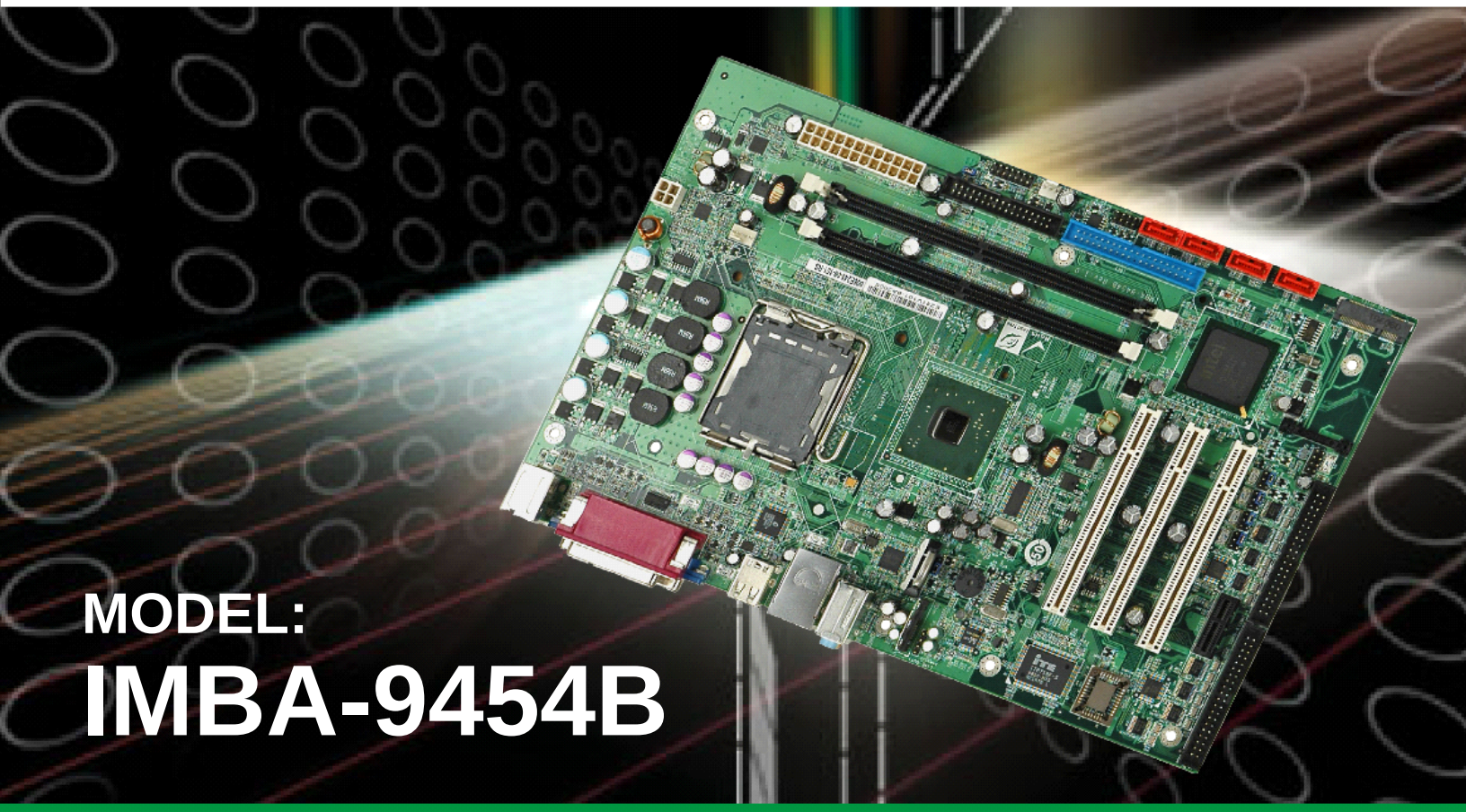
IEI Technology Corp.



MODEL:

IMBA-9454B

ATX Motherboard, Dual VGA, Eight RS-232 Serial Ports Supports Intel® Core™2 Duo, 4.0 GB DDR2, GbE, PCIe x1 PCIe Mini, 3x PCI and RoHS Compliant

User Manual

Rev. 1.00 – 4 February, 2009

RoHS Lead Free

Revision

Date	Version	Changes
4 February, 2009	1.00	Initial release

Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

TRADEMARKS

All registered trademarks and product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

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 IMBA-9454B 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 IMBA-9454B package.

- 1 x IMBA-9454B
- 2 x 4 port RS-232 cable
- 4 x SATA cable
- 1 x IDE cable
- 1 x I/O shielding
- 1 x Mini jumper pack
- 1 x Utility CD
- 1 x QIG (quick installation guide)

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

Table of Contents

1 INTRODUCTION 1

1.1 INTRODUCTION 2
1.2 FEATURES 2
1.3 OVERVIEW 2
1.4 PERIPHERAL CONNECTORS AND JUMPERS 3
1.5 TECHNICAL SPECIFICATIONS 4

2 DETAILED SPECIFICATIONS 7

2.1 OVERVIEW 8
2.2 DIMENSIONS 8
2.3 DATA FLOW 9
2.4 COMPATIBLE PROCESSORS 10
2.5 INTEL® 945G NORTHBRIDGE CHIPSET 10
2.5.1 Memory 10
2.5.2 VGA 10
2.6 INTEL® ICH7 SOUTHBRIDGE CHIPSET 11
2.6.1 Audio 11
2.6.2 IDE Interface 11
2.6.3 PCI Interface 11
2.6.4 Real Time Clock 11
2.6.5 SATA Controller 12
2.6.6 USB Controller 12
2.7 PCIE BUS COMPONENTS 12
2.7.1 PCIe Mini Card Slot 12
2.7.2 PCIe x1 Expansion Slot 12
2.7.3 Realtek PCIe 8111CP GbE Controller 12
2.8 PCI BUS COMPONENTS 13
2.8.1 PCI Expansion Card Slot 13
2.9 LPC BUS COMPONENTS 13
2.9.1 BIOS Chipset 13
2.9.2 Serial Port Chips 13

2.9.3 Super I/O *14*
2.9.3.1 Enhanced Hardware Monitor 14
2.9.3.2 Fan Speed Controller 14
2.9.3.3 Parallel Port 14
2.9.3.4 Keyboard and Mouse Controller 14
2.10 ENVIRONMENTAL AND POWER SPECIFICATIONS 14
2.10.1 System Monitoring *14*
2.10.2 Operating Temperature and Temperature Control *15*
2.10.3 Power Consumption *15*

3 UNPACKING 17

3.1 ANTI-STATIC PRECAUTIONS 18
3.2 UNPACKING 18
3.2.1 Unpacking Precautions *18*
3.3 UNPACKING CHECKLIST 19
3.3.1 Package Contents *19*
3.3.2 Optional Components *20*

4 CONNECTOR PINOUTS 22

4.1 PERIPHERAL INTERFACE CONNECTORS 23
4.1.1 Layout *23*
4.1.2 Peripheral Interface Connectors *23*
4.1.3 External Peripheral Interface Panel Connectors *24*
4.2 INTERNAL PERIPHERAL CONNECTORS 25
4.2.1 ATX Power Supply Connector (4-pins) *25*
4.2.2 ATX Power Supply Connector (24-pins) *26*
4.2.3 Fan Connectors *27*
4.2.4 Floppy Disk Connector *28*
4.2.5 Front Panel Connectors *28*
4.2.6 IDE Connector *29*
4.2.7 Line Out Connector *30*
4.2.8 PCIe Mini Card Slot *31*
4.2.9 PCIe x1 Slot *31*
4.2.10 PCI Slot *32*
4.2.11 SATA Drive Connectors *33*

4.2.12 Serial Port Connector 1 ..... *34*
4.2.13 Serial Port Connector 2 ..... *35*
4.2.14 SPI Flash Connector *36*
4.2.15 USB Connectors (Internal) *37*
4.3 EXTERNAL PERIPHERAL INTERFACE CONNECTORS 38
4.3.1 Keyboard/Mouse Connector *39*
4.3.2 Parallel Port Connector *40*
4.3.3 Ethernet Connector *41*
4.3.4 Audio Connectors *42*
4.3.5 USB Connectors *43*
4.3.6 VGA Connector *44*

5 INSTALLATION 45

5.1 ANTI-STATIC PRECAUTIONS 46
5.2 INSTALLATION CONSIDERATIONS 46
5.2.1 Installation Notices *47*
5.2.2 Installation Checklist *47*
5.3 CPU INSTALLATION 49
5.3.1 LGA775 CPU Installation *49*
5.3.2 LGA775 Cooling Kit Installation *52*
5.4 DIMM INSTALLATION 54
5.5 JUMPER SETTINGS 56
5.5.1 AT/ATX Power Selection *57*
5.5.2 Clear CMOS Jumper *58*
5.5.3 COM1 Pin-9 Setup *59*
5.5.4 COM2 Pin-9 Setup *59*
5.5.5 COM3 Pin-9 Setup *60*
5.5.6 COM4 Pin-9 Setup *60*
5.6 CHASSIS INSTALLATION 61
5.7 INTERNAL PERIPHERAL DEVICE CONNECTIONS 62
5.7.1 ATA Flat Cable Connection *62*
5.7.2 Dual RS-232 Cable Connection *63*
5.7.3 FDD Cable Connection *64*
5.7.4 Four Serial Port Connector *65*
5.7.5 PCIe Mini Card Installation *66*

5.7.6 SATA Drive Connection *67*
5.8 EXTERNAL PERIPHERAL INTERFACE CONNECTION 69
5.8.1 PS/2 Keyboard/Mouse Connection *69*
5.8.2 Parallel Device Connection *70*
5.8.3 RJ-45 Ethernet Connection *71*
5.8.4 USB Connection *71*
5.8.5 Audio Connection *72*
5.8.6 VGA Monitor Connection *73*

6 BIOS SETUP 75

6.1 INTRODUCTION 76
6.1.1 Starting Setup *76*
6.1.2 Using Setup *76*
6.1.3 Getting Help *77*
6.1.4 Unable to Reboot After Configuration Changes *77*
6.1.5 BIOS Menu Bar *77*
6.2 MAIN 78
6.3 ADVANCED 79
6.3.1 CPU Configuration *81*
6.3.2 IDE Configuration *82*
6.3.2.1 IDE Master, IDE Slave 84
6.3.3 Floppy Configuration *89*
6.3.4 Super IO Configuration *90*
6.3.5 Hardware Health Configuration *95*
6.3.6 Power Configuration *98*
6.3.6.1 General ACPI Configuration 99
6.3.6.2 APM Configuration 100
6.3.7 Remote Access Configuration *102*
6.3.8 USB Configuration *105*
6.3.8.1 USB Mass Storage Device Configuration 107
6.4 PCI/PNP 108
6.5 BOOT 110
6.5.1 Boot Settings Configuration *111*
6.5.2 Boot Device Priority *113*
6.5.3 Hard Disk Drives *114*

6.5.4 Removable Drives *115*
6.5.5 CD/DVD Drives *116*
6.6 SECURITY 116
6.7 CHIPSET 118
6.7.1 Northbridge Configuration *120*
6.8 EXIT 122

7 DRIVER INSTALLATION 124

7.1 AVAILABLE SOFTWARE DRIVERS 125
7.2 DRIVER CD AUTO-RUN 125
7.3 CHIPSET DRIVER 127
7.4 VGA DRIVER 130
7.5 LAN DRIVER 135
7.6 AUDIO DRIVER 137
7.6.1 BIOS Setup *137*
7.6.2 Driver Installation *137*

A BIOS OPTIONS 141

B TERMINOLOGY 145

C DIGITAL I/O INTERFACE 149

C.1 INTRODUCTION 150
C.2 DIO CONNECTOR PINOUTS 150
C.3 ASSEMBLY LANGUAGE SAMPLES 151
C.3.1 Enable the DIO Input Function *151*
C.3.2 Enable the DIO Output Function *151*

D WATCHDOG TIMER 152

E ADDRESS MAPPING 155

E.1 DIRECT MEMORY ACCESS (DMA) 156
E.2 INPUT/OUTPUT (IO) 156
E.3 INTERRUPT REQUEST (IRQ) 158
E.4 MEMORY 159

F COMPATIBILITY 160

F.1 COMPATIBLE OPERATING SYSTEMS 161

F.2 COMPATIBLE PROCESSORS 161
F.3 COMPATIBLE MEMORY MODULES 162

G HAZARDOUS MATERIALS DISCLOSURE 163

G.1 HAZARDOUS MATERIALS DISCLOSURE TABLE FOR IPB PRODUCTS CERTIFIED AS ROHS COMPLIANT UNDER 2002/95/EC WITHOUT MERCURY 164

H AC'97 AUDIO CODEC 167

H.1 INTRODUCTION 168
H.1.1 Accessing the AC'97 CODEC 168
H.1.2 Driver Installation 168
H.2 SOUND EFFECT CONFIGURATION 169
H.2.1 Accessing the Sound Effects Manager 169
H.2.2 Sound Effect Manager Configuration Options 170

List of Figures

Figure 1-1: Overview 3
Figure 2-1: IMBA-9454B Dimensions (mm) 8
Figure 2-2: External Interface Panel Dimensions (mm) 8
Figure 2-3: Data Flow Block Diagram 9
Figure 2-4: CPU & Northbridge 10
Figure 2–5: Southbridge 11
Figure 4-1: Connector and Jumper Locations 23
Figure 4-2: ATX Power Supply Connector (4-pins) Location 25
Figure 4-3: ATX Power Connector Location 26
Figure 4-4: Fan Connectors Locations 27
Figure 4-5: FDC Connector Location 28
Figure 4-6: Multi-panel Connector Location 29
Figure 4-7: IDE Device Connector Locations 30
Figure 4-8: Line Out Connector Location 30
Figure 4-9: PCIe Mini Card Slot Location 31
Figure 4-10: PCIe x1 Expansion Card Slot 32
Figure 4-11: PCI Slot Location 32
Figure 4-12: SATA Drive Connector Locations 33
Figure 4-13: Serial Port Connector 1 Location 34
Figure 4-14: Serial Port Connector 2 Location 35
Figure 4-15: SPI Flash Connector 37
Figure 4-16: USB Connector Pinout Locations 38
Figure 4-17: IMBA-9454B External Interface Connectors 39
Figure 4-18: PS/2 Pinouts 39
Figure 4-19: Parallel Port Connector Pinout Locations 40
Figure 4-20: Ethernet Connector Pinout Locations 41
Figure 4-21: Ethernet Connector 42
Figure 4-22: Audio Connector 43
Figure 4-23: USB Connector Pinout Locations 43
Figure 4-24: VGA Connector 44

Figure 5-1: Intel LGA775 50
Figure 5-2: Remove the CPU Socket Protective Shield 50
Figure 5-3: Open the CPU Socket Load Plate 51
Figure 5-4: Insert the LGA775 CPU 52
Figure 5-5: IEI Cooling Kit 53
Figure 5-6: Securing the Heat sink to the PCB Board 54
Figure 5-7: Installing a DIMM 55
Figure 5-8: Jumper Locations 57
Figure 5-9: IDE Cable Connection 63
Figure 5-10: Dual RS-232 Cable Installation 64
Figure 5-11: FDD Cable Connection 65
Figure 5-12: Four Serial Port Connector 66
Figure 5-13: Serial Device Connector 66
Figure 5-14: PCIe Mini Card Installation 67
Figure 5-15: SATA Drive Cable Connection 68
Figure 5-16: SATA Power Drive Connection 68
Figure 5–17: PS/2 Keyboard/Mouse Connector 70
Figure 5–18: Parallel Port 70
Figure 5-19: RJ-45 Ethernet Connector 71
Figure 5-20: USB Connector 72
Figure 5–21: Audio Connectors 73
Figure 5-22: VGA Connector 73
Figure 7-1: Introduction Screen 126
Figure 7-2: Available Drivers 126
Figure 7-3: Chipset Driver Installation Program 127
Figure 7-4: Chipset Driver Installation Welcome Screen 128
Figure 7-5: Chipset Driver License Agreement 128
Figure 7-6: Chipset Driver Installation 129
Figure 7-7: Chipset Driver Installation Complete 130
Figure 7-8: Select the Operating System 131
Figure 7-9: VGA Driver Version Information 131
Figure 7-10: VGA Driver File Extraction 132
Figure 7-11: VGA Driver Welcome Screen 132
Figure 7-12: VGA Driver License Agreement 133
Figure 7-13: VGA Driver Readme File 133

Figure 7-14: VGA Driver Installing 134
Figure 7-15: Intel® Graphics Media Accelerator Installation Complete 134
Figure 7-16: LAN Driver Directory 135
Figure 7-17: LAN Driver Welcome 136
Figure 7-18: LAN Driver Installation Ready 136
Figure 7-19: Device Manager List 137
Figure 7-20: Audio Driver Directory 138
Figure 7-21: Audio Driver Welcome Screen 138
Figure 7-22: Audio Driver Software Configuration 139
Figure 7-23: Audio Driver Digital Signature 139
Figure 7-24: Restart the Computer 140

List of Tables

Table 1-1: Technical Specifications 6
Table 2-1: Power Consumption 16
Table 3-1: Package List Contents 20
Table 3-2: Optional Components 21
Table 4-1: Peripheral Interface Connectors 24
Table 4-2: External Peripheral Interface Panel Connectors 25
Table 4-3: ATX Power Supply Connector (4-pins) Pinouts 26
Table 4-4: ATX Power Connector Pinouts 27
Table 4-5: Fan Connectors Pinouts 28
Table 4-6: Multi-panel Connector Pinouts 29
Table 4-7: Line Out Connector Pinouts 31
Table 4-8: SATA Drive Connector Pinouts 33
Table 4-9: Serial Port Connector 1 Pinouts 35
Table 4-10: Serial Port Connector 2 Pinouts 36
Table 4-11: SPI Flash Connector 37
Table 4-12: USB Port Connector Pinouts 38
Table 4-13: PS/2 Connector Pinouts 40
Table 4-14: Parallel Port Connector Pinouts 41
Table 4-15: Ethernet Connector Pinouts 42
Table 4-16: Ethernet Connector LEDs 42
Table 4-17: USB Connector Pinouts 43
Table 4-18: VGA Connector Pinouts 44
Table 5-1: Jumpers 57
Table 5-2: CF Master/Slave Selection Settings 58
Table 5-3: Clear CMOS Jumper Settings 58
Table 5-4: COM1 RI/Voltage Selection 59
Table 5-5: COM1 Voltage Setting 59
Table 5-6: COM2 RI/Voltage Selection 59
Table 5-7: COM2 Voltage Setting 60
Table 5-8: COM3 RI/Voltage Selection 60

Table 5-9: COM3 Voltage Setting 60
Table 5-10: COM4 RI/Voltage Selection.....61
Table 5-11: COM4 Voltage Setting 61
Table 5-12: IEI Provided Cables 62
Table 6-1: BIOS Navigation Keys 77

BIOS Menus

BIOS Menu 1: Main 78
BIOS Menu 2: Advanced 80
BIOS Menu 3: CPU Configuration 81
BIOS Menu 4: IDE Configuration 82
BIOS Menu 5: IDE Master and IDE Slave Configuration 84
BIOS Menu 6: Floppy Configuration 89
BIOS Menu 7: Super IO Configuration 90
BIOS Menu 8: Hardware Health Configuration 95
BIOS Menu 9: ACPI Configuration 98
BIOS Menu 10: General ACPI Configuration 99
BIOS Menu 11: Advanced Power Management Configuration 100
BIOS Menu 12: Remote Access Configuration [Advanced] 102
BIOS Menu 13: USB Configuration 105
BIOS Menu 14: USB Mass Storage Device Configuration 107
BIOS Menu 15: PCI/PnP Configuration 108
BIOS Menu 16: Boot 110
BIOS Menu 17: Boot Settings Configuration 111
BIOS Menu 18: Boot Device Priority Settings 113
BIOS Menu 19: Hard Disk Drives 114
BIOS Menu 20: Removable Drives 115
BIOS Menu 21: CD/DVD Drives 116
BIOS Menu 22: Security 117
BIOS Menu 23: Chipset 118
BIOS Menu 24: Northbridge Chipset Configuration 120
BIOS Menu 25:Exit 122

Chapter

1

Introduction

1.1 Introduction

The IMBA-9454B motherboard has an LGA775 socket for Intel® processors. The IMBA-9454B offers eight RS-232 serial ports and two VGA outputs. Four of the RS-232 ports support power through pin-9 supporting either the standard RI signal, 5 V or 12 V power. The VGA ports support three display modes. The first mode support display of the same output on both monitors. The second supports display of two different pictures on both. Finally, extended view spreads a single output image over two monitors installed next to each other, or above each other.

The IMBA-9454B also features six USB ports, four SATA II ports, an IDE port, a FDD port, a parallel port, three PCI slots, a PCIe x1 slot and a PCIe Mini card slot.

1.2 Features

Some of the IMBA-9454B features are listed below.

- RoHS compliant
- Supports Intel® Core™2 Duo, Pentium® 4, Pentium® D and Celeron® D
- Integrated Intel® GMA950 graphics engine
- Maximum FSB of 1066 MHz
- Two DDR2 DIMMs up to 2.0 GB each
- High performance PCIe Gigabit Ethernet chipset
- Four SATA 3.0 Gb/s drives supported
- Two Ultra ATA 100 IDE devices supported
- Six USB 2.0 devices supported
- Expansion:
  - 1 x PCIe x1 expansion slot
  - 1 x PCIe Mini card slot
  - 3 x PCI slots

1.3 Overview

The diagram below shows the connectors on the IMBA-9454B.

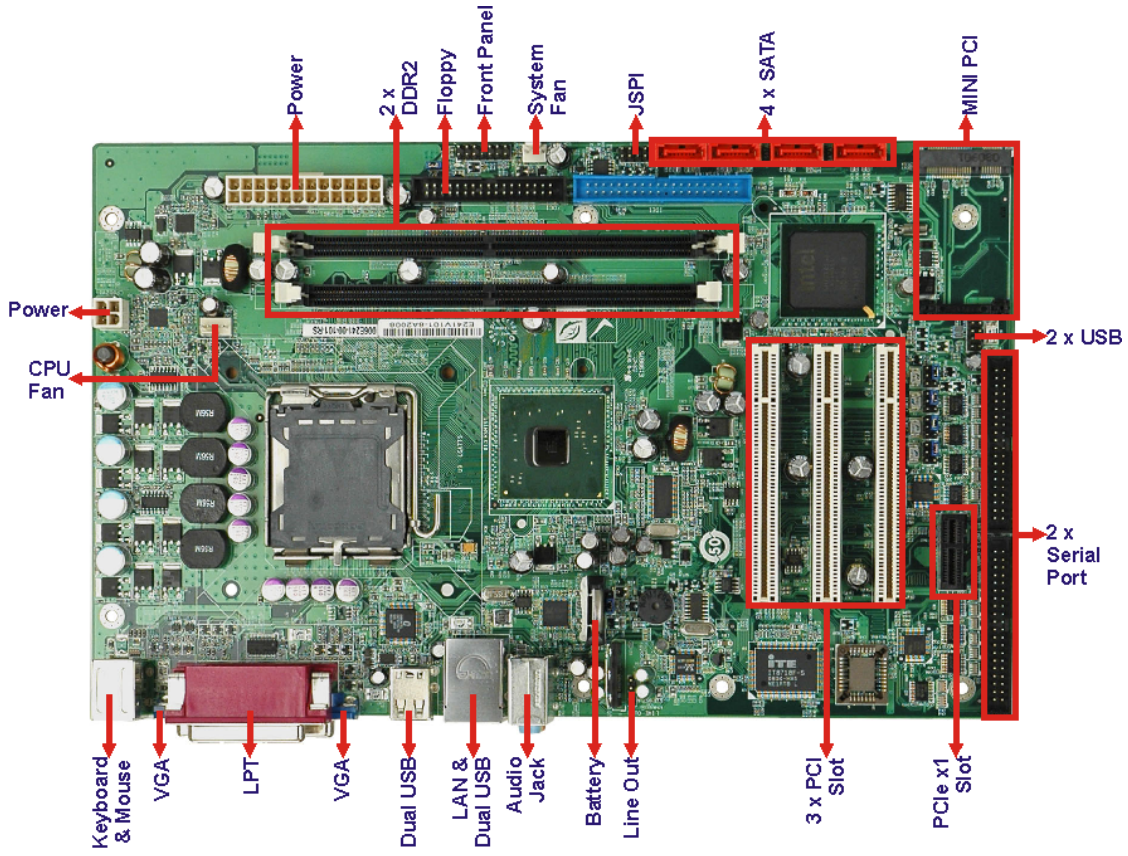


Figure 1-1: Overview

1.4 Peripheral Connectors and Jumpers

The IMBA-9454B has the following on-board connectors:

- 1 x 12 V power connector
- 1 x ATX power connector
- 1 x Audio connector
- 1 x Audio line out connector
- 2 x DDR2 DIMM slots
- 2 x Fan connectors
- 1 x Floppy disk connector
- 1 x Front panel connector
- 1 x IDE disk drive connector
- 1 x PCIe mini card slot
- 1 x PCIe slot

- 3 x PCI slots
- 4 x SATA drive connectors
- 2 x Serial port connectors (4 ports per connector)
- 1 x SPI flash connector
- 2 x USB connectors

The IMBA-9454B has the following external peripheral interface connectors on the board rear panel:

- 1 x PS/2 dual keyboard/mouse connector
- 1 x Parallel port connector
- 2 x VGA connector
- 1 x Gigabit Ethernet connector
- 4 x USB connectors
- 3 x Audio jacks

The IMBA-9454B has the following on-board jumpers:

- AT/ATX power selection
- Clear CMOS
- COM1 Pin-9 setup
- COM2 Pin-9 setup
- COM3 Pin-9 setup
- COM4 Pin-9 setup

1.5 Technical Specifications

IMBA-9454B technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in Chapter 2.

Specification	IMBA-9454B
Form Factor	ATX motherboard

Specification	IMBA-9454B
System CPU	Intel® Core™ 2 Duo (up to 2.66 GHz) Intel® Pentium® 4 (up to 3.8 GHz) Intel® Pentium® D (up to 3.6 GHz) Intel® Celeron® D (up to 3.6 GHz) (Hyperthreading Technology supported)
Front Side Bus	533 MHz, 800 MHz or 1066 MHz
System Chipset	Northbridge: Intel® 945G Express Southbridge: Intel® ICH7
Memory	Two 240-pin DDR2 DIMM slots support two 2.0 GB 400 MHz, 533 MHz or 667 MHz DDR2 SDRAM DIMMs each
Display	Two VGA connectors
BIOS	AMI BIOS
Audio	Audio out, line-in and mic-in on rear I/O panel
LAN	Realtek PCIe 8111CP GbE Controller
COM	Eight on-board serial ports Jumpers select RI/5 V/12 V for pin-9 on COM1 – COM4
USB 2.0	Six USB 2.0 devices supported
IDE	One 40-pin IDE supporting ATA100
Floppy Disk	One FDD connector
SATA	Four SATA 3.0 Gb/s drives supported
Keyboard/mouse	Two PS/2 connectors for keyboard or mouse
Watchdog Timer	Software programmable 1-255 sec. by super I/O
Power Consumption	+12 V @ 10.44 A +5 V @ 2.11 A 3.3 V @ 6.07 A
Temperature	0ºC ~ 60ºC (32ºF ~140ºF)
Humidity (operating)	5%~95% non-condensing

Specification	IMBA-9454B
Dimensions	304 mm x 190 mm
Weight (GW/NW)	1200 g / 650 g

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Overview

This chapter describes the specifications and on-board features of the IMBA-9454B in detail.

2.2 Dimensions

The dimensions of the board are listed below and shown in **Figure 2-1**.

- **Length**: 304 mm
- **Width**: 190 mm

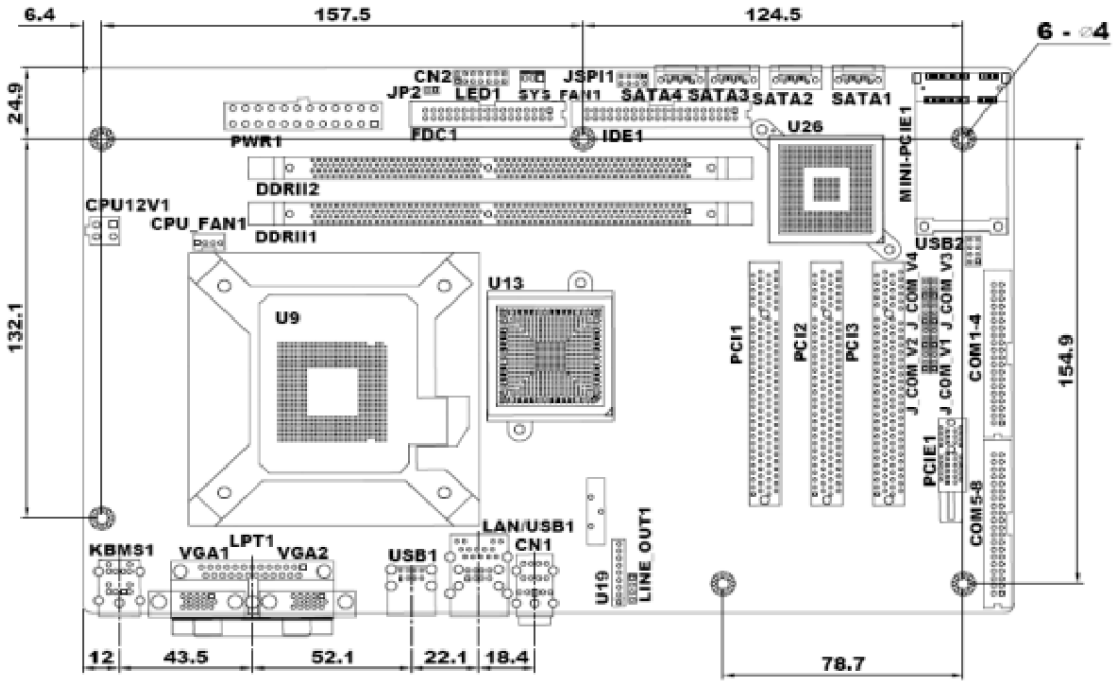


Figure 2-1: IMBA-9454B Dimensions (mm)

External peripheral interface connector panel dimensions are shown in **Figure 2-2**.

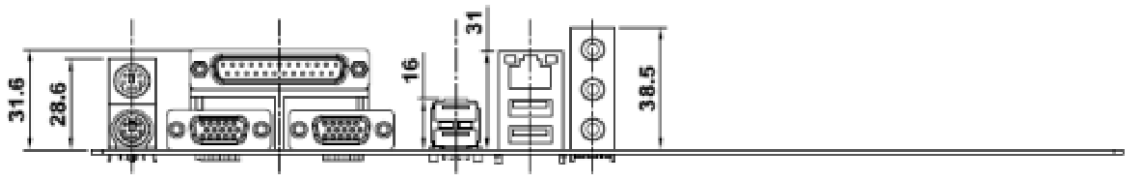


Figure 2-2: External Interface Panel Dimensions (mm)

2.3 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.

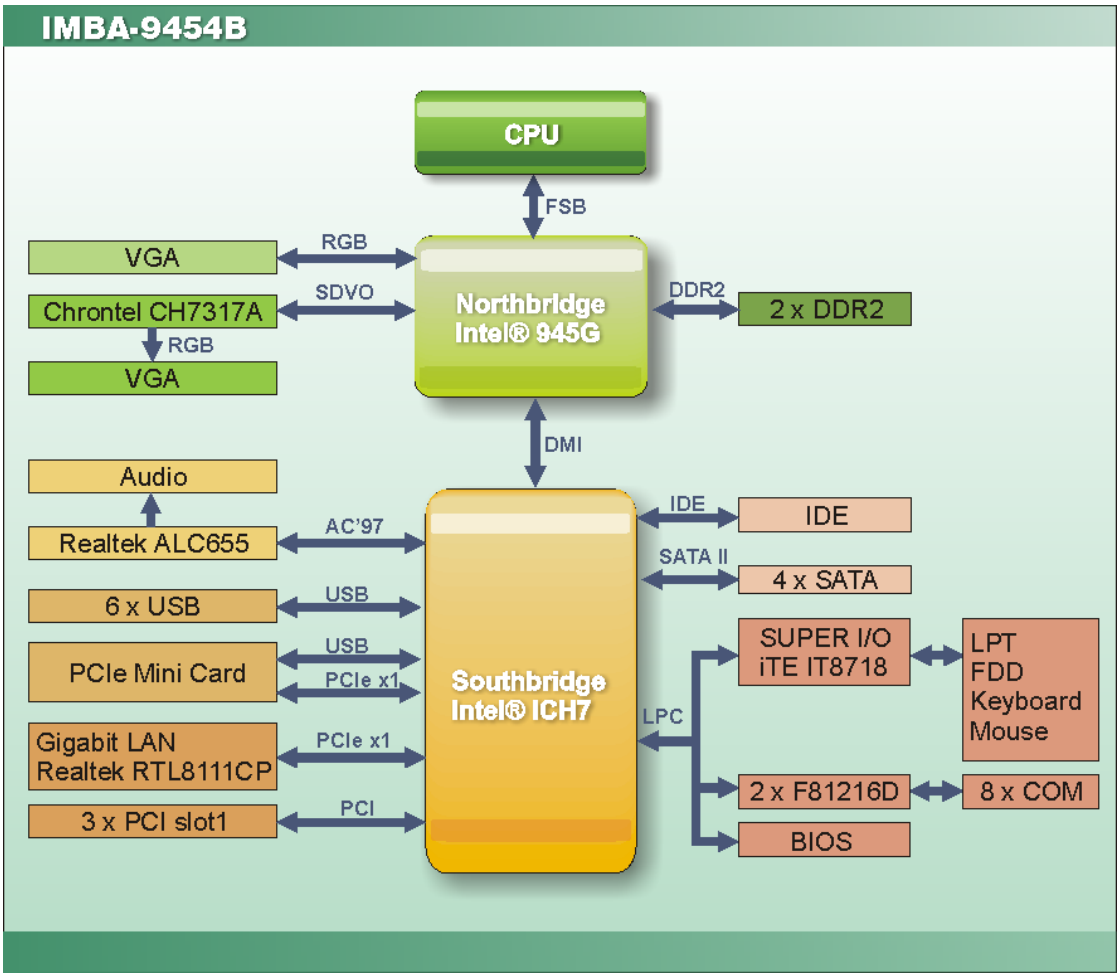


Figure 2-3: Data Flow Block Diagram

2.4 Compatible Processors

The IMBA-9454B support LGA775 Intel® processors. Processors supported by the IMBA-9454B include the Core™2 Duo, Pentium® 4, Pentium® D and Celeron® D.

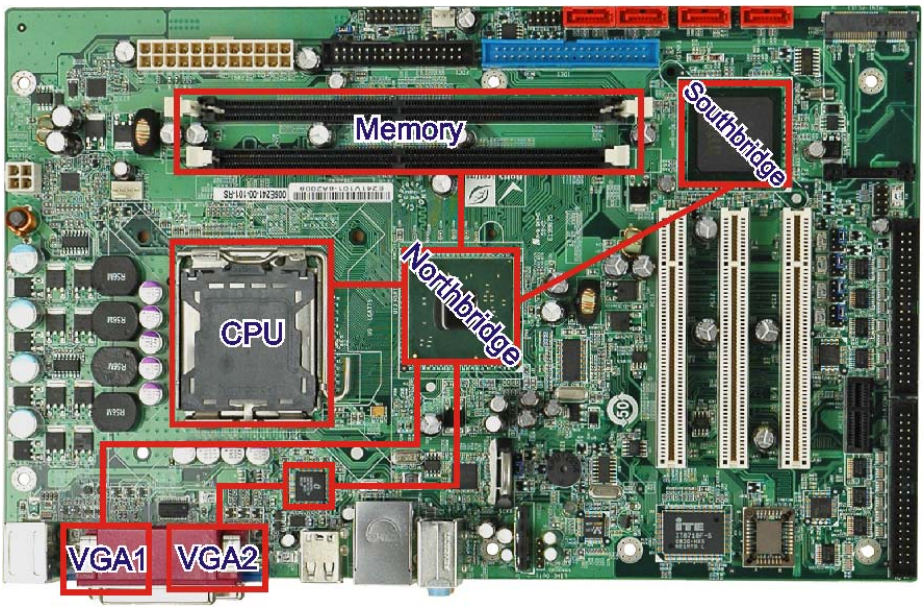


Figure 2-4: CPU & Northbridge

2.5 Intel® 945G Northbridge Chipset

The CPU connects to the Intel® 945G Northbridge chip. The Northbridge is connected to main memory and to the graphics interfaces. The Northbridge also connects to the Southbridge through the DMI interface.

2.5.1 Memory

The IMBA-9454B supports two DDR2 modules up to 2.0 GB each.

2.5.2 VGA

One VGA port is connected directly to the Northbridge. The second VGA port is connected to the SDVO interface through an SDVO-to-VGA chip.

2.6 Intel® ICH7 Southbridge Chipset

The Southbridge chipset is connected to the interfaces listed in the subsections below.

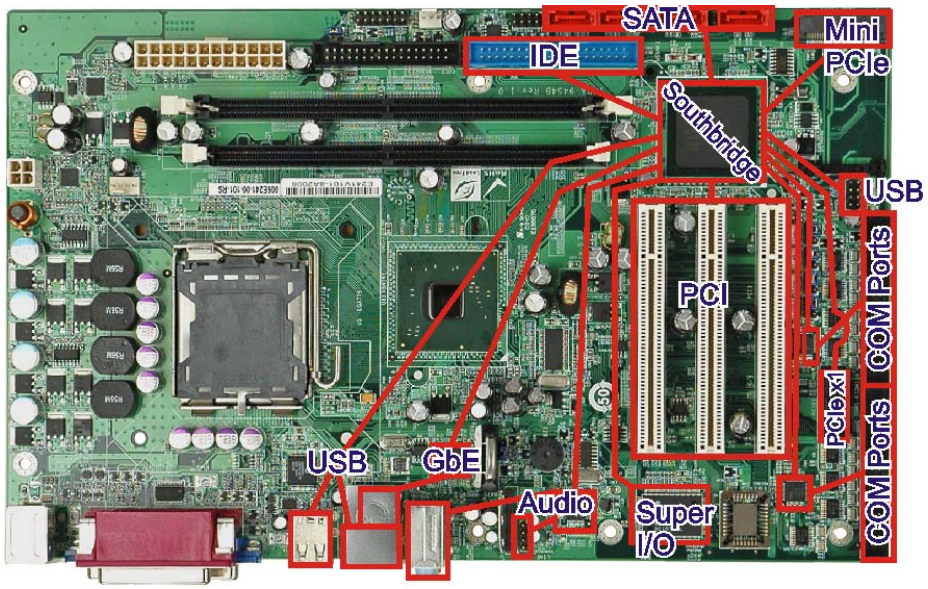


Figure 2–5: Southbridge

2.6.1 Audio

The audio controller supports line output, line input and microphone input through audio jacks on the rear I/O panel.

2.6.2 IDE Interface

The IDE interface supports up to two IDE devices and transfer rates of up to 100 MB/s.

2.6.3 PCI Interface

The PCI interface connects to three PCI slots.

2.6.4 Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818 A real time clock (RTC) integrated into the ICH7. 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.

2.6.5 SATA Controller

The SATA II ports support 3.0 Gb/s data transfer rates.

The integrated SATA controller on the ICH7 Southbridge supports four SATA drives with independent DMA operations. SATA controller specifications are listed below.

- Supports four SATA drives
- Supports 3.0 Gb/s data transfer speeds

2.6.6 USB Controller

Six USB ports are supported on the IMBA-9454B. Two USB ports are located on the rear I/O panel, four more are accessible through two pin-headers on the board.

2.7 PCIe Bus Components

The PCIe bus is connected to the following components:

- PCIe Mini card slot
- PCIe x1 expansion slot
- Realtek PCIe 8111CP GbE controller

2.7.1 PCIe Mini Card Slot

PCIe Mini cards offer system expansion on cards much smaller than standard PCIe expansion cards and with smaller size and faster speed than Mini PCI expansion cards.

2.7.2 PCIe x1 Expansion Slot

The PCIe x1 expansion slot allows a PCIe x1 expansion card to be added to the system. PCIe expansion cards includes Ethernet cards, wireless cards and other add-ons.

2.7.3 Realtek PCIe 8111CP GbE Controller

The Realtek PCIe 8111CP GbE controller provides 1.0 Gb/s network access. The gigabit Ethernet port is also backward compatible with Fast Ethernet and standard Ethernet.

2.8 PCI Bus Components

The PCI bus is connected to the following components:

- Three PCI expansion card slots

2.8.1 PCI Expansion Card Slot

PCI expansion card slots provide an expansion card interface for a number of legacy cards. Newer card typically use PCIe x1, but many older cards utilize the PCI standard.

2.9 LPC Bus Components

The LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset
- Two serial port chips

2.9.1 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. The BIOS features:

- AMI Flash BIOS
- SMIBIOS (DMI) compliant
- Console redirection function support
- PXE (Pre-boot Execution Environment) support
- USB booting support

2.9.2 Serial Port Chips

The two serial port chips support a total of eight serial ports, four serial ports per chip. The first four serial ports support the following setups for pin-9:

- RI
- 5 V power
- 12 V power

All serial ports support the RS-232 communication protocol only.

2.9.3 Super I/O

The iTE IT8718F Super I/O chipset is connected to the Intel® ICH7 Southbridge through the LPC bus. The iTE IT8718F is connected to the interfaces listed in the subsections below.

2.9.3.1 Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors all the thermal and voltage inputs. These are reported to the BIOS and can be seen in the BIOS hardware health configuration menu.

2.9.3.2 Fan Speed Controller

The fan speed controller allows the fan speeds to be controlled. One of the pins connected to the fan sends the fan speed information that is then relayed to the BIOS.

2.9.3.3 Parallel Port

The Super I/O parallel port (LPT) supports standard mode, enhanced mode and high-speed mode parallel port devices. The LPT is compliant with the following LPT modes.

2.9.3.4 Keyboard and Mouse Controller

The Super I/O keyboard controller can execute the 8042 instruction set.

2.10 Environmental and Power Specifications

This section outlines the system environmental and power specifications.

2.10.1 System Monitoring

The IMBA-9454B monitors the following thermal inputs:

- System temperature
- Power temperature
- CPU temperature

The IMBA-9454B monitors the following voltages:

- CPU core
- 1.80 V
- 3.30 V
- 5.00 V
- 1.05 V
- 1.50 V
- VBAT

The IMBA-9454B monitors the following fan speeds:

- CPU fan speed
- System fan speed

2.10.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the IMBA-9454B 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.

2.10.3 Power Consumption

Table 2-1 shows the power consumption with a 3.0 GHz Intel® Pentium® 4 and 1.0 GB DDR2.

Voltage	Current
+3.3 V	6.07 A
+5 V	2.11 A

Voltage	Current
+12 V	10.44 A

Table 2-1: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IMBA-9454B may result in permanent damage to the IMBA-9454B and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-9454B. Dry climates are especially susceptible to ESD. It is critical that the following anti-static precautions are strictly adhered to whenever handling the IMBA-9454B or any other electrical component.

- ***Wear an anti-static wristband*** - Wearing a simple anti-static wristband can help to prevent ESD from damaging the IMBA-9454B.
- ***Self-grounding*** - Touch a grounded conducting material before handling and periodically while handling the IMBA-9454B.
- ***Use an anti-static pad*** - When configuring the IMBA-9454B, place it on an antic-static pad to reduce the possibility of ESD damage.
- ***Only handle the edges of the IMBA-9454B*** - When handling the IMBA-9454B, hold it by its edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the IMBA-9454B 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 IMBA-9454B 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 any components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IMBA-9454B was purchased from or contact an IEI sales representative directly by sending an email to sales@iei.com.tw.

3.3.1 Package Contents

The IMBA-9454B is shipped with the following components:

Quantity	Item and Part Number	Image
1	IMBA-9454B	
2	4 COM (wo bracket) (**P/N**: 32200-025401-RS)	
1	ATA 66/100 flat cable (P/N: 32200-000052-RS)	
4	SATA cables (P/N: 32000-062800-RS)	
1	I/O Shielding (P/N: 45014-0016C0-00-RS)	
1	Mini jumper Pack (P/N: 33100-000079-RS)	

Quantity	Item and Part Number	Image
1	Quick Installation Guide	
1	Utility CD	

Table 3-1: Package List Contents

3.3.2 Optional Components

The following optional components are available from IEI.

Item and Part Number	Image
CPU cooling kit (P/N: CF-775A-RS)	
CPU cooler (**P/N**: CF-520-RS)	
FDD cable (P/N: 32200-000017-RS)	
SATA power cable (P/N: 32100-088600-RS)	

Item and Part Number	Image
Wireless LAN card 802.11b/g (**P/N**: WMPCIE-V01-RS)	
Wireless LAN card 802.11b/g (**P/N**: WMUSB-V01-RS)	
Dual USB cable (P/N: CB-USB02-RS)	

Table 3-2: Optional Components

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

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

4.1.1 Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

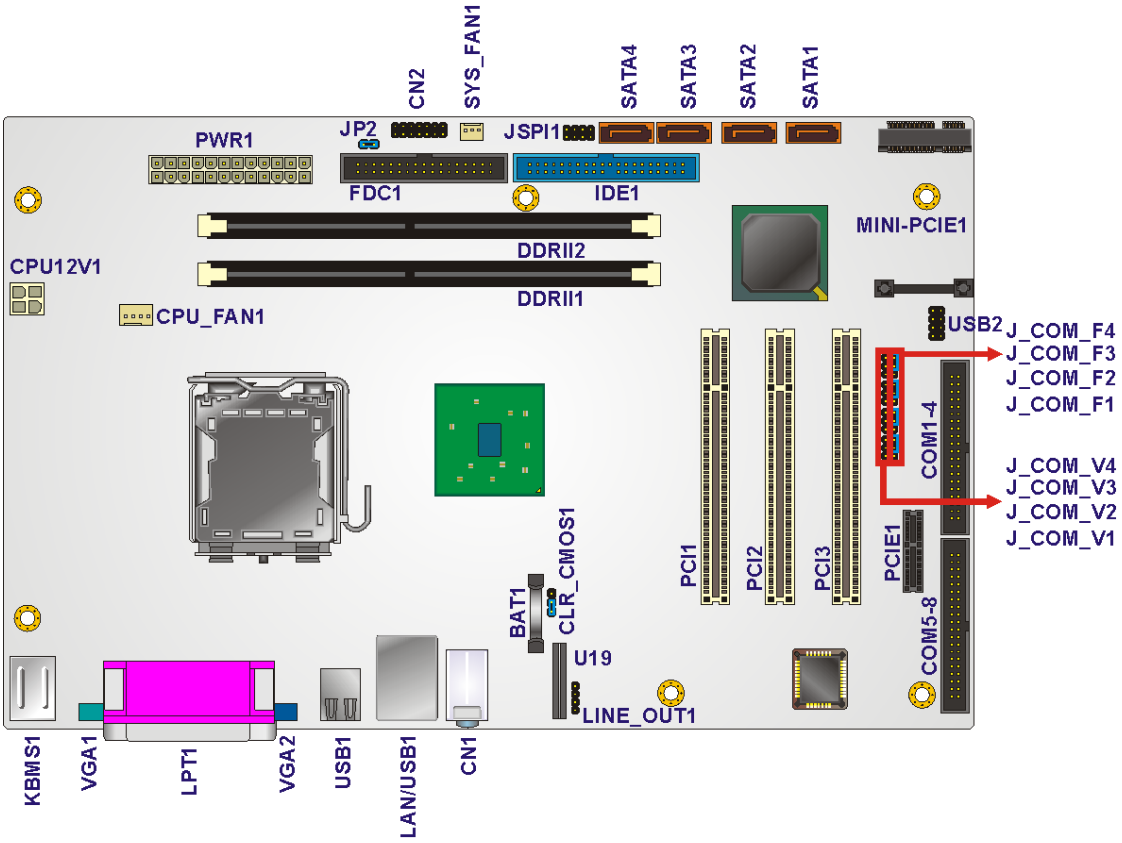


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the IMBA-9454B. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
+12 V ATX power connector	4-pin header	CPU12 V1
ATX power connector	24-pin header	PWR1
Fan connectors	4-pin wafer	CPU_FAN1 SYS_FAN1
Floppy disk drive connector	34-pin box header	FDC1
Front panel connectors	14-pin header	CN2
IDE Interface connector	40-pin box header	IDE
Line out connector	4-pin header	LINE_OUT1
PCIe Mini card slot	PCIe Mini	MINI_PCIE1
PCIe x1 slot	PCIe x1 expansion slot	PCIE1
PCI slot	PCI expansion slot	PCI1 PCI2 PCI3
SATA drive connector	7-pin SATA	SATA1 SATA2 SATA3 SATA4
Serial port connector 1	40-pin box header	COM1-4
Serial port connector 2	40-pin box header	COM5-8
SPI flash connector	8-pin header	JSPI1
USB connector	8-pin header	USB2

Table 4-1: Peripheral Interface Connectors

4.1.3 External Peripheral Interface Panel Connectors

Table 4-2 lists the external peripheral interface panel connectors on the IMBA-9454B. Detailed descriptions of these connectors can be found in.

Connector	Type	Label
Audio connector	3 x Audio jacks	CN1
Ethernet/USB connector	RJ-45/USB port combo connector	LAN/USB1
Keyboard/Mouse	PS/2	KBMS1
Parallel port connector	DB-25 (female)	LPT1
USB connectors	USB connectors	LAN/USB1 USB1
VGA connector	DB-15 (female)	VGA1, VGA2

Table 4-2: External Peripheral Interface Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the IMBA-9454B.

4.2.1 ATX Power Supply Connector (4-pins)

CN Label: **CPU12 V1**

CN Type: 4-pin ATX power connector (1x4)

CN Location: See **Figure 4-2**

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

The 4-pin ATX power supply connector is connected to a +12 V ATX power supply.

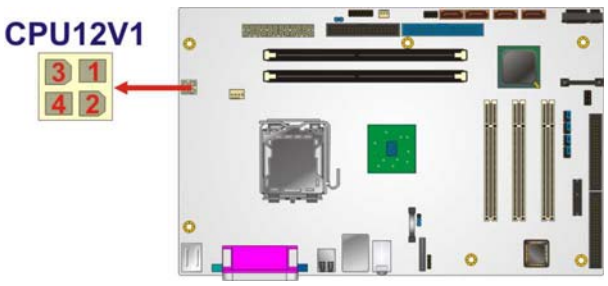


Figure 4-2: ATX Power Supply Connector (4-pins) Location

PIN	DESCRIPTION
1	GND
2	GND
3	+12 V
4	+12 V

Table 4-3: ATX Power Supply Connector (4-pins) Pinouts

4.2.2 ATX Power Supply Connector (24-pins)

CN Label: **PWR1**

CN Type: 24-pin ATX power connector (2x12)

CN Location: See **Figure 4-3**

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

The 24-pin ATX power supply connector is connected to a ATX power supply.

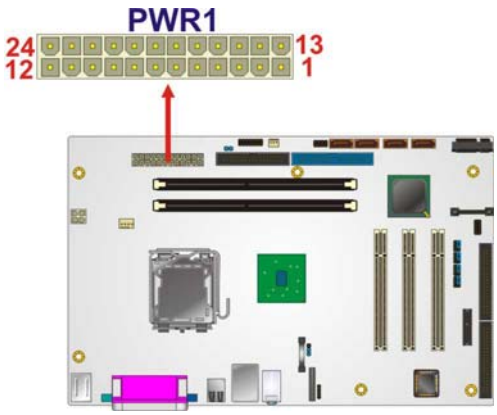


Figure 4-3: ATX Power Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	+3.3 V	13	+3.3 V
2	+3.3 V	14	-12 V
3	Ground	15	COM
4	+5.0 V	16	PS-ON
5	Ground	17	Ground

PIN	DESCRIPTION	PIN	DESCRIPTION
6	+5.0 V	18	Ground
7	Ground	19	Ground
8	PWR-OK	20	-5.0 V
9	5 VSB	21	+5.0 V
10	+12.0 V	22	+5.0 V
11	+12.0 V	23	+5.0 V
12	+3.3 V	24	Ground

Table 4-4: ATX Power Connector Pinouts

4.2.3 Fan Connectors

CN Label: **CPU_FAN1 & SYS_FAN1**

CN Type: 4-pin wafer connector & 3-pin wafer connector

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

CN Pinouts: See **Table 4-5**

The fan connectors are connected to cooling fans. The speed of the cooling fans is sensed and controlled through the BIOS settings.

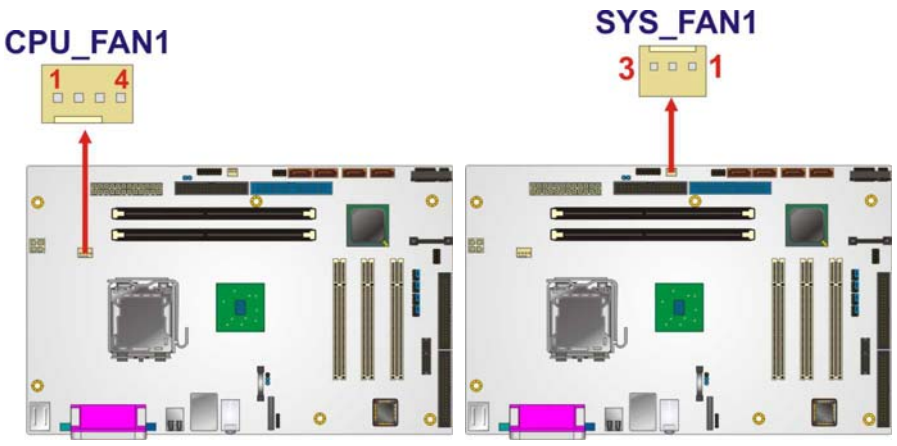


Figure 4-4: Fan Connectors Locations

PIN	CPU_FAN1	SYS_FAN1
1	GND	GND
2	+12 V	+12 V
3	Rotation Signal	Rotation Signal
4	Control	

Table 4-5: Fan Connectors Pinouts

4.2.4 Floppy Disk Connector

CN Label: **FDC1**

CN Type: 34-pin header (2x17)

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

The floppy disk connector is connected to a floppy disk drive.

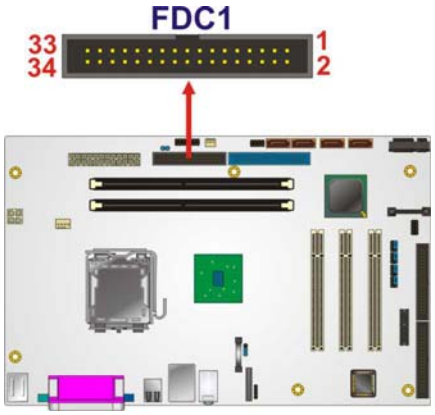


Figure 4-5: FDC Connector Location

4.2.5 Front Panel Connectors

CN Label: **CN2**

CN Type: 14-pin header (2x7)

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

CN Pinouts: See **Table 4-6**

The multi-panel connector connects to external switches and indicators to monitor and controls the motherboard.

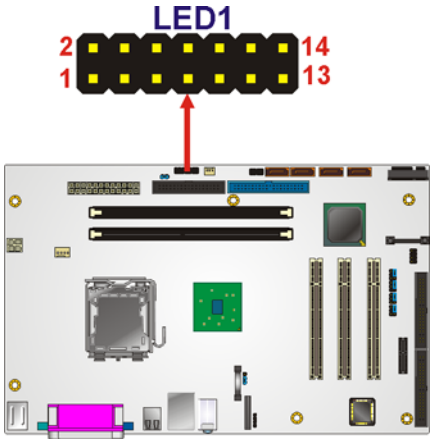


Figure 4-6: Multi-panel Connector Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Power LED+	2	Speaker+
3	N/C	4	N/C
5	Power LED-	6	N/C
7	Power button-	8	Speaker-
9	Power button+	10	N/C
11	IDE LED+	12	Reset button+
13	IDE LED-	14	Reset button-

Table 4-6: Multi-panel Connector Pinouts

4.2.6 IDE Connector

CN Label: **IDE**

CN Type: 40-pin box header (2x20)

CN Location: See **Figure 4-7**

One 40-pin IDE device connector on the IMBA-9454B supports connectivity to two hard disk drives.

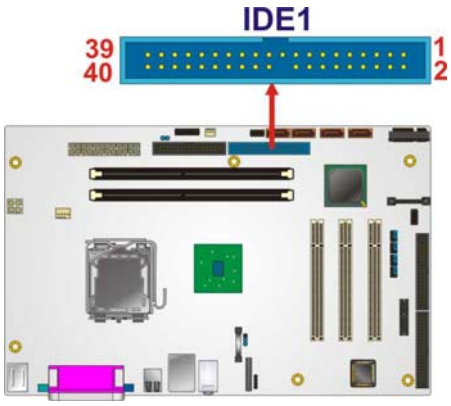


Figure 4-7: IDE Device Connector Locations

4.2.7 Line Out Connector

CN Label:	**LINE_OUT1**
CN Type:	4-pin header (1x4)
CN Location:	See **Figure 4-8**
CN Pinouts:	See **Table 4-7**

The line out connector provides audio output that can be connected to the front panel.

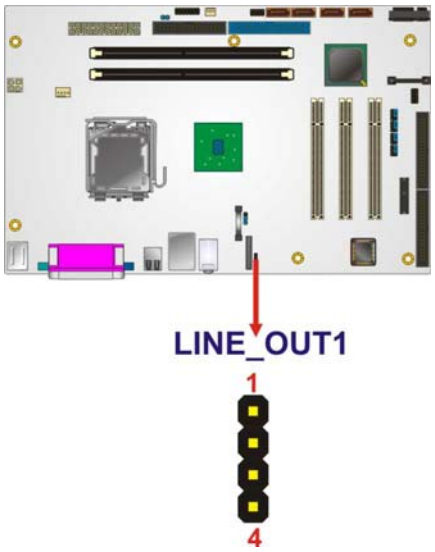


Figure 4-8: Line Out Connector Location

PIN	DESCRIPTION
1	Line out left
2	Ground
3	Ground
4	Line out right

Table 4-7: Line Out Connector Pinouts

4.2.8 PCIe Mini Card Slot

CN Label: **MINI_PCIE1**

CN Type: PCIe Mini card slot

CN Location: See **Figure 4-9**

A PCIe Mini expansion card can be installed in the PCIe Mini card slot.

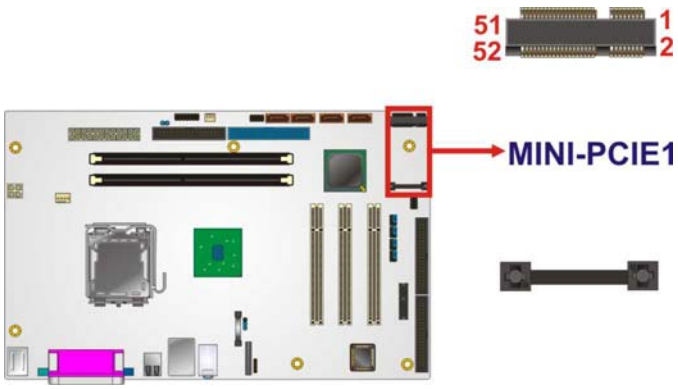


Figure 4-9: PCIe Mini Card Slot Location

4.2.9 PCIe x1 Slot

CN Label: **PCIE1**

CN Type: PCIe x1 expansion slot

CN Location: See **Figure 4-10**

The PCIe x1 slot if for installing PCIe x1 expansion cards.

Figure 4-10: PCIe x1 Expansion Card Slot

4.2.10 PCI Slot

CN Label:	**PCI1 to PCI3**
CN Type:	PCI Slot
CN Location:	See **Figure 4-11**

The PCI slot enables a PCI expansion module to be connected to the board.

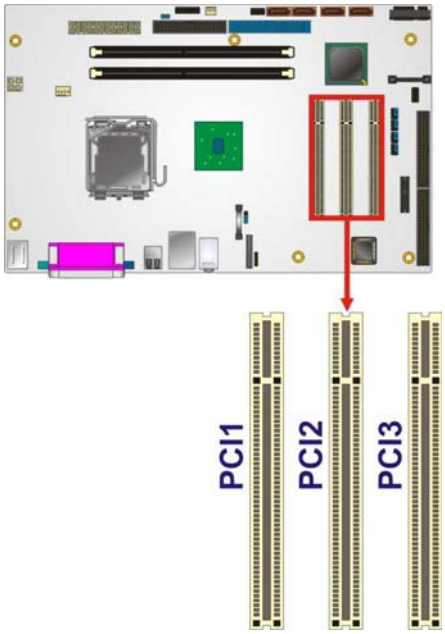


Figure 4-11: PCI Slot Location

4.2.11 SATA Drive Connectors

CN Label:	**SATA1, SATA2, SATA3 and SATA4**
CN Type:	7-pin SATA drive connectors
CN Location:	See **Figure 4-12**
CN Pinouts:	See **Table 4-8**

The SATA drive connectors are connected to SATA 3 Gb/s disk drives that transfer data at speeds as high as 3.0 Gb/s.

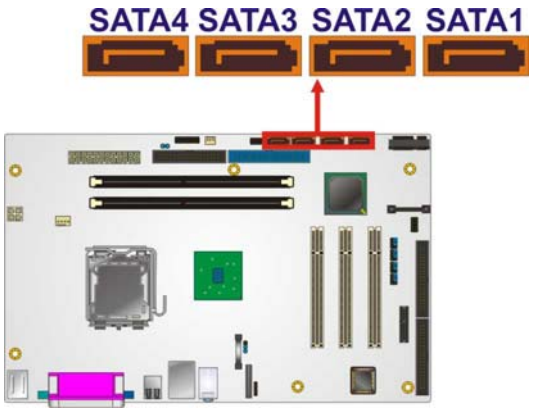


Figure 4-12: SATA Drive Connector Locations

PIN	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 4-8: SATA Drive Connector Pinouts

4.2.12 Serial Port Connector 1

CN Label:	**COM1-4**
CN Type:	40-pin box header (2x20)
CN Location:	See **Figure 4-13**
CN Pinouts:	See **Table 4-9**

The serial port connector provides a connection for four serial ports. These serial ports also support a selectable pin-9. Use the jumpers to adjust the pin-9 settings.

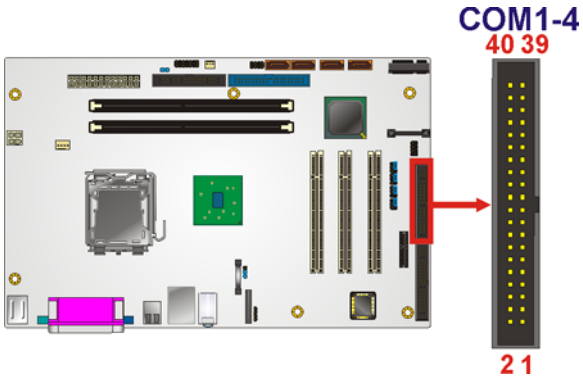


Figure 4-13: Serial Port Connector 1 Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD1	2	DSR1
3	RXD1	4	RTS1
5	TXD1	6	CTS1
7	DTR1	8	RI1
9	GND	10	NC
11	DCD2	12	DSR2
13	RXD2	14	RTS2
15	TXD2	16	CTS2
17	DTR2	18	RI2
19	GND	20	NC
21	DCD3	22	DSR3
23	RXD3	24	RTS3

PIN	DESCRIPTION	PIN	DESCRIPTION
25	TXD3	26	CTS3
27	DTR3	28	RI3
29	GND	30	NC
31	DCD4	32	DSR4
33	RXD4	34	RTS4
35	TXD4	36	CTS4
37	DTR4	38	RI4
39	GND	40	NC

Table 4-9: Serial Port Connector 1 Pinouts

4.2.13 Serial Port Connector 2

CN Label: **COM5-8**

CN Type: 40-pin header (2x20)

CN Location: See **Figure 4-14**

CN Pinouts: See **Table 4-10**

The serial port connector if for serial ports COM5 to COM8.

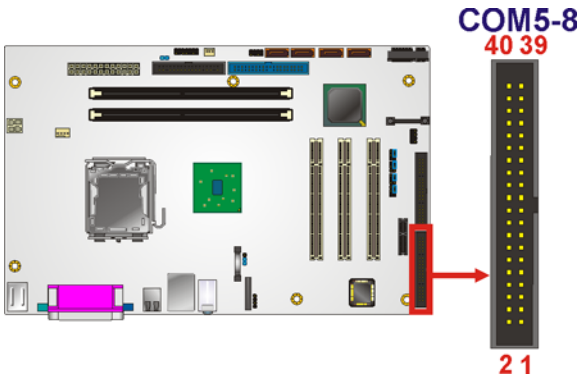


Figure 4-14: Serial Port Connector 2 Location

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD5	2	DSR5
3	RXD5	4	RTS5

PIN	DESCRIPTION	PIN	DESCRIPTION
5	TXD5	6	CTS5
7	DTR5	8	RI5
9	GND	10	NC
11	DCD6	12	DSR6
13	RXD6	14	RTS6
15	TXD6	16	CTS6
17	DTR6	18	RI6
19	GND	20	NC
21	DCD7	22	DSR7
23	RXD7	24	RTS7
25	TXD7	26	CTS7
27	DTR7	28	RI7
29	GND	30	NC
31	DCD8	32	DSR8
33	RXD8	34	RTS8
35	TXD8	36	CTS8
37	DTR8	38	RI8
39	GND	40	NC

Table 4-10: Serial Port Connector 2 Pinouts

4.2.14 SPI Flash Connector

CN Label: **JSPI1**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-15**

CN Pinouts: See **Table 4-11**

The SPI flash connector is for flashing a new BIOS onto the SPI BIOS chip.

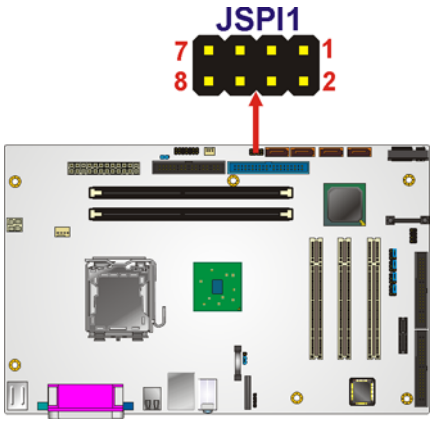


Figure 4-15: SPI Flash Connector

PIN	DESCRIPTION
1	SPI_VCC
2	Ground
3	SPI_CS-
4	SPICLK
5	SPIMISO
6	SPIMOSI
7	NC
8	NC

Table 4-11: SPI Flash Connector

4.2.15 USB Connectors (Internal)

CN Label: **USB2**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-16**

CN Pinouts: See **Table 4-12**

The USB header connects to two USB ports. The USB ports support low, fast and hi-speed USB.

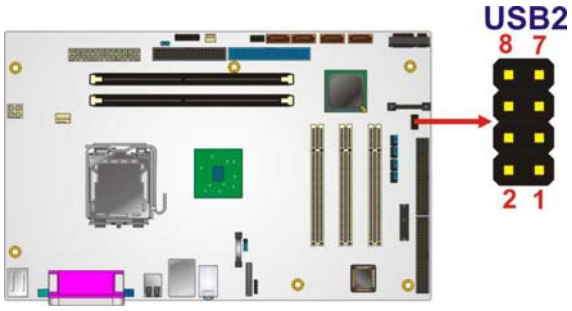


Figure 4-16: USB Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	Power	2	Ground
3	Data-	4	Data+
5	Data+	6	Data-
7	Ground	8	Power

Table 4-12: USB Port Connector Pinouts

4.3 External Peripheral Interface Connectors

The external peripheral interface connectors on the back panel are connected to devices externally when the IMBA-9454B is installed in a chassis. The peripheral connectors on the rear panel are:

- 1 x Keyboard/mouse connector
- 1 x Parallel port connector
- 1 x RJ-45 Ethernet connector
- 3 x Audio jacks
- 4 x USB 2.0 connectors
- 2 x VGA connector

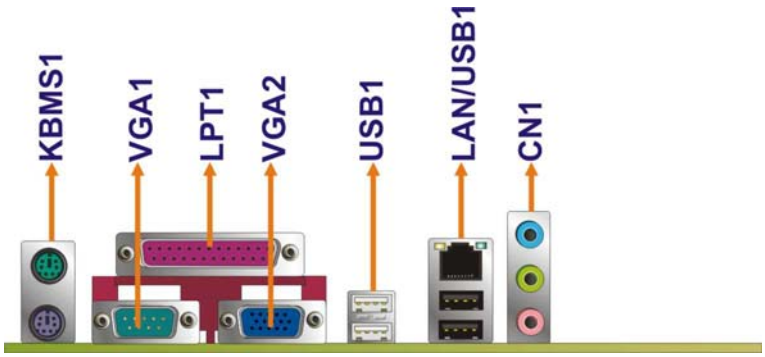


Figure 4-17: IMBA-9454B External Interface Connectors

4.3.1 Keyboard/Mouse Connector

CN Label: **KBMS1**

CN Type: PS/2 connector

CN Location: See **Figure 4-17** (labeled number 1)

CN Pinouts: See **Figure 4-18** and **Table 4-13**

The IMBA-9454B keyboard and mouse connectors are standard PS/2 connectors.

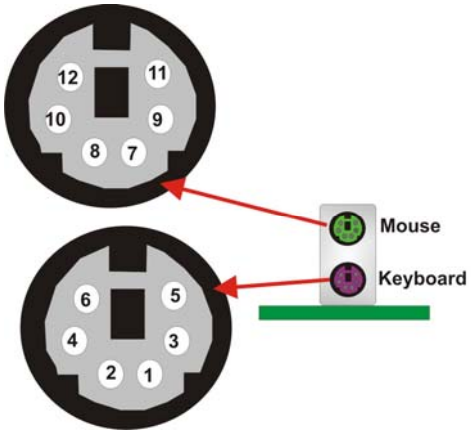


Figure 4-18: PS/2 Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	L_KDAT	7	L_MDAT
2	NC	8	NC

PIN	DESCRIPTION	PIN	DESCRIPTION
3	GND	9	GND
4	5 V	10	5 V
5	L_KCLK	11	L_MCLK
6	NC	12	NC

Table 4-13: PS/2 Connector Pinouts

4.3.2 Parallel Port Connector

CN Label: **LPT1**

CN Type: DB-25

CN Location: See **Figure 4-17** (labeled number 2)

CN Pinouts: See **Figure 4-19** and **Table 4-14**

These ports are usually connected to a printer. IMBA-9454B includes one on-board parallel ports accessed through one 25-pin D-type female connector.

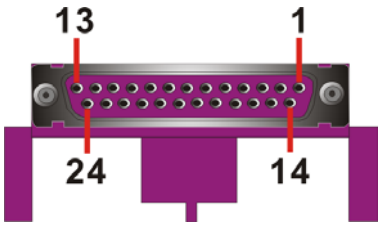


Figure 4-19: Parallel Port Connector Pinout Locations

PIN	Description	PIN	Description
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE

PIN	Description	PIN	Description
17	PRINTER SELECT LN#	18	GND
19	GND	20	GND
21	GND	22	GND
23	GND	24	GND
25	GND		

Table 4-14: Parallel Port Connector Pinouts

4.3.3 Ethernet Connector

CN Label: **LAN/USB1**

CN Type: RJ-45 ports

CN Location: See **Figure 4-17** (labeled 3)

CN Pinouts: See **Figure 4-20**, **Table 4-15** and **Table 4-16**

A 1 Gb connection can be made between the Ethernet connectors and a Local Area Network (LAN) through a network hub.

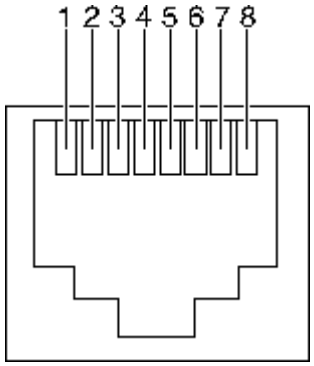


Figure 4-20: Ethernet Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+ (or MDX0+)	5	N/C (or MDX2-)
2	TX- (or MDX0-)	6	RX- (or MDX1-)
3	RX+ (or MDX1+)	7	N/C (or MDX3+)

PIN	DESCRIPTION	PIN	DESCRIPTION
4	N/C (or MDX2+)	8	N/C (or MDX3-)

Table 4-15: Ethernet Connector Pinouts

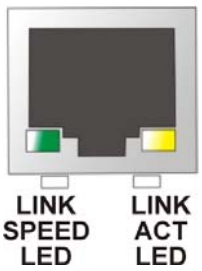


Figure 4-21: Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked (**Table 4-16**).

SPEED LED		LINK LED	
Status	**Description**	**Status**	**Description**
GREEN	ON: 100 MB OFF: 10 MB	YELLOW	ON: Linked Flashing: Activity

Table 4-16: Ethernet Connector LEDs

4.3.4 Audio Connectors

CN Label: **CN1**

CN Type: Audio jack

CN Location: See **Figure 4-17** (labeled number 4)

CN Pinouts: See **Figure 4-22**

- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Speaker Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port can also connect to front speakers.

- **Microphone (Pink):** Connects a microphone.

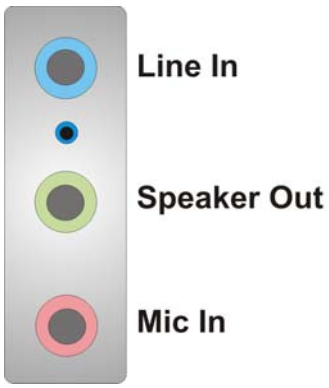


Figure 4-22: Audio Connector

4.3.5 USB Connectors

CN Label:	**LAN/USB1, USB1**
CN Type:	Dual USB port
CN Location:	See **Figure 4-17** (labeled 5)
CN Pinouts:	See **Figure 4-23** and **Table 4-17**

USB devices connect directly to the USB connectors on the external peripheral connector panel.

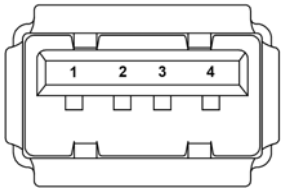


Figure 4-23: USB Connector Pinout Locations

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	5	VCC
2	USBD0-	6	USBD0-
3	USBD0+	7	USBD0+
4	GND	8	GND

Table 4-17: USB Connector Pinouts

4.3.6 VGA Connector

CN Label: **VGA1, VGA2**

CN Type: HD-D-sub 15 Female connector

CN Location: See **Figure 4-17** (labeled 6)

CN Pinouts: See **Figure 4-24** and **Table 4-18**

The standard HD-D-sub 15 female connector connects to a CRT or LCD monitor.

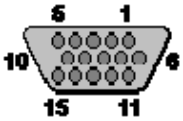


Figure 4-24: VGA Connector

PIN	Description	PIN	Description
1	RED	2	GREEN
3	BLUE	4	N/C
5	GND	6	GND
7	GND	8	GND
9	VCC	10	GND
11	N/C	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDC CLK		

Table 4-18: VGA Connector Pinouts

Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IMBA-9454B may result in permanent damage to the IMBA-9454B and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-9454B. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-9454B, 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 IMBA-9454B, place it on an antic-static pad. This reduces the possibility of ESD damage.
- ***Only handle the edges of the PCB***: When handling the PCB, hold it by its edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the IMBA-9454B is installed. All installation notices pertaining to the installation of the IMBA-9454B should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the IMBA-9454B and injury to the person installing the motherboard.

5.2.1 Installation Notices

WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the IMBA-9454B and injury to the user.

Before and during the installation please DO the following:

- **Read the user manual**:
  - The user manual provides a complete description of the IMBA-9454B 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 IMBA-9454B on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn off all power to the IMBA-9454B**:
  - When working with the IMBA-9454B, 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 IMBA-9454B **DO NOT**:

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

5.2.2 Installation Checklist

The following checklist is provided to ensure the IMBA-9454B is properly installed.

- All the items in the packing list are present (see **Chapter 3**)
- A CPU is installed
- A CPU cooling kit is properly installed
- Compatible memory modules are properly inserted into the memory slots
- The IMBA-9454B is installed into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices (if applicable) are properly connected
  - IDE devices
  - SATA drives
  - Floppy disk drive
  - System front panel connector
  - Power supply
  - USB cable
  - Serial port cable
  - Parallel port cable
  - Keyboard/mouse cable
- The following external peripheral devices (if applicable) are properly connected to the chassis:
  - VGA screen
  - Keyboard
  - Mouse
  - USB devices
  - LAN
  - Audio jacks

5.3 CPU Installation

WARNING:

A CPU should never be turned on without the specified cooling kit being installed. If the cooling kit (heat sink and fan) is not properly installed and the system turned on, permanent damage to the CPU and other electronic components attached to the system may be incurred. Running a CPU without a cooling kit may also result in injury to the user.

The CPU, CPU cooling kit and DIMM are the most critical components of the IMBA-9454B. If any of these components is not installed, the IMBA-9454B cannot operate.

5.3.1 LGA775 CPU Installation

NOTE:

To enable Hyper-threading, both the CPU, chipset and operating system must support hyper-threading.

WARNING:

CPUs are expensive and sensitive components. When installing the CPU please be careful not to damage it in anyway. Make sure the CPU is installed properly and ensure the correct cooling kit is properly installed.

The LGA775 is shown in **Figure 5-1**.

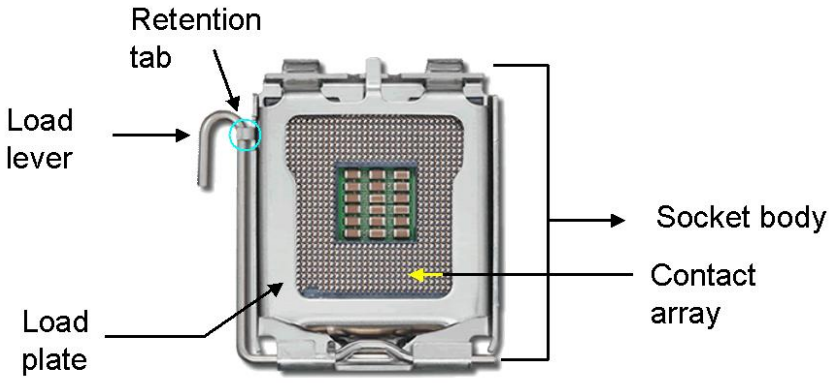


Figure 5-1: Intel LGA775

To install a LGA775 CPU onto the IMBA-9454B, follow the steps below:

WARNING:

When handling the CPU, only hold it on the sides. DO NOT touch the pins at the bottom of the CPU.

Step 1: **Remove the protective cover.** Remove the black protective cover by prying it off the load plate. To remove the protective cover, locate the "**REMOVE**" sign and use your fingernail to pry the protective cover off. See **Figure 5-2**.

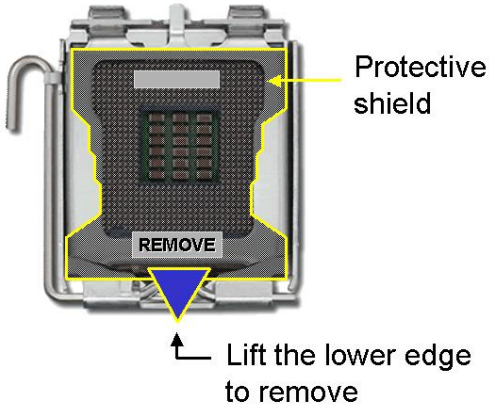


Figure 5-2: Remove the CPU Socket Protective Shield

Step 2: **Open the socket**. Disengage the load lever by pressing the lever down and slightly outward to clear the retention tab. Rotate the load lever to a fully open position. Then rotate the load plate towards the opposite direction. See **Figure 5-3**.

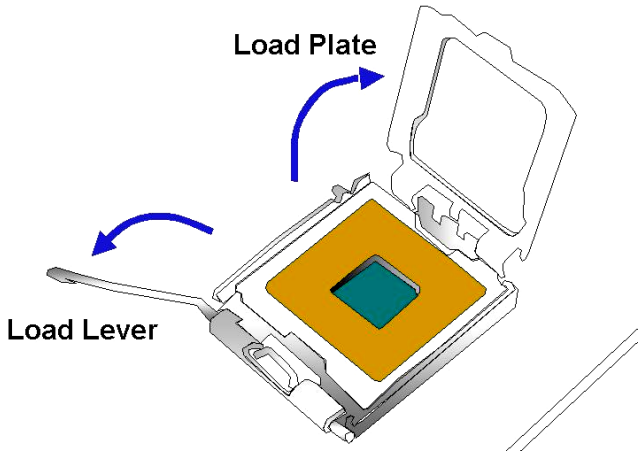


Figure 5-3: Open the CPU Socket Load Plate

Step 3: **Inspect the CPU socket** Make sure there are no bent pins and make sure the socket contacts are free of foreign material. If any debris is found, remove it with compressed air.

Step 4: **Orientate the CPU properly**. Make sure the IHS (Integrated Heat Sink) side is facing upward.

Step 5: **Correctly position the CPU.** Match the Pin 1 mark with the cut edge on the CPU socket.

Step 6: **Align the CPU pins.** Locate pin 1 and the two orientation notches on the CPU. Carefully match the two orientation notches on the CPU with the socket alignment keys.

Step 7: **Insert the CPU.** Gently insert the CPU into the socket. If the CPU pins are properly aligned, the CPU should slide into the CPU socket smoothly. See **Figure 5-4**.

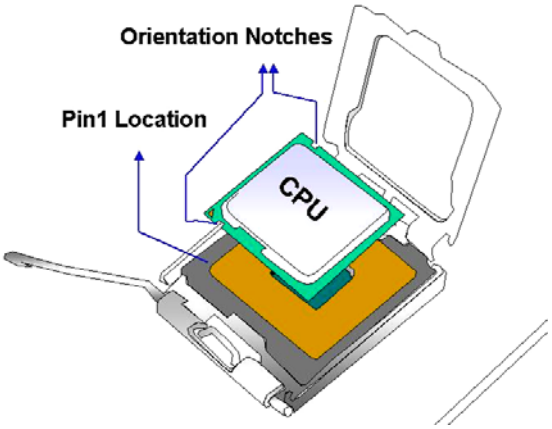


Figure 5-4: Insert the LGA775 CPU

Step 8: **Close the CPU socket.** Close the load plate and engage the load lever by pushing it back to its original position. Secure the load lever under the retention tab on the side of CPU socket.

Step 9: **Connect the CPU 12 V cable to the 12After the cooling kit is installed** connect the CPU cable to the CPU 12 V power connector

5.3.2 LGA775 Cooling Kit Installation

WARNING:

It is strongly recommended that the original heat sink and cooler provided by Intel not be used on the IMBA-9454B.

IEI's cooling kits include a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.

Figure 5-5: IEI Cooling Kit

The cooling kit can be purchased separately. The cooling kits comprise of a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

Follow the instructions below to install a cooling kit.

Step 1: **Place the cooling kit onto the LGA775 CPU**. Make sure the CPU cable can be properly routed when the cooling kit is installed.

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

Step 3: **Mount the cooling kit**. Gently place the cooling kit on top of the CPU. Make sure the four threaded screws on the corners of the cooling kit properly pass through the predrilled holes on the bottom of the PCB.

Step 4: **Secure the cooling kit**. From the solder side of the PCB, align the support bracket to the screw threads on heat sink that were inserted through the PCB holes. (See **Figure 5-6**)

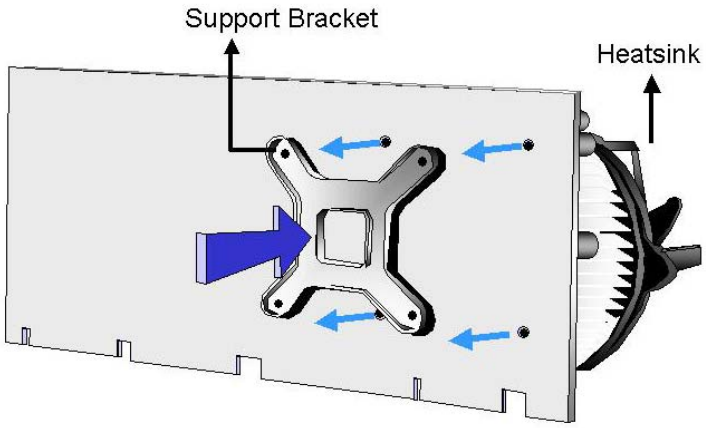


Figure 5-6: Securing the Heat sink to the PCB Board

Step 5: **Tighten the screws**. Use a screwdriver to tighten the four screws. Tighten each nut a few turns at a time and do not over-tighten the screws.

Step 6: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the IMBA-9454B. Carefully route the cable and avoid heat generating chips and fan blades.

5.4 DIMM Installation

WARNING:

Using incorrectly specified DIMM may cause permanently damage the IMBA-9454B. Please make sure the purchased DIMM complies with the memory specifications of the IMBA-9454B. DIMM specifications compliant with the IMBA-9454B are listed in Chapter 2.

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-7**.

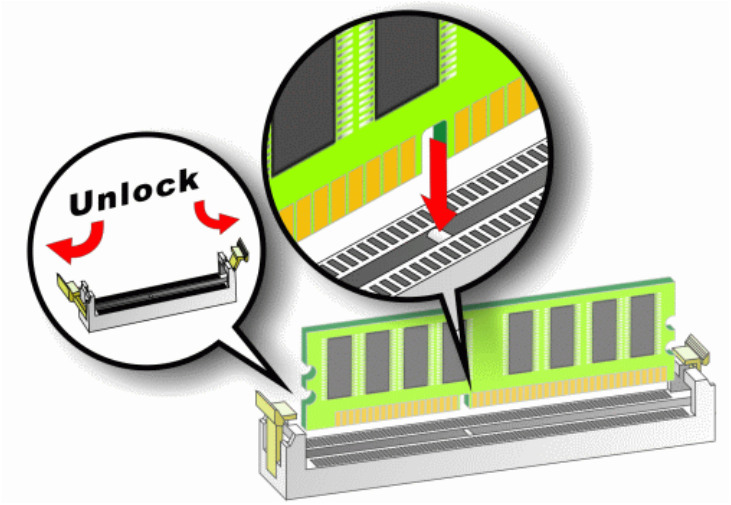


Figure 5-7: Installing a DIMM

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-7**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-7**.

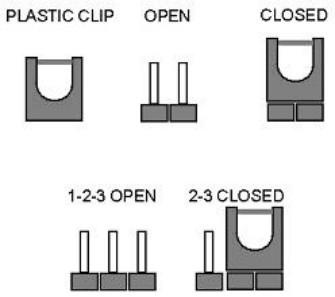
Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-7**.

Step 4: **Removing a DIMM**. To remove a DIMM, push both handles outward. The memory module is ejected by a mechanism in the socket.

5.5 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.



Before the IMBA-9454B is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the IMBA-9454B are listed in **Table 5-1**.

Description	Label	Type
AT/ATX power selection	JP2	2-pin header
Clear CMOS jumper	CLR_CMOS1	3-pin header
COM1 pin-9 setup	J_COM_F1 J_COM_V1	6-pin header
COM2 pin-9 setup	J_COM_F2 J_COM_V2	6-pin header
COM3 pin-9 setup	J_COM_F3 J_COM_V3	6-pin header

Description	Label	Type
COM4 pin-9 setup	J_COM_F4 J_COM_V4	6-pin header

Table 5-1: Jumpers

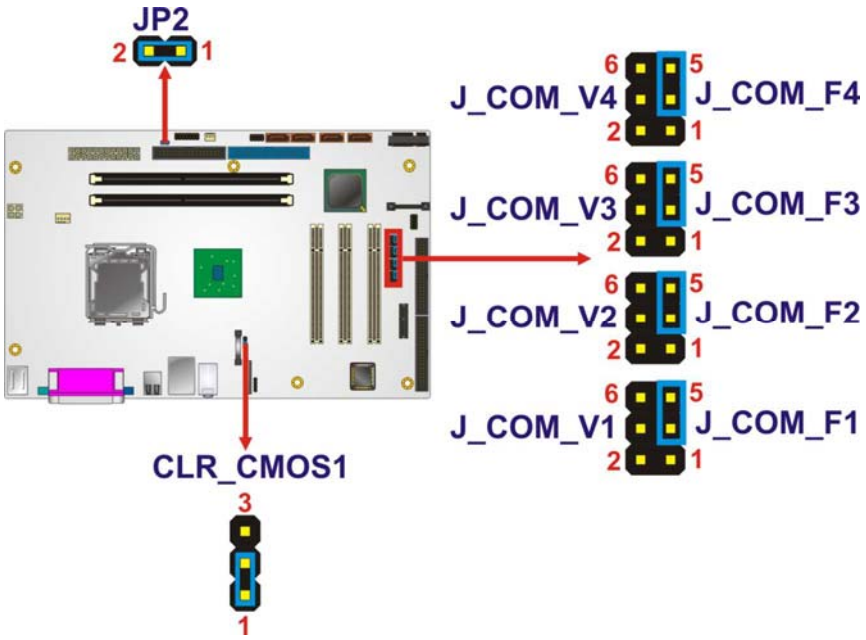


Figure 5-8: Jumper Locations

5.5.1 AT/ATX Power Selection

Jumper Label: **JP2**

Jumper Type: 2-pin header

Jumper Settings: See **Table 5-2**

Jumper Location: See **Figure 5-8**

This jumper sets the motherboard to use AT or ATX power. AT power turns the computer off directly by turning power supply on and off. ATX provides more advanced power settings and allows the system to be turned on and off remotely and to enter different sleep states.

Pins	Description	
Open	AT	
Short	ATX	Default

Table 5-2: CF Master/Slave Selection Settings

5.5.2 Clear CMOS Jumper

Jumper Label:	**JP1**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 5-3**
Jumper Location:	See **Figure 5-8**

If the IMBA-9454B fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

If the "CMOS Settings Wrong" message is displayed during the boot up process, the fault may be corrected by pressing the F1 to enter the CMOS Setup menu. Do one of the following:

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

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

The clear CMOS jumper settings are shown in **Table 5-3**.

Pins	Description	
1-2	Keep CMOS Setup	Default
2-3	Clear CMOS Setup	

Table 5-3: Clear CMOS Jumper Settings

5.5.3 COM1 Pin-9 Setup

Jumper Label:	**J_COM_F1 & J_COM_V1**
Jumper Type:	6-pin header (both settings on the same physical pin header set)
Jumper Settings:	See **Table 5-4** and **Table 5-5**
Jumper Location:	See **Figure 5-8**

This jumper sets the function of pin-9 as either RI, 5 V or 12 V.

Pins	Description	
1-2	Voltage	
2-3	RI	Default

Table 5-4: COM1 RI/Voltage Selection

Pins	Description	
1-2	5 V	
2-3	12 V	Default

Table 5-5: COM1 Voltage Setting

5.5.4 COM2 Pin-9 Setup

Jumper Label:	**J_COM_F2 & J_COM_V2**
Jumper Type:	6-pin header (both settings on the same physical pin header set)
Jumper Settings:	See **Table 5-6** and **Table 5-7**
Jumper Location:	See **Figure 5-8**

This jumper sets the function of pin-9 as either RI, 5 V or 12 V.

Pins	Description	
1-2	Voltage	
2-3	RI	Default

Table 5-6: COM2 RI/Voltage Selection

Pins	Description	
1-2	5 V	
2-3	12 V	Default

Table 5-7: COM2 Voltage Setting

5.5.5 COM3 Pin-9 Setup

Jumper Label: **J_COM_F3 & J_COM_V3**

Jumper Type: 6-pin header (both settings on the same physical pin header set)

Jumper Settings: See **Table 5-8** and **Table 5-9**

Jumper Location: See **Figure 5-8**

This jumper sets the function of pin-9 as either RI, 5 V or 12 V.

Pins	Description	
1-2	Voltage	
2-3	RI	Default

Table 5-8: COM3 RI/Voltage Selection

Pins	Description	
1-2	5 V	
2-3	12 V	Default

Table 5-9: COM3 Voltage Setting

5.5.6 COM4 Pin-9 Setup

Jumper Label: **J_COM_F4 & J_COM_V4**

Jumper Type: 6-pin header (both settings on the same physical pin header set)

Jumper Settings: See **Table 5-10** and **Table 5-11**

Jumper Location: See **Figure 5-8**

This jumper sets the function of pin-9 as either RI, 5 V or 12 V.

Pins	Description	
1-2	Voltage	
2-3	RI	Default

Table 5-10: COM4 RI/Voltage Selection

Pins	Description	
1-2	5 V	
2-3	12 V	Default

Table 5-11: COM4 Voltage Setting

5.6 Chassis Installation

WARNING

Airflow is critical to the cooling of the CPU and other onboard components. The chassis into which the IMBA-9454B is placed must have air vents to allow proper airflow to cool the system components.

The IMBA-9454B must be installed in a chassis with ventilation holes on the sides allowing airflow to travel over the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow over the board surface.

NOTE

IEI has a wide range of chassis available. Please contact your IMBA-9454B vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about available chassis.

5.7 Internal Peripheral Device Connections

The cables listed in **Table 5-12** are shipped with the IMBA-9454B.

Quantity	Type
1	ATA 66/100 flat cable
2	Dual RS-232 cables
2	SATA drive cables
1	SATA drive power cable

Table 5-12: IEI Provided Cables

5.7.1 ATA Flat Cable Connection

The ATA 66/100 flat cable connects to an IDE device. Follow the instructions below to connect an IDE HDD to the IMBA-9454B.

Step 1: **Locate the IDE connector**. The locations of the IDE device connectors are shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the IDE cable connector to the onboard connector. See **Figure 5-9**. A key on the front of the cable connector ensures it can only be inserted in one direction.

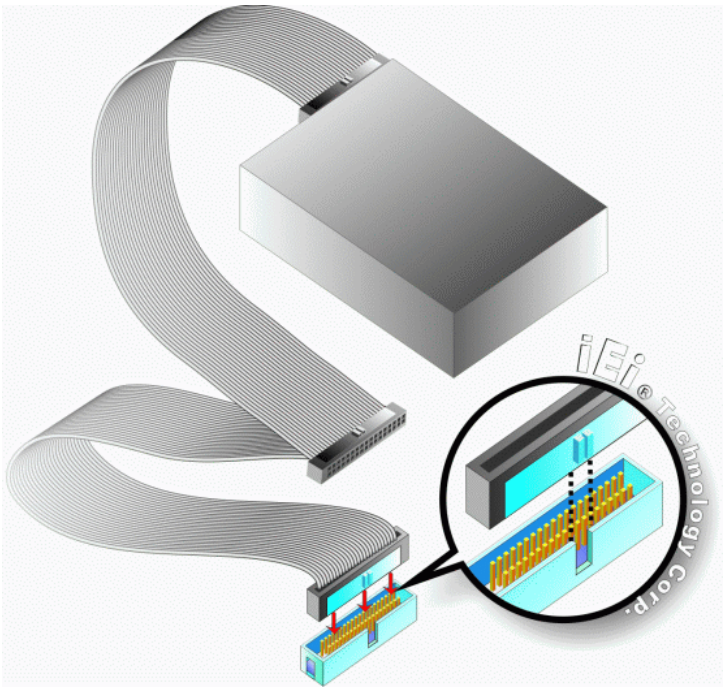


Figure 5-9: IDE Cable Connection

Step 3: **Connect the cable to an IDE device**. Connect the two connectors on the other side of the cable to one or two IDE devices. Make sure that pin 1 on the cable corresponds to pin 1 on the connector

5.7.2 Dual RS-232 Cable Connection

The dual RS-232 cable consists of two serial port connectors attached to a serial communications cable that is then attached to two bracket mounted D-sub 9 male connectors. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connector**. The location of the RS-232 connector is shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Insert the connectors into the serial port box headers. See **Figure 5-10**. A key on the front of the cable connectors ensures the connectors can only be installed in one direction.

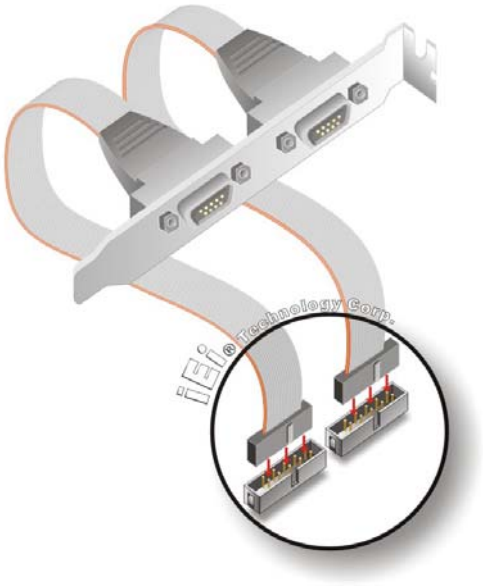


Figure 5-10: Dual RS-232 Cable Installation

Step 3: **Secure the bracket**. The dual RS-232 connector has two D-sub 9 male connectors secured to a bracket. To secure the bracket to a chassis please refer to the reference material that came with the chassis

5.7.3 FDD Cable Connection

The FDD flat cable connects to the IMBA-9454B to one FDD device. To connect an FDD to the IMBA-9454B please follow the instructions below.

Step 1: **Locate the FDD connector**. The location of the FDD device connector is shown in **Chapter 3**.

Step 2: **Insert the connector**. Connect the FDD cable connector to the on-board connector. See **Figure 5-11**. A key on the front of the cable connector ensures it can only be inserted in one direction.

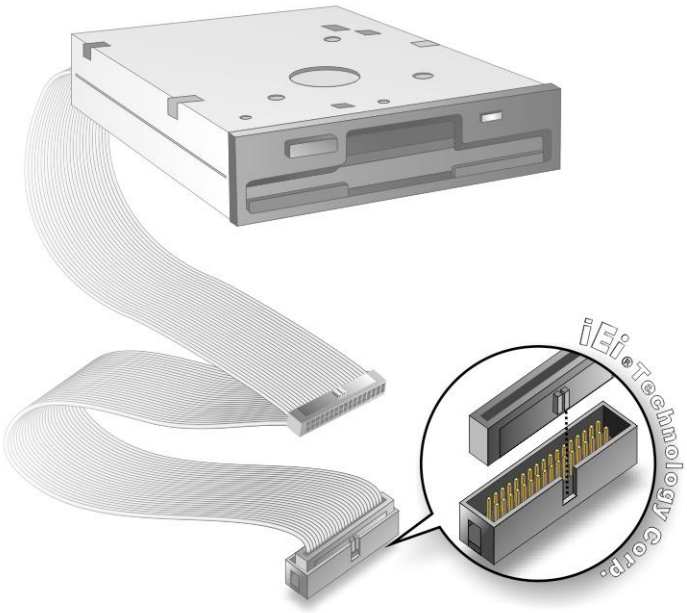


Figure 5-11: FDD Cable Connection

Step 3: **Connect the cable to an FDD device**. Connect the connector at the other end of the cable to an FDD device. Make sure that pin 1 on the cable corresponds to pin 1 on the connector.

5.7.4 Four Serial Port Connector

The 40-pin serial port connector connects the board connector to four DB-9 connectors. To install, please follow the steps below.

Step 1: **Locate the COM connector**. The locations of the COM port connectors are shown in Chapter 4.

Step 2: **Insert the cable connector.** Align the cable connector with the onboard connector. Make sure pin 1 on the board and connector line up. Error! Reference source not found..

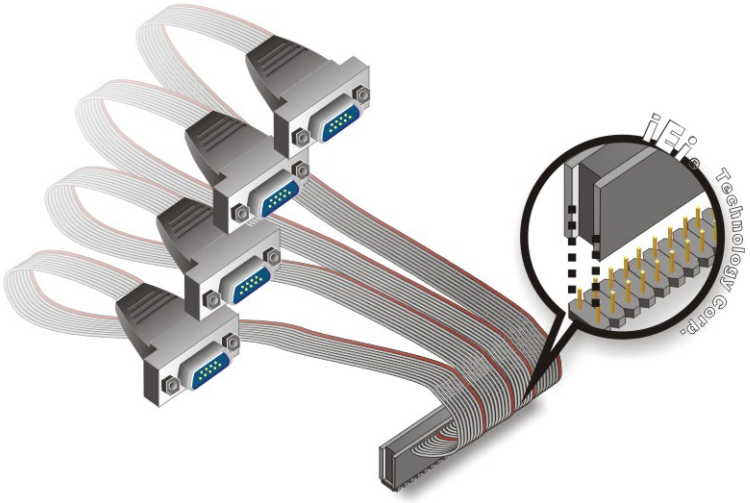


Figure 5-12: Four Serial Port Connector

Step 3: **Secure the serial ports to the chassis**. Tighten the screws on the DB-9 connectors to secure them to the chassis.

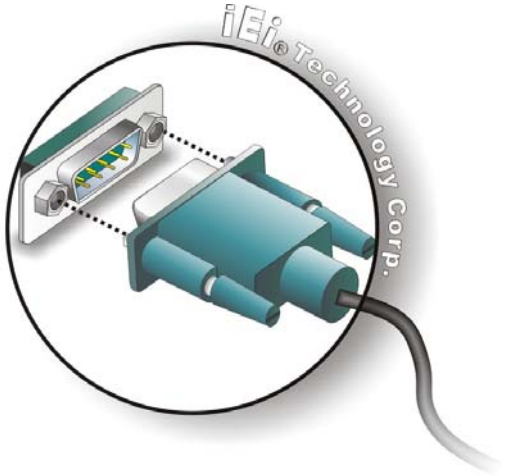


Figure 5-13: Serial Device Connector

5.7.5 PCIe Mini Card Installation

To install the PCIe Mini card, please refer to the diagram and instructions below.

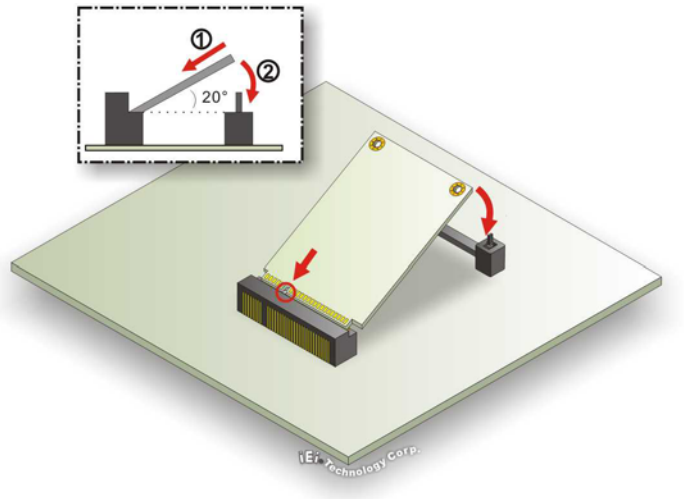


Figure 5-14: PCIe Mini Card Installation

Step 1: **Insert into the socket at and angle**. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20º.

Step 2: **Push down until the card clips into place**. Push the other end of the card down until it clips into place on the plastic connector.

5.7.6 SATA Drive Connection

The IMBA-9454B is shipped with SATA drive cables and SATA drive power cable. Follow the steps below to connect the SATA drives to the motherboard.

Step 1: **Locate the connectors**. The locations of the SATA drive connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-15**.

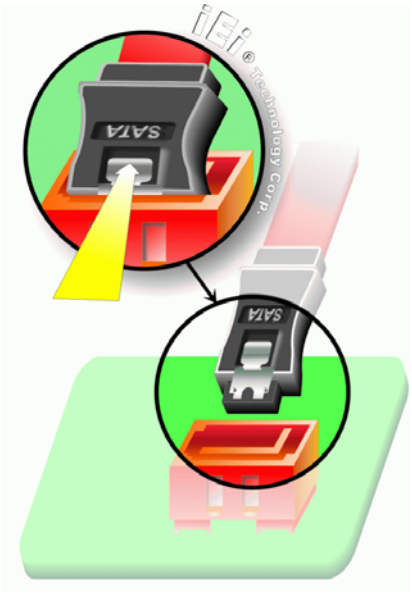


Figure 5-15: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-16**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-16**.

Figure 5-16: SATA Power Drive Connection

5.8 External Peripheral Interface Connection

The following external peripheral devices can be connected to the external peripheral interface connectors.

- Mouse and keyboard
- Parallel devices
- RJ-45 Ethernet cable connectors
- USB devices
- Audio devices
- VGA monitor

To install these devices, connect the corresponding cable connector from the actual device to the corresponding IMBA-9454B external peripheral interface connector making sure the pins are properly aligned.

5.8.1 PS/2 Keyboard/Mouse Connection

The IMBA-9454B has a dual PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is used to connect to a keyboard and mouse to the system. Follow the steps below to connect a keyboard and mouse to the IMBA-9454B.

Step 5: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 6: **Insert the keyboard/mouse connector**. Insert a PS/2 keyboard or mouse connector into the appropriate PS/2 connector on the external peripheral interface connector. See **Figure 5–17**.

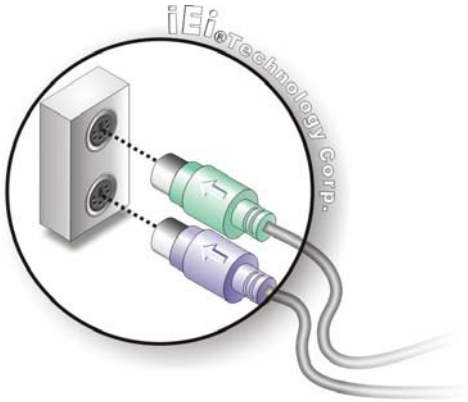


Figure 5–17: PS/2 Keyboard/Mouse Connector

5.8.2 Parallel Device Connection

The IMBA-9454B has a single female DB-25 connector on the external peripheral interface panel for parallel devices. Follow the steps below to connect a parallel device to the IMBA-9454B.

Step 7: **Locate the DB-25 connector**. The location of the DB-25 connector is shown in **Chapter 3**.

Step 8: **Insert the DB-25 connector**. Insert the DB-25 connector of a parallel device into the DB-25 connector on the external peripheral interface. See **Figure 5–18**.

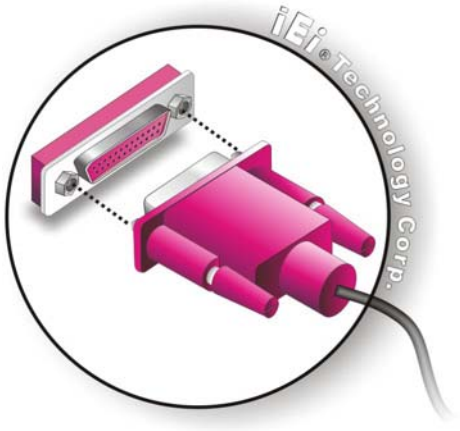


Figure 5–18: Parallel Port

Step 9: **Secure the connector**. Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

5.8.3 RJ-45 Ethernet Connection

The IMBA-9454B has two RJ-45 Ethernet connectors on the external peripheral interface panel for LAN communications. Follow the steps below to connect an RJ-45 Ethernet connector to the IMBA-9454B.

Step 1: **Locate the RJ-45 connector**. The location of the RJ-45 connector is shown in **Chapter 3**.

Step 2: **Insert an RJ-45 plug**. Insert the RJ-45 plug of a LAN into the RJ-45 receptacle on the external peripheral interface. See **Figure 5-19**.

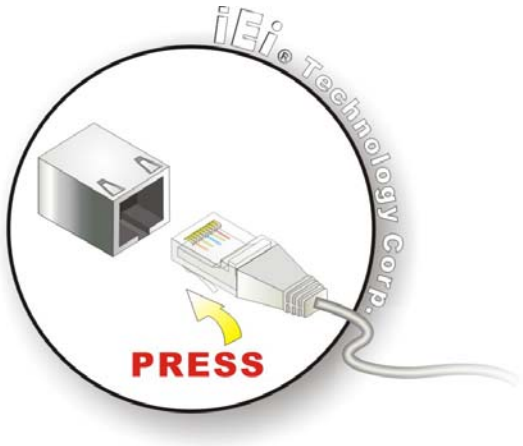


Figure 5-19: RJ-45 Ethernet Connector

5.8.4 USB Connection

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the IMBA-9454B.

Step 3: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 4: **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface.

See **Figure 5-20**.

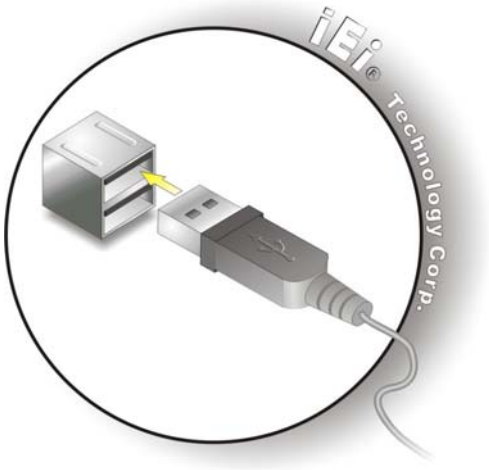


Figure 5-20: USB Connector

5.8.5 Audio Connection

Audio signals are interfaced through three phone jack connections. The red phone jack is for Mic In, blue is for Line In and green is for Speaker Out. Follow the steps below to connect audio devices to the IMBA-9454B.

Step 5: **Locate the audio phone jacks**. The location of the audio phone jacks are shown in **Chapter 3**.

Step 6: **Insert audio phone jack plugs**. Insert audio phone jack plugs into the audio phone jacks on the external peripheral interface. See **Figure 5–21**.

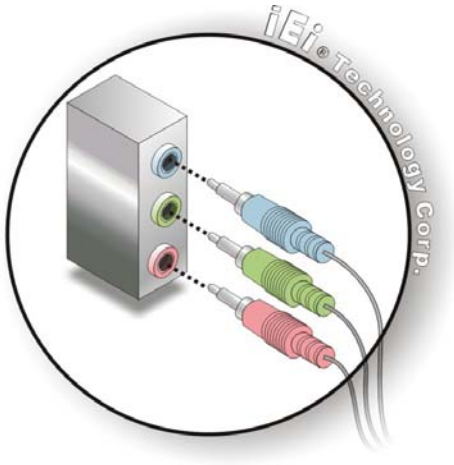


Figure 5–21: Audio Connectors

5.8.6 VGA Monitor Connection

The IMBA-9454B has a single female DB-15 connector on the external peripheral interface panel for a VGA monitor. Follow the steps below to connect a VGA monitor to the IMBA-9454B.

Step 7: **Locate the DB-15 connector**. The location of the DB-15 connector is shown in **Chapter 3**.

Step 8: **Insert the VGA connector**. Insert the DB-15 connector of a VGA monitor into the DB-15 connector on the external peripheral interface. See **Figure 5-22**.

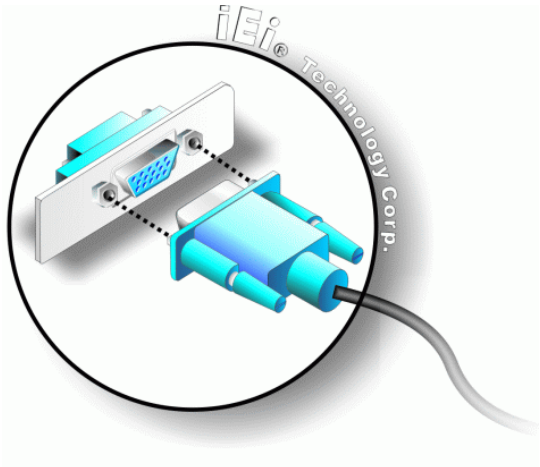


Figure 5-22: VGA Connector

Step 9: **Secure the connector**. Secure the VGA connector to the external interface by tightening the two retention screws on either side of the connector.

Chapter

6

BIOS Setup

6.1 Introduction

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

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
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

Key	Function
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 **Section 5.4**.

6.1.5 BIOS Menu Bar

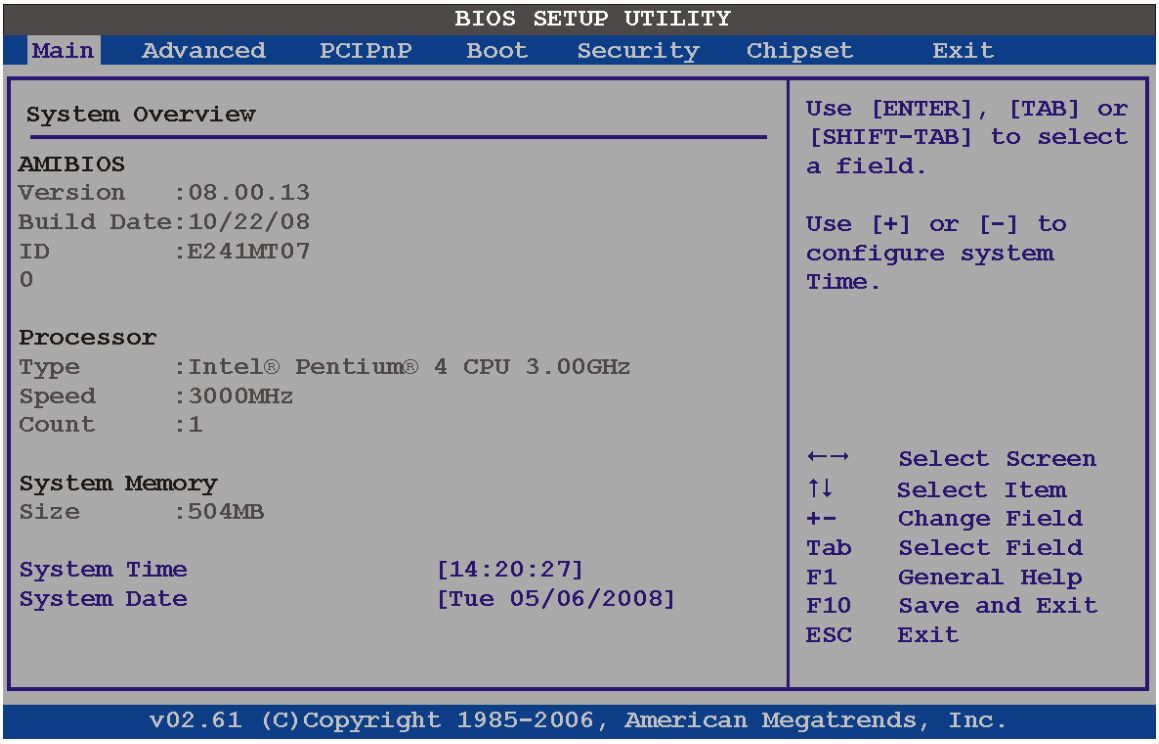
The menu bar on top of the BIOS screen has the following main items:

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **Boot** Changes the system boot configuration.
- **Security** Sets User and Supervisor Passwords.
- **Chipset** Changes the chipset 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 Menu 1: Main

- **System Overview**

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

- **AMI BIOS**: Displays auto-detected BIOS information
  - **Version**: Current BIOS version
  - **Build Date**: Date the current BIOS version was made
  - **ID**: Installed BIOS ID
- **Processor**: Displays auto-detected CPU specifications
  - **Type**: Names the currently installed processor
  - **Speed**: Lists the processor speed
  - **Count**: The number of CPUs on the motherboard

- **System Memory**: Displays the auto-detected system memory.
  - **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.

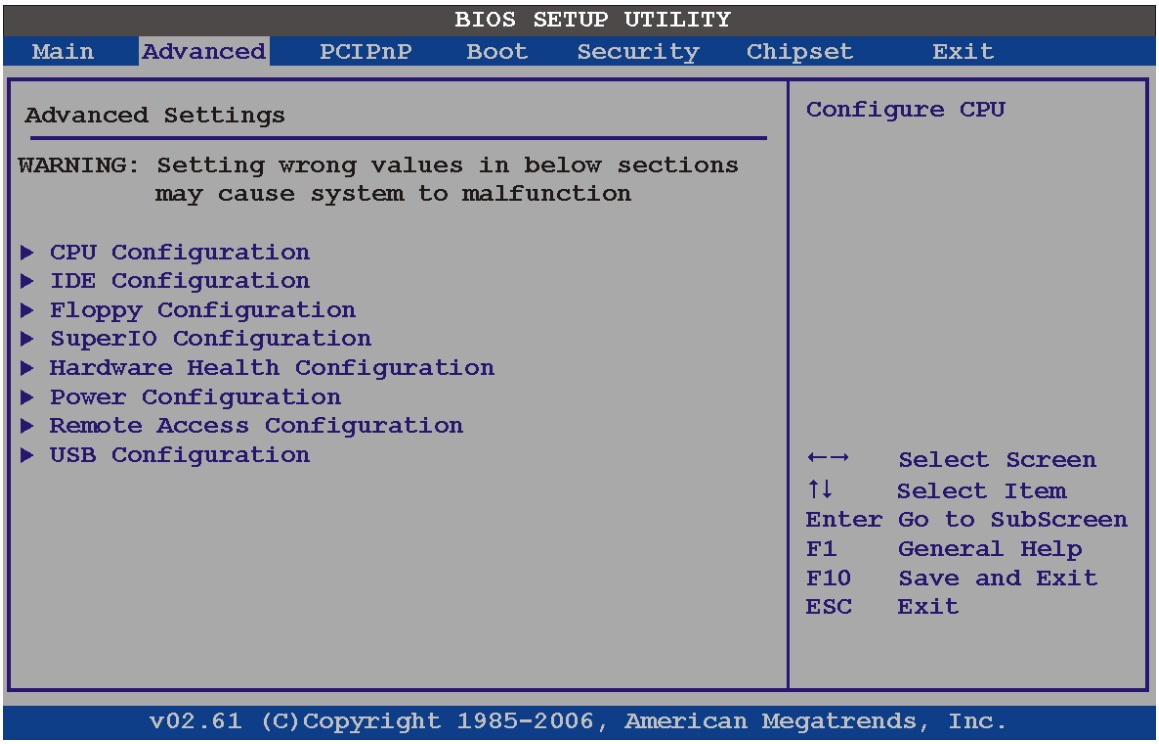
6.3 Advanced

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.

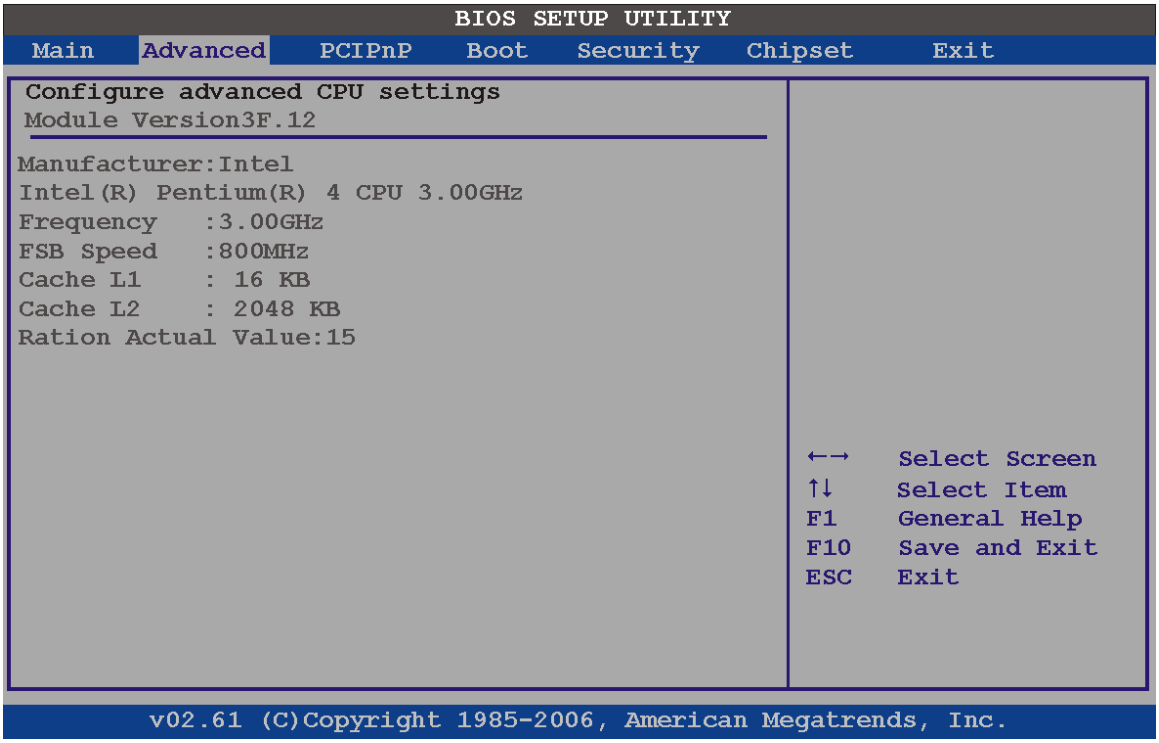
- CPU configuration
- IDE configuration
- Floppy configuration
- Super I/O configuration
- Hardware health configuration
- Power configuration
- Remote access configuration
- USB configuration



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.



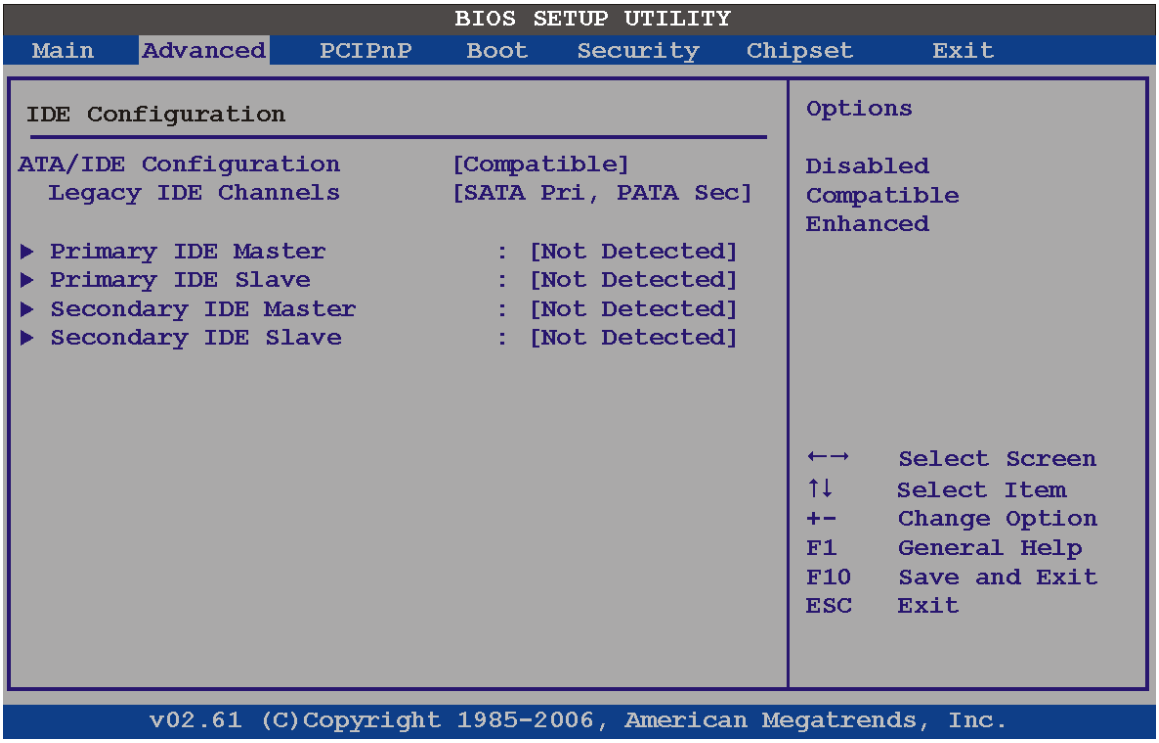
BIOS Menu 3: CPU Configuration

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

- **Module Version**: xx.xx
- **Manufacturer**: Lists the name of the CPU manufacturer
- **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 Value**: Displays the ratio at which the CPU is actually operating

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 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 [PATA Pri, SATA Sec]

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

➔ **PATA Pri, SATA Sec** **DEFAULT** The IDE drives are enabled on the Primary IDE channel. The SATA drives are enabled on the Secondary IDE channel.

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

- **Primary/Secondary IDE Master/Slave**

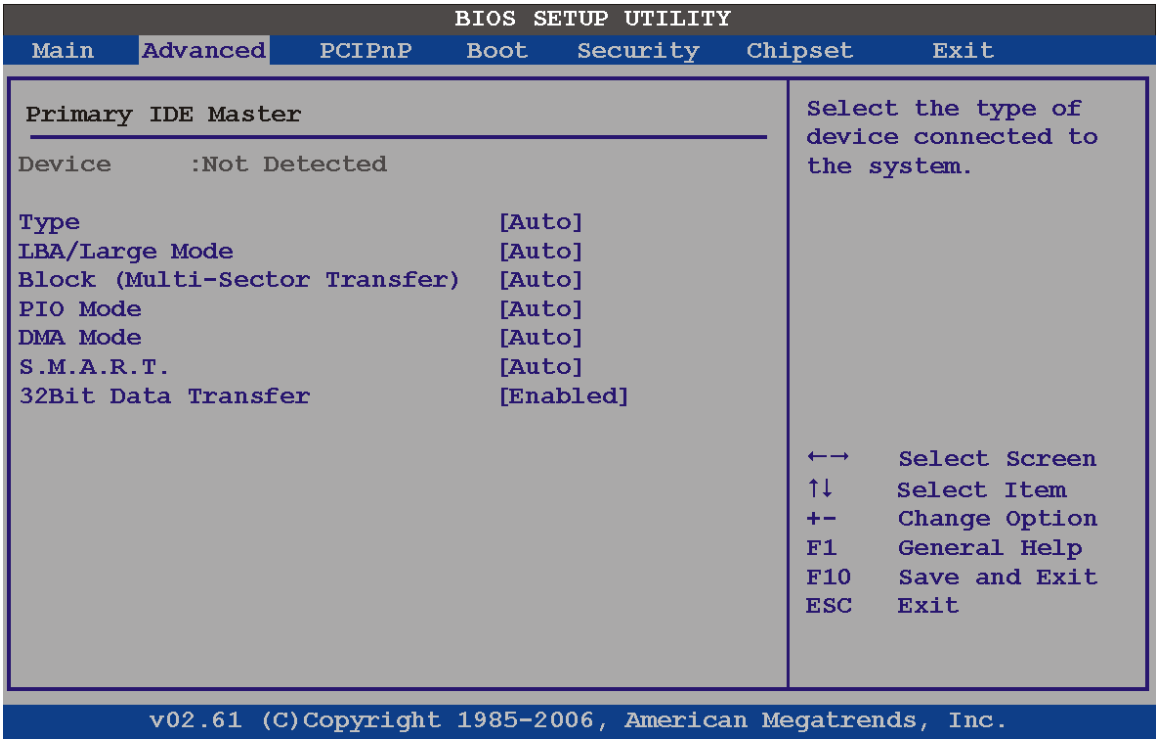
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the IDE Configuration menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave

These settings are adjusted according to the instructions in the subsection below.

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 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
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per

interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.

- **PIO Mode**: Indicates the PIO mode of the installed device.
- **DMA Mode**: Adjust the DMA mode options.
- **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 to 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

➔ **3** PIO mode 3 selected with a maximum transfer rate of 11.1 MB/s

➔ **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.

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

➔ **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.)

➔ **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.)

➔ **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.

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

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

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

- **32Bit Data Transfer [Enabled]**

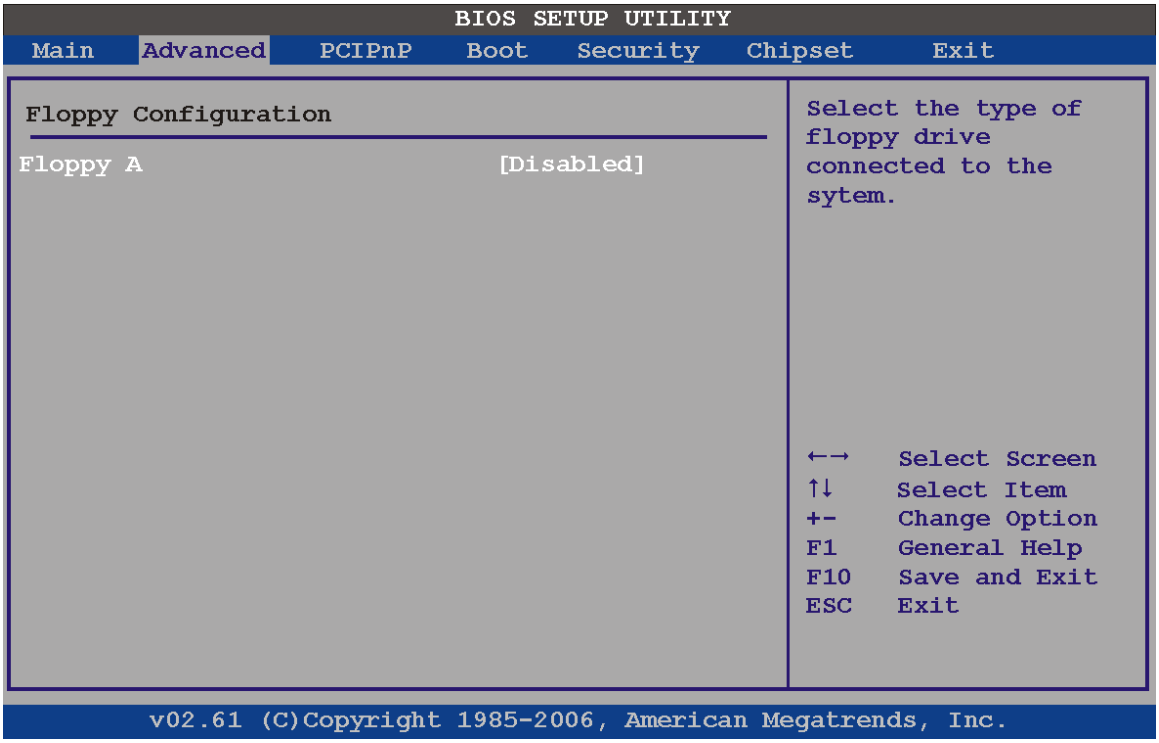
Use the 32Bit Data Transfer BIOS option to enables or disable 32-bit data transfers.

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

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

6.3.3 Floppy Configuration

Use the Floppy Configuration menu to configure the floppy disk drive connected to the system.



BIOS Menu 6: Floppy Configuration

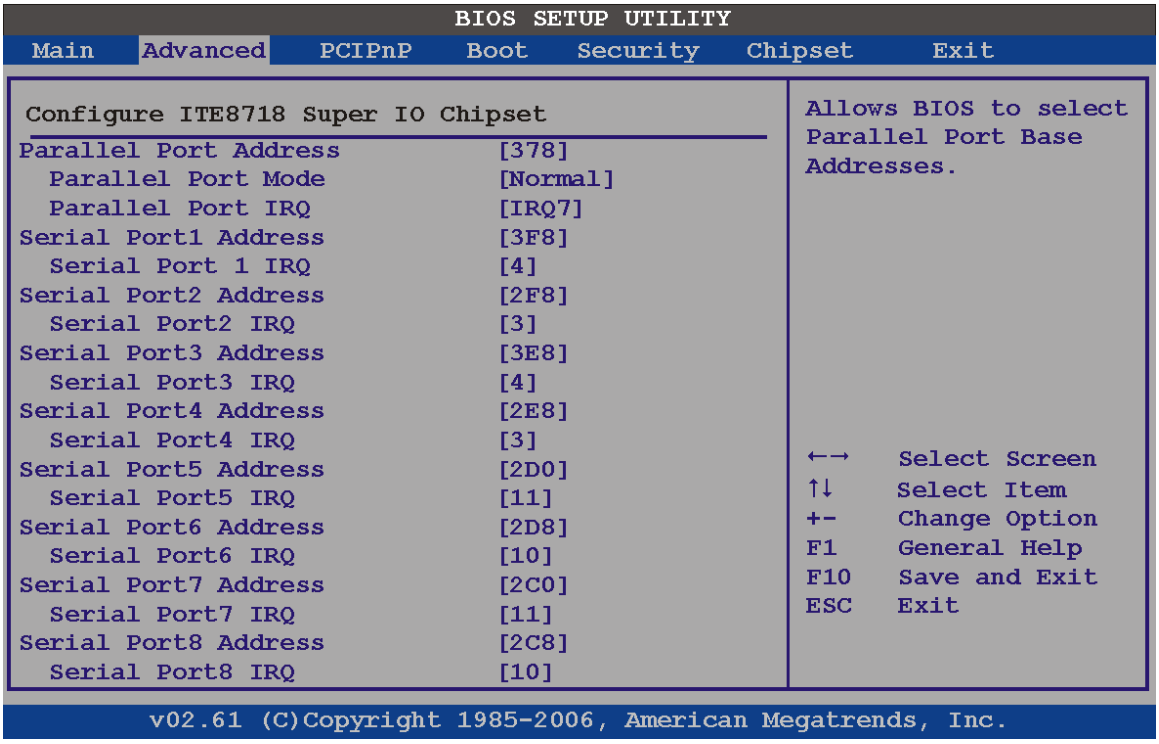
- **Floppy A/B**

Use the Floppy A/B option to configure the floppy disk drive. Options are listed below:

- Disabled
- 360 KB 51/4”
- 1.2 MB 51/4”
- 720 KB 31/2”
- 1.44 MB 31/2” **DEFAULT**
- 2.88 MB 31/2”

6.3.4 Super IO Configuration

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



BIOS Menu 7: Super IO Configuration

- **Parallel Port Address [378]**

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

➔ **Disabled**		No base address is assigned to the Parallel Port
➔ **378**	**DEFAULT**	Parallel Port I/O port address is 378
➔ **278**		Parallel Port I/O port address is 278
➔ **3BC**		Parallel Port I/O port address is 3BC

- **Parallel Port Mode [Normal]**

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

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

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

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

➔ **ECP+EPP** The parallel port is also compatible with both ECP and EPP devices described above

- **Parallel Port IRQ [IRQ7]**

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

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

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

- **Serial Port1 Address [3F8]**

Sets the base address for the serial port.

- Disabled
- 3F8 **DEFAULT**
- 2F8
- 3E8
- 2E8

- **Serial Port1 IRQ [4]**

  Sets the IRQ for the serial port.

  - 4 **DEFAULT**

- **Serial Port2 Address [3F8]**

  Sets the base address for the serial port.

  - Disabled
  - 3F8
  - 2F8 **DEFAULT**
  - 3E8
  - 2E8

- **Serial Port2 IRQ [4]**

  Sets the IRQ for the serial port.

  - 3 **DEFAULT**

- **Serial Port3 Address [3F8]**

  Sets the base address for the serial port.

  - Disabled
  - 3F8
  - 2F8
  - 3E8 **DEFAULT**
  - 2E8

- **Serial Port3 IRQ [4]**

  Sets the IRQ for the serial port.

  - 4 **DEFAULT**

- **Serial Port4 Address [3F8]**

  Sets the base address for the serial port.

- Disabled
- 3F8
- 2F8
- 3E8
- 2E8 **DEFAULT**

- **Serial Port4 IRQ [4]**

  Sets the IRQ for the serial port.

  - 3 **DEFAULT**

- **Serial Port5 Address [3F8]**

  Sets the base address for the serial port.

  - Disabled
  - 2D0 **DEFAULT**
  - 2D8
  - 2C0
  - 2C8

- **Serial Port5 IRQ [4]**

  Sets the IRQ for the serial port.

  - 11 **DEFAULT**

- **Serial Port6 Address [3F8]**

  Sets the base address for the serial port.

  - Disabled
  - 2D0
  - 2D8 **DEFAULT**
  - 2C0
  - 2C8

- **Serial Port6 IRQ [4]**

  Sets the IRQ for the serial port.

  - 10 **DEFAULT**

- **Serial Port7 Address [3F8]**

  Sets the base address for the serial port.

  - Disabled
  - 2D0
  - 2D8
  - 2C0 **DEFAULT**
  - 2C8

- **Serial Port7 IRQ [4]**

  Sets the IRQ for the serial port.

  - 11 **DEFAULT**

- **Serial Port8 Address [3F8]**

  Sets the base address for the serial port.

  - Disabled
  - 2D0
  - 2D8
  - 2C0
  - 2C8 **DEFAULT**

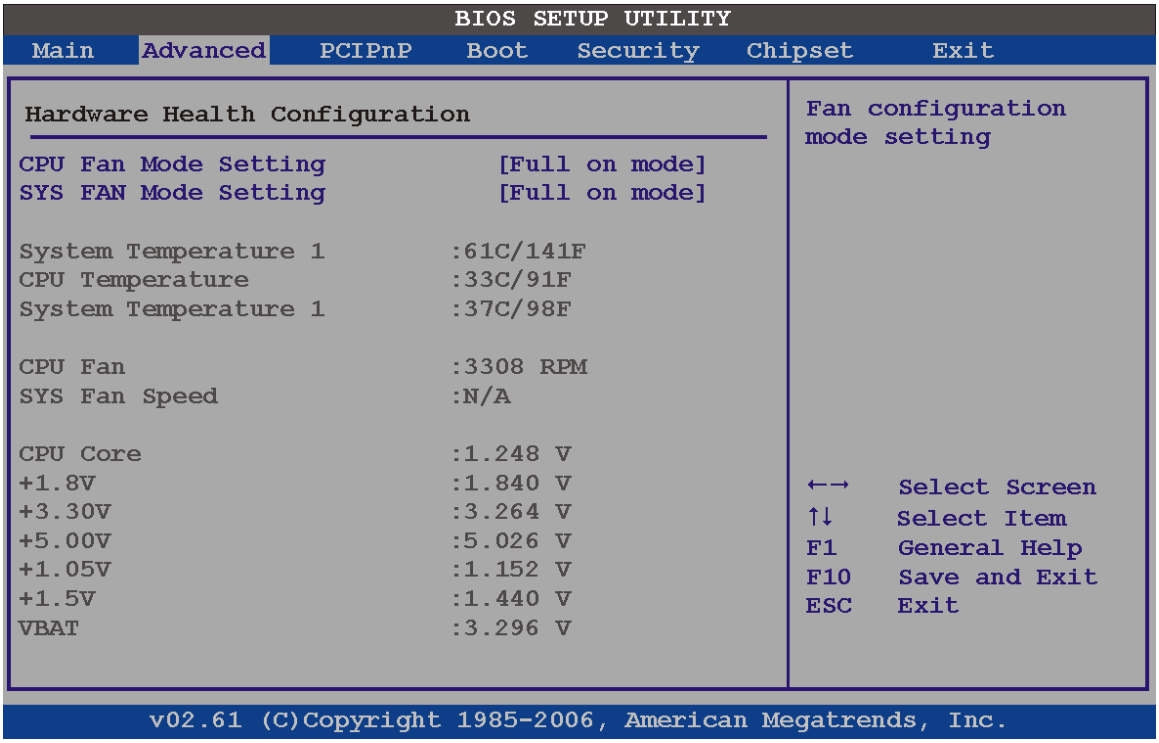
- **Serial Port8 IRQ [4]**

  Sets the IRQ for the serial port.

  - 10 **DEFAULT**

6.3.5 Hardware Health Configuration

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



BIOS Menu 8: Hardware Health Configuration

- **CPU/SYS Fan Mode Setting [Full On Mode]**

Use the **CPU/SYS Fan Mode Setting** option to configure the second fan.

➔ **Full On Mode**	**DEFAULT**	Fan is on all the time
➔ **Automatic mode**		Fan is off when the temperature is low enough. Parameters must be set by the user.
➔ **PWM Manual mode**		Pulse width modulation set manually

When **Automatic Mode** is selected, the following parameters can be set.

- Temperature limit of OFF
- Temperature limit of Start
- Fan start PWM
- Slope PWM

When the **CPU FAN Mode Setting** option is in the **PWM Manual Mode**, the following parameters can be set.

- CPU Fan PWM control

- **Temperature Limit of OFF [000]**

WARNING:

Setting this value too high may cause the fan to stop when the CPU is at a high temperature and therefore cause the system to be damaged.

The fan will turn off when the temperature falls below this value.

- Minimum Value: 0°C
- Maximum Value: 127°C

CPU Temp. Limit of Start [020]

WARNING:

Setting this value too high may cause the fan to start only when the CPU is at a high temperature and therefore cause the system to be damaged.

If the fan is off, it will turn off when the temperature exceeds this value.

- Minimum Value: 0°C
- Maximum Value: 127°C

- **CPU Fan Start PWM [070]**

  The fan will enter PWM mode when this temperature setting exceeded.

  - PWM Minimum Mode: 0
  - PWM Maximum Mode: 127

- **Slope PWM 1 [0.5 PWM]**

  The fan uses this PWM setting when the fan exceeds the temperature above.

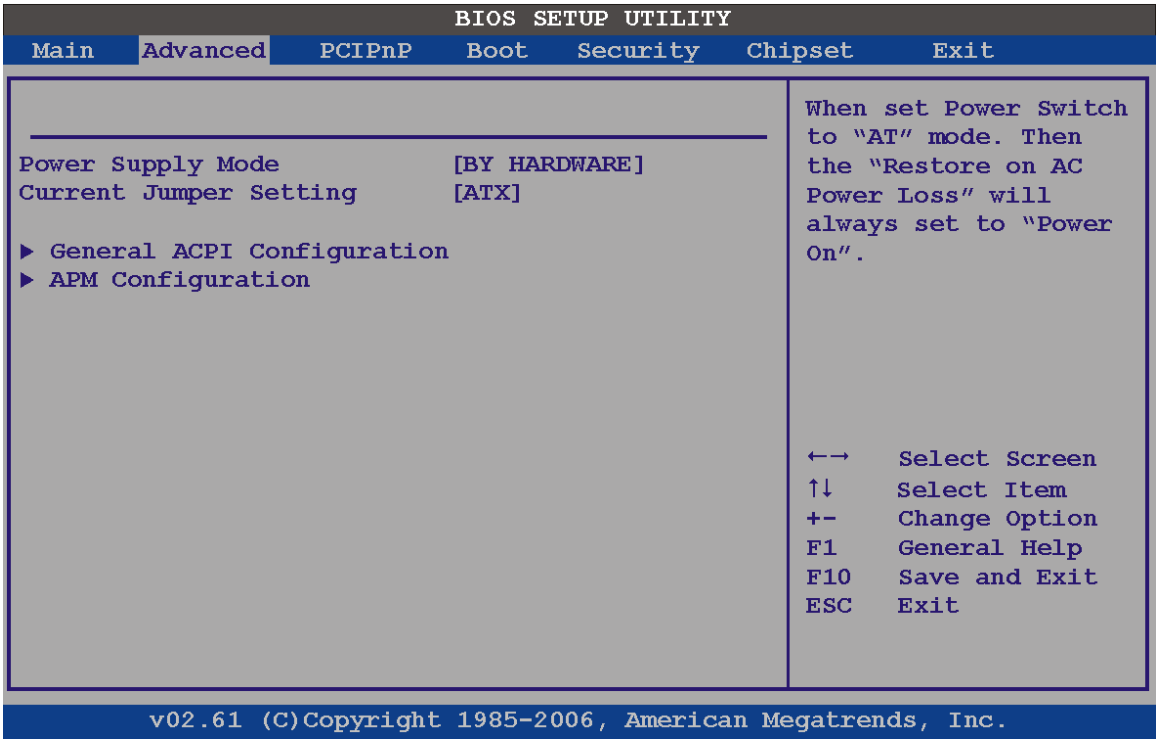
  - 0 PWM
  - 1 PWM
  - 2 PWM
  - 4 PWM
  - 8 PWM
  - 16 PWM
  - 32 PWM
  - 64 PWM

  The following values are monitored by the system:

  - System Temperatures: The following system temperatures are monitored
    - CPU temperature
    - System temperature 1
    - System temperature 2
  - Fan Speeds: The CPU cooling fan speed is monitored.
    - CPU fan speed
    - SYS fan speed
  - Voltages: The following system voltages are monitored
    - CPU core
    - 1.8 V
    - 3.3 V
    - 5.0 V
    - 1.05 V
    - 1.5 V
    - VBAT

6.3.6 Power Configuration

The power configuration menu adjusts the power settings for the different components of the board.



BIOS Menu 9: ACPI Configuration

- **Power Supply Mode [BY HARDWARE]**

The power supply mode setting determines whether AT or ATX power is used.

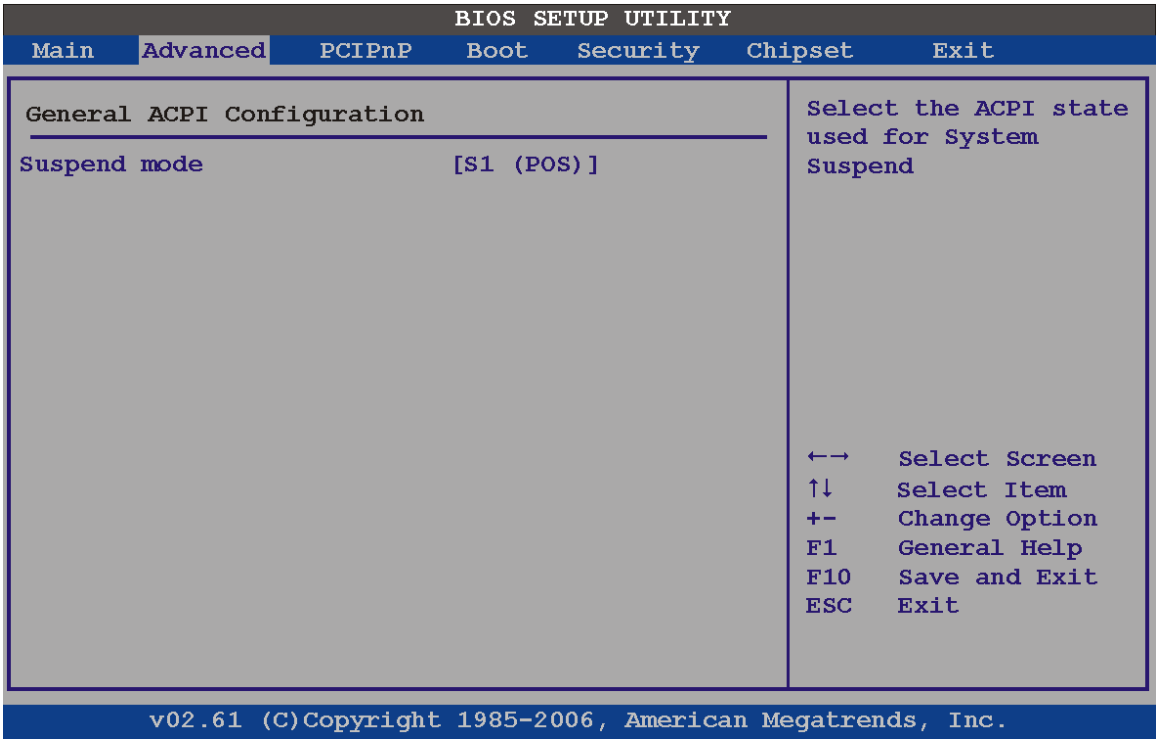
➔	**AT**		Power mode set to AT
➔	**ATX**		Power mode set to ATX
➔	**BY HARDWARE**	**DEFAULT**	The power mode is set by an onboard jumper

- **Current Jumper Setting [ATX]**

This jumper shows the current setting of the power supply mode jumper.

6.3.6.1 General ACPI Configuration

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



BIOS Menu 10: General ACPI Configuration

- **Suspend Mode [S1 (POS)]**

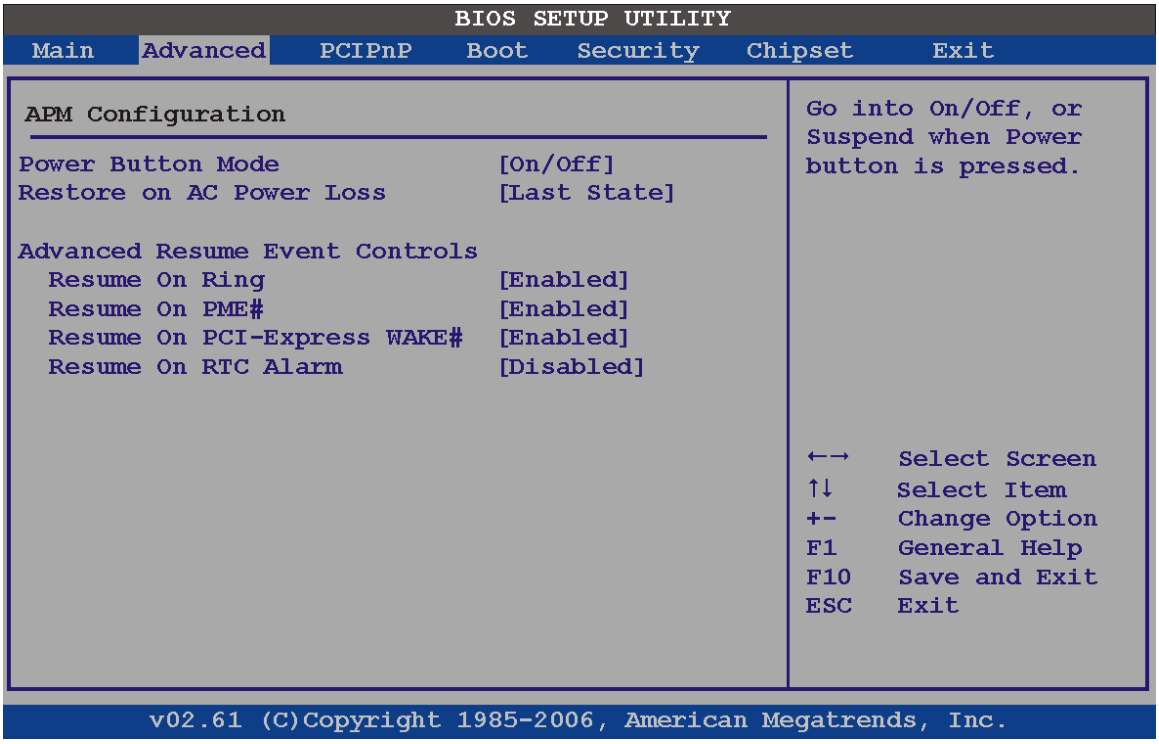
Use the Suspend Mode option to specify the sleep state the system enters when it is not being used.

➔ **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.

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

6.3.6.2 APM Configuration

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



BIOS Menu 11: Advanced Power Management Configuration

- **Power Button Mode [On/Off]**

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

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

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

- **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 off.
➔	**Power On**		The system turns on.
➔	**Last State**	**DEFAULT**	The system returns to the state just before power loss

- **Resume on Ring [Enabled]**

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.

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

- **Resume on PME# [Enabled]**

The **Resume on PME#** BIOS option specifies if the system is roused from a suspended or standby state when the "magic packet" is received over the LAN.

➔	**Disabled**		Not woken by network activity
➔	**Enabled**	**DEFAULT**	Woken by magic packet sent on LAN

- **Resume on PCI-Express WAKE# [Enabled]**

The **Resume on PCI-Express WAKE#** BIOS option specifies if the system is roused from a suspended or standby state when there is activity on the PCI-Express bus.

➔	**Disabled**		Wake event not generated by PCI-Express activity
➔	**Enabled**	**DEFAULT**	Wake event generated by PCI-Express 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.

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

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

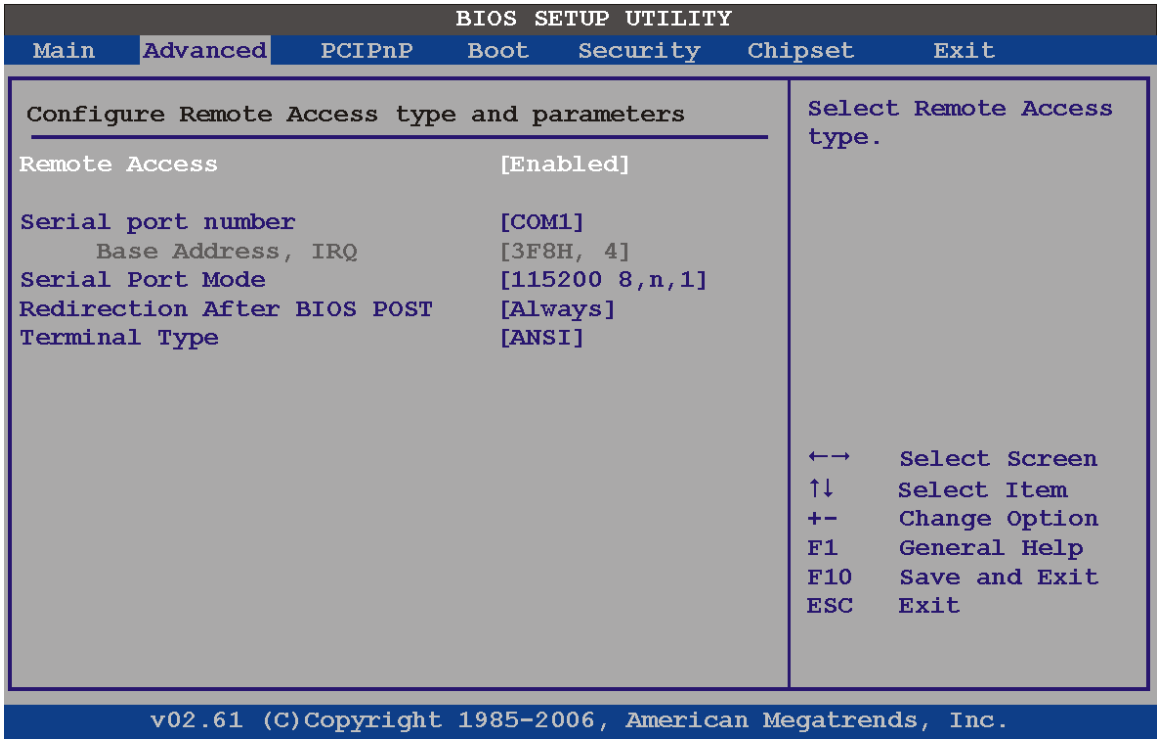
RTC Alarm Date (Days)

System Time

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

6.3.7 Remote Access 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 Menu 12: Remote Access Configuration [Advanced]

- **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 [2D0h, B]**

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

- **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)

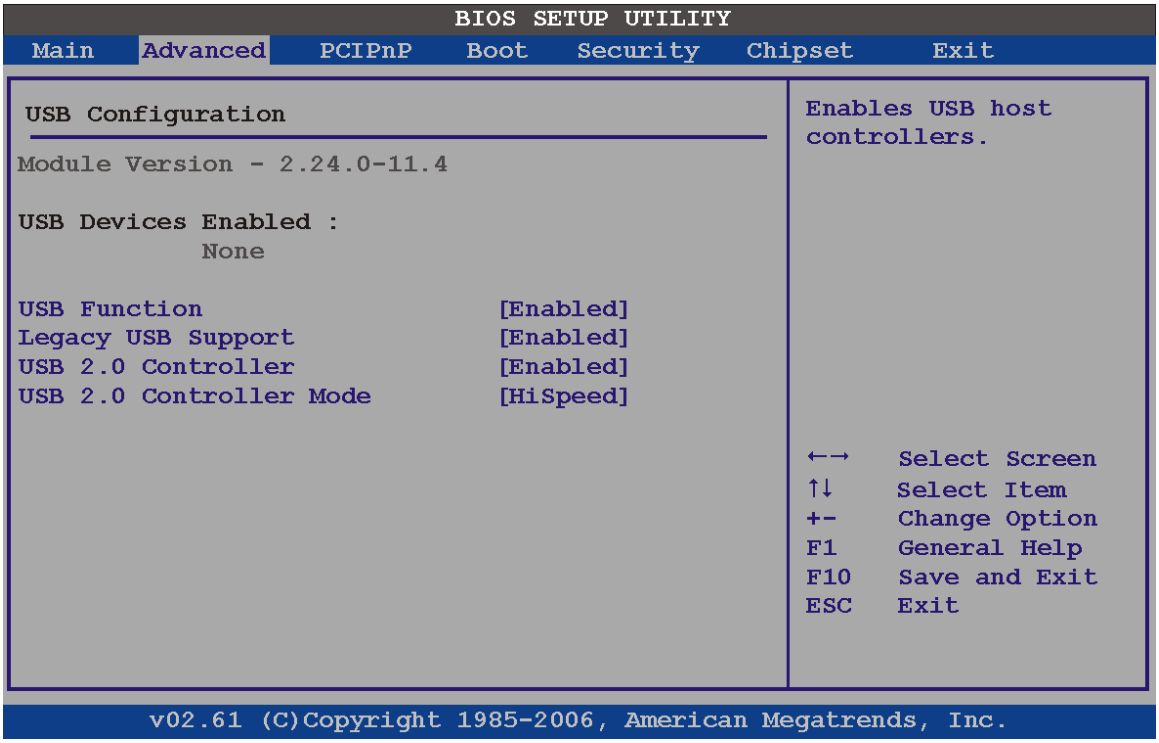
- **Terminal Type [ANSI]**

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

6.3.8 USB Configuration

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



BIOS Menu 13: USB Configuration

- **USB Configuration**

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

  - Module Version: x.xx.x-xx.x

- **USB Functions [Enabled]**

This option turns USB on and off.

  - Disabled
  - Enabled **DEFAULT**

- **USB2.0 Controller [Enabled]**

  This option allows the use Hi-Speed USB connectivity.

  - Disabled
  - Enabled **DEFAULT**

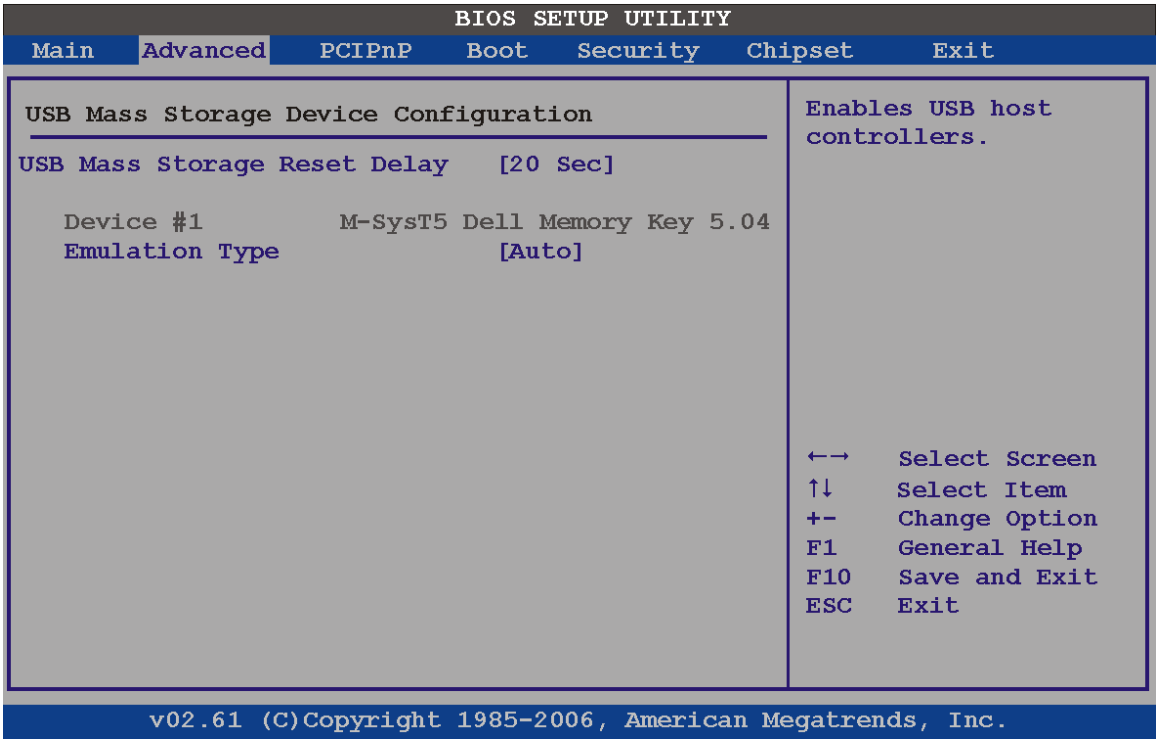
- **Legacy USB Support [Enabled]**

  This option allows a USB keyboard and mouse to be used before USB drivers are loaded. A USB keyboard and mouse can be used before the operating system is loaded, for example, to navigate around the BIOS menus.

➔ **Disabled**		Support disabled
➔ **Enabled**	**DEFAULT**	Support enabled
➔ **Auto**		Support enabled only if a USB keyboard or mouse is attached

6.3.8.1 USB Mass Storage Device Configuration

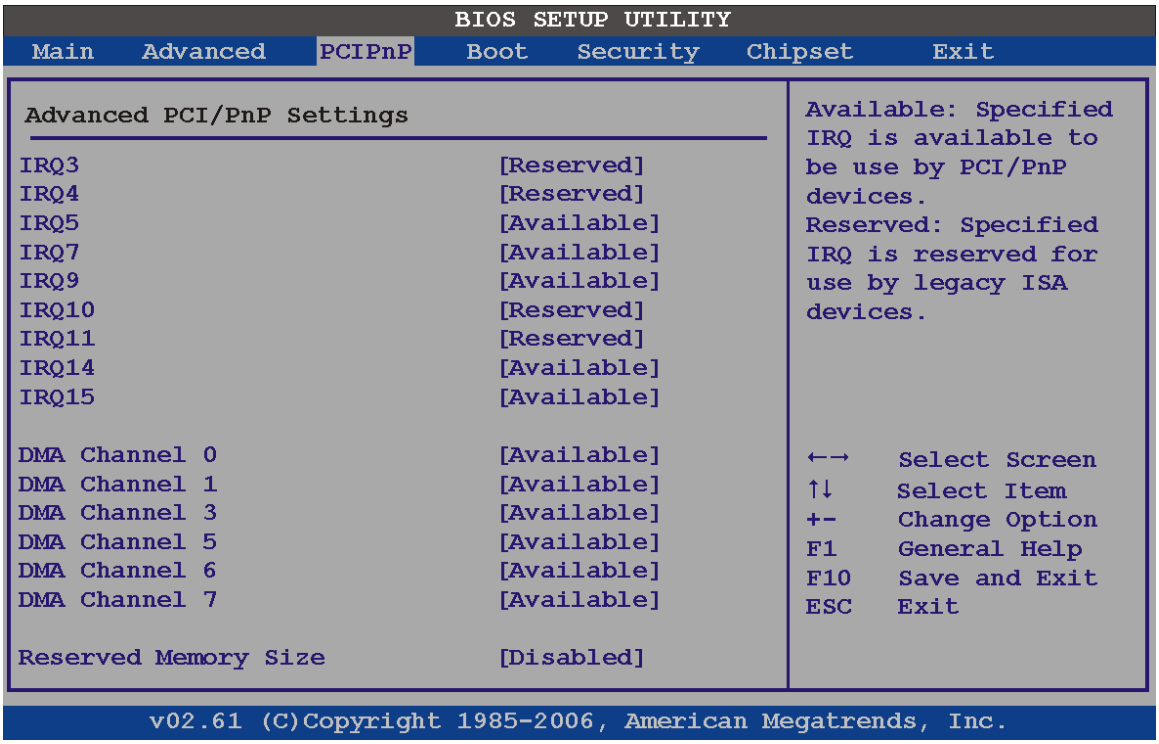
Use the USB Mass Storage Device Configuration menu (**BIOS Menu 14**) lists the USB mass storage class devices.



BIOS Menu 14: USB Mass Storage Device Configuration

6.4 PCI/PnP

Use the **PCI/PnP** menu (**BIOS Menu 15**) to configure advanced PCI and PnP settings.



BIOS Menu 15: 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]**

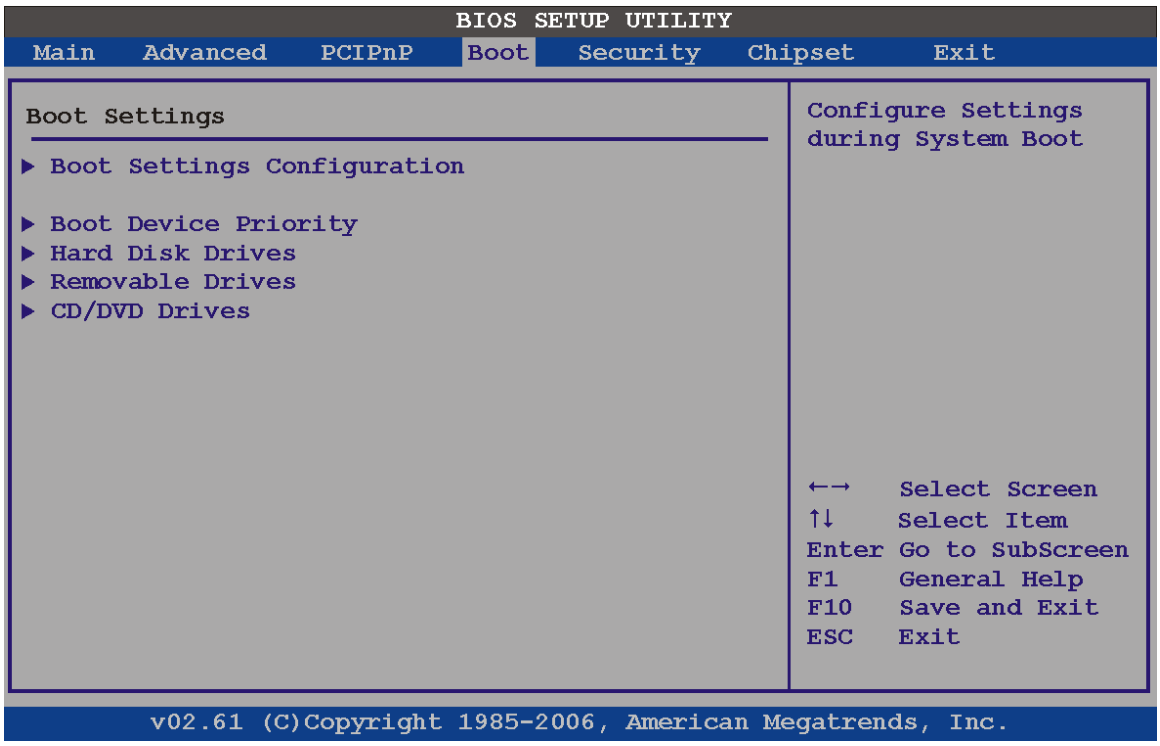
Use the **Reserved Memory Size** BIOS option to specify the amount of memory that should be reserved for legacy ISA devices.

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

6.5 Boot

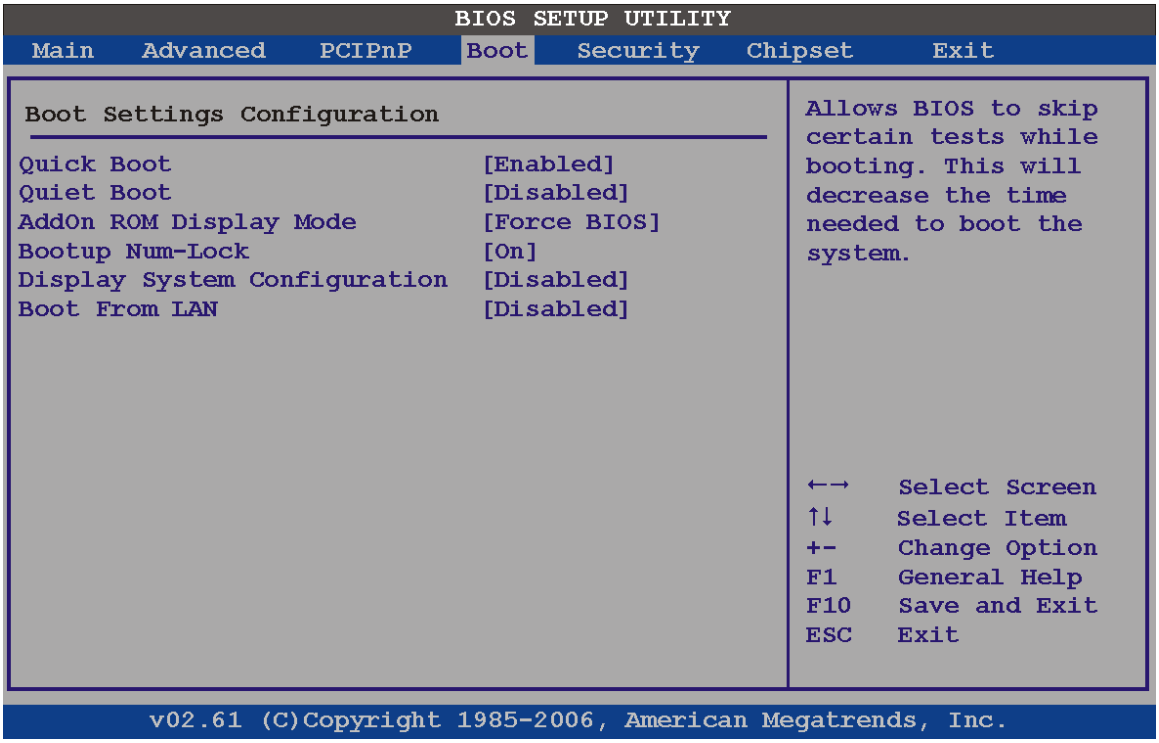
Use the Boot menu (**BIOS Menu 16**) to configure system boot options.



BIOS Menu 16: Boot

6.5.1 Boot Settings Configuration

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



BIOS Menu 17: Boot Settings Configuration

- **Quick Boot [Enabled]**

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

➔ **Disabled**		No POST procedures are skipped
➔ **Enabled**	**DEFAULT**	Some POST procedures are skipped to decrease the system boot time

- **Quiet Boot [Disabled]**

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

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed

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

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

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

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

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

- **Bootup Num-Lock [On]**

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

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

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

- **Display System Configuration [Enabled]**

Use the **Display System Configuration** option to select whether or not system configuration information is shown on screen after POST.

➔ **Disabled** System configuration information is not shown on screen after POST.

➔ **Enabled** **DEFAULT** System configuration information is shown on screen after POST.

- **Boot From LAN Support [Disabled]**

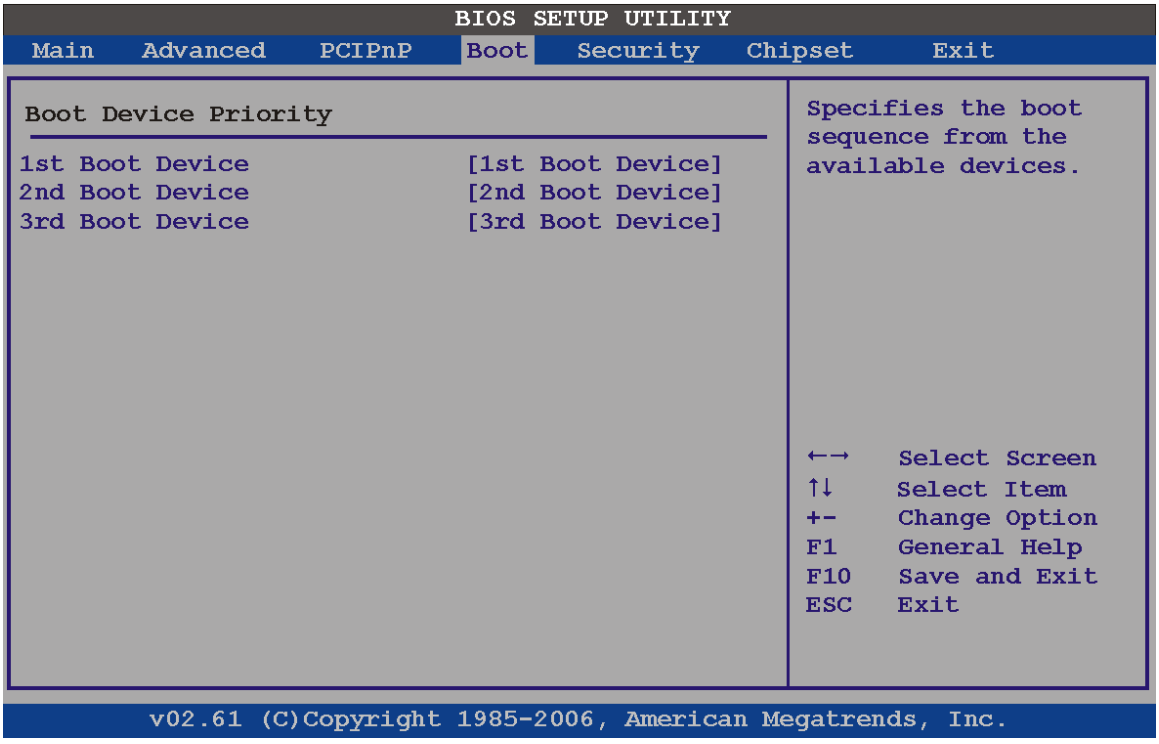
The **BOOT From LAN Support** option enables the system to be booted from a remote system.

➔ **Disabled** **DEFAULT** Cannot be booted from a remote system through the LAN

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

6.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 18**) to specify the boot sequence from the available devices.



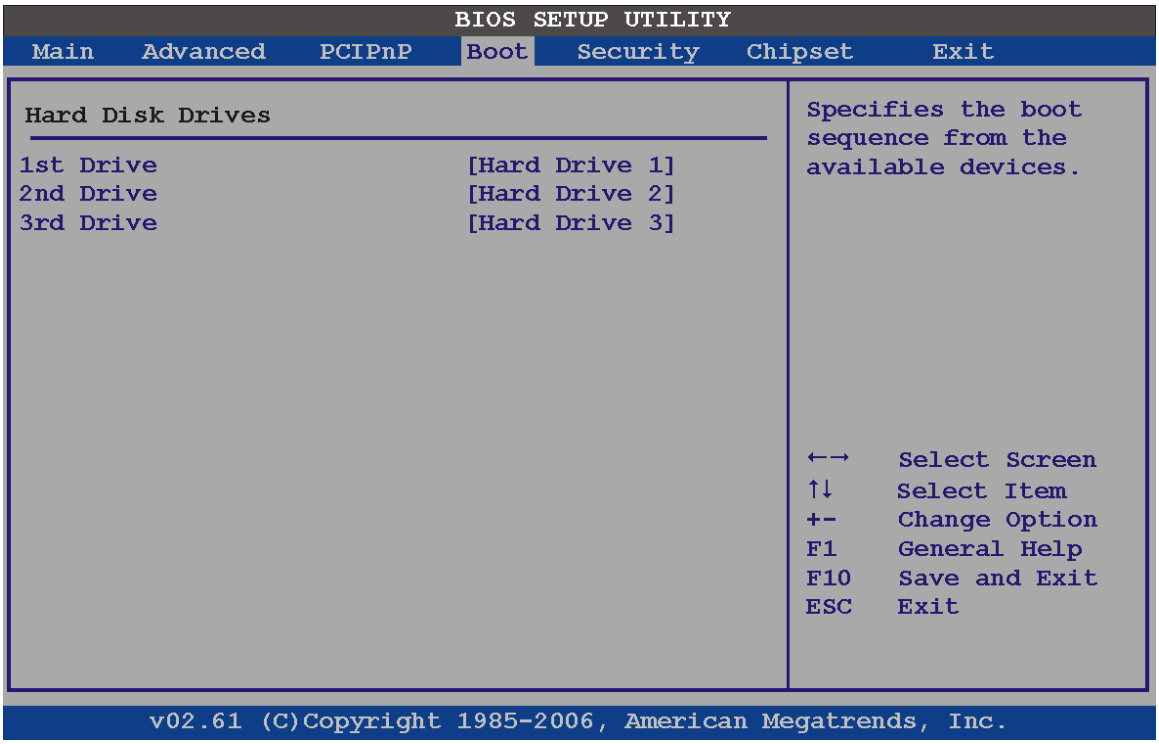
BIOS Menu 18: Boot Device Priority Settings

Possible boot devices may include:

- 1st FLOPPY DRIVE
- HDD
- CD/DVD

6.5.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs.



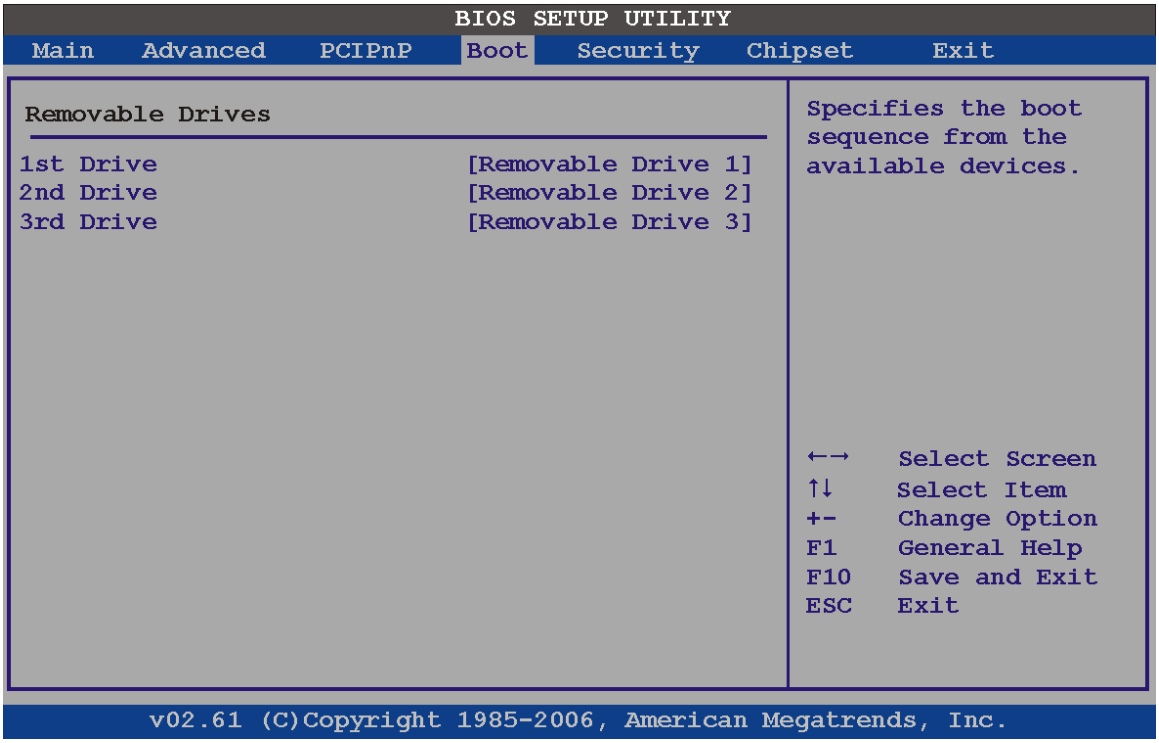
BIOS Menu 19: Hard Disk Drives

When the menu is opened, the HDDs connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive
- 3rd Drive
- 4th Drive

6.5.4 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 20**) to specify the boot sequence of the available FDDs.



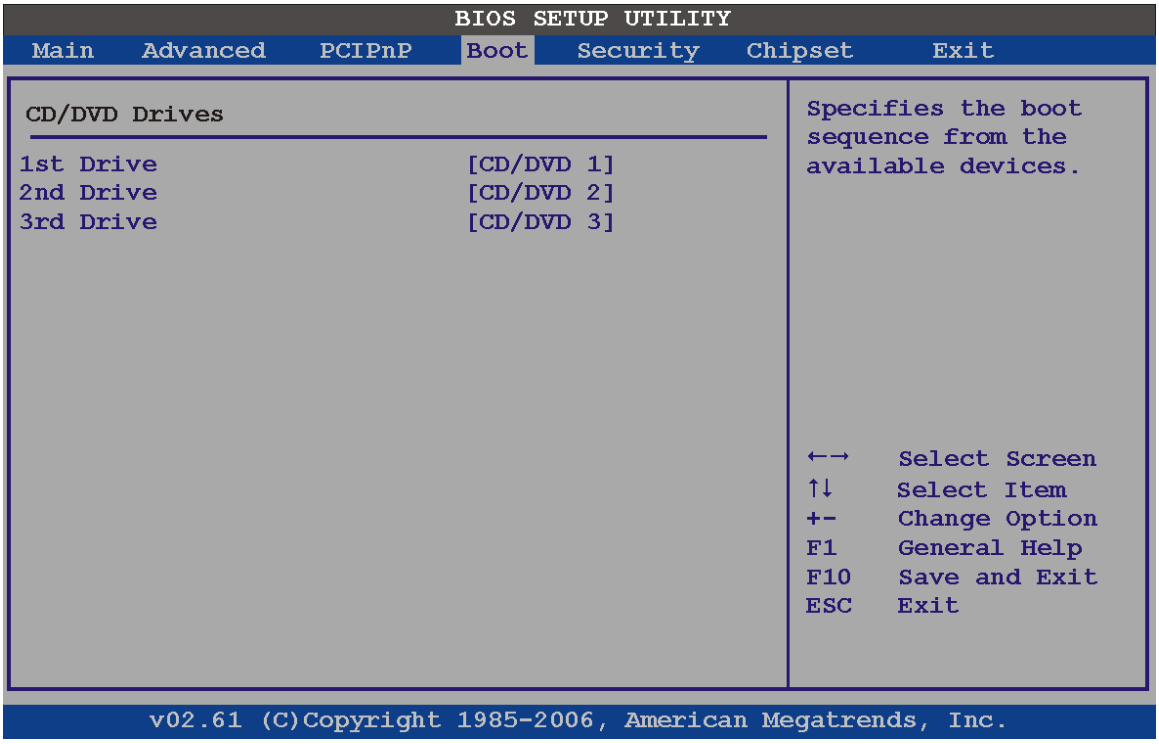
BIOS Menu 20: Removable Drives

When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive

6.5.5 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives.



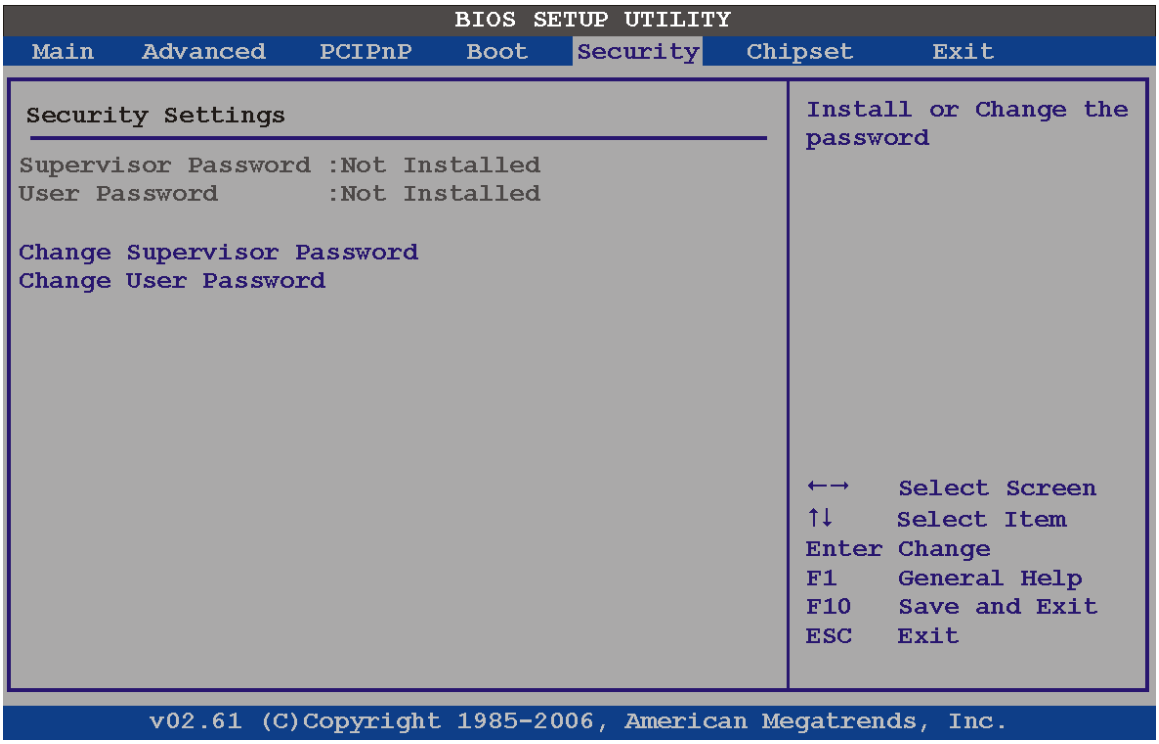
BIOS Menu 21: CD/DVD Drives

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
- 4th Drive

6.6 Security

Use the **Security** menu (**BIOS Menu 22**) to set system and user passwords.



BIOS Menu 22: Security

- **Change Supervisor Password**

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

- **Change User Password**

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

- **Clear User Password**

Use the **Clear User Password** to clear a user's password. The default for this option is **Not Installed**. If a user password must be cleared, use this option.

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

Use the **Boot Sector Virus Protection** to enable or disable boot sector protection.

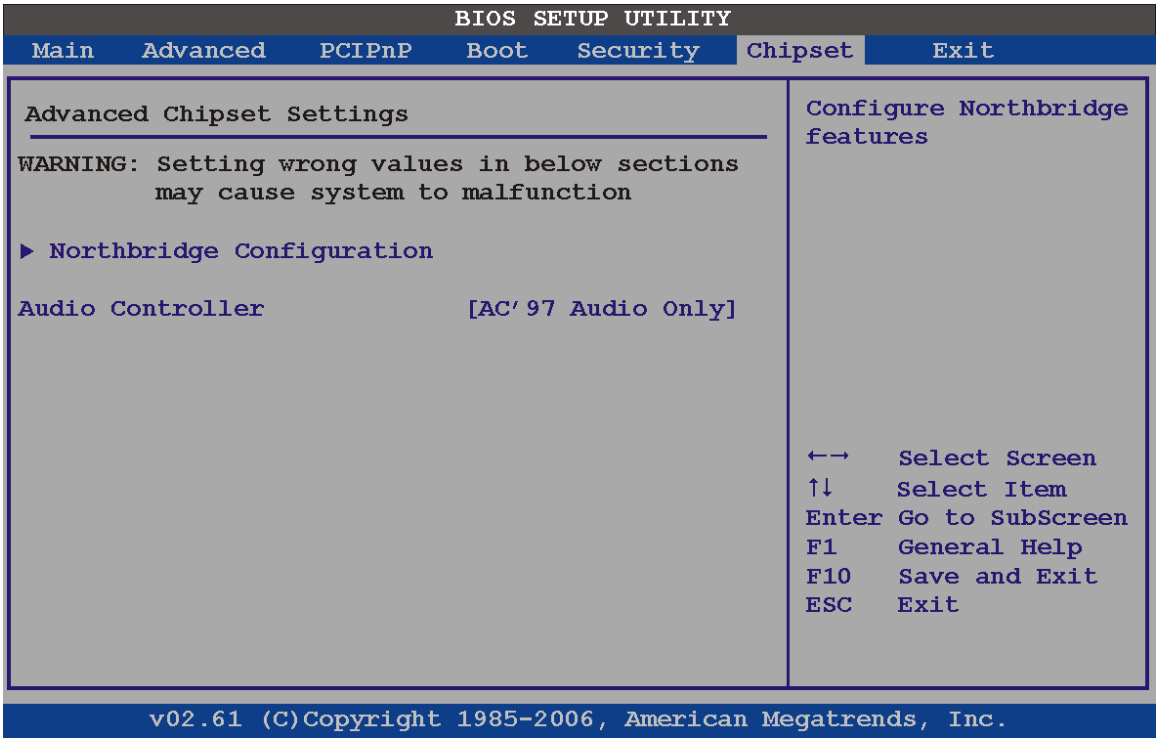
➔	**Disabled**	**DEFAULT**	Disables the boot sector virus protection
➔	**Enabled**		Enables the boot sector virus protection

6.7 Chipset

Use the Chipset menu (**BIOS Menu 23**) 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 Menu 23: Chipset

- **Audio Controller [AC'97 Audio Only]**

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

➔ **AC'97 Audio Only**	**DEFAULT**	The on-board AC'97 audio controller is enabled.
➔ **All Disabled**		The on-board audio controller is disabled.

- **Spread Spectrum Clock [Disabled]**

Use the **Spread Spectrum Clock** option to reduce the EMI. Excess EMI is generated when the system clock generator pulses have extreme values. Spreading the pulse spectrum modulates changes in the extreme values from spikes to flat curves, thus reducing the EMI. This benefit may in some cases be outweighed by problems with timing-critical devices, such as a clock-sensitive SCSI device.

➔ **Disabled**	**DEFAULT**	EMI not reduced
➔ **Enabled**		EMI reduced

- **Onboard LAN1 [Enabled]**

The **Onboard LAN1** option enables or disables the on-board LAN1.

➔ **Enabled**	**DEFAULT**	The on-board LAN1 controller is manually enabled
➔ **Disabled**		The on-board LAN1 controller is manually disabled

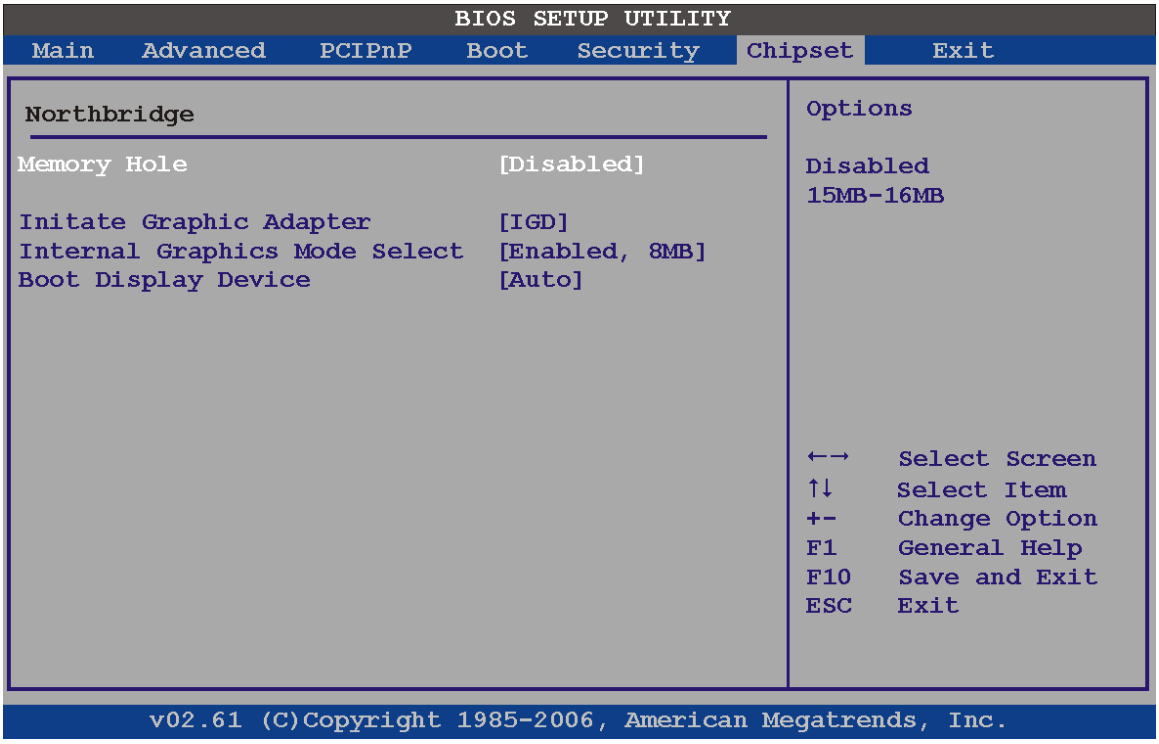
- **Onboard LAN2 [Enabled]**

The **Onboard LAN2** option enables or disables the on-board LAN2.

➔ **Enabled**	**DEFAULT**	The on-board LAN2 controller is manually enabled
➔ **Disabled**		The on-board LAN2 controller is manually disabled

6.7.1 Northbridge Configuration

Use the Northbridge Configuration menu (**BIOS Menu 24**) to configure the Northbridge chipset.



BIOS Menu 24: Northbridge Chipset Configuration

- **Memory Hole [Disabled]**

Use the **Memory Hole** option to reserve 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
➔	**15 MB** – **16 MB**		Between 15 MB and 16 MB of memory is reserved for ISA expansion cards

- **Initiate Graphic Adapter**

  Use the **Initiate Graphic Adapter** option to select the graphics controller used as the primary boot device. Select either an integrated graphics controller (IGD) or a combination of PCI graphics controller, a PCI express (PEG) controller or an IGD. Configuration options are listed below:

  - IGD **DEFAULT**
  - PCI/IGD

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

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

  - ➔ **Disable**
  - ➔ **Enable, 1 MB** 1 MB of memory used by internal graphics device
  - ➔ **Enable, 8 MB** **DEFAULT** 8 MB of memory used by internal graphics device

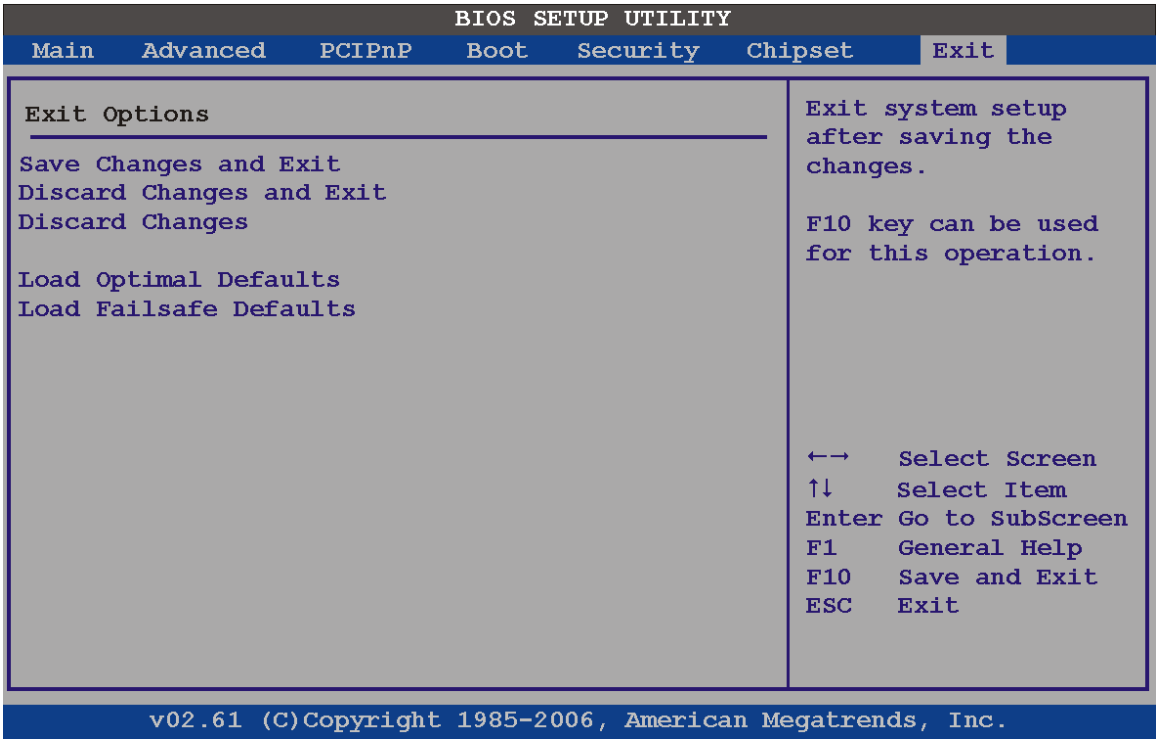
Boot Display Device

Use the **Boot Display Device** option to select the display device used by the system when it boots. Configuration options are listed below.

- Auto **DEFAULT**
- CRT1
- CRT2
- CRT+CRT2

6.8 Exit

Use the Exit menu (**BIOS Menu 25**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 25: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

Driver 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:

- Chipset driver
- VGA driver
- LAN driver
- Audio driver

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the IMBA-9454B are on the CD that came with the system. To install the drivers, please follow the steps below.

Step 1: Insert the CD into a CD drive connected to the system.

NOTE:

If the system does not initiate the "autorun" program when the CD is inserted, click the Start button, select Run, then type X:\autorun.exe (where X:\ is the system CD drive) to access the IEI Driver CD main menu.

Step 2: The driver main menu appears (**Figure 7-1**).

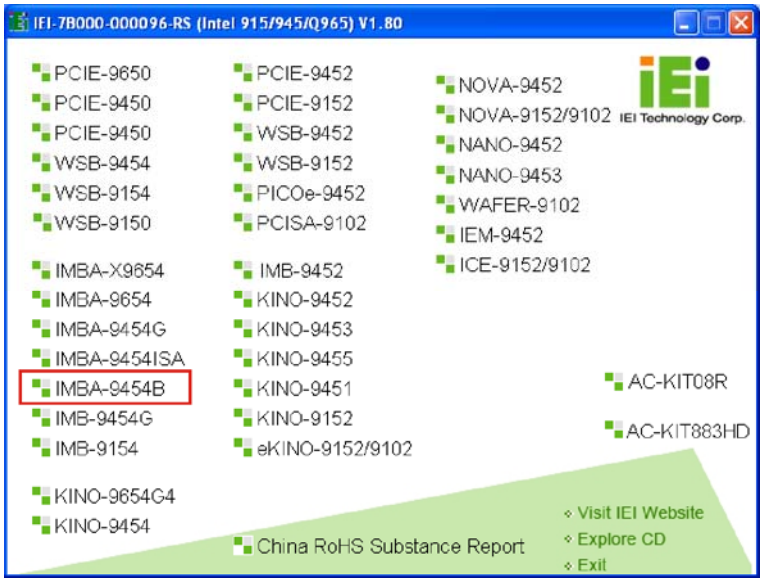


Figure 7-1: Introduction Screen

Step 3: Click IMBA-9454B.

Step 4: A new screen with a list of available drivers appears (**Figure 7-2**).

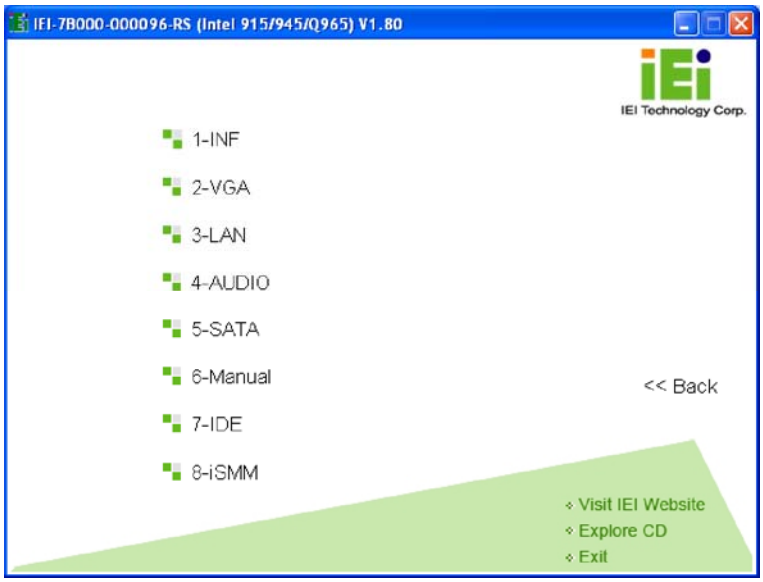


Figure 7-2: Available Drivers

Step 5: Select the driver to install from the list in **Figure 7-2**. Detailed driver installation instructions follow below.

7.3 Chipset Driver

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

Step 6: Select **INF** from the list in **Figure 7-2**.

Step 7: Browse to the directory shown in **Figure 7-3**.

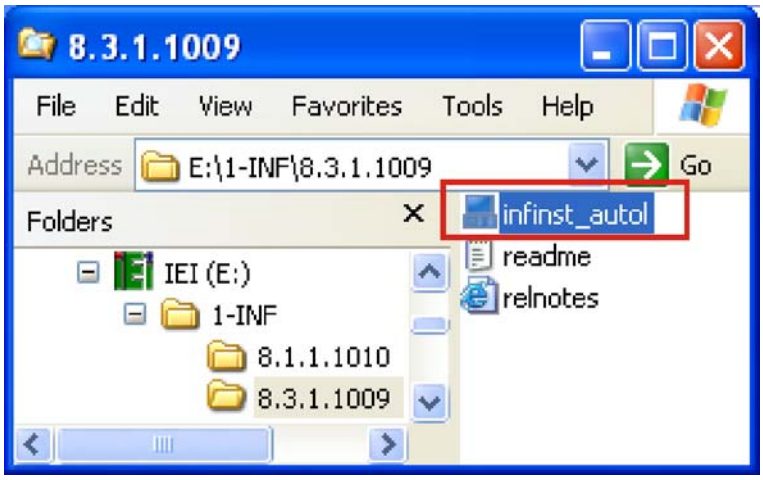


Figure 7-3: Chipset Driver Installation Program

Step 8: Double-click the **infinst_autol.exe** icon.

Step 9: The welcome screen in **Figure 7-4** appears.

Figure 7-4: Chipset Driver Installation Welcome Screen

Step 10: Click **NEXT** to continue the installation process.

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

Figure 7-5: Chipset Driver License Agreement

Step 12: Read the license agreement. To accept the terms and conditions stipulated in the agreement, click **YES**.

Step 13: The driver installation begins (**Figure 7-6**).

Figure 7-6: Chipset Driver Installation

Step 14: Click **NEXT** when the drivers have finished installing.

Step 15: The final screen is displayed (**Figure 7-7**).

Figure 7-7: Chipset Driver Installation Complete

Step 16: Select "Yes, I want to restart this computer now," then click **FINISH** to complete the driver installation and restart the computer.

7.4 VGA Driver

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

Step 1: Select the VGA driver from the list in **Figure 7-2**.

Step 2: Browse to the directory shown in **Figure 7-8**.

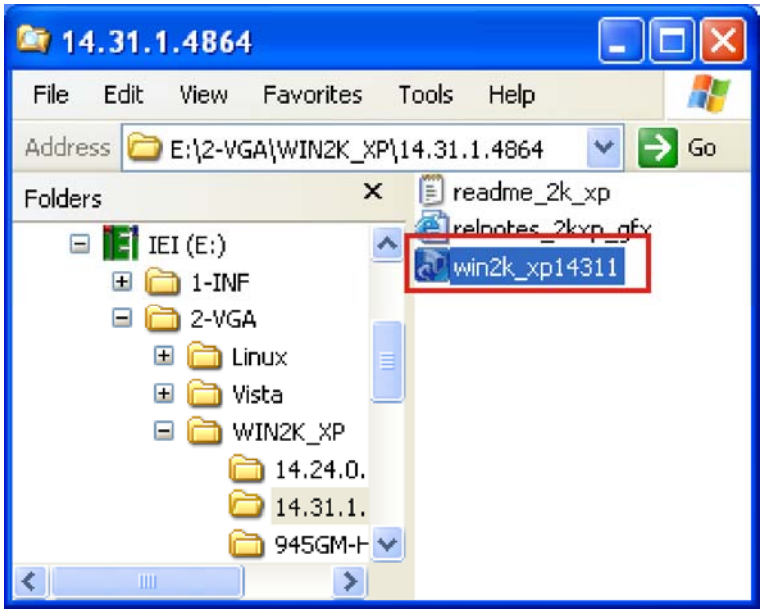


Figure 7-8: Select the Operating System

Step 3: Double-click the installation for your operating system.

Step 4: The driver version information is shown in **Figure 7-9**.

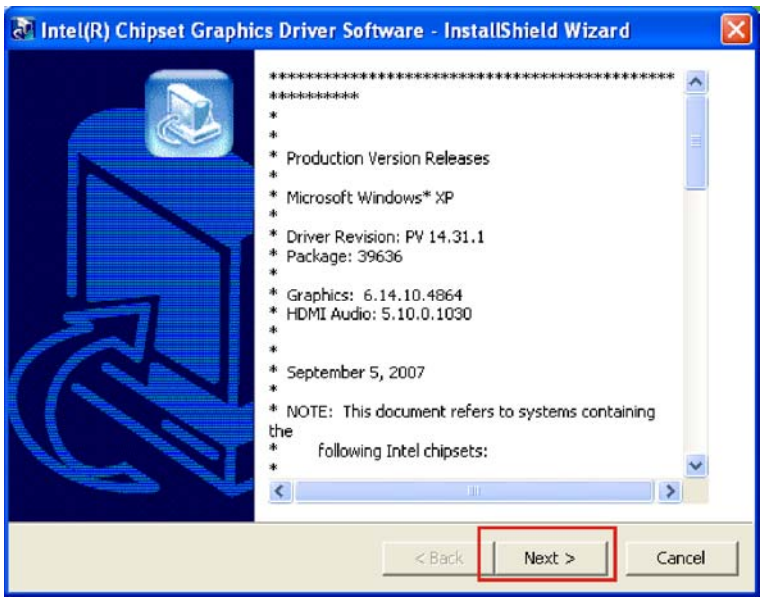


Figure 7-9: VGA Driver Version Information

Step 5: Click **NEXT** to begin extracting files (**Figure 7-10**).

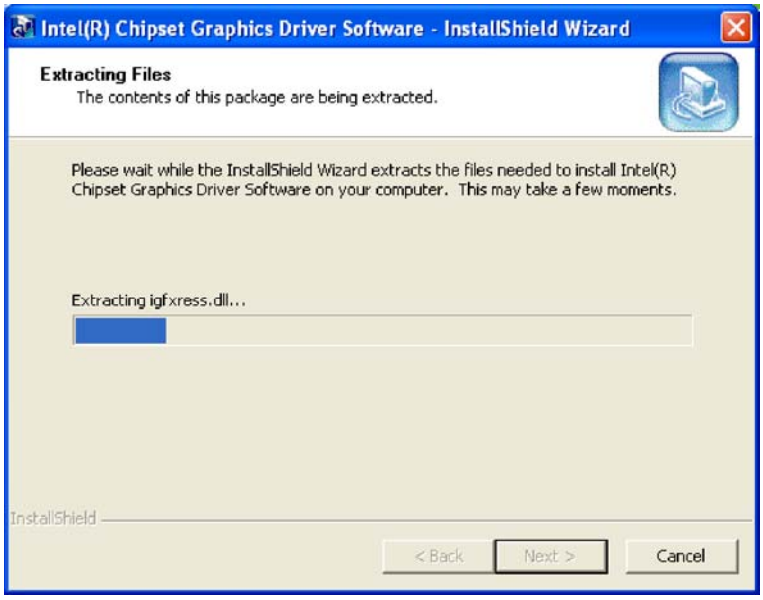


Figure 7-10: VGA Driver File Extraction

Step 6: The **Graphics Media Accelerator Driver Welcome** screen appears (**Figure 7-11**).

Figure 7-11: VGA Driver Welcome Screen

Step 7: Click **NEXT** and a license agreement appears (**Figure 7-12**).

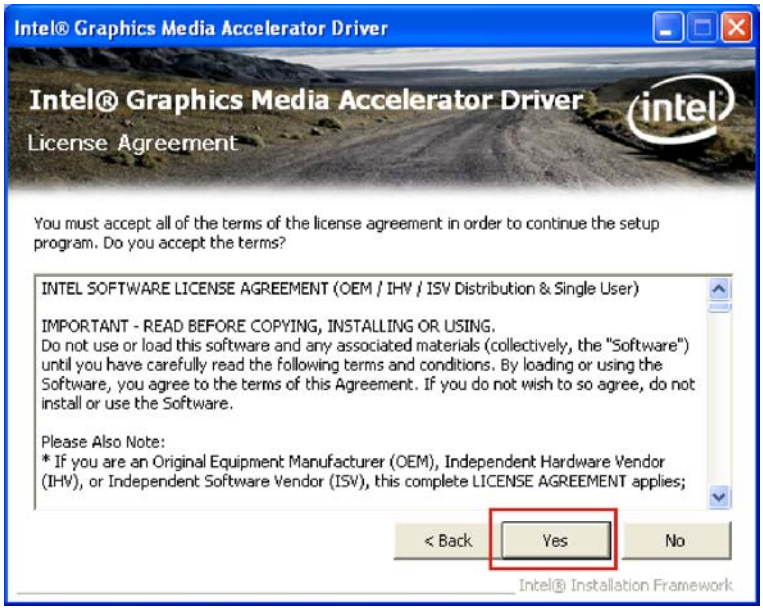


Figure 7-12: VGA Driver License Agreement

Step 8: Read the license agreement. Click **YES** to accept the terms and continue installation (**Figure 7-13**).

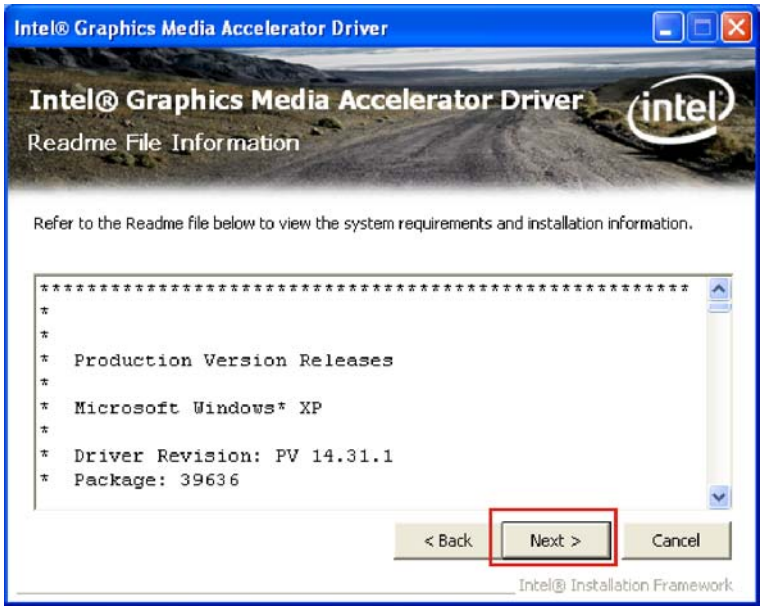


Figure 7-13: VGA Driver Readme File

Step 9: The VGA drivers are setup (**Figure 7-14**).

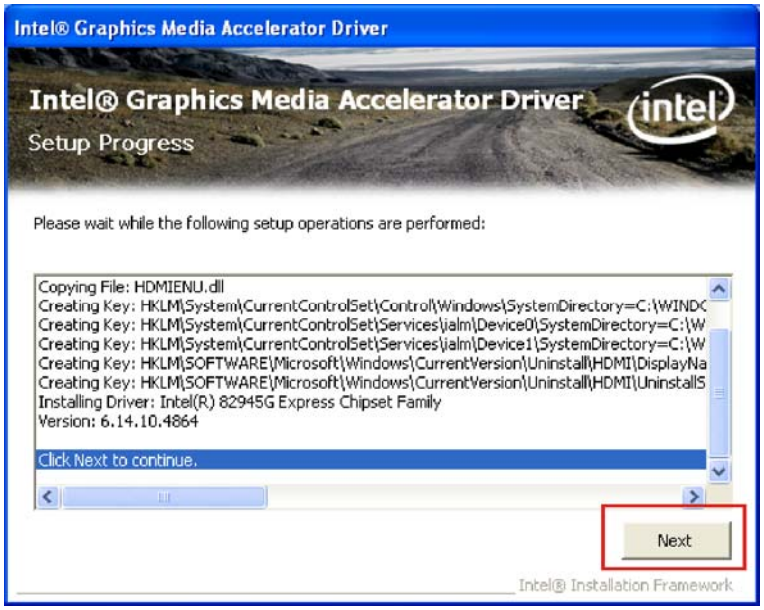


Figure 7-14: VGA Driver Installing

Step 10: After the driver installation process is complete, a confirmation screen appears (**Figure 7-15**).

Figure 7-15: Intel® Graphics Media Accelerator Installation Complete

Step 11: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.5 LAN Driver

To install the Broadcom LAN driver, please follow the steps below.

Step 1: Select the VGA driver from the list in **Figure 7-2**.

Step 2: Browse to the directory with the setup file (**Figure 7-16**).

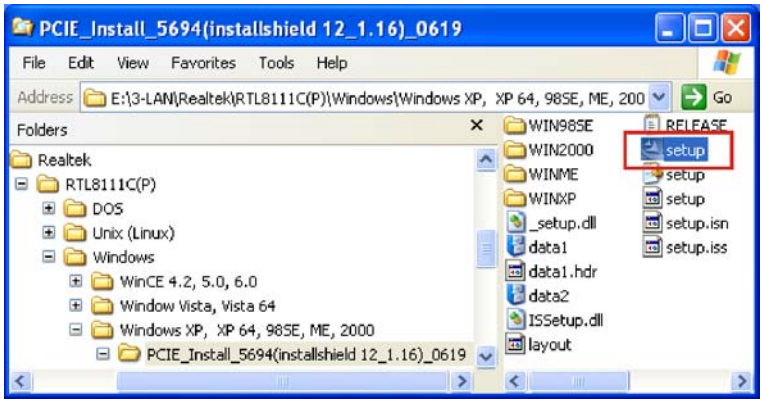


Figure 7-16: LAN Driver Directory

Step 3: Double-click the **Setup** icon (**Figure 7-17**).

Step 4: The LAN driver welcome screen appears (**Figure 7-17**).

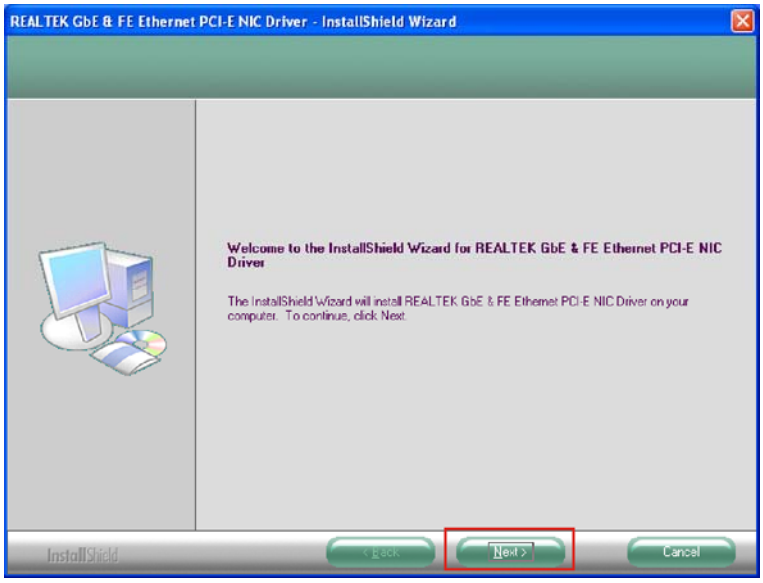


Figure 7-17: LAN Driver Welcome

Step 5: Click **NEXT** to continue.

Step 6: The LAN driver is ready to install (**Figure 7-18**).

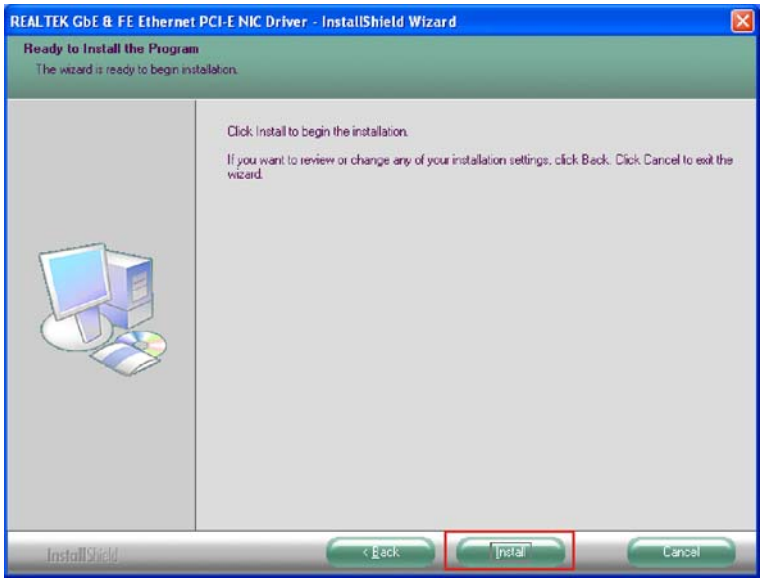


Figure 7-18: LAN Driver Installation Ready

Step 7: Click **INSTALL** to begin the driver installation.

Step 8: The installation is complete (**Figure 7-19**).

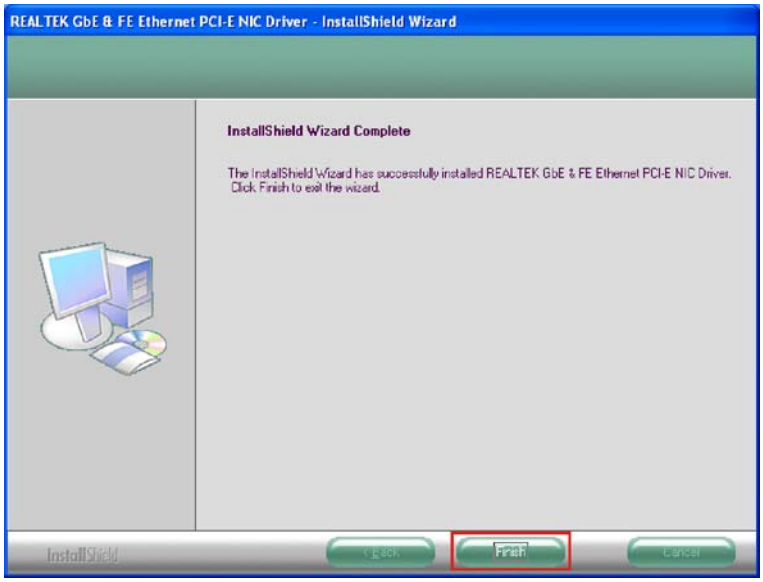


Figure 7-19: Device Manager List

Step 9: Click finish to exit the LAN driver installation wizard.

7.6 Audio Driver

To install the Realtek AC `97 audio driver, please follow the steps below.

7.6.1 BIOS Setup

Step 1: Enter the BIOS setup. To do this, reboot the system and press **DEL** during POST.

Step 2: Go to the Southbridge Configuration menu. Set the **Audio Controller** option to [AC`97].

Step 3: Press **F10** to save the changes and exit the BIOS setup. The system reboots.

7.6.2 Driver Installation

To install the audio driver please follow the steps below.

Step 1: Select **AUDIO** from the list in **Figure 7-2**.

Step 2: Browse to the directory shown in **Figure 7-20**.

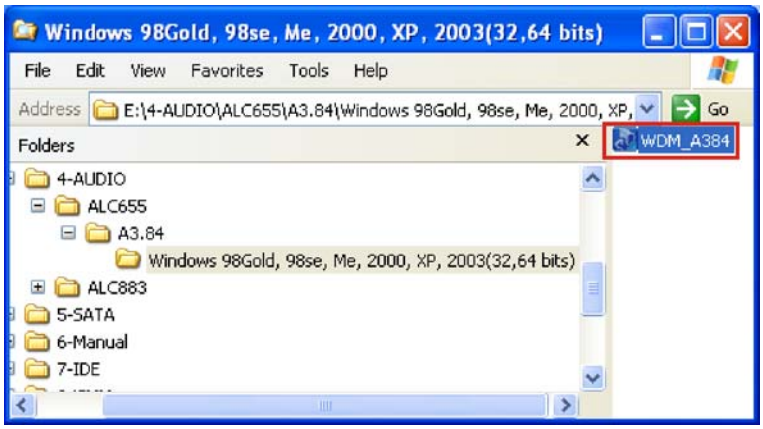


Figure 7-20: Audio Driver Directory

Step 3: Double-click the **WDM_A384** icon.

Step 4: Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 7-21**).

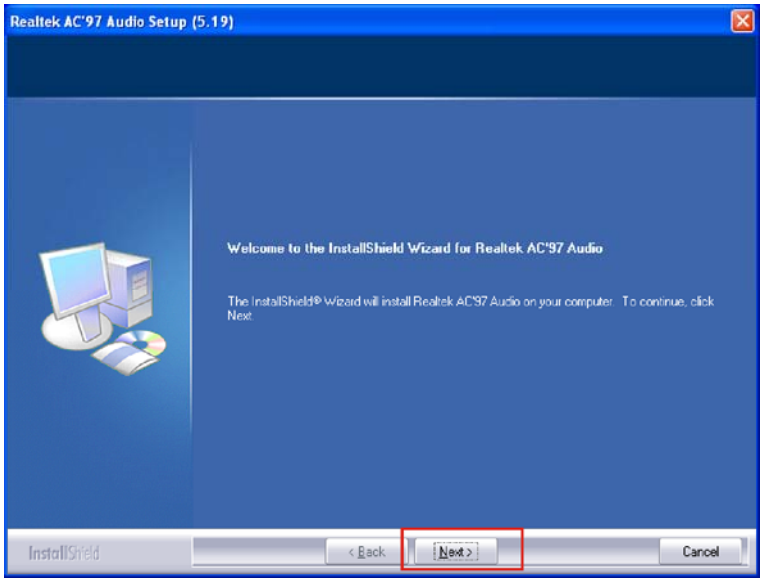


Figure 7-21: Audio Driver Welcome Screen

Step 5: Click **NEXT** to continue the installation.

Step 6: InstallShield starts to install the new software as shown in **Figure 7-22**.

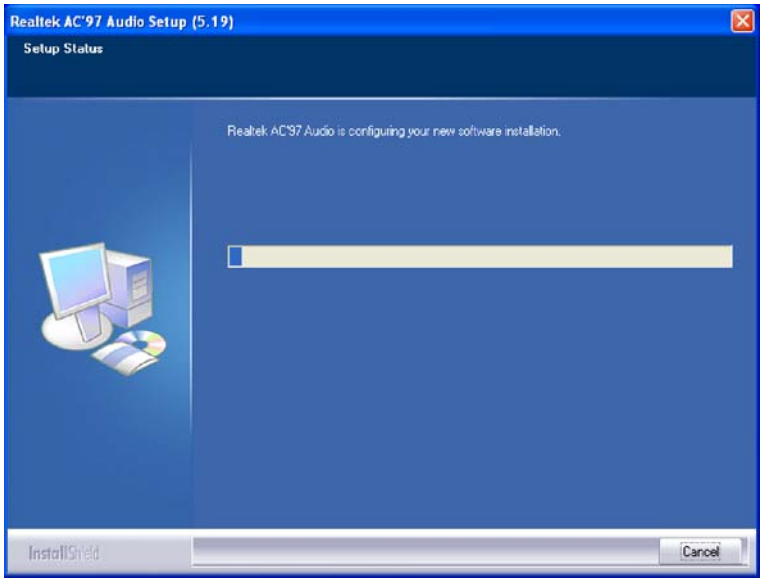


Figure 7-22: Audio Driver Software Configuration

Step 7: At this stage the **Digital Signal Not Found** screen shown in **Figure 7-23** appears.

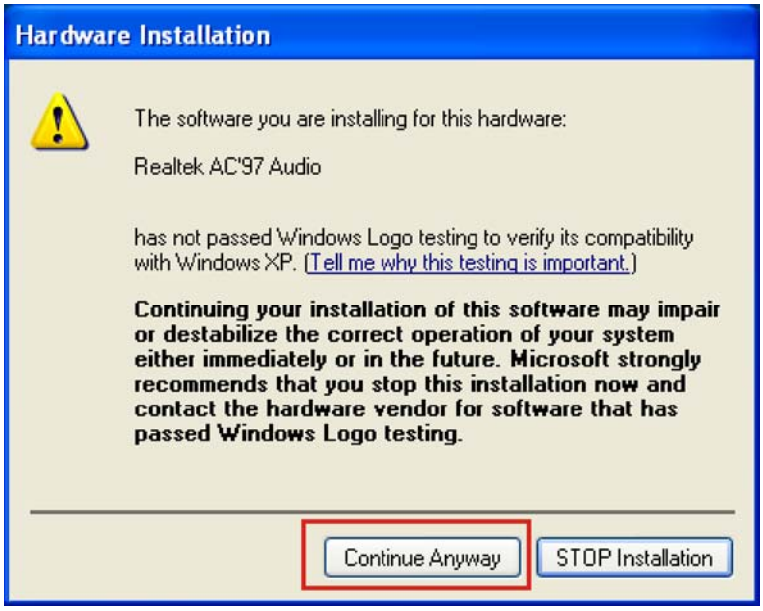


Figure 7-23: Audio Driver Digital Signature

Step 8: Click **CONTINUE ANYWAY** and the driver installation begins (Error! Reference source not found.**)**.

Step 9: After the driver installation process is complete, a confirmation screen appears (**Figure 7-24**).

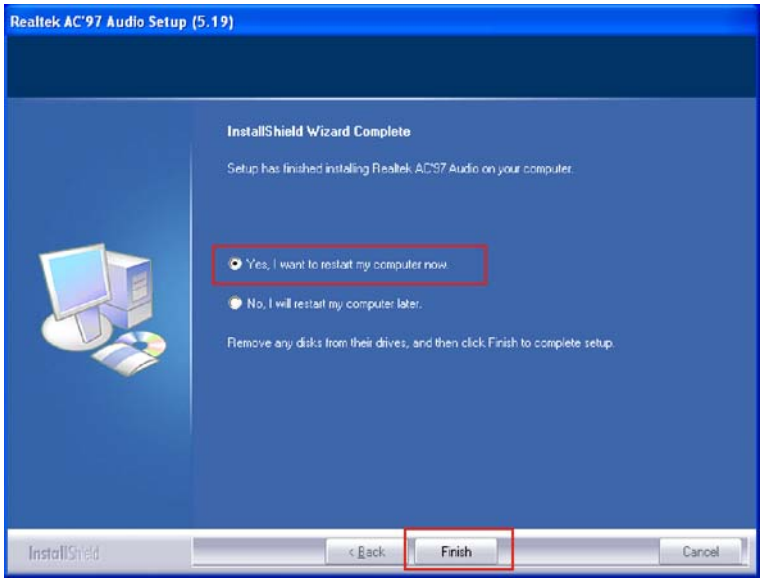


Figure 7-24: Restart the Computer

Step 10: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Appendix

A

BIOS Options

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

- System Overview 78
- System Time [xx:xx:xx] 79
- System Date [xx/xx/xx] 79
- ATA/IDE Configurations [Compatible] 82

Legacy IDE Channels [PATA Pri, SATA Sec] 83

- Primary/Secondary IDE Master/Slave 83
- Auto-Detected Drive Parameters 84
- Type [Auto] 85
- LBA/Large Mode [Auto] 85
- Block (Multi Sector Transfer) [Auto] 86
- PIO Mode [Auto] 86
- DMA Mode [Auto] 87
- S.M.A.R.T [Auto] 88
- 32Bit Data Transfer [Enabled] 88
- Floppy A/B 89
- Parallel Port Address [378] 90
- Parallel Port Mode [Normal] 90
- Parallel Port IRQ [IRQ7] 91
- Serial Port1 Address [3F8] 91
- Serial Port1 IRQ [4] 92
- Serial Port2 Address [3F8] 92
- Serial Port2 IRQ [4] 92
- Serial Port3 Address [3F8] 92
- Serial Port3 IRQ [4] 92
- Serial Port4 Address [3F8] 92
- Serial Port4 IRQ [4] 93
- Serial Port5 Address [3F8] 93
- Serial Port5 IRQ [4] 93
- Serial Port6 Address [3F8] 93
- Serial Port6 IRQ [4] 94
- Serial Port7 Address [3F8] 94
- Serial Port7 IRQ [4] 94
- Serial Port8 Address [3F8] 94

- Serial Port8 IRQ [4] 94
- CPU/SYS Fan Mode Setting [Full On Mode] 95
- Temperature Limit of OFF [000] 96

CPU Temp. Limit of Start [020] 96

- CPU Fan Start PWM [070] 97
- Slope PWM 1 [0.5 PWM] 97
- Power Supply Mode [BY HARDWARE] 98
- Current Jumper Setting [ATX] 98
- Suspend Mode [S1 (POS)] 99
- Power Button Mode [On/Off] 100
- Restore on AC Power Loss [Last State] 100
- Resume on Ring [Enabled] 101
- Resume on PME# [Enabled] 101
- Resume on PCI-Express WAKE# [Enabled] 101
- Resume On RTC Alarm [Disabled] 101
- Remote Access [Disabled] 103
- Serial Port Number [COM1] 103
- Base Address, IRQ [2D0h, B] 103
- Serial Port Mode [115200 8,n,1] 103
- Redirection After BIOS POST [Always] 104
- Terminal Type [ANSI] 104
- USB Configuration 105
- USB Functions [Enabled] 105
- USB2.0 Controller [Enabled] 106
- Legacy USB Support [Enabled] 106
- IRQ# [Available] 108
- DMA Channel# [Available] 109
- Reserved Memory Size [Disabled] 109
- Quick Boot [Enabled] 111
- Quiet Boot [Disabled] 111
- AddOn ROM Display Mode [Force BIOS] 112
- Bootup Num-Lock [On] 112
- Display System Configuration [Enabled] 112
- Boot From LAN Support [Disabled] 113
- Change Supervisor Password 117

- Change User Password 117
- Clear User Password 117
- Boot Sector Virus Protection [Disabled] 118
- Audio Controller [AC'97 Audio Only] 119
- Spread Spectrum Clock [Disabled] 119
- Onboard LAN1 [Enabled] 119
- Onboard LAN2 [Enabled] 119
- Memory Hole [Disabled] 120
- Initiate Graphic Adapter 121
- Internal Graphics Mode Select [Enable, 8 MB] 121

Boot Display Device 121

- Save Changes and Exit 122
- Discard Changes and Exit 122
- Discard Changes 122
- Load Optimal Defaults 123
- Load Failsafe Defaults 123

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

Digital I/O Interface

C.1 Introduction

The DIO connector on the IMBA-9454B is interfaced to GPIO ports on the Super I/O chipset. The DIO has both 4-bit digital inputs and 4-bit digital outputs. The digital inputs and digital outputs are generally 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.

NOTE:

For further information, please refer to the datasheet for the Super I/O chipset.

C.2 DIO Connector Pinouts

The following table list the digital I/O ports with their pin numbers and

Pin	Description	Super I/O Pin	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	GP27	General purpose I/O port 2 bit 7.
4	Output 2	GP26	General purpose I/O port 2 bit 6.
5	Output 1	GP25	General purpose I/O port 2 bit 5.
6	Output 0	GP24	General purpose I/O port 2 bit 4.
7	Input 3	GP23	General purpose I/O port 2 bit 3.
8	Input 2	GP22	General purpose I/O port 2 bit 2
9	Input 1	GP21	General purpose I/O port 2 bit 1
10	Input 0	GP20	General purpose I/O port 2 bit 0

Table C-1: Digital I/O Connector Pinouts

C.3 Assembly Language Samples

C.3.1 Enable the DIO Input Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O input functions is listed below.

MOV	**AX, 6F08H**	Sets the digital port as input
INT	**15H**	Initiates the INT 15H BIOS call

C.3.2 Enable the DIO Output Function

The BIOS interrupt call INT 15H controls the digital I/O. An assembly program to enable digital I/O output functions is listed below.

MOV	**AX, 6F09H**	Sets the digital port as output
MOV	**BL, 09H**	
INT	**15H**	Initiates the INT 15H BIOS call

Appendix

D

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 D-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:

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

E

Address Mapping

E.1 Direct Memory Access (DMA)

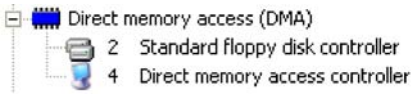


Figure E-1: Direct Memory Access (DMA)

E.2 Input/Output (IO)

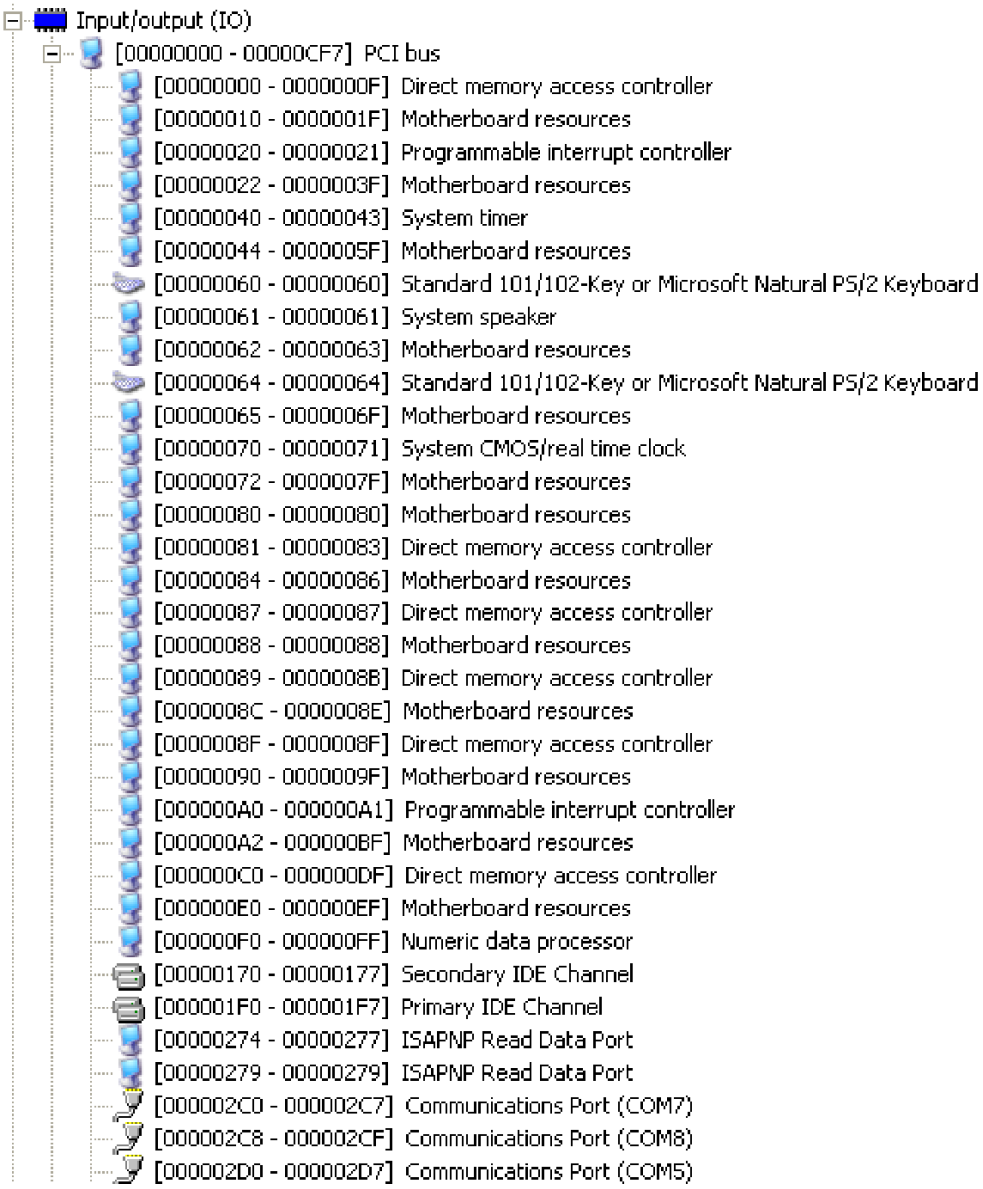


Figure E-2: Input/Output (IO) (1 of 2)

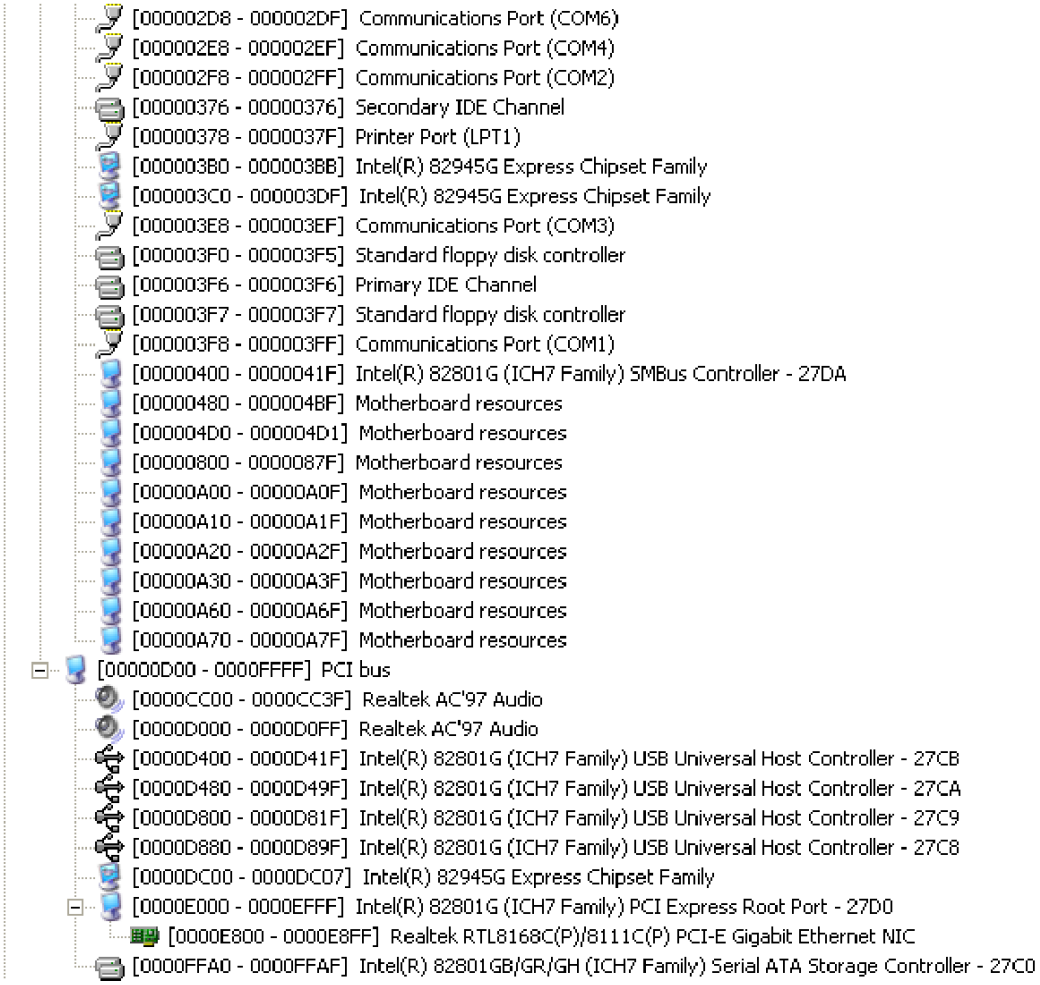


Figure E-3: Input/Output (IO) (2 of 2)

E.3 Interrupt Request (IRQ)

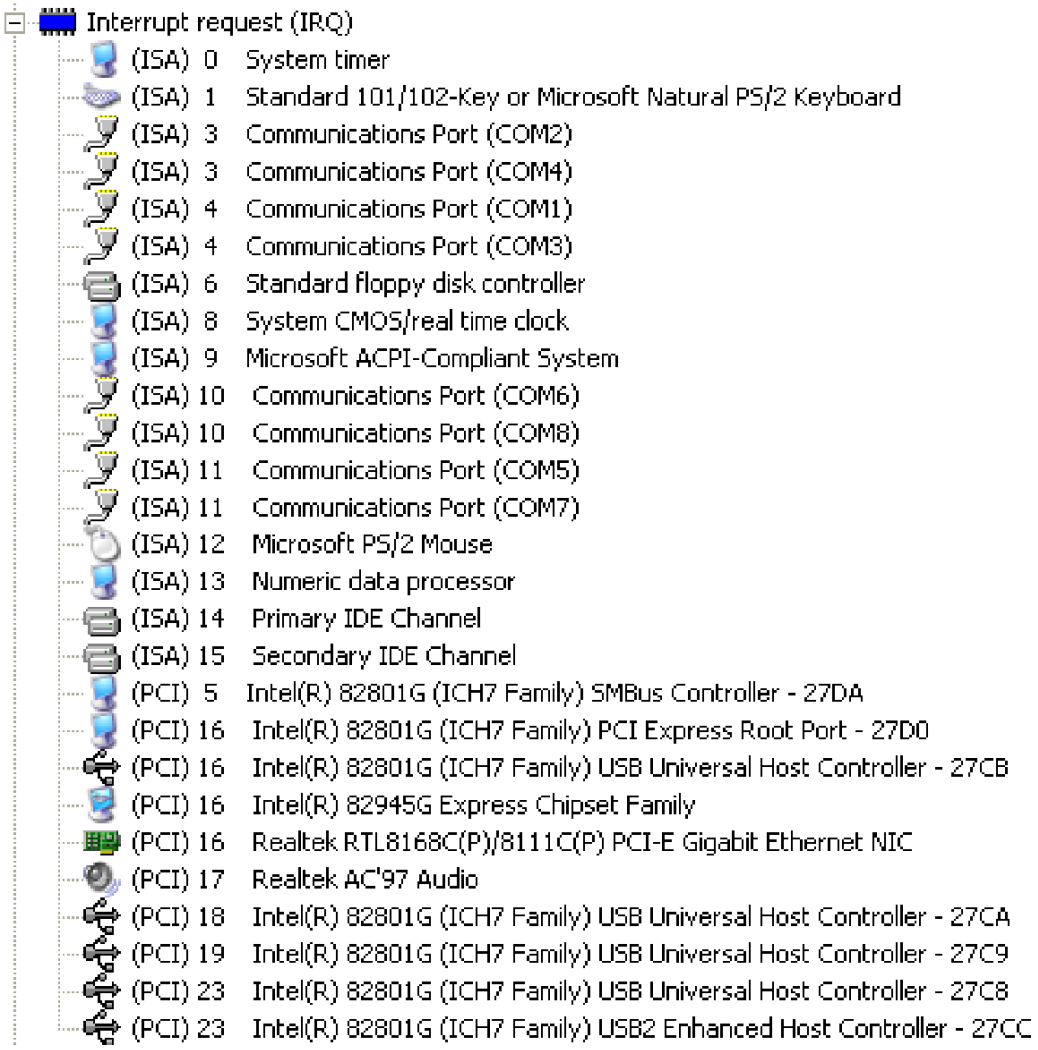


Figure E-4: Interrupt Request (IRQ)

E.4 Memory

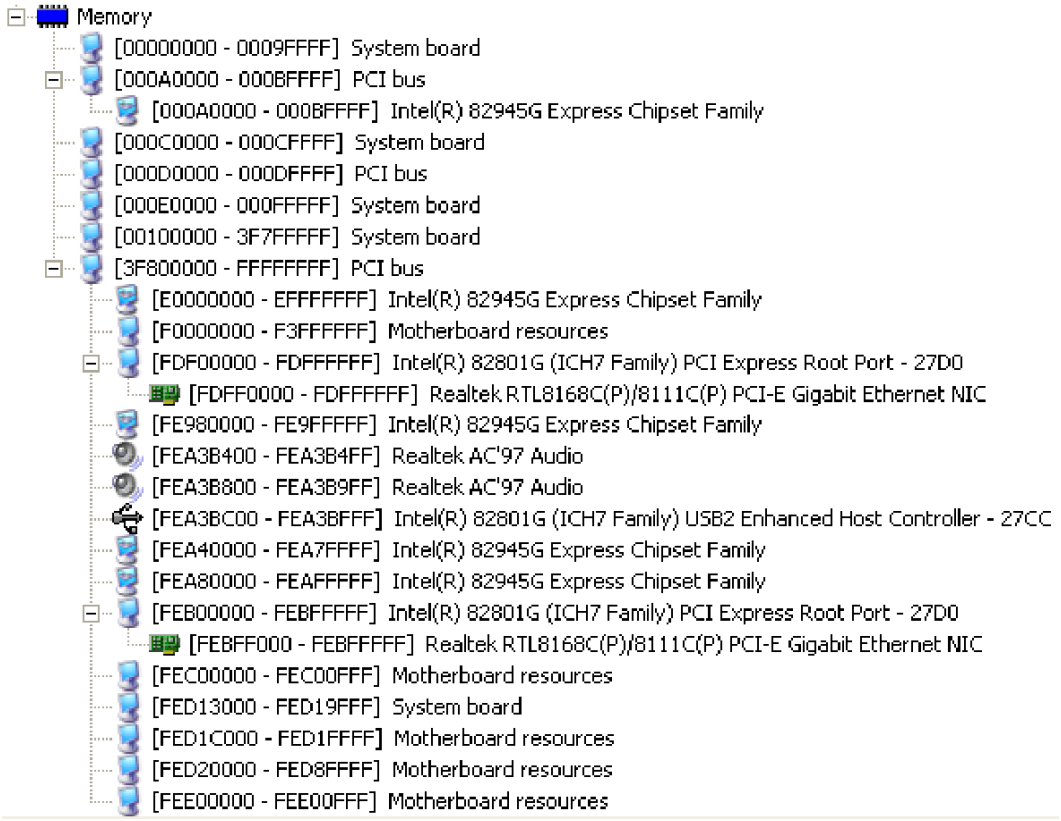


Figure E-5: Memory

Appendix

F

Compatibility

NOTE:

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the IMBA-9454B

F.1 Compatible Operating Systems

The following operating systems have been successfully run on the IMBA-9454B.

- MS-DOS 6.22
- Microsoft Windows XP (32-bit)
- Microsoft Windows 2000
- Red Hat 9.0

F.2 Compatible Processors

The following Intel® Socket 478 processors have been successfully tested on the IMBA-9454B

CPU	FSB	Frequency	L2 Cache
Intel® Pentium 4	800 MHz	3.2 GHz	1 MB

Table F-1: Compatible Processors

F.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the IMBA-9454B other memory modules that comply with the specifications may also work on the IMBA-9454B but have not been tested.

The following memory modules have been successfully tested on the IMBA-9454B.

Manufacturer	Model No.	Capacity	Speed	Type
Kingston	KVR400X64C3A	512 MB	400 MHz	DDR

Table F-2: Compatible Memory Modules

Appendix

G

Hazardous Materials Disclosure

G.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。						

Appendix

H

AC'97 Audio Codec

H.1 Introduction

The onboard audio supports audio output, line input and microphone input.

H.1.1 Accessing the AC'97 CODEC

The CODEC is accessed through the phone jacks on the rear panel of the motherboard. The phone jacks include:

- LINE IN
- LINE OUT
- MIC IN

H.1.2 Driver Installation

The driver installation has been described in the driver installation chapter.

After rebooting, the sound effect configuration utility appears in the **Windows Control Panel** (**Figure H-1**). If the peripheral speakers are properly connected, sound effects should be heard.

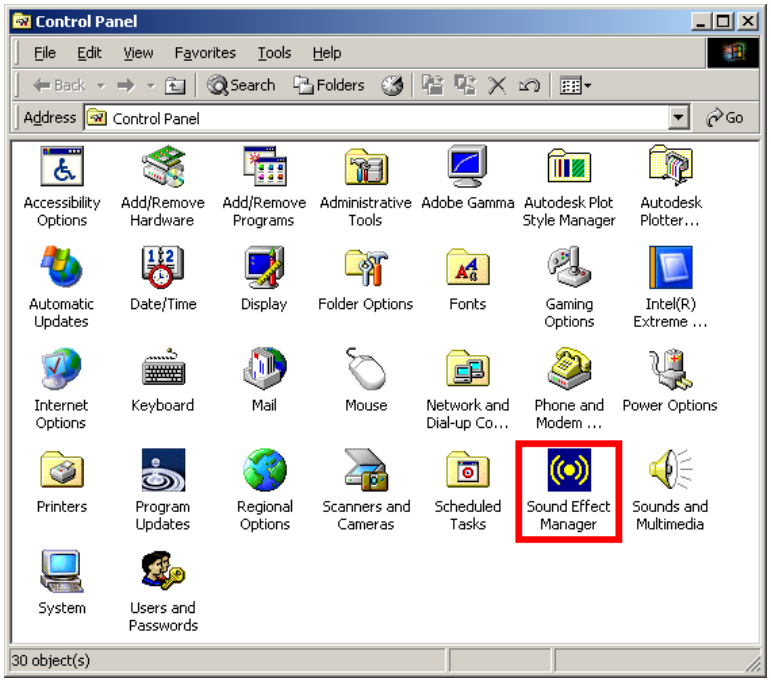


Figure H-1: Control Panel Sound Effect Manager

H.2 Sound Effect Configuration

H.2.1 Accessing the Sound Effects Manager

Follow the steps below to access the **Sound Effect Manager**.

Step 1: Install the audio driver.

Step 2: Click the Sound Effect Manager icon in the system task bar (**Figure H-2**).

Figure H-2: Sound Effect Manager Icon [Task Bar]

Step 3: The sound effect manager appears (**Figure H-3**).

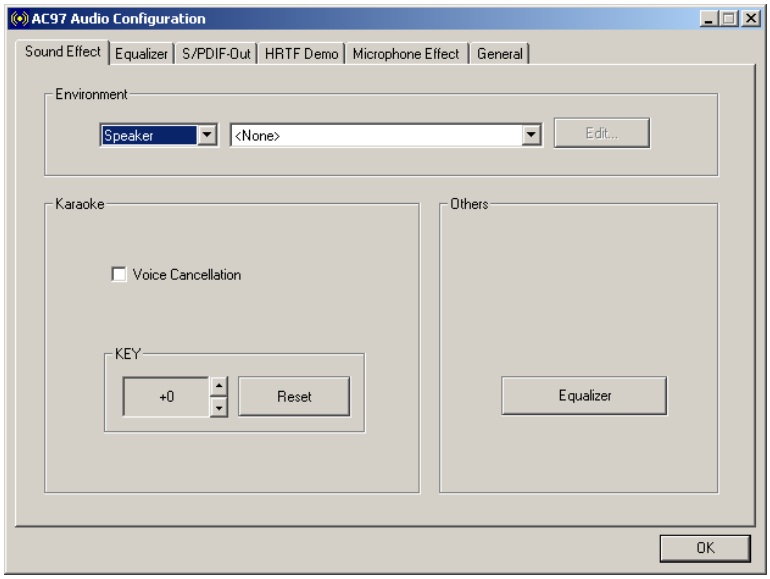


Figure H-3: Sound Effects Manager (ALC655)

NOTE:

The Sound Effect Manager shown in **Figure H-3** may differ between systems.

The following section describes the different configuration options in the Sound Effect Manager.

H.2.2 Sound Effect Manager Configuration Options

The **Sound Effects Manager** enables configuration of the items listed below. To configure these items click the corresponding menu tab in the **Sound Effects Manager** (**Figure H-3)**.

NOTE:

The Karaoke Mode is configured in the Sound Effect menu. To access Karaoke configuration settings, click on the Sound Effect menu tab.

- Sound Effect
- Karaoke Mode
- Equalizer
- Speaker Configuration
- Speaker Test
- S/PDIF-In
- S/PDIF-Out
- Connector Sensing
- HRTF Demo
- Microphone Effect
- General

NOTE:

Not all Realtek Sound Effect Managers have all the above listed options. The Sound Effect Manager loaded onto the system may only have some of the options listed above.

Below is a brief description of the available configuration options in the **Sound Effects Manager**.

- ***Sound Effect*** - Select a sound effect from the 23 listed options in the drop down menu. Selected sound effect properties can be edited. Click **EDIT** to edit the sound effect.
- ***Karaoke Mode*** - **Karaoke Mode** is accessed in the Sound Effect tab. The **Voice Cancellation** disables the vocal part of the music being played. The **Key adjustment** up or down arrow icons enable users to define a key that fits a certain vocal range.
- ***Equalizer Selection*** - Preset equalizer settings enable easy audio range settings. Ten frequency bands can be configured.
- ***Speaker Configuration*** - Multi-channel speaker settings are configured in this menu. Configurable options include:
  - Headphone
  - Channel mode for stereo speaker output
  - Channel mode for 4 speaker output
  - Channel mode for 5.1 speaker output
  - Synchronize the phone jack switch with speakers settings
- ***Speaker Test*** - Each speaker connected to the system is tested individually to see if the 4-channel or 6-channel audio operates properly.
- ***S/PDIF-In & S/PDIF-Out*** - S/PDIF is used to transmit digital and analog audio signals with either a 48 or 44.1 KHz sample rate.
- ***HRTF Demo*** - Adjust HRTF (Head Related Transfer Functions) 3D positional audio before running 3D applications.
- ***Microphone Effect*** - Microphone noise suppression is enabled in this menu.
- ***General*** - General information about the installed AC'97 audio configuration utility is listed here.

Index

+

+12V ATX power supply connector.....25
location and pinouts 25

A

ACPI 99
anti-static precautions.....18, 46
anti-static pad 18, 46
anti-static wristband.....18, 46
handling.....18, 46
self-grounding.....18, 46
ATA flat cable 62
ATX power supply connector.....26
location and pinouts 26
Audio
connection 72
Audio connector.....72

B

BIOS 104
ACPI Configuration.....98
APM Configuration 100
Boot 110
Boot Settings Configuration 111
Chipset 118
CPU Configuration 81
Exit.....122
Floppy Configuration 89
General ACPI Configuration.....99
Hardware Health Configuration.....95
IDE Configuration 82
IDE Master, IDE Slave.....84
NorthBridge Configuration..... 120
Super IO Configuration.....90
System Overview.....78
USB Configuration..... 105
USB Mass Storage Device Configuration
..... 107
BIOS Chipset 13

C

CF card
setup jumper.....57
CF card setup jumper 57
chassis.....61
installation.....61
clear CMOS jumper 58
CMOS 58
clear CMOS jumper.....58
COM 2
COM 2 mode selection..... 59, 60
COM 2 mode selection jumper 59, 60
connectors, pinouts and location
+12V ATX power supply 25
ATX power supply.....26
COM 2 serial port 35
fans.....27
floppy disk.....28
multi-panel 28
PCI Express power.....31
PCI Express x16 slot 31
PCI slot 32

serial port (COM 2) 35
serial SATA drives 33
SPDIF 36
USB (internal) 37
cooling fan 53, 97
cooling kit installation 52
CPU
cooling fan 53
heat sink 53
installation 49

D

DB-15 44
DB-15 connector 70, 73
DB-25 40
dimensions 8
board 8
external peripheral interface connector panel 8
DIMM 54
installation 54
specifcations 54
Drivers
Audio Driver 137
Chipset Driver 127
Intel Graphics Media Accelerator Driver 130
LAN Driver 135

E

electrostatic discharge 18, 46
Enhanced Hardware Monitor 14
Environmental and Power Specifications 14
Ethernet
connection 71
external indicators 29
external peripheral interface 69
connection 69
connectors 69
External Peripheral Interface Connectors 38
Audio Jacks 42
Ethernet (RJ-45) 41
Keyboard/Mouse 39
Parallel Port 40
USB 43
VGA 44
external switches 29

F

fan connector 27
location and pinouts 27
Features 2
floppy disk connector 28
location and pinouts 28
floppy disk drive 28
FSB 81

H

hard disk drives
SATA 33
heat sink 53

I

IDE connector, 40-pin 29
location and pinouts 29
IDE device 62
ATA flat cable 62

connector 62
Installation
Floppy Drive 64
Serial Cable 65
installation checklist 47

J

jumper 56
CF card setup 57
clear CMOS 58
COM 2 mode selection 59, 60
jumper configuration 56
jumper settings 56

K

keyboard controller 14

L

LPC bus 13

M

memory module installation 54, 66
memory support 10
multi-panel connector 29
location and pinouts 29

O

Operating Temperature 15

P

parallel port 14
PCI Express x16 Slot 31
location and pinouts 31
PCI slot 32
location and pinouts 32
Peripheral Connectors and Jumpers 3
Power Button Mode 100
Power Consumption 15
power supply 25, 26
ATX power supply 25, 26
PS/2 39
PS/2 connector 69
PS/2 keyboard
connection 69

R

real time clock 11
RJ-45 connector 71
RS-232
cable connection 63
dual cable 63

S

Safety Precautions 161
SATA
controller 12
SATA drive 67
cables 67
connection 67
power cable 67
SATA drive connector 33
location and pinouts 33
SATA drives 33
socket LGA775 CPU
cooling kit * MERGEFORMAT 52
cooling kit installation * MERGEFORMAT

.....52
installation.....49
SODIMM.....66
installation.....66
Sound Effect Configuration.....169
Sound Effects Manager.....169
Super I/O chipset.....14
System Monitoring.....14
system voltages.....95, 97

T

technical specifications.....4
Temperature Control.....15

U

unpacking.....18
unpacking checklist.....19
unpacking precautions.....18
USB
connection.....71
USB connector.....71

V

VGA monitor
connection..... 70, 73

W

warranty validation.....47