IEi

IEI Technology Corp.

MODEL:

ICE-945GSE

COM Express Module (Type 2)
Intel® ATOM™ CPU
RoHS Compliant

User Manual

RoHS Lead Free

Rev. 1.00 – 11 March, 2009

Revision

Date	Version	Changes
11 March, 2009	1.01	Updated product name
08 December, 2008	1.00	Initial release

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Packing List

> **NOTE:**
>
> If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the ICE-945GSE from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw

The items listed below should all be included in the ICE-945GSE package.

- 1 x ICE-945GSE
- 1 x Heatspreader
- 1 x Utility CD
- 1 x QIG (quick installation guide)

Images of the above items are shown in **Chapter 3**.

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Chapter

1

Introduction

1.1 Overview

Figure 1–1: ICE-945GSE

The ICE-945GSE COM Express module provides the main processing chips and is connected to a compatible COM Express carrier board. The ICE-945GSE is equipped with an 1.6 GHz Intel® ATOM™ N270 CPU, Intel® 945GSE Northbridge and Intel® ICH7M Southbridge and provides multiple modern serial I/O options, while offering limited support for legacy I/Os. The COM Express standard allows the COM Express carrier board to be designed, while leaving the choice of processor till the later stages of design. The ICE-945GSE provides a low power option with the full range of modern I/O options. The ICE-945GSE embedded module is designed for flexible integration by system developers into customized platform devices.

1.2 Applications

The ICE-945GSE is designed to a COM Express carrier board for being embedded in customized baseboards for flexible applications.

1.3 Benefits

Some of the ICE-945GSE embedded platform benefits include:

- ▪ Low power, high performance

- ▪ Easy integration into customized baseboards

- ▪ Easy upgrading

- ▪ Easy maintenance

- ▪ Easy design compatibility

- ▪ Low cost product development

1.4 Features

Some of the ICE-945GSE features are listed below:

- ▪ Complies with COM Express form factor

- ▪ Complies with RoHS

- ▪ Embedded 1.6 GHz Intel® ATOM™ N270 CPU

- ▪ Supports up to 2 GB of 400 MHz or 533 MHz of DDR2 memory

- ▪ Comes with two high performance gigabit Ethernet (GbE) controller

- ▪ Support for four USB 2.0 devices

- ▪ Support for one IDE device and one compact flash module

1.5 Overview Picture

An overview of the ICE-945GSE embedded module can be seen in **Figure 1-2** and **Figure 1-3**.
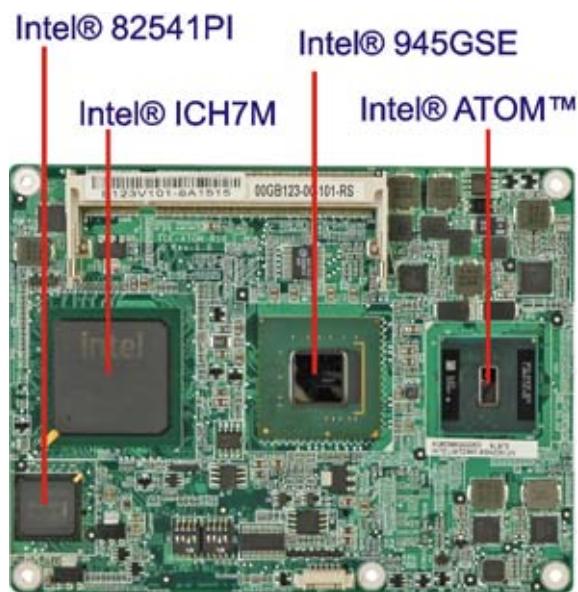
Figure 1-2: ICE-945GSE Overview (Front Side)
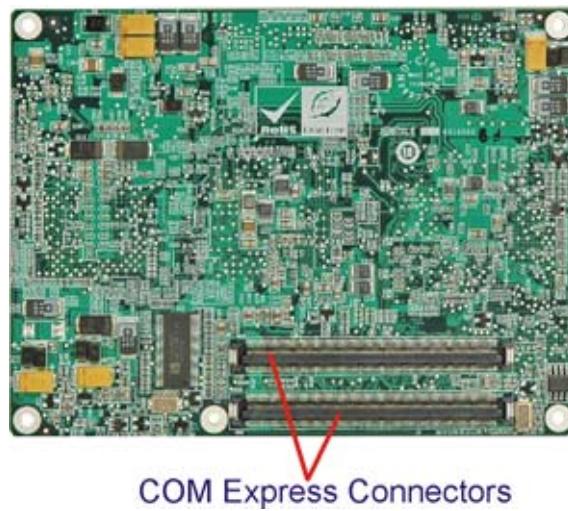
Figure 1-3: ICE-945GSE Overview (Reverse Side)

1.5.1 Connectors

The ICE-945GSE has the following interface connectors on-board:

- 2 x COM Express connectors (AB and CD)
- 1 x SO-DIMM socket

1.5.2 IO Interface Support

The ICE-945GSE embedded module supports the following IO interfaces on the baseboard:

- 8 x USB 2.0
- 1 x SDVO
- 4 x PCIe x1
- 4 x PCI
- 2 x SATA
- 1 x IDE
- 1 x GbE
- HD Audio (through HD audio chip on the baseboard, connected to HD audio interface on the ICE-945GSE)
- Legacy ports (COM, LPT, BIOS, PS/2) through super I/O on the baseboard connected to the LPC interface on the ICE-945GSE.

1.5.3 Technical Specifications

ICE-945GSE technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in the detailed specifications chapter.

Specification	Value
CPUs Supported	1.6 GHz Intel® ATOM™ N270
System Chipset	Intel® 945GSE Intel® ICH7M
Ethernet	Intel® 82541PI GbE
Memory	One DDR2 400/533 MHz SO-DIMM up to 2.0 GB
Graphics	VGA HDTV Dual-channel 18-bit LVDS SDVO

Specification	Value
I/O Interfaces	8 x USB 2 .0 2 x SATA 1 x IDE 1 x GbE
Expansion	4 x PCIe x1 4 x PCI (32-bit, 33 MHz)
BIOS	AMI
Power Support	AT/ATX power supported
Power Consumption	12 V @ 0.95 A
Watchdog Timer	Software programmable supports 1~255 sec. system reset
Physical Dimensions	125 mm x 95 mm
Weight	GW: 700 g NW: 250 g
Operating Temperature	Minimum: 0°C (32°F) Maximum: 60°C (140°F)

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Dimensions

The dimensions of the board are listed below:

- **Length**:   125 mm
- **Width**:   95 mm

2.1.1 Main Dimensions

The figure below shows the dimensions from the top view.
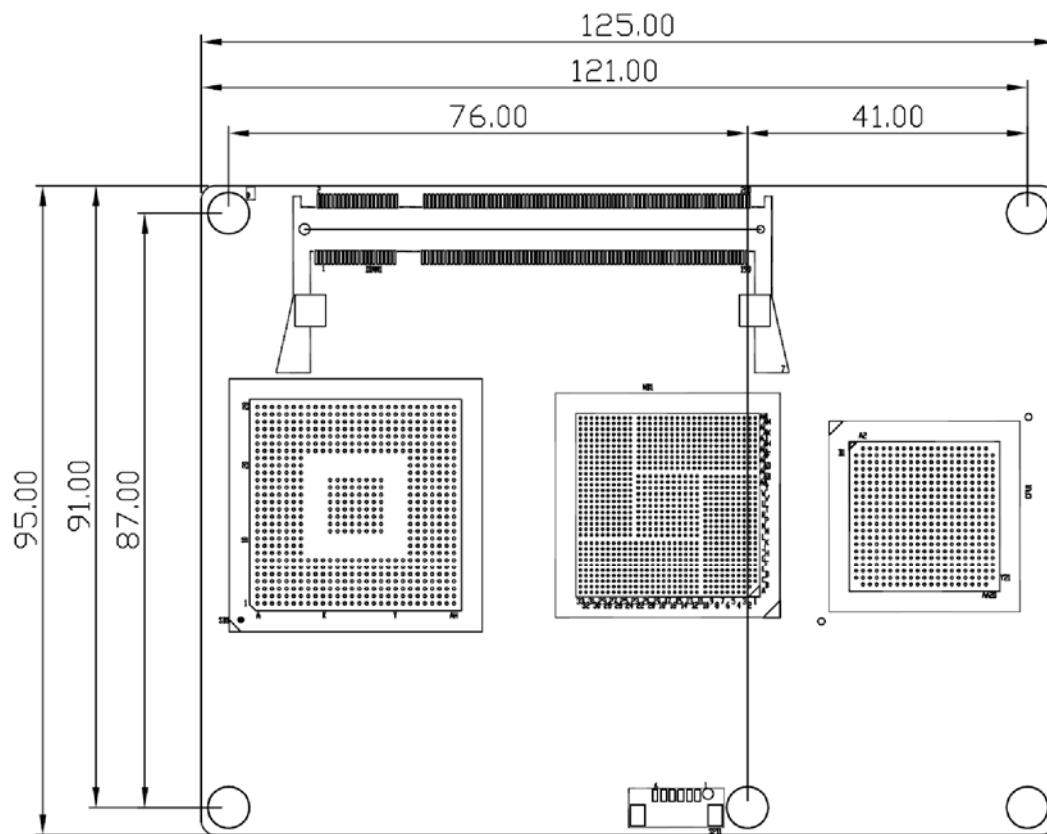
Figure 2-1: Main Dimensions (mm)

2.1.2 Side Dimensions

The figure below shows the dimensions as viewed from the side.
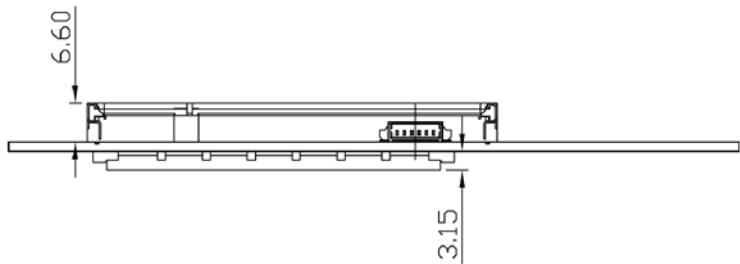
Figure 2-2: Side Dimensions (mm)

2.2 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the motherboard and described in the following sections of this chapter.
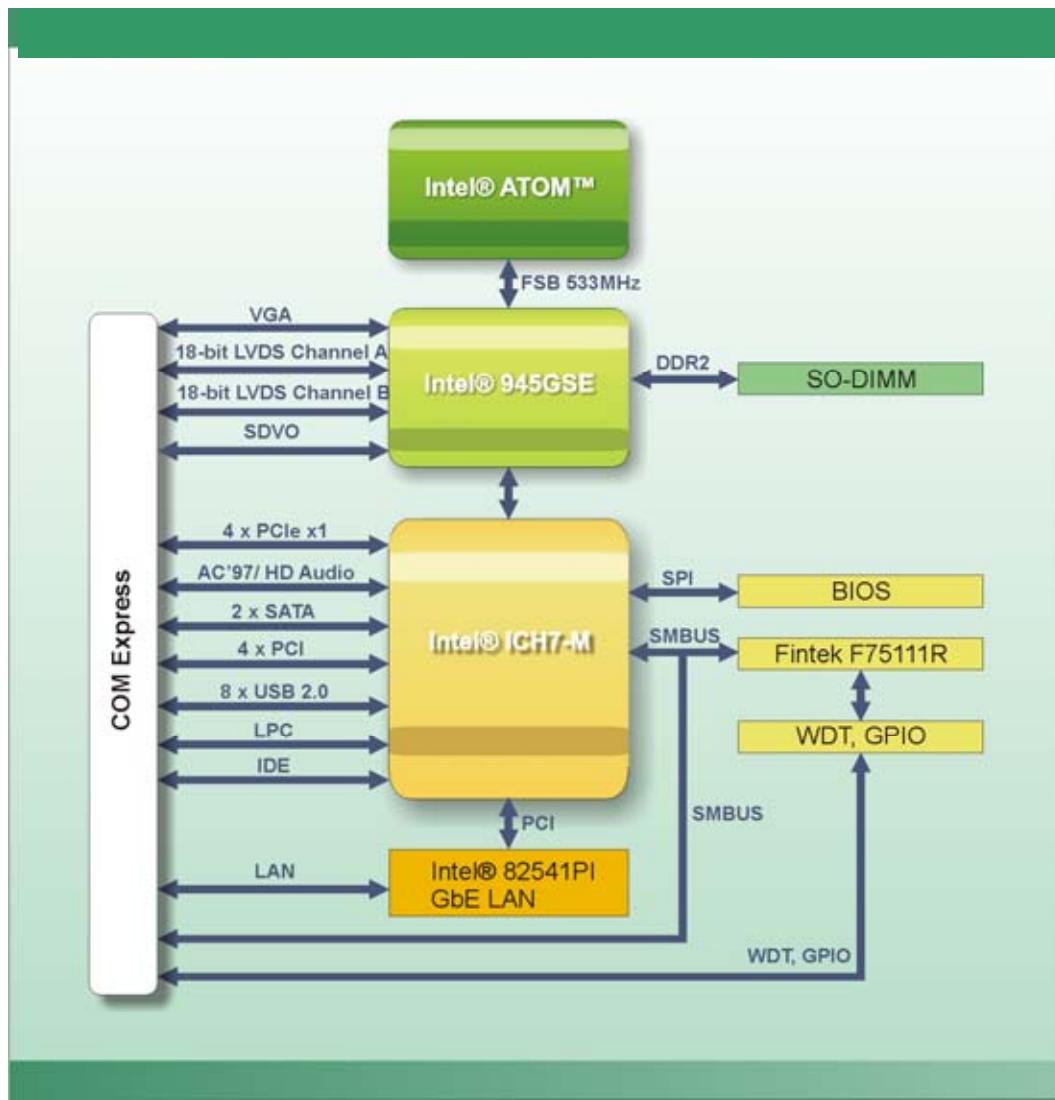
Figure 2-3: Data Flow Block Diagram

2.3 Embedded 1.6 GHz Intel® ATOM™ N270 Processor

The ICE-945GSE comes with an embedded 45 nm 1.6 GHz Intel® ATOM™ N270 processor. The processor connects to the Intel® 945GSE Northbridge through the FSB. The processor is shown in **Figure 2-4** below.
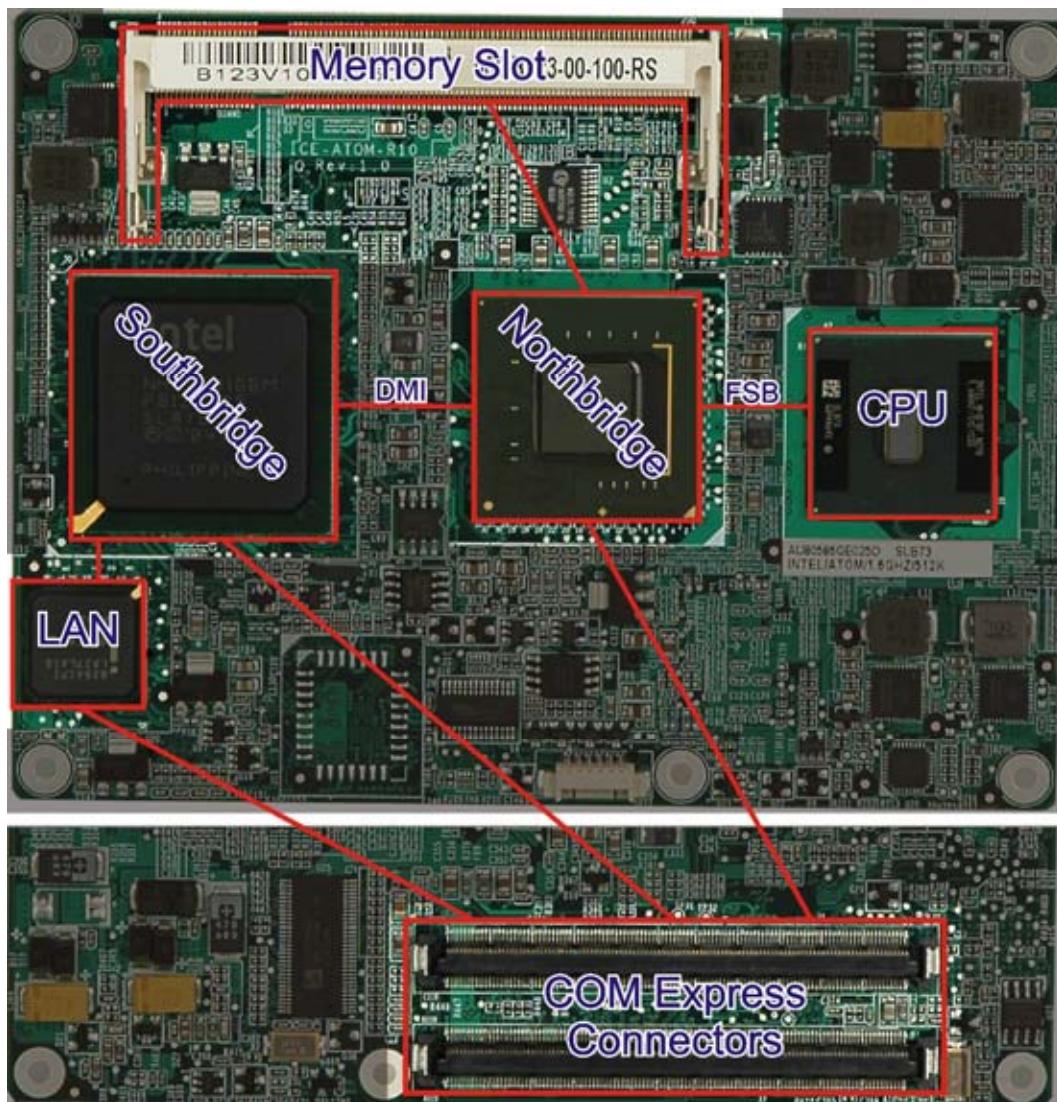
Figure 2-4: Connections

Some of the features of the 1.6 GHz Intel® ATOM™ N270 are listed below

- On-die, primary 32-kB instructions cache and 24-kB write-back data cache
- 400/533 MHz source-synchronous front side bus (FSB)
- 2-Threads support
- On-die 512-kB, 8-way L2 cache
- Support for IA 32-bit architecture
- Intel® Streaming SIMD Extensions-2 and -3 (Intel® SSE2 and Intel® SSE3) support and Supplemental Streaming SIMD Extension 3 (SSSE3) support
- Micro-FCBGA8 packaging technologies

- Thermal management support via Intel® Thermal Monitor 1 and Intel Thermal Monitor 2
- FSB Lane Reversal for flexible routing
- Supports C0/C1(e)/C2(e)/C4(e)
- L2 Dynamic Cache Sizing
- Advanced power management features including Enhanced Intel SpeedStep® Technology
- Execute Disable Bit support for enhanced security

2.4 Intel® 945GSE Northbridge Chip

The Intel® 945GSE is connected to the 1.6 GHz Intel® ATOM™ N270 CPU through the FSB and to the Intel® ICH7M Southbridge through the DMI. The Intel® 945GSE is connected to the SO-DIMM and supports DDR2 memory. The Intel® 945GSE also provides graphics capabilities (described elsewhere). The Intel® 945GSE and its connections are shown in **Figure 2-4**.

2.4.1 DDR2 Controller

There is one 200-pin DDR2 SO-DIMM socket on the ICE-945GSE. The socket supports DDR2 SO-DIMM with the following specifications:

- Maximum Memory supported 2 GB
- Support for DDR2 at 400 MHz and 533 MHz
- No support for Dual-Channel Interleaved mode of operation
- Enhanced Addressing support (Swap only)

The SO-DIMM socket is shown in **Figure 2-4**.

2.4.2 Graphics

The Intel® 945GSE Northbridge chipset has an Intel® Gen. 3.5 integrated graphics engine that supports the following display devices through connectors on the carrier board:

- Analog CRT
- LVDS
- TV-Out

- SDVO ports

The graphics are interfaced to the carrier board through the COM Express connectors shown in **Figure 2-4**.

2.4.2.1 Analog CRT (VGA)

The Intel® 945GSE internal graphics engine, with an integrated 400 MHz RAMDAC and hot plug CRT support, supports analog CRT monitors up to QXGA.

2.4.2.2 LVDS

The Intel® 945GSE internal graphics engine supports LVDS displays with the following features:

- Up to UXGA monitors with a maximum resolution of 1600 x 1200
- 18-bit 25 MHz to 112 MHz single-channel or dual-channel LVDS screens
- CPIS 1.5 compliant LVDS screens

2.4.2.3 TV Out

The Intel® 945GSE internal graphics engine has the following TV output features:

- Three integrated 10-bit DACs
- Overscaling
- NTSC and PAL formats supported
- Supports RCA or S-VIDEO connectivity
- Supports HDTV with the following resolutions:
  - o 480p
  - o 720p
  - o 1080i
  - o 1080p

2.4.2.4 SDVO

The SDVO can be connected to an external chip to enable various graphics outputs. The Intel® 945GSE internal graphics engine has the following SDVO output features:

- Concurrent operation of PCIe x1 with SDVO

- One SDVO ports supported

  o SDVO is muxed onto the PCIe pins

  o DVI 1.0 support for external digital monitor

  o Only Downstream HDCP support

  o Supports TV and DVD formats

  o Display hot plug support

2.5 Intel® ICH7M Southbridge Chipset

The Intel® ICH7M Southbridge chipset is connected to the Intel® 945GSE Northbridge through the chip-to-chip Direct Media Interface (DMI). The Intel® ICH7M provides the I/O capabilities to the system.

All the connections on the Intel® ICH7M are wired through the COM Express connectors to connectors on the carrier board. Some of the features of the Intel® ICH7M are listed below. The connections from the Intel® ICH7M are shown in **Figure 2-4**.

- Complies with PCI Express Base Specification, Revision 1.0a
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33 MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  o Enhanced DMA controller
  o Interrupt controller
  o Timer functions
- Integrated SATA host controller with DMA operations interfaced to two SATA connectors on the ICE-945GSE
- Integrated IDE controller supports Ultra ATA 100/66/33
- Supports the four USB 2.0 devices on the ICE-945GSE with four UHCI controllers and one EHCI controller
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Audio Codec '97 (AC'97) Revision 2.3
- Supports Intel® High Definition Audio
- Contains Low Pin Count (LPC) interface
- Supports Firmware Hub (FWH) interface
- Serial peripheral interface support

2.5.1 HD Audio Controller

The HD audio controller can be connected to a AC'97 or HD Audio chip to add audio capabilities to the system. AC'97 audio provides 5.1 channel output. HD Audio provides 7.1 channel output. Both provide microphone and line input.

2.5.2 IDE Interface

The IDE interface can be connected to an IDE connector or to a CompactFlash® slot.

The integrated IDE interface is able to support the following IDE HDDs:

- **Ultra ATA/100**, with data transfer rates up to 100 MB/s
- **Ultra ATA/66**, with data transfer rates up to 66 MB/s
- **Ultra ATA/33**, with data transfer rates up to 33 MB/s

Specification	Ultra ATA/100	Ultra ATA/66	Ultra ATA/33
IDE devices	2	2	2
PIO Mode	0 – 4	0 – 4	0 – 4
PIO Max Transfer Rate	16.6 MB/s	16.6 MB/s	16.6 MB/s
DMA/UDMA designation	UDMA 5	UDMA 4	UDMA 2
DMA/UDMA Max Transfer	100 MB/s	66 MB/s	33 MB/s
Controller Interface	5 V	5 V	5 V

Table 2-1: Supported HDD Specifications

2.5.3 Low Pin Count (LPC) Interface

The Intel® ICH7M LPC interface complies with the LPC 1.1 specifications. The LPC bus from the Intel® ICH7M can be connected to the following devices:

- Super I/O chipset
- COM port chipset

2.5.4 PCI Bus

The PCI interface on the Intel® ICH7M is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

- PCI Revision 2.3 compliant
- 33 MHz
- 5 V tolerant PCI signals (except PME#)
- Integrated PCI arbiter supports up to seven PCI bus masters

2.5.5 PCIe Bus

The Intel® ICH7M Southbridge chipset has four PCIe lanes. These PCIe lanes are connected to PCIe x1 devices.

2.5.6 GbE Ethernet

The ICE-945GSE provides a Gigabit Ethernet connection through the Intel® 82541PI chip connected to the LAN connector on the Intel® ICH7M.

2.5.7 Real Time Clock

The real time clock in integrated in the Intel® ICH7M. The RTC operates on a 3 V battery and 32.768 KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.5.8 SATA Controller

The integrated SATA controller on the Southbridge supports up to two SATA drives with independent DMA operations.

SATA controller specifications are listed below.

- Supports two SATA drives
- Supports 1.5 Gb/s data transfer speeds
- Supports Serial ATA Specification, Revision 1.0a

2.5.9 SPI Bus

The Serial Peripheral Interface is a short distance serial bus for communication with other devices on the motherboard. The SPI interface from the board is interfaced to the items below:

- SPI BIOS.

2.5.10 USB Controller

Up to eight high-speed, full-speed or low-speed USB devices are supported by the Intel® ICH7M on the ICE-945GSE. High-speed USB 2.0, with data transfers of up to 480 MB/s, is enabled with the Intel® ICH7M integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the Intel® ICH7M integrated Universal Host Controller Interface (UHCI) controllers.

2.6 Environmental and Power Specifications

2.6.1 System Monitoring

The ICE-945GSE monitors the following temperatures:

- CPU temperature
- System temperature
- On-chip temperature

The ICE-945GSE monitors the following fan speeds:

- CPU (FAN1) speed
- System (FAN2) speed
- System (FAN3) speed

The ICE-945GSE monitors the following voltages:

- Vcore
- +12 V
- +3.30 V
- +5.00 V
- VBAT

The values for the above environmental parameters are all recorded in the BIOS Hardware Health Configuration menu.

2.6.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the ICE-945GSE are listed below.

- Minimum Operating Temperature: 0ºC (32°F)
- Maximum Operating Temperature: 60°C (140°F)

A cooling fan and 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.

2.6.3 Power Consumption

Table 2-2 shows the power consumption parameters for the ICE-945GSE running with a 1.6 GHz Intel® ATOM™ N270 with 2.0 GB DDR2 memory.

Voltage	Current
+12 V	0.95 A

Table 2-2: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the ICE-945GSE may result in permanent damage to the ICE-945GSE and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the ICE-945GSE. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the ICE-945GSE, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- *Wear an anti-static wristband*: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- *Self-grounding*: Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- *Use an anti-static pad*: When configuring the ICE-945GSE, place it on an antic-static pad. This reduces the possibility of ESD damaging the ICE-945GSE.
- *Only handle the edges of the PCB*: When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the ICE-945GSE is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the ICE-945GSE does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the ICE-945GSE from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

3.3.1 Package Contents

The ICE-945GSE is shipped with the following components:

Quantity	Item	Image
1	ICE-945GSE	
1	Heatspreader	
1	Quick Installation Guide	
1	Utility CD	

Table 3-1: Package List Contents

Chapter

4

Connectors

4.1 Peripheral Interface Connectors

Section 4.1.1 shows interface connector locations. **Section 4.1.2** lists all the interface connectors seen in **Section 4.1.1**.

4.1.1 ICE-945GSELayout

Figure 4-1 shows the on-board peripheral connectors, backplane peripheral connectors and on-board jumpers.
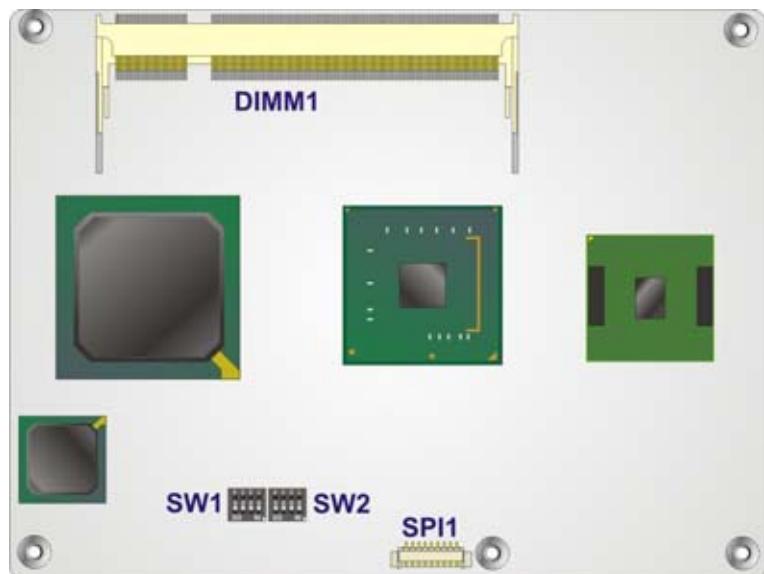
Figure 4-1: Connector and Jumper Locations (Front Side)
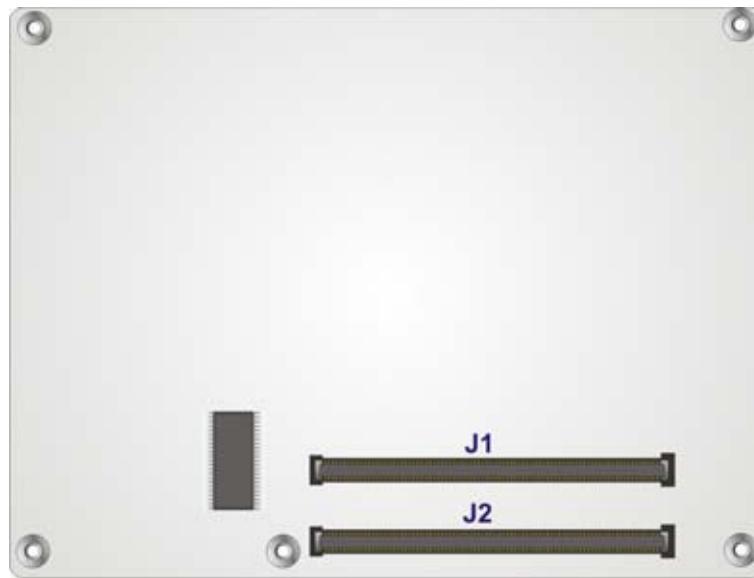
Figure 4-2: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the interface connectors on the ICE-945GSE Detailed descriptions of these connectors can be found in **Section 4.2**.

Connector	Type	Label
COM Express connector CD	COM Express connector	J1
COM Express connector AB	COM Express connector	J2
SO-DIMM socket	SO-DIMM socket	DIMM1
SPI programming connector	6-pin connector	SPI1

Table 4-1: ICE-945GSE Interface Connectors

4.2 ETX Interface Connectors

The ICE-945GSE embedded module has standard four standard ETX interface connectors on the reverse side of the board. The location of the pins and the pinout descriptions are given below.

4.2.1 COM Express Connector CD

CN Label:	J1
CN Type:	220-pin COM Express connector
CN Location:	See **Figure 4-3**
CN Pinouts:	See **Table 4-2**

The standard COM Express connector locations and pinouts are shown below.
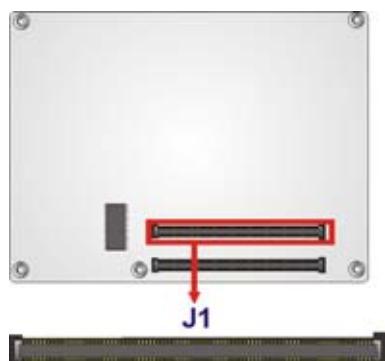
Figure 4-3: COM Express Connector CD Location

Pin No.	Description	Pin No.	Description
C1	GND	D1	GND
C2	IDE_D7	D2	IDE_D5
C3	IDE_D6	D3	IDE_D10
C4	IDE_D3	D4	IDE_D11
C5	IDE_D15	D5	IDE_D12
C6	IDE_D8	D6	IDE_D4
C7	IDE_D9	D7	IDE_D0
C8	IDE_D2	D8	IDE_REQ
C9	IDE_D13	D9	IDE_IOW#
C10	IDE_D1	D10	IDE_ACK#
C11	GND	D11	GND
C12	IDE_D14	D12	IDE_IRQ
C13	IDE_IORDY	D13	IDE_A0

Pin No.	Description	Pin No.	Description
C14	IDE_IOR#	D14	IDE_A1
C15	PCI_PME#	D15	IDE_A2
C16	PCI_GNT2#	D16	IDE_CS1#
C17	PCI_REQ2#	D17	IDE_CS3#
C18	PCI_GNT1#	D18	IDE_RESET#
C19	PCI_REQ1#	D19	PCI_GNT3#
C20	PCI_GNT0#	D20	PCI_REQ3#
C21	GND	D21	GND
C22	PCI_REQ0#	D22	PCI_AD1
C23	PCI_RESET#	D23	PCI_AD3
C24	PCI_AD0	D24	PCI_AD5
C25	PCI_AD2	D25	PCI_AD7
C26	PCI_AD4	D26	PCI_C/BE0#
C27	PCI_AD6	D27	PCI_AD9
C28	PCI_AD8	D28	PCI_AD11
C29	PCI_AD10	D29	PCI_AD13
C30	PCI_AD12	D30	PCI_AD15
C31	GND	D31	GND
C32	PCI_AD14	D32	PCI_PAR
C33	PCI_C/BE1#	D33	PCI_SERR#
C34	PCI_PERR#	D34	PCI_STOP#
C35	PCI_LOCK#	D35	PCI_TRDY#
C36	PCI_DEVSEL#	D36	PCI_FRAME#
C37	PCI_IRDY#	D37	PCI_AD16
C38	PCI_C/BE2#	D38	PCI_AD18
C39	PCI_AD17	D39	PCI_AD20
C40	PCI_AD19	D40	PCI_AD22
C41	GND	D41	GND
C42	PCI_AD21	D42	PCI_AD24
C43	PCI_AD23	D43	PCI_AD26
C44	PCI_C/BE3#	D44	PCI_AD28
C45	PCI_AD25	D45	PCI_AD30

Pin No.	Description	Pin No.	Description
C46	PCI_AD27	D46	PCI_IRQC#
C47	PCI_AD29	D47	PCI_IRQD#
C48	PCI_AD31	D48	PCI_CLKRUN#
C49	PCI_IRQA#	D49	PCI_M66EN
C50	PCI_IRQB#	D50	PCI_CLK
C51	GND	D51	GND
C52	PEG_RX0+	D52	PEG_TX0+
C53	PEG_RX0-	D53	PEG_TX0-
C54	TYPE0#	D54	PEG_LANE_RV#
C55	PEG_RX1+	D55	PEG_TX1+
C56	PEG_RX1-	D56	PEG_TX1-
C57	TYPE1#	D57	TYPE2#
C58	PEG_RX2+	D58	PEG_TX2+
C59	PEG_RX2-	D59	PEG_TX2-
C60	GND	D60	GND
C61	PEG_RX3+	D61	PEG_TX3+
C62	PEG_RX3-	D62	PEG_TX3-
C63	RSVD	D63	RSVD
C64	RSVD	D64	RSVD
C65	PEG_RX4+	D65	PEG_TX4+
C66	PEG_RX4-	D66	PEG_TX4-
C67	FAN_PWMOUT	D67	GND
C68	PEG_RX5+	D68	PEG_TX5+
C69	PEG_RX5-	D69	PEG_TX5-
C70	GND	D70	GND
C71	PEG_RX6+	D71	PEG_TX6+
C72	PEG_RX6-	D72	PEG_TX6-
C73	SDVO_DATA	D73	SVDO_CLK
C74	PEG_RX7+	D74	PEG_TX7+
C75	PEG_RX7-	D75	PEG_TX7-
C76	GND	D76	GND
C77	FAN_TACHOIN	D77	IDE_CBLID#

Pin No.	Description	Pin No.	Description
C78	PEG_RX8+	D78	PEG_TX8+
C79	PEG_RX8-	D79	PEG_TX8-
C80	GND	D80	GND
C81	PEG_RX9+	D81	PEG_TX9+
C82	PEG_RX9-	D82	PEG_TX9-
C83	RSVD	D83	RSVD
C84	GND	D84	GND
C85	PEG_RX10+	D85	PEG_TX10+
C86	PEG_RX10-	D86	PEG_TX10-
C87	GND	D87	GND
C88	PEG_RX11+	D88	PEG_TX11+
C89	PEG_RX11-	D89	PEG_TX11-
C90	GND	D90	GND
C91	PEG_RX12+	D91	PEG_TX12+
C92	PEG_RX12-	D92	PEG_TX12-
C93	GND	D93	GND
C94	PEG_RX13+	D94	PEG_TX13+
C95	PEG_RX13-	D95	PEG_TX13-
C96	GND	D96	GND
C97	RSVD	D97	PEG_ENABLE#
C98	PEG_RX14+	D98	PEG_TX14+
C99	PEG_RX14-	D99	PEG_TX14-
C100	GND	D100	GND
C101	PEG_RX15+	D101	PEG_TX15+
C102	PEG_RX15-	D102	PEG_TX15-
C103	GND	D103	GND
C104	+V12	D104	+V12
C105	+V12	D105	+V12
C106	+V12	D106	+V12
C107	+V12	D107	+V12
C108	+V12	D108	+V12
C109	+V12	D109	+V12

Pin No.	Description	Pin No.	Description
C110	GND	D110	GND

Table 4-2: COM Express Connector CD Pin Definitions

4.2.2 COM Express Connector AB

CN Label: J2

CN Type: 220-pin COM Express connector

CN Location: See **Figure 4-4**

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

The standard COM Express connector locations and pinouts are shown below.
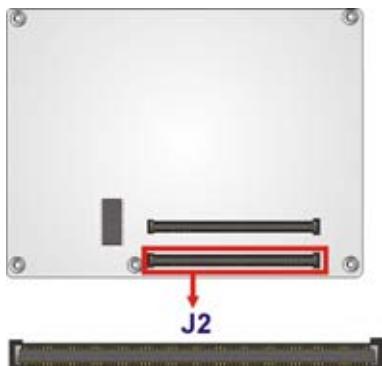
Figure 4-4: COM Express Connector AB Location

Pin No.	Description	Pin No.	Description
A1	GND	B1	GND
A2	GBE0_MDI3-	B2	GBE0_ACT#
A3	GBE0_MDI3+	B3	LPC_FRAME#
A4	GBE0_LINK100#	B4	LPC_AD0
A5	GBE0_LINK1000#	B5	LPC_AD1
A6	GBE0_MDI2-	B6	LPC_AD2
A7	GBE0_MDI2+	B7	LPC_AD3
A8	GBE0_LINK#	B8	LPC_DRQ0#
A9	GBE0_MDI1-	B9	LPC_DRQ1#

Pin No.	Description	Pin No.	Description
A10	GBE0_MDI1+	B10	LPC_CLK
A11	GND	B11	GND
A12	GBE0_MDI0-	B12	PWRBTN#
A13	GBE0_MDI0+	B13	SMB_CK
A14	GBE0_CTREF	B14	SMB_DAT
A15	SUS_S3#	B15	SMB_ALERT#
A16	SATA0_TX+	B16	SATA1_TX+
A17	SATA0_TX-	B17	SATA1_TX-
A18	SUS_S4#	B18	SUS_STAT#
A19	SATA0_RX+	B19	SATA1_RX+
A20	SATA0_RX-	B20	SATA1_RX-
A21	GND	B21	GND
A22	SATA2_TX+	B22	SATA3_TX+
A23	SATA2_TX-	B23	SATA3_TX-
A24	SUS_S5#	B24	PWR_OK
A25	SATA2_RX+	B25	SATA3_RX+
A26	SATA2_RX-	B26	SATA3_RX-
A27	BATLOW#	B27	WDT
A28	ATA_ACT#	B28	AC_SDIN2
A29	AC_SYNC	B29	AC_SDIN1
A30	AC_RST#	B30	AC_SDIN0
A31	GND	B31	GND
A32	AC_BITCLK	B32	SPKR
A33	AC_SDOUT	B33	I2C_CK
A34	BIOS_DISABLE#	B34	I2C_DAT
A35	THRMTRIP#	B35	THRM#
A36	USB6-	B36	USB7-
A37	USB6+	B37	USB7+
A38	USB_6_7_OC#	B38	USB_4_5_OC#
A39	USB4-	B39	USB5-
A40	USB4+	B40	USB5+
A41	GND	B41	GND

Pin No.	Description	Pin No.	Description
A42	USB2-	B42	USB3-
A43	USB2+	B43	USB3+
A44	USB_2_3_OC#	B44	USB_0_1_OC#
A45	USB0-	B45	USB1-
A46	USB0+	B46	USB1+
A47	VCC_RTC	B47	EXCD1_PERST#
A48	EXCD0_PERST#	B48	EXCD1_CPPE#
A49	EXCD0_CPPE#	B49	SYS_RESET#
A50	LPC_SERIRQ	B50	CB_RESET#
A51	GND	B51	GND
A52	PCIE_TX5+	B52	PCIE_RX5+
A53	PCIE_TX5-	B53	PCIE_RX5-
A54	GPI0	B54	GPO1
A55	PCIE_TX4+	B55	PCIE_RX4+
A56	PCIE_TX4-	B56	PCIE_RX4-
A57	GND	B57	GPO2
A58	PCIE_TX3+	B58	PCIE_RX3+
A59	PCIE_TX3-	B59	PCIE_RX3-
A60	GND	B60	GND
A61	PCIE_TX2+	B61	PCIE_RX2+
A62	PCIE_TX2-	B62	PCIE_RX2-
A63	GPI1	B63	GPO3
A64	PCIE_TX1+	B64	PCIE_RX1+
A65	PCIE_TX1-	B65	PCIE_RX1-
A66	GND	B66	WAKE0#
A67	GPI2	B67	WAKE1#
A68	PCIE_TX0+	B68	PCIE_RX0+
A69	PCIE_TX0-	B69	PCIE_RX0-
A70	GND	B70	GND
A71	LVDS_A0+	B71	LVDS_B0+
A72	LVDS_A0-	B72	LVDS_B0-
A73	LVDS_A1+	B73	LVDS_B1+

Pin No.	Description	Pin No.	Description
A74	LVDS_A1-	B74	LVDS_B1-
A75	LVDS_A2+	B75	LVDS_B2+
A76	LVDS_A2-	B76	LVDS_B2-
A77	LVDS_VDD_EN	B77	LVDS_B3+
A78	LVDS_A3+	B78	LVDS_B3-
A79	LVDS_A3-	B79	LVDS_BKLT_EN
A80	GND	B80	GND
A81	LVDS_A_CK+	B81	LVDS_B_CK+
A82	LVDS_A_CK-	B82	LVDS_B_CK-
A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL
A84	LVDS_I2C_DAT	B84	5 VSB
A85	GPI3	B85	5 VSB
A86	KBD_RST#	B86	5 VSB
A87	KBD_A20GATE	B87	5 VSB
A88	PCIE0_CK_REF+	B88	RSVD
A89	PCIE0_CK_REF-	B89	VGA_RED
A90	GND	B90	GND
A91	RSVD	B91	VGA_GRN
A92	RSVD	B92	VGA_BLU
A93	GPO0	B93	VGA_HSYNC
A94	RSVD	B94	VGA_VSYNC
A95	RSVD	B95	VGA_I2C_CK
A96	GND	B96	VGA_I2C_DAT
A97	+V12	B97	TV_DAC_A
A98	+V12	B98	TV_DAC_B
A99	+V12	B99	TV_DAC_C
A100	GND	B100	GND
A101	+V12	B101	+V12
A102	+V12	B102	+V12
A103	+V12	B103	+V12
A104	+V12	B104	+V12
A105	+V12	B105	+V12

Pin No.	Description	Pin No.	Description
A106	+V12	B106	+V12
A107	+V12	B107	+V12
A108	+V12	B108	+V12
A109	+V12	B109	+V12
A110	GND	B110	GND

Table 4-3: COM Express Connector AB Pin Definitions

4.2.3 SO-DIMM Connector

CN Label: **DIMM1**

CN Type: SO-DIMM connector

CN Location: See **Figure 4-5**

The SO-DIMM socket is for installing SO-DIMM memory.
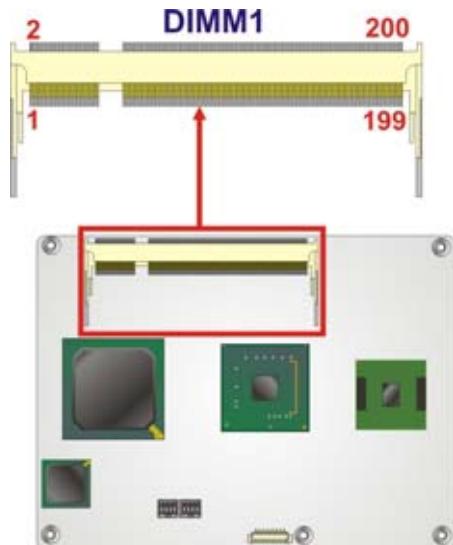
Figure 4-5: SO-DIMM Connector Location

4.2.4 SPI Connector

CN Label: **SPI1**

CN Type: 6-pin connector

CN Location: See **Figure 4-6**

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

The SPI connector is for flashing new BIOS onto the SPI BIOS chip.
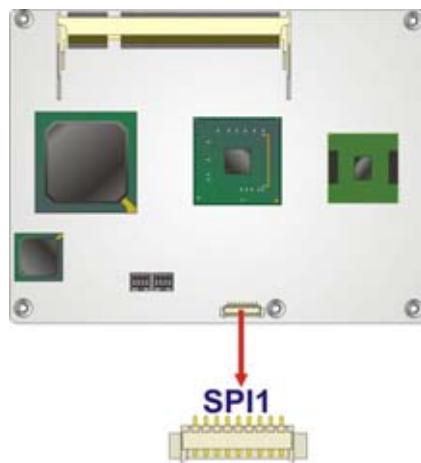
Figure 4-6: SPI Flash Connector Location

Pin No.	Description
1	SPI_VCC (+3.3 V)
2	SPI_CS#
3	SPI_MISO
4	SPI_CLK
5	SPI_MOSI
6	GND

Table 4-4: SPI Flash Connector Pin Definitions

Chapter

5

Installation

5.1 Installation Considerations

![NOTE icon] **NOTE:**

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

Before and during the installation of the ICE-945GSE, please do the following:

- ▪ Read the user manual
  - ○ The user manual provides a complete description of the ICE-945GSE, 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 helps prevent ESD damage.
- ▪ Place the CPU module on an antistatic pad
  - ○ When installing or configuring the CPU module, place it on an antistatic pad. This helps to prevent potential ESD damage.
- ▪ Turn off all power to the ICE-945GSE
  - ○ When working with the CPU module, 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 ICE-945GSE DO NOT:

- ▪ **DO NOT** remove any of the stickers on the PCB board. These stickers are required for warranty validation.
- ▪ **DO NOT** use the product before verifying all the cables and power connectors are properly connected.
- ▪ **DO NOT** allow screws to come in contact with the PCB circuit, connector pins, or its components.

5.2 Unpacking

   NOTE:

If any of the items listed below are missing when the ICE-945GSE is unpacked, do not proceed with the installation and contact the ICE-945GSE reseller or vendor.

5.2.1 Unpacking Precautions

Before installing the ICE-945GSE, unpack the CPU module. Some components on ICE-945GSE are very sensitive to static electricity and can be damaged by a sudden rush of power. To protect it from being damaged, follow these precautions:

   ▪ The user should ground them self to remove any static charge before touching the ICE-945GSE. To do so wear a grounded wrist strap at all times or frequently touch any conducting materials that is connected to the ground.
   ▪ Handle the ICE-945GSE 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.

5.2.2 Checklist

When unpacking the ICE-945GSE, please make sure that the package contains the following items.

   ▪ 1 x ICE-945GSE embedded module
   ▪ 1 x Heatspreader
   ▪ 1 x Utility CD
   ▪ 1 x QIG

If one or more of these items are missing, please contact the reseller or vendor the ICE-945GSE was purchased from and do not proceed any further with the installation.

5.3 SO-DIMM Installation

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below and refer to
Figure 5-1.
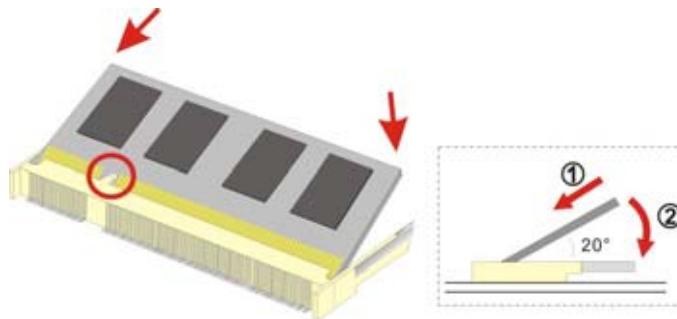
Figure 5-1: SO-DIMM Installation

Step 1: **Locate the SO-DIMM socket**. Place the ICE-945GSE on an anti-static pad.

Step 2: **Align the SO-DIMM with the socket**. The SO-DIMM must be oriented in such a
way that the notch in the middle of the SO-DIMM must be aligned with the
plastic bridge in the socket.

Step 3: **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle. (See
Figure 5-1)

Step 4: **Open the SO-DIMM socket arms**. Gently pull the arms of the SO-DIMM socket
out and push the rear of the SO-DIMM down. (See **Figure 5-1**)
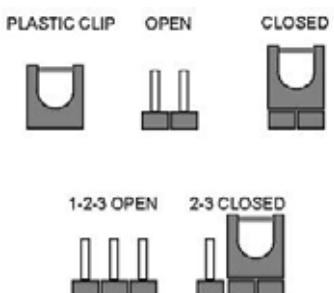
Step 5: **Secure the SO-DIMM**. Release the arms on the SO-DIMM socket. They clip into
place and secure the SO-DIMM in the socket.

5.4 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three 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.

Jumper Locations

Before the ICE-945GSE is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the ICE-945GSE are listed in **Table 5-1** and shown in **Figure 5–2**.

Description	Type	Label
LVDS panel resolution	4-in-1 switch	SW1
BIOS selection	4-in-1 switch	SW2

Table 5-1: Jumpers
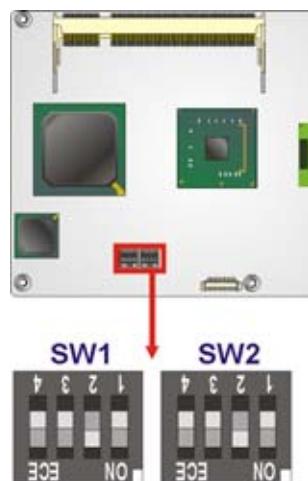
Figure 5–2: Jumper Locations

5.4.1 LVDS Panel Resolution

Jumper Label:	**SW1**
Jumper Type:	4-in-1 switch
Jumper Settings:	See **Table 5-2**
Jumper Location:	See **Figure 5–2**

This switch sets the resolution of the panel attached to the LVDS output. Settings are shown in **Table 5-2**.

1	2	3	4	DESCRIPTION
OFF	OFF	OFF	OFF	640 x 480 (18-bit)
ON	OFF	OFF	OFF	800 x 480 (18-bit)
OFF	ON	OFF	OFF	800 x 600 (18-bit)
ON	ON	OFF	OFF	1024 x 768 (18-bit)
OFF	OFF	ON	OFF	1280 x 1024 (36-bit)
ON	OFF	ON	OFF	1400 x 1050 (36-bit)
OFF	ON	ON	OFF	1400 x 900 (36-bit)
ON	ON	ON	OFF	1600 x 1200 (36-bit)

Table 5-2: LVDS Panel Resolution

5.4.2 BIOS Selection

Jumper Label:	**SW2**
Jumper Type:	4-in-1 switch
Jumper Settings:	See **Table 5-3**
Jumper Location:	See **Figure 5–2**

This jumper selects which BIOS to use. There is a BIOS included on the ICE-945GSE, but a BIOS connected to the LPC or PCI bus can be used instead. The clear CMOS jumper settings are shown in **Table 5-3**.

1	2	3	4	Description
OFF	ON	OFF	OFF	SPI
ON	OFF	OFF	OFF	LPC
OFF	OFF	OFF	OFF	PCI

Table 5-3: BIOS Selection

5.5 Mounting the ICE-945GSE

WARNING!

Never run the embedded module without an appropriate heat sink.

WARNING!

Please note that the installation instructions described in this manual should be carefully followed in order to avoid damage to the CPU module components and injury to the user.

⚠ **WARNING!**

> When installing electronic components onto the embedded module or installing the embedded module onto the baseboard, always take anti-static precautions in order to prevent ESD damage to the CPU module and other electronic components like the CPU and SO-DIMM module.

The ICE-945GSE embedded module has two standard COM Express connectors on the reverse side. Align these COM Express connectors with the corresponding connectors on a compatible baseboard. Gently push the embedded module down to ensure the connectors are properly connected.

Baseboard can be designed by the end user, customized by IEI, or purchased from IEI. For more information visit the IEI website (www.ieiworld.com) or contact an IEI sales representative.

Chapter

6

BIOS Setup

6.1 Introduction

  NOTE:

The BIOS items shown below are from a ICE-945GSE installed on the ICE-DB-9S-R10 reference carrier board. The ICE-DB-9S-R10 reference carrier board is available from iEi, contact sales@iei.com.tw or go to http://www.ieiworld.com for more information.

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.

6.1.1 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.

6.1.2 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

Key	Function
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
Page Up key	Increase the numeric value or make changes
Page Dn 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 6-1: BIOS Navigation Keys

6.1.3 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.

6.1.4 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 5**.

6.1.5 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.
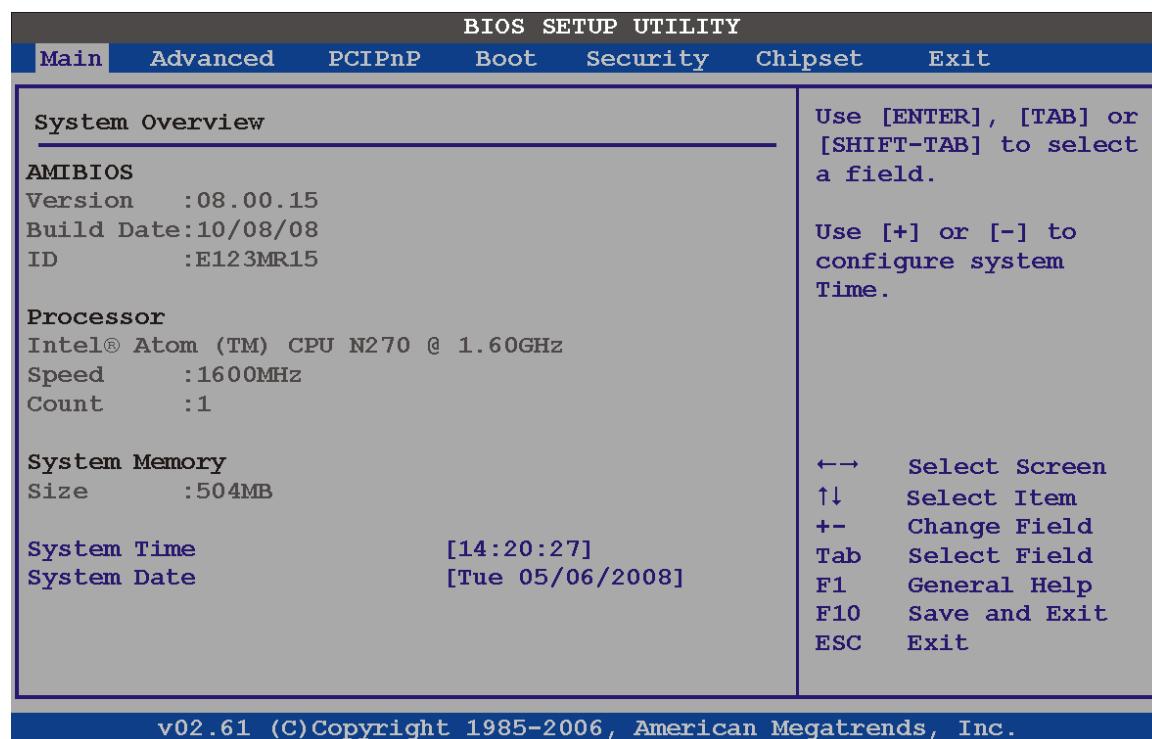
- ▪ **Security** Sets User and Supervisor Passwords.
- ▪ **Chipset** Changes the chipset settings.
- ▪ **Power** Changes power management settings.
- ▪ **Exit** Selects exit options and loads default settings

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

6.2 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    Exit

 System Overview                                 Use [ENTER], [TAB] or
                                                 [SHIFT-TAB] to select
 AMIBIOS                                         a field.
 Version    :08.00.15
 Build Date:10/08/08                             Use [+] or [-] to
 ID         :E123MR15                            configure system
                                                 Time.
 Processor
 Intel® Atom (TM) CPU N270 @ 1.60GHz
 Speed      :1600MHz
 Count      :1

 System Memory                                   ←→    Select Screen
 Size       :504MB                               ↑↓    Select Item
                                                 +-    Change Field
 System Time              [14:20:27]             Tab   Select Field
 System Date              [Tue 05/06/2008]       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

  o   Version: Current BIOS version

  o   Build Date: Date the current BIOS version was made

  o   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.

6.3 Advanced

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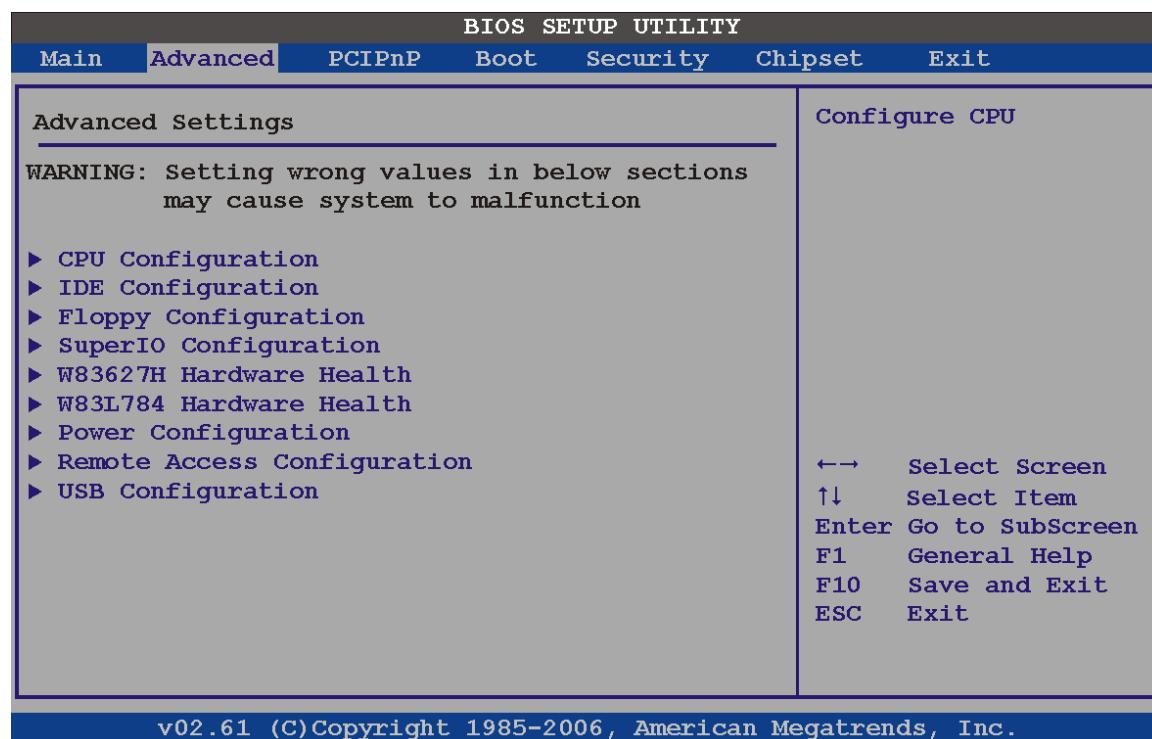
WARNING:

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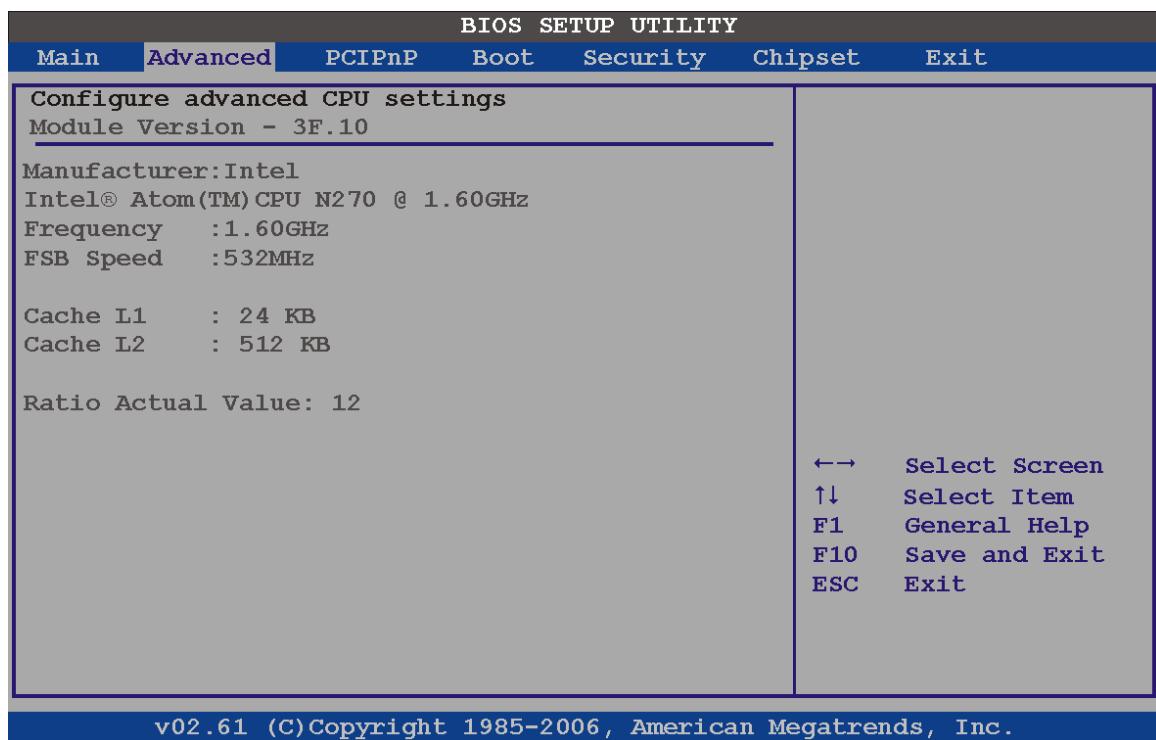
```
                          BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit

 Advanced Settings                            Configure CPU

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

 ▶ CPU Configuration
 ▶ IDE Configuration
 ▶ Floppy Configuration
 ▶ SuperIO Configuration
 ▶ W83627H Hardware Health
 ▶ W83L784 Hardware Health
 ▶ Power Configuration                        ←→    Select Screen
 ▶ Remote Access Configuration                ↑↓    Select Item
 ▶ USB Configuration                          Enter Go to SubScreen
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit


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```

BIOS Menu 2: Advanced

6.3.1 CPU Configuration

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

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

   Configure advanced CPU settings
   Module Version - 3F.10

  Manufacturer:Intel
  Intel® Atom(TM)CPU N270 @ 1.60GHz
  Frequency   :1.60GHz
  FSB Speed   :532MHz

  Cache L1    : 24 KB
  Cache L2    : 512 KB

  Ratio Actual Value: 12

                                            ←→    Select Screen
                                            ↑↓    Select Item
                                            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
- **Ratio actual**: Lists the clock multiplier

6.3.2 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
   Main    Advanced    PCIPnP    Boot    Security   Chipset    Exit

   IDE Configuration                                 Options

   ATA/IDE Configuration        [Compatible]         Disabled
      Legacy IDE Channels       [SATA Pri, PATA Sec] Compatible
                                                     Enhanced
   ▶ Primary IDE Master         :  [Not Detected]
   ▶ Primary IDE Slave          :  [Not Detected]
   ▶ Secondary IDE Master       :  [Not Detected]
   ▶ Secondary IDE Slave        :  [Not Detected]



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


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```

BIOS Menu 4: IDE Configuration

ATA/IDE Configurations [Compatible]

Use the **ATA/IDE Configurations** option to configure the ATA/IDE controller.

➔ **Disabled**   Disables the on-board ATA/IDE controller.

➔ **Compatible**   Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.

➔ **Enhanced** DEFAULT Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6 storage devices. Some legacy OS do not support this mode.

Legacy IDE Channels [SATA Pri, PATA Sec]

➔ **SATA Only** Only the SATA drives are enabled.

➔ **SATA Pri, PATA Sec** DEFAULT The SATA drive are enabled on the primary IDE channel. The PATA drives are enabled on the secondary IDE channel.

➔ **PATA Only** The IDE drives are enabled on the primary and secondary IDE channels. SATA drives are disabled.

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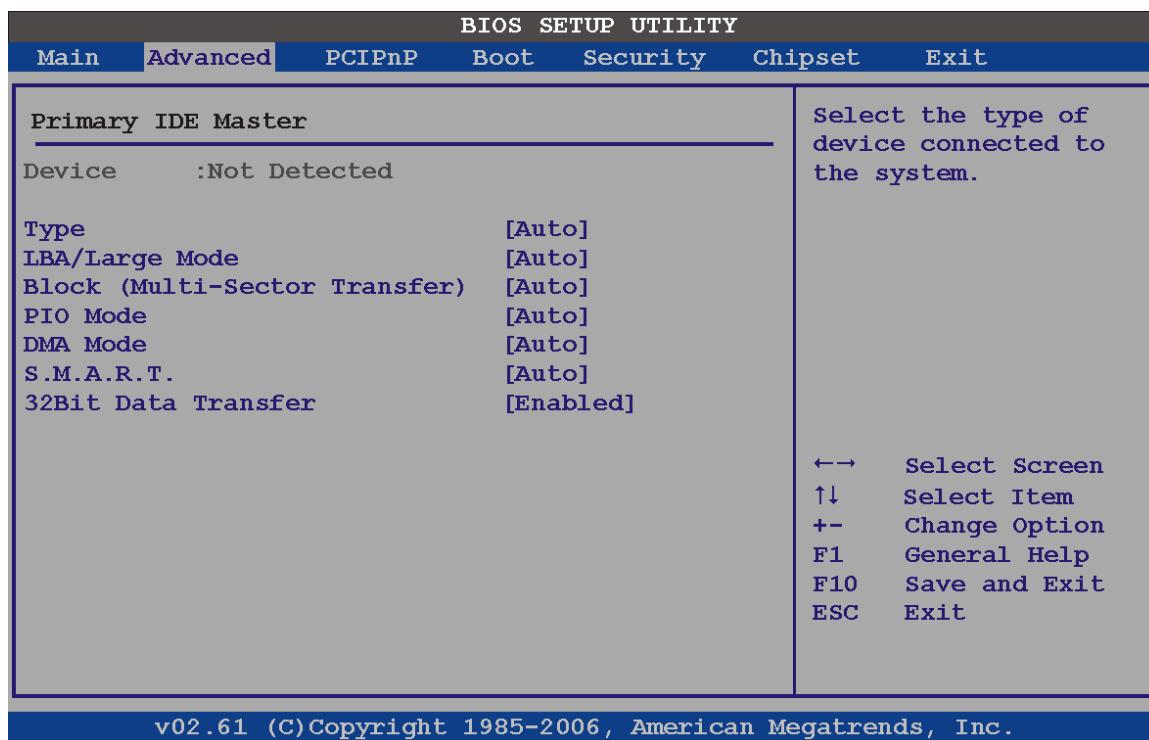
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- ▪ 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 876.3.2.1** appear.

6.3.2.1 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
    Main    Advanced    PCIPnP    Boot    Security    Chipset    Exit

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


    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:

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **Vendor**: Lists the device manufacturer
- **Size**: List the storage capacity of the device.
- **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.

▪ **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.

▪ **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.

▪ **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.

▪ **32Bit Data Transfer**: Enables 32-bit data transfer.

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 3.3 MB/s

➔ **1**   PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s

➔ **2**   PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s

è	**3**	PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s
è	**4**	PIO mode 4 selected with a maximum transfer rate of 16.6 MB/s
		(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.

è	**Auto**	DEFAULT	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
è	**SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1 MB/s
è	**SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2 MB/s
è	**SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3 MB/s
è	**MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2 MB/s
è	**MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3 MB/s
è	**MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6 MB/s
è	**UDMA1**		Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6 MB/s
è	**UDMA1**		Ultra DMA mode 1 selected with a maximum data transfer rate of 25 MB/s
è	**UDMA2**		Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3 MB/s

è **UDMA3** Ultra DMA mode 3 selected with a maximum data transfer rate of 44 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

è **UDMA4** Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

è **UDMA5** Ultra DMA mode 5 selected with a maximum data transfer rate of 99.9 MB/s (To use this mode, it is required that an 80-conductor ATA cable is used.)

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.

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

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

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

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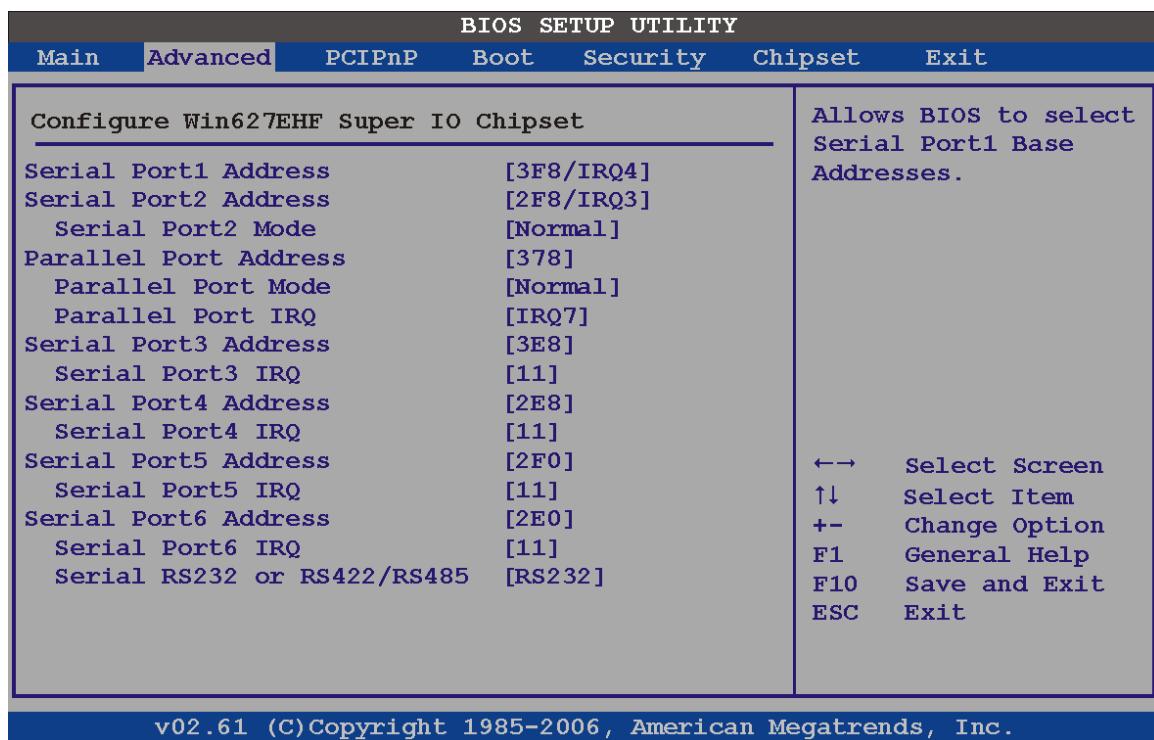
Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

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

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

6.3.3 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 6**) to set or change the configurations for the FDD controllers, parallel ports and serial ports.

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

 Configure Win627EHF Super IO Chipset              Allows BIOS to select
                                                    Serial Port1 Base
 Serial Port1 Address          [3F8/IRQ4]           Addresses.
 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            [11]
 Serial Port5 Address          [2F0]               ←→   Select Screen
   Serial Port5 IRQ            [11]                ↑↓   Select Item
 Serial Port6 Address          [2E0]               +-   Change Option
   Serial Port6 IRQ            [11]                F1   General Help
   Serial RS232 or RS422/RS485 [RS232]            F10   Save and Exit
                                                   ESC   Exit


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```

BIOS Menu 6: Super IO Configuration

Serial Port1 Address [3F8/IRQ4]

Use the **Serial Port1 Address** option to select the I/O and IRQ base addresses.

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

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

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

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

Serial Port1 Mode [Normal]

Use the **Serial Port1 Mode** option to select the transmitting and receiving mode.

- ▪ Normal　　　　Default
- ▪ IrDA
- ▪ ASK IR

Serial Port2 Address [2F8/IRQ3]

Use the **Serial Port2 Address** option to select the I/O and IRQ addresses.

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

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

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

➔ **2E8/IRQ3**　　　　　　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 transmitting and receiving mode.

- ▪ Normal　　　　Default
- ▪ IrDA
- ▪ ASK IR

Serial Port3 Address [3E8]

Use the **Serial Port 3 Address** option to set the I/O address.

➔ **Disabled**　　　　　　No I/O address assigned

➔ **3E8**　　DEFAULT　The assigned I/O address is 3E8

➔ **2E8**　　　　　　The assigned I/O address is 2E8

➔ **2F0**　　　　　　The assigned I/O address is 2F0

➔ **2E0**　　　　　　The assigned I/O address is 2E0

Serial Port 3 IRQ [11]

Use the **Serial Port 3 IRQ** option selects the IRQ.

- ▪ 11　　　　　Default

▪ 10

Select RS232 or RS422/RS485 [RS232]

Use the **Select RS232 or RS422/RS485** option to select the transmitting and receiving mode.

▪ RS232　　　　Default
▪ RS422/485

Serial Port4 Address [2E8]

Use the **Serial Port 4 Address** option to set the I/O address.

➔ **Disabled**　　　　　No I/O address assigned

➔ **3E8**　　　　　　　The assigned I/O address is 3E8

➔ **2E8**　　　DEFAULT　The assigned I/O address is 2E8

➔ **2F0**　　　　　　　The assigned I/O address is 2F0

➔ **2E0**　　　　　　　The assigned I/O address is 2E0
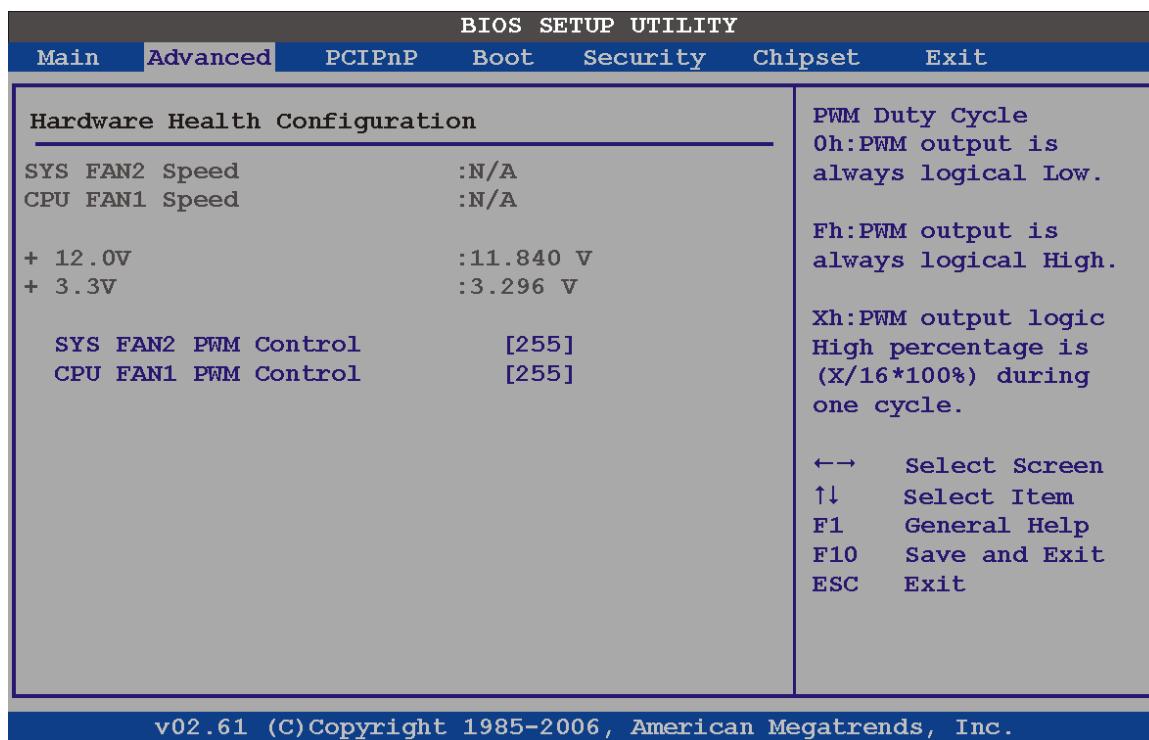
Serial Port 4 IRQ [10]

Use the **Serial Port 4 IRQ** option selects the IRQ.

▪ 11
▪ 10　　　　Default

6.3.4 W83627H Hardware Health

The **Hardware Health Configuration** menu (**BIOS Menu 7**) shows the operating temperature, fan speeds and system voltages.

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

  Hardware Health Configuration                 PWM Duty Cycle
                                                0h:PWM output is
  SYS FAN2 Speed               :N/A            always logical Low.
  CPU FAN1 Speed               :N/A
                                                Fh:PWM output is
  + 12.0V                      :11.840 V       always logical High.
  + 3.3V                       :3.296 V
                                                Xh:PWM output logic
    SYS FAN2 PWM Control        [255]          High percentage is
    CPU FAN1 PWM Control        [255]           (X/16*100%) during
                                                one cycle.

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

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```

BIOS Menu 7: Hardware Health Configuration

Fan PWM Control [255]

The Fan PWM Control setting sets the speed of the fan as a portion of maximum speed.

- PWM minimum speed (off): 0
- PWM maximum speed: 255

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

- **Fan Speeds**: The CPU cooling fan speed is monitored.
  o System (FAN2) speed
  o CPU (FAN1) speed

▪ **Voltages**: The following system voltages are monitored

　○　+3.30 V

　○　+12.0 V

6.3.5 W83L782 Hardware Health

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

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

  Hardware Health                                PWM Duty Cycle
  ─────────────────────────────────             0h:PWM output is
  On-Chip Temperature          :55C/129F        always logical Low.
  CPU Temperature              :66C/150F
  System Temperature           :57C/134F        Fh:PWM output is
                                                always logical High.
  SYS FAN3 Speed               :N/A
                                                Xh:PWM output logic
  Vcore                        :1.136 V         High percentage is
  +3.3V                        :3.296 V         (X/16*100%) during
  VBAT                         :2.502 V         one cycle.
  +5V                          :5.049 V
                                                ←→   Select Screen
     SYS FAN3 PWM Control        [255]          ↑↓   Select Item
                                                F1   General Help
                                                F10  Save and Exit
                                                ESC  Exit


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```

BIOS Menu 8: Hardware Health Configuration

Fan PWM Control [255]

The Fan PWM Control setting sets the speed of the fan as a portion of maximum speed.
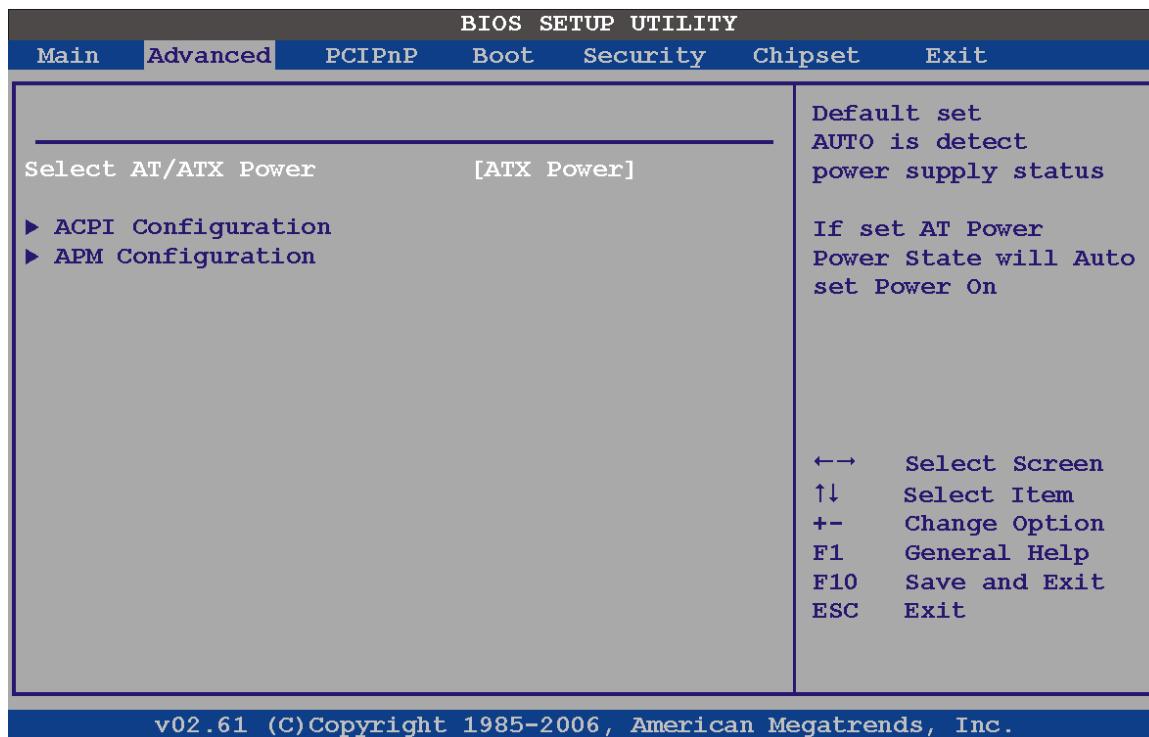
▪ PWM minimum speed (off): 0
▪ PWM maximum speed: 255

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

- ▪ **System Temperatures**: The following system temperatures are monitored

  ○ On-chip temperature

  ○ CPU temperature

  ○ System temperature

- ▪ **Fan Speeds**: The CPU cooling fan speed is monitored.

  ○ System (FAN3) speed

- ▪ **Voltages**: The following system voltages are monitored

  ○ Vcore

  ○ +3.30 V

  ○ +5.00 V

  ○ VBAT

6.3.6 Power Configuration

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

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

                                                    Default set
                                                    AUTO is detect
   Select AT/ATX Power            [ATX Power]       power supply status

▶ ACPI Configuration                                If set AT Power
▶ APM Configuration                                 Power State will Auto
                                                    set Power On




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


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```

BIOS Menu 9: Power Configuration
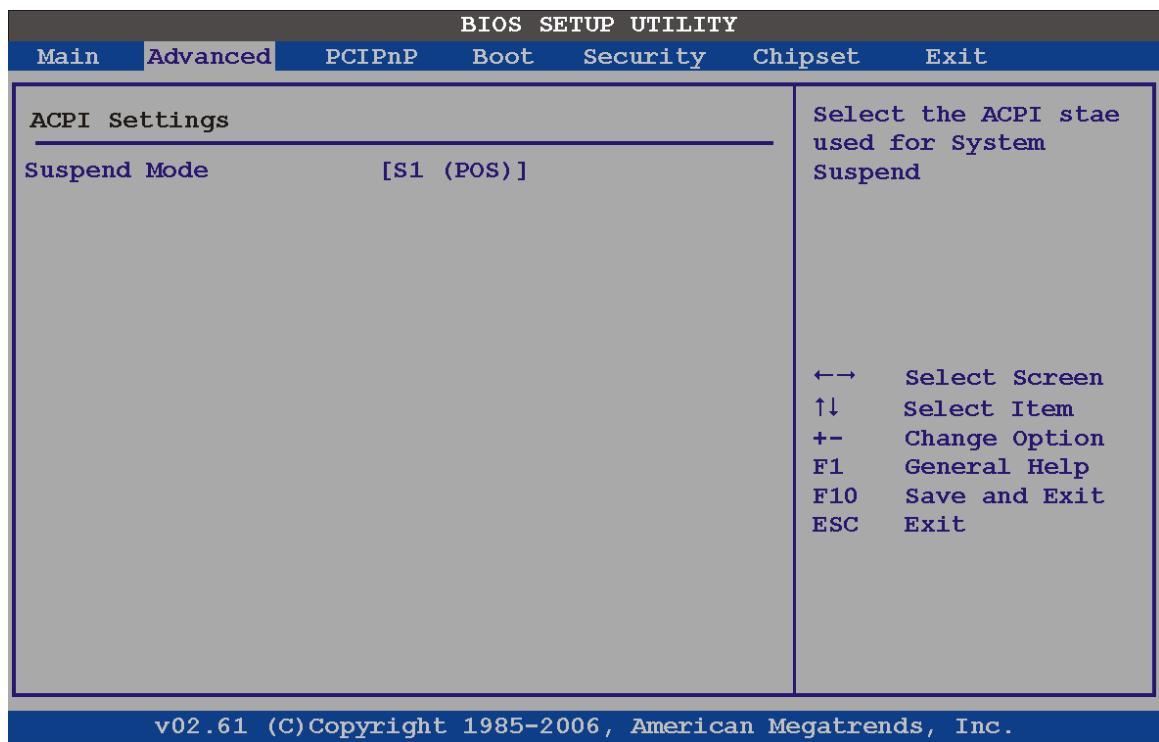
Select AT/ATX Power [ATX Power]

Use the **Select AT/ATX Power** option to set the power mode of the system.

➔ **AT Power**   Use AT power

➔ **ATX Power**   DEFAULT   Use ATX power

6.3.6.1 ACPI Configuration

The **ACPI Configuration** menu (**BIOS Menu 10**) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.

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

  ACPI Settings                                   Select the ACPI stae
                                                  used for System
  Suspend Mode            [S1 (POS)]              Suspend




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




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```

BIOS Menu 10: ACPI Configuration
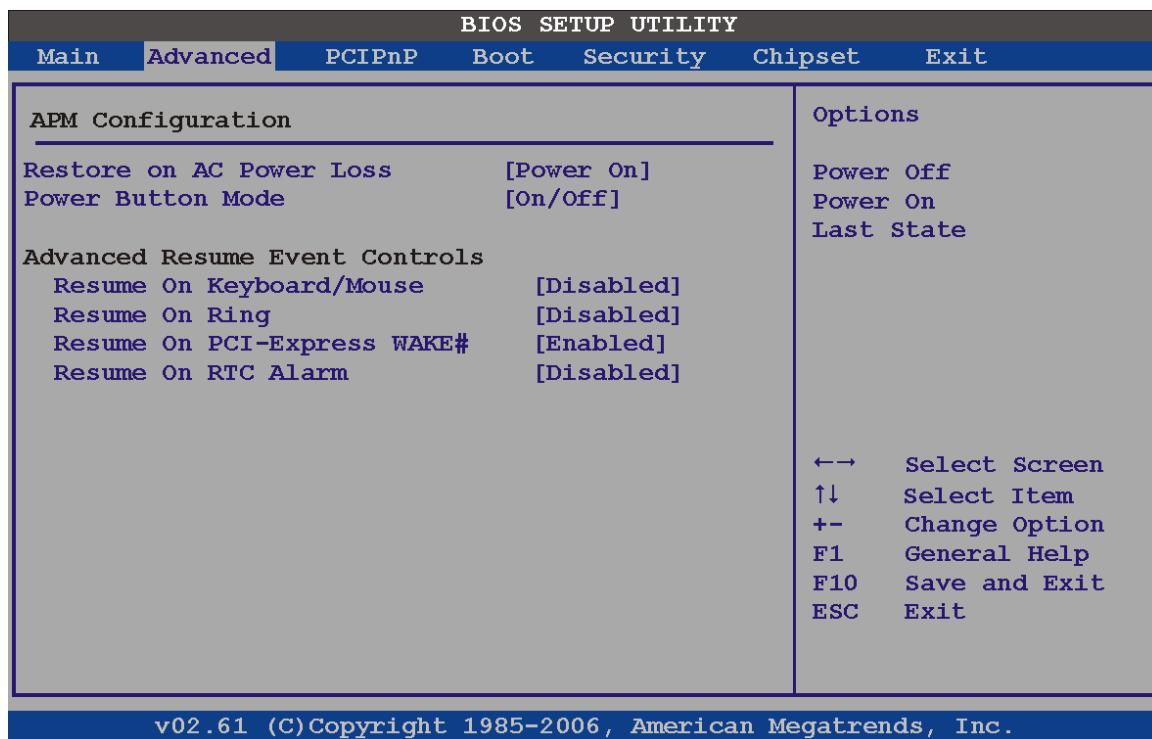
Suspend Mode [S1(POS)]

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

➔ **S1 (POS)** **DEFAULT** 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.

6.3.6.2 APM Configuration

The **APM Configuration** menu (**BIOS Menu 11**) allows the advanced power management options to be configured.

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

 APM Configuration                              Options

 Restore on AC Power Loss        [Power On]     Power Off
 Power Button Mode               [On/Off]       Power On
                                                Last State
 Advanced Resume Event Controls
   Resume On Keyboard/Mouse       [Disabled]
   Resume On Ring                 [Disabled]
   Resume On PCI-Express WAKE#    [Enabled]
   Resume On RTC Alarm            [Disabled]


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



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```

BIOS Menu 11:Advanced Power Management Configuration

Restore on AC Power Loss [Last State]

Use the **Restore on AC Power Loss** BIOS option to specify 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

è **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.

Power Button Mode [On/Off]

Use the **Power Button Mode** BIOS to specify how the power button functions.

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

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

Resume on Keyboard/Mouse [Disabled]

Use the **Resume on Keyboard/Mouse** BIOS option to enable activity on either the keyboard or mouse to rouse the system from a suspend or standby state. That is, the system is roused when the mouse is moved or a button on the keyboard is pressed.

è **Disabled** DEFAULT Wake event not generated by activity on the keyboard or mouse

è **Enabled** Wake event generated by activity on the keyboard or mouse

Resume on Ring [Disabled]

Use the **Resume on Ring** BIOS option to enable activity on the RI (ring in) modem line to rouse the system from a suspend or standby state. That is, the system will be roused by an incoming call on a modem.

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

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

Resume on PCI-Express WAKE# [Enabled]

Use the **Resume PCI-Express WAKE#** BIOS option to enable activity on the PCI-Express WAKE# signal to rouse the system from a suspend or standby state.

è **Disabled**   Wake event not generated by PCI-Express WAKE# signal activity

è **Enabled**   DEFAULT   Wake event generated by PCI-Express WAKE# signal activity

Resume On RTC Alarm [Disabled]
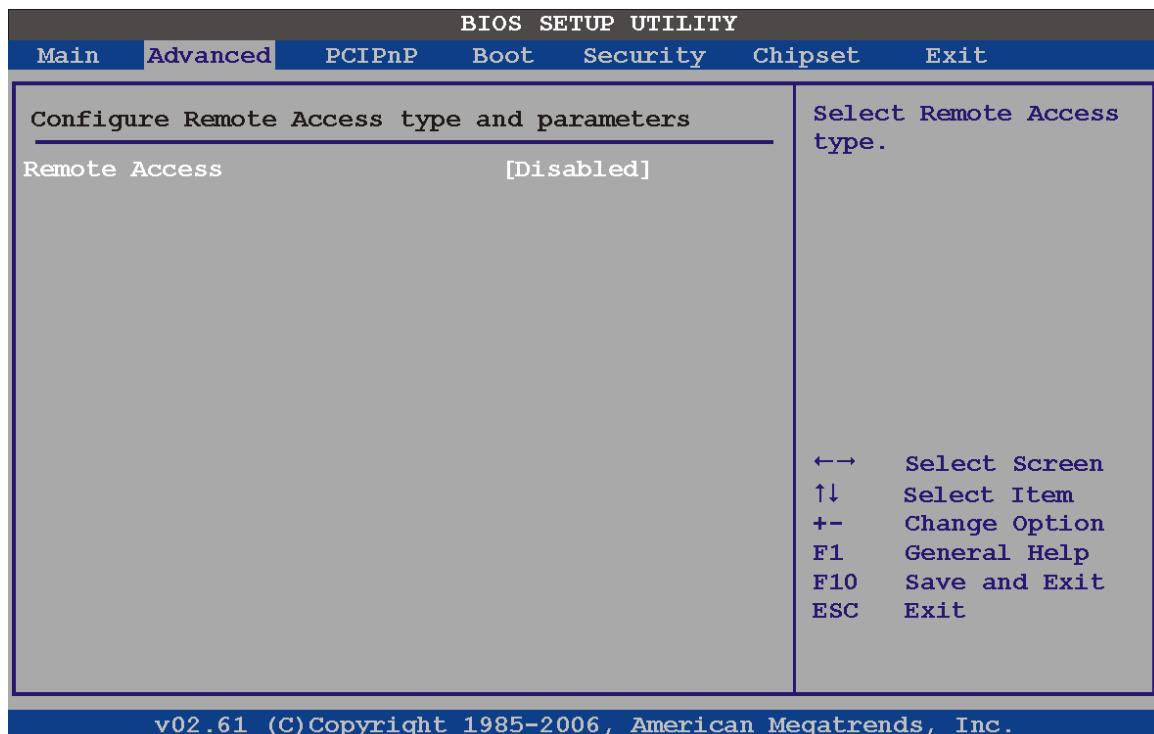
Use the **Resume On RTC Alarm** option to specify the time the system should be roused from a suspended state.

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

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

     - **RTC Alarm Date (Days)**

     - **RTC Alarm Time**

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

6.3.7 Remote Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 12**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.

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

   Configure Remote Access type and parameters        Select Remote Access
                                                       type.
   Remote Access                     [Disabled]




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


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```

BIOS Menu 12: Remote Access Configuration

Remote Access [Disabled]

Use the **Remote Access** option to enable or disable access to the remote functionalities of the system.

➔ **Disabled**   **DEFAULT**   Remote access is disabled.

➔ **Enabled** Remote access configuration options shown below

appear:

- **Serial Port Number**
- **Serial Port Mode**
- **Flow Control**
- **Redirection after BIOS POST**
- **Terminal Type**
- **VT-UTF8 Combo Key Support**

These configuration options are discussed below.

Serial Port Number [COM1]

Use the **Serial Port Number** option allows to select the serial port used for remote access.

➔ **COM1** **DEFAULT** System is remotely accessed through COM1

➔ **COM2** System is remotely accessed through COM2

NOTE: Make sure the selected COM port is enabled through the Super I/O configuration menu.

Base Address, IRQ [2F8h,3]

The **Base Address, IRQ** option cannot be configured and only shows the interrupt address of the serial port listed above.

Serial Port Mode [115200 8,n,1]

Use the **Serial Port Mode** option to select baud rate through which the console redirection is made. The following configuration options are available

- 115200 8,n,1 DEFAULT
- 57600 8,n,1
- 38400 8,n,1
- 19200 8,n,1
- 09600 8,n,1

NOTE:

Identical baud rate setting musts be set on the host (a management computer running a terminal software) and the slave

Flow Control [None]

Use the **Flow Control** option to report the flow control method for the console redirection application.

➔ **None**   DEFAULT   No control flow,

➔ **Hardware**   Hardware is set as the console redirection

➔ **Software**   Software is set as the console redirection

Redirection After BIOS POST [Always]

Use the **Redirection After BIOS POST** option to specify when console redirection should occur.

➔ **Disabled**   The console is not redirected after POST

➔ **Boot Loader**   Redirection is active during POST and during Boot Loader

➔ **Always**   DEFAULT   Redirection is always active (Some OSes may not work if set to Always)

Terminal Type [ANSI]

Use the **Terminal Type** BIOS option to specify the remote terminal type.

➔ **ANSI**   DEFAULT   The target terminal type is ANSI

➔ **VT100**   The target terminal type is VT100

➔ **VT-UTF8**   The target terminal type is VT-UTF8

VT-UTF8 Combo Key Support [Disabled]

Use the **VT-UFT8 Combo Key Support** option to enable additional keys that are not provided by VT100 for the PC 101 keyboard.

The VT100 Terminal Definition is the standard convention used to configure and conduct emergency management tasks with UNIX-based servers. VT100 does not support all keys on the standard PC 101-key layout, however. The VT-UTF8 convention makes available additional keys that are not provided by VT100 for the PC 101 keyboard.

➔ **Disabled**   DEFAULT   Disables the VT-UTF8 terminal keys

➔ **Enabled**   Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

**Sredir Memory Display Delay [Disabled]**
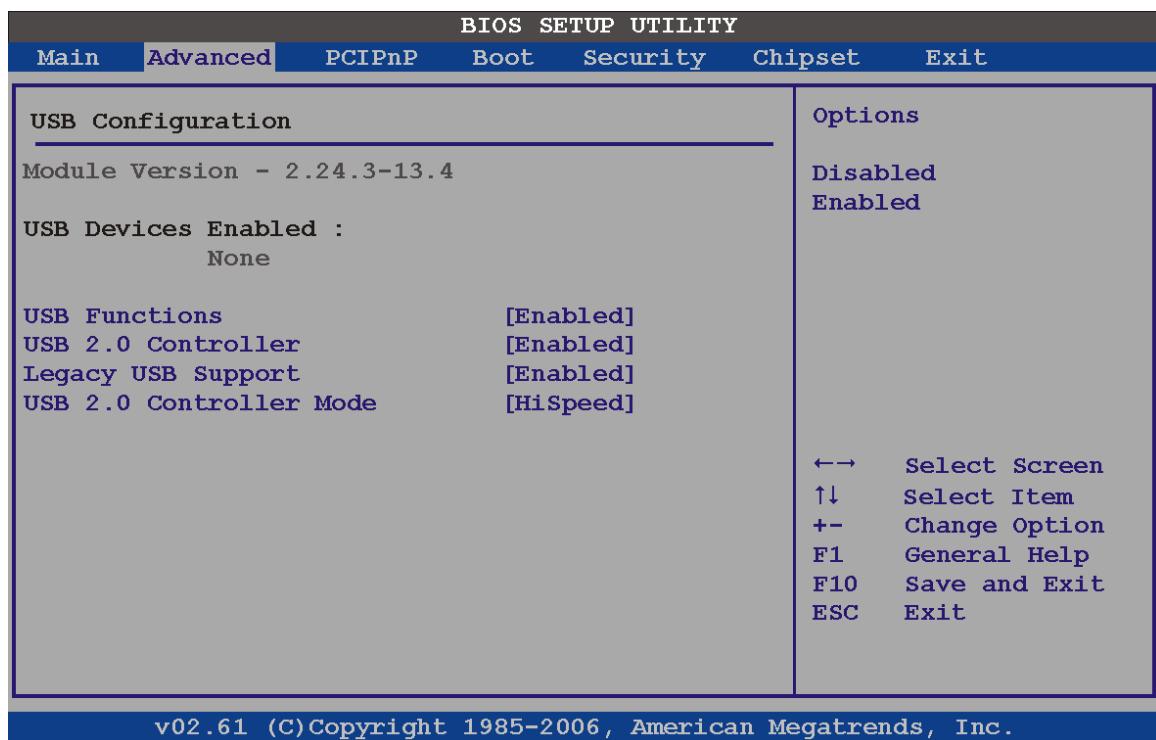
Use the **Sredir Memory Display Delay** option to select the delay before memory information is displayed. Configuration options are listed below

- No Delay   DEFAULT
- Delay 1 sec
- Delay 2 sec
- Delay 4 sec

6.3.8 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 13**) to read USB configuration information and configure the USB settings.

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

  USB Configuration                               Options

 Module Version - 2.24.3-13.4                     Disabled
                                                  Enabled
 USB Devices Enabled :
            None

 USB Functions                  [Enabled]
 USB 2.0 Controller             [Enabled]
 Legacy USB Support             [Enabled]
 USB 2.0 Controller Mode        [HiSpeed]


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


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```

BIOS Menu 13: USB Configuration

USB Functions [Enabled]

Use the **USB Function** option to enable or disable the USB controllers.

➔ **Disabled** USB controllers are enabled

➔ **Enabled** DEFAULT USB controllers are disabled

USB 2.0 Controller [Enabled]

The **USB 2.0 Controller** BIOS option enables or disables the USB 2.0 controller

➔ **Disabled** USB function disabled

➔ **Enabled** DEFAULT USB function enabled

USB2.0 Controller Mode [HiSpeed]

The **USB2.0 Controller Mode** BIOS option sets the speed of the USB2.0 controller.

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

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

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** Legacy USB support disabled if no USB devices are connected

6.4 PCI/PnP

Use the PCI/PnP menu (**BIOS Menu 14**) 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    Exit

  Advanced PCI/PnP Settings                            Available: Specified
                                                       IRQ is available to
  IRQ3                          [Reserved]             be use by PCI/PnP
  IRQ4                          [Reserved]             devices.
  IRQ5                          [Available]            Reserved: Specified
  IRQ7                          [Available]            IRQ is reserved for
  IRQ9                          [Available]            use by legacy ISA
  IRQ10                         [Available]            devices.
  IRQ11                         [Reserved]
  IRQ14                         [Available]
  IRQ15                         [Available]


  DMA Channel 0                 [Available]            ←→   Select Screen
  DMA Channel 1                 [Available]            ↑↓   Select Item
  DMA Channel 3                 [Available]            +-   Change Option
  DMA Channel 5                 [Available]            F1   General Help
  DMA Channel 6                 [Available]            F10  Save and Exit
  DMA Channel 7                 [Available]            ESC  Exit


  Reserved Memory Size          [Disabled]

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```

BIOS Menu 14: PCI/PnP Configuration

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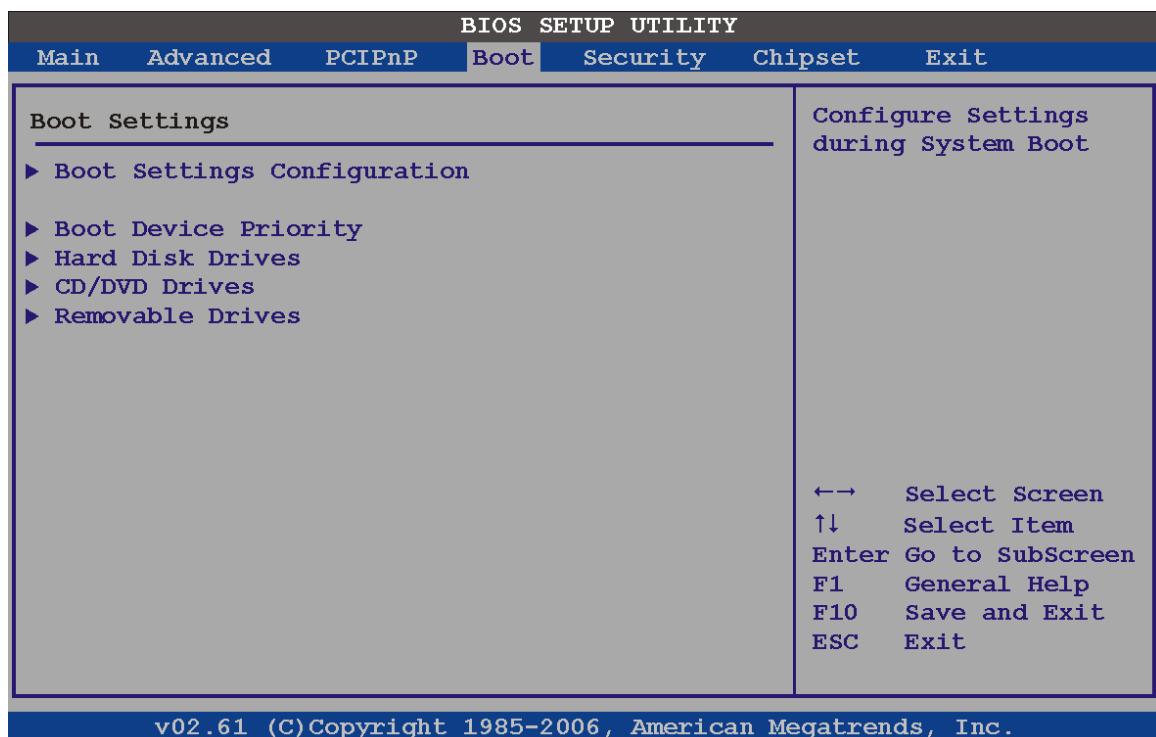
Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

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

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

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

➔ **64K**   64 KB reserved for legacy ISA devices
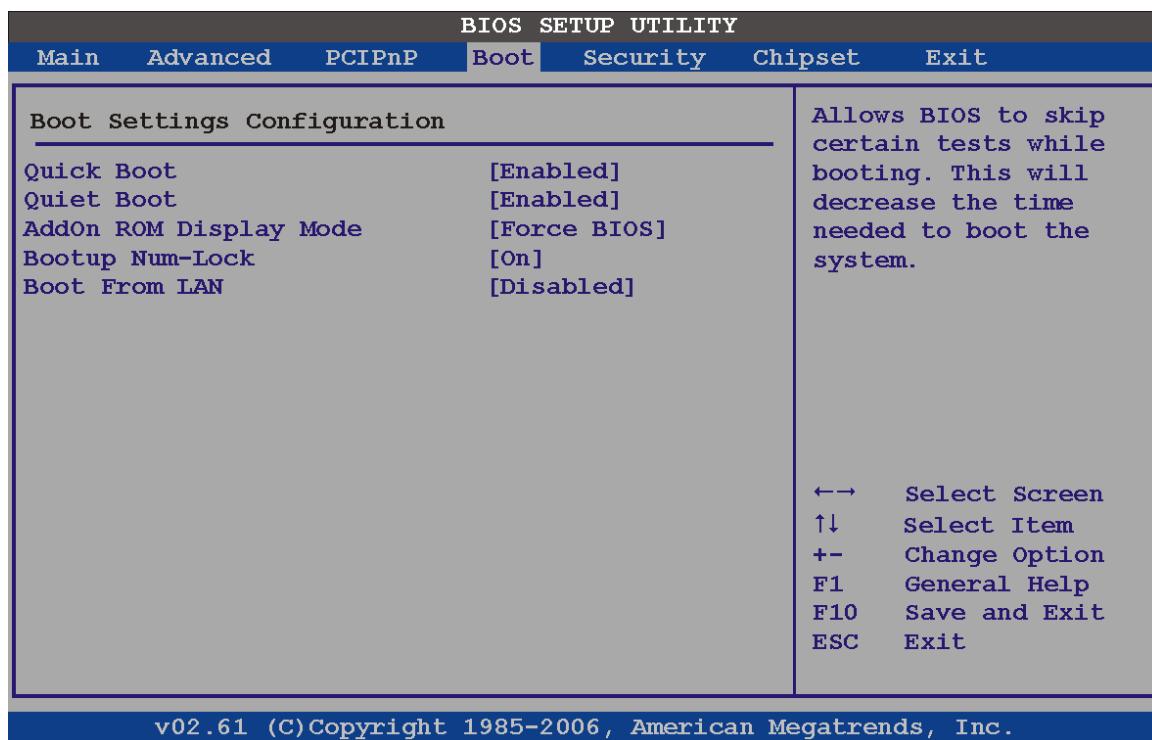
6.5 Boot

Use the Boot menu (**BIOS Menu 15**) to configure system boot options.

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

  Boot Settings                              Configure Settings
                                             during System Boot
 ▶ Boot Settings Configuration

 ▶ Boot Device Priority
 ▶ Hard Disk Drives
 ▶ CD/DVD Drives
 ▶ Removable Drives



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

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```

BIOS Menu 15: Boot

6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (**BIOS Menu 15**) to configure advanced system boot options.

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

  Boot Settings Configuration                        Allows BIOS to skip
                                                     certain tests while
  Quick Boot                    [Enabled]            booting. This will
  Quiet Boot                    [Enabled]            decrease the time
  AddOn ROM Display Mode        [Force BIOS]         needed to boot the
  Bootup Num-Lock               [On]                 system.
  Boot From LAN                 [Disabled]



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


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```

BIOS Menu 16: 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]

The **AddOn ROM Display Mode** option allows add-on ROM (read-only memory) messages to be displayed.

➔ **Force BIOS**   DEFAULT   Allows the computer system to force a third party BIOS to display during system boot.

➔ **Keep Current**   Allows the computer system to display the information during system boot.

Bootup Num-Lock [Off]

The **Bootup Num-Lock** BIOS option allows the Number Lock setting to be modified during boot up.

➔ **Off**   DEFAULT   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**   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.

Boot From LAN Support [Disabled]

The **BOOT From LAN Support** option enables the system to be booted from a remote system.
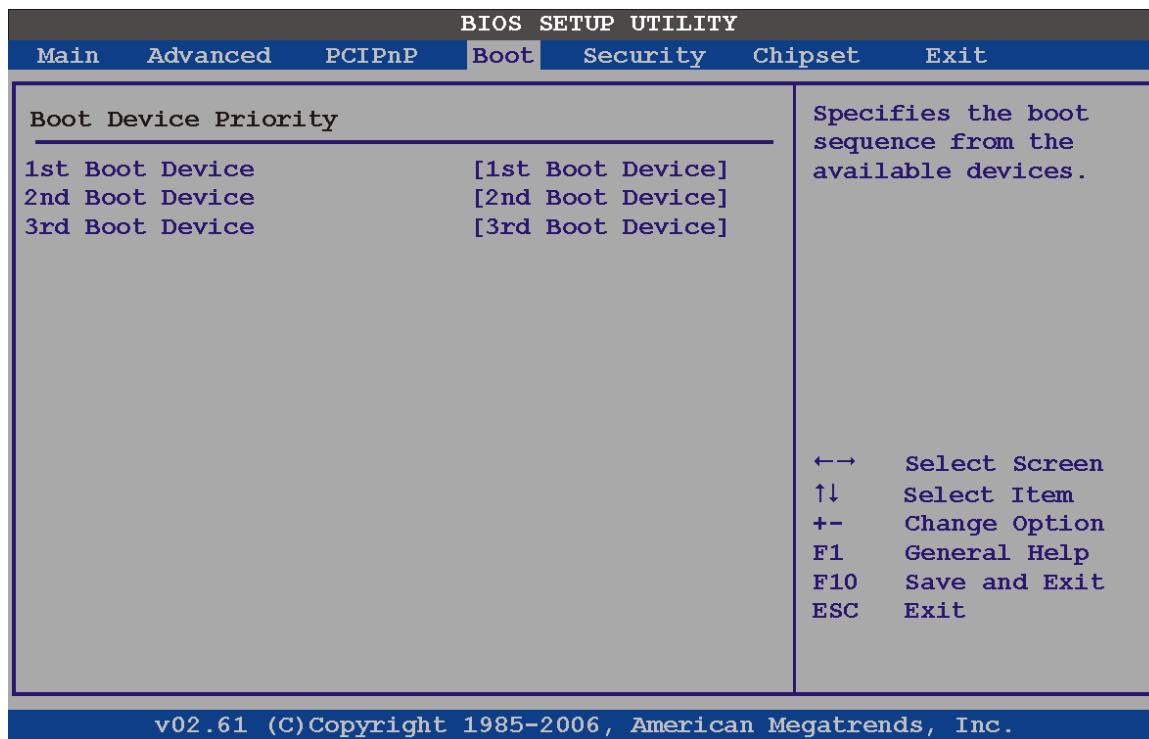
➔ **Disabled**   DEFAULT   Cannot be booted from a remote system through the LAN

➔ **Enabled** **DEFAULT** Can be booted from a remote system through the LAN

6.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 17**) to specify the boot sequence from the available devices. The following options are available:

- 1st Boot Device
- 2nd Boot Device
- 3rd Boot Device

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

  Boot Device Priority                          Specifies the boot
                                                sequence from the
  1st Boot Device            [1st Boot Device]  available devices.
  2nd Boot Device            [2nd Boot Device]
  3rd Boot Device            [3rd Boot Device]




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


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```

BIOS Menu 17: Boot Device Priority Settings

6.5.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. When the menu is opened, the HDDs connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive
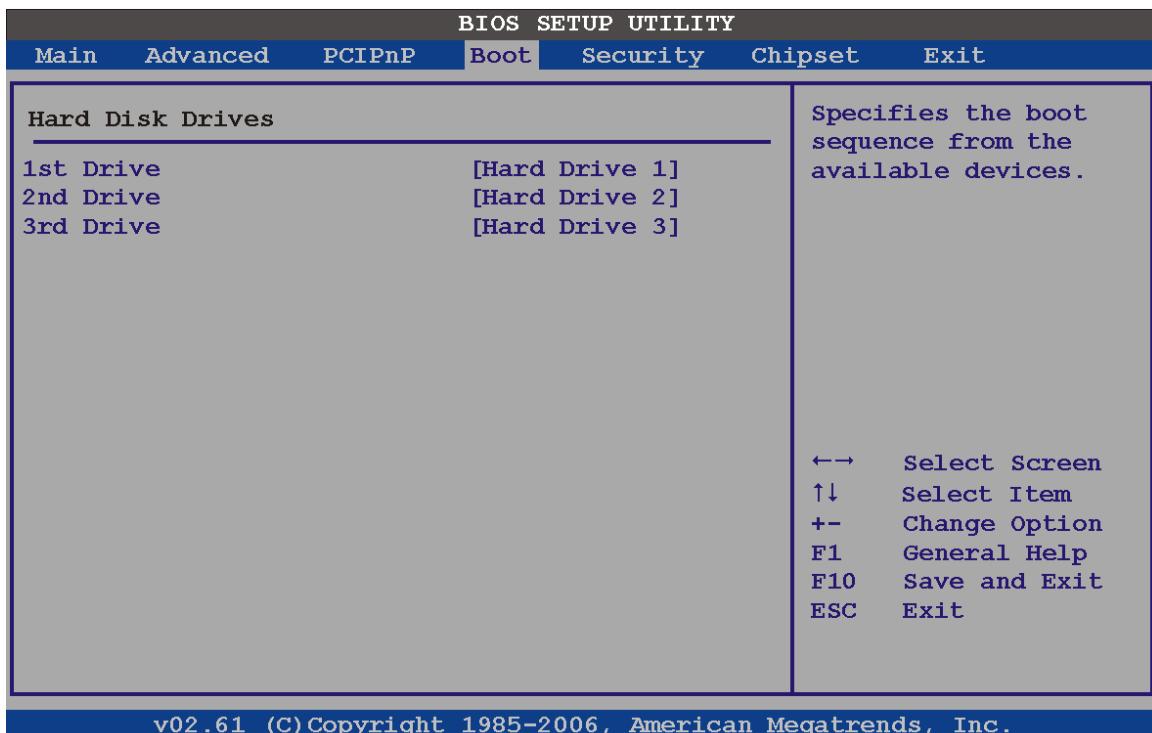
- 3rd Drive

NOTE:

Only installed drives are shown in the list.

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

 Hard Disk Drives                               Specifies the boot
 ───────────────────────────────────────        sequence from the
 1st Drive                    [Hard Drive 1]     available devices.
 2nd Drive                    [Hard Drive 2]
 3rd Drive                    [Hard Drive 3]




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


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```

BIOS Menu 18: Hard Disk Drives
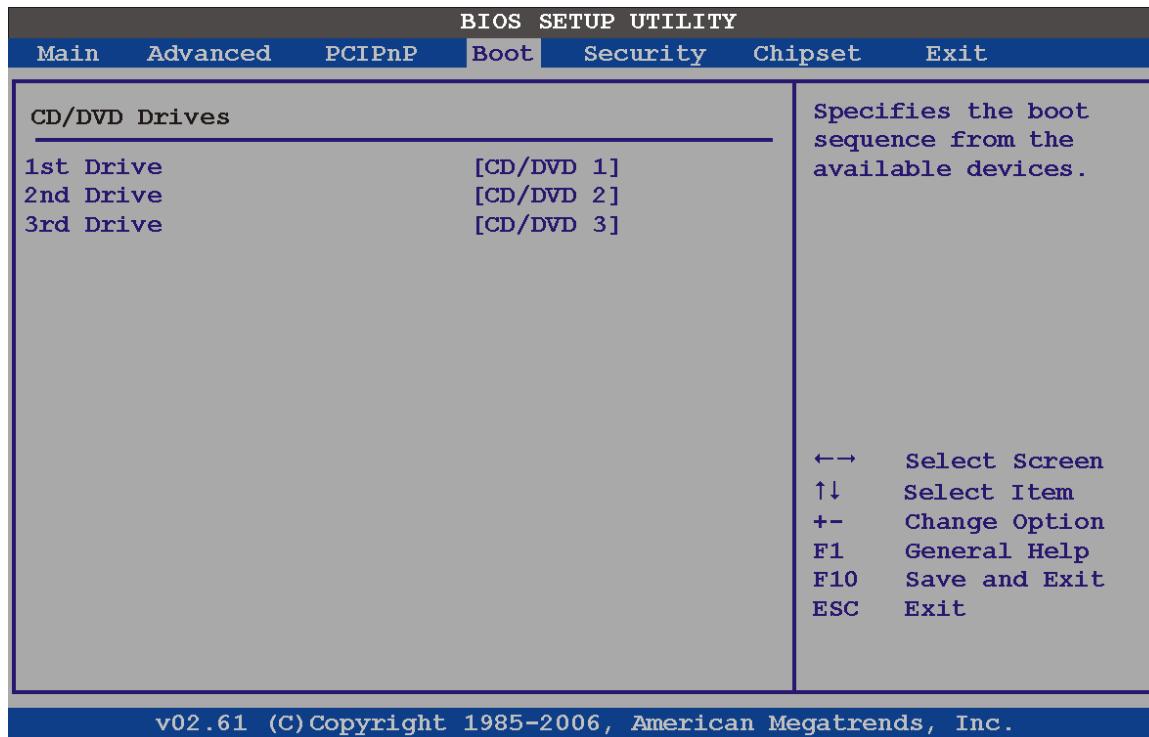
6.5.4 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive
- 3rd Drive

NOTE:

Only installed CD and DVD drives are shown in the list

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

 CD/DVD Drives                                    Specifies the boot
                                                  sequence from the
 1st Drive                    [CD/DVD 1]          available devices.
 2nd Drive                    [CD/DVD 2]
 3rd Drive                    [CD/DVD 3]




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


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```

BIOS Menu 19: CD/DVD Drives

6.5.5 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 20**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive

  NOTE:

  Only installed removable drives are shown in the list. This menu does
  not show if there are no removable drives.

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

  Removable Drives                              Specifies the boot
  ─────────────────────────────                sequence from the
                                                available devices.
  1st Drive                  [Removable Drive 1]
  2nd Drive                  [Removable Drive 2]
  3rd Drive                  [Removable Drive 3]




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


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```
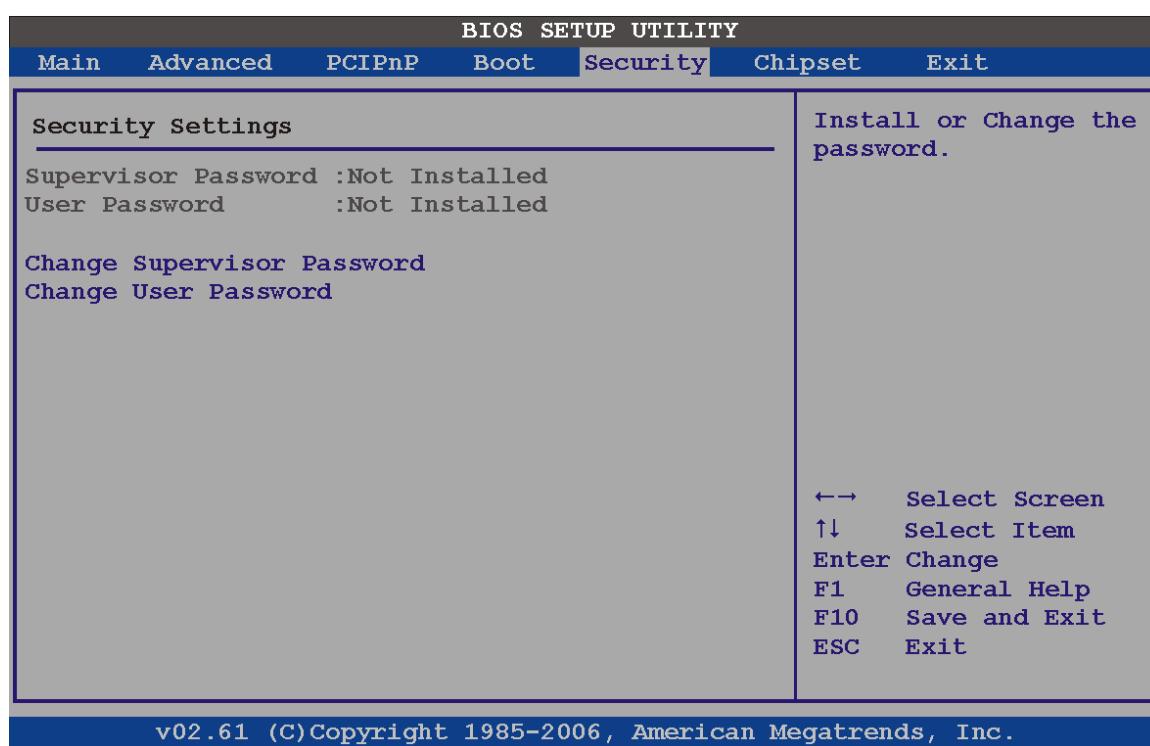
  BIOS Menu 20: Removable Drives

6.6 Security

Use the Security menu (**BIOS Menu 21**) to set system and user passwords.

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

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

    Change Supervisor Password
    Change User Password


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

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```

BIOS Menu 21: 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**.

6.7 Chipset
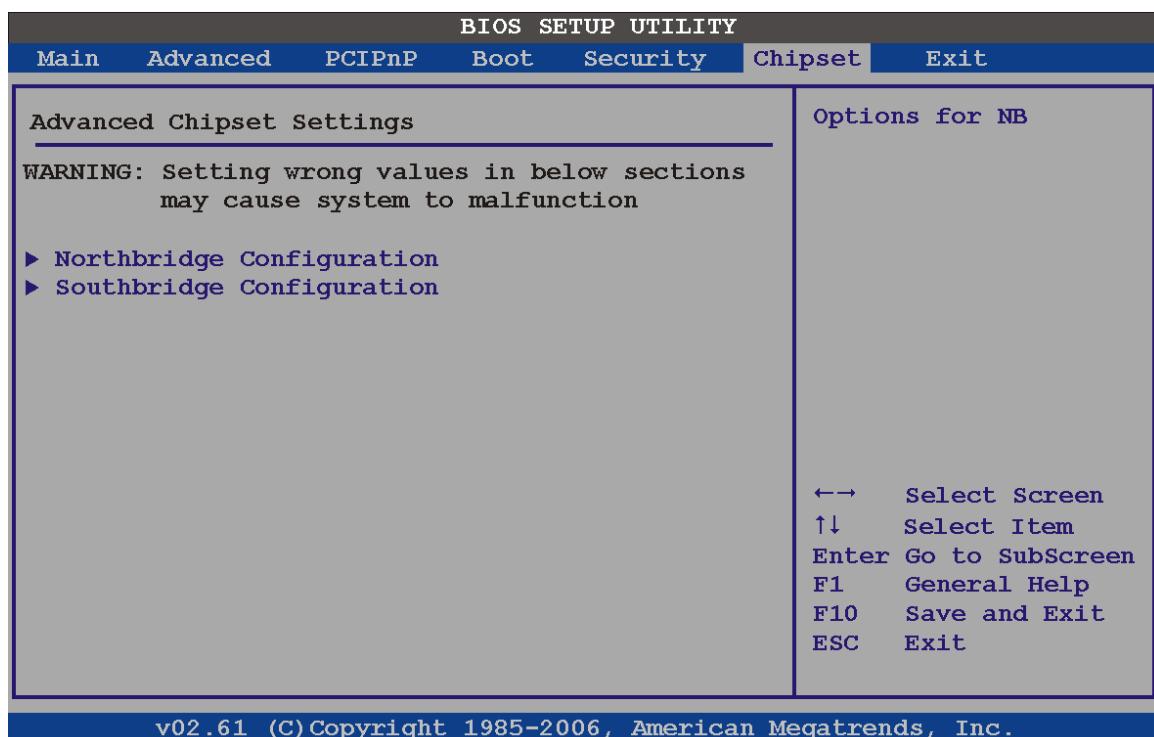
Use the **Chipset** menu (**BIOS Menu 22**) to access the Northbridge and Southbridge configuration menus

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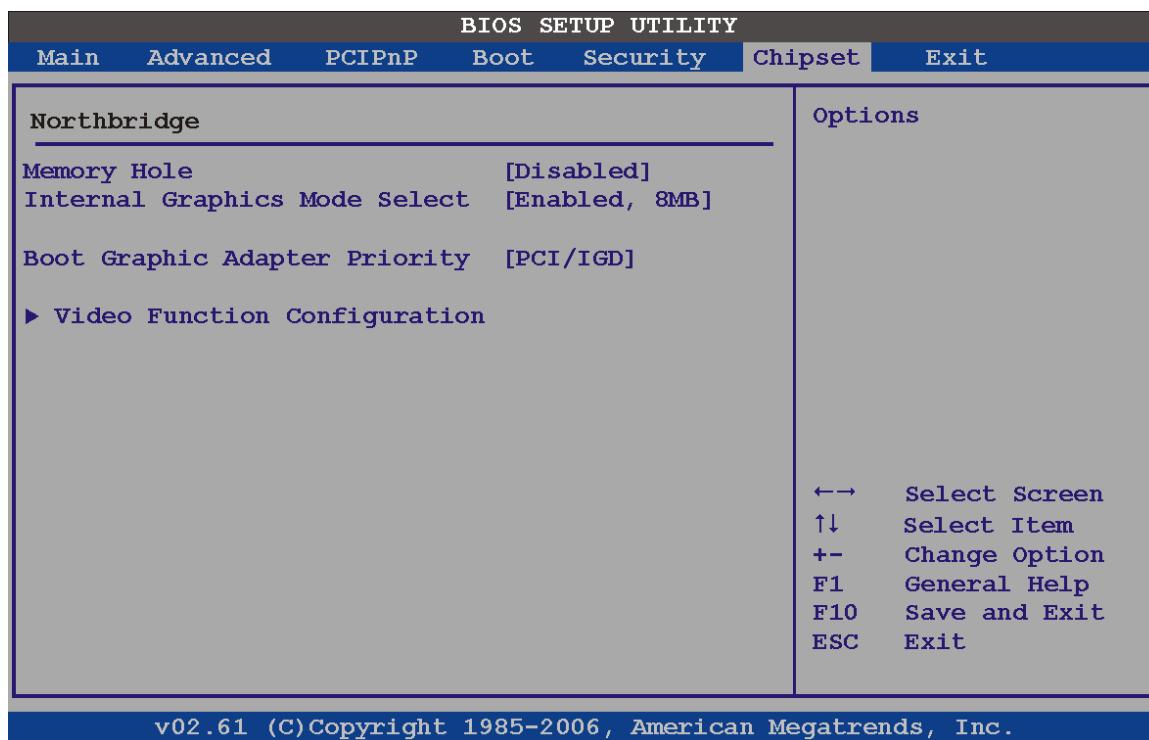
Setting the wrong values for the Chipset BIOS selections in the Chipset
BIOS menu may cause the system to malfunction.

```
                        BIOS SETUP UTILITY
  Main    Advanced    PCIPnP    Boot    Security   Chipset    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 SubScreen
                                              F1    General Help
                                              F10   Save and Exit
                                              ESC   Exit

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```

BIOS Menu 22: Chipset

6.7.1 Northbridge Chipset Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 22**) to configure the Northbridge chipset settings.

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

   Northbridge                                   Options

   Memory Hole                    [Disabled]
   Internal Graphics Mode Select  [Enabled, 8MB]

   Boot Graphic Adapter Priority  [PCI/IGD]

   ▶ Video Function Configuration


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


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```

BIOS Menu 23: Northbridge Chipset Configuration

Memory Hole [Disabled]

The **Memory Hole** reserves the memory space between 15 MB and 16 MB 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

➔ **Enabled**   Memory is reserved for ISA expansion cards

Internal Graphics Mode Select [Enable, 8 MB]

The **Internal Graphic Mode Select** option determines the amount of system memory that can be used by the Internal graphics device.

➔ **Disable**

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

➔ **Enable, 8 MB**   DEFAULT   8 MB of memory used by internal graphics device
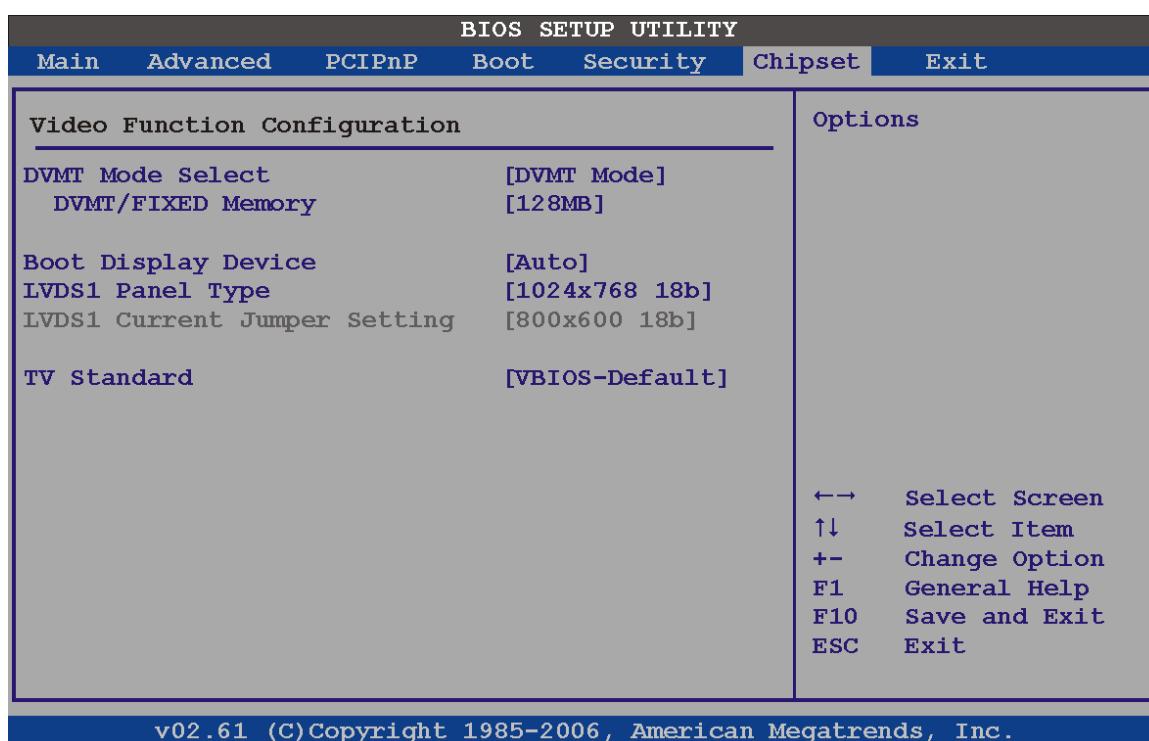
Boot Graphic Adapter Priority [PCI/IGD]

The **Boot Graphic Adapter Priority** setting determines the priority of the attached graphics devices.

➔ **IGD**   Only the internal graphics devices are checked, these include VGA, LVDS, TV and SDVO.

➔ **PCI/IGD**   DEFAULT   Graphics cards connected to the PCI expansion card slots on the backplane are checked first for graphics cards. Next, the internal devices, mentioned above, are checked.

6.7.1.1 Video Function Configuration

Use the **Video Function Configuration** menu to configure the video device connected to the system.

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

 Video Function Configuration                  Options

DVMT Mode Select                [DVMT Mode]
  DVMT/FIXED Memory             [128MB]

Boot Display Device             [Auto]
LVDS1 Panel Type                [1024x768 18b]
LVDS1 Current Jumper Setting    [800x600 18b]

TV Standard                     [VBIOS-Default]


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

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```

BIOS Menu 24: Video Function Configuration

DVMT Mode Select [DVMT Mode]

Use the **DVMT Mode Select** option to select the Intel Dynamic Video Memory Technology (DVMT) operating mode.

➔ **Fixed Mode**   A fixed portion of graphics memory is reserved as graphics memory.

➔ **DVMT Mode** DEFAULT   Graphics memory is dynamically allocated according to the system and graphics needs.

➔ **Combo Mode**　　　A fixed portion of graphics memory is reserved as graphics memory. If more memory is needed, graphics memory is dynamically allocated according to the system and graphics needs.

DVMT/FIXED Memory

Use the **DVMT/FIXED Memory** option to specify the maximum amount of memory that can be allocated as graphics memory. This option can only be configured for if **DVMT Mode** or **Fixed Mode** is selected in the **DVMT Mode Select** option. If **Combo Mode** is selected, the maximum amount of graphics memory is 128 MB. Configuration options are listed below.

- 64 MB
- 128 MB　　　**DEFAULT**
- Maximum DVMT

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
- TV
- EFP
- LFP

LVDS1 Panel Type

Use the **LVDS Panel Type** to determine the LCD panel resolution. Configuration options are listed below:

- 640 x 480 18-bit
- 800 x 480 18-bit
- 800 x 600 18-bit
- 1024 x 768 18-bit　　Default

- 1280 x 1024 36-bit
- 1400 x 1050 36-bit
- 1440 x 900 36-bit
- 1600 x 1200 36-bit
- by H/W

LCD Current Jumper Setting

Use the **LCD Current Jumper Setting** shows the current setting of the screen resolution jumper.

TV Standard
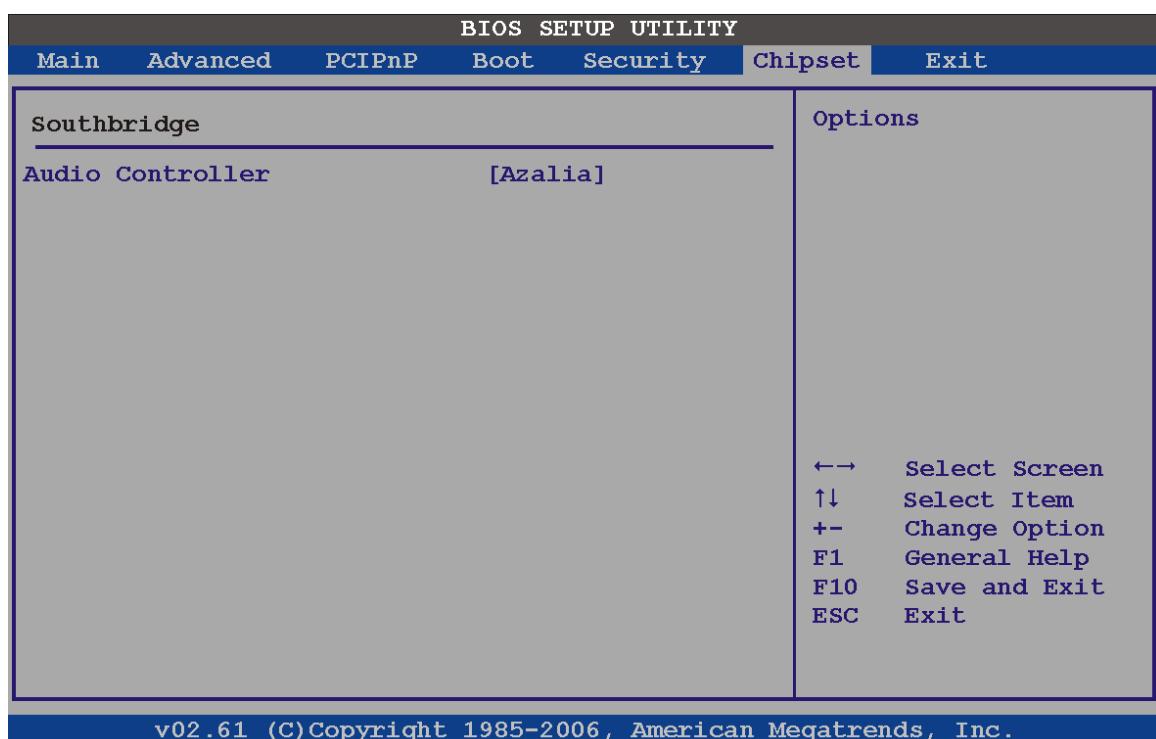
The **TV Standard** option specifies the TV type connected to the system.

- VBIOS   Default
- NTSC
- PAL
- SECAM
- SMPTE240M
- ITU-R television
- SMPTE295M
- SMPTE296M
- EIA-770.2
- EIA-770.3

6.7.2 Southbridge Configuration

The **Southbridge Configuration** menu (**BIOS Menu 25**) allows the Southbridge chipset to be configured.

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

 Southbridge                                       Options

 Audio Controller              [Azalia]




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


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```

BIOS Menu 25: Southbridge Chipset Configuration
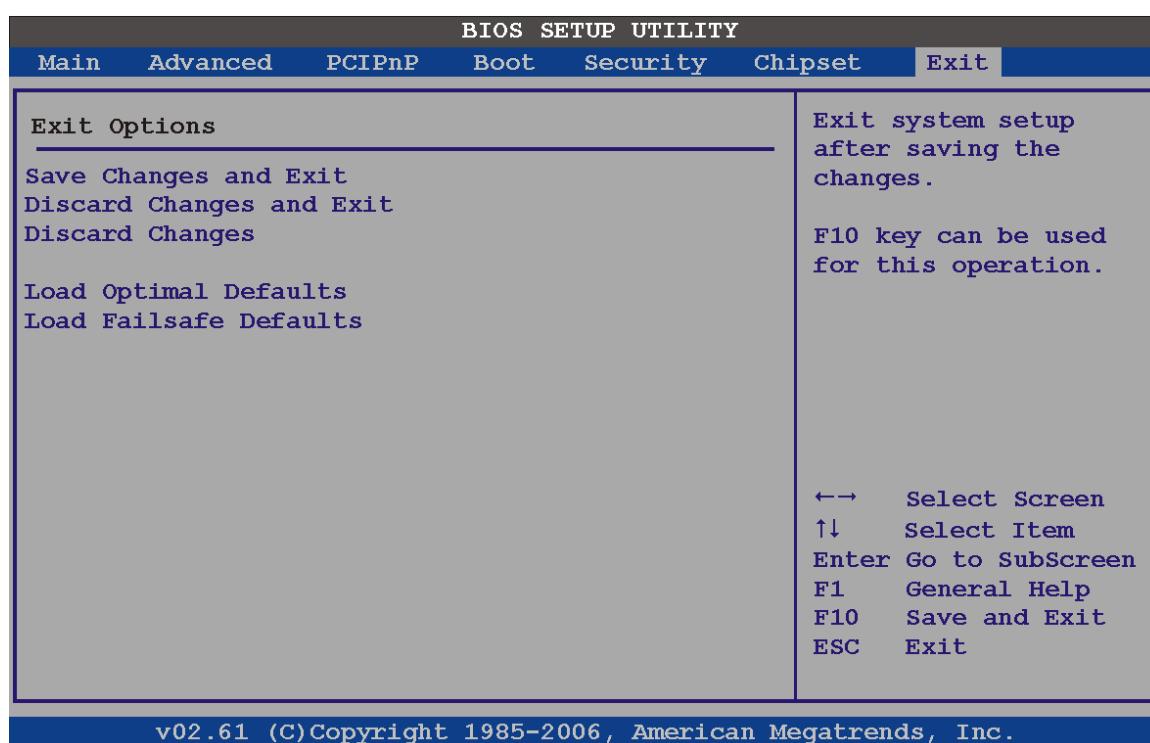
Audio Controller [All Disabled]

The **Audio Controller** option enables or disables the audio controller.

➔   **Azalia**   DEFAULT   High Definition Audio is enabled

➔   **AC'97 Audio Only**   AC'97 audio is enabled

➔   **All Disabled**   Audio is disabled

6.8 Exit

Use the **Exit** menu (**BIOS Menu 26**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```
                          BIOS SETUP UTILITY
   Main    Advanced    PCIPnP    Boot    Security    Chipset    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 SubScreen
                                               F1    General Help
                                               F10   Save and Exit
                                               ESC   Exit

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```

BIOS Menu 26: Exit

Save Changes and Exit

Use the **Save Changes and Exit** option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

Discard Changes and Exit

Use the **Discard Changes and Exit** option to exit the BIOS configuration setup program without saving the changes made to the system.

Discard Changes

Use the **Discard Changes** option to discard the changes and remain in the BIOS configuration setup program.

Load Optimal Defaults

Use the **Load Optimal Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F9 key can be used for this operation.**

Load Failsafe Defaults

Use the **Load Failsafe Defaults** option to load failsafe default values for each of the parameters on the Setup menus. **F8 key can be used for this operation.**

Chapter

7

Software Installation

7.1 Available Software Drivers

⚠️ **NOTE:**

The content 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 following drivers can be installed on the system:

Installation instructions are given below.

7.2 Starting the Driver Program

To access the driver installation programs, please do the following.

Step 1: Insert the CD-ROM that came with the system into a CD-ROM drive attached to
the system.

Step 2: The screen in **Figure 7-1** appears.

Figure 7-1: Start Up Screen

Step 3: Click **ICE-945GSE**.

Step 4: The screen in **Figure 7-2** appears.

Figure 7-2: Select Operating System

Step 5: Select the operating system installed on the ICE-945GSE system. This manual describes the installation for a **Windows XP** operating system.

Step 6: The list of drivers in **Figure 7-3** appears.
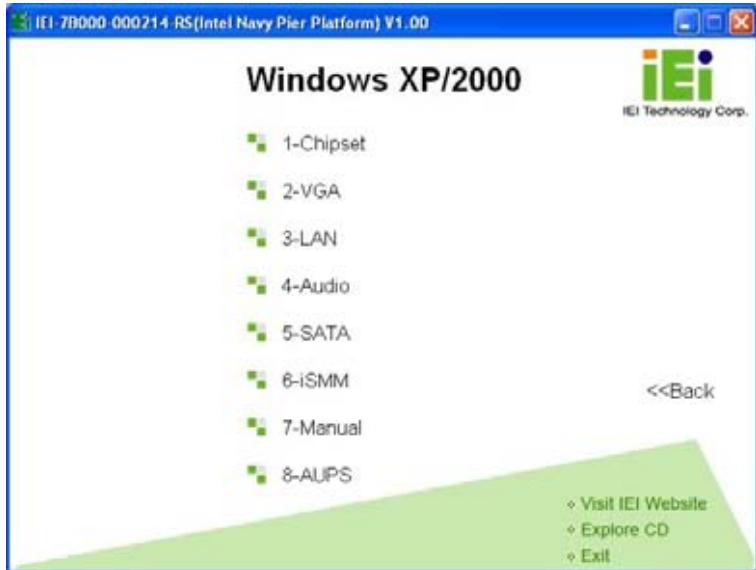
Figure 7-3: Drivers

7.3 Chipset Driver Installation

To install the chipset driver, please do the following.

Step 7: Access the driver list shown in **Figure 7-3**. (See **Section 7.2**)

Step 8: Click "**1-Chipset Driver**"

Step 9: When the setup files are completely extracted the **Welcome Screen** in

Figure 7-4 appears.

Figure 7-4: Chipset Driver Welcome Screen

Step 10: Click **Next** to continue.

Step 11: The license agreement in **Figure 7-5** appears.

Figure 7-5: Chipset Driver License Agreement

Step 12: Read the **License Agreement**.

Step 13: Click the Yes button to accept the license agreement and continue.

Step 14: The Read Me file in **Figure 7-6** appears.

Figure 7-6: Chipset Driver Read Me File

Step 15: Click Next to continue.

Step 16: **Setup Operations** are performed as shown in **Figure 7-7**.

Figure 7-7: Chipset Driver Setup Operations

Step 17: Once the **Setup Operations** are complete, click the NEXT icon to continue.

Step 18: The **Finish** screen appears.

Figure 7-8: Chipset Driver Installation Finish Screen

Step 19: Select "**Yes, I want to restart the computer now**" and click the **Finish** icon.

See **Figure 7-8**.

7.4 VGA Driver Installation

To install the VGA driver, please do the following.

Step 20: Access the driver list shown in **Figure 7-3**. (See **Section 7.2**)

Step 21: Click "**2-VGA**"

Step 22: The VGA Read Me file in **Figure 7-9** appears.
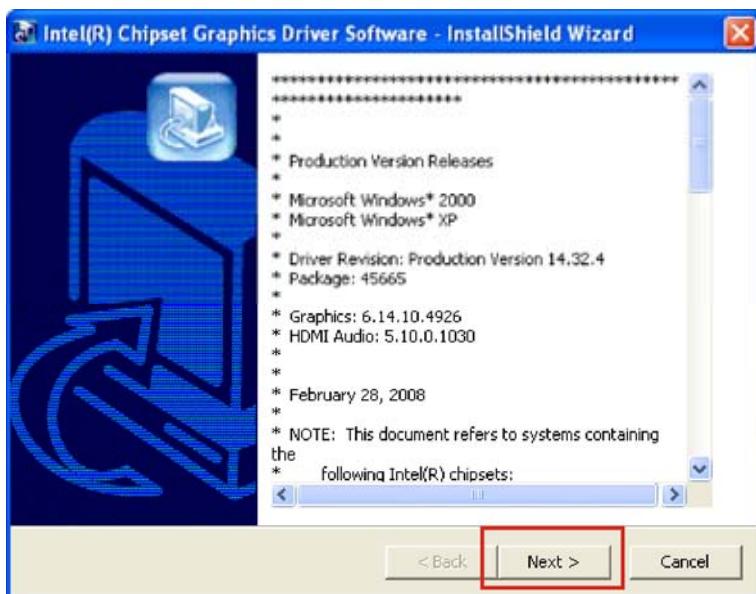
Figure 7-9: VGA Driver Read Me File

Step 23: Click NEXT to continue.

Step 24: The installation files are extracted. See **Figure 7-10**.
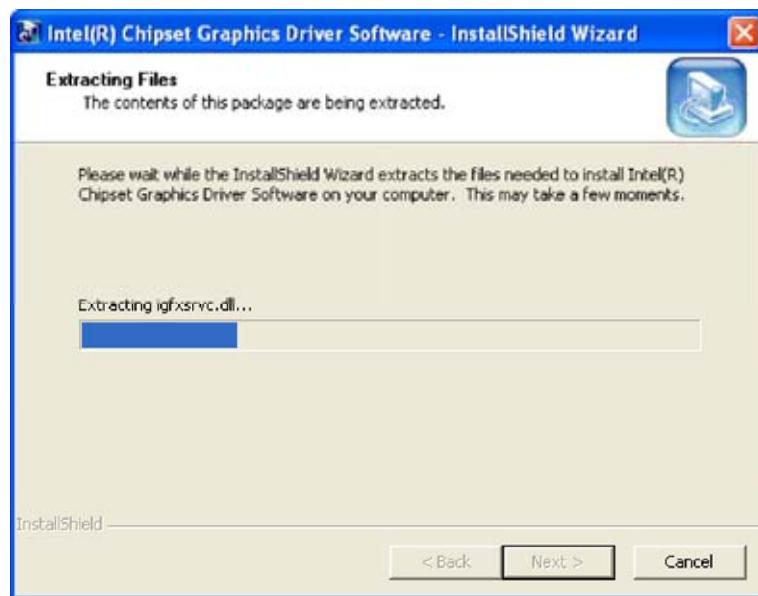
Figure 7-10: VGA Driver Setup Files Extracted

Step 25: The **Welcome Screen** in **Figure 7-11** appears.

Figure 7-11: VGA Driver Welcome Screen

Step 26: Click NEXT to continue.

Step 27: The license agreement in **Figure 7-12** appears.
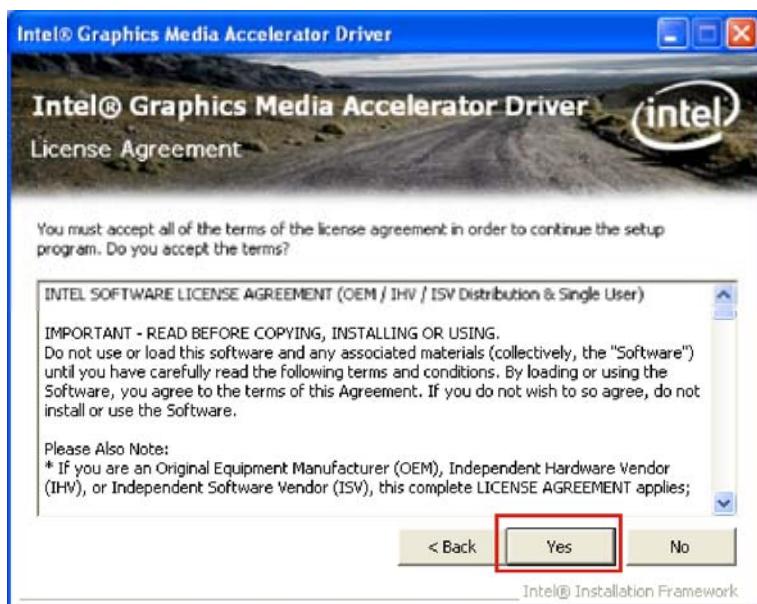
Figure 7-12: VGA Driver License Agreement

Step 28: Read the **License Agreement**.

Step 29: Click **YES** to accept the license agreement and continue.

Step 30: The Readme file in **Figure 7-13** appears.
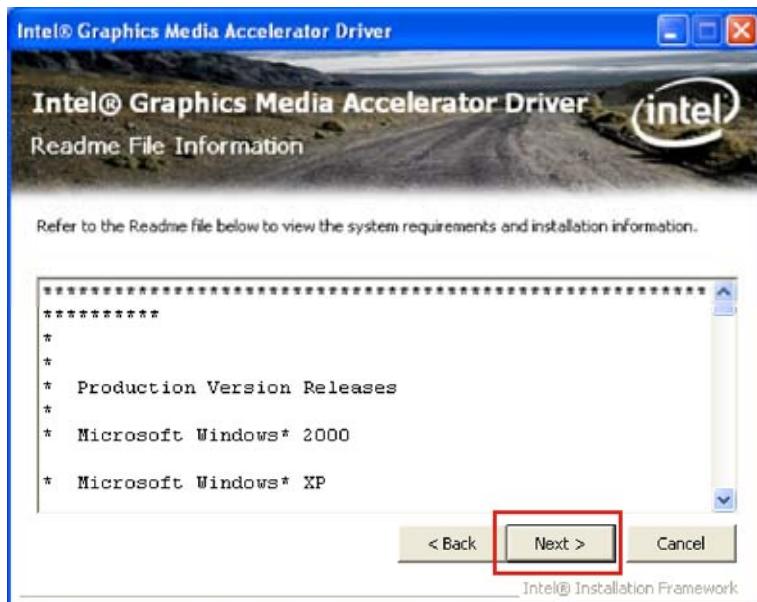
Figure 7-13: VGA Driver Read Me File

Step 31: Click NEXT to continue.

Step 32: **Setup Operations** are performed as shown in **Figure 7-14**.

NOTE:

The "Found New Hardware Wizard" will appear and then disappear during this step. Do not adjust any settings in the "Found New Hardware Wizard" window.

Figure 7-14: VGA Driver Setup Operations

Step 33: Once the **Setup Operations** are complete, click NEXT to continue.

Step 34: The **Finish** screen appears.

Figure 7-15: VGA Driver Installation Finish Screen

Step 35: Select "**Yes, I want to restart the computer now**" and click FINISH. See

Figure 7-15.

7.5 LAN Driver Installation

To install the chipset driver, please do the following.

Step 36: Access the driver list shown in **Figure 7-3**. (See **Section 7.2**)

Step 37: Click "**3-LAN**"

Step 38: The **Welcome** screen in **Figure 7-16** appears.
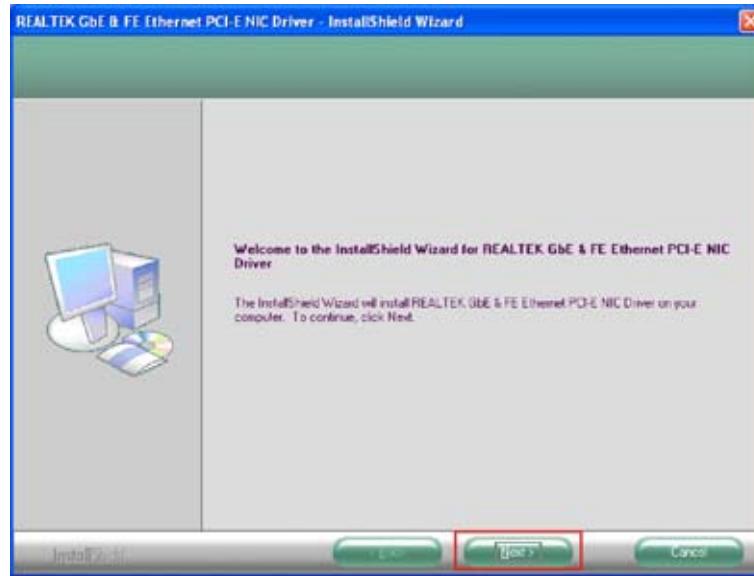
Figure 7-16: LAN Driver Welcome Screen

Step 39: Click NEXT to continue.

Step 40: The **Ready to Install** screen in **Figure 7-17** appears.
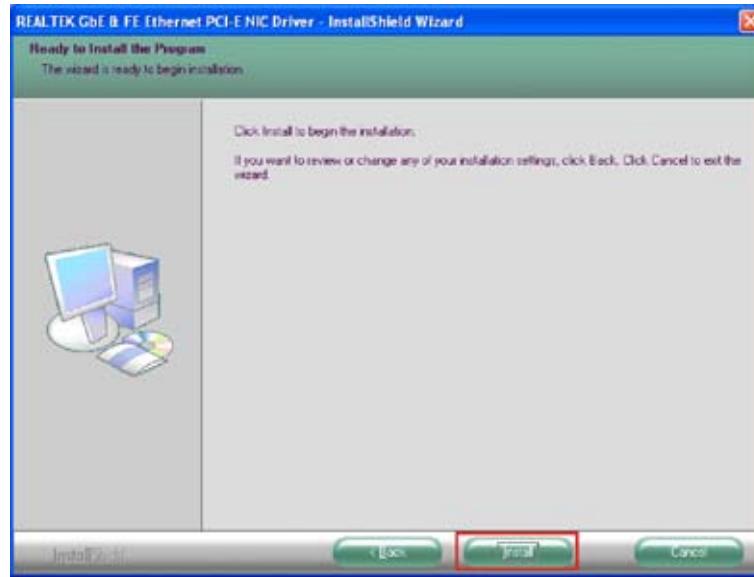
Figure 7-17: LAN Driver Welcome Screen

Step 41: Click NEXT to proceed with the installation.

Step 42: The program begins to install.

Step 43: The installation progress can be monitored in the progress bar shown in

Figure 7-18.
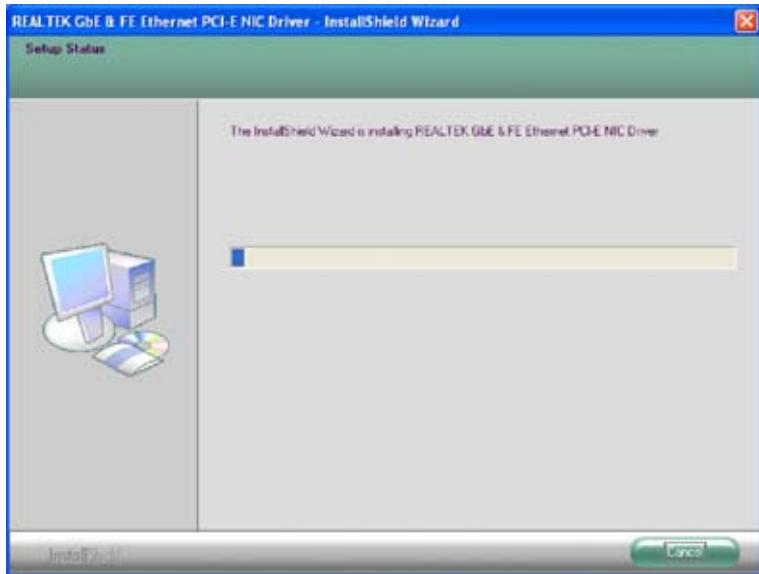
Figure 7-18: LAN Driver Installation

Step 44: When the driver installation is complete, the screen in **Figure 7-19** appears.
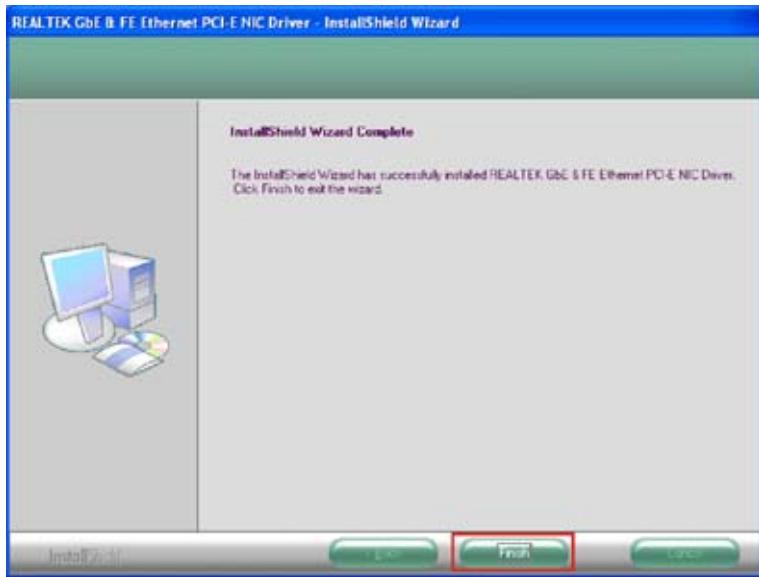
Figure 7-19: LAN Driver Installation Complete

Step 45: Click **FINISH** to exit the InstallShield Wizard (**Figure 7-19**).

7.6 Audio Driver Installation

There is no audio driver on the ICE-945GSE. To add audio capabilities to the ICE-945GSE, connect a HD Audio kit or AC'97 audio kit available from IEI. Follow the installation applicable to the installed audio kit.

7.6.1 AC'97 Driver Installation

To install the chipset driver, please do the following.

Step 46: Access the driver list shown in **Figure 7-3**. (See **Section 7.2**)

Step 47: Click "**4-Audio**"
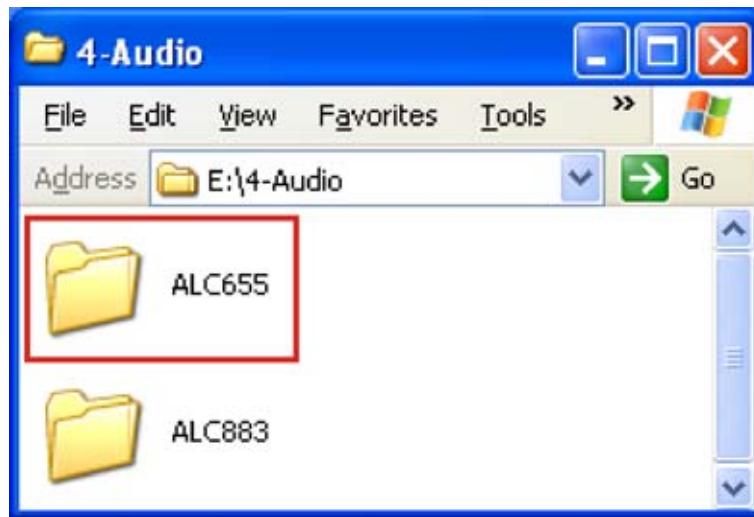
Figure 7-20: AC'97 Audio

Step 48: Browse to "**E:\4-Audio\ALC665\Windows\Windows 98Gold, 98se, Me, 2000,**

XP, 2003(32,64 bits)\A3.84" **Figure 7-21**
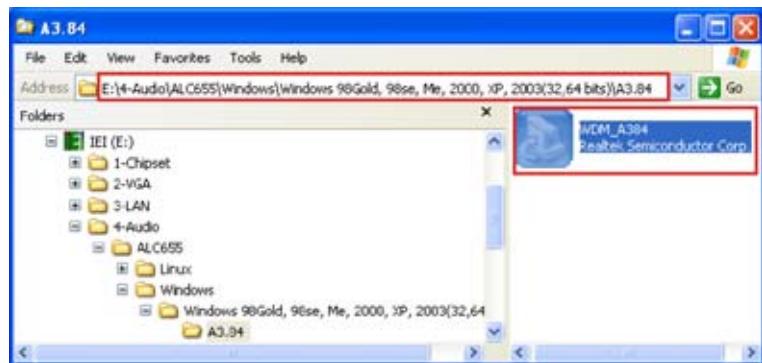
Figure 7-21: AC'97 Audio Driver Options

Step 49: Double-click the installation file in **Figure 7-21**.

Step 50: The AC'97 Driver Installation screen in **Figure 7-22** appears.
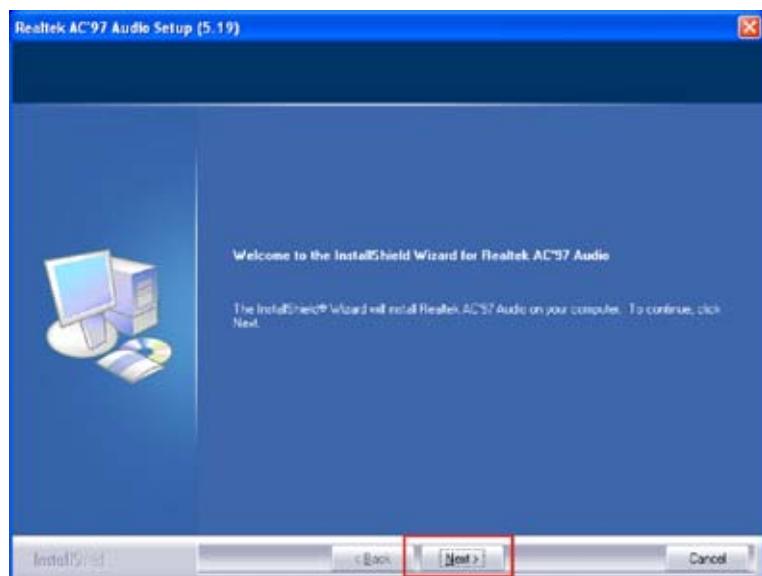
Figure 7-22: AC'97 Driver Installation Welcome Screen

Step 51: Click NEXT to continue.

Step 52: The Verification window in **Figure 7-23** may appear.

Figure 7-23: AC'97 Driver Installation Verification

Step 53: Click CONTINUE ANYWAY.

Step 54: When the driver is installed, the driver installation finish screen in **Figure 7-24** appears.
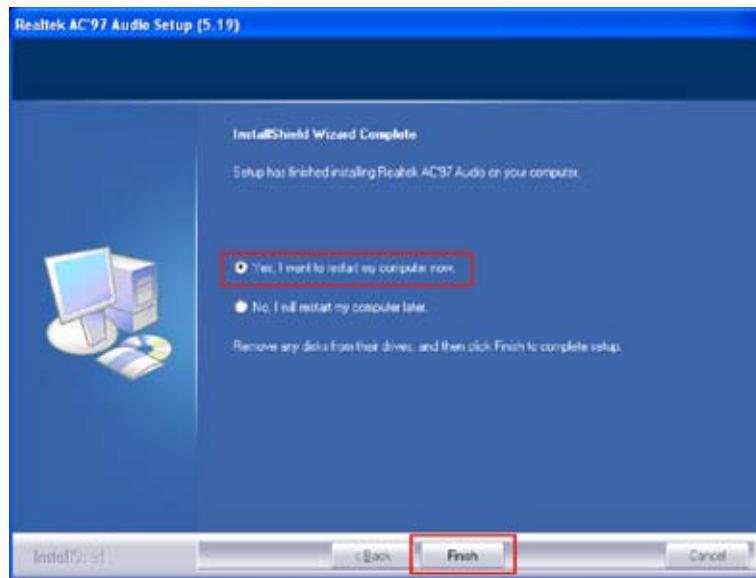
Figure 7-24: AC'97 Driver Installation Complete

Step 55: Select "**Yes, I wish to restart my computer now**" And click FINISH to exit the

InstallShield Wizard and restart the computer.

7.6.2 HD Audio Driver Installation

To install the chipset driver, please do the following.

Step 56: Access the driver list shown in **Figure 7-3**. (See **Section 7.2**)

Step 57: Click "**4-Audio**"

Figure 7-25: HD Audio

Step 58: Browse to "**E:\4-Audio\ALC883\Windows\Windows 2000, XP, 2003(32,64**

bits)" **Figure 7-26**
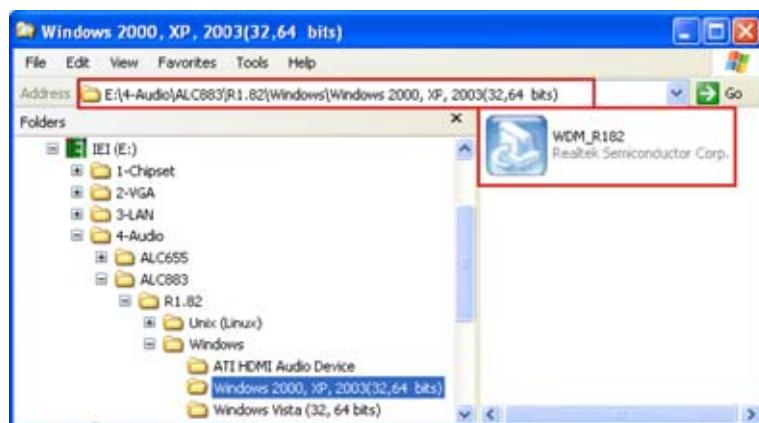
Figure 7-26: HD Audio Driver Options

Step 59: Double-click the installation file in **Figure 7-26**.

Step 60: The AC'97 Driver Installation screen in **Figure 7-27** appears.
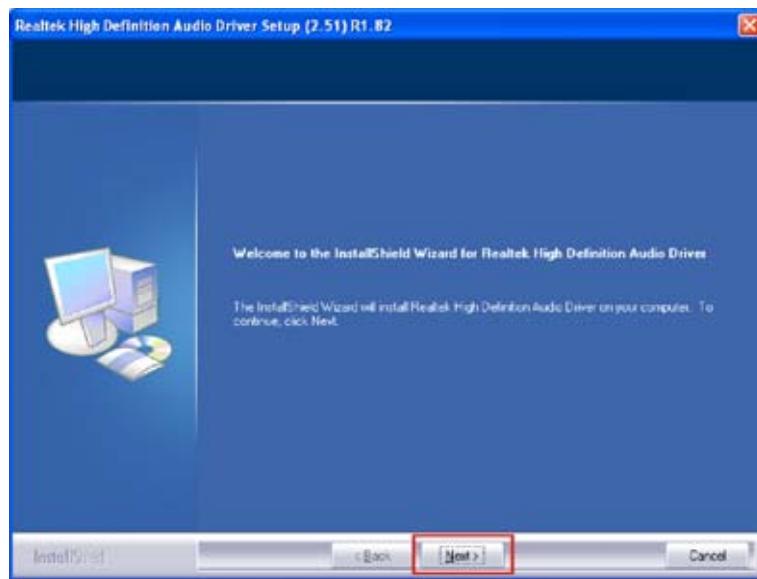
Figure 7-27: HD Audio Driver Installation Welcome Screen

Step 61: Click **NEXT** to continue.

Step 62: When the driver is installed, the driver installation finish screen in **Figure 7-28** appears.
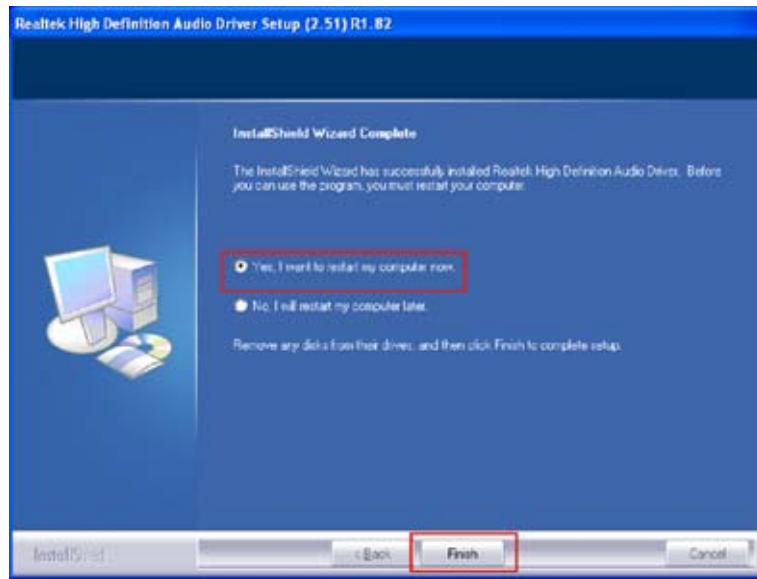
Figure 7-28: HD Audio Driver Installation Complete

Step 63: Select "**Yes, I wish to restart my computer now**" And click FINISH to exit the

InstallShield Wizard and restart the computer.

7.7 iSMM Installation

The iSMM (Intelligent System Management Module) allows hardware functions to be monitored from within the operating system. The iSMM can be set to sound an alarm when voltages, temperatures or fan speeds rise above or fall below the set limits.

Step 64: Access the driver list shown in **Figure 7-3**. (See **Section 7.2**)

Step 65: Click "**6-iSMM**"

Step 66: The iSMM directory appears. (**Figure 7-29**)
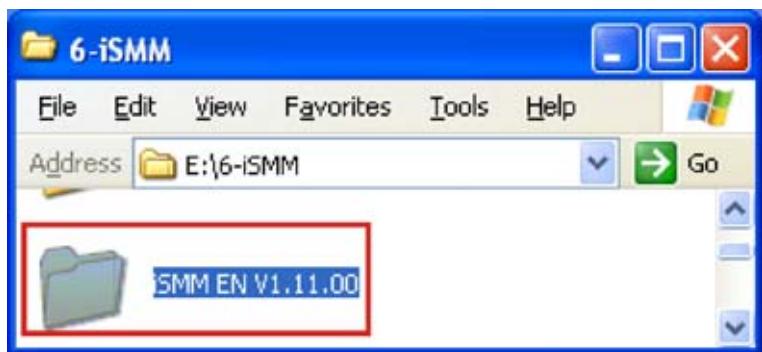
Figure 7-29: iSMM Directory

Step 67: Double click the **iSMM EN V1.11.00** directory icon. (**Figure 7-29**)

Step 68: The contents of the directory are displayed. (**Figure 7-30**)
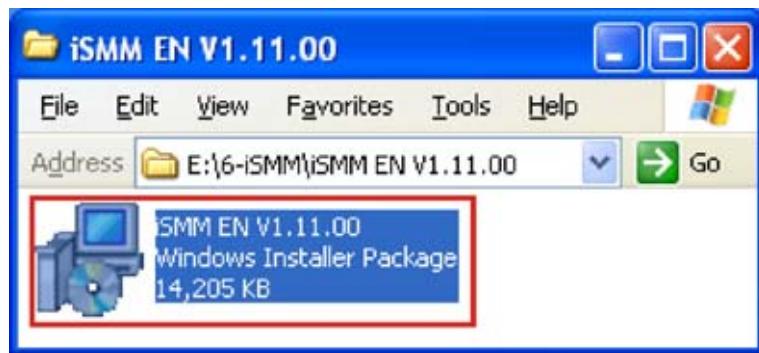
Figure 7-30: iSMM Installation File

Step 69: Double click the **iSMM EN V1.11.00** setup file. (**Figure 7-30**)

Step 70: The **iSMM InstallShield Welcome Screen** appears. (**Figure 7-31**)
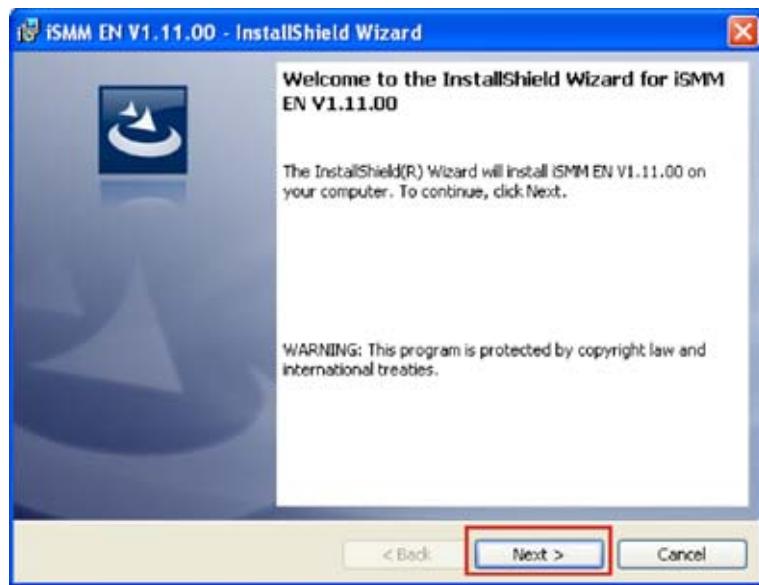
Figure 7-31: iSMM InstallShield Welcome Screen

Step 71: Click N<small>EXT</small> to continue.

Step 72: The **License Agreement** screen appears. (**Figure 7-32**)
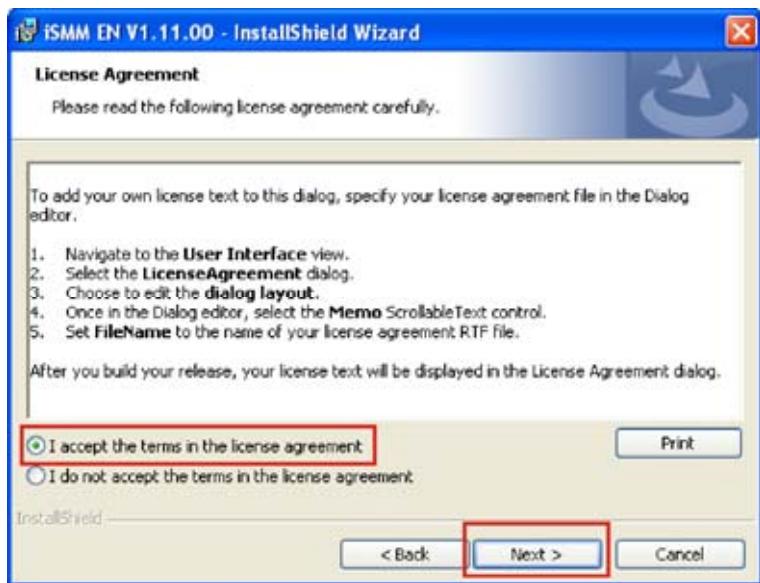
Figure 7-32: iSMM License Agreement

Step 73: Select "**I accept the terms of the license agreement.**" (**Figure 7-32**)

Step 74: Click NEXT to continue.(**Figure 7-32**)

Step 75: The **Customer Information** screen appears.(**Figure 7-33**)
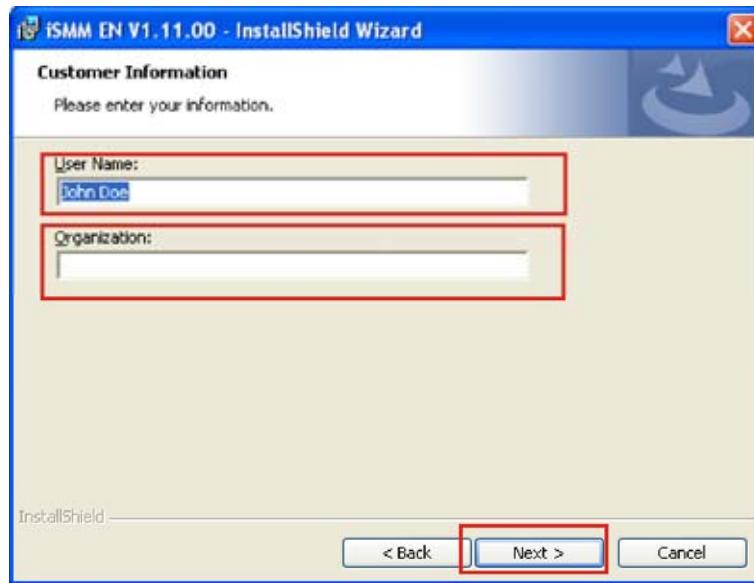
Figure 7-33: iSMM Customer Information

Step 76: Fill in the "User Name" and "Organization" fields, which will be automatically

filled with the settings for the current user.(**Figure 7-33**)

Step 77: Click **Next** to continue.(**Figure 7-33**)

Step 78: The **Setup Type** screen appears. (**Figure 7-34**)

Figure 7-34: iSMM Setup Type

Step 79: Select "**Complete**" (**Figure 7-34**)

Step 80: Click NEXT to continue. (**Figure 7-34**)

Step 81: The **Installation Confirmation** screen appears. (**Figure 7-35**)
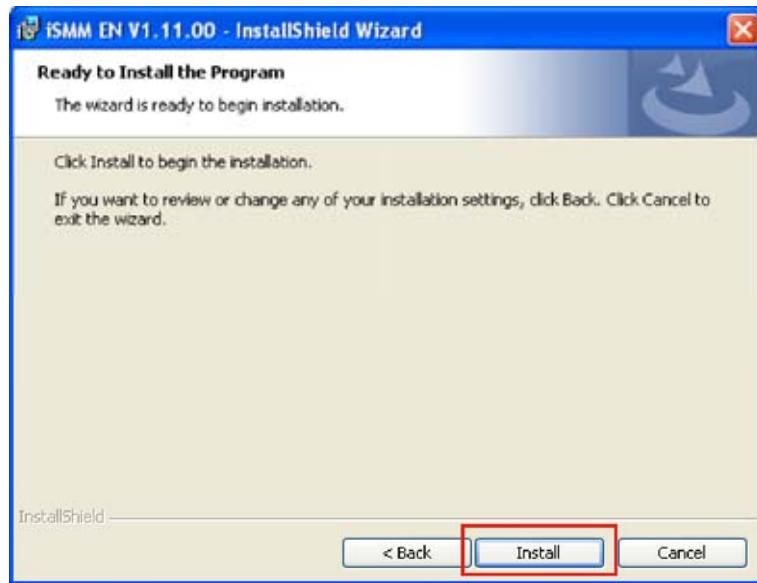
Figure 7-35: iSMM Installation Confirmation

Step 82: Click INSTALL to begin installing the drivers. (**Figure 7-35**)

Step 83: The InstallShield Wizard Completed appears when the drivers are finished

installing. (**Figure 7-36**)

Figure 7-36: iSMM InstallShield Wizard Complete

Step 84: Click FINISH to exit the installation program.(**Figure 7-36**)

Step 85: The **Restart Confirmation** screen appears.(**Figure 7-37**)
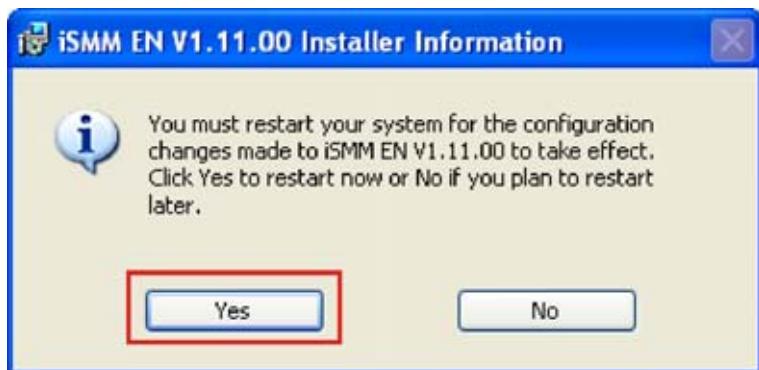
Figure 7-37: iSMM Restart Confirmation

Step 86: Select YES to restart the system, or NO to restart the system manually later.

Appendix

A

BIOS Options

Below is a list of BIOS configuration options in the BIOS chapter.

Appendix

B

Terminology

AC '97	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
ACPI	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
AHCI	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
ATA	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
ARMD	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
ASKIR	Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.
BIOS	The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user
CODEC	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
CompactFlash®	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

DMA Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.

DIMM Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.

DIO The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.

EHCI The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.

EIDE Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MB/s and 16.6 MB/s.

EIST Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.

FSB The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.

GbE Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gb/s and complies with the IEEE 802.3-2005 standard.

GPIO General purpose input

HDD Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.

ICH The Input/Ouput Controll Hub (ICH) is an Intel® Southbridge chipset.

IrDA Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.

L1 Cache The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.

L2 Cache The Level 2 Cache (L2 Cache) is an external processor memory cache.

LCD	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.
LVDS	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAM	Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.
SATA	Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gb/s and the SATA II bus has data transfer speeds of up to 3.0 Gb/s.
S.M.A.R.T	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
UART	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
UHCI	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
USB	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12 Mb/s data transfer rates and USB 2.0 supports 480 Mb/s data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

Watchdog Timer

  NOTE:

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited 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 EMIs 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 C-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. When 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 THE APPLICATION PROGRAM HERE

;

> CMP   EXIT_AP, 1   *;is the application over?*
> JNE   W_LOOP   *;No, restart the application*
>
> MOV   AX, 6F02H   *;disable Watchdog Timer*
> MOV   BL, 0   *;*
> INT   15H

;

; EXIT ;

Appendix

D

Address Mapping

D.1 Direct Memory Access (DMA)
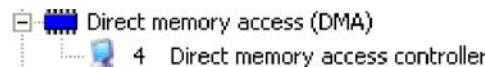
Figure D-1: Direct Memory Access (DMA)

D.2 Input/Output (IO)

Figure D-2: Input/Output (IO) (1 of 2)
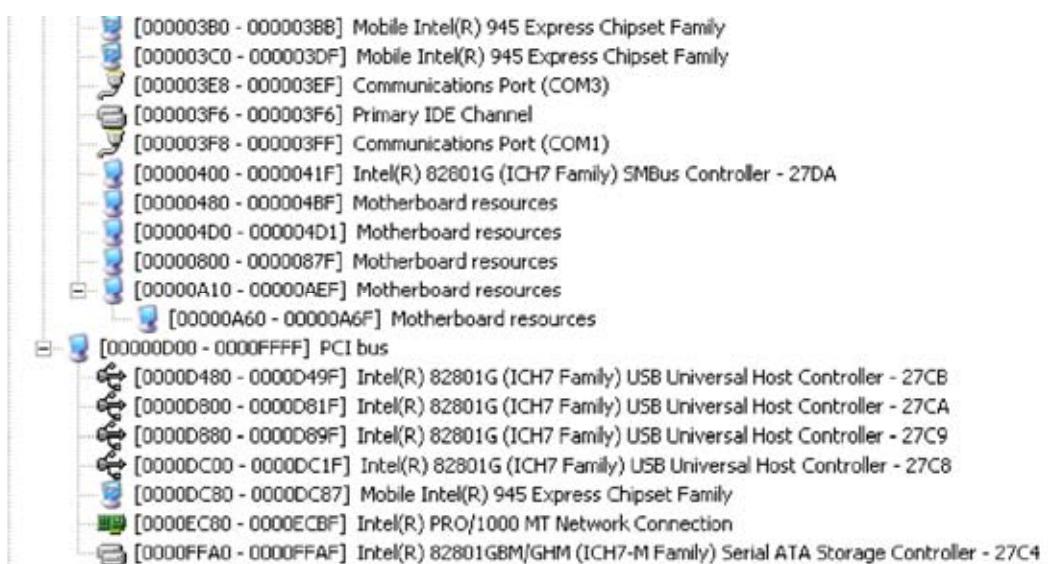
Figure D-3: Input/Output (IO) (2 of 2)

## D.3 Interrupt Request (IRQ)
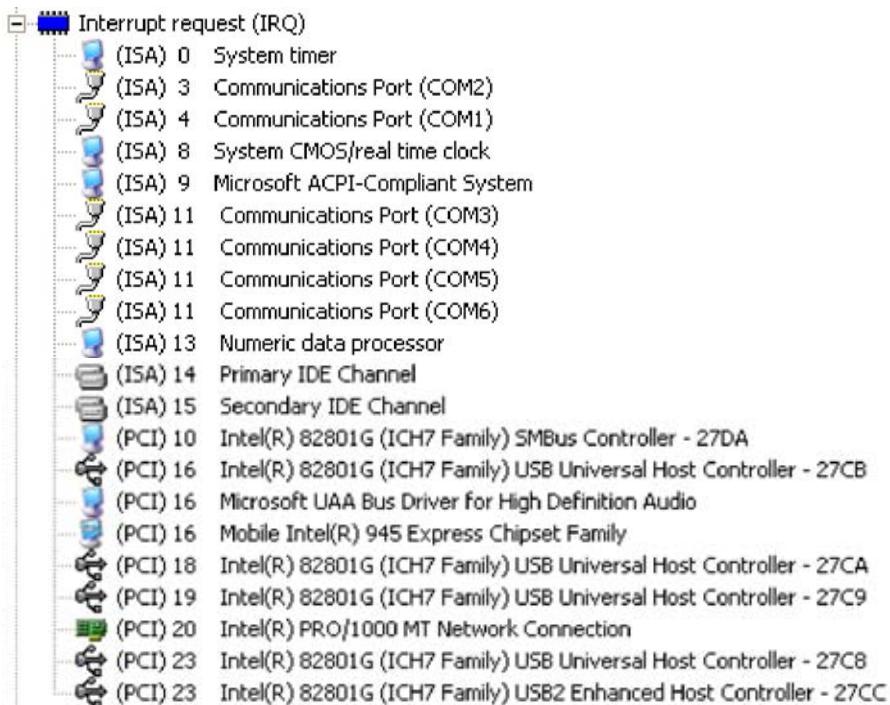
Figure D-4: Interrupt Request (IRQ)

D.4 Memory

Figure D-5: Memory

Appendix

E

Compatibility

NOTE:

> The compatible items described here have been tested by the IEI R&D team and found to be compatible with the ICE-945GSE

E.1 Compatible Operating Systems

The following operating systems have been successfully run on the ICE-945GSE.

- Microsoft® Windows Vista
- Microsoft® Windows XP (32-bit)
- Microsoft® Windows 2000
- Fedora 7

E.2 Compatible Processors

The following processors have been successfully tested on the ICE-945GSE

CPU	FSB	Frequency
Intel® ATOM™ N270	533 MHz	1.6 GHz

Table E-1: Compatible Processors

E.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the ICE-945GSE other memory modules that comply with the specifications may also work on the ICE-945GSE but have not been tested.

The following memory modules have been successfully tested on the ICE-945GSE.

Manufacturer	Capacity	Speed	Type
Transcend	2.0 GB	667 MHz	DDR2

Table E-2: Compatible Memory Modules

F

Hazardous Materials Disclosure

F.1 Hazardous Materials Disclosure Table for IPB Products Certified as RoHS Compliant Under 2002/95/EC Without Mercury

The details provided in this appendix are to ensure that the product is compliant with the Peoples Republic of China (China) RoHS standards. The table below acknowledges the presences of small quantities of certain materials in the product, and is applicable to China RoHS only.

A label will be placed on each product to indicate the estimated "Environmentally Friendly Use Period" (EFUP). This is an estimate of the number of years that these substances would "not leak out or undergo abrupt change." This product may contain replaceable sub-assemblies/components which have a shorter EFUP such as batteries and lamps. These components will be separately marked.

Please refer to the table on the next page.

Part Name	Toxic or Hazardous Substances and Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (CR(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
Housing	X	O	O	O	O	X
Display	X	O	O	O	O	X
Printed Circuit Board	X	O	O	O	O	X
Metal Fasteners	X	O	O	O	O	O
Cable Assembly	X	O	O	O	O	X
Fan Assembly	X	O	O	O	O	X
Power Supply Assemblies	X	O	O	O	O	X
Battery	O	O	O	O	O	O

O: This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006

X: This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006

此附件旨在确保本产品符合中国 RoHS 标准。以下表格标示此产品中某有毒物质的含量符合中国 RoHS 标准规定的限量要求。

本产品上会附有"环境友好使用期限"的标签，此期限是估算这些物质"不会有泄漏或突变"的年限。本产品可能包含有较短的环境友好使用期限的可替换元件，像是电池或灯管，这些元件将会单独标示出来。

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O
O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。						