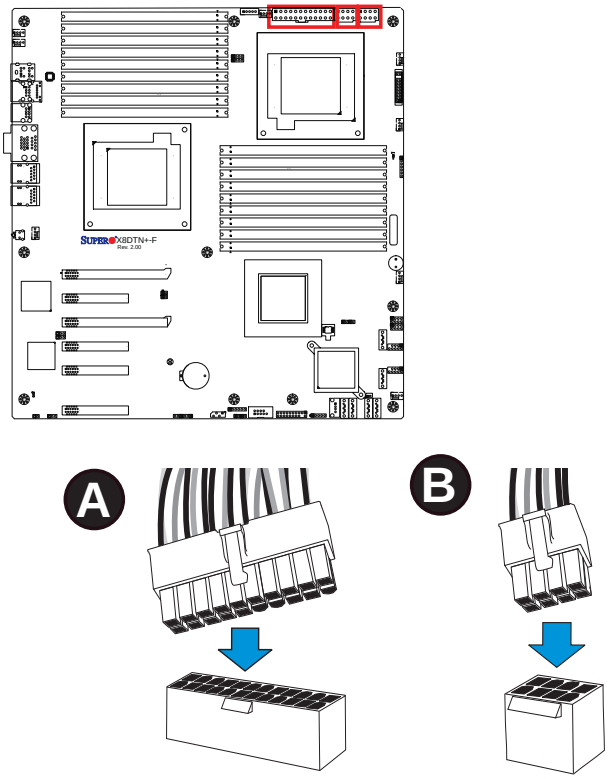


Note: Chassis and I/O plate images are for illustration purposes only. They may be different from what you have.

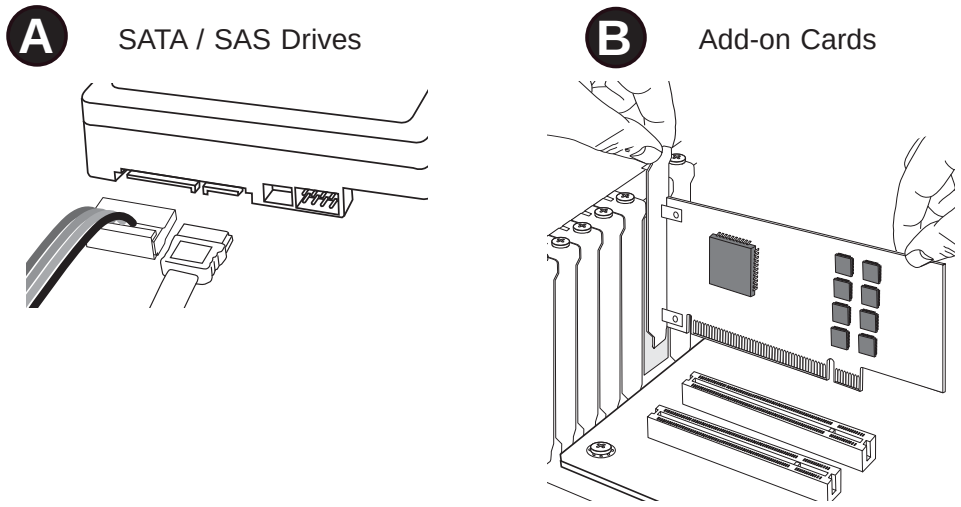
1-5 Installing the Motherboard



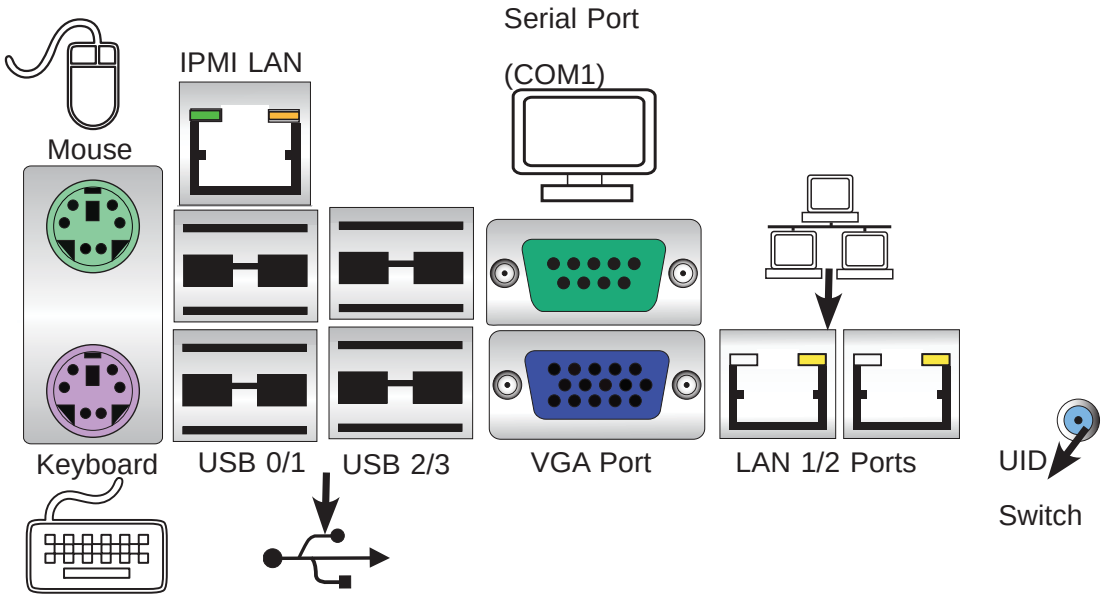
1-6 Connecting the Power Supply



1-7 Installing Internal Peripherals



1-8 Installing External Peripherals



Chapter 2

Overview

2-1 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.

Please check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

The following items are included in the retail box.

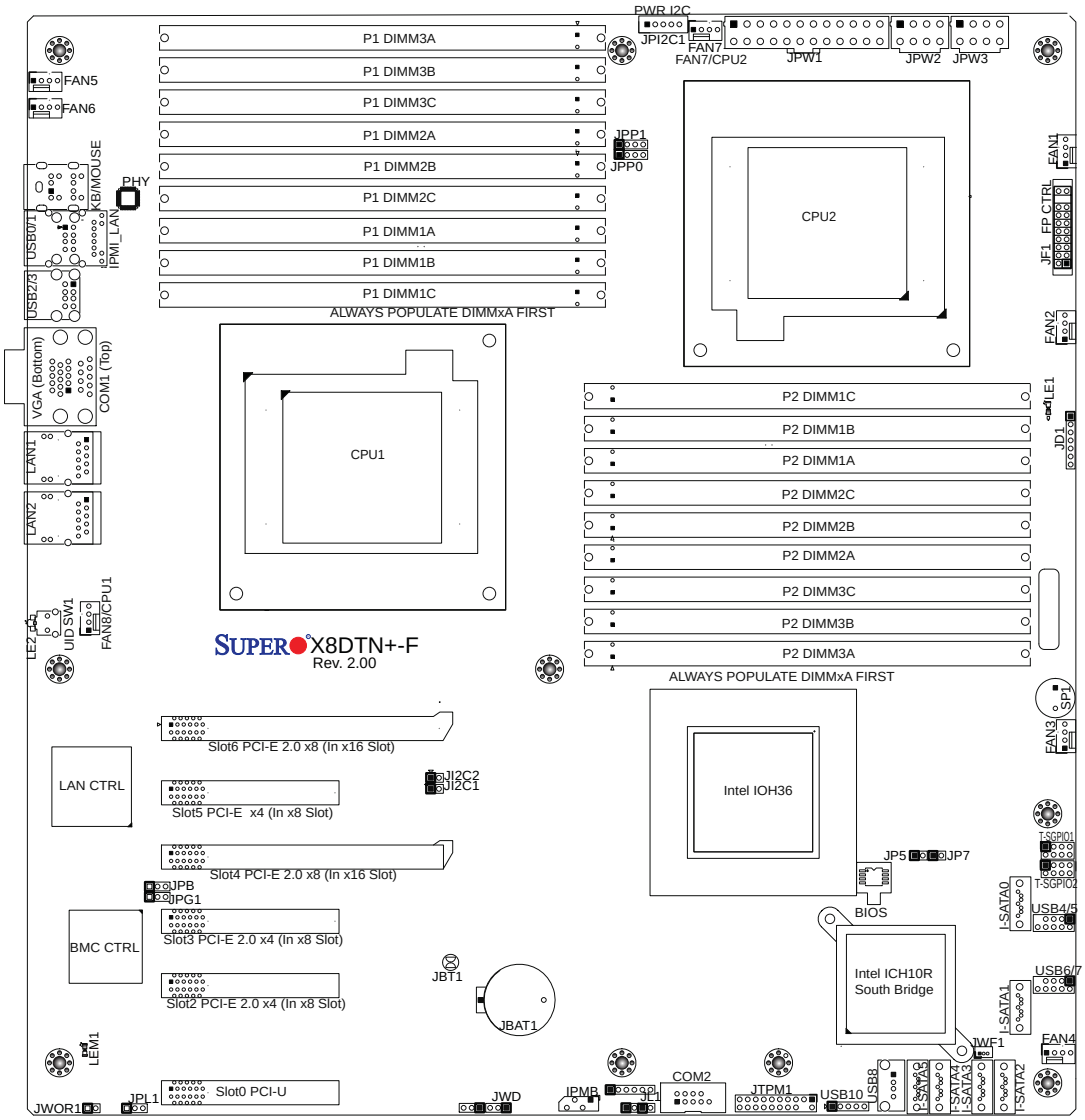
- One (1) Supermicro Mainboard
- One (1) Serial Port cable (CBL-010L)
- Six (6) Serial ATA cables (CBL-0044Lx6)
- One (1) USB 2.0 cable (CBL-083L)
- One (1) I/O backpanel shield (MCP-260-00034-0N)
- One (1) Supermicro CD containing drivers and utilities
- One (1) User's/BIOS Manual (MNL#1199)

SUPER® Motherboard Image



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

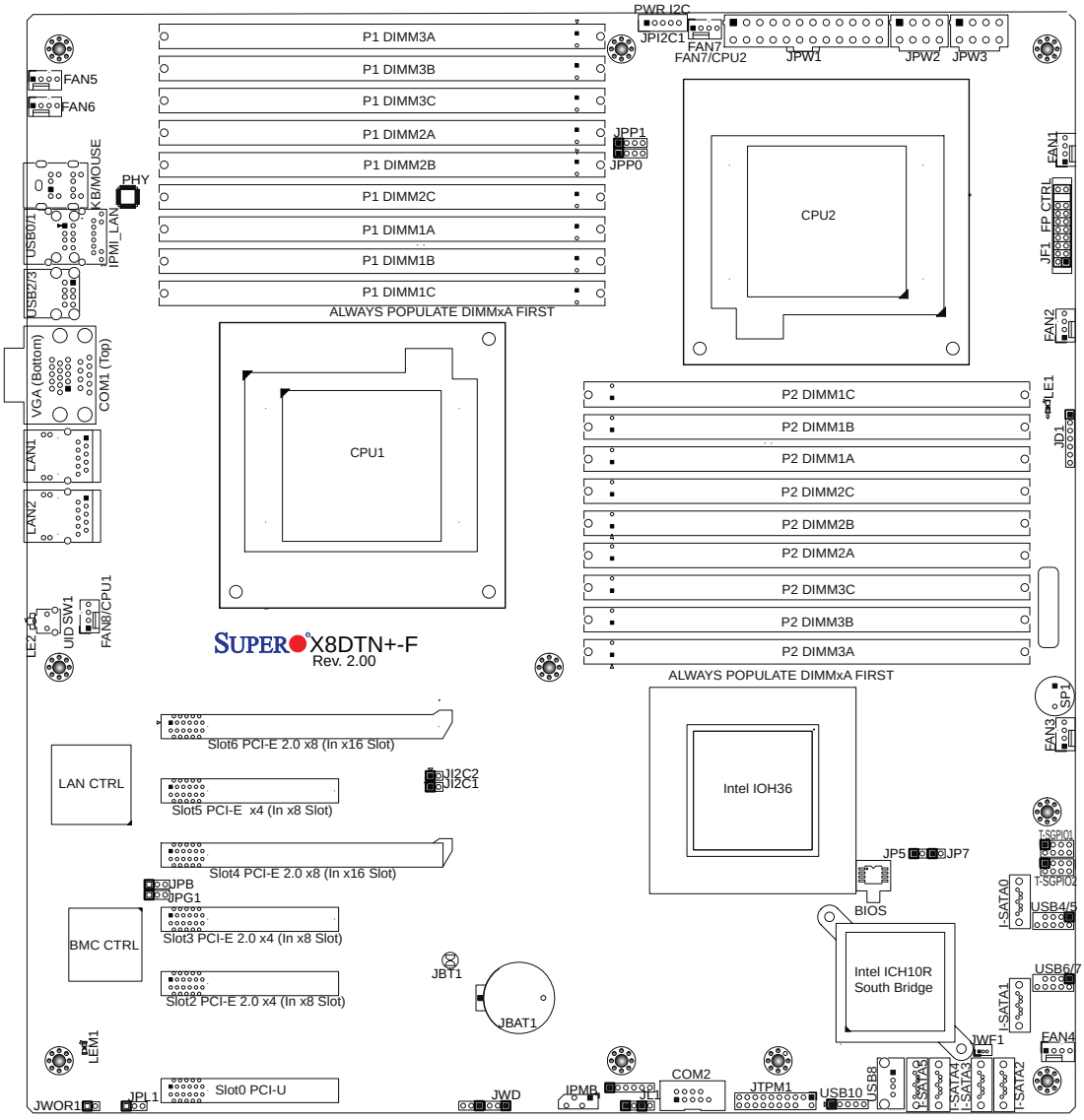
Motherboard Layout



Notes:

- See Chapter 3 for detailed information on jumpers, I/O ports and JF1 front panel connections.
- "■" indicates the location of "Pin 1".
- Jumpers not indicated are for testing only.
- When LE1 (Onboard Power LED Indicator) is on, system power is on. Unplug the power cable before installing or removing any components.
- IPMI 2.0 support is available on this motherboard. For more information, refer to the user guide posted on our website @ http://www.supermicro.com/support/manuals/

X8DTN+-F/X8DTN+-F-LR Quick Reference



X8DTN+-F/X8DTN+-F-LR Jumpers

Jumper	Description	Default Setting
JBT1	Clear CMOS	See Chpt. 3
JI²C1/JI²C2	SMB to PCI-E Slots	Open (Disabled)
JPG1	VGA Enable	Pins 1~2 (Enabled)
JPL1	GLAN Ports Enable	Pins 1-2 (Enabled)
JWD	Watch Dog	Pins 1~2 (Reset)

Connectors	Description
JBAT1	Onboard Battery
COM1/COM2	COM1/COM2 Serial Connections
FAN 1~8	CPU//System Fan Headers (Fans 7, 8: CPU Fans)
IPMB	4-pin BMC I^2C Header (for an IPMI Card)
I-SATA 0~5	Intel SB SATA Connectors 0~5
JD1	Speaker/Power LED Indicator
JF1	Front Panel Control Header
JL1	Chassis Intrusion
JPI^{2}C1	Power Supply SMBbus I^2C Header
JPW1	ATX 24-Pin Power Connector (See Warning on Pg. 2-6.)
JPW2/JPW3	12V 8-Pin Power Connectors (See Warning on Pg. 2-6.)
JPTM1	Trusted Platform Support Header
JWF1	SATA DOM (Disk_On_Module) PWR
JWOR1	Wake_On_Ring Header
KB/MS	PS2 Keyboard/Mouse
LAN1/LAN2	G-bit Ethernet Ports 1/2
(IPMI) LAN	IPMI_Dedicated LAN
SP1	Onboard Buzzer (Internal Speaker)
T-SGPIO 1/2	Serial_Link General Purpose I/O Headers
USB 0/1, 2/3	Back Panel USB 0/1, 2/3
USB 4/5, 6/7, 8, 10	Front Panel Accessible USB Connections
UID SW1	UID (Universal Identifier) Switch
VGA	Backpanel VGA Port

LED	Description	State	Status
LE1	Standby PWR LED	Green: On	PWR On
LE2	UID Switch LED	Blue	Unit Identified
LEM1	BMC Heartbeat LED	Green: Blinking	BMC Normal

Warning!

To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the two 8-pin (JPW2,JPW3) power connectors on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

Motherboard Features

<table>
<tr><td>CPU</td><td>
Two Intel® 5500/5600 Series (LGA 1366) processors; each processor supports two full-width Intel Quick-Path Interconnect (QPI) links with a total of up to 51.2 GT/s Data Transfer Rate (6.4 GT/s per direction)
</td></tr>
<tr><td>Memory</td><td>

RDIMM
240-pin Reg. DDR3 ECC 1333/1066/800 MHz memory with support of up to 288 GB in 18 slots

Note 1. 240-pin Dual Rank (DR) 16 GB Reg. ECC DDR3 1333/1066/800 MHz memory will support up to 288 GB. Memory speed will be downgraded to 800 MHz. (Refer to the notes in the memory configuration tables in Chpt. 3.)

Note 2. 240-pin Quad Rank (QR) 16 GB Reg. ECC DDR3 1066/800 MHz memory will support up to 192 GB (with 6 DIMMs max. per CPU). Memory speed will be downgraded to 800 MHz. (Refer to the notes in memory configuration tables in Chpt. 3.)
LRDIMM (Load Reduced DIMM, for X8DTN+-F-LR Only)
LRDIMM DDR3 ECC 1066 MHz memory with support of up 288 GB in 18 slots

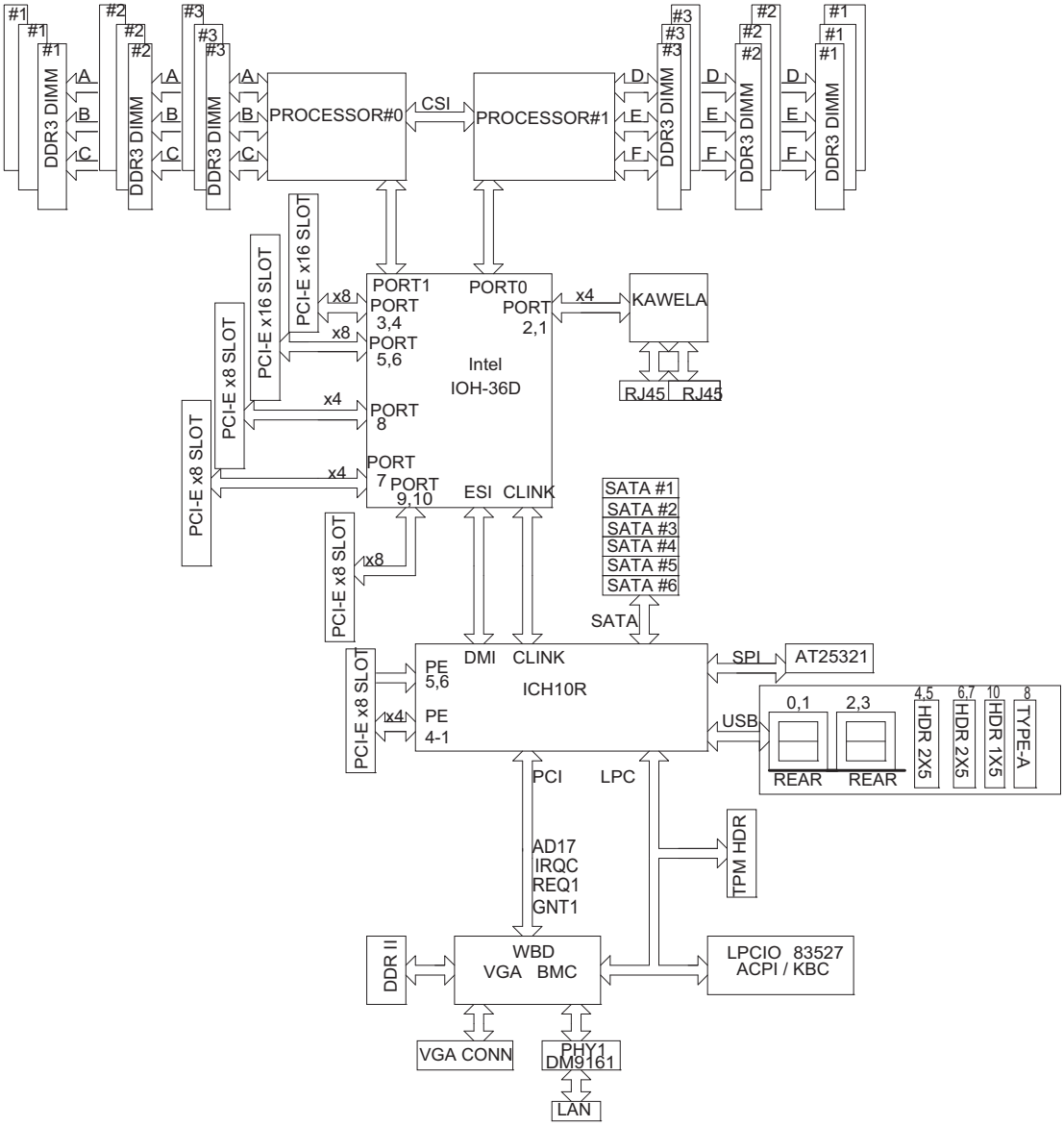
Warning: For your system memory to work properly, be sure to use the correct BIOS ROM for your system. For the X8DTN+-F, use the X8DTN+-F BIOS. For the X8DTN+-F-LR, use the X8DTN+-F-LR BIOS. To flash the BIOS, refer to http://www.supermicro.com/products/motherboard/QPI/5500/X8DTN_.cfm?IPMI=Y.
UDIMM
Unbuffered ECC/Non-ECC DDR3 1333/1066/800 MHz memory of up to 48 GB memory

<table>
<tr><th colspan="2">DIMM sizes</th></tr>
<tr><td>• UDIMM</td><td>1 GB, 2 GB, and 4GB</td></tr>
<tr><td>• RDIMM</td><td>1 GB, 2GB, 4GB, 8GB and 16 GB</td></tr>
</table>
</td></tr>
</table>

Chipset	• Intel® 5520 Chipset (5520 IOH & ICH10R)	
Expansion Slots	• Two (2) PCI Exp. 2.0 x8 in x16 (Slots 4/6)	
	• Two (2) PCI Exp. 2.0 x4 in x8 (Slots 2/3)	
	• One (1) PCI Exp. 2.0 x8 slot (Slot 0-UIO)	
	• One (1) PCI x4 slot (Slot 5)	
Graphics	• Winbond BMC Video Controller (Matrox G200eW)	
Network	• One Intel 82576EB Gigabit (10/100/1000 Mb/s) Ethernet Dual-Port Controller for LAN 1/LAN 2 ports.	
	• Realtek RTL8201N PHY to support IPMI_LAN 2.0	
I/O Devices	**SATA Connections**	
	• SATA Ports	Six (6)
	• RAID (Windows)	RAID 0, 1, 5, 10
	• RAID (Linux)	RAID 0, 1, 10
	Integrated IPMI 2.0	
	• IPMI 2.0 supported by the WPCM450 BMC	
	Keyboard/Mouse	
	• PS/2 Keyboard/Mouse ports on the I/O backplane	
	Serial (COM) Ports	
	• Two (2) Fast UART 16550 Connections: one 9-pin RS-232 port and one header	
	Super I/O	
	• Winbond Super I/O 83627DH	
Peripheral Devices	**USB Devices**	
	• Four (4) USB ports on the rear I/O panel (USB 0/1)	
	• Two (2) USB connections for front access (USB 8/10)	
	• Two (2) Type A internal connector (USB 4/5, 6/7)	
BIOS	• 32 Mb SPI AMI BIOS® SM Flash BIOS	
	• APM 1.2, PCI 2.3, ACPI 1.0/2.0/3.0, USB Keyboard, Plug & Play (PnP) and SMBIOS 2.5	
Power Config.	• ACPI Power Management	
	• Main switch override mechanism	
	• Keyboard Wake-up from Soft-Off	
	• External modem ring-on	
	• Power-on mode for AC power recovery	

PC Health Monitoring	**CPU Monitoring**
	• Onboard voltage monitors for CPU 1 Vcore, CPU 2 Vcore, +3.3V, +5V, +12V, +3.3V Stdby, +5V Stdby, CPU 1 DIMM, CPU 2 DIMM, and VBAT
	• CPU 3-Phase switching voltage regulator per CPU
	• CPU/System overheat LED and control
	• CPU Thermal Trip support
	• Thermal Monitor 2 (TM2) support
	Fan Control
	• Fan status monitoring with firmware 4-pin (Pulse Width Modulation) fan speed control
	• Low noise fan speed control
System Management	• PECI (Platform Environment Configuration Interface) 2.0 support
	• System resource alert via Supero Doctor III
	• SuperoDoctor III, Watch Dog, NMI
	• Chassis Intrusion Header and Detection
Dimensions	• 13.68" (L) x 13.00" (W) (347.47 mm x 330.20 mm)

Notes



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.

2-2 Chipset Overview

Built upon the functionality and the capability of the Intel 5520 platform, the X8DTN+-F/X8DTN+-F-LR motherboard provides the performance and feature sets required for dual-processor-based high-end systems and HPC/Cluster servers. The 5520 platform consists of the 5500/5600 Series (LGA 1366) processor, the 5520 (IOH), and the ICH10R (South Bridge). With the Intel QuickPath interconnect (QPI) controller built in, the 5500/5600 Series Processor is the first dual-processing platform that offers the next generation point-to-point system interconnect interface which will greatly enhance system performance by utilizing serial link interconnections, allowing for increased bandwidth and scalability.

The IOH connects to each processor through an independent QuickPath Interconnect (QPI) link. Each link consists of 20 pairs of unidirectional differential lanes for data transmission in addition to a differential forwarded clock. A full-width QPI link pair provides 84 signals. Each processor supports two QuickPath links, one going to the other processor and the other to the 5520 IO Hub.

The 5520 chipset supports up to 36 PCI Express Gen2 lanes, peer-to-peer read and write transactions. The ICH10R provides up to six PCI-Express ports, six SATA ports and eight USB connections.

In addition, the 5520 chipset also offers a wide range of RAS (Reliability, Availability and Serviceability) features. These features include memory interface ECC, x4/x8 Single Device Data Correction (SDDC), Cyclic Redundancy Check (CRC), parity protection, out-of-band register access via SMBus, memory mirroring, and Hot-plug support on the PCI-Express Interface.

Main Features of the 5500/5600 Series Processor and the 5520 Chipset

- Four processor cores in each processor with 8MB shared cache among cores
- Two full-width Intel QuickPath interconnect (QPI) links, up to 6.4 GT/s of data transfer rate in each direction
- Virtualization Technology, Integrated Management Engine supported
- Point-to-point cache coherent interconnect, Fast/narrow unidirectional links, and Concurrent bi-directional traffic
- Error detection via CRC and Error correction via Link level retry

2-3 Special Features

Recovery from AC Power Loss

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

2-4 PC Health Monitoring

This section describes the PC health monitoring features of the motherboard. All have an onboard System Hardware Monitor chip that supports PC health monitoring. An onboard voltage monitor will scan these onboard voltages continuously: Onboard voltage monitors for CPU 1 Vcore, CPU 2 Vcore, +3.3V, +5V, +12V, +3.3V Stdby, +5V Stdby, CPU 1 DIMM, CPU 2 DIMM, and VBAT. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware Control

The PC health monitor can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management via BIOS (under the Hardware Monitoring section in the Advanced Setting).

Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. Once 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 users 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 Supero Doctor III in the Windows OS

environment or used with Supero Doctor II in Linux. Supero Doctor is used to notify the user of certain system events. For example, you can also configure Supero Doctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds go beyond a pre-defined range.

2-5 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 enabling operating system-directed power management, ACPI also provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures, while providing a processor architecture-independent implementation that is compatible with Windows 2003, Windows XP, Windows Vista and Windows 2008Operating 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.

2-6 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 X8DTN+-F/X8DTN+-F-LR motherboard accommodates 24-pin ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. In addition, two 12V 8-pin power connections are also required to ensure adequate power supply to the system. Also your power supply must supply 1.5A for the Ethernet ports.

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

Warning: To prevent damage to the power supply or motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the two 8-pin (JPW2,JPW3) power connectors on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

2-7 Super I/O

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

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

2-8 Overview of the Winbond WPCM450 Controller

The Winbond WPCM450 Controller is a Baseboard Management Controller (BMC) that supports the 2D/VGA-compatible Graphics Core with the PCI interface, Virtual Media, and Keyboard/Video/Mouse Redirection (KVMR) modules. With blade-oriented Super I/O capability built-in, the WPCM450 Controller is ideal for legacy-reduced server platforms.

The WPCM450 interfaces with the host system via a PCI interface to communicate with the Graphics core. It supports USB 2.0 and 1.1 for remote keyboard/mouse/virtual media emulation. It also provides LPC interface to control Super IO functions. The WPCM450 is connected to the network via an external Ethernet PHY module.

The WPCM450 communicates with onboard components via six SMBus interfaces, fan control, and Platform Environment Control Interface (PECI) buses.

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

Chapter 3

Installation

3-1 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.
- 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.

Unpacking

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

3-2 Processor and Heatsink Installation

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

Notes:

1. 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.

2. Make sure to install the motherboard into the chassis before you install the CPU heatsink and heatsink fans.

3. When purchasing a motherboard without a 5500/5600 Series processor pre-installed, make sure that the CPU socket plastic cap is in place, and none of the CPU socket pins are bent; otherwise, contact the retailer immediately.

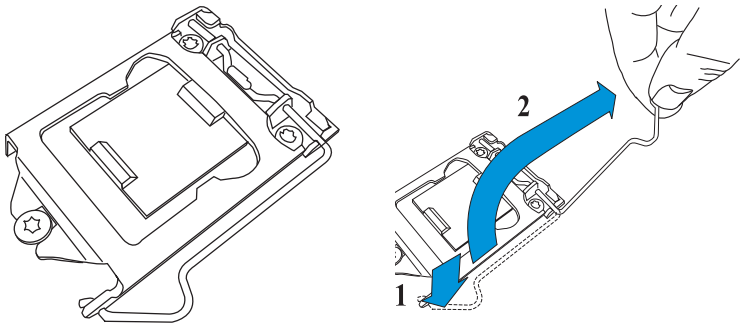
4. Refer to the Motherboard Features Section for more details on CPU support.

Installing an LGA 1366 Processor

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

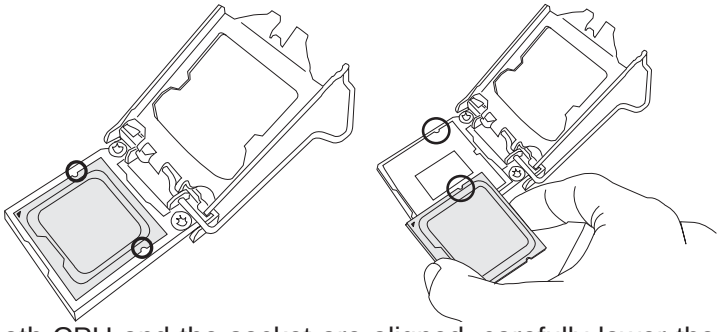
2. Gently lift the socket clip to open the load plate.

3. Hold the plastic cap at its north and south center edges to remove it from the CPU socket.



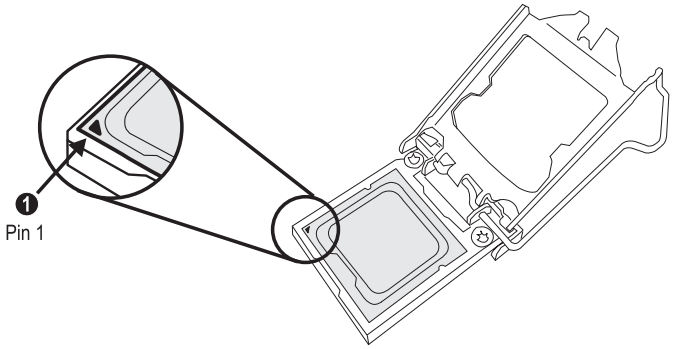
4. After removing the plastic cap, using your thumb and the index finger, hold the CPU at the north and south center edges.

5. Align the CPU key, the semi-circle cutout, against the socket key, the notch below the gold color dot on the side of the socket.



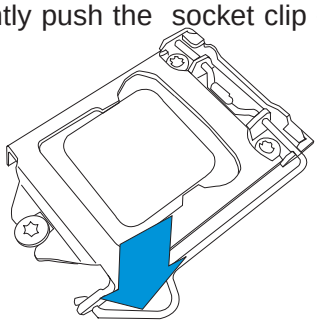
6. Once both CPU and the socket are aligned, carefully lower the CPU straight down into the socket. (To avoid damaging the CPU or the socket, do not rub the CPU against the surface of the socket or its pins.)

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



8. Once the CPU is securely seated on the socket, lower the CPU load plate to the socket.

9. Use your thumb to gently push the socket clip down to the clip lock.



Warning: Please save the plastic cap. The motherboard must be shipped with the plastic cap properly installed to protect the CPU socket pins. Shipment without the plastic cap properly installed will cause damage to the socket pins.

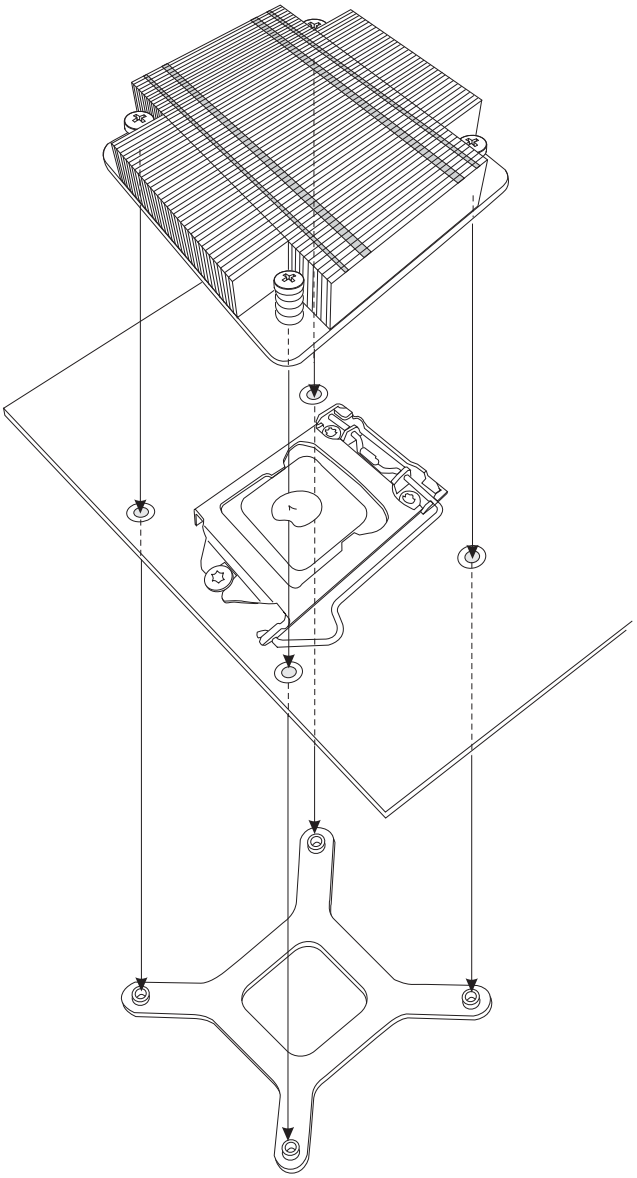
Installing a Passive CPU Heatsink

1. Do not apply any thermal grease to the heatsink or the CPU die because the required amount has already been applied.

2. Place the heatsink on top of the CPU so that the four mounting holes are aligned with those on the retention mechanism.

3. Install two diagonal screws (e.g. the #1 and the #2 screws) and tighten them until just snug (-do not fully tighten the screws to avoid possible damage to the CPU.)

4. Finish the installation by fully tightening all four screws.



Removing the Passive Heatsink

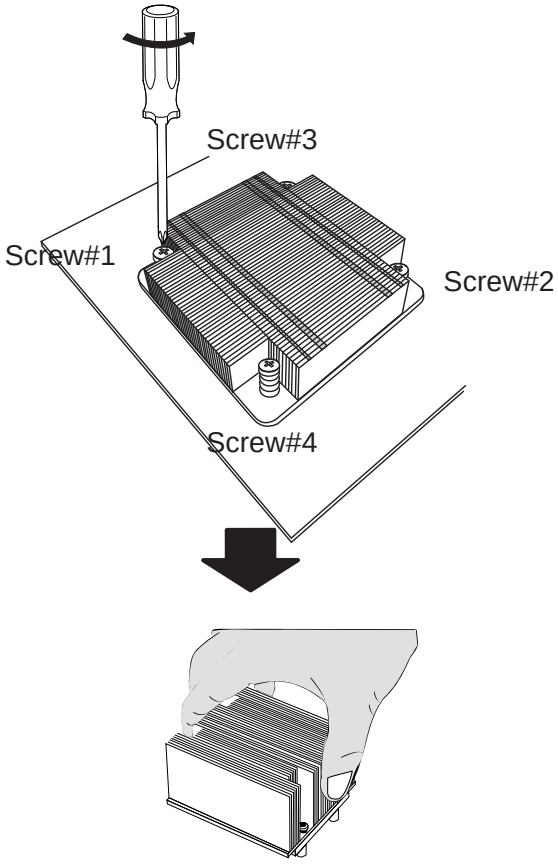
Warning: We do not recommend that the CPU or the heatsink be removed. However, if you do need to remove the heatsink, please follow the instructions below to uninstall the heatsink to prevent damage to the CPU or other components.

1. Unplug the power cord from the power supply.

2. Disconnect the heatsink fan wires from the CPU fan header.

3. Using a screwdriver, loosen and remove the heatsink screws from the motherboard in the sequence as show in the picture below.

4. Hold the heatsink as shown in the picture below and gently wriggle the heatsink to loosen it from the CPU. (Do not use excessive force when wriggling the heatsink.)



5. Once the CPU is loosened, remove the heatsink from the CPU socket.

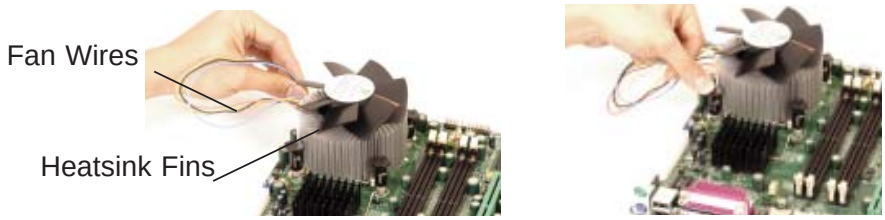
6. To reinstall the CPU and the heatsink, clean the surface of the CPU and the heatsink to get rid of the old thermal grease. Reapply the proper amount of thermal grease on the surface before reinstalling them on the motherboard.

Installing an Active Fan CPU Heatsink

1. Locate the CPU Fan power connector on the motherboard. (Refer to the motherboard layout in Chapter 2 for the CPU Fan location.)

2. Position the heatsink so that the heatsink fan wires are closest to the CPU fan power connector and do not interfere with other components.

3. Inspect the CPU Fan wires to make sure that the wires are routed through the bottom of the heatsink.



4. Remove the thin layer of the protective film from the copper core of the heatsink.

Warning: CPU may overheat if the protective film is not removed from the heatsink.)

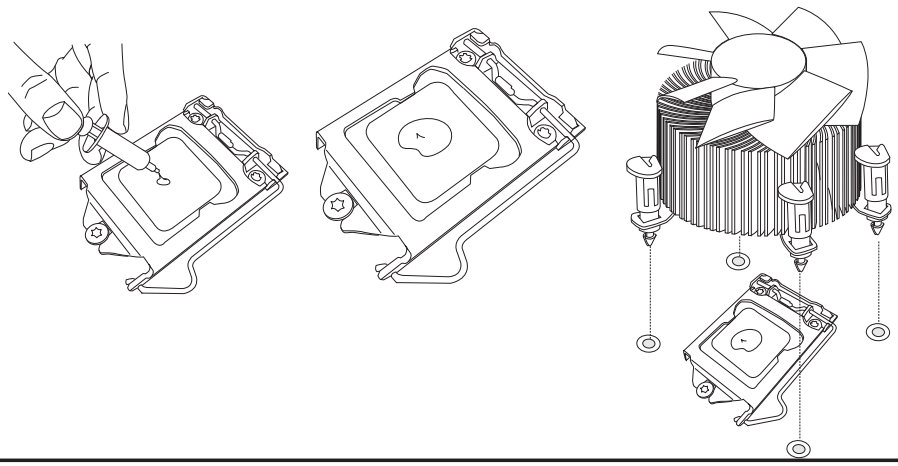
5. Apply the proper amount of thermal grease on the CPU. (**Note**: if your heatsink came with a thermal pad, please ignore this step.)

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

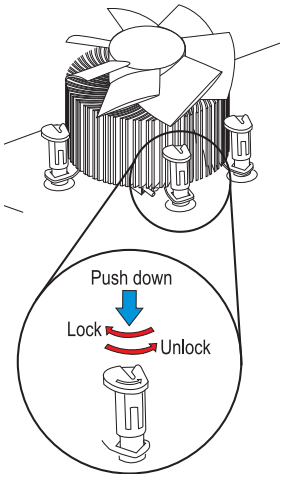
7. Align the four heatsink fasteners with the mounting holes on the motherboard.

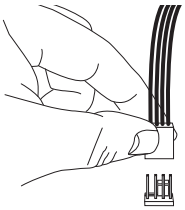
8. Gently push the pairs of diagonal fasteners (#1 & #2, and #3 & #4) into the mounting holes until you hear a click. (**Note**: Make sure to properly orient each fastener so that the narrow end of the groove is pointing outward.)

9. Repeat Step 7 to insert all four heatsink fasteners into the mounting holes.



10. Once all four fasteners are securely inserted into the mounting holes, and the heatsink is properly installed on the motherboard, connect the heatsink fan wires to the CPU Fan connector.

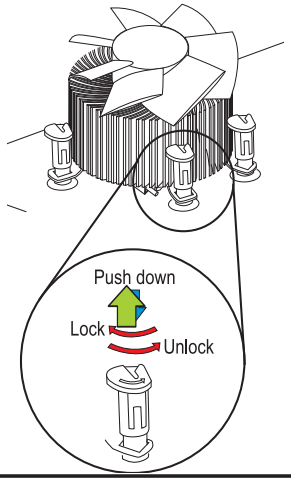


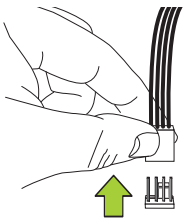


Removing the Active Heatsink

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

1. Unplug the power cord from the power supply.
2. Disconnect the heatsink fan wires from the CPU fan header.
3. Use your finger tips to gently press on the fastener cap and turn it counterclockwise to make a 1/4 (90^0) turn, and then pull the fastener upward to loosen it.
4. Repeat Step 3 to loosen all fasteners from the mounting holes.
5. With all fasteners loosened, remove the heatsink from the CPU.





3-3 Installing and Removing the Memory Modules

Note: Check the Supermicro website for recommended memory modules.

CAUTION

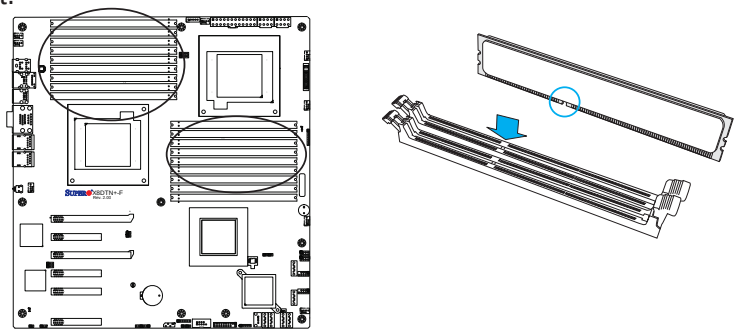
STOP

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-DIMM #1A. (For best performance, please use the memory modules of the same type and same speed in the same bank.)

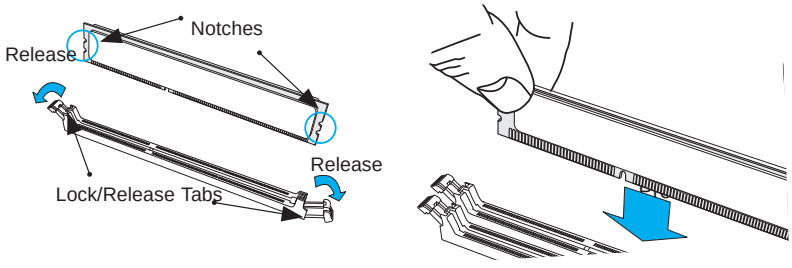
2. Position the DIMM module's bottom key, so it aligns with the receptive point on the slot.



3. Push the Lock/Release tabs to their Release positions. Make sure that the side notches of a DIMM module align with the Lock/Release tabs of the slot when it is pressed in.

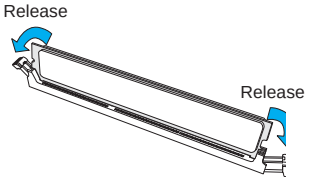
4. Insert the DIMM module vertically and press it down until the module snaps into place.

5. Press the Lock/Release tabs to secure the DIMM module.



Removing Memory Modules

1. Reverse the steps above to remove the DIMM modules from the motherboard.



Memory Support

The X8DTN+-F (/-LR) Motherboard supports the following memory configuration:

- **RDIMM**
  - 240-pin Reg. DDR3 ECC 1333/1066/800 MHz memory with support of up to 288 GB in 18 slots

Note 1. 240-pin Dual Rank (DR) 16 GB Reg. ECC DDR3 1333/1066/800 MHz memory will support up to 288 GB. Memory speed will be downgraded to 800 MHz. (Refer to the notes in the memory configuration tables in Chpt. 3.)

Note 2. 240-pin Quad Rank (QR) 16 GB Reg. ECC DDR3 1066/800 MHz memory will support up to 192 GB (with 6 DIMMs max. per CPU). Memory speed will be downgraded to 800 MHz. (Refer to the notes in memory configuration tables in Chpt. 3.)

- **LRDIMM (Load Reduced DIMM, for X8DTN+-F-LR Only)**
  - LRDIMM DDR3 ECC 1066 MHz memory with support of up 288 GB in 18 slots

Warning: For your system memory to work properly, be sure to use the correct BIOS ROM for your system. For the X8DTN+-F, use the X8DTN+-F BIOS. For the X8DTN+-F-LR, use the X8DTN+-F-LR BIOS. To flash the BIOS, refer to http://www.supermicro.com/products/motherboard/QPI/5500/X8DTN_.cfm?IPMI=Y.

- **UDIMM**
  - Unbuffered ECC/Non-ECC DDR3 1333/1066/800 MHz memory of up to 48 GB

DIMM Module Population Configuration

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

Memory Population for Optimal Performance -For a Motherboard with One CPU (CPU1) Installed									
P1-DIMMs	**To Populate P1-DIMMs**								
	Branch 0			**Branch 1**			**Branch 2**		
3 DIMMs	P1-1A			P1-2A			P1-3A		
6 DIMMs	P1-1A	P1-1B		P1-2A	P1-2B		P1-3A	P1-3B	
9 DIMMs (RDIMMs only) (**Note**)	P1-1A	P1-1B	P1-1C	P1-2A	P1-2B	P1-2C	P1-3A	P1-3B	P1-3C
Note: Max. of 6 UDIMM modules are supported by a CPU.									

Memory Population for Optimal Performance -For a Motherboard with One CPU (CPU2) Installed									
P2-DIMMs	**To Populate P2-DIMMs**								
	Branch 0			**Branch 1**			**Branch 2**		
3 DIMMs	P2-1A			P2-2A			P2-3A		
6 DIMMs	P2-1A	P2-1B		P2-2A	P2-2B		P2-3A	P2-3B	
9 DIMMs (RDIMMs only (**Note**)	P2-1A	P2-1B	P2-1C	P2-2A	P2-2B	P2-2C	P2-3A	P2-3B	P2-3C
Note: Max. of 6 UDIMM modules are supported by a CPU.									

Memory Population for Optimal Performance -For a Motherboard with Two CPUs Installed						
	CPU 1 (To Populate P1-DIMMs)			**CPU 2 (To Populate P2-DIMMs)**		
	Branch 0	**Branch 1**	**Branch 2**	**Branch 0**	**Branch 1**	**Branch 2**
6 DIMMs	P1-1A	P1-2A	P1-3A	P2-1A	P2-2A	P2-3A
12 DIMMs	P1-1A/1B	P1-2A/2B	P1-3A/3B	P2-1A/1B	P2-2A/2B	P2-3A/3B
18 DIMMs (For RDIMMs only) **(Note)**	P1-1A/1B/1C	P1-2A/2B/2C	P1-3A/3B/3C	P2-1A/1B/1C	P2-2A/2B/2C	P2-3A/3B/3C
Note: Max. of 6 UDIMM modules are supported by a CPU.						

Memory Support for the Motherboard w/ the 5500 CPU(s) Installed

RDIMM Population for the Motherboard w/5500 Processors Installed				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type (Reg.= Registered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
3	1	Reg. DDR3 ECC	800,1066,1333	SR or DR
3	1	Reg. DDR3 ECC	800,1066	QR
3	2	Reg. DDR3 ECC	800,1066	Mixing SR, DR
3	2	Reg. DDR3 ECC	800 **(Note)**	Mixing SR, DR, QR
3	3	Reg. DDR3 ECC	800 **(Note)**	Mixing SR, DR
Note: 1066 RDIMMs will run at 800 MHz (-BIOS automatic downgrading)				

UDIMM Population for the Motherboard w/5500 CPUs Installed				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type (Unb.= Unbuffered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
3	1	Unb. DDR3 ECC/Non-ECC	800,1066,1333	SR or DR
3	2	Unb. DDR3 ECC/Non-ECC	800,1066	Mixing SR, DR
3	3	Not available	Not available	Not available

Memory Support for the Motherboard w/ the 5600 CPU(s) Installed

- 1.5V DIMMs

1.5V RDIMM Population for the Motherboard w/5600 CPUs Installed				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type (Reg.=Registered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
3	1	Reg. DDR3 ECC	800,1066,1333	SR or DR
3	1	Reg. DDR3 ECC	800,1066 (Note 1)	QR
3	2	Reg. DDR3 ECC	800,1066, 1333	Mixing SR, DR
3	2	Reg. DDR3 ECC	800 (Note 2)	Mixing SR, DR, QR
3	3	Reg. DDR3 ECC	800 (Note 2)	Mixing SR, DR

Note 1: 1333 MHz RDIMMs will run at 1066 MHz (-BIOS automatic downgrading).
Note 2: 1333/1066 MHz RDIMMs will run at 800 MHz (-BIOS automatic downgrading).
Note 3: MIxing of 1.35V and 1.5V DIMMs is not recommended.

1.5V LRDIMM Population for the Motherboard w/5600 CPUs Installed (for X8DTN+-F-LR Only)				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type (LR= Load Reduced)**	**Speeds (in MHz)**	**Ranks per DIMM (QR=Quad Rank, OR=Octal Rank)**
3	1	LR DDR3 ECC	1066	QR or OR
3	2	LR DDR3 ECC	1066	QR or OR
3	3	LR DDR3 ECC	1066	QR

1.5V UDIMM Population for the Motherboard w/5600 CPUs Installed				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type (Unb.= Unbuffered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
3	1	Unb. DDR3 ECC/Non-ECC	800,1066,1333	SR or DR
3	2	Unb. DDR3 ECC/Non-ECC	800,1066, 1333	Mixing SR, DR
3	3	Not Available	Not Available	Not Available
Note 1: 1333 MHz for two DIMMs per channel is supported when Unbuf./ECC DIMMs are used. **Note 2:** MIxing of 1.35V and 1.5V DIMMs is not recommended.				

- 1.35V DIMMs

1.35V RDIMM Population for the Motherboard w/5600 CPUs Installed				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type (Reg.=Registered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
3	1	Reg. DDR3 ECC	800,1066,1333	SR or DR
3	1	Reg. DDR3 ECC	800 (Note 1)	QR
3	2	Reg. DDR3 ECC	800,1066 (Note 2)	Mixing SR, DR
3	2	Reg. DDR3 ECC	800 (Note 3)	Mixing SR, DR, QR
3	3	Not Available	Not Available	Not Available
Note 1: 1333/1066 MHz QR RDIMMs will run at 800 MHz (-BIOS automatic downgrading). **Note 2:** 1333 MHz SR/DR RDIMMs will run at 800 MHz (-BIOS automatic downgrading). **Note 3:** 1333/1066 MHz SR/DR/QR RDIMMs will run at 800 MHz (-BIOS automatic downgrading). **Note 4:** MIxing of 1.35V and 1.5V DIMMs is not recommended.				

1.35V UDIMM Population for the Motherboard w/5600 CPUs Installed				
DIMM Slots per Channel	**DIMMs Populated per Channel**	**DIMM Type (Unb.= Unbuffered)**	**Speeds (in MHz)**	**Ranks per DIMM (any combination; SR=Single Rank, DR=Dual Rank, QR=Quad Rank)**
3	1	Unb. DDR3 ECC	800,1066,1333	SR or DR
3	2	Unb. DDR3 ECC	800,1066	Mixing SR, DR
3	3	Not Available	Not Available	Not Available
Note 1: 1333 MHz for two DIMMs per channel is supported when Unbuf./ECC DIMMs are used. **Note 2:** MIxing of 1.35V and 1.5V DIMMs is not recommended.				

Note 1: Due to OS limitations, some operating systems may not show more than 4 GB of memory.

Note 2: Due to memory allocation to system devices, the amount of memory that remains available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. (See the following Table.)

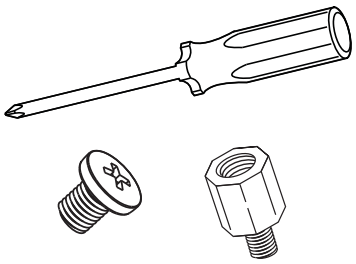
Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Remaining (-Available) (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99 GB
Local APIC	4 KB	3.99 GB
Area Reserved for the chipset	2 MB	3.99 GB
I/O APIC (4 Kbytes)	4 KB	3.99 GB
PCI Enumeration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

3-4 Motherboard Installation

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

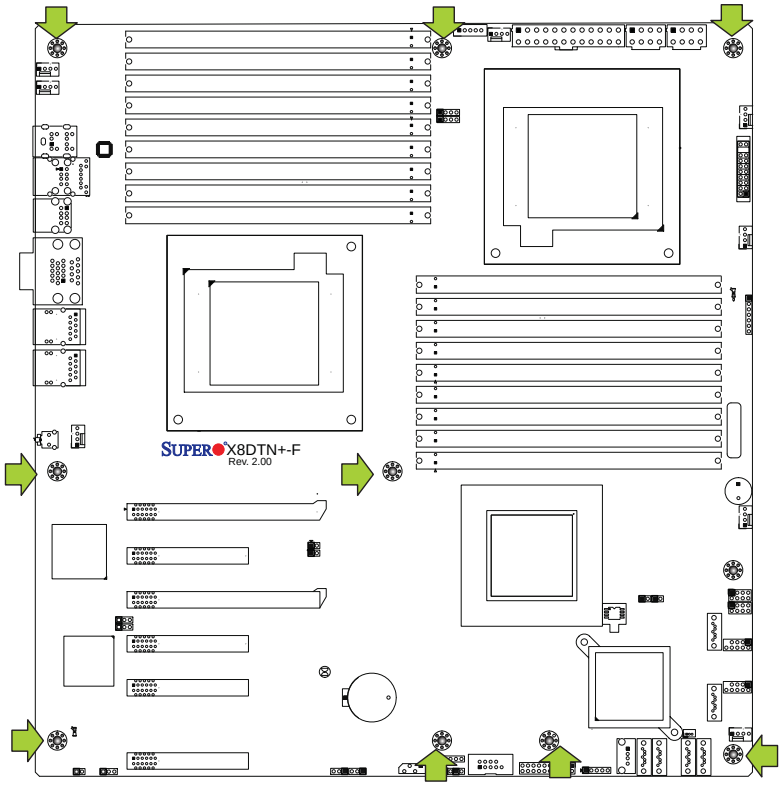
Tools Needed

- Philips Screwdriver
- Pan head screws (9 pieces)
- Standoffs (9 pieces, if needed)



Location of Mounting Holes

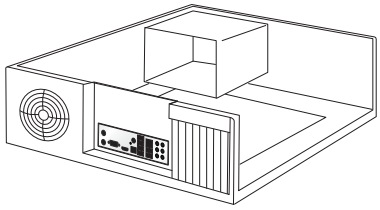
There are nine (9) mounting holes on this motherboard indicated by the arrows.



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

Installing the Motherboard

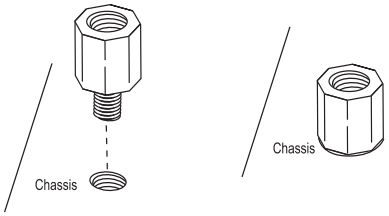
1. Install the I/O shield into the chassis.



2. Locate the mounting holes on the motherboard.

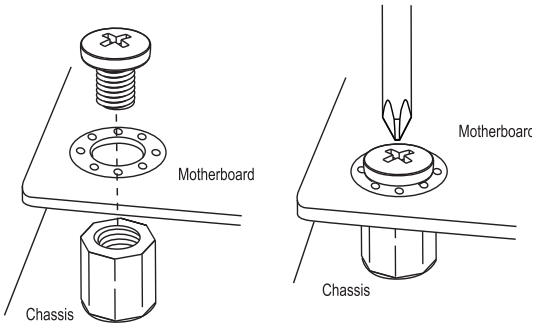
3. Locate the matching mounting holes on the chassis. Align the mounting holes on the motherboard against the mounting holes on the chassis.

4. Install standoffs in the chassis as needed.



5. Install the motherboard into the chassis carefully to avoid damaging motherboard components.

6. Using the Philips screwdriver, insert a Pan head #6 screw into a mounting hole on the motherboard and its matching mounting hole on the chassis.



7. Repeat Step 5 to insert #6 screws into all mounting holes.

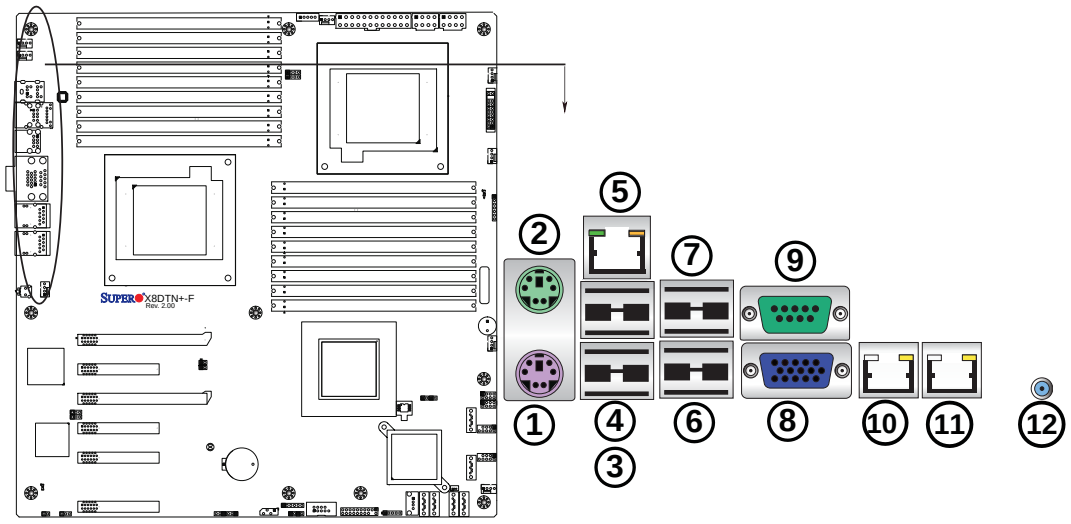
8. Make sure that the motherboard is securely placed in the chassis.

Note: Images displayed are is illustration only. Your chassis or components might look different.

3-5 Control Panel Connectors/I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See the picture below for the colors and locations of the various I/O ports.

Back Panel Connectors/I/O Ports



Back Panel I/O Port Locations and Definitions

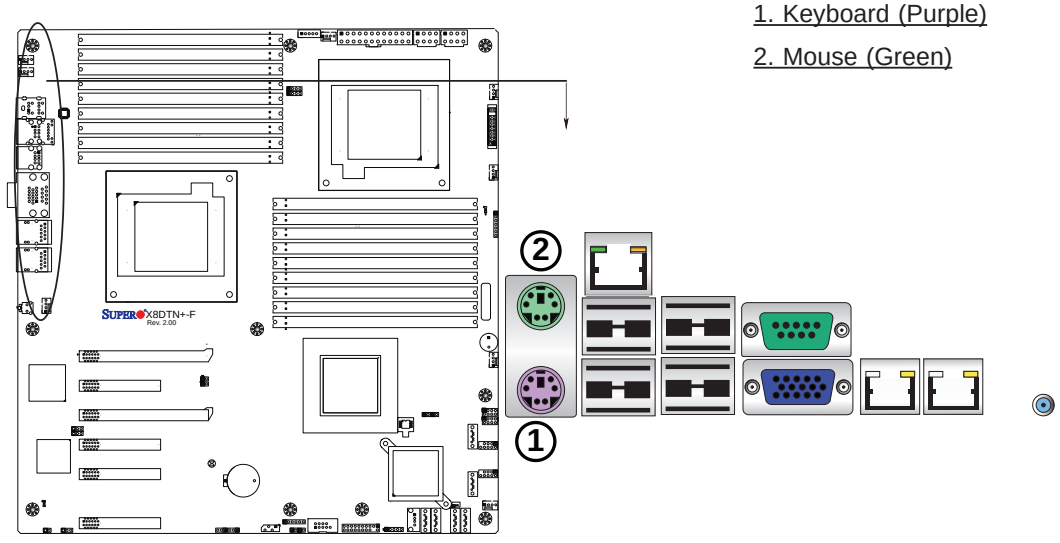
1. Keyboard (Purple)
2. PS/2 Mouse (Green)
3. Back Panel USB Port 0
4. Back Panel USB Port 1
5. IPMI_Dedicated LAN
6. Back Panel USB Port 3
7. Back Panel USB Port 4
8. VGA (Blue)
9. COM Port 1 (Turquoise)
10. Gigabit LAN 1
11. Gigabit LAN 2
12. UID Switch

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located next to the Back Panel USB Ports 0~1 on the motherboard. See the table at right for pin definitions.

PS/2 Keyboard/Mouse Pin Definitions

PS2 Keyboard		PS2 Mouse	
Pin#	Definition	Pin#	Definition
1	KB Data	1	Mouse Data
2	No Connection	2	No Connection
3	Ground	3	Ground
4	Mouse/KB VCC (+5V)	4	Mouse/KB VCC (+5V)
5	KB Clock	5	Mouse Clock
6	No Connection	6	No Connection
VCC: with 1.5A PTC (current limit)			



1. Keyboard (Purple)
2. Mouse (Green)

Universal Serial Bus (USB)

Four Universal Serial Bus ports (USB 0/1, 2/3) are located on the I/O back panel. Additionally, six USB connections (USB 4/5, 6/7, 8, 10) are on the motherboard to provide front chassis access. (Cables are not included). See the tables on the right for pin definitions.

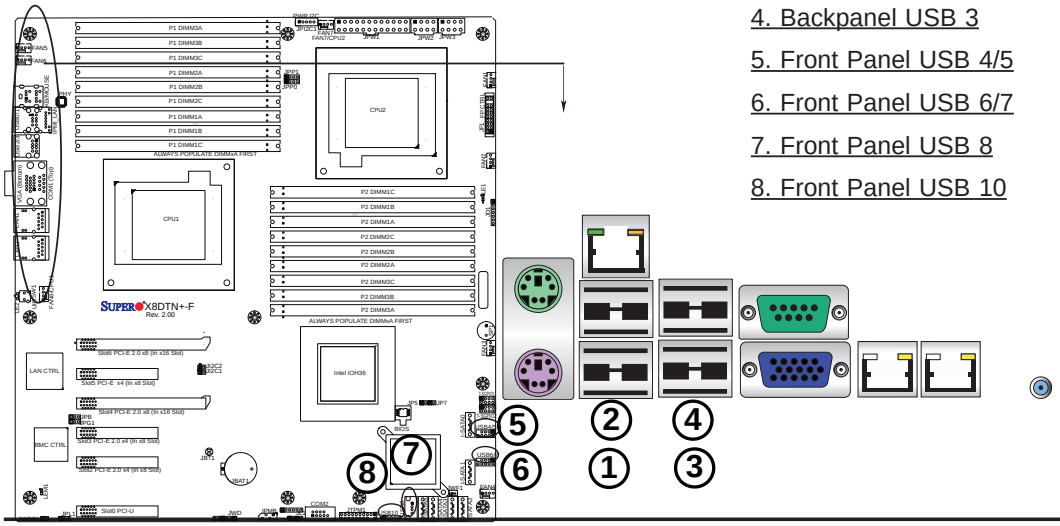
Backplane USB (0/1, 2/3) Pin Definitions

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

FP USB (4/5, 6/7, 8, 10) Pin Definitions

USB 4/6/8 Pin #	Definition	USB 5/7/10 Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	Key	5	NC

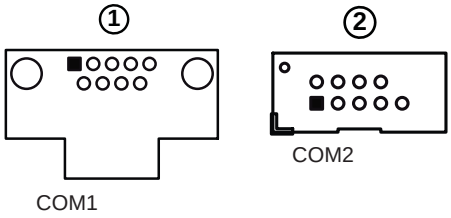
(NC= No connection)



1. Backpanel USB 0
2. Backpanel USB 1
3. Backpanel USB 2
4. Backpanel USB 3
5. Front Panel USB 4/5
6. Front Panel USB 6/7
7. Front Panel USB 8
8. Front Panel USB 10

Serial Ports

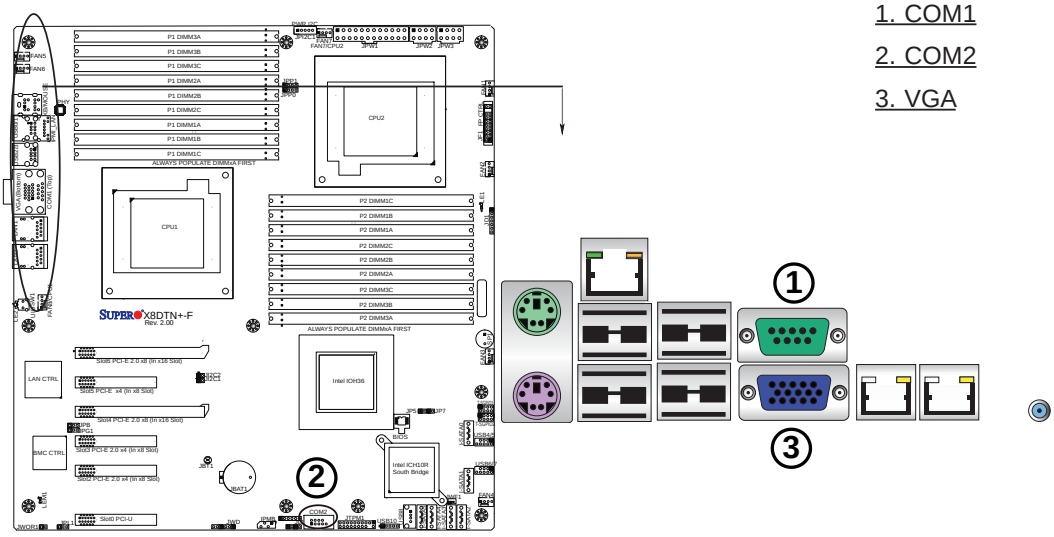
Two COM connections (COM1 & COM2) are located on the motherboard. COM1 is located on the Backplane I/O panel. COM2 is located close to the ICH10R South Bridge to provide additional serial connection support. See the table on the right for pin definitions.



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

Video Connection

A Video (VGA) port is located below-COM1 on the I/O backplane. Refer to the board layout below for the locations.



1. COM1
2. COM2
3. VGA

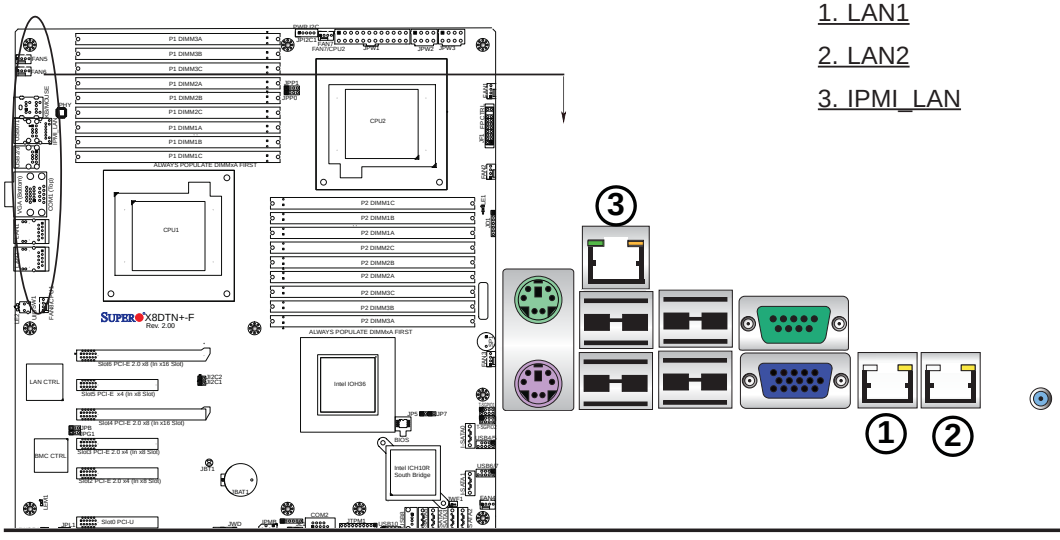
Ethernet Ports

Two Ethernet ports (LAN1/LAN2) are located at on the I/O backplane on the X8DTN+-F/(-LR). In addition, an IPMI_Dedicated LAN is located above USB 0/1 ports on the backplane to provide KVM support for IPMI 2.0. All these ports accept RJ45 type cables. (**Note**: Please refer to the LED Indicator Section for LAN LED information.)

LAN Ports Pin Definition

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

(NC: No Connection)

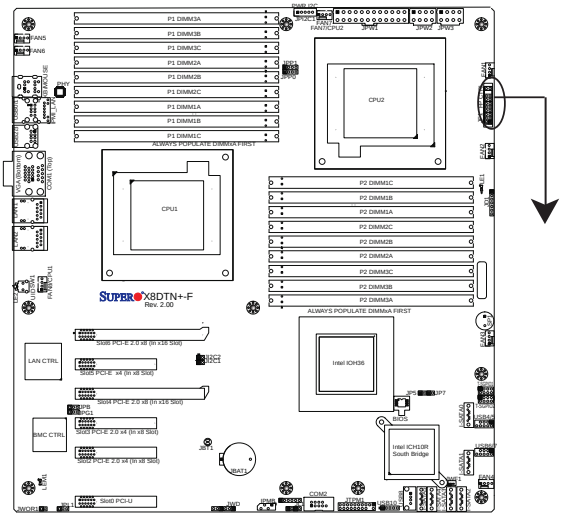


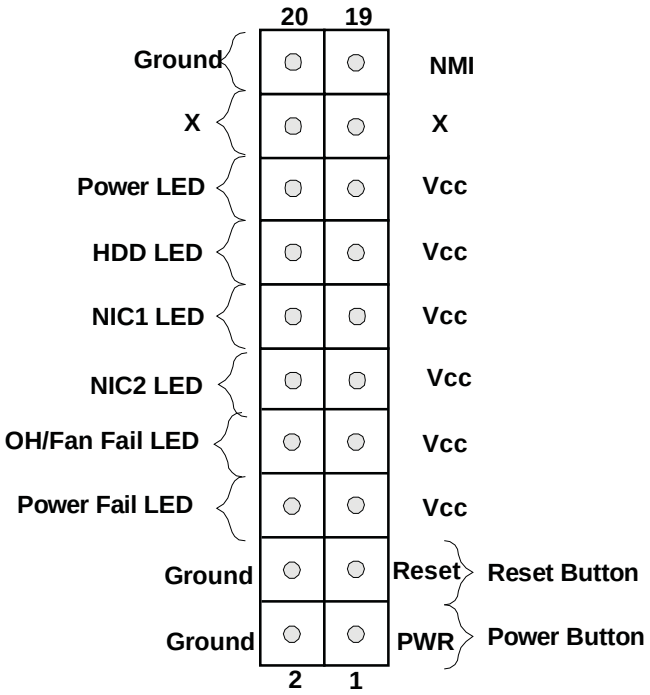
1. LAN1
2. LAN2
3. IPMI_LAN

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 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

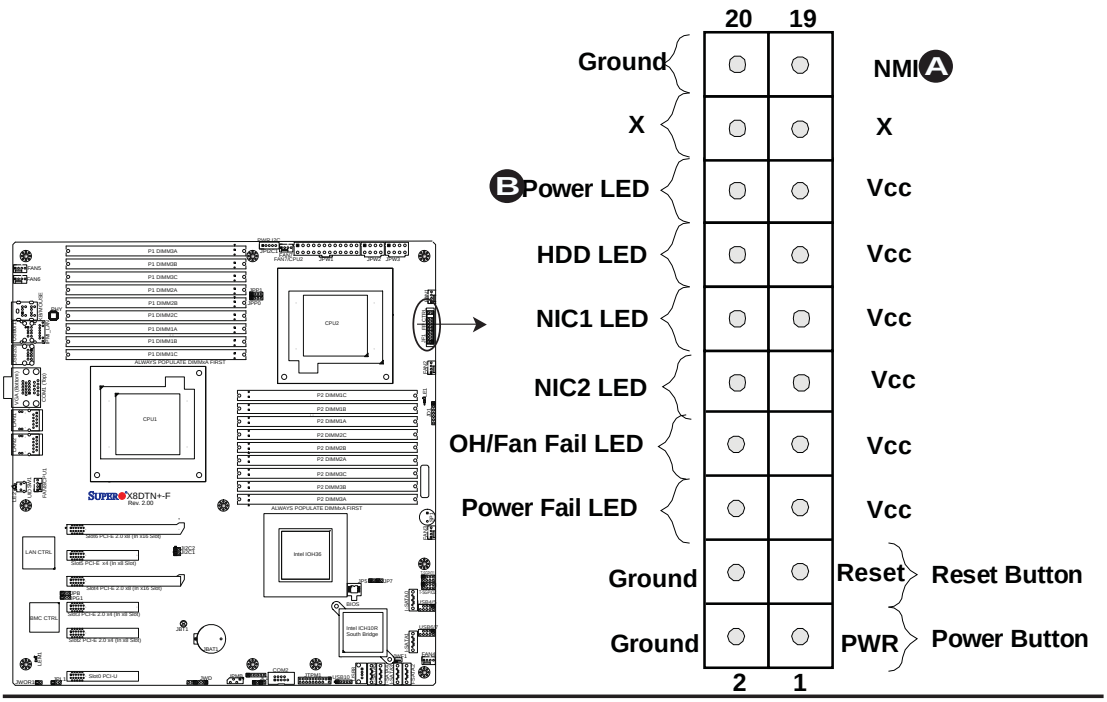
Power LED

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	+5V
16	Ground

A. NMI

B. PWR LED



HDD LED

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

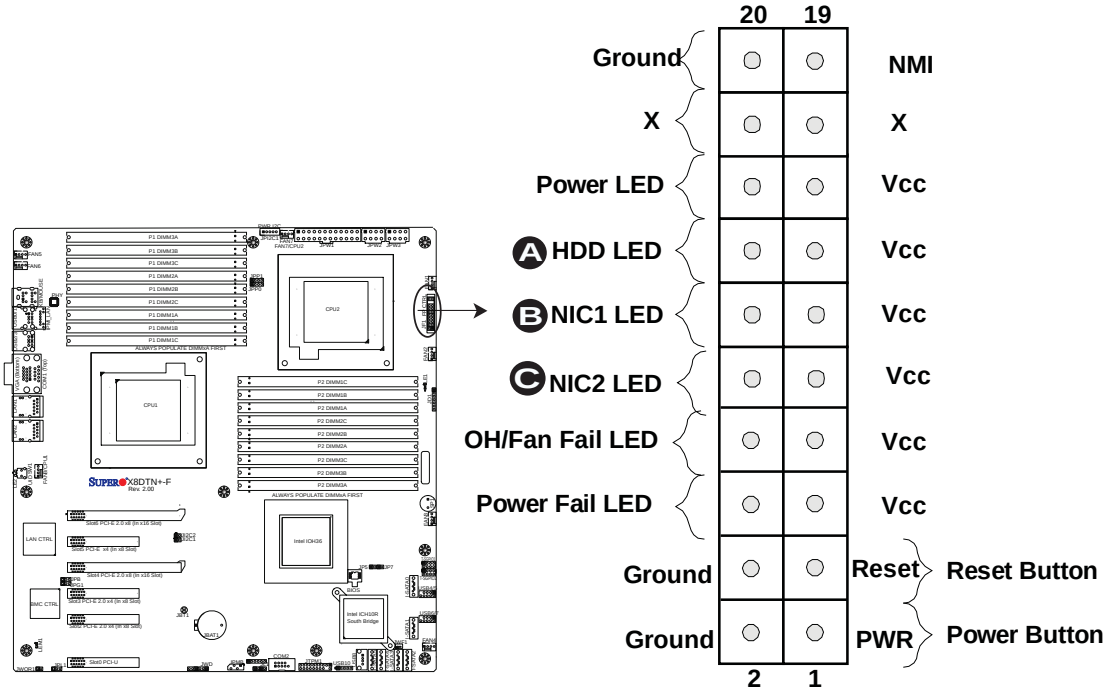
HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	+5V
14	HD Active

NIC1/NIC2 LED Indicators

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

GLAN1/2 LED Pin Definitions (JF1)	
Pin#	Definition
9/11	Vcc
10/12	Ground

A. HDD LED
B. NIC1 LED
C. NIC2 LED



Overheat (OH)/Fan Fail LED

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

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

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

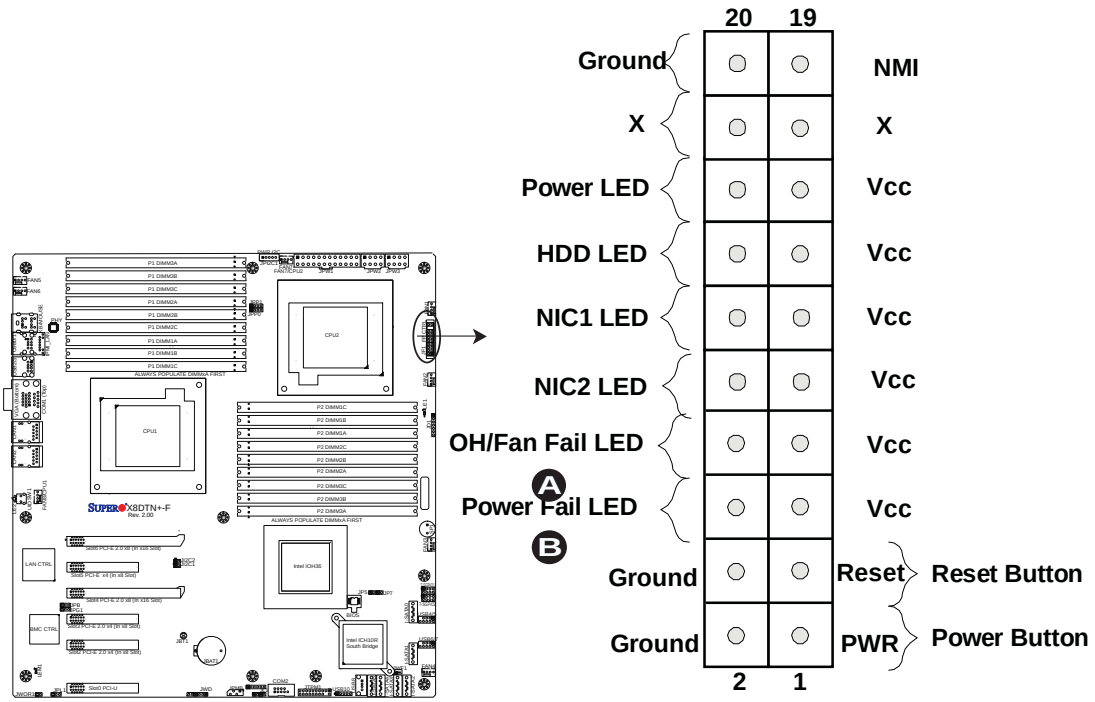
Power Fail LED

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	Vcc
6	Ground

A. OH/Fan Fail & UID LEDs

B. PWR Supply Fail



Reset Button

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

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

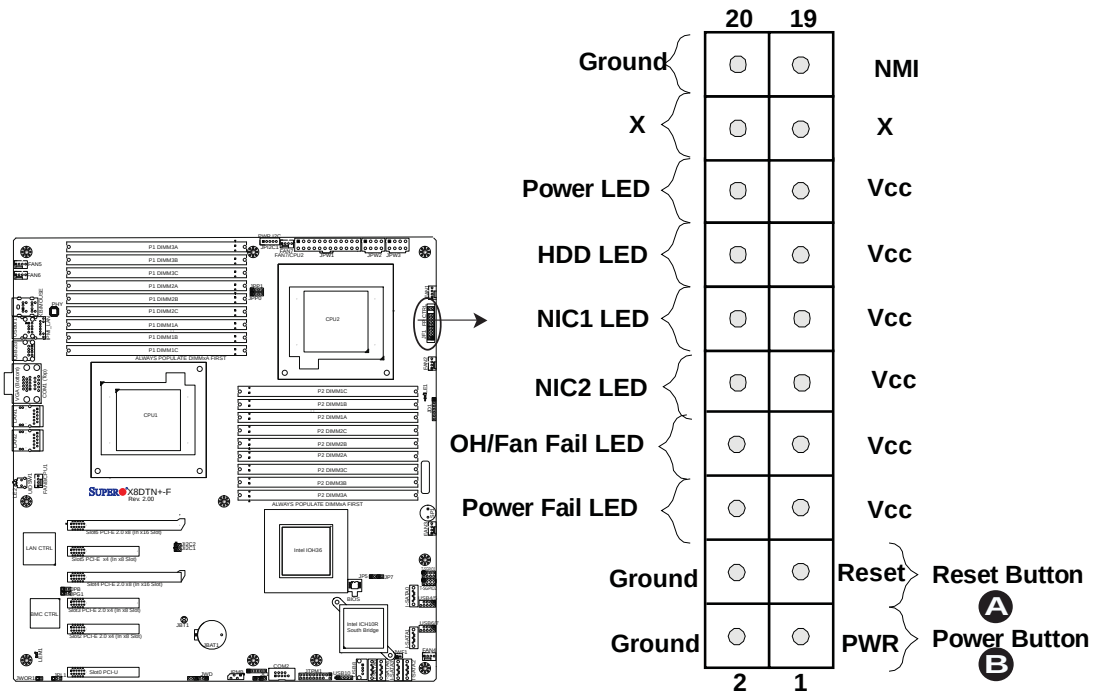
Power Button

The Power Button connection is located on pins 1 and 2 of JF1. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in the BIOS - see Chapter 5). To turn off the power when set to suspend mode, press the button for at least 4 seconds. Refer to the table on the right for pin definitions.

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

A. Reset Button

B. PWR Button



3-6 Connecting Cables

Power Connectors

A 24-pin main power supply connector (JPW1) and two 8-pin CPU PWR connectors (JPW2/JPW3) on the motherboard. These power connectors meet the SSI EPS 12V specification. These power connectors must also be connected to your power supply. See the table on the right for pin definitions.

Warning: To avoid damaging the power supply or the motherboard, please use a power supply that contains a 24-pin and two 8-pin power connectors. Be sure to connect these connectors to the 24-pin (JPW1) and the two 8-pin (JPW2,JPW3) power connectors on the motherboard. Failure in doing so will void the manufacturer warranty on your power supply and motherboard.

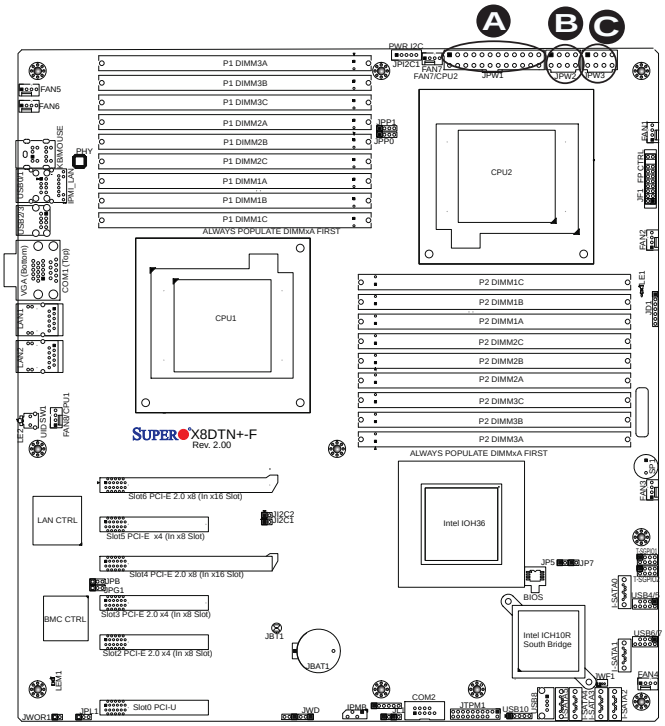
ATX Power 24-pin Connector Pin Definitions

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

12V 8-pin PWR Connector Pin Definitions

Pins	Definition
1 through 4	Ground
5 through 8	+12V

(Required)



A. JPW1: 24-pin ATX PWR (Req'd)

B. JPW2: 8-pin Processor PWR (Req'd)

C. JPW3: 8-pin Processor PWR (Req'd)

Fan Headers

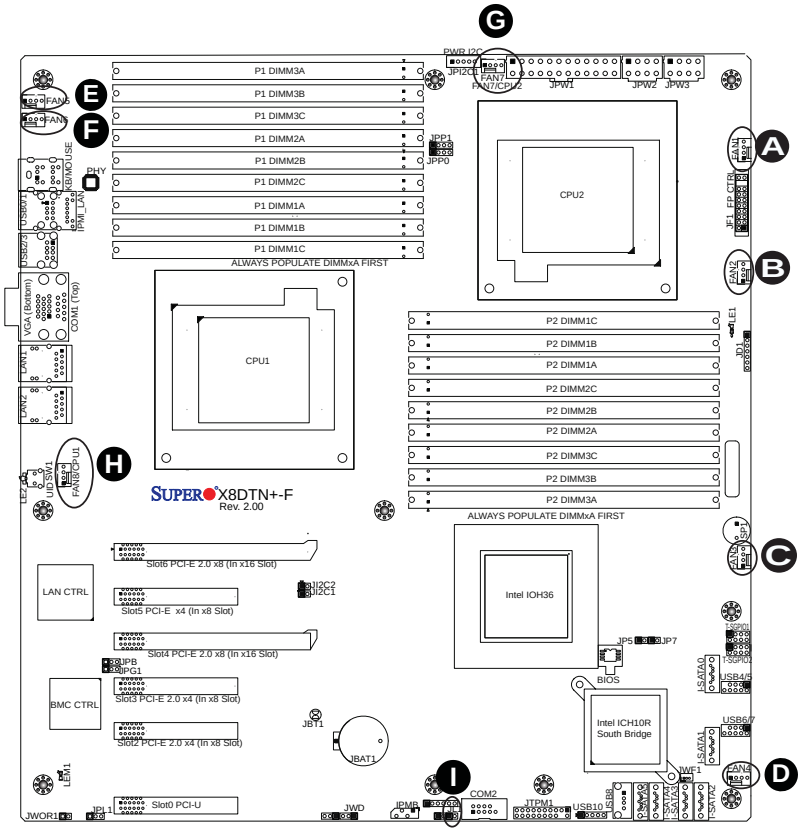
This motherboard has six chassis/system fan headers (Fan 1 to Fan6) and two CPU fans (Fan7/Fan8) on the motherboard. All these 4-pin fans headers are backward compatible with the traditional 3-pin fans. However, fan speed control is available for 4-pin fans only. The fan speeds are controlled by Thermal Management via Hardware Monitoring in the Advanced Setting in the BIOS. (See Chapter 5 for more details.) See the table on the right for pin definitions.

Fan Header Pin Definitions	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	PWR 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



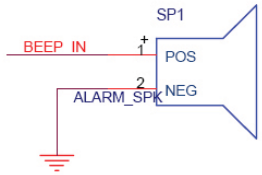
A. Fan 1
B. Fan 2
C. Fan 3
D. Fan 4
E. Fan 5
F. Fan 6
G. Fan 7 (CPU2 Fan)
H. Fan 8 (CPU1 Fan)
I. Chassis Intrusion

Internal Speaker

The Internal Speaker, located at SP1, can be used to provide audible indications for various beep codes. See the table on the right for pin definitions. Refer to the layout below for the locations of the Internal Buzzer (SP1).

Internal Buzzer (SP1) Pin Definition

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



Power LED/Speaker

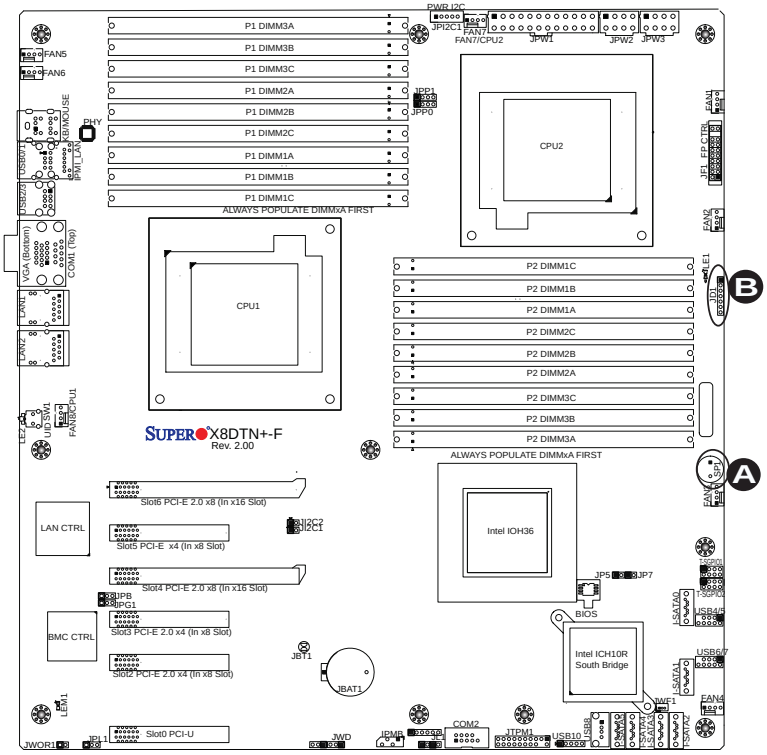
On the JD1 header, pins 1-3 are used for power LED indication, and pins 4-7 are for the speaker. See the tables on the right for pin definitions. Please note that the speaker connector pins (4-7) are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with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

PWR LED Connector Pin Definitions

Pin Setting	Definition
Pin 1	Anode (+)
Pin2	Cathode (-)
Pin3	NA

Speaker Connector Pin Settings

Pin Setting	Definition
Pins 4-7	External Speaker
Pins 6-7	Internal Speaker



A. Internal Speaker (Buzzer)

B. PWR LED/Speaker

TPM Header

A Trusted Platform Module header (JTPM1) is located next to COM2 port to provide TPM support for system data security. (BIOS default: Infineon TPM module support). See the table on the right for pin definitions.

TPM Header Pin Definitions

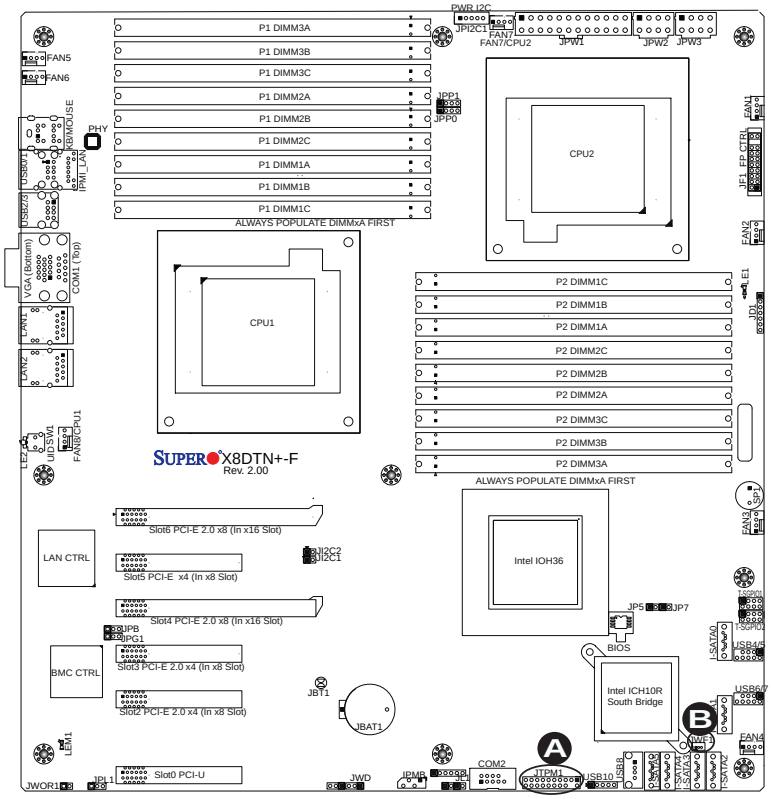
Pin #	Definition	Pin #	Definition
1	LCLK	2	GND
3	LFRAME#	4	<(KEY)>
5	LRESET#	6	+5V (X)
7	LAD 3	8	LAD 2
9	+3.3V	10	LAD1
11	LAD0	12	GND
13	SMB_ CLK4	14	SMB_DAT4
15	+3V_ DUAL	16	SERIRQ
17	GND	18	CLKRUN# (X)
19	LPCPD#	20	LDRQ# (X)

DOM Power Connector

A power connector for SATA DOM (Disk_On_Module) Devices is located at JWF1. Connect the appropriate cable here to provide power support for your DOM devices.

DOM PWR Pin Definitions

Pin#	Definition
1	+5V
2	Ground
3	Ground



A. TPM Header

B. DOM PWR

Power SMB (I²C) Connector

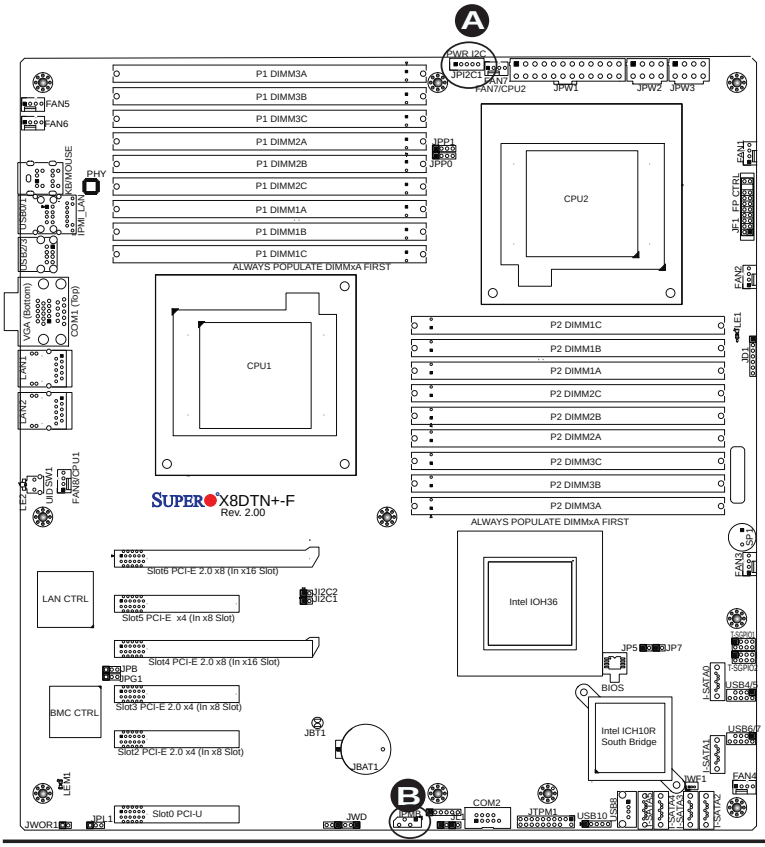
Power System Management Bus (I²C) Connector (JPI²C1) monitors power supply, fan and system temperatures. See the table on the right for pin definitions.

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

IPMB

A System Management Bus header for IPMI 2.0 is located at IPMB. Connect the appropriate cable here to use the IPMB I²C connection on your system.

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



A. JPI²C1

B. IPMB

T-SGPIO 1/2 Headers

Two SGPIO (Serial-Link General Purpose Input/Output) headers are located on the motherboard. These headers support Serial_Link interfaces 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	CLK	8	NC

Note: NC= No Connection

Unit Identification Switch/LED

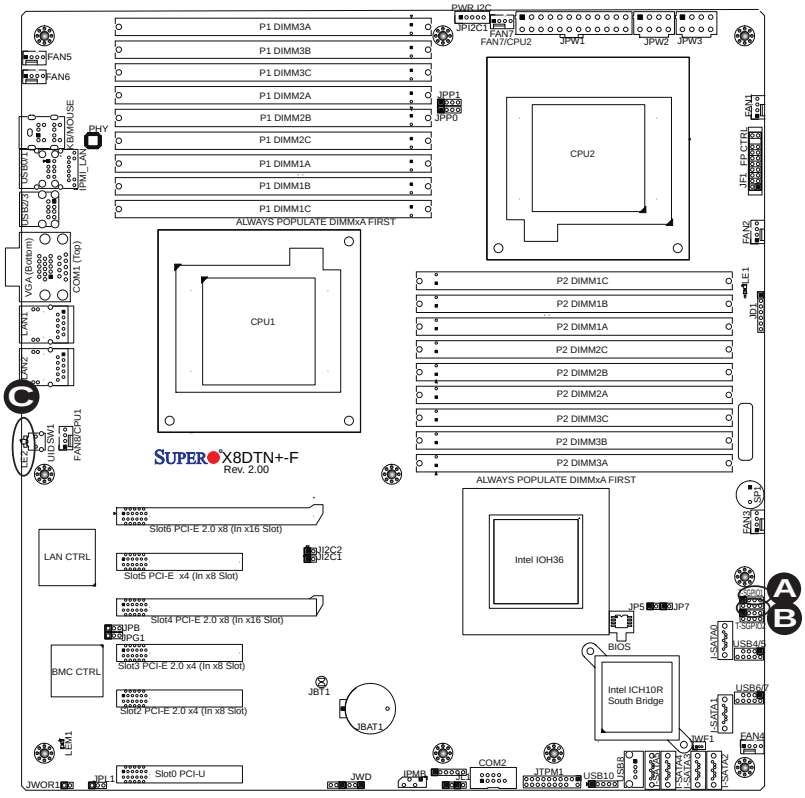
A Unit Identifier switch (UID) and a rear UID LED indicator (LE2) are located next to LAN ports on the back of the chassis. When the user pushes the rear UID switch, the rear UID LED (LE2) will be turned on. Push the UID switch again to turn off the LED indicator. The UID switch provides easy identification of a system unit that may be in need of service. See the tables on the right for more information.

UID Switch (UID) Pin Definitions

Pin#	Definition
1	Ground
2	Ground
3	Button In
4	Ground

UID LED (LE2) Status

Color/State	OS Status	
Blue: On	Windows OS	Unit Identified
Blue: Blinking	Linux OS	Unit Identified



A. T-SGPIO1

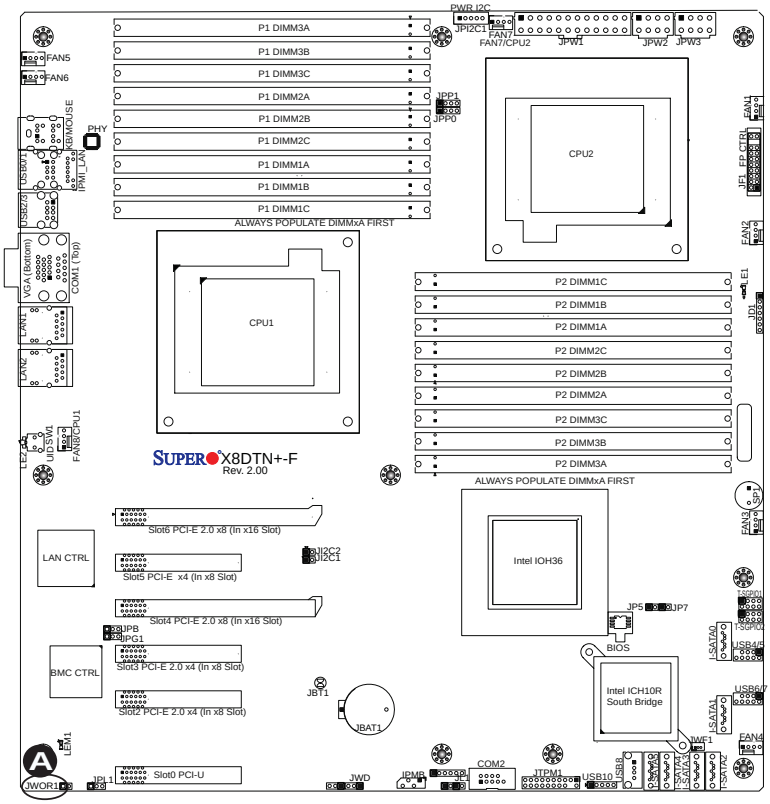
B. T-SGPIO2

C. UID Swtich/UID LED

Wake-On-Ring

The Wake-On-Ring header is designated JWOR1. This function allows your computer to waken up when it receives an incoming call to the modem while in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

Wake-On-Ring Pin Definitions	
Pin#	Definition
1	Ground
2	Wake-up

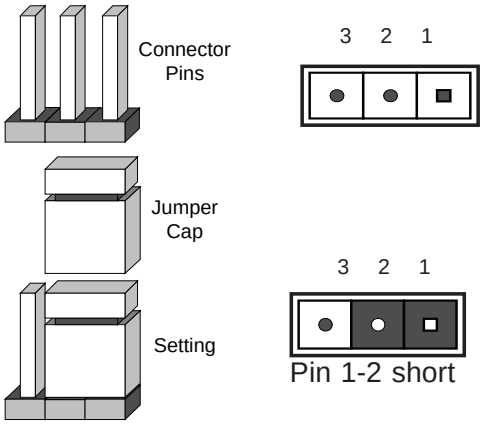


A. Wake-On-Ring

3-7 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.



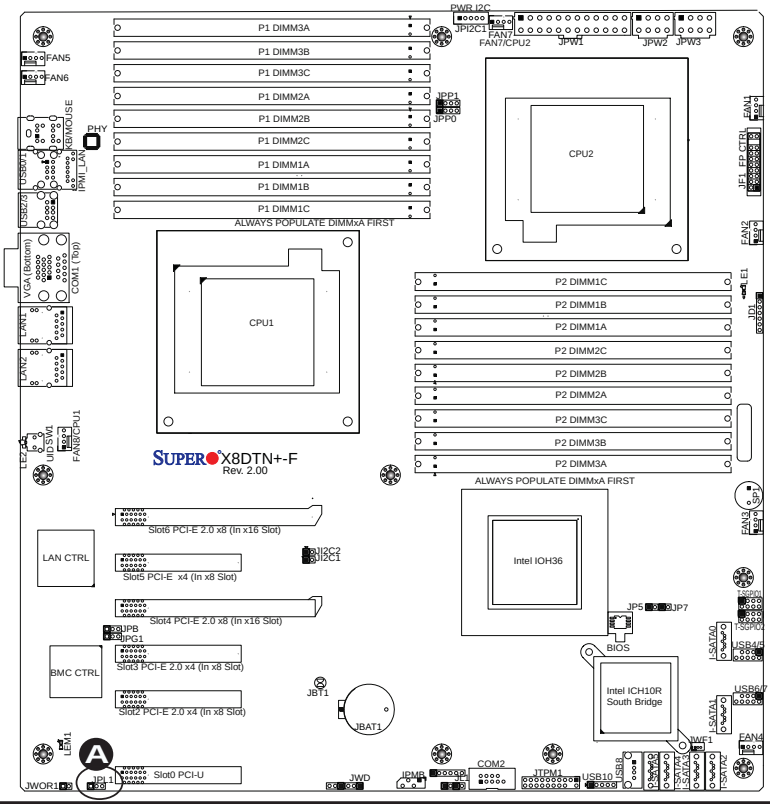
Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

GLAN Enable/Disable

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

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

A. GLAN Port 1 Enable



CMOS Clear

JBT1 is used to clear CMOS. Instead of pins, this "jumper" consists of contact pads to prevent the 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.

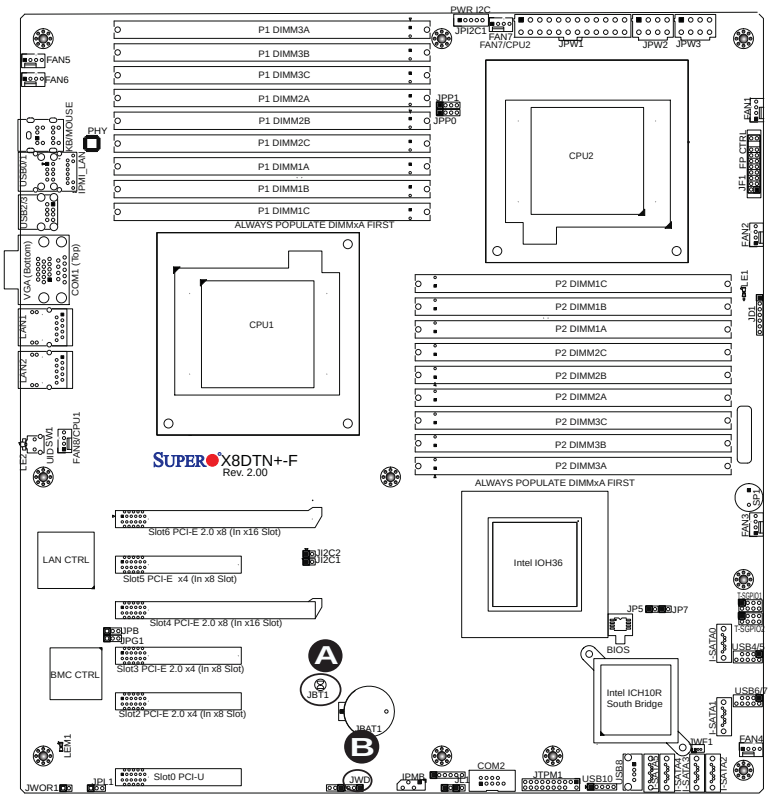
Note 2. Be sure to remove the onboard CMOS Battery before you short JBT1 to clear CMOS.

Note 3. Clearing CMOS will also clear any passwords.

Watch Dog Enable/Disable

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

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



A. Clear CMOS

B. Watch Dog Enable

I²C Bus to PCI-Exp. Slots

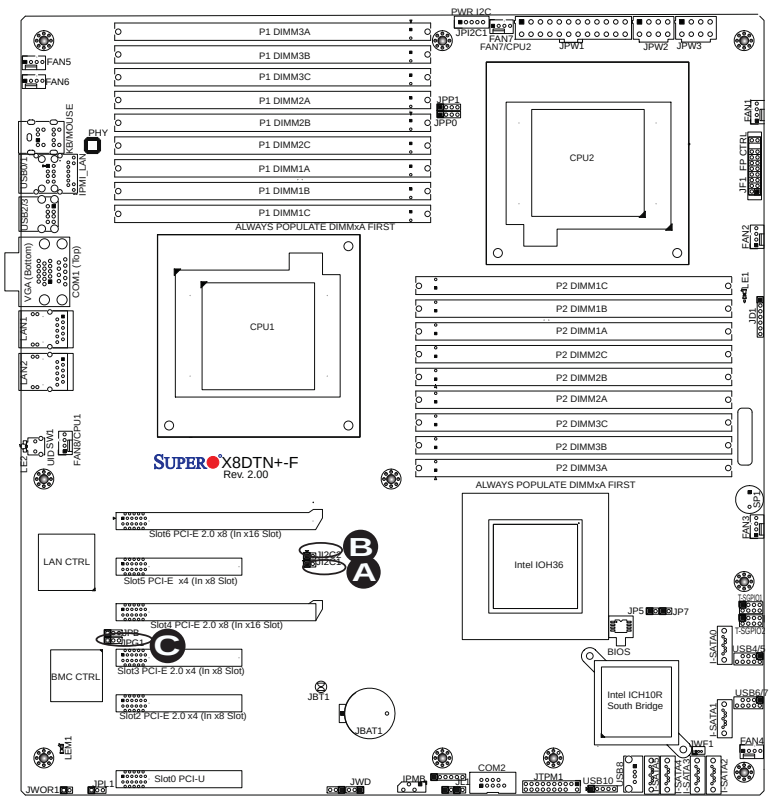
Jumpers JI²C1 and JI²C2 allow you to connect the System Management Bus (I²C) to PCI and PCI-Express slots. These two jumpers are to be set at the same time. The default setting is Open to disable the connections. See the table on the right for jumper settings.

I²C for PCI/PCI-E slots Jumper Settings	
Jumper Setting	Definition
Closed	Enabled
Open	Disabled (Default)

VGA Enable

Jumper JPG1 allows the user to enable the onboard VGA connectors. 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



A. JI²C1
B. JI²C2
C. VGA Enable

3-8 Onboard LED Indicators

GLAN LEDs

Two LAN ports (LAN 1/LAN 2) are located on the I/O Backplane of the motherboard. Each Ethernet LAN port has two LEDs. The yellow LED indicates activity, while the other Link LED may be green, amber or off to indicate the speed of the connections. See the tables at right for more information.



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

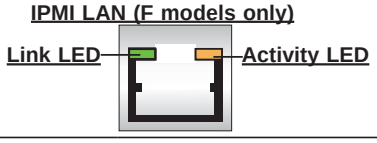
LAN 1/LAN 2 Activity LED (Left) LED State		
Color	Status	Definition
Yellow	Flashing	Active

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

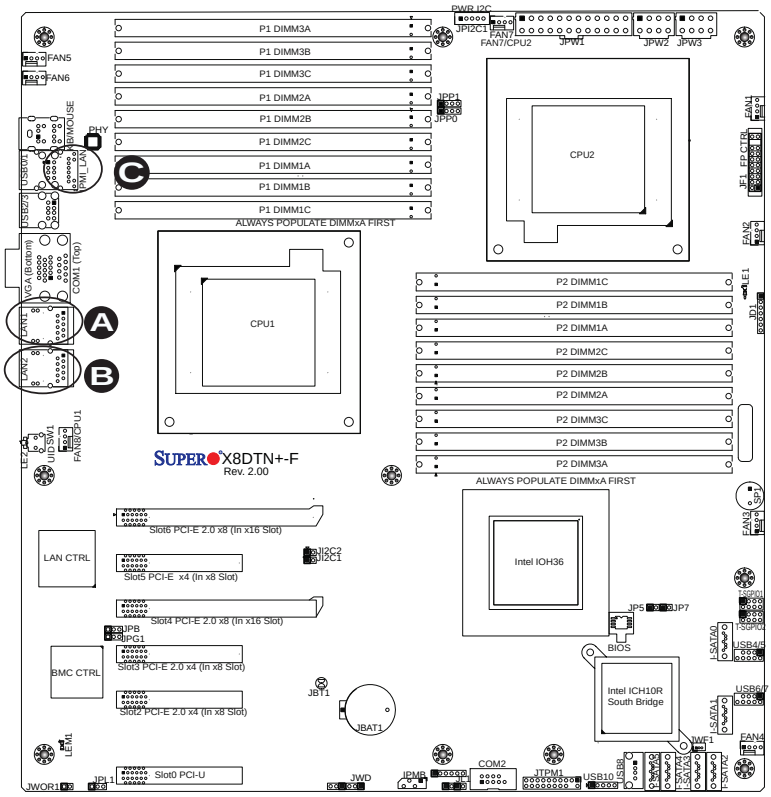
IPMI Dedicated LAN LEDs

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 tables at right for more information.

IPMI LAN (F models only)



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



A. LAN1 LEDs

B. LAN 2 LEDs

C. IPMI LAN LEDs

Onboard Power LED

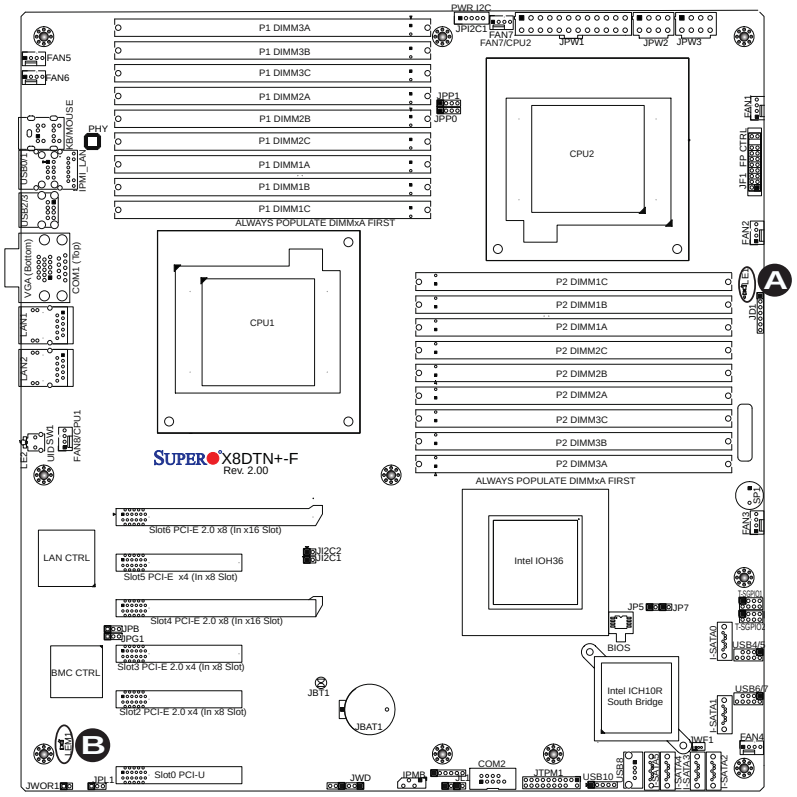
An Onboard Power LED is located at LE1 on the motherboard. When this LED is lit, the system is on. Be sure to turn off the system and unplug the power cord before removing or installing components. See the tables at right for more information.

Onboard PWR LED (LE1) State	
State/Color	Definition
Off	System Off (PWR cable not connected)
Green	System Power On

BMC Heartbeat LED

A BMC Heartbeat LED is located at LEM1 on the motherboard. When LEM1 is blinking, BMC functions normally. See the table at right for more information.

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



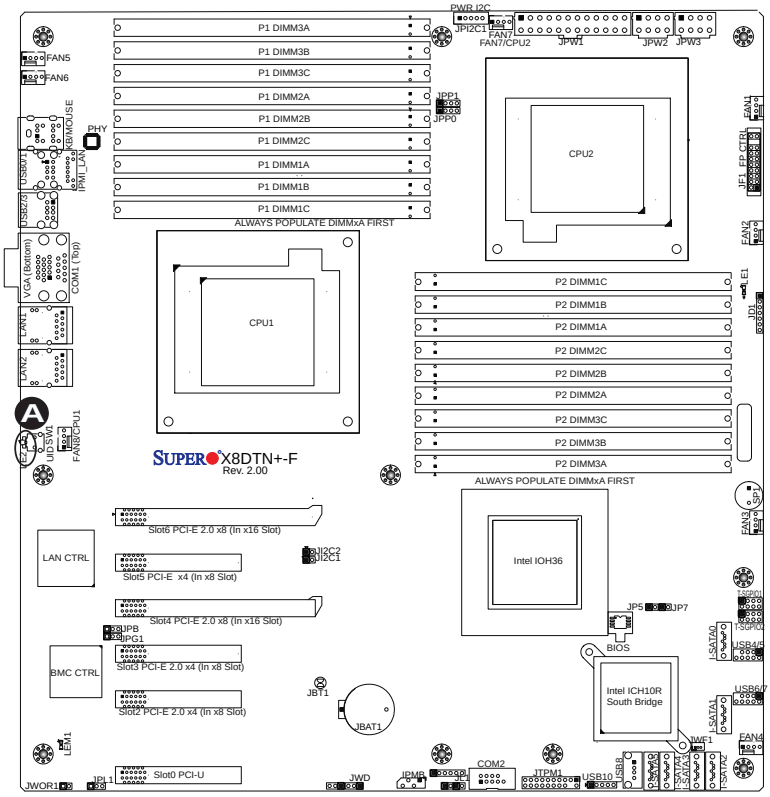
A. Onboard PWR LED

B. BMC Heartbeat LED

Rear UID LED

The rear UID LED is located at LE2 on the backplane. This LED is used in conjunction with the rear UID switch to provide easy identification of a system that might be in need of service. Refer to UID Switch on Page 3-30 for more information.

UID LED (LE2) Status		
Color/State	OS	Status
Blue: On	Windows OS	Unit Identified
Blue: Blinking	Linux OS	Unit Identified



A. UID Rear LED

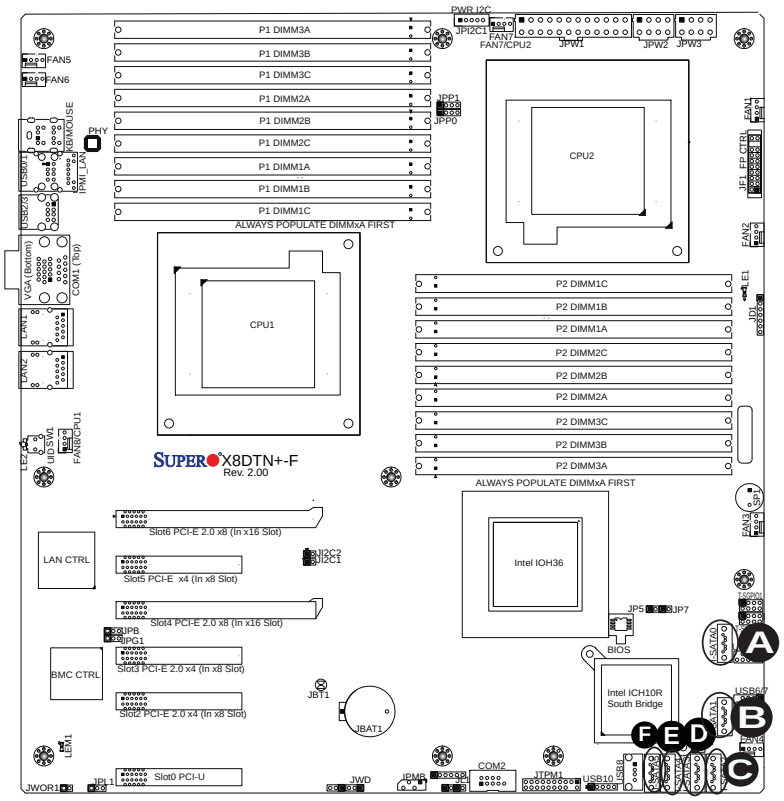
3-9 Serial ATA Connections

Serial ATA Ports

There are six Serial ATA Ports (I-SATA0~I-SATA 5) located on the motherboard. These ports, supported by the Intel ICH10R South Bridge, 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/support/manuals/.



A. I-SATA0
B. I-SATA1
C. I-SATA2
D. I-SATA3
E. I-SATA4
F. I-SATA5

Notes

Chapter 4

Troubleshooting

4-1 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 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 the Appendix 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. If there is still no error beep, try to turn on the system again with only one processor in CPU Socket#1. If there is still no error beep, replace the motherboard.

- If there are error beeps, clear the CMOS settings by unplugging the power cord and contracting both pads on the CMOS Clear Jumper (JBT1). (Refer to Section 3-7 in Chapter 3.)

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. If the system boots, check for bad DIMM modules or slots by following the Memory Errors Troubleshooting procedure in this Chapter.

Losing the System's Setup Configuration

1. Make sure that you are using a high quality power supply. A poor quality power supply may cause the system to lose the CMOS setup information. Refer to Section 2-6 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 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 to use the same RAM speed for all DIMMs in the system.

3. Make sure you are using the correct type of DDR3 RDIMM, LRDIMM or UDIMM modules as recommended by the manufacturer. Refer to Page 2-6 in Chapter 2 for memory support.

4. Check for bad DIMM modules or slots by swapping a single module among all memory slots and check the results.

5. Make sure that all memory modules are fully seated in their slots. Follow the instructions given in Section 3-3 in Chapter 3.

6. Please follow the instructions given in the DIMM Population Tables listed in Section 3-3 in Chapter 3 to install your memory modules.

When the System Becomes Unstable

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

1. CPU/BIOS support: Check if your CPU is supported and if you have the latest BIOS installed.

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 compatibility list.

3. HDD support: Check if 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 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. 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, 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 problems.

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.

4-2 Technical Support Procedures

Before contacting Technical Support, please take the following steps. Also, please note that as a motherboard manufacturer, Supermicro does not sell directly to end-users, so it is best to first check with your distributor or reseller for troubleshooting

services. They should know of any possible problem(s) with the specific system configuration that was sold to you.

1. Please go through the 'Troubleshooting Procedures' and 'Frequently Asked Question' (FAQ) sections in this chapter or see the FAQs on our web site (http://www.supermicro.com/support/faqs/) before contacting Technical Support.

2. BIOS upgrades can be downloaded from our website (http://www.supermicro.com/support/bios/).

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 web site at (http://www.supermicro.com/support/contact.cfm).

- 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 or by fax at: (408) 503-8000, option 2.

4-3 Frequently Asked Questions

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

Answer: The X8DTN+-F(/-LR) has 18 240-pin DIMM slots that support DDR3 RDIMM, LRDIMM, UDIMM modules. Refer to Page 2-6 for memory support. It is strongly recommended that you do not mix memory modules of different speeds and sizes. Please follow all memory installation instructions given on Section 3-3 in Chapter 3.

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 web site at http://www.supermicro.com/support/bios/. Please check our BIOS warning message and the information on how to update your BIOS on our web site. Select

your motherboard model and download the BIOS file to your computer. Also, check the current BIOS revision and make sure that it is newer than your BIOS before downloading. You can choose from the zip file and the .exe file. If you choose the zip BIOS file, please unzip the BIOS file onto a bootable USB device. Run the batch file using the format flash.bat filename.rom from your bootable USB device to flash the BIOS. Then, your system will automatically reboot.

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

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

Question: What's on the CD that came with my motherboard?

Answer: The supplied compact disc has quite a few drivers and programs that will greatly enhance your system. We recommend that you review the CD and install the applications you need. Applications on the CD include chipset drivers for the Windows OS, security and audio drivers.

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.

4-4 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 to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete. For faster service, You can also request a RMA authorization online (http://www.supermicro.com/support/rma/).

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 5

BIOS

5-1 Introduction

This chapter describes the AMI BIOS Setup Utility for the X8DTN+-F/X8DTN+-F-LR. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screens.

Starting BIOS Setup Utility

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

Warning: For your system memory to work properly, be sure to use the correct BIOS ROM for your system. For the X8DTN+-F, use the X8DTN+-F BIOS. For the X8DTN+-F-LR, use the X8DTN+-F-LR BIOS. Refer to memory support in Section 3-3 of Chapter 3 for more details.

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

Each main BIOS menu option is described in this manual. The 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 a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it. (**Note**: the AMI BIOS has default text messages built in. Supermicro retains the option to include, omit, or change any of these text messages.)

The AMI BIOS Setup Utility uses a key-based navigation system called "hot keys". Most of the AMI BIOS setup utility "hot keys" can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

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

How To Change the Configuration Data

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

Note: For AMI BIOS Recovery, please refer to the AMI BIOS Recovery Instructions posted on our website at http://www.supermicro.com/support/manuals/.

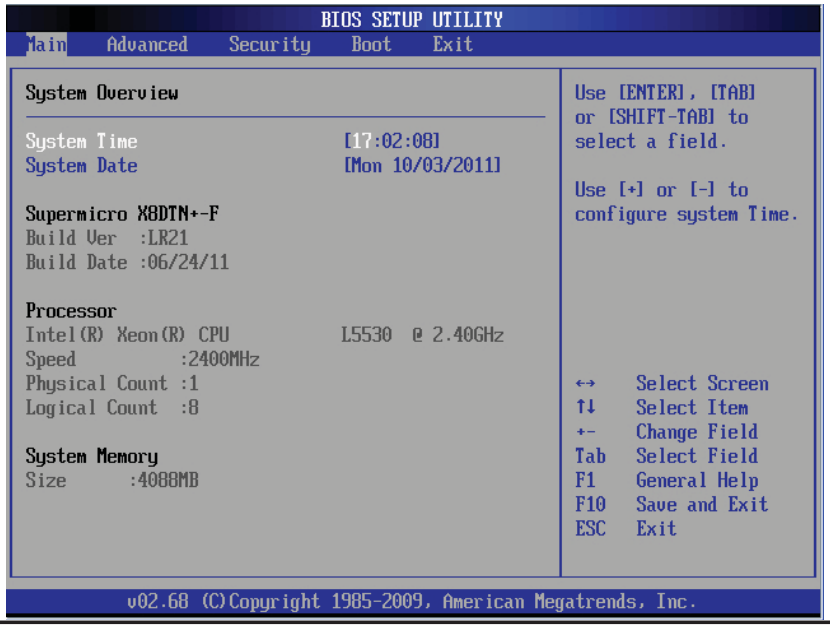
Starting the Setup Utility

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 Supermicro be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

5-2 Main Setup

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



System Overview: The following BIOS information will be displayed:

System Time/System Date

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

Supermicro X8DTN+-F

- **Build Version**: This item displays the BIOS revision used in your system.
- **Build Date**: This item displays the date when this BIOS was completed.

Processor

The AMI BIOS will automatically display the status of the processor used in your system:

- **CPU Type**: This item displays the type of CPU used in the motherboard.
- **Speed**: This item displays the speed of the CPU detected by the BIOS.
- **Physical Count**: This item displays the number of processors installed in your system as detected by the BIOS.
- **Logical Count**: This item displays the number of CPU Cores installed in your system as detected by the BIOS.

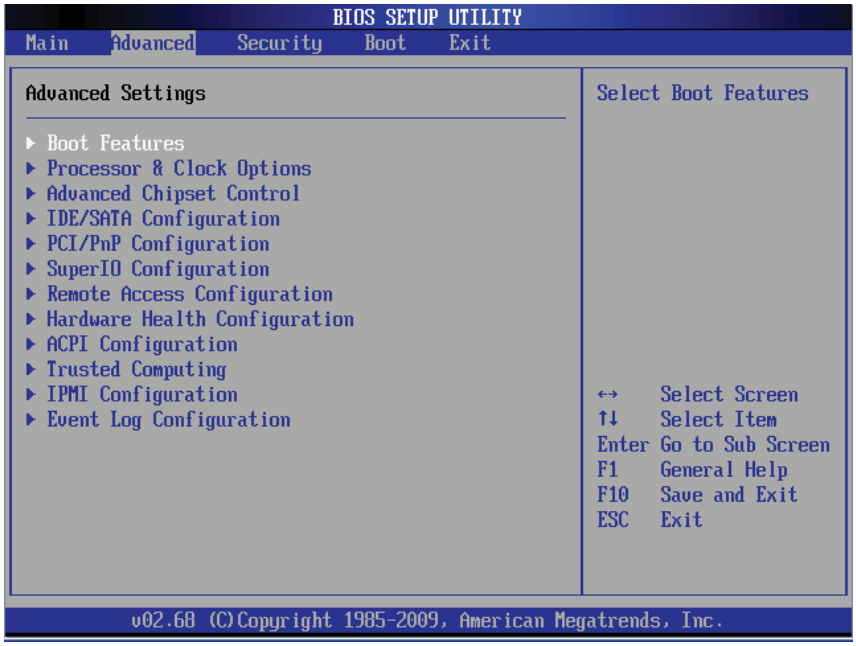
System Memory

This displays the size of memory available in the system:

- **Size**: This item displays the memory size detected by the BIOS.

5-3 Advanced Setup Configurations

Use the arrow keys to select Boot Setup and press <Enter> to access the submenu items.



▶Boot Features

Quick Boot

Select Enabled to skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

Quiet Boot

This feature allows the user to select bootup screen display between POST messages or 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

This item sets 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

This feature selects the Power-on state for Numlock key. The options are Off and **On**.

Wait For 'F1' If Error

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

Hit 'Del' Message Display

Select Enabled to display "Press DEL to run Setup" during POST. The options are **Enabled** and Disabled.

Interrupt 19 Capture

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

Power Configuration

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_Second_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_Second_Override.

Restore on AC Power Loss

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

Watch Dog Function

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

▶Processor and Clock Options

This submenu allows the user to configure the Processor and Clock settings.

CPU Ratio

This option allows the user to set the ratio between the CPU Core Clock and the FSB Frequency. (**Note**: if an invalid ratio is entered, the AMI BIOS will restore the setting

to the previous state.) The default setting is Auto which will allow the BIOS set the ratio depending on the CPU installed on the board. The default setting is **Auto**.

C1E Support

Select Enabled to enable Enhanced Halt State support which will significantly reduce the CPU's power consumption by reducing the CPU's clock cycle and voltage during a "Halt State." The options are Disabled and **Enabled**.

Hardware Prefetcher (Available when supported by the CPU)

If enabled, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

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

The CPU prefetches the cache line for 64 bytes if this option is set to Disabled. The CPU prefetches both cache lines for 128 bytes as comprised if this option is set to **Enabled**.

DCU Prefetcher (Available when supported by the CPU)

Select Enabled to activate Level 1 Data Prefetcher to enhance system performance. For DP servers, enable or disable this feature based on application specifications. The options are **Enabled** and Disabled.

Data Reuse Optimization (Available when supported by the CPU)

Select Enabled to maximize Data Reuse support to enhance system performance for DP platforms. For DP servers, enable or disable this feature based on application specifications. The options are **Enabled** and Disabled.

MPS and ACPI MADT Ordering

This feature allows the user to configure the MPS (Multi-Processor Specification) and ACPI settings for your motherboard. Select **Modern Ordering** if the XP or a newer version of Windows OS is used in the motherboard. Select Legacy Ordering if the 2000 or an earlier version of Windows OS is used. The options are **Modern Ordering** and Legacy Ordering.

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

Select Enabled to use the feature of Virtualization Technology and allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are **Enabled** and Disabled. **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

Execute-Disable Bit Capability (Available when supported by the OS and the CPU)

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

Simultaneous Multi-Threading (Available when supported by the CPU)

Set to Enabled to use the Simultaneous Multi-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1 and 2.

Intel® EIST Technology

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. **Please refer to Intel's web site for detailed information.** The options are Disable (Disable GV3) and **Enable (Enable GV3)**.

Intel® Turbo Boost (Available when Intel® EIST Technology is enabled)

Select Enabled to use the Turbo Mode to boost system performance. The options are **Enabled** and Disabled.

Intel® C-STATE Tech

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and **Enabled**.

C3 State

This feature allows the user to decide how the onboard 5500/5600 Series processor will act at C3 State. The options are Disabled, **ACPI C2** and ACPI C3**.**

C6 State

This feature allows the user to decide how the onboard 5500/5600 Series processor will act at C6 State. The options are Disabled and **Enabled.**

C-State package limit setting (Available when Intel® C-State Tech is enabled)

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

C1 Auto Demotion

When this feature is enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and **Enabled.**

C3 Auto Demotion

When this feature is enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled.**

ACPI T State

When this feature is enabled, CPU Throttling state will be reported in the ACPI (Advanced Configuration and Power Interface) protocol. The options are Disabled and **Enabled**.

Intel AES-NI (Available when supported by the OS and the CPU)

If this feature is set to Enabled, Intel AES-NI will add new encryption features to help accelerate AES Software application, providing code authorization and signature verification to improve system performance. The default is **Disabled**. (Refer to Intel and Microsoft Web Sites for more information.)

Clock Spread Spectrum

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

▶Advanced Chipset Control

The items included in the Advanced Settings submenu are listed below:

▶CPU Bridge Configuration

QPI (Quick Path Interconnect) Links Speed

This feature selects data transfer speed for QPI Link connections. The options are Slow-Mode, and **Full Speed**.

QPI Frequency (Available if the item - QPI Speed is set to Full Speed)

Use this feature to select the desired QPI frequency. The options are **Auto**, 4.800 GT, 5.866GT, 6.400 GT.

QPI L0s and L1

This feature allows the user to set the QPI power state to a lower setting. L0s and L1 are automatically selected by the motherboard. The options are **Disabled** and Enabled.

Memory Frequency

This feature forces a DDR3 module to run at a frequency other than what the system has detected. Select Force SPD (Serial Presence Detect) to force the module to run at a frequency specified on the SPD table. The available options are **Auto**, Force DDR-800, Force DDR-1066, Force DDR-1333 and Force SPD.

Memory Mode

Select Independent to make all DIMMs available to the operating system. Select Channel Mirroring to maintain two identical copies of all data in Channel 1 and Channel 2 memory modules for data security. Select Lockstep for the motherboard to use two areas of memory to run the same set of operations in parallel. Select Sparing for a preset threshold of correctable errors to be used to trigger fail-over. The spare memory is put online and used as active memory in place of the failed memory. This option is supported by Intel 5600 Series processors only. The options are **Independent**, Channel Mirroring, and Lockstep.

Demand Scrubbing

Demand Scrubbing is a memory error-correction scheme that allows the processor to write corrected data back into the memory block from where it was read by the Processor. The options are Enabled and **Disabled**.

Patrol Scrubbing

Select Enabled to use Patrol Scrubbing, a memory error-correction scheme that works in the background to look for and correct errors. The options are **Enabled** and Disabled.

Throttling - Closed Loop

Throttling improves reliability and reduces power in the processor by automatic voltage control during processor idle states. Available options are Disabled and **Enabled**. If Enabled, the following items will appear:

Hysteresis Temperature (Available for Closed Loop only)

Temperature Hysteresis is the temperature lag (in degrees Celsius) after the DIMM temperature threshold is reached before Closed Loop Throttling begins. The options are Disabled, **1.5°C**, 3.0°C, and 6.0°C.

Guardband Temperature (Available for Closed Loop only)

This is the temperature which applies to the DIMM temperature threshold. Each step is in 0.5°C increment. The default is **[006]**.

Inlet Temperature

This is the temperature detected at the chassis inlet. Each step is in 0.5°C increment. The default is **[070]**.

Temperature Rise

This is the temperature rise to the DIMM thermal zone. Each step is in 0.5°C increment. The default is **[020]**.

Air Flow

This is the air flow speed to the DIMM modules. Each step is one mm/sec. The default is **[1500]**.

Altitude

This feature defines how many meters above or below sea level the system is located. The options are **Sea Level or Below,** 1~300, 301~600, 601~900, 901~1200, 1201~1500, 1501~1800, 1801~2100, 2101~2400, 2401~2700, 2701~3000.

DIMM Pitch

This is the physical space between each DIMM module. Each step is in 1/1000 of an inch. The default is **[400]**.

▶North Bridge Configuration

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

Intel I/O AT

This feature works with the Intel I/O AT (Acceleration Technology) to accelerate the performance of TOE devices. (**Note**: A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some or all packet processing of this add-on card.) When this feature is set to Enabled, it will enhance overall system performance by providing direct memory access for data transferring. The options are **Enabled** and Disabled.

DCA (Direct Cache Access) Technology (Available when Intel I/O AT is enabled)

This feature works in conjunction with the Intel I/O AT (Acceleration Technology) to accelerate the performance of the TOE device. When this feature set to Enabled, it

will enhance overall system performance by providing direct cache access for data transferring. The options are **Enabled** and Disabled.

DCA Prefetch Delay

A DCA Prefetch is used with TOE components to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching too frequently can saturate the cache directory and delay necessary cache accesses. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], [24], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120]

Intel VT-d

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are **Enabled** and Disabled.

Active State Power-Management

Select enable to configure the power states of PCI-Express L0s and L1 links. The options are Enabled and **Disabled**.

IOH PCIE Max Payload Size

Some add-on cards perform faster with the coalesce feature, which limits the payload size to 128B; while others, with a payload size of 256B which inhibits the coalesce feature. Please refer to your add-on card user guide for the desired setting. The options are **256B** and 128MB.

▶South Bridge Configuration

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

USB Functions

Select Enabled to use onboard USB connections. The Options are: Disabled, and **Enabled**. (If this item is set to Enabled, USB 2.0 Controller will be enabled.)

Legacy USB Support

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the motherboard. The settings are Disabled, **Enabled** and Auto.

USB 2.0 Controller

Select Enabled to activate USB 2.0 Controller. The options are **Enabled** and Disabled. (**Note**: If the item - USB Functions is enabled, USB 2.0 Controller will always

be enabled. When the item - USB Functions is set to Disabled, the user has the option to enable or disable USB 2.0 Controller.)

USB 2.0 Controller Mode

Use this feature to select the USB 2.0 Controller mode. The options are **Hi-Speed (480 Mbps)** and Full Speed (12 Mbps).

BIOS EHCI Hand-Off

Select Enabled to enable BIOS Enhanced Host Controller Interface support to provide a workaround solution for an operating system that does not support EHCI Hand-Off. When enabled, EHCI Interface will be changed from the BIOS-controlled to the OS-controlled. The options are Disabled and **Enabled**.

▶ME Subsystem Configuration

This feature allows the user to configure ME Subsystem Configuration settings.

ME-EHCI

Select Enabled to enable Intel ME EHCI (Management Engine Enhanced Host Controller Interface) support. The options are **Enabled** and Disabled.

▶IDE/SATA Configuration

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

SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to legacy compatibility mode, while selecting Enhanced sets SATA#1 to native SATA mode. The options are Disabled, Compatible and **Enhanced**.

Configure SATA#1 as

This feature allows the user to select the drive type for SATA#1. The options are **IDE,** RAID and AHCI. (When the option-RAID is selected, the item-ICH RAID Code Base will appear.)

ICH RAID Code Base (This feature is available when the option-RAID is selected)

Select Intel to enable Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select Adaptec to enable Adaptec's SATA RAID firmware to configure Adaptec's SATA RAID settings. The options are **Intel** and Adaptec.

SATA#2 Configuration (This feature is available when the option-IDE is selected)

Selecting Enhanced will set SATA#2 to native SATA mode. The options are Disabled, and **Enhanced**.

Primary IDE Master/Slave, Secondary IDE Master/Slave, Third IDE Master, and Fourth IDE Master

These settings allow the user to set the parameters of Primary IDE Master/Slave, Secondary IDE Master/Slave, Third and Fourth IDE Master slots. Press <Enter> to activate the following submenu items. Set the correct configuration settings accordingly. The items included in the submenu are:

Type

This item is used to select the type of device connected to the system. The options are Not Installed, **Auto**, CD/DVD and ARMD.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a disk drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be able to support 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows of up to 64 KB of data be transferred per interrupt. Select Disabled to allow data to be transferred from and to the device one sector at a time. Select Auto to allow data to be transferred between devices with multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto**, 0, 1, 2, 3, and 4.

Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE disk drive support cannot be determined.

Select 0 ~ 4 to allow the AMI BIOS to use PIO mode 0 ~ 4. It has a data transfer rate of 3.3 MB/s ~ 16.6 MB/s. See the table below.

PIO Mode Select Options

Option Selected	PIO Mode	Max. Transfer Rate
0	PIO Mode 0	3.3 MB/s
1	PIO Mode 1	5.2 MB/s
2	PIO Mode 2	8.3 MB/s
3	PIO Mode 3	11.1 MB/s
4	PIO Mode 4	16.6 MB/s

DMA Mode

Select Auto to allow the BIOS to automatically detect IDE DMA mode when the IDE disk drive support cannot be determined. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn. See the table below for DMA Mode Select Options.

DMA Mode Select Options

Option Selected	DMA Mode	Max. Transfer Rate
SWDMA 0	Single-Word DMA 0	2.1 MB/s
SWDMA1	Single-Word DMA 1	4.2 MB/s
SWDMA 2	Single-Word DMA 2	8.3MB/s
MWDMA 0	Multi-Word DMA 0	4.2 MB/s
MWDMA1	Multi-Word DMA 1	13.3 MB/s
MWDMA 2	Multi-Word DMA 2	16.6 MB/s
UDMA 0	Ultra DMA 0	16.6 MB/s
UDMA 1	Ultra DMA 1	25 MB/s
UDMA 2	Ultra DMA 2	33.3 MB/s
UDMA 3	Ultra DMA 3	44.4 MB/s
UDMA 4	Ultra DMA 4	66.6 MB/s
UDMA5	Ultra DMA 5	100 MB/s
UDMA 6	Ultra DMA 6	133 MB/s

S.M.A.R.T. For Hard disk drives

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select Auto to allow the AMI BIOS to automatically detect hard disk drive support. Select Disabled to prevent the AMI BIOS from using the S.M.A.R.T. Select Enabled to allow the AMI BIOS to use the S.M.A.R.T. to support hard drive disk. The options are Disabled, Enabled, and **Auto**.

32Bit Data Transfer

Select Enable to enable 32-bit IDE data transfer support. The options are **Enabled** and Disabled.

IDE Detect Timeout (sec)

Use this feature to set the timeout value for BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec), 5, 10, 15, 20, 25, 30, and **35**.

▶Advanced PCI/PnP Configuration

Clear NVRAM

This feature clears the NVRAM (Non-Volatile Random Access Memory) during system boot. The options are **No** and Yes.

Plug & Play OS

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if Plug & Play is supported by your OS.) Select **No** to allow the AMI BIOS to configure all devices in the system.

PCI Latency Timer

This feature sets 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.

PCI IDE BusMaster

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are Disabled and **Enabled.**

SR-IOV Supported

Select Enabled to enable SR-IOV (Intel Single Root I/O Virtualization) support to enhance Virtualization performance. The options are Enabled and **Disabled.**

PCI Slot1~ PCI Slot6 Option ROM/PCI-U Slot 0 OPROM

Select Enabled to enable the onboard PCI Slot Option ROM as specified (except the VGA card). This is to boot computer using a network interface. The options are **Enabled** and Disabled.

Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM

Select Enabled to enable the onboard LAN1 or LAN2 Option ROM. This is to boot computer using a network interface. The options are Enabled and **Disabled.**

Onboard LAN Option ROM Select

This feature allows the user to select the onboard LAN option ROM type. The options are iSCSI and **PXE**.

▶Super IO Device Configuration

Serial Port1 Address/ Serial Port2 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 or 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

physically becomes unavailable. Select 3F8/IRQ4 to allow the serial port to use 3F8 as its I/O port address and IRQ 4 for the interrupt address. The options for Serial Port1 are Disabled, **3F8/IRQ4**, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port2 are Disabled, **2F8/IRQ3**, 3E8/IRQ4, and 2E8/IRQ3.

Serial Port 2 Attribute

This feature allows the user to set COM 2 as a normal serial port or a virtual COM port used for **SOL** (Serial Over LAN). The options are **SOL**, and COM.

▶Remote Access Configuration

Remote Access

This allows the user to enable or disable Remote Access support. The options are Disabled and **Enabled**. If Remote Access is set to Enabled, the following items will display:

Serial Port Number

This feature allows the user decide which serial port to be used for Console Redirection. The options are COM 1 and **COM 2**.

Base Address, IRQ

This item displays the based address and IRQ of the serial port specified above. The default setting for **COM1** is 3F8h, 4. The default for COM 2 is 2F8h, 3.

Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

Redirection After BIOS POST

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active after POST. (Note: This setting may not be supported by some operating systems.) Select Boot Loader to keep Console Redirection active during POST and when the Boot Loader is being loaded. The options are Disabled, Boot Loader, and **Always**.

Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are **ANSI**, VT100, and VT-UTF8.

VT-UTF8 Combo Key Support

Select Enable to enable a terminal keyboard which allows the user to send commands from a remote console. The options are **Enabled** and Disabled.

Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay,** Delay 1 Sec, Delay 2 Sec, and Delay 4 Sec.

▶Hardware Health Configuration

This feature allows the user to monitor system health and review the status of each item as displayed.

CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.



Warning! 1.Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed. 2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

- The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about 5ºC above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

CPU 1 Temperature/CPU 2 Temperature/System Temperature

This feature displays current temperature readings for the CPU and the System.

The following items will be displayed for your reference only:

CPU 1 Temperature/CPU 2 Temperature

The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded by unique temperature information that the motherboard can read. This 'Temperature Threshold' or 'Temperature Tolerance' has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing CPU Fan speed, triggering the Overheat Alarm, etc). Since CPUs can have different 'Temperature Tolerances', the installed CPU can now send information to the motherboard what its 'Temperature Tolerance' is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU's temperature status, rather than by just simply seeing a temperature reading (i.e., 25^{o}C). The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

Low – This level is considered as the 'normal' operating state. The CPU temperature is well below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control).

Medium – The processor is running warmer. This is a 'precautionary' level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU 'Temperature Tolerance'. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings.

User intervention: No action is required. However, consider checking the CPU fans and the chassis ventilation for blockage.

High – The processor is running hot. This is a 'caution' level since the CPU's 'Temperature Tolerance' has been reached (or has been exceeded) and may activate an overheat alarm.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

Notes: 1. The system may shut down if it continues for a long period to prevent damage to the CPU.

2. The information provided above is for your reference only. For more information on thermal management, please refer to Intel's Web site at www.Intel.com.

System Temperature: The system temperature will be displayed (in degrees in Celsius and Fahrenheit) as it is detected by the BIOS.

Fan Speed Readings

This feature displays the fan speed readings from Fan1 through Fan9.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select "Full Speed/FS" to allow the onboard fans to run at full speed for maximum cooling. The FS setting is recommended for special system configuration or debugging. Select "Performance/PF" for better system cooling. The PF setting is recommended for high-power-consuming and high-density systems. Select "Balanced/BL" for the onboard fans to run at a speed that will balance the needs between system cooling and power saving. The BL setting is recommended for regular systems with normal hardware configurations. Select "Energy Saving/ES" for best power efficiency and maximum quietness. The Options are: Full Speed/FS, Performance/PF, **Balanced/BL**, and Energy Saving/ES.

Voltages Readings

The following voltage readings will be displayed.

CPU1 Vcore, CPU2 Vcore, +5V, +5Vsb, +12V, CPU1 DIMM, CPU2 DIMM, 3.3V, 3.3Vsb, and Vbat.

▶ACPI Configuration

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

ACPI Aware O/S

Select Enabled to enable ACPI support and allow the OS to control ACPI if this feature is supported by the CPU. The options are **Yes** and No.

ACPI Version Features

This feature allows the user to select the ACPI version. The options are ACPI v1.0, ACPI v2.0 and **ACPI v3.0**. Please refer to ACPI's website at http://www.acpi.info/ for further explanation.

ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list. The options are **Enabled** and Disabled.

APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

Headless Mode

Select Enabled to allow the system to function normally without a keyboard, monitor or mouse attached. The options are Enabled and **Disabled**.

NUMA Support

Select Enabled to use the feature of Non-Uniform Memory Access to improve CPU performance. The options are Disabled, **Enabled** and NUMA for SLES 11.

ACPI SLIT Table

If this item is set to Enabled, the ACPI SLIT (System Locality Information) Table is supported by the system. The options are **Enabled** and Disabled.

High Precision Event Timer

Select Enabled to activate the High Performance 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 Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

WHEA Support

Select Enabled to enable Windows Hardware Error Architecture (WHEA) support which will provide a common infrastructure for handling hardware errors on Windows platforms in order to reduce system crashes due to hardware errors and improve system recovery and health monitoring. The default setting is **Enabled.**

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

TCG/TPM Support

Select Yes on this item and enable the TPM jumper on the motherboard to enable TCG (TPM 1.1/1.2)/TPM support to improve data integrity and network security. The options are No and **Yes**.

If this feature is set to Yes, the following items will display.

Execute TPM Command

Select Enabled to execute TPM commands you've selected. Select Don't Change to keep the current TPM commands without making any changes. Select Disabled to abandon the changes you have made on TPM commands. The options are Enabled, Disabled and **Don't Change**.

TPM Enable/Disable Status

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

TPM Owner Status

This item displays the status of TPM Ownership.

▶IPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of network interfaces used for system monitoring and management from a remote site. For details on IPMI, please visit Intel's website at www.intel.com.

Status of BMC

Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This item displays the status of the BMC micro controller.

IPMI Firmware Revision

This item displays the revision number of the current IPMI Firmware.

▶View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of BMC System Event entries. To view an event, select an Entry Number and pressing <Enter> to display the information as shown in the screen.

- Total Number of Entries

▶View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events.

To view an event, select an Entry Number and press <Enter> to display the information as shown in the screen.

- SEL Entry Number
- SEL Record ID
- SEL Record Type
- Entry Timestamp

- Generator ID
- Event Message Format Version
- Event Sensor Type
- Event Sensor Number
- Event Direction Type
- Event Data

Clear BMC System Event Log

Select OK and press the <Enter> key to clear the BMC system log. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.

⚠ **Caution**: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

▶Set LAN Configuration

Set this feature to configure the IPMI LAN settings.

Channel Number

Enter the channel number for the SET LAN Configuration command. It is initially set to **[1]**.

Channel Number Status

This feature displays the channel status for the Channel Number selected above: "Channel Number is OK".

IP Address Source

This feature allows the user to select the source of the IP address for the system. If Static is selected, the user will need to manually enter the IP address for the system. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network that the system is attached to, and request the next available IP address. The options are **DHCP** and Static. If Static is selected, the following items will be available for configuration.

IP Address

The BIOS will automatically enter the IP address of this machine; however it may be over-written. This should be in decimal and in dotted quad form (i.e.,

192.168.10.253). The value of each three-digit number separated by dots should not exceed 255.

Subnet Mask

This item displays the current subnet mask setting for your IPMI connection. The value of each three-digit number separated by dots should not exceed 255.

Gateway Address

The BIOS will automatically enter the Gateway address of this machine; however it may be over-written. Gateway addresses are 4-decimal numbers in dotted quad form (i.e., 192.168.10.253). The value of each 3-digit number separated by dots should not exceed 255.

Mac Address

The BIOS will automatically enter the Mac address of this machine; however it may be over-written. Mac addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots.

▶Event Log Configuration

View Event Log

Use this option to view the System Event Log.

Mark all events as read

This option marks all events as read. The options are **OK** and Cancel.

Clear event log

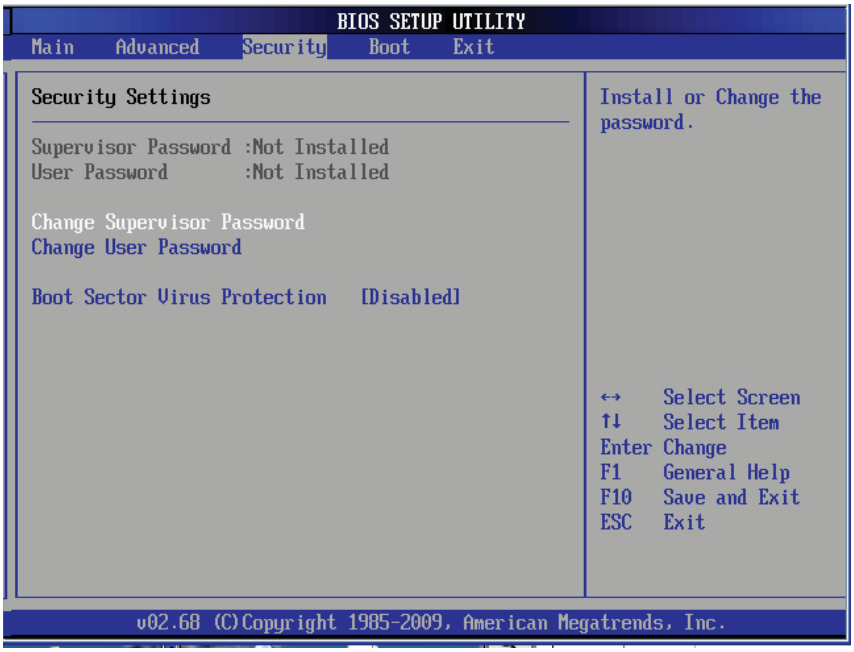
This option clears the Event Log memory of all messages. The options are OK and **Cancel.**

PCI Error Log

Use this option to enable PCI error (PERR) logging. The options are Yes and **No**.

5-4 Security Settings

The AMIBIOS Setup Utility allows you to enter a Supervisor and a User passwords. If you use both passwords, the Supervisor password must be set first.



Supervisor Password

This feature indicates if a supervisor's password has been entered (installed).

User Password

This feature indicates if a user's password has been entered (installed).

Change Supervisor Password

Select this item and press <Enter> to enter a supervisor password.

Change User Password

Select this item and press <Enter> to enter a user password.

Clear User Password (Available only if User Password has been set)

This item allows you to clear a user password after it has been entered.

Password Check

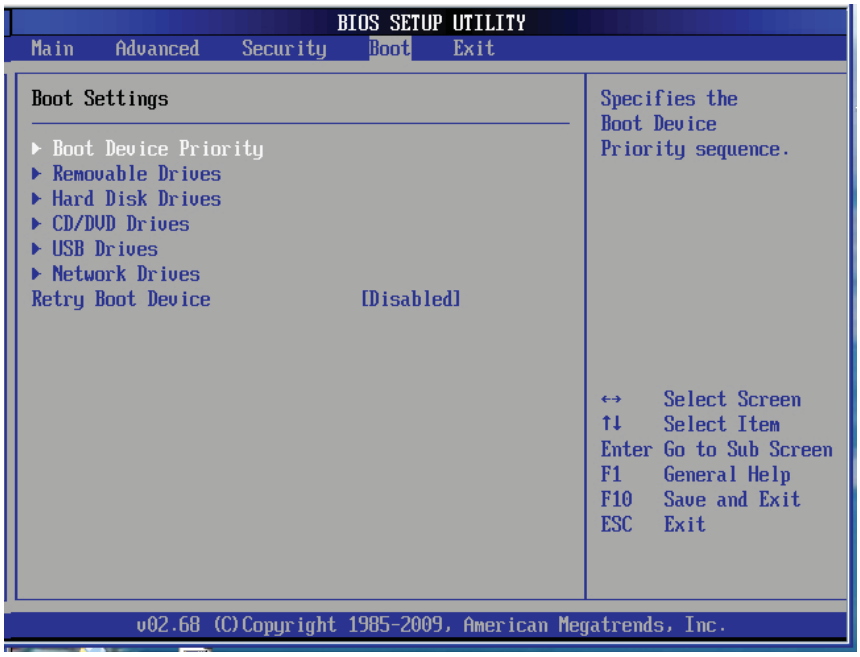
Select Setup for the system to check for a password when the system enter the AMI Setup Utility. Select Always for the system to check for a password at bootup. The options are **Setup** and Always.

Boot Sector Virus Protection

If this item is set to Enabled, the AMI BIOS displays a warning when any program (or virus) issues a Disk Format command or attempts to write to the boot sector of the hard disk drive. The options are Enabled and **Disabled**.

5-5 Boot Configuration

Use this feature to configure boot settings.



▶Boot Device Priority

This feature allows the user to specify the sequence of priority for boot devices. The settings are available boot devices and Disabled.

- 1st Boot Device/2nd Boot Device/3rd Boot Device

▶Removable Drives

This feature allows the user to specify the boot sequence from available removable drives. The settings are 1st boot device, 2nd boot device, and Disabled.

- 1st Drive/2nd Drive

▶Hard Disk Drives

This feature allows the user to specify the boot sequence from all available hard disk drives. The settings are Disabled and a list of all HDDs detected.

- 1st Drive/2nd Drive

▶CD/DVD Drives

Use this feature to specify the boot sequence from available CD/DVD drives.

- 1st Drive/2nd Drive

▶USB Drives

Use this feature to specify the boot sequence from available USB Drives.

- 1st Drive/2nd Drive

▶Network Drives

Use this feature to specify the boot sequence from available Network drives.

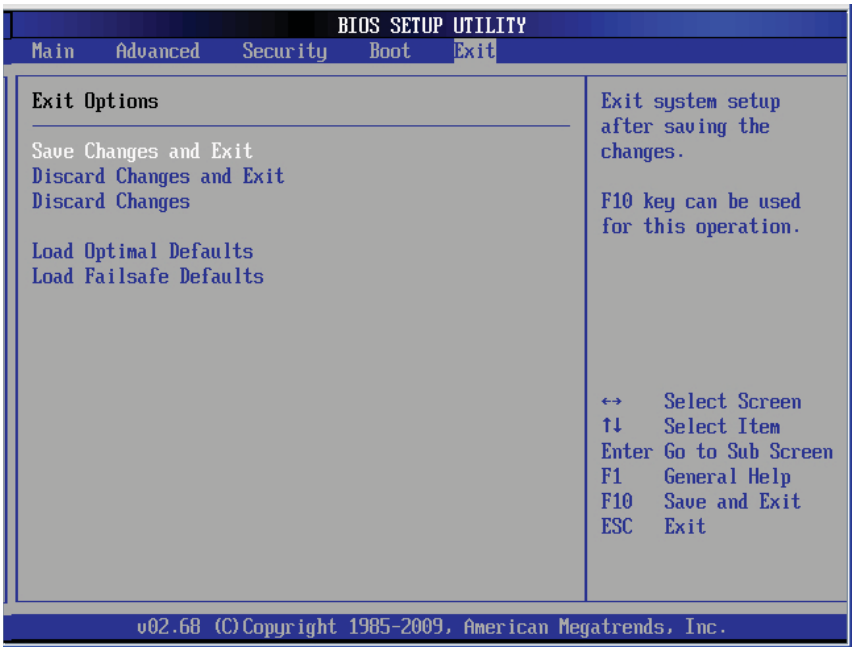
- 1st Drive/2nd Drive

Retry Boot Devices

Select Enabled to enable Retry Boot Devices support which will allow the system to attempt to boot from a specific boot device after a boot failure. The options are Enabled and **Disabled**.

5-6 Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit screen.



Save Changes and Exit

When you have completed the system configuration changes, select this option to save the BIOS Setup Utility and reboot the computer so that new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

Discard Changes and Exit

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

Discard Changes

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

Load Optimal Defaults

Select Load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

Appendix A

BIOS Error Beep Codes

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

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

Fatal errors will not allow the system to continue the boot-up 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	**Error Message**	**Description**
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep w/ Front Panel OH LED on	System Overheat	1 continuous beep with the front panel OH LED on

Notes

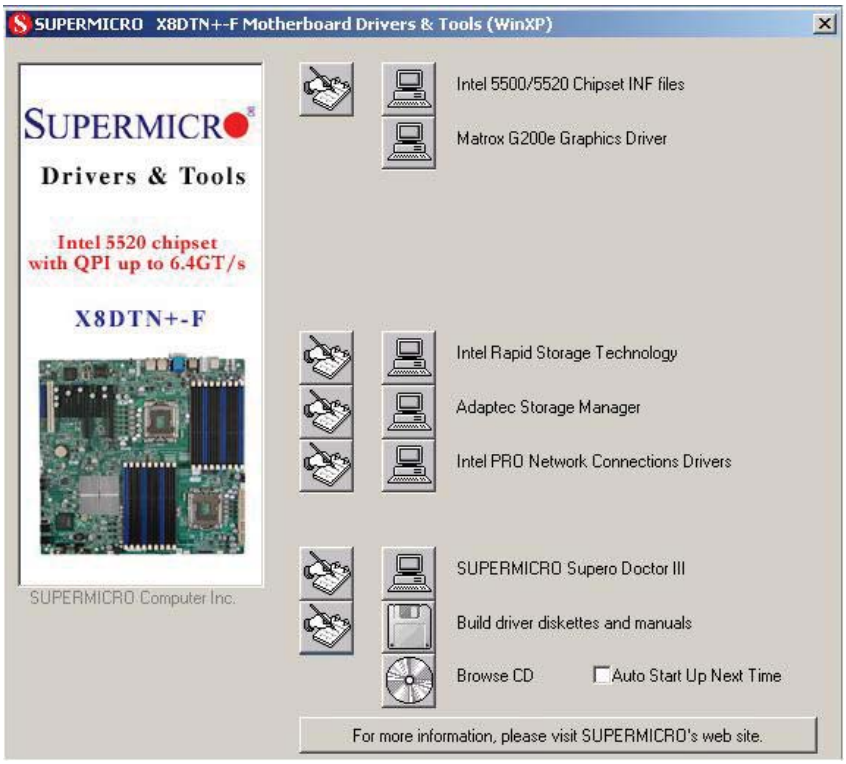
Appendix B

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 on 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.

B-2 Configuring Supero Doctor III

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

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

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

Supero Doctor III Interface Display Screen-I (Health Information)



Supero Doctor III Interface Display Screen-II (Remote Control)



Note: SD III Software Revision 1.0 can be downloaded from our Web site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/UserGuide.pdf. For Linux, we will still recommend that you use Supero Doctor II.

Notes

(Disclaimer Continued)

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