

Intel® Desktop Board D945GCLF Product Guide

Order Number: E35045-004

Revision History

Revision	Revision History	Date
-001	First release of the Intel® Desktop Board D945GCLF Product Guide	April 2008
-002	Second release of the Intel® Desktop Board D945GCLF Product Guide	May 2008
-003	Third release of the Intel® Desktop Board D945GCLF Product Guide	July 2008
-004	Fourth release of the Intel® Desktop Board D945GCLF Product Guide	December 2008

If an FCC declaration of conformity marking is present on the board, the following statement applies:

FCC Declaration of Conformity

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions related to the EMC performance of this product, contact:

Intel Corporation, 5200 N.E. Elam Young Parkway, Hillsboro, OR 97124,
1-800-628-8686

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to an outlet on a circuit other than the one to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Any changes or modifications to the equipment not expressly approved by Intel Corporation could void the user's authority to operate the equipment.

Tested to comply with FCC standards for home or office use.

Canadian Department of Communications Compliance Statement

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

Disclaimer

Information in this document is provided in connection with Intel® products. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Intel's Terms and Conditions of Sale for such products, Intel assumes no liability whatsoever, and Intel disclaims any express or implied warranty, relating to sale and/or use of Intel products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright or other intellectual property right. Intel products are not intended for use in medical, life saving, or life sustaining applications. Intel may make changes to specifications and product descriptions at any time, without notice.

Desktop Board D945GCLF may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request. Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order.

Copies of documents which have an ordering number and are referenced in this document, or other Intel literature, may be obtained from Intel Corporation by going to the World Wide Web site at: <http://www.intel.com/> or by calling 1-800-548-4725.

Intel, the Intel logo, and Intel Atom are trademarks of Intel Corporation in the U. S. and other countries.

* Other names and brands may be claimed as the property of others.

Copyright © 2008, Intel Corporation. All rights reserved.

Preface

This Product Guide gives information about board layout, component installation, and regulatory requirements for Intel® Desktop Board D945GCLF.

Intended Audience

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

Intended Uses

All Intel® Desktop 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 Desktop Board Features: a summary of product features
- 2 Installing and Replacing Desktop Board Components: instructions on how to install the Desktop Board and other hardware components
- 3 Updating the BIOS: a description of how to update the BIOS
- A BIOS Error Messages: information about BIOS error messages and beep codes
- B Regulatory Compliance: safety and EMC regulations and product certifications

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 to 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)
MB	Megabyte (1,048,576 bytes)
Mbit	Megabit (1,048,576 bits)
MHz	Megahertz (one million hertz)

Contents

1 Desktop Board Features

Desktop Board Components.....	10
Processor.....	12
Main Memory.....	12
Intel® 945GC Express Chipset.....	13
Onboard Audio Subsystem	13
Input/Output (I/O) Controller	14
LAN Subsystem	15
LAN Subsystem Software.....	15
LAN Status LEDs.....	15
Hi-Speed USB 2.0 Support	16
Enhanced IDE Interface	16
Serial ATA.....	16
Expandability.....	16
BIOS	17
IDE Auto Configuration.....	17
PCI Auto Configuration	17
Security Passwords.....	17
Power Management Features	18
ACPI	18
Hardware Support	18
Power Connectors	18
Fan Headers	18
+5 V Standby Power Indicator LED	19
LAN Wake Capabilities.....	20
Wake from USB	20
Wake from PS/2 Keyboard/Mouse.....	20
PME# Wakeup Support	20
Battery	20
Real-Time Clock.....	20

2 Installing and Replacing Desktop Board Components

Before You Begin	21
Installation Precautions.....	22
Prevent Power Supply Overload	22
Observe Safety and Regulatory Requirements.....	22
Installing the I/O Shield	23
Installing and Removing the Desktop Board	24
Installing and Removing Memory.....	25
Installing DIMMs	25
Removing DIMMs.....	27
Connecting the IDE Cable.....	27
Connecting the Serial ATA (SATA) Cable.....	29
Connecting Internal Headers.....	30
Front Panel HD Audio Header	31
Connecting the Hi-Speed USB 2.0 Header	31
Connecting to the Front Panel Header.....	32
Connecting a Chassis Fan.....	32

Connecting Power Supply Cables	33
Setting the BIOS Configuration Jumper	34
Clearing Passwords	35
Replacing the Battery	36
3 Updating the BIOS	
Updating the BIOS with the Intel® Express BIOS Update Utility	41
Updating the BIOS with the Iflash Memory Update Utility	41
Obtaining the BIOS Update File	41
Updating the BIOS with the Iflash Memory Update Utility	42
Recovering the BIOS	42
A BIOS Error Messages	
BIOS Front-panel Power LED Codes	43
BIOS Beep Codes	43
BIOS Error Messages	44
B Regulatory Compliance	
Safety Standards	45
Place Battery Marking	45
European Union Declaration of Conformity Statement.....	46
Product Ecology Statements	47
Recycling Considerations	47
Lead-free 2LI/Pb-free 2LI Board	50
Restriction of Hazardous Substances (RoHS)	51
European Union RoHS	51
China RoHS	51
EMC Regulations	53
Ensure Electromagnetic Compatibility (EMC) Compliance.....	54
Product Certifications.....	55
Board-Level Certification Markings	55
Chassis and Component Certifications.....	56

Figures

1. Intel Desktop Board D945GCLF Components	10
2. Back Panel Audio Connectors	14
3. LAN Status LEDs	15
4. Location of the Standby Power Indicator	19
5. Installing the I/O Shield	23
6. Desktop Board D945GCLF Mounting Screw Holes	24
7. Use DDR2 DIMMs	25
8. Installing a DIMM	26
9. Connecting the IDE Cable	28
10. Connecting the Serial ATA Cable	29
11. Internal Headers	30
12. Location of the Chassis Fan Header	32
13. Connecting a 2 x 10 or 2 x 12 Power Supply Cable	33
14. BIOS Configuration Jumper Block.....	34
15. Removing the Battery	40
16. Desktop Board D945GCLF China RoHS Material Self Declaration Table.....	52

Tables

1. Feature Summary.....	9
2. Desktop Boards D945GCLF Components	11
3. LAN Status LEDs	15
4. Front Panel Audio Header Signal Names for Intel High Definition Audio.....	31
5. Hi-Speed USB 2.0 Header Signal Names	31
6. Front Panel Header Signal Names	32
7. Jumper Settings for the BIOS Setup Program Modes.....	35
8. BIOS Front-panel Power LED Blink Codes	43
9. BIOS Beep Codes	43
10. BIOS Error Messages	44
11. Safety Standards.....	45
12. Lead-Free Second Level Interconnect Marks	50
13. China RoHS Environmentally Friendly Use Period Mark	51
14. EMC Regulations.....	53
15. Product Certification Markings	55

1 Desktop Board Features

This chapter briefly describes the main features of Intel® Desktop Board D945GCLF. Table 1 summarizes the features of the Desktop Board.

Table 1. Feature Summary

Form Factor	Mini-ITX (171.45 millimeters [6.75 inches] x 171.45 millimeters [6.75 inches])
Processor	Intel® Atom™ processor 230
Main Memory	<ul style="list-style-type: none">• One 240-pin SDRAM Dual Inline Memory Module (DIMM) socket• 533 MHz single channel DDR2 SDRAM interface• Supports up to 2 GB of system memory
Chipset	Intel® 945GC Express Chipset consisting of: <ul style="list-style-type: none">• Intel® 82945GC Express Chipset Graphics and Memory Controller Hub (GMCH)• Intel® 82801GB I/O Controller Hub (ICH7)
Graphics	Intel® 945GC Express Chipset with Intel® Graphics Media Accelerator 950 (Intel® GMA 950)
Audio	<ul style="list-style-type: none">• RealTek* ALC662 audio codec• Support for Intel® High Definition Audio• Support for 4-channel audio (two independent 2-channel audio streams)
Expansion Capabilities	One PCI* bus add-in card connector
Peripheral Interfaces	<ul style="list-style-type: none">• Up to six USB 2.0 ports<ul style="list-style-type: none">— Four ports routed to the back panel— Two ports routed to an onboard USB header• One IDE interface with ATA-100/66 support (two devices)• Two Serial ATA (3.0 Gb/s) interfaces• One VGA connector• One parallel port• One serial port• PS/2* keyboard and mouse ports
BIOS	<ul style="list-style-type: none">• Intel® BIOS• Support for SMBIOS• Intel® Rapid BIOS Boot• Intel® Express BIOS Update
LAN Support	<ul style="list-style-type: none">• 10/100 Mb/s LAN Subsystem
Power Management	<ul style="list-style-type: none">• Support for Advanced Configuration and Power Interface (ACPI)• Wake on USB, PCI, PS/2, LAN, and front panel
Supported Operating Systems	<ul style="list-style-type: none">• Microsoft Windows Vista* Home Basic Edition• Microsoft Windows Vista Home Basic 64-bit Edition• Microsoft Windows* XP Professional• Microsoft Windows XP Professional x64 Edition• Microsoft Windows XP Home

For more information about Desktop Board D945GCLF, including the Technical Product Specification (TPS), BIOS updates, and device drivers, go to <http://support.intel.com/support/motherboards/desktop/>.

Desktop Board Components

Figure 1 shows the location of the major components on Desktop Board D945GCLF.

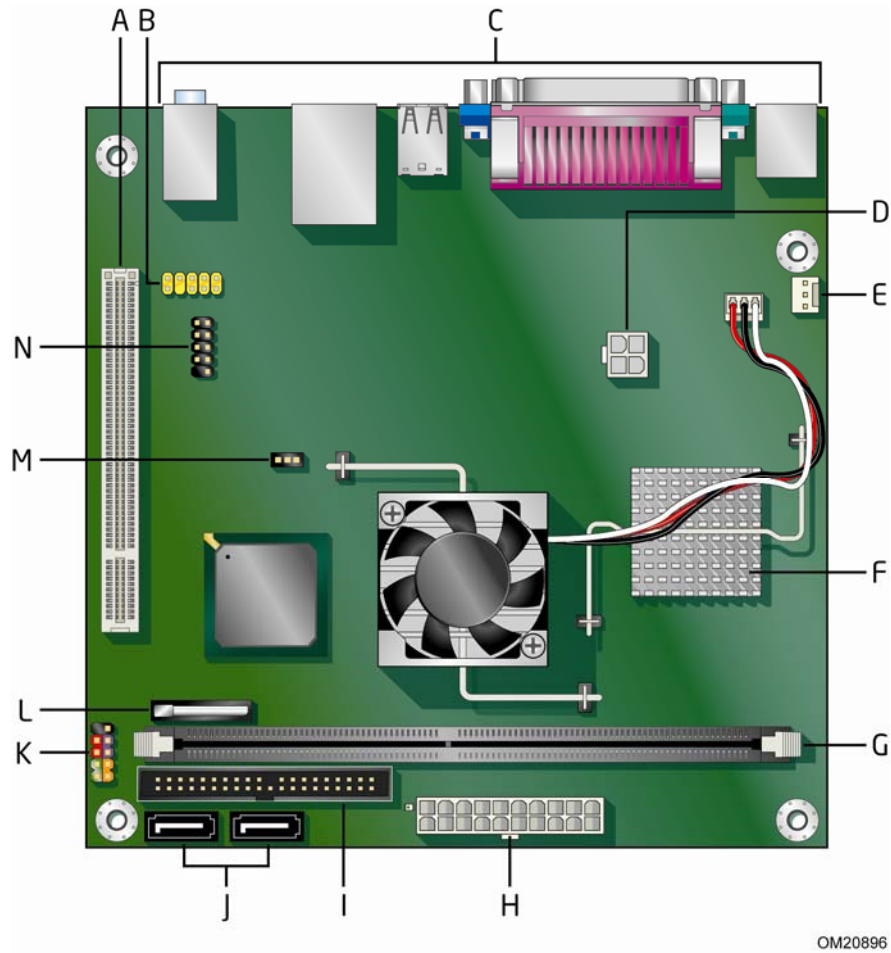


Figure 1. Intel Desktop Board D945GCLF Components

Table 2. Desktop Boards D945GCLF Components

Label	Description
A	PCI bus add-in card connector
B	Front panel audio header
C	Back panel connectors
D	12 V processor core voltage connector (2 x 2)
E	Rear fan (3-pin) header
F	Processor
G	DDR 2 DIMM connector
H	Main power connector (2 x 10)
I	IDE connector
J	Serial ATA connectors (2)
K	Front panel header
L	Battery
M	BIOS configuration jumper
N	Hi-speed USB 2.0 header

Processor



CAUTION

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

Desktop Board D945GCLF includes an Intel Atom processor 230. The processor is soldered to the Desktop Board and is not customer upgradeable.

Main Memory



NOTE

To be fully compliant with all applicable Intel® SDRAM memory specifications, the board should be populated with DIMMs that support the Serial Presence Detect (SPD) data structure. If your DIMMs 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.

The Desktop Board has one 240-pin Double Data Rate 2 (DDR2) SDRAM Dual Inline Memory Module (DIMM) connector with gold-plated contacts. It supports:

- 533 MHz unbuffered, non-registered DDR2 DIMMs
- Serial Presence Detect (SPD) memory only
- Non-ECC memory
- Up to 2 GB of memory

For the latest list of tested memory, go to

<http://support.intel.com/support/motherboards/desktop/>.

Intel® 945GC Express Chipset

The Intel 945GC Express Chipset consists of the following devices:

- Intel 82945GC Express Chipset Graphics and Memory Controller Hub (GMCH)
- Intel 82801GB I/O Controller Hub (ICH7)

The GMCH component provides interfaces to the processor, memory, and the DMI interconnect. This component also provides integrated graphics capabilities via the Intel® Graphics Media Accelerator 950 (Intel® GMA 950).

The ICH7 is a centralized controller for the board's I/O paths. For more information about the Intel 945GC Express Chipset, go to

http://www.intel.com/design/chipsets/express_flyer.htm.

Onboard Audio Subsystem

Desktop Board D945GCLF has a 4-channel (two independent 2-channel audio streams) onboard audio subsystem that includes a Realtek ALC662 audio codec.

The audio subsystem features:

- Intel High Definition Audio interface
- Advanced jack sense, for the back panel connectors, that enables the audio codec to recognize the device that is connected to an audio port and retask the connector via the audio driver.
- S/N (signal-to-noise) ratio: 95 dB
- Microphone input supporting:
 - Stereo microphone
 - Microphone boost

The subsystem includes the following headers and connectors:

- Front panel audio header, including functionality for:
 - Line out
 - Microphone in
- Back panel audio connectors that are configurable through the audio device drivers:
 - Line in/retasking jack
 - Line out/retasking jack
 - Mic in/retasking jack

Figure 2 shows the default assignment of the back panel audio connectors.

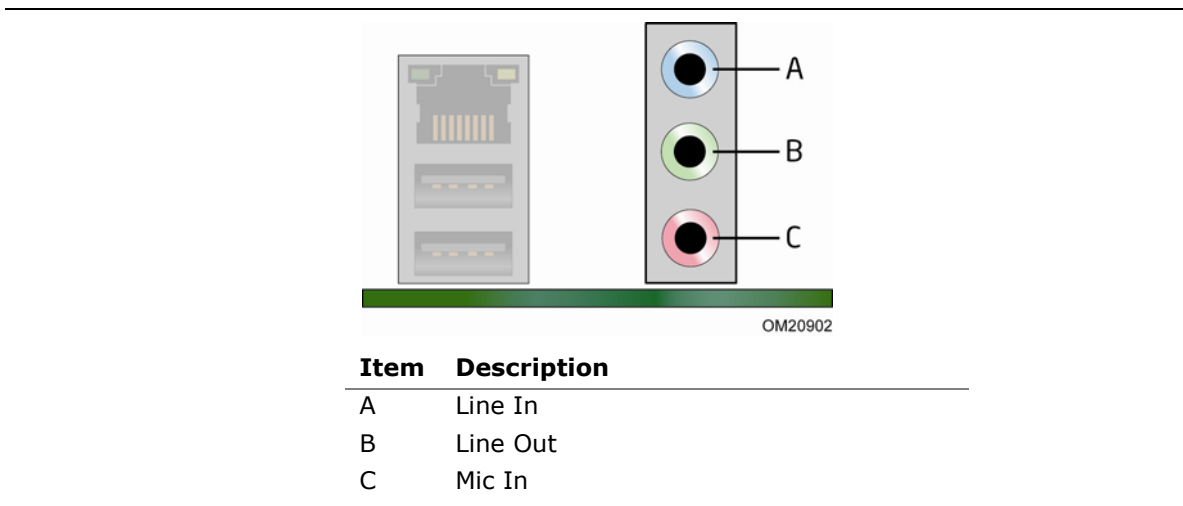


Figure 2. Back Panel Audio Connectors



NOTE

The back panel audio line out connector is designed to power headphones or amplified speakers only. Poor audio quality occurs if passive (non-amplified) speakers are connected to this output.

Related Links:

Go to the following locations for more information about:

- Audio drivers and utilities <http://support.intel.com/support/motherboards/desktop/>
- Installing a front panel audio solution (page 31)

Input/Output (I/O) Controller

The super I/O controller features the following:

- One serial port
- One parallel port with Extended Capabilities Port (ECP) and Enhanced Parallel Port (EPP) support
- Serial IRQ interface compatible with serialized IRQ support for PCI systems
- PS/2-style mouse and keyboard interfaces
- Intelligent power management, including a programmable wake up event interface
- PCI power management support

LAN Subsystem

The LAN, based on the RealTek RTL8102EL Ethernet Controller, provides the following functions:

- 10/100 Mb/s Ethernet LAN
- Support for RJ-45 connector with status indicator LEDs
- Programmable transit threshold
- Configurable EEPROM that contains the MAC address

LAN Subsystem Software

For LAN software and drivers, refer to the D945GCLF link on Intel's World Wide Web site at <http://support.intel.com/support/motherboards/desktop>.

LAN Status LEDs

Two LEDs are built into the RJ-45 LAN connector located on the back panel (see Figure 3). These LEDs indicate the operating states of the LAN.

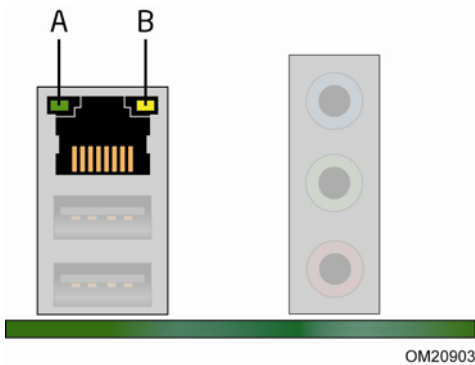


Figure 3. LAN Status LEDs

Table 3 describes the LED states when the board is powered up and the LAN subsystem is operating.

Table 3. LAN Status LEDs

LED	LED Color	LED State	Indicates
Activity (A)	Green	Blinking	LAN activity is occurring.
Speed (B)	N/A	Off	10 Mbits/s data rate is selected.
	Yellow	On (steady state)	100 Mbits/s data rate is selected.

Hi-Speed USB 2.0 Support



NOTE

Computer systems that have an unshielded cable attached to a USB port might not meet FCC Class B requirements, even if no device or a low-speed USB device is attached to the cable. Use a shielded cable that meets the requirements for a full-speed USB device.

The Desktop Board supports up to six USB 2.0 ports (four ports routed to the back panel and two ports routed to an onboard USB 2.0 header). The USB 2.0 ports are backward compatible with USB 1.1 devices. USB 1.1 devices will function normally at USB 1.1 speeds.

USB 2.0 support requires both an operating system and drivers that fully support USB 2.0 transfer rates. Disabling Hi-Speed USB in the BIOS reverts all USB 2.0 ports to USB 1.1 operation. This may be required to accommodate operating systems that do not support USB 2.0.

Enhanced IDE Interface

The IDE interface handles the exchange of information between the processor and peripheral devices such as hard disks and optical drives inside the computer. The interface supports:

- Up to two IDE devices (such as hard drives)
- ATAPI-style devices (such as CD-ROM or DVD drives)
- Older PIO Mode devices
- Ultra DMA-33/66/100 modes

Serial ATA

The Desktop Board supports two Serial ATA channels (3.0 Gb/s), connecting one device per channel.

Expandability

The Desktop Board supports one PCI add-in card.

BIOS

The BIOS provides the Power-On Self-Test (POST), the BIOS Setup program, the PCI and IDE auto-configuration utilities, and the video BIOS.

IDE Auto Configuration

If you install an IDE 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 an IDE device. You can override the auto-configuration options by specifying manual configuration in the BIOS Setup program.

PCI Auto Configuration

If you install a PCI 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 PCI 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.
- 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, see Clearing Passwords on page 35.

Power Management Features

Power management is implemented at several levels, including:

- Advanced Configuration and Power Interface (ACPI)
- Hardware support:
 - Power connectors
 - Fan headers
 - +5 V standby power indicator LED
 - LAN Wake capabilities
 - Wake from USB
 - Wake from PS/2 keyboard/mouse
 - PME# wakeup 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 Desktop Board requires an operating system that provides full ACPI support.

Hardware Support

Power Connectors

The Desktop Board has two power connectors. See Figure 13 on page 33 for the location of the power connectors.

Fan Headers

The Desktop Board has a 3-pin MCH fan header and a 3-pin chassis fan header. See Figure 12 on page 32 for the location of the chassis fan header.

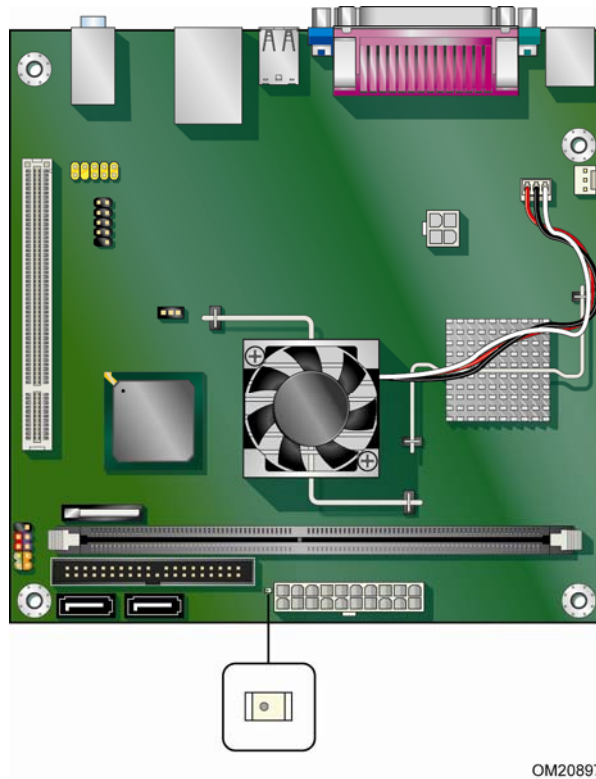
+5 V Standby Power Indicator LED



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 attached devices.

The Desktop Board's standby power indicator, shown in Figure 4, is lit when there is standby power to the system. This includes the DIMM socket and the PCI bus connector, even though the computer appears to be off.



OM20897

Figure 4. Location of the Standby Power Indicator

For more information on standby current requirements for the Desktop Board, refer to the Technical Product Specification on the D945GCLF web page at:

<http://support.intel.com/support/motherboards/desktop/>

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.

Wake from USB



NOTE

Wake from USB requires the use of a USB peripheral that supports wake from USB.

USB bus activity wakes the computer from an ACPI S1 state.

Wake from PS/2 Keyboard/Mouse

PS/2 keyboard/mouse activity wakes the computer from an ACPI S1 state.

PME# Wakeup Support

When the PME# signal on the PCI bus is asserted, the computer wakes from an ACPI S1 or S5 state.

Battery

A battery on the Desktop Board keeps the values in CMOS RAM and the clock current when the computer is turned off. Go to page 36 for instructions on how to replace the battery.

Real-Time Clock

The Desktop Board has a time-of-day clock and 100-year calendar. The battery on the Desktop Board keeps the clock current when the computer is turned off.

2 Installing and Replacing Desktop Board Components

This chapter tells you how to:

- Install the I/O shield
- Install and remove the Desktop Board
- Install and remove memory
- Connect the IDE cable
- Connect the SATA cable
- Connect internal headers
- Connect chassis fan and power supply cables
- Set the BIOS configuration and audio jumpers
- Clear passwords
- Replace the battery

Before You Begin



CAUTIONS

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 installing the Desktop Board:

- 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 Desktop Board, observe all warnings and cautions in the installation instructions.

To avoid injury, be careful of:

- Sharp pins on connectors or headers
- Sharp pins on printed circuit assemblies
- Rough edges and sharp corners on the chassis
- Hot components (such as 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.

Observe Safety and Regulatory Requirements

Read and adhere to 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 chassis and module suppliers, you increase safety risk and the possibility of noncompliance with regional laws and regulations.

Refer to Appendix B for safety and regulatory requirements.

Installing the I/O Shield

The Desktop 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 Desktop Board in the chassis. Place the shield inside the chassis as shown in Figure 5. 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.

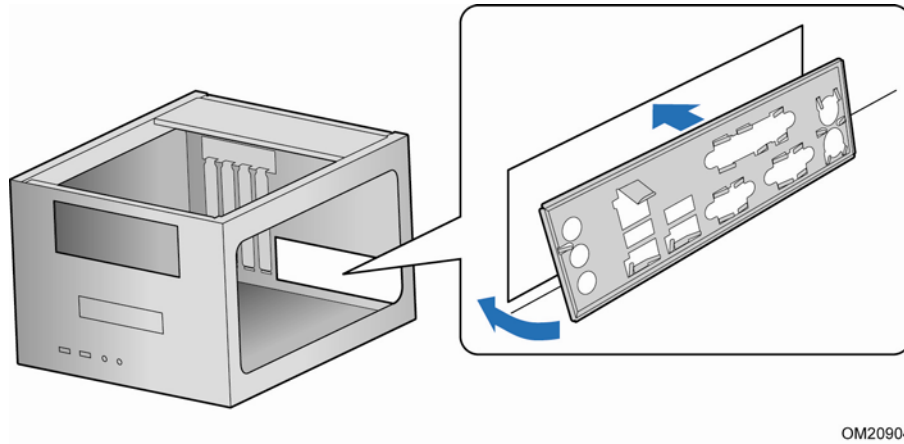


Figure 5. Installing the I/O Shield

Installing and Removing the Desktop Board



CAUTION

Only qualified technical personnel should do 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 Desktop Board.

Figure 6 shows the location of the mounting screw holes for Desktop Board D945GCLF.

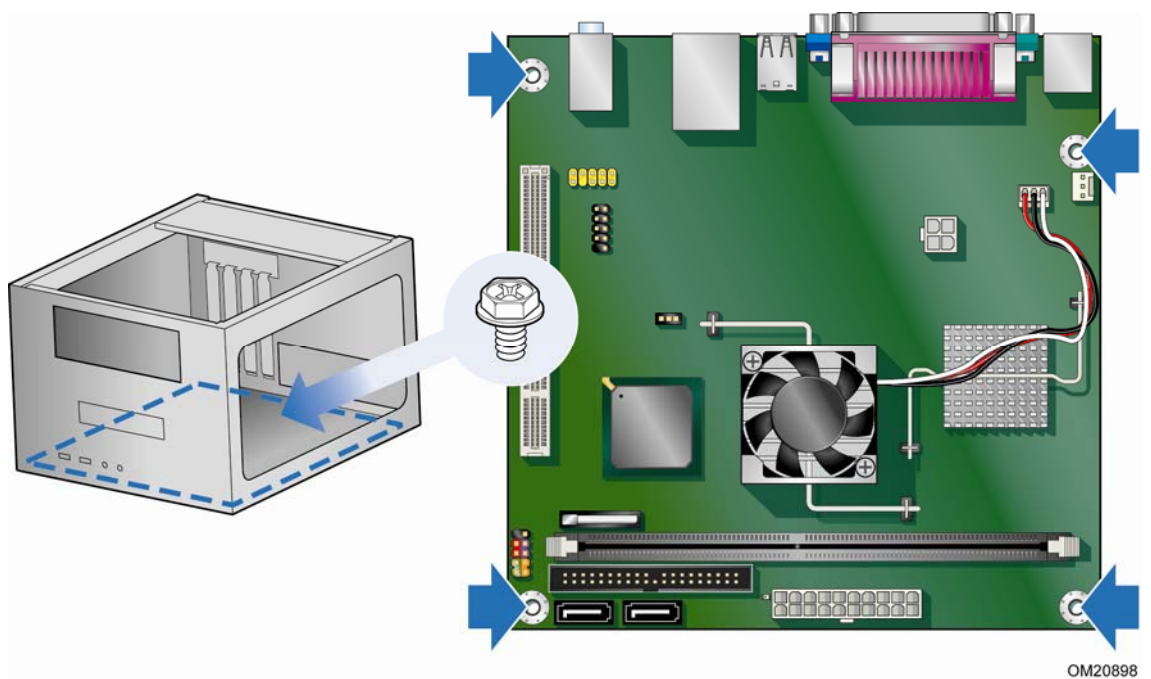


Figure 6. Desktop Board D945GCLF Mounting Screw Holes

Installing and Removing Memory



NOTE

To be fully compliant with all applicable Intel SDRAM memory specifications, the boards require DIMMs that support the Serial Presence Detect (SPD) data structure.

The Desktop Board has one 240-pin DDR2 DIMM socket.

Installing DIMMs

To make sure you have the correct DIMM, place it on the illustration in Figure 7 showing the DDR2 DIMM. All the notches should match the DDR2 DIMM.

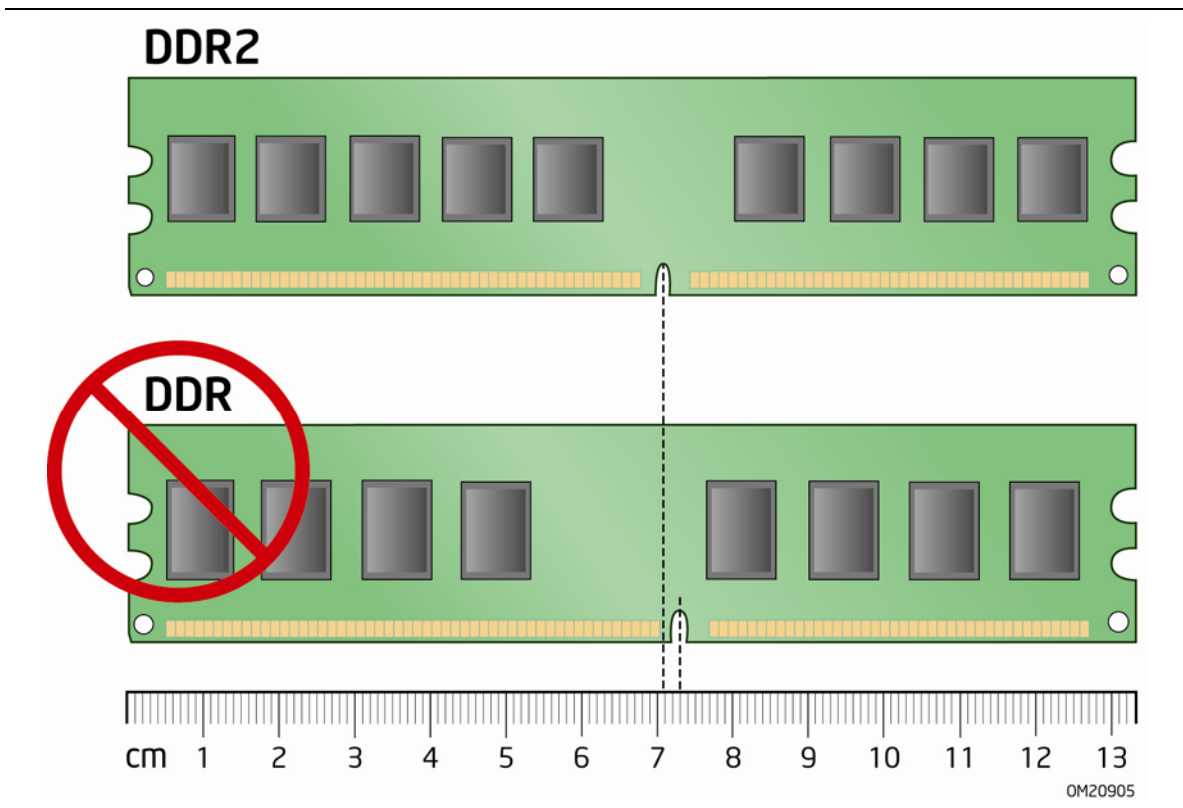


Figure 7. Use DDR2 DIMMs

1. Observe the precautions in "Before You Begin" on page 21.
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 socket (see Figure 8).

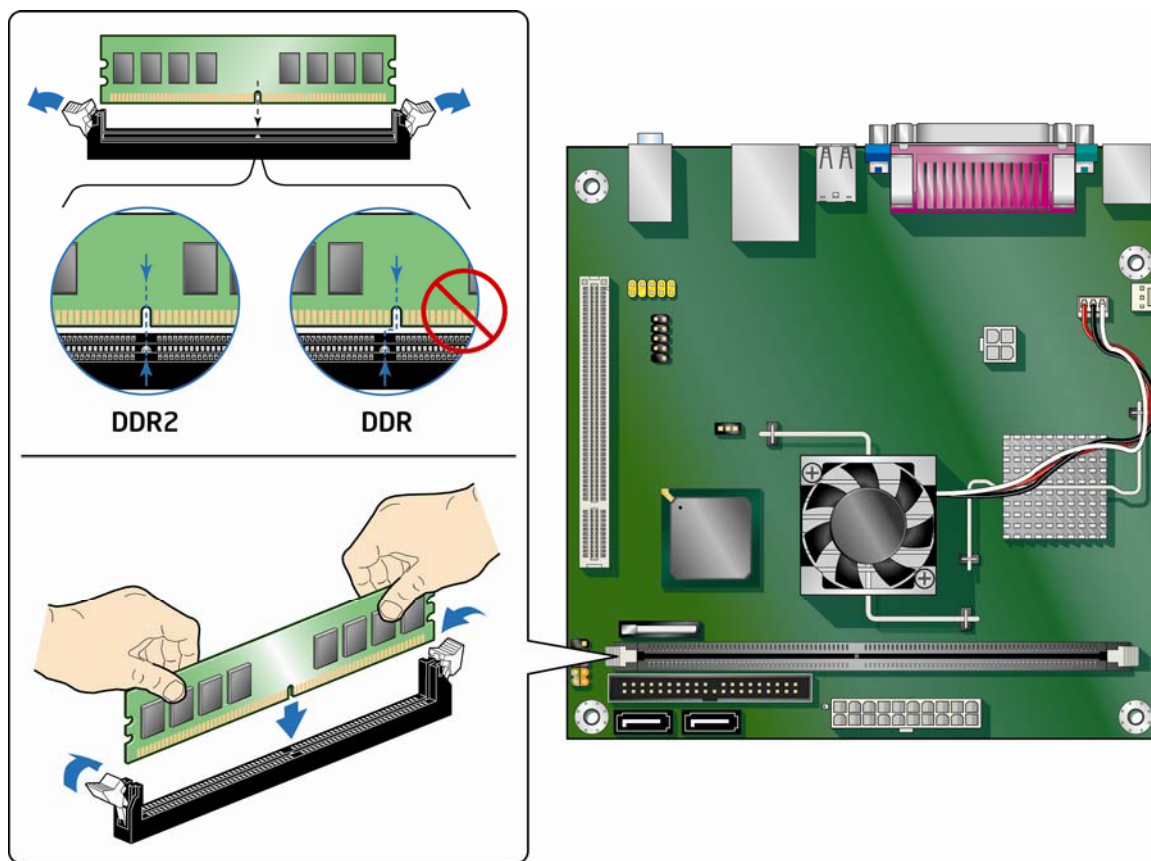


Figure 8. Installing a DIMM

4. Make sure the clips at either end of the DIMM socket are pushed outward to the open position.
5. Holding the DIMM by the edges, remove it from its anti-static package.
6. Position the DIMM above the socket. Align the small notch at the bottom edge of the DIMM with the key in the socket (see Figure 8).
7. Insert the bottom edge of the DIMM into the socket.
8. 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.
9. 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 21.
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. Gently spread the retaining clips at each end of the DIMM socket. The DIMM pops out of the socket.
6. Hold the DIMM by the edges, lift it away from the socket, and store it in an anti-static package.
7. Reinstall and reconnect any parts you removed or disconnected to reach the DIMM sockets.
8. Replace the computer's cover and reconnect the AC power cord.

Connecting the IDE Cable

The IDE cable can connect two drives to the Desktop Board. The cable supports the ATA-100 transfer protocol. Figure 9 shows the correct installation of the cable.



NOTES

ATA-100 compatible cables are backward compatible with drives using slower IDE transfer protocols. If an ATA-100 disk drive and a disk drive using any other IDE transfer protocol are attached to the same cable, the maximum transfer rate between the drives may be reduced to that of the slowest drive.

Do not connect an ATA device as a slave on the same IDE cable as an ATAPI master device. For example, do not connect an ATA hard drive as a slave to an ATAPI CD-ROM drive.

For correct function of the cable:

1. Observe the precautions in "Before You Begin" on page 21.
2. Attach the cable end with the single connector (blue) to the Intel Desktop Board (Figure 9).
3. Attach the cable end with the two closely spaced connectors (gray and black) to the drives.

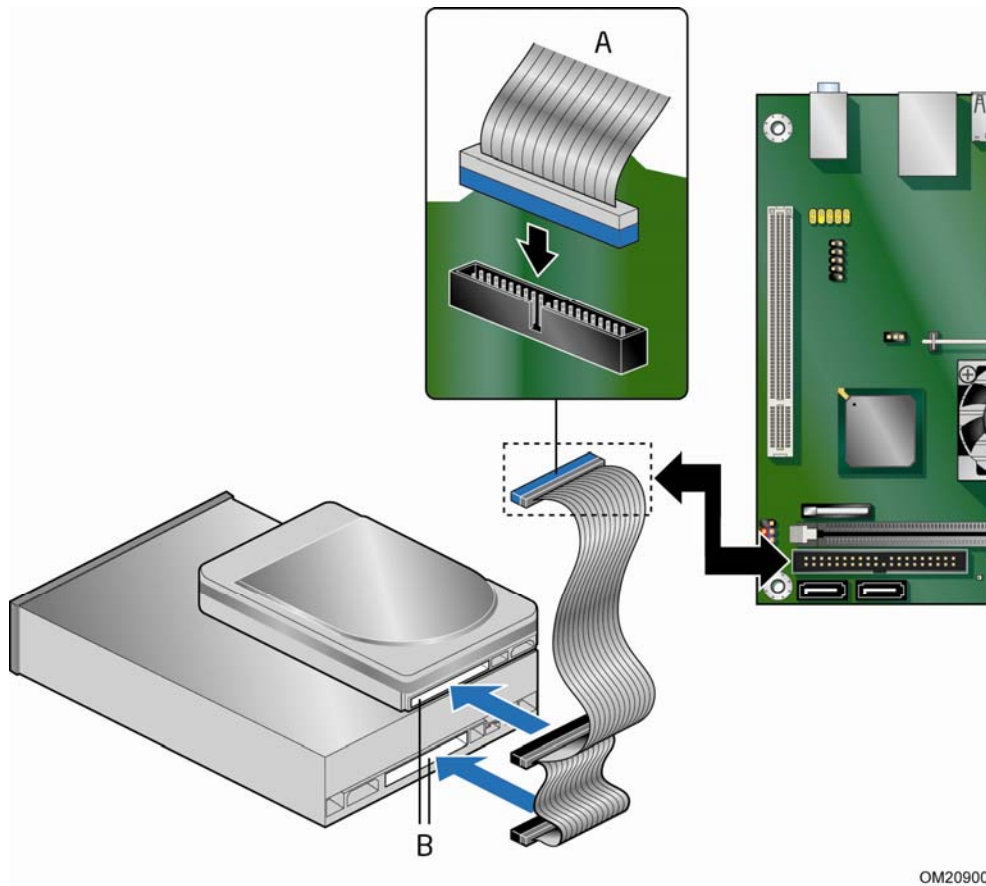


Figure 9. Connecting the IDE Cable

Connecting the Serial ATA (SATA) Cable

The SATA cable supports the Serial ATA protocol and connects a single drive to the desktop board. For correct cable function:

1. Observe the precautions in "Before You Begin" on page 21.
 2. Attach the locking cable end to the connector on the board (Figure 10, A).
 3. Attach the cable end without the lock to the drive (Figure 10, B).
-

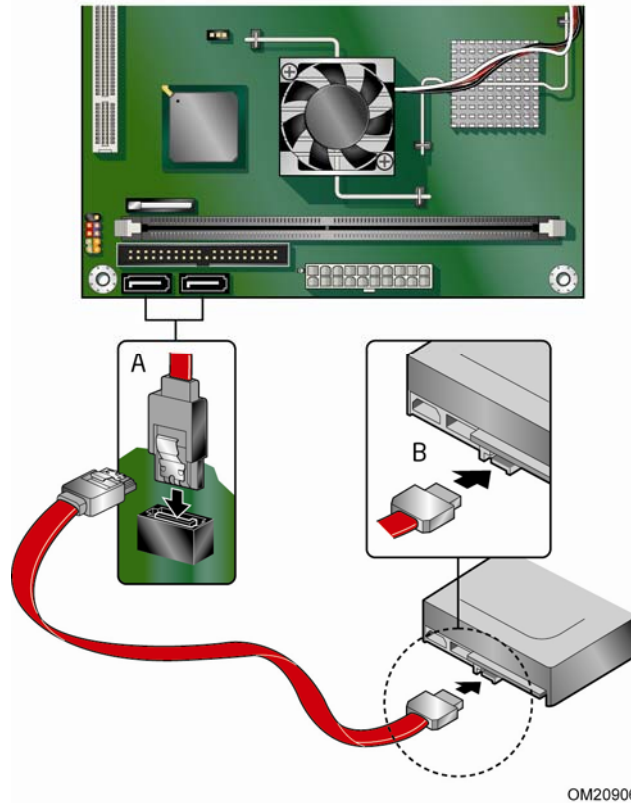
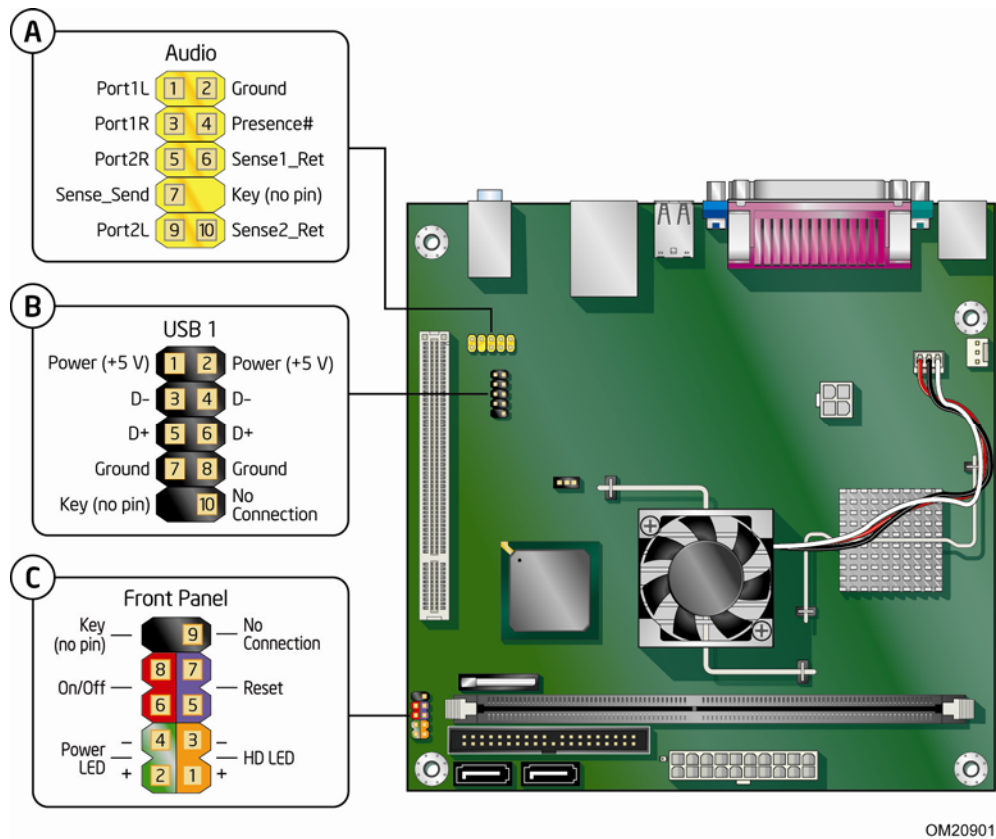


Figure 10. Connecting the Serial ATA Cable

Connecting Internal Headers

Before connecting cables to the internal headers, observe the precautions in "Before You Begin" on page 21. Figure 11 shows the location of the board's internal headers.



Item	Description
A	Audio
B	Hi-speed USB 2.0
C	Front panel

Figure 11. Internal Headers

Front Panel HD Audio Header

Figure 11, A shows the location of the front panel audio header. Table 4 shows the pin assignments for the front panel audio header.

Table 4. Front Panel Audio Header Signal Names for Intel High Definition Audio

Pin	Signal Name	Pin	Signal Name
1	PORT 1L	2	GND
3	PORT 1R	4	PRESENCE#
5	PORT 2R	6	SENSE1_RETURN
7	SENSE_SEND	8	KEY (no pin)
9	PORT 2L	10	SENSE2_RETURN

To install a cable that connects a front panel audio solution to the front panel audio header, follow these steps:

1. Observe the precautions in "Before You Begin" on page 21.
2. Turn off all peripheral devices connected to the computer. Turn off the computer and disconnect the AC power cord.
3. Remove the cover.
4. Install a correctly keyed and shielded front panel audio cable.

Connecting the Hi-Speed USB 2.0 Header

Before connecting to the USB 2.0 header, observe the precautions in "Before You Begin" on page 21. See Figure 11, B on page 30 for the location of the USB 2.0 header.

Table 5 shows the pin assignments for the headers.

Table 5. Hi-Speed USB 2.0 Header Signal Names

USB Port A		USB Port B	
Pin	Signal Name	Pin	Signal Name
1	Power	2	Power
3	D-	4	D-
5	D+	6	D+
7	Ground	8	Ground
9	Key	10	No connect

Note: USB ports may be assigned as needed.

Connecting to the Front Panel Header

Before connecting to the front panel header, observe the precautions in "Before You Begin" on page 21. See Figure 11, C on page 30 for the location of the front panel header.

Table 6 shows the pin assignments for the front panel header.

Table 6. Front Panel Header Signal Names

Pin	Signal	In/Out	Description	Pin	Signal	In/Out	Description
Hard Drive Activity LED				Power LED			
1	HD_PWR	Out	Hard disk LED pull-up (330 Ω) to +5 V	2	HDR_BLNK_GRN	Out	Front panel green LED
3	HDA#	Out	Hard disk active LED	4	HDR_BLNK_YEL	Out	Front panel yellow LED
Reset Switch				On/Off Switch			
5	Ground		Ground	6	SWITCH_ON#	In	Power switch
7	FP_RESET#	In	Reset switch	8	Ground		Ground
Power				Not Connected			
9	+5 V		Power	10	N/C		No pin

Connecting a Chassis Fan

Figure 12 shows the location of the chassis fan header. Connect the chassis fan cable to this header.

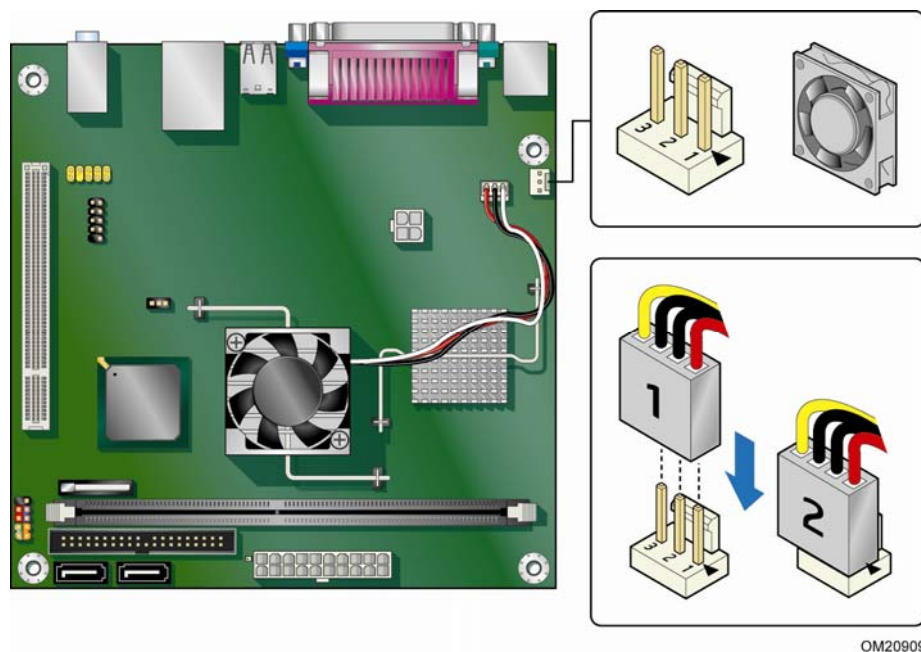


Figure 12. Location of the Chassis Fan Header

Connecting Power Supply Cables



CAUTION

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

Figure 13 shows the location of the power connectors.

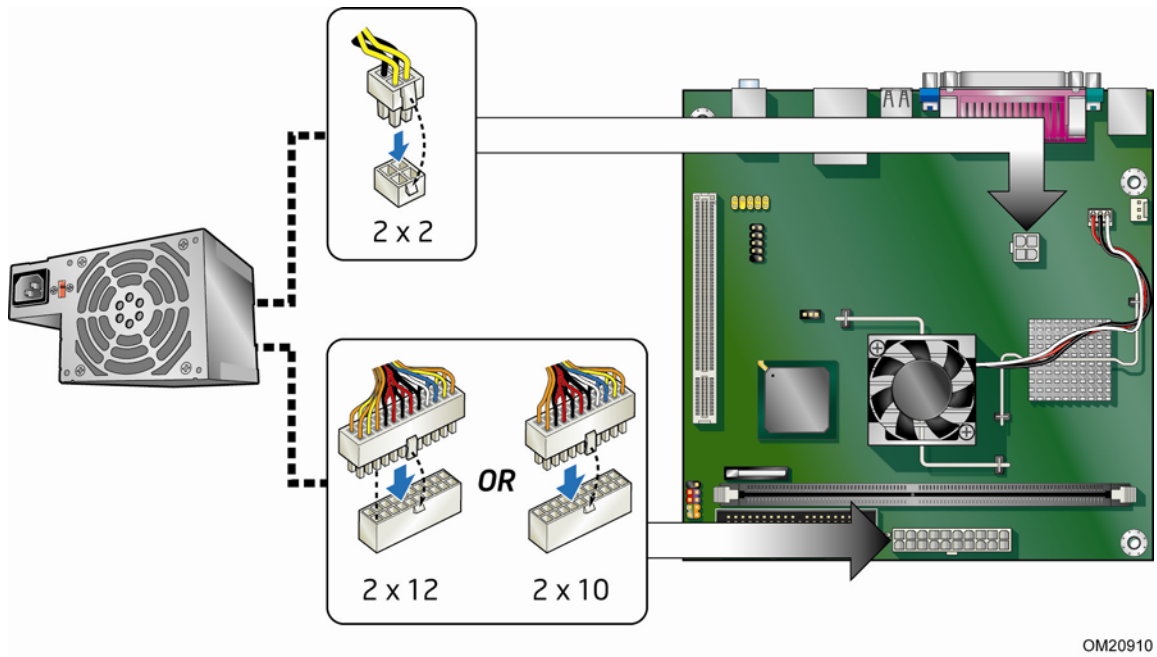


Figure 13. Connecting a 2 x 10 or 2 x 12 Power Supply Cable

1. Observe the precautions in "Before You Begin" on page 21.
2. Connect the 12 V processor core voltage power supply cable to the 2 x 2 connector (Figure 13).
3. Connect the main power supply cable (2 x 10 or 2 x 12) to the 2 x 10 connector (Figure 13).

Setting the BIOS Configuration Jumper



NOTE

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

Figure 14 shows the location of the Desktop Board's BIOS configuration jumper block.

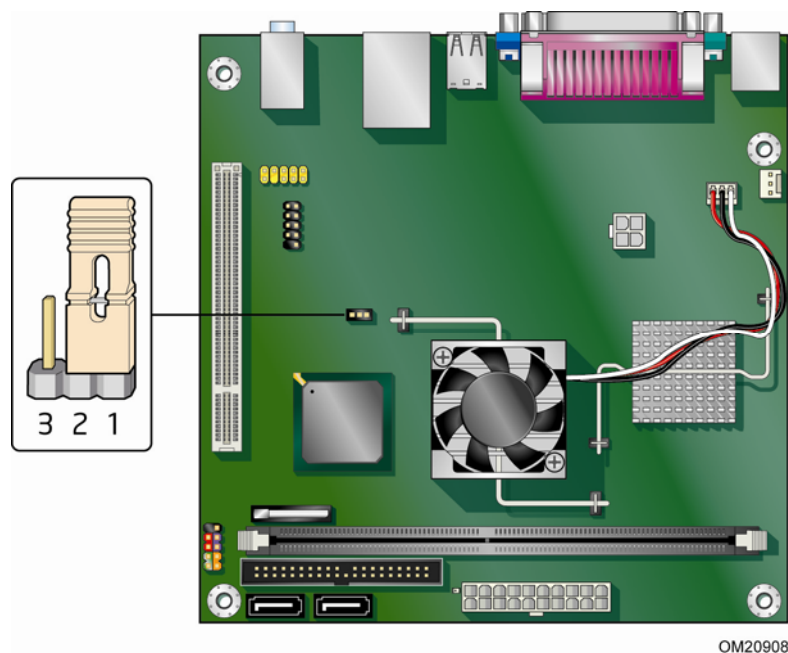
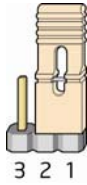
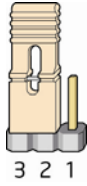
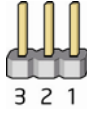


Figure 14. BIOS Configuration Jumper Block

The three-pin BIOS jumper block enables all board configuration to be done in the BIOS Setup program. Table 7 shows the jumper settings for the Setup program modes.

Figure 14 shows the location of the Desktop Board's BIOS configuration jumper block.

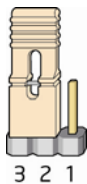
Table 7. Jumper Settings for the BIOS Setup Program Modes

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 from a recovery diskette 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 is set to normal mode.

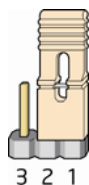
1. Observe the precautions in "Before You Begin" on page 21.
2. Turn off all peripheral devices connected to the computer. Turn off the computer. Disconnect the computer's power cord from the AC power source (wall outlet or power adapter).
3. Remove the computer cover.
4. Find the configuration jumper block (see Figure 14, B).
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 15 on page 40 shows the location of the battery.



CAUTION

Risk of explosion if the battery is replaced with an incorrect type. Batteries should be recycled where possible. Disposal of used batteries must be in accordance with local environmental regulations.



PRECAUTION

Risque d'explosion si la pile usagée est remplacée par une pile de type incorrect. Les piles usagées doivent être recyclées dans la mesure du possible. La mise au rebut des piles usagées doit respecter les réglementations locales en vigueur en matière de protection de l'environnement.



FORHOLDSREGEL

Eksplodingsfare, hvis batteriet erstattes med et batteri af en forkert type. Batterier bør om muligt genbruges. Bortskaffelse af brugte batterier bør foregå i overensstemmelse med gældende miljølovgivning.



OBS!

Det kan oppstå eksplosjonsfare hvis batteriet skiftes ut med feil type. Brukte batterier bør kastes i henhold til gjeldende miljølovgivning.



VIKTIGT!

Risk för explosion om batteriet ersätts med felaktig batterityp. Batterier ska kasseras enligt de lokala miljövårdsbestämmelserna.



VARO

Räjähdysvaara, jos pariston tyyppi on väärä. Paristot on kierrätettävä, jos se on mahdollista. Käytetyt paristot on hävitettävä paikallisten ympäristömääräysten mukaisesti.



VORSICHT

Bei falschem Einsetzen einer neuen Batterie besteht Explosionsgefahr. Die Batterie darf nur durch denselben oder einen entsprechenden, vom Hersteller empfohlenen Batterietyp ersetzt werden. Entsorgen Sie verbrauchte Batterien den Anweisungen des Herstellers entsprechend.



AVVERTIMENTO

Esiste il pericolo di un esplosione se la pila non viene sostituita in modo corretto. Utilizzare solo pile uguali o di tipo equivalente a quelle consigliate dal produttore. Per disfarsi delle pile usate, seguire le istruzioni del produttore.



PRECAUCIÓN

Existe peligro de explosión si la pila no se cambia de forma adecuada. Utilice solamente pilas iguales o del mismo tipo que las recomendadas por el fabricante del equipo. Para deshacerse de las pilas usadas, siga igualmente las instrucciones del fabricante.



WAARSCHUWING

Er bestaat ontplofingsgevaar als de batterij wordt vervangen door een onjuist type batterij. Batterijen moeten zoveel mogelijk worden gerecycled. Houd u bij het weggooien van gebruikte batterijen aan de plaatselijke milieuwetgeving.



ATENÇÃO

Haverá risco de explosão se a bateria for substituída por um tipo de bateria incorreto. As baterias devem ser recicladas nos locais apropriados. A eliminação de baterias usadas deve ser feita de acordo com as regulamentações ambientais da região.



AŚCIAROŽZNAŚĆ

Існуе рызыка выбуху, калі заменены акумулятар непраўльнага тыпу. Акумулятары павінны, па магчымасці, перерацоўвацца. Пазбаўляцца ад старых акумулятараў патрэбна згодна з мясцовымі заканадаўствам па экалогіі.



UPOZORNĚNÍ

V případě výměny baterie za nesprávný druh může dojít k výbuchu. Je-li to možné, baterie by měly být recyklovány. Baterie je třeba zlikvidovat v souladu s místními předpisy o životním prostředí.



Προσοχή

Υπάρχει κίνδυνος για έκρηξη σε περίπτωση που η μπαταρία αντικατασταθεί από μία λανθασμένου τύπου. Οι μπαταρίες θα πρέπει να ανακυκλώνονται όταν κάτι τέτοιο είναι δυνατό. Η απόρριψη των χρησιμοποιημένων μπαταριών πρέπει να γίνεται σύμφωνα με τους κατά τόπο περιβαλλοντικούς κανονισμούς.



VIGYÁZAT

Ha a telepet nem a megfelelő típusú telepre cseréli, az felrobbanhat. A telepeket lehetőség szerint újra kell hasznosítani. A használt telepeket a helyi környezetvédelmi előírásoknak megfelelően kell kiselejtezni.



注意

異なる種類の電池を使用すると、爆発の危険があります。リサイクルが可能な地域であれば、電池をリサイクルしてください。使用後の電池を破棄する際には、地域の環境規制に従ってください。



AWAS

Risiko letupan wujud jika bateri digantikan dengan jenis yang tidak betul. Bateri sepatutnya dikitar semula jika boleh. Pelupusan bateri terpakai mestilah mematuhi peraturan alam sekitar tempatan.



OSTRZEŻENIE

Istnieje niebezpieczeństwo wybuchu w przypadku zastosowania niewłaściwego typu baterii. Zużyte baterie należy w miarę możliwości utylizować zgodnie z odpowiednimi przepisami ochrony środowiska.



PRECAUȚIE

Risc de explozie, dacă bateria este înlocuită cu un tip de baterie necorespunzător. Bateriile trebuie reciclate, dacă este posibil. Depozitarea bateriilor uzate trebuie să respecte reglementările locale privind protecția mediului.



ВНИМАНИЕ

При использовании батарее несоответствующего типа существует риск ее взрыва. Батареи должны быть утилизированы по возможности. Утилизация батарей должна проводиться по правилам, соответствующим местным требованиям.



UPOZORNENIE

Ak batériu vymeníte za nesprávny typ, hrozí nebezpečenstvo jej výbuchu. Batérie by sa mali podľa možnosti vždy recyklovať. Likvidácia použitých batérií sa musí vykonávať v súlade s miestnymi predpismi na ochranu životného prostredia.



POZOR

Zamenjava baterije z baterijo drugačnega tipa lahko povzroči eksplozijo. Če je mogoče, baterije reciklirajte. Rabljene baterije zavržite v skladu z lokalnimi okoljevarstvenimi predpisi.



คำเตือน

ระวังการระเบิดที่เกิดจากเปลี่ยนแบตเตอรี่ผิดประเภท หากเป็นไปได้ ควรนำแบตเตอรี่ไปรีไซเคิล การทิ้งแบตเตอรี่ใช้แล้วต้องเป็นไปตามกฎข้อบังคับด้านสิ่งแวดล้อมของท้องถิ่น.



UYARI

Yanlış türde pil takıldığında patlama riski vardır. Piller mümkün olduğunda geri dönüştürülmelidir. Kullanılmış piller, yerel çevre yasalarına uygun olarak atılmalıdır.



ОСТОРОГА

Використовуйте батареї правильного типу, інакше існуватиме ризик вибуху. Якщо можливо, використані батареї слід утилізувати. Утилізація використаних батарей має бути виконана згідно місцевих норм, що регулюють охорону довкілля.



UPOZORNĚNÍ

V případě výměny baterie za nesprávný druh může dojít k výbuchu. Je-li to možné, baterie by měly být recyklovány. Baterie je třeba zlikvidovat v souladu s místními předpisy o životním prostředí.



ETTEVAATUST

Kui patarei asendatakse uue ebasobivat tüüpi patareiga, võib tekkida plahvatusoht. Tühjad patareid tuleb võimaluse korral viia vastavasse kogumispunkti. Tühjade patareide äraviskamisel tuleb järgida kohalikke keskkonnakaitse alaseid reegleid.



FIGYELMEZTETÉS

Ha az elemet nem a megfelelő típusúra cseréli, felrobbanhat. Az elemeket lehetőség szerint újra kell hasznosítani. A használt elemeket a helyi környezetvédelmi előírásoknak megfelelően kell kiselejtezni.



UZMANĪBU

Pastāv eksplozijas risks, ja baterijas tiek nomainītas ar nepareiza veida baterijām. Ja iespējams, baterijas vajadzētu nodot attiecīgos pieņemšanas punktus. Bateriju izmešanai atkritumos jānotiek saskaņā ar vietējiem vides aizsardzības noteikumiem.



DÉMESIO

Naudojant netinkamo tipo baterijas įrenginys gali sprogti. Kai tik įmanoma, baterijas reikia naudoti pakartotinai. Panaudotas baterijas išmesti būtina pagal vietinius aplinkos apsaugos nuostatus.



ATTENZJONI

Riskju ta' splużjoni jekk il-batterija tinbidel b'tip ta' batterija mhux korrett. Il-batteriji għandhom jiġu riċiklati fejn hu possibbli. Ir-rimi ta' batteriji użati għandu jsir skond ir-regolamenti ambjentali lokali.

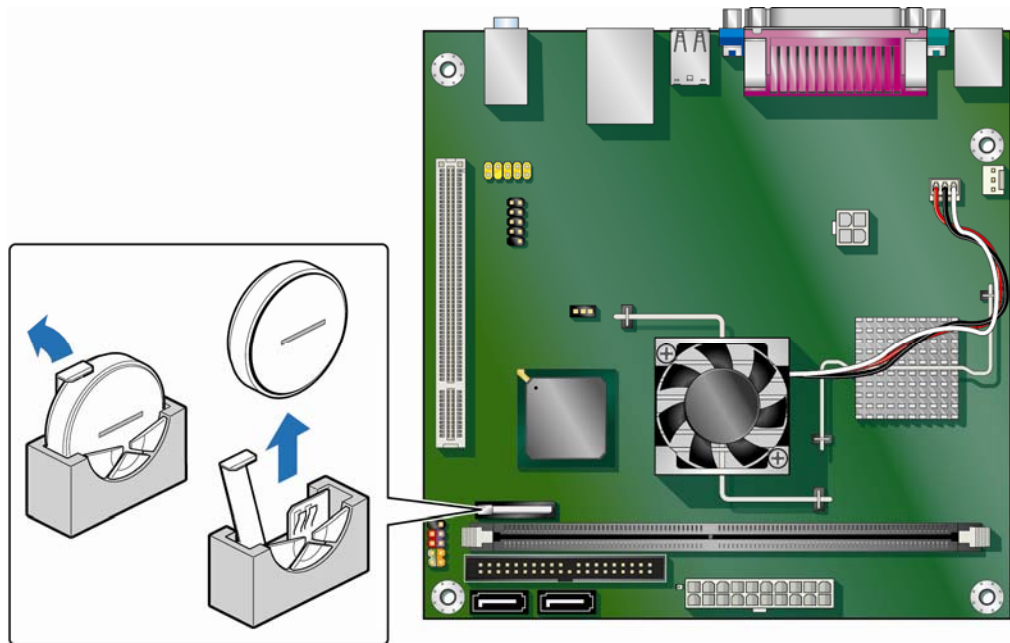


OSTRZEŻENIE

Ryzyko wybuchu w przypadku wymiany na baterie niewłaściwego typu. W miarę możliwości baterie należy poddać recyklingowi. Zużytych baterii należy pozbywać się zgodnie z lokalnie obowiązującymi przepisami w zakresie ochrony środowiska.

To replace the battery, follow these steps:

1. Observe the precautions in "Before You Begin" (see page 21).
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 15).
5. Push the battery retention clip aside and remove the battery from the connector as shown in Figure 15. Note the orientation of the "+" and "-" on the battery.
6. Install the new battery in the connector, making sure to orient the "+" and "-" correctly.
7. Replace the computer cover.



OM20907

Figure 15. 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 Express BIOS Update utility or the Iflash Memory Update utility, and how to recover the BIOS if an update fails.

Updating the BIOS with the Intel® Express BIOS Update Utility

With the Intel Express BIOS Update utility you can update the system BIOS while in the Windows environment. The BIOS file is included in an automated update utility that combines the functionality of the Intel® Flash Memory Update Utility and the ease of use of Windows-based installation wizards.

To update the BIOS with the Intel Express BIOS Update utility:

1. Go to <http://support.intel.com/support/motherboards/desktop/>.
2. Navigate to the D945GCLF page, click "[view] Latest BIOS updates," and select the Express BIOS Update utility file.
3. Download the file to your hard drive. (You can also save this file to a removable USB device. This is useful if you are updating the BIOS for multiple identical systems.)
4. Close all other applications. This step is required. Your system will be rebooted at the last Express BIOS Update window.
5. Double-click the executable file from the location on your hard drive where it was saved. This runs the update program.
6. Follow the instructions provided in the dialog boxes to complete the BIOS update.

Updating the BIOS with the Iflash Memory Update Utility

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

Obtaining the BIOS Update File

You can update to a new version of the BIOS by using the Iflash BIOS update file.

The Iflash BIOS update file is a compressed file that contains the files you need to update the BIOS. The Iflash BIOS update file contains:

- New BIOS file
- Intel Flash Memory Update Utility

You can obtain either of these files through your computer supplier or by navigating to the Desktop Board D945GCLF page at <http://support.intel.com/support/motherboards/desktop>.

Navigate to the D945GCLF page, click "[view] Latest BIOS updates," and select the Iflash BIOS Update utility file.



CAUTION

Do not interrupt the process or the system may not function properly.

Updating the BIOS with the Iflash Memory Update Utility

With the Iflash Memory update utility you can update the system BIOS from a bootable USB flash drive or other bootable USB media. The Iflash 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 Iflash Memory update utility allows you to:

- Update the BIOS
- 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 may not function properly.

1. Uncompress the BIOS update file and copy the .BIO file and IFLASH.EXE to a bootable USB flash drive or other bootable USB media.
2. Configure the BIOS or use the F10 key 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.

Recovering the BIOS

It is unlikely that anything will interrupt the BIOS update; however, if an interruption occurs, the BIOS could be damaged. For more information about recovering the BIOS for desktop board D945GCLF, go to:

<http://support.intel.com/support/motherboards/desktop/>

A BIOS Error Messages

BIOS Front-panel Power LED Blink Codes

The front-panel power LED is used by the BIOS to display messages. For example, the LED is on when the system is powered on, and blinks off for 0.5 second when processor initialization is complete. In addition, whenever a recoverable error occurs during POST, the BIOS causes the front-panel power LED to blink an error message describing the problem (see Table 8).

Table 8. BIOS Front-panel Power LED Blink Codes

Type	Pattern
Processor initialization complete	On when system powers up, then off for 0.5 second
POST complete	On when system powers up, then off for 0.5 second
BIOS update in progress	Off when update begins, then on for 0.5 second, then off for 0.5 second; pattern repeats until BIOS update is complete
Video error	On-off (0.5 second each) two times, then 3.0 second pause (off) between on-off blink pattern; repeat entire pattern (two on-off blinks and pause) until system is powered off
Memory error	On-off (0.5 second each) three times, then 3.0 second pause (off) between on-off blink pattern; repeat entire pattern (three on-off blinks and 3-second pause) until system is powered off
Thermal warning	On-off (0.5 second each) four times, then 3.0 second pause (off) between on-off blink pattern; repeat entire pattern (four on-off blinks and 3-second pause) until 16 th on blink, then end

BIOS Beep Codes

The BIOS beep codes are listed in Table 9. These beep codes can be heard through a speaker attached to the board's line out jack (see Figure 2, B on page 14).

Table 9. BIOS Beep Codes

Type	Pattern	Frequency
Memory error	Three long beeps	1280 Hz
Thermal warning	Four alternating beeps: High tone, low tone, high tone, low tone	High tone: 2000 Hz Low tone: 1600 Hz

BIOS Error Messages

Whenever a recoverable error occurs during POST, the BIOS displays an error message on the PC monitor that describes the problem. Table 10 lists the BIOS error messages and a brief description of each.

Table 10. BIOS Error Messages

Error Message	Explanation
CMOS Battery Low	The battery may be losing power.
CMOS Checksum Bad	The CMOS checksum is incorrect. The 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.

B Regulatory Compliance

This appendix contains the following regulatory compliance information for Desktop Board D945GCLF:

- Safety standards
- European Union Declaration of Conformity statement
- Product Ecology statements
- Electromagnetic Compatibility (EMC) regulations
- Product certifications

Safety Standards

Desktop Board D945GCLF complies with the safety standards stated in Table 11 when correctly installed in a compatible host system.

Table 11. Safety Standards

Regulation	Title
CSA/UL 60950-1, First Edition	Information Technology Equipment – Safety - Part 1: General Requirements (USA and Canada)
EN 60950-1:2006, Second Edition	Information Technology Equipment – Safety - Part 1: General Requirements (European Union)
IEC 60950-1:2005, Second Edition	Information Technology Equipment – Safety - Part 1: General Requirements (International)

Place Battery Marking

There is insufficient space on this Desktop Board to provide instructions for replacing and disposing of the Lithium ion coin cell battery. For system safety certification, the statement below or an equivalent statement is required to be permanently and legibly marked on the chassis near the battery.



CAUTION

Risk of explosion if the battery is replaced with an incorrect type. Batteries should be recycled where possible. Disposal of used batteries must be in accordance with local environmental regulations.

A suitable caution label is included with Desktop Board D945GCLF.

Related Links

For information about replacing the battery, go to page 36.

European Union Declaration of Conformity Statement

We, Intel Corporation, declare under our sole responsibility that the product Intel® Desktop Board D945GCLF is in conformity with all applicable essential requirements necessary for CE marking, following the provisions of the European Council Directives 2004/108/EC (EMC Directive) and 2006/95/EC (Low Voltage Directive).

The product is properly CE marked demonstrating this conformity and is for distribution within all member states of the EU with no restrictions.



This product follows the provisions of the European Directives 2004/108/EC and 2006/95/EC.

Čeština Tento výrobek odpovídá požadavkům evropských směrnic 2004/108/EC a 2006/95/EC.

Dansk Dette produkt er i overensstemmelse med det europæiske direktiv 2004/108/EC & 2006/95/EC.

Dutch Dit product is in navolging van de bepalingen van Europees Directief 2004/108/EC & 2006/95/EC.

Eesti Antud toode vastab Euroopa direktiivides 2004/108/EC ja 2006/95/EC kehtestatud nõuetele.

Suomi Tämä tuote noudattaa EU-direktiivin 2004/108/EC & 2006/95/EC määräyksiä.

Français Ce produit est conforme aux exigences de la Directive Européenne 2004/108/EC & 2006/95/EC.

Deutsch Dieses Produkt entspricht den Bestimmungen der Europäischen Richtlinie 2004/108/EC & 2006/95/EC.

Ελληνικά Το παρόν προϊόν ακολουθεί τις διατάξεις των Ευρωπαϊκών Οδηγιών 2004/108/EC και 2006/95/EC.

Magyar E termék megfelel a 2004/108/EC és 2006/95/EC Európai Irányelv előírásainak.

Icelandic Þessi vara stenst reglugerð Evrópska Efnahags Bandalagsins númer 2004/108/EC & 2006/95/EC.

Italiano Questo prodotto è conforme alla Direttiva Europea 2004/108/EC & 2006/95/EC.

Latviešu Šis produkts atbilst Eiropas Direktīvu 2004/108/EC un 2006/95/EC noteikumiem.

Lietuvių Šis produktas atitinka Europos direktyvų 2004/108/EC ir 2006/95/EC nuostatas.

Malti Dan il-prodott hu konformi mal-provvedimenti tad-Direttivi Ewropej 2004/108/EC u 2006/95/EC.

Norsk Dette produktet er i henhold til bestemmelsene i det europeiske direktivet 2004/108/EC & 2006/95/EC.

Polski Niniejszy produkt jest zgodny z postanowieniami Dyrektyw Unii Europejskiej 2004/108/EC i 2006/95/EC.

Portuguese Este produto cumpre com as normas da Diretiva Europeia 2004/108/EC & 2006/95/EC.

Español Este producto cumple con las normas del Directivo Europeo 2004/108/EC & 2006/95/EC.

Slovensky Tento produkt je v súlade s ustanoveniami európskych direktív 2004/108/EC a 2006/95/EC.

Slovenščina Izdelek je skladen z določbami evropskih direktiv 2004/108/EC in 2006/95/EC.

Svenska Denna produkt har tillverkats i enlighet med EG-direktiv 2004/108/EC & 2006/95/EC.

Türkçe Bu ürün, Avrupa Birliği'nin 2004/108/EC ve 2006/95/EC yönergelerine uyar.

Product Ecology Statements

The following information is provided to address worldwide product ecology concerns and regulations.

Recycling Considerations

As part of its commitment to environmental responsibility, Intel has implemented the Intel® Product Recycling Program to allow retail consumers of Intel's branded products to return used products to selected locations for proper recycling.

Please consult http://www.intel.com/intel/other/ehs/product_ecology for the details of this program, including the scope of covered products, available locations, shipping instructions, terms and conditions, etc.

中文

作为其对环境责任之承诺的部分，英特尔已实施 Intel Product Recycling Program（英特尔产品回收计划），以允许英特尔品牌产品的零售消费者将使用过的产品退还至指定地点作恰当的重复使用处理。

请参考http://www.intel.com/intel/other/ehs/product_ecology了解此计划的详情，包括涉及产品之范围、回收地点、运送指导、条款和条件等。

Deutsch

Als Teil von Intels Engagement für den Umweltschutz hat das Unternehmen das Intel Produkt-Recyclingprogramm implementiert, das Einzelhandelskunden von Intel Markenprodukten ermöglicht, gebrauchte Produkte an ausgewählte Standorte für ordnungsgemäßes Recycling zurückzugeben.

Details zu diesem Programm, einschließlich der darin eingeschlossenen Produkte, verfügbaren Standorte, Versandanweisungen, Bedingungen usw., finden Sie auf der http://www.intel.com/intel/other/ehs/product_ecology

Español

Como parte de su compromiso de responsabilidad medioambiental, Intel ha implantado el programa de reciclaje de productos Intel, que permite que los consumidores al detalle de los productos Intel devuelvan los productos usados en los lugares seleccionados para su correspondiente reciclado.

Consulte la http://www.intel.com/intel/other/ehs/product_ecology para ver los detalles del programa, que incluye los productos que abarca, los lugares disponibles, instrucciones de envío, términos y condiciones, etc.

Français

Dans le cadre de son engagement pour la protection de l'environnement, Intel a mis en œuvre le programme Intel Product Recycling Program (Programme de recyclage des produits Intel) pour permettre aux consommateurs de produits Intel de recycler les produits usés en les retournant à des adresses spécifiées.

Visitez la page Web http://www.intel.com/intel/other/ehs/product_ecology pour en savoir plus sur ce programme, à savoir les produits concernés, les adresses disponibles, les instructions d'expédition, les conditions générales, etc.

日本語

インテルでは、環境保護活動の一環として、使い終えたインテルブランド製品を指定の場所へ返送していただき、リサイクルを適切に行えるよう、インテル製品リサイクルプログラムを発足させました。

対象製品、返送先、返送方法、ご利用規約など、このプログラムの詳細情報は、http://www.intel.com/intel/other/ehs/product_ecology (英語)をご覧ください。

Malay

Sebagai sebahagian daripada komitmennya terhadap tanggungjawab persekitaran, Intel telah melaksanakan Program Kitar Semula Produk untuk membenarkan pengguna-pengguna runcit produk jenama Intel memulangkan produk terguna ke lokasi-lokasi terpilih untuk dikitar semula dengan betul.

Sila rujuk http://www.intel.com/intel/other/ehs/product_ecology untuk mendapatkan butir-butir program ini, termasuklah skop produk yang dirangkumi, lokasi-lokasi tersedia, arahan penghantaran, terma & syarat, dsb.

Portuguese

Como parte deste compromisso com o respeito ao ambiente, a Intel implementou o Programa de Reciclagem de Produtos para que os consumidores finais possam enviar produtos Intel usados para locais selecionados, onde esses produtos são reciclados de maneira adequada.

Consulte o site http://www.intel.com/intel/other/ehs/product_ecology (em Inglês) para obter os detalhes sobre este programa, inclusive o escopo dos produtos cobertos, os locais disponíveis, as instruções de envio, os termos e condições, etc.

Russian

В качестве части своих обязательств к окружающей среде, в Intel создана программа утилизации продукции Intel (Product Recycling Program) для предоставления конечным пользователям марок продукции Intel возможности возврата используемой продукции в специализированные пункты для должной утилизации.

Пожалуйста, обратитесь на веб-сайт http://www.intel.com/intel/other/ehs/product_ecology за информацией об этой программе, принимаемых продуктах, местах приема, инструкциях об отправке, положениях и условиях и т.д.

Türkçe

Intel, çevre sorumluluğuna bağlılığının bir parçası olarak, perakende tüketicilerin Intel markalı kullanılmış ürünlerini belirlenmiş merkezlere iade edip uygun şekilde geri dönüştürmesini amaçlayan Intel Ürünleri Geri Dönüşüm Programı'nı uygulamaya koymuştur.

Bu programın ürün kapsamı, ürün iade merkezleri, nakliye talimatları, kayıtlar ve şartlar v.s dahil bütün ayrıntılarını öğrenmek için lütfen http://www.intel.com/intel/other/ehs/product_ecology web sayfasına gidin.

Lead-free 2LI/Pb-free 2LI Board

The electronics industry is transitioning to European Union (EU) Restriction of Hazardous Substances (RoHS)-compliant products. The RoHS legislation restricts the use of six materials. One of these restricted materials is lead. Lead is the most common and problematic of the RoHS restricted materials.

There are exemptions in RoHS that allow the use of lead in some very limited locations in electronic products. Maximum lead concentration values have been established for RoHS-compliant electronic products that allow up to 1000 ppm of lead.

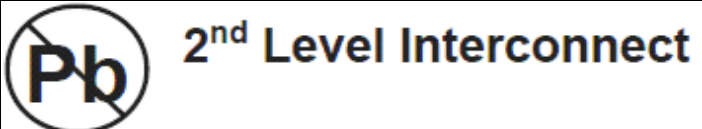
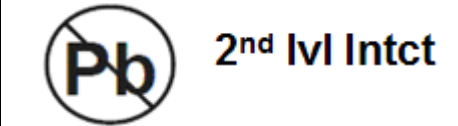
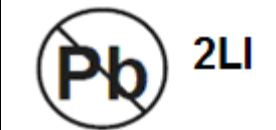
Lead-free/Pb-free is a nickname that is often used (or misused) for RoHS-compliant products. In this case, the term "Lead-free/Pb-free" means that lead has been removed where required by the RoHS legislation but still may exist as an impurity below 1000 ppm.

The term "Lead-free 2LI/Pb-free 2LI" means lead-free second level interconnect (2LI). The balls, leads, or pads used to connect the component to a printed circuit board are lead-free, but the first level interconnect (FLI) is not lead-free. The use of lead in the FLI is acceptable because of the RoHS "flip chip" or "die bump" interconnect exemption.

Desktop Board D945GCLF is a lead-free second level interconnect product. Table 12 shows the lead-free second level interconnect marks as they appear on the board and accompanying collateral. These marks are based on JEDEC standard J-STD-609, "Marking and Labeling of Components, PCBs and PCBA's to Identify Lead, Lead Free and Other Attributes."

For more information concerning Intel's lead-free initiatives, refer to <http://www.intel.com/technology/silicon/leadfree.htm>.

Table 12. Lead-Free Second Level Interconnect Marks

Description	Mark
This symbol is used to identify electrical and electronic assemblies and components in which the Pb concentration level in the Desktop Board substrate and the solder connections from the board to the components (second-level interconnect) is not greater than 0.1% by weight (1000 ppm).	<div data-bbox="678 1255 1385 1396">  </div> <p data-bbox="1019 1423 1047 1444">or</p> <div data-bbox="800 1457 1265 1593">  </div> <p data-bbox="1019 1619 1047 1640">or</p> <div data-bbox="891 1654 1174 1795">  </div>

Restriction of Hazardous Substances (RoHS)

European Union RoHS

EU RoHS Directive 2002/95/EC restricts the use of the following six materials in various types of electronic and electrical equipment:

- Lead
- Mercury
- Cadmium
- Hexavalent chromium
- Polybrominated biphenyls (PBB)
- Polybrominated diphenyl ether (PBDE)

The maximum concentrations allowed are 0.1% or 1000 ppm (except for cadmium, which is limited to 0.01% or 100 ppm) by weight of homogeneous material.

Desktop Board D945GCLF complies with these restrictions.

China RoHS

“China RoHS” is the term used by industry generally to describe legislation implemented by the Ministry of Information Industry (MII) in the People's Republic of China for the control of pollution by electronic information products (EIP). The official title of the China RoHS regulation is “Management Methods for Controlling Pollution by Electronic Information Products.”


China RoHS bans the same substances and has the same limits as EU RoHS. However, the China RoHS regulation requires specific product marking and a self-declaration of the controlled substances contained in each product.

Desktop Board D945GCLF is a China RoHS-compliant product.

The required China RoHS mark indicates the product's Environmental Friendly Usage Period (EFUP). The EFUP is defined as the number of years for which listed controlled substances will not leak or chemically deteriorate while in the product. The EFUP for Intel Desktop Boards has been determined to be 10 years.

The EFUP for Desktop Board D945GCLF is shown in Table 13.

Table 13. China RoHS Environmentally Friendly Use Period Mark

Description	Mark
This is an example of the symbol used on Intel Desktop Boards and associated collateral. The color of the mark may vary depending upon the application. The Environmental Friendly Usage Period (EFUP) for Intel Desktop Boards has been determined to be 10 years.	

The China MII also stipulates that a material Self Declaration Table (SDT) must be included in a product's user documentation. The SDT for Desktop Board D945GCLF is shown in Figure 16.

关于符合中国《电子信息产品污染控制管理办法》的声明

Management Methods on Control of Pollution from
Electronic Information Products
(China RoHS declaration)

产品中有毒有害物质的名称及含量

部件名称 (Parts)	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr6+)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
主板组件 Motherboard Assembly	×	○	○	○	○	○
<p>○：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>○：Indicates that this hazardous substance contained in all homogeneous materials of this part is below the limit requirement in SJ/T 11363-2006.</p> <p>×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>×：Indicates that this hazardous substance contained in at least one of the homogeneous materials of this part is above the limit requirement in SJ/T 11363-2006.</p> <p>对销售之日的所售产品,本表显示我公司供应链的电子产品信息产品可能包含这些物质。注意：在所售产品中可能会也可能不会含有所有所列的部件。</p> <p>This table shows where these substances may be found in the supply chain of our electronic information products, as of the date of sale of the enclosed product. Note that some of the component types listed above may or may not be a part of the enclosed product.</p>						

Figure 16. Desktop Board D945GCLF China RoHS Material Self Declaration Table

EMC Regulations

Desktop Board D945GCLF complies with the EMC regulations stated in Table 14 when correctly installed in a compatible host system.

Table 14. EMC Regulations

Regulation (Class B)	Title
FCC 47 CFR Part 15, Subpart B	Title 47 of the Code of Federal Regulations, Part 15, Subpart B, Radio Frequency Devices. (USA)
ICES-003 Issue 4	Interference-Causing Equipment Standard, Digital Apparatus. (Canada)
EN55022:2006	Limits and methods of measurement of Radio Interference Characteristics of Information Technology Equipment. (European Union)
EN55024:1998	Information Technology Equipment – Immunity Characteristics Limits and methods of measurement. (European Union)
EN55022:2006	Australian Communications Authority, Standard for Electromagnetic Compatibility. (Australia and New Zealand)
CISPR 22:2005 +A1:2005 +A2:2006	Limits and methods of measurement of Radio Disturbance Characteristics of Information Technology Equipment. (International)
CISPR 24:1997 +A1:2001 +A2:2002	Information Technology Equipment – Immunity Characteristics – Limits and Methods of Measurement. (International)
VCCI V-3/2007.04, V-4/2007.04	Voluntary Control for Interference by Information Technology Equipment (Japan)

Japanese Kanji statement translation: This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB 情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

Korean Class B statement translation: This is household equipment that is certified to comply with EMC requirements. You may use this equipment in residential environments and other non-residential environments.

이 기기는 가정용으로 전자파적합등록을 한 기기로서
주거지역에서는 물론 모든 지역에서 사용할 수 있습니다.

Ensure Electromagnetic Compatibility (EMC) Compliance

Before computer integration, make sure that the power supply and other modules or peripherals, as applicable, have passed Class B EMC testing and are marked accordingly.

Pay close attention to the following when reading the installation instructions for the host chassis, power supply, and other modules:

- Product certifications or lack of certifications
- External I/O cable shielding and filtering
- Mounting, grounding, and bonding requirements
- Keying connectors when mating the wrong connectors could be hazardous








If the power supply and other modules or peripherals, as applicable, are not Class B EMC compliant before integration, then EMC testing may be required on a representative sample of the newly completed computer.

Product Certifications

Board-Level Certification Markings

Desktop Board D945GCLF has the product certification markings shown in Table 15.

Table 15. Product Certification Markings

Description	Mark
UL joint US/Canada Recognized Component mark. Includes adjacent UL file number for Intel Desktop Boards: E210882.	
FCC Declaration of Conformity logo mark for Class B equipment. Includes Intel name and D945GCLF model designation.	
CE mark. Declaring compliance to European Union (EU) EMC directive and Low Voltage directive.	
Australian Communications Authority (ACA) and New Zealand Radio Spectrum Management (NZ RSM) C-tick mark. Includes adjacent Intel supplier code number, N-232.	
Japan VCCI (Voluntary Control Council for Interference) mark.	
S. Korea MIC (Ministry of Information and Communication) mark. Includes adjacent MIC certification number: CPU-D945GCLF (B).	
Taiwan BSMI (Bureau of Standards, Metrology and Inspections) mark. Includes adjacent Intel company number, D33025.	
Printed wiring board manufacturer's recognition mark. Consists of a unique UL recognized manufacturer's logo, along with a flammability rating (solder side).	V-0

Chassis and Component Certifications

Ensure that the chassis and certain components; such as the power supply, peripheral drives, wiring, and cables; are components certified for the country or market where used. Agency certification marks on the product are proof of certification. Typical product certifications include:

In Europe

The CE marking signifies compliance with all applicable European requirements. If the chassis and other components are not properly CE marked, a supplier's Declaration of Conformity statement to the European EMC directive and Low Voltage directive (as applicable), should be obtained. Additionally, other directives, such as the Radio and Telecommunications Terminal Equipment (R&TTE) directive may also apply depending on product features.

In the United States

A certification mark by a Nationally Recognized Testing Laboratory (NRTL) such as UL, CSA, or ETL signifies compliance with safety requirements. Wiring and cables must also be UL listed or recognized and suitable for the intended use. The FCC Class B logo for home or office use signifies compliance with electromagnetic interference (EMI) requirements.

In Canada

A nationally recognized certification mark such as CSA or cUL signifies compliance with safety requirements. The Industry Canada statement at the front of this product guide demonstrates compliance with Canadian EMC regulations.