MSI

MICRO-STAR INTERNATIONAL

MD-3000 Micro ATX Mainboard

Version 1.0

Manual Rev: 1.0
Release Date: Dec. 2001

CE N1996

FCC-B Radio Frequency Interference Statement

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 when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Notice 1
The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Notice 2
Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

VOIR LA NOTICE D'INSTALLATION AVANT DE RACCORDER AU RESEAU.

Micro-Star International MD-3000

FC **Tested to comply with FCC Standard**

For Home or Office Use

Edition

Dec. 2001

Copyright Notice

Trademarks

Revision History

Revision	Revision History	Date

Safety Instructions

1. Always read the safety instructions carefully.
2. Keep this User's Manual for future reference.
3. Keep this equipment away from humidity.
4. Lay this equipment on a reliable flat surface before setting it up.
5. The openings on the enclosure are for air convection hence protects the equipment from overheating. DO NOT COVER THE OPENINGS.
6. Make sure the voltage of the power source and adjust properly 110/220V before connecting the equipment to the power inlet.
7. Place the power cord such a way that people can not step on it. Do not place anything over the power cord.
8. Always Unplug the Power Cord before inserting any add-on card or module.
9. All cautions and warnings on the equipment should be noted.
10. Never pour any liquid into the opening that could damage or cause electrical shock.
11. If any of the following situations arises, get the equipment checked by a service personnel:
    - The power cord or plug is damaged
    - Liquid has penetrated into the equipment
    - The equipment has been exposed to moisture
    - The equipment has not work well or you can not get it work according to User's Manual.
    - The equipment has dropped and damaged
    - If the equipment has obvious sign of breakage
12. DO NOT LEAVE THIS EQUIPMENT IN AN ENVIRONMENT UNCONDITIONED, STORAGE TEMPERATURE ABOVE 60^0C (140^0F), IT MAY DAMAGE THE EQUIPMENT.

CAUTION: Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

CONTENTS

Getting Started 1

Congratulations on purchasing the MSI mainboard. ***MD-3000*** Micro ATX mainboard is an excellent computer mainboard based on the innovative *Intel® Brookdale and ICH2* chipset, which supports the ***Intel®*** ***Pentium 4*** processor and provides you with a cost-effective solution.

TOPICS

Mainboard Specification

CPU

- Support Socket478 for Intel® Pentium 4(FC-PGA2) processor
- Support 1.3GHz, 1.4GHz and up to 2.XGHz

Chipset

- Intel® Brookdale chipset
  - AGP 4x/2x universal slot
  - Support 100MHz FSB
  - Support 400MHz Intel NetBurst micro-architecture bus.
- Intel® ICH2 chipset (360 BGA)
  - AC'97 Controller integrated
  - 2 full IDE channels, up to ATA100
  - Integrated 10/100Mbit/sec Etherent
  - Low pin count interface for Winbond SIO

Main Memory (This section refers only to S-DRAM Layout)

- Support two 168-pin DIMM sockets
- Support a 32 to 1GB memory using 512Mbit technology
- Max. memory size: 2GB

Slots

- One AGP (Accelerated Graphics Port) 2x/4x slot
- Two PCI 2.2 32-bit Master PCI Bus slots, the third PCI can support 2 Master devices
- Support 3.3v/5v PCI bus interface

On-boardIDE

- An IDE controller on the ICH2 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA 66/ 100 operation modes
- Can connect to four IDE devices

On-board Peripherals

- One floppy port that supports two FDD with 360KB, 720KB, 1.44MB and 2.88MB
- Two serial ports (COM A/ Reserved in pin header)
- One parallel port that supports SPP/EPP/ECP modes
- Four USB ports (2 rear connectors and 2 USB front pin header)
- One RJ-45 connector
- One Line-In/ 3 Line-Out/Game port

Network

- Realtek 8100 single chip fast 10/100 Mb/s Ethernet controller
- ACPI, APM supported

H/W Audio (option)

- C-media CMI8738-6CH-MX
- Support 6 channel audio
- AC'97 2.1 compliant
- Support SPDIF

BIOS

- The mainboard BIOS provides "Plug & Play" BIOS that can detect the periph-eral devices and expansion cards installed on the board automatically
- Support Desktop Management Interface (DMI) function that can record your mainboard specifications

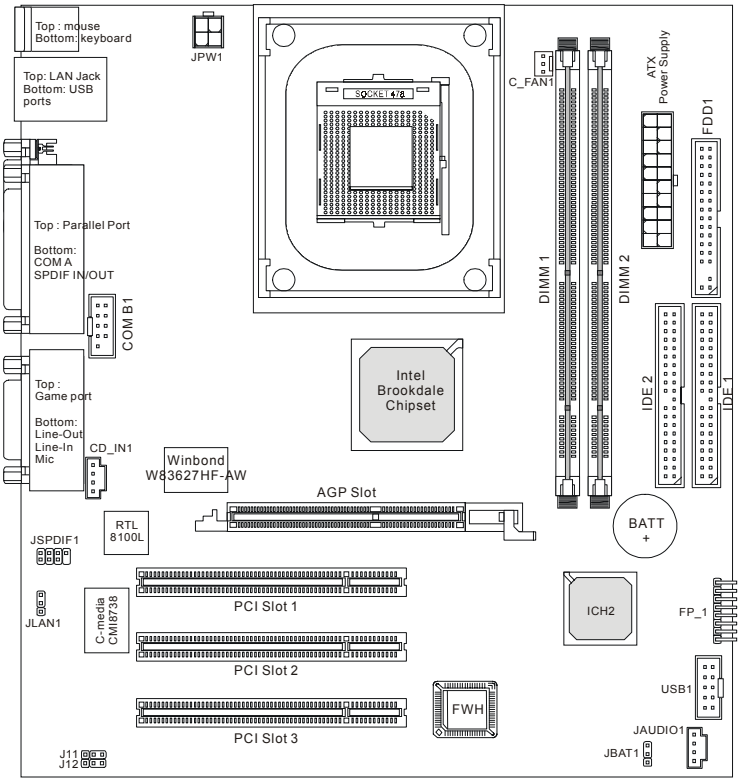
Dimension

- Micro ATX Form Factor (24.4cm x 22.4cm)

Mounting

- 6 mounting holes

Mainboard Layout



MD-3000 Micro ATX Mainboard

2 Hardware Setup

This chapter provides you with the information about hardware setup procedures. While doing the installation, be careful in holding the components and follow the installation procedures. For some components, if you install in the wrong orientation, the components will not work properly.

Use a grounded wrist strap before handling computer components. Static electricity may damage the components.

TOPICS

Central Processing Unit: CPU

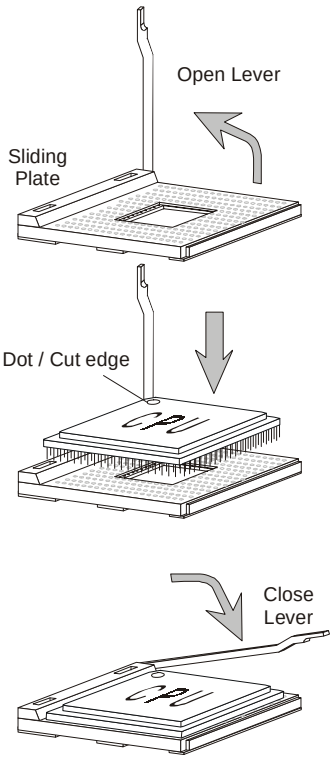
The mainboard supports Intel® Pentium® 4 processor in the 478 pin package. The mainboard uses a CPU socket called PGA478 for easy CPU installation. When you are installing the CPU, **make sure the CPU has a heat sink and a cooling fan attached on the top to prevent overheating.** If you do not find the heat sink and cooling fan, contact your dealer to purchase and install them before turning on the computer.

CPU Installation Procedures

1. Pull the lever sideways away from the socket. Then, raise the lever up to a 90-degree angle.

2. Look for the dot/cut edge. The dot/cut edge should point towards the lever pivot. The CPU will only fit in the correct orientation.

3. Hold the CPU down firmly, and then close the lever to complete the installation.



WARNING! *Overheating will seriously damage the CPU and system, always make sure the cooling fan can work properly to protect the CPU from overheating.*

CPU Core Speed Derivation Procedure

If	CPU Clock	=	100MHz
	Core/Bus ratio	=	14
then	CPU core speed	=	Host Clock x Core/Bus ratio
		=	100MHz x 14
		=	1.4GHz

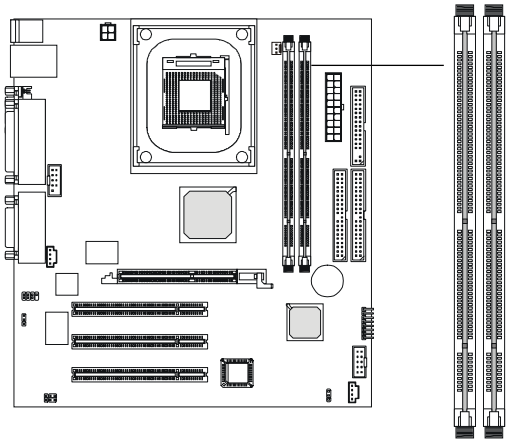
WARNING!

Overclocking

This motherboard is designed to support overclocking. However, please make sure your components are able to tolerate such abnormal setting, while doing overclocking. Any attempt to operate beyond product specifications is not recommended. ***We do not guarantee the damages or risks caused by inadequate operation or beyond product specifications.***

Memory (This section describes only S-DRAM

The mainboard provides 2 slots for 168-pin, 3.3V SDRAM DIMM with 4 memory banks. You can install PC133/PC100 SDRAM modules on the DIMM slots (DIMM 1~2). Advice: DDR Modules have only one notch!



DIMM Slots (DIMM 1~2)

Introduction to SDRAM

Synchronous DRAM (SDRAM) is a type of dynamic RAM memory chip that has been widely used starting in the latter part of the 1990s. SDRAMs are based on standard dynamic RAM chips, but have sophisticated features that make them considerably faster. First, SDRAM chips are fast enough to be synchronized with the CPU's clock, which eliminates wait states. Second, the SDRAM chip is divided into two cell blocks, and data is interleaved between the two so that while a bit in one block is being accessed, the bit in the other is being prepared for access. This allows SDRAM to burst the second and subsequent, contiguous characters at a rate of 10ns, compared to 60ns for the first character.

SDRAM provides 800 MBps or 1 GBps data transfer depending on whether the bus is 100MHz or 133MHz.

DIMM Module Combination

To operate properly, at least one DIMM module must be installed. Memory modules can be installed on the slots in any order. You can install either single- or double-sided modules to meet your own needs.

Memory modules can be installed in any combination as follows:

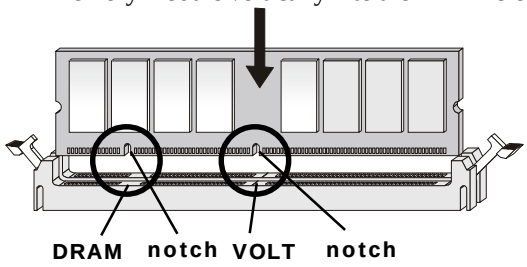
Slot	Memory Module	Total Memory
DIMM 1 (Bank 0 & Bank 1)	S/D	32MB~1GB
DIMM 2 (Bank 2 & Bank 3)	S/D	32MB~1GB
Maximum System Memory Supported		32MB~2GB

S: Single Side D: Double Side

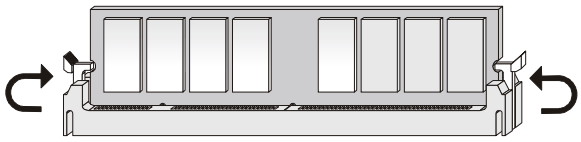
Installing DIMM Modules

The DIMM slot has 2 Notch Keys "VOLT and DRAM". The module will only fit in the right orientation.

1. Insert the DIMM memory module vertically into the DIMM slot. Then push it in.



2. The plastic clip at each side of the DIMM slot will automatically close.



Power Supply

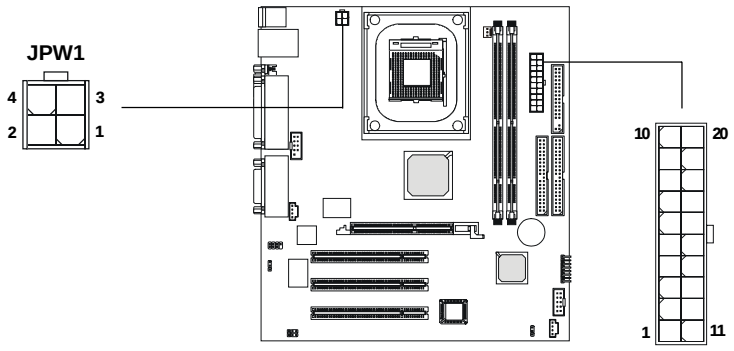
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector

This connector allows you to connect to an ATX power supply. To connect to the ATX power supply, make sure the plug of the power supply is inserted in the proper orientation and the pins are aligned. Then push down the power supply firmly into the connector.

ATX 12V Power Connector: JPW1

This 12V power connector is used to provide power to the CPU.



JPW1 Pin Definition

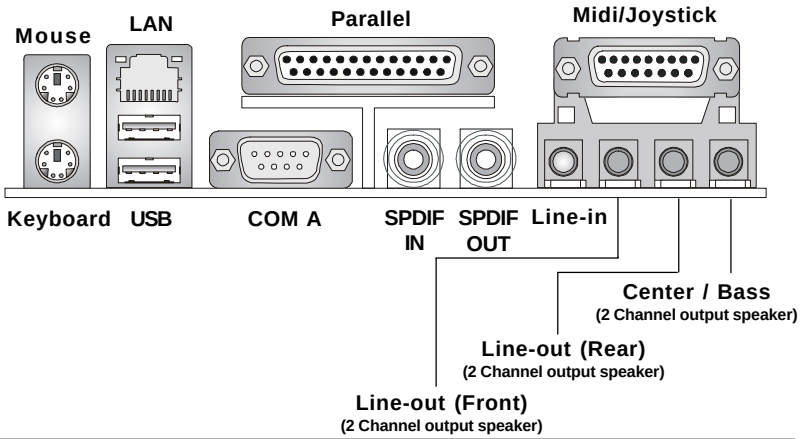
PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

ATX Power Supply Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	5V	14	PS_ON
5	GND	15	GND
6	5V	16	GND
7	GND	17	GND
8	PW_OK	18	-5V
9	5V_SB	19	5V
10	12V	20	5V

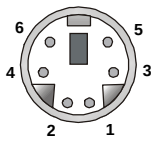
Back Panel

The Back Panel provides the following connectors:



Mouse Connector: JKBMS1

The mainboard provides a standard PS/2® mouse mini DIN connector for attaching a PS/2® mouse. You can plug a PS/2® mouse directly into this connector. The connector location and pin assignments are as follows:



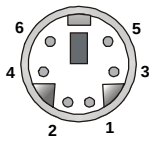
PS/2 Mouse (6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Mouse DATA	Mouse DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Mouse Clock	Mouse clock
6	NC	No connection

Keyboard Connector: JKBMS1

The mainboard provides a standard PS/2® keyboard mini DIN connector for attaching a PS/2® keyboard. You can plug a PS/2® keyboard directly into this connector.



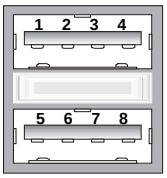
PS/2 Keyboard (6-pin Female)

Pin Definition

PIN	SIGNAL	DESCRIPTION
1	Keyboard DATA	Keyboard DATA
2	NC	No connection
3	GND	Ground
4	VCC	+5V
5	Keyboard Clock	Keyboard clock
6	NC	No connection

USB Connectors

The mainboard provides a UHCI (Universal Host Controller Interface) Universal Serial Bus root for attaching USB devices such as keyboard, mouse or other USB-compatible devices. You can plug the USB device directly into the connector.



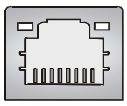
USB Ports

USB Port Description

PIN	SIGNAL	DESCRIPTION
1	VCC	+5V
2	-Data 0	Negative Data Channel 0
3	+Data0	Positive Data Channel 0
4	GND	Ground
5	VCC	+5V
6	-Data 1	Negative Data Channel 1
7	+Data 1	Positive Data Channel 1
8	GND	Ground

LAN (RJ-45) Jack

The mainboard provides one standard RJ-45 jack for connection to Local Area Network (LAN). You can connect a network cable to the LAN jack.



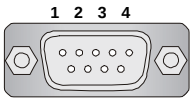
Pin Definition

PIN	SIGNAL	DESCRIPTION
1	TDP	Transmit Differential Pair
2	TDN	Transmit Differential Pair
3	RDP	Receive Differential Pair
4	NC	Not Used
5	NC	Not Used
6	RDN	Receive Differential Pair
7	NC	Not Used
8	NC	Not Used

Serial Port Connector: COM A & COM B1

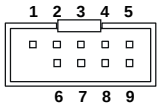
The mainboard offers two 9-pin male DIN connectors for serial port COM A and COM B1. The ports are 16550A high speed communication ports that send/receive 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to them.

COM A



9-Pin Male DIN Connectors

COM B1



Pin Definition

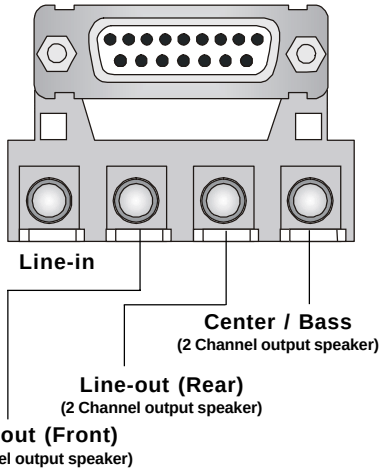
PIN	SIGNAL	DESCRIPTION
1	DCD	Data Carry Detect
2	SIN	Serial In or Receive Data
3	SOUT	Serial Out or Transmit Data
4	DTR	Data Terminal Ready)
5	GND	Ground
6	DSR	Data Set Ready
7	RTS	Request To Send
8	CTS	Clear To Send
9	RI	Ring Indicate

Joystick/Midi Connectors

You can connect a joystick or game pad to this connector.

Audio Port Connectors

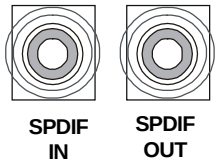
Line In is used for external CD player, Tape player, or other audio devices. **Line Out** are connectors for Speakers or Headphones. **Center/Bass** is a connector for audio device which is used as a center speaker or supports bass effect.



Note: Details on the application of 6-channel audio can be acquired in Appendix A.

SPDIF Connectors

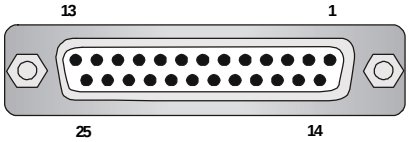
The SPDIF connectors privided on the back pannel can be used to connect your digital audio equipment.



Note: Details on the application of 6-channel audio can be acquired in Appendix A.

Parallel Port Connector: LPT1

The mainboard provides a 25-pin female centronic connector for LPT. A parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.



Pin Definition

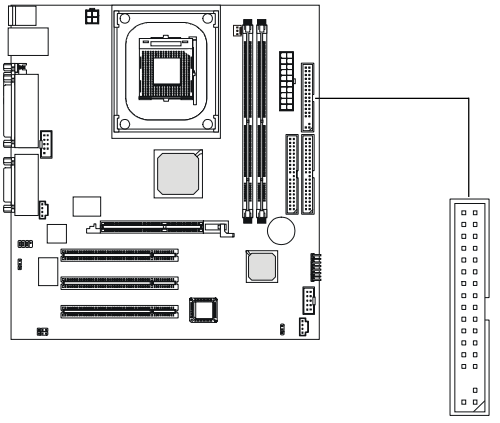
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	Paper End
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select In
18	GND	Ground
19	GND	Ground
20	GND	Ground
21	GND	Ground
22	GND	Ground
23	GND	Ground
24	GND	Ground
25	GND	Ground

Connectors

The mainboard provides connectors to connect to FDD, IDE HDD, case, LAN, USB Ports, and CPU/System FAN.

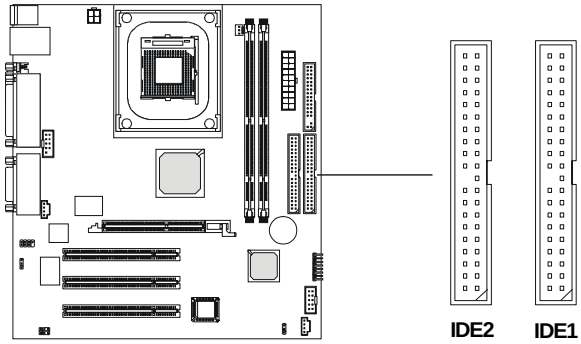
Floppy Disk Drive Connector: FDD1

The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra DMA 33/66/100 controller that provides PIO mode 0~4, Bus Master, and Ultra DMA/33/66/100 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices. These connectors support the provided IDE hard disk cable.



IDE1 (Primary IDE Connector)

The first hard drive should always be connected to IDE1. IDE1 can connect a Master and a Slave drive. You must configure second hard drive to Slave mode by setting the jumper accordingly.

IDE2 (Secondary IDE Connector)

IDE2 can also connect a Master and a Slave drive.

TIP:

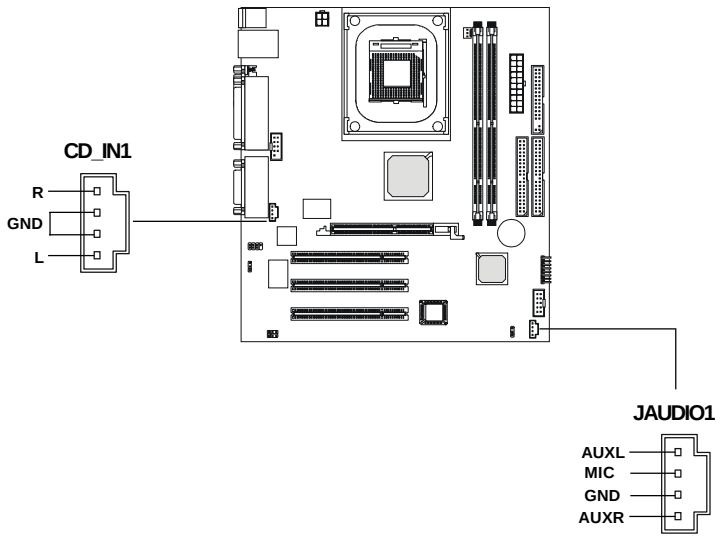
If you install two hard disks on cable, you must configure the second drive to Slave mode by setting its jumper. Refer to the hard disk documentation supplied by hard disk vendors for jumper setting instructions.

CD-In Connector: CD_IN1

The connector is for CD-ROM audio connector.

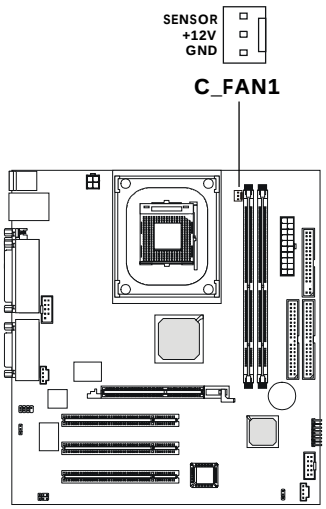
Front Audio Line-out Connector: JAUDIO1

The connector is for front audio output devices.



Fan Power Connectors: C_FAN1

The C_FAN1 (processor fan) supports system cooling fan with +12V. It supports three-pin head connector. When connecting the wire to the connectors, always take note that the red wire is the positive and should be connected to the +12V, the black wire is Ground and should be connected to GND. If the mainboard has a System Hardware Monitor chipset on-board, you must use a specially designed fan with speed sensor to take advantage of the CPU fan control.



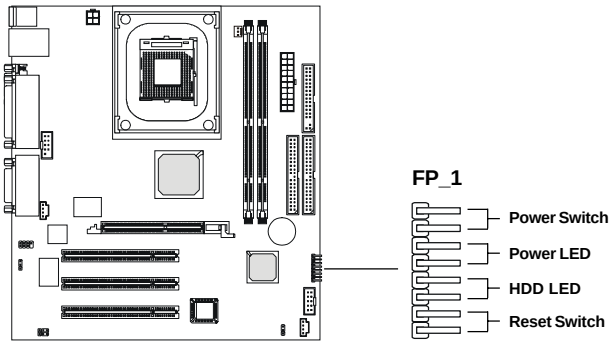
Note:

1. Always consult the vendor for proper CPU cooling fan.

2. CPU Fan supports the fan control. You can install the PC Alert utility that will automatically control the CPU Fan speed according to the actual CPU temeperature.

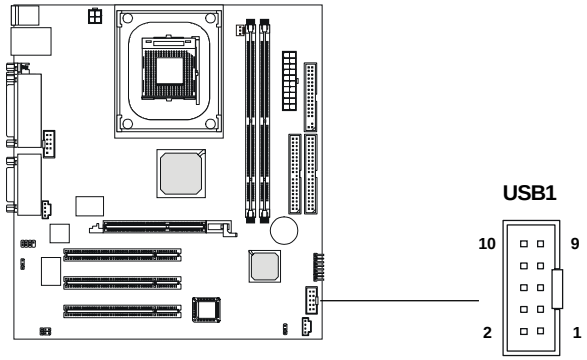
Front Panel Connectors: FP_1

The case connector block FP_1 allows you to connect to the Power Switch, Reser Switch, Speaker, Power LED, and HDD LED on the case.



Front USB Connector: USB1

The mainboard provides a front Universal Serial Bus connector for users to connect to USB port.

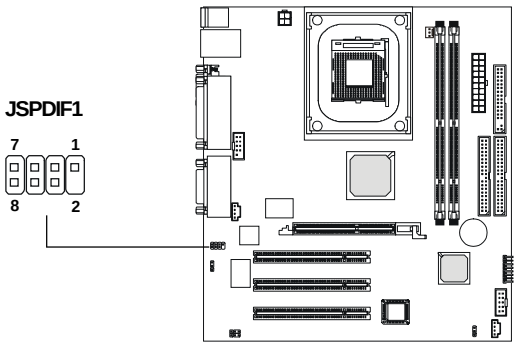


USB1 Pin Definition

Pin	Description	Pin	Description
1	USBPWR	2	GND
3	USBDT2-	4	GND
5	USBDT2+	6	USBDT3+
7	GND	8	USBDT3-
9	GND	10	USBPWR

SPDIF Bracket Jumper: JSPDIF1

The mainboard comes with a jumper for users to connect an optional bracket for SPDIF output and input.



JSPDIF1 Pin Definition

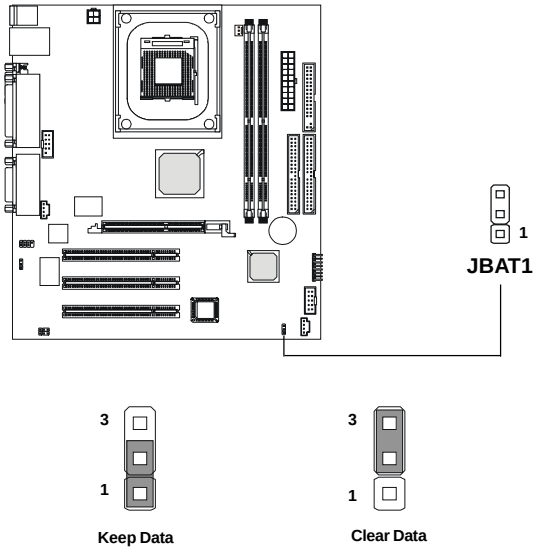
Pin	Description	Pin	Description
1	+12V	2	NC
3	NC	4	SPDIFO
5	SPDIFI	6	GND
7	SPDIF2	8	SPGPIO

Jumpers

The motherboard provides the following jumpers for you to set the computer's function. This section will explain how to change your motherboard's function through the use of these jumpers.

Clear CMOS Jumper: JBAT1

There is a CMOS RAM on board that has a power supply from external battery to keep the data of system configuration. With the CMOS RAM, the system can automatically boot OS every time it is turned on. If you want to clear the system configuration, use the JBAT1 (Clear CMOS Jumper) to clear data. Follow the instructions below to clear the data:

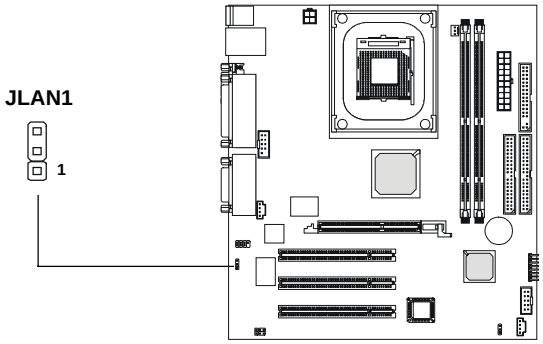


WARNING!

You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

LAN Enable/Disable Jumper: JLAN1

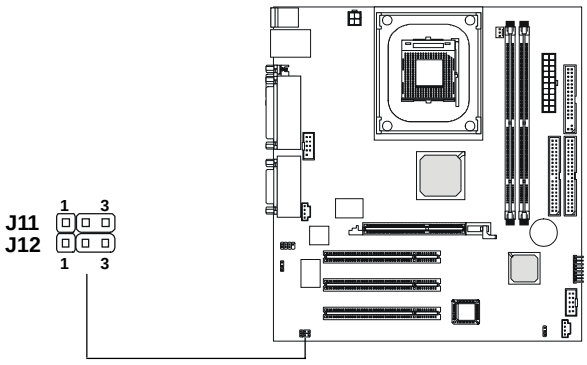
Use the jumper to enable or disable the onboard LAN function. Follow the instructions below to clear the data:

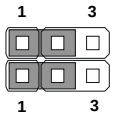


LAN Enable　　LAN Disable

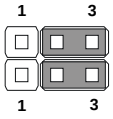
Center/Bass Setting Jumper: J11 & J12

The mainboard comes with two Jumpers for users to set up their center or bass speaker. If you connect a pair of speakers which supports bass through the Center/Bass audio connector *(refer to P.2-11)*, you may need to set up which speaker can output bass in order to get a better sound effect. If you merely connect a single center or bass speaker, the setting of these two jumpers will be invalid. Follow the instructions below to set up the speakers:





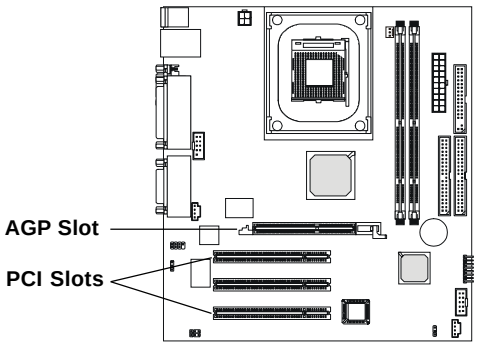
Set the center speaker to the left and woofer to the right



Set the center speaker to the right and woofer to the left

Slots

The motherboard provides three 32-bit Master PCI bus slots and one AGPslot.



AGP (Accelerated Graphics Port) Slot

The AGP slot allows you to insert the AGP graphics card. AGP is an interface specification designed for the throughput demands of 3D graphics. It introduces a 66MHz, 32-bit channel for the graphics controller to directly access main memory and provides three levels of throughputs: 1x (266Mbps), 2x (533Mbps) and 4x (1.07Gbps).

PCI Slots

Three PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration.

PCI Interrupt Request Routing

The IRQ, abbreviation of interrupt request line and pronounced I-R-Q, are hardware lines over which devices can send interrupt signals to the microprocessor. The PCI IRQ pins are typically connected to the PCI bus INT A# ~ INT D# pins as follows:

	Order 1	Order 2	Order 3	Order 4
PCI Slot 1	INT A#	INT B#	INT C#	INT D#
PCI Slot 2	INT B#	INT C#	INT D#	INT A#
PCI Slot 3	INT C#	INT D#	INT A#	INT B#

Using SPDIF & 4-/6-channel Audio Function A

The mainboard comes with C-Media 6-channel audio function, which allows you to attach digital audio device or 4/6 speakers for better space sound effect. The section will tell you how to activate SPDIF or 4-/6-channel audio function.

TOPICS

Installing C-Media Drivers

The mainboard is able to active the audio connectors from 2-channel to 4-/6-channel or the SPDIF connectors. To use the function, you need to install the C-Media drivers.

To install C-Media drivers:

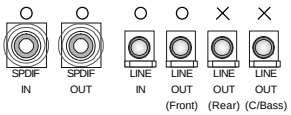
1. Insert the companion CD into the CD-ROM drive. The setup screen will automatically appear.
2. Click on **C-Media Sound Drivers**.
3. Follow the on-screen instructions to complete installation.
4. Restart the system.

> ***Note:*** *For Windows NT4.0, you need to install the C-Media Sound Drivers* ***manually****.*

Hardware Configuration

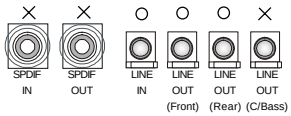
After installing the C-Media drivers, you can attach the speakers for 4-/6-channel audio output. Always connect the speakers to the LINE OUT connectors. The SPDIF is void when 4-/6-channel audio output is active. Different connector configurations for 2-/4-/6-channel operations are listed below:

2-Channel



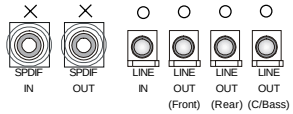
In 2-channel configuration, Line In, Line Out (Front) and SPDIF connectors are active.

4-Channel



When set to 4-channel configuration,Line In, Line Out (Front) and Line Out (Rear) connectors are active.

6-Channel



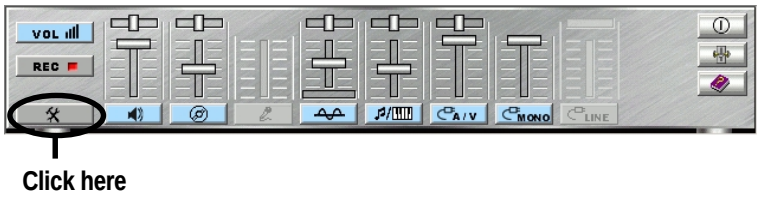
When set to 6-channel configuration, Line In, Line Out (Front), Line Out (Rear), Line Out (C/Bass) connectors are active.

Software Configuration

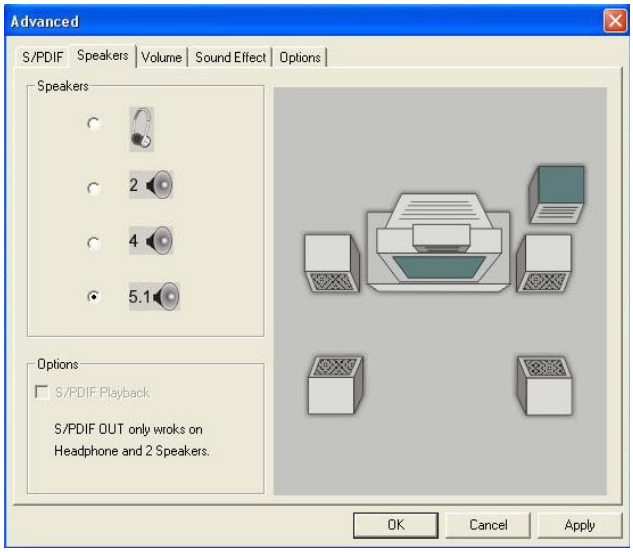
To have 4-/6-channel audio work, you must set appropriate configuration in the C-Media software application.

To set the multi-channel configuration:

1. Click the C-Media Mixer icon from the window tray on the bottom.
2. The following screen appears. Click the indicated button.



3. The "Advanced" window appears.



4. Select 5.1 for 6-channel or 4 for 4-channel audio output.
5. Click OK.