

SYSTEMBAUGRUPPE D1306
SYSTEM BOARD D1306

TECHNISCHES HANDBUCH
TECHNICAL MANUAL

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**Systembaugruppe
D1306
System board D1306**

**Technisches Handbuch
Technical Manual**

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Introduction

This Technical Manual describes the system board D1306, which can be equipped with up to four Intel processors.

You will find further information in the "BIOS Setup" description.

Further information about drivers is provided in the readme files on the hard disk, on the supplied drivers diskettes, on the "Drivers & Utilities" or on the "ServerStart" CD.

Notational conventions

The meanings of the symbols and fonts used in this manual are as follows:



Pay particular attention to text marked with this symbol. Failure to observe this warning endangers your life, destroys the device, or may lead to loss of data.



Supplementary information, remarks, and tips follow this symbol.

- ▶ Text which follows this symbol describes activities that must be performed in the order shown.
- ↳ This symbol indicates that you must enter a blank space (press the Space Bar) at this point.
- ⏎ This symbol indicates that you must press the Enter key.

Text in this typeface indicates screen outputs.

Text in this bold typeface indicates the entries you make via the keyboard.

Text in italics indicates commands or menu items.

"Quotation marks" indicate names of chapters or terms.

Important notes

Store this manual close to the device. If you pass the device on to third parties, you should pass this manual on with it.



Be sure to read this page carefully and note the information before you open the device.

You cannot access the system board components without first opening the device. How to dismantle and reassemble the device is described in the Operating Manual accompanying the device.

Please observe the safety information provided in the "Important notes" chapter in the device's operating manual.

Incorrect replacement of the lithium battery may lead to a risk of explosion. It is therefore essential to observe the instructions in the ["Add-on modules"](#) - ["Replacing the lithium battery"](#) section.



The shipped version of this board complies with the requirements of the EEC directive 89/336/EEC "Electromagnetic compatibility".

Compliance was tested in a typical PC configuration.

When installing the board, refer to the specific installation information in the Operating Manual or Technical Manual of the receiving device.

Connecting cables for peripherals must be adequately shielded to avoid interference.



Components can become very hot during operation. Ensure you do not touch components when making extensions to the system board. There is a danger of burns!



The warranty is invalidated if the device is damaged during the installation or replacement of system expansions. Information on which system expansions you can use is available from your sales outlet or the customer service centre.

Information about boards

To prevent damage to the system board or the components and conductors on it, please take great care when you insert or remove boards. Take great care to ensure that extension boards are slotted in straight, without damaging components or conductors on the system board, or any other components, for example EMI spring contacts.

Be especially careful with the locking mechanisms (catches, centring pins etc.) when you replace the system board or components on it, for example memory modules or processors.

Never use sharp objects (screwdrivers) for leverage.



Boards with electrostatic sensitive devices (ESD) are identifiable by the label shown.

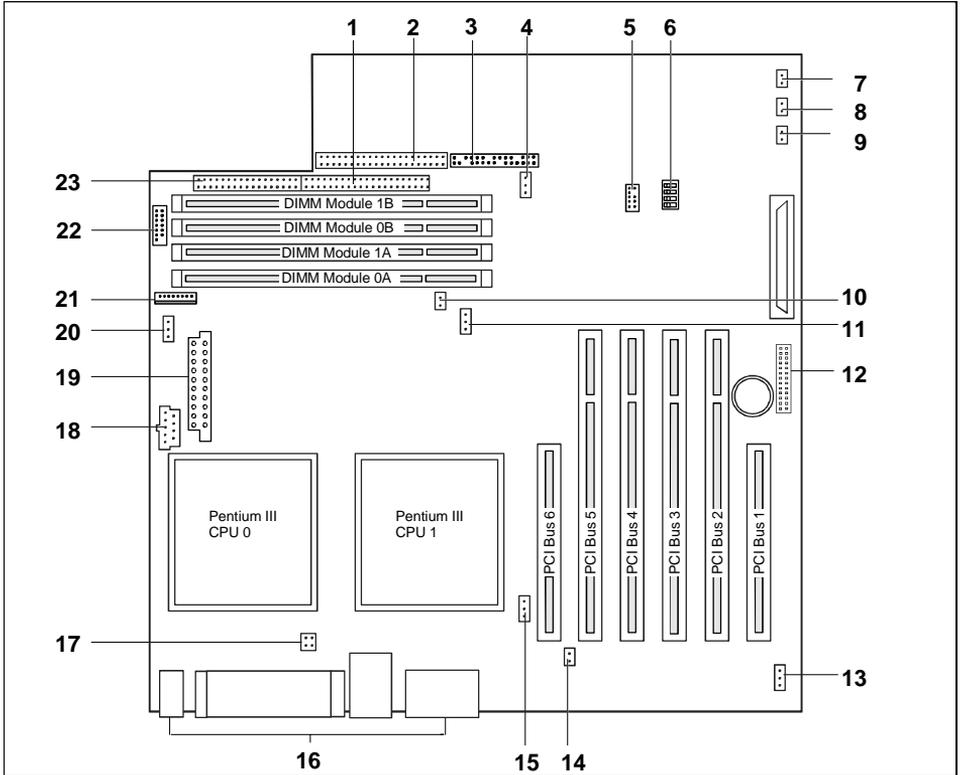
When you handle boards fitted with ESDs, you must, under all circumstances, observe the following points:

- You must always discharge static build up (e.g. by touching a grounded object) before working.
- The equipment and tools you use must be free of static charges.
- Remove the power plug from the mains supply before inserting or removing boards containing ESDs.
- Always hold boards with ESDs by their edges.
- Never touch pins or conductors on boards fitted with ESDs.

Features

- two processor slots for Pentium III processors with up to 1,4 GHz and higher ("end of lifetime") and 133 MHz Front Side Bus
512 Kbyte second level cache
- four 64 bit PCI slots with 66 MHz
- two 32 bit PCI slots with 33 MHz
- four DIMM slots (PC133) for up to 4 Gbyte main memory (SDRAM memory modules)
- onboard SCSI controller Ultra 160 to the 64 bit/66MHz PCI bus with LVDS (Low Voltage Differential) SCSI-Interface
- Screen controller ATI Rage XL VGA with 24 bit and 230 MHz RAMDAC
- Intel 82559GM Ethernet LAN controller with 10/100 Mbit/s
- IDE hard disk controller connected to PCI bus
ultra DMA33 mode capable, supports PIO modes 0-4
- Floppy disk drive controller (possible formats: 720 KB, 1.44 MB, 2.88 MB)
- Server management onboard with Scylla
- system monitoring
- Security functions:
 - Cover monitoring: cover monitoring reports when the cover has been opened without authorisation.
 - Simple error detection and correction in the main memory with an ECC (only for memory modules with ECC)
 - System, Setup and Keyboard password
 - parallel and serial ports can be deactivated
 - Write protection for floppy disk drive
 - Boot hard disk virus warning function
 - Flash BIOS and EEPROMs (on the memory modules) virus protection function.
- one external parallel interface (ECP- and EPP-compatible)
- two external serial ports (COM1 and COM2)
- two external and one internal USB port (USB = Universal Serial Bus)
- 1 internal WOL interface
- two external PS/2 interfaces for keyboard and mouse
- Real-time clock/calendar with integrated battery backup

Interfaces and connectors



1 = IDE drives (primary)

2 = IDE drives (primary)

3 = Control panel

4 = Fan (SysFan 2)

5 = USB port

6 = Switch block

7 = Cover monitoring

8 = SMB 1

9 = SMB 2

10 = NMI

11 = Fan (CPU 1)

12 = Connector for RSB (Remote Service Board)

13 = Wake On LAN (WOL)

14 = Power supply RSB

15 = Fan (SysFan 1)

16 = External ports

17 = Power supply (ATX 12 V)

18 = Power supply (ATX 3,3 V)

19 = Power supply (ATX)

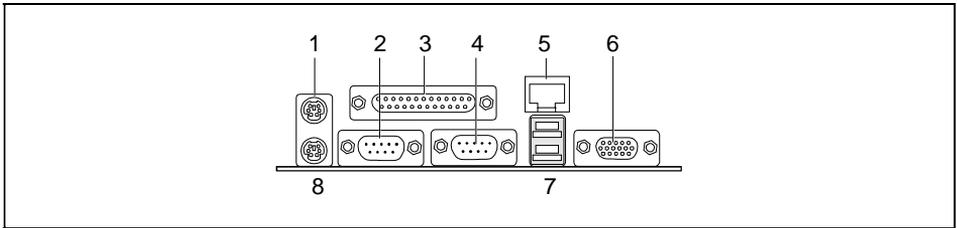
20 = Fan (CPU 0)

21 = Power supply monitoring

22 = Power supply (Intel 3.3 V)

23 = Port for floppy disk drive

External ports



- | | |
|---------------------------|------------------------|
| 1 = PS/2 mouse port | 5 = LAN connector |
| 2 = Serial interface COM1 | 6 = VGA port |
| 3 = Parallel port | 7 = USB port 1 and 2 |
| 4 = Serial port COM2 | 8 = PS/2 keyboard port |



If a USB chipcard reader (SmartCard reader) is installed, no device may be connected to serial interface 2 (COM2).

Please use the current driver from the supplied driver disk for the USB chipcard reader (SmartCard reader).

Temperature / System monitoring

Temperature and system monitoring aim to reliably protect the computer hardware against damage caused by overheating. In addition, any unnecessary noise is also prevented by reducing the fan speed, and information is provided about the system status. Cover monitoring protects the system from unauthorised opening.

The temperature and system monitoring are controlled by an onboard controller developed by Fujitsu Siemens.

The following functions are supported:

Temperature monitoring:

Measurement of the processor temperature, measurement of the system temperature with an onboard temperature sensor, measurement of the ambient temperature with an optional temperature sensor.

Fan monitoring:

Fans that are no longer available, blocked or sticky fans are detected. Blocked or sticky fans are operated with 12 V pulse voltage. Fans removed while the system is switched off are signaled by the *Display news* LED when the system is switched on again and processed by the BIOS or the application.

Fan control:

The fans are regulated according to temperature.

Sensor monitoring:

The removal of, or a fault in, a temperature sensor is detected. Should this happen all fans monitored by this sensor run at maximum speed, to achieve the greatest possible protection of the hardware. Temperature sensors removed while the system is switched off are signaled by the *Display news* LED and processed by the BIOS or the application.

Cover monitoring:

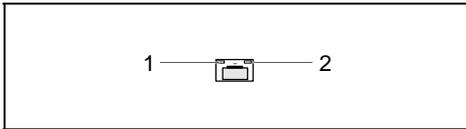
Unauthorised opening of the cover is detected, even when the system is switched off. However, this will only be indicated when the system is switched on again.

LAN connector

This system board has an Intel 82559 LAN controller. The LAN controller is equipped with a 3 KB transmission and receiving buffer (FIFO) and supports WOL function through Magic Packet™.

It is also possible to boot a device without its own boot hard disk via LAN. Here Bootix LAN BootP and Intel PXE are supported.

The LAN RJ45 connector is equipped with a yellow and a green LED (light emitting diode).



1 = Yellow indicator

2 = Green indicator

Green a connection exists (e.g. to a hub).

Yellow Link Mode: the LAN connection is active.
 WOL mode: a Magic Packet™ is being received.

PCI bus resources

PCI slots

The following table shows an overview of the PCI slots:

PCI slot	64bit/32bit	Description	Bus frequency
6	32 bit	32 bit PCI bus slot	33 MHz / 5 V
5	64 bit	64 bit PCI bus slot	66 MHz / 3.3 V
4	64 bit	64 bit PCI bus slot	66 MHz / 3.3 V
3	64 bit	64 bit PCI bus slot	66 MHz / 3.3 V
2	64 bit	64 bit PCI bus slot	66 MHz / 3.3 V
1	32 bit	32 bit PCI bus slot	33 MHz / 5 V

PCI IRQ line x - Assignment of the PCI interrupts

PCI IRQ Line x defines which ISA interrupts are used for the separate PCI slots.

If you select *Auto* in the BIOS setup, the interrupts are assigned automatically and no further settings are required.

Multifunctional PCI boards or boards with an integrated PCI-to-PCI bridge can use several PCI interrupts (INTA#, INTB#, INTC#, INTD#). Monofunctional PCI boards (default) only use one PCI interrupt (INTA#) per PCI slot.

The PCI interrupts INTA#, INTB#, INTC# and INTD# are available for every PCI slot.

The same interrupt can be assigned simultaneously to several PCI boards. You should avoid this condition due to reduced performance.

If you use a setting other than *Auto*, the Plug&Play functionality of the system BIOS for the corresponding PCI boards is deactivated.

Auto The PCI interrupts are assigned automatically in accordance with the Plug&Play guidelines.

Disabled No ISA interrupt is assigned to the PCI interrupt.

3, 4, 5, 7, 10, 11, 12, 14, 15

The selected ISA interrupt is assigned to the PCI interrupt. You may not select an ISA interrupt that is used by a component on the system board (e.g. controller) or an ISA board.

	A	B	C	D
Slot 1	PCI IRQ line 0	PCI IRQ line 1	PCI IRQ line 2	PCI IRQ line 3
Slot 2	PCI IRQ line 4	PCI IRQ line 5	PCI IRQ line 6	PCI IRQ line 7
Slot 3	PCI IRQ line 6	PCI IRQ line 7	PCI IRQ line 4	PCI IRQ line 5
Slot 4	PCI IRQ line 8	PCI IRQ line 9	PCI IRQ line 10	PCI IRQ line 11
Slot 5	PCI IRQ line 10	PCI IRQ line 11	PCI IRQ line 8	PCI IRQ line 9
Slot 6	PCI IRQ line 2	PCI IRQ line 3	PCI IRQ line 0	PCI IRQ line 1
VGA	PCI IRQ line 12	-	-	-
SCSI	PCI IRQ line 13	-	-	-
LAN	PCI IRQ line 14	-	-	-
USB	PCI IRQ line 12	-	-	-

A..D = Interrupt output of the PCI controller

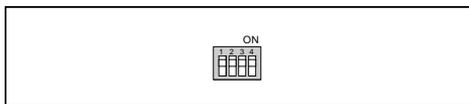
Screen resolution

Depending on the operating system used the screen resolutions in the following table refer to the screen controller on the system board. If you are using an external screen controller, you will find details of supported screen resolutions in the Operating Manual or Technical Manual supplied with the controller.

Screen resolution	Refresh rate (Hz)	Max. number of colours
640x480	200	16.7 mio.
800x600	200	16.7 mio.
1024x768	150	16.7 mio.
1057x864	120	16.7 mio.
1280x1024	100	16.7 mio.
1600x1200	85	16.7 mio.

Shaded screen resolutions are not supported by LCD monitors (TFT).

Settings with switches



- Switch 1 = must always be set to *off*
- Switch 2 = System BIOS recovery
- Switch 3 = Write-protection for floppy disk
- Switch 4 = Write-protection for Flash BIOS

Recovering System BIOS - switch 2

Switch 2 enables recovery of the old system BIOS after an attempt to update has failed. To restore the old system BIOS you need a Flash BIOS Diskette (please call our customer service centre).

- on* The system boots from the "Flash BIOS floppy disk" from Drive A and reprograms the system BIOS on the board.
- off* The System BIOS is started with the system BIOS from the system board (default setting).

Write protection for floppy disks - switch 3

Switch 3 is used to define whether floppy disks can be written or deleted in the floppy disk drive. To write and delete floppy disks, the write-protection in *BIOS Setup* must be disabled (in menu *Security*, the field *Diskette Write* must be set to *Enabled*).

- on* The floppy disk drive is write-protected.
- off* Floppy disks can be read, written and deleted (default setting).

Write protection for Flash BIOS - switch 4

Switch 4 is used to define whether the System BIOS is write protected or not.

- on* The System BIOS can neither be written to nor deleted. Flash-BIOS update from floppy disk is not possible (default setting).
- off* The System BIOS can be written or deleted. Flash-BIOS update from floppy disk is possible

Processor's clock speed

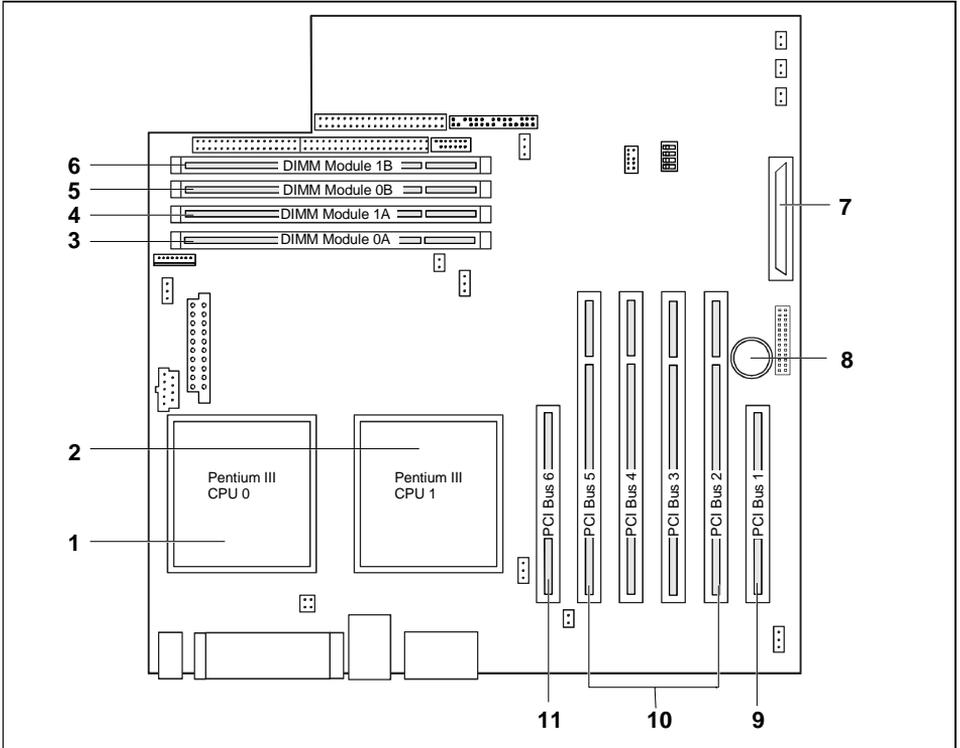
The clock frequency of the processor is set automatically. It cannot be changed manually.

If 2 processors are installed, these processors must be of the same type and frequency, as otherwise the system will "hang". This means two Pentium III Tualatin or two Pentium III Coppermine with the same clock frequency must be used.

Add-on modules



For all steps described in this chapter pull the power plug out of the mains outlet!



- | | |
|---|---------------------|
| 1 = Socket for processor 1 (CPU 0) | 7 = SCSI connection |
| 2 = Socket for processor 2 (CPU 1) | 8 = Lithium battery |
| 3 = Location 0A for main memory (bank 0) | 9 = PCI slot 1 |
| 4 = Location bank 1A for main memory | 10 = PCI slots 2-5 |
| 5 = Location 0B for main memory (bank 0) | 11 = PCI slot 6 |
| 6 = Location bank 1B for main memory (bank 1) | |

PCI slots PCI 2, PCI 3, PCI 4 and PCI 5 support 3.3 V operation and auxiliary voltages. PCI slots PCI 1 and PCI 6 support 5 V operating voltage.

Slot sequence

- Insert 64 bit / 66 MHz adapter preferably into PCI slots 2, 3.
- Insert 64 bit / 33 MHz adapter preferably into PCI slots 4, 5.
- Insert 32 bit / 33 MHz adapter preferably into PCI slots 1, 6.



Take special care to the coding of the PCI slot and the adapter when you select a PCI slot.

Upgrading main memory

These slots are suitable for 128, 256, 512 and 1024 Mbyte SDRAM memory modules of the DIMM format. The board supports a maximum of 4 Gbytes.

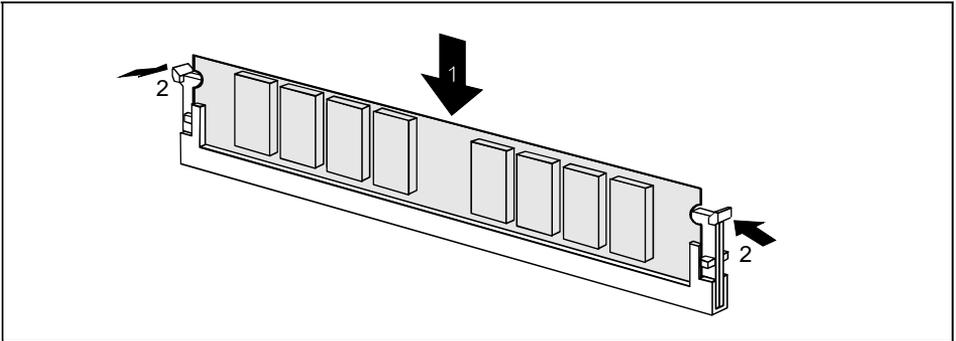
In other words, you fit the first pair to bank 0, and the second pair in bank 1. One memory bank must always be fully equipped with memory modules of the same type.



You may only use buffered (registered) 3.3V memory modules. Unbuffered memory modules are not permitted.

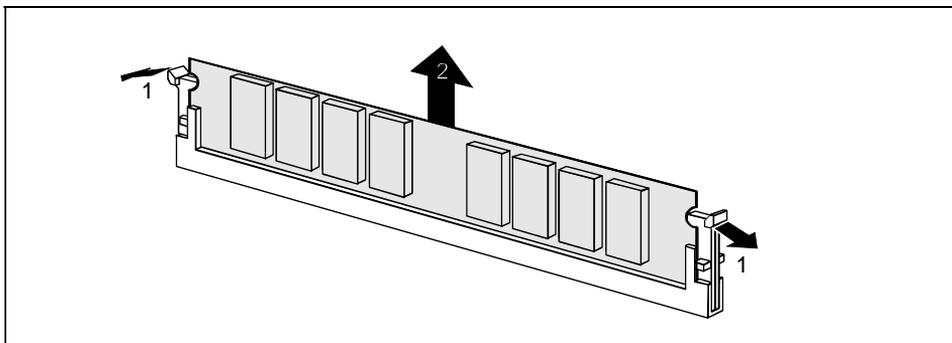
SDRAM memory modules must be designed for a clock frequency of 133 MHz (meets PC133 specification).

Installing a memory module



- ▶ Push the holders on each side of the memory compartment outwards.
- ▶ Insert the memory module in the slot while folding the side holders up until the memory module engages (2).

Removing a memory module



- ▶ Push the clips on the right and left of the compartment outward (1).
- ▶ Carefully remove the memory module from the compartment (2).

Replacing the lithium battery

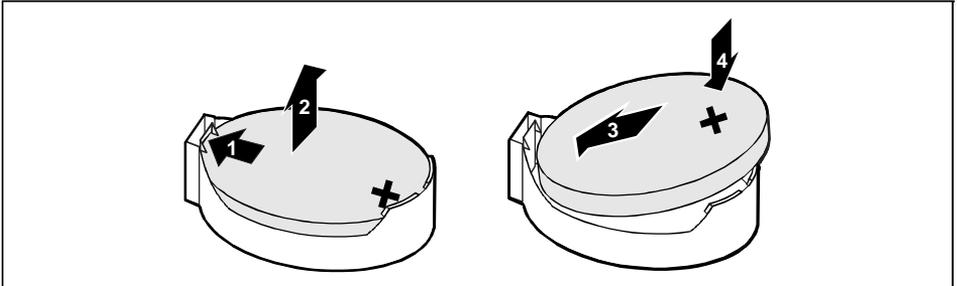


Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer (CR2032).

Do not throw lithium batteries into the household waste. They must be disposed of in accordance with local regulations concerning special waste.

Ensure that you insert the battery the right way round. The plus pole must be on the top!



- ▶ Lift the contact (1) a few millimetres and remove the lithium battery from its socket (2).
- ▶ Insert a new lithium battery of the same type into the socket (3).

Glossary

The technical terms and abbreviations given below represent only a selection of the full list of common technical terms and abbreviations.

Not all technical terms and abbreviations listed here are valid for the described system board.

ACPI	Advanced Configuration and Power Management Interface
AC'97	Audio Codec '97
AGP	Accelerated Graphics Port
AMR	Audio Modem Riser
AOL	Alert On LAN
APM	Advanced Power Management
ATA	Advanced Technology Attachment
BIOS	Basic Input Output System
CAN	Controller Area Network
CPU	Central Processing Unit
CNR	Communication Network Riser
C-RIMM	Continuity Rambus Inline Memory Module
DDR	Double Data Rate
DIMM	Dual Inline Memory Module
DRAM	Dynamic Random Access Memory
ECC	Error Correcting Code
EEPROM	Electrical Erasable Programmable Read Only Memory
FDC	Floppy Disk Controller
FIFO	First-In First-Out
FSB	Front Side Bus
FWH	Firmware Hub
GMCH	Graphics and Memory Controller Hub
GPA	Graphics Performance Accelerator
I ² C	Inter Integrated Circuit
IAPC	Instantly Available Power Managed Desktop PC Design
ICH	I/O Controller Hub
IDE	Intelligent Drive Electronics

IPSEC	Internet Protocol Security
ISA	Industrial Standard Architecture
LAN	Local Area Network
LSA	LAN Desk Service Agent
MCH	Memory Controller Hub
MMX	MultiMedia eXtension
NIC	Networking Interface Card
P64H	PCI64 Hub
PCI	Peripheral Component Interconnect
PXE	Preboot eXecution Environment
RAM	Random Access Memory
RAMDAC	Random Access Memory Digital Analogue Converter
RDRAM	Rambus Dynamic Random Access Memory
RIMM	Rambus Inline Memory Module
RTC	Real Time Clock
SB	Soundblaster
SDRAM	Synchronous Dynamic Random Access Memory
SGRAM	Synchronous Graphic Random Access Memory
SIMD	Streaming Mode Instruction (Single Instruction Multiple Data)
SMBus	System Management Bus
SVGA	Super Video Graphic Adapter
USB	Universal Serial Bus
VGA	Video Graphic Adapter
WOL	Wake On LAN