User Guide

EVGA nForce 790i SLI FTW Motherboard

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Before You Begin…

Parts NOT in the Kit

This kit contains all the hardware necessary to install and connect your new EVGA nForce® 790i SLI FTW motherboard. However, it does not contain the following items that must be purchased separately to make the motherboard functional.

- **Intel Microprocessor**
- **System Memory**
- **Cooling fan for the Microprocessor**
- **Graphics Card**
- **Power Supply**

EVGA assumes you have purchased all necessary parts needed to allow for proper system functionality.

Intentions of the Kit

This kit provides you with the motherboard and all connecting cables necessary to install the motherboard into a PC case. If you are *building* a PC, you will use most of the cables provided in the kit. If however, you are *replacing* a motherboard, you will not need many of the cables.

When *replacing* a motherboard in a PC case, it is highly recommended to reinstall the operating system even though the current hard disk drives may already have one installed.

EVGA nForce 790i SLI FTW Motherboard

Thank you for purchasing the EVGA nForce 790i SLI FTW Motherboard. This motherboard offers the tools, performance, and overclocking potential that PC Enthusiasts demand. When combined with two or three SLI-Ready NVIDIA GeForce graphics cards, you get innovative NVIDIA SLI Technology for enhanced visual performance.

Motherboard Specifications

- Size
  ATX form factor of 12 inches x 9.6 inches
- Microprocessor support
  Intel Core 2 Extreme, Intel Core 2 Quad, Intel Core 2 Duo, Pentium EE, Pentium D, Pentium
- Operating systems:
  Supports Windows XP 32bit/64bit and Windows Vista 32bit/64bit
- Contains NVIDIA nForce 790i SLI MCP and SPP
- System Memory support
  Supports dual channel JEDEC DDR3-1600MHz and SLI-Ready memory up to 2000 MHz. Supports up to 8 GBs of DDR3 memory.
- Ten USB 2.0 Ports
  - Supports hot plug
  - Ten USB 2.0 ports (six rear panel ports, two 10-pin onboard USB headers)
  - Supports wake-up from S1 and S3 mode
  - Supports USB 2.0 protocol up to 480 Mbps transmission rate

- Onboard Serial ATA II
  - 300MBps data transfer rate
  - Six Serial ATA II connectors from south bridge with support for RAID 0, RAID 1, RAID 0+1, RAID 5, and JBOD
  - Four Serial ATA II connectors from JMicron's JMB362 (one rear panel port for eSATA, three onboard)
  - Supports hot plug and NCQ (Native Command Queuing)
- Onboard LAN
  - Dual LAN interface built-in onboard
  - Supports 10/100/1000 Mbit/sec Ethernet
- Onboard 1394
  - Supports hot plug
  - Two 1394a ports (one rear panel port, one onboard header) with rate of transmission at 400 Mbps
- Onboard Audio
  - Azalia High-Definition audio
  - Supports 8-channel audio
  - Supports S/PDIF output
  - Supports Jack-Sensing function
- Triple PCI Express x16 Support
  - 2 x16 PCI Express 2.0
  - 1 x16 PCI Express 1.0
  - Supports 4 GB/sec (8 GB/sec concurrent) bandwidth
  - Low power consumption and power management features
- Green Function
  - Supports ACPI (Advanced Configuration and Power Interface)
  - Supports S0 (normal), S1 (power on suspend), S3 (suspend to RAM), S4 (Suspend to disk - depends on OS), and S5 (soft - off)
- Expansion Slots
  - Two PCI slots
  - Two PCI Express x1 slot
  - Three PCI Express x16 Graphics slots

Unpacking and Parts Descriptions

Unpacking

The EVGA nForce 790i SLI FTW motherboard comes with all the necessary cables for adding a motherboard to a new chassis. If you are replacing a motherboard, you may not need many of these cables.

Be sure to inspect each piece of equipment shipped in the packing box. If anything is missing or damaged, contact your reseller.

All parts shipped in this kit are RoHS-compliant (lead-free) parts.

Equipment

The following equipment is included in the EVGA nForce 790i SLI FTW motherboard box.

EVGA nForce 790i SLI FTW Motherboard

This PCI Express motherboard contains the NVIDIA nForce 790i SLI SPP and MCP and is SLI-ready.

1 – Visual guide

Helps to visually guide you through the hardware installation of the motherboard.

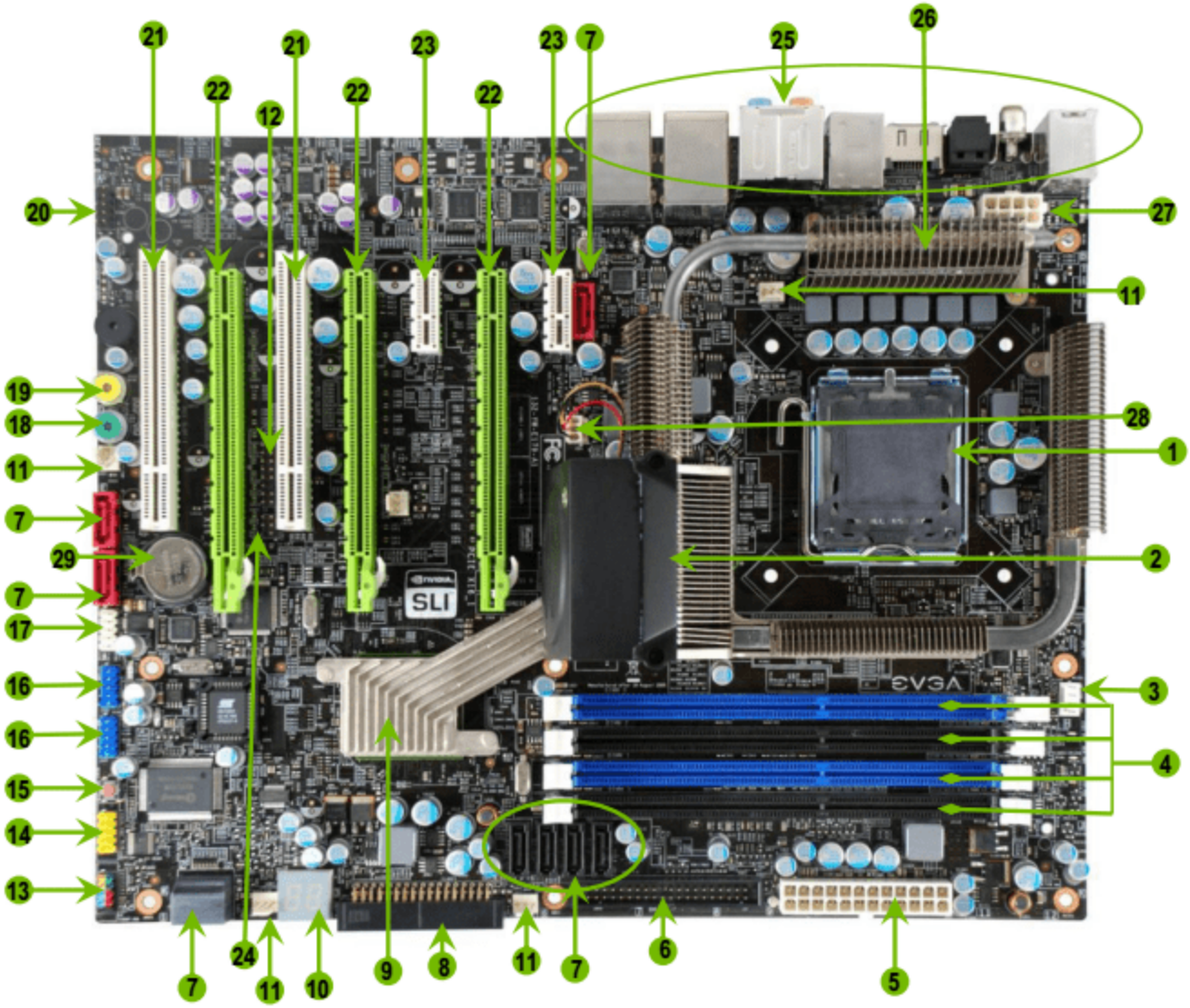
1 - I/O Shield

Installs in the chassis to block radio frequency transmissions, protect internal components from dust and foreign objects and aids in proper airflow within the chassis.

	**1 - Floppy Cable** Used to attach a floppy drive to the motherboard.
	**3 - 2-Port SATA Power Cables** Allows a Molex power connector to adapt to a SATA power connector.
	**1 - IEEE 1394a** *(Firewire)* **Cable** Provides one additional IEEE1394 ports the back panel of the chassis.
	**1 - USB 2.0 4-Port Cable** Provides four additional USB ports to the back panel of the chassis.
	**6 - SATA Signal Cables** Used to support the Serial ATA protocol and each one connects a single drive to the motherboard
	**1 - Serial Port** *(Comm2)* **Cable** Used for serial based legacy devices
	**1 - IDE-ATA 133 HDD Cable** Passes data between the IDE connection on the motherboard and IDE device**.**
	**1 - 2-Way SLI Bridge** Allows for a 2-Way SLI set up with compatible NVIDA GeForce Graphics Cards
	**1 - 3-Way SLI Bridge** Allows for a 3-Way SLI set up with compatible NVIDA GeForce Graphics Cards

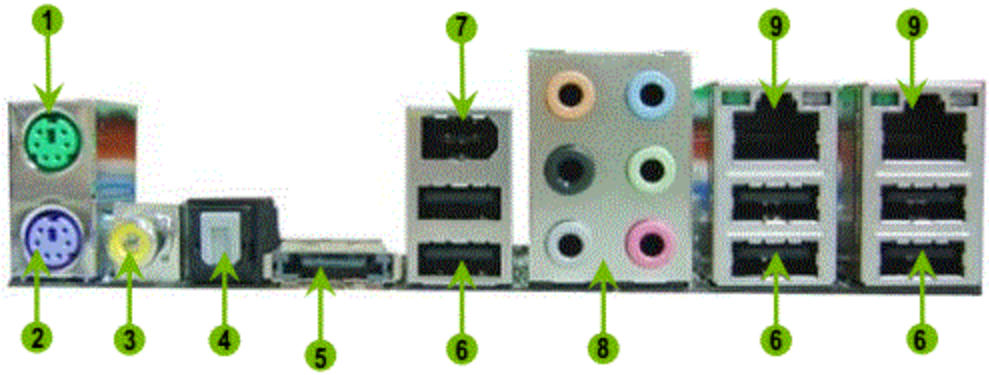
EVGA nForce 790i SLI FTW Motherboard

The EVGA nForce 790i SLI FTW motherboard with the NVIDIA nForce 790i SLI SPP and MCP processors is a PCI Express, SLI-ready motherboard. Figure 1 shows the motherboard and Figures 2 shows the back panel connectors.



1. CPU Socket – For Intel LGA 775 CPUs	11. Fan connectors – Connect auxiliary fans to these headers	21. PCI slots – For PCI based components
2. nForce 790i SLI SPP with Active Cooling – Also known as the Northbridge	12. HD Audio Connector – For Hi-Definition Audio	22. PCI Express x16 slots (SLI) – For graphics cards, multiple slots are used for SLI configurations
3. CPU fan connector – Connect CPU Fan to this connector	13. Front panel connector – For use with a system chassis	23. PCI Express x1 slot – Exclusive for devices that require a PCI-E x1 slot
4. DDR3 DIMM slots 0 – 3 – For System Memory	14. Serial connector – For Serial Port Cable	24. SPDIF connector – Digital Audio connection
5. 24-pin ATX power connector – Main Power Connection	15. CMOS Clear Button – Easily clears the system BIOS	25. Backpanel connectors (Figure 2)
6. IDE connector – For IDE devices such as a CD-ROM or Hard Disk Drive	16. USB headers – For USB Port Cable	26. Heat dissipater – Passive heatsink for Voltage Regulators
7. Serial-ATA (SATA) connectors – For SATA devices such as a CD-ROM or Hard Disk Drive	17. 1394a connector – For Firewire Port Cable	27. 8-pin ATX_12V power connector – CPU 8-Pin Power connector
8. FDD connector – Floppy Disk Drive Connector	18. Power button – With integrated power LED indicator	28. MCP/SPP fan connector – Connect Northbridge fan to this connector
9. NVIDIA MCP (passive heat sink) – Also known as the Southbridge	19. Reset button – With integrated HDD activity LED	29. Motherboard CMOS Battery – Helps retain system BIOS settings
10. LED POST Code Readout – See Appendix A. for Code Descriptions	20. Front panel Audio connector – For use with a system chassis	

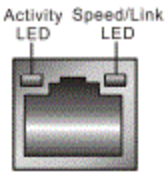
Figure 1. EVGA nForce 790i SLI FTW Motherboard Layout



1. PS/2 Mouse Port
2. PS/2 Keyboard Port
3. Coaxial SPDIF output
4. Optical SPDIF output
5. eSATA port
6. USB 2.0 ports (Six)
7. 1394a (Firewire) Port
8.

Audio Port	2-Channel	6-Channel	8-Channel
Blue	Line-In	Line-In	Line-In
Green	Line-Out	Front Speaker Out	Front Speaker Out
Pink	Mic In	Mic In	Mic In
Orange		Center/Subwoofer	Center/Subwoofer
Black		Rear Speaker Out	Rear Speaker Out
Grey			Side Speaker Out

9. LAN Port with LEDs to indicate status.



Activity LED Status	Description
Off	No data transmission
Blinking (Green)	Data transmission

Speed/Link LED Status	Description
Yellow	1000 Mbps data rate
Green	100 Mbps data rate
Off	10 Mbps data rate

Figure 2. Chassis Backpanel Connectors

Hardware Installation

This section will guide you through the installation of the motherboard. The topics covered in this section are:

- Preparing the motherboard
  - Installing the CPU
  - Installing the CPU fan
  - Installing the memory
- Installing the motherboard
- Connecting cables and setting switches

Safety Instructions

To reduce the risk of fire, electric shock, and injury always follow basic safety precautions.

Remember to remove power from your computer by disconnecting the AC main source before removing or installing any equipment from/to the computer chassis.

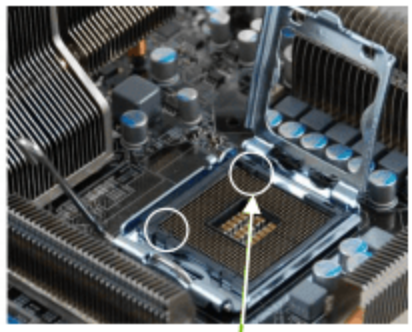
Preparing the Motherboard

Installing the CPU

Be very careful when handling the CPU. Make sure not to bend or break any pins in the CPU socket. Hold the processor only by the edges and do not touch the bottom of the processor.

Use the following procedure to install the CPU onto the motherboard.

1. Unhook the socket lever by pushing *down* and *away* from the socket.
2. Lift the load plate. There is a protective socket cover on the load plate to protect the socket when there is no CPU installed.
3. Remove the protective socket cover from the load plate.
4. Remove the processor from its protective cover, making sure you hold it only by the edges. It is a good idea to save the cover so that whenever you remove the CPU, you have a safe place to store it.
5. Align the notches in the processor with the notches on the socket.
6. Lower the processor straight down into the socket with out tilting or sliding it into the socket



Make sure the CPU is fully seated and level in the socket.

7. Close the load plate over the CPU and press down while you close and engage the socket lever.

Installing the CPU Fan

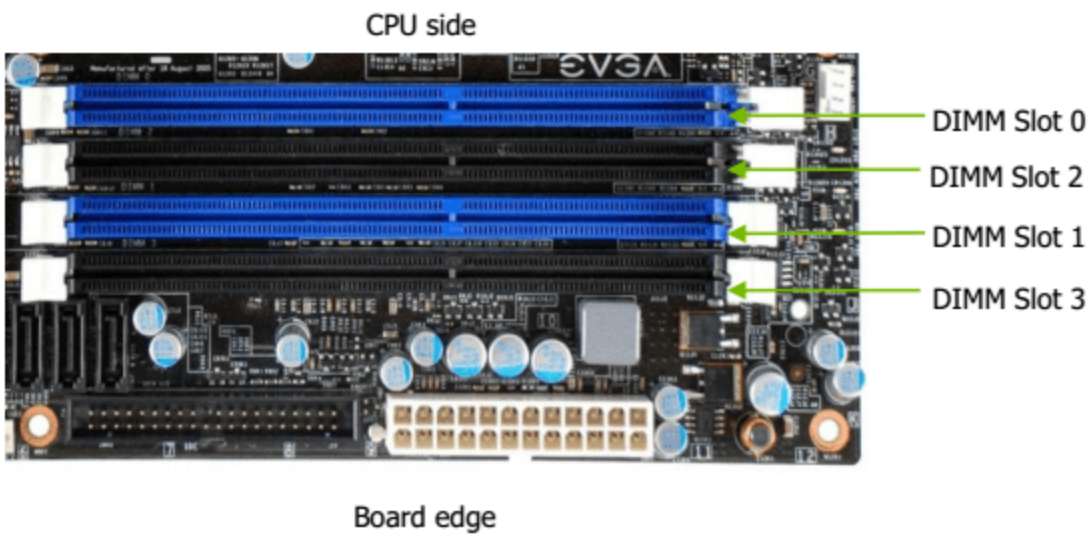
There are many different fan types that can be used with this motherboard. Follow the instruction that came with you fan assembly. Be sure that the fan orientation is correct for your chassis type and your fan assembly.

Installing System Memory (DIMMs)

Your new motherboard has four 240-pin slots for DDR3 memory. These slots support 256 MB, 512 MB, 1 GB, and 2 GB DDR3. There must be at least one memory bank populated to ensure normal operation. Use the following the recommendations for installing memory. (See Figure 1 on page 5 for the location of the memory slots.)

For memory over 1600MHz(PC3 12800) use slots 2 and 3 (black).

- **One DIMM**: Install into slot 3. You can install the DIMM into any slot; however, slot 3 is preferred.
- **Two DIMMS**: Install into either slots: 0 and 1 or 2 and 3. The idea is to not have the DIMMS in adjacent slots.
- **Four DIMMS**: Install into slots 0, 1, 2, and 3.



Use the following procedure to install memory DIMMS. Note that there is only one gap near the center of the DIMM slot. This slot matches the slot on the memory DIMM to ensure the component is installed properly.

1. Unlock a DIMM slot by pressing the module clips outward.
2. Align the memory module to the DIMM slot and insert the module vertically while applying light downward pressure to properly seat the DIMM. The plastic clips at both sides of the DIMM slot automatically lock the DIMM into the connector.

Installing the Motherboard

The sequence of installing the motherboard into the chassis depends on the chassis you are using and if you are replacing an existing motherboard or working with an empty chassis. Determine if it would be easier to make all the connections prior to this step or to secure the motherboard and then make all the connections. It is normally easier to secure the motherboard first.

Use the following procedure to install the I/O shield and secure the motherboard into the chassis.

Be sure that the CPU fan assembly has enough clearance for the chassis covers to lock into place and for the expansion cards. Also make sure the CPU Fan assembly is aligned with the vents on the covers.

Installing the I/O Shield

The motherboard kit comes with an I/O shield that is used to block radio frequency transmissions, protects internal components from dust and foreign objects, and promotes correct airflow within the chassis.

Before installing the motherboard, install the I/O shield from the *inside* of the chassis. Press the I/O shield into place and make sure it fits securely. If the I/O shield does not fit into the chassis, you would need to obtain the proper size from the chassis supplier.

Securing the Motherboard into the Chassis

Most computer chassis have a base with mounting studs or spacers to allow the mother board to be secured to the chassis and help to prevent short circuits. If there are stud(s) that do not align with a mounting hole on the motherboard, it is recommended that you remove that stud(s) to prevent the possibility of a short circuit. In most cases, it is recommended to secure the motherboard using a minimum of eight (8) to ten (10) studs.

1. Carefully place the motherboard onto the studs/spacers located inside the chassis.
2. Align the mounting holes with the studs/spacers.
3. Align the connectors to the I/O shield.
4. Ensure that the fan assembly is aligned with the chassis vents according to the fan assembly instruction.
5. Secure the motherboard with a minimum of eight-to-ten screws.

Connecting Cables

This section takes you through all the connections necessary on the motherboard. This will include:

- Power Connections
  - 24-pin ATX power (**PWR1**)
  - 8-pin ATX 12V power (**PWR2**)
- Internal Headers
  - Front panel
  - IEEE 1394a
  - USB Headers
  - Audio
  - COM
- FDD
- IDE

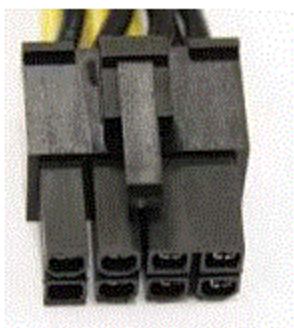
- Serial ATA II
- Chassis Fans
- Rear panel USB 2.0 Adapter
- Expansion slots
- CMOS Clear Button

See Figure 1 on page 5 to locate the connectors and button referenced in the following procedure.

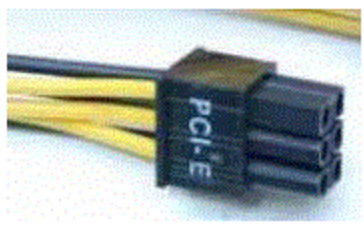
Power Connections

To support 3-way SLI, this motherboard has the following specific power supply requirements:

- Minimum 1000 W peak power
- Six PCI-E power connectors configured in either of the following configurations (see Figure 3):
  - Three 6-pin (3x2) and three 8-pin (4x2) PCI-E power connectors
    or
  - Six 6-pin (3x2) PCI-E power connectors



8-pin (4x2) PCI-E Connector



6-pin (3x2) PCI-E connector

Figure 3. Power Supply Connectors

Make sure you have enough power to cover all the expansion cards you will be installing. To determine what you power requirements are for your specific configuration or a certified power supply vendor, refer to www.slizone.com.

24-pin ATX Power (PWR1)

PWR1 is the main power supply connector located along the edge of the board next to the DIMM slots. Make sure that the power supply cable and pins are properly aligned with the connector on the motherboard. Firmly plug the power supply cable into the connector and make sure it is secure.

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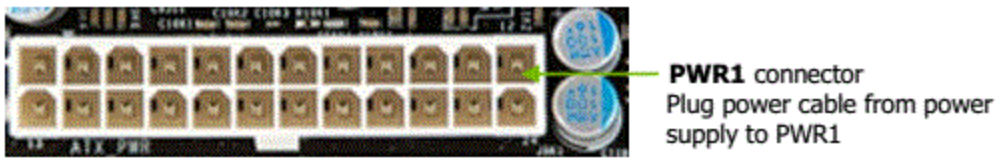


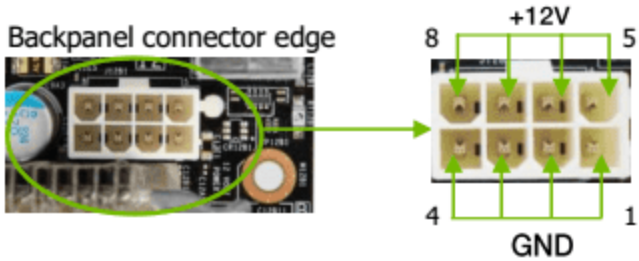
Figure 4. PWR1 Motherboard Connector

Table 1. PWR1 Pin Assignments

Connector	Pin	Signal	Pin	Signal
	1	+3.3V	13	+3.3V
	2	+3.3V	14	-12V
	3	GND	15	GND
	4	+5V	16	PS_ON
	5	GND	17	GND
	6	+5V	18	GND
	7	GND	19	GND
	8	PWROK	20	RSVD
	9	+5V_AUX	21	+5V
	10	+12V	22	+5V
	11	+12V	23	+5V
	12	+3.3V	24	GND

8-pin ATX 12V Power (PWR2)

PWR2, the 8-pin ATX 12V power connection, is used to provide power to the CPU. Align the pins to the connector and press firmly until seated.



Connecting IDE Hard Disk Drives

The IDE connector supports Ultra ATA 133/100/66 IDE hard disk drives.

1. Connect the blue connector (the cable end with a single connector) to the motherboard.
2. Connect the black connector (the cable with two closely spaced black and grey connectors) to the Ultra ATA master device.
3. Connect the gray connector to a slave device.

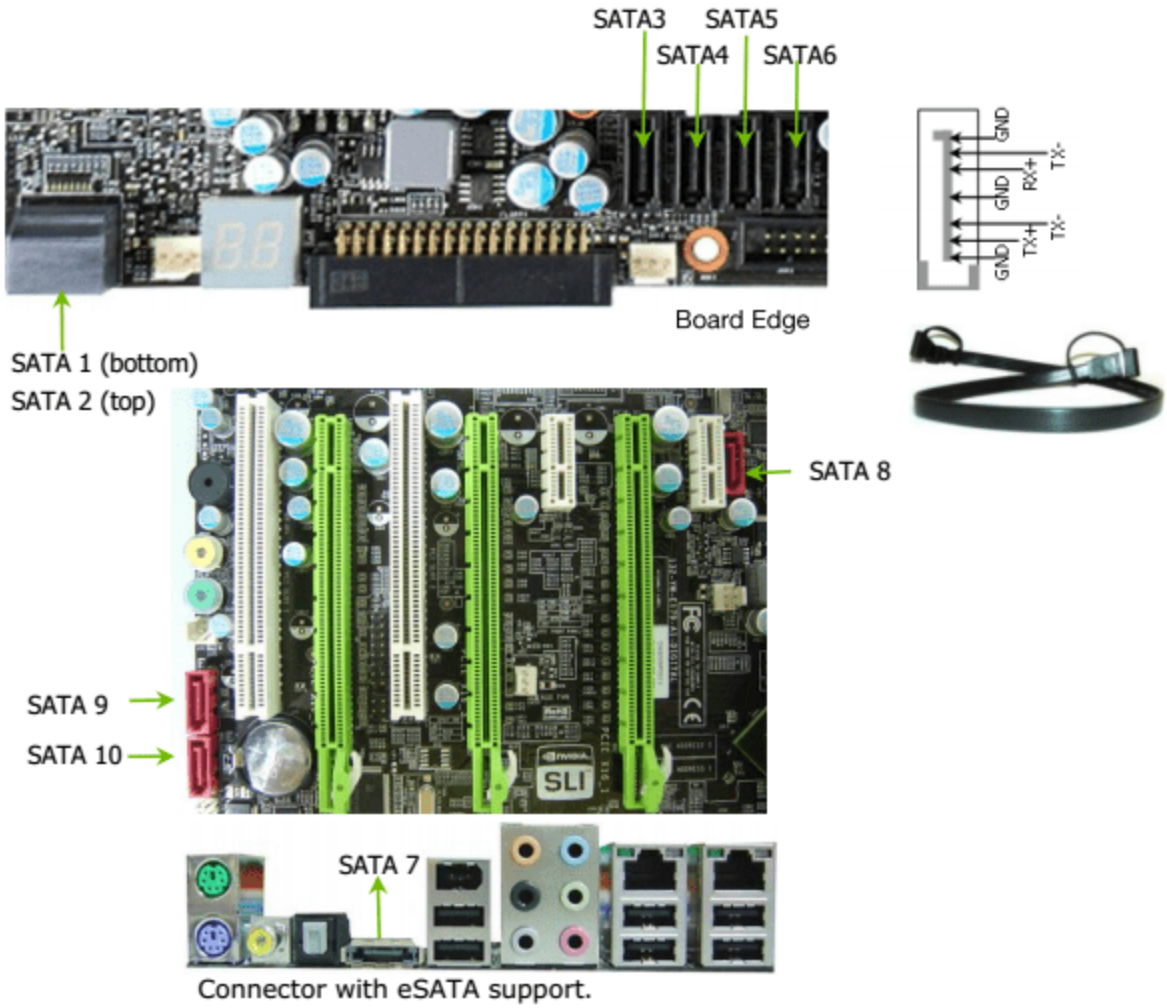
If you install two hard disk drives, you must configure the second drive as a slave device by setting its jumper accordingly. Refer to the hard disk documentation for the jumper settings.

If an ATA-66/100 disk drive and a disk drive using any other IDE transfer protocol are attached to the same cable, the maximum transfer rate between the drives may be reduced to that of the slowest drive.

Connecting Serial ATA Cables

The Serial ATA connector is used to connect a Serial ATA I or Serial ATA II device to the motherboard. These connectors support the thin Serial ATA cables for primary storage devices. The current Serial ATA II interface allows up to 300MB/s data transfer rate.

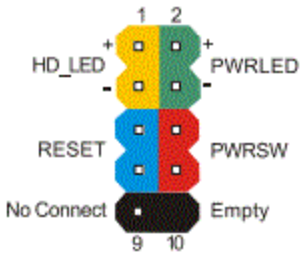
There are ten Serial ATA connectors on the motherboard, The six black connectors (SATA1~SATA6) from south bridge chipset that support RAID 0, RAID 1, RAID 5, RAID 0+1 and JBOD configurations and four connectors (SATA7~SATA10) from JMicron's JMB362.



Connecting Internal Headers

Front Panel Header

The front panel header on this motherboard is used to connect the following four cables.
(see Table 2 for pin definitions):



- **PWRLED**

  Attach the front panel power LED cable to these two pins of the header. The Power LED indicates the system's status. When the system is turned on, the LED is on. When the system is turned off, the LED is off. When the system is in S1, S1, S3, S4 standby, the LED will blink.

Some chassis do not have all four cables. Be sure to match the name on the connectors to the corresponding pins.

- **PWRSW**

  Attach the power button cable from the case to these two pins. Pressing the power button on the front panel turns the system on and off rather than using the onboard power button.

- **HD_LED**

  Attach the hard disk drive indicator LED cable to these two pins. The HDD indicator LED indicates the activity status of the hard disks.

- **RESET**

  Attach the reset button cable from the front panel of the case to the these two pins. The system restarts when the reset button is pressed.

Table 2.Front Panel Header Pins

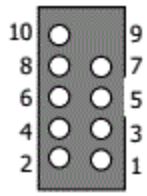
	Pin	Signal
HD_LED	1	HD_PWR
	3	HD Active
PWRLED	2	PWR LED
	4	STBY LED
RESET	5	Ground
	7	RST BTN
PWRSW	6	PWR BTN
	8	Ground
No Connect	9	+5V
Empty	10	Empty

IEEE 1394a

The IEEE 1394a (*Firewire*) expansion cable bracket is provided in the box but if you do not require the additional external connections, you do not need to install it.

1. Secure the bracket to the rear panel of your chassis.
2. Connect the end of the cable to the IEEE 1394a connector on the motherboard.

Table 3. IEEE 1394a Connector Pins

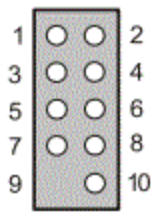
Connector	Pin	Signal
IEEE 1394a Connector 	1	TPA+
	2	TPA-
	3	GND
	4	GND
	5	TPB+
	6	TPB-
	7	+12V
	8	+12V
	9	Empty
	10	GND

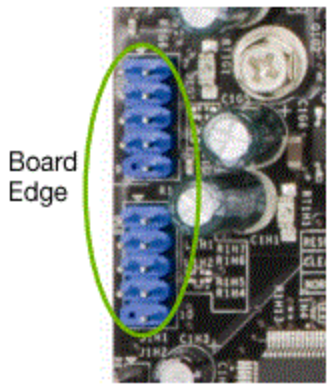
USB Headers

This motherboard contains six (6) USB 2.0 ports that are exposed on the rear panel of the chassis (Figure 2). The motherboard also contains two 10-pin internal header connectors onboard that can be used to connect an optional external bracket containing four (4) USB 2.0 ports.

3. Secure the bracket to the rear panel of your chassis.
4. Connect the two ends of the cables to the USB 2.0 headers on the motherboard.

Table 4. USB 2.0 Header Pins

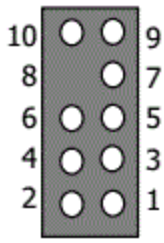
Connector	Pin	Signal
USB 2.0 Header Connector 	1	5V_DUAL
	3	Data-
	5	Data+
	7	GND
	9	Empty
	Pin	**Signal**
	2	5V_DUAL
	4	Data-
	6	Data+
	8	GND
	10	No Connect



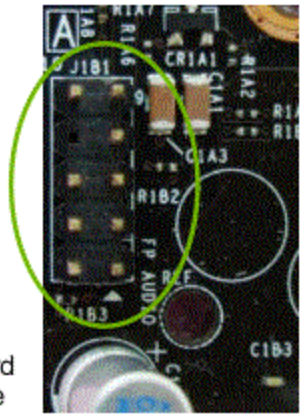
Front Audio

The audio connector uses the AC97 standard and provides two kinds of audio output choices: Front Audio and Rear Audio. The front Audio supports re-tasking function.

Table 5. Front Audio Connector

Connector	Pin	Signal
Front Audio Connector 	1	PORT1_L
	2	AUD_GND
	3	PORT1_R
	4	PRECENCE_J
	5	PORT2_R
	6	SENSE1_RETURN
	7	SENSE_SEND
	8	Empty
	9	PORT2_L
	10	SENSE2_RETURN

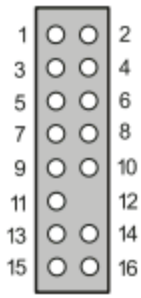
Board Edge

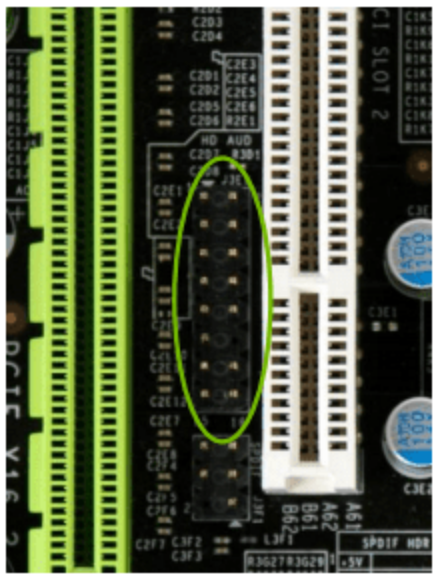


HD Audio

The HD Audio connection supports HD audio standard. Use this if the case does not use the AC97 connectors.

Table 6. HD Audio Connector

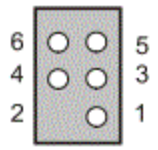
Connector	Pin	Signal
HD audio Connector 	1	BCLK
	2	GND
	3	RESET#
	4	+3.3V
	5	SYNC
	6	GND
	7	SDATA_OUT
	8	+3.3V
	9	SDATA_IN0
	10	+12V
	11	SDATA_IN1
	12	KEY
	13	NC
	14	+3.3V_DUAL
	15	SDATA_IN2
	16	GND



SPDIF Audio

The SPDIF header is used to connect to an NVIDIA graphics card for HDMI audio.

Table 7. SPDIF Audio Connector

Connector	Pin	Signal
SPDIF Audio Connector 	1	Power
	2	No Pin
	3	**SPDIF**
	4	SPDIFI
	5	**GROUND**
	6	GROUND