ASUS

Motherboard

P4SD-LA

(Yale)

User Guide

Contents

P4SD-LA (Yale) specifications summary

CPU	Socket 478 for Intel® Pentium® 4 Northwood/Prescott New power design to support up to 3.2+GHz processors On-die 512KB/256KB L2 cache with full speed Supports Intel® Hyper-Threading technology
Chipset	Intel® Springdale PE MCH Intel® ICH5
Front Side Bus (FSB)	800/533/400MHz
Memory	4 x 184-pin DDR DIMM sockets for up to 4GB memory Supports PC3200/PC2700/PC2100 unbuffered non-ECC DDR DIMMs
Expansion slots	1 x AGP 8X/4X 3 x PCI
VGA	Integrated 3D graphics controller in Springdale chipset AGP slot supports LCD and TV-out cards
Serial ATA	Intel ICH5 supports two UltraDMA150 SATA devices
IDE	2 x UltraDMA100/66 connectors
Audio	RealTek ALC650 6-channel audio CODEC
LAN	Realtek 8101L 10/100 Mbps Fast Ethernet controller
IEEE 1394	TSB43AB22A 1394 controller for 1394 ports
Special features	Power Loss Restart ASUS EZ Flash
Hardware Monitoring	SMSC LPC47MI92 chip monitors CPU/chassis fan speeds and temperature
]Rear panel I/O	1 x Parallel port 1 x Serial port 1 x PS/2 keyboard port 1 x PS/2 mouse port 4 x USB 2.0/USB 1.1 ports 1 x RJ-45 port 1 x IEEE 1394 port Line In/Line Out/Microphone ports
Internal I/O	2 x USB 2.0/1.1 connector for 4 additional USB ports CPU/chassis fan connectors 20-pin/4-pin ATX power connectors Speaker Out connector CD/AUX audio connectors Front headphone connector Front MIC connector

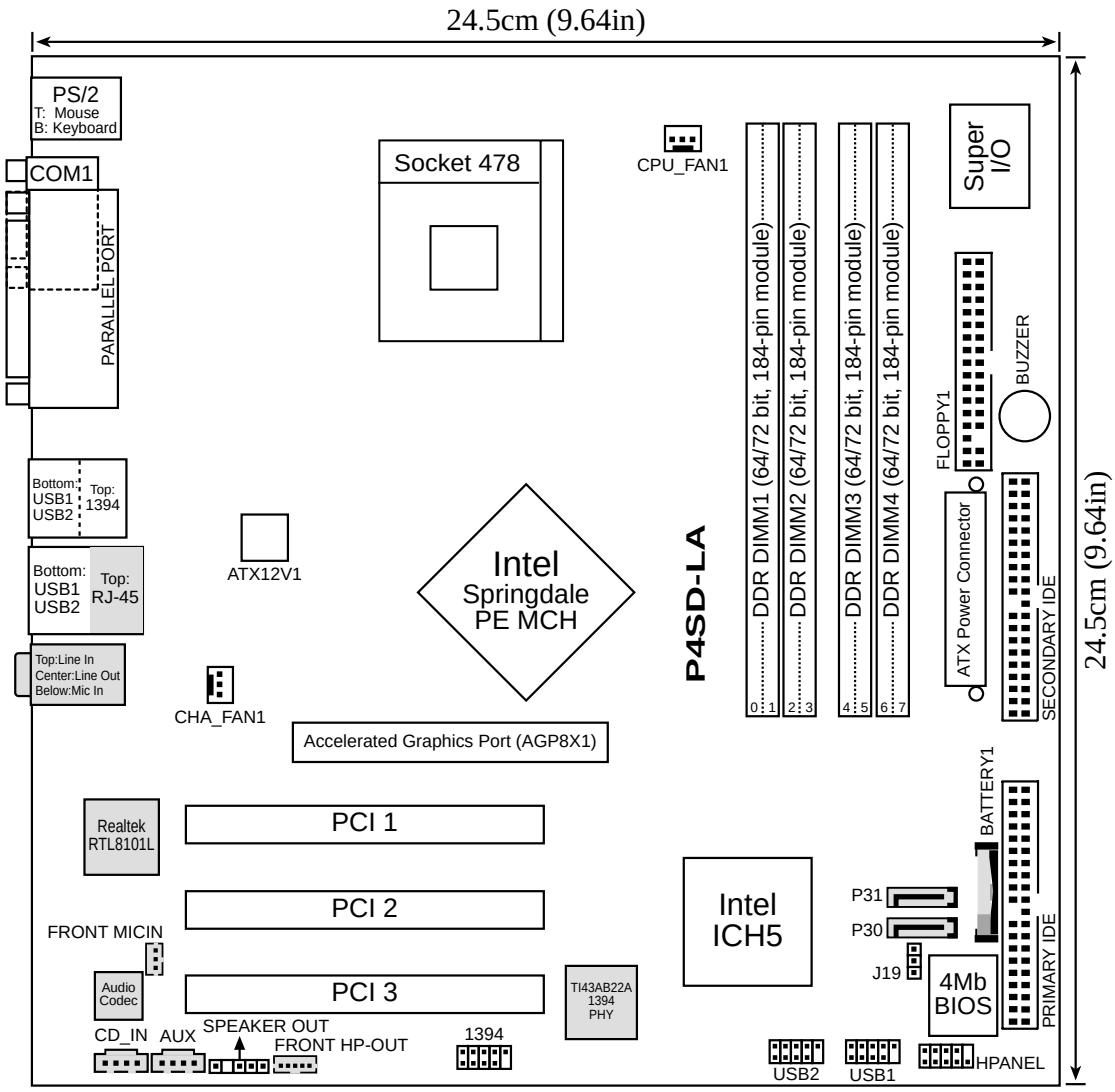
(Continued next page)

P4SD-LA (Yale) specifications summary

BIOS features	4Mb Flash EEPROM, AMI BIOS with enhanced ACPI, PnP, DMI2.0, Green features
Industry standard	PCI 2.2, USB 2.0
Manageability	WfM 2.0. DMI 2.0, WOL/WOR by PME
Form factor	Micro-ATX form factor: 9.6 in x 9.6 in (24.5 cm x 24.5 cm)

** Specifications are subject to change without notice*

1. Motherboard layout

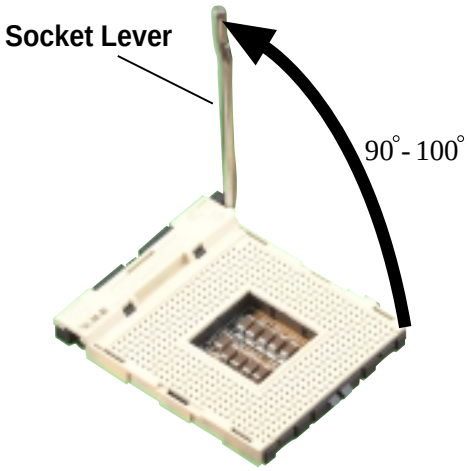


2. Central Processing Unit (CPU)

The motherboard comes with a surface mount 478-pin Zero Insertion Force (ZIF) socket. The socket is designed for the Intel® Pentium® 4 Northwood/Prescott processor in the 478-pin package with 512KB L2 cache. This processor supports 800/533/400MHz front side bus (FSB), and allows data transfer rates of 6.4GB/s, 4.2GB/s, and 3.2GB/s.

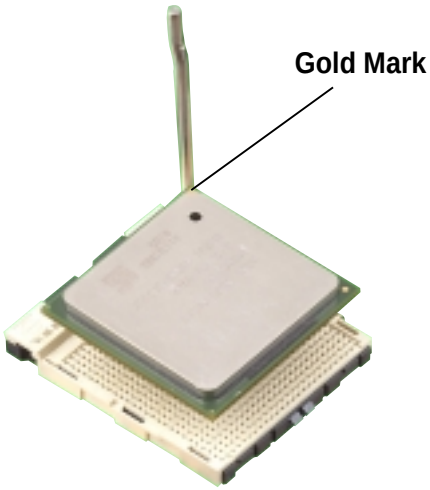
Follow these steps to install a CPU.

1. Locate the 478-pin ZIF socket on the motherboard.
2. Unlock the socket by pressing the lever sideways, then lift it up to a 90°-100° angle.



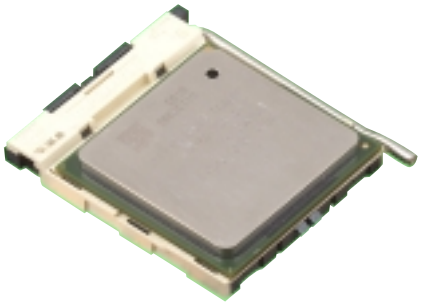
Make sure that the socket lever is lifted up to 90°-100° angle, otherwise the CPU does not fit in completely.

3. Position the CPU above the socket such that its marked corner matches the base of the socket lever.
4. Carefully insert the CPU into the socket until it fits in place.



The CPU fits only in one correct orientation. DO NOT force the CPU into the socket to prevent bending the pins and damaging the CPU!

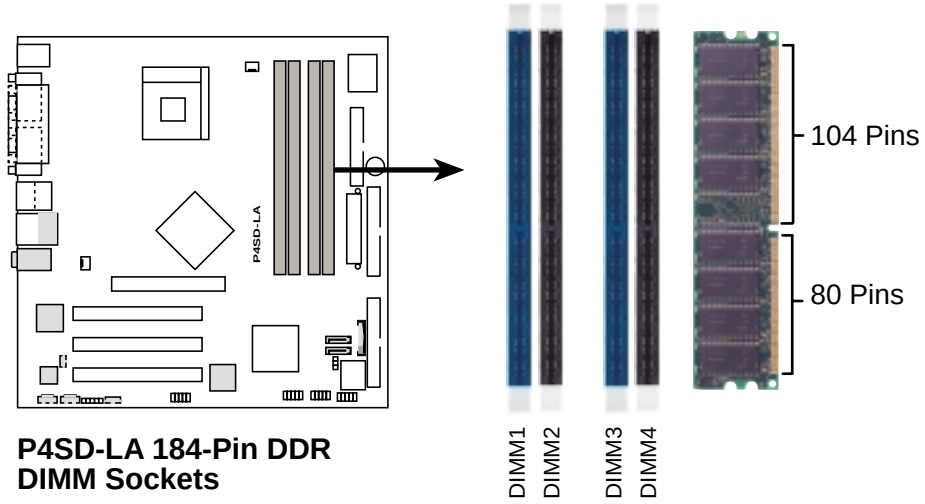
5. When the CPU is in place, push down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.
6. Install a CPU heatsink and fan following the instructions that came with the heatsink package.
7. Connect the CPU fan cable to the CPU_FAN1 connector on the motherboard.



3. System memory

The motherboard comes with four Double Data Rate (DDR) Dual Inline Memory Module (DIMM) sockets. These sockets support up to 2GB system memory using 184-pin unbuffered non-ECC PC2700/PC2100 (FSB533) or PC2100/PC1600 (FSB400) DDR DIMMs.

The following figure illustrates the location of the DDR DIMM sockets.



P4SD-LA 184-Pin DDR DIMM Sockets

Memory configurations

You may install 64MB, 128MB, 256MB, 512MB, and 1GB DDR DIMMs into the DIMM sockets using the memory configurations in this section.

Important notes on memory configurations

1. Installing DDR DIMMs other than the recommended configurations may cause memory sizing error or system boot failure. Use any of the recommended configurations in Table 1.
2. Install only **identical** (the same type and size) DDR DIMM pairs using the recommended configurations.
3. Make sure that the memory frequency matches the CPU FSB (Front Side Bus). Refer to Table 2 below.
4. Double-sided 16-bit DDR DIMMs are not supported on this motherboard.
5. It is not recommended to create a three-DIMM configuration in dual-channel mode. The third DIMM is ignored in the dual-channel operation.

Table 1 Recommended memory configurations

Mode		Sockets DIMM1	DIMM2	DIMM3	DIMM4
Single-channel	(1)	Installed	—	—	—
	(2)	—	Installed	—	—
	(3)	—	—	Installed	—
	(4)	—	—	—	Installed
Dual-channel*	(1)	Installed	—	Installed	—
	(2)	—	Installed	—	Installed
	(3)	Installed	Installed	Installed	Installed

** Use **only** identical DDR DIMM pairs.*

Table 2 Memory frequency/CPU FSB synchronization

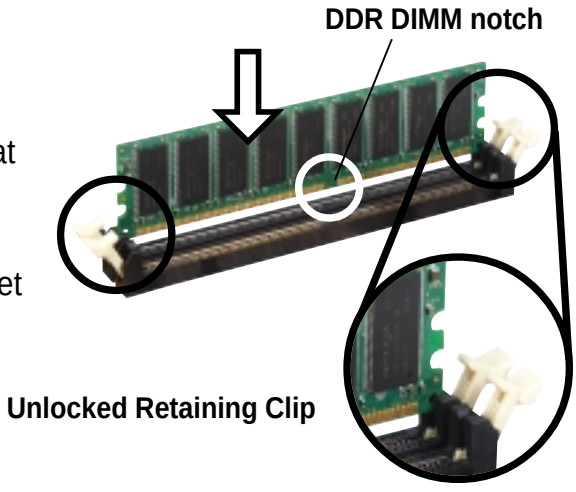
CPU FSB	DDR DIMM Type	Memory Frequency
800 MHz	PC3200/PC2700/PC2100	400/333/266 MHz
533 MHz	PC2700/PC2100	333/266 MHz
400 MHz	PC2100	266 MHz

Installing a DIMM

Make sure to unplug the power supply before adding or removing DIMMs or other system components. Failure to do so may cause severe damage to both the motherboard and the components.

Follow these steps to install a DIMM.

1. Unlock a DIMM socket by pressing the retaining clips outward.
2. Align a DIMM on the socket such that the notch on the DIMM matches the break on the socket.
3. Firmly insert the DIMM into the socket until the retaining clips snap back in place and the DIMM is properly seated.



4. Expansion slots

The motherboard has three PCI slots and one Accelerated Graphics Port (AGP) slot.

To install and configure an expansion card:

1. Install an expansion card following the instructions that came with the chassis. NOTE: The AGP slot supports only +0.8V and +1.5V AGP cards.
2. Turn on the system and change the necessary BIOS settings, if any.
3. Assign an IRQ to the card. Refer to the tables below.
4. Install the drivers and/or software applications for the expansion card according to the card documentation.

Standard interrupt assignments

IRQ	Priority	Standard Function
0	1	System Timer
1	2	Keyboard Controller
2	N/A	Programmable Interrupt
3*	11	Communications Port (COM2)
4*	12	Communications Port (COM1)
5*	13	IRQ holder for PCI steering
6	14	Floppy Disk Controller
7*	15	Printer Port (LPT1)
8	3	System CMOS/Real Time Clock
9*	4	IRQ holder for PCI steering
10*	5	Advance AC'97 CODEC
11*	6	Standard PCI Graphics Adapter (VGA)
12*	7	PS/2 Compatible Mouse Port
13	8	Numeric Data Processor
14*	9	Primary IDE Channel
15*	10	Secondary IDE Channel

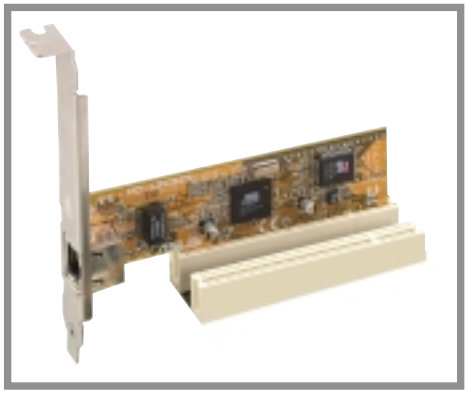
* These IRQs are usually available for ISA or PCI devices.

IRQ assignments for this motherboard

	A	B	C	D	E	F	G	H
PCI slot 1	—	—	—	—	—	shared	—	—
PCI slot 2	—	—	—	—	—	—	used	—
PCI slot 3	—	—	—	—	—	—	—	shared
AGP slot	shared	—	—	—	—	—	—	—
Onboard USB controller 1	shared	—	—	—	—	—	—	—
Onboard USB controller 2	—	—	—	shared	—	—	—	—
Onboard USB controller 3	—	—	used	—	—	—	—	—
Onboard USB controller 4	shared	—	—	—	—	—	—	—
Onboard USB 2.0 controller	—	—	—	—	—	—	—	shared
Onboard LAN	—	—	—	shared	—	—	—	—
Onboard audio	—	used	—	—	—	—	—	—
Onboard 1394 controller	—	—	—	—	—	shared	—	—

PCI slots

There are three 32-bit PCI slots on this motherboard. The slots support PCI cards such as a LAN card, SCSI card, USB card, and other cards that comply with PCI specifications.

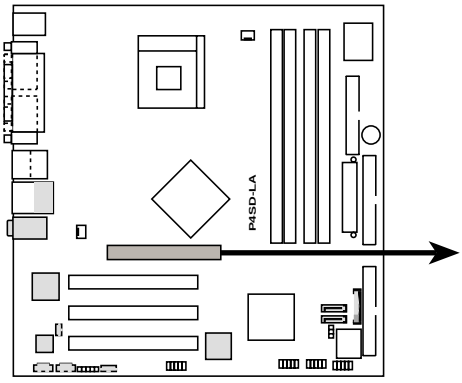


AGP slot

This motherboard has an Accelerated Graphics Port (AGP) slot that supports +0.8V AGP 8X and +1.5V AGP 4X cards. When you buy an AGP card, make sure that you ask for one with +0.8V+1.5V specification.

Note the notches on the card golden fingers to ensure that they fit the AGP slot on your motherboard.

Install only +0.8V/+1.5V AGP cards on this motherboard!



P4SD-LA Accelerated Graphics Port (AGP8X)

AGP Card without Retention Notch

5. Jumper

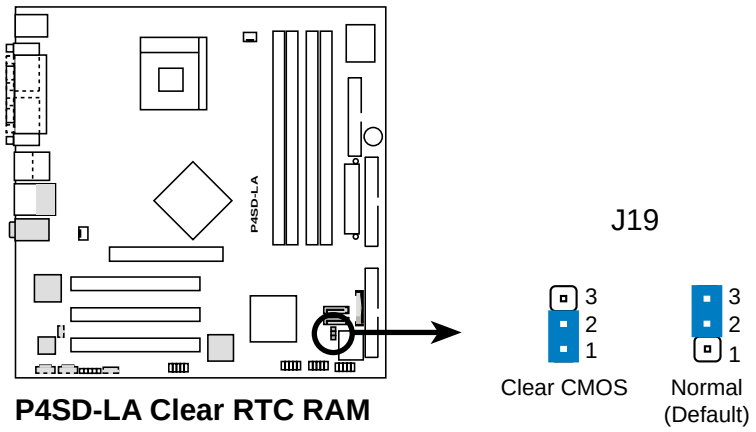
Clear RTC RAM (3-pin J19)

This jumper allows you to clear the Real Time Clock (RTC) RAM in CMOS. You can clear the CMOS memory of date, time, and system setup parameters by erasing the CMOS RTC RAM data. The RAM data in CMOS, that include system setup information such as system passwords, is powered by the onboard button cell battery.

To erase the RTC RAM:

1. Turn OFF the computer and unplug the power cord.
2. Move the jumper cap from pins 2-3 (Normal) to pins 1-2 (Clear CMOS). Keep the cap on pins 2-3 for about 5~10 seconds, then move the cap back to pins 2-3.
3. Plug the power cord and turn ON the computer.
4. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

Except when clearing the RTC RAM, never remove the cap on jumper J19 default position. Removing the cap will cause system boot failure!



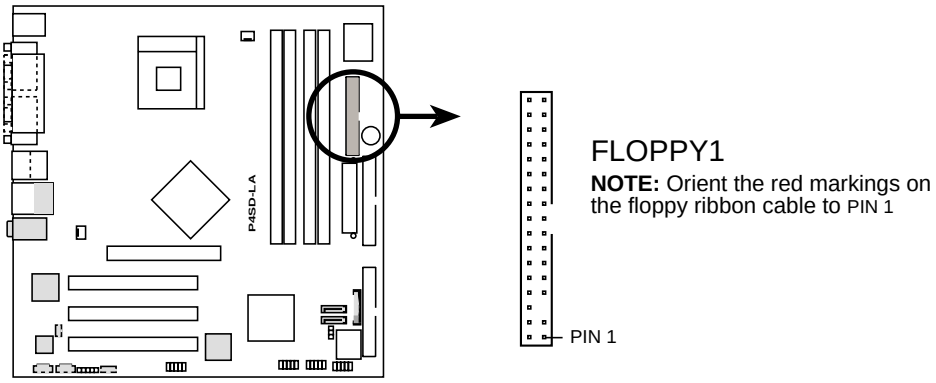
P4SD-LA Clear RTC RAM

6. Connectors

This section describes and illustrates the internal connectors on the motherboard.

1. Floppy disk drive connector (34-1 pin FLOPPY1)

This connector supports the provided floppy drive ribbon cable. After connecting one end to the motherboard, connect the other end to the floppy drive. (Pin 5 is removed to prevent incorrect insertion when using ribbon cables with pin 5 plug).



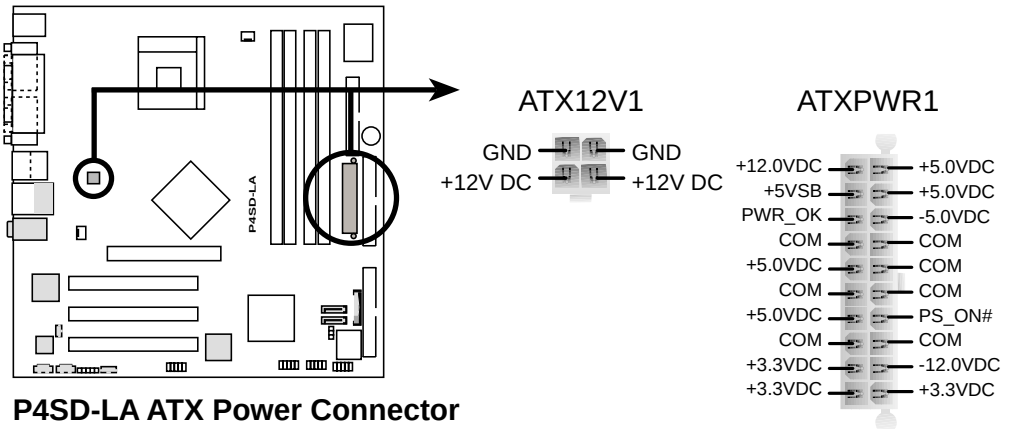
P4SD-LA Floppy Disk Drive Connector

2. ATX power connectors (20-pin ATX_POWER1, 4-pin ATX12V)

These connectors connect to an ATX 12V power supply. The plugs from the power supply are designed to fit these connectors in only one orientation. Find the proper orientation and push down firmly until the connectors completely fit.

In addition to the 20-pin ATXPWR connector, this motherboard requires that you connect the 4-pin ATX +12V power plug to provide sufficient power to the CPU.

Make sure that your ATX 12V power supply can provide 8A on the +12V lead and at least 1A on the +5-volt standby lead (+5VSB). The minimum recommended wattage is 230W, or 300W for a fully configured system. The system may become unstable and may experience difficulty powering up if the power supply is inadequate.

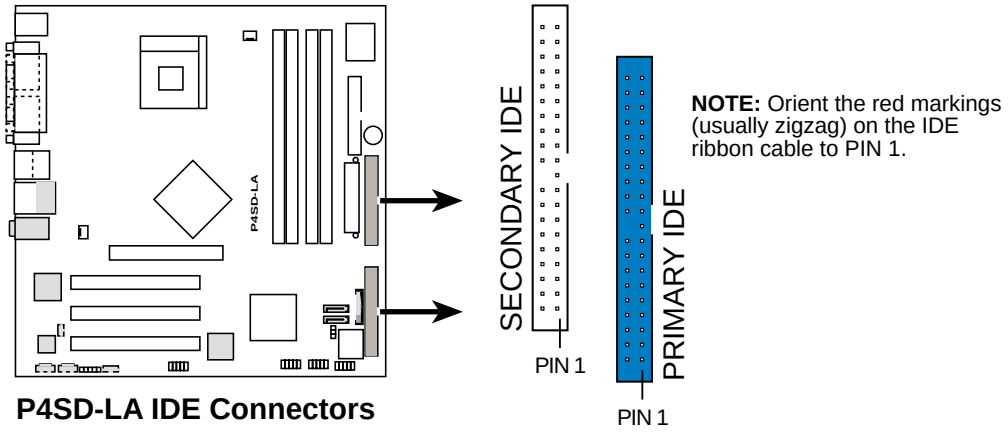


P4SD-LA ATX Power Connector

3. IDE connectors (40-1 pin PRIMARY_IDE, SECONDARY_IDE)

This connector supports the provided UltraDMA100/66 IDE hard disk ribbon cable. Connect the cable's blue connector to the primary (recommended) or secondary IDE connector, then connect the gray connector to the UltraDMA100/66 slave device (hard disk drive) and the black connector to the UltraDMA100/66 master device. It is recommended that you connect non-UltraDMA100/66 devices to the secondary IDE connector. If you install two hard disks, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings. BIOS supports specific device bootup. If you have more than two UltraDMA100/66 devices, purchase another UltraDMA100/66 cable. You may configure two hard disks to be both master devices with two ribbon cables – one for the primary IDE connector and another for the secondary IDE connector.

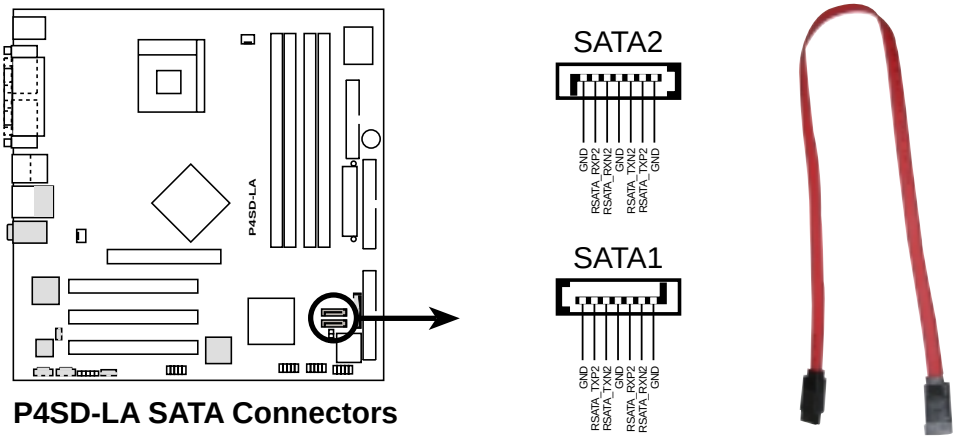
1. Pin 20 on each IDE connector is removed to match the covered hole on the UltraDMA cable connector. This prevents incorrect orientation when you connect the cables.
2. The hole near the blue connector on the UltraDMA100/66 cable is intentional.



P4SD-LA IDE Connectors

4. Serial ATA connectors (7-pin SATA1, SATA2)

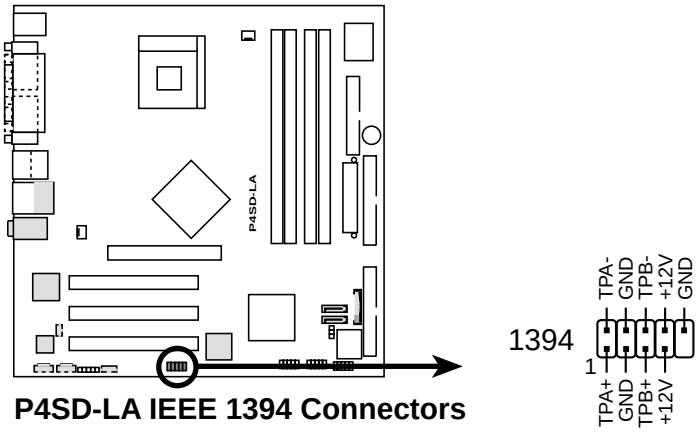
These next generation connectors support the thin Serial ATA cables for Serial ATA hard disks. The current Serial ATA interface allows up to 150 MB/s data transfer rate, faster than the standard parallel ATA with 133 MB/s (Ultra ATA133).



P4SD-LA SATA Connectors

5. IEEE 1394 connector (10-1 pin 1394)

This connector is for a 10-to-6-pin 1394 serial connector cable that connects to a 1394 module. Attach the 10-1 pin cable plug to this connector, and the 6-pin cable plug to the 1394 module. You may also connect a 1394-compliant internal hard disk to this connector.

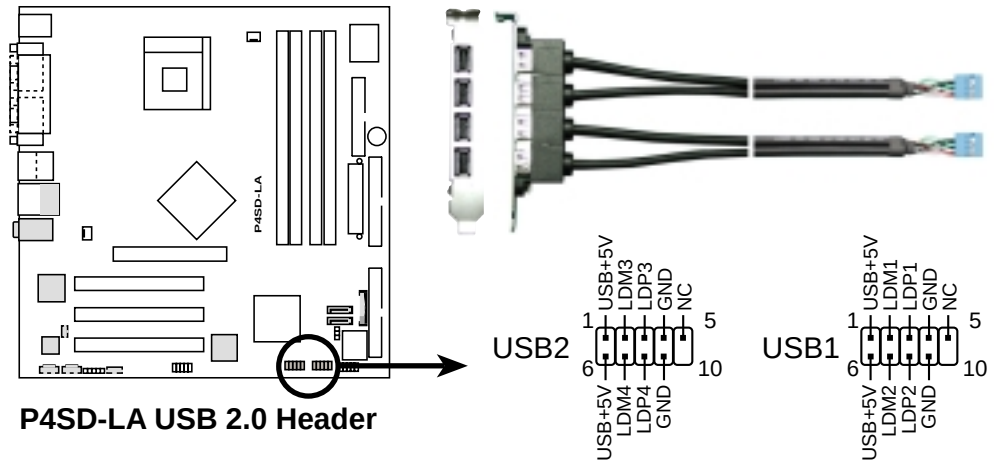


P4SD-LA IEEE 1394 Connectors

6. USB headers (10-1 pin USB1, USB2)

If the USB ports on the rear panel are inadequate, two USB headers are available for additional USB ports. The USB headers comply with USB 2.0 specification that supports up to 480 Mbps connection speed. This speed advantage over the conventional 12 Mbps on USB 1.1 allows faster Internet connection, interactive gaming, and simultaneous running of high-speed peripherals. You may connect a USB module to any of the USB headers.

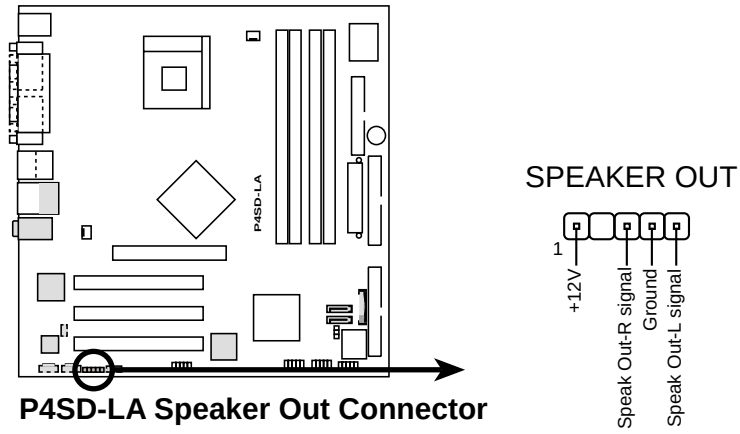
The USB module is purchased separately.



P4SD-LA USB 2.0 Header

7. Speaker out connector (5-1 pin SPEAKER OUT)

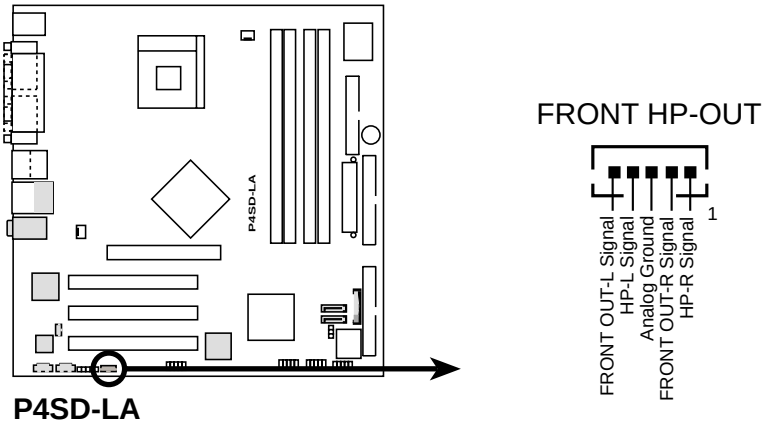
This connector is for an optional audio module. Connect one end of the audio cable to this connector and the other end to the audio module.



P4SD-LA Speaker Out Connector

8. Front headphone connector (5-pin FRONT HP-OUT)

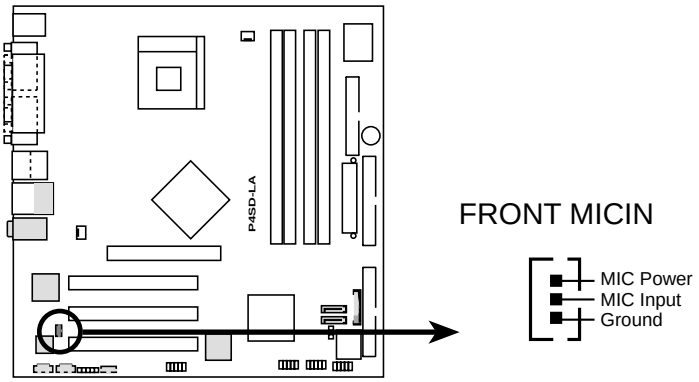
This connector is for a chassis-mounted front panel headphone jack.



P4SD-LA
Front HeadPhone Header Connector

9. Microphone connector (3-pin FRONT MICIN)

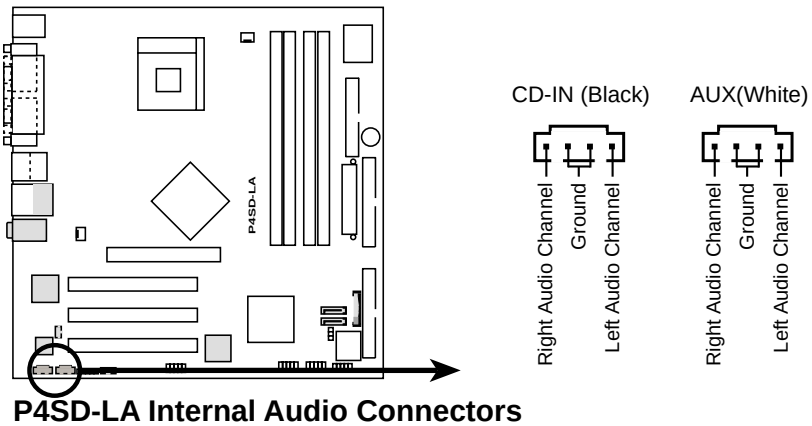
This connector is for a chassis-mounted front panel microphone jack. Use a 3-pin audio cable to connect the microphone jack to this connector.



P4SD-LA Front Microphone Connector

10. Internal audio connectors (4-pin CD-IN, AUX)

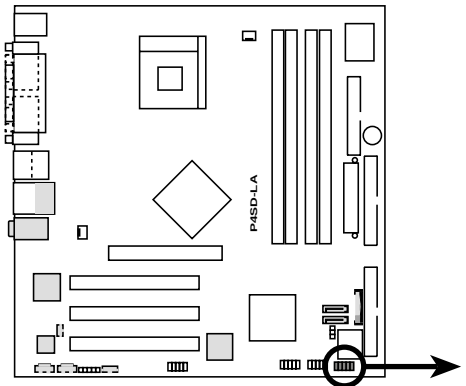
These connectors allow you to receive stereo audio input from sound sources such as a CD-ROM, TV tuner, or MPEG card.



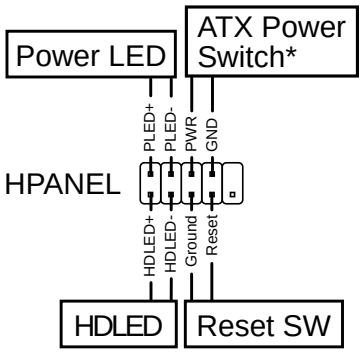
P4SD-LA Internal Audio Connectors

11. System panel connector (20-pin HPANEL)

This connector accommodates several system front panel functions.



P4SD-LA Front Panel Connector



- **System Power LED Lead (3-1 pin PLED)**

  This 3-1 pin connector connects to the system power LED. The LED lights up when you turn on the system power, and blinks when the system is in sleep mode.

- **Hard Disk Activity LED Lead (2-pin HDLED)**

  This 2-pin connector is for the HDD LED cable. The read or write activities of the device connected to the any of IDE connectors cause the IDE LED to light up.

- **ATX Power Switch / Soft-Off Switch Lead (2-pin PWRBTN)**

  This connector connects a switch that controls the system power. Pressing the power switch turns the system between ON and SLEEP, or ON and SOFT OFF, depending on the BIOS or OS settings. Pressing the power switch while in the ON mode for more than 4 seconds turns the system OFF.

- **Reset Switch Lead (2-pin RESET)**

  This 2-pin connector connects to the case-mounted reset switch for rebooting the system without turning off the system power.