



Getting Started

Thank you for purchasing the MD-8088 v1.X M-ATX mainboard. The MD-8088 is based on **Intel® 865PE & Intel® ICH5** chipsets for optimal system efficiency. Designed to fit the advanced **Intel® Pentium 4** processor in the 478-pin package, MD-8088 delivers a high performance and professional desktop platform solution.

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Mainboard Specifications

CPU

- Supports Socket 478 for Intel® Pentium 4 (Socket 478) Northwood processor
- Supports up to 3.2 GHz P4 processor

Chipsets

- Intel® Springdale-865PE chipset
 - Supports AGP 8x/4x at 0.8V (AGP 3.0) or 4x at 1.5V (not supports 3.3V)
 - Supports 133/166/200MHz memory FSB
 - Supports 400/533/800MHz Intel NetBurst micro-architecture bus.
- Intel® ICH5 chipset (421 mBGA)
 - AC'97 2.3 interface
 - 8 USB 2.0/1.1 ports
 - 2 channel Ultra ATA/100 Bus Master IDE controller
 - SMBus 2.0 support

Main Memory

- Supports eight memory banks using four 184-pin unbuffered DIMM
- Supports dual-channel function
- Max memory size is 4GB without ECC
- Supports DDR266/DDR333/DDR400 memory module

Slots

- Three 32-bit Master PCI Bus slot
- One mini PCI slot
- One AGP(Accelerated Graphic Port) slot

On-Board IDE

- An IDE controller on the ICH5 chipset provides IDE HDD/CD-ROM with PIO, Bus Master and Ultra DMA66/100/133 operation modes.
- Can connect up to four IDE devices.

On-Board Peripherals

- On-Board Peripherals include:
 - 1 floppy port supports 2 FDD with 360K, 720K, 1.2M, 1.44M and 2.88 Mbytes.
 - 1 serial port
 - 1 parallel port supports SPP/EPP/ECP mode

- 8 USB 2.0 / 1.1 ports (Rear*4 / Front*4)
- 1 Front USB 1.1 port for Card Reader
- 1 RJ45 connector
- 1 Rear 1394 port (6 Pins) / 1 Front 1394 port (4/6 Pins)
- 1 Optical SPDIF-In / 1 Optical SPDIF-Out
- 1 Coaxial SPDIF-In / 1 Coaxial SPDIF-Out
- 4 Line-Out / 1 Line-In

Audio

- S/W C-Media 9780 7.1 channel with SPDIF in/out.

LAN

- VIA® VT6105L LAN Controller

IEEE 1394(Optional)

- VIA® VT6306 / VT6307 PCI 1394a Integrated Host 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

- M-ATX Form Factor: 24.38 cm (L) x 24.38 cm (W)

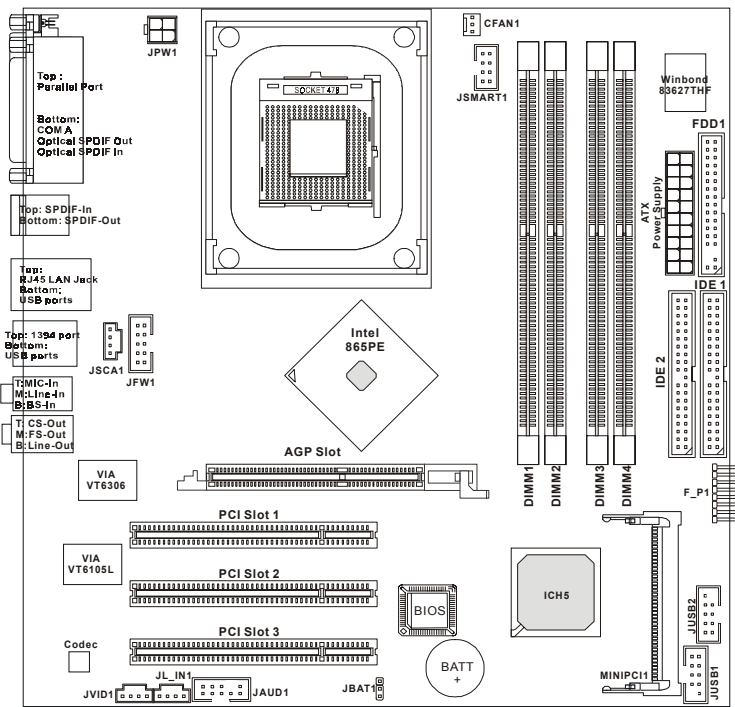
Mounting

- 6 mounting holes

Others

- Support STR/STD
- PC 2001 compliant

Mainboard Layout



MD-8088 v1.X M-ATX Mainboard

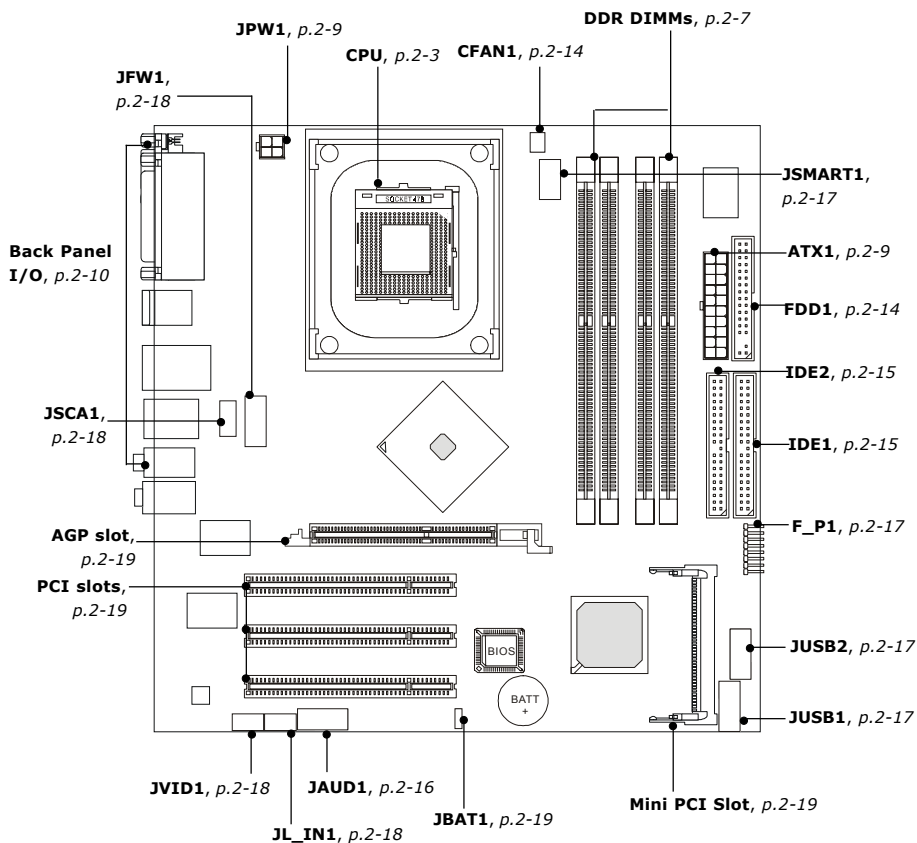
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Hardware Setup

This chapter tells you how to install the CPU, memory modules, and expansion cards, as well as how to setup the jumpers on the mainboard. Also, it provides the instructions on connecting the peripheral devices, such as the mouse, keyboard, etc.

While doing the installation, be careful in holding the components and follow the installation procedures.

Quick Components Guide

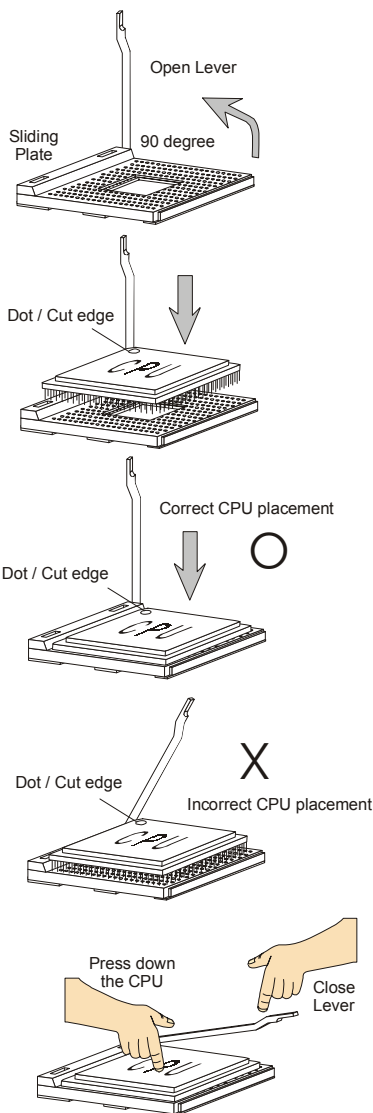


Central Processing Unit: CPU

The mainboard supports Intel® Pentium® 4 Northwood 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 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 cut edge. The cut edge 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.
4. Press the two levers down to fasten the fan. Each lever can be pressed down in only ONE direction.

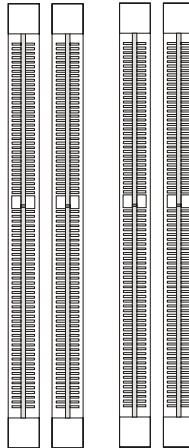
5. Connect the fan power cable from the mounted fan to the 3-pin fan power connector on the board.



NOTES

Memory

The mainboard provides 4 slots for 184-pin DDR SDRAM DIMM (Double In-Line Memory Module) modules and supports the memory size up to 4GB. You can install DDR400/DDR333 modules on the DDR DIMM slots (DIMM 1~4).



**DDR DIMM Slots
(DIMM 1~4)**

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. Please note that the DDR SDRAM does not support ECC (error correcting code) and registered DIMM.

DDR Population Rules

Install at least one DIMM module on the slots. Each DIMM slot supports up to a maximum size of 1GB. Users can install either single- or double-sided modules to meet their own needs. Please note that ***each DIMM can work respectively for single-channel DDR, but there are some rules while using dual-channel DDR*** (Please refer to the suggested DDR population table on p. 2-8). Users may install memory modules of different type and density on

different-channel DDR DIMMs. However, the **same type and density memory modules** are necessary while using dual-channel DDR, or instability may happen.

Please refer to the following table for detailed dual-channel DDR. Other combination not listed below will function as single-channel DDR.

DIMM1 (Ch A)	DIMM2 (Ch A)	DIMM3 (Ch B)	DIMM4 (Ch B)	System Density
128MB~1GB		128MB~1GB		256MB~2GB
	128MB~1GB		128MB~1GB	256MB~2GB
128MB~1GB	128MB~1GB	128MB~1GB	128MB~1GB	512MB~4GB

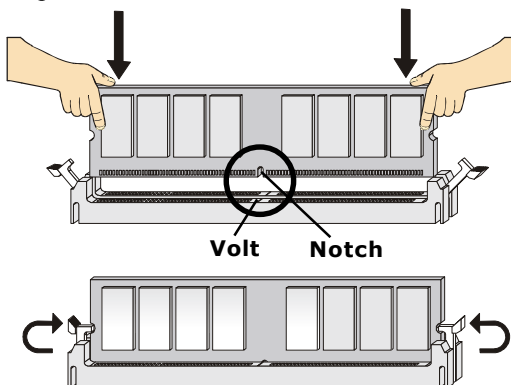


MSI Reminds You...

*Dual-channel DDR works **ONLY** in the 3 combinations listed in the table above.*

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



MSI Reminds You...

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

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.

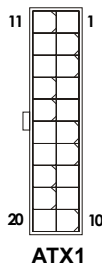
ATX 20-Pin Power Connector: ATX1

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.

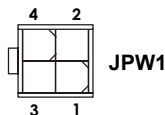
ATX 12V Power Connector: JPW1

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

ATX1 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



JPW1 Pin Definition

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

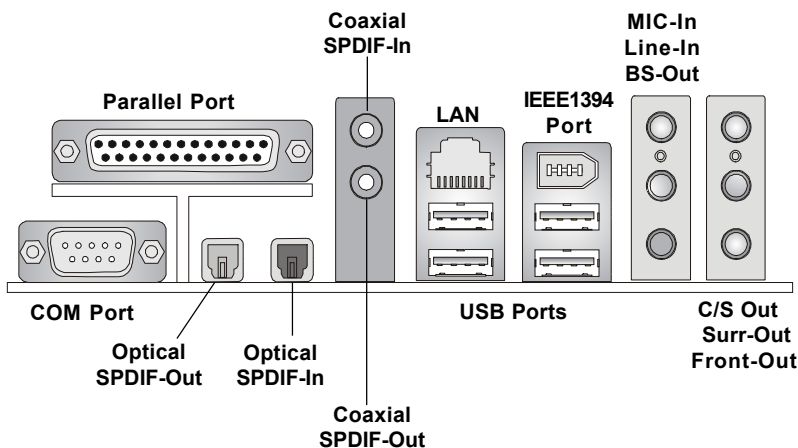


MSI Reminds You...

Power supply of 300 (and up) watt is highly recommended for system stability.

Back Panel

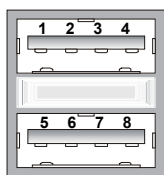
The back panel provides the following connectors:



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 Port Description

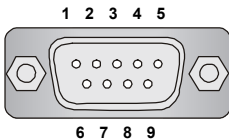


USB Ports

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

Serial Port Connector: COM Port

The mainboard offers one 9-pin male DIN connectors as serial port COM port. 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.



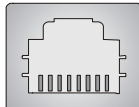
9-Pin Male DIN Connector

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

RJ-45 LAN Jack

The mainboard provides a RJ-45 connector that allows your computer to be connected to a network environment.

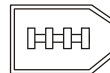


**LAN Jack
(RJ-45)**

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

IEEE1394 Port

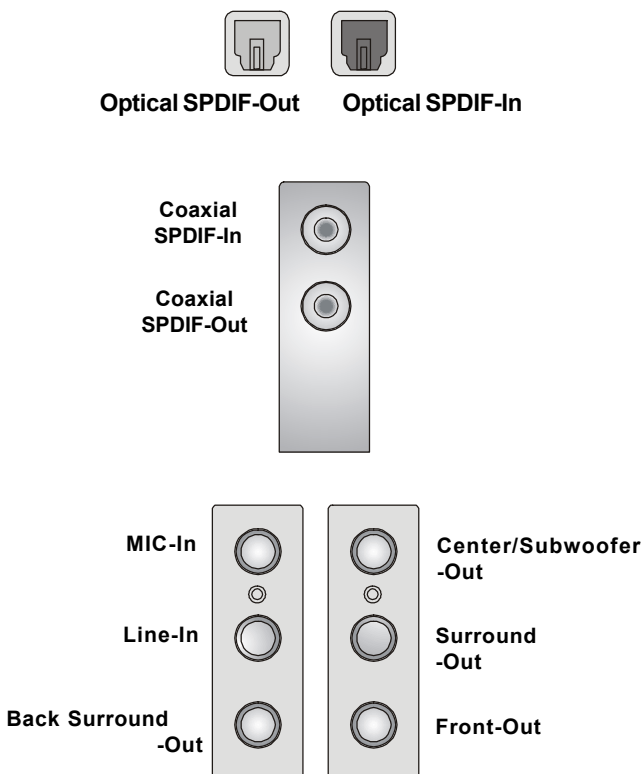
The mainboard provides a rear IEEE 1394 port. The standard IEEE1394 port connects to IEEE1394 devices without external power. The IEEE1394 high-speed serial bus complements USB by providing enhanced PC connectivity for a wide range of devices, including consumer electronics audio/video (A/V) appliances,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



**IEEE1394
Port
(Standard)**

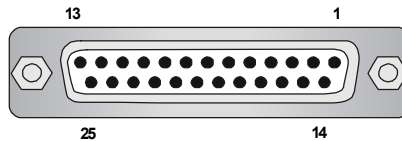
Audio Port Connectors

This mainboard supports 7.1-channel audio operation. To have correct audio operation, please connect the speakers to the proper connectors as illustrated below. The Optical/Coaxial SPDIF connectors provided on the back panel also can be used to connect your digital audio equipment.



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

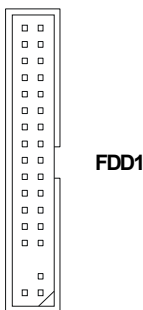
PIN	SIGNAL	DESCRIPTION
1	STROBE	Strobe
2	DATA0	Data0
3	DATA1	Data1
4	DATA2	Data2
5	DATA3	Data3
6	DATA4	Data4
7	DATA5	Data5
8	DATA6	Data6
9	DATA7	Data7
10	ACK#	Acknowledge
11	BUSY	Busy
12	PE	PaperEnd
13	SELECT	Select
14	AUTO FEED#	Automatic Feed
15	ERR#	Error
16	INIT#	Initialize Printer
17	SLIN#	Select 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, 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.



Fan Power Connectors: CFAN1

The CFAN1 (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.

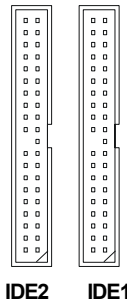


MSI Reminds You...

Always consult the vendors for proper CPU cooling fan.

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 DMA33/66/100 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.

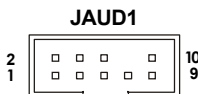


MSI Reminds You...

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.

Front Panel Audio Connector: JAUD1

The JAUD1 front panel audio connector allows you to connect front panel audio devices if available.



JAUD1 Pin Definition

PIN	SIGNAL	DESCRIPTION
1	AUD_MIC	Front panel microphone input signal
2	AUD_GND	Ground used by analog audio circuits
3	AUD_MIC_BIAS	Microphone power
4	AUD_VCC	Filtered +5V used by analog audio circuits
5	AUD_FPOUT_R	Right channel audio signal to front panel
6	AUD_RET_R	Right channel audio signal return from front panel
7	HP_ON	Reserved for future use to control headphone amplifier
8	KEY	No pin
9	AUD_FPOUT_L	Left channel audio signal to front panel
10	AUD_RET_L	Left channel audio signal return from front panel



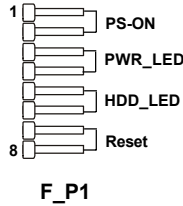
MSI Reminds You...

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.



Front Panel Connector: F_P1

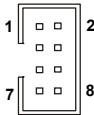
The mainboard provides one front panel connector for electrical connection to the front panel switches and LEDs.



Smart Card Reader Connector: JSMART

The mainboard provides one smart card reader header for users to connect to smart card interface.

JSMART1

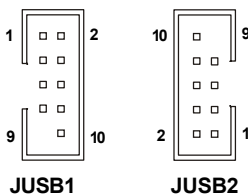


Pin Definition

Pin	Signal	Pin	Signal
1	VCC5	2	SCRST#
3	SCPWR#	4	SCPSNT
5	GND	6	SCIO
7	SCLED	8	SCCLK

Front USB Connectors: JUSB1 / JUSB2

The mainboard provides two USB 2.0 pin header JUSB1 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.**

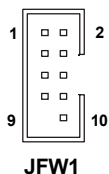


JUSB1/2 Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	VCC	2	VCC
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	GND	8	GND
9	Key	10	USBOC

IEEE 1394 Connectors: JFW1

The mainboard provides one IEEE1394 pin header that allows you to connect IEEE 1394 port via front panel.

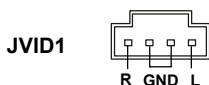


Pin Definition

PIN	SIGNAL	PIN	SIGNAL
1	TPA+	2	TPA-
3	Ground	4	Ground
5	TPB+	6	TPB-
7	Cable power	8	Cable power
9	Key (no pin)	10	Ground

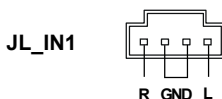
Video-In Connector: JVID1

The connector is for CD-ROM video connector.



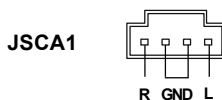
Front Audio Line-In Connector: JL_IN1

The JL_IN1 Front Audio Line-In connector allows you to connect front panel audio devices if available.



Front Audio Line-In Connector: JSCA1

The JSCA1 connector is used to connect to the scart audio output in Europe.

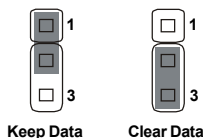


Jumpers

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. That battery has long life time for at least 5 years. 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:



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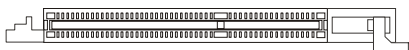
You can clear CMOS by shorting 2-3 pin while the system is off. Then return to 1-2 pin position. Avoid clearing the CMOS while the system is on; it will damage the mainboard.

Slots

The motherboard provides one AGP slot and five 32-bit 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 slot supports 8x/4x AGP card.



AGP Slot

PCI (Peripheral Component Interconnect) Slots

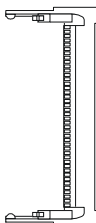
The PCI slots allow you to insert the expansion cards to meet your needs. When adding or removing expansion cards, make sure that you unplug the power supply first. Meanwhile, read the documentation for the expansion card to make any necessary hardware or software settings for the expansion card, such as jumpers, switches or BIOS configuration. ***The second PCI slot (in BLUE color) supports 2 master devices.***



PCI Slots

Mini PCI Slot

This slot is used to connect the standard Mini-PCI card.



Mini PCI Slot

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 B#	INT C#	INT D#	INT A#
PCI Slot 2	INT C#	INT D#	INT A#	INT B#
PCI Slot 3	INT D#	INT A#	INT B#	INT C#