



Getting Started

Thank you for purchasing the MS-6785 v1.X Micro ATX mainboard. The MS-6785 is based on **SiS®648FX** & **SiS®963** chipsets for optimal system efficiency. Designed to fit the advanced Intel® Pentium® 4 processors in the 478 pin package, the MS-6785 delivers a high performance and professional desktop platform solution.

Mainboard Specifications

CPU

- ▶ Socket 478 for P4 processors with 400/533/800 MHz (100/133/200MHz QDIR).
- ▶ Core frequency up to 3.2GHz.

Chipset

- ▶ SiS[®]648FX (839 pin BGA)
 - Supports Intel[®] Pentium[®] 4 processors with data transfer rate up to 800 MHz.
 - Supports 64-bit high performance DDR400/333/266 memory controller.
 - Supports AGP 8X/4X interface at 0.8v or 4x at 1.5v with fast write transaction.
 - Supports bi-directional 16-bit data bus with 1GHz bandwidth MuTIOL.
- ▶ SiS[®]963 (371 pin BGA)
 - Supports high throughput SiS MuTIOL 1GHz interconnecting to SiS[®]963 media I/O.
 - Supports Dual-IDE ATA 66/100/133.
 - Integrated Direct Sound AC97 audio.
 - Low pin count interface for SIO.
 - Advanced power management and PC2001 compliance.
 - High speed USB 2.0 controller, 480Mb/s.

MainMemory

- ▶ Supports four memory banks using two 184-pin DDR DIMMs.
- ▶ Supports up to 2GB PC3200/2700/2100DDR SDRAMs.
- ▶ Supports 2.5v DDR SDRAM.

Slots

- ▶ One AGP (Accelerated Graphics Port) slot
 - Supports AGP 3.0 4x/8x.
- ▶ Three 32-bit PCI bus slots.
 - Support 3.3v/5v PCI bus interface.
 - The second PCI slot in *BLUE* supports 2 master devices.

On-BoardIDE

- ▶ Dual IDE controllers integrated in SiS 963.
- ▶ Supports P/O, Bus Master, Ultra DMA66/100/133 operation.
- ▶ Can connect up to four IDE devices.

On-Board Peripherals

- ▶ On-Board Peripherals include:
 - One floppy port supports 2 FDDs with 360K, 720K, 1.2M, 1.44M and 2.88Mbytes
 - One serial port (COM A)
 - One parallel port supports SPP/EPP/ECP mode (Optional)
 - One RJ-45 LAN port
 - Vertical audio ports
 - One RCA_SPDIF In & one RCA_SPDIF Out
 - Three 1394 ports [Rear x 2 (6 / 4 pins) + Front x 1 (6 pins)]
 - Six USB 2.0 ports (Rear * 2/ Front * 4)

OnboardIEEE1394

- ▶ Integrated in SiS®963.
- ▶ Agere FW803 PHY.

Audio

- ▶ S/W C-Media 9739A 5.1 channel with SPDIF in/out.

LAN

- ▶ VIA® VT6103 LAN controller.

BIOS

- ▶ The mainboard BIOS provides “Plug & Play” BIOS which detects the peripheral devices and expansion cards of the board automatically.
- ▶ The mainboard provides a Desktop Management Interface (DMI) function which records your mainboard specifications.

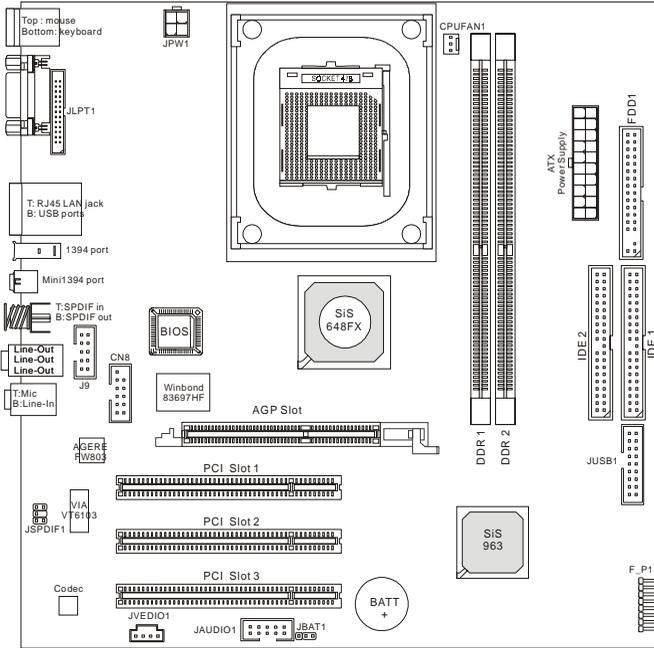
Dimension

- ▶ Micro ATX Form Factor: 24.0 cm x 24.5 cm.

Mounting

- ▶ 6 mounting holes.

Mainboard Layout



MS-6785v1.X Micro ATX Mainboard

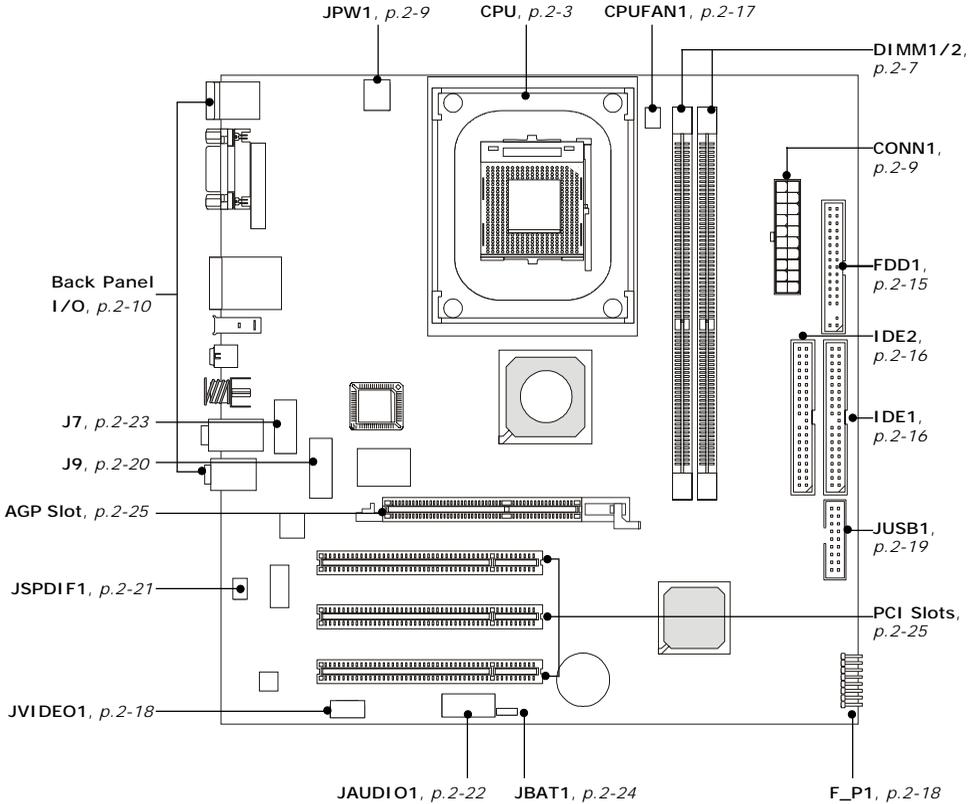
2

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.

Quick Components Guide



Central Processing Unit: CPU

The mainboard supports Intel® Pentium® 4 processors 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 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
		=	1.4 GHz



MSI Reminds You...

Overheating

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

Replacing the CPU

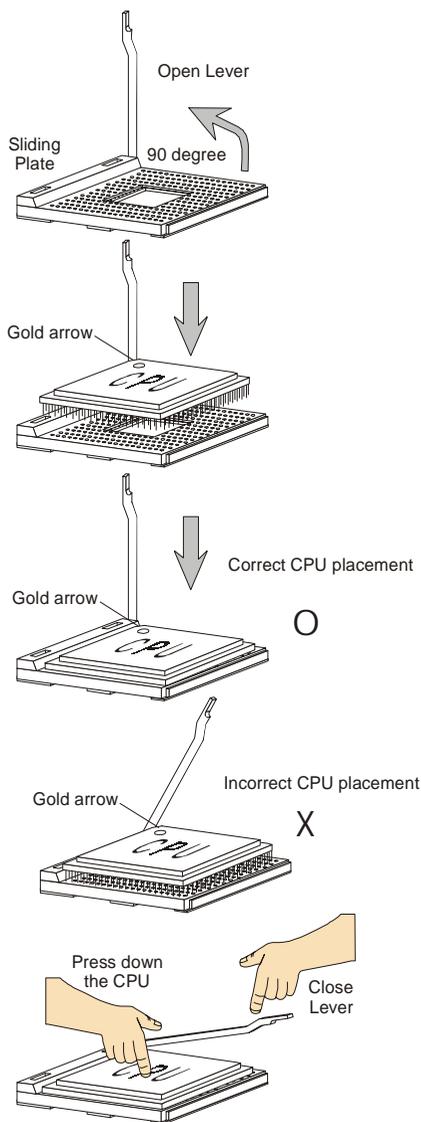
While replacing the CPU, always turn off the ATX power supply or unplug the power supply's power cord from grounded outlet first to ensure the safety of CPU.

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.***

CPU Installation Procedures for Socket 478

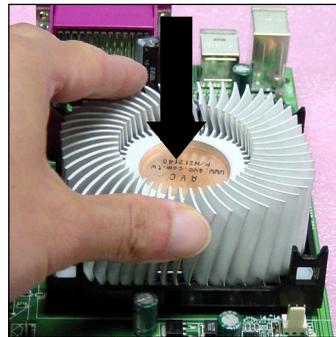
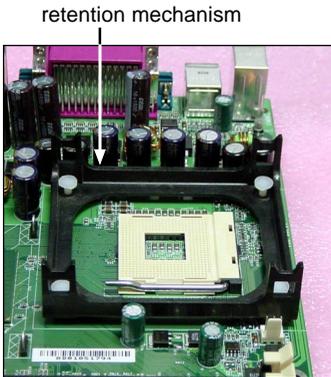
1. Please turn off the power and unplug the power cord before installing the CPU.
2. Pull the lever sideways away from the socket. Make sure to raise the lever up to a 90-degree angle.
3. Look for the gold arrow. The gold arrow should point towards the lever pivot. The CPU can only fit in the correct orientation.
4. If the CPU is correctly installed, the pins should be completely embedded into the socket and can not be seen. Please note that any violation of the correct installation procedures may cause permanent damages to your mainboard.
5. Press the CPU down firmly into the socket and close the lever. As the CPU is likely to move while the lever is being closed, always close the lever with your fingers pressing tightly on top of the CPU to make sure the CPU is properly and completely embedded into the socket.



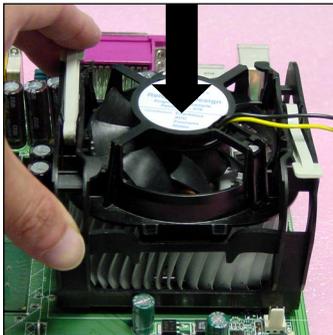
Installing the CPU Fan

As processor technology pushes to faster speeds and higher performance, thermal management becomes increasingly important. To dissipate heat, you need to attach the CPU cooling fan and heatsink on top of the CPU. Follow the instructions below to install the Heatsink/Fan:

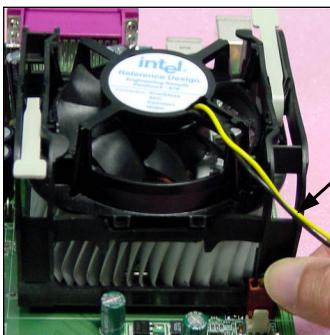
1. Locate the CPU and its retention mechanism on the motherboard.
2. Position the heatsink onto the retention mechanism.



3. Mount the fan on top of the heatsink. Press down the fan until its four clips get wedged in the holes of the retention mechanism.
4. Press the two levers down to fasten the fan. Each lever can be pressed down in only ONE direction.



5. Connect the fan power cable from the mounted fan to the 3-pin fan power connector on the board.



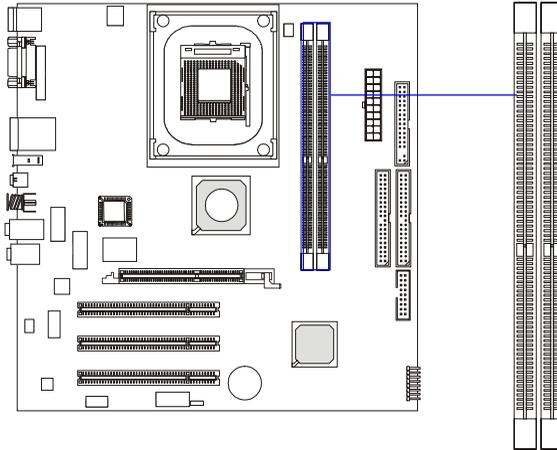
fan power cable



NOTES

Memory

The mainboard provides 2 slots for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) modules and supports the memory size up to 2GB. You can install PC2700/DDR333, PC2100/DDR266 or PC1600/DDR200 modules on the DDR DIMM slots (DIMM 1~2).



**DDR DIMM Slots
(DIMM 1~2)**

Introduction to DDR SDRAM

DDR (Double Data Rate) SDRAM is similar to conventional SDRAM, but doubles the rate by transferring data twice per cycle. It uses 2.5 volts as opposed to 3.3 volts used in SDR SDRAM, and requires 184-pin DIMM modules rather than 168-pin DIMM modules used by SDR SDRAM. High memory bandwidth makes DDR an ideal solution for high performance PC, workstations and servers.

DIMM Module Combination

Install at least one DIMM module on the slots. 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 & 1)	S/D	64MB~1GB
DIMM 2 (Bank 2 & 3)	S/D	64MB~1GB
Maximum System Memory Supported		64MB~2GB

S: Single Side

D: Double Side

Installing DDR Modules

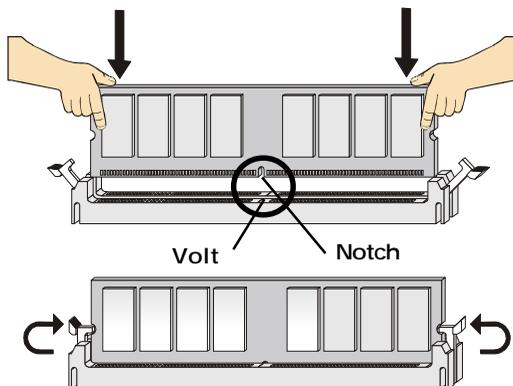
1. The DDR DIMM has only one notch on the center of module. The module will only fit in the right orientation.
2. Insert the DIMM memory module vertically into the DIMM slot. Then push it in until the golden finger on the memory module is deeply inserted in the socket.



MSI Reminds You...

You can barely see the golden finger if the module is properly inserted in the socket.

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



Power Supply

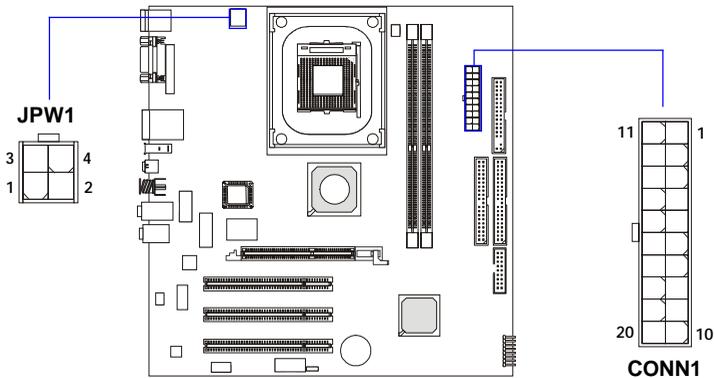
The mainboard supports ATX power supply for the power system. Before inserting the power supply connector, always make sure that all components are installed properly to ensure that no damage will be caused.

ATX 20-Pin Power Connector: CONN1

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

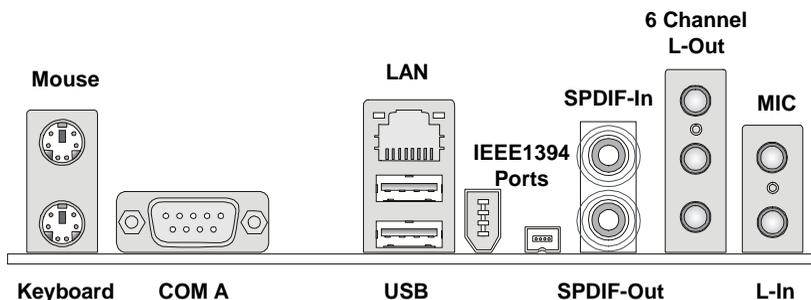
PIN	SIGNAL
1	GND
2	GND
3	12V
4	12V

CONN1 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

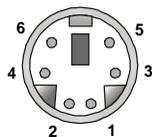
Back Panel

The back panel provides the following connectors:



Mouse/Keyboard Connector

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



**PS/2 Mouse/Keyboard
(6-pin Female)**

Pin Definition

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

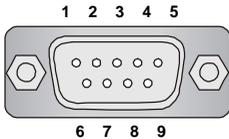
SPDIF Connectors

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



Serial Port Connector: COM A

The mainboard offers one 9-pin male DIN connectors as serial port COM A. This port is a 16550A high speed communication port that sends/receives 16 bytes FIFOs. You can attach a serial mouse or other serial devices directly to this connector.



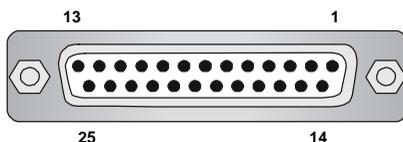
9-Pin Male DIN Connector

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

Parallel Port Connector: LPT1

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

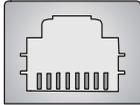


Pin Definition

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

RJ-45 LAN Jack (Optional)

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.



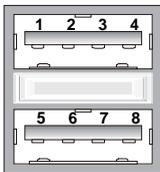
RJ-45 LAN Jack

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

USB Connectors

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



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

IEEE1394 Ports

The mainboard provides two IEEE 1394 ports. The mini IEEE1394 port is designed for you to connect the IEEE1394 device with external power. The standard IEEE1394 port connects to IEEE1394 devices without external power. The IEEE1394 high-speed serial bus complements USB by providing enhanced PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances, storage peripherals, other PCs, and portable devices.



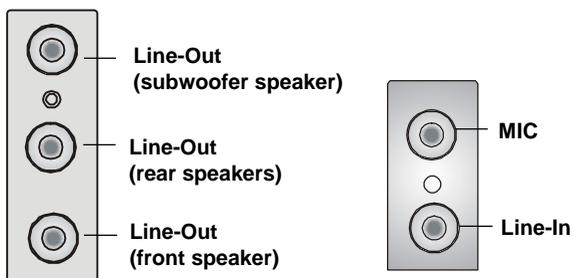
**IEEE1394 Port
(Standard)**



**IEEE1394 Port
(Mini)**

Audio Port Connectors

Line Out is a connector for Speakers or Headphones. **Line In** is used for external CD player, Tape player, or other audio devices. **Mic** is a connector for microphones.

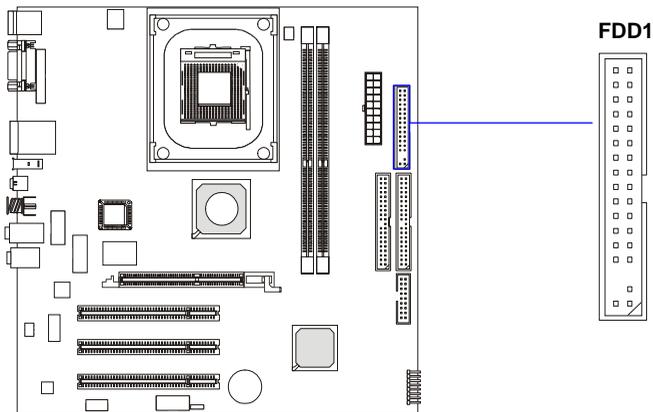


Connectors

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

Floppy Disk Drive Connector: FDD1

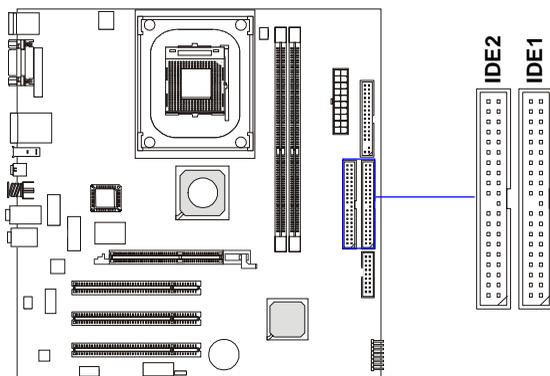
The mainboard provides a standard floppy disk drive connector that supports 360K, 720K, 1.2M, 1.44M and 2.88M floppy disk types.



Hard Disk Connectors: IDE1 & IDE2

The mainboard has a 32-bit Enhanced PCI IDE and Ultra ATA 33/66/100/133 controller that provides PIO mode 0~4, Bus Master, and Ultra ATA 33/66/100/133 function. You can connect up to four hard disk drives, CD-ROM, 120MB Floppy (reserved for future BIOS) and other devices.

The Ultra ATA 133 interface boosts data transfer rates between the computer and the hard drive up to 133 megabytes (MB) per second. The new interface is one-third faster than earlier record-breaking Ultra ATA/100 technology and is backwards compatible with the existing Ultra ATA interface.



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.

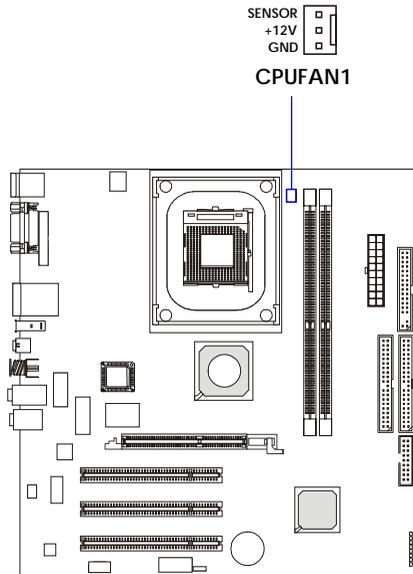


MSI Reminds You...

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.

Fan Power Connectors: CPUFAN1

The CPUFAN1 (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.

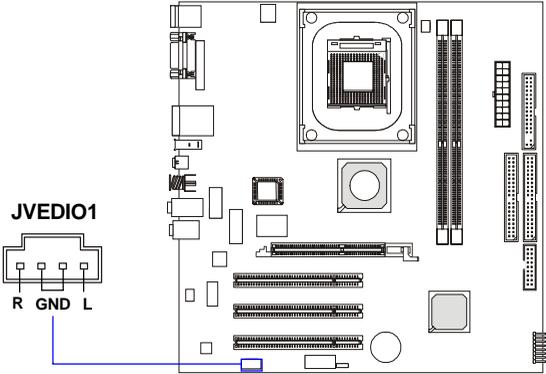


MSI Reminds You...

Always consult the vendors for proper CPU cooling fan.

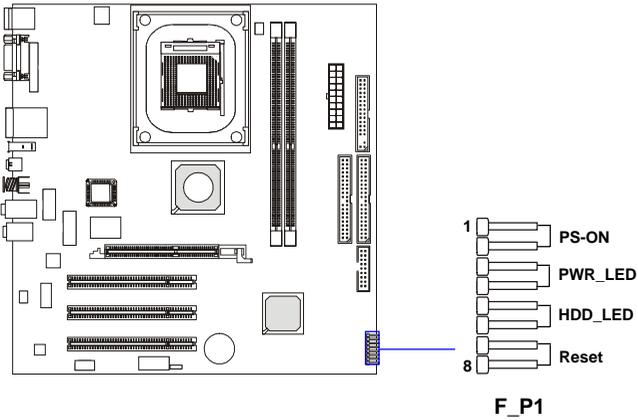
CD-In Connector: JVIDEO1

The connector is for CD-ROM video connector.



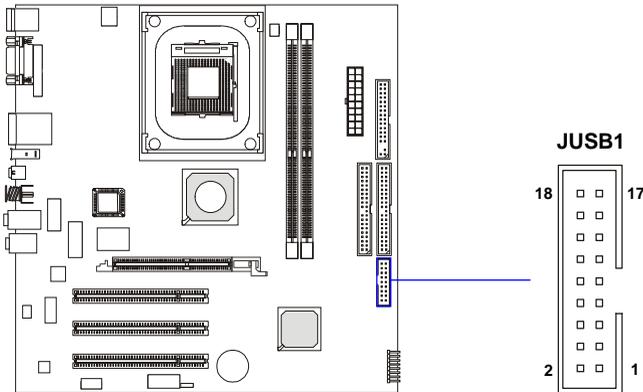
Front Panel Connector: F_P1

The mainboard provides one front panel connector for electrical connection to the front panel switches and LEDs.



Front USB Connector: JUSB1

The mainboard provides one USB 2.0 pin header *JUSB1* (optional USB 2.0 bracket available) that is compliant with Intel® I/O Connectivity Design Guide. USB 2.0 technology increases data transfer rate up to a maximum throughput of 480Mbps, which is 40 times faster than USB 1.1, and is ideal for connecting high-speed USB interface peripherals such as **USB HDD, digital cameras, MP3 players, printers, modems and the like.**

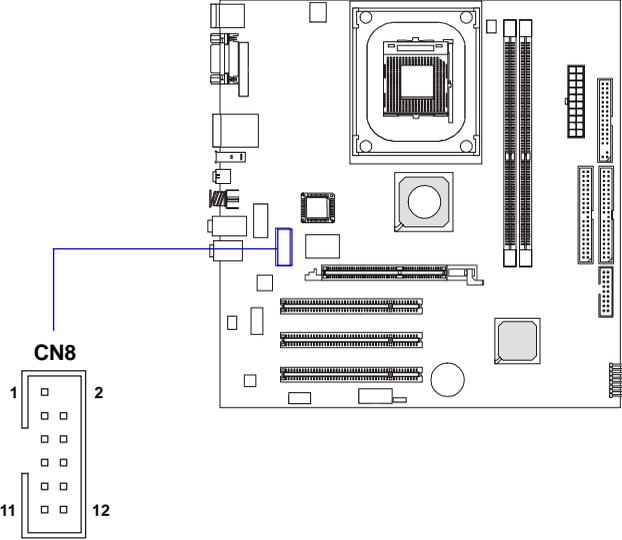


JUSB1 Pin Definition

Pin	Description	Pin	Description
1	Power	2	Power
3	D1+	4	D0+
5	D1-	6	D0-
7	GND	8	GND
9	SGND	10	SGND
11	GND	12	GND
13	D3-	14	D2-
15	D3+	16	D2+
17	Power	18	Power

Joystick/Game Connector: CN8 (Optional)

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

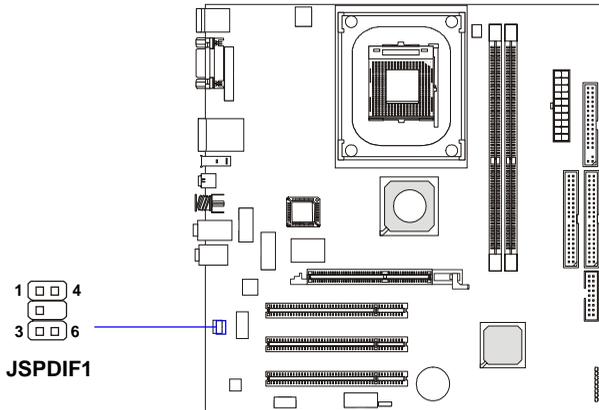


J9 Pin Definition

Pin	Description	Pin	Description
1	FVCC5 (power)	2	Key pin
3	RXD	4	GP4
5	GP5	6	GP6
7	GP7	8	GP2
9	GP1	10	GP0
11	GP3	12	TXD

SPDIF Connector: JSPDIF1

The connector is used to connect an optional bracket for SPDIF (Sony & Philips Digital Interconnect Format) digital audio transmission.

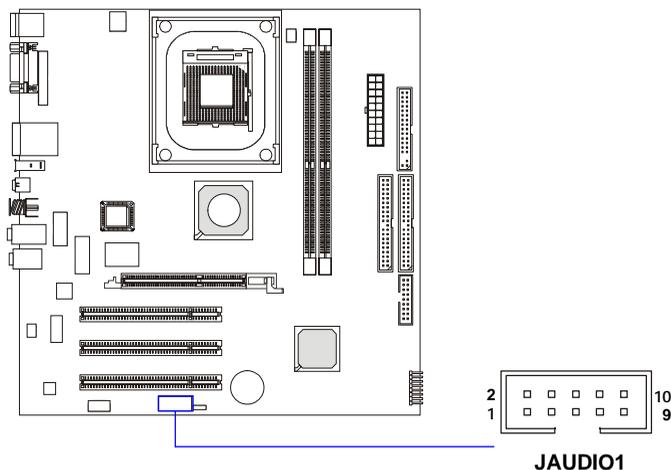


JSPDIF1 Pin Definition

Pin	Description	Pin	Description
1	VCC5	2	VCC3
3	SPDIF-O	4	NC
5	GND	6	SPDIF-I

Front Panel Audio Connector: JAUDIO1

The JAUDIO1 front panel audio connector allows you to connect front panel audio devices if available.



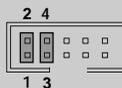
JAUDIO1 Pin Definition

Pin	Description	Pin	Description
1	Speaker_R	2	Front_R
3	Speaker_L	4	Front_L
5	GND	6	GND
7	MIC_IN	8	Line_Next_R
9	MIC_IN_S	10	Line_Next_L



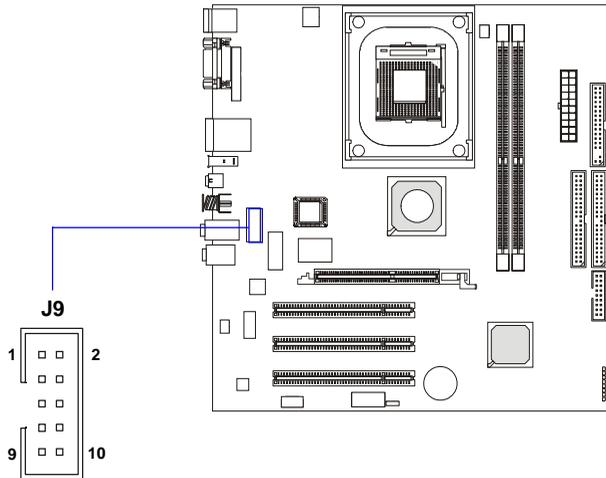
MSI Reminds You...

If you don't want to connect to the front audio header, pins 1 & 2, 3 & 4 have to be jumpered in order to have signal output directed to the rear audio ports. Otherwise, the Line-Out connector on the back panel will not function.



IEEE 1394 Connector: J9 (Optional)

The mainboard provides one IEEE1394 connector with housing that allows you to connect optional IEEE 1394 ports.

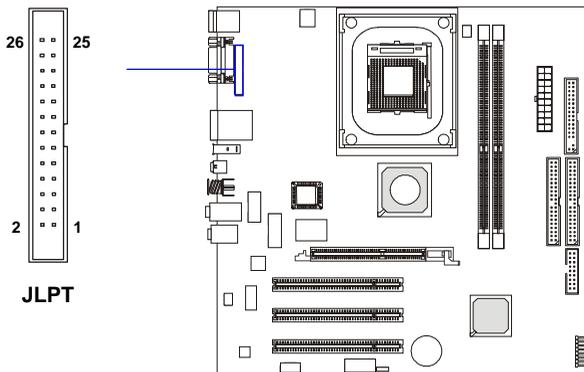


Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	IEGND	2	GND
3	TPA0-	4	TPA0+
5	Power	6	Power
7	TPB0+	8	TPB0-
9	GND	10	IEGND

Print Port: JLPT

This mainboard provides a pin header, JLPT, for connecting a printer.



Pin Definition

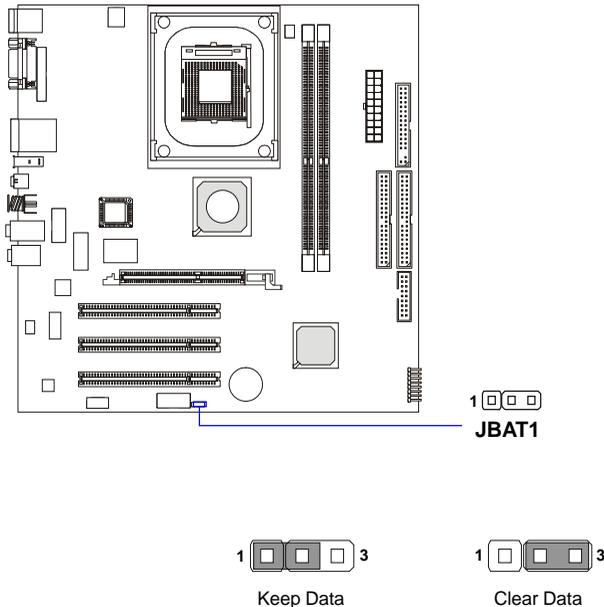
PIN	DESCRIPTION
1	STROBE
2	DATA0
3	DATA1
4	DATA2
5	DATA3
6	DATA4
7	DATA5
8	DATA6
9	DATA7
10	ACK#
11	BUSY
12	PE
13	SELECT
14	AUTO FEED#
15	ERR#
16	INIT#
17	SLIN#
18	GND
19	GND
20	GND
21	GND
22	GND
23	GND
24	GND
25	GND
26	NC

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 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:

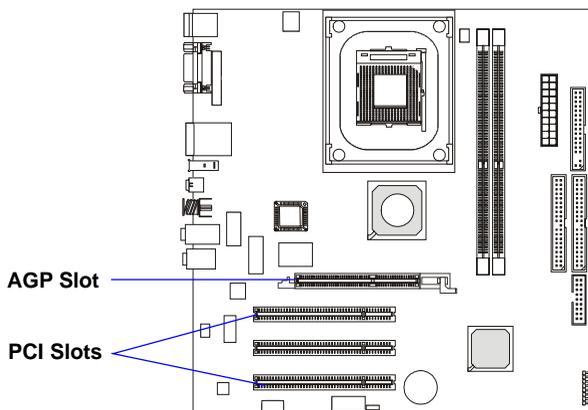


MSI Reminds You...

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.

Slots

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



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. The onboard AGP slot supports up to 8X AGP card.

PCI (Peripheral Component Interconnect) Slots

The 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. ***The second PCI slot (in BLUE color) supports 2 master devices.***

PCI Interrupt Request Routing

The IRQ, acronym 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#