iEi

IEI Technology Corp.

NANO-8522

EPIC SBC Intel / Celeron M CPU with CRT/LCD, LAN, SATA and Audio

USER MANUAL

Rev. 1.0, June 2006

RoHS Lead Free

REVISION HISTORY

Title	NANO-8522 Celeron M Board	
Revision Number	Description	Date of Issue
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Glossary

AC '97   Audio Codec 97

ACPI   Advanced Configuration and Power
             Interface

APM   Advanced Power Management

ARMD   ATAPI Removable Media Device

ASKIR   Shift Keyed Infrared

ATA   Advanced Technology Attachments

BIOS   Basic Input/Output System

CFII   Compact Flash Type 2

CMOS   Complementary Metal Oxide
             Semiconductor

CPU   Central Processing Unit

Codec   Compressor/Decompressor

COM   Serial Port

DAC   Digital to Analog Converter

DDR   Double Data Rate

DIMM   Dual Inline Memory Module

DIO   Digital Input/Output

DMA   Direct Memory Access

EIDE   Enhanced IDE

EIST   Enhanced Intel SpeedStep
             Technology

FDD   Floppy Disk Drive

FDC   Floppy Disk Connector

FFIO   Flexible File Input/Output

FIFO   First In/First Out

FSB   Front Side Bus

IrDA   Infrared Data Association

HDD   Hard Disk Drive

IDE   Integrated Data Electronics

I/O   Input/Output

ICH4   I/O Controller Hub 4

L1 Cache Level 1 Cache

L2 Cache Level 2 Cache

LCD   Liquid Crystal Display

LPT   Parallel Port Connector

LVDS   Low Voltage Differential Signaling

MAC   Media Access Controller

OS   Operating System

PCI   Peripheral Connect Interface

PIO   Programmed Input Output

PnP   Plug and Play

POST   Power On Self Test

RAM   Random Access Memory

SATA   Serial ATA

S.M.A.R.T Self Monitoring Analysis and
             Reporting Technology

SPD   Serial Presence Detect

S/PDI   Sony/Philips Digital Interface

SDRAM   Synchronous Dynamic Random
             Access Memory

SIR   Serial Infrared

TPM   Trusted Platform Module

UART   Universal Asynchronous
             Receiver-transmitter

USB   Universal Serial Bus

VGA   Video Graphics Adapter

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Chapter

1

Introduction

1.1 NANO-8522 Board Overview

The EPIC form factor NANO-8522 Intel Petium M / Celeron M Socket 479 embedded board is fully equipped with a high performance processor and advanced multi-mode I/Os. The NANO-8522 is designed for system manufacturers, integrators, and VARs that want performance, reliability, and quality at a reasonable price.

1.1.1 NANO-8522 Board Variations

Two IEI NANO-8522 models are available. The models are listed in **Table 1-1**.

Model	CPU	Clock Speed—Ultra Low Voltage	FSB	Socket / On board	Ethernet
NANO-8522G-R10	Intel Pentium M / Celeron M	1 GHz and 900 MHz	400 MHz	Socket 479	1GbE
NANO-8522E-800Z-R10	Intel Celeron M	800 MHz	400 MHz	On board	10/100Mbps

Table 1-1: NANO-8522 Board Variations

1.1.2 NANO-8522 Board Benefits

EPIC form factor NANO-8522 defines a new industry open standard for small form factor embedded computer boards. Some of the NANO-8522 board benefits include,

- allowing additional space to support advanced processors and technologies
- supporting complex I/O functions for industrial, medical, military, transportation, and commercial applications
- saving money and space from cables

1.1.3 NANO-8522 Board Features

Some of the NANO-8522 board features are listed below:

- Complies with EPIC form factor
- Complies with RoHS
- Supports AT/ATX power supply
- Supports up to 1GB of 266MHz or 200MHz single channel DDR memory

- Supports dual independent displays, CRT/LCD display and 36-bit LVDS flat panel screens
- Supports PCI-104 extension slot
- Complete I/O support with
    - 2 x SATA-150 connectors
    - 6 x USB 2.0 connectors
    - 1 x Parallel port connector
    - 1 x CFII connector
    - 3 x RS-232 connectors
    - 1 x RS232/422/485 selector
    - 1 x PS/2 Keyboard/Mouse connector
    - 1 x IDE device connector

1.2   NANO-8522 Board Overview
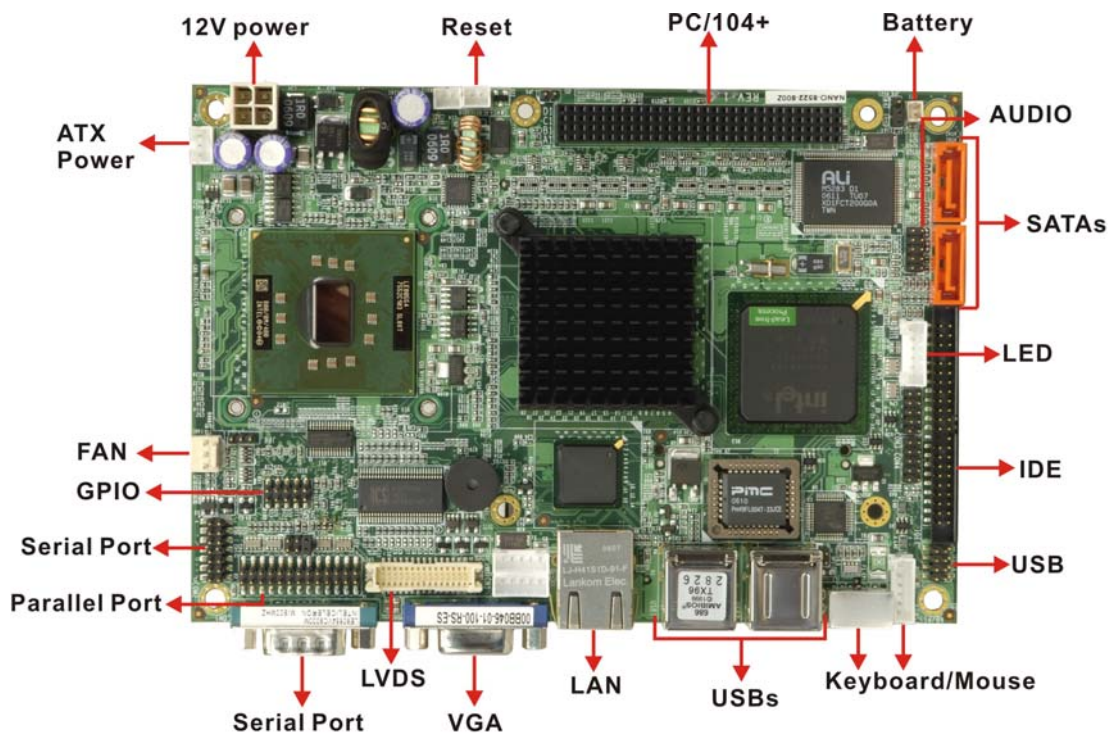
Figure 1-1: NANO-8522 Board Overview (Top View)
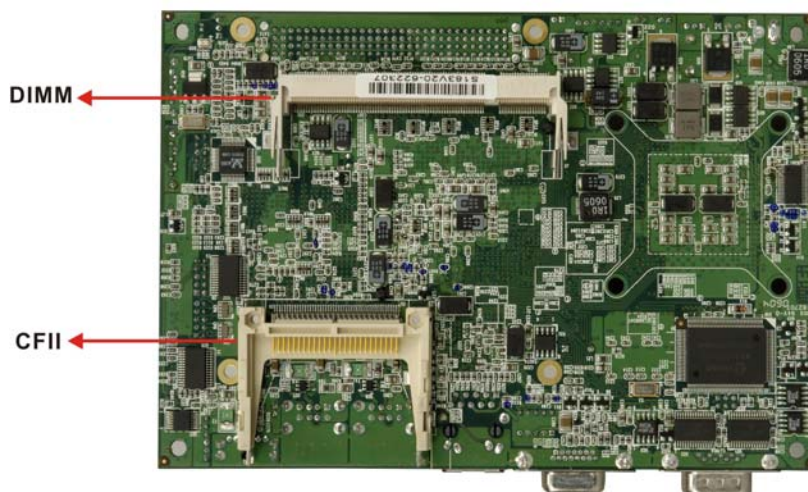
Figure 1-2: NANO-8522 Board Overview (Bottom View)

1.2.1 NANO-8522 Board Connectors

The NANO-8522 board has the following connectors onboard:

- 1 x 12V power connector
- 1 x 4-bit GPIO connector
- 1 x ATX power button connector
- 1 x ATX power connector
- 1 x Audio connector
- 1 x Battery connector
- 1 x Compact flash connector
- 1 x DDR SDRAMSODIMM socket
- 1 x DIO connector
- 1 x Fan connector
- 1 x IDE device connector
- 1 x Keyboard/mouse connector
- 1 x LED connector
- 1 x LCD LVDS interface connector
- 1 x Parallel port connector
- 1 x PC/104-plus connector
- 1 x Reset connector
- 2 x Serial ATA connectors
- 3 x Serial port connectors
- 2 x USB 2.0 connectors

The NANO-8522 board has the following connectors on the board rear panel:

- 1 x Serial port connector (COM)
- 1 x VGA connector
- 1 x RJ-45 Ethernet connector
- 4 x USB 2.0 ports
- 1 x Keyboard/Mouse connector

The location of these connectors on the NANO-8522 can be seen in **Figure 1-1** and **Figure 1-2**. These connectors are fully described in *Chapter 3 Connectors and Jumpers*.

1.2.2 Technical Specifications

NANO-8522 board technical specifications are listed in **Table 1-2**. Detailed descriptions of each specification can be found in *Chapter 2 Detailed Specifications*.

SPECIFICATION	
CPUs Supported	Intel® Pentium® M Socket 479, Intel® Celeron® M Socket 479, or Intel® Celeron® M 800 MHz zero cache processor on board
Chipsets	Northbridge: Intel® 852GM Southbridge: Intel® ICH4
I/O Controller	ICH4
Graphics Support	Intel® Extreme Graphics 2
Display	CRT integrated in Intel® 852GM Dual 18-bit LVDS integrated in Intel® 852GM
Memory	One DDR SDRAM SODIMM memory module (Max. 1GB)
PCI Bus Interface	PCI-104
HDD Interface	One IDE channel supports two Ultra ATA/33 devices
Serial ATA Interface	Two SATA connectors supported
USB Interfaces	Six USB 2.0 connectors supported
Serial Ports	Four COM ports
Real Time Clock	256-byte battery backed CMOS RAM
Hardware Monitoring	Cooling fans, temperature and system voltages
Power Management	Supports Advanced Configuration and Power Interface (ACPI) Specifications Revision 2.0

Ethernet	Intel 82541PI for GbE / Intel 82551ER for 10/100Mbps
BIOS	AMI flash BIOS
Physical Dimensions	115mm x 165mm (width x length)
Weight	GW: 1.1 Kg NW: 0.95 Kg
Operating Temperature	Minimum: 0ºC (32°F) Maximum: 60°C (140°F)
Audio Interfaces	AC '97 Codec Realtek ALC655

Table 1-2: Technical Specifications

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Chapter

2

Detailed Specifications

2.1 CPU Support

Table-2-1 lists the CPUs supported by the NANO-8522 board.

Model	Clock Speed	L2 Cache	Max. FSB	Socket
Intel® Pentium® M	1.30 to 1.70 GHz	1 MB	400 MHz	479
Intel® Celeron® M	1.20 to 1.73 GHz	1 MB	400 MHz	479
Intel® Celeron® M	800 MHz	512 KB	400 MHz	On board

Table-2-1: Supported CPUs

2.1.1 Intel® Pentium® M :

The Intel® Pentium® M processor comes with the following features:

- Intel® Streaming SIMD Extensions accelerates 3D graphics performance, video decoding/encoding, and speech recognition.
- SpeedStep® Technology enhances overall system power management
- Micro-FCPGA and Micro-FCBGA packaging technologies
- Compatibility with IA-32 software.
- Advanced branch prediction architecture that reduces the number of mispredicted branches.

2.1.2 Intel® Celeron® M :

The (ULV) Intel® Celeron® M processor comes with the following features:

- Intel® Streaming SIMD Extensions accelerates 3D graphics performance, video decoding/encoding, and speech recognition.
- Advanced power management features
- Compatible with IA-32 software.
- Advanced branch prediction and data prefetch logic

2.2   Onboard Chipsets

2.2.1 Northbridge and Southbridge Chipsets

The following chipsets are preinstalled on the board:

- **Northbridge**: Intel® 852GM
- **Southbridge**: Intel® ICH4

The following two sections (**Section 2.2.2** and **Section 2.2.3**) list some of the features of the Intel® 852GM and the Intel® ICH4 chipsets. For more information on these two chipsets please refer to the Intel website.

2.2.2 Intel® 852GM Northbridge Chipset

The Intel® 852GM Northbridge chipset comes with the following features:

- Supports Intel® NetBurst® micro-architecture
- 400 MHz system bus delivers a high-bandwidth connection between the processor and the platform
- Supports integrated graphics utilizing Intel® Extreme Graphics 2 technology
- Three USB host controllers provide high performance peripherals with 480 Mbps of bandwidth, while enabling support for up to six USB 2.0 ports.
- The latest AC '97 implementation delivers 20-bit audio for enhanced sound quality and full surround-sound capability.
- LAN Connect Interface (LCI) provides flexible network solutions such as 10/100 Mbps Ethernet and 10/100 Mbps Ethernet with LAN manageability
- Dual Ultra ATA/100 controllers, coupled with the Intel® Application Accelerator supports faster IDE transfers to storage devices
- Intel Application Accelerator software provides additional performance over native ATA drivers by improving I/O transfer rates and enabling faster O/S load time, resulting in accelerated boot times

2.2.3 Intel® ICH4 Southbridge Chipset

The ICH4 provides extensive I/O support. Functions and capabilities include:

- PCI Local Bus Specification, Revision 2.2-compliant with support for 33 MHz PCI operations.
- PCI slots (supports up to 6 Req/Gnt pairs)
- ACPI Power Management Logic Support
- Enhanced DMA controller, Interrupt controller, and timer functions
- Integrated IDE controller supports Ultra ATA100/66/33
- USB host interface with support for six USB ports; three UHCI host controllers; one EHCI high-speed
- USB 2.0 Host controller
- Integrated LAN controller
- System Management Bus (SMBus) Specification, Version 2.0 with additional support for I^2C devices
- Supports Audio Codec '97, Revision 2.3 specification (a.k.a., AC '97 Component Specification, Revision 2.3)
- Link for Audio and Telephony codecs (up to seven channels)
- Low Pin Count (LPC) interface
- Firmware Hub (FWH) interface support
- Alert On LAN* (AOL) and Alert On LAN 2* (AOL2)

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2.3   Data Flow

Figure 2-1 shows the data flow between the two onboard chipsets and other components installed on the NANO-8522 and described in the following sections of this chapter.
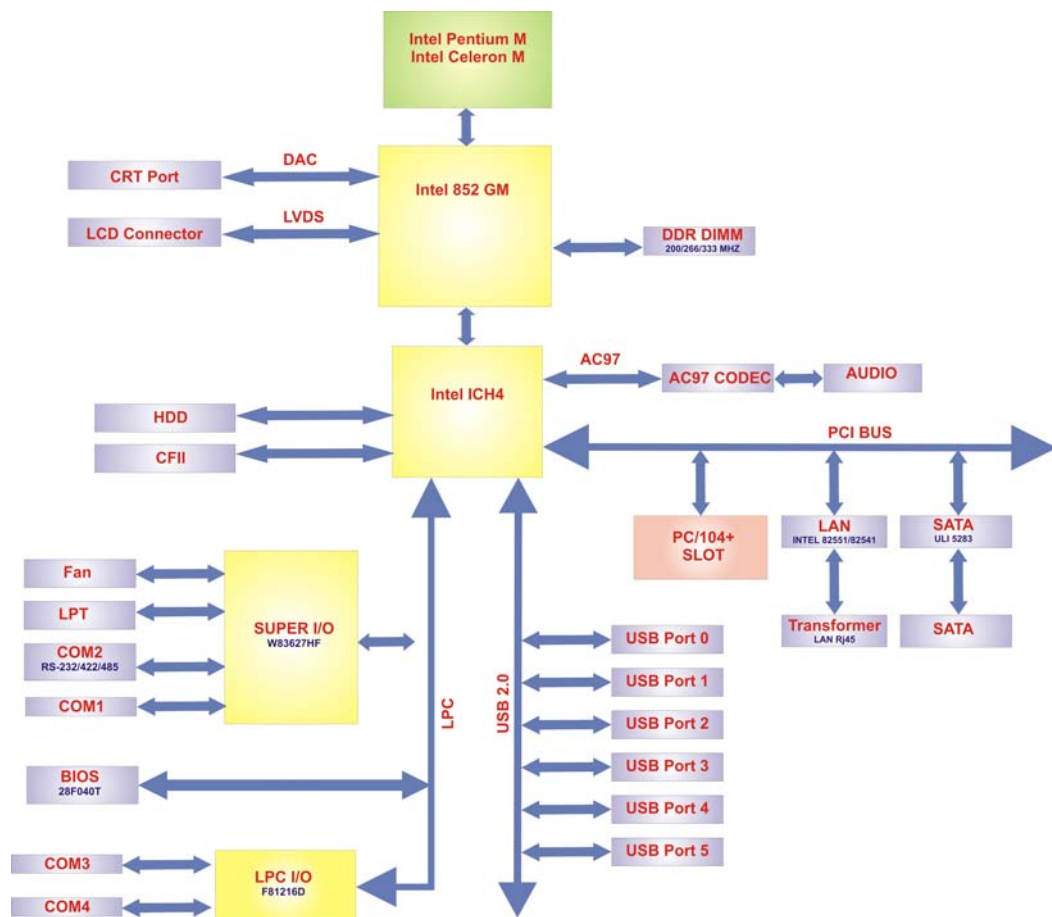
Figure 2-1: Data Flow Block Diagram

2.4   Graphics Support

The Intel® Extreme Graphics 2 is integrated on the Intel® 852GM Northbridge chipset. The Intel® Extreme Graphics 2 features are listed below.

- **Enhanced Rapid Pixel and Texel Rendering**: Optimized visual quality and performance from the addition of hardware to support of texel formatting, bicubic filter, color blending accuracy, and video mixing render, resulting in optimized visual quality and performance.

- **Zone Rendering 2 Technology**: Enhances the performance of zone rendering by using larger zones and new commands that improve graphics pipeline efficiency.

- **Dynamic Video Memory Technology v2.0**: Increases total system performance by optimizing the efficiency of AGP dynamic video memory by increasing its size of Video RAM allocation to 96 MB.

- **Enhanced Intelligent Memory Management**: Improves memory bandwidth efficiency and platform performance by improving the memory management arbitration between CPU, system memory and graphics memory.

Intel® Extreme Graphics 2 specifications are listed below:

- Enhanced 2D:
  - 256-bit internal path
  - 8/16/32bpp
  - DirectDraw*, GDI, GDI+
  - Anti-aliased text support
  - Alpha blending
  - Alphas stretch blitter
  - Hardware alpha blended RGB cursor
  - Color space conversion
  - 5x2 overlay support
  - Rotate, scale and translate operations
- High-performance 3D:
  - 256-bit internal path
  - 32bpp/ 24ZorW/ 8 Stencil

- o DX7*/DX8*/OGL*1.1
- o DXTn texture compression
- o Up to 4 textures / pixel on a single pass
- o Cubic reflection map
- o Embossed/DOT3 bump mapping
- o Multi-texture
- o DOT3 bump-mapping
- o Point sprites
- ■ Video and Display:
  - o DirectShow*/DirectVA*
  - o Hardware motion compensation support for DVD playback
  - o 4x2 overlay filter
  - o 350 MHz DAC frequency
  - o Maximum DVO pixel rate of up to 330MP/s
  - o Flat panel monitors and TV-out support via AGP Digital Display (ADD) cards
  - o 350 MHz DAC for 1800x1440 @ 85Hz max CRT resolution or 2048x1536@60Hz max FP resolution
  - o Synchronous display for dual monitor capabilities
  - o 350MHz RAMDAC for up to QXGA analog monitor support
  - o Dual DVO ports for up to QXGA digital display support
  - o Multiple display types (LVDS, DVI, TV-out, CRT)

2.5   Memory Support

The NANO-8522 supports one 200-pin 266MHz or 200MHz DDR SDRAM SODIMM with a maximum capacity of 1GB.

2.6   PCI Bus Interface Support

The PCI bus on the NANO-8522 board has the following feature:

- ■ 33MHz Revision 2.2 is implemented

2.7   10/100/1000 Base-T Internet

The onboard Intel 82551ER (for NANO-8522E-800Z-R10) controller provides 10/100 Base-T Internet connectivity to the system. The Intel 82551ER controller features are below.

- IEEE 802.3 10BASE-T compliant physical layer interface
- IEEE 802.3u Auto-Negotiation and 100BASE-TX support
- Reduces board space requirements
- Prevents data overruns or underruns
- Provides excellent performance with offloading of TCP, UDP and IP checksums
- 32-bit PCI bus controller with embedded memory
- Multiple priority queues augment Quality of Service (QoS) performance

The onboard Intel 82541PI (for NANO-8522G-R10) controller provides Ethernet interface for 10/100/1000 Base-T applications. The Intel 82541PI controller features are below.

- IEEE 802.3 10BASE-T compliant physical layer interface
- IEEE 802.3u Auto-Negotiation and 100BASE-TX support
- Power Save mode switches link speed from 1000Mb/s down to 10 or 100Mb/s
- PCI clock suspension for low-power mobile design
- Programmable host memory receive buffers (256B to 16KB)
- TCP segmentation (LSO), TCP and UDP checksum off-loading
- Compliance with PCI Power Management v1.1/ACPI v2.0
- Automatic link speed switching from 1000Mb/s down to 10 or 100Mb/s in standby

2.8   IDE Device Support

The NANO-8522 southbridge chipset IDE controller supports up to two HDDs with the following specifications:

- Supports PIO IDE transfers up to 16MB/s
- Supports Ultra ATA/33 devices with data transfer rates up to 33MB/s

2.9   SATA Drive Support

The NANO-8522 supports two first-generation SATA drives with transfer rates of up to 1.5GB/s.

2.10   Real Time Clock

256-byte battery backed CMOS RAM

2.11   System Monitoring

The NANO-8522 board is capable of self-monitoring various aspects of its operating status including:

- CPU, chipset, and battery voltage, +3.3V, +5V, and +12V
- RPM of cooling fans
- CPU and board temperatures (by the corresponding embedded sensors)

2.12   USB Interfaces

The NANO-8522 board has six USB interfaces, two internal and four external. The USB interfaces support USB 2.0.

2.13   BIOS

The NANO-8522 board uses a licensed copy of AMI BIOS. The features of the flash BIOS used are listed below:

- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (**P**re-Boot E**x**ecution **E**nvironment) support
- USB booting support

2.14   Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the NANO-8522 board are listed below.

- Minimum Operating Temperature: 0ºC (32°F)

- Maximum Operating Temperature: 60°C (140°F)

A heat sink must be installed on the CPU. Thermal paste must be smeared on the lower side of the heat sink before it is mounted on the CPU. Heat sinks are also mounted on the Northbridge and Southbridge chipsets to ensure the operating temperature of these chips remain low.

✔ **NOTE:**

The NANO-8522 comes with a preinstalled heat sink and CPU. The heat sink should not be removed during operation. If the CPU is replaced, prior to running the system, the heat sink must be reinstalled on the NANO-8522.

2.15 Audio Codec

The NANO-8522 has an integrated REALTEK ALC655 CODEC. The ALC655 CODEC is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR-based designs. Some of the features of the codec are listed below.

- Meets performance requirements for audio on PC99/2001 systems
- Meets Microsoft WHQL/WLP 2.0 audio requirements
- 16-bit Stereo full-duplex CODEC with 48KHz sampling rate
- Compliant with AC'97 Rev 2.3 specifications
- Front-Out, Surround-Out, MIC-In and LINE-In Jack Sensing
- 14.318MHz -> 24.576MHz PLL to eliminate crystal
- 12.288MHz BITCLK input
- Integrated PCBEEP generator to save buzzer
- Interrupt capability
- Three analog line-level stereo inputs with 5-bit volume control, LINE_IN, CD, AUX
- High-quality differential CD input

- Two analog line-level mono inputs: PCBEEP, PHONE-IN
- Two software selectable MIC inputs
- Dedicated Front-MIC input for front panel applications (software selectable)
- Boost preamplifier for MIC input
- LINE input shared with surround output; MIC input shared with Center and LFE output
- Built-in 50mW/20ohm amplifier for both Front-out and Surround-Out
- External Amplifier Power Down (EAPD) capability
- Power management and enhanced power saving features
- Supports Power-Off CD function
- Adjustable VREFOUT control
- Supports 48KHz S/PDIF output, complying with AC'97 Rev 2.3 specifications
- Supports 32K/44.1K/48KHz S/PDIF input
- Power support: Digital: 3.3V; Analog: 3.3V/5V
- Standard 48-pin LQFP package
- EAX™ 1.0 & 2.0 compatible
- Direct Sound 3D™ compatible
- A3D™ compatible
- I3DL2 compatible
- HRTF 3D positional audio
- 10-band software equalizer
- Voice cancellation and key shifting in Karaoke mode
- AVRack® Media Player
- Configuration Panel for improved user convenience

2.16 Power Consumption

Table 2-2 shows the power consumption parameters for the NANO-8522 when a zero cache ULV Celeron M CPU is running with a clock speed of 800MHz and a 256MB 266MHz DDR.

Voltage	Current
+12V	0.85A

Table 2-2: Power Consumption

Table 2-3 shows the power consumption parameters for the NANO-8522 when a Pentium CPU is running with a clock speed of 1.7GHz and a 512MB 266MHz DDR.

Voltage	Current
+12V	3.5A

Table 2-3: Power Consumption

2.17 Packaged Contents and Optional Accessory Items

2.17.1 Package Contents

The NANO-8522 is shipped with the following components.

- 1 x NANO-8522 single board computer
- 1 x IDE flat cable 44p/44p
- 1 x Keyboard/PS2 Mouse Y cable
- 1 x Audio cable
- 2 x SATA cables
- 1 x SATA Power cable
- 1 x Power cable
- 2 x RS232 cables
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x QIG (quick installation guide)

Listed below are some optional cables:

- CPU Cooler

- USB cable
- LPT cable
- RS232/422/485 cable

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Chapter

3

Connectors and Jumpers

3.1   Peripheral Interface Connectors

The locations of the peripheral interface connectors are shown in **Section 3.1.1**. A complete list of all the peripheral interface connectors can be seen in **Section 3.1.2**.

3.1.1 NANO-8522 Board Layout

Figure 3-1 and Figure 3-2 shows the onboard peripheral connectors, rear panel peripheral connectors and onboard jumpers.
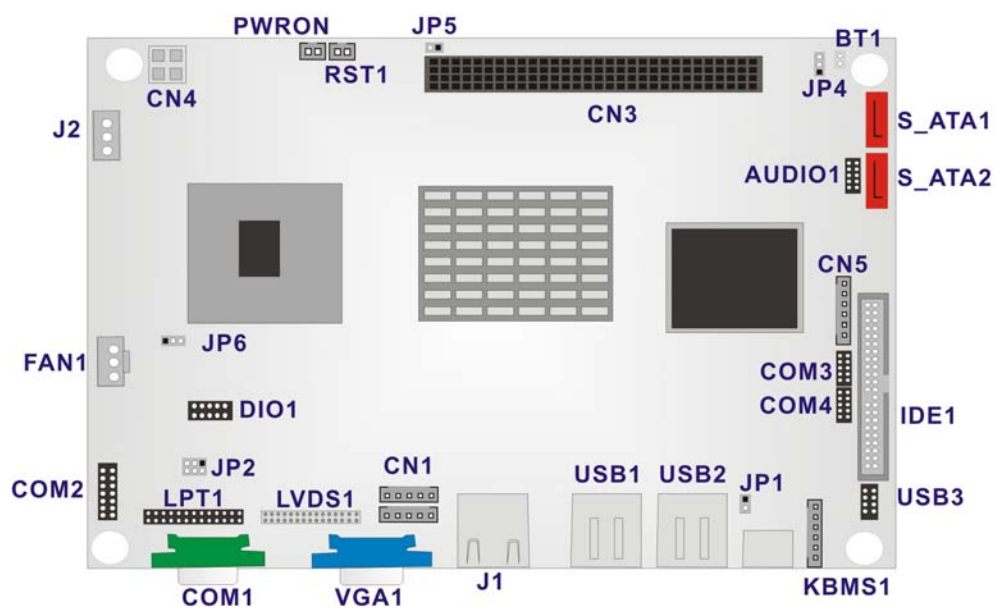
Figure 3-1: Connector and Jumper Locations (Top Side)
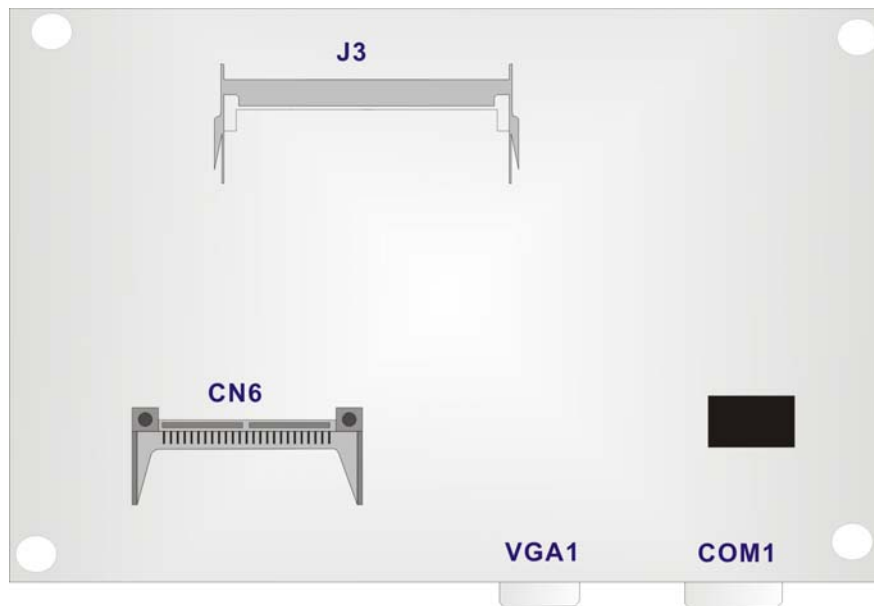
Figure 3-2: Connector and Jumper Locations (Solder Side)

3.1.2 Peripheral Interface Connectors

Table 3-1 shows a list of the peripheral interface connectors on the NANO-8522 board. Detailed descriptions of these connectors can be found in **section 3.2** on **page 41**.

Connector	Type	Label
4-bit GPIO connector	**10-pin header**	**DIO1**
ATX power button connector	**2-pin header**	**PWRON**
ATX power connector	**3-pin header**	**J2**
Audio connector	**10-pin header**	**AUDIO1**
Battery connector	**2-pin header**	**BT1**
Board 12V power connector	**4-pin header**	**CN4**
CFII connector (Secondary IDE connector)	**50-pin**	**CN6**
DDR SODIMM slot	**200-pin slot**	**J3**
Inverter connector	**5-pin header**	**CN1**

IR interface connector	**5-pin header**	**IR1**
Fan connector	**3-pin header**	**FAN1**
IDE interface connector (Primary)	**44-pin header**	**IDE1**
Keyboard/Mouse connector	**6-pin header**	**KBMS1**
LED connector	**6-pin header**	**CN5**
LVDS connector	**30-pin header**	**LVDS1**
Parallel port connector	**26-pin header**	**LPT1**
PC/104+ connector	**120-pin PCI slot**	**CN3**
Reset connector	**2-pin header**	**RST1**
Serial ATA connector	**7-pin header**	**S_ATA1**
Serial ATA connector	**7-pin header**	**S_ATA2**
Serial port2 connector	**14-pin header**	**COM2**
Serial port3 connector	**10-pin header**	**COM3**
Serial port4 connector	**10-pin header**	**COM4**
USB 2.0 internal USB connector	**8-pin header**	**USB3**

Table 3-1: Peripheral Interface Connectors

3.1.3 Rear Panel Connectors

Table 3-2 lists the rear panel connectors on the NANO-8522 board. Detailed descriptions of these connectors can be found in **Section 3.3**on **page 66**.

Connector	Type	Label
Ethernet connector	**RJ-45 connector**	**J1**
Keyboard/Mouse connector	**PS/2 connector**	**KB/PS1**
Serial port1 connector	**9-pin serial port connectors**	**COM1**
Two USB 2.0 ports	**USB port connectors**	**USB1**

Two USB 2.0 ports	USB port connectors	USB2
VGA Connector	15-pin VGA connector	VGA1

Table 3-2: Peripheral Interface Connectors

3.1.4 Onboard Jumpers

Table 3-3 lists the onboard jumpers. Detailed descriptions of these jumpers can be found in **Section 3.4** on **page 70**.

Connector	Type	Label
CF card setup	2-pin header	JP1
Clear CMOS	3-pin header	JP4
COM2 RS232/RS422/RS485 selector	6-pin header	JP2
LCD voltage selector	3-pin header	JP6
PC104+ SERIRQ net to CN3 pin B1 selector	3-pin header	JP5

Table 3-3: Onboard Jumpers

3.2   Internal Peripheral Connectors

Internal peripheral connectors are found on the board and are only accessible when the board is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the NANO-8522 board.

3.2.1 4-bit GPIO Connector

CN Label: **DIO1**

CN Type: **2x5 pin headers**

CN Location: **See Figure 3-3**

CN Pinouts: **See Table 3-4**

The General Purpose Input/Output (GPIO) connector connects external devices. The GPIO connector provides a set of configurable IO ports for either input or output.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	OUT0	4	OUT1
5	OUT2	6	OUT3
7	IN0	8	IN1
9	IN2	10	IN3

Table 3-4: 4-bit GPIO Connector Pinouts
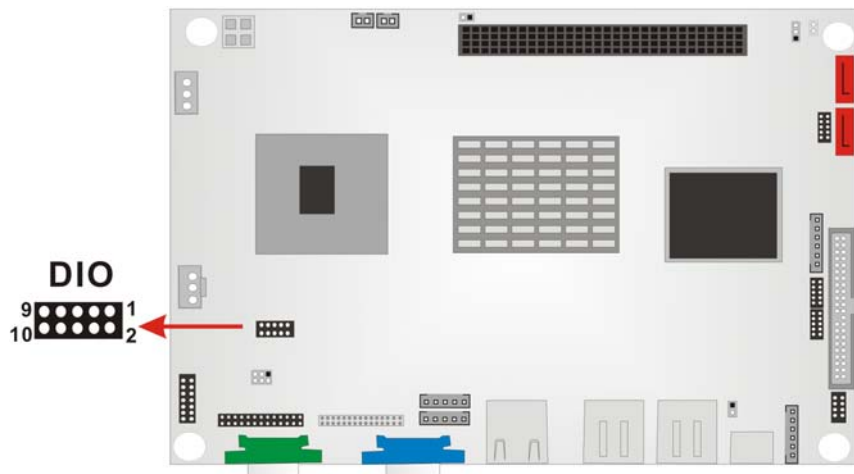
Figure 3-3: 4-bit GPIO Connector Location

3.2.2 ATX Power Button Connector

CN Label: PWRON

CN Type: 1x2 pin headers

CN Location: See Figure 3-4

CN Pinouts: See Table 3-5

The ATX power button connector supports ATX power switch and enables power on/off from the chassis.

PIN NO.	DESCRIPTION
1	Button 1
2	Button 2

Table 3-5: Power Button Connector Pinouts
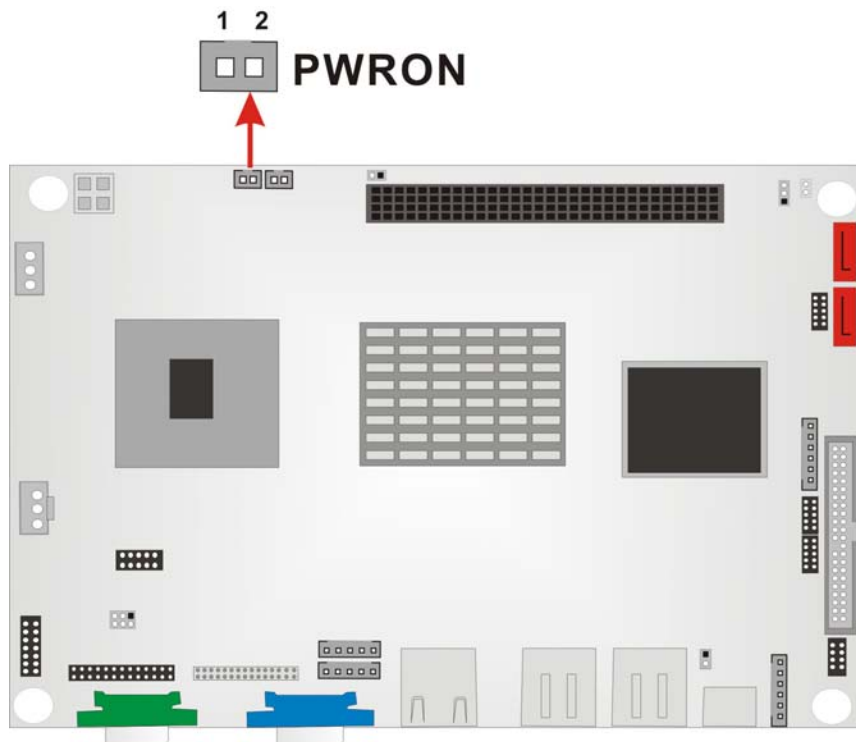
Figure 3-4: Power Button Connector Location

3.2.3 ATX Power Connector

CN Label: J2

CN Type: 1x3 pin header

CN Location: See Figure 3-5

CN Pinouts: See Table 3-6

This connector supports the ATX power supply.

PIN NO.	DESCRIPTION
1	5VSBY
2	GND
3	PSON

Table 3-6: Power Connector Pinouts
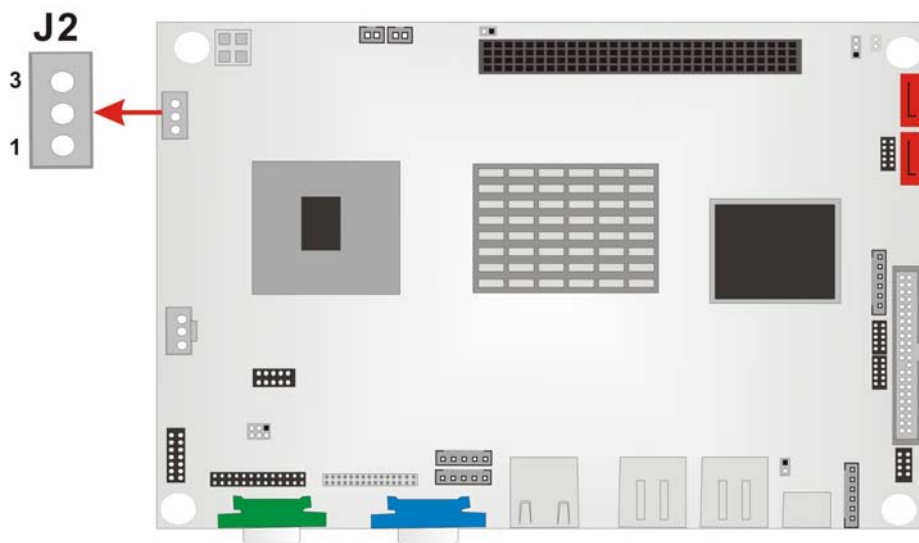
Figure 3-5: Power Connector Location

3.2.4 Audio Connector

CN Label: **AUDIO1**

CN Type: **2x5 pin headers**

CN Location: **See Figure 3-6**

CN Pinouts: **See Table 3-7**

The NANO-8522 has a built-in AC '97 AUDIO CODEC connector directly connected to the MIC-IN, LINE-IN and LINE-OUT.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LINE_OUT-R	2	LINE_IN-R
3	GND	4	GND
5	LINE_OUT-L	6	LINE_IN-L
7	GND	8	GND
9	MIC-IN	10	NC

Table 3-7: Audio Connector Pinouts
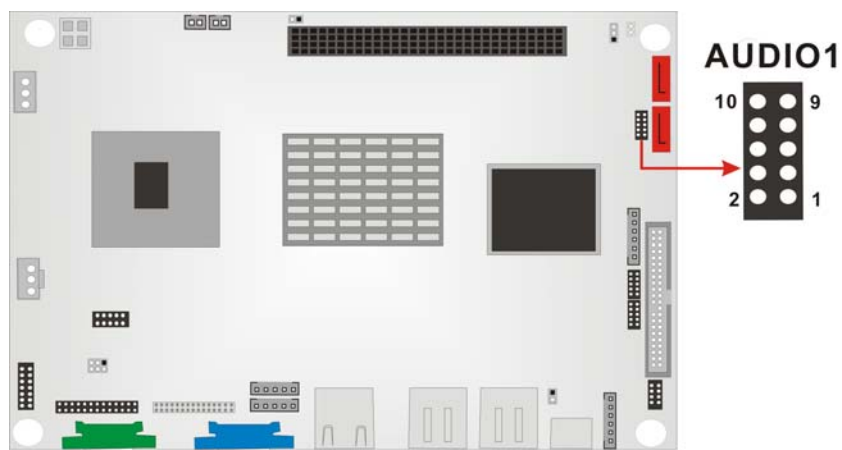
Figure 3-6: Audio Connector Location

3.2.5 Battery Connector

CN Label: **BT1**

CN Type: **1x2 pin header**

CN Location: **See Figure 3-7**

The battery connector is connected to a preinstalled VARTA CR2032 3V battery
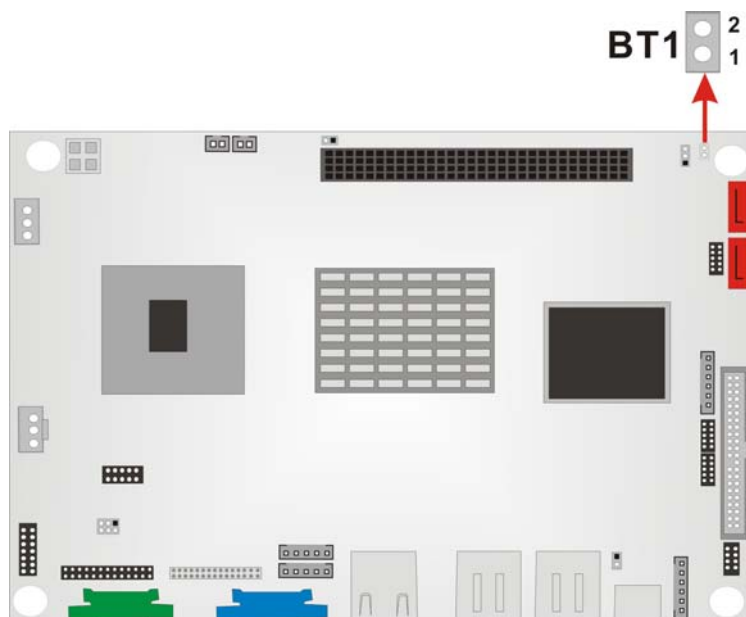
Figure 3-7: Battery Connector Location

3.2.6 12V Power Connector

    CN Label: **CN4**

    CN Type: **1x4 pin header**

    CN Location: **See Figure 3-8**

    CN Pinouts: **See Table 3-8**

Connects a power source from a power supply unit (PSU) to the NANO-8522.

PIN NO.	DESCRIPTION
1	GND
2	GND
3	VCC12
4	VCC12

Table 3-8: 12V Power Connector Pinouts
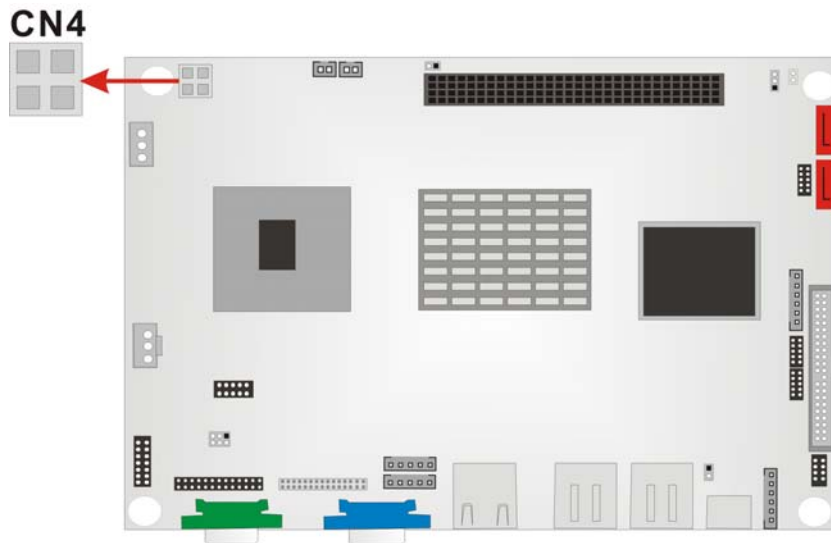
Figure 3-8: 12V Power Connector Location

3.2.7 Compact Flash Type 2 Socket

CN Label: **CN6**

CN Type: **50-pin**

CN Location: **See Figure 3-9**

CN Pinouts: **See Table 3-9**

A CFII (compact flash type II connector) is located on the solder side of the NANO-8522. The CFII connector is for applications without external storage. The Compact Flash socket provides an alternative to hard disk drives in applications where hard disk drives may consume too much space and storage capacity is not a requirement. The CF card behaves like a secondary IDE master disk drive.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GROUND	26	VCC-IN CHECK1
2	DATA 3	27	DATA 11
3	DATA 4	28	DATA 12
4	DATA 5	29	DATA 13
5	DATA 6	30	DATA 14
6	DATA 7	31	DATA 15

7	HDC_CS0#	32	HDC_CS1
8	N/C	33	N/C
9	GROUND	34	IOR#
10	N/C	35	IOW#
11	N/C	36	N/C
12	N/C	37	INTERRUPT
13	VCC_COM	38	VCC_COM
14	N/C	39	CSEL
15	N/C	40	N/C
16	N/C	41	HDD_RESET
17	N/C	42	IORDY
18	SA2	43	N/C
19	SA1	44	VCC_COM
20	SA0	45	HDD_ACTIVE#
21	DATA 0	46	N/C
22	DATA 1	47	DATA 8
23	DATA 2	48	DATA 9
24	N/C	49	DATA 10
25	VCC-IN CHECK2	50	GROUND

Table 3-9: CFII Socket Pinouts
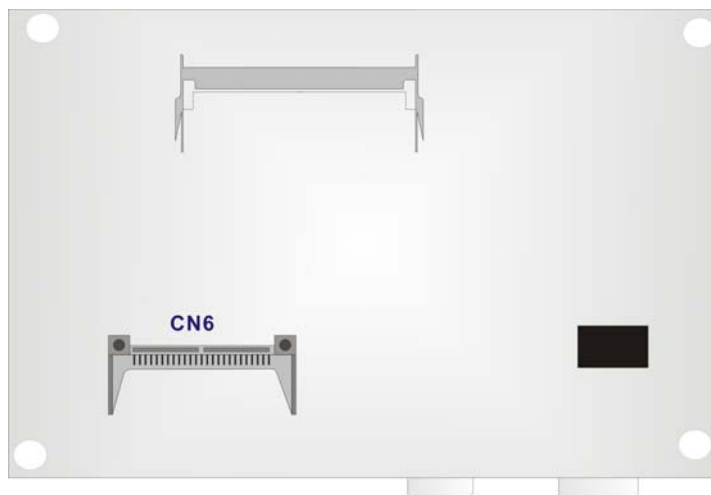
Figure 3-9: CFII Socket Location (Solder Side)

3.2.8 DDR SODIMM Socket

CN Label: J3

CN Type: **200 Pin DDR-SDRAM SODIMM Socket**

CN Location: **See Figure 3-10**

A 200 pin DDR-SDRAM SODIMM socket is located on the rear side of the NANO-8522 board. The SODIMM socket can support 266MHz DDR SODIMM SDRAM of up to 1GB.

Figure 3-10: SODIMM Socket Location (Solder Side)

3.2.9 Fan Connector

CN Label: FAN1

CN Type: **1x3 pin header**

CN Location: **See Figure 3-11**

CN Pinouts: **See Table 3-10**

The cooling fan connector provides a 12V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the

system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

PIN NO.	DESCRIPTION
1	Fan Speed Detect
2	+12V
3	GND

Table 3-10: Fan Connector Pinouts
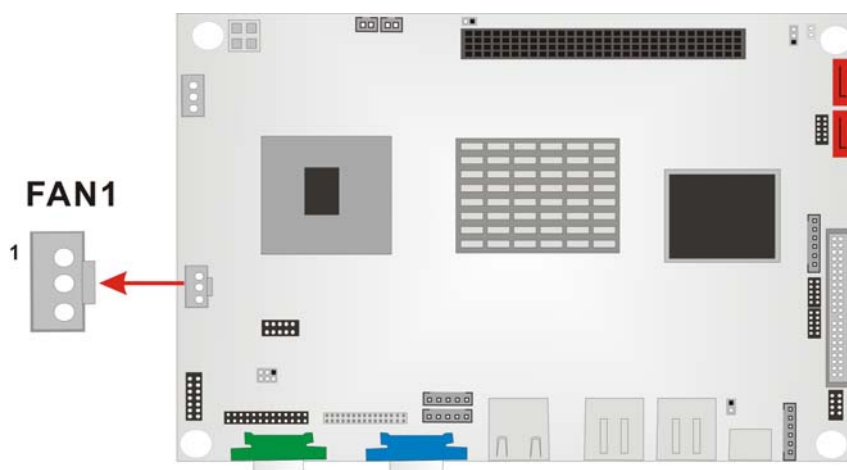
Figure 3-11: Fan Connector Location

3.2.10 IDE Interface Connector

CN Label:	**IDE1**
CN Type:	**2x22 pin header**
CN Location:	**See Figure 3-12**
CN Pinouts:	**See Table 3-11**

One IDE connector provides connectivity to two IDE devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	RESET#	2	GROUND
3	DATA 7	4	DATA 8
5	DATA 6	6	DATA 9
7	DATA 5	8	DATA 10
9	DATA 4	10	DATA 11
11	DATA 3	12	DATA 12
13	DATA 2	14	DATA 13
15	DATA 1	16	DATA 14
17	DATA 0	18	DATA 15
19	GROUND	20	N/C
21	IDE DRQ	22	GROUND
23	IOW#	24	GROUND
25	IOR#	26	GROUND
27	IDE CHRDY	28	GROUND
29	IDE DACK	30	GROUND–DEFAULT
31	INTERRUPT	32	N/C
33	SA1	34	N/C
35	SA0	36	SA2
37	HDC CS0#	38	HDC CS1#
39	HDD ACTIVE#	40	GROUND
41	VCC	42	VCC
43	GROUND	44	N/C

Table 3-11: IDE Connector Pinouts
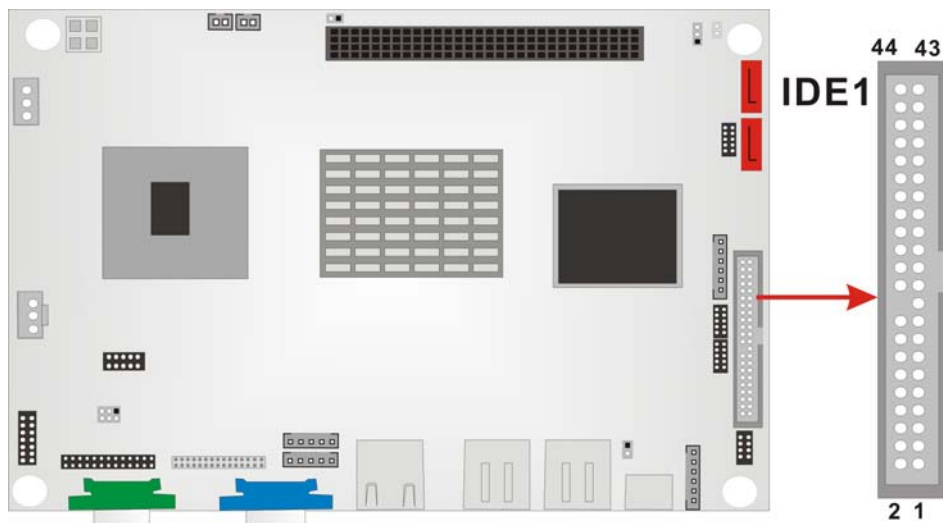
Figure 3-12: IDE Connector Location

3.2.11 Inverter Connector

CN Label:	**CN1**
CN Type:	**1x5 pin headers**
CN Location:	**See Figure 3-13**
CN Pinouts:	**See Table 3-12**

The inverter connector connects to the LCD backlight inverter.

PIN NO.	DESCRIPTION
1	BKLTCTL
2	GND
3	+12V
4	GND
5	BKLEN

Table 3-12: Inverter Connector Pinouts
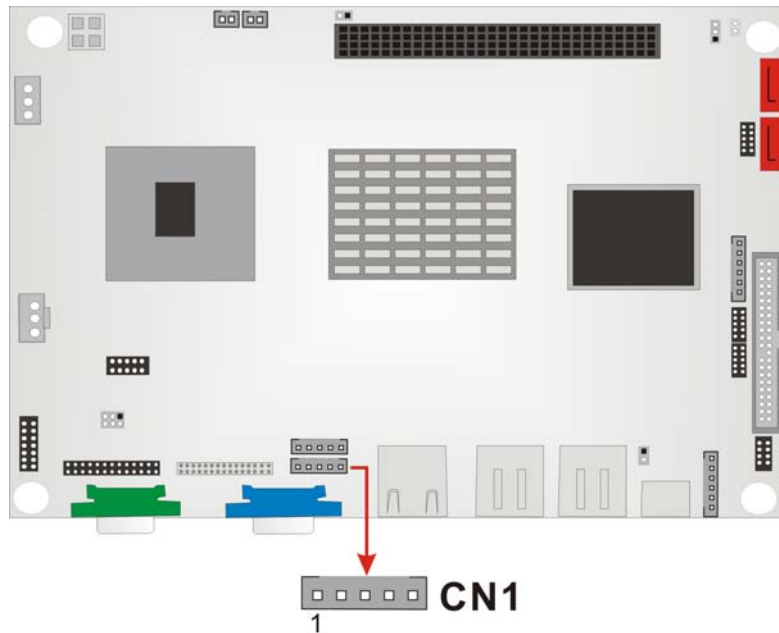
Figure 3-13: Inverter Connector Location

3.2.12 IR Interface Connector

CN Label: IR1

CN Type: 1x5 pin headers

CN Location: See Figure 3-14

CN Pinouts: See Table 3-13

The integrated infrared (IrDA) connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.

PIN NO.	DESCRIPTION
1	VCC
2	N/C
3	RXD
4	GND
5	TXD

Table 3-13: IR Interface Connector Pinouts
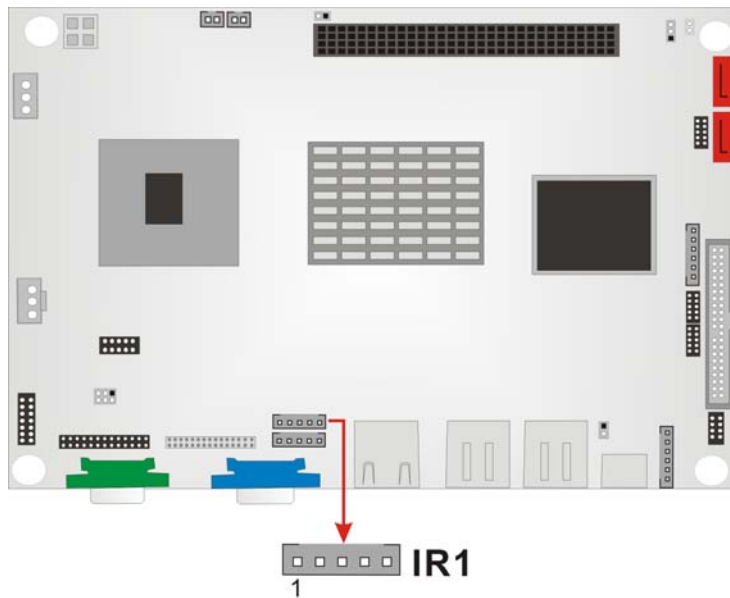
Figure 3-14: IR Interface Connector Location

3.2.13 Keyboard/Mouse Connector

CN Label: KBMS1

CN Type: 1x6 pin header

CN Location: See Figure 3-15

CN Pinouts: See Table 3-14

The Keyboard/PS2 mouse cable shipped with the NANO-8522 board is connected to the keyoard/mouse connector.

PIN NO.	DESCRIPTION
1	VCC5
2	MOUSE DATA
3	MOUSE CLOCK
4	KEYBOARD DATA
5	KEYBOARD CLOCK
6	GND

Table 3-14: Keyboard/Mouse Connector Pinouts

IEI® Technology, Corp.
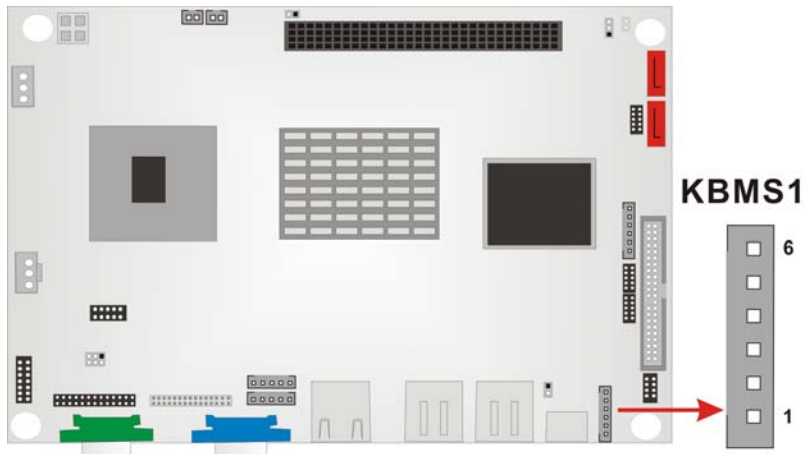
Figure 3-15: Keyboard/Mouse Connector Location

3.2.14 LED Connector

CN Label: **CN5**

CN Type: **1x6 pin header**

CN Location: **See Figure 3-16**

CN Pinouts: **See Table 3-15**

This connector connects to the LED lights indicating the hard drive activity and the power status.

PIN NO.	DESCRIPTION
1	+5V
2	GND
3	VCC5 LED+
4	GND
5	HDD LED+
6	HDD LED-

Table 3-15: LED Connector Pinouts
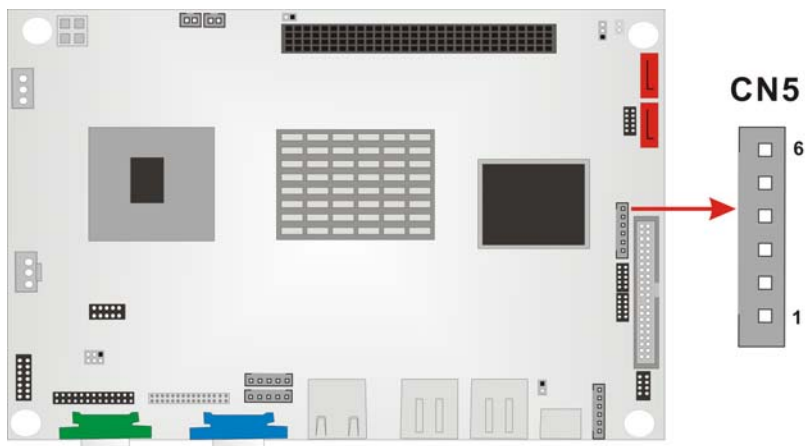
Figure 3-16: LED Connector Location

3.2.15 LVDS Connector

CN Label: **LVDS1**

CN Type: **DF 13**

CN Location: **See Figure 3-17**

CN Pinouts: **See Table 3-16**

LVDS (Low Voltage Differential Signaling) is a low noise, low power, and low amplitude method for high-speed data transmission over a copper wire. The LVDS connector is typically connected to an LCD screen.

PIN NO.	Description	PIN NO.	Description
2	GND	1	NC
4	AY0-	3	AY0+
6	AY1-	5	AY1+
8	AY2-	7	AY2+
10	AYCLK-	9	AYCLK+
12	AY3-	11	AY3+
14	GND	13	GND
16	BY0-	15	BY0+
18	BY1-	17	BY1+
20	BY2-	19	BY2+

22	BYCLK-	21	BYCLK+
24	BY3-	23	BY3+
26	GND	25	GND
28	LCDVCC	27	LCDVCC
30	LCDVCC	29	LCDVCC

Table 3-16: LVDS Connector Pinouts
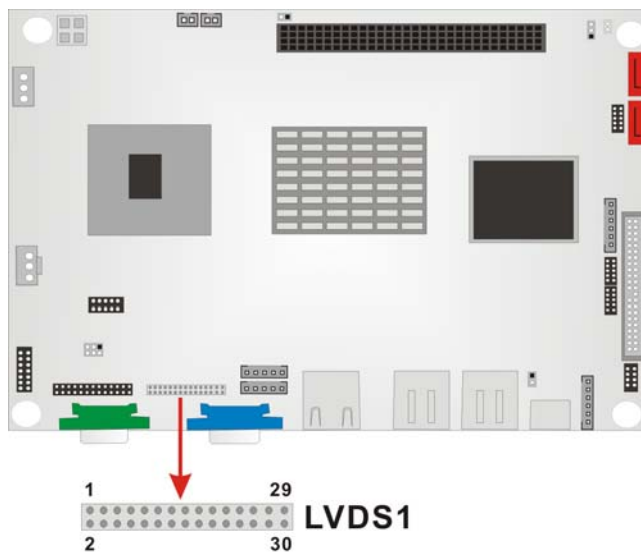
Figure 3-17: LVDS Connector

3.2.16 Parallel Port Connector

CN Label: **LPT1**

CN Type: **2x13 pin header**

CN Location: **See Figure 3-18**

CN Pinouts: **See Table 3-17**

The parallel port connector is usually connected to a printer. A 26-pin flat-cable connector is used to connect the parallel port with a printer or other parallel communication devices.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	STROBE#	14	AUTO FORM FEED #

2	DATA0	15	ERROR#
3	DATA1	16	INITIALIZE#
4	DATA2	17	PRINTER SELECT LN#
5	DATA3	18	GND
6	DATA4	19	GND
7	DATA5	20	GND
8	DATA6	21	GND
9	DATA7	22	GND
10	ACKNOWLEDGE#	23	GND
11	BUSY	24	N/C
12	PAPER EMPTY	25	GND
13	PRINTER SELECT		

Table 3-17: Parallel Port Connector Pinouts
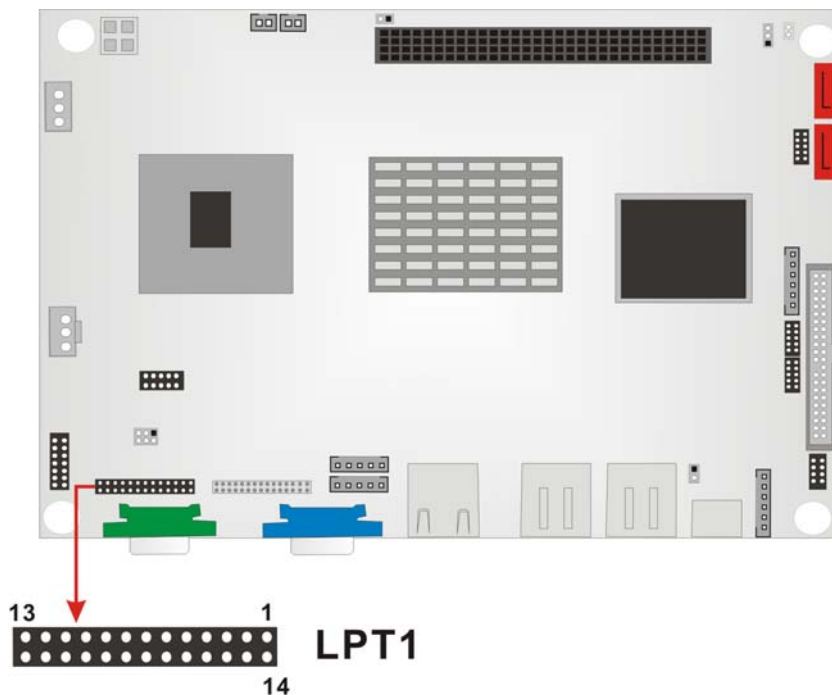
Figure 3-18: Parallel Port Connector Location

3.2.17 PC/104+ Connector

CN Label: CN3

CN Type: 4x30 pin PCI slot

CN Location: See Figure 3-19

CN Pinouts: See Table 3-18

This connector supports the PC/104+ module.

PIN	Description	PIN	Description	PIN	Description	PIN	Description
A1	GROUND	B1	NC/SERIRQ	C1	+5V	D1	AD0
A2	VIO	B2	AD2	C2	AD1	D2	+5V
A3	AD5	B3	GND	C3	AD4	D3	AD3
A4	CBE0-	B4	AD7	C4	GND	D4	AD6
A5	GND	B5	AD9	C5	AD8	D5	GND
A6	AD11	B6	VIO	C6	AD10	D6	N66EV
A7	AD14	B7	AD13	C7	GND	D7	AD12
A8	+3.3V	B8	CBE1-	C8	AD15	D8	+3.3V
A9	SERR-	B9	GND	C9	SBO-	D9	PAR
A10	GND	B10	PERR-	C10	+3.3V	D10	SDONE
A11	STOP-	B11	+3.3V	C11	LOCK-	D11	GND
A12	+3.3V	B12	TRDY-	C12	GND	D12	DEVSEL-
A13	FRAME-	B13	GND	C13	IRDY-	D13	+3.3V
A14	GND	B14	AD16	C14	+3.3V	D14	CBE2-
A15	AD18	B15	+3.3V	C15	AD17	D15	GND
A16	AD21	B16	AD20	C16	GND	D16	AD19
A17	+3.3V	B17	AD23	C17	AD22	D17	+3.3V
A18	IDSEL0	B18	GND	C18	IDSEL1	D18	IDSEL2
A19	AD24	B19	CBE3-	C19	VIO	D19	IDSEL3
A20	GND	B20	AD26	C20	AD25	D20	GND
A21	AD29	B21	+5V	C21	AD28	D21	AD27
A22	+5V	B22	AD30	C22	GND	D22	AD31
A23	REQ0-	B23	GND	C23	REQ1-	D23	VIO
A24	GND	B24	REQ2-	C24	+5V	D24	GNT0-

A25	GNT1-	B25	VIO	C25	GNT2-	D25	GND
A26	+5V	B26	PCICLK0	C26	GND	D26	PCICLK1
A27	PCICLK2	B27	+5V	C27	PCICLK3	D27	GND
A28	GND	B28	INTD-	C28	+5V	D28	PCIRST-
A29	+12V	B29	INTA-	C29	INTB-	D29	INTC-
A30	-12v	B30	REQ3-	C30	GNT3-	D30	GND/3.3V

Table 3-18: PC/104+ Connector Pinouts
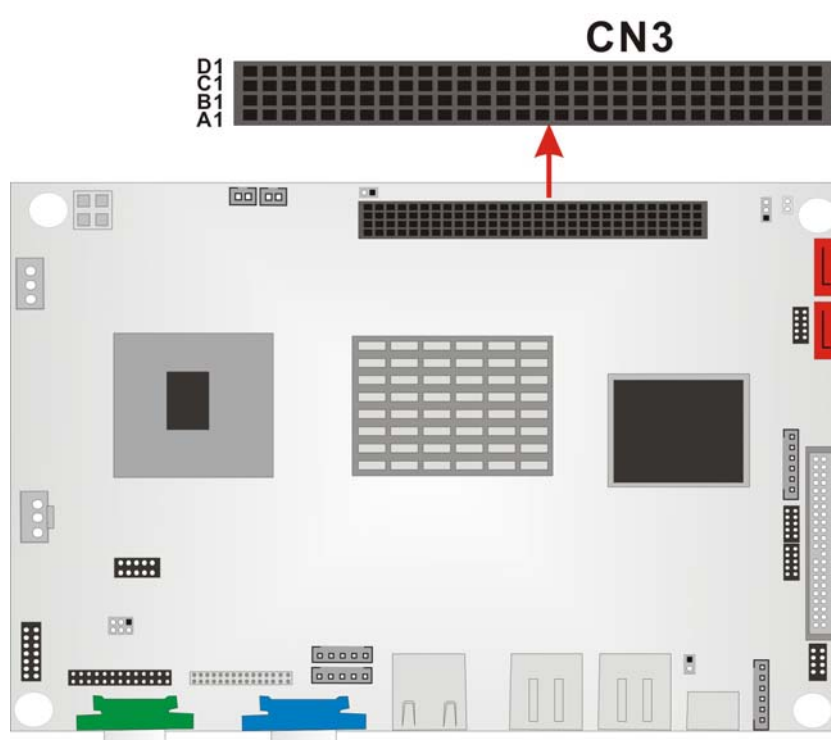
Figure 3-19: PC/104+ Connector Location

3.2.18 Reset Connector

CN Label: RST1

CN Type: 1x2 pin header

CN Location: See Figure 3-20

CN Pinouts: See Table 3-19

PIN NO.	DESCRIPTION
1	Reset 1
2	Reset 2

Table 3-19: Reset Connector Pinouts
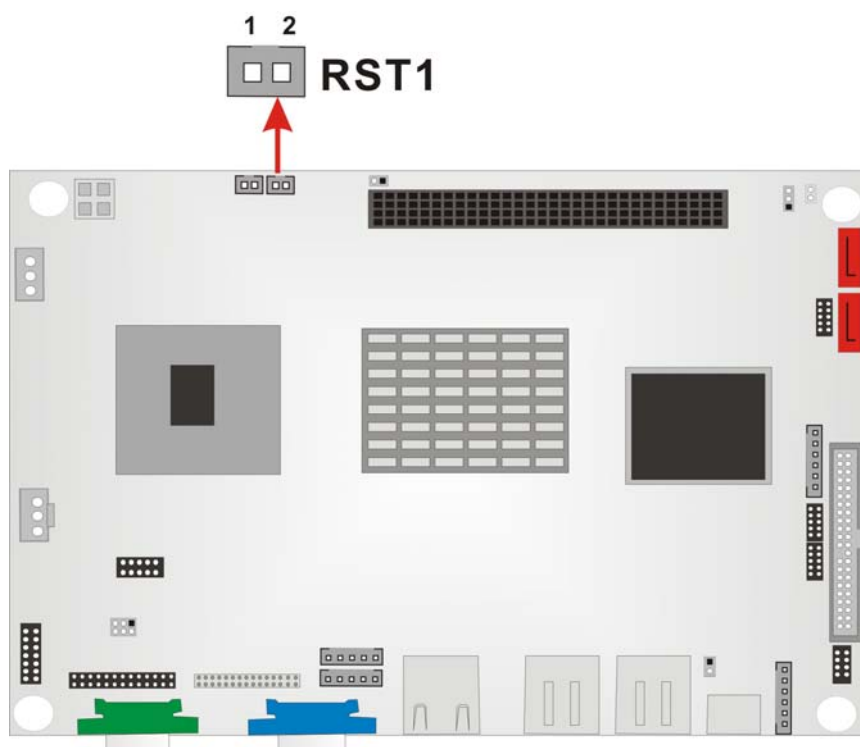
Figure 3-20: Reset Connector Location

3.2.19 SATA Connectors

CN Label: **S_ATA1, S_ATA2**

CN Type: **1x7 pin header**

CN Location: **See Figure 3-21**

CN Pinouts: **See Table 3-20**

The NANO-8522 provides two first-generation SATA ports to connect with SATA drives.
The SATA drives transmit data at speeds up to 150MB/s.

PIN NO.	DESCRIPTION
1	GND
2	TX0+
3	TX0-
4	GND
5	RX0-
6	RX0+
7	GND

Table 3-20: SATA Connector Pinouts
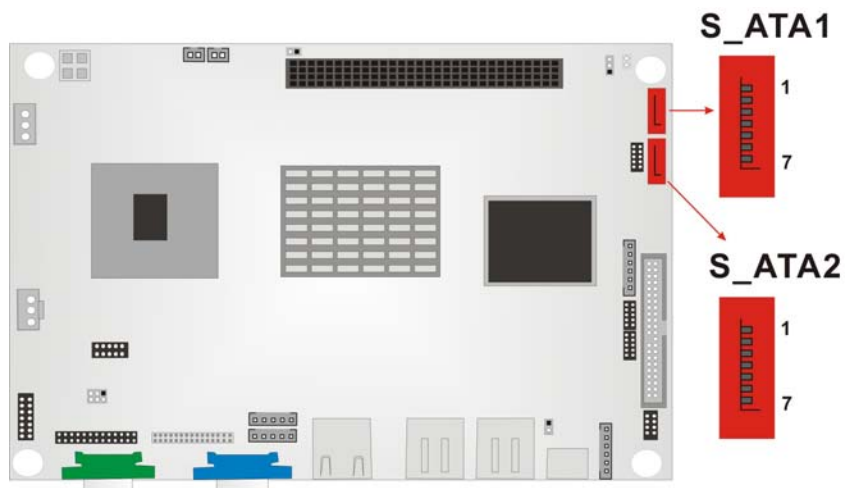
Figure 3-21: SATA Connector Location

3.2.20 Serial Port2 Connector

CN Label: COM2

CN Type: 2x7 pin header

CN Location: See Figure 3-22

CN Pinouts: See Table 3-21

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD#	2	DSR#
3	RxD	4	RTS#
5	TxD	6	CTS#
7	DTR#	8	RI#
9	GND	10	GND
11	TxD485+	12	TxD485-
13	RxD485+	14	RxD485-

Table 3-21: COM2 Connector Pinouts
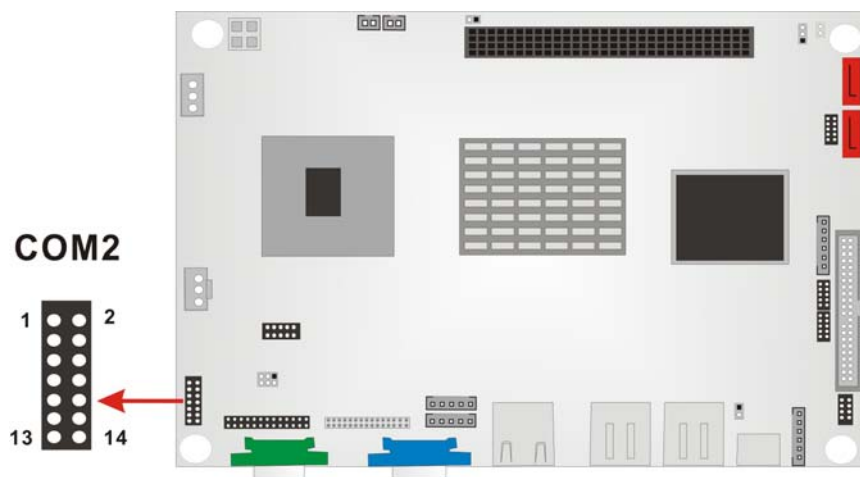
Figure 3-22: COM2 Connector Location

3.2.21 Serial Port3 Connector

CN Label: **COM3**

CN Type: **2x5 pin header**

CN Location: **See Figure 3-23**

CN Pinouts: **See Table 3-22**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD#	2	DSR#
3	RX	4	RTS#
5	TX	6	CTS#
7	DTR#	8	RI#
9	GND	10	GND

Table 3-22: COM3 Connector Pinouts
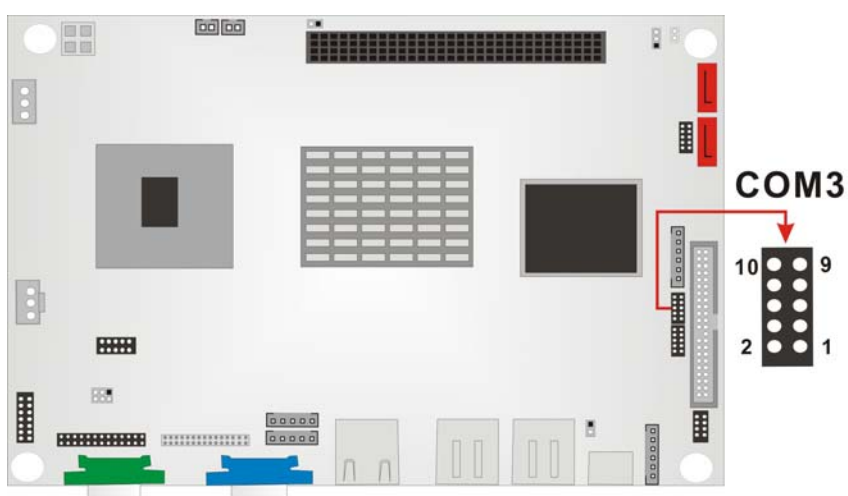
Figure 3-23: COM3 Connector Location

3.2.22 Serial Port4 Connector

CN Label: **COM4**

CN Type: **2x5 pin header**

CN Location: **See Figure 3-24**

CN Pinouts: **See Table 3-23**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD#	2	DSR#
3	RX	4	RTS#
5	TX	6	CTS#
7	DTR#	8	RI#
9	GND	10	GND

Table 3-23: COM4 Connector Pinouts
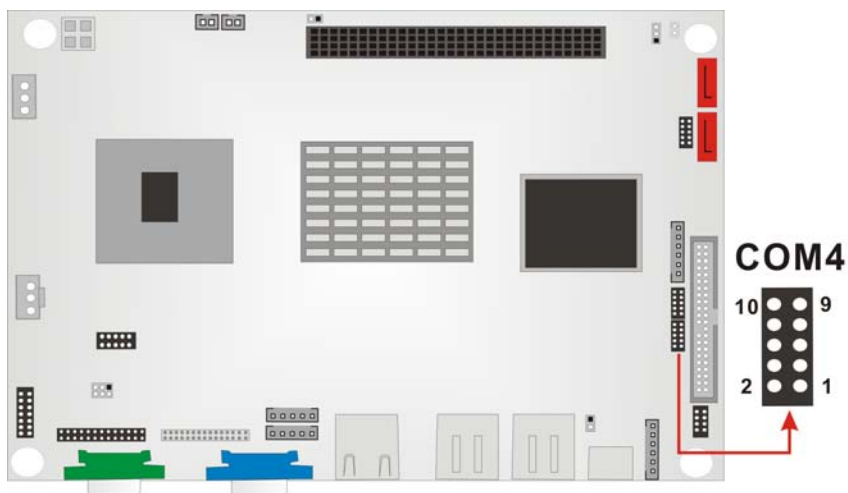
Figure 3-24: COM4 Connector Location

3.2.23 USB Connector

CN Label: **USB3**

CN Type: **2x4 pin header**

CN Location: **See Figure 3-25**

CN Pinouts: **See Table 3-24**

Two USB devices can be connected directly to the onboard USB connector. The onboard USB connector is USB 2.0 compliant.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	USBVCC4	2	GND
3	D4F-	4	D5F+
5	D4F+	6	D5F-
7	GND	8	USBVCC4

Table 3-24: USB Connector Pinouts
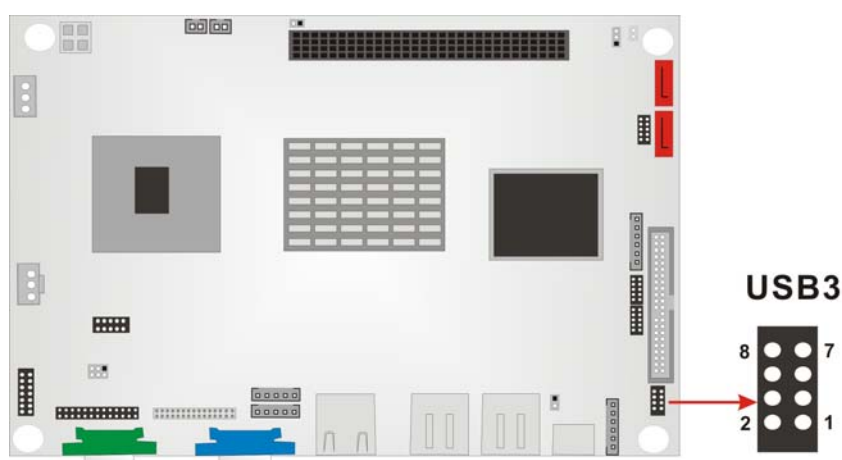
Figure 3-25: USB Connector Location

3.3 External (Rear Panel) Connectors

Figure 3-26 shows the NANO-8522 board rear panel. The peripheral connectors on the back panel can be connected to devices externally when the NANO-8522 is installed in a chassis. The peripheral connectors on the rear panel are:

- 1 x RJ-45 Ethernet connector
- 1 x PS/2 keyboard/mouse connector
- 1 x Serial port connector
- 4 x USB2.0 connectors
- 1 x VGA connector
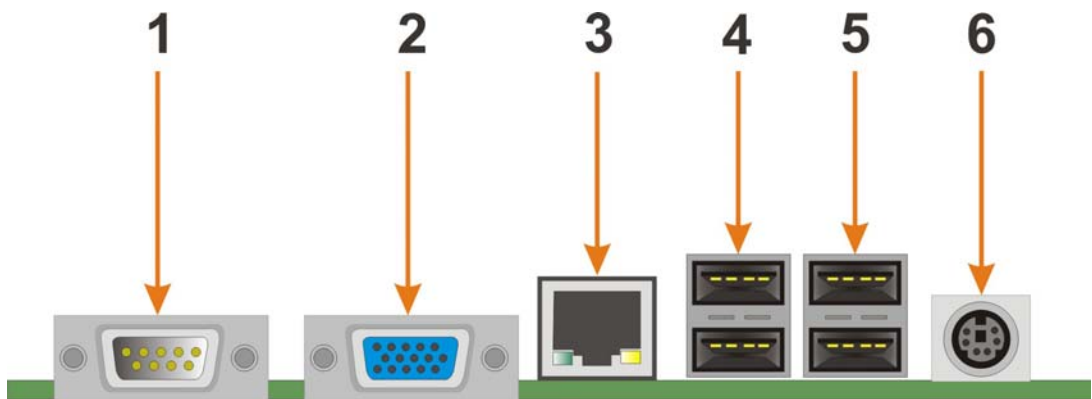
Figure 3-26: NANO-8522 Board Rear Panel

3.3.1 Ethernet Connector

CN Label: **J1**

CN Type: **RJ-45**

CN Location: **See Figure 3-26 (labeled number 3)**

CN Pinouts: **See Table 3-25**

The NANO-8522 is equipped with LAN 10/100/1000-TX Ethernet controller. The Ethernet connector can be directly connected to a Local Area Network (LAN) through a network hub. An RJ-45 Ethernet connector is shown in **Figure 3-27**.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX0+	7	TX3+
2	TX0-	8	TX3-
3	TX1+	9	Active +
4	TX2+	10	Active -
5	TX2-	11	LINK +
6	TX1-	12	LINK -

Table 3-25: RJ-45 Ethernet Connector Pinouts
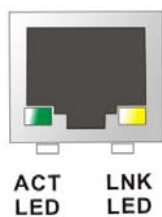
Figure 3-27: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 3-26**.

STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

Table 3-26: RJ-45 Ethernet Connector LEDs

3.3.2 Keyboard/Mouse Connector

CN Label: **KB/PS1**

CN Type: **PS/2 connector**

CN Location: **See Figure 3-26 (labeled number 6)**

3.3.3 Serial Port Connectors

CN Label: **COM1**

CN Type: **DB-9**

CN Location: **See Figure 3-26 (labeled number 1)**

CN Pinouts: **See Table 3-27**

The serial ports (COM1) can be connected to a serial communications device directly.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	2	RX
3	TX	4	DTR

5	GND	6	DSR
7	RTS	8	CTS
9	RI		

Table 3-27: Serial Port Pinouts

3.3.4 USB Connectors

CN Label: **USB1, USB2**

CN Type: **USB port**

CN Location: **See Figure 3-26 (labeled number 4 & 5)**

CN Pinouts: **See Table 3-28, Table 3-29**

USB devices can be connected directly to the USB connectors on the rear panel.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	USBVCC0	5	USBVCC0
2	D0F-	6	D1F-
3	D0F+	7	D1F+
4	GND	8	GND

Table 3-28: USB1 Connector Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	USBVCC2	5	USBVCC2
2	D2F-	6	D3F-
3	D2F+	7	D3F+
4	GND	8	GND

Table 3-29: USB2 Connector Pinouts

3.3.5 VGA Connector

CN Label: **VGA1**

CN Type: **15-pin**

CN Location: **See Figure 3-26 (labeled number 2)**

CN Pinouts: See Table 3-30

The standard 15-pin VGA connector connects to a CRT or LCD display monitor.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Red	9	No Connect
2	Green	10	Ground
3	Blue	11	No Connect
4	No Connect	12	DDC DAT
5	Ground	13	Horizontal Synchronization
6	Ground	14	Vertical Synchronization
7	Ground	15	DDC Clock
8	Ground		

Table 3-30: VGA Connector Pinouts

3.4   Onboard Jumpers

NOTE:

A jumper is a metal bridge that is used to close an electrical circuit.   It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them.   To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.
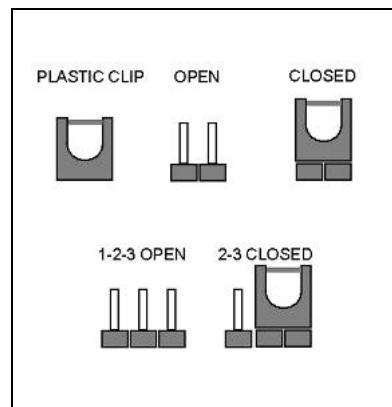
Figure 3-28 Jumper

The NANO-8522 board has the following four onboard jumpers:

- CF card setup (JP1)
- Clear CMOS (JP4)
- COM2 RS232/RS422/RS485 selector (JP2)
- LCD Voltage selector (JP6)
- PC104+ SERIRQ net to CN3 pin B1 selector (JP5)
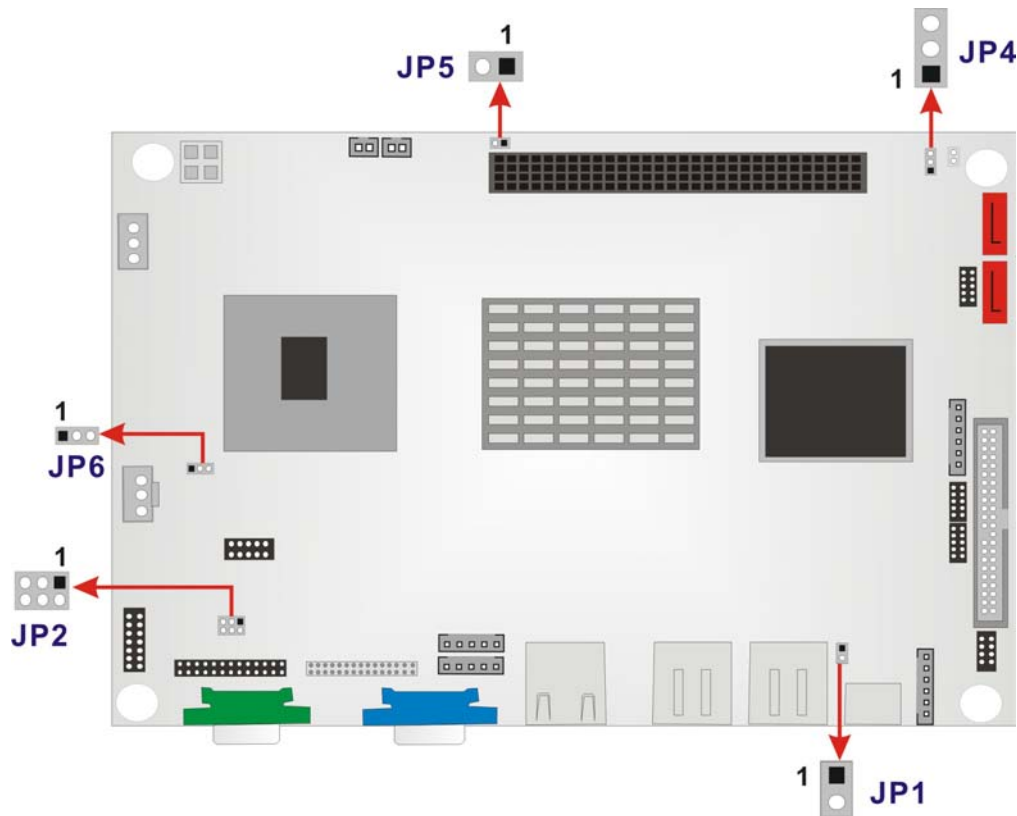
Figure 3-29: Jumper Locations

3.4.1 CF Card Setup

Jumper Label: **JP1**

Jumper Type: **2-pin header**

Jumper Settings: **See Table 3-31**

Jumper Location: **See Figure 3-29**

Use this jumper (JP1) to set a compact flash card as either the slave device or the master device.

JP1	DESCRIPTION
Open	Slave(Default)
Close	Master

Table 3-31: JP1 Jumper Settings

3.4.2 Clear CMOS Jumper

Jumper Label: **JP4**

Jumper Type: **3-pin header**

Jumper Settings: **See Table 3-32**

Jumper Location: **See Figure 3-29**

If the NANO-8522 fails to boot due to improper BIOS setting, use this jumper to clear the CMOS data and reset the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message displays during the boot up process, try to correct the fault by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

- Enter the correct CMOS setting
- Load Optimal Defaults
- Load Failsafe Defaults.

After done one of the above, save changes and exit the CMOS Setup menu.

JP4	CLEAR CMOS
1-2 closed	Normal (default)
2-3 closed	Clear CMOS

Table 3-32: JP4 Jumper Settings

3.4.3 COM2 Selector

Jumper Label: **JP2**

Jumper Type: **6-pin header**

Jumper Settings: **See Table 3-33**

Jumper Location: **See Figure 3-29**

JP2	DESCRIPTION
1-2 closed	RS232 (default)
3-4 closed	RS422
5-6 closed	RS485

Table 3-33: JP2 Jumper Settings

3.4.4 LCD Voltage Selector

Jumper Label: **JP6**

Jumper Type: **3-pin header**

Jumper Settings: **See Table 3-34**

Jumper Location: **See Figure 3-29**

This jumper allows the user to set the voltage for the LCD panel. Before setting this jumper please refer to the LCD panel user guide to determine the required voltage. After the required voltage is known, make the necessary jumper setting in accordance with the settings shown in **Table 3-34** (LCDVCC signal indicates pin 27-30 defined in **Table 3-16: LVDS Connector Pinouts**).

JP6	DESCRIPTION
1-2 closed	LCDVCC = +3.3V (default)
2-3 closed	LCDVCC = +5V

Table 3-34: JP6 Jumper Settings

3.4.5 PC/104+ Selector

Jumper Label: **JP5**

Jumper Type: **2-pin header**

Jumper Settings: **See Table 3-35**

Jumper Location: **See Figure 3-29**

JP5	DESCRIPTION
Open	Disconnect (default)
Close	Connect

Table 3-35: JP5 Jumper Settings

Chapter

4

Installation and Configuration

4.1   Installation Considerations

![NOTE icon] **NOTE:**

The following installation notices and installation considerations should be read and understood before the NANO-8522 is installed. All installation notices pertaining to the installation of the NANO-8522 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of NANO-8522 and injury to the person installing the NANO-8522.

4.1.1 Installation Notices

Before and during the installation of the NANO-8522 board, please do the following:

- Read the user manual
  - The user manual provides a complete description of the NANO-8522 board, installation instructions and configuration options.
- Wear an electrostatic discharge cuff (ESD)
  - Electronic components are easily damaged by ESD. Wearing an ESD cuff removes ESD from the body and help to prevent ESD damage.
- Place the board on an antistatic pad
  - When installing or configuring the board, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn off all power to the NANO-8522 board
  - When working with the board, make sure that it is disconnected from all power supplies and that no electricity is being fed into the system.

Before and during the installation of the NANO-8522 board DO NOT:

- remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- use the product before verifying all cables and power connectors are properly connected.
- allow screws to come in contact with the PCB circuit, connector pins, or its components.

4.2   Unpacking

![NOTE icon] **NOTE:**

If any of the items listed below are missing when the NANO-8522 is unpacked, do not proceed with the installation and contact the reseller or vendor.

4.2.1 Unpacking Precautions

Before installing the NANO-8522 board, unpack the board first. Some components on NANO-8522 are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect it from being damage, follow these precautions:

- The user should ground themselves to remove any static charge before touching the NANO-8522. Wear a grounded wrist strap at all times or frequently touch any conducting materials that are connected to the ground.
- Handle the NANO-8522 by its edges. Do not touch the IC chips, leads or circuitry if not necessary.

Do not place a PCB on top of an anti-static bag. Only the inside of the bag is safe from static discharge.

4.2.2 Checklist

When unpacking the NANO-8522, please make sure the package contains the following items.

- 1 x NANO-8522 single board computer
- 1 x IDE flat cable 44p/44p
- 1 x KB/PS2 Mouse Y cable
- 1 x Audio cable
- 2 x SATA cables
- 1 x SATA Power cable
- 1 x Power cable

- 2 x RS232 cables
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x QIG (quick installation guide)

If one or more of these items are missing, please contact the reseller or vendor and do not proceed any further with the installation.

4.3   NANO-8522 Board Installation

⚠️ **WARNING!**

1. Never run the NANO-8522 without an appropriate heatsink and cooler that can be ordered from IEI Technology or purchased separately.
2. Be sure to use the CPU 12V power connector (CN4) for the CPU power.

⚠️ **WARNING!**

Please note that the installation instructions described in this manual should be carefully followed in order to avoid damage to the NANO-8522 components and injury to the body.

⚠️ **WARNING!**

When installing electronic components onto the NANO-8522 always take the following anti-static precautions in order to prevent ESD damage to the NANO-8522 and other electronic components like the CPU and DIMM modules

4.3.1 Preinstalled Components

The components listed below are preinstalled on the NANO-8522.

- CPU (Intel Pentium M/Celeron M Socket 479 for NANO-8522G-R10)
- CPU heat sink

- Northbridge heat sink
- Southbridge heat sink

4.3.2 Components to Install

To install the NANO-8522, the following components must be installed or connected to the NANO-8522.

- CPU (Intel Celeron M 800MHz for NANO-8522E-800Z-R10)
- DIMM modules
- Compact flash device
- Peripheral devices

4.3.3 CPU Installation

⚠ **WARNING!**

CPUs are expensive and sensitive components. When installing the CPU, please be careful not to damage it in anyway. Make sure to install it properly and ensure that a heatsink and CPU cooling fan is properly installed before running the CPU card or else both the CPU and the board will be damaged.

To install an Intel 479-pin CPU onto the motherboard, follow the steps below:

Step 1:   **Unlock the CPU retention screw.** When shipped, the retention screw of the CPU socket should be in the unlocked position. If it is not in the unlocked position, use a screwdriver to reposition the screw in an unlocked position. (See **Figure 4-1**)
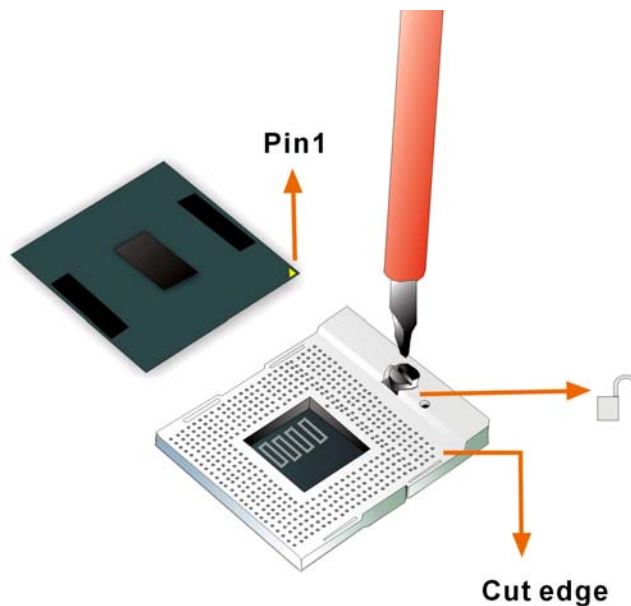
Figure 4-1: Make sure the CPU socket retention screw is unlocked

Step 2: **Inspect the CPU socket** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 3: **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward.

Step 4: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

Step 5: **Align the CPU pins.** Carefully align the CPU pins with the holes in the CPU socket.

Step 6: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly

Step 7: **Lock the retention screw.** Rotate the retention screw into the locked position. (See **Figure 4-2**)
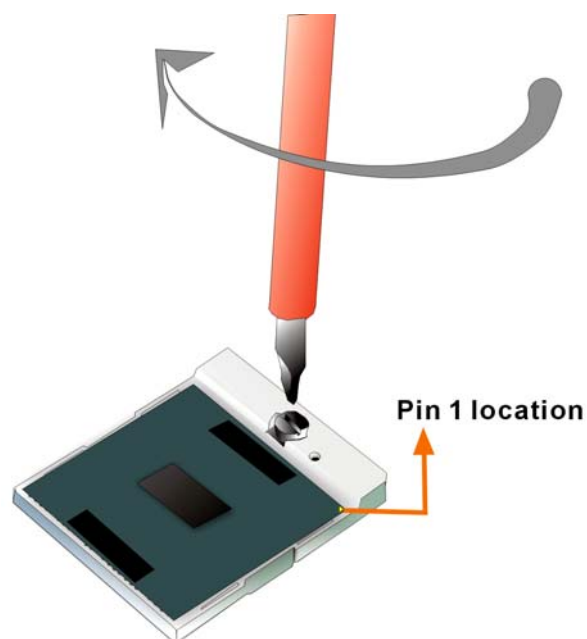
Figure 4-2: Lock the CPU Socket Retention Screw

4.3.4 Cooling Kit (CF-479B-RS) Installation

Figure 4-3: IEI CF-479B-RS Cooling Kit

IEI provides a cooling kit designed for socket 479 CPUs. (See **Figure 4-3**) The cooling kit is comprised of a CPU heatsink and a cooling fan.

NOTE:

The CF-479B-RS heatsink comes with a sprayed layer of thermal paste. Make sure not to accidentally wipe away the thermal paste while unpacking or installing the heatsink. Thermal paste between the CPU and the heatsink is important for optimum heat dissipation.

To install the CF-479B-RS cooling kit, please follow the steps below.

Step 1: **Place the cooling kit onto the CPU.** Make sure that the CPU cable can be properly routed when the cooling kit is installed.

Step 2: **Properly align the cooling kit.** Make sure its four threaded screw fasteners can pass through the pre-drilled holes on PCB.

Step 3: **Secure the cooling kit.** From the solder side of the PCB, align the provided nut caps to the heatsink screw threads that protrude through the PCB holes. Without over tightening the nut caps, insert them onto the protruding screw threads to secure the cooling kit to the PCB board. (See **Figure 4-4**)
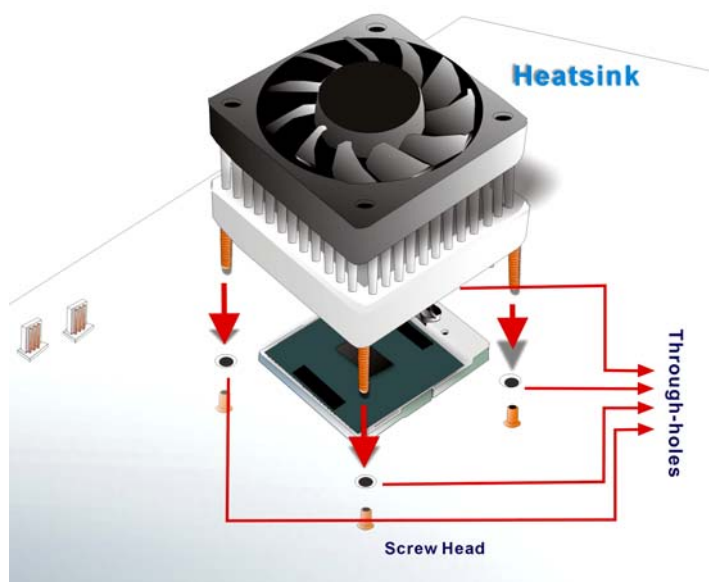
Figure 4-4: Securing the Cooling Kit

Step 4: **Connect the fan cable**. Connect the cooling kit fan cable to the FAN1 connector on the motherboard. Carefully route the cable and avoid heat generating chips and fan blades. (See **Figure 4-5**)
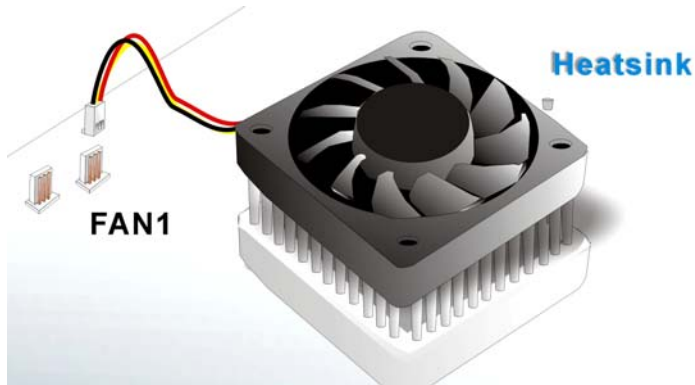
Figure 4-5: Connect the cooling fan cable

4.3.5 DIMM Module Installation

4.3.5.1 Purchasing the Memory Module

⚠️ **WARNING!**

The board supports DDR1 SODIMM modules only. DDR1 and DDR2 are not compatible. If a DDR2 SODIMM module is installed, the system may be damaged and become inaccessible. Please only use DDR1 SODIMM modules.

When purchasing the SODIMM modules, the following considerations should be taken into account:

- The maximum SODIMM capacity supported is 1GB
- The maximum SODIMM frequency supported is 266MHz.
- The SODIMM chip must be a 200-pin memory chip

4.3.5.2 DIMM Module Installation

The NANO-8522 board has one 200-pin SODIMM socket. To install the SODIMM module, follow the instructions below.

Step 1: Turn the NANO-8522 over so that the SODIMM socket is facing up.

Step 2: Push the SODIMM chip into the socket at an angle.

Step 3: Gently pull the arms of the SODIMM socket out and push the rear of the SODIMM module down.

Step 4: Release the arms on the SODIMM socket. They clip into place and secure the SODIMM module in the socket.

4.3.6 Peripheral Device Connection

Cables provided by IEI that connect peripheral devices to the board are listed in **Table 4-1**. Cables not included in the kit must be separately purchased.

Quantity	Type
1	Keyboard/ PS2 mouse cable
1	IDE flat cable 44p/44p
1	Audio cable
2	SATA cable
1	SATA Power cable
1	Power cable
2	RS232 cable

Table 4-1: IEI Provided Cables

4.3.6.1 IDE Disk Drive Connector (IDE1)

The cable used to connect the NANO-8522 to the IDE HDD is a standard 44-pin ATA/33 flat cable. To connect an IDE device to the NANO-8522, follow the instructions below.

Step 1: Find the ATA/33 flat cable in the kit that came with the NANO-8522.

Step 2: Connect one end of the cable to the IDE1 connector on the NANO-8522. A keyed pin on the IDE connectors prevents it from being connected incorrectly.

Step 3: Locate the red wire on the other side of the cable that corresponds to the pin 1 connector.

Step 4:   Connect the other side of the cable to the IDE device making sure that the pin 1 cable corresponds to pin 1 on the connector.

Step 1:

![NOTE icon] **NOTE:**

When two IDE disk drives are connected together, back-end jumpers on the drives must be used to configure one drive as a master and the other as a slave.

4.3.6.2 Keyboard/Mouse Connection

The cable used to connect the NANO-8522 to the keyboard and mouse is Y-cable that is connected to KBMS1. To connect a keyboard and mouse, please do the following.

Step 2:   Insert the connector at the end of the keyboard/mouse cable in the keyboard/mouse connector on the NANO-8522.

Step 3:   Connect the respective cables to the keyboard and mouse

4.4   Chassis Installation

After the CPU, the cooling kit, and the DIMM modules have been installed and after the internal peripheral connectors have been connected to the peripheral devices and the jumpers have been configure, the NANO-8522 can be mounted into chassis.

To mount a board into a chassis, please refer to the chassis user guide that came with the product.

4.5   Rear Panel Connectors

4.5.1 LCD Panel Connection

The conventional CRT monitor connector, VGA1, is a 15-pin, female D-SUB connector. Pin assignments can be seen in that can be connected to external monitors.

4.5.2 Ethernet Connection

The rear panel RJ-45 connectors can be connected to an external LAN and communicate with data transfer rates up to 1000M/s.

4.5.3 USB Connection

The rear panel USB connectors provide easier and quicker access to external USB devices. The rear panel USB connector is a standard connector and can easily be connected to other USB devices.

4.5.4 Keyboard and Mouse Connection

A PS/2 keyboard and a PS/2 mouse can be connected to the appropriate PS/2 connector on the rear panel.

Chapter

5

AMI BIOS Setup

5.1 Introduction

A licensed copy of AMI BIOS is preprogrammed into the ROM BIOS. The BIOS setup program allows users to modify the basic system configuration. This chapter describes how to access the BIOS setup program and the configuration options that may be changed.

5.1.1 Starting Setup

The AMI BIOS is activated when the computer is turned on. The setup program can be activated in one of two ways.

> 1. Press the **DELETE** key as soon as the system is turned on or
> 2. Press the **DELETE** key when the "**Press Del to enter SETUP**" message appears on the screen.

If the message disappears before the **DELETE** key is pressed, restart the computer and try again.

5.1.2 Using Setup

Use the arrow keys to highlight items, press **ENTER** to select, use the PageUp and PageDown keys to change entries, press **F1** for help and press **ESC** to quit. Navigation keys are shown in.

Key	Function
Up arrow	Move to previous item
Down arrow	Move to next item
Left arrow	Move to the item on the left hand side
Right arrow	Move to the item on the right hand side
Esc key	Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
"+" key	Increase the numeric value or make changes
"-" key	Decrease the numeric value or make changes

F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 /F3 key	Change color from total 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

Table 5-1: BIOS Navigation Keys

5.1.3 Getting Help

When **F1** is pressed a small help window describing the appropriate keys to use and the possible selections for the highlighted item appears. To exit the Help Window press **Esc** or the **F1** key again.

5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in Chapter **Chapter 3**, **Section 3.4.2.**

5.1.5 BIOS Menu Bar

The **menu bar** on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset settings.
- **Power** Changes power management settings.
- **Exit** Selects exit options and loads default settings

The following sections completely describe the configuration options found in the menu items at the top of the BIOS screen and listed above.

5.2 Main

The **Main** BIOS menu (**BIOS Menu 1**) appears when the **BIOS Setup** program is entered.

The **Main** menu gives an overview of the basic system information.

```
                        BIOS SETUP UTILITY
  Main    Advanced   PCIPnP    Boot    Security   Chipset    Power     Exit

  System Overview                              Use [ENTER], [TAB]
  _____          or [SHIFT-TAB] to
                                                select a field.
  AMIBIOS
  Version   :08.00.13                           Use [+] or [-] to
  Build Date:06/21/06                           configure system Time.
  ID        :B046M004

  Processor
  Type      :Intel(R) Celeron(R) M processor
  Speed     :800MHz
  Count     :1

  System Memory                                 ←    Select Screen
  Size      :504MB                              ↑↓   Select Item
                                                +-   Change Field
  System Time            [00:28:26]             Tab  Select Field
  System Date            [Tue 01/01/2002]       F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit


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```

BIOS Menu 1: Main

➔ **System Overview**

The **System Overview** lists a brief summary of different system components. The fields in **System Overview** cannot be changed. The items shown in the system overview include:

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**:   Current BIOS version
  - **Build Date**:   Date the current BIOS version was made
  - **ID**:   Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications

- o **Type**: Names the currently installed processor
- o **Speed**: Lists the processor speed
- o **Count**: The number of CPUs on the motherboard
- **System Memory**: Displays the auto-detected system memory.
  - o **Size**: Lists memory size

The **System Overview** field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

Use the **System Time** option to set the system time. Manually enter the hours, minutes and seconds.

➔ **System Date [xx/xx/xx]**

Use the **System Date** option to set the system date. Manually enter the day, month and year.

5.3 Advanced

Use the **Advanced** menu (**BIOS Menu 2**) to configure the CPU and peripheral devices through the following sub-menus:

⚠️ **WARNING:**

Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.

- CPU Configuration (see Section 5.3.1)
- IDE Configuration (see Section 5.3.2)
- Floppy Configuration (see Section 5.3.3)
- SuperIO Configuration (see Section 5.3.4)
- Hardware Health Configuration (see Section 5.3.5)
- ACPI Configuration (see Section 5.3.6)
- MPS Configuration (see Section 5.3.7)

- Smbios Configuration (see Section 5.3.8)
- USB Configuration (see Section 5.3.9)

```
                        BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit

  Advanced Settings                                  Configure CPU.

  WARNING: Setting wrong values in below sections
           may cause system to malfunction.

  ▶ CPU Configuration
  ▶ IDE Configuration
  ▶ Floppy Configuration
  ▶ SuperIO Configuration
  ▶ Hardware Health Configuration
  ▶ ACPI Configuration
  ▶ MPS Configuration                                ←     Select Screen
  ▶ Smbios Configuration                             ↑↓    Select Item
  ▶ USB Configuration                                Enter Go to Sub Screen
                                                     F1    General Help
                                                     F10   Save and Exit
                                                     ESC   Exit


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```

BIOS Menu 2: Advanced

5.3.1 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 3**) to view detailed CPU specifications and configure the CPU.

```
                     BIOS SETUP UTILITY
     Advanced

 Configure advanced CPU settings              |        Options
 Module Version - 11.05                       |
                                              | Disabled
 Manufacturer: Intel                          | Enabled
 Brand String: Intel(R) Celeron(R) M processor|
 Frequency   : 800MHz                         |
 FSB Speed   : 400MHz                         |
                                              |
 Cache L1    : 32 KB                          |
 Cache L2    : 0 KB                           |
                                              |
                                              |
 Hyper Threading Technology    [Enabled]      | ←    Select Screen
                                              | ↑↓   Select Item
                                              | +-   Change Option
                                              | F1   General Help
                                              | F10  Save and Exit
                                              | ESC  Exit
                                              |

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```

BIOS Menu 3: CPU Configuration

The CPU Configuration menu (**BIOS Menu 3**) lists the following CPU details:

- **Manufacturer**: Lists the name of the CPU manufacturer
- **Brand String**: Lists the brand name of the CPU being used
- **Frequency:** Lists the CPU processing speed
- **FSB Speed**: Lists the FSB speed
- **Cache L1**: Lists the CPU L1 cache size
- **Cache L2**: Lists the CPU L2 cache size

The following **CPU Configuration** menu item can be configured.

- Hyper Threading Technology

➔ **Hyper Threading Technology [Enabled]**

   ➔ **Disabled**   Disables the use of hyper threading technology

   ➔ **Enabled**   **DEFAULT**   Enables the use of hyper threading technology

5.3.2 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 4**) to change and/or set the configuration of the IDE devices installed in the system.

```
                      BIOS SETUP UTILITY
   Advanced

  IDE Configuration                            DISABLED: disables the
  ─────────────────────────                    integrated IDE
  OnBoard PCI IDE Controller    [Both]         Controller.
  OnBoard PCI IDE Operate Mode  [Legacy Mode]  PRIMARY: enables only
                                               the Primary IDE
  ▶ Primary IDE Master          : [Not Detected]  Controller.
  ▶ Primary IDE Slave           : [Not Detected]  SECONDARY: enables
  ▶ Secondary IDE Master        : [Not Detected]  only the Secondary IDE
  ▶ Secondary IDE Slave         : [Not Detected]  Controller.
                                               BOTH: enables both IDE
  Hard Disk Write Protect       [Disabled]     Controllers.
  IDE Detect Time Out (Sec)     [35]
  ATA(PI) 80Pin Cable Detection [Host & Device]
                                               ←     Select Screen
                                               ↑↓    Select Item
                                               +-    Change Option
                                               F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit

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```

BIOS Menu 4: IDE Configuration

➔ **OnBoard PCI IDE Controller [Both]**

Use the **OnBoard PCI IDE Controller** BIOS option to specify the IDE channels used by the onboard PCI IDE controller. The following configuration options are available.

➔ **Disabled**   Prevents the system from using the onboard IDE controller

➔ **Primary**   Only allows the system to detect the Primary IDE channel, including both the Primary Master and the

Primary Slave

➔ **Secondary**   Only allows the system to detect the Secondary IDE channel, including both the Secondary Master and Secondary Slave

➔ **Both**   DEFAULT   Allows the system to detect both the Primary and Secondary IDE channels including the Primary Master, Primary Slave, Secondary Master and Secondary Slave.

➔ **Onboard PCI IDE Mode [Legacy Mode]**

Use the **Onboard PCI IDE Mode** BIOS option to set the running mode for the PCI IDE.

➔ **Legacy Mode**   DEFAULT   The PCI IDE mode is the same as the IDE mode

➔ **Native Mode**   The PCI IDE mode is the native mode

➔ **Hard Disk Write Protect [Disabled]**

The **Hard Disk Write Protect** BIOS option protects the hard disks from being overwritten. This menu item is only effective if the device is accessed through the BIOS.

➔ **Disabled**   DEFAULT   Allows hard disks to be overwritten

➔ **Enabled**   Prevents hard disks from being overwritten

➔ **IDE Detect Time Out (Sec) [35]**

The **IDE Detect Time Out (Sec)** BIOS option specifies the maximum time (in seconds) the AMI BIOS will search for IDE devices. This allows fine-tunes the settings to allow for faster boot times. The following configuration options are available.

- 0 seconds
- 5 seconds
- 10 seconds
- 15 seconds
- 20 seconds

- 25 seconds
- 30 seconds
- 35 seconds (Default)

The best setting to use if the onboard IDE controllers are set to a specific IDE disk drive in the AMI BIOS is "0 seconds" and a large majority of ultra ATA hard disk drives can be detected well within "35 seconds" (the default setting).

➔ **ATA (PI) 80Pin Cable Detection [Host & Device]**

When an Ultra ATA/66, an Ultra ATA/100 or an Ultra ATA/133 IDE hard disk drive is used, an 80-conductor ATA cable must be used. The 80-conductor ATA cable is plug compatible with the standard 40-conductor ATA cable. The system must detect the presence of correct cable so that the AMIBIOS can instruct the drive to run at the correct speed for the cable type detected.

The **ATA (PI) 80Pin Cable Detection** BIOS option determines how the IDE cable will be detected.

➔ **Host & Device** DEFAULT Both the motherboard onboard IDE controller and IDE disk drive are used to detect the type of IDE cable used.

➔ **Host** The motherboard onboard IDE controller detects the type of IDE cable used.

➔ **Device** The IDE disk drive to detects the type of IDE cable used.

➔ **IDE Master and IDE Slave**

When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave

- Secondary IDE Master
- Secondary IDE Slave

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 5.3.2.1** appear.

5.3.2.1 IDE Master, IDE Slave

Use the **IDE Master** and **IDE Slave** configuration menu to view both primary and secondary IDE device details and configure the IDE devices connected to the system.

```
                        BIOS SETUP UTILITY
       Advanced

  Primary IDE Master                           Select the type
                                               of device connected
  Device   :Not Detected                       to the system.

  Type                       [Auto]
  LBA/Large Mode             [Auto]
  Block (Multi-Sector Transfer)  [Auto]
  PIO Mode                   [Auto]
  DMA Mode                   [Auto]
  S.M.A.R.T.                 [Auto]
  32Bit Data Transfer        [Enabled]

                                          ←→    Select Screen
                                          ↑↓    Select Item
                                          +-    Change Option
                                          F1    General Help
                                          F10   Save and Exit
                                          ESC   Exit

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```

BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

The "grayed-out" items in the left frame are IDE disk drive parameters automatically detected from the firmware of the selected IDE disk drive. The drive parameters are listed as follows:

- **Type**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **DMA Mode**: Indicates the highest Asynchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

➔ **Type [Auto]**

Use the **Type** BIOS option select the type of device the AMIBIOS attempts to boot from after the Power-On Self-Test (POST) is complete.

➔ **Not Installed**   BIOS is prevented from searching for an IDE disk drive on the specified channel.

➔ **Auto   DEFAULT**   The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.

➔ **CD/DVD**   The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.

➔ **ARMD**   This option specifies an ATAPI Removable Media Device. These include, but are not limited to:

      ➔ **ZIP**

      ➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

Use the **LBA/Large Mode** option to disable or enable BIOS to auto detects LBA (Logical Block Addressing). LBA is a method of addressing data on a disk drive. In LBA mode, the maximum drive capacity is 137 GB.

➔ **Disabled**   BIOS is prevented from using the LBA mode control on the specified channel.

➔ **Auto**   **DEFAULT**   BIOS auto detects the LBA mode control on the specified channel.

➔ **Block (Multi Sector Transfer) [Auto]**

Use the **Block (Multi Sector Transfer)** to disable or enable BIOS to auto detect if the device supports multi-sector transfers.

➔ **Disabled**   BIOS is prevented from using Multi-Sector Transfer on the specified channel. The data to and from the device occurs one sector at a time.

➔ **Auto**   **DEFAULT**   BIOS auto detects Multi-Sector Transfer support on the drive on the specified channel. If supported the data transfer to and from the device occurs multiple sectors at a time.

➔ **PIO Mode [Auto]**

Use the **PIO Mode** option to select the IDE PIO (Programmable I/O) mode program timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases.

➔ **Auto**   **DEFAULT**   BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.

➔ **0**   PIO mode 0 selected with a maximum transfer rate of 3.3MBps

➔ **1**   PIO mode 1 selected with a maximum transfer rate of 5.2MBps

➔ **2**   PIO mode 2 selected with a maximum transfer rate of 8.3MBps

➔ **3**   PIO mode 3 selected with a maximum transfer rate of 11.1MBps

➔ **4**   PIO mode 4 selected with a maximum transfer rate of 16.6MBps

(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

Use the **DMA Mode** BIOS selection to adjust the DMA mode options.

➔ **Auto**   **DEFAULT**   BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.

➔ **S.M.A.R.T [Auto]**

Use the **S.M.A.R.T** option to auto-detect, disable or enable Self-Monitoring Analysis and Reporting Technology (SMART) on the drive on the specified channel. **S.M.A.R.T** predicts impending drive failures. The **S.M.A.R.T** BIOS option enables or disables this function.

➔ **Auto**   **DEFAULT**   BIOS auto detects HDD SMART support.

➔ **Disabled**   Prevents BIOS from using the HDD SMART feature.

➔   **Enabled**   Allows BIOS to use the HDD SMART feature

➔   **32Bit Data Transfer [Disabled]**

Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

➔   **Disabled**   DEFAULT   Prevents the BIOS from using 32-bit data transfers.

➔   **Enabled**   Allows BIOS to use 32-bit data transfers on supported hard disk drives.

5.3.3 Floppy Configuration

Use the **Floppy Configuration** menu (**BIOS Menu 6**) to set or change the configurations for floppy disk drives.

```
                        BIOS SETUP UTILITY
    Advanced

 Floppy Configuration                             Select the type of
                                                  floppy drive
 Floppy A                    [Disabled]           connected to the
 Floppy B                    [Disabled]           system.




                                                  ←     Select Screen
                                                  ↑↓    Select Item
                                                  +-    Change Option
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit


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```
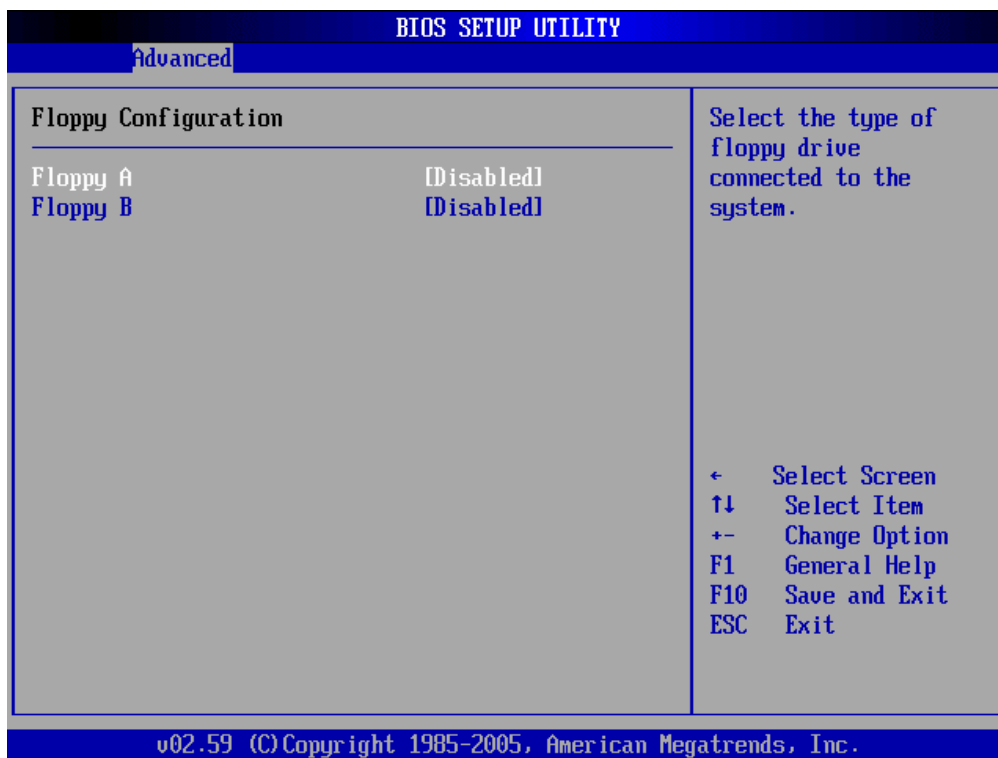
BIOS Menu 6: Floppy Configuration

➔ **Floppy A [Disabled]**

The **Floppy A** configuration option determines the types of the floppy drive installed in the system. The following configuration options are available.

- Disabled (default)
- 360 KB 5¼"
- 1.2 MB 5¼"
- 720 KB 3 ½"
- 1.44 MB 3½"
- 2.88 MB 3½"

➔ **Floppy B [Disabled]**

The **Floppy B** configuration option determines the types of the floppy drive installed in the system. The following configuration options are available.

- Disabled (default)
- 360 KB 5¼"
- 1.2 MB 5¼"
- 720 KB 3 ½"
- 1.44 MB 3½"
- 2.88 MB 3½"

5.3.4 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 7**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

```
                        BIOS SETUP UTILITY
 Advanced

 Configure Win627EHF Super IO Chipset            Allows BIOS to Enable
 ─────────────────────────────────────────      or Disable Floppy
 OnBoard Floppy Controller    [Enabled]          Controller.
 Serial Port1 Address         [3F8/IRQ4]
 Serial Port2 Address         [2F8/IRQ3]
   Serial Port2 Mode          [Normal]
 Parallel Port Address        [378]
   Parallel Port Mode         [Normal]
   Parallel Port IRQ          [IRQ7]
 Serial Port3 Address         [3E8]
   Serial Port3 IRQ           [11]
 Serial Port4 Address         [2E8]
   Serial Port4 IRQ           [10]                ←     Select Screen
                                                  ↑↓    Select Item
                                                  +-    Change Option
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit


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```

BIOS Menu 7: Super IO Configuration

➔ **On Board Floppy Controller [Enabled]**

  ➔ **Disabled**   Allows BIOS to disable the floppy controller

  ➔ **Enabled** **DEFAULT** Allows BIOS to enable the floppy controller

➔ **Serial Port1 Address [3F8/IRQ4]**

  Use the **Serial Port1 Address** option to select the Serial Port 1 base address.

  ➔ **Disabled**   No base address is assigned to Serial Port 1

  ➔ **3F8/IRQ4** **DEFAULT** Serial Port 1 I/O port address is 3F8 and the interrupt
                          address is IRQ4

  ➔ **3E8/IRQ4**   Serial Port 1 I/O port address is 3E8 and the interrupt
                          address is IRQ4

  ➔ **2E8/IRQ3**   Serial Port 1 I/O port address is 2E8 and the interrupt

address is IRQ3

➔ **Serial Port2 Address [2F8/IRQ3]**

Use the **Serial Port2 Address** option to select the Serial Port 2 base address.

➔ **Disabled**   No base address is assigned to Serial Port 2

➔ **2F8/IRQ3**   DEFAULT   Serial Port 2 I/O port address is 3F8 and the interrupt address is IRQ3

➔ **3E8/IRQ4**   Serial Port 2 I/O port address is 3E8 and the interrupt address is IRQ4

➔ **2E8/IRQ3**   Serial Port 2 I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port2 Mode [Normal]**

Use the **Serial Port2 Mode** option to select the Serial Port2 operational mode.

➔ **Normal**   DEFAULT   Serial Port 2 mode is normal

➔ **IrDA**   Serial Port 2 mode is IrDA

➔ **ASK IR**   Serial Port 2 mode is ASK IR

➔ **Parallel Port Address [378]**

Use the **Parallel Port Address** option to select the parallel port base address.

➔ **Disabled**   No base address is assigned to the Parallel Port

➔ **378**   DEFAULT   Parallel Port I/O port address is 378

➔ **278**   Parallel Port I/O port address is 278

➔ **3BC**   Parallel Port I/O port address is 3BC

➔ **Parallel Port Mode [Normal]**

Use the **Parallel Port Mode** option to select the mode the parallel port operates in.

➔ **Normal**   DEFAULT   The normal parallel port mode is the standard mode for parallel port operation.

➔ **Bi-directional**   Parallel port outputs are 8-bits long. Inputs are accomplished by reading 4 of the 8 bits on the status register.

➔ **ECP**   The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the SPP mode.

➔ **EPP**   The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.

➔ **ECP & EPP**   The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode

The parallel port is also be compatible with EPP devices described above

➔ **Parallel Port IRQ [IRQ7]**

Use the **Parallel Port IRQ** selection to set the parallel port interrupt address.

➔ **IRQ5**   IRQ5 is assigned as the parallel port interrupt address

➔ **IRQ7**   **DEFAULT**   IRQ7 is assigned as the parallel port interrupt address

➔ **Serial Port3 Address [3E8]**

Use the **Serial Port3 Address** option to select the base addresses for serial port 3

➔ **Disabled**   No base address is assigned to serial port 3

➔ **3E8**   **DEFAULT**   Serial port 3 I/O port address is 3E8

➔ **2F8**   Serial port 3 I/O port address is 2F8

➔ **3E8**   Serial port 3 I/O port address is 3E8

➔ **2E8**   Serial port 3 I/O port address is 2E8

➔ **2F0**   Serial port 3 I/O port address is 2F0

➔ **2E0**   Serial port 3 I/O port address is 2E0

➔ **Serial Port3 IRQ [11]**

Use the **Serial Port3 IRQ** option to select the interrupt address for serial port 3.

➔ **4**   Serial port 3 IRQ address is 4

➔ **9**   Serial port 3 IRQ address is 9

➔ **10**   Serial port 3 IRQ address is 10

➔ **11**   **DEFAULT**   Serial port 3 IRQ address is 11

➔ **Serial Port4 Address [2E8]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

➔ **Disabled**   No base address is assigned to serial port 3

➔ **3F8**   Serial port 4 I/O port address is 3F8

➔ **2F8**   Serial port 4 I/O port address is 2F8

➔ **3E8**   Serial port 4 I/O port address is 3E8

➔ **2E8**   DEFAULT   Serial port 4 I/O port address is 2E8

➔ **2F0**   Serial port 4 I/O port address is 2F0

➔ **2E0**   Serial port 4 I/O port address is 2E0

➔ **Serial Port4 IRQ [10]**

Use the **Serial Port4 IRQ** option to select the interrupt address for serial port 4.

➔ **3**   Serial port 4 IRQ address is 3

➔ **9**   Serial port 4 IRQ address is 9

➔ **10**   DEFAULT   Serial port 4 IRQ address is 10

➔ **11**   Serial port 4 IRQ address is 11

5.3.5 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 8**) shows the operating temperature, fan speeds and system voltages.

```
                          BIOS SETUP UTILITY
   Advanced

 Hardware Health Configuration

 System Temperature             :45°C/113°F
 CPU Temperature                :51°C/123°F


 Vcore                          :0.928 V
 AVCC                           :3.296 V
 3VCC                           :3.296 V
 +12V                           :11.440 V
 VTT                            :1.512 V
 GMCH                           :1.192 V
 +3.3V                          :3.344 V        ←    Select Screen
 +2.5V                          :2.560 V        ↑↓   Select Item
 VSB                            :3.248 V        F1   General Help
 VBAT                           :3.152 V        F10  Save and Exit
                                                ESC  Exit



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```
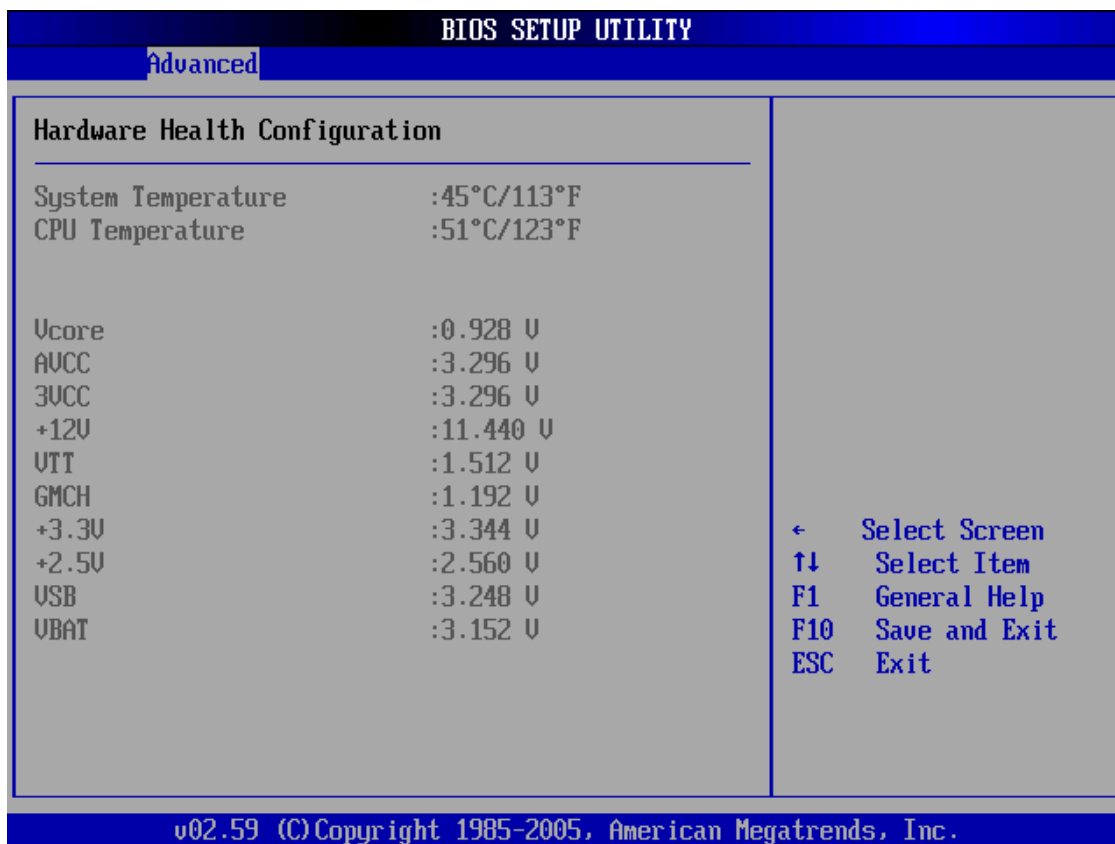
BIOS Menu 8: Hardware Health Configuration

The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures**: The following system temperatures are monitored
  - System Temperature
  - CPU Temperature
- **Voltages**: The following system voltages are monitored
  - Vcore
  - AVCC
  - 3VCC
  - +12V
  - VTT
  - GMCH

○ +3.3V

○ +2.5V

○ VSB

○ VBAT

5.3.6 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 9**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.

```
                       BIOS SETUP UTILITY
  Advanced

 ACPI Settings                                    General ACPI
 ──────────────────────────────                   Configuration settings
 ▶ General ACPI Configuration
 ▶ Advanced ACPI Configuration
 ▶ Chipset ACPI Configuration



                                                  ←     Select Screen
                                                  ↑↓    Select Item
                                                  Enter Go to Sub Screen
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit


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```
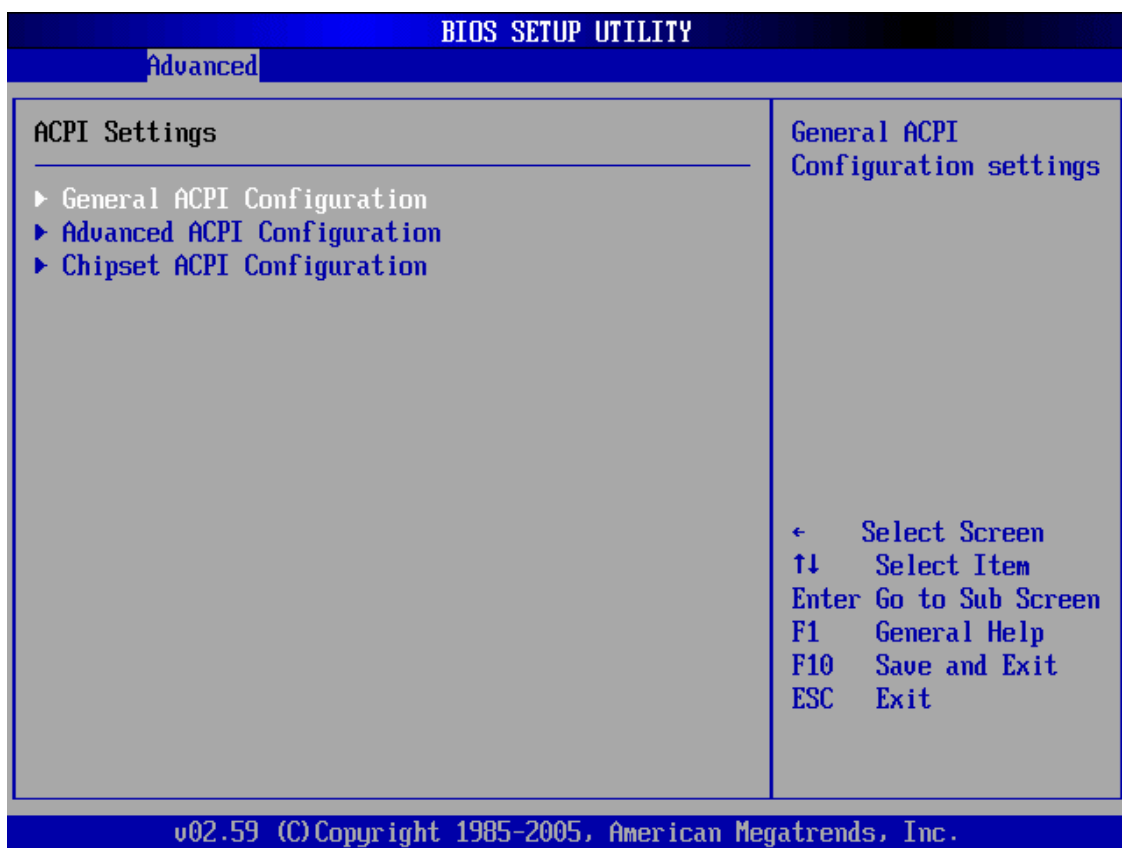
BIOS Menu 9: ACPI Configuration

5.3.6.1 General ACPI Configuration

Use the **General ACPI Configuration** menu (**BIOS Menu 10**) to select the ACPI state when the system is suspended.

```
                        BIOS SETUP UTILITY
  Advanced

 General ACPI Configuration                        Select the ACPI
 ─────────────────────────────────                 state used for
 Suspend mode                [Auto]                 System Suspend.
 Repost Video on S3 Resume   [No]




                                                   ←     Select Screen
                                                   ↑↓    Select Item
                                                   +-    Change Option
                                                   F1    General Help
                                                   F10   Save and Exit
                                                   ESC   Exit



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```
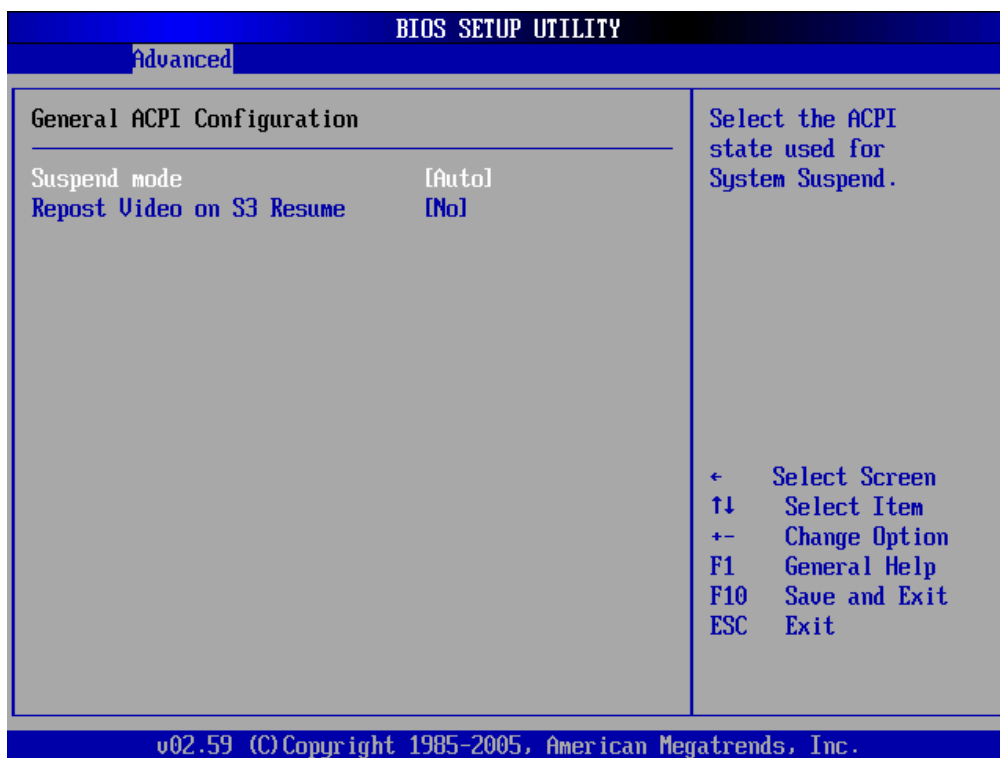
BIOS Menu 10: General ACPI Configuration

➔   **Suspend Mode [Auto]**

Use the **Suspend Mode** option to specify the sleep state the system enters when it is not
being used.

➔   **S1 (POS)**   The system enters S1(POS) sleep state. The system
                          appears off. The CPU is stopped; RAM is refreshed; the
                          system is running in a low power mode.

➔   **S3 (STR)**   The system enters a S3(STR) sleep state. The CPU has no
                          power; RAM is in slow refresh; the power supply is in a
                          reduced power mode.

➔   **Auto**   **DEFAULT**   The BIOS automatically selects a sleep state for the
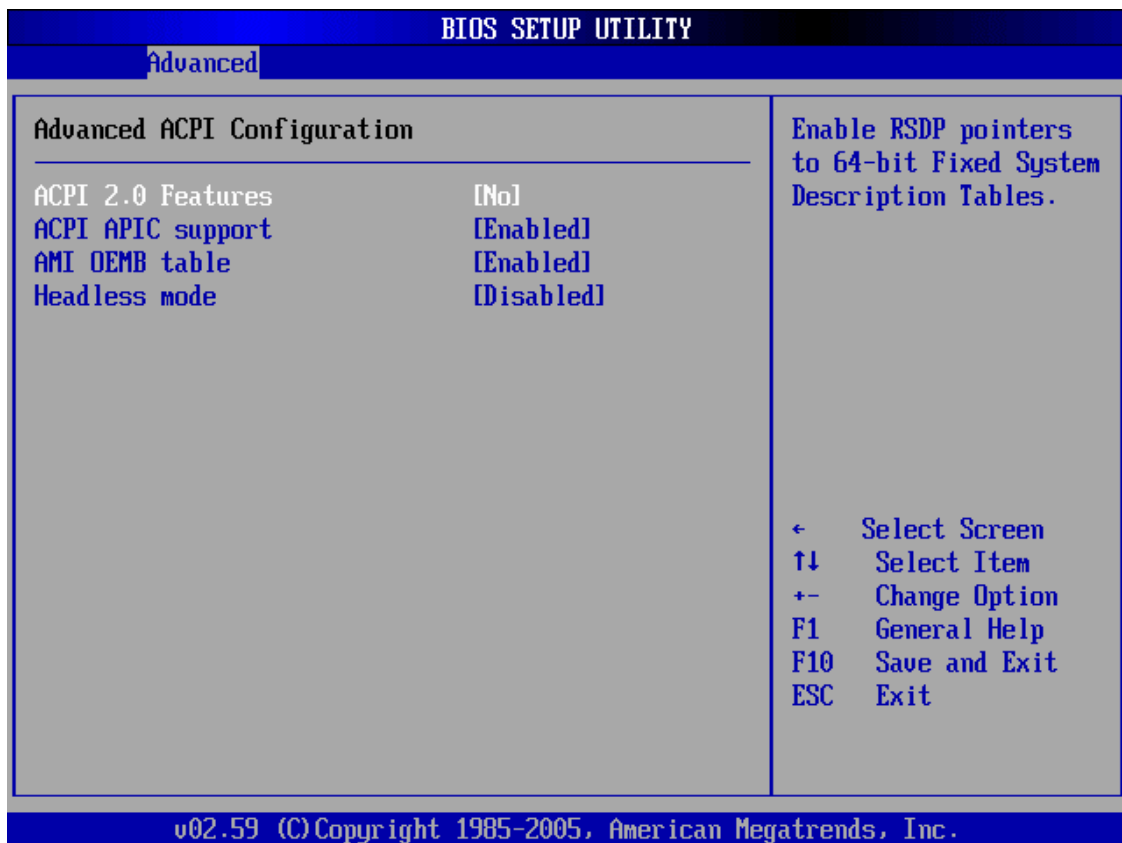   system.

➔ **Repost Video on S3 Resume [No]**

Use the **Repost Video on S3 Resume** to determine whether the VGA BIOS post will be invoked after the system is roused from an S3 (STR) suspend state.

➔ **No** **DEFAULT** The VGA BIOS post is not invoked

➔ **Yes** The VGA BIOS post is invoked

5.3.6.2 Advanced ACPI Configuration

Use the **Advanced ACPI Configuration** menu (**BIOS Menu 11**) to select the ACPI state when the system is suspended.

```
                        BIOS SETUP UTILITY
 Advanced

 Advanced ACPI Configuration                      Enable RSDP pointers
                                                  to 64-bit Fixed System
 ACPI 2.0 Features            [No]                Description Tables.
 ACPI APIC support            [Enabled]
 AMI OEMB table               [Enabled]
 Headless mode                [Disabled]




                                                  ←     Select Screen
                                                  ↑↓    Select Item
                                                  +-    Change Option
                                                  F1    General Help
                                                  F10   Save and Exit
                                                  ESC   Exit



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```

BIOS Menu 11: Advanced ACPI Configuration

➔ **ACPI 2.0 Features [No]**

Use the **ACPI 2.0 Features** option to enable the ACPI (Advanced Configuration and Power Interface) features. By enabling this feature the system RSDP (Root System Description Pointer) is able to obtain physical addresses for other 64-bit fixed system description tables.

➔ **No**   DEFAULT   RSDP pointers to 64-bit fixed systems are not provided to the system

➔ **Yes**   RSDP pointers to 64-bit fixed systems are provided to the system

➔ **ACPI APIC Support [Enabled]**

Use the **ACPI APIC Support** option to add a pointer to an ACPI APIC table in the RSDT (Root System Description Table). The RSDT is an array of pointers that direct the system to the physical addresses of other description tables. The RSDT is the main ACPI table. The RSDP is located in low memory space of the system and provides the physical address of the RSDT. The RSDT itself is identified in memory because it starts with the signature "RSDT."

➔ **Disabled**   Pointers to the APIC APIC table are not be provided in the RSDT

➔ **Enabled**   DEFAULT   Pointers to the APIC APIC table are provided in the RSDT

➔ **AMI OEMB table [Enabled]**

Use the **AMI OEMB table** option to add a pointer to an OEMB table in the RSDT table and the Extended System Description Table (XSDT), which accommodates physical addresses of description headers that are larger than 32-bits. Notice that both the XSDT and the RSDT can be pointed to by the RSDP structure.

➔ **Disabled**   Pointers to the AMI OEMB table are not provided in the RSDT and the XSDT

➔ **Enabled** DEFAULT Pointers to the AMI OEMB table are provided in the RSDT and the XSDT

➔ **Headless Mode [Disabled]**

Use the **Headless Mode** option to update the ACPI FACP (Fixed ACPI Description Table) to indicate headless operations, i.e. a computer without a monitor, keyboard and mouse.

➔ **Disabled** DEFAULT The FACP is not updated to indicate headless mode

➔ **Enabled** The FACP is updated to indicate headless mode

5.3.6.3 Chipset ACPI Configuration

Use the **Advanced ACPI Configuration** menu (**BIOS Menu 12**) to select the ACPI state when the system is suspended.
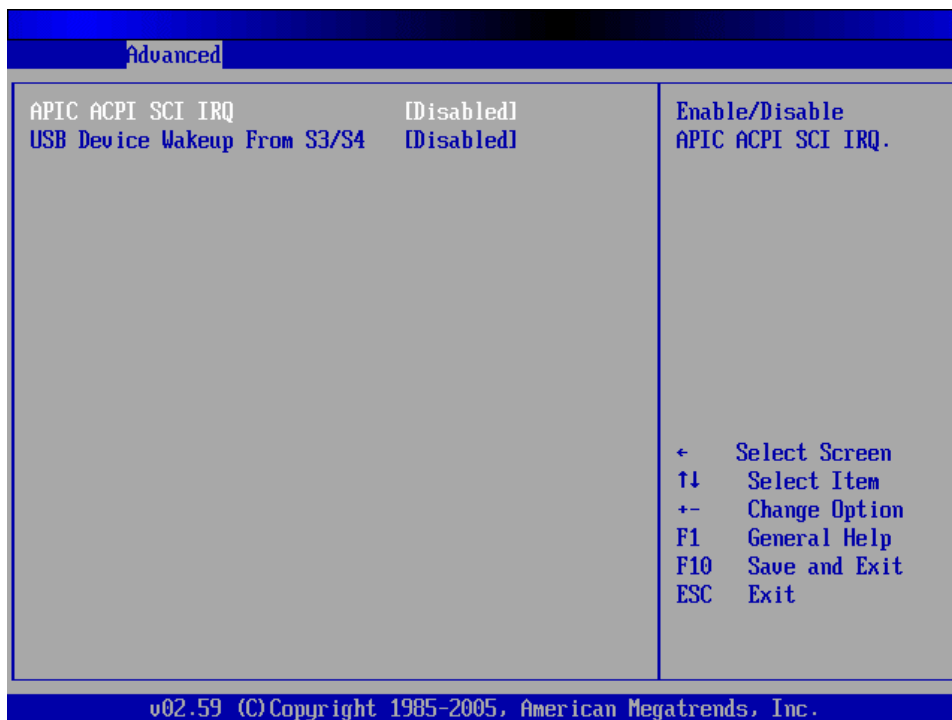
BIOS Menu 12: Chipset ACPI Configuration

➔ **APIC ACPI SCI IRQ [Disabled]**

Use **APIC ACPI SCI IRQ** option to enable the system to send a flag report to the ACPI OS if a SCI IRQ interrupt event is made via the APIC.

➔ **Disabled**   **DEFAULT**   No flag report is sent to the ACPI OS when there is a "SCI IRQ" interrupt event.

➔ **Enabled**   Flag report is sent to the ACPI OS when there is a "SCI IRQ" interrupt event is made via the APIC.

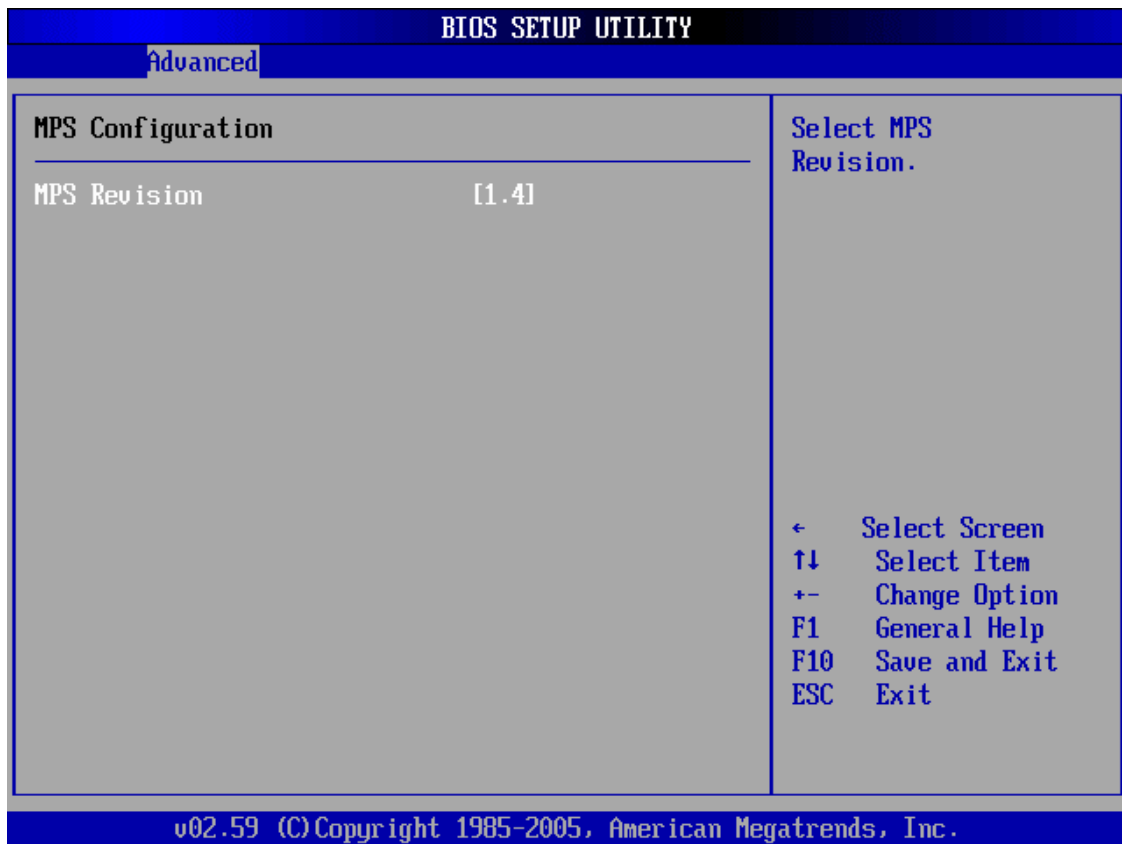➔ **USB Device Wakeup From S3/S4 [Disabled]**

The **USB Device Wakeup From S3/S4** BIOS function enables activity on the specified USB device to rouse the system from a sleep state.

➔ **Disabled**   **DEFAULT**   Activity on the USB cannot rouse the system

➔ **Enabled**   Activity on the USB can rouse the system

5.3.7 MPS Configuration

Use the **MPS Configuration** menu (**BIOS Menu 13)** to select `he multi-processor table.

```
                        BIOS SETUP UTILITY
    Advanced

MPS Configuration                              Select MPS
                                               Revision.
MPS Revision                  [1.4]




                                          ←    Select Screen
                                          ↑↓   Select Item
                                          +-   Change Option
                                          F1   General Help
                                          F10  Save and Exit
                                          ESC  Exit


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```

BIOS Menu 13: MPS Configuration

➔ **MPS Revision [1.4]**

Use the **Multiprocessor Specification (MPS) for OS** option to specify the MPS version to be used.

➔ **1.1**   MPS version 1.1 is used

➔ **1.4 DEFAULT** MPS version 1.4 is used

5.3.8 Smbios Configuration

Use the **Smbios Configuration** menu (**BIOS Menu 14**) to configure SMBIOS parameters.

```
                  Smbios Configuration Screen
       Advanced

  Smbios Configuration                    SMBIOS SMI Wrapper
                                          support for PnP Func
  Smbios Smi Support           [Enabled]  50h-54h




                                          ←     Select Screen
                                          ↑↓    Select Item
                                          +-    Change Option
                                          F1    General Help
                                          F10   Save and Exit
                                          ESC   Exit



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```
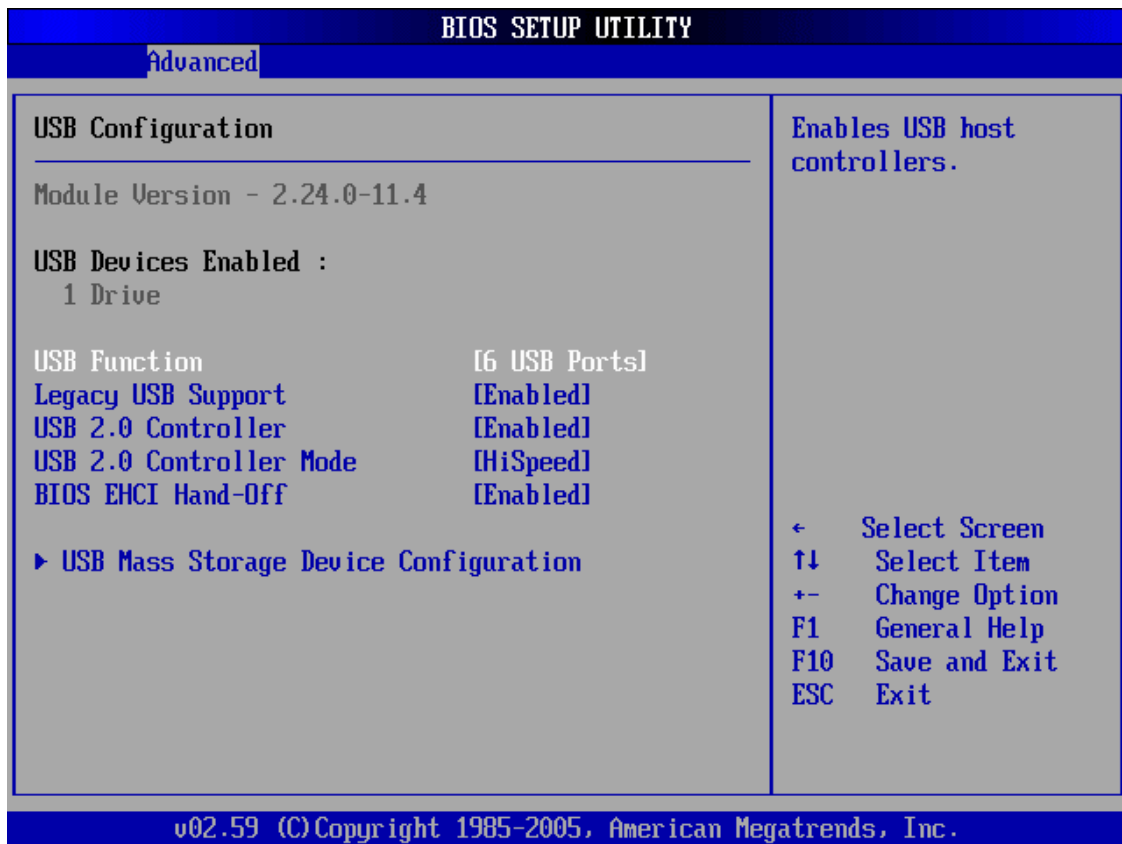
BIOS Menu 14: Smbios Configuration

➔ **Smbios Smi Support [Enabled]**

Use the **Smbios Smi Support** to enable the system to support the SMBIOS SMI wrapper for the PnP function 50h – 54h.

➔ **Disabled**   SMBIOS SMI wrapper for the PnP function 50h – 54h not supported

➔ **Enabled**   DEFAULT   SMBIOS SMI wrapper for the PnP function 50h – 54h supported

5.3.9 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 15**) to read USB configuration information and configure the USB settings.

```
                         BIOS SETUP UTILITY
   Advanced

   USB Configuration                              Enables USB host
                                                  controllers.
   Module Version - 2.24.0-11.4

   USB Devices Enabled :
     1 Drive

   USB Function                [6 USB Ports]
   Legacy USB Support          [Enabled]
   USB 2.0 Controller          [Enabled]
   USB 2.0 Controller Mode     [HiSpeed]
   BIOS EHCI Hand-Off          [Enabled]
                                                  ←    Select Screen
   ▶ USB Mass Storage Device Configuration        ↑↓   Select Item
                                                  +-   Change Option
                                                  F1   General Help
                                                  F10  Save and Exit
                                                  ESC  Exit


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```

BIOS Menu 15: USB Configuration

➔ **USB Configuration**

The **USB Configuration** field shows the system USB configuration. The items listed are:

  ▪ Module Version: 2.24.0-11.4

➔ **USB Devices Enabled**

The **USB Devices Enabled** field lists the USB devices that are enabled on the system

➔ **USB Function [6 USB Ports]**

Use the **USB Function** BIOS option to enable USB host controllers.

  ➔ **Disabled**   USB function support disabled

➔   **2 USB Ports**   The USB controller activates 2 USB ports

➔   **4 USB Ports**   The USB controller activates 4 USB ports

➔   **6 USB Ports**   DEFAULT   The USB controller activates 6 USB ports

➔   **Legacy USB Support [Enabled]**

Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

Normally if this option is not enabled, any attached USB mouse or USB keyboard does not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can control the system even when there is no USB driver loaded onto the system.

➔   **Disabled**   Legacy USB support disabled

➔   **Enabled**   DEFAULT   Legacy USB support enabled

➔   **Auto**   The Legacy USB support is automatically detected and enabled.

➔   **USB 2.0 Controller [Enabled]**

Use the **USB 2.0 Controller** BIOS option to enable or disable the USB 2.0 controller

➔   **Enabled**   DEFAULT   USB 2.0 controller enabled

➔   **Disabled**   USB 2.0 controller disabled

➔   **USB2.0 Controller Mode [HiSpeed]**

Use the **USB2.0 Controller Mode** option to set the speed of the USB2.0 controller.

➔   **FullSpeed**   The controller is capable of operating at 12Mb/s

➔   **HiSpeed**   DEFAULT   The controller is capable of operating at 480Mb/s

→ **BIOS EHCI Handoff [Enable]**

Use the **BIOS EHCI Handoff** option for systems running OSes that do not have EHCI hand-off support. The EHCI ownership change is managed by the EHCI driver.

→ **Disabled**   Systems with OSes that do not support EHCI can use the EHCI handoff functionality.

→ **Enabled** DEFAULT   Systems with OSes that do not support EHCI cannot use the EHCI handoff functionality.

→ **USB Mass Storage Device Configuration**

The **USB Mass Storage Device Configuration** field appears if a USB drive is connected to one of the USB ports or connectors. If this option is selected a menu appears.

5.4   PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 16**) to configure advanced PCI and PnP settings.

⚠ **WARNING!**

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu may cause the system to malfunction.

```
                        BIOS SETUP UTILITY
 Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit
┌────────────────────────────────────────────────┬──────────────────────────┐
│ Advanced PCI/PnP Settings                    ▲  │ Clear NVRAM during       │
│                                                 │ System Boot.             │
│ WARNING: Setting wrong values in below sections │                          │
│          may cause system to malfunction.       │                          │
│                                                 │                          │
│ Clear NVRAM                   [No]              │                          │
│ Plug & Play O/S               [No]              │                          │
│ PCI Latency Timer             [64]              │                          │
│ Allocate IRQ to PCI VGA       [Yes]             │                          │
│ Palette Snooping              [Disabled]        │                          │
│ PCI IDE BusMaster             [Disabled]        │                          │
│ OffBoard PCI/ISA IDE Card     [Auto]            │                          │
│                                                 │  ←      Select Screen    │
│ IRQ3                          [Available]       │  ↑↓     Select Item      │
│ IRQ4                          [Available]       │  +-     Change Option    │
│ IRQ5                          [Available]       │  F1     General Help     │
│ IRQ7                          [Available]       │  F10    Save and Exit    │
│ IRQ9                          [Available]       │  ESC    Exit             │
│ IRQ10                         [Available]       │                          │
│ IRQ11                         [Available]    ▼  │                          │
└────────────────────────────────────────────────┴──────────────────────────┘
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```

BIOS Menu 16: PCI/PnP Configuration

➔ **Clear NVRAM [No]**

Use the **Clear NVRAM** option to specify if the NVRAM (Non-Volatile RAM) is cleared when the power is turned off.

➔ **No** **DEFAULT** System does not clear NVRAM during system boot

➔ **Yes** System clears NVRAM during system boot

➔ **Plug & Play O/S [No]**

Use the **Plug & Play O/S** BIOS option to specify whether system plug and play devices are configured by the operating system or the BIOS.

➔ **No** **DEFAULT** If the operating system does not meet the Plug and Play

specifications, this option allows the BIOS to configure all the devices in the system.

➔ **Yes** This setting allows the operating system to change the interrupt, I/O, and DMA settings. Set this option if the system is running Plug and Play aware operating systems.

➔ **PCI Latency Timer [64]**

Use the **PCI Latency Timer** option to specify the PCI latency time. The latency time is measured in units of PCI clock cycles for the PCI device latency timer register. Configuration options are:

- 32
- 64 (Default)
- 96
- 128
- 160
- 192
- 224
- 248

➔ **Allocate IRQ to PCI VGA [Yes]**

Use the **Allocate IRQ to PCI VGA** option to restrict the system from giving the VGA adapter card an interrupt address.

➔ **Yes** DEFAULT Assigns an IRQ to a PCI VGA card if card requests IRQ

➔ **No** Does not assign IRQ to a PCI VGA card even if the card requests an IRQ

➔ **Palette Snooping [Disabled]**

Use the **Palette Snooping** option to enable or disable the palette snooping function.

➔ **Disabled** DEFAULT Unless the VGA card manufacturer requires palette

snooping to be enabled, this option should be disabled.

➔ **Enabled** PCI devices are informed that an ISA based Graphics device is installed in the system so the ISA based Graphics card functions correctly. This does not necessarily indicate a physical ISA adapter card. The graphics chipset can be mounted on a PCI card. Always check with the adapter card manual first, before modifying the default settings in the BIOS.

➔ **PCI IDE BusMaster [Disabled]**

Use the **PCI IDE BusMaster** BIOS option to enable or prevent PCI IDE busmastering.

➔ **Disabled** DEFAULT Busmastering is prevented

➔ **Enabled** IDE controller on the PCI local bus has mastering capabilities

➔ **OffBoard PCI/ISA IDE Card [Auto]**

Use the **OffBoard PCI/ISA IDE Card** BIOS option to select the **OffBoard PCI/ISA IDE Card**.

➔ **Auto** DEFAULT The location of the Off Board PCI IDE adapter card is automatically detected by the AMIBIOS.

➔ **PCI Slot 1** PCI Slot 1 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 1.

➔ **PCI Slot 2** PCI Slot 2 is selected as the location of the OffBoard PCI IDE adapter card. Only select this slot if the adapter card is installed in PCI Slot 2.

➔ **PCI Slot 3** PCI Slot 3 is selected as the location of the OffBoard

PCI IDE adapter card. Only select this slot if the
adapter card is installed in PCI Slot 3.

➔ **PCI Slot 4**   PCI Slot 4 is selected as the location of the OffBoard
PCI IDE adapter card. Only select this slot if the
adapter card is installed in PCI Slot 4.

➔ **PCI Slot 5**   PCI Slot 5 is selected as the location of the OffBoard
PCI IDE adapter card. Only select this slot if the
adapter card is installed in PCI Slot 5.

➔ **PCI Slot 6**   PCI Slot 6 is selected as the location of the OffBoard
PCI IDE adapter card. Only select this slot if the
adapter card is installed in PCI Slot 6.

➔ **IRQ#   [Available]**

Use the **IRQ#** address to specify what IRQs can be assigned to a particular peripheral
device.

➔ **Available**   DEFAULT   The specified IRQ is available to be used by PCI/PnP
devices

➔ **Reserved**   The specified IRQ is reserved for use by Legacy ISA
devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5
- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14

- IRQ 15

➔ **DMA Channel# [Available]**

Use the **DMA Channel#** option to assign a specific DMA channel to a particular PCI/PnP device.

➔ **Available**   DEFAULT   The specified DMA is available to be used by PCI/PnP devices

➔ **Reserved**   The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

- DM Channel 0
- DM Channel 1
- DM Channel 3
- DM Channel 5
- DM Channel 6
- DM Channel 7

➔ **Reserved Memory Size [Disabled]**

Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

➔ **Disabled**   DEFAULT   No memory block reserved for legacy ISA devices

➔ **16K**   16KB reserved for legacy ISA devices

➔ **32K**   32KB reserved for legacy ISA devices

➔ **64K**   54KB reserved for legacy ISA devices

5.5 Boot

Use the **Boot** menu (**BIOS Menu 17**) to configure system boot options.

```
                        BIOS SETUP UTILITY
 Main    Advanced   PCIPnP   Boot   Security   Chipset   Power    Exit

 Boot Settings                              Configure Settings
 _____               during System Boot.

 ▶ Boot Settings Configuration

 ▶ Boot Device Priority
 ▶ Removable Drives

                                            ←     Select Screen
                                            ↑↓    Select Item
                                            Enter Go to Sub Screen
                                            F1    General Help
                                            F10   Save and Exit
                                            ESC   Exit


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```

BIOS Menu 17: Boot

5.5.1 Boot Settings Configuration

Use the **Boot Settings Configuration** menu (**BIOS Menu 18**) to configure advanced system boot options.

```
                          BIOS SETUP UTILITY
                            Boot

Boot Settings Configuration                      Allows BIOS to skip
                                                 certain tests while
Quick Boot                [Enabled]              booting. This will
Quiet Boot                [Disabled]             decrease the time
AddOn ROM Display Mode     [Force BIOS]          needed to boot the
Bootup Num-Lock            [On]                  system.
PS/2 Mouse Support         [Auto]
Wait For 'F1' If Error     [Enabled]
Hit 'DEL' Message Display  [Enabled]
Interrupt 19 Capture       [Disabled]

                                                 ←    Select Screen
                                                 ↑↓   Select Item
                                                 +-   Change Option
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit

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```

BIOS Menu 18: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

Use the **Quick Boot** BIOS option to make the computer speed up the boot process.

   ➔ **Disabled**   No POST procedures are skipped

   ➔ **Enabled**   DEFAULT   Some POST procedures are skipped to decrease the

                                system boot time

➔ **Quiet Boot [Disabled]**

Use the **Quiet Boot** BIOS option to select the screen display when the system boots.

   ➔ **Disabled**   DEFAULT   Normal POST messages displayed

   ➔ **Enabled**   OEM Logo displayed instead of POST messages

➔ **AddOn ROM Display Mode [Force BIOS]**

Use the **AddOn ROM Display Mode** option to allow add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS** DEFAULT The system forces third party BIOS to display during system boot.

➔ **Keep Current** The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

Use the **Bootup Num-Lock** BIOS option to specify if the number lock setting must be modified during boot up.

➔ **Off** Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.

➔ **On** DEFAULT Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

➔ **PS/2 Mouse Support [Auto]**

Use the **PS/2 Mouse Support** option adjusts PS/2 mouse support capabilities.

➔ **Disabled** PS/2 mouse support is disabled and prevented from using system resources.

➔ **Enabled** Allows the system to use a PS/2 mouse.

➔ **Auto**   **DEFAULT**   Allows the system to automatically detect if a PS/2 mouse is being used.

➔ **Wait For 'F1' If Error [Enabled]**

Use the **Wait For 'F1' if Error** option to specify how the system responds when the system detects an error on boot up.

➔ **Disabled**   If there is an error when booting up, the system does not wait for user intervention but continues to boot up in the operating system. Only use this setting if there is a known reason for a BIOS error to appear. An example would be a system administrator must remote boot the system. The computer system does not have a keyboard currently attached.

➔ **Enabled**   **DEFAULT**   If there is an error during boot up, the system waits for a user to press "F1" and enter the BIOS to rectify the problem. The BIOS can then be adjusted to the correct settings.

➔ **Hit 'DEL' Message Display [Enable]**

Use the **Hit "DEL" Message Display** option to specify whether the instruction to hit the delete button to enter BIOS during POST appears or not.

➔ **Disabled**   No message displayed during POST

➔ **Enabled**   **DEFAULT**   Displays "**Press DEL to run Setup**" message in POST

➔ **Interrupt 19 Capture [Disabled]**

Use the **Interrupt 19 Capture** option to allow optional ROMs such as network controllers to trap BIOS interrupt 19.

➔ **Disabled** **DEFAULT** Does not allow optional ROM to trap interrupt 19

➔ **Enabled** Allows optional ROM to trap interrupt 19

5.6 Security

Use the **Security** menu (**BIOS Menu 19**) to set system and user passwords.

```
                        BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit

  Security Settings                                   Install or Change the
  ──────────────────────────────────                 password.
  Supervisor Password :Not Installed
  User Password        :Not Installed

  Change Supervisor Password
  Change User Password
  Clear User Password

  Boot Sector Virus Protection   [Disabled]



                                                 ←     Select Screen
                                                 ↑↓    Select Item
                                                 Enter Change
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit



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```

BIOS Menu 19: Security

➔ **Change Supervisor Password**

Use the **Change Supervisor Password** to set or change a supervisor password. The default for this option is **Not Installed**. If a supervisor password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change Supervisor Password**.

→ **Change User Password**

Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be installed, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password.**

→ **Clear User Password**

Use the **Clear User Password** to clear a user password.

→ **Boot Sector Virus Protection [Disabled]**

→ **Disabled**   DEFAULT   Disables the boot sector virus protection

→ **Enabled**   Enables the boot sector virus protection

5.7   Chipset

Use the **Chipset** menu (**BIOS Menu 20**) to access the NorthBridge and SouthBridge configuration menus

⚠️ **WARNING!**

Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.

```
                        BIOS SETUP UTILITY
 Main    Advanced   PCIPnP    Boot    Security   Chipset   Power    Exit

 Advanced Chipset Settings                          Options for NB

 WARNING: Setting wrong values in below sections
          may cause system to malfunction.

 ▶ NorthBridge Configuration
 ▶ SouthBridge Configuration




                                               ←     Select Screen
                                               ↑↓    Select Item
                                               Enter Go to Sub Screen
                                               F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit


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```

BIOS Menu 20: Chipset

5.7.1 NorthBridge Configuration

Use the **NorthBridge Configuration** menu (**BIOS Menu 21**) to configure the northbridge chipset.

```
                NorthBridge Chipset Configuration
                                                    Chipset

 DRAM Frequency                   [Auto]                  Options
 Configure DRAM Timing by SPD     [Enabled]
                                                      200 Mhz
 Memory Hole                      [Disabled]          266 Mhz
 Init. Graphic Adapter Priority   [Internal VGA]      333 Mhz
 Internal Graphics Mode Select    [Enabled, 8MB]      Auto
 Graphics Aperture Size           [ 64MB]

 Video Function Configuration
   Boot Display Device            [Auto]
   Flat Panel Type                [640x480LVDS]
   Local Flat Panel Scaling       [Auto]

                                                 ←    Select Screen
                                                 ↑↓   Select Item
                                                 +-   Change Option
                                                 F1   General Help
                                                 F10  Save and Exit
                                                 ESC  Exit


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```

BIOS Menu 21:NorthBridge Chipset Configuration

➔ **DRAM Frequency [Auto]**

Use the **DRAM Frequency** option to specify the DRAM frequency or allow the system to
automatically detect the DRAM frequency.

➔ **200MHz**   Sets the DRAM frequency to 200MHz

➔ **266MHz**   Sets the DRAM frequency to 266MHz

➔ **333MHz**   Sets the DRAM frequency to 333MHz

➔ **Auto**   DEFAULT   Automatically selects the DRAM frequency

➔ **Configure DRAM Timing by SPD [Enabled]**

Use the **Configure DRAM Timing by SPD** option to determine if the system uses the SPD *(*Serial Presence Detect) EEPROM to configure the DRAM timing. The SPD EEPROM contains all necessary DIMM specifications including the speed of the individual components such as CAS and bank cycle time as well as valid settings for the module and the manufacturer's code. The SPD enables the BIOS to read the spec sheet of the DIMMs on boot-up and then adjust the memory timing parameters accordingly.

➔ **Disabled**   DRAM timing parameters are manually set using the DRAM sub-items

➔ **Enabled**   **DEFAULT**   DRAM timing parameter are set according to the DRAM Serial Presence Detect (SPD)

If the **Configure DRAM Timing by SPD** option is disabled, the following configuration options appear.

- DRAM CAS# Latency [3]
- DRAM RAS# to CAS# Delay [5 DRAM Clocks]
- DRAM RAS# Precharge [5 DRAM Clocks]
- DRAM RAS# Activate to Precha [15 DRAM Clocks]

➔ **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve memory space between 15MB and 16MB for ISA expansion cards that require a specified area of memory to work properly. If an older ISA expansion card is used, please refer to the documentation that came with the card to see if it is necessary to reserve the space.

➔ **Disabled**   **DEFAULT**   Memory is not reserved for ISA expansion cards

➔ **15MB – 16MB**   Between 15MB and 16MB of memory is reserved for ISA expansion cards

➔ **Init. Graphic Adapter Priority [Internal VGA]**

The **Init. Graphic Adapter Priority** option selects the graphics controller the system uses as a primary boot device. The options are:

- Internal VGA
- PCI/Int-VGA

➔ **Internal Graphics Mode Select [Enable, 8MB]**

Use the **Internal Graphic Mode Select** option to specify the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**

➔ **Enable, 1MB**   1MB of memory used by internal graphics device

➔ **Enable, 4MB**   4MB of memory used by internal graphics device

➔ **Enable, 8MB**   DEFAULT   8MB of memory used by internal graphics device

➔ **Enable, 16MB**   16MB of memory used by internal graphics device

➔ **Enable, 32MB**   32MB of memory used by internal graphics device

➔ **Graphics Aperture Size [64MB]**

The **Graphics Aperture Size** option selects the size of the AGP aperture. The aperture is a portion of the PCI memory address range dedicated as graphics memory address space.

➔ **64MB**   DEFAULT   Graphics aperture size set as 64MB

➔ **128MB**   Graphics aperture size set as 128MB

➔ **256MB**   Graphics aperture size set as 256MB

➔ **Boot Display Device [Auto]**

The **Boot Display Device** BIOS option selects the display device the system uses when it boots. The available options are listed below:

- Auto (Default)
- CRT on Port 0
- LFP on Port 2
- LFP on Port 3
- DFP on Port 2
- DFP on Port 3
- TV on Port 2
- TV on Port 3
- CRT-Port 0 & CRT-Port 2
- CRT-Port 0 & CRT-Port 3
- CRT-Port 0 & LFP-Port 2
- CRT-Port 0 & LFP-Port 3
- CRT-Port 0 & DFP-Port 2
- CRT-Port 0 & DFP-Port 3
- DFP-Port 2 & DFP-Port 3

→ **Flat Panel Type [640x480 18bit LVDS]**

The **Flat Panel Type** BIOS option specifies the flat panel PC type being used.

NOTE:

Please refer to the technical documents that came with the flat panel PC to ensure the correct settings are selected.

The following options are available:

- 640x480 LVDS   (Default)
- 800x600 LVDS
- 1024x768 24bit LVDS
- 1280x1024 LVDS
- 1024x768 18 bit LVDS
- 1600x1200 LVDS
- 800x600 24bit LVDS
- 800x600 18bit LVDS

- 1024x768 36bit LVDS
- Type 12
- Type 13
- Type 14
- Type 15
- Type 16

➔ **Local Flat Panel Scaling [Auto]**

The **Local Flat Panel Scaling** option selects the mode of the local flat panel scaling.

➔   **Auto**   D<small>EFAULT</small>   Automatically scale the connected local flat panel.

➔   **Forced Scaling**   The connected local flat panel is forced to scale.

➔   **Disabled**   Disable the local flat panel scaling.

5.7.2 SouthBridge Configuration

The **SouthBridge Intel ICH4 Configuration** menu (**BIOS Menu 22**) the southbridge chipset to be configured.

```
                South Bridge Chipset Configuration
                                    Chipset

  OnBoard AC'97 Audio        [Auto]           Enable/Disable
                                              OnBoard AC'97 Audio.
  Restore on AC Power Loss   [Last State]




                                              ←    Select Screen
                                              ↑↓   Select Item
                                              +-   Change Option
                                              F1   General Help
                                              F10  Save and Exit
                                              ESC  Exit


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```
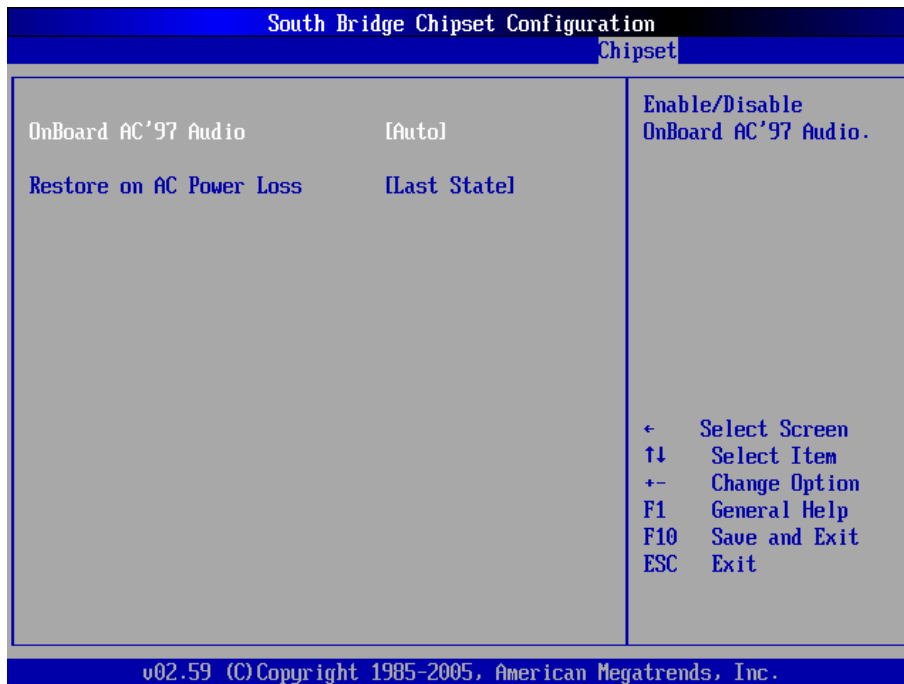
BIOS Menu 22:SouthBridge Chipset Configuration

➔ **OnBoard AC97 Audio DEVICE**

The **OnBoard AC97 Audio DEVICE** option enables or disables the AC'97 CODEC.

➔ **Auto**   DEFAULT   The onboard AC'97 automatically detected and enabled

➔ **Disabled**   The onboard AC'97 is disabled

➔ **Restore on AC Power Loss [Last State]**

The Restore on AC Power Loss BIOS option specifies what state the system returns to if there is a sudden loss of power to the system.

➔ **Power Off**   The system remains turned off

➔ **Power On**   The system turns on

➔ **Last State**   DEFAULT   The system returns to its previous state. If it was on, it turns itself on. If it was off, it remains off.

5.8   Power Key

The **Power** menu (**BIOS Menu 23**) allows the advanced power management options to be configured.

```
                          BIOS SETUP UTILITY
┌──────────┬────────────┬─────────┬──────┬──────────┬─────────┬───────┬──────┐
│  Main    │  Advanced  │  PCIPnP │ Boot │ Security │ Chipset │ Power │ Exit │
├──────────┴────────────┴─────────┴──────┴──────────┴─────────┴───────┴──────┤
│  APM Configuration                          ▲  │  Enable or disable      │
│  ──────────────────────────────────────────    │  APM.                   │
│  Power Management/APM        [Enabled]          │                         │
│  Video Power Down Mode       [Suspend]          │                         │
│  Hard Disk Power Down Mode   [Suspend]          │                         │
│  Standby Time Out            [Disabled]         │                         │
│  Suspend Time Out            [Disabled]         │                         │
│  Throttle Slow Clock Ratio   [50%]              │                         │
│  Keyboard & PS/2 Mouse       [MONITOR]          │                         │
│  FDC/LPT/COM Ports           [MONITOR]          │                         │
│  Primary master IDE          [MONITOR]          │                         │
│  Primary slave IDE           [MONITOR]          │  ←      Select Screen   │
│  Secondary master IDE        [MONITOR]          │  ↑↓     Select Item     │
│  Secondary slave IDE         [MONITOR]          │  +-     Change Option   │
│                                                 │  F1     General Help    │
│  System Thermal              [Disabled]         │  F10    Save and Exit   │
│                                                 │  ESC    Exit            │
│  Power Button Mode           [On/Off]           │                         │
│                                                 │                         │
│  Resume On Ring              [Disabled]      ▼  │                         │
├─────────────────────────────────────────────────────────────────────────┤
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└─────────────────────────────────────────────────────────────────────────┘
```

BIOS Menu 23:Power

➔   **Power Management/APM [Enabled]**

The **Power Management/APM** BIOS option allows access to the advanced power management features. If this option is disabled, the only other option on the screen is the "**Resume On RTC Alarm**."

➔   **Disabled**   Disables the Advanced Power Management (APM) feature

➔   **Enabled**   DEFAULT   Enables the APM feature

➔ **Video Power Down Mode [Suspend]**

The **Video Power Down Mode** BIOS option specifies in what system mode the video device can be turned off.

    ➔ **Disabled**   The Video cannot be turned off in the Suspend or Standby mode

    ➔ **Standby**   The video can be turned off in the Standby mode

    ➔ **Suspend** DEFAULT   The video can be turned off in the Suspend mode

➔ **Hard Disk Power Down Mode [Suspend]**

The **Hard Disk Power Down Mode** BIOS specifies in what system mode the hard disk device can be turned off.

    ➔ **Disabled**   The hard disk cannot be turned off in the Suspend or Standby mode

    ➔ **Standby**   The hard disk can be turned off in the Standby mode

    ➔ **Suspend** DEFAULT   The hard disk can be turned off in the Suspend mode

➔ **Standby Time Out [Disabled]**

The **Power Management/APM** option must be enabled in order to change this configuration option. The **Standby Time Out** option specifies what length of time without activity on certain components will place those components in a standby state. The options are:

- Disabled (Default)
- 1 Min
- 2 Min
- 4 Min
- 8 Min
- 10 Min
- 20 Min

- 30 Min
- 40 Min
- 50 Min
- 60 Min

➔ **Suspend Time Out [Disabled]**

The **Power Management/APM** option must be enabled in order to change this configuration option. The **Suspend Time Out** option specifies what length of time without activity on certain components will place those components in a suspended state. The options are:

- Disabled (Default)
- 1 Min
- 2 Min
- 4 Min
- 8 Min
- 10 Min
- 20 Min
- 30 Min
- 40 Min
- 50 Min
- 60 Min

➔ **Throttle Slow Clock Ratio [50%]**

The **Power Management/APM** option must be enabled in order to change this configuration option. The **Throttle Slow Clock Ratio** option allows the BIOS to throttle the CPU clock to reduce power consumption. For example, a throttle ratio of 50% means the BIOS throttles back the CPU clock to operate at 50% of its normal operational time. Throttle slow clock ratio options are:

- 87.5%
- 75%
- 62.5%
- 50% (default)
- 37.5%

- 25%
- 12.5%

➔ **Keyboard & PS/2 Mouse [MONITOR]**

The **Power Management/APM** option must be enabled in order to change this configuration option. The **keyboard & PS/2 mouse** option enables monitoring of activity on the keyboard and PS/2 mouse ports and rouses the system from a sleep or suspend state.

➔ **Ignore** The system does not monitor the keyboard and PS/2 mouse ports and does not rouse the system from a sleep or suspend state when an IRQ is detected.

➔ **Monitor** D EFAULT The system monitors the keyboard and PS/2 mouse ports and rouses the system from a sleep or suspend state when an IRQ is detected.

➔ **FDC/LPT/COM Ports [MONITOR]**

The **Power Management/APM** option must be enabled in order to change this configuration option. The **FDC/LPT/COM Ports** option enables monitoring of activity on the FDC/LPT/COM ports and rouses the system from a sleep or suspend state.

➔ **Ignore** The system does not monitor the FDC/LPT/COM ports and does not rouse the system from a sleep or suspend state when an IRQ is detected.

➔ **Monitor** D EFAULT The system monitors the FDC/LPT/COM ports and rouses the system from a sleep or suspend state when an IRQ is detected.

➔ **Primary master IDE [MONITOR]**

The **Power Management/APM** option must be enabled in order to change this configuration option. The **Primary Master IDE** option enables monitoring of activity of the primary master IDE device and rouses the system from a sleep or suspend state.

➔ **Ignore** The system does not monitor the primary master IDE device and does not rouse the system from a sleep or suspend state when an IRQ is detected.

➔ **Monitor** DEFAULT The system monitors the primary master IDE device and rouses the system from a sleep or suspend state when an IRQ is detected.

➔ **Primary slave IDE [MONITOR]**

The **Power Management/APM** option must be enabled in order to change this configuration option. The **Primary Slave IDE** option enables monitoring of activity of the primary slave IDE device and rouses the system from a sleep or suspend state.

➔ **Ignore** The system does not monitor the primary slave IDE device and does not rouse the system from a sleep or suspend state when an IRQ is detected.

➔ **Monitor** DEFAULT The system monitors the primary slave IDE device and rouses the system from a sleep or suspend state when an IRQ is detected.

➔ **Secondary master IDE [MONITOR]**

The **Power Management/APM** option must be enabled in order to change this configuration option. The **Secondary Master IDE** option enables monitoring of activity of the secondary master IDE device and rouses the system from a sleep or suspend state.

➔ **Ignore** The system does not monitor the secondary master IDE

device and does not rouse the system from a sleep or suspend state when an IRQ is detected.

➔ **Monitor** DEFAULT The system monitors the secondary master IDE device and rouses the system from a sleep or suspend state when an IRQ is detected.

➔ **Secondary slave IDE [MONITOR]**

The **Power Management/APM** option must be enabled in order to change this configuration option. The **Secondary Slave IDE** option enables monitoring of activity of the secondary slave IDE device and rouses the system from a sleep or suspend state.

➔ **Ignore** DEFAULT The system does not monitor the secondary slave IDE device and does not rouse the system from a sleep or suspend state when an IRQ is detected.

➔ **Monitor** The system monitors the secondary slave IDE device and rouses the system from a sleep or suspend state when an IRQ is detected.

➔ **System Thermal [Disabled]**

The **System Thermal** BIOS option enables the manual setting of the **Thermal Active Temperature** and the **THRM throttle Ratio** BIOS options.

➔ **Disabled** DEFAULT **Thermal Active Temperature** and the **THRM throttle Ratio** BIOS options cannot be set manually.

➔ **Enabled** **Thermal Active Temperature** and the **THRM throttle Ratio** BIOS options can be set manually.

➔ **Power Button Mode [On/Off]**

The **Power Button Mode** BIOS specifies how the power button functions.

➔ **On/Off** **DEFAULT** When the power button is pressed the system is either turned on or off

➔ **Suspend** When the power button is pressed the system goes into suspend mode

➔ **Resume on Ring [Disabled]**

The **Resume on Ring** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the RI (ring in) modem line. That is, the system will be roused by an incoming call on a modem.

➔ **Disabled** **DEFAULT** Wake event not generated by an incoming call

➔ **Enabled** Wake event generated by an incoming call

➔ **Resume on Lan [Disabled]**

The **Resume on Lan** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the LAN.

➔ **Disabled** **DEFAULT** Wake event not generated by LAN activity

➔ **Enabled** Wake event generated by LAN activity

➔ **Resume on PME# [Disabled]**

The **Resume on PME#** BIOS option specifies if the system will be roused from a suspended or standby state when there is activity on the PCI PME (power management event) controller.

➔ **Disabled** **DEFAULT** Wake event not generated by PCI PME controller activity

➔ **Enabled** Wake event generated by PCI PME controller activity

➔ **Resume On RTC Alarm [Disabled]**

The **Resume On RTC Alarm** determines when the computer is roused from a suspended state.

➔ **Disabled** DEFAULT   The real time clock (RTC) cannot generate a wake event

➔ **Enabled**   If selected, the following appears with values that can be selected:

➔ **RTC Alarm Date (Days)**

➔ **System Time**

After setting the alarm, the computer turns itself on from a suspend state when the alarm goes off.

5.9   Exit

The **Exit** menu (**BIOS Menu 24**) loads default BIOS values, optimal failsafe values and to save configuration changes.

```
                        BIOS SETUP UTILITY
 Main    Advanced    PCIPnP    Boot    Security    Chipset    Power    Exit

 Exit Options                                     Exit system setup
 _____             after saving the
 Save Changes and Exit                           changes.
 Discard Changes and Exit
 Discard Changes                                 F10 key can be used
                                                 for this operation.
 Load Optimal Defaults
 Load Failsafe Defaults




                                                 ←     Select Screen
                                                 ↑↓    Select Item
                                                 Enter Go to Sub Screen
                                                 F1    General Help
                                                 F10   Save and Exit
                                                 ESC   Exit



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```

BIOS Menu 24:Exit

➔ **Save Changes and Exit**

If configuration changes are complete, select this option to save them and exit the BIOS
menus.

➔ **Discard Changes and Exit**

If configuration changes are complete but do need to be saved, select this option to exit
the BIOS menus.

➔ **Discard Changes**

If configuration changes are complete but do need to be saved but BIOS still needs to be
run , select this option.

➔ **Load Optimal Defaults**

This option loads optimal default values for each of the parameters on the Setup menus.

F9 key can be used for this operation.

➔ **Load Failsafe Defaults**

This option loads failsafe default values for each of the parameters on the Setup menus.

F8 key can be used for this operation.

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Chapter

6

Software Drivers

6.1 Available Software Drivers

![NOTE icon] **NOTE:**

> The contents of the CD may vary throughout the life cycle of the product and is subject to change without prior notice. Visit the IEI website or contact technical support for the latest updates.

The NANO-8522 board has five software drivers:

- Chipset
- Audio
- LAN
- VGA
- SATA

All five drivers can be found on the CD that came with the NANO-8522. To install the drivers please follow the instructions in the sections below

6.2 Chipset Driver Installation

To install the chipset driver, please follow the steps below:

Step 1: Insert the CD into the system that contains the NANO-8522 board. Open the **Chipset/852GM** directory and locate the icon for the **Setup** installation file. Once located, use the mouse to double click the icon.

Step 2: The "InstallShield Wizard Preparation Screen" in **Figure 6-1** appears.
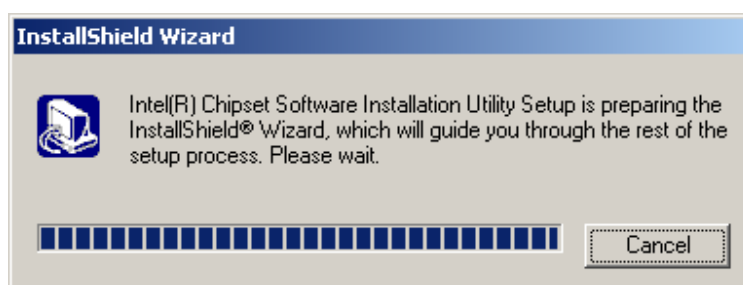
Figure 6-1: InstallShield Wizard Preparation Screen

Step 3:   The "Welcome" window in **Figure 6-2** appears next.
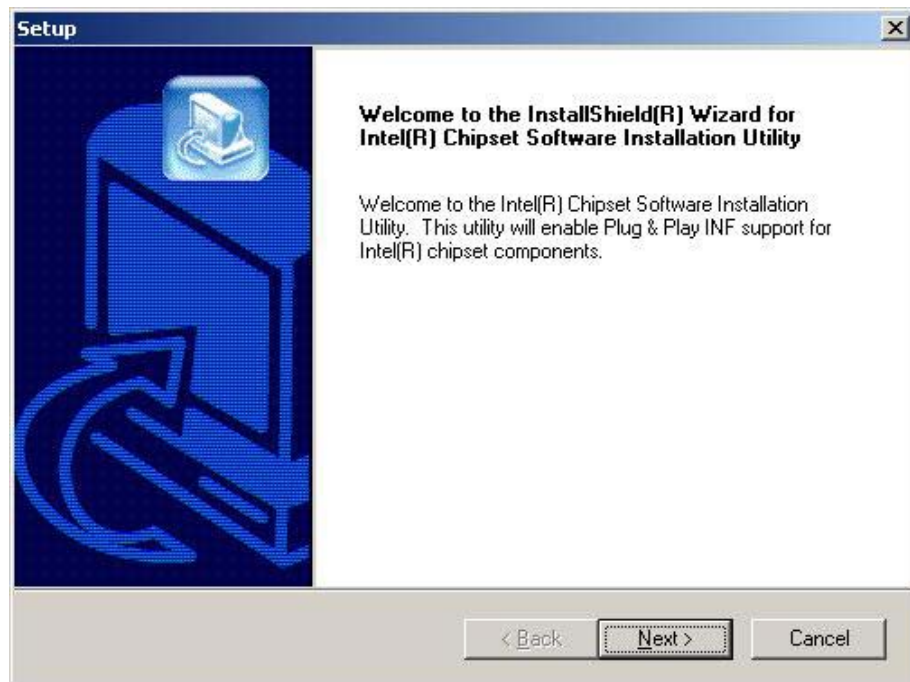
Figure 6-2: Welcome Screen

Step 4:   Click "**Next**" and the license agreement shown in **Figure 6-3** appears.
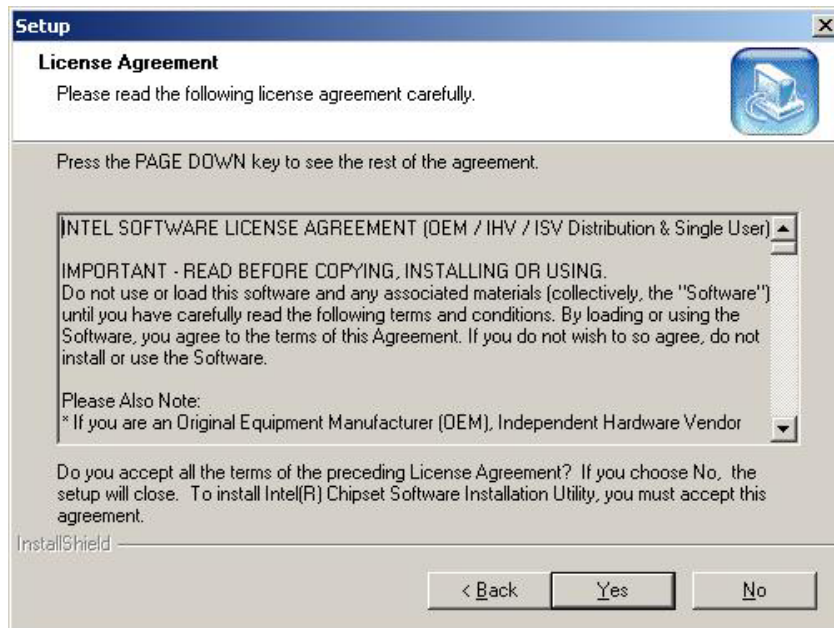
Figure 6-3: License Agreement

Step 5: Agree to the license terms by clicking "**Yes**". The "**Readme**" in **Figure 6-4**

appears.
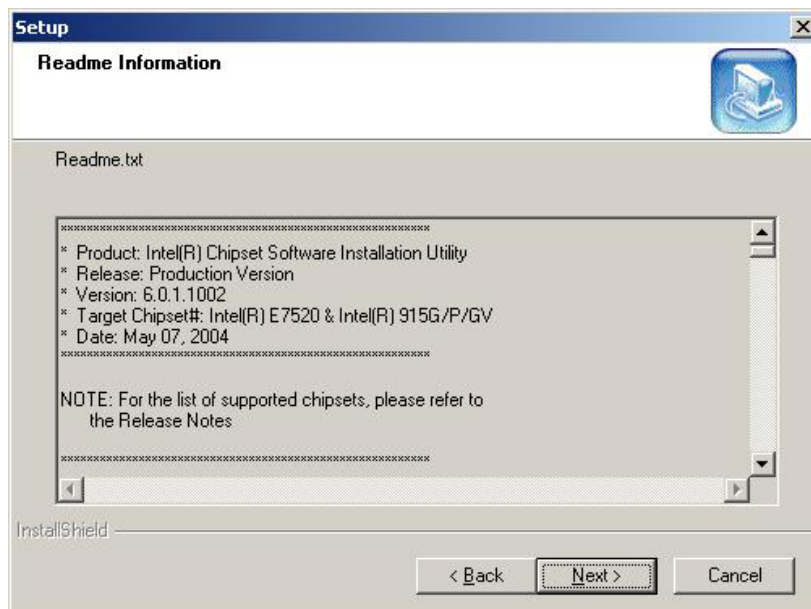
Figure 6-4: Readme Information

Step 6:	Click "**Yes**". The driver is installed on the computer. After the installation is complete, the installation complete screen shown in **Figure 6-5** appears. Select the preferred option and click "**Finish**" to complete the installation process.
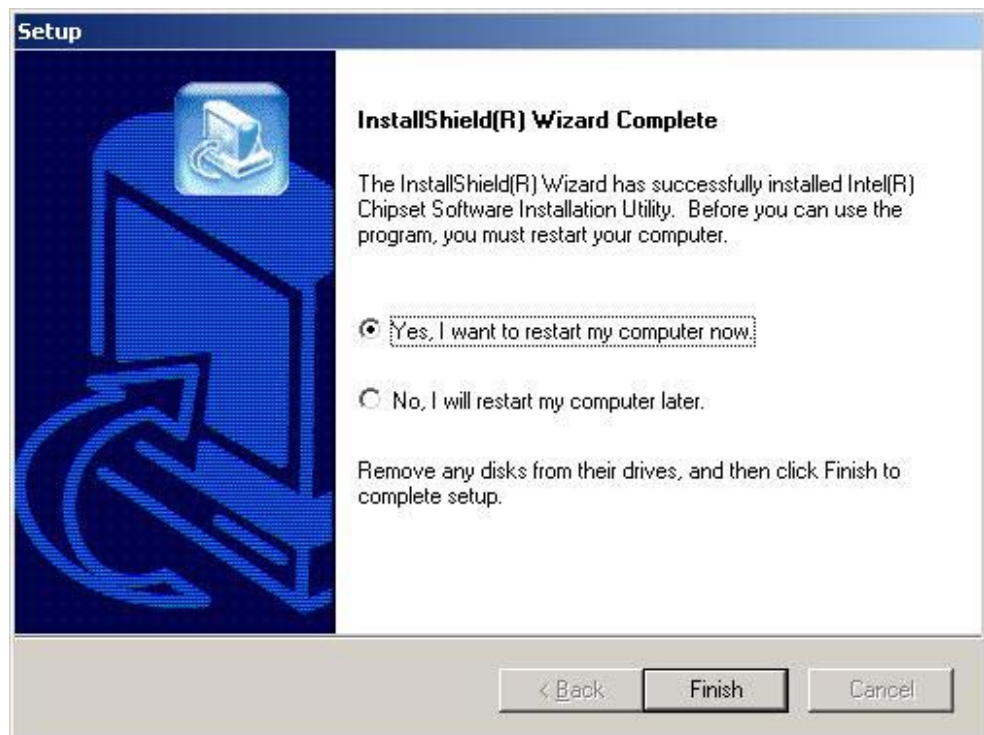
Figure 6-5: Restart the Computer

6.3   RealTek Audio Driver Installation

To install the RealTek AC'97 Audio driver, please follow the steps below:

Step 1:	Insert the CD into the system that contains the NANO-8522 board. Open the CD folder and locate the **AUDIO DRIVER A3.79** directory. Open the directory and look for icon for the **setup.exe** installation file. Once located, use the mouse to double click the icon.

Step 2:	Once double clicking the **Setup** icon, the install shield wizard for the audio driver starts. See **Figure 6-6.**
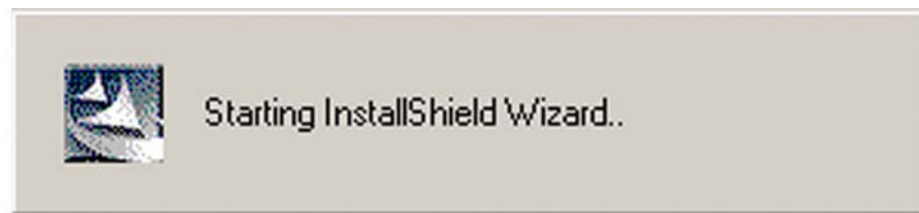
Figure 6-6: Audio Driver Install Shield Wizard Starting

Step 3: The RealTek Audio Setup prepares the install shield to guide through the rest of the setup process. See **Figure 6-7**.
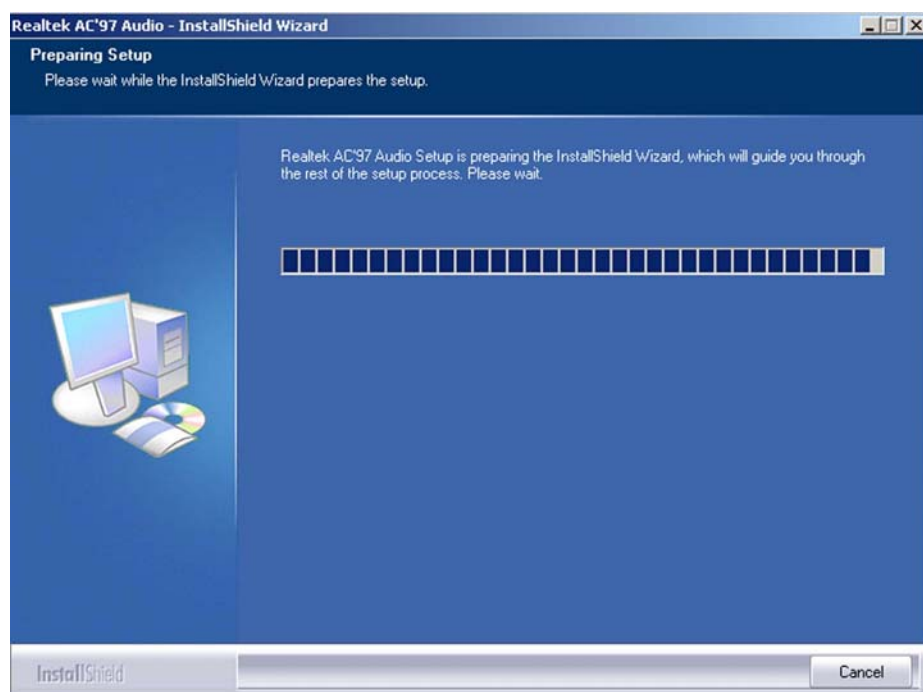
Figure 6-7: Audio Driver Setup Preparation

Step 4: After install shield is prepared, the welcome screen shown in **Figure 6-8** appears. To continue the installation process, click the "**Next**" button. The install shield starts to configure the new software as shown in **Figure 6-9**.
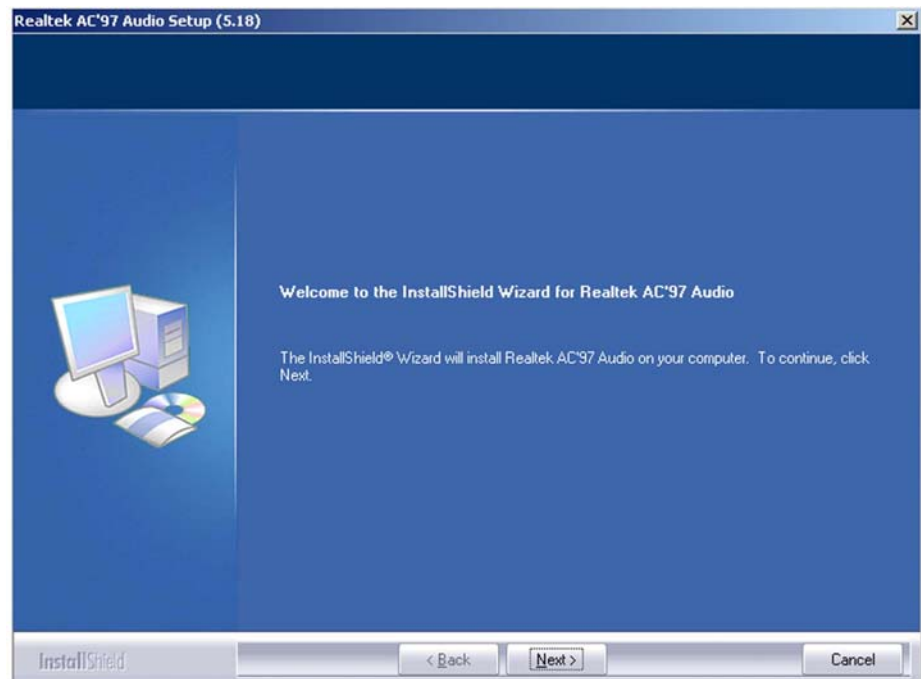
Figure 6-8: Audio Driver Welcome Screen
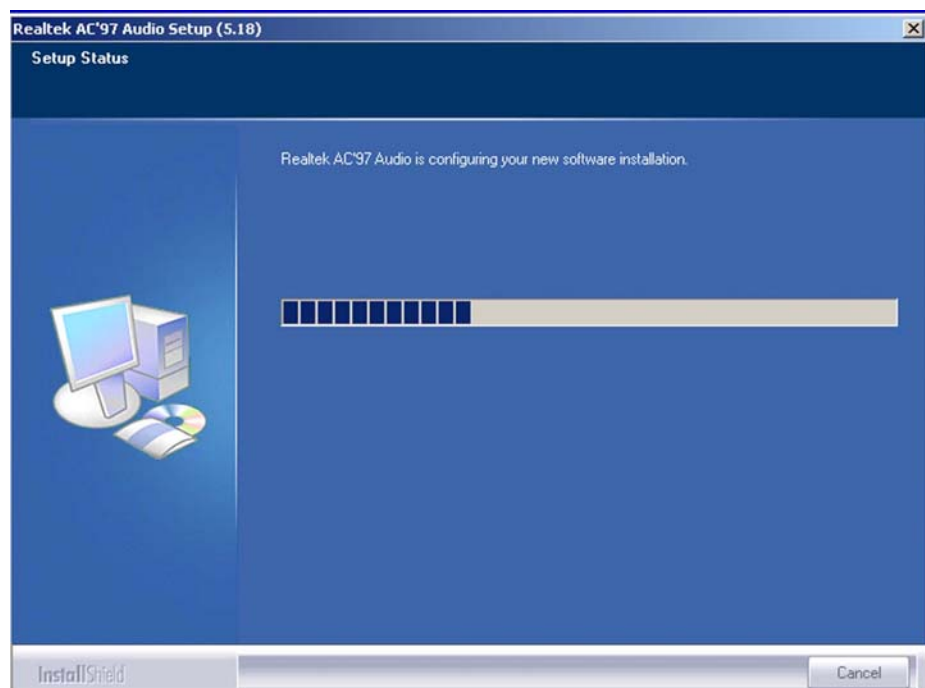
Figure 6-9: Audio Driver Software Configuration

Step 5: At this stage the "**Digital Signal Not Found**" screen shown in **Figure 6-10**

appears. To continue the installation process, click the "**Yes**" button. The

installation notice shown below appears.

Figure 6-10: Audio Driver Digital Signal

Step 6: At this stage the clicking the "**Yes**" button in **Figure 6-10** appears, the installation

of the driver begins. See **Figure 6-11**.
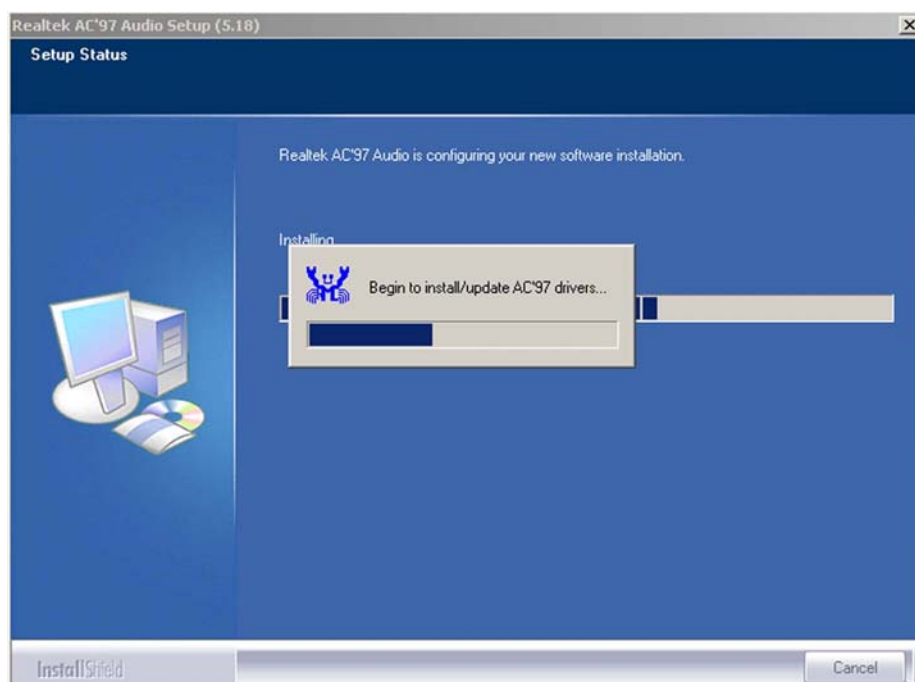
Figure 6-11: Audio Driver Installation Begins

Step 7: After the driver installation process is complete, a confirmation screen shown in

Figure 6-12 appears
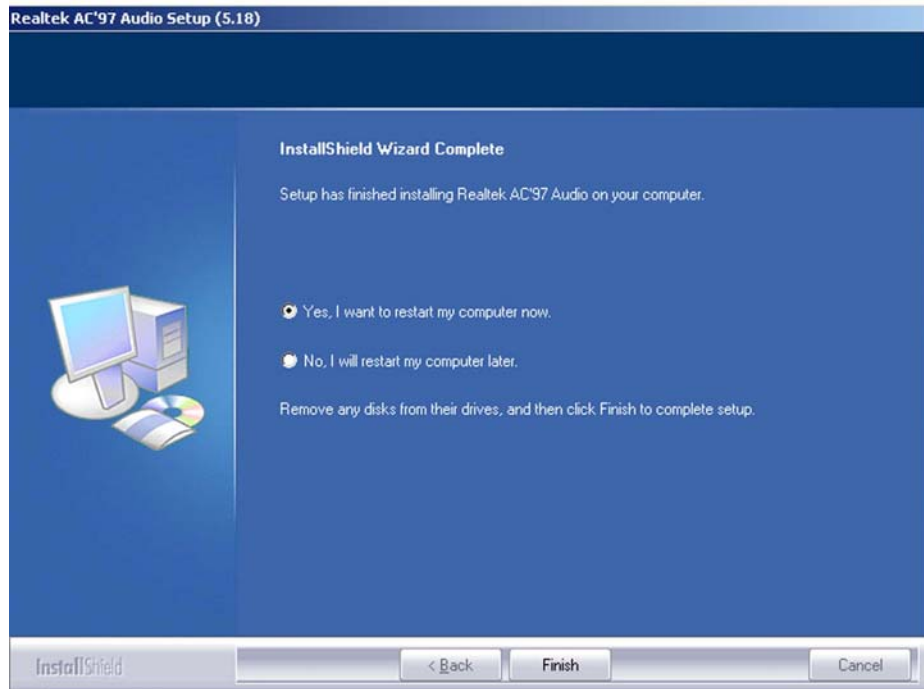
Figure 6-12: Audio Driver Installation Complete

Step 8: The confirmation screen shown in **Figure 6-12** allows user to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once decided when to restart the computer, click the "**Finish**" button.

6.4 Intel Graphics Media Accelerator Driver

To install the GMA driver, please follow the steps below:

Step 1: Insert the CD into the system that contains the NANO-8522. Open the CD folder and locate the icon for the **Setup** installation file. Once located, use the mouse to double click the icon.

Step 2: Once double clicking the Setup icon, a Welcome screen shown in **Figure 6-13** appears.
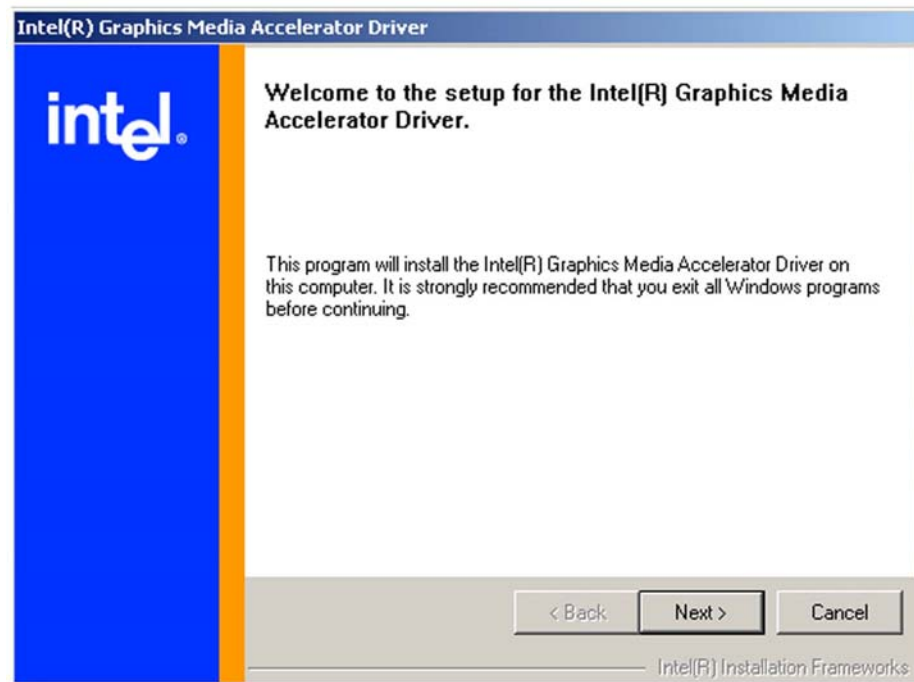
Figure 6-13: GMA Driver Installation Welcome Screen

To continue installing click "**Next**" and a license agreement shown in **Figure 6-14** appears. Read through the license agreement.
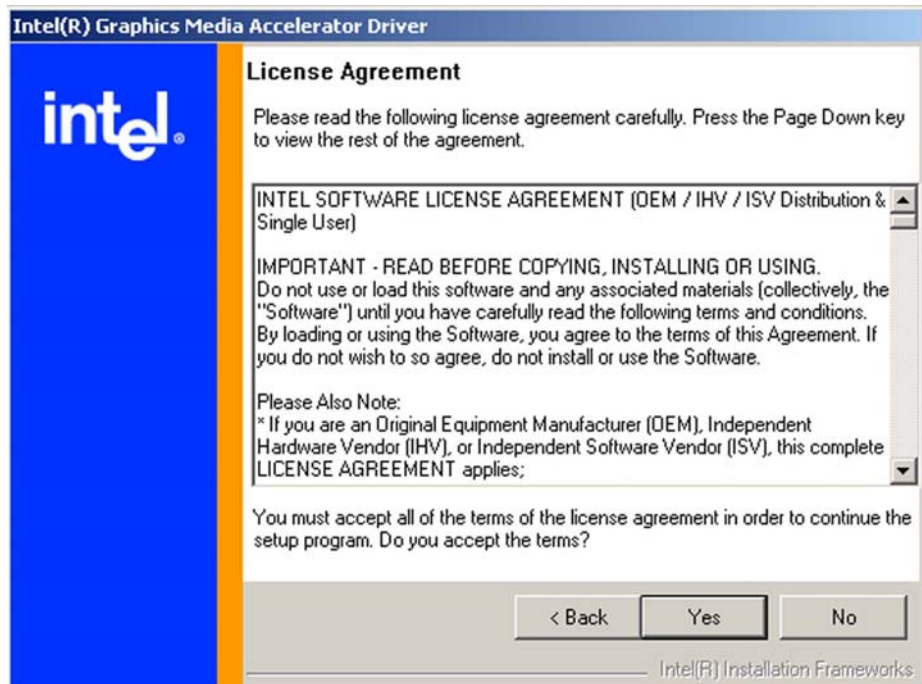
Figure 6-14: GMA Driver License Agreement

Accept the terms and conditions stipulated in the license agreement by clicking

the "**Yes**" button (**Figure 6-14**). The installation notice shown in **Figure 6-15**

appears.

Figure 6-15: GMA Driver Installing Notice

After the driver installation process is complete, a confirmation screen shown in

Figure 6-16 appears.
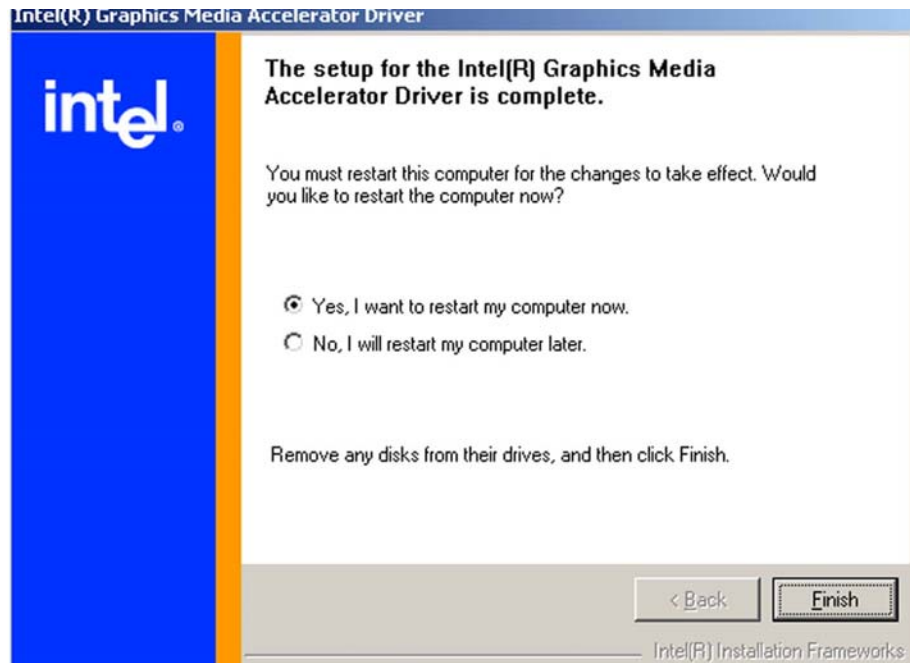
Figure 6-16: GMA Driver Installation Complete

Step 6: The confirmation screen shown in **Figure 6-16** allows user to restart the computer immediately after the installation is complete or to restart the computer later. For the settings to take effect the computer must be restarted. Once decided when to restart the computer, click the "**Finish**" button.

6.5   LAN Driver Installation

To install the LAN driver, please follow the steps below:

Step 1: Insert the CD into the system that contains the NANO-8522. Open the **LAN** directory and locate the icon for the relevant **Setup** installation file. Once located, use the mouse to double click the icon.

Step 2: Once double clicked the Setup icon, a LAN License Agreement screen shown in **Figure 6-17** appears.

Figure 6-17: LAN License Agreement

Accept the License Agreement by clicking "**Next**." The follow-up window

prompts for the directory the driver is stored in. (See **Figure 6-18**)

Figure 6-18: Select the Driver Directory

Step 4: After selecting the directory the driver is installed in, click "**Next**." The screen in

Figure 6-19 appears.
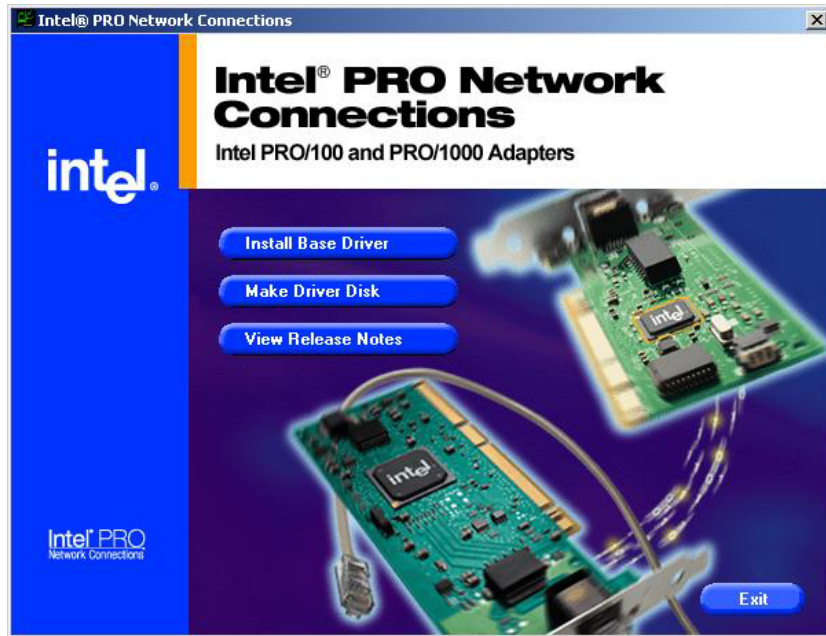
Figure 6-19: LAN Driver Configuration

Step 5: In Figure 6-19, there are three options.

- Install Base Driver → Installs the base driver
- Make Driver Disk → Copies the driver to disk
- View Release Notes → Opens word document of the release notes

6.6   SATA - ALi RAID Driver Installation

CAUTION!

Because of the inherent limitations by Intel's ICH4 chipset, the ALi M5283 SATA and RAID controller is implemented as a device that requires device driver during the Windows installation process. To successfully install the device driver, please carefully read the following instructions.

The ALi driver is especially required if SATA drives are the only hard disk drives in the NANO-8522 system. Otherwise, the Windows installation program may fail to locate the hard drives whether configuring the SATA disk drives into RAID volumes or using them as individual disk drives.

The system BIOS can identify SATA disk drives, but cannot control their operation. The separately installed driver therefore is necessary.

6.6.1 Installation Steps During Windows XP Installation

Step 1:   Enable SATA ROM using the BIOS configuration utility. The process has been detailed in Appendix E.

Step 2:   Locate the ALi installation driver folder within the Utility CD that came with the motherboard.

Step 3:   Copy files under a sub-directory named "SATA50XX" (taking Windows XP installation as the example) to the root directory of floppy diskette (labeled driver diskette). The file names are listed below:

- disk1
- 5283096D.bin
- txtsetup.oem

Also copy the OS option directory "win98_me", "win_nt", or "win_xp", and related driver files in each directory.

Step 4: Boot from Windows installation CD-ROM (set CD-ROM as the 1st Boot Device), when the Windows XP Setup blue screen appears and prompts users to Press F6. Please press the F6 key, if third-party SCSI or RAID driver installation is needed.

Step 5: The setup program continues, later when the setup program prompts users to specify additional adapters, please press the **S** key.

Step 6: The setup program prompts user to insert the driver diskette. Please insert the driver diskette, and press **ENTER** to continue.

Step 7: The follow-up window lists out the installation choices, please select **ALi SATA/RAID Controller** for Windows XP and press **ENTER** to continue.

Step 8: The follow-up window lists out the devices to be installed, in which selected ALi controller(s) should be included.

Step 9: Repeat step 5, but select **ALi ATA/RAID Controller** at step 7. If both controllers are installed, go to next step.

Step 10: If users want to install other devices, please operate at this time. If all devices have been successfully installed, please go to next step.

Step 11: Press **ENTER** to continue Windows XP setup.

6.6.2 Installation Steps under Existing Windows XP

After Windows XP is started, Windows system automatically finds the newly installed adapter and prompts user to install its driver. Please follow these steps to install the driver:

Step 1: When the Found New Hardware Wizard windows appear (Mass Storage Controller), select Install from a list or specify location (Advanced) and click **Next** to continue.

Step 2: In the follow-up window, please select "**Don't search, I will choose the driver to install**", then click **Next** to continue.

Step 3: In the follow-up window, please select SCSI and RAID controllers, and then click

Next to continue.

Step 4: In the follow-up window, click **Have Disk**, then insert the driver diskette and type in the driver location: e.g., a CD-ROM, then click OK to continue.

Step 5: In the follow-up window, select **ALi SATA/RAID Controller**, then click **Next** to continue.

Step 6: Confirm the follow-up windows and click the **Finish** button to continue.

Step 7: Please "**confirm**" the Digital Signature Not Found window when it appears, when finished, please restart the computer.

Step 8: Repeat step 1, but select **ALi ATA/RAID Controller** at step 4.

Appendix

A

BIOS Configuration Options

A.1 BIOS Configuration Options

Below is a list of BIOS configuration options described in *Chapter 5*.

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Appendix

B

Watchdog Timer

NOTE:

> The following discussion applies to DOS environment.   It is recommended to contact IEI support or visit our website for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

A BIOS function call (INT 15H) is used to control the Watchdog Timer:

INT 15H:

AH – 6FH Sub-function:	
AL – 2:	Sets the Watchdog Timer's period.
BL:	Time-out value (Its unit-second is dependent on the item "Watchdog Timer unit select" in CMOS setup).

Table B-1: AH-6FH Sub-function

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. While the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the Watchdog timer is disabled if the time-out value is set to zero.

A tolerance of at least 10% must be maintained to avoid unknown routines within the operating system (DOS), such as disk I/O that can be very time-consuming.

![NOTE icon] **NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

Example program:

; **INITIAL TIMER PERIOD COUNTER**
;
W_LOOP:

```
        MOV     AX, 6F02H          ;setting the time-out value
        MOV     BL, 30             ;time-out value is 48 seconds
        INT     15H
 ;
```
; **ADD YOUR APPLICATION PROGRAM HERE**
;
```
        CMP     EXIT_AP, 1         ;is your application over?
        JNE     W_LOOP         ;No, restart your application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H
;
```
; **EXIT ;**

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Appendix

C

Address Mapping

C.1 IO Address Map

I/O address Range	Description
000-01F	DMA Controller
020-021	Interrupt Controller
040-043	System time
060-06F	Keyboard Controller
070-07F	System CMOS/Real time Clock
080-09F	DMA Controller
0A0-0A1	Interrupt Controller
0C0-0DF	DMA Controller
0F0-0FF	Numeric data processor
1F0-1F7	Primary IDE Channel
2E8-2EF	Serial Port 4 (COM4)
2F8-2FF	Serial Port 2 (COM2)
378-37F	Parallel Printer Port 1 (LPT1)
3B0-3BB	Intel(R) 82852 Graphics Controller
3C0-3DF	Intel(R) 82852 Graphics Controller
3E8-3EF	Serial Port 3 (COM3)
3F6-3F6	Primary IDE Channel
3F7-3F7	Standard floppy disk controller
3F8-3FF	Serial Port 1 (COM1)

Table C-1: IO Address Map

C.2 1st MB Memory Address Map

Memory address	Description
00000-9FFFF	System memory
A0000-BFFFF	VGA buffer
F0000-FFFFF	System BIOS
1000000-	Extend BIOS

Table C-2: 1st MB Memory Address Map

IEI® Technology, Corp.

C.3 IRQ Mapping Table

IRQ0	System Timer	IRQ8	RTC clock
IRQ1	Keyboard	IRQ9	ACPI
IRQ2	Available	IRQ10	COM4
IRQ3	COM2	IRQ11	COM3
IRQ4	COM1	IRQ12	PS/2 mouse
IRQ5	Audio Codec	IRQ13	FPU
IRQ6	FDC	IRQ14	Primary IDE
IRQ7	Available	IRQ15	Secondary IDE

Table C-3: IRQ Mapping Table

C.4 DMA Channel Assignments

Channel	Function
0	Available
1	Available
2	Floppy disk (8-bit transfer)
3	Available
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

Table C-4: DMA Channel Assignments

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Appendix

D

External AC'97 Audio
CODEC

D.1 Introduction

The NANO-8522 board comes with an onboard Realtek ALC655 CODEC. Realtek ALC655 is a 16-bit, full duplex AC'97 Rev. 2.3 compatible audio CODECwith a sampling rate of 48KHz.

D.1.1 Accessing the AC '97 CODEC

The CODEC is accessed through one 16-pin header including:

1. A LINE input shared with surround output
2. A MIC input shared with Center and LFE output
3. A LINE output
4. A MIC input line.

D.1.2 Driver Installation

The driver installation has been described in **Chapter 6**, **Section 6.3**.

After rebooting the sound effect configuration utility appears in the Windows Control Panel (see **Figure 6-20**). If the peripheral speakers are properly connected, sound effects should be heard.
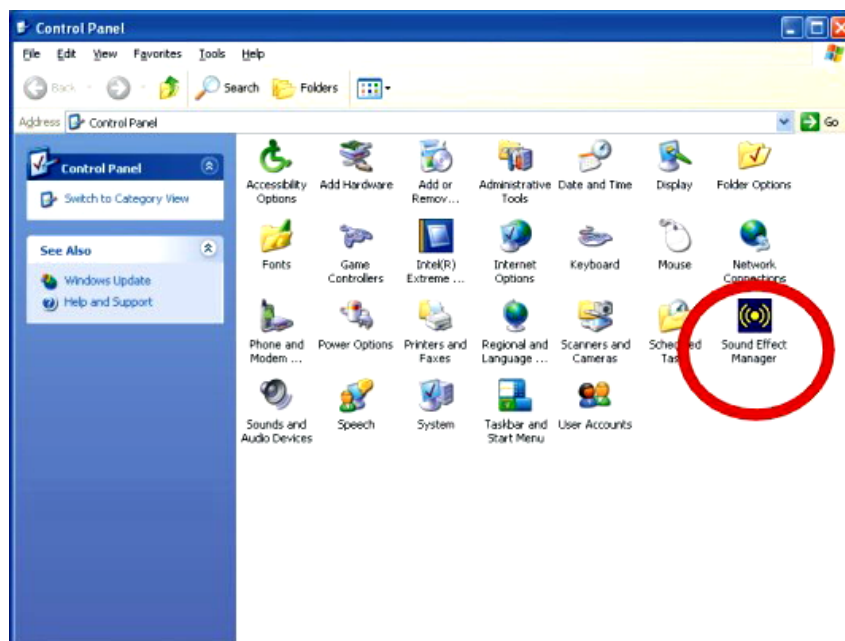
Figure 6-20: Sound Effect Manager con

D.2 Sound Effect Configuration

D.2.1 Accessing the Sound Effects Manager

To access the **Sound Effects Manager**, please do the following:

Step 9: Install the audio CODEC driver.

Step 10: Click either:

- The **Sound Effect Manager** icon in the **Notification Area** of the system task bar (see **Figure 6-21**), or

- The **Sound Effect Manager** icon in the Control Panel (**Figure 6-22**).
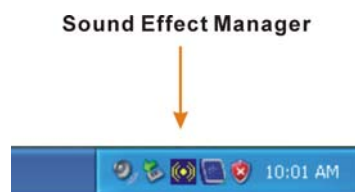
Figure 6-21:   Sound Effect Manager Icon [Task Bar]
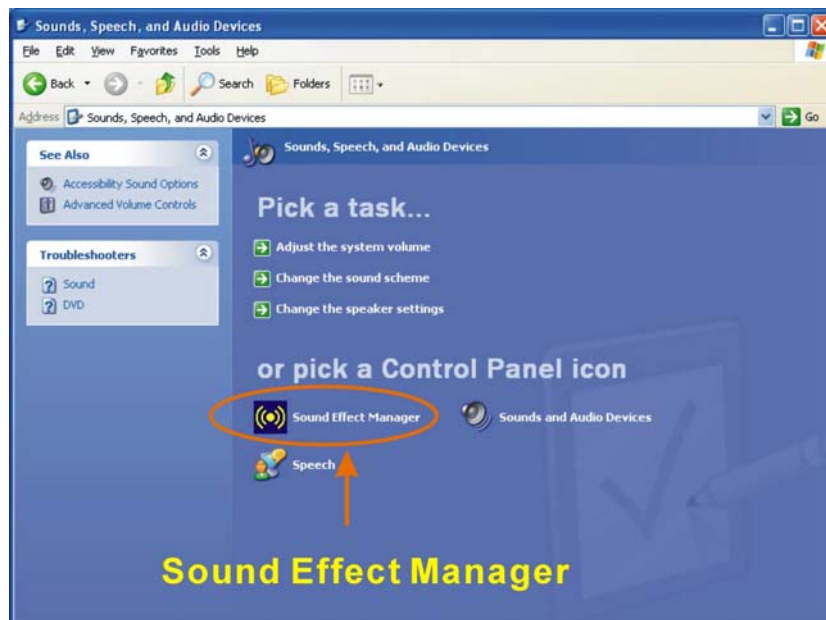
Figure 6-22: Sound Effect Manager Icon [Control Panel]

Step 11: The sound effect manager appears. (See **Figure 6-23**)
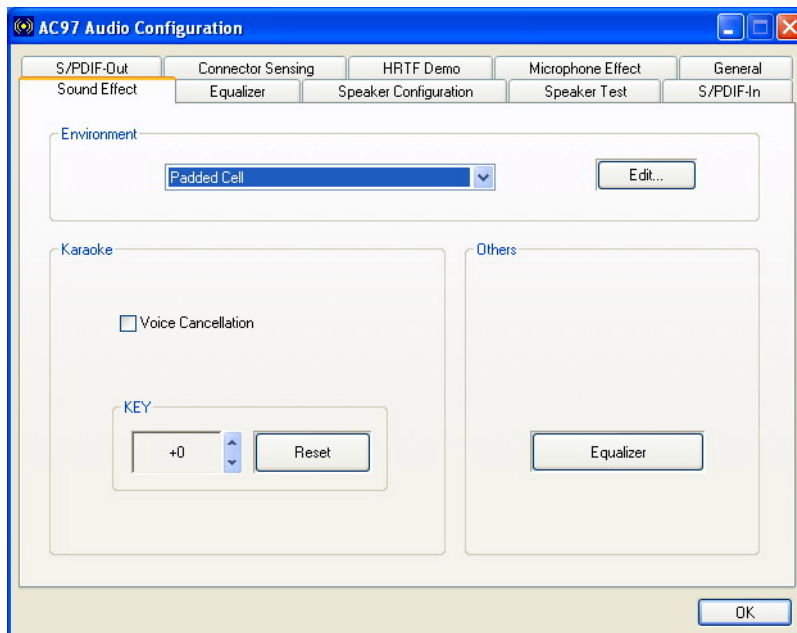
Figure 6-23: Sound Effects Manager (ALC655)

![NOTE icon] **NOTE:**

The Sound Effect Manager shown in **Figure 6-23** is for the RealTek ALC655 audio CODEC. Different CODECs may have different sound manager appearances.

The following section describes the different configuration options in the Sound Effect Manager.

D.2.2　Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** in **Figure 6-23**.

![NOTE icon] **NOTE:**

> The **Karaoke Mode** is configured in the **Sound Effect** menu. To access Karaoke configuration settings, click on the **Sound Effect** menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

![NOTE icon] **NOTE:**

> Not all RealTek **Sound Effect Managers** have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- *Sound Effect*:- Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. To edit

the sound effect click "**EDIT**."

- *Karaoke Mode*:- The **Karaoke Mode** is accessed in the Sound Effect window. The **Voice Cancellation** disables the vocal part of the music being played. The **Key adjustment** up or down arrow icons enables users to define a key that fits a certain vocal range.

- *Equalizer Selection*:- Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.

- *Speaker Configuration*:- Multi-channel speaker settings are configured in this menu. Configurable options include:
  o Headphone
  o Channel mode for stereo speaker output
  o Channel mode for 4 speaker output
  o Channel mode for 5.1 speaker output
  o Synchronize the phonejack switch with speakers settings

- *Speaker Test*:- Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.

- *S/PDIF-In & S/PDIF-Out*:- These functions are currently not supported.

- *Connector Sensing*:- Realtek ALC655 detects if an audio device is plugged into the wrong connector. If an incorrect device is plugged in a warning message appears.

- *HRTF Demo*:- Adjust HRTF (Head Related Transfer Functions) 3D positional audio here before running 3D applications.

- *Microphone Effect*:- Microphone noise suppression is enabled in this menu.

- *General*:- General information about the installed AC'97 audio configuration utility is listed here.

Appendix

E

ALi® RAID for SATA

E.1   Introduction

The ALi M5283 is a highly integrated disk drive controller that is capable of managing Parallel-ATA and Serial-ATA interface hard disk drives. The ALi controller supports PATA UDMA transfer mode up to mode 6 and SATA 1.0 disk drives. The ALi M5283 also comes with cost-effective RAID functionality that can be used to increase data read/write speed and to provide protection to data by distributing mirrored duplicates of data onto two disk drives (RAID1).

⚠️ **CAUTION!**

The associated BIOS settings must be properly configured before the Ctlr+A key combination can take effect. Refer to **Chapter 5 AMI BIOS Setup** for more details. SATA disk drive support must be initiated under the following two BIOS sub-menus.

Boot -> Onboard SATA ROM

Chipset -> Southbridge Chipset Configuration

The ALi configuration utility cannot be accessed unless the SATA disk drive support has been initiated in the AMI BIOS configuration utility.

⚠️ **CAUTION!**

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

E.1.1   Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

![WARNING icon] **WARNING!**

Irrecoverable data loss will occur if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

![CAUTION icon] **CAUTION!**

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

E.2   Features and Benefits

- Supports RAID levels 0, 1, and JBOD
- Supports connectivity to two disk drives
- Supported Operating Systems include: Windows 98/Me, Windows 2000, and Windows XP
- Windows-based software for RAID management

E.3   Accessing the ALi RAID Utility

If the SATA ROM configuration options in system BIOS have been properly configured, the RAID BIOS version and disk drive information should appear after the system POST screen.

The BIOS disk drive information should look like the following:

ALi RAID BIOS V1.XX

(c) ALi Corporation 2005, All Rights Reserved.

Identifying IDE drives…

Channel 1 Master: Maxtor xxxxxx

Channel 2 Master: Maxtor xxxxxx

Press Ctrl-A to enter ALi RAID BIOS setup utility

Press **CTRL** and **A** keys simultaneously to enter the RAID configuration utility.

E.4   RAID BIOS Setup Utility

The Serial ATA RAID volume can be configured using the RAID Configuration utility stored within the ALi RAID controller ROM. The BIOS configuration screen is divided into three major areas: Main Menu, Drive Menu, and a list for the configured RAID arrays.

```
RAID BIOS Setup Utility (c) 2003 ALi Corporation   www.ali.com.tw

Create RAID 0 Striping for Performance
Create RAID 1 Mirroring for Reliability Select
Create JBOD for integrated Capacity
Stripe Size                                      SPACE : Select
Delete RAID Setting & Partition         64K      ↑↓    : Moving Cursor
Delete All RAID Setting & Partition              ENTER : Select & Finish
Rebuild RAID Array                               ESC   : Exit
Select Boot Drive


               Drive Model       Mode        Capacity   RAID Array/Type

   Channel 1 Master: WDC WD360GD-00F   SATA1      37019MB
   Channel 2 Master: Maxtor 6Y200M0    SATA1     203928MB




               Capacity          RAID Type    Stripe Size   RAID Name
   RAID Array A    :
   RAID Array B    :
   RAID Array C    :
```

E.5   RAID Options:

E.5.1   Create RAID0 Striping for Performance

WARNING!

All data previously stored on the member drives of a RAID configuration **will be destroyed** during the RAID initialization process. If "used" drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1:   Use the arrow keys to highlight **Create RAID0 Striping for Performance** and press **ENTER**. A flashing 'S' appears at the **Drive Menu** where the member drives to be included in the RAID0 array can be chosen.

Step 2:   Use the space bar to select members of the RAID0 RAID configuration. The flashing cursor changes to a lower case 's' once any of the connected disk drives has been selected. Follow the same method to select another member drive.

Step 3:   The **Create RAID0(Y/N)** confirm box appears. Press **Y**.

Step 4:   Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array.

Step 5:   Once an array is successfully created, it will be seen in the list of configured arrays.

NOTE:

1. To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. Parallel-ATA drives connected on the same IDE channel cannot be selected as the members of a RAID0 array. Avoid mixing Parallel-ATA and Serial-ATA disk drives in a RAID0 array.

2. Always use disk drives of the same capacity to create a RAID array. The excessive capacity of a larger disk drive cannot be utilized because data stripes are equally distributed across all members of a RAID array.
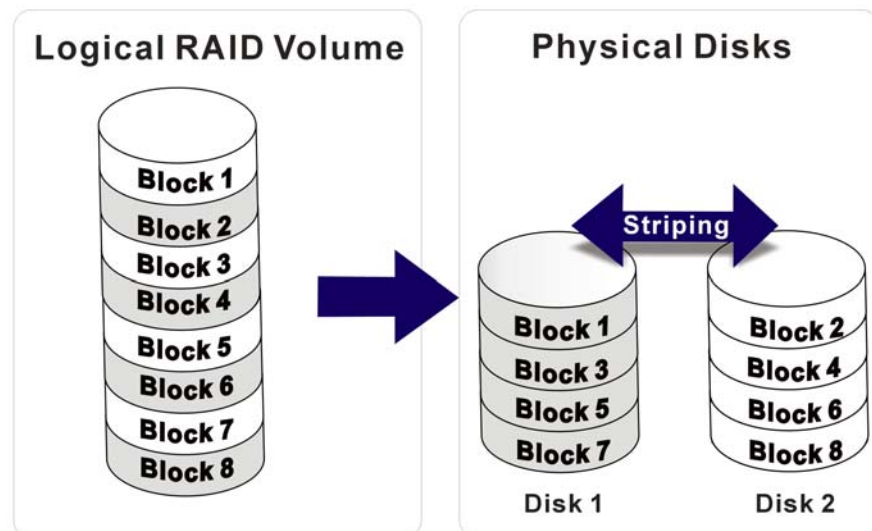
E.5.2   Create RAID1 Mirroring for Reliability

WARNING!

All data previously stored on the member drives of a RAID configuration **will be destroyed** during the RAID initialization process. If "used" drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1:   Use the arrow keys to highlight **Create RAID1 Striping for Performance** and

press **ENTER**. A flashing 'M' appears at the **Drive Menu** where the member drives to be included in the RAID1 array can be chosen.

Step 2: Use the space bar to select members of the RAID1 RAID configuration. The flashing cursor changes to a lower case 'm' once any of the connected disk drives has been selected. Follow the same method to select another member drive.

Step 3: The **Create RAID1(Y/N)** confirm box appears. Press **Y**.

Step 4: Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array.

Step 5: Once an array is successfully created, it will be seen in the list of configured arrays.

Step 6: A prompt will appear to proceed with drive copy. The **Source** and **Destination** drives will be indicated as "M" and "m" in the **Drive Menu**.

NOTE:

1. To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. Parallel-ATA drives connected on the same IDE channel cannot be selected as the members of a RAID1 array. Avoid mixing Parallel-ATA and Serial-ATA disk drives in a RAID1 array.

2. Always use disk drives of the same capacity to create a RAID array. The excessive capacity of a larger disk drive cannot be utilized because data stripes are equally distributed across all members of a RAID array.
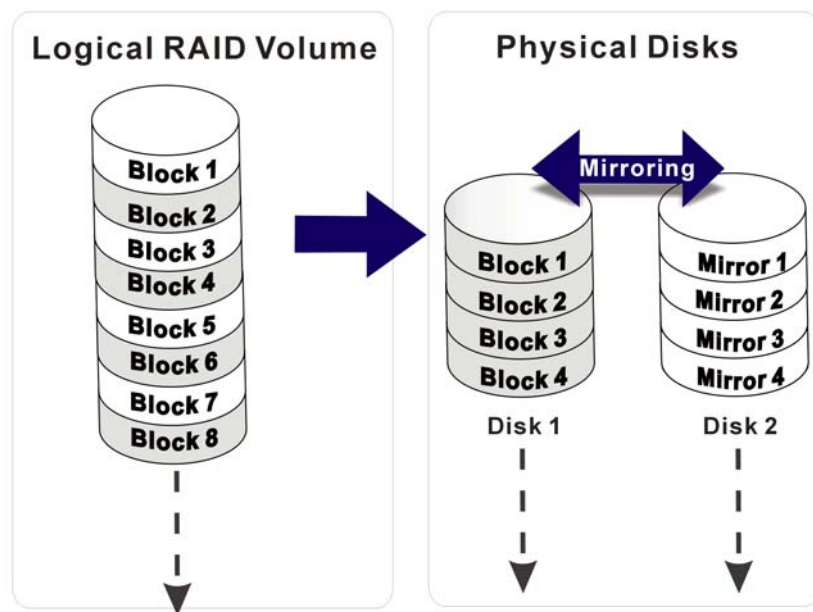
E.5.3 Create JBOD for Integrated Capacity

JBOD is defined as "Just a Bunch of Drives." JBOD provides neither performance gains nor data redundancy.

WARNING!

All data previously stored on the member drives of a RAID configuration **will be destroyed** during the RAID initialization process. If "used" drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: Use the arrow keys to highlight **Create JBOD for Integrated Capacity** and press **ENTER**. A flashing 'J' appears at the **Drive Menu** where the member drives to be included in the JBOD can be chosen.

Step 2: Use the space bar to select members of the JBOD configuration. The flashing cursor changes to a lower case 'j' once any of the connected disk drives has been selected. Follow the same method to select another member drive. The maximum number of member drives in a JBOD is four and the minimum is two.

Step 3: The **Create RAID1(Y/N)** confirm box appears. Press **Y**.

Step 4: Enter a nickname for the created array. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array.

Step 5: Once an array is successfully created, it will be seen in the list of configured arrays.

NOTE:

To reduce the chance of losing data, ALi imposes certain limitations on the RAID configuration options. Parallel-ATA drives connected on the same IDE channel cannot be selected as the members of a RAID1 array. Avoid mixing Parallel-ATA and Serial-ATA disk drives in a RAID1 array.

E.5.4   Stripe Size

The change to stripe size effects RAID0 arrays. Configurable options are:

- 64K (default)

- 32K
- 16K
- 8K
- 4K

Select a small stripe size if the I/Os to the hard drives are small and randomly occurred. Choose a larger stripe size if the I/Os are mostly large and come in sequential orders, e.g., A/V playback and editing applications. The default value should be appropriate for most applications.

E.5.5 Delete RAID Setting & Partition

> ⚠ **WARNING!**
>
> If a RAID configuration is deleted, all data previously stored on the member drives of the RAID configuration will also be deleted.

Step 1: Use the arrow keys to highlight **Delete RAID Setting & Partition** and press **ENTER**. A flashing 'E' appears at the **Drive Menu** where the member drives to be removed can be chosen.

Step 2: The **Data on RAID drives will be erased (Y/N)** confirm box appears. Press **Y**.

E.5.6 Delete All RAID Setting & Partition

> ⚠ **WARNING!**
>
> If a RAID configuration is deleted, all data previously stored on the member drives of the RAID configuration will also be deleted.

Step 1: Use the arrow keys to highlight **Delete All RAID Setting & Partition** and press **ENTER**.

Step 2: The **Data on RAID drives will be erased (Y/N)** confirm box appears. Press **Y**.

E.5.7   Rebuild RAID Array

The **Rebuild RAID Array** option can rebuild a RAID array if a member of a RAID configuration should fail. Neither RAID0 nor JBOD provides data redundancy. The **Rebuild RAID Array** option only applies to RAID1 arrays and is applicable when a member of a RAID1 configuration has failed.

Step 1:   Use the arrow keys to highlight **Rebuild RAID Array** and press **ENTER**. A

flashing 'R' appears at the list of existing arrays. The source and destination

drives will be displayed.

Step 2:   Press **Y** to begin the rebuild process.

⚠️ **NOTE:**

A status bar will indicate the rebuild progress. Rebuild consumes considerable system resources and the time required for rebuilding a RAID array may vary depending on the size of stored data, disk drive capacity, and drive performance.

E.5.8   Select Boot Drive

Step 1:   Use the arrow keys to highlight **Select Boot Drive** and press **ENTER**. A flashing

'A' appears at the **Drive Menu** where the boot drive can be chosen.

Step 2:   Press **ENTER** or the space bar to finish the configuration.

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Appendix

F

Digital I/O Port Programming Guide

One characteristic of digital circuit is its fast response to high or low signal.   This kind of response is highly needed for harsh and critical industrial operating environment.   That is the reason for designing 4-bit digital inputs and 4-bit digital outputs on the NANO-8522.

Digital Input and Output, generally, are control signals. Use these signals to control external devices that needs On/Off circuit or TTL devices. Read or write data to the selected address to enable the function of digital IO.

NOTE:

This function is applied by Winbond W83627HF chipset, if partners have further questions about it, please refer to the original datasheets or contact with our customer service department.

W83627HF pin	DIO pin	W83627HF pin	DIO pin
GP10	IN0	GP14	OUT0
GP11	IN1	GP15	OUT1
GP12	IN2	GP16	OUT2
GP13	IN3	GP17	OUT3

A BIOS function call (INT 15H) is used to control Watchdog Timer:

INT 15H:

AH − 6FH
Sub-function:
AL − 8: Set the Digital port is INPUT
AL   : Digital I/O input value

Example program:

```
MOV     AX, 6F08H              ;setting the Digital port is input
INT     15H                    ;
```

AL low byte = value

AH – 6FH
Sub-function: **AL – 9**: Set the Digital port is OUTPUT   **BL**   : Digital I/O output value

Example program:

```
MOV     AX, 6F09H              ;setting the Digital port is output
MOV     BL, 09H                         ;Digital value is 09H
INT      15H                   ;
```

Digital Output is 1001b

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