

Intel® Server Board S1200KP Product Guide

Order Number: G39481-003

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Preface

This Product Guide gives information about board layout, component installation, BIOS update, and regulatory requirements for Intel® Server Board S1200KP.

Intended Audience

The Product Guide is intended for technically qualified personnel. It is not intended for general audiences.

Use Only for Intended Applications

All Intel® Server Boards are evaluated as Information Technology Equipment (I.T.E.) for use in personal computers (PC) for installation in homes, offices, schools, computer rooms, and similar locations. The suitability of this product for other PC or embedded non-PC applications or other environments, such as medical, industrial, alarm systems, test equipment, etc. may not be supported without further evaluation by Intel®.

Document Organization

The chapters in this Product Guide are arranged as follows:

- 1 Server Board Features: a summary of product features
- 2 Installing and Replacing Server Board Components: instructions on how to install the Server Board and other hardware components
- 3 Updating the BIOS: instructions on how to update the BIOS
 - a. Error Messages and Indicators: information about BIOS error messages and beep codes

Conventions

The following conventions are used in this manual:



CAUTION

Cautions warn the user about how to prevent damage to hardware or loss of data.

NOTE

Notes call attention to important information.

Terminology

The table below gives descriptions of some common terms used in the product guide.

Term	Description
GB	Gigabyte (1,073,741,824 bytes)
GHz	Gigahertz (one billion hertz)
KB	Kilobyte (1024 bytes)

Preface

Term	Description
MB	Megabyte (1,048,576 bytes)
Mb	Megabit (1,048,576 bits)
MHz	Megahertz (one million hertz)

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1 Server Board Features

This chapter briefly describes the features of Intel® Server Board S1200KP. Table 1 summarizes the major features of the Server Board.

Table 1. Feature Summary

Feature	Description
Form Factor	Mini-ITX (6.7 inches by 6.7 inches [170.18 millimeters by 170.18 millimeters])
Processor	<ul style="list-style-type: none"> • Intel® Xeon® E3-1200 Processors, the 2nd Generation Intel® Core™ i3 Processors, Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors with up to 95W TDP in an LGA1155 socket ^{1,2} <ul style="list-style-type: none"> — One PCI Express* 2.0 x16 (with Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors) or PCI Express* 3.0 x 16 (with Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors) graphics interface — Integrated memory controller with dual channel DDR3 memory support — Integrated graphics processing (processors with Intel® Graphics Technology)
Memory	<ul style="list-style-type: none"> • Two 240-pin DDR3 DRAM Dual Inline Memory Module (DIMM) sockets • Support for DDR3 1066/1333 MHz (with Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors) or DDR3 1333/1600 MHz (with Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors) DIMMs • Support for 1Gb, 2Gb, and 4Gb memory technology • Support for up to 16 GB of system memory with two DIMMs using 4 Gb memory technology • Support for ECC and non-ECC memory ³
Chipset	Intel® C206 Platform Controller Hub (PCH) Chipset
Graphics	<ul style="list-style-type: none"> • Integrated graphics support for processors with Intel® Graphics Technology: <ul style="list-style-type: none"> — DVI-I • Discrete graphics support for PCI Express* 2.0 x16 (with Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors) or PCI Express* 3.0 x 16 (with Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors) add-in graphics card
Peripheral Interfaces	<ul style="list-style-type: none"> • Eight USB 2.0 ports: <ul style="list-style-type: none"> — Four ports are implemented with stacked back panel connectors (black) — Four front panel ports implemented through three internal headers • Two SATA 6.0Gb/s interfaces through Intel® C206 Chipset with Intel® Rapid Storage Technology RAID support (blue) • Two SATA 3.0Gb/s interfaces through Intel® C206 Chipset with Intel® Rapid Storage Technology RAID support (black)
Expansion Capabilities	<ul style="list-style-type: none"> • One PCI Express* 2.0 x16 (with Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors) or PCI Express* 3.0 x 16 (with Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors) add-in card connector
BIOS	<ul style="list-style-type: none"> • Intel® BIOS resident in the Serial Peripheral Interface (SPI) Flash device • Support for Advanced Configuration and Power Interface (ACPI), Plug and Play,

Server Board Features

Feature	Description
	and System Management BIOS (SMBIOS)
Instantly Available PC Technology	<ul style="list-style-type: none"> • Support for PCI Express* Revision 2.0 (with Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors) or PCI Express* Revision 3.0 (with Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors) • Suspend to RAM support • Wake on PCI Express*, LAN, front panel, and USB ports
LAN Support	<ul style="list-style-type: none"> • Gigabit (10/100/1000Mbps/s) LAN subsystem using the Intel® 82574 and 82579 Gigabit Ethernet Controller
Legacy I/O Control	<ul style="list-style-type: none"> • Nuvoton* W83677HG-i I/O controller for hardware management support
Hardware Monitor Subsystem	<ul style="list-style-type: none"> • Hardware monitoring through the Nuvoton* I/O controller • Voltage sense to detect out of range power supply voltages • Thermal sense to detect out of range thermal values • Two fan headers • Two fan sense inputs used to monitor fan activity • Fan speed control

Notes:

1. Pairing a mini-ITX chassis and more than 65W TDP processor with the supplied standard Intel® thermal solution may not meet Intel®'s thermal requirement standard. Please verify that your thermal solution and chassis will meet the necessary thermal requirements. Failing to do so may cause the processor to throttle, significantly decreasing system performance.
2. The product codes of DBS1200KP and BBS1200KP can only support Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors. The product codes of DBS1200KPR and BBS1200KPR can support Intel® Xeon® E3-1200 Processors, the 2nd Generation Intel® Core™ i3 Processors, Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors.
3. ECC DIMMS are recommended to use for server system.

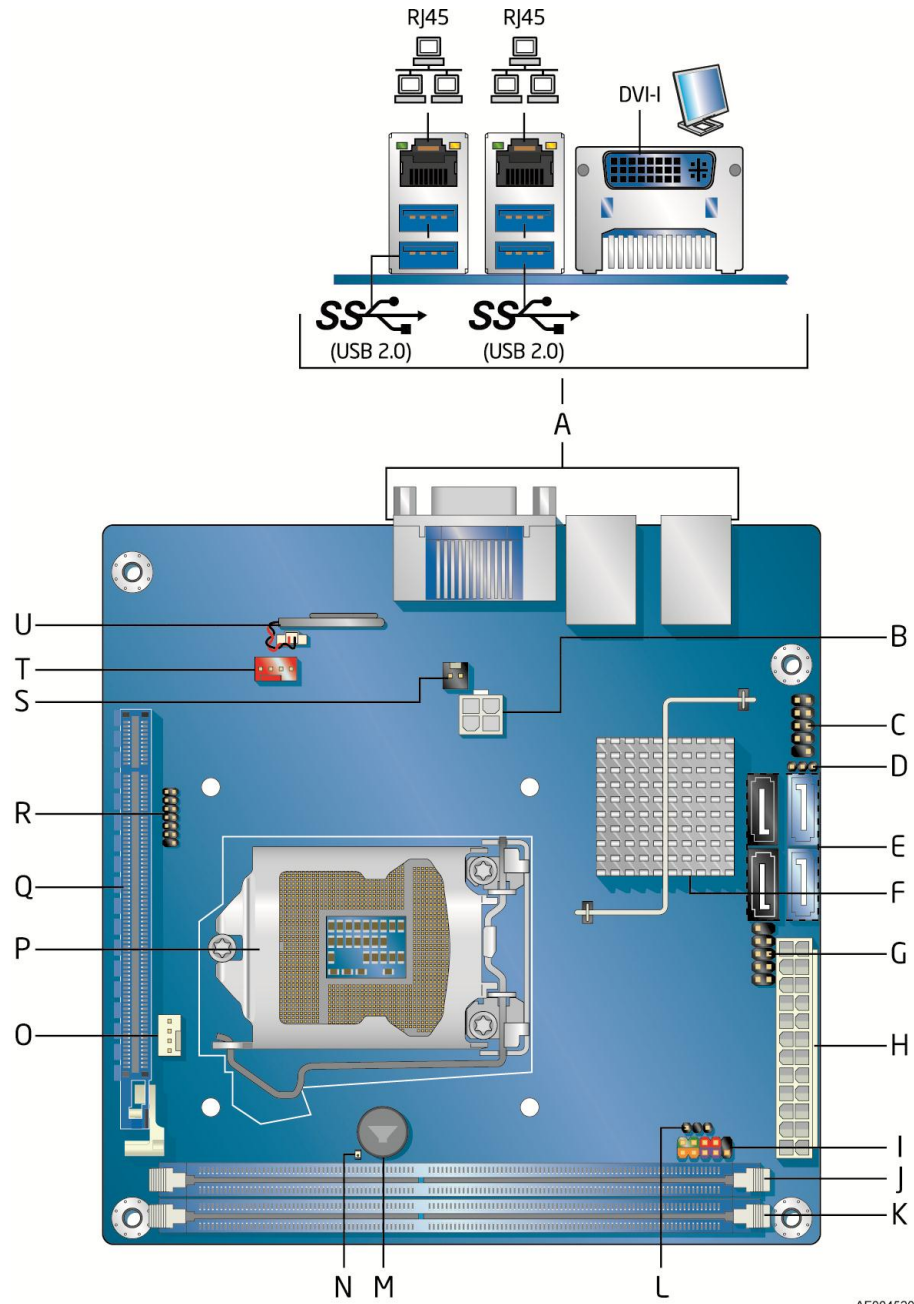
Supported Operating Systems

The Server Board provides full support for the following operating systems:

- Microsoft Windows 7* Ultimate 64-bit edition
- Microsoft Windows 7* Ultimate 32-bit edition
- Microsoft Windows 7* Home Basic 64-bit edition
- Microsoft Windows 7* Home Premium 64-bit edition
- Microsoft Windows 7* Home Premium 32-bit edition
- Microsoft Windows 7* Home Basic 32-bit edition
- Microsoft Windows Server 2008 R2 SP1* with Hyper-v
- Microsoft Windows Small Business Server 2011 Essentials*
- Redhat* Enterprise Linux 6.0
- SUSE* Linux Enterprise Server 11

Server Board Components

Figure 1 shows the approximate location of the major components on Intel® Server Board S1200KP.



AF004520

Figure 1. Intel® Server Board S1200KP Components

Table 2. Intel® Server Board S1200KP Components

Item/callout	Description
A	Back panel connectors
B	Processor core power connector (2 x 2)
C	Front panel USB 2.0 header
D	BIOS Setup configuration jumper block
E	SATA connectors
F	Intel® C206 Chipset
G	Front panel USB 2.0 header
H	Main power connector (2 x 12)
I	Front panel header
J	DIMM 1 (Channel A DIMM 1)
K	DIMM 2 (Channel B DIMM 1)
L	Alternate front panel power LED header
M	Piezoelectric speaker
N	Standby power LED
O	Processor fan header
P	LGA1155 processor socket
Q	PCI Express* x16 bus add-in card connector
R	Low Pin Count (LPC) Debug header
S	Chassis intrusion header
T	System fan header
U	Battery

Online Support

For more information on Intel® Server Board S1200KP consult the following online resources:

- Intel® Server Board S1200KP <http://www.intel.com/products/server>
- Supported processors and tested memory <http://serverconfigurator.intel.com>
- BIOS and driver updates <http://downloadcenter.intel.com>

Processor



CAUTION

Failure to use an appropriate power supply and/or not connecting the 12 V (2 x 2 pin) power connector to the Server Board may result damage to the board, or the system may not function properly.

Intel® Server Board S1200KP supports the Intel® Xeon® E3-1200 Processors, the 2nd Generation Intel® Core™ i3 Processors, Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors with up to 95W TDP in an LGA1155 socket. Processors are not included with the Server Board and must be purchased separately. The processor connects to the Server Board through the LGA1155 socket.

NOTE

The product codes of DBS1200KP and BBS1200KP can only support Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors. The product codes of DBS1200KPR and BBS1200KPR can support Intel® Xeon® E3-1200 Processors, the 2nd Generation Intel® Core™ i3 Processors, Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors.

For information on supported processors for Intel® Server Board S1200KP, go to <http://serverconfigurator.intel.com>.

Intel® C206 Express Chipset

Intel® C206 Chipset with Direct Media Interface (DMI) interconnect provides interfaces to the processor and the USB, SATA, LPC, LAN and PCI Express* interfaces. The Intel® C206 Chipset is a centralized controller for the board's I/O paths.

Main Memory

NOTE

1. To be fully compliant with all applicable Intel® DRAM memory specifications, the board should be populated with DIMMs that support the Serial Presence Detect (SPD) data structure. If your memory modules do not support SPD, you will see a notification to this effect on the screen at power up. The BIOS will attempt to configure the memory controller for normal operation.
2. ECC DIMMs are recommended to use for server system.

The board has two DDR3 DIMM sockets arranged in two channels and supports the following memory features:

- Two independent memory channels with interleaved mode support
- Support for ECC and non-ECC DIMMs.
- Unbuffered, single-sided or double-sided DIMMs with x8 organization and single-sided DIMMs with x16 organization
- 16 GB maximum total system memory (with 4 Gb memory technology)
- Minimum total system memory: 512 MB
- Serial Presence Detect
- Support for DDR3 1066/1333 MHz (with Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors) or DDR3 1333/1600 MHz (with Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors) DIMMs

Graphics Subsystem

The board supports system graphics through either Intel® HD Graphics or a PCI Express* 2.0 x16 (with Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors) or PCI Express* 3.0 x 16 (with Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors) add-in graphics card.

Integrated Graphics

The board supports integrated graphics through the Intel® Flexible Display Interface (Intel® FDI) for processors with Intel® HD Graphics.

Intel® HD Graphics

The Intel® HD Graphics controller features the following:

- 3D Features
 - DirectX10.1* and OpenGL* 3.0 compliant
 - DirectX11.0* CS4.0 only
 - Shader Model 4.0
- Video
 - Hi-Definition content at up to 1080p resolution
 - Hardware accelerated MPEG-2, VC-1/WMV, and H.264/AVC High-Definition video formats
 - Blu-ray* Stereoscopic 3D via HDMI 1.4
 - Intel® HD Technology with advanced hardware video transcoding
- Dynamic Video Memory Technology (DVMT) 5.0 support including support of up to 1.7 GB Video Memory with a 4 GB and above system memory configuration

Digital Visual Interface (DVI-I)

The DVI-I port supports both digital and analog DVI displays. The maximum supported resolution is 1900 x 1200 (WUXGA). The DVI port is compliant with the DVI 1.0 specification. The DVI analog output can be converted to VGA using a DVI-VGA converter.

VGA Displays

The DVI-I port supports VGA displays when a DVI-I to VGA converter is used. The maximum supported resolution is 2560 x 1600 (WQXGA).

The DVI-A port is enabled for the POST whenever a monitor is attached.

PCI Express* x16 Graphics

The Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors in an LGA1155 socket support discrete add in graphics cards via the PCI Express* 2.0 x16 graphics connector. And the Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3

Processors in an LGA1155 socket support discrete add in graphics cards via the PCI Express* 3.0 x16 graphics connector:

- Supports PCI Express* GEN3 frequency of 8 GHz resulting in 8.0 Gb/s each direction (1 GB/s) per lane. The maximum theoretical bandwidth on the interface is 16 GB/s in each direction, simultaneously, for an aggregate of 32 GB/s when operating in x16 GEN3 mode.
- Supports PCI Express* GEN2 frequency of 5 GHz resulting in 5.0 Gb/s each direction (500 MB/s) per lane. The maximum theoretical bandwidth on the interface is 8 GB/s in each direction, simultaneously, for an aggregate of 16 GB/s when operating in x16 GEN2 mode.
- Supports PCI Express* GEN1 frequency of 2.5 GHz resulting in 2.5 Gb/s each direction (250 MB/s) per lane. The maximum theoretical bandwidth on the interface is 4 GB/s in each direction, simultaneously, for an aggregate of 8 GB/s when operating in x16 GEN1 mode.

LAN Subsystem

The LAN subsystem consists of the following:

- Intel® 82574L and 82579LM Gigabit Ethernet Controllers (10/100/1000 Mb/s)
- RJ-45 LAN connector with integrated status LEDs

LAN software and drivers are available at <http://downloadcenter.intel.com/>.

Two LEDs are built into the RJ-45 LAN connector located on the back panel (see Figure 2). These LEDs indicate the status of the LAN as shown in Table 3.

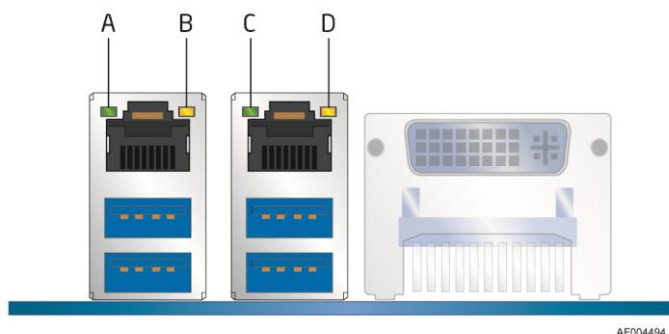


Figure 2. LAN Connector LEDs

Table 3. LAN Connector LEDs

LED	LED Color	LED State	Indicates
A (Link/Activity)	Green	Off	LAN link is not established
C (Link/Activity)		On	LAN link is established
		Blinking	LAN activity is occurring
B (Link Speed)	N/A	Off	10 Mb/s data rate
D (Link/Activity)	Green	On	100 Mb/s data rate
	Yellow	On	1000 Mb/s data rate

USB Support

The Server Board supports eight USB 2.0 ports (four ports routed to back panel connectors and four ports routed to two onboard headers). The USB 2.0 ports are high-speed, full-speed, and low-speed capable. USB 2.0 support requires both an operating system and drivers that fully support USB 2.0 transfer rates.

SATA Support

Intel® Server Board S1200KP provides two onboard 6.0 Gb/s Serial ATA (SATA) channels and two onboard 3.0 Gb/s SATA channels.

Expandability

Intel® Server Board S1200KP provides one PCI Express* 2.0 x16 (with Intel® Xeon® E3-1200 Processors or the 2nd Generation Intel® Core™ i3 Processors) or PCI Express* 3.0 x 16 (with Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors) connector for system expansion.

Legacy I/O

The I/O controller provides the following features:

- Low pin count (LPC) interface
- Serial IRQ interface compatible with serialized IRQ support for PCI systems
- Intelligent power management, including a programmable wake-up event interface

The BIOS Setup program provides configuration options for the legacy I/O controller.

BIOS

The BIOS provides the Power-On Self-Test (POST), the BIOS Setup program, and the PCI Express* and SATA auto-configuration utilities. The BIOS is stored in the Serial Peripheral Interface (SPI) Flash device.

The BIOS can be updated by following the instructions in Chapter 3 starting on page 43.

SATA Auto Configuration

If you install a SATA device (such as a hard drive) in your computer, the auto-configuration utility in the BIOS automatically detects and configures the device for your computer. You do not need to run the BIOS Setup program after installing a SATA device. You can override the auto-configuration options by specifying manual configuration in the BIOS Setup program.

PCI*/PCI Express* Auto Configuration

If you install a Conventional PCI or PCI Express* add-in card in your computer, the PCI auto-configuration utility in the BIOS automatically detects and configures the resources (IRQs, DMA channels, and I/O space) for that add-in card. You do not need to run the BIOS Setup program after you install a Conventional PCI or PCI Express* add-in card.

Security Passwords

The BIOS includes security features that restrict whether the BIOS Setup program can be accessed and who can boot the computer. A supervisor password and a user password can be set for the BIOS Setup and for booting the computer, with the following restrictions:

- The supervisor password gives unrestricted access to view and change all Setup options. If only the supervisor password is set, pressing <Enter> at the password prompt of Setup gives the user restricted access to Setup.

Server Board Features

- If both the supervisor and user passwords are set, you must enter either the supervisor password or the user password to access Setup. Setup options are then available for viewing and changing depending on whether the supervisor or user password was entered.
- Setting a user password restricts who can boot the computer. The password prompt is displayed before the computer is booted. If only the supervisor password is set, the computer boots without asking for a password. If both passwords are set, you can enter either password to boot the computer.

For instructions on resetting the password, go to Clearing Passwords on page 40.

Hardware Management

The hardware management features of Intel® Server Board S1200KP enable the board to be compatible with the Wired for Management (WfM) specification. The board has several hardware management features including the following:

- Fan speed monitoring and control
- Thermal and voltage monitoring
- Chassis intrusion detection

Hardware Monitoring and Fan Speed Control

The features of the hardware monitoring and fan speed control include:

- Smart fan control provided by the legacy I/O controller, delivering acoustically-optimized thermal management. Fan speed controllers and sensors are integrated into the legacy I/O controller.
- Thermal sensors in the processor and Intel® C206 PCH, as well as near the processor voltage regulators and system memory.
- Monitoring of system voltages to detect levels above or below acceptable values
- Thermally monitored closed-loop fan control for all fans that can adjust fan speed as needed.

Fan Monitoring

Fan monitoring can be observed via the BIOS Setup program or third-party software.

Chassis Intrusion

The board supports a chassis security feature that detects if the chassis cover has been removed. The security feature uses a mechanical switch on the chassis that can be connected to the chassis intrusion header on the Server Board. See Figure 1 for the location of the chassis intrusion header.

Power Management

Power management is implemented at several levels, including software support through the Advanced Configuration and Power Interface (ACPI) and the following hardware support:

- Power connectors
- Fan headers
- LAN wake capabilities
- Instantly Available PC technology (Suspend to RAM)
- +5 V standby power indicator LED
- Wake from USB
- PCI Express* WAKE# signal support

Software Support

ACPI

ACPI gives the operating system direct control over the power management and Plug and Play functions of a computer. The use of ACPI with the Server Board requires an operating system that provides full ACPI support.

Hardware Support

Power Connectors

ATX12V-compliant power supplies can turn off the computer power through system control. When an ACPI-enabled computer receives the correct command, the power supply removes all non-standby voltages.

When resuming from an AC power failure, the computer returns to the power state it was in before power was interrupted (either on or off). The computer's response can be set by using the Last Power State feature in the BIOS Setup program's Boot menu.

The Server Board has two power connectors. See Figure 20 on page 38 for the location of the power connectors.

Fan Headers

The function/operation of the fans is as follows:

- The fans are on when the board is in the ACPI S0 state.
- The fans are off when the computer is in the ACPI S3, S4, or S5 state.
- Each fan header is wired to a tachometer input.
- All fan headers support closed-loop fan control that can adjust the fan speed or switch the fan on or off as needed.
- All fan headers have a +12 V DC connection (up to 12 V DC when using 3-wire chassis fans).
- All fan headers are controlled by Pulse Width Modulation.
- The chassis fan header supports linear fan control on 3-wire fans.

The Server Board has a 4-pin processor fan header and two 4-pin chassis fan headers compatible with 4-wire and 3-wire chassis fans.

LAN Wake Capabilities



CAUTION

For LAN wake capabilities, the 5 V standby line for the power supply must be capable of delivering adequate +5 V standby current. Failure to provide adequate standby current when using this feature can damage the power supply.

LAN wakeup capabilities enable remote wake-up of the computer through a network. The LAN subsystem monitors network traffic and upon detecting a Magic Packet* frame, it asserts a wake-up signal that powers up the computer.

Instantly Available PC Technology



CAUTION

For Instantly Available PC technology, the 5 V standby line for the power supply must be capable of delivering adequate +5 V standby current. Failure to provide adequate standby current when using this feature can damage the power supply and/or affect ACPI S3 sleep state functionality.

Instantly Available PC technology enables the board to enter the ACPI S3 (Suspend-to-RAM) sleep state. Instantly Available PC technology enables the board to enter the ACPI S3 (Suspend-to-RAM) sleep-state. While in the S3 sleep-state, the computer will appear to be off (the power supply is off and the front panel power LED will behave as configured by the BIOS “S3 State Indicator” option). When signaled by a wake-up device or event, the system quickly returns to its last known wake state. When signaled by a wake-up device or event, the computer quickly returns to its last known awake state.

The Server Board supports the *PCI Bus Power Management Interface Specification*. Add-in cards that support this specification can participate in power management and can be used to wake the computer.

The use of Instantly Available PC technology requires operating system support and PCI 2.2 compliant add-in cards, PCI Express* add-in cards, and drivers.

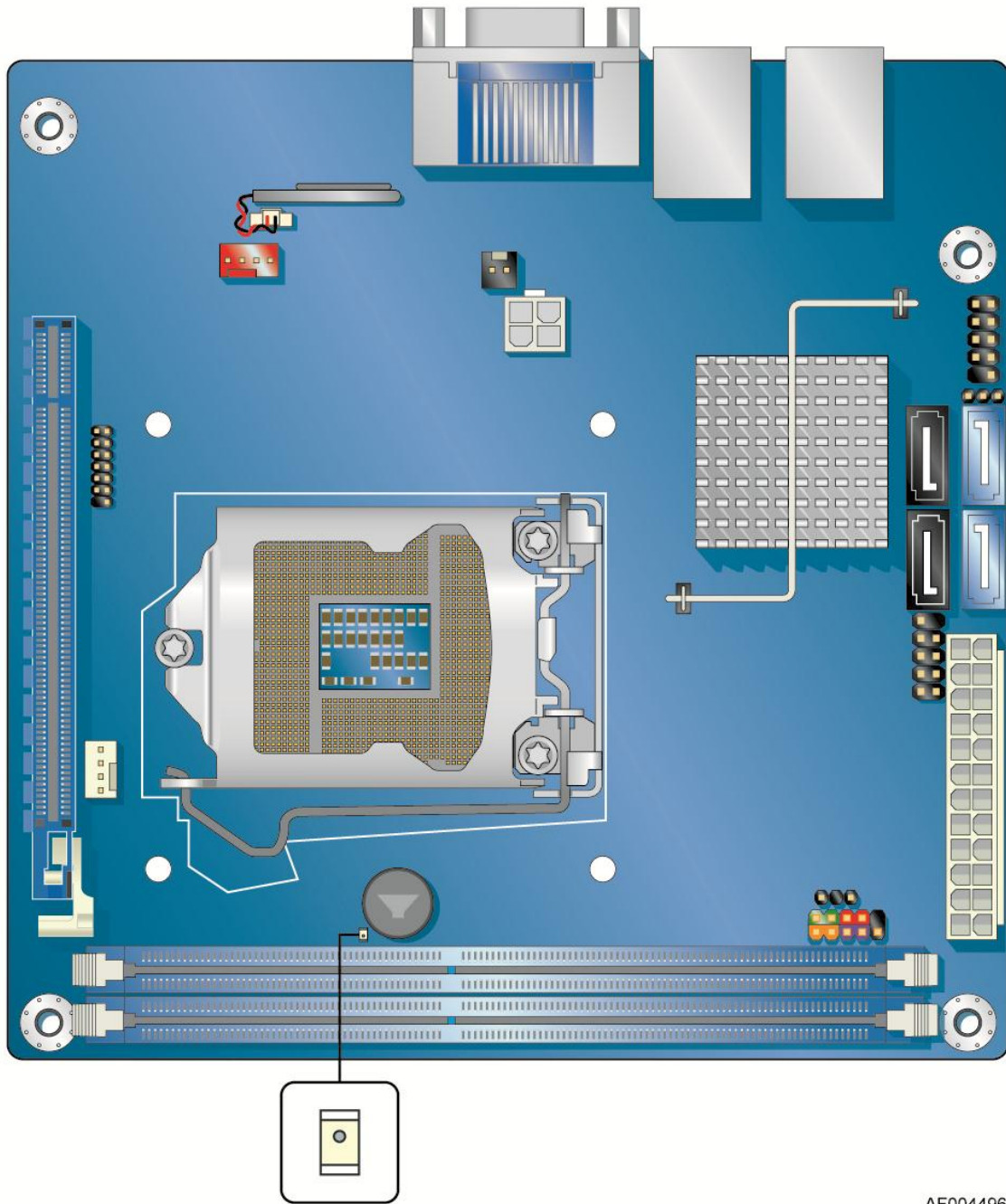
+5 V Standby Power Indicator LED



CAUTION

If the AC power has been switched off and the standby power indicator is still lit, disconnect the power cord before installing or removing any devices connected to the board. Failure to do so could damage the board and any of the attached devices.

The Server Board’s standby power indicator, shown in Figure 3, is lit when there is standby power still present on the board even when the computer appears to be off. For example, when this green LED is lit, standby power is still present at the memory module sockets and the PCI Express* connector.



AF004496

Figure 3. Location of the Standby Power Indicator

For more information on standby current requirements for the Server Board, refer to the Technical Product Specification at <http://www.intel.com/products/server>.

Wake from USB

NOTE

Wake from USB requires the use of a USB peripheral that supports Wake from USB and an operating system that supports Wake from USB.

USB bus activity wakes the computer from an ACPI S3 state.

PCI Express* WAKE# Signal Wake-up Support

When the WAKE# signal on a PCI Express* bus add-in card is asserted, the computer wakes from an ACPI S3, S4, or S5 state.

Speaker

A speaker is mounted on the Server Board. The speaker provides audible error code (beep code) information during the Power-On Self-Test (POST). Refer to Appendix A for a description of the board's beep codes.

Real-Time Clock Subsystem

A coin-cell battery (CR2032) powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the standby current from the power supply extends the life of the battery.

The clock is accurate to ± 13 minutes/year at 25 °C with standby power applied by the power supply.

NOTE

If the battery and AC power fail, date and time values will be reset and the user will be notified during the POST.

When the battery voltage drops below a certain level, the BIOS Setup program settings stored in CMOS RAM (for example, the date and time) might not be accurate. Replace the battery with an equivalent one. Go to page 41 for instructions on how to replace the battery.

2 Installing and Replacing Server Board Components

This chapter tells you how to:

- Install the I/O shield
- Install and remove the Server Board
- Install and remove a processor
- Install and remove memory
- Install and remove a PCI Express* x16 card
- Connect SATA drives
- Connect to the internal headers
- Connect chassis fan and power supply cables
- Set the BIOS configuration jumper
- Clear passwords
- Replace the battery

Before You Begin



CAUTION

The procedures in this chapter assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.

Disconnect the computer from its power source and from any telecommunications links, networks, or modems before performing any of the procedures described in this chapter. Failure to disconnect power, telecommunications links, networks, or modems before you open the computer or perform any procedures can result in personal injury or equipment damage. Some circuitry on the board can continue to operate even though the front panel power button is off.

Follow these guidelines before you begin:

- Always follow the steps in each procedure in the correct order.
- Set up a log to record information about your computer, such as model, serial numbers, installed options, and configuration information.
- Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation using an antistatic wrist strap and a conductive foam pad. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the computer chassis.

Installation Precautions

When you install and test the Intel® Server Board, observe all warnings and cautions in the installation instructions.

To avoid injury, be careful of:

- Sharp pins on connectors
- Sharp pins on printed circuit assemblies
- Rough edges and sharp corners on the chassis
- Hot components (such as processors, voltage regulators, and heat sinks)
- Damage to wires that could cause a short circuit

Observe all warnings and cautions that instruct you to refer computer servicing to qualified technical personnel.

Prevent Power Supply Overload

Do not overload the power supply output. To avoid overloading the power supply, make sure that the calculated total current loads of all the modules within the computer is less than the output current rating of each of the power supplies output circuits plus enough headroom for server board power consumption.

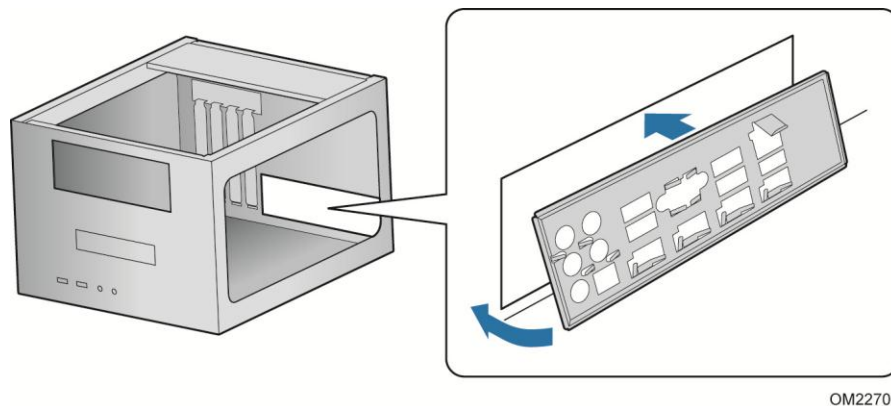
Observe Safety and Regulatory Requirements

Read and follow the instructions in this section and the instructions supplied with the chassis and associated modules. If you do not follow these instructions and the instructions provided by the chassis and module suppliers, you increase your safety risk and the possibility of noncompliance with regional laws and regulations. If the instructions for the chassis are inconsistent with these instructions or the instructions for associated modules, contact the supplier to find out how you can ensure that your computer meets safety and regulatory requirements.

Installing the I/O Shield

The Server Board comes with an I/O shield. When installed in the chassis, the shield blocks radio frequency transmissions, protects internal components from dust and foreign objects, and promotes correct airflow within the chassis.

Install the I/O shield before installing the Server Board in the chassis. Place the shield inside the chassis as shown in Figure 4. Press the shield into place so that it fits tightly and securely. If the shield does not fit, obtain a properly sized shield from the chassis supplier.



OM22701

Figure 4. Installing the I/O Shield

Installing and Removing the Server Board

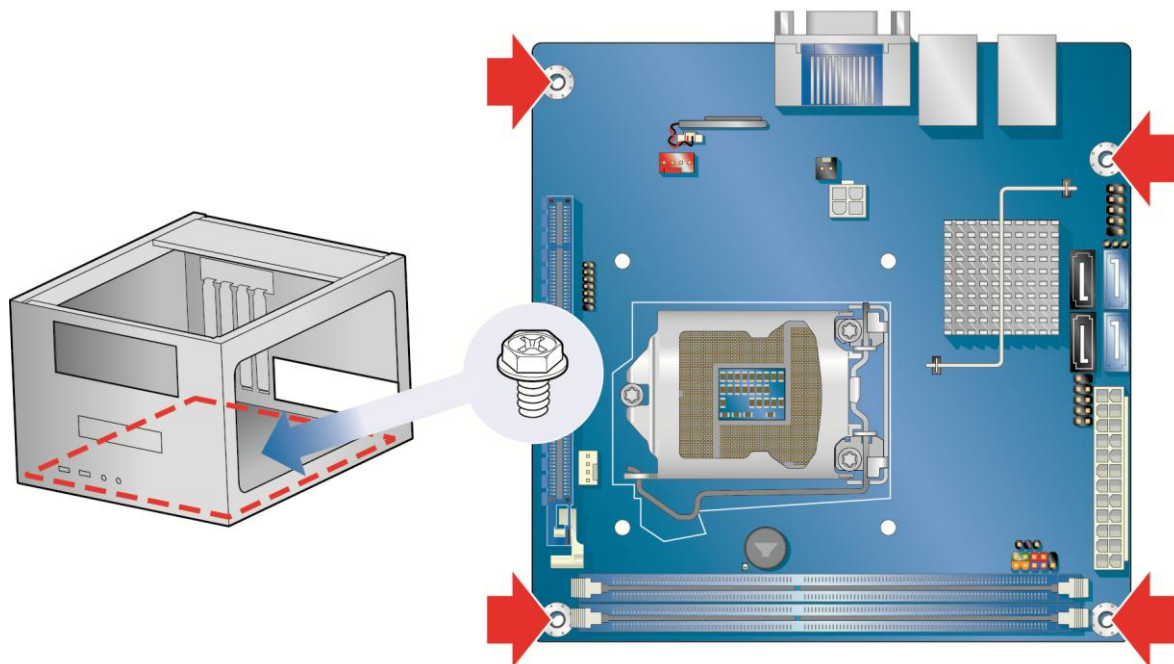


CAUTION

Only qualified technical personnel should perform this procedure. Disconnect the computer from its power source before performing the procedures described here. Failure to disconnect the power before you open the computer can result in personal injury or equipment damage.

Refer to your *Chassis Manual* for instructions on installing and removing the Server Board.

Figure 5 shows the location of the mounting screw holes for Intel® Server Board S1200KP.



AF004521

Figure 5. Intel® Server Board S1200KP Mounting Screw Hole Locations

Installing and Removing a Processor

Instructions on how to install the processor on the Server Board are given below.

Installing a Processor



CAUTION

Before installing or removing a processor, make sure the AC power has been removed by unplugging the power cord from the computer; the standby power LED should not be lit (see Figure 3 on page 16). Failure to do so could damage the processor and the board.

To install a processor, follow these instructions:

1. Observe the precautions in "Before You Begin" in page 18.
2. Unlatch the processor socket lever by pushing it down and away from the socket (Figure 6, A, B).

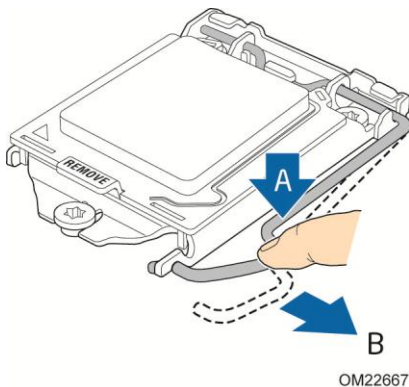
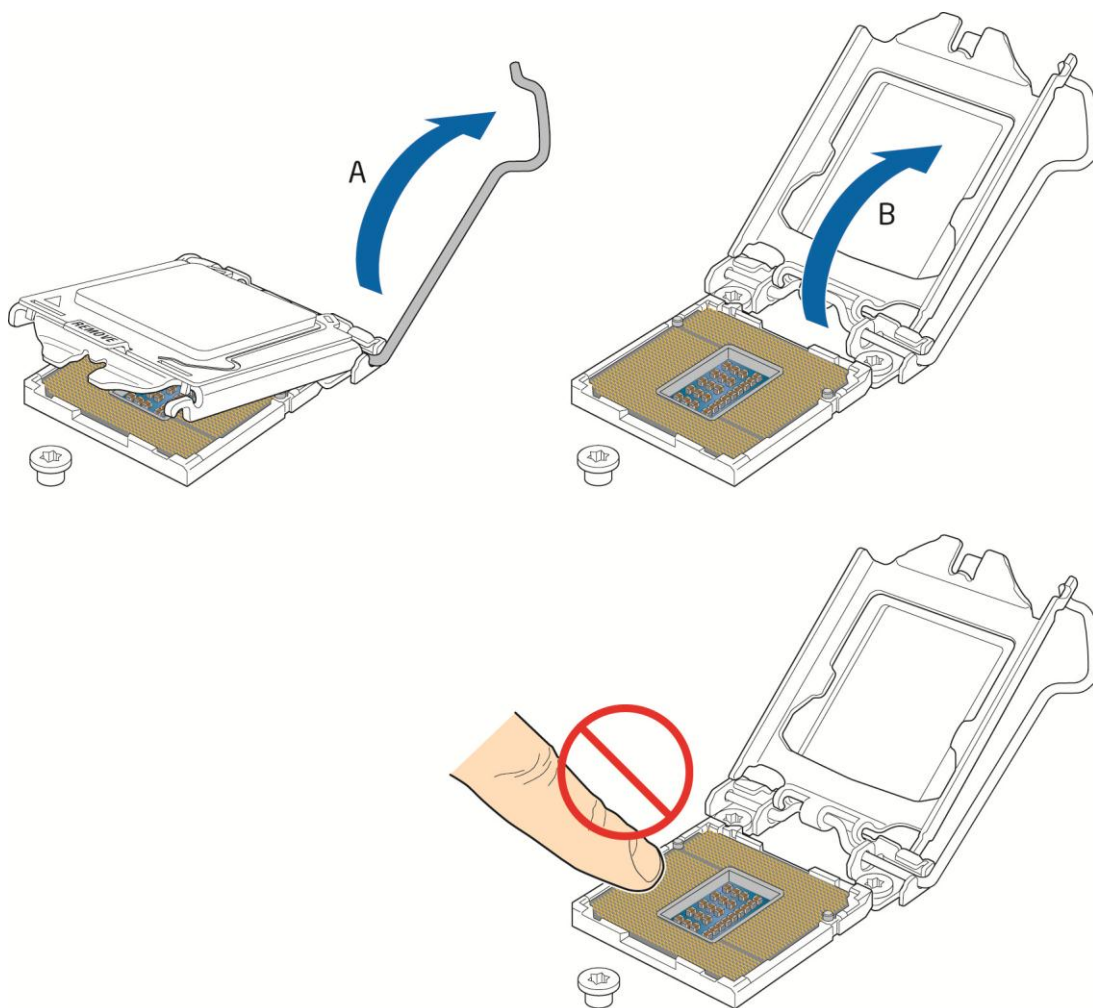


Figure 6. Unlatch the Socket Lever

3. Rotate the socket lever to lift the load plate away from the socket (Figure 7, A). Make sure that the load plate is in the fully open position (Figure 7, B) while being careful not to damage adjacent components. Do not touch the socket contacts.



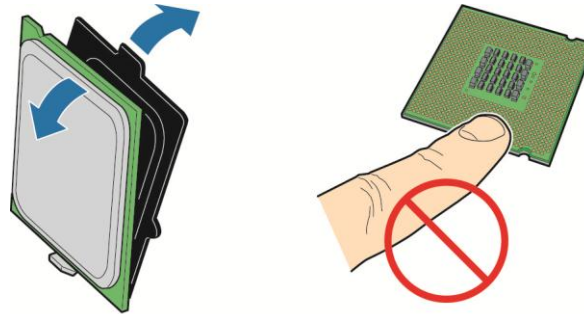
OM22668

Figure 7. Lift the Load Plate

4. Remove the processor from its protective cover. Hold the processor only at the edges, being careful not to touch the bottom of the processor (see Figure 8).

NOTE

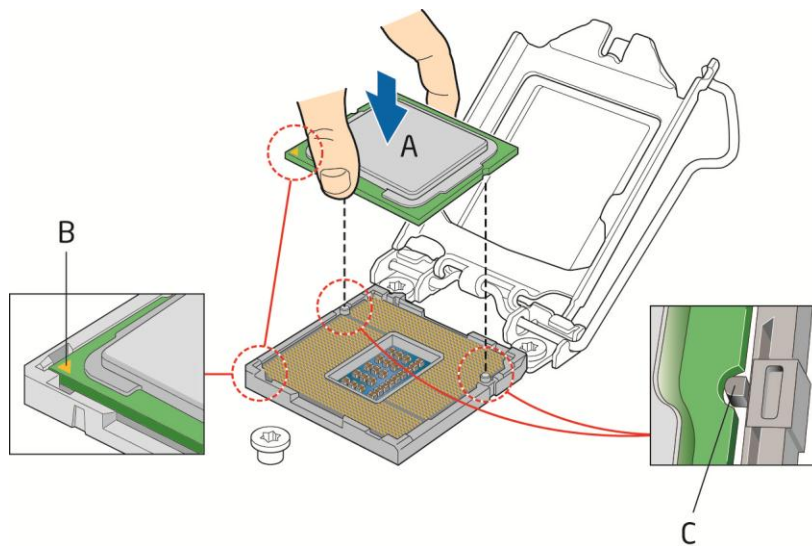
Do not discard the processor cover. Always replace the processor cover if you remove the processor from the socket.



OM22669

Figure 8. Remove the Processor from the Protective Cover

5. Hold the processor with your thumb and index finger oriented as shown in Figure 9 to align your fingers with the socket finger cutouts. Make sure that the processor Pin 1 indicator (gold triangle) is aligned with the Pin 1 chamfer on the socket (Figure 9, B) and that the notches on the processor align with the posts on the socket (Figure 9, C). Lower the processor straight down without tilting or sliding it in the socket (Figure 9, A).

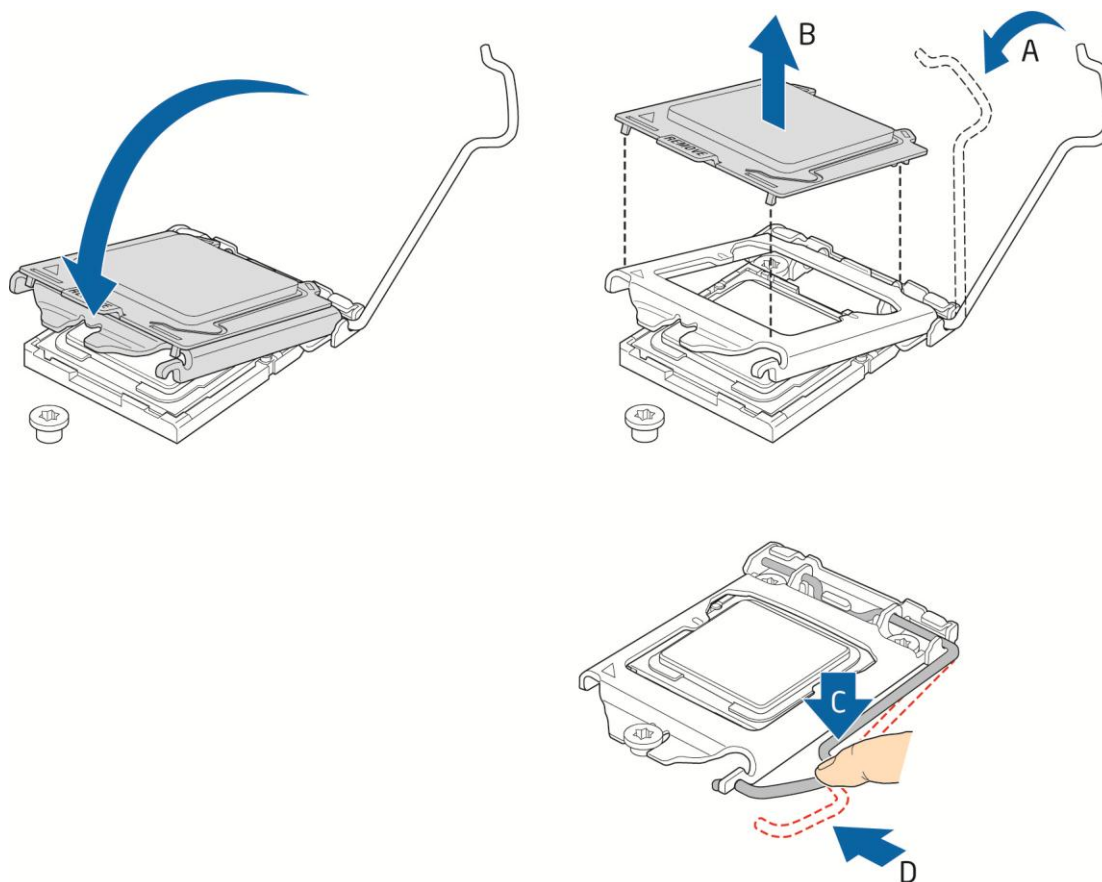


OM22670

Figure 9. Install the Processor

6. Carefully lower the socket lever (Figure 10, A) while making sure that the front edge of the load plate slides under the shoulder screw cap as the lever is lowered. Latch the socket lever

under the load plate tab (Figure 10, C, D). The socket cover (Figure 10, B) will pop off as shown.



OM22671

Figure 10. Secure the Load Plate in Place

7. Pick up the socket cover and remove it from the server board.

NOTE

Do not discard the socket cover; save it for possible future use. Always replace the socket cover if you remove the processor from the socket.

Installing a Processor Fan Heat Sink

Intel® Server Board S1200KP has mounting holes for a processor fan heat sink. For instructions on how to attach the processor fan heat sink to the Server Board, refer to the boxed processor manual or boxed thermal solution manual.

Connecting the Processor Fan Heat Sink Cable

Connect the processor fan heat sink power cable to the 4-pin processor fan header (see Figure 11). A fan with a 4-pin connector as shown in Figure 11 is recommended.

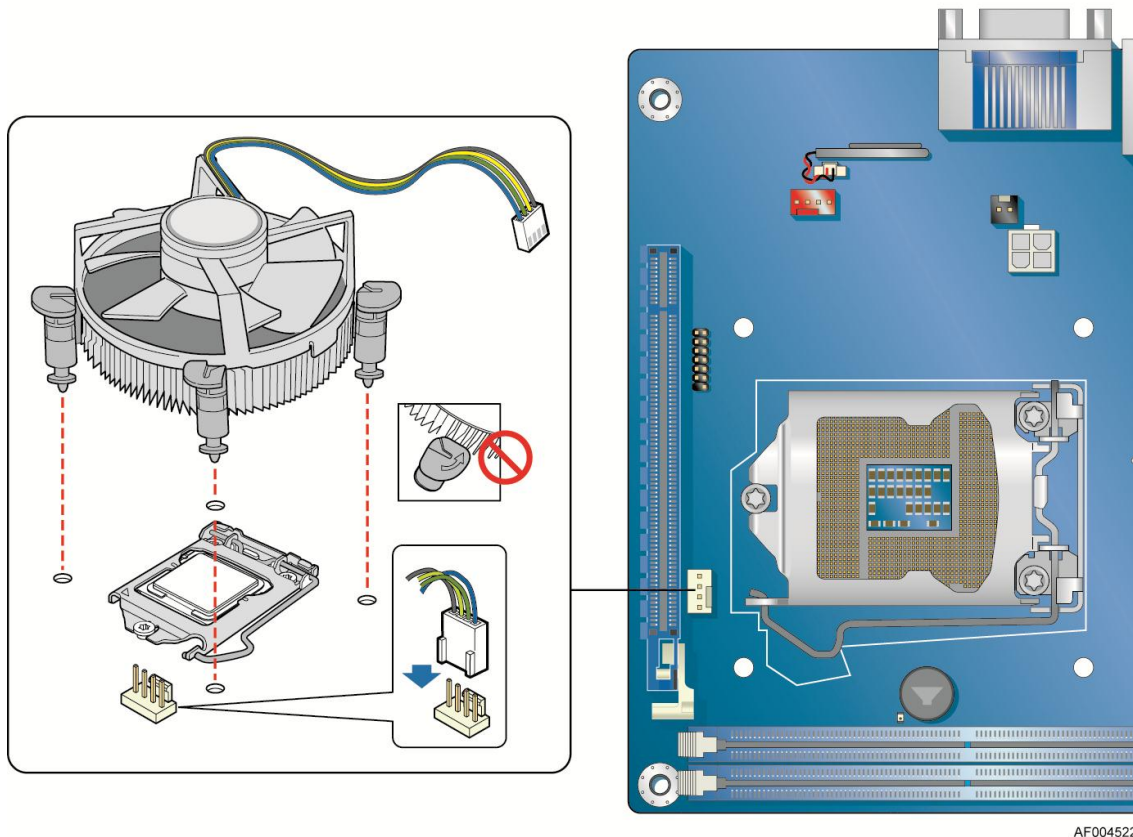


Figure 11. Connecting the Processor Fan Heat Sink Power Cable to the Processor Fan Header

Removing the Processor

For instructions on how to remove the processor fan heat sink and processor, refer to the processor installation manual.

Installing and Removing System Memory

NOTE

To be fully compliant with all applicable Intel® DRAM memory specifications, the board requires DIMMs that support the Serial Presence Detect (SPD) data structure.

The server board has two 240-pin DDR3 DIMM sockets providing Channel A and Channel B. For dual-channel performance, install a matched pair of DIMMs equal in speed and size (see Figure 12).

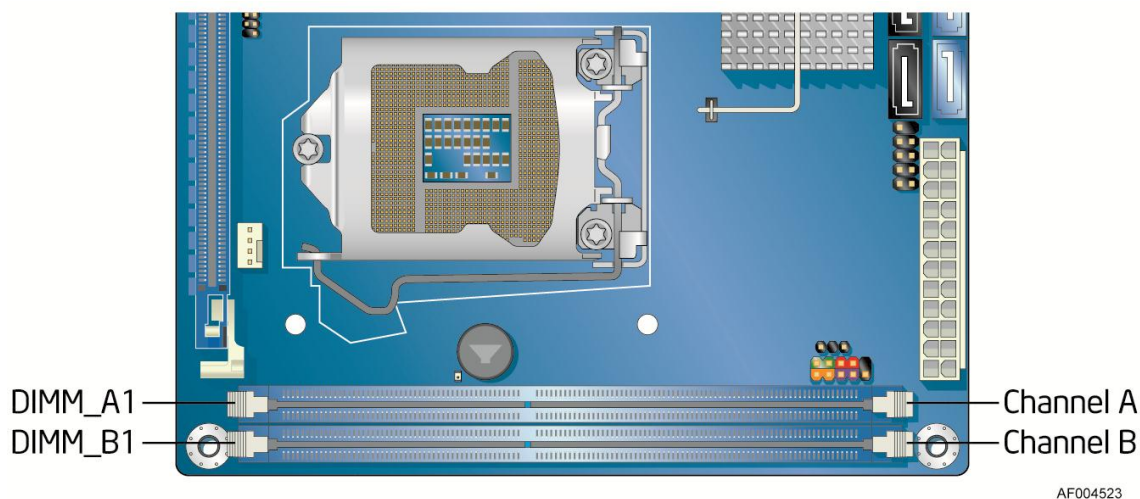


Figure 12. Dual Channel Memory Configuration Example

NOTE

The Intel® Xeon® E3-1200 Processors, the 2nd Generation Intel® Core™ i3 Processors, Intel® Xeon® E3-1200 V2 Processors or the 3rd Generation Intel® Core™ i3 Processors require memory to be installed in the DIMM_A1 (or Channel A, DIMM 1) socket.

Installing DIMMs

To make sure you have the correct DIMM, place it on the illustration of the DDR3 DIMM in Figure 13. All the notches should match with the DDR3 DIMM.

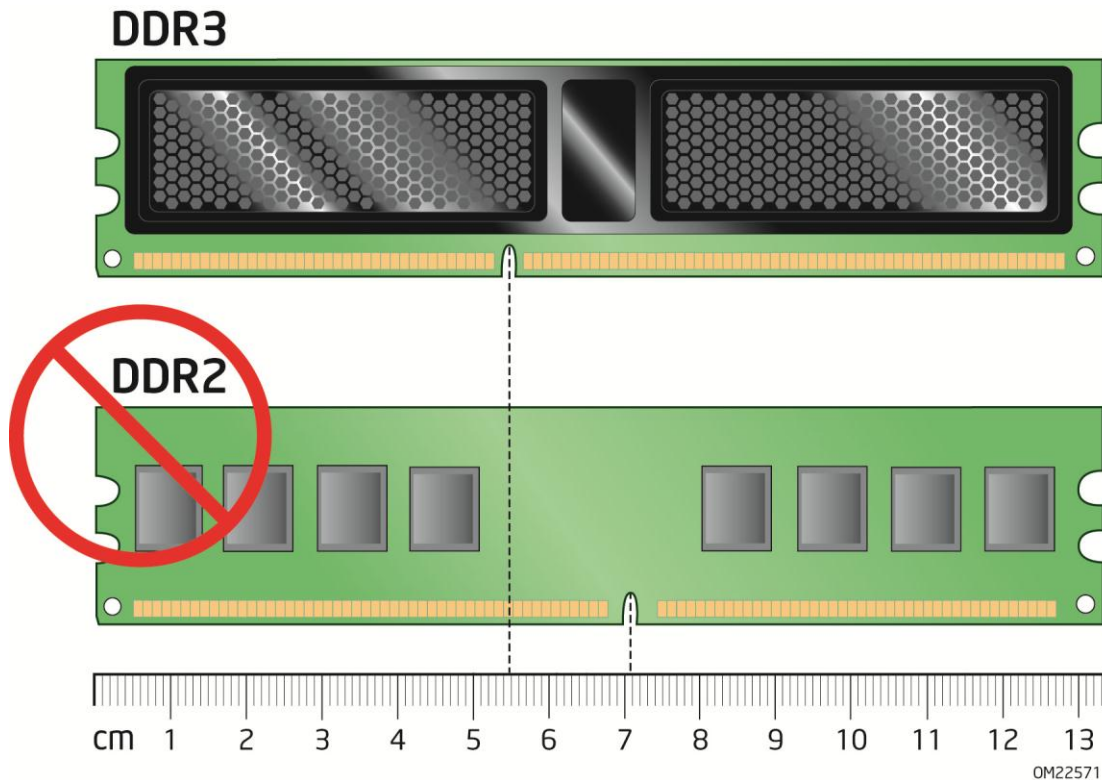
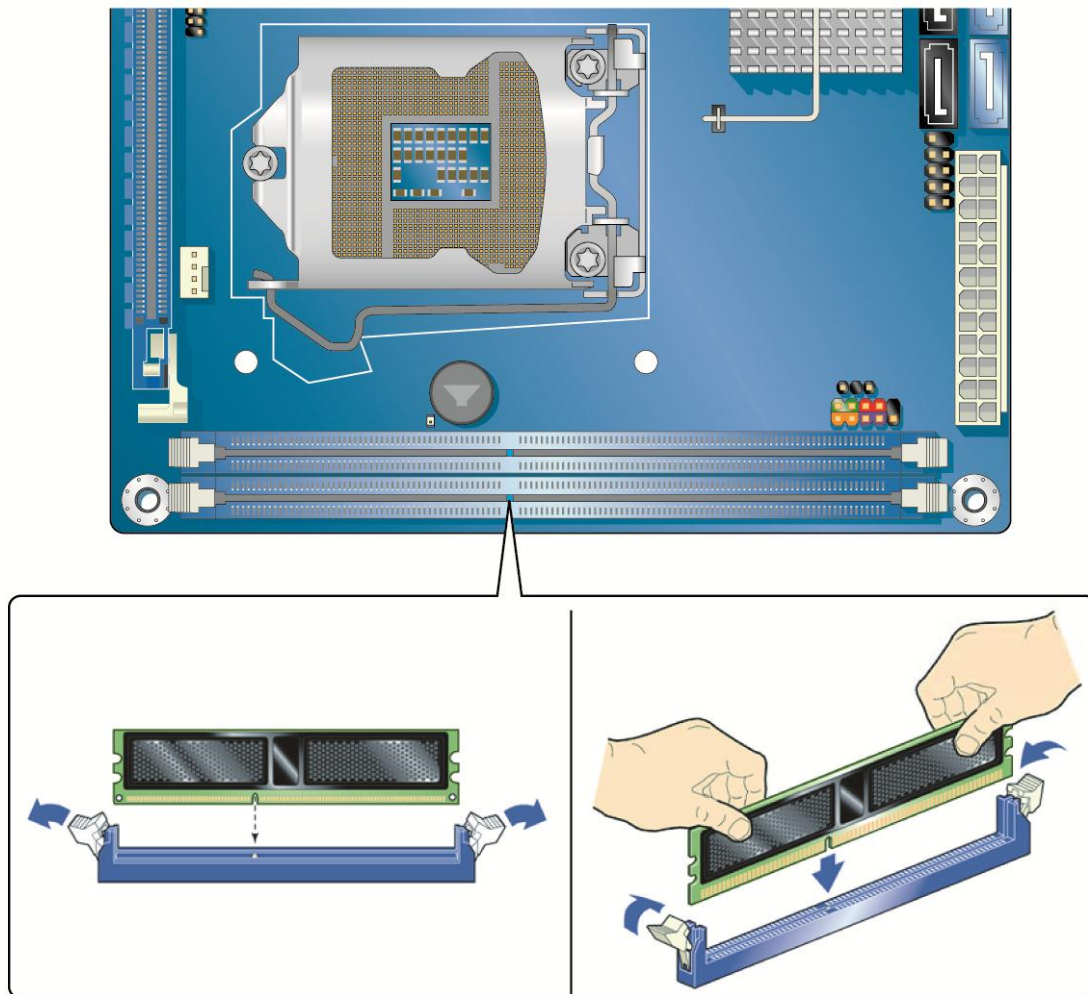


Figure 13. Use DDR3 DIMMs

To install a DIMM, follow these steps:

1. Observe the precautions in "Before You Begin" on page 18.
2. Turn off all peripheral devices connected to the computer. Turn off the computer and disconnect the AC power cord.
3. Remove the computer's cover and locate the DIMM sockets (see Figure 14).
4. If a full length PCI Express* graphics card is installed in the PCI Express* x16 connector, remove the card to gain full access to the DIMM sockets.



AF004524

Figure 14. Installing a DIMM

5. Make sure the clips at either end of the DIMM socket(s) are pushed outward to the open position.
6. Holding the DIMM by the edges, remove it from its anti-static package.
7. Position the DIMM above the socket. Align the small notch at the bottom edge of the DIMM with the keys in the socket (see inset in Figure 14).
8. Insert the bottom edge of the DIMM into the socket.

9. When the DIMM is inserted, push down on the top edge of the DIMM until the retaining clips snap into place. Make sure the clips are firmly in place.
10. Reinstall the PCI Express* graphics card if one was removed in Step 4.
11. Replace the computer's cover and reconnect the AC power cord.

Removing DIMMs

To remove a DIMM, follow these steps:

1. Observe the precautions in "Before You Begin" on page 18.
2. Turn off all peripheral devices connected to the computer. Turn off the computer.
3. Remove the AC power cord from the computer.
4. Remove the computer's cover.
5. If a full length PCI Express* graphics card is installed in the PCI Express* x16 connector, remove the card to gain access to the DIMMs.
6. Gently spread the retaining clips at each end of the DIMM socket. The DIMM pops out of the socket.
7. Hold the DIMM by the edges, lift it away from the socket, and store it in an anti-static package.
8. Reinstall the PCI Express* graphics card if one was removed in Step 5 and reconnect any other parts you removed or disconnected to reach the DIMMs.
9. Replace the computer's cover and reconnect the AC power cord.

Installing and Removing PCI Express* x16 Graphics Cards

Installing a PCI Express* x16 Graphics Card



CAUTION

Before installing a PCI Express* x16 graphics card, make sure that the tabs on the DIMM sockets are in the upright position (closed); otherwise, they may be damaged by the PCI Express* card during installation.

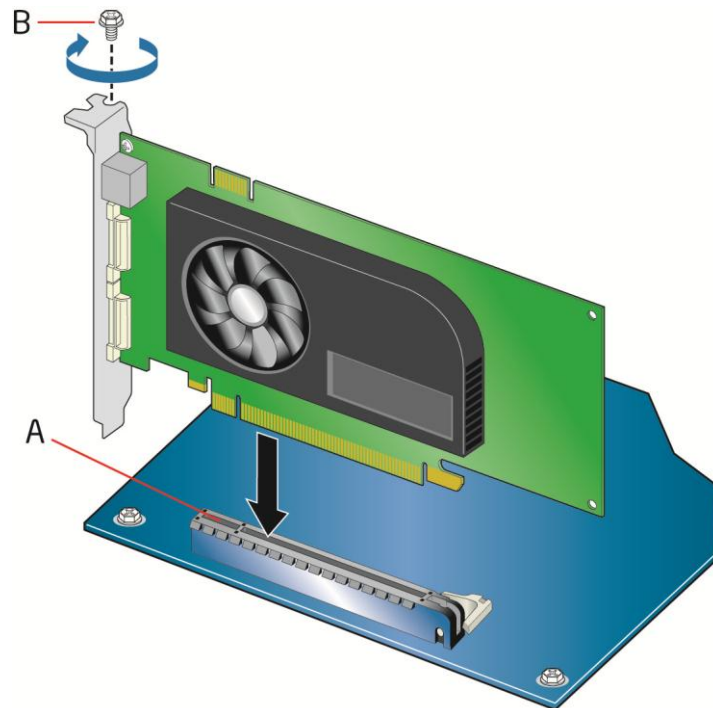


CAUTION

When installing a PCI Express* card, ensure that the card is fully seated in the PCI Express* connector before you power on the system. If the card is not fully seated in the connector, an electrical short may result across the connector pins. Depending on the over-current protection of the power supply, certain Server Board components and/or traces may be damaged.

Follow these instructions to install a PCI Express* x16 graphics card:

1. Observe the precautions in "Before You Begin" on page 18.
2. Place the card in the PCI Express* x16 connector (Figure 15, A) and press down on the card until it is completely seated in the connector and the card retention notch on the card snaps into place around the retention mechanism pin on the connector.
3. Secure the card's metal bracket to the chassis back panel with a screw (Figure 15, B).
4. Connect a monitor to the graphics card according to the manufacturer's instructions.



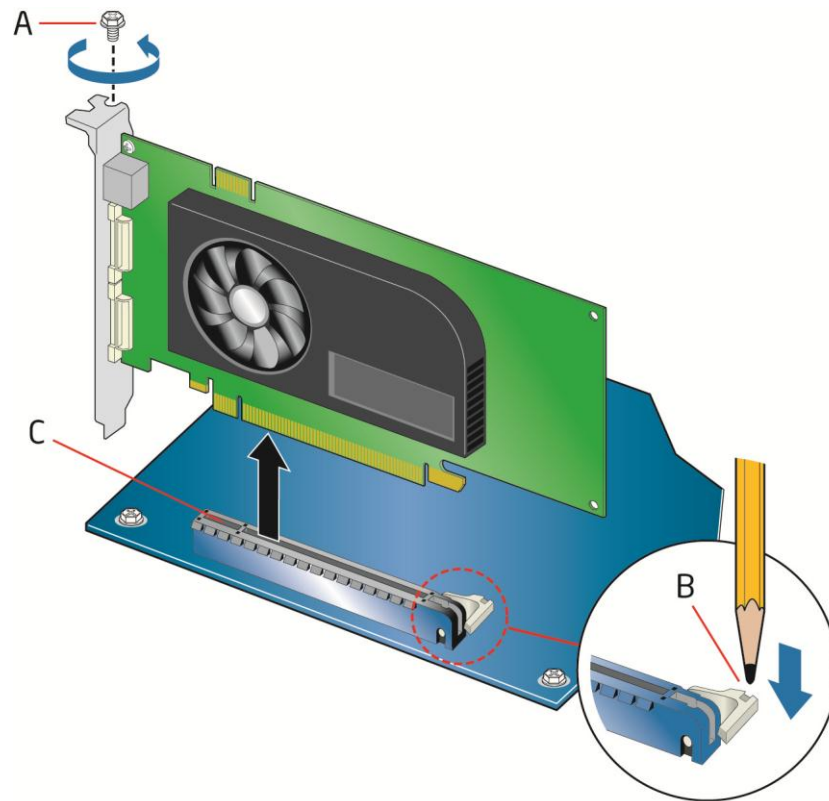
0M22709

Figure 15. Installing a PCI Express* x16 Graphics Card

Removing a PCI Express* x16 Graphics Card

Follow these instructions to remove a PCI Express* x16 graphics card from a connector:

1. Observe the precautions in “Before You Begin” on page 18.
2. Disconnect the monitor cable from the graphics card back panel connector.
3. Remove the screw (Figure 16, A) that secures the card’s metal bracket to the chassis back panel.
4. Push the card ejector lever down using the tip of a pencil or similar tool (Figure 16, B) in the notch. This will release the card from the connector (C).
5. Pull the card straight up to remove it.



OM22710

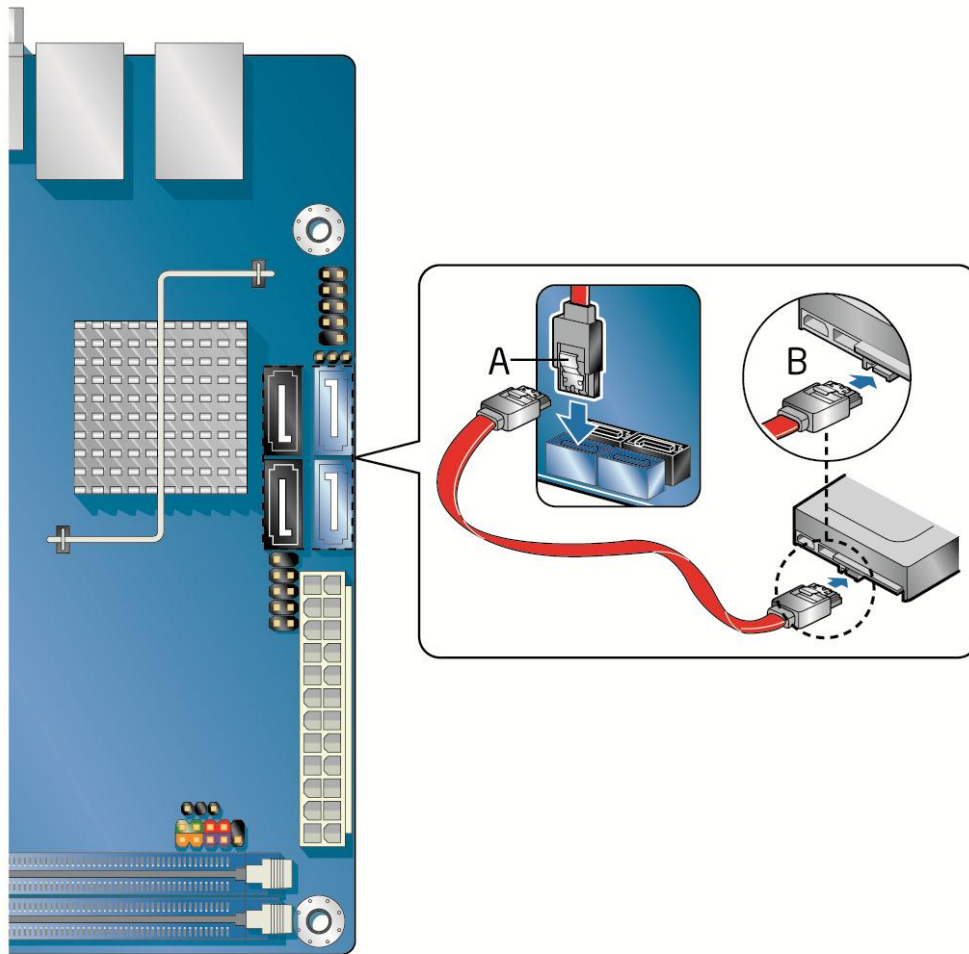
Figure 16. Removing a PCI Express* x16 Graphics Card

Connecting SATA Drives

Use the included SATA cables to connect internal SATA drives. Each cable can be used to connect one internal SATA drive to the Server Board's SATA connectors. The blue SATA connectors support 6.0 Gb/s and slower speed SATA devices while the black SATA connectors support 3.0 Gb/s and slower speed SATA devices.

For correct cable function:

1. Observe the precautions in "Before You Begin" on page 18.
2. Attach one end of the SATA cable to one of the SATA connectors on the board (Figure 17, A) and attach the other end of the cable to the SATA drive data connector (Figure 17, B).

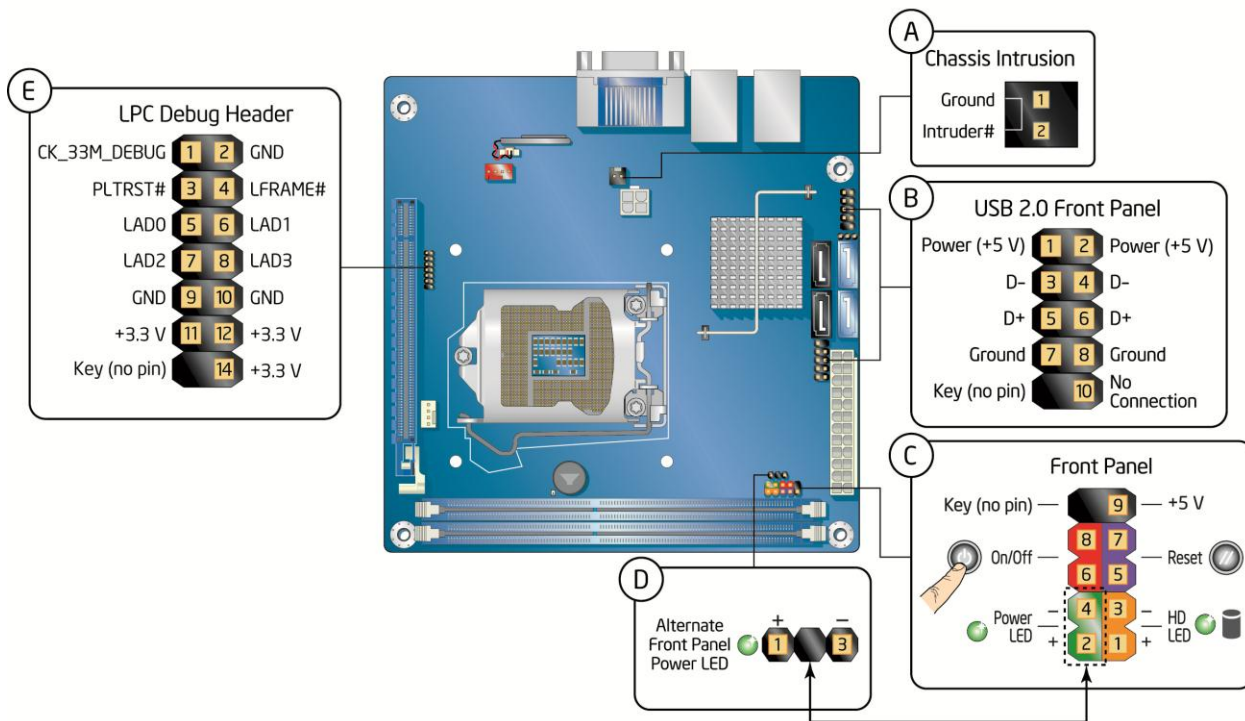


AF004525

Figure 17. Connecting a SATA Drive

Connecting to the Internal Headers

Before connecting cables to any of the internal headers, observe the precautions in “Before You Begin” on page 18. Figure 18 shows the location of the internal headers and connectors on Intel® Server Board S1200KP.



AF004526

Figure 18. Internal Headers

Chassis Intrusion Header

Figure 18, A shows the location of the chassis intrusion header. This header can be connected to a mechanical switch on the chassis to detect if the chassis cover is removed. This switch should be in the open position when the chassis cover is installed and closed when the cover is removed.

Table 4 shows the pin assignments and signal names for the chassis intrusion header.

Table 4. Chassis Intrusion Header Signal Names

Pin	Description
1	Ground
2	Intruder#

Front Panel USB 2.0 Headers

Figure 18, B shows the location of the front panel USB 2.0 headers and Table 5 shows their pin assignments and signal names.

Table 5. USB 2.0 Header Signal Names

Pin	Signal Name	Pin	Signal Name
1	Power (+5 V)	2	Power (+5 V)
3	D-	4	D-
5	D+	6	D+
7	Ground	8	Ground
9	Key (no pin)	10	No Connection

Front Panel Header

Figure 18, C shows the location of the front panel header. Table 6 shows the pin assignments and signal names for the front panel header.

Table 6. Front Panel Header Signal Names

Pin	Description	In/Out	Pin	Description	In/Out
Hard Drive Activity LED			Power LED		
1	Hard disk LED pull-up to +5 V	Out	2	Front panel LED+	Out
3	Hard disk active LED	Out	4	Front panel LED-	Out
Reset Switch			On/Off Switch		
5	Ground		6	Power switch	In
7	Reset switch	In	8	Ground	
Power			Not Connected		
9	Power	Out	10	No pin	

NOTE

When connecting individual wires from your chassis front panel to the front panel header, be sure to observe the connection polarity. Positive wires are usually solid color and negative wires are usually white or striped.

Alternate Front Panel Power LED Header

Figure 18, D shows the location of the alternate front panel power LED header. Pins 1 and 3 of this header duplicate the signals on pins 2 and 4 of the front panel header. If your chassis has a three-pin power LED cable, connect it to this header. Table 7 shows the pin assignments for the alternate front panel header.

Table 7. Alternate Front Panel Power LED Header Signal Names

Pin	Signal Name	In/Out
1	Front panel LED+	Out
2	No pin	
3	Front panel LED-	Out

Low Pin Count (LPC) Debug header

Figure 18, E shows the location of the low pin count debug header. Table 8 shows the pin assignments and signal names for the low pin count debug header.

Table 8. LPC Debug Header

Pin	Signal Name	Pin	Signal Name
1	CK_33M_DEBUG	2	GND
3	PLTRST#	4	LFRAME#
5	LAD0	6	LAD1
7	LAD2	8	LAD3
9	GND	10	GND
11	+3.3 V	12	+3.3 V
13	Not Connected	14	+3.3 V

Connecting Chassis Fan and Power Supply Cables

Connecting a Chassis Fan

Connect the chassis fan cable to the chassis fan header on the Server Board. Figure 19 shows the location of the chassis fan header.

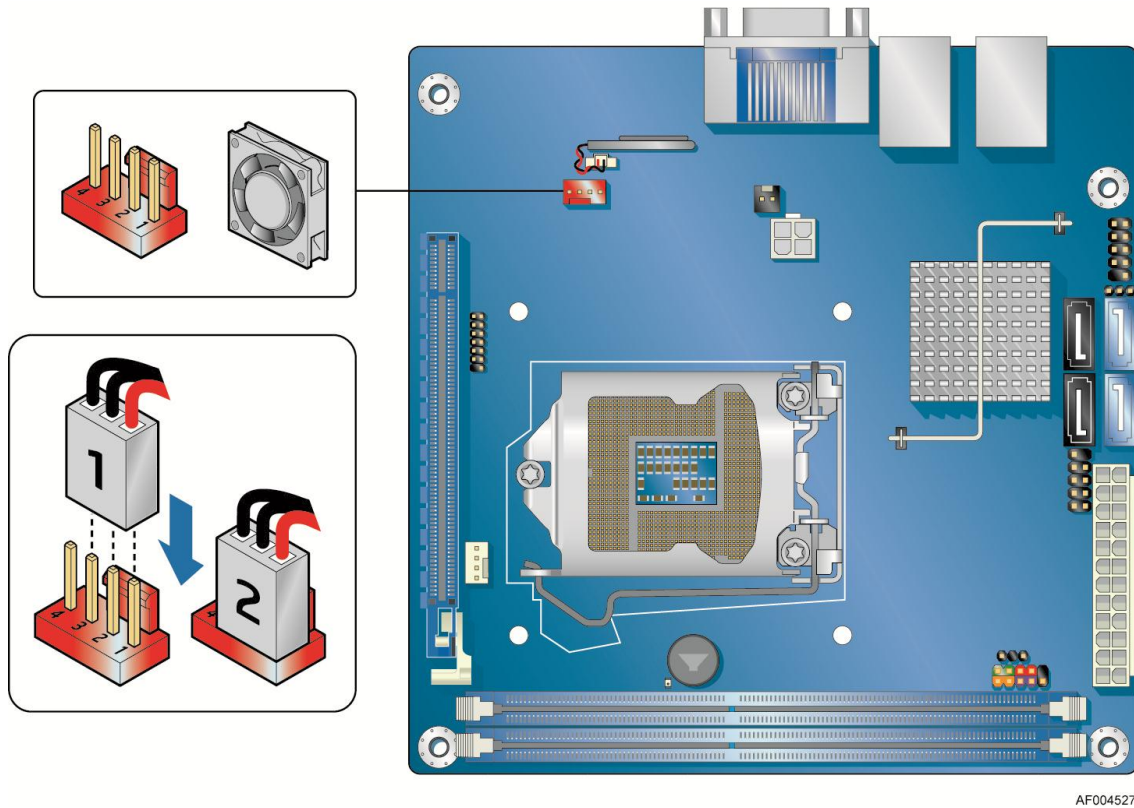


Figure 19. Location of the Chassis Fan Header

Connecting Power Supply Cables



CAUTION

Failure to use an appropriate power supply and/or not connecting the 12 V power connector (Figure 20, A) to the Server Board may result in damage to the board or the system may not function properly.

Figure 20 shows the location of the power connectors. The 2 x 12 pin main power connector (Figure 20, B) is backwards compatible with ATX12V power supplies with 2 x 10 connectors.

NOTE

If your power supply has a 2 x 10 main power connector, it is recommended that you do not install a PCI Express* x16 graphics card unless it has a direct connection to the power supply.

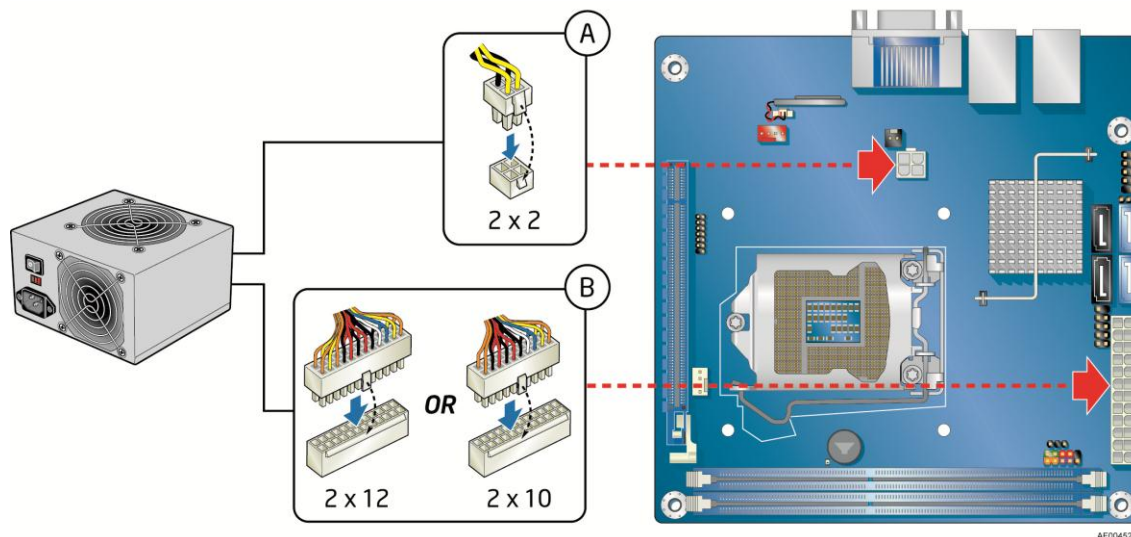


Figure 20. Connecting Power Supply Cables

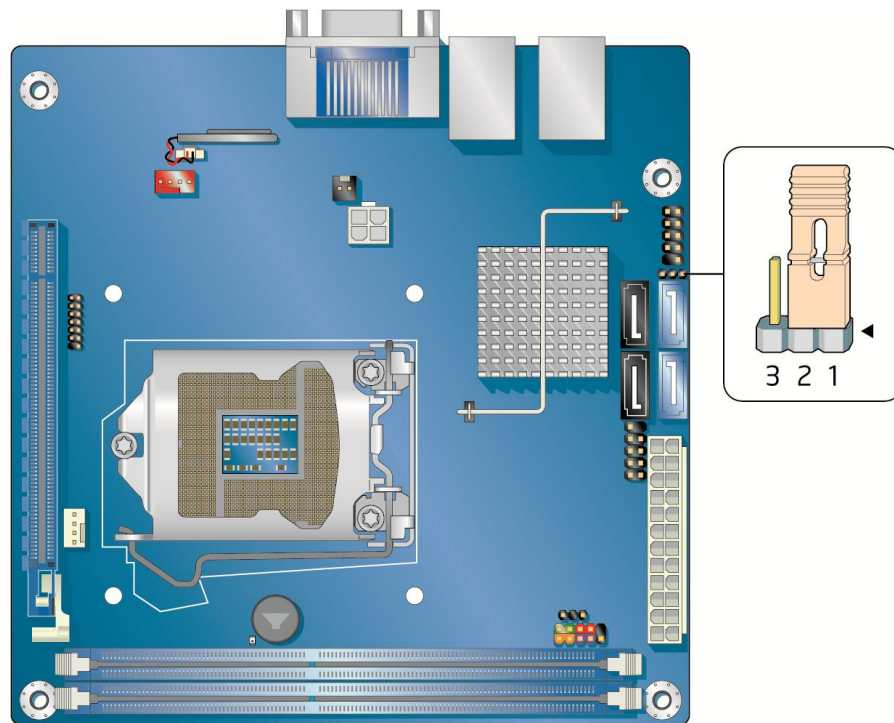
1. Observe the precautions in "Before You Begin" on page 18.
2. Connect the 12 V processor core voltage power supply cable to the 2 x 2 pin connector (Figure 20, A).
3. Connect the main power supply cable to the 2 x 12 pin connector (Figure 20, B).

Setting the BIOS Configuration Jumper

NOTE

Always turn off the power and unplug the power cord from the computer before moving the jumper. Moving the jumper with the power on may result in unreliable computer operation.

Figure 21 shows the location of the Server Board's BIOS configuration jumper block.

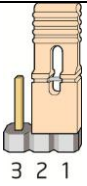
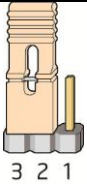



AF004499

Figure 21. Location of the BIOS Configuration Jumper Block

The three-pin BIOS jumper block enables board configuration to be done in the BIOS Setup program. Table 9 shows the jumper settings for the BIOS Setup program modes.

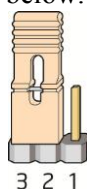
Table 9. Jumper Settings for the BIOS Setup Program Modes

Jumper Setting	Mode	Description
	Normal (default) (1-2)	The BIOS uses the current configuration and passwords for booting.
	Configure (2-3)	After the Power-On Self-Test (POST) runs, the BIOS displays the Maintenance Menu. Use this menu to clear passwords.
	Recovery (None)	The BIOS recovers data in the event of a failed BIOS update.

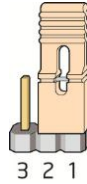
Clearing Passwords

This procedure assumes that the board is installed in the computer and the configuration jumper block is set to normal mode.

1. Observe the precautions in "Before You Begin" on page 18.
2. Turn off all peripheral devices connected to the computer. Turn off the computer. Disconnect the computer's power cord from the AC power source (wall outlet or power adapter).
3. Remove the computer cover.
4. Find the configuration jumper block (see Figure 21).
5. Place the jumper on pins 2-3 as shown below.



6. Replace the cover, plug in the computer, turn on the computer, and allow it to boot.
7. The computer starts the Setup program. Setup displays the Maintenance menu.
8. Use the arrow keys to select Clear Passwords. Press <Enter> and Setup displays a pop-up screen requesting that you confirm clearing the password. Select "Yes" and press <Enter>. Setup displays the maintenance menu again.
9. Press <F10> to save the current values and exit Setup.
10. Turn off the computer. Disconnect the computer's power cord from the AC power source.
11. Remove the computer cover.
12. To restore normal operation, place the jumper on pins 1-2 as shown below.



13. Replace the cover, plug in the computer, and turn on the computer.

Replacing the Battery

A coin-cell battery (CR2032) powers the real-time clock and CMOS memory. When the computer is not plugged into a wall socket, the battery has an estimated life of three years. When the computer is plugged in, the standby current from the power supply extends the life of the battery. The clock is accurate to ± 13 minutes/year at 25 °C with 3.3 VSB applied.

When the voltage drops below a certain level, the BIOS Setup program settings stored in CMOS RAM (for example, the date and time) might not be accurate. Replace the battery with an equivalent one. Figure 22 on page 42 shows the location of the battery.

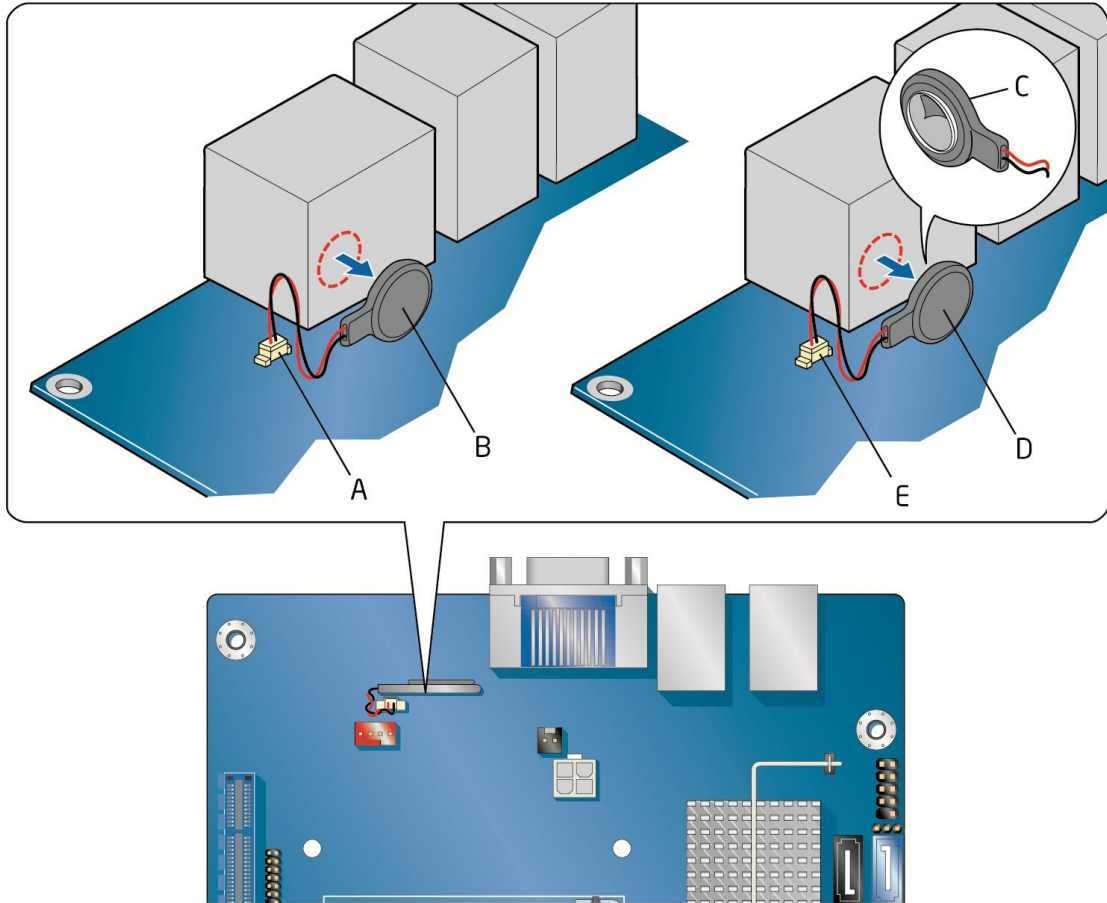


CAUTION

You will have the risk of explosion if the battery is replaced incorrectly. Batteries should be recycled if possible. Disposal of used batteries must be in accordance with local environmental regulations.

To replace the battery, follow these steps:

1. Observe the precautions in "Before You Begin" (see page 18).
2. Turn off all peripheral devices connected to the computer. Disconnect the computer's power cord from the AC power source (wall outlet or power adapter).
3. Remove the computer cover.
4. Locate the battery on the board (see Figure 22).
5. Disconnect the battery wires from the connector (Figure 22, A) and remove the battery (Figure 22, B) from the back of the I/O stack
6. To install the new battery, remove the paper backing (Figure 22, C) from the battery adhesive pad, attach the battery to the I/O stack, and connect the wires (Figure 22, E) to the server board.
7. Replace the computer cover.



AF004529

Figure 22. Removing the Battery

3 Updating the BIOS

The BIOS Setup program can be used to view and change the BIOS settings for the computer. You can access the BIOS Setup program by pressing the <F2> key after the Power-On Self-Test (POST) memory test begins and before the operating system boot begins.

This chapter tells you how to update the BIOS by either using the Intel® Flash Memory Update Utility or the <F7> key, and how to recover the BIOS if an update fails.

Updating the BIOS with the Intel® Flash Memory Update Utility

You can use the information in this section to update the BIOS using the Intel® Flash Memory Update Utility.

Obtaining the BIOS Update File

You can update to a new version of the BIOS by using the Intel® Flash Memory BIOS update file.

The Intel® Flash Memory BIOS update file is a compressed file that contains the files you need to update the BIOS. The BIOS update file contains:

- New BIOS file (including the Intel® Management Engine (Intel® ME) Firmware Image))
- Intel® Integrator Toolkit Configuration File (optional)
- Intel® Flash Memory Update Utility

You can obtain either of these files through your computer supplier or by navigating to the Intel® Server Board S1200KP page on the Intel® World Wide Web site Download Center at <http://downloadcenter.intel.com>.

On the S1200KP page, click on the “BIOS Update” link and then select the Iflash BIOS Update file.

Updating the BIOS with the Intel® Flash Memory Update Utility

With the Intel® Flash Memory Update Utility you can update the system BIOS from a bootable USB flash drive, or other bootable USB media. The BIOS update files can be extracted locally to your hard drive and copied to a bootable USB flash drive or other bootable USB media.

The Intel® Flash Memory Update Utility allows you to:

- Update the BIOS and Intel® Management Engine in flash memory
- Update the language section of the BIOS

NOTE

Review the instructions distributed with the update utility before attempting a BIOS update.



CAUTION

Do not interrupt the process or the system, for it may not function properly.

1. Uncompress the BIOS update file and copy the .BIO file, IFLASH.EXE, and .ITK file (optional) to a bootable USB flash drive or other bootable USB media.
2. Configure the BIOS or use the F10 option during POST to boot to the USB device.
3. Manually run the IFLASH.EXE file from the USB device and manually update the BIOS.

Updating the BIOS Using the F7 Function Key

To use this BIOS update method:

1. Download and save the Recovery BIOS (.BIO) file to a temporary directory.
2. Copy the .BIO to a USB thumb drive.
3. Plug the thumb drive into a USB port of the target computer.
4. Shut down the target computer.
5. Enable the F7 prompt display:
 - a. Power the computer on.
 - b. Enter the BIOS Setup by pressing F2 during boot.
 - c. Go to the Advanced > Boot Configuration menu.
 - d. Enable Display F7 to Update BIOS
 - e. Press F10 to save and exit.
6. During boot, when the F7 prompt is displayed, press F7 to enter the BIOS Flash Update tool.
7. Select the USB thumb drive and press Enter.
8. Select the .BIO file and press Enter
9. Confirm you want to update the BIOS by pressing Enter.
10. Wait 2-5 minutes for the update to complete.
11. Remove the thumb drive.
12. Restart the computer.

Recovering the BIOS

It is unlikely that anything will interrupt the BIOS update; however, if an interruption occurs, the BIOS could be damaged. Due to BIOS size and recovery requirements, a CD-R with the .BIO file in the root directory will be required.

You can obtain the Recovery BIOS Update file through your computer supplier or by navigating to the Intel® Server Board S1200KP page on the Intel® World Wide Web site Download Center at <http://downloadcenter.intel.com>.

On the S1200KP page, click on the “BIOS Update” link and then select the Recovery BIOS Update file.

Appendix A: Error Messages and Indicators

Intel® Server Board S1200KP reports POST errors in two ways:

- By sounding a beep code and blinking the front panel power LED
- By displaying an error message on the monitor

BIOS Error Codes

Whenever a recoverable error occurs during POST, the BIOS causes the board's speaker to beep and the front panel power LED to blink an error message indicating the problem (see Table 10).

Table 10. BIOS Beep Codes

Type	Pattern	Frequency/Comments
F2 Setup/F10 Boot Menu Prompt	One 0.5 second beep when the BIOS is ready to accept keyboard input	932 Hz
BIOS update in progress	None	
Video error (no add-in graphics card installed)	On-off (1.0 second each) two times, then a 2.5-second pause (off), the entire pattern repeats (beeps and pause) once and the BIOS will continue to boot.	932 Hz For processors requiring an add-in graphics card
Memory error	On-off (1.0 second each) three times, then a 2.5-second pause (off), the entire pattern repeats (beeps and pause) until the system is powered off.	932 Hz
Thermal trip warning	Alternate high and low beeps (1.0 second each) for eight beeps followed by system shut down.	High beep 2000 Hz Low beep 1500 Hz

Table 11. Front-panel Power LED Blink Codes

Type	Pattern	Note
F2 Setup/F10 Boot Menu Prompt	None	
BIOS update in progress	Off when the update begins, then on for 0.5 second, then off for 0.5 second. The pattern repeats until the BIOS update is complete.	
Video error (no add-in graphics card installed)	On-off (0.5 second each) two times, then a 3.0-second pause (off), the entire pattern repeats (blink and pause) until the system is powered off.	For processors requiring an add-in graphics card
Memory error	On-off (0.5 second each) three times, then a 3.0-second pause (off), the entire pattern repeats (blinks and pause) until the system is powered off.	
Thermal trip warning	Each beep will be accompanied by the following blink pattern: .25 seconds on, .25 seconds off, .25 seconds on, .25 seconds off. This results in a total of 32 blinks.	

BIOS Error Messages

When a recoverable error occurs during the POST, the BIOS displays an error message describing the problem. Table 12 gives an explanation of the BIOS error messages.

Table 12. BIOS Error Messages

Error Message	Explanation
CMOS Battery Low	The battery may be losing power. Replace the battery soon.
CMOS Checksum Bad	The CMOS checksum is incorrect. CMOS memory may have been corrupted. Run Setup to reset values.
Memory Size Decreased	Memory size has decreased since the last boot. If no memory was removed, then memory may be bad.
No Boot Device Available	System did not find a device to boot.