



ZOOMTM GeodeTM Development Kit

GeodeTM NX User's Manual

REVISION HISTORY

REV	EDITOR	REVISION DESCRIPTION	APPROVAL	DATE
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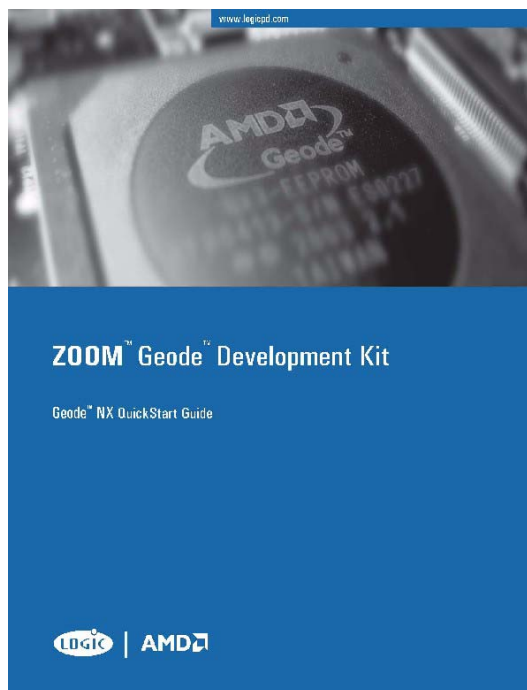
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Congratulations on your purchase of the Zoom™ Geode™ NX development kit with Silicon Integrated Systems (SiS) chipset. The NX DB1500 provides a product-ready software and hardware platform for evaluating the functionality of AMD Geode NX processors (i.e., AMD Geode NX 1750@14W processor, AMD Geode NX 1500@6W processor, and AMD Geode NX 1250@6W processor*). This results in an embedded product development cycle with less time, less cost, less risk... more innovation.

1 Getting Started

1.1 Have you read the Zoom Geode NX Development Kit QuickStart Guide?



If the answer is yes, proceed to Section 2 "Development Board Installation." If not, familiarize yourself with the *Zoom Geode NX Development Kit QuickStart Guide* before you read this document. The latest version of the QuickStart Guide is located on the Logic Product Development web site (<http://www.logicpd.com/>).

1.2 QuickStart Guide Review

Thank you for reading the QuickStart Guide before proceeding through this document. Now you are familiar with the following:

- Development Board Features
- Required Equipment
- Peripheral Connectors and Connection Diagram
- Jumper Configurations
- Self Test
- Product Notes

*The AMD Geode™ NX 1750@14W processor operates at 1.4 GHz, the AMD Geode™ NX1500@6W processor operates at 1.0 GHz, and the AMD Geode™ NX 1250@6W processor operates at 667 MHz. Model numbers reflect performance as described here: <http://www.amd.com/connectivitysolutions/geodenxbenchmark>.

2 Development Board Installation

Before you install the development board, study the configuration of your chassis to ensure that the board will fit.

2.1 Pre-Installation Precautions

Note the following precautions before installing development board components or changing any development board settings.

- Unplug the power cord from the wall socket before touching any components.
- Use a grounded wrist strap or touch a safely grounded object, such as the power supply case, before handling components to avoid damaging them due to static electricity.
- Avoid touching the ICs on components.
- Whenever you uninstall any component, place it on a grounded anti-static pad or in the bag that comes with the component.
- Before you install or uninstall any component, ensure that the ATX power supply is switched OFF or the power cord is detached from the power supply. Failure to do so may cause severe damage to the development board, peripherals, and components.

Note: When lit, the on-board LED indicates that the system is ON, in Sleep mode, or in Soft-off mode -- not powered OFF.

2.2 CPU Installation

CAUTION: The Geode NX DB1500 development board does NOT support AMD Athlon™ processors. DO NOT install an AMD Athlon processor, doing so will cause damage to both the processor and the NX DB1500 development board. The NX DB1500 development board ONLY supports AMD Geode NX processors.

- 1) Unlock the socket by lifting the lever up to a 90 degree angle.

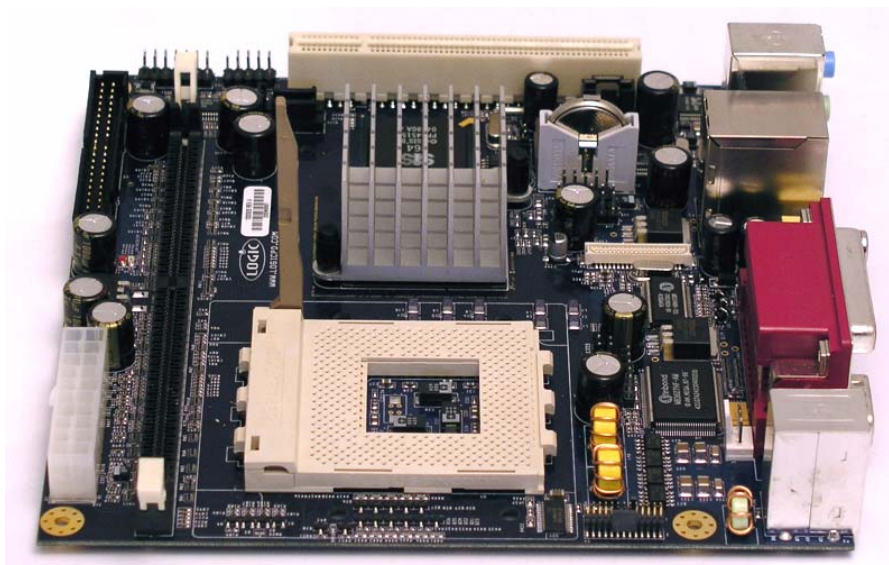


Figure 2.1 – Lift Socket Lever

- 2) Position the CPU directly above the socket such that its marked corner matches the base of the socket lever.

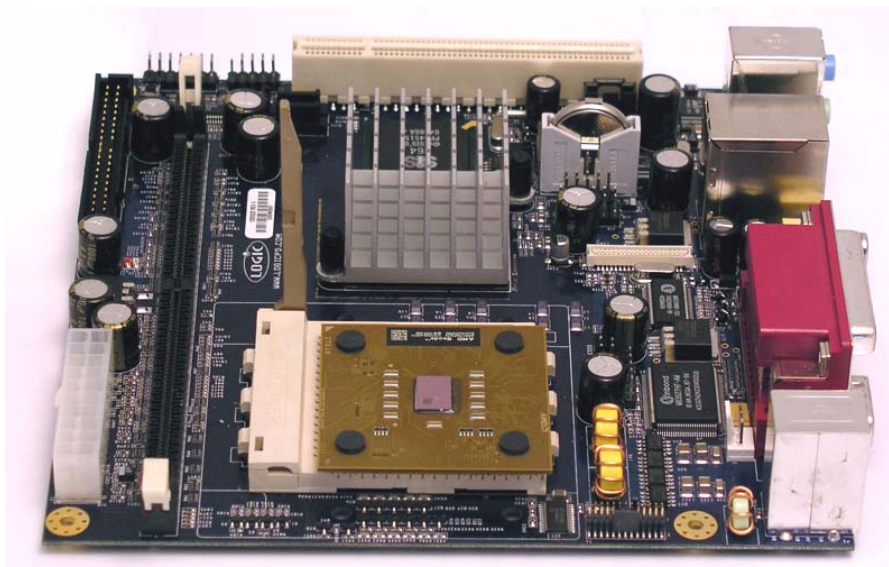


Figure 2.2 – Position the CPU

- 3) Carefully insert the CPU into the socket so it fits in place. The CPU fits only in one correct orientation. DO NOT force the CPU into the socket in order to avoid bending the CPU pins.
- 4) When the CPU is in place, press it firmly on the socket while pushing down the socket lever to secure the CPU. The lever clicks on the side tab to indicate that it is locked.

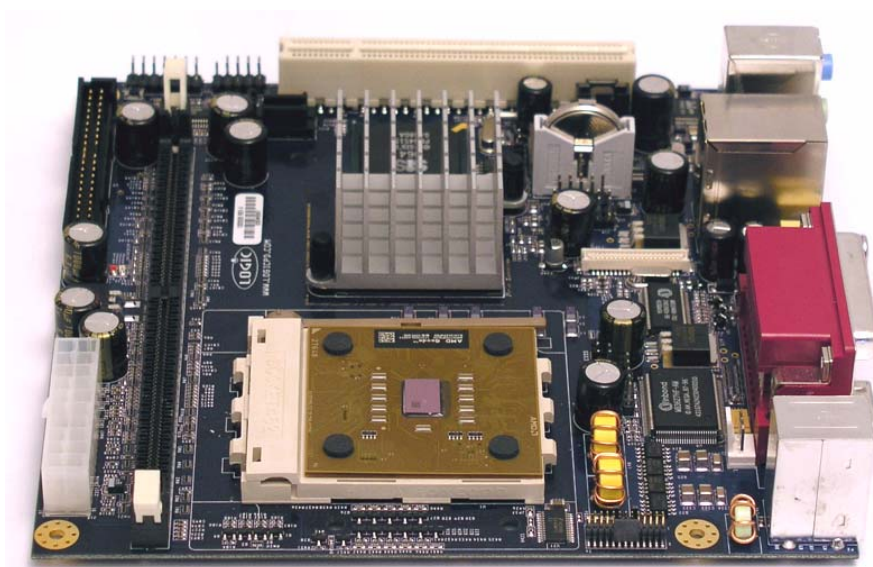


Figure 2.3 – Push Down Socket Lever

2.3 CPU Heatsink Installation

Because there are a large number of Socket 462 CPU heatsink types, the following is an example of heatsink installation. Always make sure to apply thermal grease between the CPU die and the heatsink. For more thorough installation instructions, refer to the instruction manual for your particular CPU heatsink.

Note: Placement of the notched corner of the CPU heatsink is important. The notched corner must be facing the memory DIMM side of the board. If put on backwards, damage to the board and processor may occur.

- 1) Before installing the heatsink, make sure the heatsink clip pivot is placed in the 12th slit, between heatsink fins 12 and 13, as shown in Figure 2.4. Make sure there is thermal grease applied to the bottom of the heatsink. Use caution, do not disturb the thermal grease.

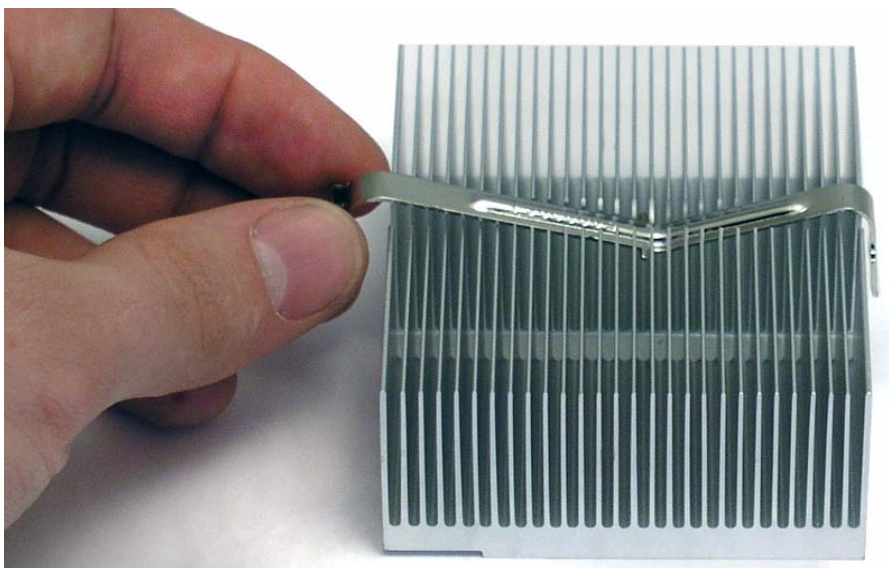


Figure 2.4 – Heatsink Clip Pivot Placement

- 2) Carefully mount the CPU heatsink over the processor - ensuring that the notched corner of the CPU heatsink is facing the memory DIMM side of the board.

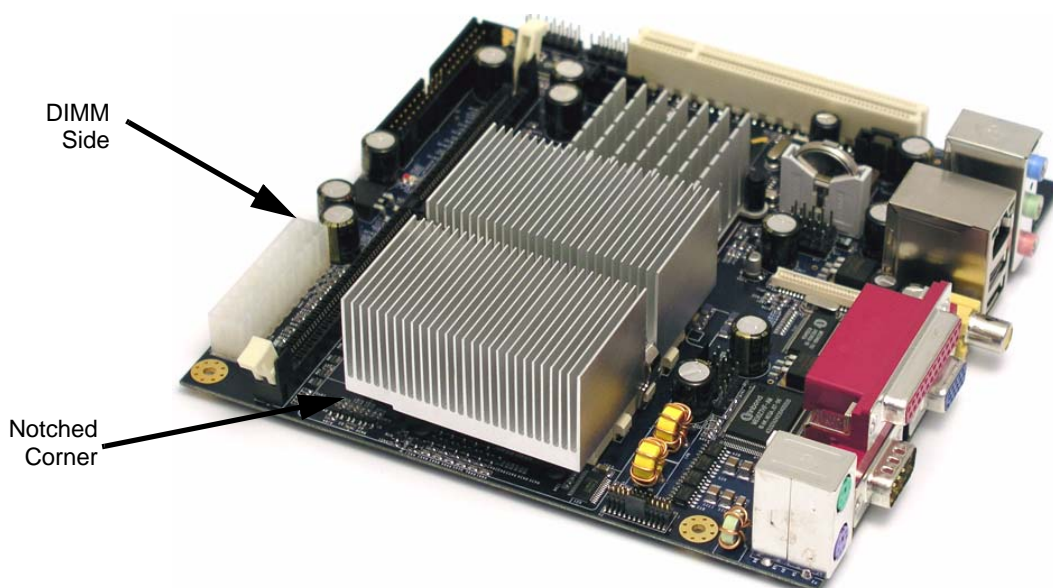


Figure 2.5 – Mount the Heatsink

- 3) Secure the heatsink to the CPU socket by connecting the heatsink clips to the CPU socket, attaching the clip at the center point. Next, carefully connect the clip by using a flathead screwdriver as shown in Figure 2.6.

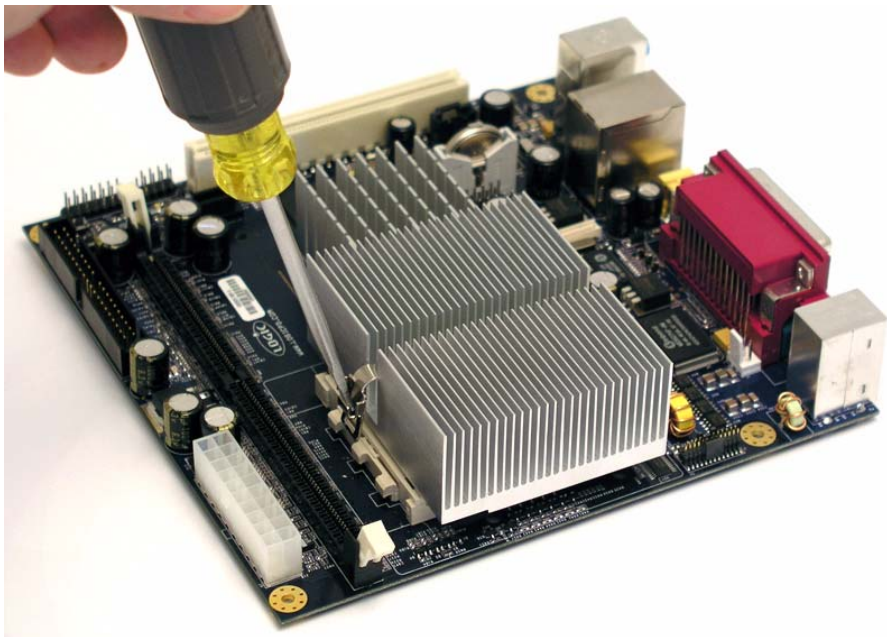


Figure 2.6 – Connect the Clip

2.4 Memory Module (DIMM) Installation

The NX DB1500 development board provides one 184-pin DDR DIMM (Double Data Rate Dual In-line Memory Module) slot.

CAUTION: The DIMM only fits in one correct orientation. It will cause permanent damage to the development board and the DIMM if the DIMM is forced into the slot at the incorrect orientation.

- 1) Unlock the DIMM slot by pressing the retaining clips outward.
- 2) Align the DIMM on the slot such that the notch on the DIMM matches the break on the slot.
- 3) Firmly insert the DIMM into the slot until the retaining clips at both ends fully snap back in place and the DIMM is properly seated.

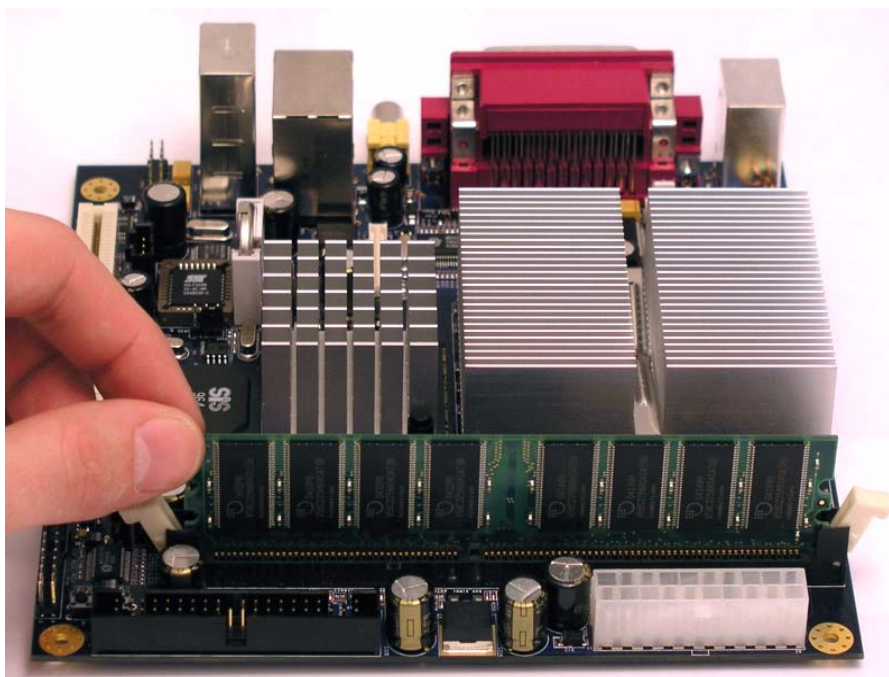


Figure 2.7 – DIMM Installation

2.5 IDE Drive Installation

The NX DB1500 development board provides one IDE connector located next to the DIMM slot. This connector supports an UltraATA 133/100/66/33 IDE hard disk ribbon cable.

- 1) Identify pin 1 on the 80-pin ribbon cable and the IDE connector.

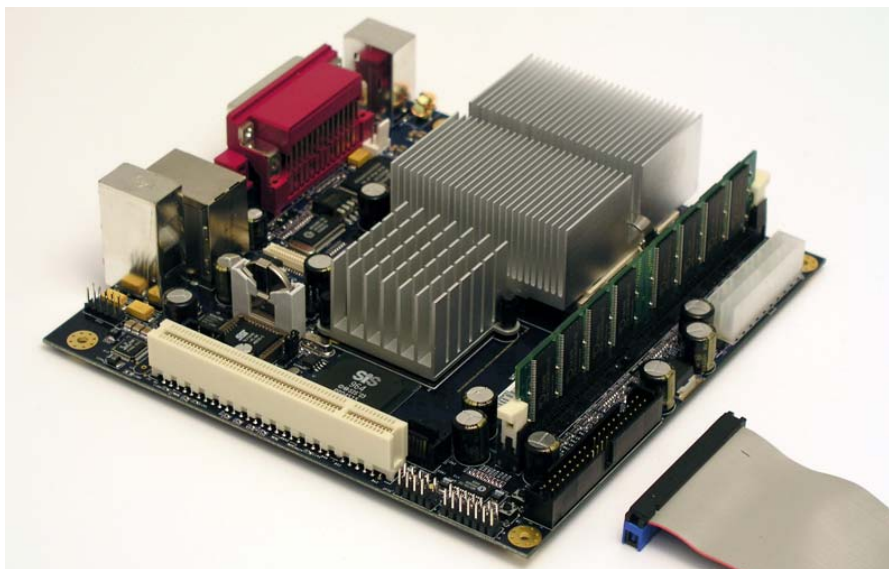


Figure 2.8 – Pin 1 Identification

- 2) Insert the 80-pin ribbon cable into the IDE connector, matching pin 1 on the cable and the connector.

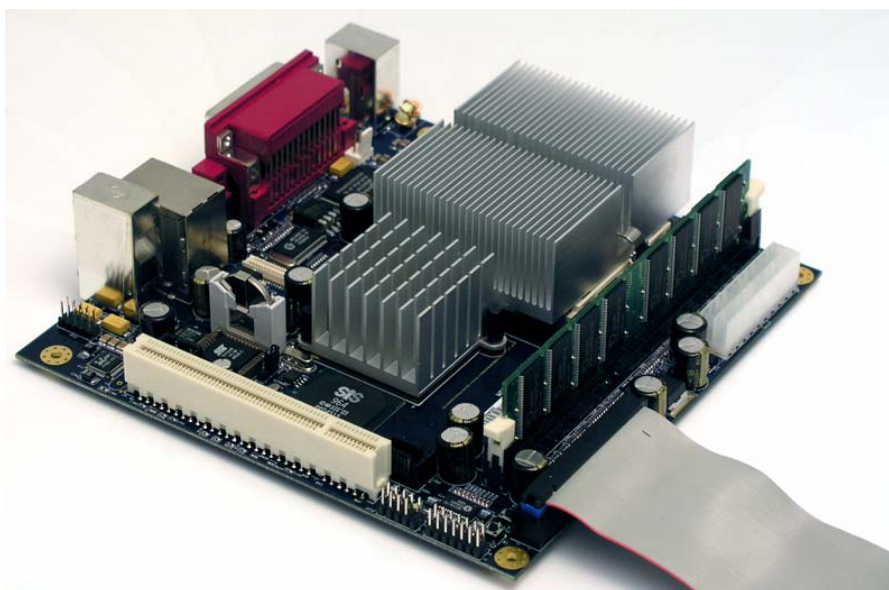


Figure 2.9 – Ribbon Cable Insertion

2.6 Serial ATA Drive Installation

The NX DB1500 development board provides two Serial ATA (SATA) connectors.

- 1) Plug one end of the Serial ATA cable into the development board Serial ATA connector. The connectors are keyed to insert in only one direction.

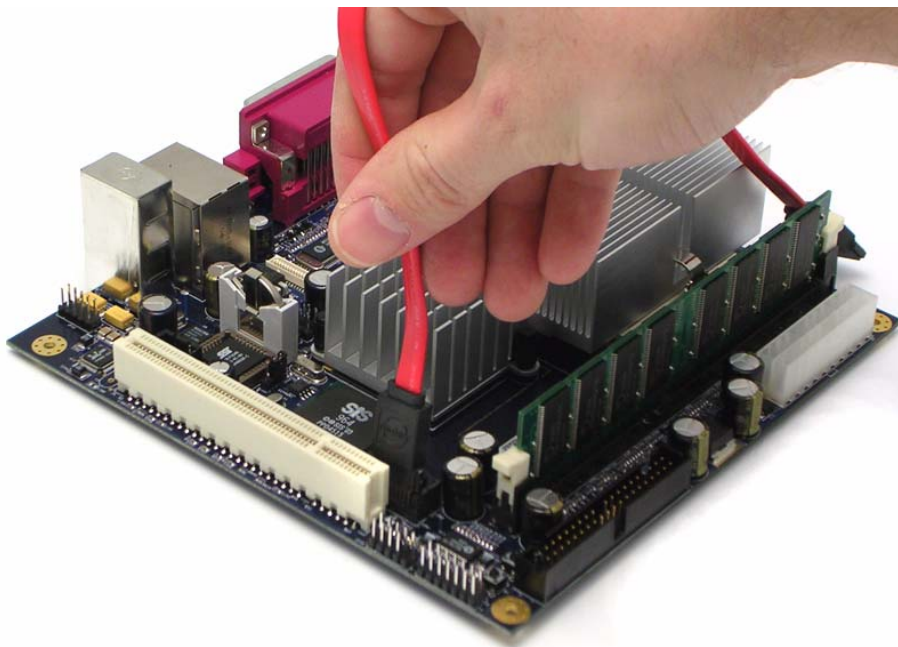


Figure 2.10 – Serial ATA Cable Connection to Development Board

- 2) Plug the other end of the Serial ATA connector into a Serial ATA ready hard drive.

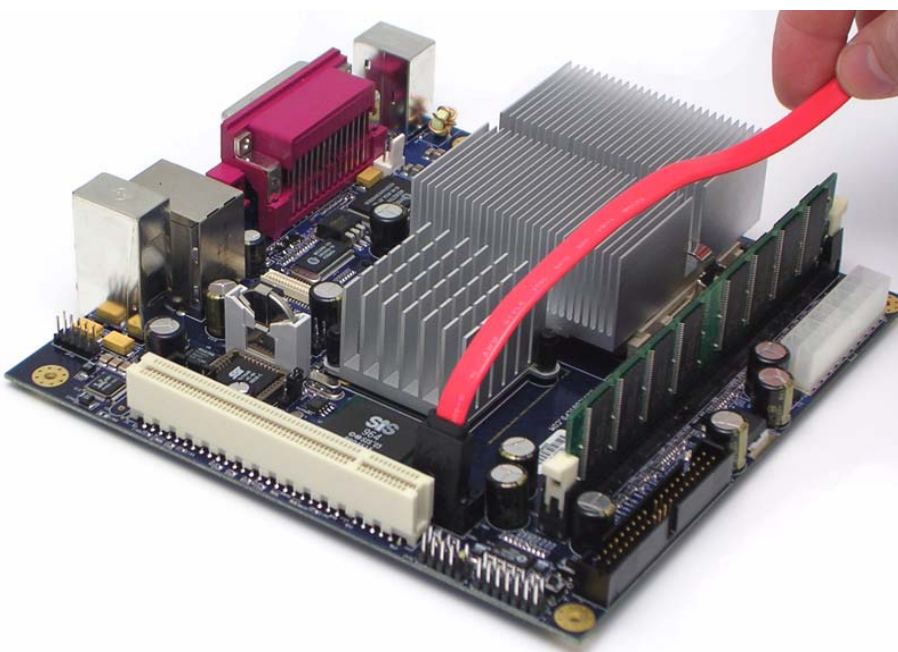


Figure 2.11 – Serial ATA Cable Connection to Hard Drive

2.7 PCI Card Installation

The development board provides one 5V PCI slot.

- 1) With the PCI card's major IC components facing away from the development board, align the card with the PCI slot.

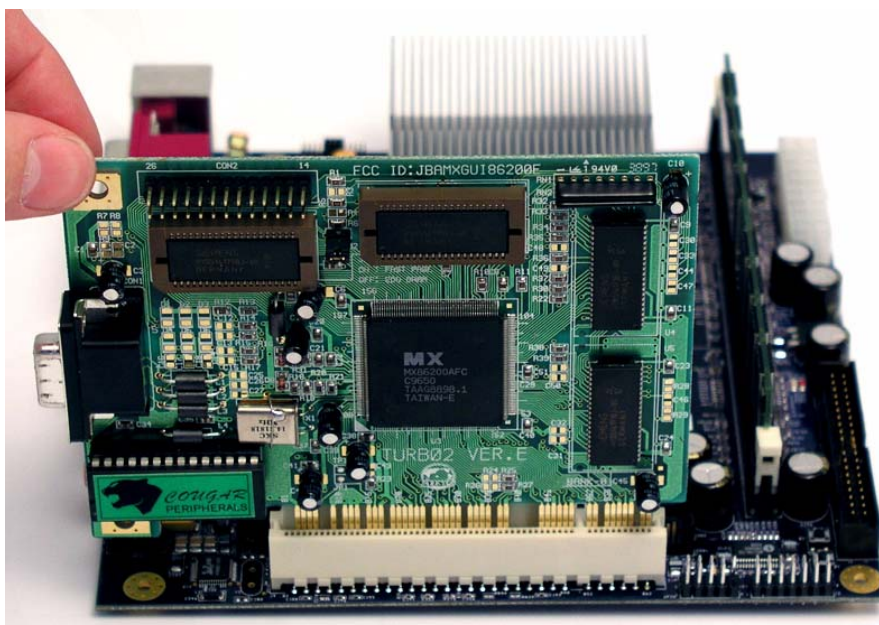


Figure 2.12 – Align Card with PCI Slot

- 2) Firmly insert the card into the PCI slot.

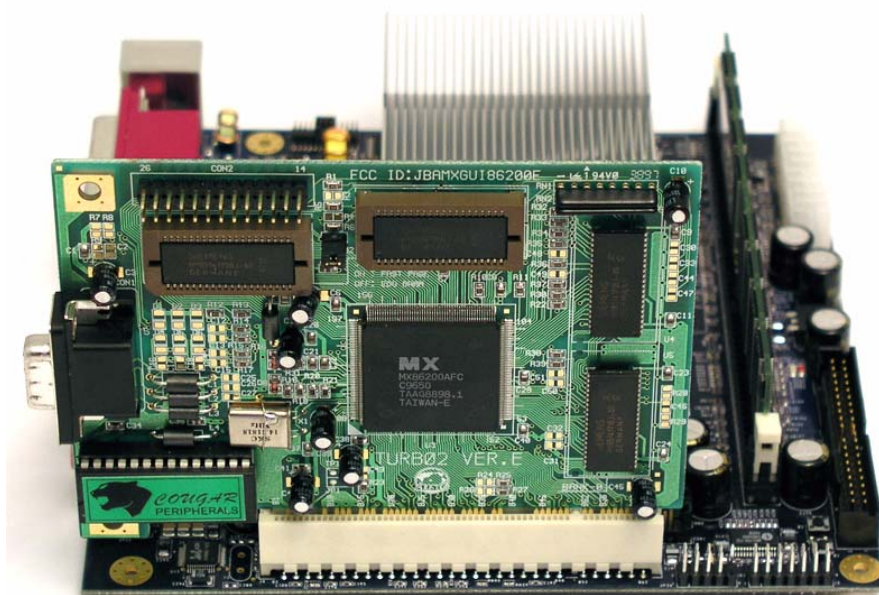


Figure 2.13 – PCI Card in PCI Slot

2.8 USB Development Board Adapter Installation

Two USB 2.0 headers are available for four additional USB port connectors. One USB 2.0 header is located near the PCI slot, next to a mounting hole. This connector is typically used for chassis front panel USB connectors. The second header is located adjacent to the battery holder. Connect a 2-port USB adapter set to this USB header and mount the USB bracket to an open slot in the chassis.

Note: The USB adapter module is not included in the Development Kit. Refer to the NX DB1500 USB 2.0 header assignment in the schematic before inserting any USB cable adapters and carefully read the installation information for the USB cable adapter being used.

- 1) Align both the 5-pin connectors so that the same color coded wires are next to each other, then insert the connectors.

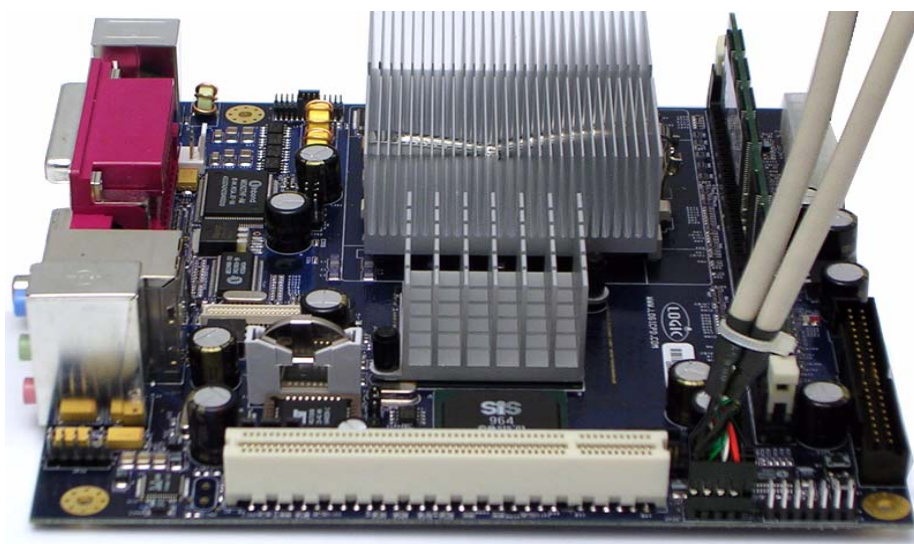


Figure 2.14 – USB Adapter* Next to PCI Slot

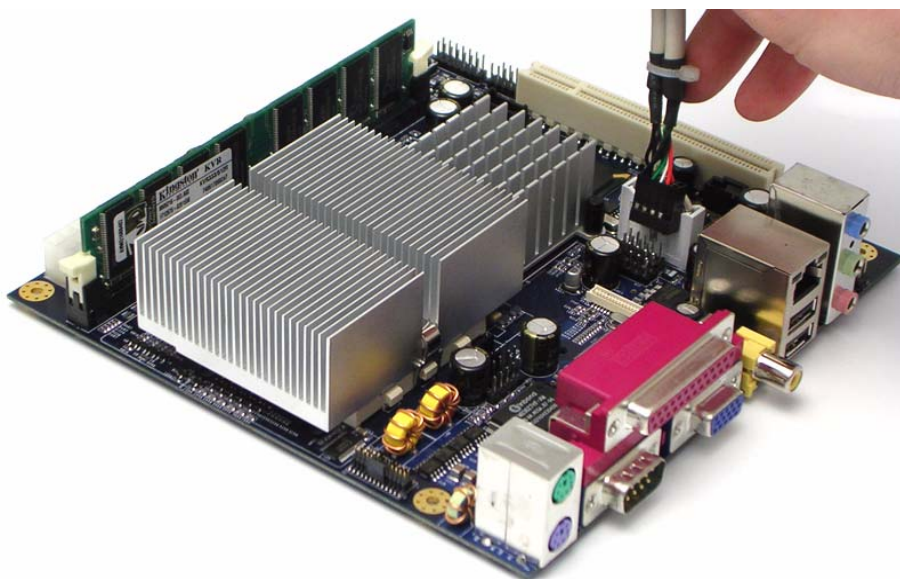


Figure 2.15 – USB Adapter* Next to Battery

*The USB Adapter pictured above is NOT included in the Development Kit.

3 Development Board Connectors

3.1 ATX Front Panel Header

The Geode NX DB1500 development board provides an ATX system panel 14-pin header that accommodates several system front panel functions as shown in Figure 3.1

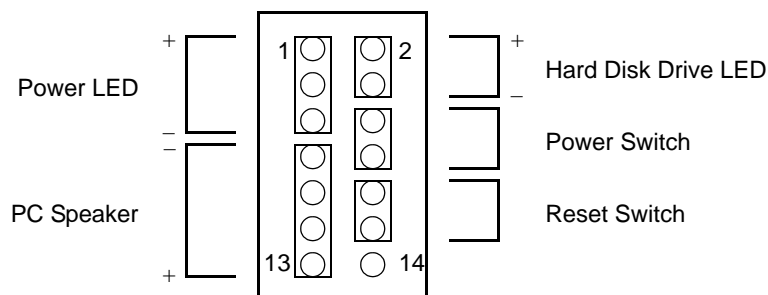


Figure 3.1 – Front Panel Header Connection Diagram

3.2 IR/CIR Connector

This connector (JP31) supports an optional wireless infrared receiving module.

3.3 CPU Fan Connector

The CPU fan connector (J5) is provided for systems running the AMD Geode NX 1750@14W processor, which requires a fan for proper operation.

Connect the fan cable to the fan connector on the development board, making sure that the black wire of the fan cable matches the ground pin on the connector.

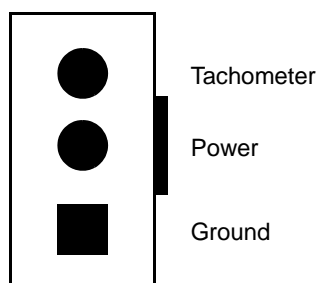


Figure 3.2 – CPU Fan Connector

3.4 ATX Power Connector

The ATX power connector connects to a standard ATX power supply. The power supply cable is designed to fit these connectors in only one orientation. The ATX power supply connector on the development board is located next to the DDR memory slot.

- 1) Align the ATX power supply cable connector with the board connector, making sure the cable connector's plastic clip is facing the board edge.

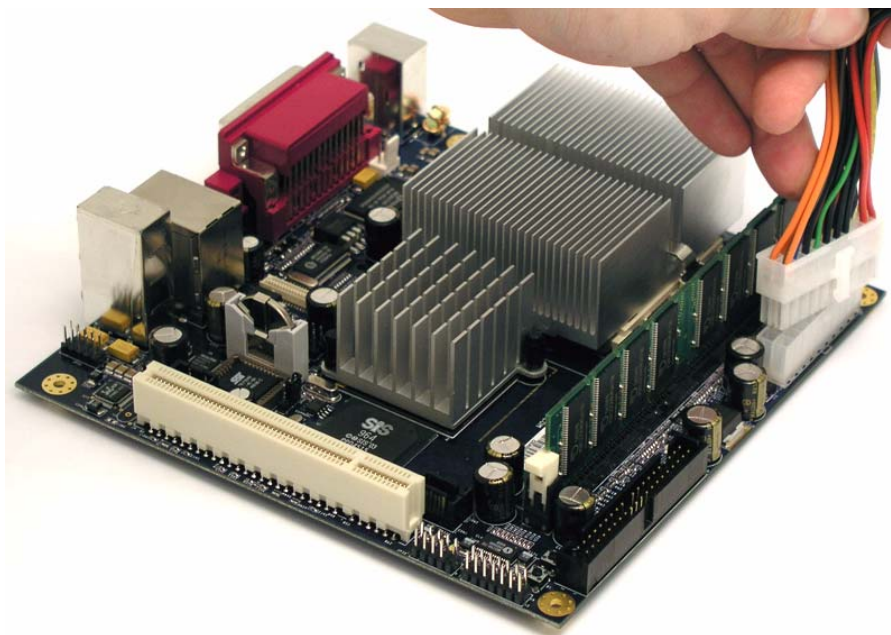


Figure 3.3 – Align Cable Connector with Board Connector

- 2) Firmly insert the cable connector until it is locked in place.

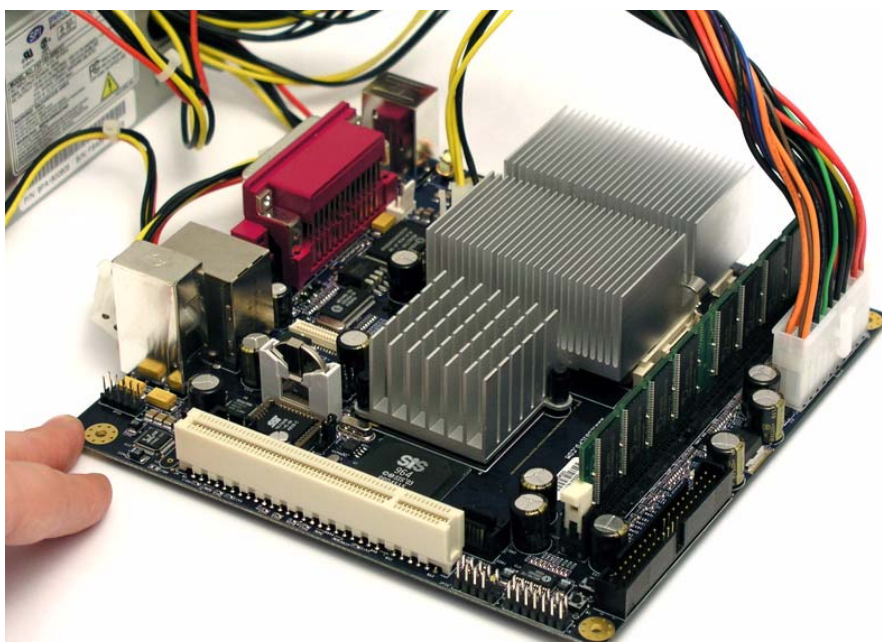


Figure 3.4 – Insert ATX Cable

4 BIOS Information

The Geode NX DB1500 development board supports a programmable Flash EEPROM. A description of how to update the Flash EEPROM using the provided utility can be found in Section 4.4 "Managing and Updating the BIOS."

Note: The BIOS shipped with the NX DB1500 development board kit is by AMI. The following subsections will vary for non AMI BIOS.

4.1 BIOS Setup

Use the BIOS Setup program when reconfiguring the system or when prompted to "Run Setup." This section explains how to configure the system using this utility.

The Flash EEPROM on the development board stores the Setup utility. When started, the system provides an opportunity to run this program. Press <Delete> during the POST (Power-On Self Test) to enter the Setup utility, otherwise, POST continues with its test routines.

If entering Setup after POST, the system must be restarted. There are three options to restart the system:

- 1) Press <Ctrl> + <Alt> + <Delete>.
- 2) Press the reset button on the system chassis.
- 3) Turn the system off and then back on. Do this last option only if the first two failed.

The Setup program is a menu driven program. It allows scrolling through the various sub-menus to make selections from the preset options.

Note: Because the BIOS software is constantly being updated, the following BIOS setup sub-menu descriptions are for reference purposes only, and may not exactly match with what appears on the screen.

4.2 BIOS Menu Bar

To access the menu bar items, press the <up> or <down> arrow key on the keyboard until the desired item is highlighted. Press <Enter> to select a menu bar.

Table 4.1 is a summary of the most commonly used BIOS options.

Table 4.1 – Commonly Used BIOS Options

Menu	Option
Main	Date, Time, BIOS version, Processor information, and System Memory
Advanced	Configuration for CPU, IDE, Floppy, Super I/O, Hardware Health, ACPI, MPS, and USB
PCIPnP	Plug and Play options
Boot	Boot options and boot drive priority
Security	Password options
Chipset	Northbridge and Southbridge configuration options
Power	Power Management options
Exit	Save and Exit options

4.3 BIOS Navigation

The right side of the BIOS Setup screen provides the navigation control button definitions. The keys here allow navigation through the various Setup menus.

Table 4.2 is a list of the legend bar keys with their corresponding function.

Table 4.2 – Legend Bar Key Functions

Keys	Operation
<- -> (Arrow Left or Arrow Right)	Select the menu screen
Arrow Up or Arrow Down	Select the item on the active menu screen
Enter	Go to the subscreen or update
F1	General help
F10	Save and exit
Esc	Exit sub-menu or exit and discard changes

4.4 Managing and Updating the BIOS

The BIOS code for the NX DB1500 development board can be updated through software. AMD may periodically release BIOS updates to enable new features. The original BIOS binary file (.bin) for the development board is included in the development kit's CD-ROM in case there is a need to restore the original BIOS. The BIOS shipped with the kit is by AMI. Follow the steps in the sections below to update the system BIOS.

4.4.1 Creating a Bootable Floppy Disk

Windows XP Environment:

- 1) Insert a new 1.44 MB floppy disk in the floppy disk drive.
- 2) From the Windows desktop, click **Start | My Computer**.
- 3) In the "My Computer" window, click the **3½" Floppy** icon.
- 4) From the "Menu" bar, click **File | Format**.
- 5) Select "Create an MS-DOS Startup Disk" in the "Format Options" field, then click **Start**.

4.4.2 Updating BIOS Using the AMI BIOS Flash Utility

The BIOS can be updated using a bootable floppy disk with the executable Flash Memory Writer Utility (FLASH867.EXE). This utility can program the entire flash chip with code from any BIOS vendor. Follow the instructions below to update or reprogram the BIOS using this utility.

- 1) Download the latest BIOS file from the AMD Alchemy and Geode Developer Support web site and save it to the floppy disk. There may be BIOS images from multiple vendors, so there may be several options. Save only the new BIOS file you wish to use on the floppy disk to avoid loading a wrong BIOS file.
- 2) Copy the FLASH867.EXE application from the tools directory of the development kit's CD-ROM to the floppy disk.
- 3) Attach a USB floppy disk drive to one of the USB ports on the development board. Enter the BIOS Setup utility and change the boot order so that the USB floppy is the first boot device. (Refer to the *Zoom Geode NX Development Kit QuickStart Guide* for background information.)
- 4) Insert the floppy disk into the USB floppy drive and reboot the development board.
- 5) Wait for the board to boot to MS-DOS. At the A:\ prompt, type "FLASH867 <romfilename> /a /b /e". (Example: flash867 0ami4005.rom /a /b /e".) This command reprograms the flash chip and reports the progress on the screen. A screen capture of the program output is shown below in Figure 4.1.
- 6) After the programming is complete, power off the development board by the switch on the power supply, or unplug the power cord.

- 7) Find the Clear CMOS jumper on the board (JP35) and use the jumper cap to short pins 1 and 2 for three seconds. Consult the board diagram on page 7 of the QuickStart Guide to help locate the Clear CMOS jumper.
- 8) Place the jumper cap back on pins 2 and 3. Plug in the power cord and turn on the power supply.
- 9) Once the system has been reset, the new BIOS image will boot and the user will be prompted to press a key to load BIOS defaults or enter setup

```

a:\>flash867 6a7i800g.bin /a /b /d /e
DOS/4G Protected Mode Run-time Version 2.01a
Copyright (c) Tenberry Software, Inc. 1996

Flash Utility Ver .867
(C)Copyright 1985-2002, American Megatrends Inc. All Rights Reserved.

Chipset      : SIS
Flash Part   : SST
Flash Type   : 49LF004A           -512 Kb
File Name    : 6A7I800G.BIN       -512 Kb
Checksum     : 4D00

<> Flash Boot Block.....Y      <> Reset After Flashing.....N
<> Clear CMOS after Flashing..Y  <> Keep DMI Data.....N

> BIOS Update Completed - Pass
A:\>

```

Figure 4.1 – BIOS Screen Shot

Note: Each BIOS vendor's code configures the board resources differently. This can cause problems when an OS image has been installed with one vendor's BIOS and then booted with another. Be aware that problems may occur booting an OS image after changing the board BIOS to a different vendor. (Example: If Windows XP is installed on a hard disk using an AMI BIOS, the board may hang when trying to boot the same disk using the AWARD BIOS.) It is recommended to have a separate OS image for each BIOS vendor evaluated. Updating BIOS only (from the same vendor) does not typically have this problem.



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