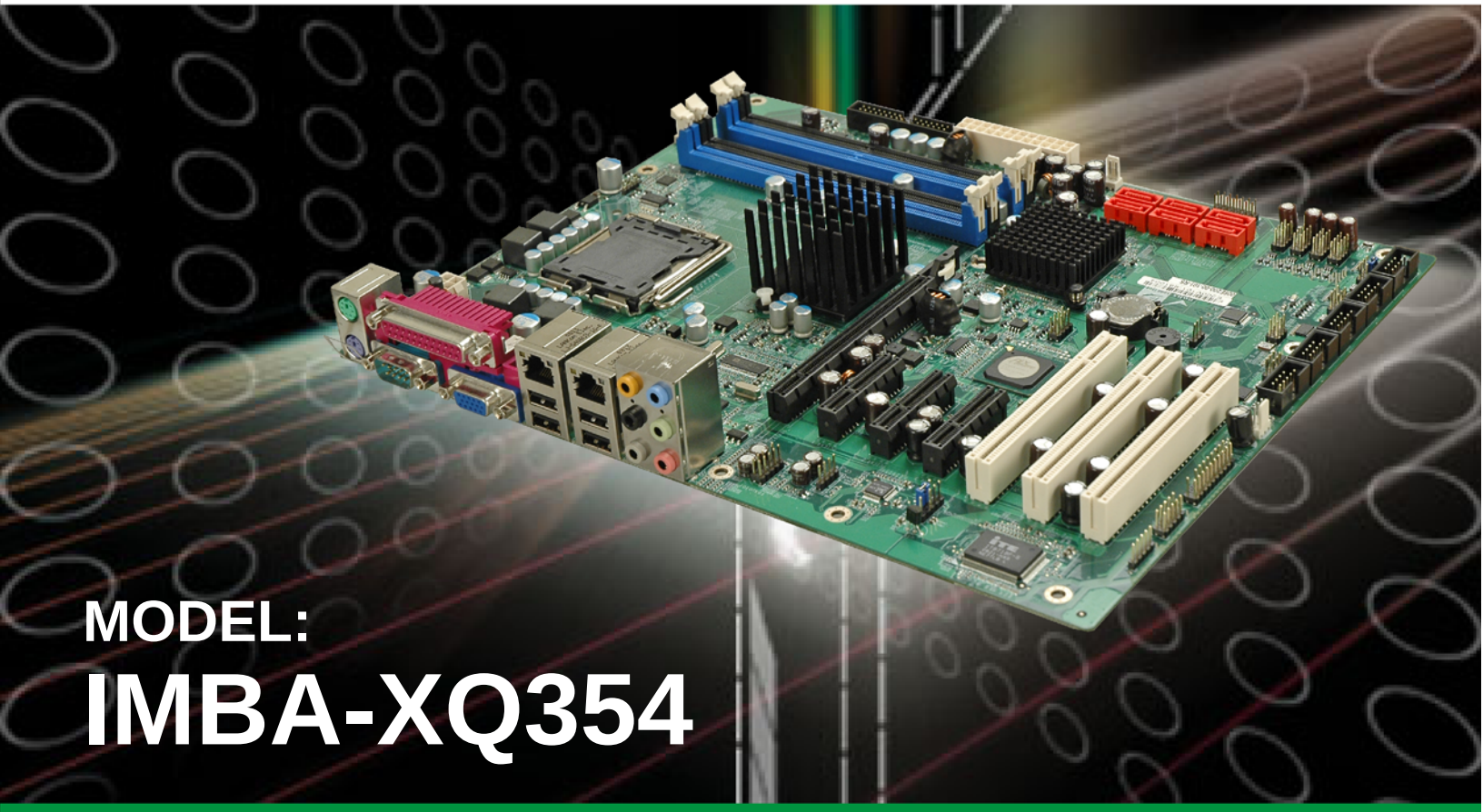
IEI Technology Corp.



MODEL:

IMBA-XQ354

ATX Motherboard for Intel® Core™2 Duo/Quad
GbE, Intel® AMT 3.0, PCIe x16, VGA, SATA with RAID 0,1,5,10
PCI, PCIe x4, HD Audio, RoHS Compliant

User Manual

Rev. 1.10 – April 2011

RoHS Lead Free

Revision

Date	Version	Changes
April 2011	1.10	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.

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.

Manual Conventions

WARNING!

Warnings appear where overlooked details may cause damage to the equipment or result in personal injury. Warnings should be taken seriously. Warnings are easy to recognize. The word “warning” is written as “**WARNING**,” both capitalized and bold and is followed by text. The text is the warning message. A warning message is shown below:

WARNING:

This is an example of a warning message. Failure to adhere to warning messages may result in permanent damage to the IMBA-XQ354 or personal injury to the user. Please take warning messages seriously.

CAUTION!

Cautionary messages should also be heeded to help reduce the chance of losing data or damaging the IMBA-XQ354. Cautions are easy to recognize. The word “caution” is written as “**CAUTION**,” both capitalized and bold and is followed. The text is the cautionary message. A caution message is shown below:

CAUTION:

This is an example of a caution message. Failure to adhere to cautions messages may result in permanent damage to the IMBA-XQ354. Please take caution messages seriously.

NOTE:

These messages inform the reader of essential but non-critical information. These messages should be read carefully as any directions or instructions contained therein can help avoid making mistakes. Notes are easy to recognize. The word “note” is written as “**NOTE**,” both capitalized and bold and is followed by text. The text is the cautionary message. A note message is shown below:

NOTE:

This is an example of a note message. Notes should always be read. Notes contain critical information about the IMBA-XQ354. Please take note messages seriously.

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-XQ354 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-XQ354 package.

- 1 x IMBA-XQ354 single board computer
- 2 x Dual RS-232 cables (P/N: 32200-004101-RS)
- 1 x RS-232 cable (P/N: 32200-029400-RS)
- 6 x SATA cables (P/N: 32000-062800-RS)
- 1 x I/O shielding (P/N: 45014-0025C0-00-RS)
- 1 x Mini Jumper Pack
- 1 x Utility CD
- 1 x QIG

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

Table of Contents

List of Figures

List of Tables

BIOS Menus

Chapter

1

Introduction

1.1 IMBA-XQ354 Motherboard Overview

Figure 1–1: IMBA-XQ354

The IMBA-XQ354 is an ATX form factor industrial PC motherboard. The ATX form factor is a relatively large form factor, providing room for extra features and capabilities including more powerful processors that benefit from the larger dimensions and better cooling of ATX computer cases.

The IMBA-XQ354 supports Intel® Core™2 Quad, Intel® Core™2 Duo and Intel® Celeron® processors and supports up to up to 8.0 GB of DDR2 memory with up to 2.0 GB in each memory slot.

Six SATA ports provide advanced storage capabilities with 3.0 MB/s data transfer rates. RAID 0 support allows for increased data throughput for applications requiring quick data access. RAID 1, 5 and 10 provide data redundancy allowing for the failure of one or more disks without losing data.

Graphics capabilities include a VGA port on the rear panel, and a PCIe x16 graphics card slot. The graphics card slot supports the latest graphics cards, offering rendering and quality capable of supporting the most intensive graphics applications.

Networking is provided through two GbE controllers. The GbE controllers allow network data speeds of up to 1.0 Gb/s, allowing for fast communication between computers on the network and with computers on external networks. The first LAN port supports Intel® AMT 3.0 for powerful remote management options.

Expansion capabilities include 10 USB ports, six serial ports and a parallel port.

1.1.1 Benefits

Some of the IMBA-XQ354 motherboard benefits include,

- Operating reliably in harsh industrial environments up to 60°C
- The system is always available and will reboot if the system crashes
- Powerful processor options are ideal for computing intensive applications
- Data is protected through fast and reliable SATA RAID storage

1.1.2 Features

Some of the IMBA-XQ354 motherboard features are listed below:

- ATX form factor
- RoHS compliant
- LGA 775 CPU socket
- PCI and PCIe expansion slots
- Supports four DDR2 DIMMs up to 2.0 GB each
- Two Gigabit Ethernet controllers
- Supports 12 USB 2.0 ports
- Integrated audio

1.2 IMBA-XQ354 Overview

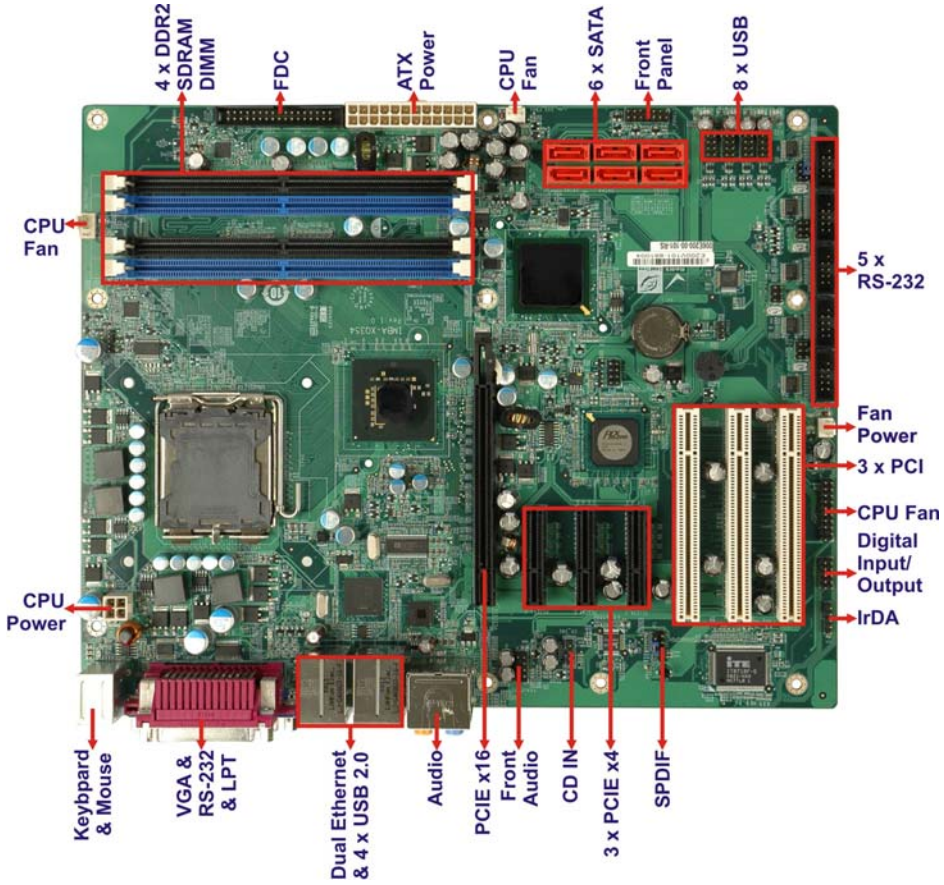


Figure 1–2: Overview

1.2.1 Connectors

The IMBA-XQ354 has the following connectors onboard:

- 1 x ATX power connector (CPU)
- 1 x ATX power connector (system)
- 1 x Audio connector
- 1 x CD-in connector
- 1 x Digital I/O (DIO) connector
- 2 x Fan connectors
- 1 x Floppy disk connector (FDC)
- 1 x Front panel connector

- 1 x Infrared connector
- 1 x PCIe x16 expansion slot
- 3 x PCIe x4 expansion slot
- 1 x PCI expansion slot
- 6 x SATA connectors
- 5 x Serial port connectors
- 1 x S/PDIF connector
- 1 x SPI flash connector
- 1 x TPM connector
- 4 x USB connectors (for eight USB ports)

The IMBA-XQ354 has the following external peripheral interface connectors:

- 6 x Audio jack connectors
- 2 x Ethernet connectors
- 1 x Keyboard connector
- 1 x Mouse connector
- 1 x Parallel port connector
- 1 x Serial port connectors
- 4 x USB ports
- 1 x VGA connector

The IMBA-XQ354 has the following onboard jumpers:

- 1 x Clear CMOS jumper
- 1 x COM3 Pin 9 Setting jumper
- 1 x COM4 Pin 9 Setting jumper
- 1 x COM5 Pin 9 Setting jumper
- 1 x COM6 Pin 9 Setting jumper
- 1 x COM3 Pin 9 Voltage Setting jumper
- 1 x COM4 Pin 9 Voltage Setting jumper
- 1 x COM5 Pin 9 Voltage Setting jumper
- 1 x COM6 Pin 9 Voltage Setting jumper
- 1 x SPDIF Out Selection jumper

The location of these connectors on the motherboard can be seen in **Figure 4-1**. These connectors are fully described in Chapter 4 and the jumpers in Chapter 5.

1.2.2 Technical Specifications:

IMBA-XQ354 motherboard technical specifications are listed in **Table 1-1**. Detailed descriptions of each specification can be found in **Chapter 2**.

Specification	IMBA-XQ354
Form Factor	ATX
CPU Supported	LGA775 Intel® Core™2 Quad LGA775 Intel® Core™2 Duo LGA775 Intel® Celeron® D
Front Side Bus	800 MHz, 1066 MHz or 1333 MHz
Northbridge Chipset	Intel® Q35
Southbridge Chipset	Intel® ICH9DO
Memory	Supports four dual-channel 2.0 GB (max.) 667 MHz or 800 MHz DDR2 SDRAM DIMMs (system max. 8.0 GB)
Expansion Slots	1 x PCIe x16 slot 3 x PCIe x4 slot 3 x PCI slot
BIOS	AMI BIOS
Graphics	VGA integrated in Intel® Q35
Floppy Disk Drives	Two 5.25” 360 KB or 1.2 MB floppy disk drives (FDD) and/or 3.5”.720 KB, 1.44 MB or 2.88 MB FDD.
Serial Ports	Six RS-232 ports supported with two from the iTE IT8718F super I/O and four from the Fintek F81216DG
Peripherals	1 x Parallel port supporting normal, EPP and ECP modes 12 x USB 2.0/1.1 ports 1 x Dual PS/2 connector (for keyboard and mouse)
USB 2.0/1.1 port	Four External Eight via internal pin header

Specification	IMBA-XQ354
Serial ATA	Supports six independent serial ATA (SATA) channels with 3.0 Gb/s data transfer rates
Ethernet	Intel® 82566DM (PHY) + Intel® ICH9DO (MAC) Intel® 82573L (MAC+PHY) through the PCIe x1 interface
Digital I/O	8-bit, 4-bit input/4-bit output
Super I/O Controller	iTE IT8718F
Audio	Realtek ALC883 HD Audio codec
Watchdog Timer	Software Programmable supports 1~255 sec. system reset
Trusted Platform Module	Supports TPM v1.2 and above
Power Supply	ATX supported
Fans	1 x 4-pin CPU cooling fan 2 x 3-pin system cooling fans
Power Consumption	3.3 V @ 2.96 A 5 V @ 6.92 A 5 VSB @ 1.61 A 12 V @ 2.77 A (2.66 GHz E6850 Intel® Core™2 Duo CPU with 1333 MHz FSB and 8.0 GB of DDR2 memory running 3DMark 2001)
Operating temperature	0ºC ~ 60ºC (requires cooler and silicone heat sink paste)
Humidity	0% ~ 95% (non-condensing)
Dimensions	305 mm x 244 mm
Weight GW/NW	1200 g/600 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-XQ354 in detail.

2.2 Dimensions

2.2.1 Board Dimensions

The dimensions of the board are listed below:

- Length: 305 mm
- Width: 244 mm

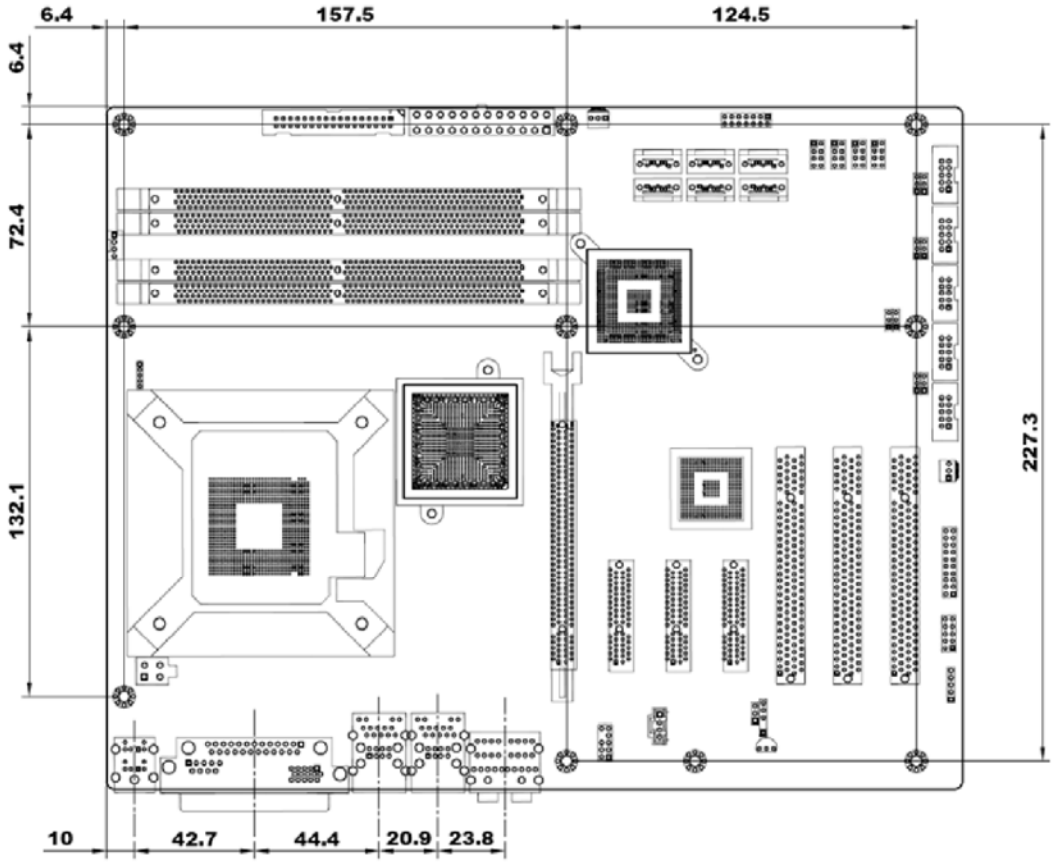


Figure 2-1: IMBA-XQ354 Dimensions (mm)

2.2.2 External Interface Panel Dimensions

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

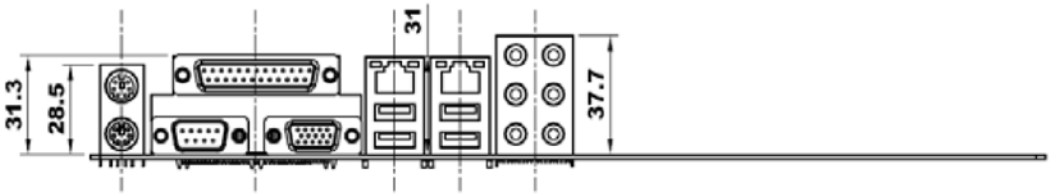


Figure 2-2: External Interface Panel Dimensions (mm)

2.3 Data Flow

Figure 2-3 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

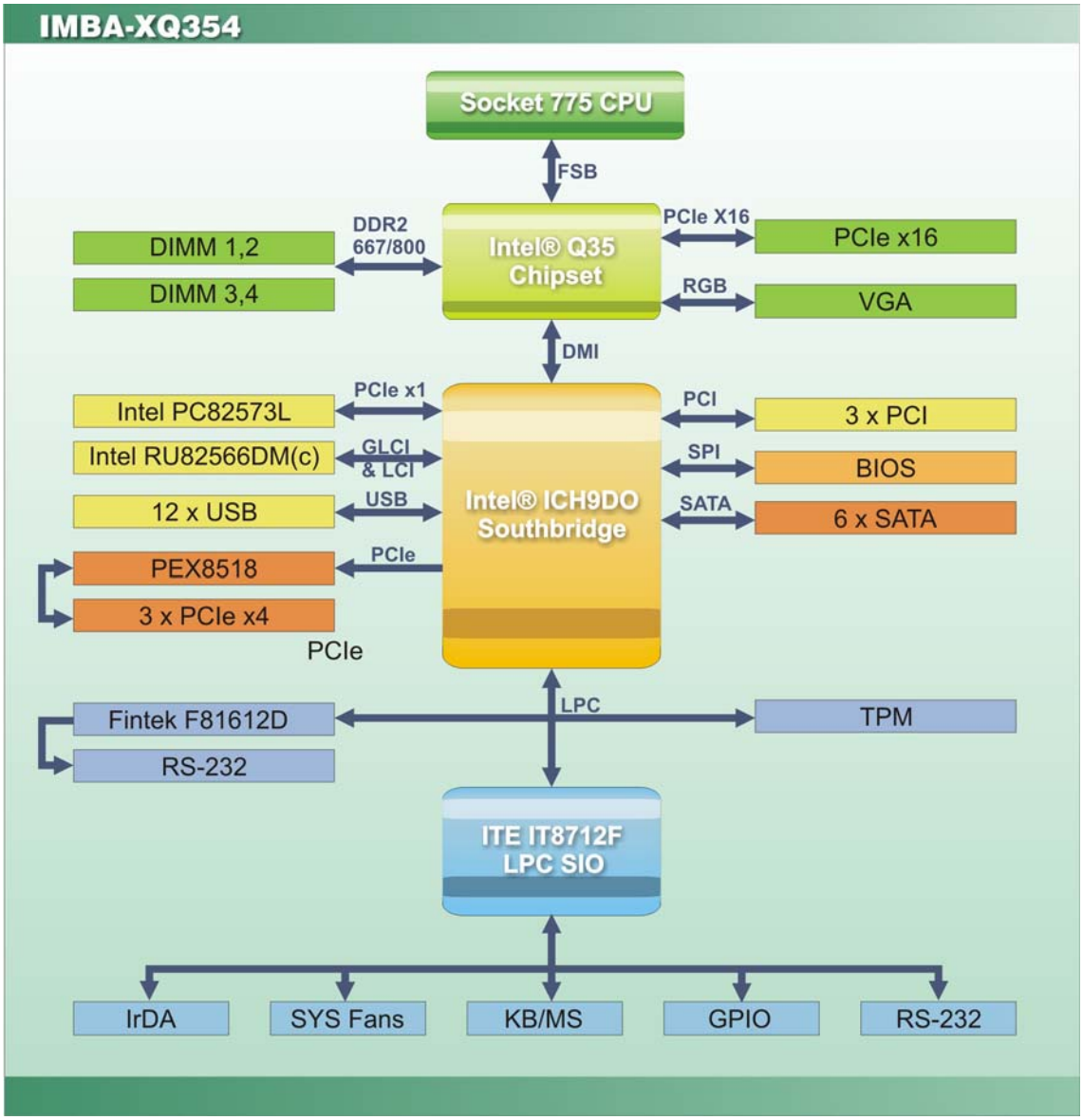


Figure 2-3: Data Flow Block Diagram

2.4 Compatible Processors

The IMBA-XQ354supports the following Intel® LGA775 processors

- Intel® Core™2 Quad (Yorkfield)
- Intel® Core™2 Duo (Wolfdale)
- Intel® Core™2 Duo (Conroe)
- Intel® Celeron® (Conroe)

2.5 Intel® Q35 Northbridge Chipset

The Intel® Q35Intel® Q35 Northbridge chipset is an advanced Graphics and Memory Controller Hub (GMCH) that supports a range of Intel® processors as listed in the previous section. The Intel® Q35Intel® Q35 Northbridge supports an 800/1066/1333 MHz FSB. The IMBA-XQ354 supports up to 2.0 GB of 667 MHz or 800 MHz DDR2 SDRAM per slot (8.0 GB total) interfaced to the Intel® Q35Intel® Q35. The Intel® Q35Intel® Q35 Northbridge is connected to an Intel® ICH9DO Southbridge chipset through the Direct Media Interface (DMI) communications link.

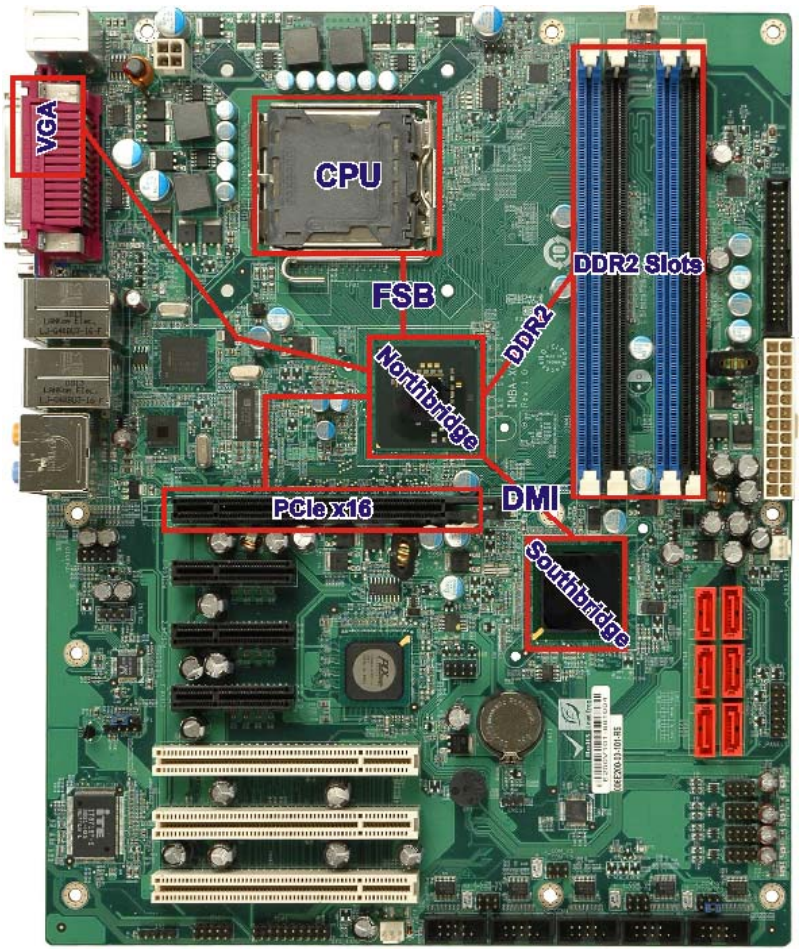


Figure 2-4: Northbridge Connections

2.5.1 Front Side Bus

The Intel® Q35Intel® Q35 Northbridge supports processors with the following FSB speeds:

- 800 MHz
- 1066 MHz
- 1333 MHz

The LGA775 socket, Intel® Q35Intel® Q35 Northbridge and the FSB are shown in **Figure 2-4**.

2.5.2 Memory Controller

The IMBA-XQ354 has four DDR2 DIMM sockets interfaced to the memory controller on the Intel® Q35Intel® Q35 Northbridge. Each DIMM socket can support a 2.0 GB (max.) 667 MHz or 800 MHz DDR2 SDRAM DIMM module with a system maximum of 8.0 GB.

NOTE:

For best performance, each memory module should have the same capacity and operating frequency.

Each DIMM socket can support DIMMs with the following specifications:

- DDR2 only
- Un-buffered only
- 667 MHz or 800 MHz
- 8.0 GB maximum capacity (2.0 GB maximum per DIMM)
- Memory bandwidth:
  - 6.4 GB/s in single-channel or dual-channel asymmetric mode
  - 12.8 GB/s in dual-channel interleaved mode assuming DDR2 800 MHz

2.5.3 PCIe x16 Interface

The Intel® Q35Intel® Q35 PCIe bus is compliant with the PCI Express 1.1a Specifications has the following PCIe lanes:

- One PCIe x16 graphics interface
- PCIe frequency of 1.25 GHz (2.5 Gb/s in each direction)

2.5.4 Graphics and Display Features

The Intel® Q35Intel® Q35 GMCH integrated graphics device (IGD) has 3D, 2D and video capabilities. The Unified Memory Architecture (UMA) uses up to 256 MB of Dynamic Video Memory Technology (DVMT) for graphics memory. External graphics accelerators on the PCIe graphics (PEG) port are supported but cannot work simultaneously with the IGD.

2.5.4.1 VGA Display Capabilities

A single external female DB-15 (VGA) connector interfaces an analog display to an analog CRT port on the Intel® Q35Intel® Q35 GMCH.

Some of the capabilities of the Intel® Q35Intel® Q35 analog CRT port are listed below:

- 400 MHz Integrated 24-bit RAMDAC
- Up to 2048 x 1536 @ 75 Hz refresh
- Hardware Color Cursor Support
- DDC2B Compliant Interface

2.5.5 Direct Media Interface (DMI)

The Direct Media Interface (DMI) is the communication bus between the Intel® Q35Intel® Q35 GMCH and the ICH9DO I/O controller hub (ICH). The DMI is a high-speed interface that integrates advanced priority-based servicing and allows for concurrent traffic and true isochronous transfer capabilities.

Some of the features of the DMI include:

- 2.0 GB/s point-to-point DMI to ICH9DO (1.0 GB/s in each direction)
- 100 MHz reference clock (shared with PCI Express* Graphics Attach)
- 32-bit downstream addressing
- APIC and MSI interrupt messaging support
- Message Signaled Interrupt (MSI) messages
- SMI, SCI and SERR error indication

2.6 Intel® ICH9DO Southbridge Chipset

The Intel® ICH9DO Southbridge is an advanced I/O controller hub (ICH) connected to the Intel® Q35 Northbridge through a DMI connection. The Intel® ICH9DO has six PCIe x1 ports, supports up to twelve USB 2.0 devices and six 3.0 Gb/s SATA II drives with Intel® Matrix Storage Technology (ACHI, RAID 0, RAID 1, RAID 5 or RAID 10). The ICH9DO also comes with an integrated GbE controller that is interfaced to an external RJ-45 connector. A High Definition Audio codec is connected to the Intel® ICH9DO to provide audio capabilities.

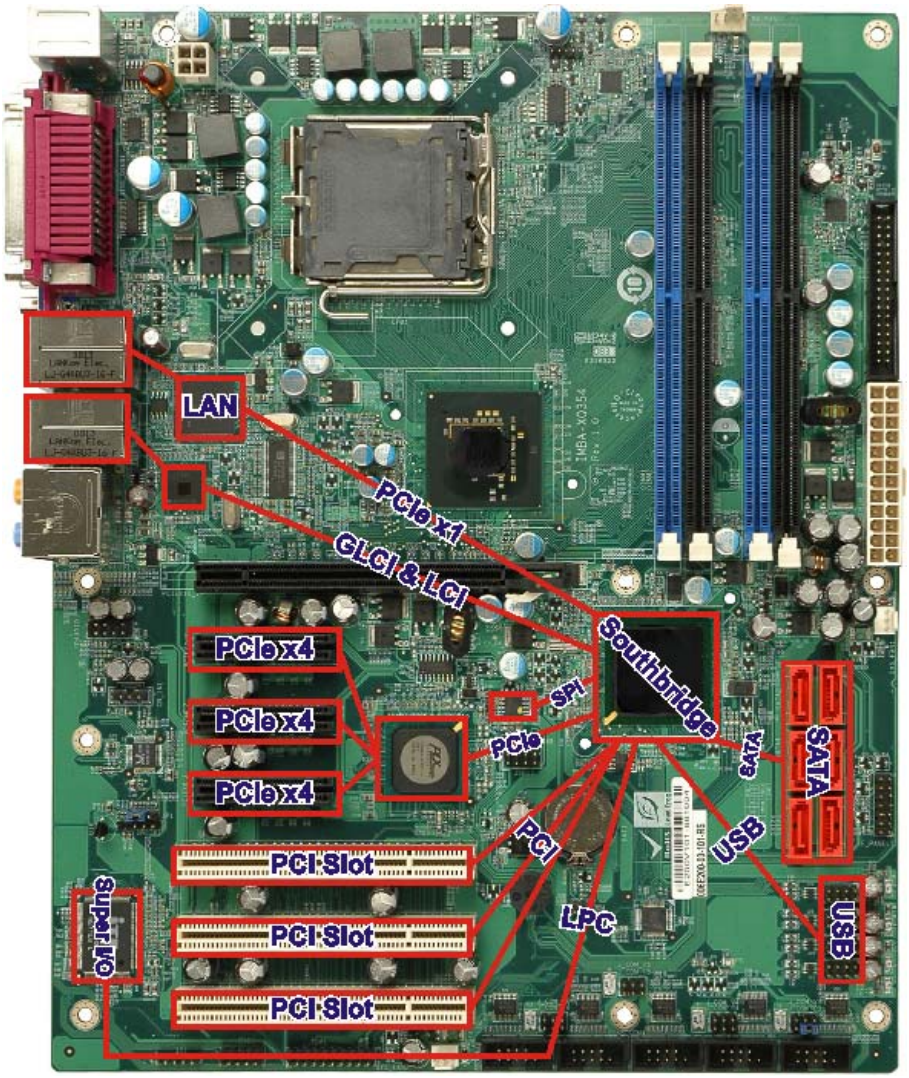


Figure 2-5: Southbridge Connections

The ICH9DO Southbridge chipset on the IMBA-XQ354 has the features listed below.

- Complies with PCI Express Base Specification, Revision 11
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33 MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  - Enhanced DMA controller
  - Interrupt controller
  - Timer functions

- Integrated SATA host controller with DMA operations on six ports with data transfer rates up to 1.5 Gb/s
- Supports twelve USB 2.0 devices with six UHCI controllers and two EHCI controller
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Intel® High Definition Audio
- Supports Intel® Matrix storage technology
- Contains Low Pin Count (LPC) interface
- Supports Firmware Hub (FWH) interface
- Serial Peripheral Interface (SPI) for Serial and Shared Flash
- Intel® Quiet System technology

2.6.1 High Definition Audio Implementation

A Realtek ALC883 HD Audio codec provides 7.1 channel audio capabilities. The Realtek ALC883 HD Audio is connected to the Intel® ICH9DO and connects to audio devices through audio jacks on the rear panel and audio headers on the board..

2.6.2 Gigabit Ethernet Controllers

The Intel® ICH9DO Southbridge integrated Gigabit Ethernet MAC is connected to the Intel® 82566DM (PHY) chip, and then to the RJ-45 connector. One PCIe x1 port is connected to the Intel® 82573L chip and then to the RJ-45 connector.

Some of the features of the Intel® ICH9DO GbE controller are listed below.

- Supports multi speeds including 10 Mb/s, 100 Mb/s and 1000 Mb/s
- Can operate in full-duplex mode at all supported speeds
- Can operate at half-duplex at 10 MB/s and 100 MB/s
- Adheres to the IEEE 802.3x Flow Control Specification.
- Configurable LED operation for customization of LED display.
- 64-bit address master support for system using more than 4 GB of physical memory.
- Configurable receive and transmit data FIFO, programmable in 1 KB increments.
- Intelligent interrupt generation to enhance driver performance.
- Compliance with Advanced Configuration and Power Interface

- Compliance with PCI Power Management standards.
- ACPI register set and power down functionality supporting D0 & D3 states.
- Full wake-up support (APM and ACPI).
- Magic Packet wake-up enable with unique MAC address.
- Fragmented UDP checksum off load for package reassembly.
- Jumbo frames supported.

2.6.2.1 Intel® 82566DM Gigabit Ethernet Device

The external RJ-45 Ethernet LAN connectors is interfaced to an Intel® 82566DM Gigabit LAN connect device. The Intel® 82566DM is a compact, single-port integrated physical layer (PHY) device interfaced directly to the Intel® ICH9DO MAC controller through the GLCI.

Some of the features of the Intel® 82566DM are listed below:

- 10 Mb/s, 100 Mb/s, or 1000 Mb/s
- Supports Intel® Active Management TechnologyS
- Supports Intel® Virtualization Technology through the Intel® Virtual Gigabit Network Connection.
- Can support legacy ASF2.0.
- Shared SPI flash with system BIOS
- Integrated linear voltage regulator
- TCP/UDP checksum and segmentation offload
- Receive side scaling
- Dual TX and RX queues
- 802.1p and 802.1q

2.6.2.2 Intel® 82573L Gigabit Ethernet Controller

The external RJ-45 Ethernet LAN connectors is interfaced to an Intel® 82573L Gigabit LAN connect device. The Intel® 82573L is a compact, single-port integrated physical layer (PHY) device interfaced directly to the Intel® ICH9DO MAC controller through the GLCI.

Some of the features of the Intel® 82573L are listed below:

- 10 Mb/s, 100 Mb/s, or 1000 Mb/s

- Can support legacy ASF2.0.
- Integrated linear voltage regulator
- TCP/UDP checksum and segmentation offload
- Receive side scaling
- Wake on LAN
- Dual TX and RX queues
- 802.1p and 802.1q

2.6.3 Low Pin Count (LPC) Interface

The ICH9DO LPC interface complies with the LPC 1.1 specifications. The LPC bus from the ICH9DO is connected to the following components:

- iTE IT8718F super I/O chip
- Fintek F81216DG serial port chip

2.6.4 PCI Interface

The PCI interface on the ICH9DO is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

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

The Intel® ICH9DO is connected to three PCI expansion card slots.

2.6.5 PCIe Bus

The Intel® ICH9DO Southbridge chipset has six PCIe x1 lanes. The four PCIe lanes are connected to the PLX PEX8518 chip, which is connected to the three PCIe x4 expansion card slots. One PCIe x1 lane is connected to the Intel® 82573L, and another is shared with the GLI.

2.6.6 Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818B real time clock (RTC) integrated into the ICH9DO. 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.

2.6.7 SATA Controller

The ICH9DO has six SATA channels. The ICH9DO SATA supports three modes of operation:

- Native IDE enabled operating system:
- Legacy operating system is used
- AHCI or RAID mode

In the AHCI or RAID mode, 3.0 Gb/s data transfer speeds are supported.

2.6.8 Serial Peripheral Interface (SPI) BIOS

The 4-pin SPI is connected to an SPI BIOS chip. A licensed copy of AMI BIOS is preinstalled on the SPI BIOS chip. A master-slave protocol is used for communication on the SPI bus. The slave is connected to the Intel® ICH9DO Southbridge and is implemented as a tri-state bus.

2.6.9 USB Controller

The ICH9DO supports 12 USB devices with low/full/hi-speed capabilities. Four USB ports are available on the rear panel, while eight are available through pin headers on the board.

2.7 LPC Bus Components

The LPC bus provides a connection for legacy devices and is connected to the:

- iTE IT8718F super I/O chipset
- Fintek F81216DG serial port chipset

2.7.1 iTE IT8718F Super I/O chipset

The iTE IT8718F Super I/O chipset is connected to the ICH9DO Southbridge through the LPC bus. The iTE IT8718F Super I/O chipset and connected components are shown in **Figure 2-6** below.

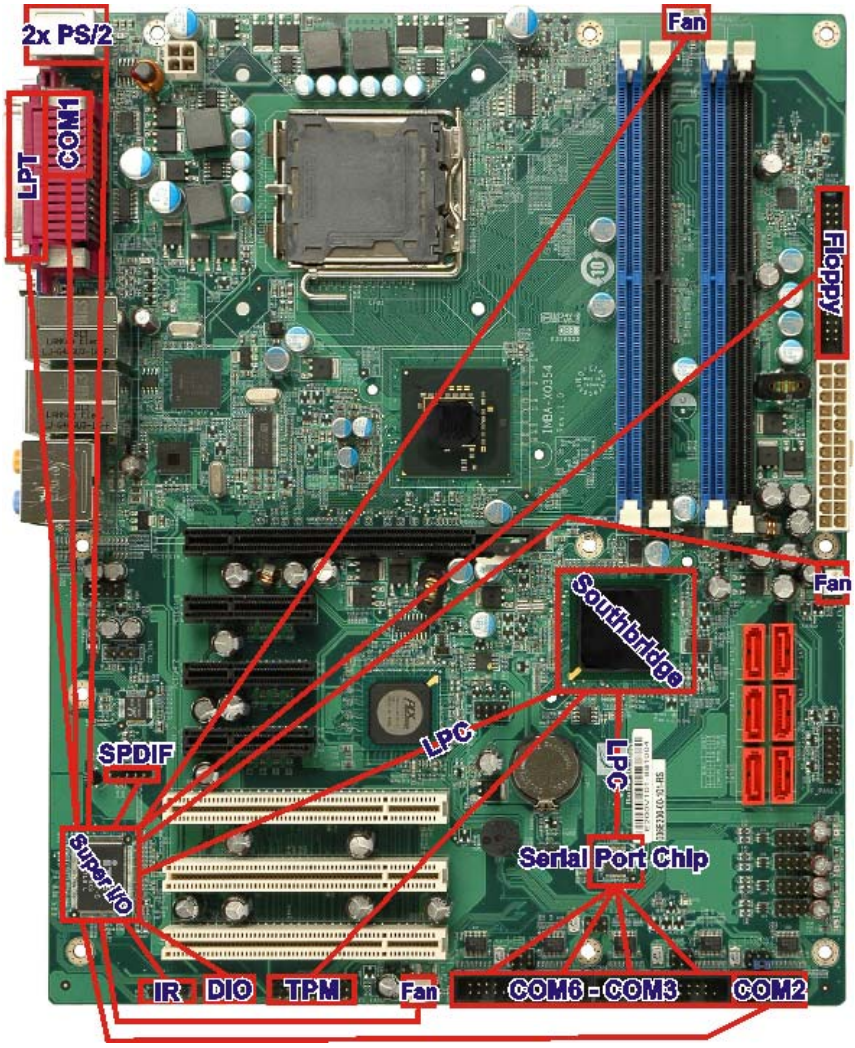


Figure 2-6: iTE IT8718F Super I/O

The iTE IT8718F is an LPC interface-based Super I/O device that comes with Environment Controller integration. Some of the features of the iTE IT8718F chipset are listed below:

- PC98/99/2001, ACPI and LANDesk Compliant

- Enhanced Hardware Monitor
- Fan Speed Controller
- Single +5 V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support
- Vbat & Vcch Support
- Single +5 V Power Supply

Some of the Super I/O features are described in more detail below:

2.7.1.1 LPC Interface

The LPC interface on the Super I/O complies with the Intel® Low Pin Count Specification Rev. 1.0. The LPC interface supports both LDRQ# and SERIRQ protocols as well as PCI PME# interfaces.

2.7.1.2 16C550 UARTs

The onboard Super I/O has two integrated 16C550 UARTs that can support the following:

- Two standard serial ports (COM1 and COM2)
- IrDa 1.0 and ASKIR protocols

Another two chipsets connected to the LPC bus provided connectivity to another two serial port connectors (COM3 and COM4).

2.7.1.3 Digital Input/Output

The input mode supports switch debouncing or programmable external IRQ routing. The output mode supports two sets of programmable LED blinking periods.

2.7.1.4 Enhanced Hardware Monitor

The Super I/O Enhanced Hardware Monitor monitors three thermal inputs, VBAT internally, and eight voltage monitor inputs. These hardware parameters are reported in the BIOS and can be read from the BIOS Hardware Health Configuration menu.

2.7.1.5 Fan Speed Controller

The Super I/O fan speed controller enables the system to monitor the speed of the fan. One of the pins on the fan connector is reserved for fan speed detection and interfaced to the fan speed controller on the Super I/O. The fan speed is then reported in the BIOS.

2.7.1.6 Floppy Disk Controller

The Super I/O floppy disk controller has the following specifications:

- Supports floppy drives with the following capacity:
  - 360K
  - 720K
  - 1.2M
  - 1.44M
  - 2.88M
- Enhanced digital separator
- 3-mode drives are supported

2.7.1.7 Keyboard/Mouse Controller

The Super I/O keyboard/mouse controller can execute the 8042 instruction set. Some of the keyboard controller features are listed below:

- The 8042 instruction is compatible with a PS/2 keyboard and PS/2 mouse
- Gate A20 and Keyboard reset output
- Supports multiple keyboard power on events
- Supports mouse double-click and/or mouse move power on events

2.7.1.8 Parallel Port

The multi-mode high-performance parallel port supports the bi-directional Standard Parallel Port (SPP), the Enhanced Parallel Port (EPP) and the Extended Capabilities Port (ECP) modes.

2.7.2 Fintek F81216DG Serial Port Chip

The Fintek F81216DG chipset enables the addition of four additional UART serial ports (COM3, COM4, COM5 and COM6). UART includes 16-byte send/receive FIFO.

The serial port chipset is interfaced to the Southbridge chipset through the LPC bus. Some of the features are listed below:

- Supports LPC interface
- Totally provides 4 UART (16550 asynchronous) ports
  - 3 x Pure UART
  - 1 x UART+IR
- One Watch dog timer with WDTOUT# signal
- One Frequency input 24/48 MHz
- Powered by 3 Vcc

2.8 Environmental and Power Specifications

The environmental and power specifications are shown in the subsections below.

2.8.1 System Monitoring

The following temperatures are monitored:

- CPU temperature
- System temperature #1
- System temperature #2

The following fans are monitored:

- CPU fan
- System fan 1
- System fan 2

The following voltages are monitored:

- CPU Core
- DDR2 1.8 V
- 3.3 V
- 5.0 V
- 12.0 V
- FSB VTT
- 1.5 V
- 1.25 V
- VBAT

2.8.2 Power Consumption

Table 2-1 shows the power consumption parameters for the IMBA-XQ354 with a 2.66 GHz E6850 Intel® Core™2 Duo CPU, 1333 MHz FSB and 8.0 GB of 800 MHz DDR2 RAM running 3DMark 2001.

Voltage	Current
+ 3.3 V	2.96 A
+ 5.0 V	6.92 A
+ 5.0 VSB	1.61 A
+ 12.0 V	2.77 A

Table 2-1: Power Consumption

Chapter

3

Packing List

3.1 Anti-static Precautions

WARNING!

Failure to take ESD precautions during the installation of the IMBA-XQ354 may result in permanent damage to the IMBA-XQ354 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-XQ354. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-XQ354, 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-XQ354, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-XQ354.
- ***Only handle the edges of the PCB***:- When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the IMBA-XQ354 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 763.1**.
- Make sure the packing box is facing upwards so the IMBA-XQ354 does not fall out of the box.
- Make sure all the components shown in **Section 763.3** are present.

3.3 Unpacking Checklist

NOTE:

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the IMBA-XQ354 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-XQ354 is shipped with the following components:

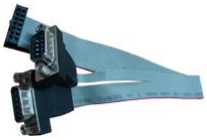
Quantity	Item and Part Number	Image
1	IMBA-XQ354	
2	Dual RS-232 cable (**P/N**: 19800-000113-RS)	
1	Single RS-232 cable (**P/N**: 19800-000114-RS)	
6	SATA cable (**P/N**: 32102-000100-100/200-RS)	
1	I/O Shielding (**P/N**: 45014-0025C0-00-RS)	
1	Mini jumper pack (2.0 mm) (**P/N**:33100-000079-RS)	

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

Table 3-1: Packing List

3.3.2 Optional Items

The IMBA-XQ354 is shipped with the following components:

Item and Part Number	Image
Dual USB cable (w bracket) (**P/N**: CB-USB02-RS)	
4-port USB cable (**P/N**: 19800-000100-200)	
RS-232/422/485 cable (**P/N**: 3200-000063-RS)	
CPU cooler (**P/N**: CF-775A-RS)	

Item and Part Number	Image
CPU cooler (**P/N**: CF-520-RS-R11)	
20-pin Infineon TPM, software management tool, firmware V3.17 (**P/N**: TPM-IN01-R11)	
PCIe x16 VGA output SDVO card supports dual display (IEI CPU board only) (**P/N**: SDVO-100VGA-R10)	
PCIe x16 DVI output SDVO card supports dual display (IEI CPU board only) (**P/N**: SDVO-100DVI-R10)	

Table 3-2: Optional Items

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 854.1.2 shows peripheral interface connector locations. **Section 854.1.2** lists all the peripheral interface connectors seen in **Section 864.1.2**.

4.1.1 IMBA-XQ354 Layout

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

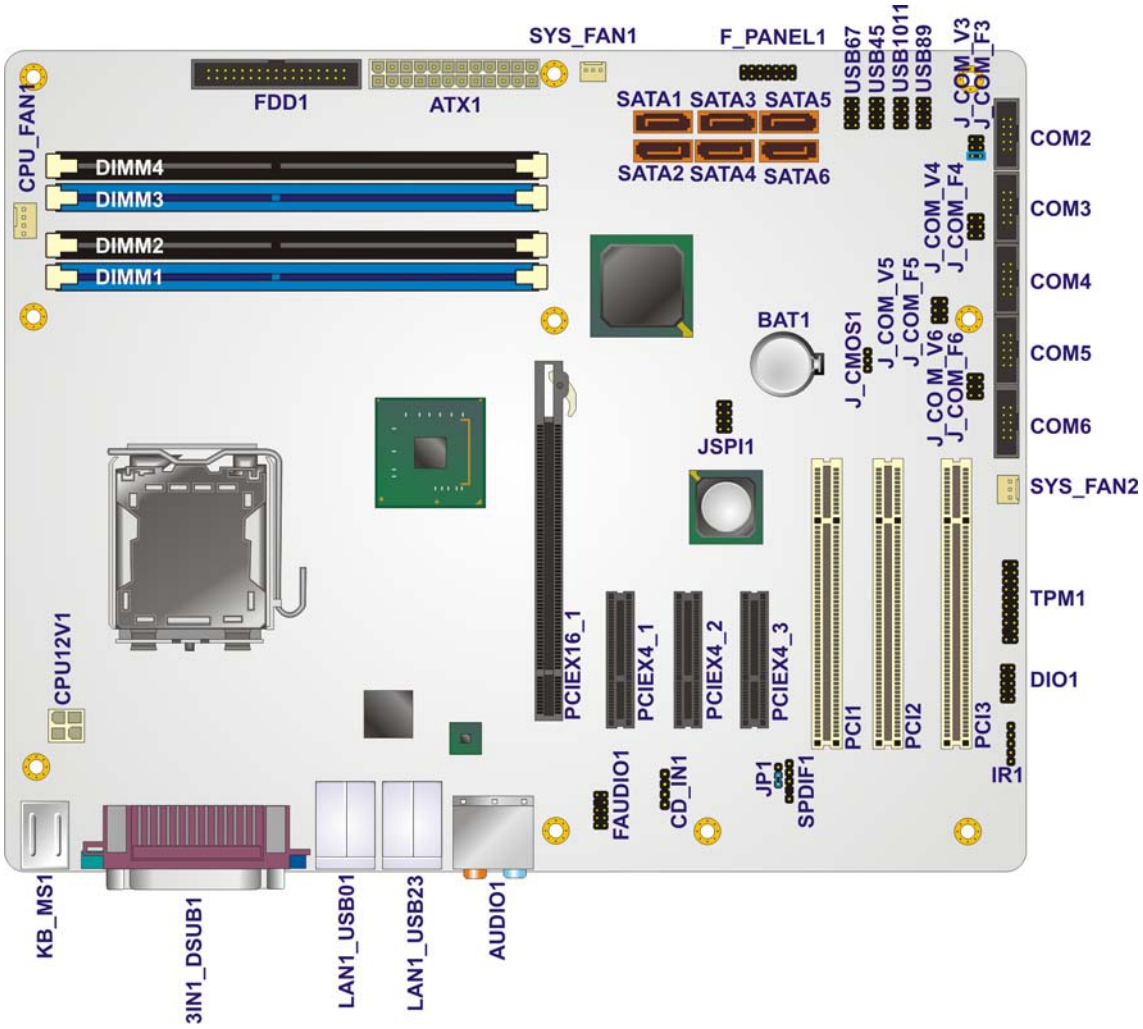


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the IMBA-XQ354. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power connector, CPU	4-pin ATX	CPU12 V1
ATX power connector, system	24-pin ATX	ATX1
Audio connector	10-pin header	FPAUDIO1
CD in connector	4-pin header	CDIN1
Digital I/O connector	10-pin header	DIO1
Fan connector, CPU	4-pin wafer	CPU_FAN1
Fan connector, System	3-pin wafer	SYS_FAN1 SYS_FAN2
Floppy disk connector	34-pin box header	FDD1
Front panel connector	14-pin header	F_PANEL1
Infrared connector	5-pin header	IR1
PCI connectors	PCI slot	PCI1 PCI2 PCI3
PCIe x4 connectors	PCIe x4 slot	PCIEX4_1 PCIEX4_2 PCIEX4_3
PCIe x16 connector	PCIe x16 slot	PCIEX16_1
SATA connector	7-pin SATA	SATA1 SATA2 SATA3 SATA4 SATA5 SATA6
SPDIF connector	5-pin header	SPDIF1

Connector	Type	Label
Serial port connector	9-pin box header	COM2 COM3 COM4 COM5 COM6
SPI flash connector	8-pin header	JSPI1
Trusted Platform Module (TPM)	20-pin header	TPM1
USB connector	10-pin header	USB45
USB connector	10-pin header	USB67
USB connector	10-pin header	USB89
USB connector	10-pin header	USB1011

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the IMBA-XQ354. Detailed descriptions of these connectors can be found in **Section 864.1**.

Connector	Type	Label
Audio Jack Connectors (six)	Audio jacks	AUDIO1
Keyboard and mouse connectors	Dual PS/2	KB_MS1
LAN Connector	RJ-45	LAN1_USB01 LAN2_USB23
Parallel port connector	DB-26 connector	3IN1_DSUB1
RS-232 serial port connector	D-sub 9-pin male	3IN1_DSUB1
USB 2.0 ports	Dual USB ports	LAN1_USB01 LAN2_USB23
VGA port connector	15-pin female VGA	3IN1_DSUB1

Table 4-2: Rear 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-XQ354.

4.2.1 ATX CPU Power Connector

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 connector is connected to an ATX power supply.

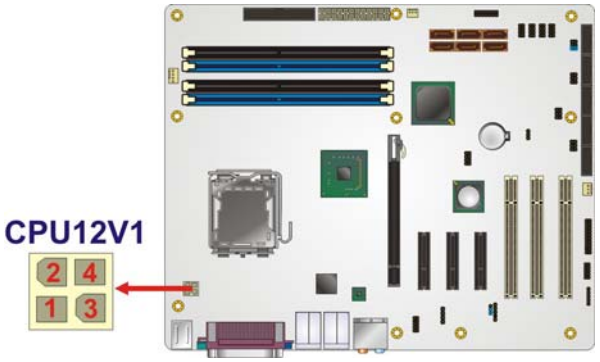


Figure 4-2: AT Power Connector Location

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

Table 4-3: ATX Power Connector Pinouts

4.2.2 ATX Power Connector

CN Label:	**ATX1**
CN Type:	24-pin ATX (2x24)
CN Location:	See **Figure 4-3**
CN Pinouts:	See **Table 4-4**

The ATX connector is connected to an external ATX power supply. Power is provided to the system, from the power supply through this connector.

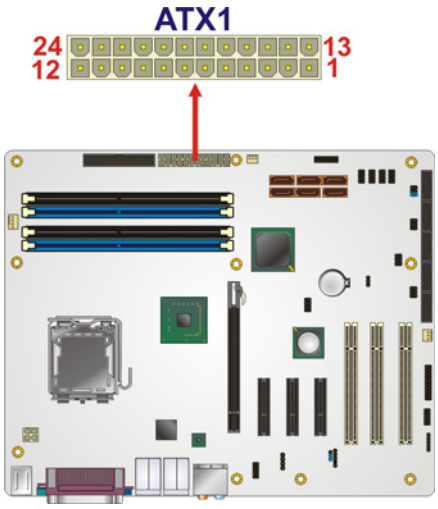


Figure 4-3: ATX Power Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	+3.3 V	13	+3.3 V
2	+3.3 V	14	-12 V
3	GND	15	GND
4	+5 V	16	PS-ON
5	GND	17	GND
6	+5 V	18	GND
7	GND	19	GND
8	NC	20	NC
9	+VCC5SB	21	+5 V

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
10	+12 V	22	+5 V
11	+12 V	23	+5 V
12	NC	24	GND

Table 4-4: ATX Power Connector Pinouts

4.2.3 Audio Connector

CN Label: **FPAUDIO1**

CN Type: 10-pin header

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

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

The 10-pin audio connector is connected to external audio devices including speakers and microphones for the input and output of audio signals to and from the system.

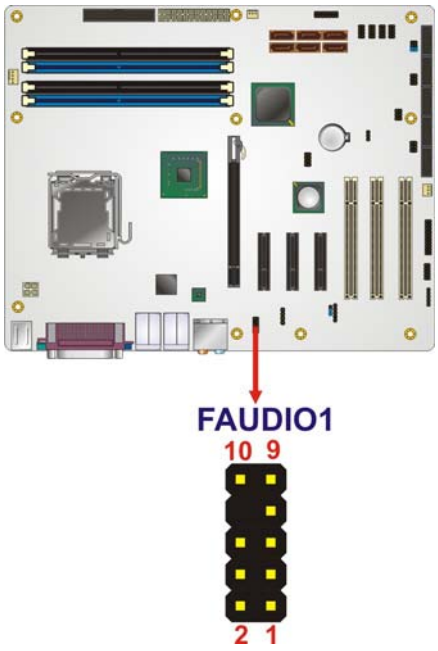


Figure 4-4: Audio Connector Pinouts

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Microphone left	2	GND
3	Microphone right	4	PRESENCE
5	Line right	6	GND
7	SENSE_SEND	8	N/C
9	Line left	10	GND

Table 4-5: Audio Connector Pinouts

4.2.4 CD In Connector

CN Label: **CD_IN1**

CN Type: 4-pin header

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

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

The 4-pin audio CD in connector is connected to an external audio CD device for the input and output of audio signals from a CD player to the system.

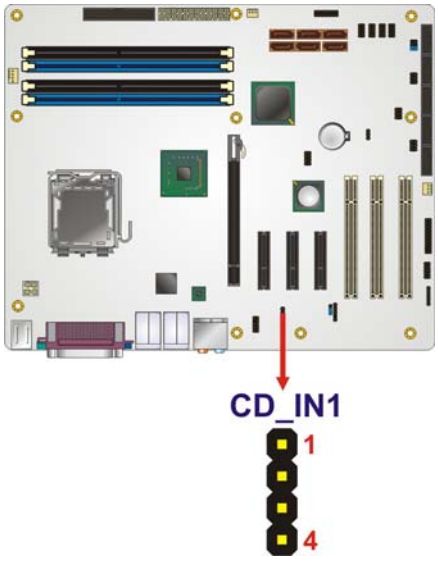


Figure 4-5: Audio CD In Connector Location

PIN NO.	DESCRIPTION
1	Left signal
2	Ground
3	Ground
4	Right signal

Table 4-6: Audio CD In Connector Pinouts

4.2.5 Digital I/O Connector

CN Label: **DIO1**

CN Type: 10-pin header (2x5)

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

CN Pinouts: See **Table 4-7**

The digital input/output connector is managed through a Super I/O chip. The Digital I/O connector pins are user programmable.

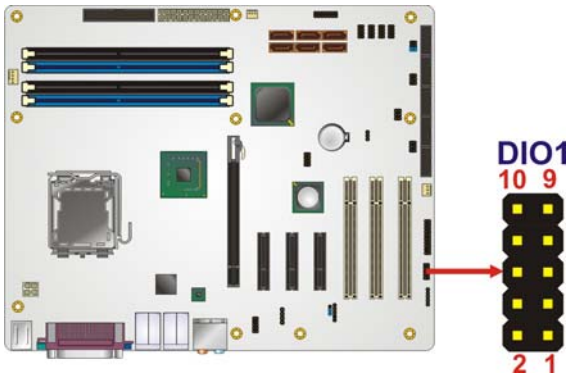


Figure 4-6: Digital I/O Connector Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
9	Input 1	10	Input 0

Table 4-7: Digital I/O Connector Pinouts

4.2.6 CPU Fan Connector

CN Label: **CPU_FAN1**

CN Type: 4-pin header

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

CN Pinouts: See **Table 4-8**

The cooling fan connector provides a 12 V, 500mA current to a CPU cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

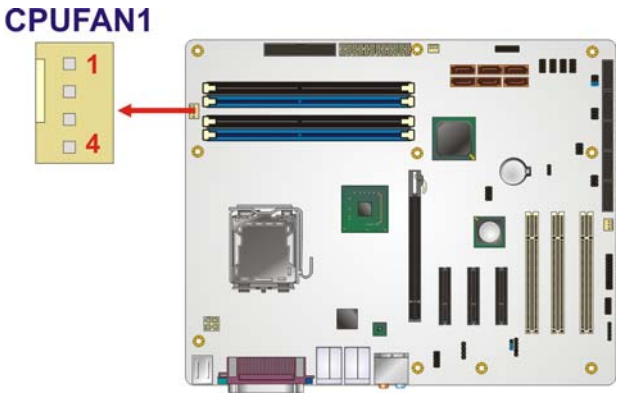


Figure 4-7: CPU Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12 VCC
3	Rotation Signal

PIN NO.	DESCRIPTION
4	Control

Table 4-8: CPU Fan Connector Pinouts

4.2.7 System Fan Connectors

CN Label: **SYS_FAN1, SYS_FAN2**

CN Type: 3-pin header

CN Location: See **Figure 4-8**

CN Pinouts: See **Table 4-9**

The cooling fan connector provides a 12 V, 500mA current to a system cooling fan. The connector has a "rotation" pin to get rotation signals from fans and notify the system so the system BIOS can recognize the fan speed. Please note that only specified fans can issue the rotation signals.

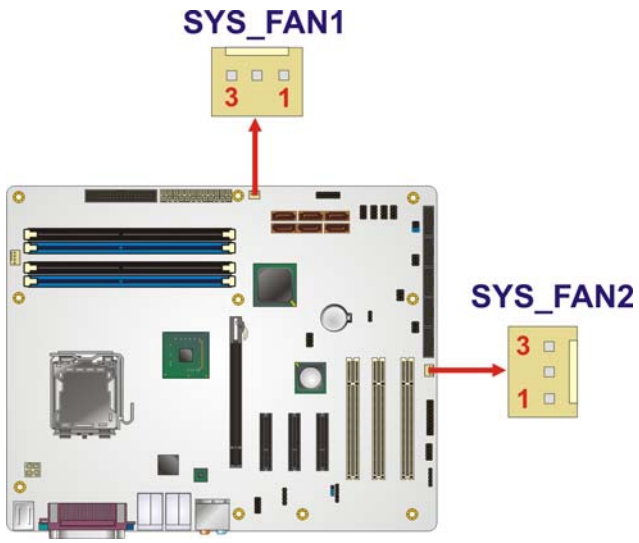


Figure 4-8: System Fan Connector Location

PIN NO.	DESCRIPTION
1	GND
2	+12 V

PIN NO.	DESCRIPTION
3	Fan Speed Detect

Table 4-9: System Fan Connector Pinouts

4.2.8 Floppy Disk Connector

CN Label: **FDD1**

CN Type: 34-pin header (2x17)

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

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

The floppy disk connector is connected to a floppy disk drive. The IMBA-XQ354 supports the following floppy disk drives:

- 360 KB
- 720 KB
- 1.2 MB
- 1.44 MB
- 2.88 MB

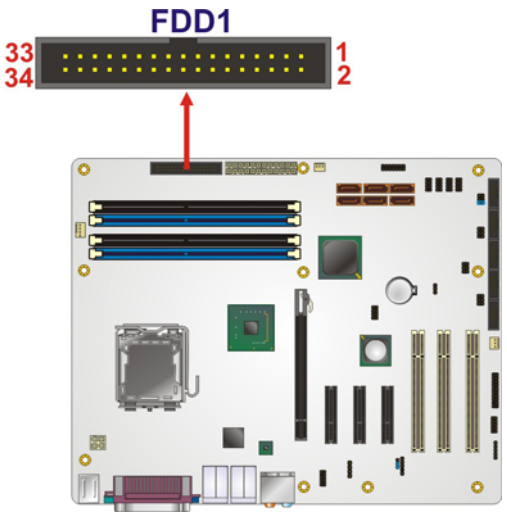


Figure 4-9: 34-pin FDD Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	2	REDUCE WRITE
3	GND	4	N/C
5	N/C	6	N/C
7	GND	8	INDEX#
9	GND	10	MOTOR ENABLE A#
11	GND	12	DRIVE SELECT B#
13	GND	14	DRIVE SELECT A#
15	GND	16	MOTOR ENABLE B#
17	GND	18	DIRECTION#
19	GND	20	STEP#
21	GND	22	WRITE DATA#
23	GND	24	WRITE GATE#
25	GND	26	TRACK 0#
27	GND	28	WRITE PROTECT#
29	GND	30	READ DATA#
31	GND	32	SIDE 1 SELECT#
33	GND	34	DISK CHANGE#

Table 4-10: 34-pin FDD Connector Pinouts

4.2.9 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header (2x10)

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

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

The front panel connector connects to external switches and indicators to monitor and control the motherboard. These indicators and switches include:

- Power button
- Reset button
- Power LED

- HDD LED
- Speaker

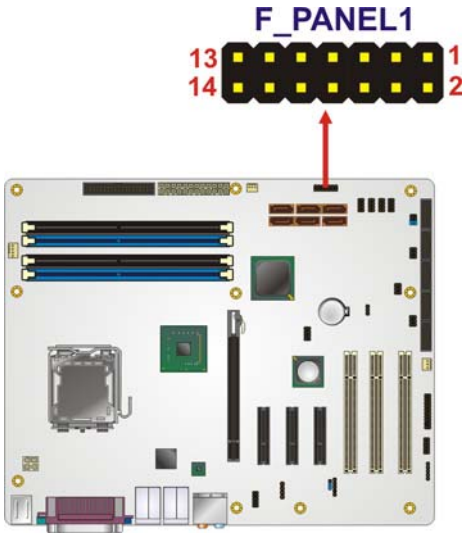


Figure 4-10: Front Panel Connector Pinout Locations

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	LED +5 V	Speaker	2	+5 V
	3	N/C		4	N/C
	5	Ground		6	N/C
Power Button	7	Power Button+		8	Speaker
	9	Power Button-	Reset	10	N/C
HDD LED	11	+5 V		12	RESET-
	13	HDLED-		14	GND

Table 4-11: Front Panel Connector Pinouts

4.2.10 Infrared Interface Connector (5-pin)

CN Label: **IR1**

CN Type: 5-pin header (1x5)

CN Location: See **Figure 4-11**

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

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

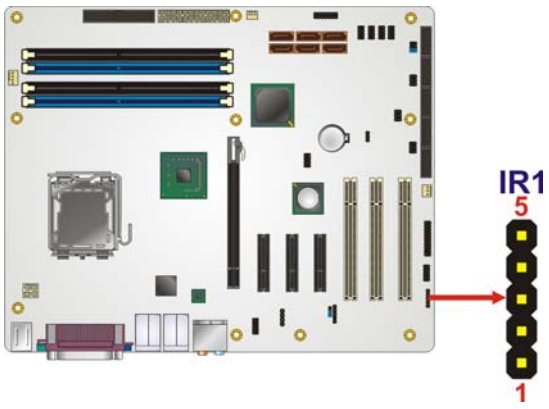


Figure 4-11: Infrared Connector Pinout Locations

PIN NO.	DESCRIPTION
1	VCC
2	NC
3	IR-RX
4	GND
5	IR-TX

Table 4-12: Infrared Connector Pinouts

4.2.11 PCI Express x4 Slot

CN Label: **PCIE4X_1, PCIE4X_2 and PCIE4X_3**

CN Type: PCIe x4 slots

CN Location: See **Figure 4-12**

CN Pinouts: See **Table 4-13**

PCIe x4 expansion devices can be inserted into the PCIe x4 slots.

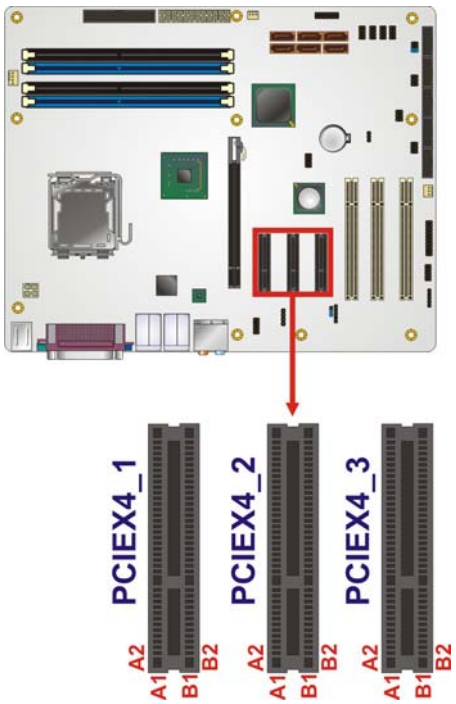


Figure 4-12: PCIe x4 Connector Locations

SIDE A				SIDE B			
PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1	N/C	A2	+12 V	B1	+12 V	B2	+12 V
A3	+12 V	A4	GND	B3	+12 V	B4	GND
A5	N/C	A6	N/C	B5	SMCLK	B6	SMDAT
A7	N/C	A8	N/C	B7	GND	B8	+3.3 V
A9	+3.3 V	A10	+3.3 V	B9	N/C	B10	3.3 V
A11	RESET	A12	GND	B11	WAKE#	B12	N/C
A13	REFCLK+	A14	REFCLK-	B13	GND	B14	HSOp(0)
A15	GND	A16	HSIp(0)	B15	HSOn(0)	B16	GND
A17	HSIn(0)	A18	GND	B17	N/C	B18	GND
A19	N/C	A20	GND	B19	HSOp(1)	B20	HSOn(1)
A21	HSIp(1)	A22	HSIn(1)	B21	GND	B22	GND
A23	GND	A24	GND	B23	HSOp(2)	B24	HSOn(2)
A25	HSIp(2)	A26	HSIn(2	B25	GND	B26	GND
A27	GND	A28	GND	B27	HSOp(3)	B28	HSOn(3)

SIDE A				SIDE B			
A29	HSIp(3)	A30	HSIn(3)	B29	GND	B30	N/C
A31	GND	A32	N/C	B31	N/C	B32	GND

Table 4-13: PCIe x4 Pinouts

4.2.12 PCI Express x16 Slot

CN Label: **PCIEX16_1**

CN Type: PCIe x16 slot

CN Location: See **Figure 4-13**

CN Pinouts: See **Table 4-14** (Side A) **Table 4-15** (Side B)

PCIe x16 expansion devices can be inserted into the PCIe x16 slot.

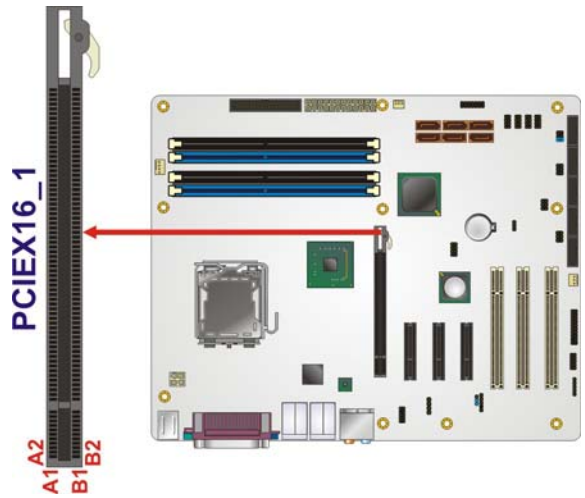


Figure 4-13: PCIe x16 Connector Location

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A1	Name	A22	HSIn(1)	A43	HSIp(6)	A64	HSIp(11)
A2	PRSNT#1	A23	GND	A44	HSIn(6)	A65	HSIn(11)
A3	+12v	A24	GND	A45	GND	A66	GND
A4	+12v	A25	HSIp(2)	A46	GND	A67	GND
A5	GND	A26	HSIn(2)	A47	HSIp(7)	A68	HSIp(12)

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
A6	JTAG2	A27	GND	A48	HSIn(7)	A69	HSIn(12)
A7	JTAG3	A28	GND	A49	GND	A70	GND
A8	JTAG4	A29	HSIp(3)	A50	RSVD	A71	GND
A9	JTAG5	A30	HSIn(3)	A51	GND	A72	HSIp(13)
A10	+3.3v	A31	GND	A52	HSIp(8)	A73	HSIn(13)
A11	+3.3v	A32	RSVD	A53	HSIn(8)	A74	GND
A12	PWRGD	A33	RSVD	A54	GND	A75	GND
A13	GND	A34	GND	A55	GND	A76	HSIp(14)
A14	REFCLK+	A35	HSIp(4)	A56	HSIp(9)	A77	HSIn(14)
A15	REFCLK-	A36	HSIn(4)	A57	HSIn(9)	A78	GND
A16	GND	A37	GND	A58	GND	A79	GND
A17	HSIp(0)	A38	GND	A59	GND	A80	HSIp(15)
A18	HSIn(0)	A39	HSIp(5)	A60	HSIp(10)	A81	HSIn(15)
A19	GND	A40	HSIn(5)	A61	HSIn(10)	A82	GND
A20	RSVD	A41	GND	A62	GND		
A21	GND	A42	GND	A63	GND		

Table 4-14: PCIe x16 Side A Pinouts

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
B1	+12v	B22	GND	B43	GND	B64	GND
B2	+12v	B23	HSOp(2)	B44	GND	B65	GND
B3	RSVD	B24	HSOn(2)	B45	HSOp(7)	B66	HSOp(12)
B4	GND	B25	GND	B46	HSOn(7)	B67	HSOn(12)
B5	SMCLK	B26	GND	B47	GND	B68	GND
B6	SMDAT	B27	HSOp(3)	B48	PRSNT#2	B69	GND
B7	GND	B28	HSOn(3)	B49	GND	B70	HSOp(13)
B8	+3.3v	B29	GND	B50	HSOp(8)	B71	HSOn(13)
B9	JTAG1	B30	RSVD	B51	HSOn(8)	B72	GND
B10	3.3 Vaux	B31	PRSNT#2	B52	GND	B73	GND
B11	WAKE#	B32	GND	B53	GND	B74	HSOp(14)
B12	RSVD	B33	HSOp(4)	B54	HSOp(9)	B75	HSOn(14)

PIN	NAME	PIN	NAME	PIN	NAME	PIN	NAME
B13	GND	B34	HSOn(4)	B55	HSOn(9)	B76	GND
B14	HSOp(0)	B35	GND	B56	GND	B77	GND
B15	HSOn(0)	B36	GND	B57	GND	B78	HSOp(15)
B16	GND	B37	HSOp(5)	B58	HSOp(10)	B79	HSOn(15)
B17	PRSNT#2	B38	HSOn(5)	B59	HSOn(10)	B80	GND
B18	GND	B39	GND	B60	GND	B81	PRSNT#2
B19	HSOp(1)	B40	GND	B61	GND	B82	RSVD#2
B20	HSOn(1)	B41	HSOp(6)	B62	HSOp(11)		
B21	GND	B42	HSOn(6)	B63	HSOn(11)		

Table 4-15: PCIe x16 Side B Pinouts

4.2.13 PCI Slot

CN Label: **PCI1, PCI2 and PCI3**

CN Type: PCI Slot

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

CN Pinouts: See **Table 4-16**

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

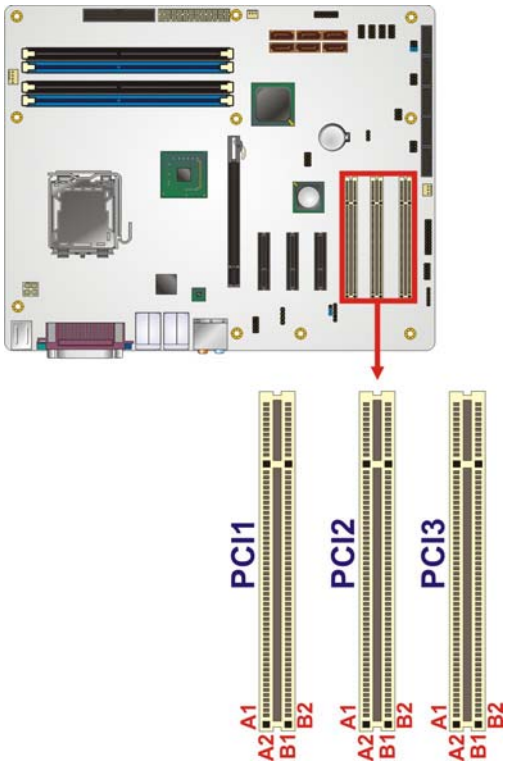


Figure 4-14: PCI Slot Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A1	TRST	B1	-12 V
A2	+12 V	B2	TCK
A3	TMS	B3	GND
A4	TDI	B4	TDO
A5	+5 V	B5	+5 V
A6	INTA	B6	+5 V
A7	INTC	B7	INTB
A8	+5 V	B8	INTD
A9	RESERVED3	B9	PRSNT1
A10	+5 V	B10	RESERVED1
A11	RESERVED4	B11	PRSNT2
A12	GND	B12	GND
A13	GND	B13	GND
A14	3.3 V_AUX	B14	RESERVED2

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A15	RST	B15	GND
A16	+5 V	B16	CLK
A17	GNT	B17	GND
A18	GND	B18	REQ
A19	PME	B19	+5 V
A20	AD30	B20	AD31
A21	+3.3 V	B21	AD29
A22	AD28	B22	GND
A23	AD26	B23	AD27
A24	GND	B24	AD25
A25	AD24	B25	+3.3 V
A26	IDSEL	B26	C/BE3
A27	+3.3 V	B27	AD23
A28	AD22	B28	GND
A29	AD20	B29	AD21
A30	GND	B30	AD19
A31	AD18	B31	+3.3 V
A32	AD16	B32	AD17
A33	+3.3 V	B33	C/BE2
A34	FRAME	B34	GND
A35	GND	B35	IRDY
A36	TRDY	B36	+3.3 V
A37	GND	B37	DEVSEL
A38	STOP	B38	GND
A39	+3.3 V	B39	LOCK
A40	SDONE	B40	PERR
A41	SBO	B41	+3.3 V
A42	GND	B42	SERR
A43	PAR	B43	+3.3 V
A44	AD15	B44	C/BE1
A45	+3.3 V	B45	AD14

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
A46	AD13	B46	GND
A47	AD11	B47	AD12
A48	GND	B48	AD10
A49	AD9	B49	GND
A52	C/BE0	B52	AD8
A53	+3.3 V	B53	AD7
A54	AD6	B54	+3.3 V
A55	AD4	B55	AD5
A56	GND	B56	AD3
A57	AD2	B57	GND
A68	AD0	B68	AD1
A59	+5 V	B59	+5 V
A60	REQ64	B60	ACK64
A61	+5 V	B61	+5 V
A62	+5 V	B62	+5 V

Table 4-16: PCI Slot

4.2.14 SATA Drive Connectors

CN Label: **SATA1, SATA2, SATA3, SATA4, SATA5 and SATA6**

CN Type: SATA drive connectors

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

CN Pinouts: See **Table 4-17**

The six SATA drive connectors are each connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 300 MB/s. The SATA drives can be configured in a RAID configuration.

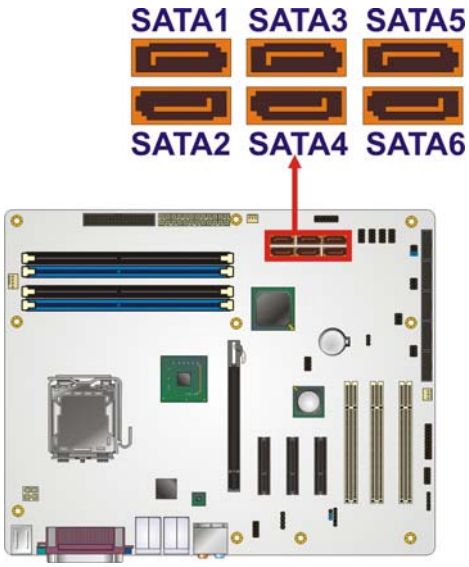


Figure 4-15: SATA Drive Connector Locations

PIN NO.	DESCRIPTION
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

Table 4-17: SATA Drive Connector Pinouts

4.2.15 SPDIF Connector

CN Label: **SPDIF1**

CN Type: 5-pin header

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

CN Pinouts: See **Table 4-18**

Use the SPDIF connector to connect digital audio devices to the system.

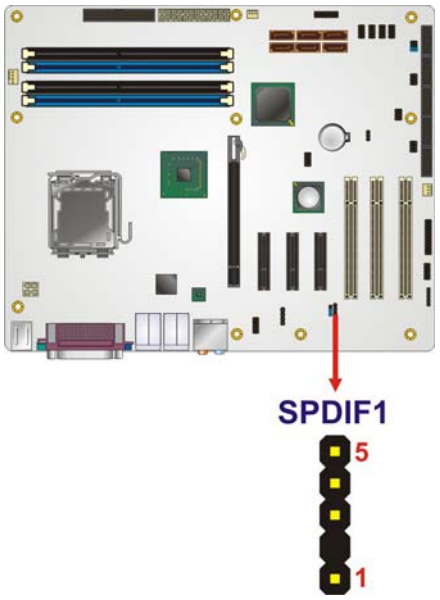


Figure 4-16: SPDIF Connector Pinout Locations

PIN	DESCRIPTION
1	5 V audio
2	NC
3	SPDIF out
4	GND audio
5	SPDIF in

Table 4-18: SPDIF Connector Pinouts

4.2.16 Serial Port Connectors

CN Label: **COM2, COM3, COM4, COM5, COM6**

CN Type: 9-pin box headers (2x5)

CN Location: See **Figure 4-17**

CN Pinouts: See **Table 4-19**

The 10-pin serial port connectors provide a RS-232 serial communications channels. The serial port connectors can be connected to external RS-232 serial port devices.

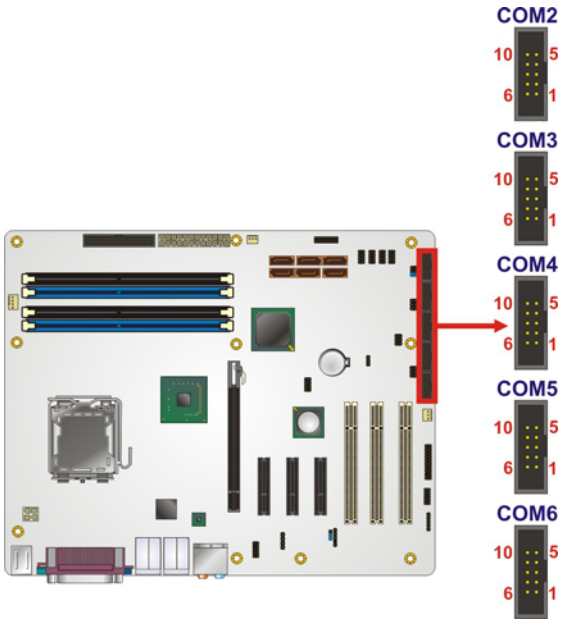


Figure 4-17: Serial Port Connectors Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Data Carrier Detect (DCD)	2	Receive Data (RXD)
3	Transmit Data (TXD)	4	Data Terminal Ready (DTR)
5	Ground (GND)	6	Data Set to Ready (DSR)
7	Request to Send (RTS)	8	Clear to Sent (CTS)
9	Ring Indicator (RI)	10	N/C

Table 4-19: Serial Port Connector Pinouts

4.2.17 SPI Flash Connector

CN Label: **JSPI1**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-18**

CN Pinouts: See **Table 4-20**

The SPI connector is for flashing the SPI BIOS.

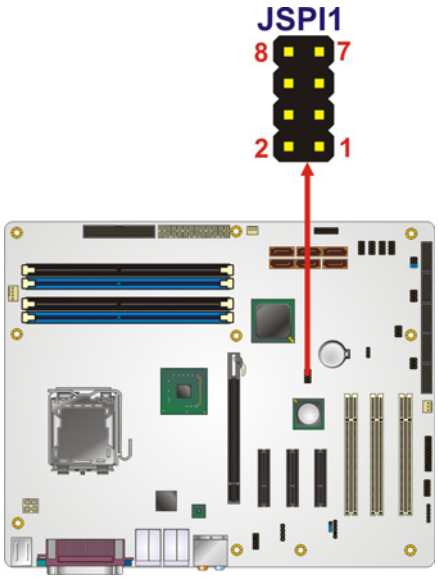


Figure 4-18: SPI Flash Connector Pinouts

PIN	DESCRIPTION	PIN	DESCRIPTION
1	VCC	2	GND
3	CS#	4	CLOCK
5	SO	6	SI
7	NC	8	NC

Table 4-20: SPI Flash Connector

4.2.18 Trusted Platform Module (TPM) Connector

CN Label: **TPM1**

CN Type: 40-pin header (2x20)

CN Location: See **Figure 4-19**

CN Pinouts: See **Table 4-21**

The Trusted Platform Module (TPM) connector secures the system on boot.

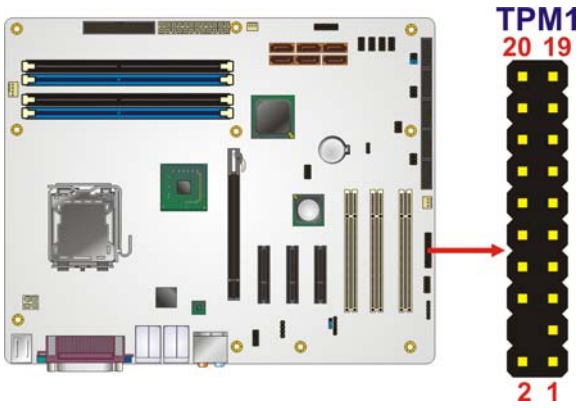


Figure 4-19: TPM Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	LCLK	2	GND2
3	LFRAME#	4	KEY
5	LRESET#	6	+5 V
7	LAD3	8	LAD2
9	+3 V	10	LAD1
11	LAD0	12	GND3
13	SCL	14	SDA
15	SB3 V	16	SERIRQ
17	GND1	18	GLKRUN#
19	LPCPD#	20	LDRQ#

Table 4-21: TPM Connector Pinouts

4.2.19 USB Connectors

CN Label: **USB45, USB67, USB89 and USB1011**

CN Type: 8-pin header (2x4)

CN Location: See **Figure 4-20**

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

The 2x5 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

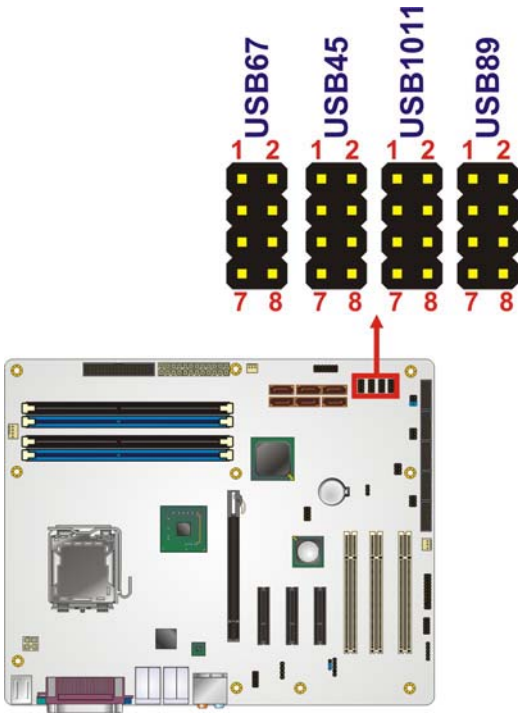


Figure 4-20: USB Connector Pinout Locations

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	2	GND
3	DATA-	4	DATA+
5	DATA+	6	DATA-
7	GND	8	VCC

Table 4-22: USB Port Connector Pinouts

4.3 External Interface Connectors

Figure 4-21 shows the IMBA-XQ354 motherboard external interface connectors. The IMBA-XQ354 on-board external interface connectors are shown in **Figure 4-21**:

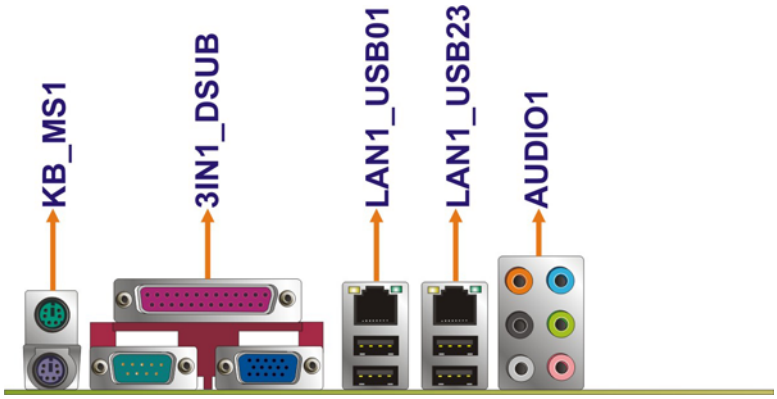


Figure 4-21: IMBA-XQ354 External Interface Connectors

4.3.1 Audio Connector

CN Label:	**AUDIO1**
CN Type:	6 x audio jacks
CN Location:	See **Figure 4-21**

The six audio jacks on the external audio connector enable the IMBA-XQ354 to be connected to external audio devices as specified below.

- **CEN/LFE Out (Orange)**: Connects to the center speaker and sub-woofer.
- **Surround Out (Black)**: Connects to a speaker on the left and right.
- **Side Out (Gray)**: Connects to side speakers.
- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

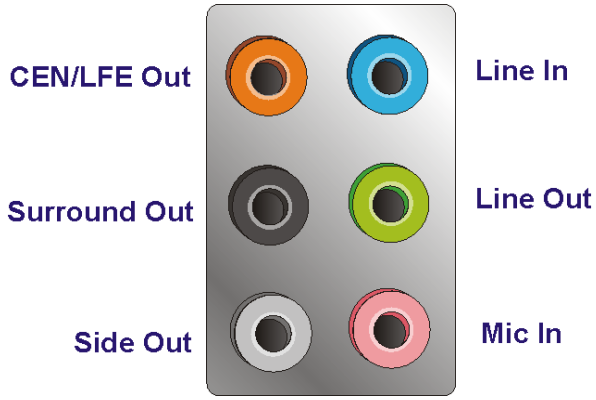


Figure 4-22: Audio Connector

4.3.2 Ethernet Connector

CN Label: **LAN1_USB01, LAN2_USB23**

CN Type: RJ-45

CN Location: See **Figure 4-21**

CN Pinouts: See **Table 4-23**

A 10/100/1000 Mb/s connection can be made to a Local Area Network.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	TX+	5	N/C
2	N/C	6	RX-
3	TX-	7	N/C
4	RX+	8	N/C

Table 4-23: Ethernet Connector Pinouts

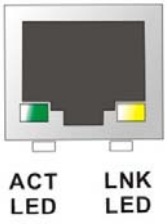


Figure 4-23: Ethernet Connector

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.

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

Table 4-24: Connector LEDs

4.3.3 Keyboard and Mouse Connector

CN Label: **KB_MS1**

CN Type: PS/2

CN Location: See **Figure 4-21**

CN Pinouts: See **Table 4-25** and **Figure 4-24**

The IMBA-XQ354 has two PS/2 connectors on the mounting bracket for easy connection to a PS/2 keyboard and PS/2 mouse.

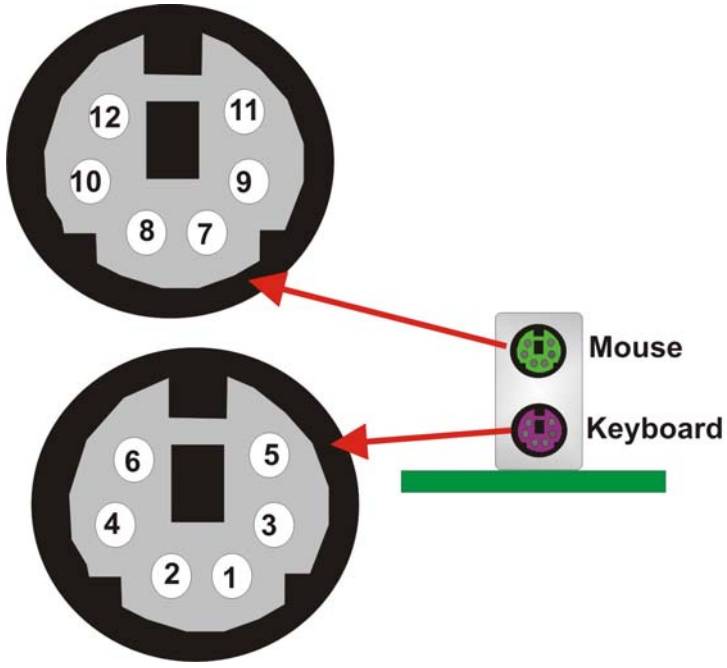


Figure 4-24: PS/2 Connector

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	KEYBOARD DATA	7	MOUSE DATA
2	NC	8	NC
3	GND	9	GND
4	+5 V	10	+5 V
5	KEYBOARD CLOCK	11	MOUSE DATA
6	NC	12	NC

Table 4-25: PS/2 Connectors

4.3.4 Parallel Port Connector

CN Label: **LPT**

CN Type: 26-pin box header

CN Location: See **Figure 4-21**

CN Pinouts: See **Table 4-26**

The 26-pin parallel port connector connects to a parallel port connector interface or some other parallel port device such as a printer.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	14	AUTO FORM FEED #
2	DATA 0	15	ERROR#
3	DATA 1	16	INITIALIZE
4	DATA 2	17	PRINTER SELECT LN#
5	DATA 3	18	GROUND
6	DATA 4	19	GROUND
7	DATA 5	20	GROUND
8	DATA 6	21	GROUND
9	DATA 7	22	GROUND
10	ACKNOWLEDGE	23	GROUND
11	BUSY	24	GROUND
12	PAPER EMPTY	25	GROUND

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
13	PRINTER SELECT		

Table 4-26: Parallel Port Connector Pinouts

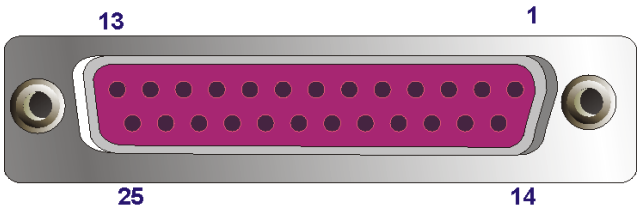


Figure 4-25: Parallel Port Connector Location

4.3.5 Serial Port Connector

CN Label: **COM1**

CN Type: DB-9 connector

CN Location: See **Figure 4-21**

CN Pinouts: See **Table 4-27** and **Figure 4-26**

The RS-232 serial connector provides serial connection in the RS-232 mode.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	DCD#	6	DSR#
2	RxD	7	RTS#
3	TxD	8	CTS#
4	DTR#	9	RI#
5	GND		

Table 4-27: Serial Port Pinouts

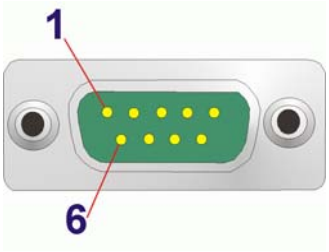


Figure 4-26: Serial Port Pinout Locations

4.3.6 USB Ports

CN Label: **LAN1_USB01 and LAN2_USB23**

CN Type: USB Combo ports

CN Location: See **Figure 4-21**

CN Pinouts: See **Table 4-28**

The USB combo port and LAN/USB combo port provides connectivity to five additional USB devices. USB devices connect directly to the USB connectors on the rear panel.

PIN	DESCRIPTION	PIN	DESCRIPTION
1	+5 V	5	+5 V
2	D3-	6	D4-
3	D3+	7	D4+
4	GND	8	GND

Table 4-28: USB Connector Pinouts

4.3.7 VGA Connector

CN Label: **VGA**

CN Type: D-sub 15-pin female connector

CN Location: See **Figure 4-21**

CN Pinouts: See **Figure 4-27** and **Table 4-29**

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

PIN	DESCRIPTION	PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	6	GROUND	11	NC
2	GREEN	7	GROUND	12	SDA
3	BLUE	8	GROUND	13	HSYNC
4	NC	9	NC	14	VSYNC
5	GROUND	10	GROUND	15	SCL

Table 4-29: VGA Connector Pinouts

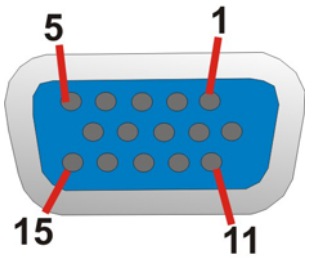


Figure 4-27: VGA Connector

Chapter

5

Installation

5.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IMBA-XQ354 may result in permanent damage to IMBA-XQ354 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-XQ354. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-XQ354, 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-XQ354, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-XQ354.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

5.2 Installation Considerations

NOTE:

The following installation notices and installation considerations should be read and understood before the IMBA-XQ354 is installed. All installation notices pertaining to the installation of IMBA-XQ354 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the IMBA-XQ354 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-XQ354, IMBA-XQ354 components 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-XQ354 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-XQ354 on an antistatic pad**:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- **Turn all power to the IMBA-XQ354 off**:
  - When working with the IMBA-XQ354, 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-XQ354 **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-XQ354 is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The jumpers have been properly configured
- The IMBA-XQ354 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - RS-232 cables
  - USB cables
  - FDD cables
  - Power cables
- The following external peripheral devices are properly connected to the chassis:
  - VGA screen
  - Keyboard
  - Mouse
  - RS-232 serial communications device

5.3 CPU, CPU Cooling Kit and DIMM 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, IMBA-XQ354 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-XQ354. If one of these component is not installed the IMBA-XQ354 cannot run.

5.3.1 Socket LGA775 CPU Installation

NOTE:

To enable Hyper-Threading Technology, the CPU, chipset and operating system must all support Hyper-Threading Technology.

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 socket is shown in **Figure 5-1**.

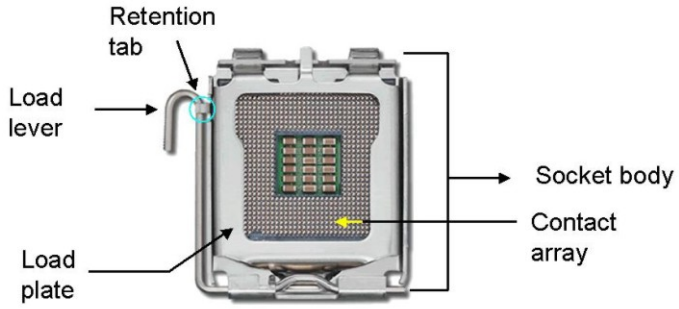


Figure 5-1: Intel LGA775 Socket

To install a socket LGA775 CPU onto the IMBA-XQ354, 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**.

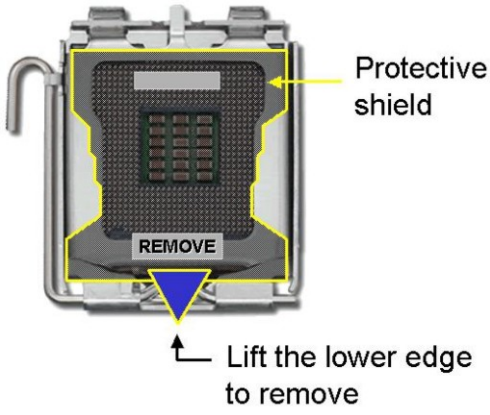


Figure 5-2: Remove the CPU Socket Protective Shield

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**.

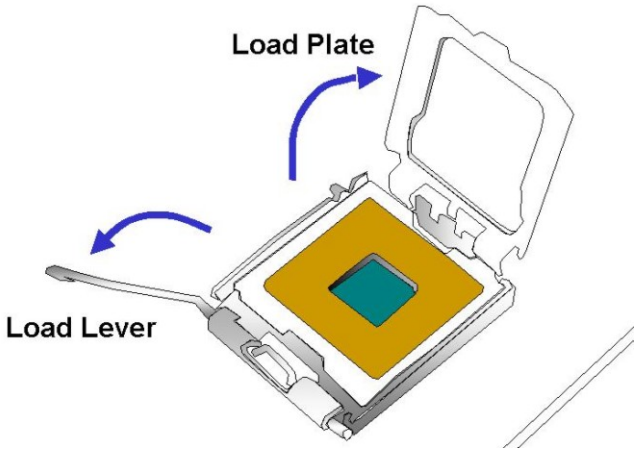


Figure 5-3: Open the CPU Socket Load Plate

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**.

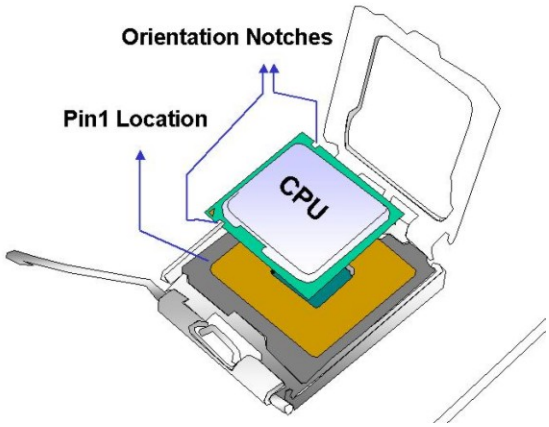


Figure 5-4: Insert the Socket LGA775 CPU

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 12** After the cooling kit is installed connect the CPU cable to the CPU 12 V power connector.

5.3.2 Socket LGA775 CF-520 Cooling Kit Installation

WARNING:

It is strongly recommended that you DO NOT use the original heat sink and cooler provided by Intel on the IMBA-XQ354.

The cooling kit includes 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: Cooling Kit

A Socket LGA775 CPU cooling kit shown in **Figure 5-5** can be purchased separately. The cooling kit comprises 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.

To install the cooling kit follow the instructions below.

Step 1: **Place the cooling kit onto the socket 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**)

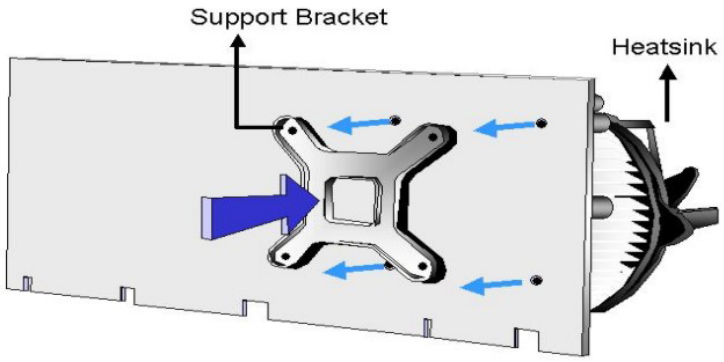


Figure 5-6: Securing the Heat sink to the PCB Board

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-XQ354. Carefully route the cable and avoid heat generating chips and fan blades.

5.3.3 DIMM Installation

WARNING:

Using incorrectly specified memory modules may cause permanent damage the IMBA-XQ354. Please make sure the memory modules comply with the recommended memory specifications.

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

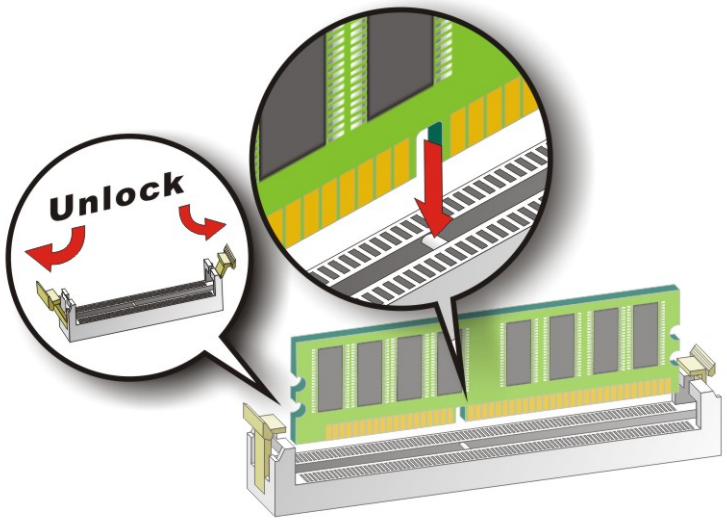


Figure 5-7: Installing a DIMM

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**.

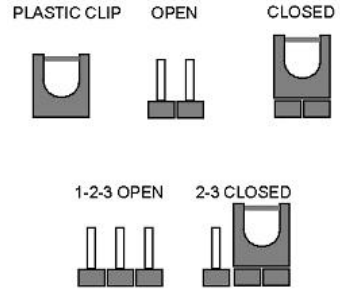
Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-7**.

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

5.4 Jumper Settings

NOTE:

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



Jumper

Before the IMBA-XQ354 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the IMBA-XQ354 are listed in **Table 5-1**.

Description	Label	Type
Clear CMOS	J_CMOS1	3-pin header
COM3 Pin 9 setting	J_COM_F3	3-pin header
COM4 Pin 9 setting	J_COM_F4	3-pin header
COM5 Pin 9 setting	J_COM_F5	3-pin header
COM6 Pin 9 setting	J_COM_F6	3-pin header
COM3 Pin 9 voltage setting	J_COM_V3	3-pin header
COM4 Pin 9 voltage setting	J_COM_V4	3-pin header
COM5 Pin 9 voltage setting	J_COM_V5	3-pin header
COM6 Pin 9 voltage setting	J_COM_V6	3-pin header
SPDIF out selection	SPDIF_OUT	3-pin header

Table 5-1: Jumpers

5.4.1 Clear CMOS Jumper

Jumper Label:	**J_CMOS1**
Jumper Type:	3-pin header
Jumper Settings:	See **Table 5-2**
Jumper Location:	See **Figure 5-8**

If the IMBA-XQ354 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 5-2**.

AT Power Select	Description	
Short 1 - 2	Keep CMOS Setup	Default
Short 2 - 3	Clear CMOS Setup	

Table 5-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-8** below.

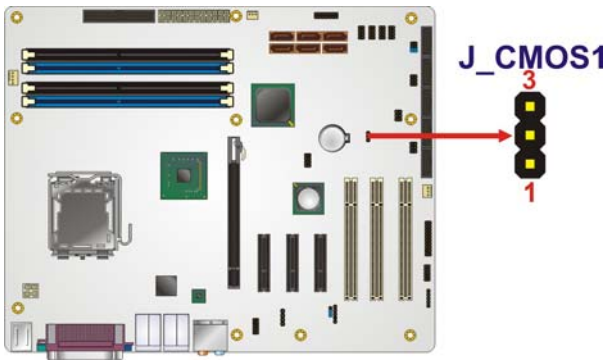


Figure 5-8: Clear CMOS Jumper

5.4.2 COM Port Pin 9 Function Select

Jumper Label:	**J_COM_F3, J_COM_F4, J_COM_F5 and J_COM_F6**
Jumper Type:	5-pin header
Jumper Settings:	See **Table 5-3**
Jumper Location:	See **Figure 5-9**

NOTE:

If the Pin 9 function is selected as voltage output, the voltage must be specified as either +5 V or as +12 V. To do this please refer to the following section.

The COM Port Pin 9 Function Select jumpers configure pin 9 on the COM3, COM4, COM5 and COM6 connectors. Pin 9 on COM3, COM4, COM5 and COM6 can be set as either a ring (RI) signal or as a power source. The COM Port Pin 9 Function Select jumper selections options are shown in **Table 5-3**.

COM Port	Jumper	Pin 9 Voltage Input	Pin 9 RI Function
COM3	J_COM_F3	Short 1-2	Short 2-3
COM4	J_COM_F4	Short 1-2	Short 2-3
COM5	J_COM_F5	Short 1-2	Short 2-3

COM Port	Jumper	Pin 9 Voltage Input	Pin 9 RI Function
COM6	J_COM_F6	Short 1-2	Short 2-3

Table 5-3: COM Port Pin 9 Function Select Jumper Settings

The COM Port Pin 9 Function Select jumper location is shown in **Figure 5-9** below.

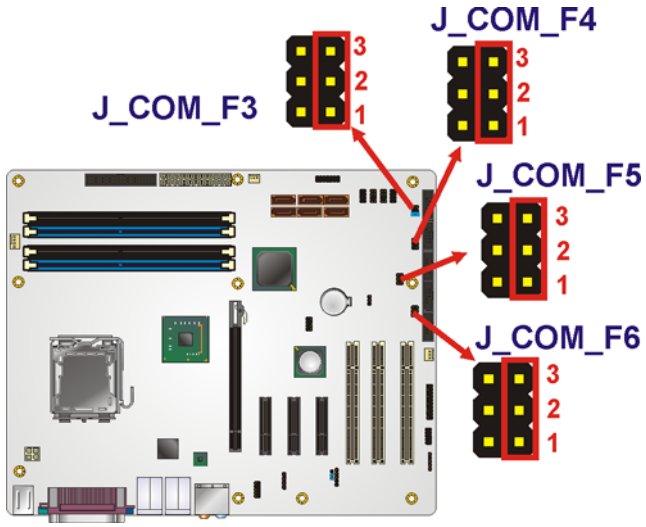


Figure 5-9: COM Port Pin 9 Function Select Jumper Location

5.4.3 COM Port Pin 9 Voltage Setting Select

Jumper Label:	**J_COM_V3, J_COM_V4, J_COM_V5 and J_COM_V6**
Jumper Type:	5-pin header
Jumper Settings:	See **Table 5-4**
Jumper Location:	See **Figure 5-10**

NOTE:

To specify pin 9 on the COM ports as either 5 V or 12 V output, pin 9 on the respective jumper must be set to the voltage function and not the RI function. Please see the previous section.

The COM Port Pin 9 Voltage Setting Select jumpers configure the voltage output provided by pin 9 on the COM3, COM4, COM5 and COM6 connectors. Pin 9 on COM3, COM4, COM5 and COM6 can provide 5 V or 12 V of power to an external device. The COM Port Pin 9 Voltage Setting Select jumper selections options are shown in **Table 5-4**.

COM Port	Jumper	Pin 9 +5 V	Pin 9 +12 V
COM3	J_COM_V3	Short 1-2	Short 2-3
COM4	J_COM_V4	Short 1-2	Short 2-3
COM5	J_COM_V5	Short 1-2	Short 2-3
COM6	J_COM_V6	Short 1-2	Short 2-3

Table 5-4: COM Port Pin 9 Voltage Setting Select Jumper Settings

The COM Port Pin 9 Voltage Setting Select jumper location is shown in **Figure 5-10** below.

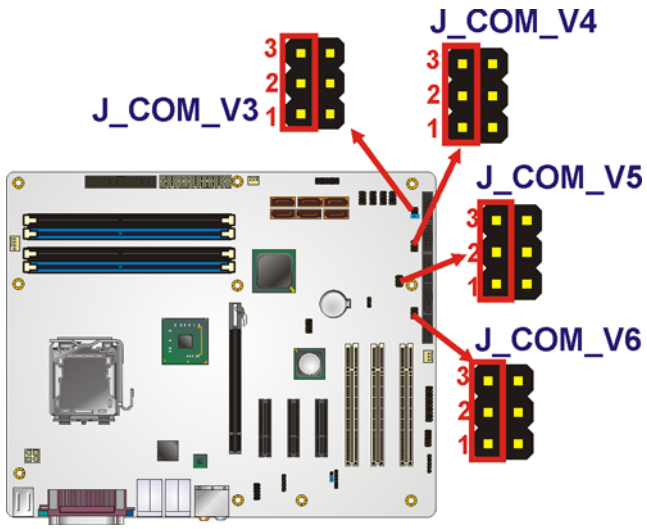


Figure 5-10: COM Port Pin 9 Voltage Setting Select Jumper Location

5.4.4 SPDIF Out Selection

Jumper Label: **JP1**

Jumper Type: 3-pin header

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

Jumper Location: See **Figure 5-11**

The SPDIF Out Selection jumper specifies the type of connection made to the SPDIF connector. The SPDIF1 port can provide digital audio to external speakers or compressed AC3 data to an external Dolby Digital Decoder via a coaxial cable. The SPDIF Out Selection jumper specifies the connection type. Jumper settings are shown in **Table 5-5** and the jumper location is shown in **Figure 5-11**.

SPDIF_OUT	Description	
1-2	RCA connector	Default
2-3	Optical connector	

Table 5-5: SPDIF Out Selection Jumper Settings

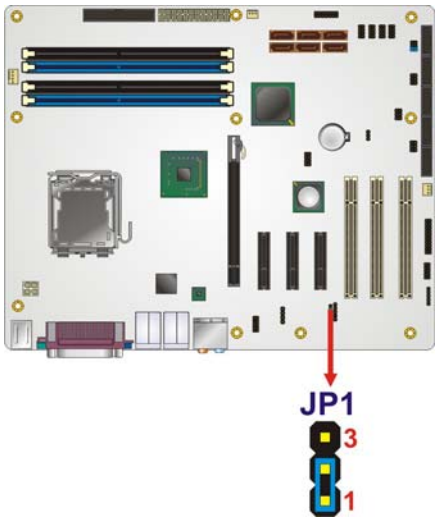


Figure 5-11: SPDIF Out Selection Jumper Pinout Location

5.5 Chassis Installation

5.5.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the IMBA-XQ354 must have air vents to allow cool air to move into the system and hot air to move out.

The IMBA-XQ354 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through 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 through the board surface.

5.5.2 IMBA-XQ354 Installation

To install the IMBA-XQ354 motherboard into the chassis please refer to the reference material that came with the chassis.

5.5.3 Dual RS-232 Cable with Slot Bracket

The dual RS-232 cable slot connector consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9 male connector that is mounted onto a slot. To install the dual RS-232 cable, please follow the steps below.

Step 1: **Locate the connectors**. The locations of the RS-232 connectors are shown in **Chapter 3**.

Step 2: **Insert the cable connectors**. Insert one connector into each serial port box headers. See **Figure 5-12**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

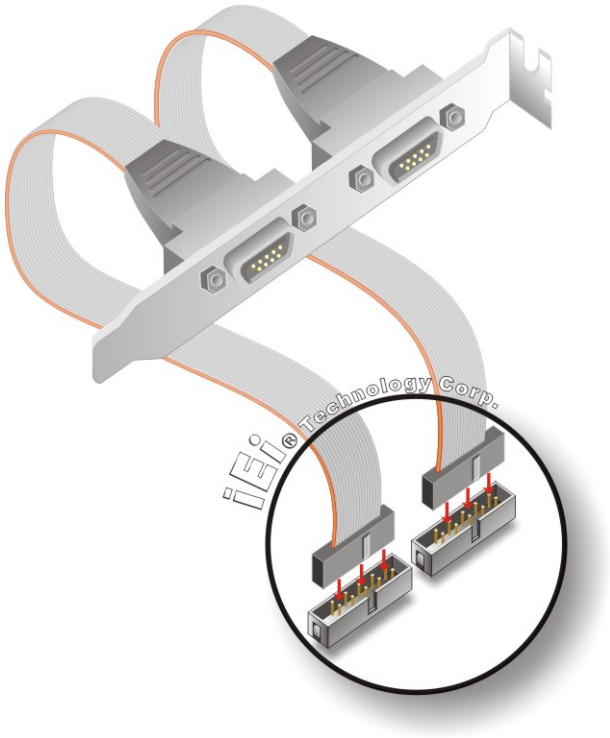


Figure 5-12: Dual RS-232 Cable Installation

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

5.5.4 Single RS-232 Cable with Slot Bracket

The single RS-232 cable consists of one serial port connectors attached to a serial communications cable that is then attached to a D-sub 9 male connector that is mounted onto a bracket. To install the single 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 connector into the serial port box header. See **Figure 5-13**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.

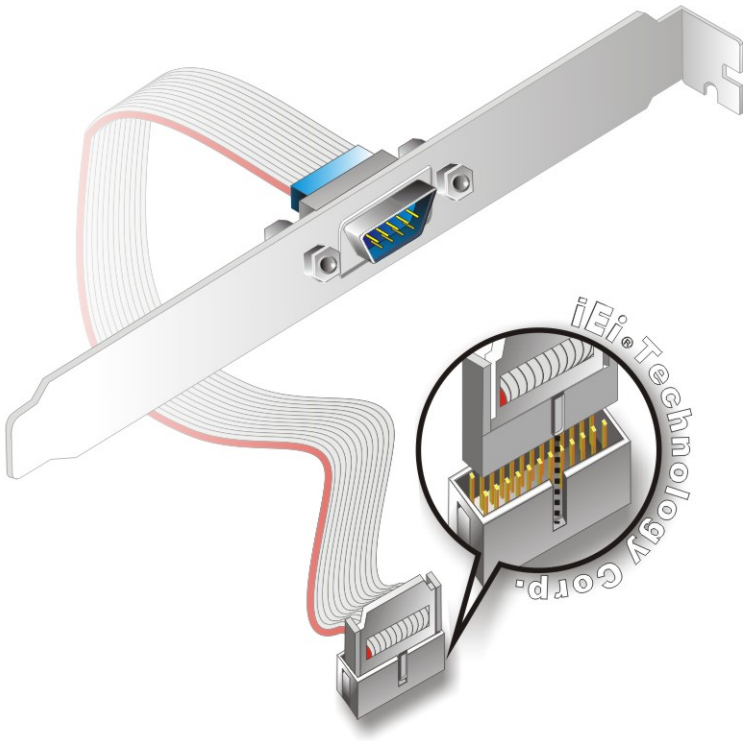


Figure 5-13: Single RS-232 Cable Installation

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

5.5.5 SATA Drive Connection

The IMBA-XQ354 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

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 on-board SATA drive connector. See **Figure 5-14**.

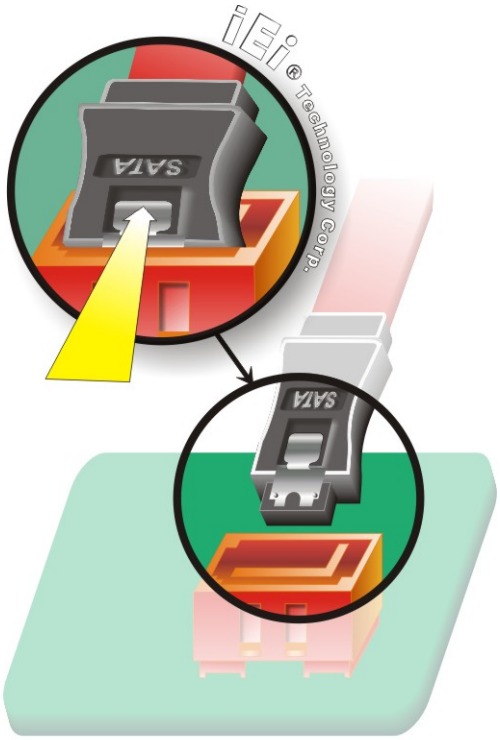


Figure 5-14: SATA Drive Cable Connection

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 5-15**.

NOTE:

The SATA power cable is an optional item that must be purchased separately

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-15**.

Figure 5-15: SATA Power Drive Connection

5.5.6 USB Cable (Dual Port) with Slot Bracket

The IMBA-XQ354 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

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

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the IMBA-XQ354 USB connector.

Step 3: **Insert the cable connectors** Once the cable connectors are properly aligned with the USB connectors on the IMBA-XQ354, connect the cable connectors to the on-board connectors. See **Figure 5-16**.

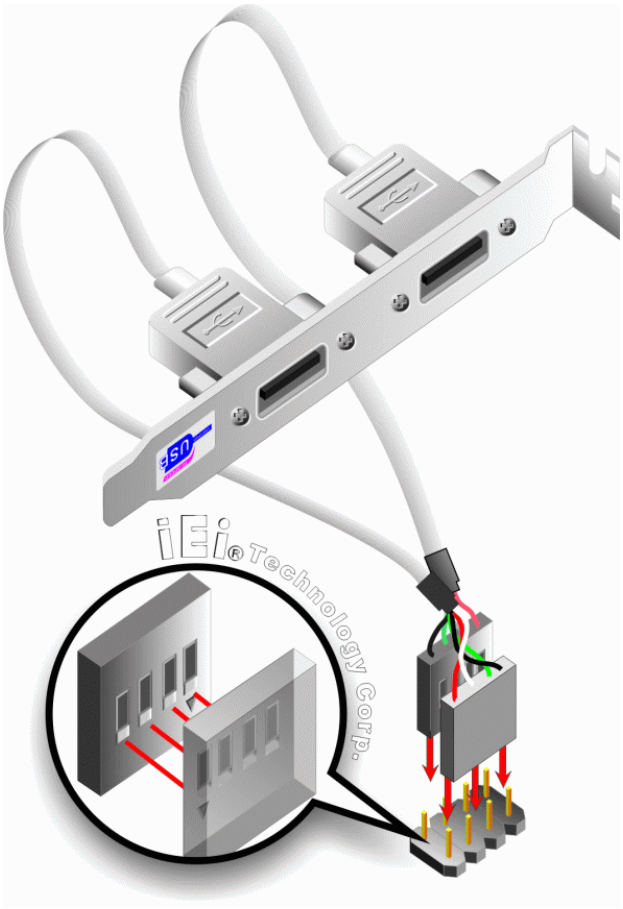


Figure 5-16: Dual USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.5.7 USB Cable (Four Port)

Four port USB 2.0 cables can be separately purchased from IEI. To install a four port USB cable onto the IMBA-XQ354, please follow the steps below.

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

WARNING:

If the USB pins are not properly aligned, the USB device can burn out.

Step 2: **Align the connectors**. Each cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the IMBA-XQ354 USB connectors.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the IMBA-XQ354, connect the cable connectors to the on-board connectors. See **Figure 5-16**.

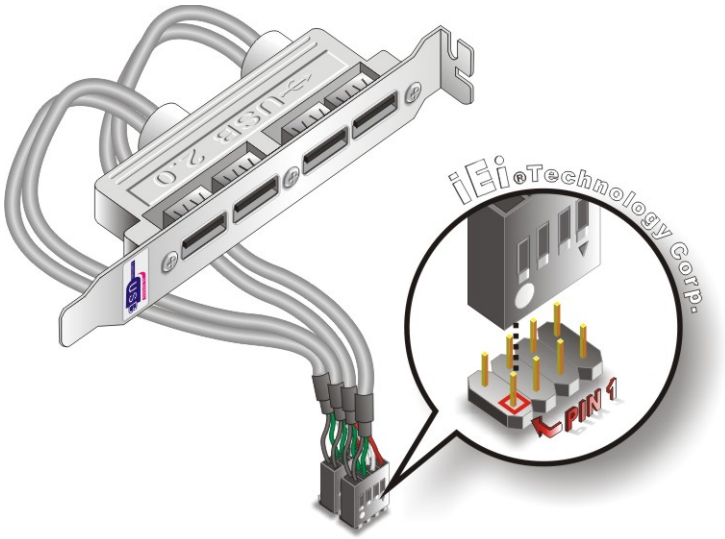


Figure 5-17: Four Port USB Cable Connection

Step 4: **Attach the bracket to the chassis**. The USB 2.0 connectors are attached to a bracket. To secure the bracket to the chassis please refer to the installation instructions that came with the chassis.

5.6 External Peripheral Interface Connection

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

- Keyboard and mouse connectors
- Serial port devices
- VGA screens
- Parallel port devices
- Ethernet connection
- USB devices
- Audio jacks

To install these devices, connect the corresponding cable connector from the actual device to the corresponding IMBA-XQ354 external peripheral interface connector making sure the pins are properly aligned.

5.6.1 Keyboard and Mouse

The IMBA-XQ354 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-XQ354.

Step 1: **Locate the dual PS/2 connector**. The location of the dual PS/2 connector is shown in **Chapter 3**.

Step 2: **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 5-18**.

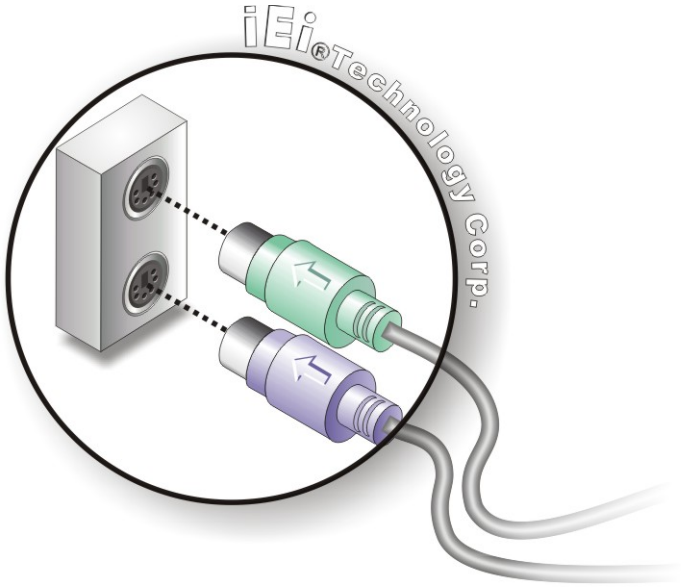


Figure 5-18: PS/2 Keyboard/Mouse Connector

5.6.2 LAN

There are two external RJ-45 LAN connectors. The RJ-45 connectors enable connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

Step 1: **Locate the RJ-45 connectors**. The locations of the USB connectors are shown in **Chapter 4**.

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the IMBA-XQ354. See **Figure 5-19**.

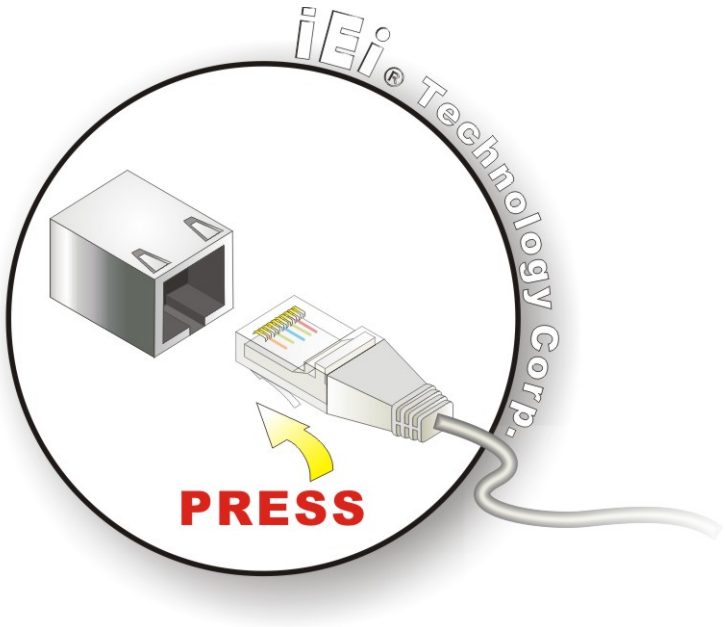


Figure 5-19: LAN Connection

Step 3: **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the on-board RJ-45 connector.

5.6.3 Parallel Device Connection

The IMBA-XQ354 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-XQ354.

Step 1: **Locate the DB-25 connector**. The location of the DB-25 connector is shown in **Chapter 3**.

Step 2: **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 5-20**.

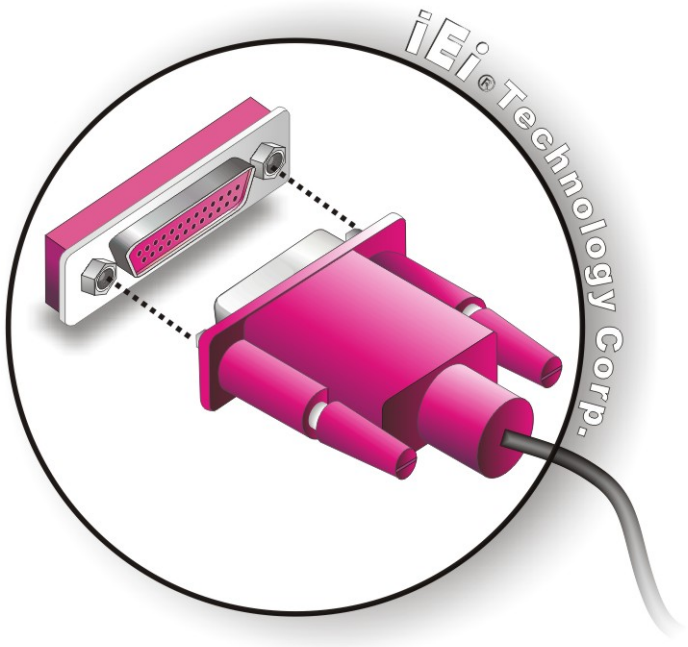


Figure 5-20: Parallel Device Connector

Step 3: **Secure the connector**. Secure the DB-25 connector to the external interface by tightening the two retention screws on either side of the connector.

5.6.4 Serial Device

The IMBA-XQ354 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the IMBA-XQ354.

Step 1: **Locate the DB-9 connector**. The location of the DB-9 connector is shown in **Chapter 3**.

Step 2: **Insert the serial connector**. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See **Figure 5-21**.

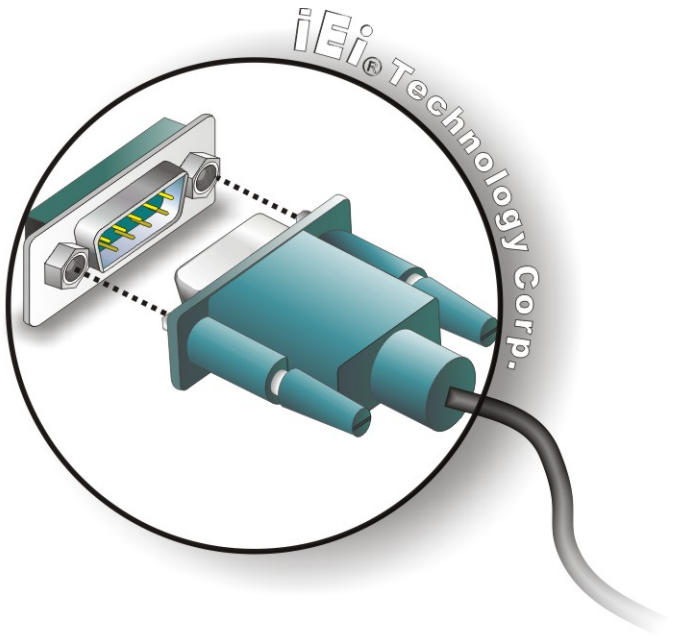


Figure 5-21: Serial Device Connector

Step 3: **Secure the connector**. Secure the serial device connector to the external interface by tightening the two retention screws on either side of the connector.

5.6.5 USB

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-XQ354.

Step 1: **Locate the USB Series "A" receptacle connectors**. The location of the USB Series "A" receptacle connectors are shown in **Chapter 3**.

Step 2: **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 5-22**.

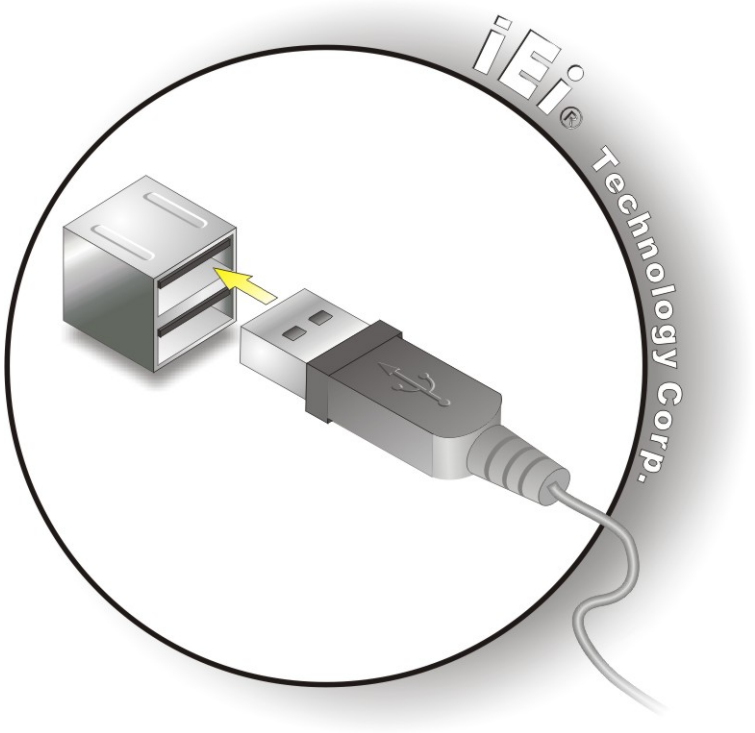


Figure 5-22: USB Connector

5.6.6 VGA Monitor

The IMBA-XQ354 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the IMBA-XQ354, please follow the instructions below.

Step 1: **Locate the female DB-15 connector**. The location of the female DB-15 connector is shown in **Chapter 3**.

Step 2: **Align the VGA connector**. Align the male DB-15 connector on the VGA screen cable with the female DB-15 connector on the external peripheral interface.

Step 3: **Insert the VGA connector**. Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the IMBA-XQ354. See **Figure 5-23**.

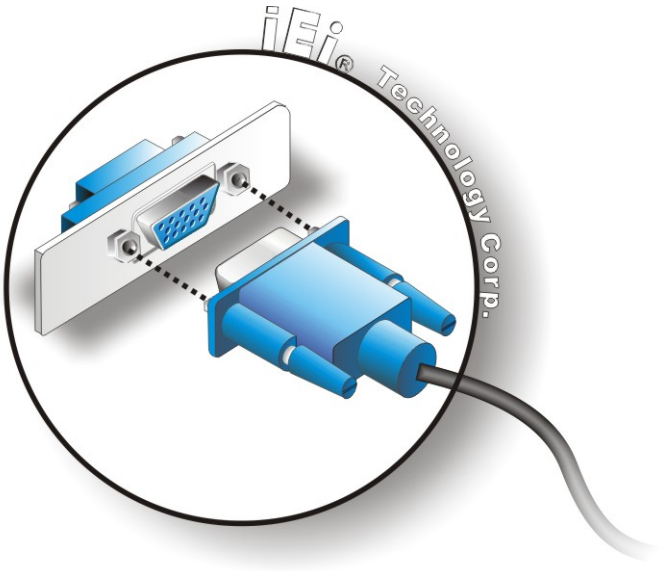


Figure 5-23: VGA Connector

Step 4: **Secure the connector**. Secure the DB-15 VGA connector from the VGA monitor to the external interface by tightening the two retention screws on either side of the connector.

5.6.7 Audio Connector

The six audio jacks on the external audio connector enable the IMBA-XQ354 to be connected to a 7.1 channel surround sound setup. To install the audio devices, follow the steps below.

Step 1: **Identify the audio plugs**. The plugs on your home theater system or speakers may not match the colors on the rear panel. If audio plugs are plugged into the wrong jacks, sound quality will be very bad.

Step 2: **Plug the audio plugs into the audio jacks**. Plug the audio plugs into the audio jacks. If the plugs on your speakers are different, an adapter will need to be used to plug them into the audio jacks.

- **CEN/LFE Out (Orange)**: Connects to the center speaker and sub-woofer.
- **Surround Out (Black)**: Connects to a speaker on the left and right.

- **Side Out (Gray)**: Connects to side speakers.
- **Line In port (Light Blue):** Connects a CD-ROM, DVD player, or other audio devices.
- **Line Out port (Lime):** Connects to a headphone or a speaker. With multi-channel configurations, this port connect to front speakers.
- **Microphone (Pink):** Connects a microphone.

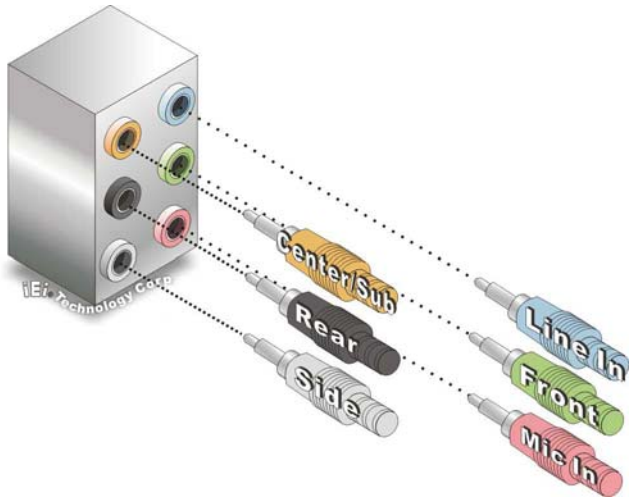


Figure 5-24: Audio Connector

Step 3: **Check audio clarity**. Check that the sound is coming through the right speakers by adjusting the balance front to rear and left to right.

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. 0.

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 **Chapter 5**.

6.1.5 BIOS Menu Bar

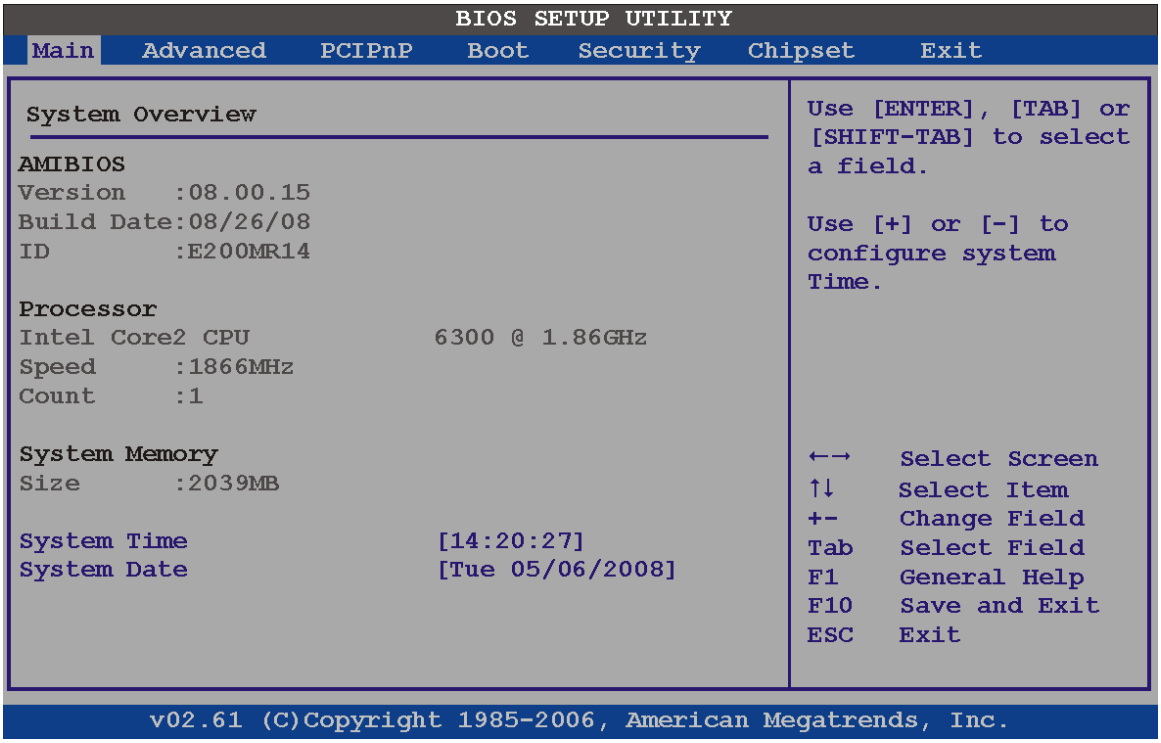
The **menu bar** on top of the BIOS screen has the following main items:

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

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

6.2 Main

The Main BIOS menu (**BIOS Menu 1**) appears when the BIOS Setup program is entered. The Main menu gives an overview of the basic system information.



BIOS 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 [hh:mm:ss]**

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

➔ **System Date [DAY dd/mm/yyyy]**

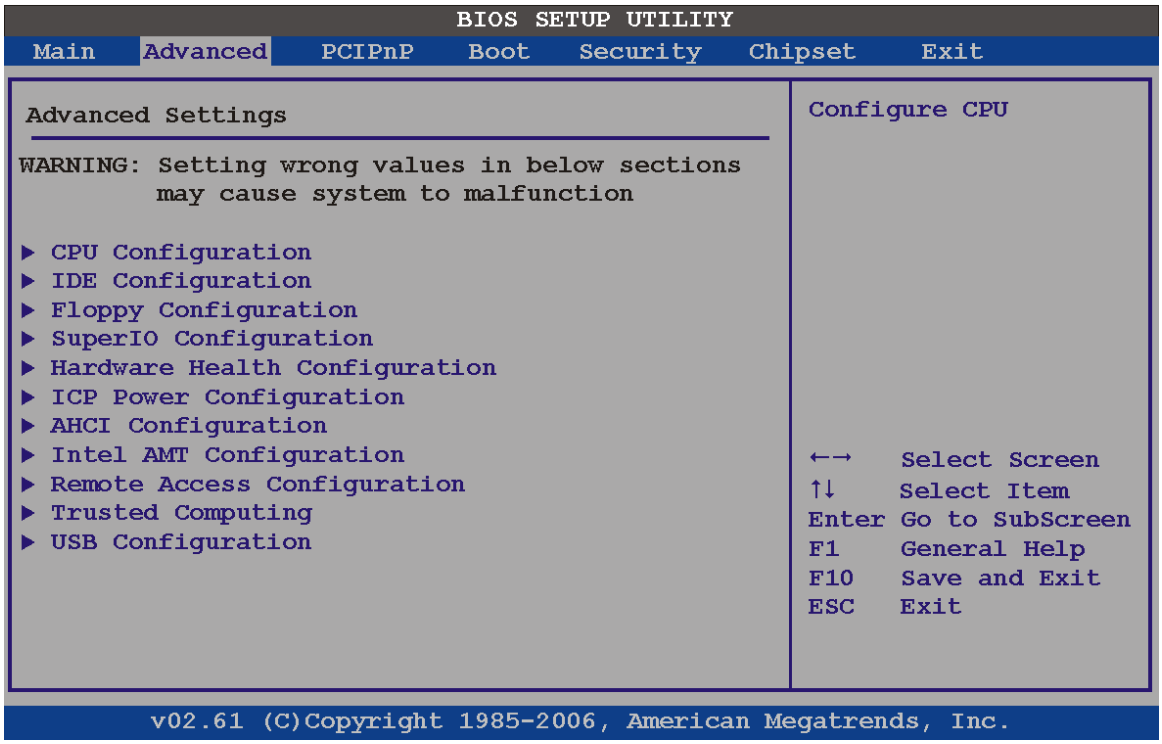
Use the **System Date** option to set the system date. Manually enter the day, month and year.

6.3 Advanced

Use the **Advanced** menu to configure the CPU and peripheral devices through the following sub-menus:

WARNING:

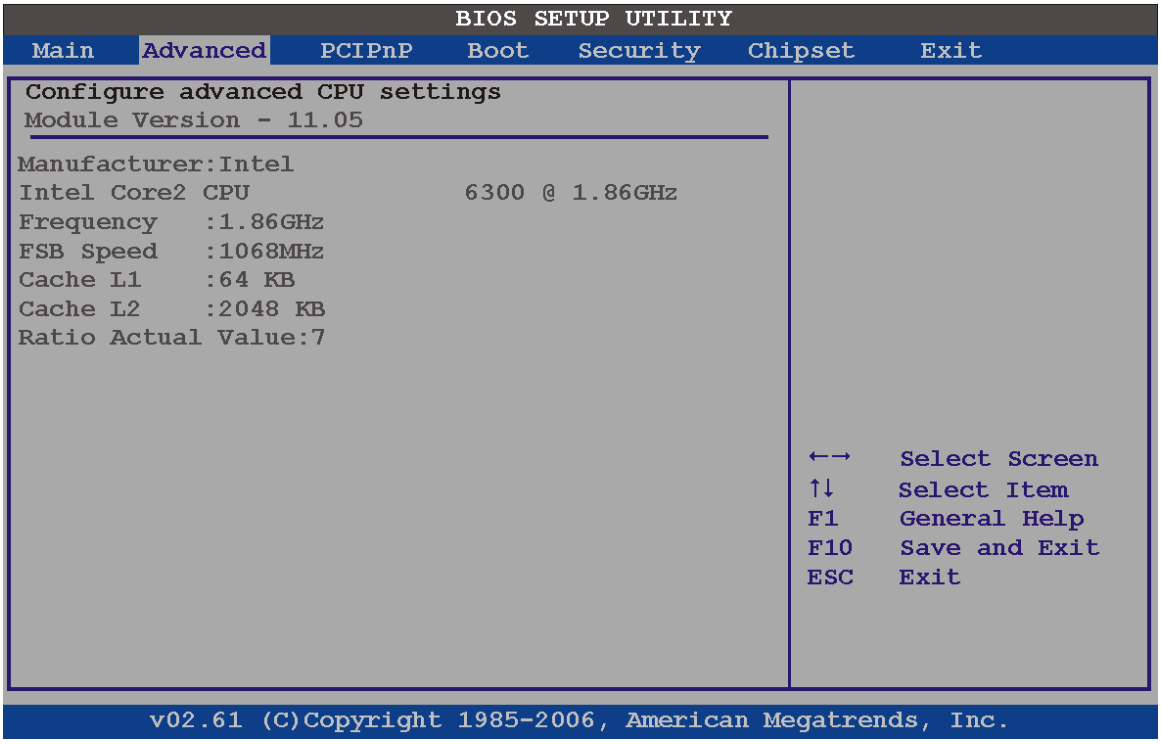
Setting the wrong values in the sections below may cause the system to malfunction. Make sure that the settings made are compatible with the hardware.



BIOS 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.



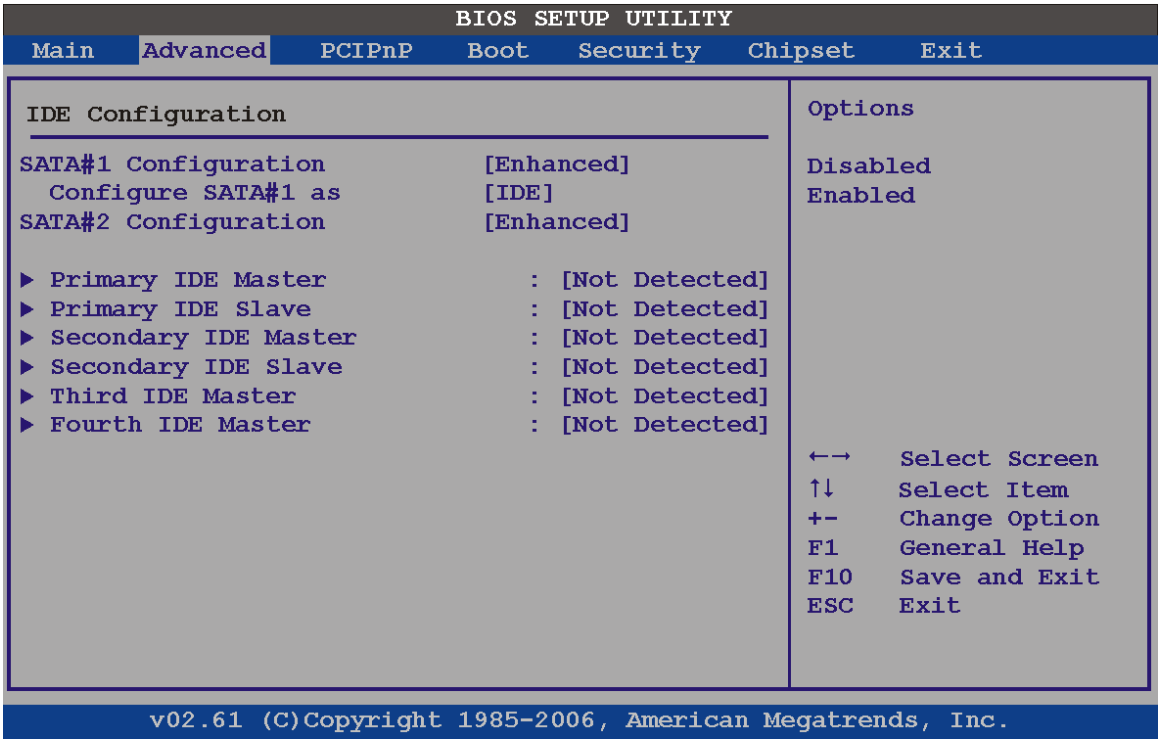
BIOS Menu 3: CPU Configuration

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

- **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**: Clock speed ratio

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

➔ **SATA#n Configuration [Enhanced]**

Use the **SATA#n** BIOS option to enable the nth SATA drive port.

➔ **Enhanced** **DEFAULT** The nth SATA drive port is activated

➔ **Disabled** The nth SATA drive port is disabled

➔ **Configure SATA#n as [IDE]**

Use the **Configure SATA#n as** BIOS option to configure the nth SATA port as an IDE drive, a SATA drive (AHCI mode) or a SATA drive in a RAID configuration.

- ➔ **IDE** **DEFAULT** The drive connected to the nth SATA port is configured as an IDE drive
- ➔ **RAID** The SATA drive connected to the nth SATA drive port is specified as a SATA drive that is part of a RAID array
- ➔ **AHCI** The SATA drive connected to the nth SATA drive port is specified as a normal SATA drive.

➔ **IDE Master and IDE Slave**

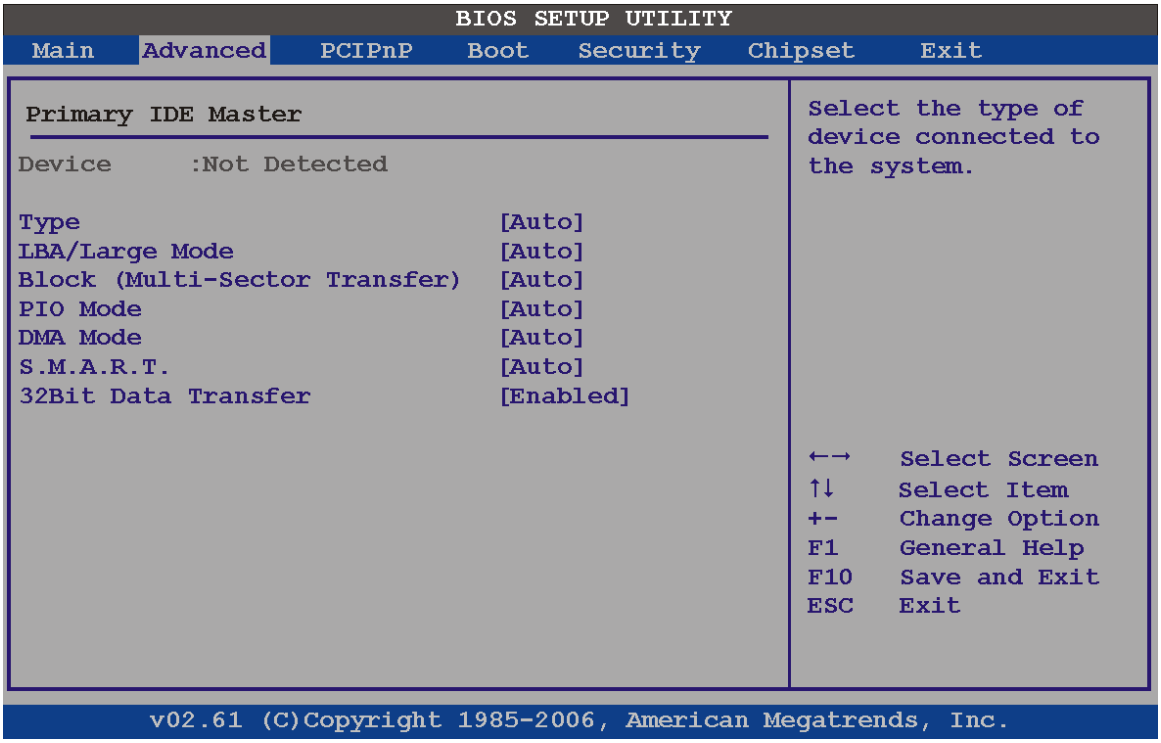
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- Primary IDE Master
- Primary IDE Slave
- Secondary IDE Master
- Secondary IDE Slave
- Third IDE Master
- Fourth IDE Master

The **IDE Configuration** menu (**BIOS Menu 4**) allows changes to the configurations for the IDE devices installed in the system. If an IDE device is detected, and one of the above listed four BIOS configuration options are selected, the IDE configuration options shown in **Section 976.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

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



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ **Auto-Detected Drive Parameters**

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

- **Device**: Lists the device type (e.g. hard disk, CD-ROM etc.)
- **Type**: Indicates the type of devices a user can manually select
- **Vendor**: Lists the device manufacturer
- **Size**: List the storage capacity of the device.
- **LBA Mode**: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.

- **Block Mode**: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- **PIO Mode**: Indicates the PIO mode of the installed device.
- **Async DMA**: Indicates the highest Asynchronous DMA Mode that is supported.
- **Ultra DMA**: Indicates the highest Synchronous DMA Mode that is supported.
- **S.M.A.R.T.**: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- **32Bit Data Transfer**: Enables 32-bit data transfer.

➔ **Type [Auto]**

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

➔ **Not Installed**		BIOS is prevented from searching for an IDE disk drive on the specified channel.
➔ **Auto**	**DEFAULT**	The BIOS auto detects the IDE disk drive type attached to the specified channel. This setting should be used if an IDE hard disk drive is attached to the specified channel.
➔ **CD/DVD**		The CD/DVD option specifies that an IDE CD-ROM drive is attached to the specified IDE channel. The BIOS does not attempt to search for other types of IDE disk drives on the specified channel.
➔ **ARMD**		This option specifies an ATAPI Removable Media Device. These include, but are not limited to: ZIP LS-120

➔ **LBA/Large Mode [Auto]**

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

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

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

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

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

➔ **PIO Mode [Auto]**

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

➔ **Auto**	**DEFAULT**	BIOS auto detects the PIO mode. Use this value if the IDE disk drive support cannot be determined.
➔ **0**		PIO mode 0 selected with a maximum transfer rate of 3.3 MB/s
➔ **1**		PIO mode 1 selected with a maximum transfer rate of 5.2 MB/s
➔ **2**		PIO mode 2 selected with a maximum transfer rate of 8.3 MB/s

- **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

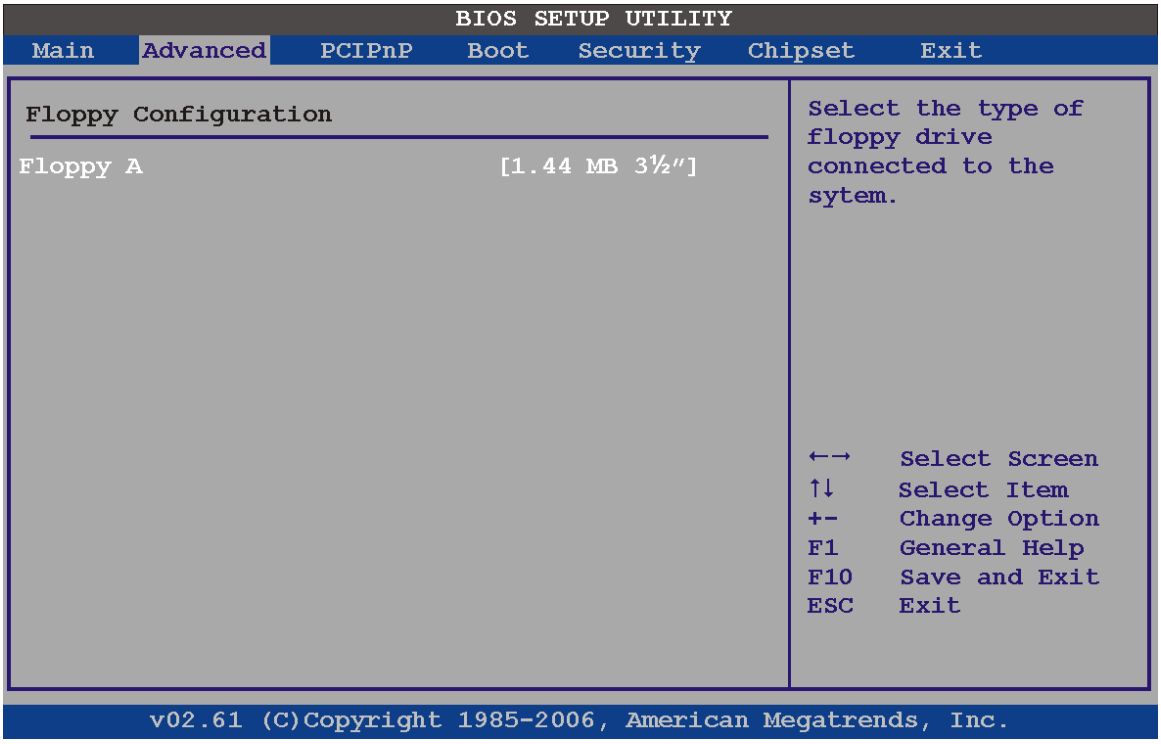
➔ **32Bit Data Transfer [Enabled]**

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: IDE Master and IDE Slave Configuration

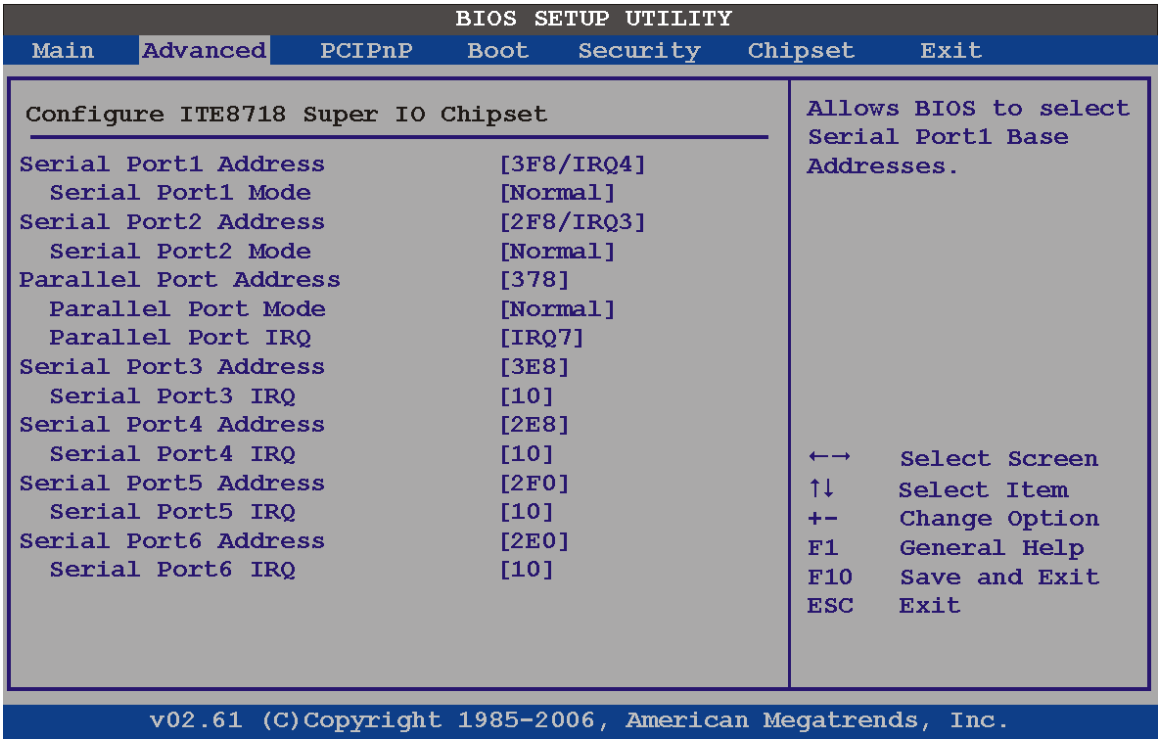
➔ **Floppy A**

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’
- 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

➔ **Serial Port1 Address [3F8/IRQ4]**

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

➔ **Disabled**		No base address is assigned to Serial Port 1
➔ **3F8/IRQ4**	**DEFAULT**	I/O port address is 3F8 and the interrupt address is IRQ4
➔ **3E8/IRQ4**		I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		I/O port address is 2E8 and the interrupt address is IRQ3

➔ **Serial Port1 Mode [Normal]**

Use the **Serial Port1 Mode** option to select the Serial Port1 operational mode.

➔ **Normal**	**DEFAULT**	Serial Port 1 mode is normal
➔ **IrDA**		Serial Port 1 mode is IrDA
➔ **ASK IR**		Serial Port 1 mode is ASK IR

➔ Serial Port2 Address [2F8/IRQ3]

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

➔ **Disabled**		No base address is assigned to Serial Port 2
➔ **2F8/IRQ3**	**DEFAULT**	I/O port address is 3F8 and the interrupt address is IRQ3
➔ **3E8/IRQ4**		I/O port address is 3E8 and the interrupt address is IRQ4
➔ **2E8/IRQ3**		I/O port address is 2E8 and the interrupt address is IRQ3

➔ Serial Port2 Mode [Normal]

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

➔ **Normal**	**DEFAULT**	Serial Port 2 mode is normal
➔ **IrDA**		Serial Port 2 mode is IrDA
➔ **ASK IR**		Serial Port 2 mode is ASK IR

➔ Parallel Address [378]

The **Parallel Port Address** BIOS option assigns the I/O port address of the parallel port. The following address options are available:

➔ **Disabled**		No I/O port 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]

The Parallel Port Mode selection selects 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 SPP mode.
➔ **EPP + 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 The parallel port becomes compatible with EPP devices described above

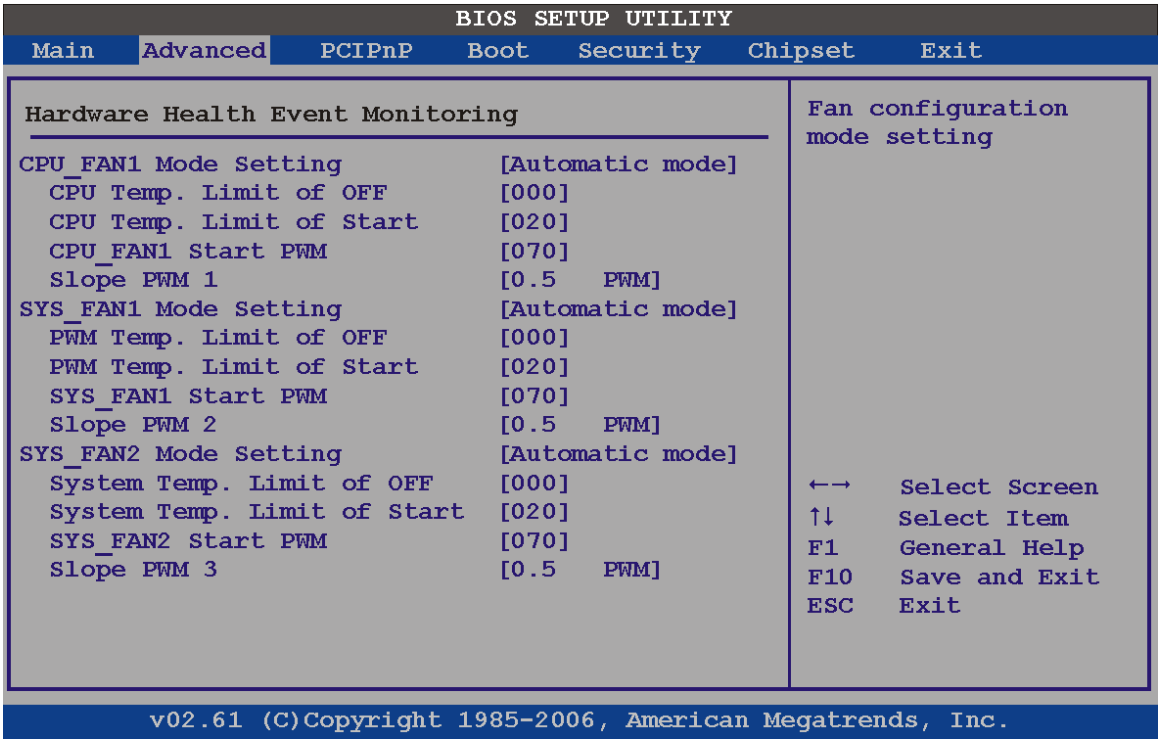
➔ **Parallel Port IRQ [IRQ7]**

The **Parallel Port Address** BIOS option assigns the parallel port interrupt address. The following address options are available.

➔ **IRQ5**		Parallel port interrupt address is IRQ5
➔ **IRQ7**	**DEFAULT**	Parallel port interrupt address is IRQ7

6.3.5 Hardware Health Configuration

The **Hardware Health Configuration** menu (**BIOS Menu 8** and **BIOS Menu 9**) shows the operating temperature, fan speeds and system voltages.



BIOS Menu 8: Hardware Health Configuration

➔ **FAN Mode Setting [Full On Mode]**

Use the **FAN Mode Setting** option to configure the fan mode options for the following fans:

- CPU fan
- System fan 1
- System fan 2

The fan mode setting options are listed below.

➔ **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.

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

- CPU Temp. Limit of OFF
- CPU Temp. Limit of Start
- CPU Fan Start PWM
- Slope PWM 1

➔ **CPU Temp. 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 **CPU Temp. Limit of OFF** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of OFF** option to select the CPU temperature at which the cooling fan should automatically turn off. To select a value, select the **CPU Temp. Limit of OFF** option and enter a decimal number between 000 and 127. The temperature range is specified below.

- 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.

The **CPU Temp. Limit of Start** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **CPU Temp. Limit of Start** option to select the CPU temperature at which the cooling fan should automatically turn on. When the fan starts, it rotates using the starting pulse width modulation (PWM) specified in the **Fan 3 Start PWM** option below. To select a value, select the **CPU Temp. Limit of Start** option and enter a decimal number between 000 and 127. The temperature range is specified below.

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

➔ **CPU Fan Start PWM [070]**

The **Fan 3 Start PWM** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Fan 3 Start PWM** option to select the PWM mode the fan starts to rotate with after the temperature specified in the **Temperature 3 Limit of Start** is exceeded. The Super I/O chipset supports 128 PWM modes. To select a value, select the **Fan 3 Start PWM** option and enter a decimal number between 000 and 127. The temperature range is specified below.

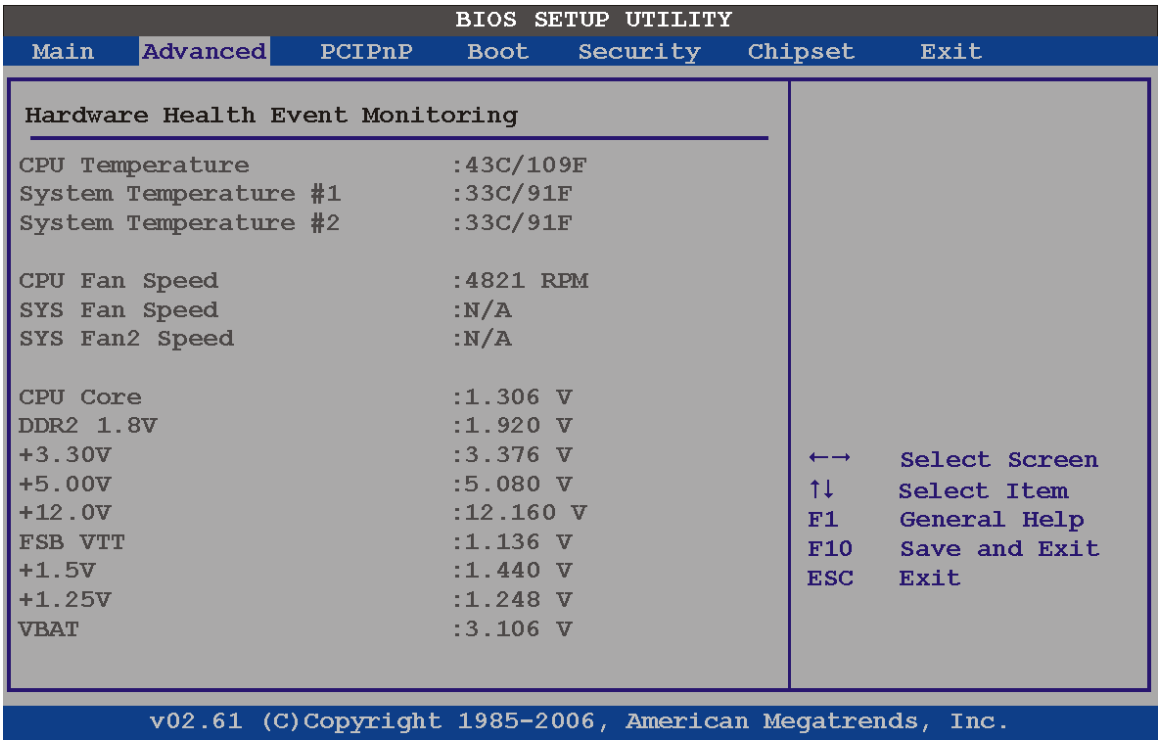
- PWM Minimum Mode: 0
- PWM Maximum Mode: 127

➔ **Slope PWM 1 [1 PWM]**

The **Slope PWM 1** option can only be set if the **CPU FAN Mode Setting** option is set to **Automatic Mode**. Use the **Slope PWM 1** option to select the linear rate at which the PWM mode increases with respect to an increase in temperature. A list of available options is shown below:

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

- 64 PWM



BIOS Menu 9: Hardware Health Configuration 2

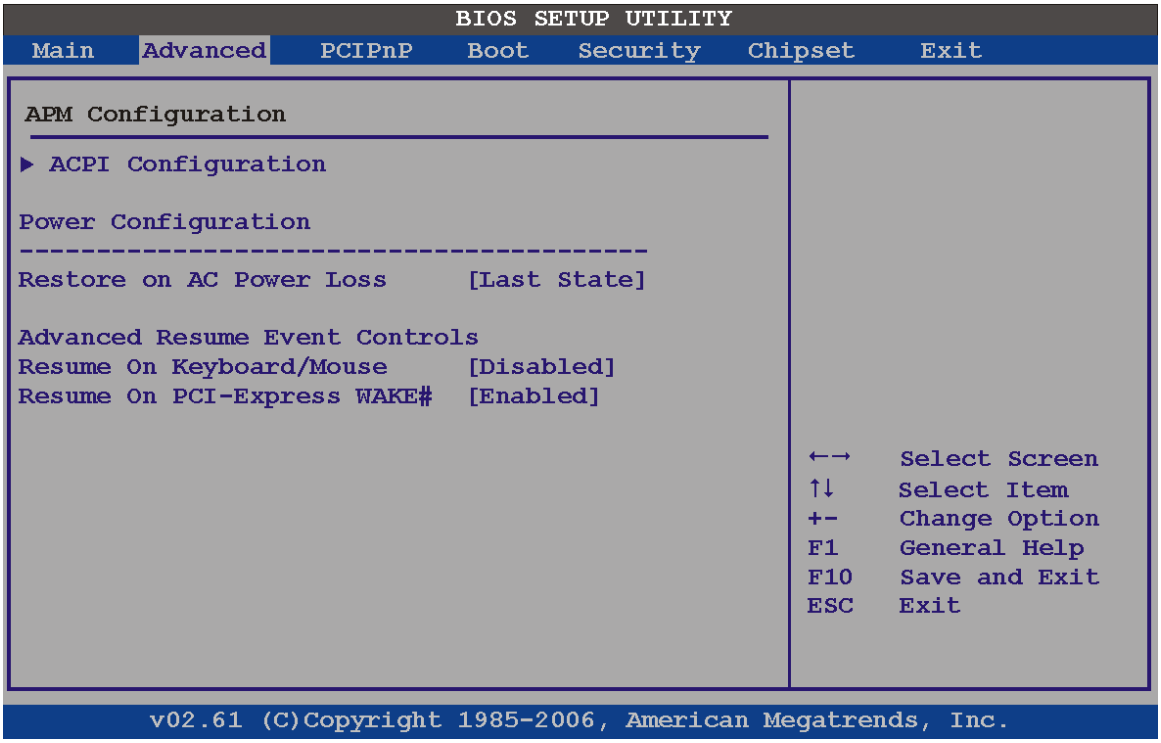
The following system parameters and values are shown. The system parameters that are monitored are:

- **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
  - System fan 1 speed
  - System fan 2 speed
- **Voltages**: The following system voltages are monitored
  - CPU Core
  - DDR2 +1.8 V
  - +3.30 V
  - +5.00 V

- +12.0 V
- FSB VTT
- +1.5 V
- +1.25 V
- VBAT

6.3.6 APM Configuration

Use the **APM Configuration** menu (**BIOS Menu 10**) to configure the drive connected to SATA connector n.



BIOS Menu 10: AHCI Port n Configuration Menu

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

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

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

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

Resume on Keyboard/Mouse [Disabled]

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

- **Disabled** **DEFAULT** Wake event not generated by activity on the keyboard or mouse
- **Enabled** Wake event generated by activity on the keyboard or mouse
- **Disabled** **DEFAULT** Wake event not generated by an incoming call
- **Enabled** Wake event generated by an incoming call

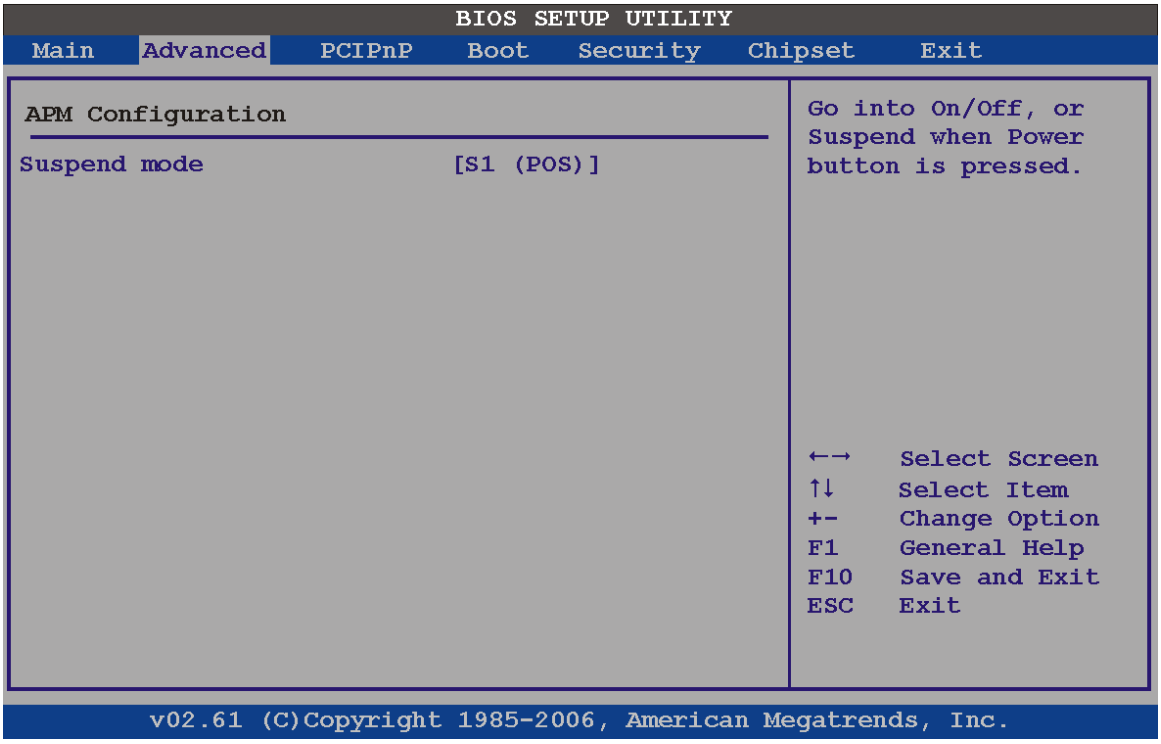
Resume on PCI-Express WAKE# [Enabled]

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

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

6.3.6.1 ACPI Configuration

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



BIOS Menu 11: Advanced ACPI Configuration

➔ **Suspend Mode [S1(POS)]**

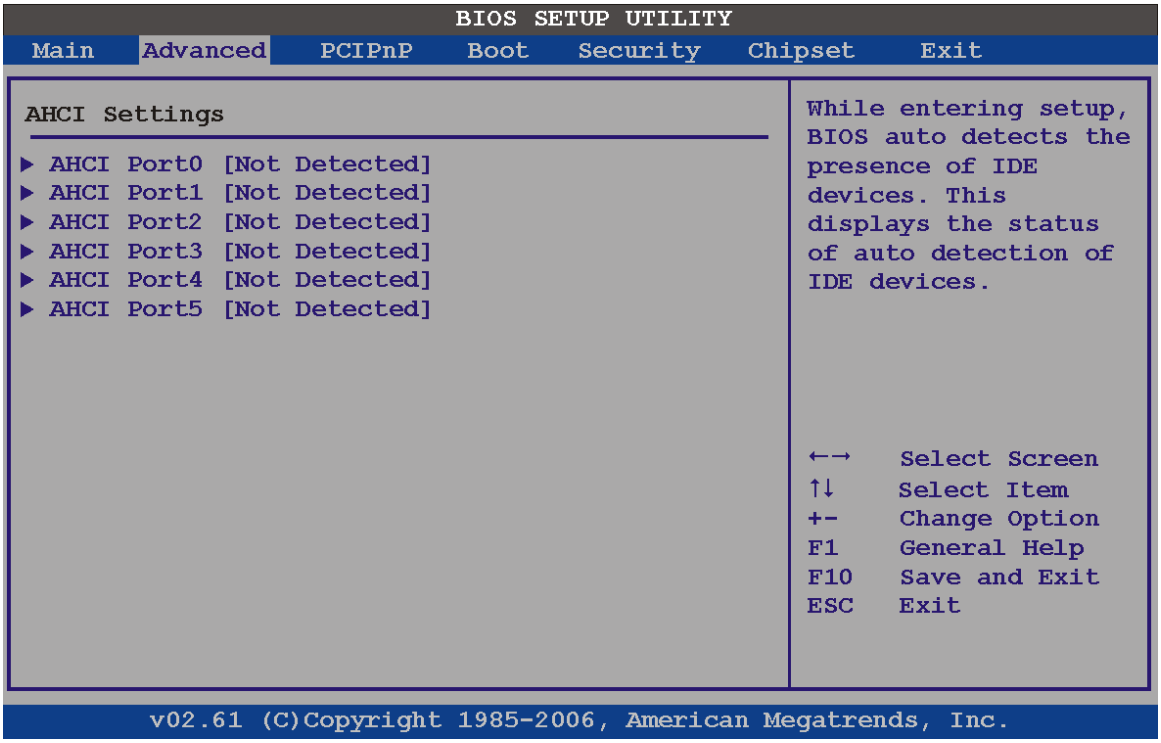
Use the **Suspend Mode** option to specify the sleep state the system enters when it is not being used.

➔ **S1 (POS)** 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)** **DEFAULT** The system enters S3(STR) sleep state.

6.3.7 AHCI Configuration

Use the **AHCI Configuration** Settings menu (**BIOS Menu 12**) to report on the auto-detection of devices connected to the onboard SATA drive connectors.



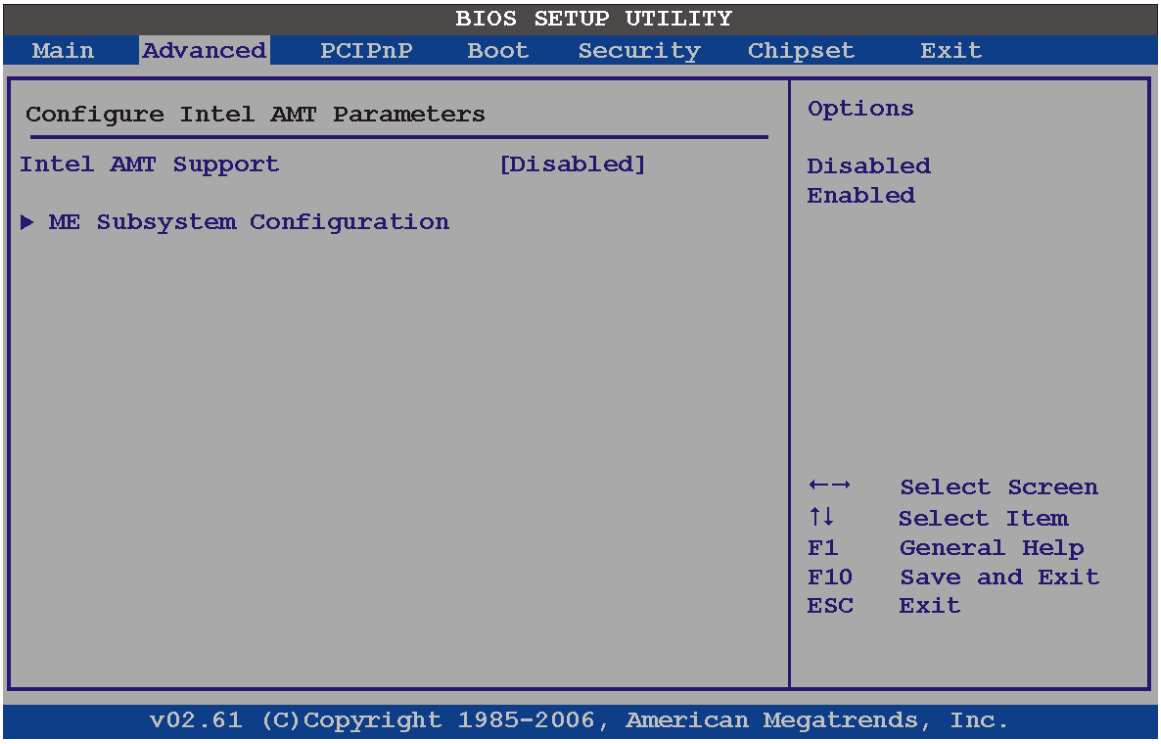
BIOS Menu 12: AHCI Configuration

➔ **AHCI Port n [Not Detected]**

Use the **AHCI Port n** BIOS option to check what AHCI (Advanced Host Controller Interface) devices are detected to a specified SATA drive connector. If a device is detected, selecting the BIOS option, e.g. "**AHCI Port 3**" opens a new window.

6.3.8 Intel AMT Configuration

Use the **Intel AMT** menu (**BIOS Menu 13**) to enable the system to be managed through the Intel® Active Management Technology (AMT) interface. The interface is implemented through LAN1.



BIOS Menu 13: Intel AMT Configuration

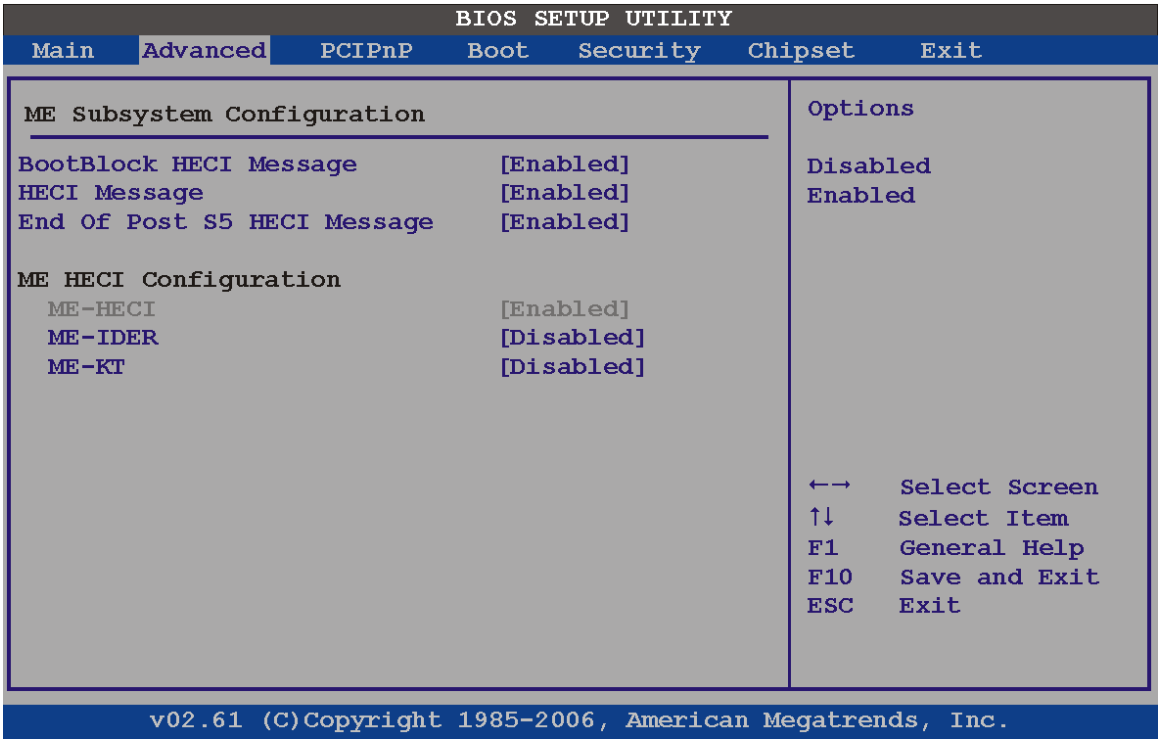
➔ **Intel AMT Support (Disabled)**

Use the **Intel AMT Support** option to enable or disable Intel AMT on the system.

➔	**Disabled**	**DEFAULT**	Intel® AMT disabled
➔	**Enabled**		Intel® AMT enabled

6.3.8.1 ME Subsystem Configuration

Use the ME Subsystem Configuration menu (**BIOS Menu 15**) to configure the Intel® Management Engine (ME) configuration options.



BIOS Menu 14: ME Subsystem Configuration

➔ **BootBlock HECI Message [Enabled]**

Use the **BootBlock HECI Message** option to enable or disable boot disk sector that contains the Intel® AMT Host-Embedded Controller Interface (HECI) message.

➔ **Disabled**		Boot sector disabled
➔ **Enabled**	**DEFAULT**	Boot sector enabled

➔ **HECI Message [Enabled]**

Use the **HECI Message** option to enable or disable the Intel® AMT Host-Embedded Controller Interface (HECI) message.

➔	**Disabled**		HECI message disabled
➔	**Enabled**	**DEFAULT**	HECI message enabled

➔ **End of Post S5 HECI Message [Enabled]**

Use the **End of Post S5 HECI Message** option to enable or disable the Intel® AMT the HECI message to wake the system in an S5 sleep state.

➔	**Disabled**		HECI bus cannot rouse system from an S5 state
➔	**Enabled**	**DEFAULT**	HECI bus can rouse system from an S5 state

➔ **ME-HECI [Enabled]**

This option is not user configurable.

➔ **ME-IDER [Enabled]**

Use the **ME-IDER** option to enable or disable the IDE-Redirection (IDER) protocol. This allows redirection of CD, floppy and DVD drives through the management engine.

➔	**Disabled**		The IDER protocol is disabled
➔	**Enabled**	**DEFAULT**	The IDER protocol is enabled

➔ **ME-KT [Enabled]**

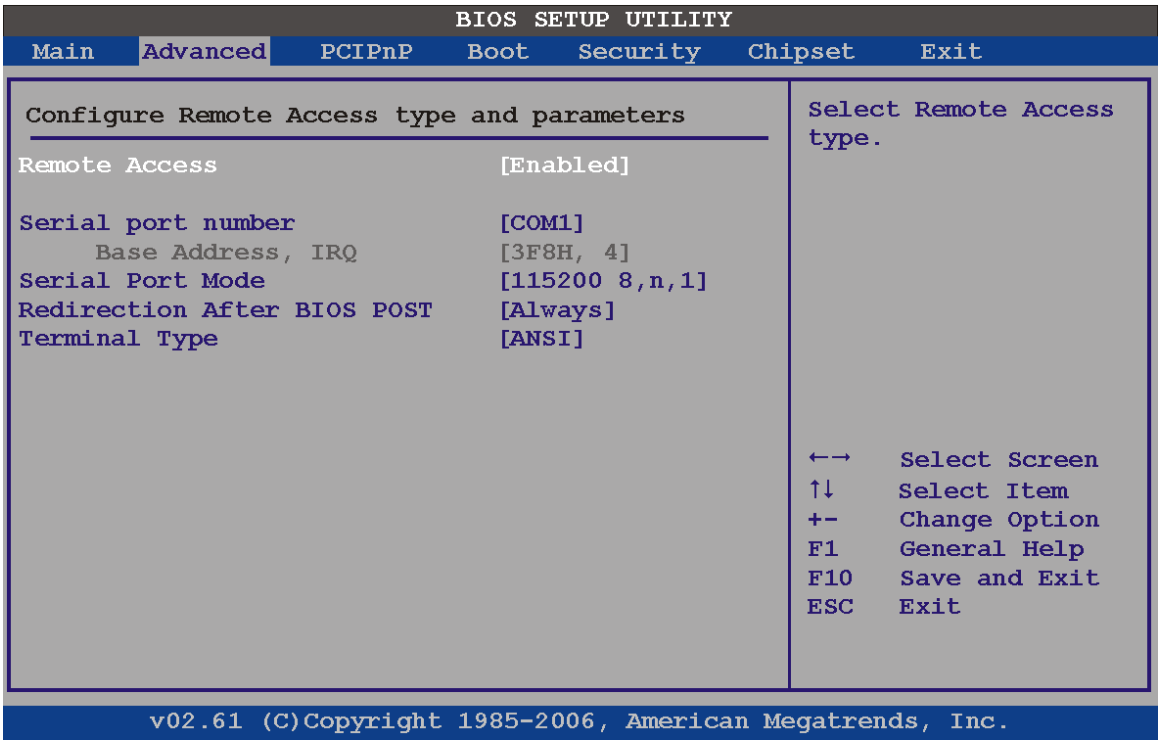
Use the **ME-KT** option to enable or disable the Serial Over LAN (SOL) protocol to enable the Intel® AMT enabled to redirect the keyboard/text through the management engine.

➔	**Disabled**		The SOL protocol is disabled
➔	**Enabled**	**DEFAULT**	The SOL protocol is enabled

6.3.9 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 15**) 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 15: 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
-- Sredir Memory Display Delay
These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

Use the **Serial Port Number** option 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 [3F8h,4]**

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

➔ **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)

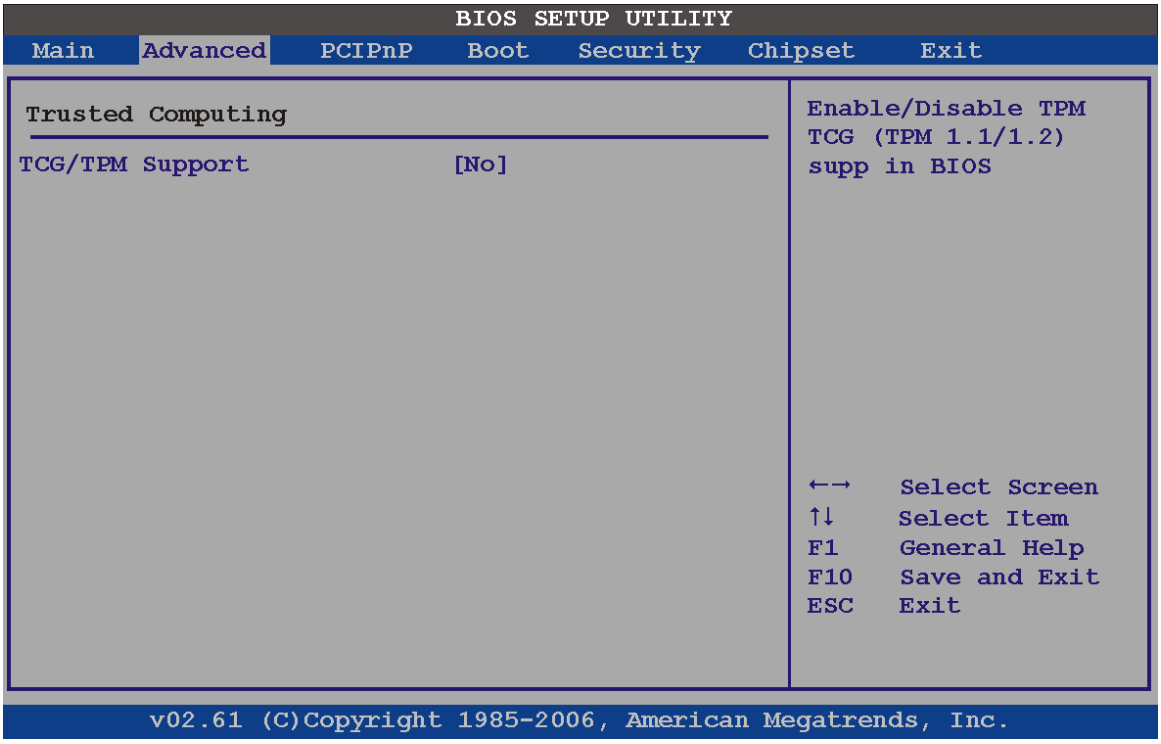
➔ **Terminal Type [ANSI]**

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

6.3.10 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 16**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 16: Trusted Computing

➔ **TCG/TPM Support [No]**

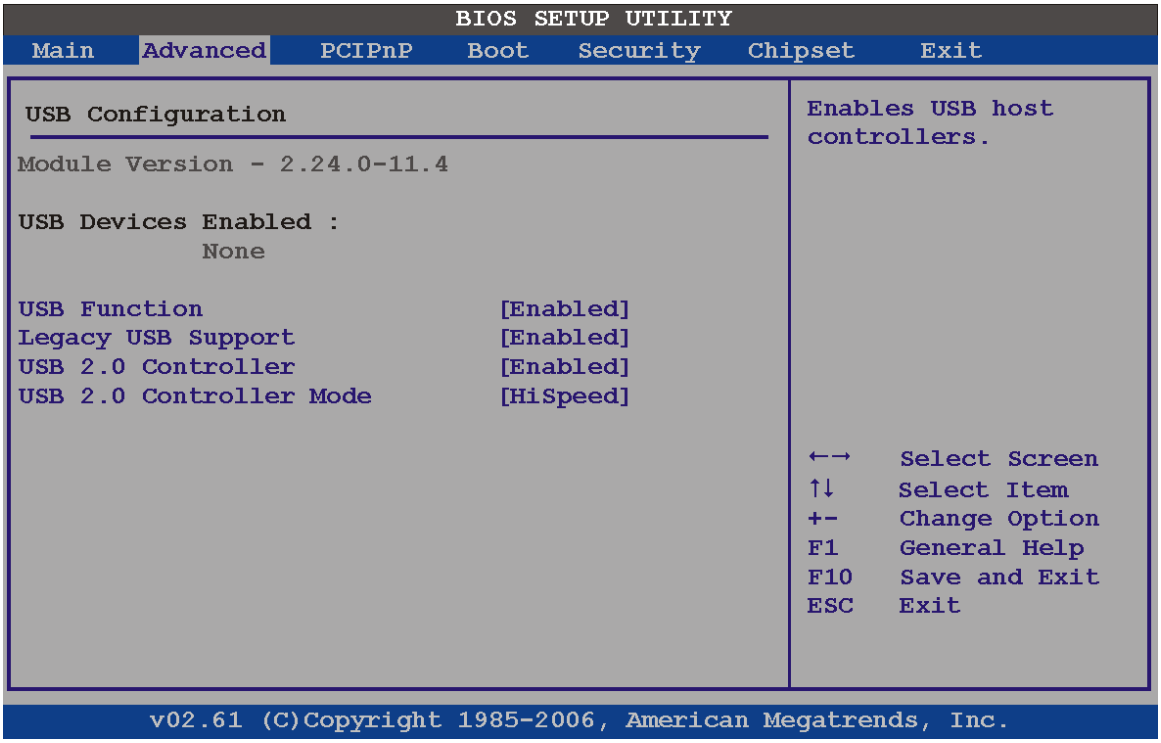
Use the **TCG/TPM Support** option to configure support for the TPM.

➔ **No** **DEFAULT** TPM support is disabled.

➔ **Yes** TPM support is enabled.

6.3.11 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 17**) to read USB configuration information and configure the USB settings.



BIOS Menu 17: USB Configuration

➔ **USB Functions [Enabled]**

Use the **USB Function** BIOS option to enable or disable USB function support.

➔ **Disabled**		USB function support disabled
➔ **Enabled**	**DEFAULT**	USB function support enabled

➔ **Legacy USB Support [Enabled]**

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

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

➔	**Disabled**		Legacy USB support disabled
➔	**Enabled**	**DEFAULT**	Legacy USB support enabled
➔	**Auto**		Legacy USB support disabled if no USB devices are connected

➔ **USB 2.0 Controller [Enabled]**

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

➔	**Disabled**		USB 2.0 controller disabled
➔	**Enabled**	**DEFAULT**	USB 2.0 controller enabled

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

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

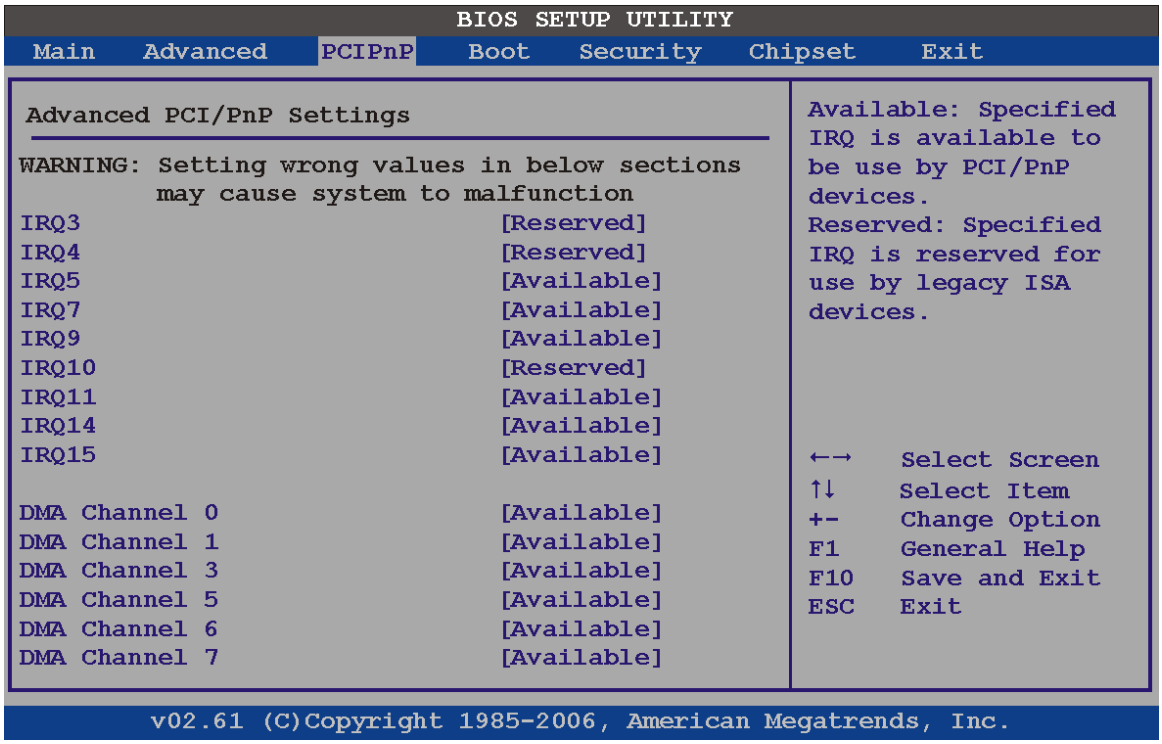
➔	**FullSpeed**		The controller is capable of operating at 12 Mb/s
➔	**HiSpeed**	**DEFAULT**	The controller is capable of operating at 480 Mb/s

6.4 PCI/PnP

Use the PCI/PnP menu (**BIOS Menu 18**) to configure advanced PCI and PnP settings.

WARNING:

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



BIOS Menu 18: 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

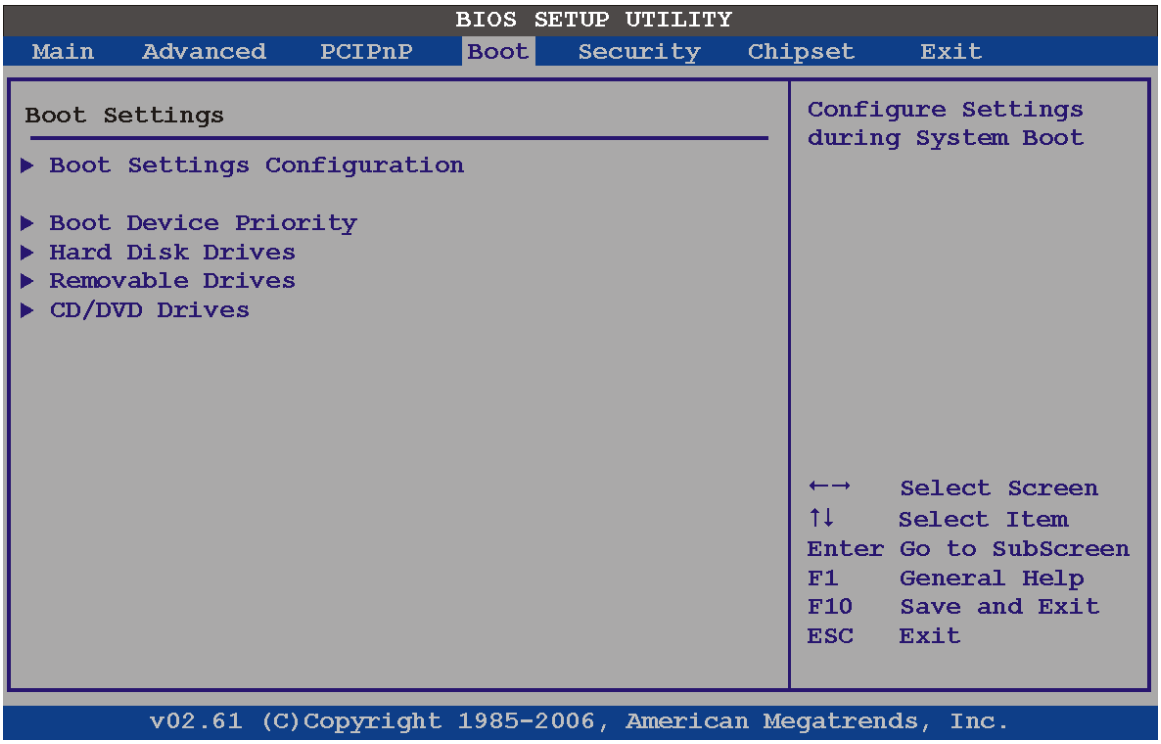
➔ **Reserved Memory Size [Disabled]**

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

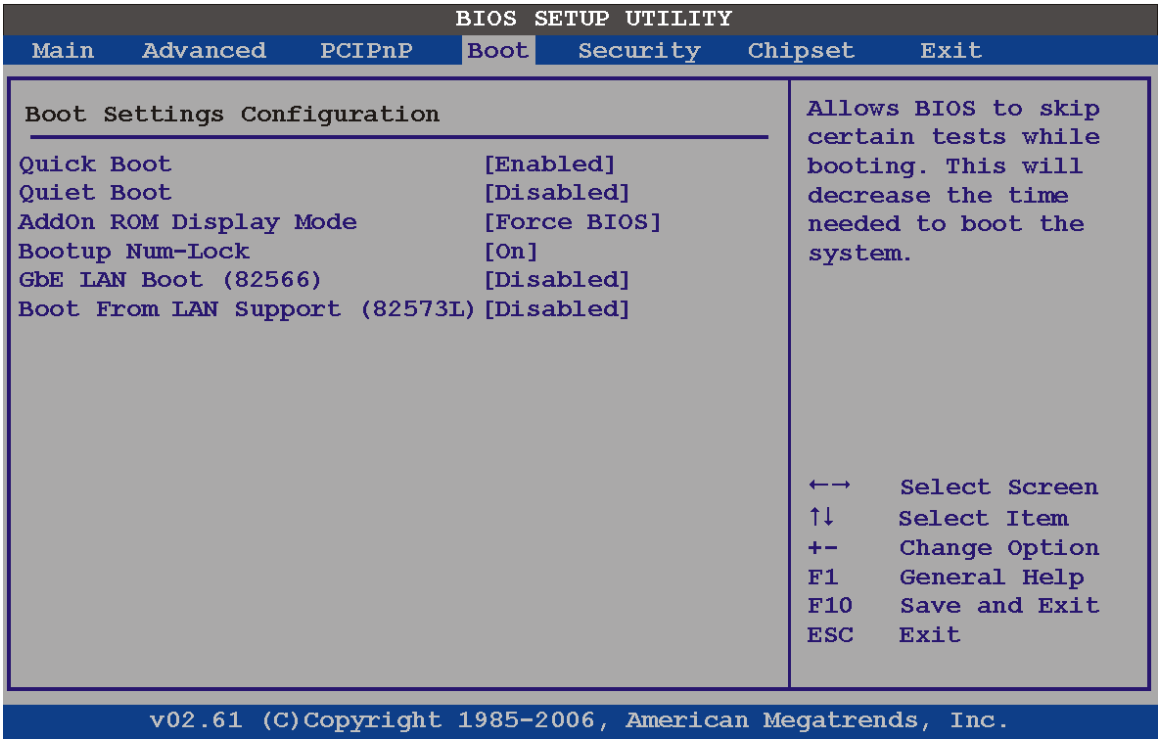
Use the Boot menu (**BIOS Menu 19**) to configure system boot options.



BIOS Menu 19: Boot

6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (**BIOS Menu 19**) to configure advanced system boot options.



BIOS Menu 20: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

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

➔ **Disabled** No POST procedures are skipped

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

➔ **Quiet Boot [Disabled]**

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

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

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

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

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

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

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

➔ **Bootup Num-Lock [Off]**

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

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

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

➔ **GbE LAN Boot (82566) [Disabled]**

The **GbE LAN Boot** option enables remote boot of the system through LAN1. This LAN port also supports remote management using Intel® AMT.

➔ **Disabled** **DEFAULT** Cannot be booted remotely through this port

➔ **Enabled** Can be booted remotely through this port

➔ **Boot From LAN Support (82573L) [Disabled]**

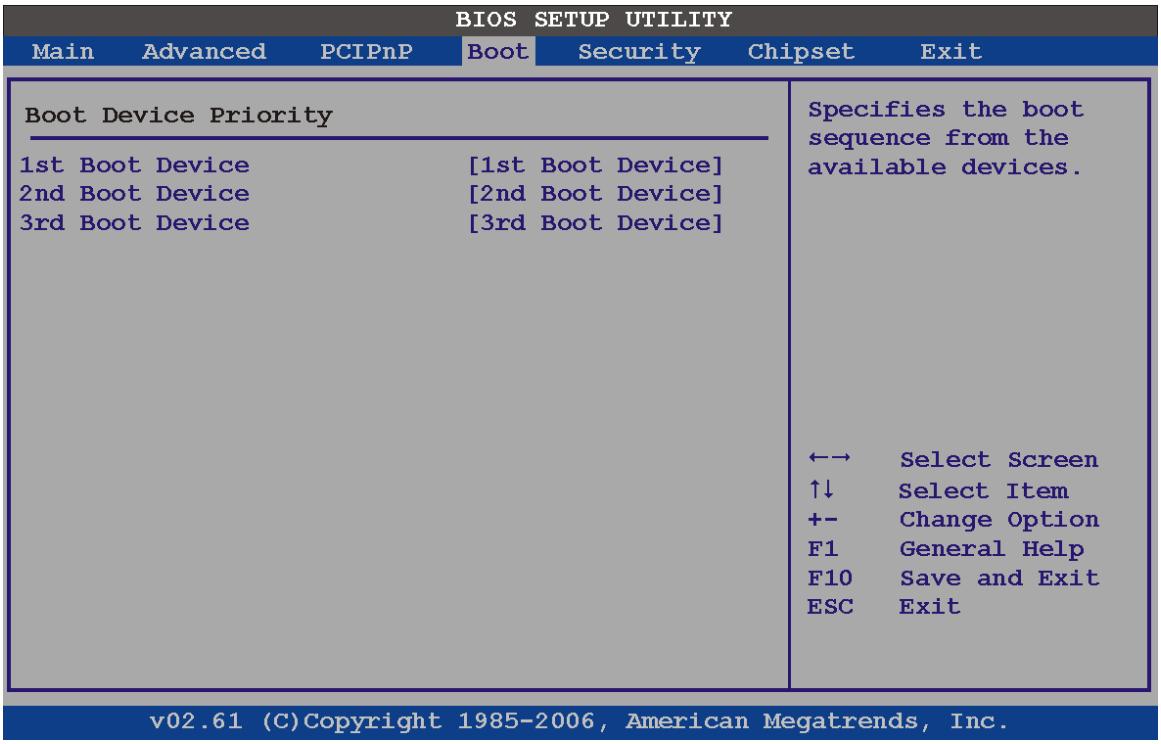
The **BOOT From LAN Support** allows the system to be booted remotely over a network through LAN2.

➔ **Disabled**	**DEFAULT**	Cannot be booted remotely through this port
➔ **Enabled**		Can be booted remotely through this port

6.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 21**) to specify the boot sequence from the available devices. The following options are available:

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



BIOS Menu 21: Boot Device Priority Settings

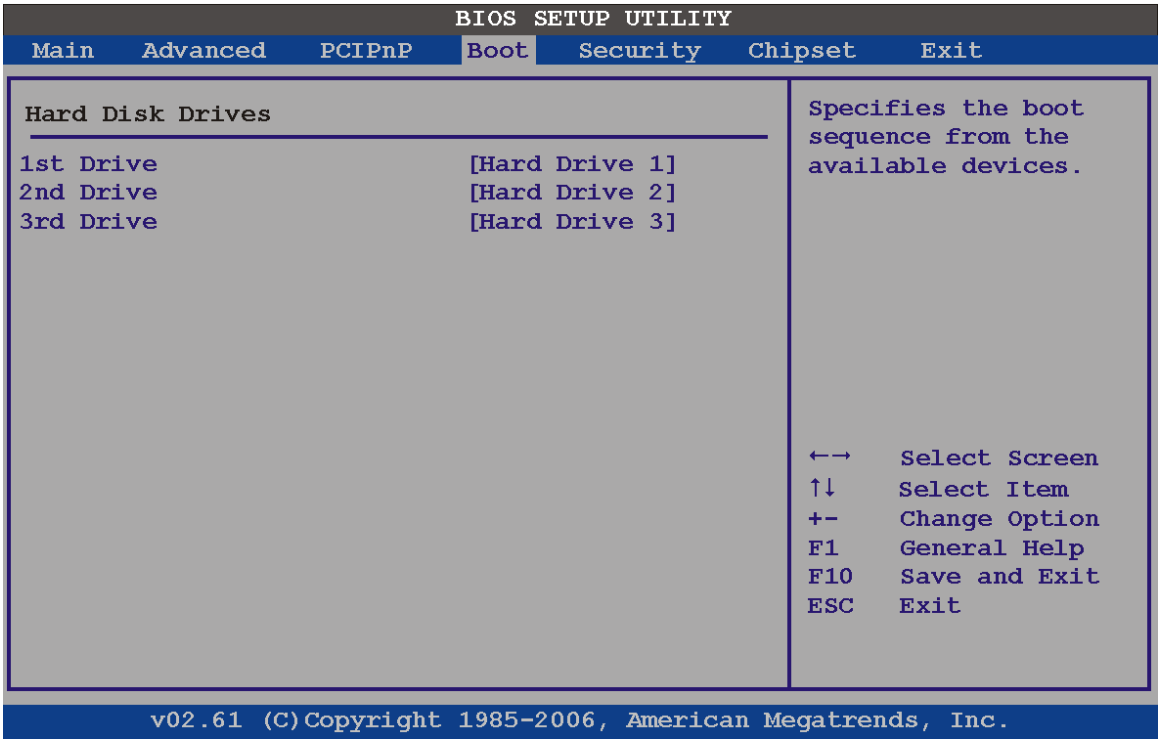
6.5.3 Hard Disk Drives

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

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

NOTE:

Only installed drives are shown in the list.



BIOS Menu 22: Hard Disk Drives

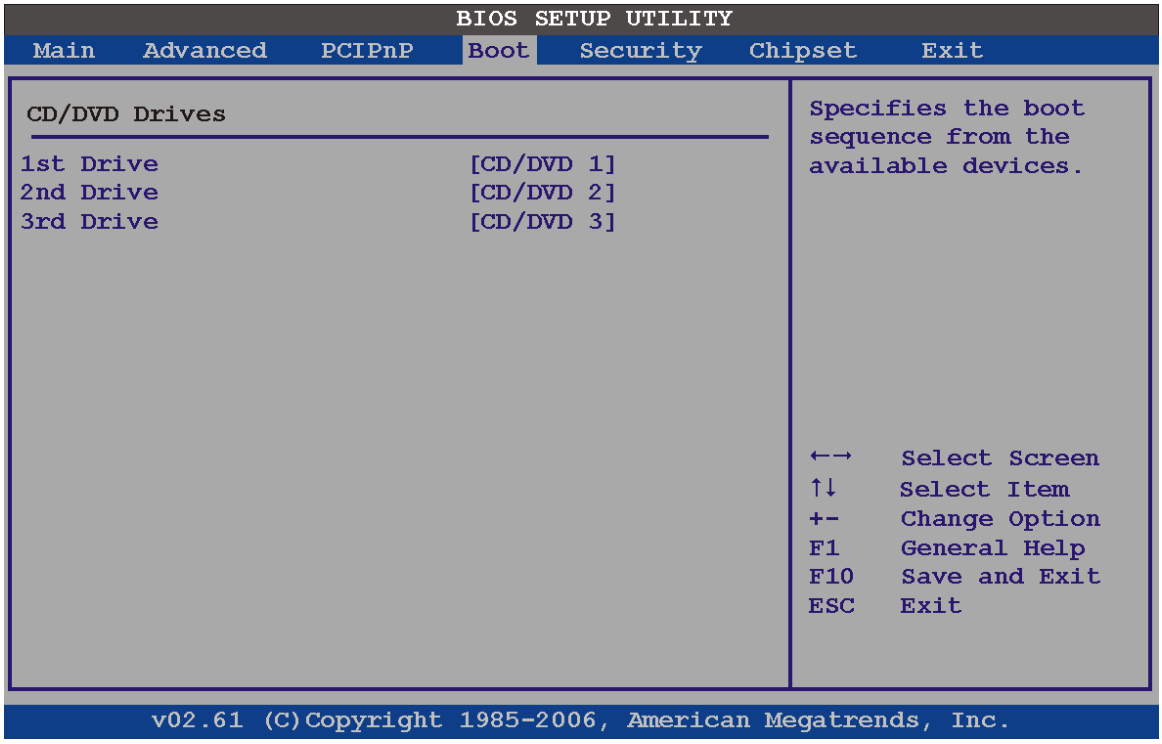
6.5.4 CD/DVD Drives

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

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

NOTE:

Only installed CD and DVD drives are shown in the list



BIOS Menu 23: CD/DVD Drives

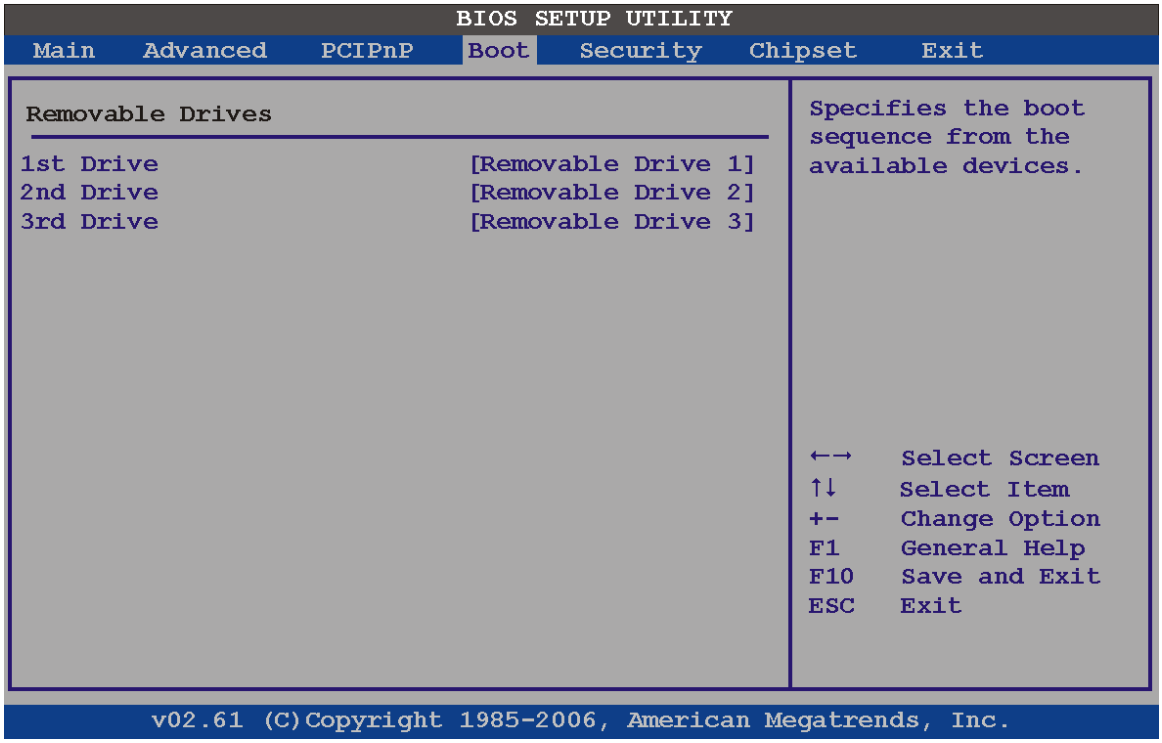
6.5.5 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 24**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive

NOTE:

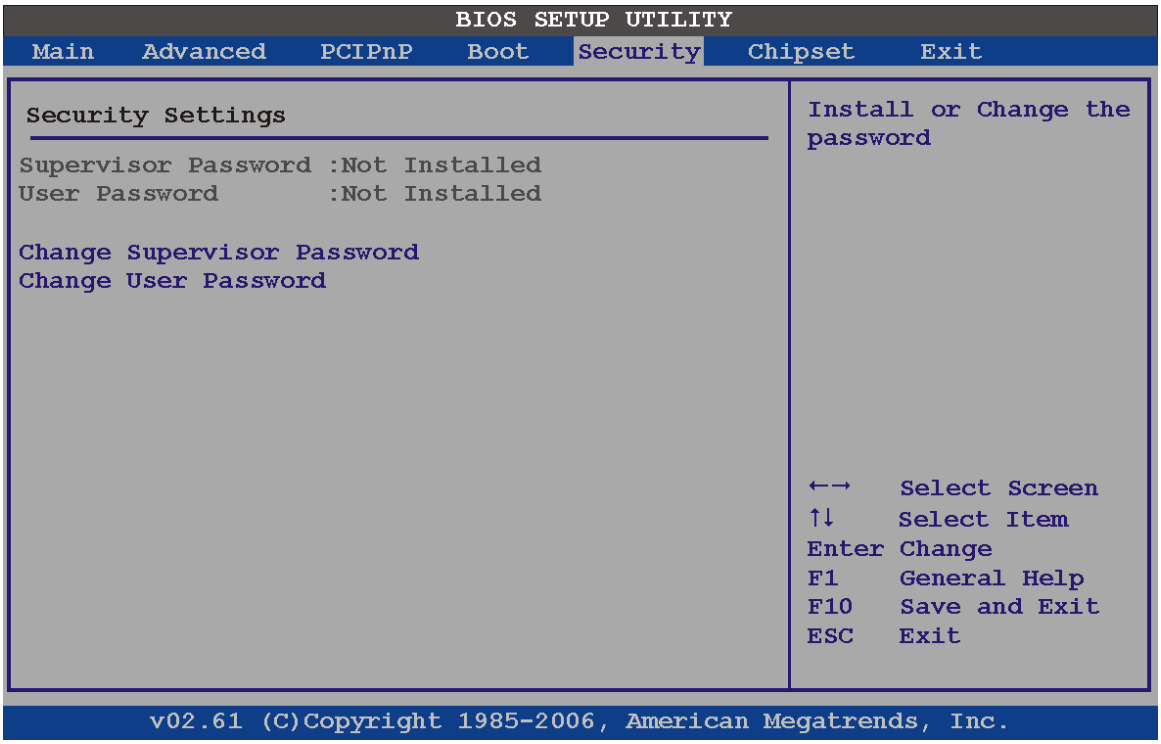
Only installed removable drives are shown in the list. This menu does not show if there are no removable drives.



BIOS Menu 24: Removable Drives

6.6 Security

Use the Security menu (**BIOS Menu 25**) to set system and user passwords.



BIOS Menu 25: 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**

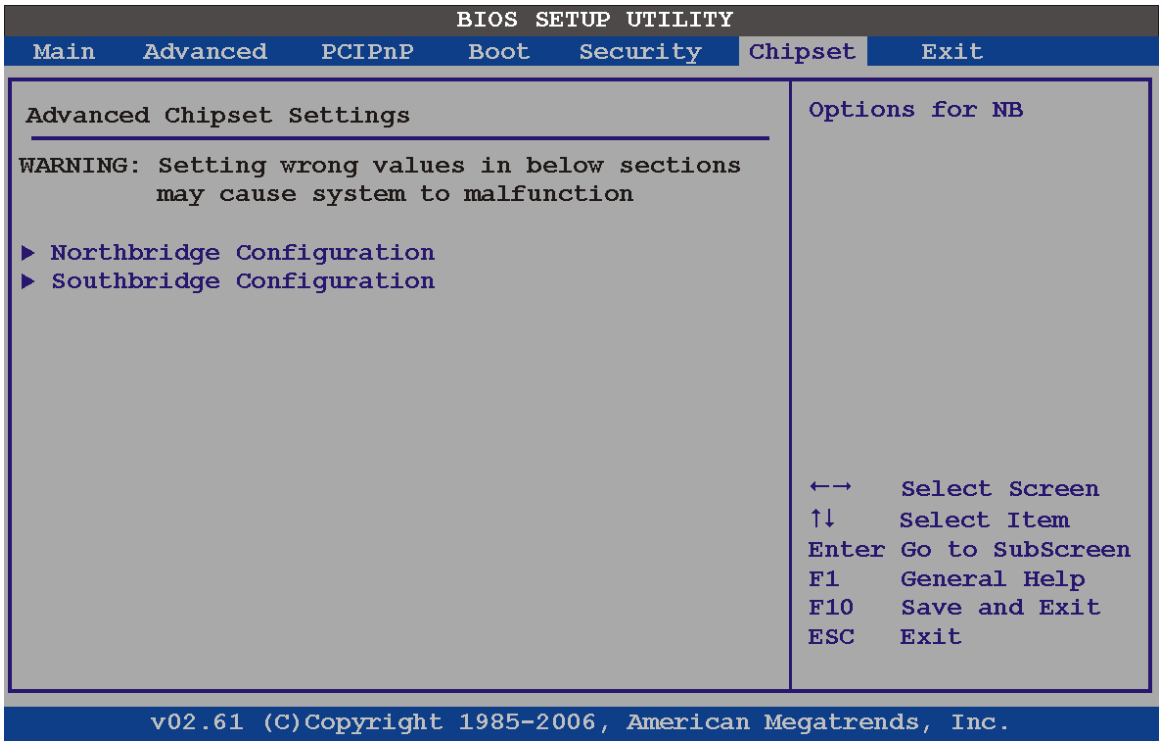
Use the **Change User Password** to set or change a user password. The default for this option is **Not Installed**. If a user password must be cleared, select this field and enter the password. After the password has been added, **Install** appears next to **Change User Password**.

6.7 Chipsets

Use the **Chipset** menu to access the Northbridge and Southbridge configuration menus

WARNING:

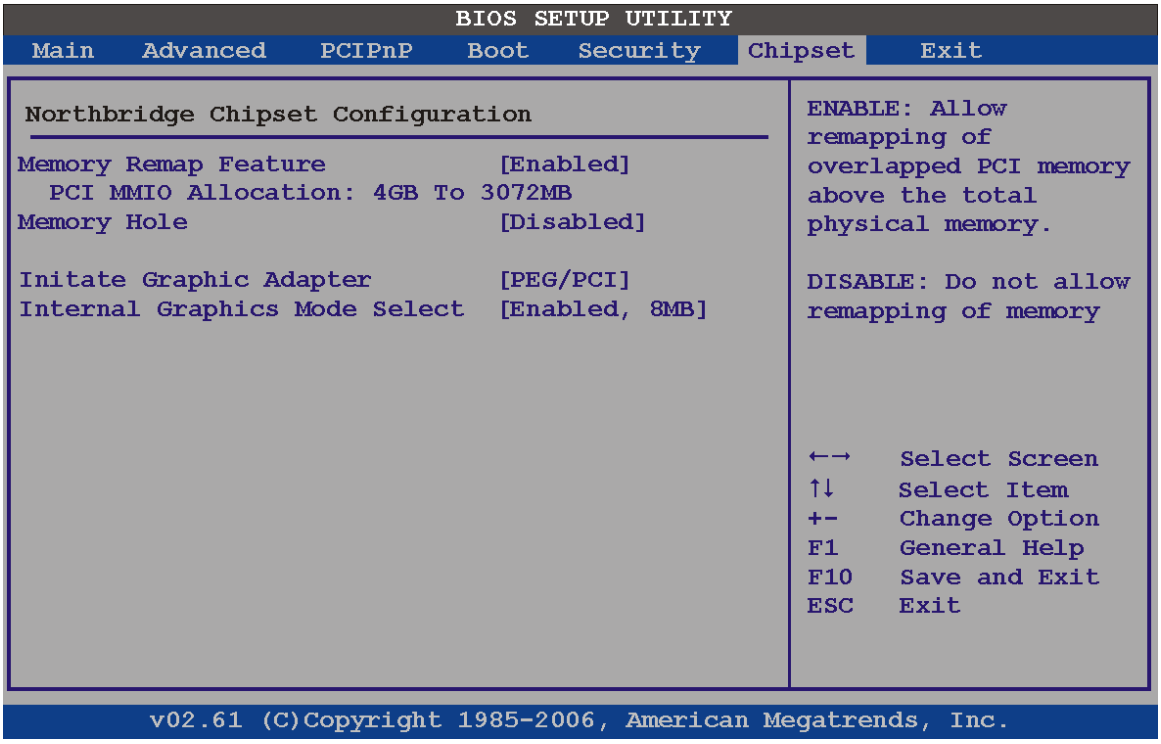
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 26: Chipset

6.7.1 Northbridge Chipset Configuration

Use the Northbridge Chipset Configuration menu (**BIOS Menu 27**) to configure the Northbridge chipset settings.



BIOS Menu 27:Northbridge Chipset Configuration

➔ **Memory Remap Feature [Enabled]**

Use the **Memory Remap Feature** option to allow the overlapped PCI memory above the total physical memory to be remapped. Enabling this option allows full use of 4 GB or more RAM in Windows VISTA, which reports only up to 3.12 GB when this feature is disabled.

➔	**Enabled**	**DEFAULT**	Overlapped PCI memory can be remapped
➔	**Disabled**		Overlapped PCI memory cannot be remapped

➔ **Memory Hole [Disabled]**

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

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

➔ **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
- PEG/IGD
- PEG/PCI **DEFAULT**
- PCI/PEG
- PCI/IGD

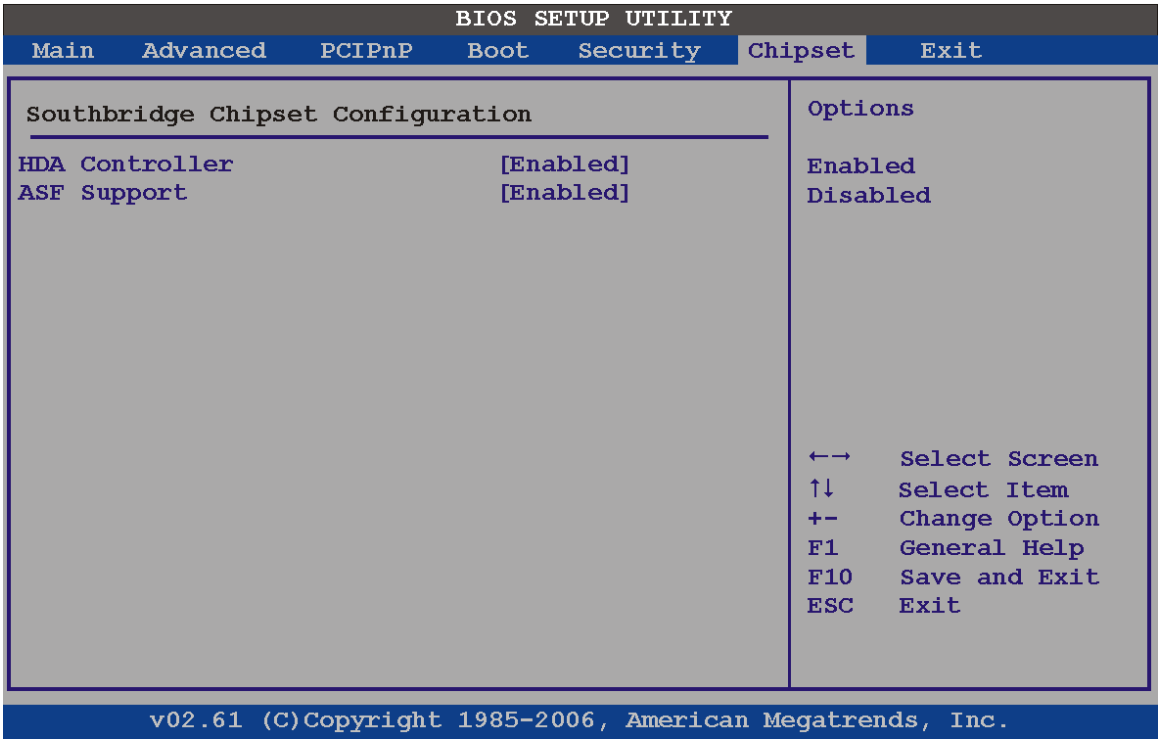
➔ **Internal Graphics Mode Select [Enable, 8 MB]**

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

➔ **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

6.7.2 Southbridge Chipset Configuration

Use the Southbridge Configuration menu (**BIOS Menu 28**) to configure the Southbridge chipset.



BIOS Menu 28:Southbridge Chipset Configuration

➔ **HDA Controller [Disabled]**

Use the **HDA Controller** option to enable the Southbridge high definition audio controller. If the optional AC-KIT-833HD has been connected to the system, or any other HDA device, this option should be enabled.

➔ **Disabled**	**DEFAULT**	Southbridge HDA controller is disabled
➔ **Enabled**		Southbridge HDA controller is enabled

➔ **ASF Support [Enabled]**

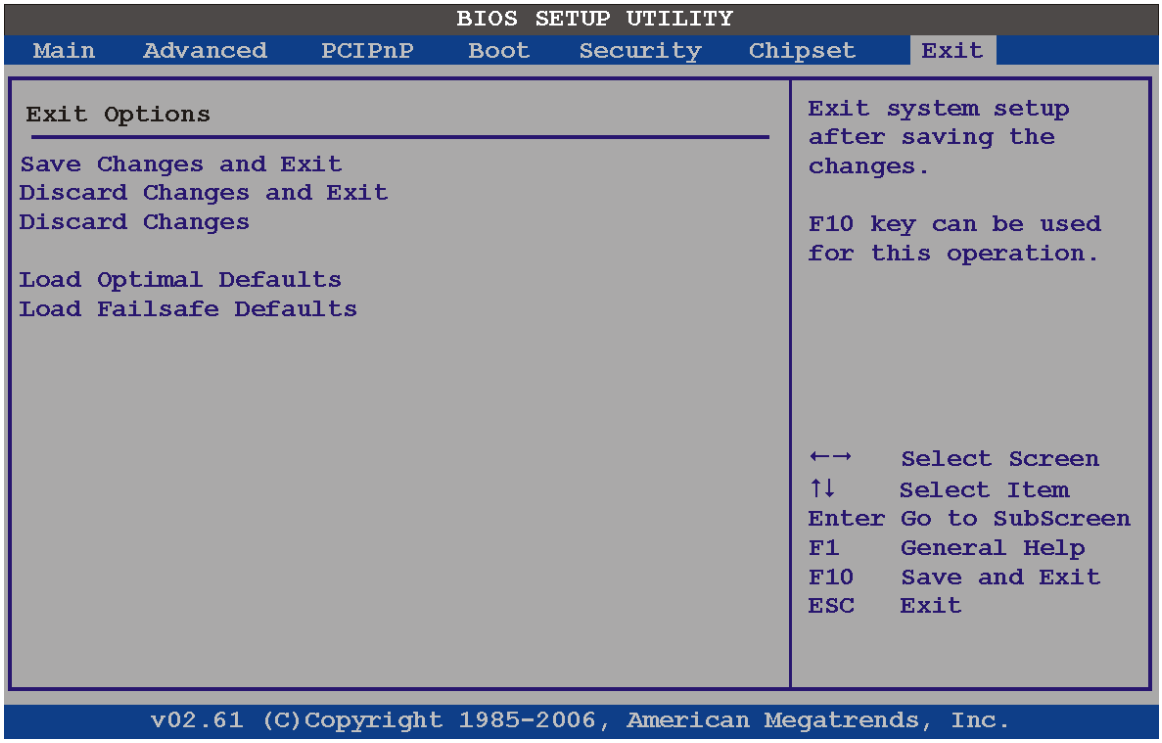
Use the **ASF Support** BIOS to allow remote management using ASF technology.

➔ **Disabled** The system will not communicate with a remote management server.

➔ **Enabled** **DEFAULT** The Alert Standard Format (ASF) controller is activated and can communicate with a remote management server.

6.8 Exit

Use the **Exit** menu (**BIOS Menu 29**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 29:Exit

➔ **Save Changes and Exit**

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

➔ **Discard Changes and Exit**

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

➔ **Discard Changes**

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

➔ **Load Optimal Defaults**

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

➔ **Load Failsafe Defaults**

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

Chapter

7

Software Drivers

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.

The following drivers can be installed on the system:

Installation instructions are given below.

7.2 Starting the Driver Program

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

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

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

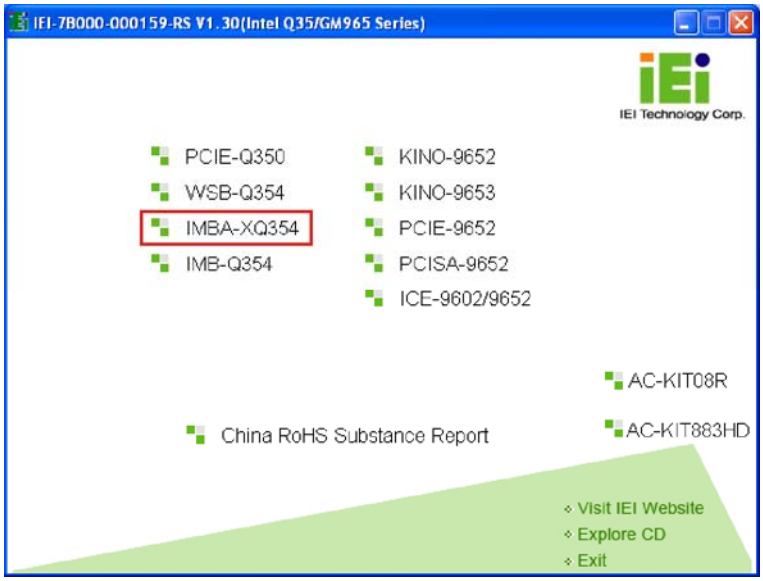


Figure 7-1: Start Up Screen

Step 3: Click **IMBA-XQ354**.

Step 4: The list of drivers in **Figure 7-2** appears.

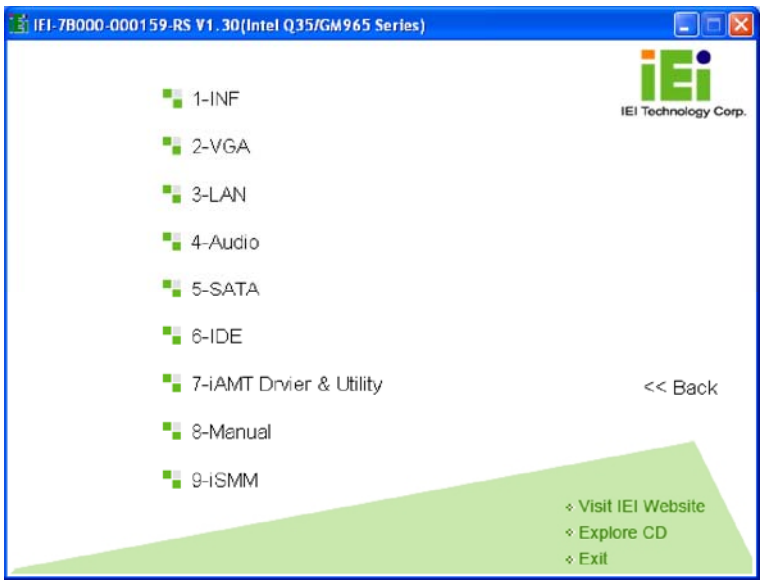


Figure 7-2: Drivers

7.3 Chipset Driver

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

Step 1: Click "**INF**" inm the drivers list.

Step 2: Browse to "**E:\1-INF\8.3.1.1009**", and double-click "**infinst_autol**" in **Figure 7-3**.

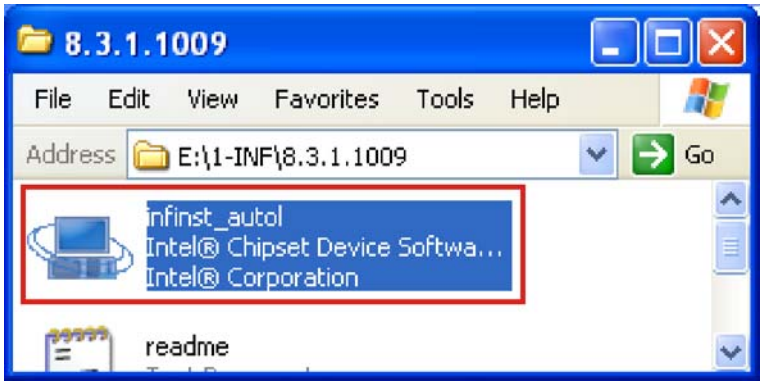


Figure 7-3: Intel® Chipset Driver Directory

Step 3: The Welcome screen appears (**Figure 7-4**).

Figure 7-4: Intel® Setup Welcome Screen

Step 4: Click **NEXT** to continue.

Step 5: The Intel® license agreement screen appears (**Figure 7-5**).

Figure 7-5: Intel® Chipset Driver License Agreement

Step 6: Click **YES** to accept the agreement and continue.

Step 7: The Readme file contents are displayed (**Figure 7-6**).

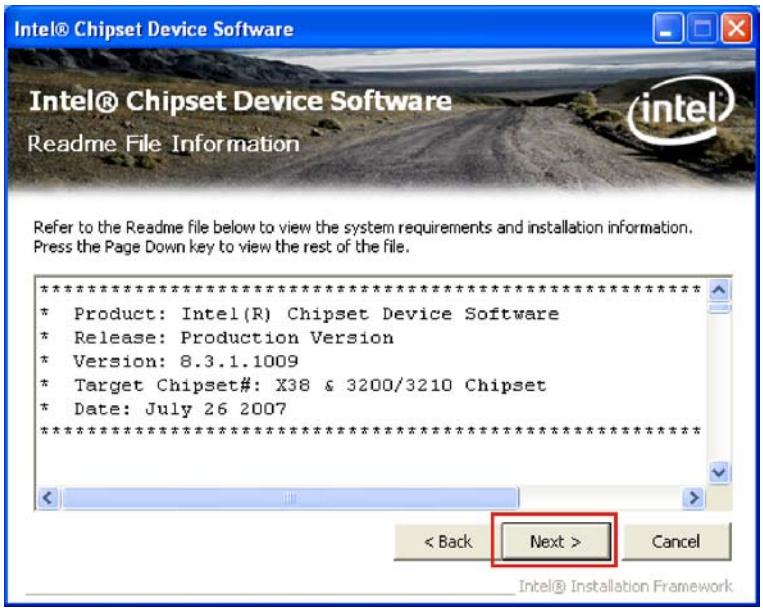


Figure 7-6: Readme File

Step 8: Click **NEXT** to begin the installation.

Step 9: When the setup is complete, the final screen appears (**Figure 7-7**).

Figure 7-7: Intel® Chipset Driver Complete Installation Screen

Step 10: To exit the installation, click **FINISH**.

7.4 Graphics Driver

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

Step 1: Click "**Graphics**" from the driver menu.

Step 2: Browse to the graphics driver folder ("**E:\2-VGA\WIN2K_XP\14.31.1.4864**" for Windows XP) (**Figure 7-8**).

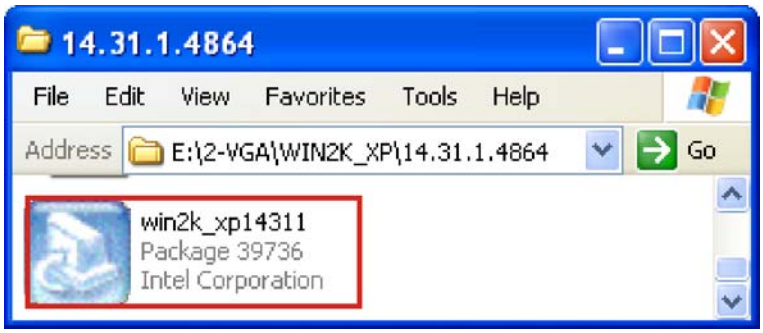


Figure 7-8: Graphics Driver File

Step 3: Double-click the driver file

Step 4: The version information file appears (**Figure 7-9**).

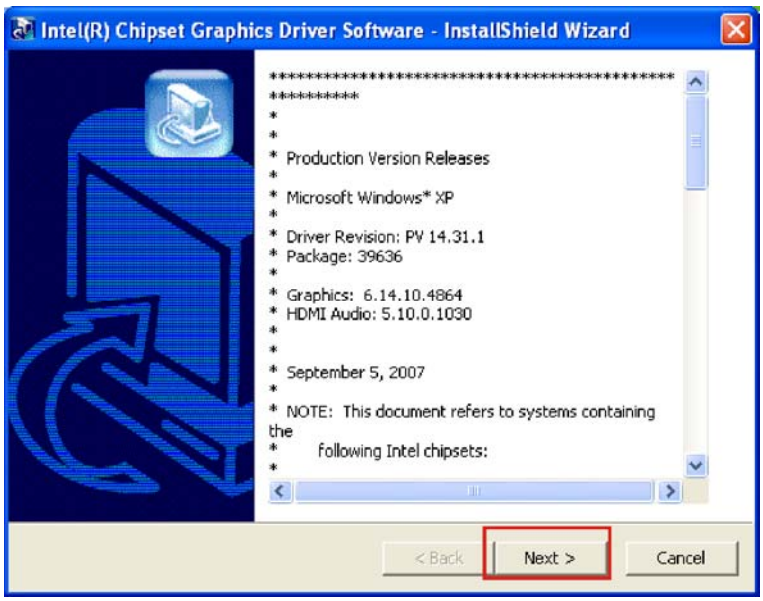


Figure 7-9: Graphics Driver Readme File

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

Step 6: The welcome screen appears (**Figure 7-10**).

Figure 7-10: Graphics Driver Installation Welcome Screen

Step 7: Click **NEXT** to continue.

Step 8: The license agreement appears (**Figure 7-11**).

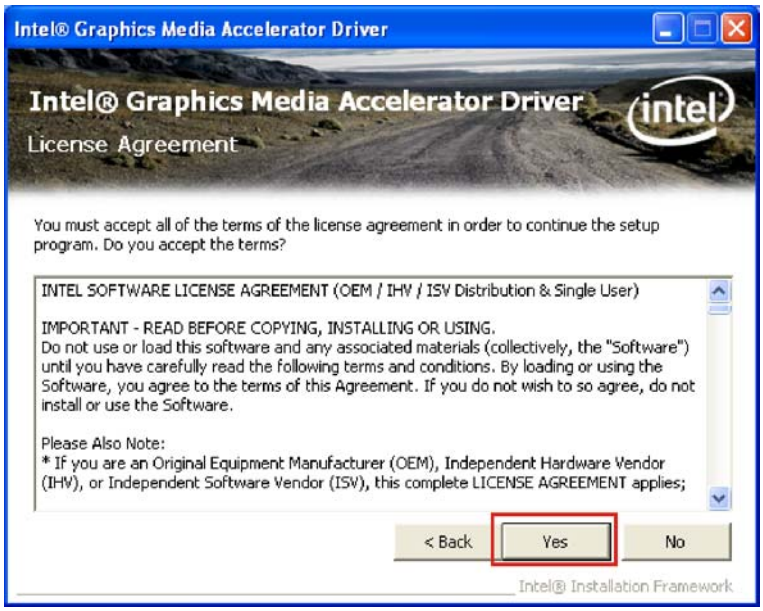


Figure 7-11: GMA Driver License Agreement

Step 9: Click **YES** to continue.

Step 10: The Readme file appears (**Figure 7-12**).

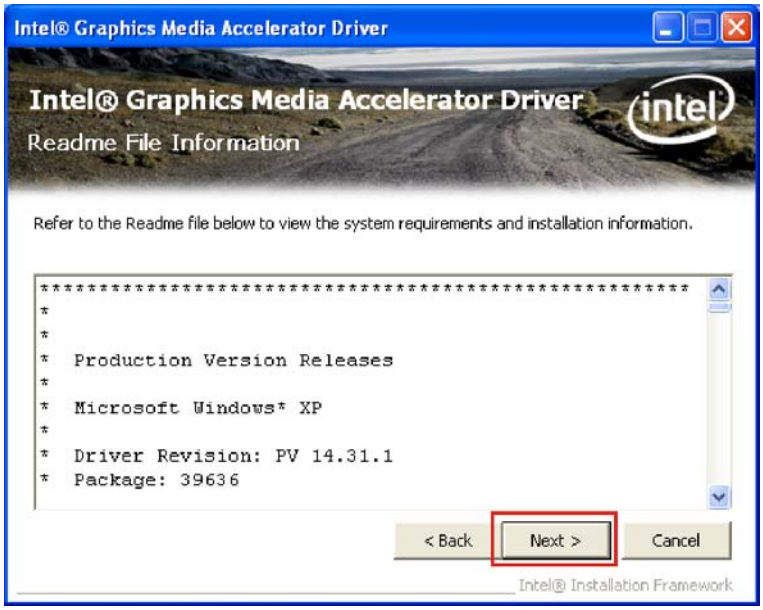


Figure 7-12: GMA Driver Installing Notice

Step 11: Click **NEXT** to continue.

Step 12: The driver installation progress is shown (**Figure 7-13**).

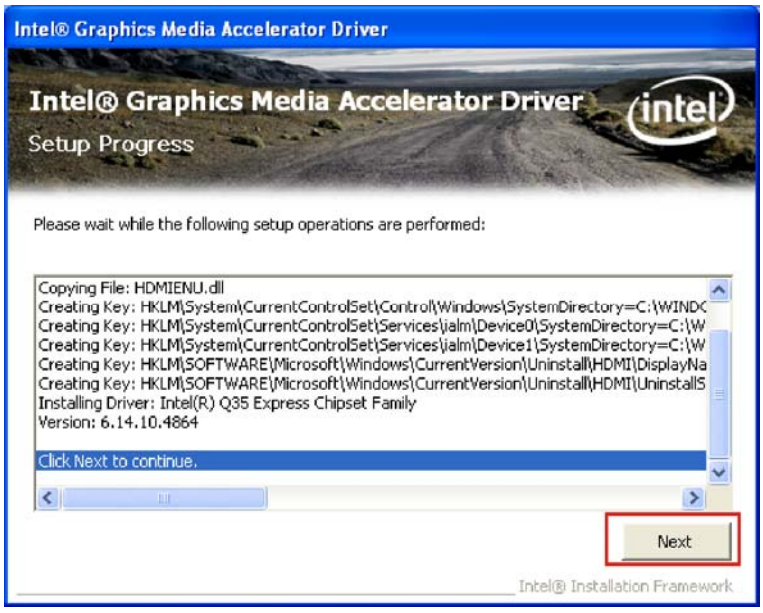


Figure 7-13: GMA Driver Installation Complete

Step 13: Click **NEXT** to continue to the final screen.

Figure 7-14: GMA Driver Installing Notice

Step 14: For newly installed drivers to take effect, the computer must be restarted. Select "**Yes**" to restart the computer now (close any other programs first), or "**No**" to restart it later. Click **FINISH** to complete the installation.

7.5 LAN Driver

To install the LAN drivers, please follow the steps below.

Step 1: Click "**LAN**" in the driver menu.

Step 2: Browse to the LAN driver directory ("**E:\3-LAN\Intel\Intel 82566DM, MM\WIN_2KXP\32bit\12**" for Windows XP (**Figure 7-15**).

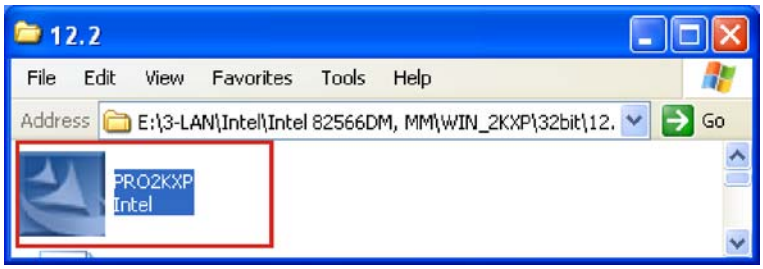


Figure 7-15: LAN Driver File

Step 3: Double click **PRO2KXP** icon.

Step 4: The welcome screen appears (**Figure 7-16**).

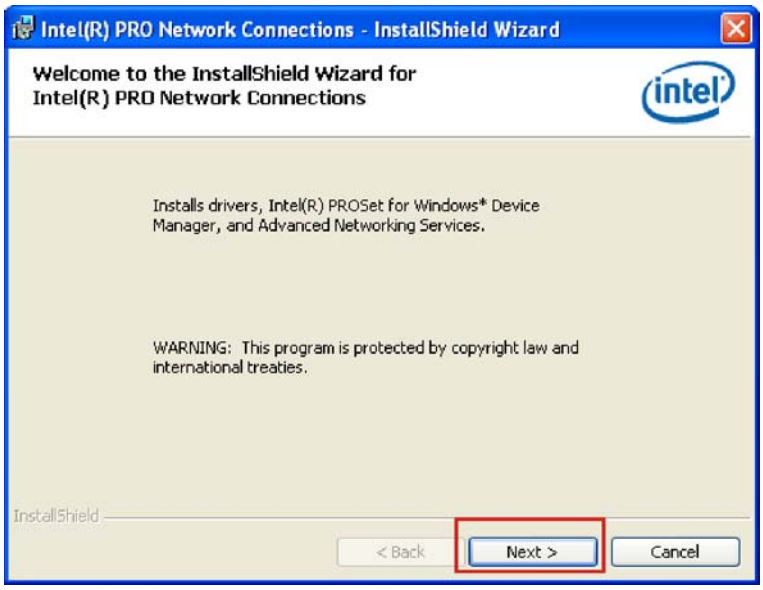


Figure 7-16: LAN Driver Welcome Screen

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

Step 6: The license agreement appears (**Figure 7-17**).

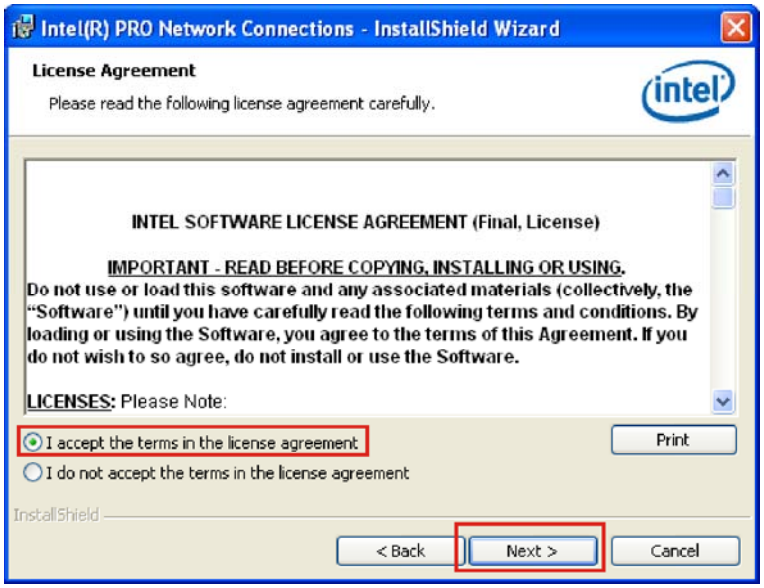


Figure 7-17: LAN Driver License Agreement

Step 7: Accept the conditions of the license agreement and click **NEXT** to continue.

Step 8: The Setup Options screen appears (**Figure 7-18**).

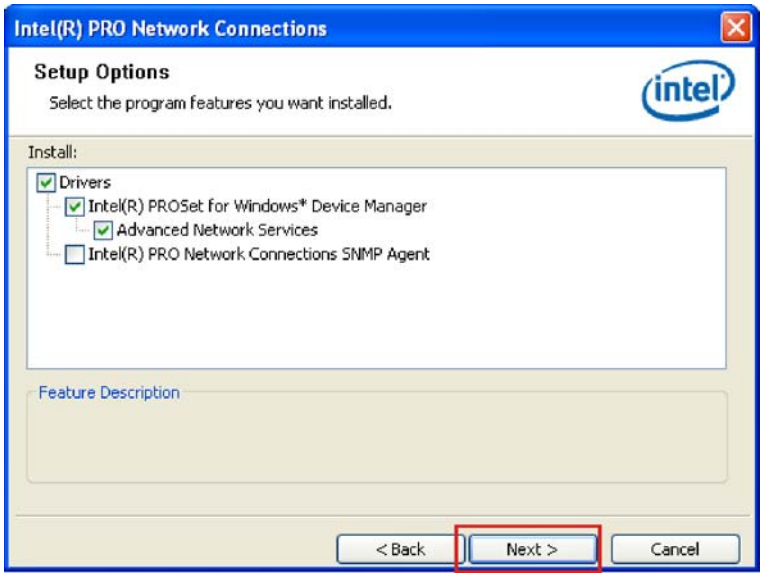


Figure 7-18: LAN Driver Setup Options

Step 9: Select the setup options (default recommended) and click **NEXT** to continue.

Step 10: The drivers are ready to install. Click **INSTALL** to begin the installation process (**Figure 7-19**).

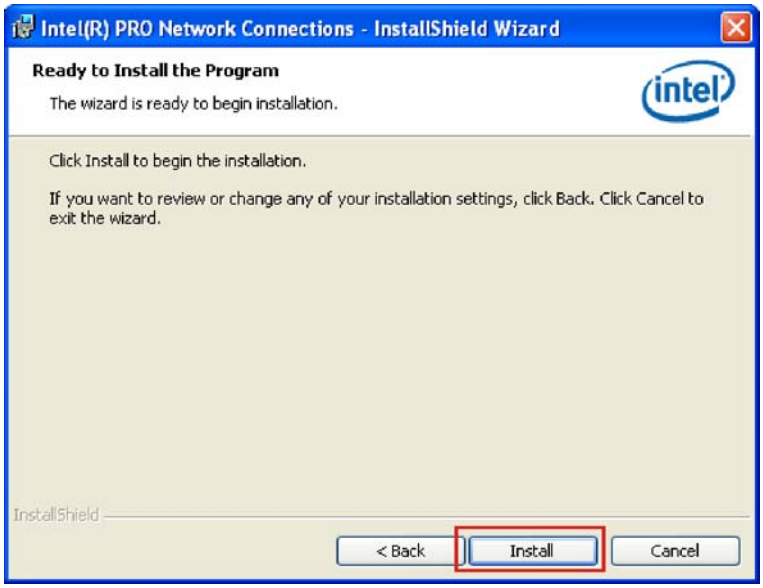


Figure 7-19: LAN Driver Installation Ready Window

Step 11: Click **INSTALL** to begin the driver installation.

Step 12: The window shows the installation is complete (**Figure 7-20**).

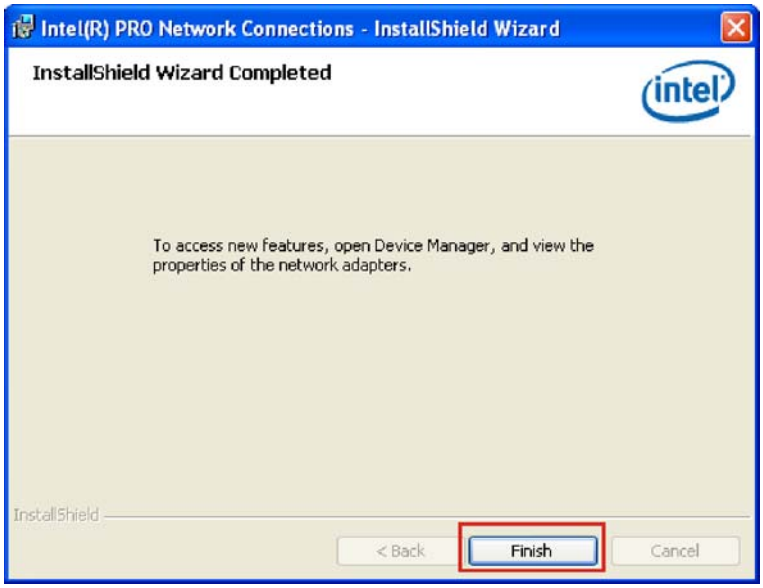


Figure 7-20: LAN Driver Installation Progress

Step 13: Click **FINISH** to exit the setup program.

7.6 Audio Driver

To install the Realtek High Definition (HD) Audio driver, please follow the steps below.

NOTE:

This driver only needs to be installed if an external audio kit with a RealTek ALC883 codec is installed.

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. Enable the High Definition Audio controller.

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 main menu.

Step 2: Browse to the audio setup file directory (**Figure 7-21**).

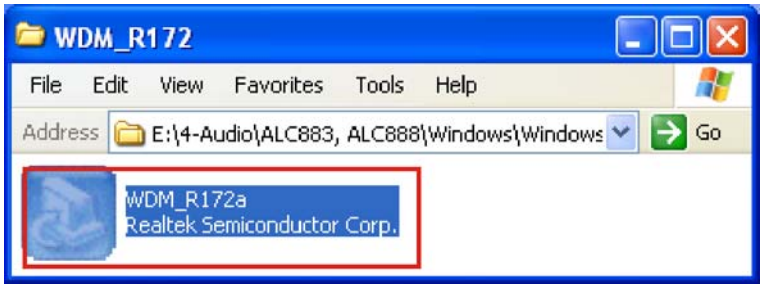


Figure 7-21: Audio Setup File

Step 3: The audio driver InstallShield wizard begins (**Figure 7-22**).

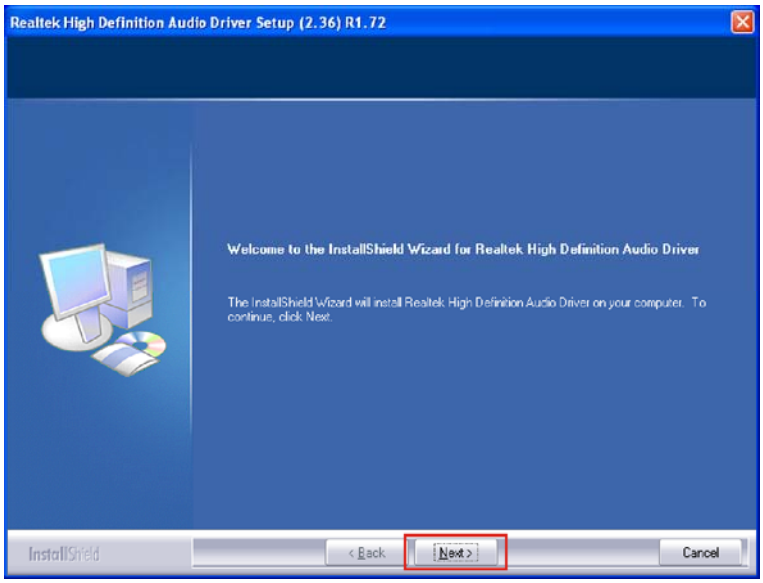


Figure 7-22: InstallShield Wizard Welcome Screen

Step 4: Click **NEXT** to continue the installation.

Step 5: Don't click on any screens until the final screen appears (**Figure 7-23**).

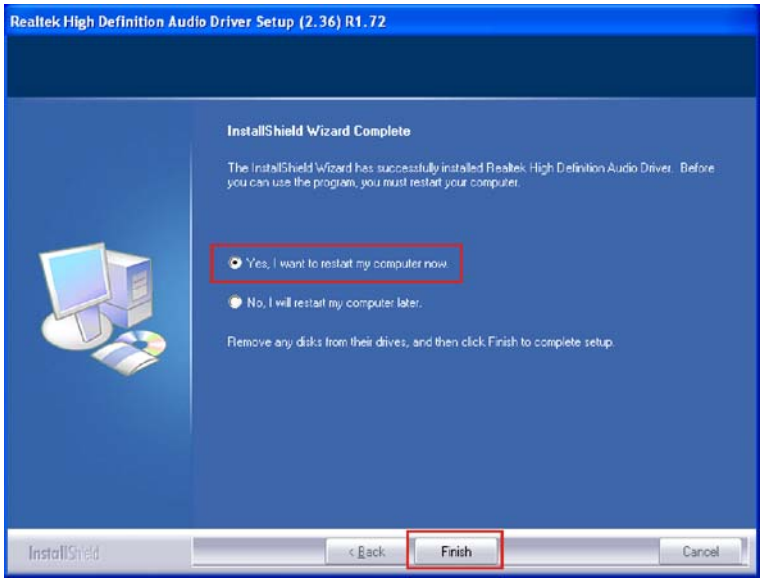


Figure 7-23: Installation Wizard Finished

Step 6: For the audio drivers to take effect, the computer must be restarted. Select "Yes" to restart the computer immediately after exiting the wizard, or "No" to restart it later. Click **FINISH** to exit the InstallShield Wizard.

7.7 Intel® Matrix Storage Manager Driver

To install the Intel® Matrix Storage Manager driver, please follow the steps below:

Step 1: Select **SATA**.

Step 2: A new window opens (**Figure 7-24**).

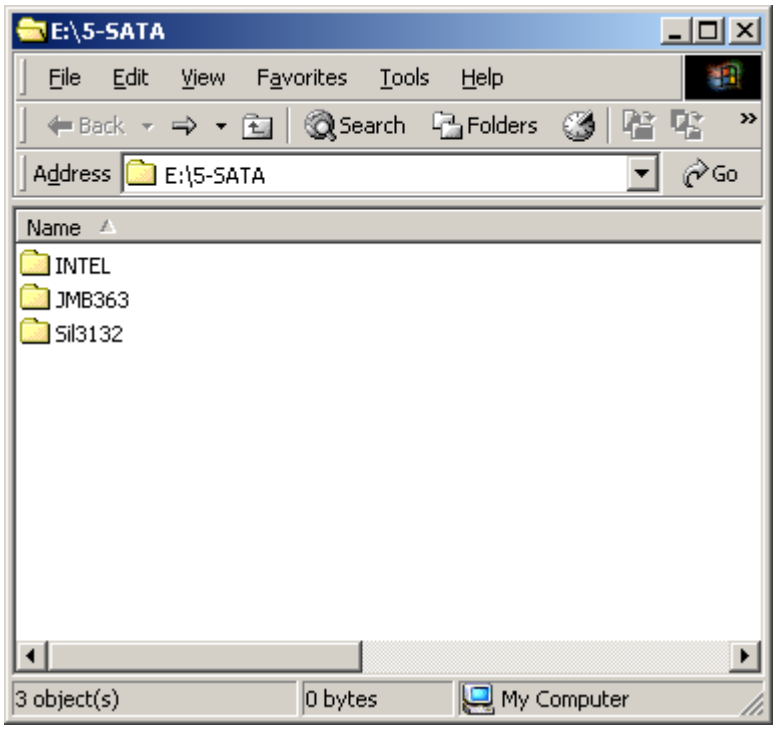


Figure 7-24: SATA RAID Driver Installation Program

Step 3: Double-click the **INTEL®** folder.

Step 4: Double-click the **iata62_cd.exe** program icon in **Figure 7-25**.

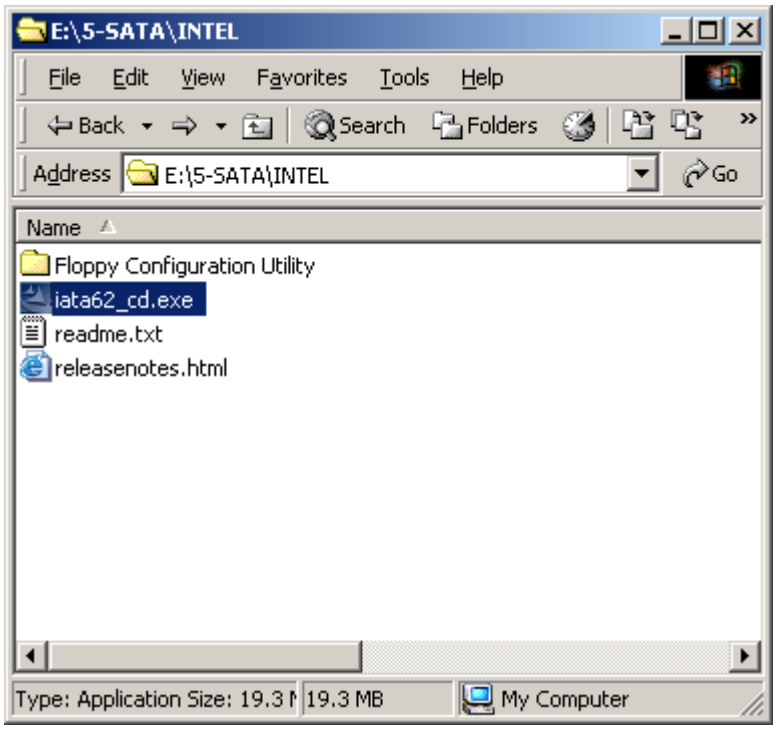


Figure 7-25: SATA RAID Setup Program Icon

Step 5: **Figure 7-26** shows the InstallShield Wizard preparing to guide the user through the rest of the process.

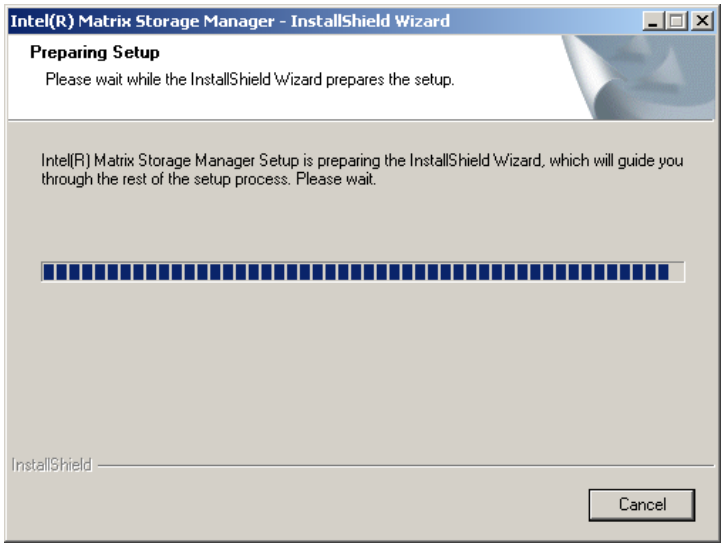


Figure 7-26: InstallShield Wizard Setup Screen

Step 6: **Figure 7-27** shows the Matrix Storage Manager software configuring the installation process.

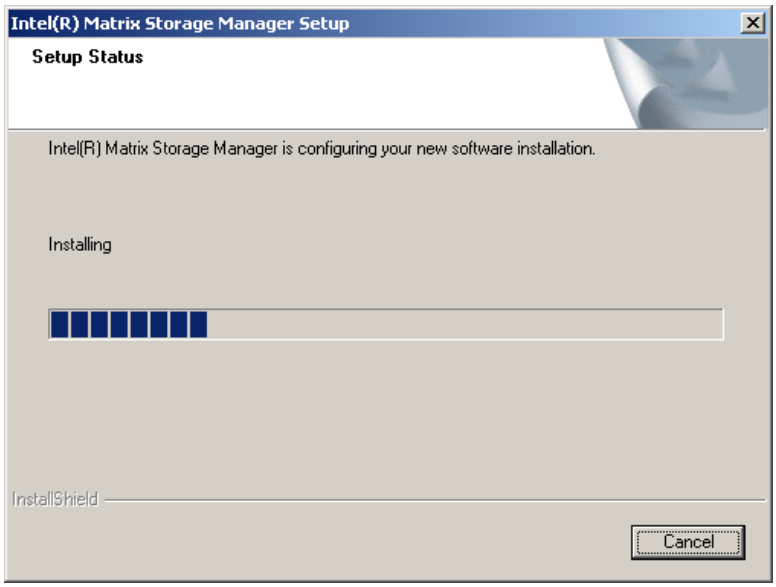


Figure 7-27: Matrix Storage Manager Setup Screen

Step 7: **Figure 7-28** shows the Matrix Storage Manager welcome screen.

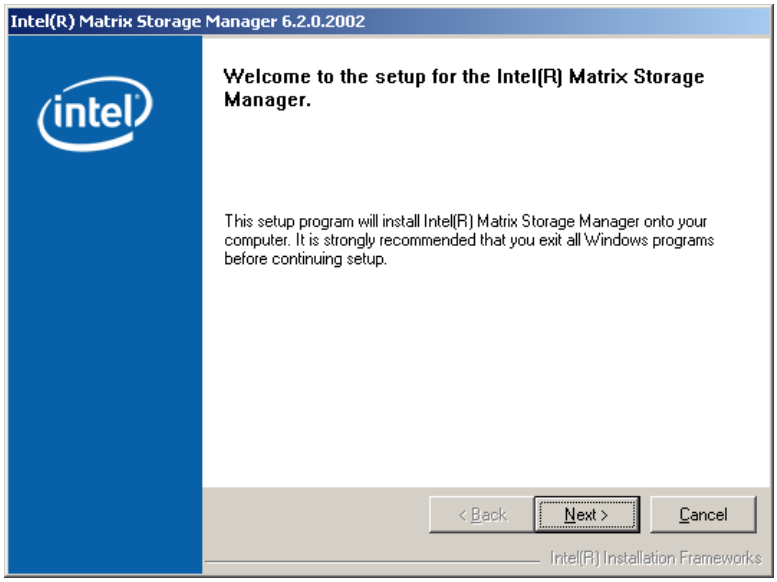


Figure 7-28: Matrix Storage Manager Welcome Screen

Step 8: Click **NEXT** and a warning appears (**Figure 7-29**). Read the warning carefully and decide whether or not to continue the installation process.

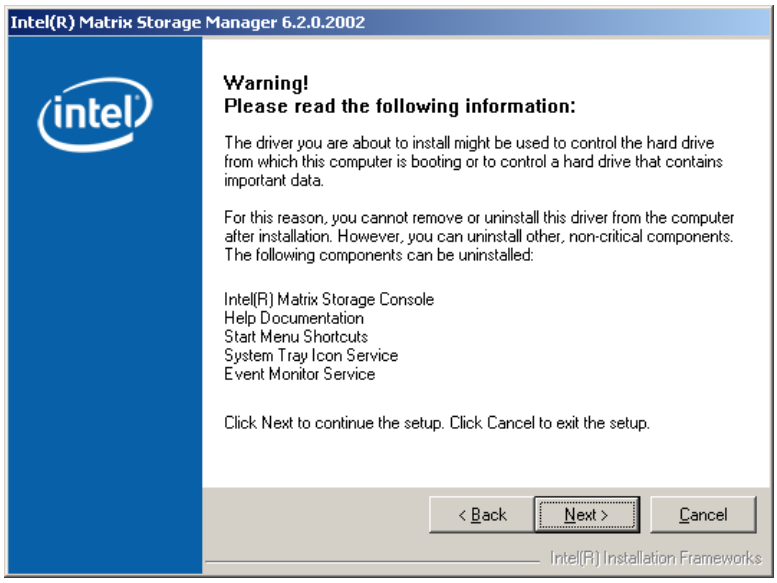


Figure 7-29: Matrix Storage Manager Warning Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-30**).

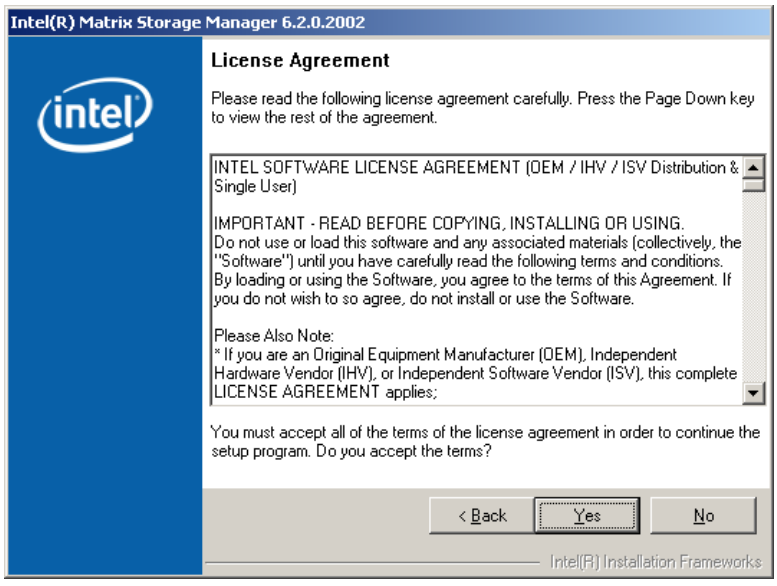


Figure 7-30: Matrix Storage Manager License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the Readme information file shown in **Figure 7-31** appears.

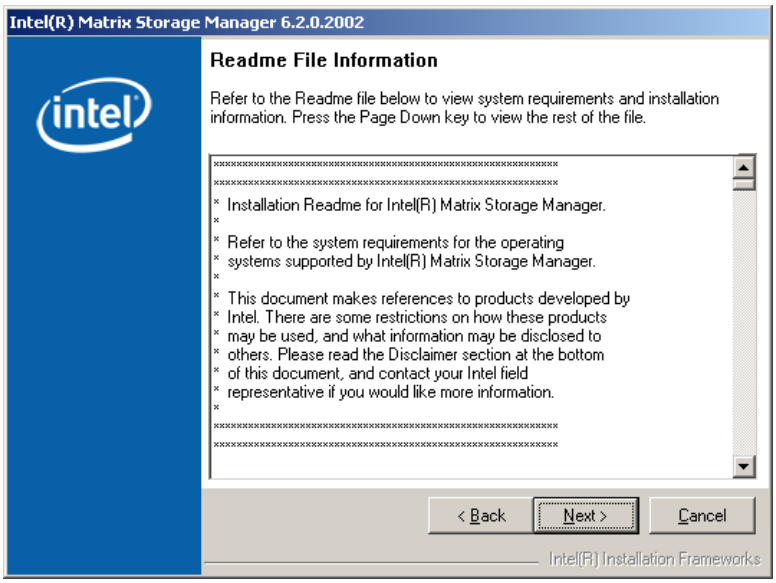


Figure 7-31: Matrix Storage Manager Readme File

Step 11: Read the Readme file information and click **NEXT**.

Step 12: After the driver installation process is complete, a confirmation screen appears (**Figure 7-32**).

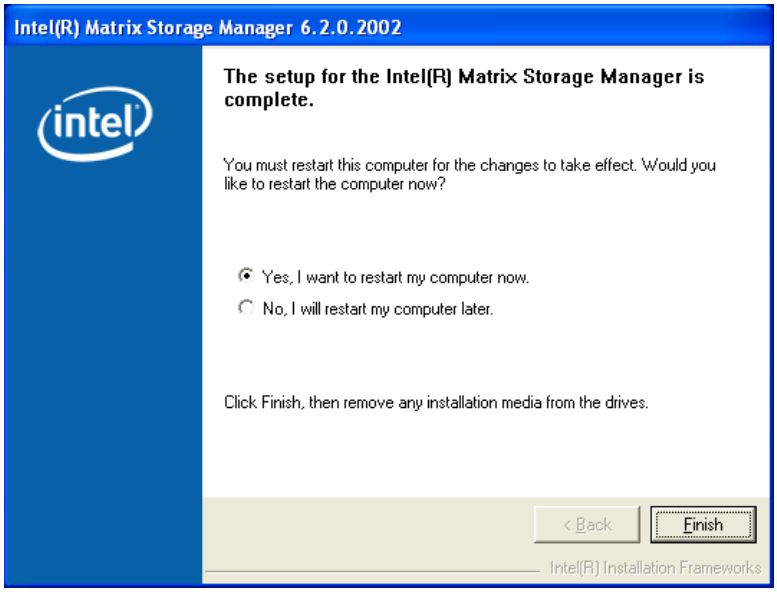


Figure 7-32: Matrix Storage Manager Setup Complete

Step 13: 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 exit the wizard.

7.8 Intel® AMT (HECI) Driver

The Intel® AMT HECI drivers are a software interface between the operating system and the AMT subsystem. All communications between the OS and AMT is accomplished through the HECI interface. For more information on Intel® AMT, please visit http://www.intel.com/technology/platform-technology/intel-amt/. To install the Intel® AMT HECI drivers, please follow the steps below:

Step 1: Select "**iAMT and Utilities**" from the drivers menu.

Step 2: Browse to the "**HECI**" folder (**Figure 7-33**).

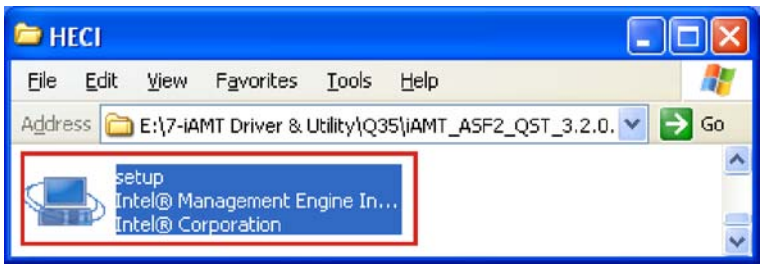


Figure 7-33: AMT HECI Driver Directory

Step 3: Double-click the setup file (**Figure 7-34**).

Step 4: The welcome screen appears (**Figure 7-34**).

Figure 7-34: AMT HECI Welcome Screen

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

Step 6: The License Agreement appears (**Figure 7-35**).

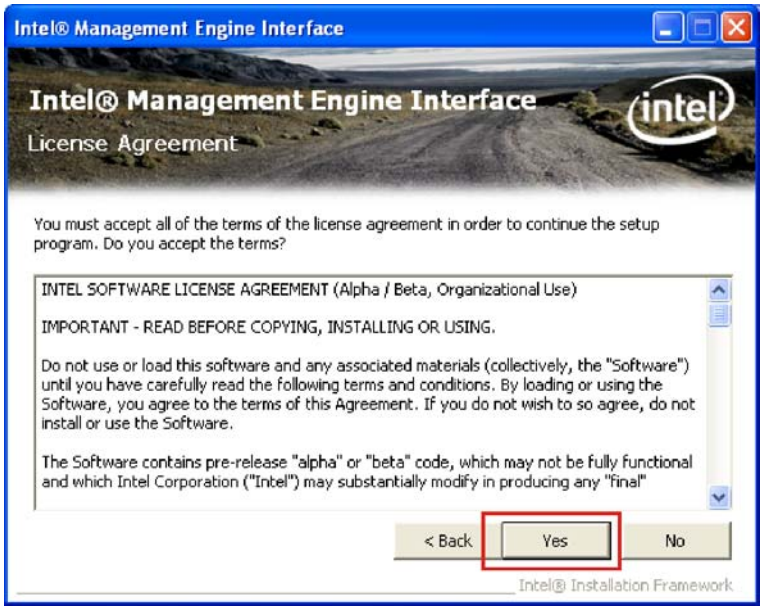


Figure 7-35: AMT HECI License Agreement

Step 7: Click **YES** to agree to the terms of the agreement and continue installation.

Step 8: The IAMT Readme file appears (**Figure 7-36**).

Figure 7-36: AMT HECI Driver Readme File

Step 9: Click **NEXT** to continue.

Step 10: Driver setup is complete.

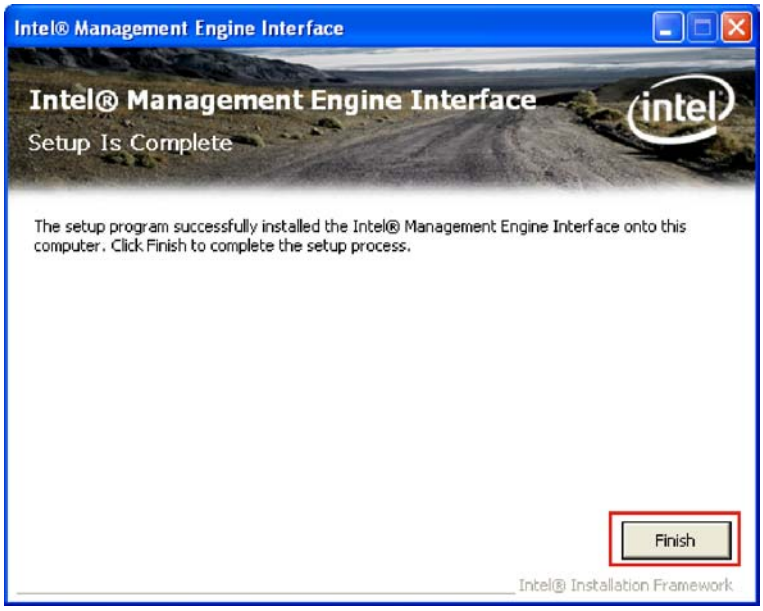


Figure 7-37: AMT HECI Driver Installation Complete

Step 11: Click **FINISH** to exit the InstallShield wizard.

7.9 Intel® AMT (SOL) Driver

The Intel® AMT Serial Over LAN (SOL) drivers allow remote management of the system through a serial port device redirected through the LAN interface. For more information on Intel® AMT, please visit http://www.intel.com/technology/platform-technology/intel-amt/. To set up SOL, please follow the steps below:

Step 1: Select "**iAMT and Utilities**" from the drivers menu.

Step 2: Browse to the "**HECI**" folder (**Figure 7-38**).

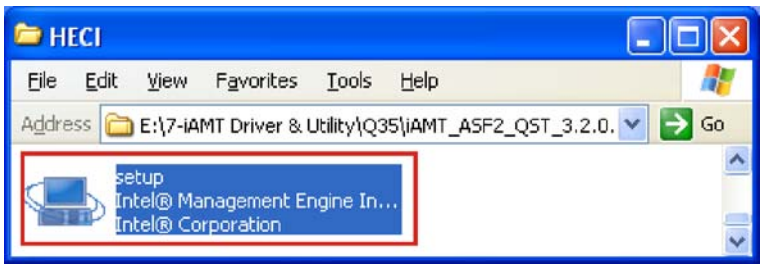


Figure 7-38: IAMT Driver Directory

Step 3: The welcome screen appears (**Figure 7-39**).

Figure 7-39: IAMT Welcome Screen

Step 4: Click **NEXT** to continue.

Step 5: The License Agreement appears (**Figure 7-40**).

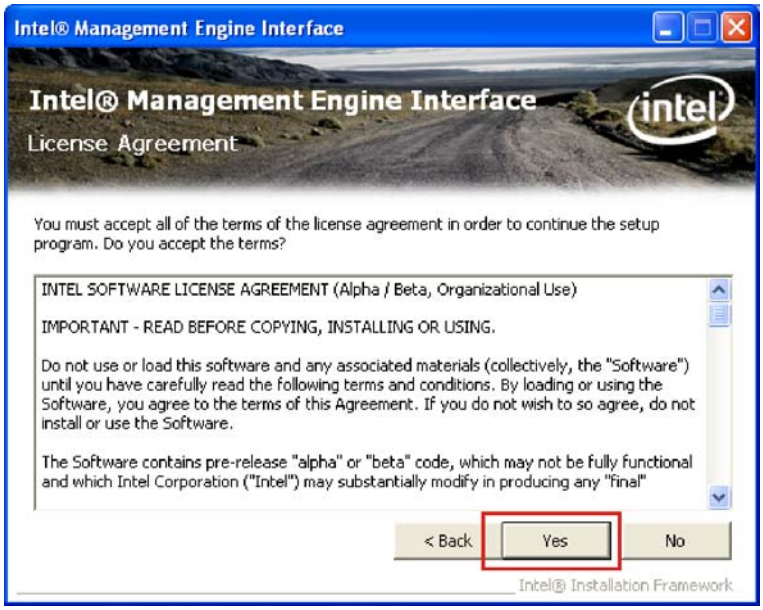


Figure 7-40: IAMT License Agreement

Step 6: Click **YES** to agree to the terms of the agreement and continue the installation.

Step 7: The IAMT Readme file appears (**Figure 7-41**).

Figure 7-41: IAMT Readme File

Step 8: Click **NEXT** to continue.

Step 9: The final installation screen appears (**Figure 7-42**).

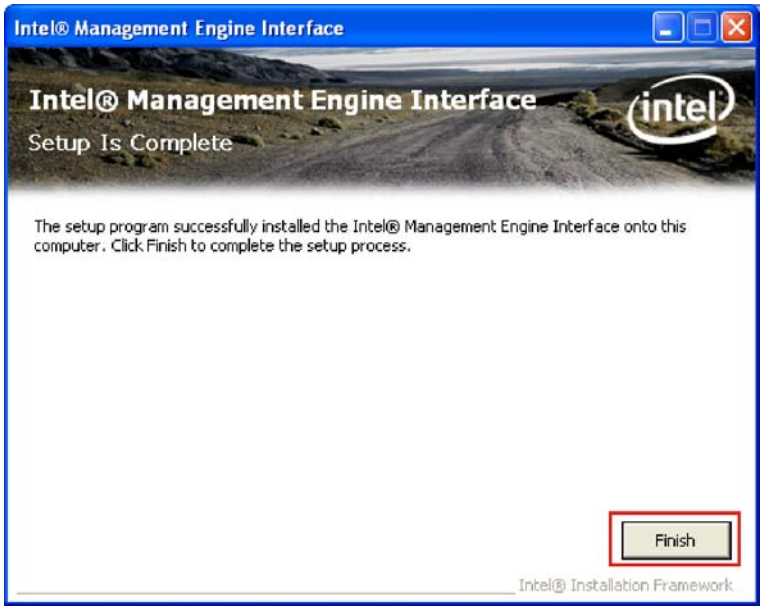


Figure 7-42: Completed Installation

Step 10: Click **FINISH** to complete the IAMT installation.

Chapter

8

Intel® AMT Setup

8.1 Intel® AMT Setup Procedure

The IMBA-XQ354is featured with the Intel® Active Management Technology (AMT) 3.0. To enable the Intel® AMT function, follow the steps below.

Step 1: Make sure the **DIMM1** socket is installed with one DDR2 DIMM.

Step 2: Connect an Ethernet cable to the RJ-45 connector labeled **LAN2_USB23**.

Step 3: The AMI BIOS options regarding the Intel® ME or Intel® AMT must be enabled, including:

- Intel® AMT Configuration [Advanced]
- ME Subsystem Configuration [Advanced]
- Configure the Intel® Management Engine BIOS extension (MEBx) (see **Section 108.2** below)

Step 4: Properly install the Intel® AMT drives. Make sure to install both HECI and LMS_SOL drivers from the iAMT Driver & Utility directory in the driver CD (see **Section 107.8**).

Step 5: The following dialog window is displayed after the OS is loaded to show the Intel® AMT status on the IMBA-XQ354 is enabled.

Figure 8-1: Intel® Active Management Technology Status Dialog

8.2 Intel® Management Engine BIOS Extension

This section describes the essential steps for using the Intel® Management Engine BIOS extension (MEBx).

Step 1: A screen prompts the user to press <Ctrl+P> after a single beep during boot-up process. To get into the Intel® MEBx settings, press <**Ctrl+P**>.

Step 2: Enter the Intel® current ME password as required (**Figure 8-2**). Enter the factory default ME password: **Abab12!@** (the Intel® default password is **admin**).

NOTE:

The default Intel® ME password is "admin". When the BIOS is cleared, the password will reset to "admin".

Figure 8-2: Intel® Current ME Password

Step 3: To change the password, select **Change Intel® ME Password**. Enter a new password following the strong password rule (containing at least one upper case letter, one lower case letter, one digit and one special character, and be at least eight characters). (**Figure 8-3**)

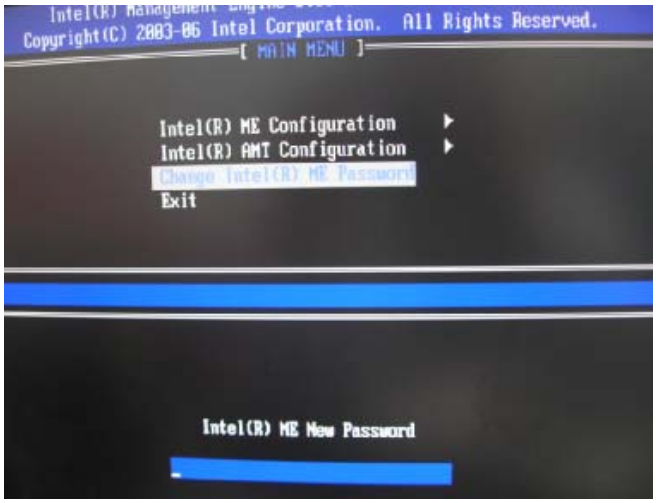


Figure 8-3: Change Intel® ME Password

Step 4: Verify the new password by entering again (**Figure 8-4**).

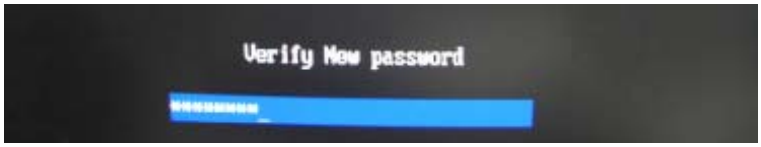


Figure 8-4: Verify New Password

Step 5: Select Intel® AMT Configuration and press Enter (**Figure 8-5**).

Figure 8-5: Intel® AMT Configuration

Step 6: Select Provision Model and press Enter. (**Figure 8-6**)

Figure 8-6: Provision Model

Step 7: When the screen in **Figure 8-7** prompts, enter N and press Enter.

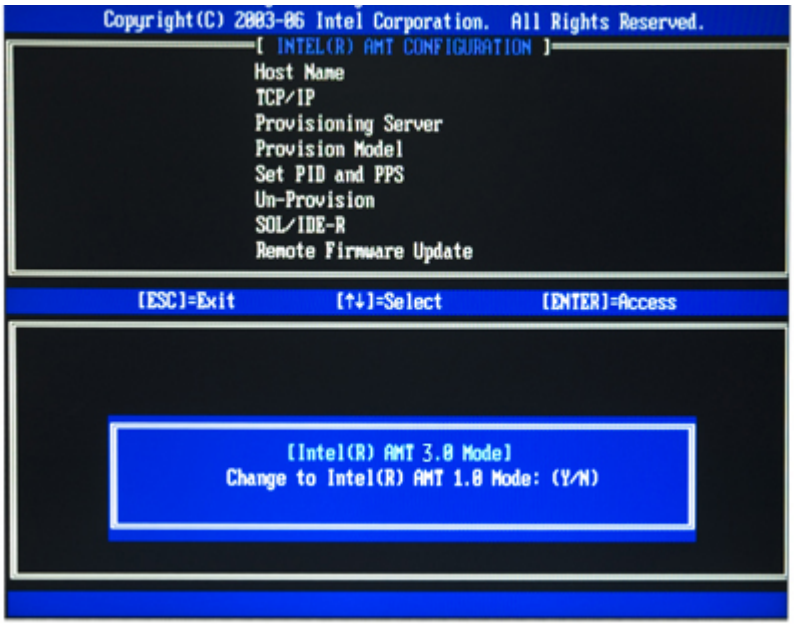


Figure 8-7: Intel® AMT 3.0 Mode

Step 8: A message prompts to confirm to Change to Small Business (**Figure 8-8**). Enter **Y** and press **Enter**.

Figure 8-8: Enterprise

Step 9: Select TCP/IP (in Intel AMT Configuration) and press **Enter**. A message prompts for disabling network interface. Enter **N** to enable network interface.

Figure 8-9: Enable Network Interface

Step 10: Enable or disable DHCP. DHCP is enabled by default. If DHCP is disabled, enter the following TCP/IP settings:

- Static TCP/IP address (the static TCP/IP address and Intel® AMI Host Name must be different from those configured in the operating system)
- Subnet mask
- Default Gateway address (optional)
- Preferred Domain Naming Services (DNS) serer address (optional)
- Alternate DNS server address (optional)
- Domain name (optional)

Step 11: Make other necessary settings in the Intel® MEBx depending on users' need.

Step 12: To exit the Intel® MEBx, return to the main menu and select **Exit**. (**Figure 8-10**)

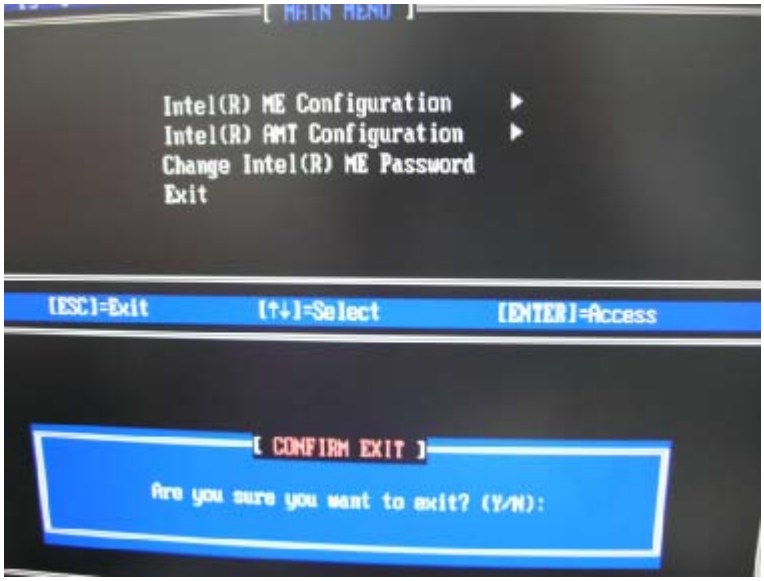


Figure 8-10: Exit

8.3 Using the Intel® AMT Web Interface

NOTE:

Prior to use the Intel® AMT web interface, please make sure the Intel® AMT drivers are properly installed in the IMBA-XQ354and the Intel® AMT enabled confirmation dialog window displays after boot-up.

To access an Intel® AMT client system from a remote console, follow the steps below.

Step 1: Obtain the IP address of the client system.

Step 2: On the remote management console, open a web browser.

Step 3: If DHCP is enabled in the TCP/IP menu of the Intel® ME BIOS (**Section 108.2**, **Step 10**), get the client system IP address in the MS DOS. Enter the client system IP address and the port number in the web browser:

http://*ip_address*:16992 Example: http://192.168.1.7:16992 (**Figure 8-11**)

Or simply enter the defined host name: http://*host_name*:16992

Example: http://AMTsystem:16992

Figure 8-11: Intel® AMT Web Address

Step 4: If a static IP address is defined for the Intel® AMT client system, enter the defined client system IP address and the port number in the web browser.

Step 5: A login window prompts (**Figure 8-12**).

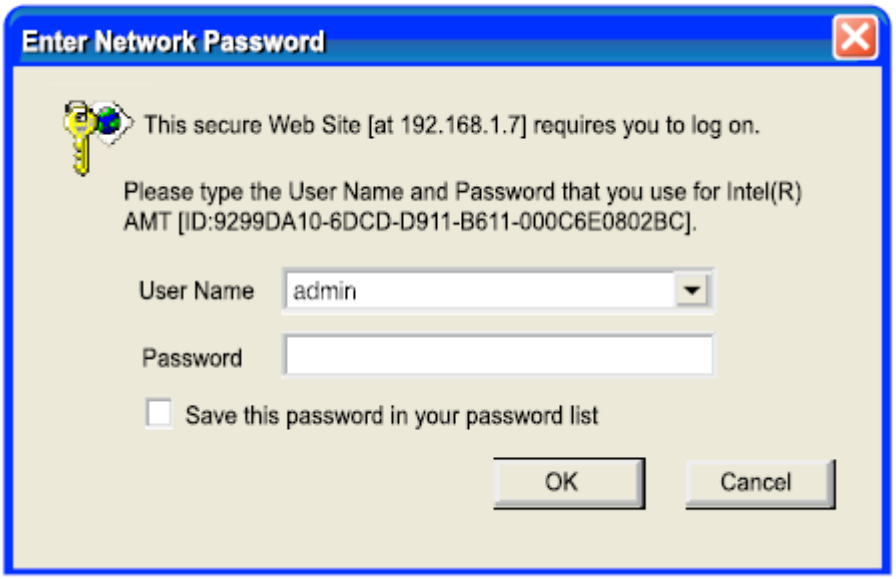


Figure 8-12: Intel® AMT Web Login Dialog

Step 6: Enter admin as the user name (**Figure 8-12**).

Step 7: Enter the password changed in the Intel® MEBx configuration. The default password is **Abab12!@**

Step 8: Press **OK** and the Intel® AMT web interface appears (**Figure 8-13**).

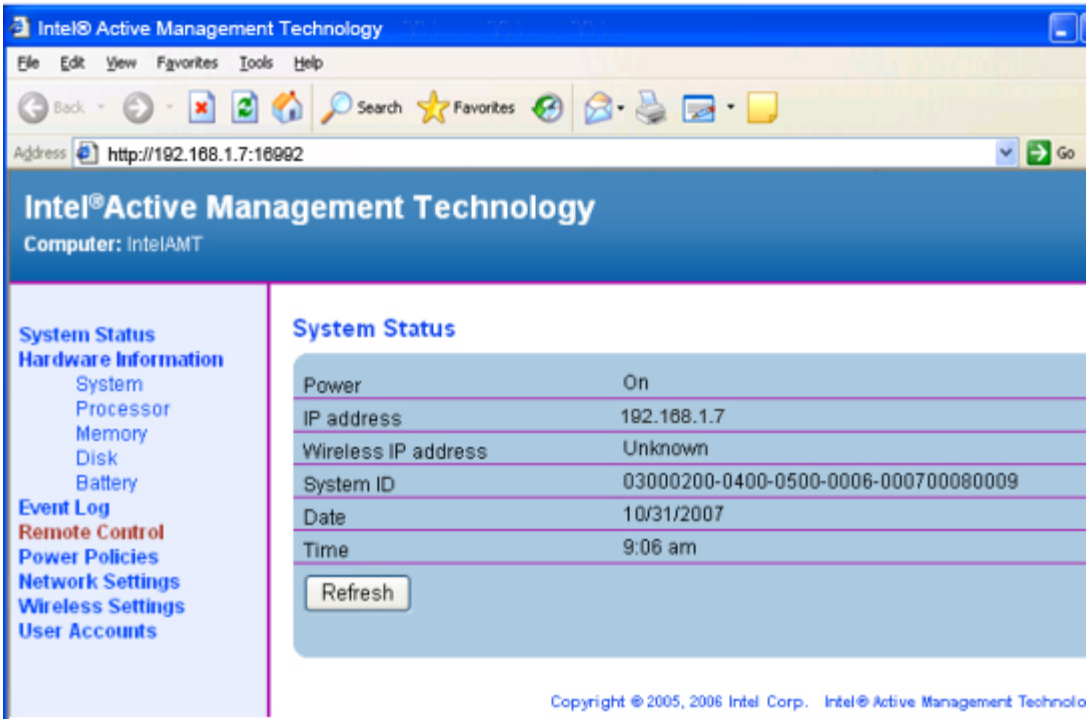


Figure 8-13: Intel® AMT Web Interface

NOTE:

To enhance the platform manageability of theIMBA-XQ354, work with the Independent Software Vendors (ISV) to implement the Intel® AMT management utility on the system.

Appendix

A

BIOS Options

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

Appendix

B

Terminology

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

DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MB/s and 16.6 MB/s.
EIST	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
FSB	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
GbE	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gb/s and complies with the IEEE 802.3-2005 standard.
GPIO	General purpose input
HDD	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
ICH	The Input/Ouput Controll Hub (ICH) is an Intel® Southbridge chipset.
IrDA	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
L1 Cache	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
L2 Cache	The Level 2 Cache (L2 Cache) is an external processor memory cache.

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

Appendix

C

Digital I/O Interface

C.1 Introduction

The DIO connector 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 Digital I/O port pins and their pin numbers are listed in the table below.

Pin	Description	Super I/O Pin No	Super I/O Pin Description
1	Ground	N/A	N/A
2	VCC	N/A	N/A
3	Output 3	20	GP27
4	Output 2	21	GP26
5	Output 1	22	GP25
6	Output 0	23	GP24
7	Input 3	24	GP23
8	Input 2	25	GP22
9	Input 1	26	GP21
10	Input 0	27	GP20

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)

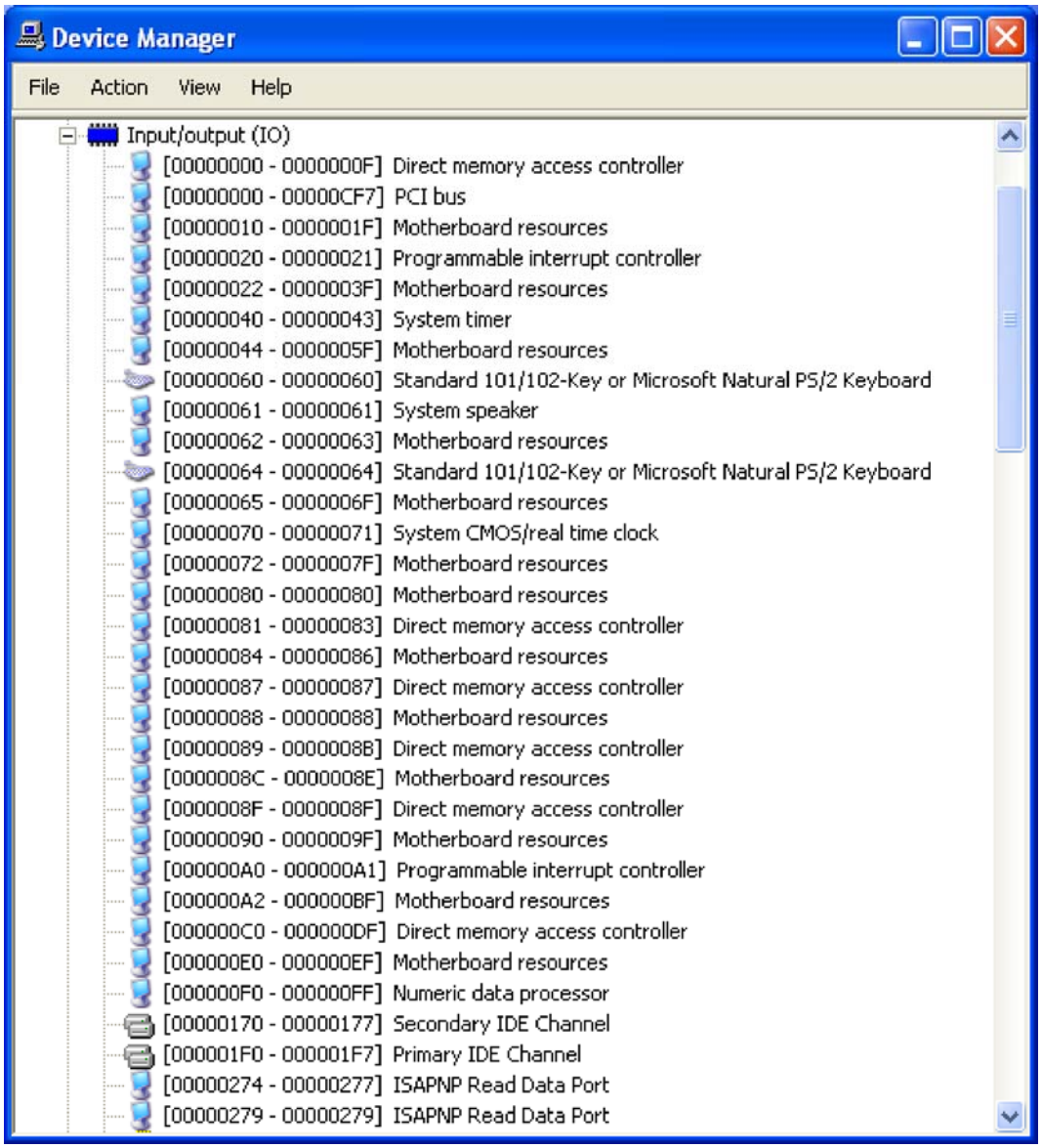


Figure E-2: Input/Output (IO) (1 of 2)

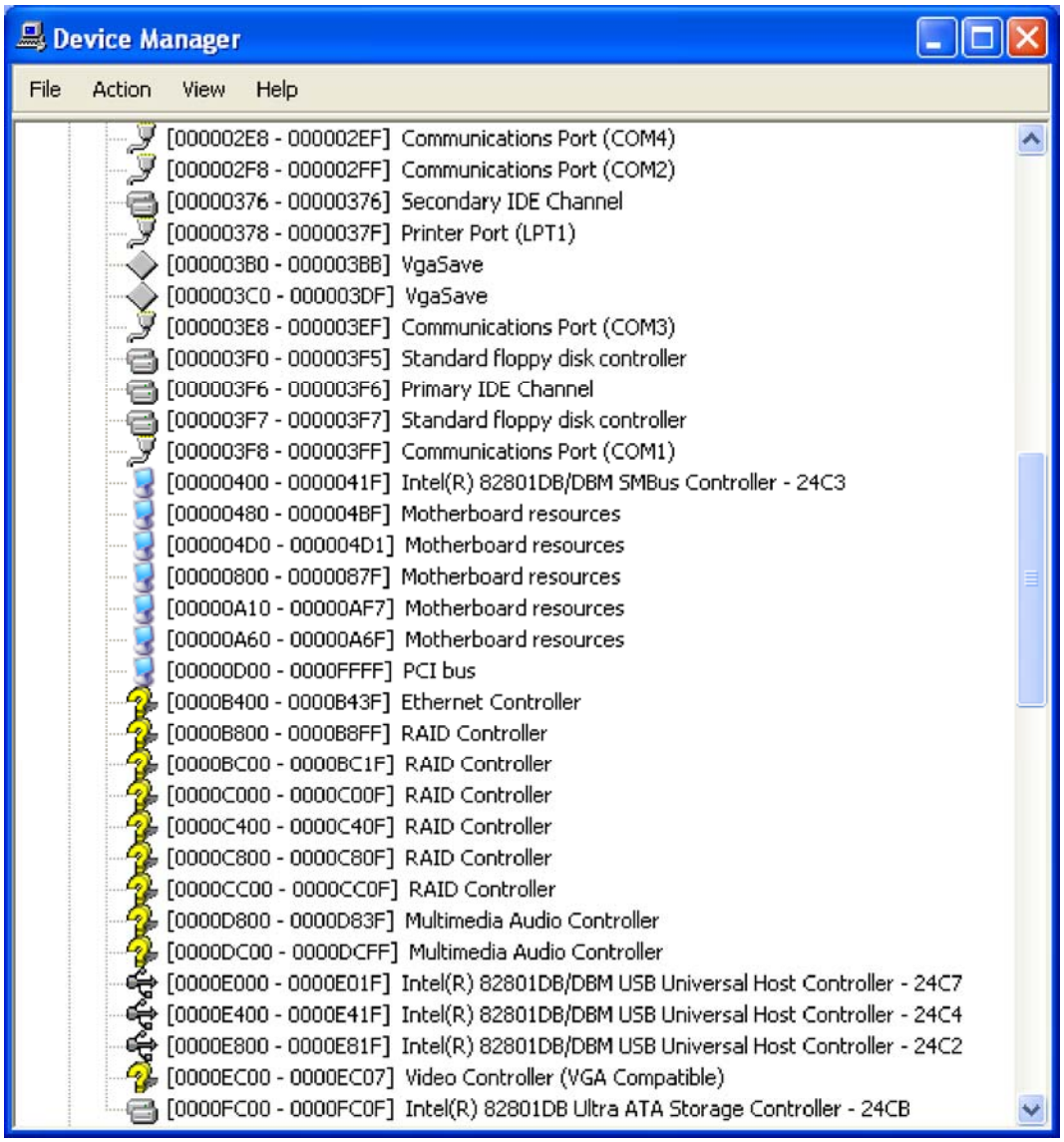


Figure E-3: Input/Output (IO) (2 of 2)

E.3 Interrupt Request (IRQ)

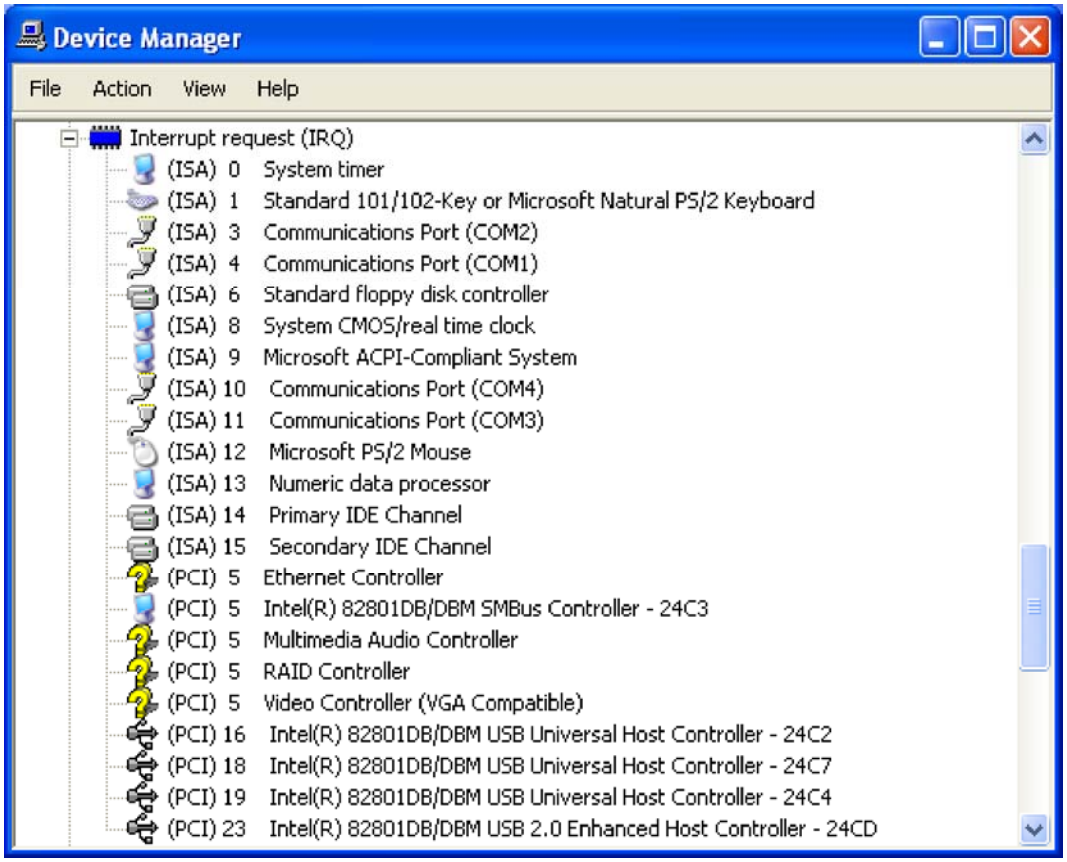


Figure E-4: Interrupt Request (IRQ)

E.4 Memory

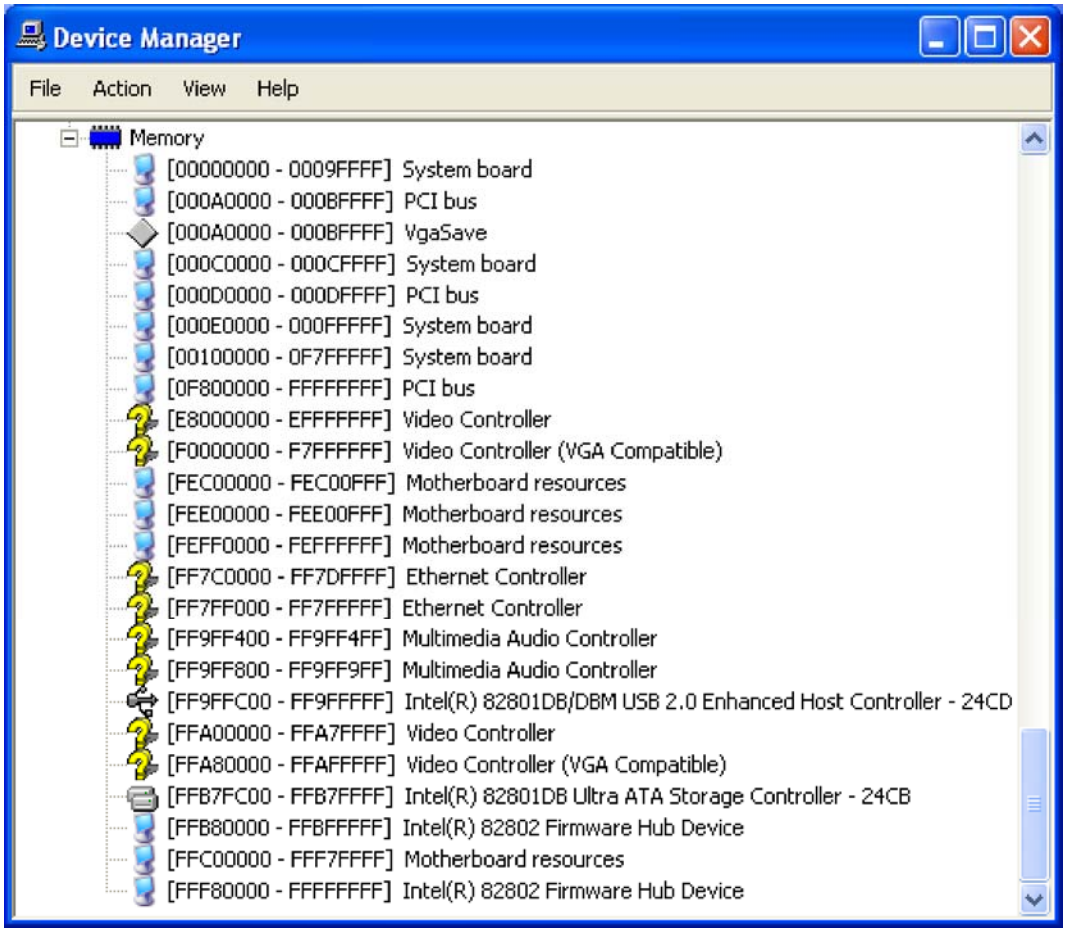


Figure E-5: Memory

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-XQ354

F.1 Compatible Operating Systems

The following operating systems have been successfully run on the IMBA-XQ354.

- Windows 2000 SP4
- Windows Server 2003 (32bit/64bit)
- Windows Server 2008 (32bit/64bit)
- Windows XP SP2
- Windows XPE-POS
- Windows Vista Ultimate (32bit/64bit)
- Linux (Mandriva 2008)
- Linux (Ubuntu 8.04)
- Linux (openSuSE 11.0)
- Linux (Fedora 9)

F.2 Compatible Processors

The following processors have been successfully tested on the IMBA-XQ354

CPU	Model	FSB	Frequency
Intel® Core™2 Quad	Q9450	1333 MHz	2.66 GHz
Intel® Core™2 Quad	Q9300	1333 MHz	2.50 GHz
Intel® Core™2 Duo	E8400	1333 MHz	3.00 GHz
Intel® Core™2 Duo	E8200	1333 MHz	2.66 GHz
Intel® Core™2 Duo	E6850	1333 MHz	3.00 GHz
Intel® Core™2 Duo	E6750	1333 MHz	2.66 GHz
Intel® Core™2 Duo	E6550	1333 MHz	2.33 GHz
Intel® Core™2 Duo	E6400	1066 MHz	2.13 GHz
Intel® Core™2 Duo	E6350	1333 MHz	3.00 GHz

CPU	Model	FSB	Frequency
Intel® Core™2 Duo	E6300	1066 MHz	1.86 GHz
Intel® Core™2 Duo	E4400	800 MHz	2.00 GHz
Intel® Core™2 Duo	E4300	800 MHz	1.80 GHz
Intel® Dual Core	E2160	800 MHz	1.80 GHz

Table F-1: Compatible Processors

F.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the IMBA-XQ354 other memory modules that comply with the specifications may also work on the IMBA-XQ354 but have not been tested.

The following memory modules have been successfully tested on the IMBA-XQ354.

Manufacturer	Capacity	Speed	Type
Apacer	512 MB	533 MHz	DDR2
Corsair	512 MB	667 MHz	DDR2
Unigen	512 MB	667 MHz	DDR2
Transcend	512 MB	800 MHz	DDR2
Apacer	512 MB	800 MHz	DDR2
Kingmax	1.0 GB	667 MHz	DDR2
Apacer	1.0 GB	667 MHz	DDR2
Corsair	1.0 GB	667 MHz	DDR2
Corsair	1.0 GB	800 MHz	DDR2
Transcend	2.0 GB	533 MHz	DDR2
Apacer	2.0 GB	667 MHz	DDR2
Adata	2.0 GB	667 MHz	DDR2
Transcend	2.0 GB	667 MHz	DDR2

Manufacturer	Capacity	Speed	Type
Transcend	2.0 GB	800 MHz	DDR2
Umax	2.0 GB	800 MHz	DDR2
Adata	2.0 GB	800 MHz	DDR2

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 motherboard comes with an onboard audio chipset. The provides the audio capabilities to the system.

H.1.1 Accessing the AC'97 CODEC

The audio outputs and outputs are located on the rear panel and through pin headers on the board.

H.1.2 Driver Installation

The driver installation has already been described.

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.

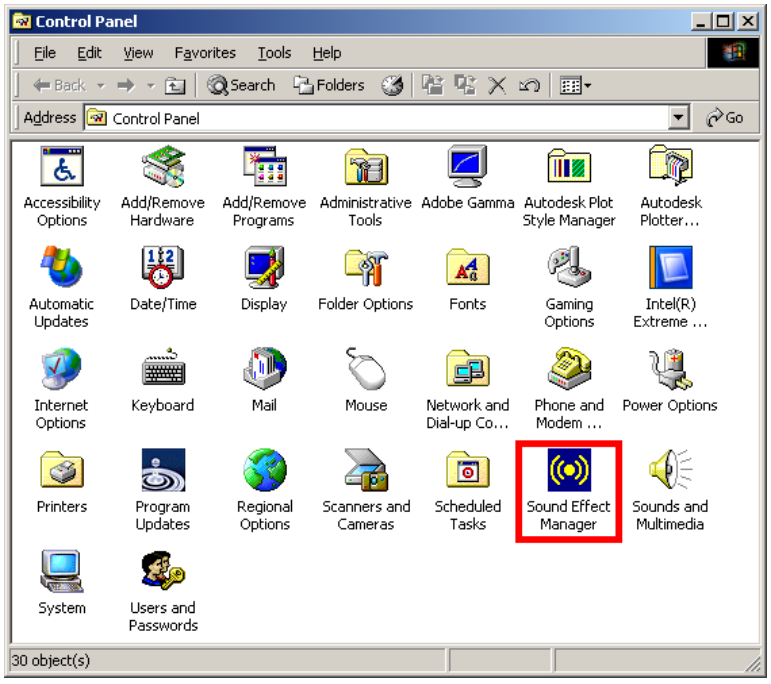


Figure H-1: Control Panel Sound Effect Manager

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 drivers.

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**).

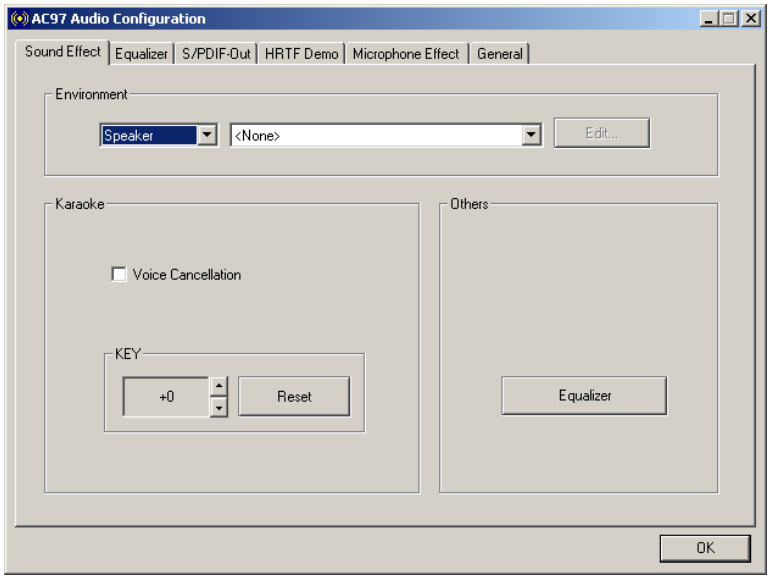


Figure H-3: Sound Effects Manager

NOTE:

The Sound Effect Manager shown in **Figure H-3** is for the Realtek ALC655 audio Codec. Different Codecs may have different sound manager appearances.

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

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

A

B

C

D

E

F

H

I

J

K

L

M

O

P

R

S

T

U

V

W