**MODEL:**

# IMBA-XQ354S

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

# User Manual

Rev. 1.10 – July 7, 2014

# Revision

| Date | Version | Changes |
|---|---|---|
| July 7, 2014 | 1.10 | Initial release |

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# 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-XQ354S 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-XQ354S. 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-XQ354S. Please take caution messages seriously.

![IEI Integration Corp. logo]

**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-XQ354S. Please take note messages seriously.

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**Chapter**

**1**

# Introduction

## 1.1 Overview



**Figure 1–1: IMBA-XQ354S**

The IMBA-XQ354S 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-XQ354S 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 3Gb/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 the Intel® GbE controller. The GbE controller allows 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.

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

## 1.2 Benefits

Some of the IMBA-XQ354S 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

## 1.3 Features

Some of the IMBA-XQ354S 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
- One Gigabit Ethernet controller
- Supports 12 USB 2.0 ports
- Integrated audio

## 1.4 Connectors

The connectors on the IMBA-XQ354S are shown in the figure below.
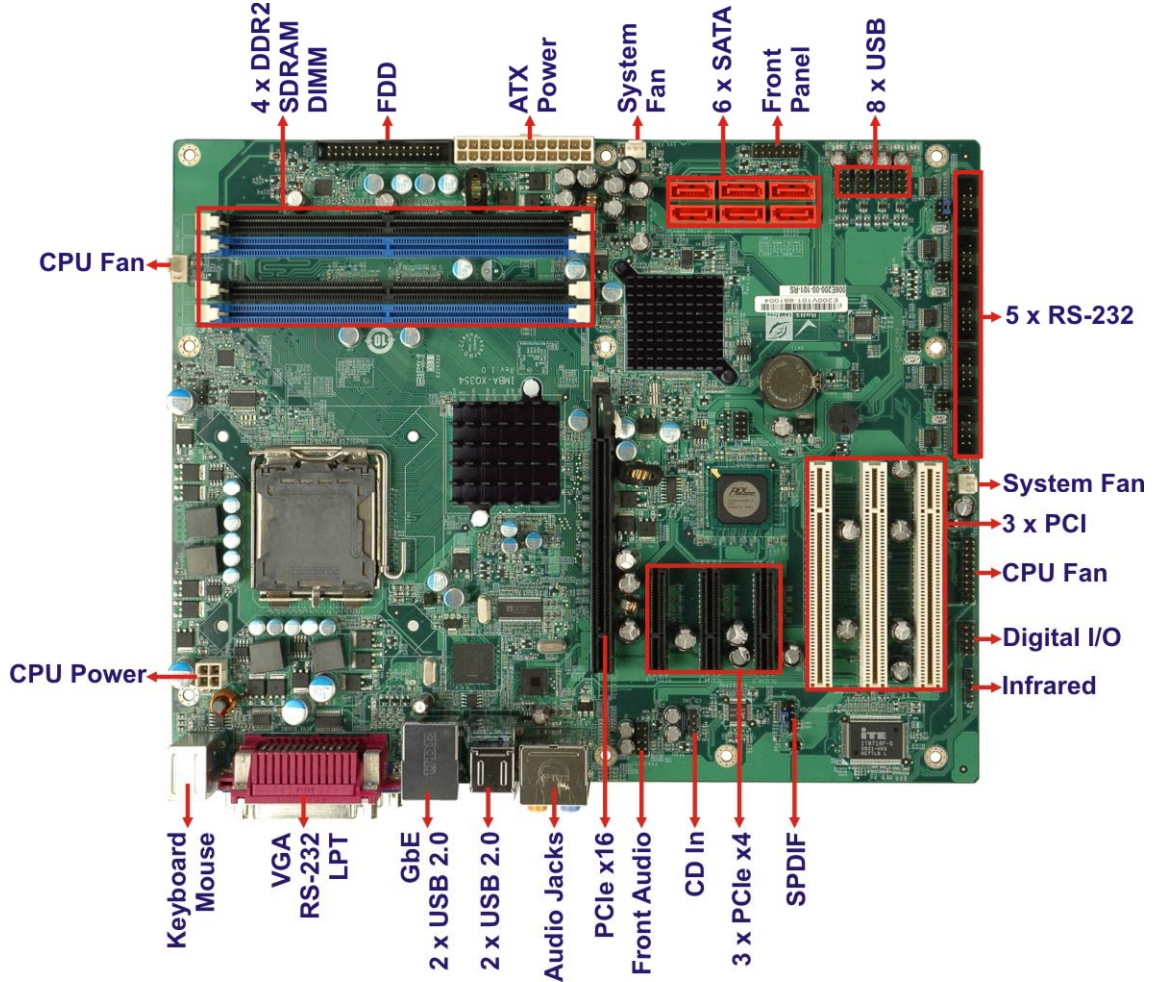


**Figure 1–2: Overview**

## 1.5 Dimensions

The dimensions of the board are listed below:

- ▪ Length:        305 mm
- ▪ Width:        244 mm
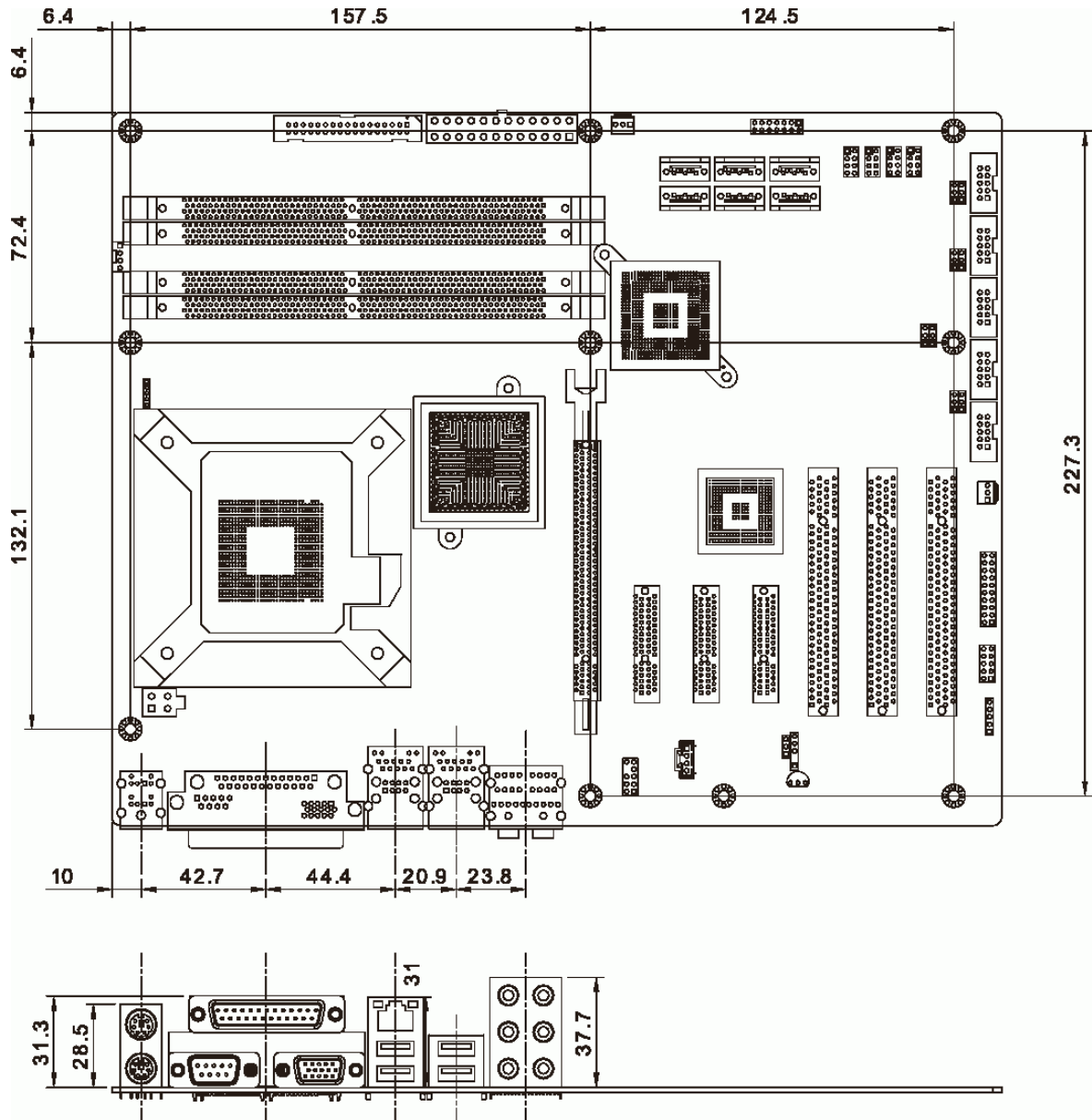


**Figure 1-3: IMBA-XQ354S Dimensions (mm)**

## 1.6 Data Flow

**Figure 1-4** shows the data flow between the system chipset, the CPU and other components installed on the motherboard.
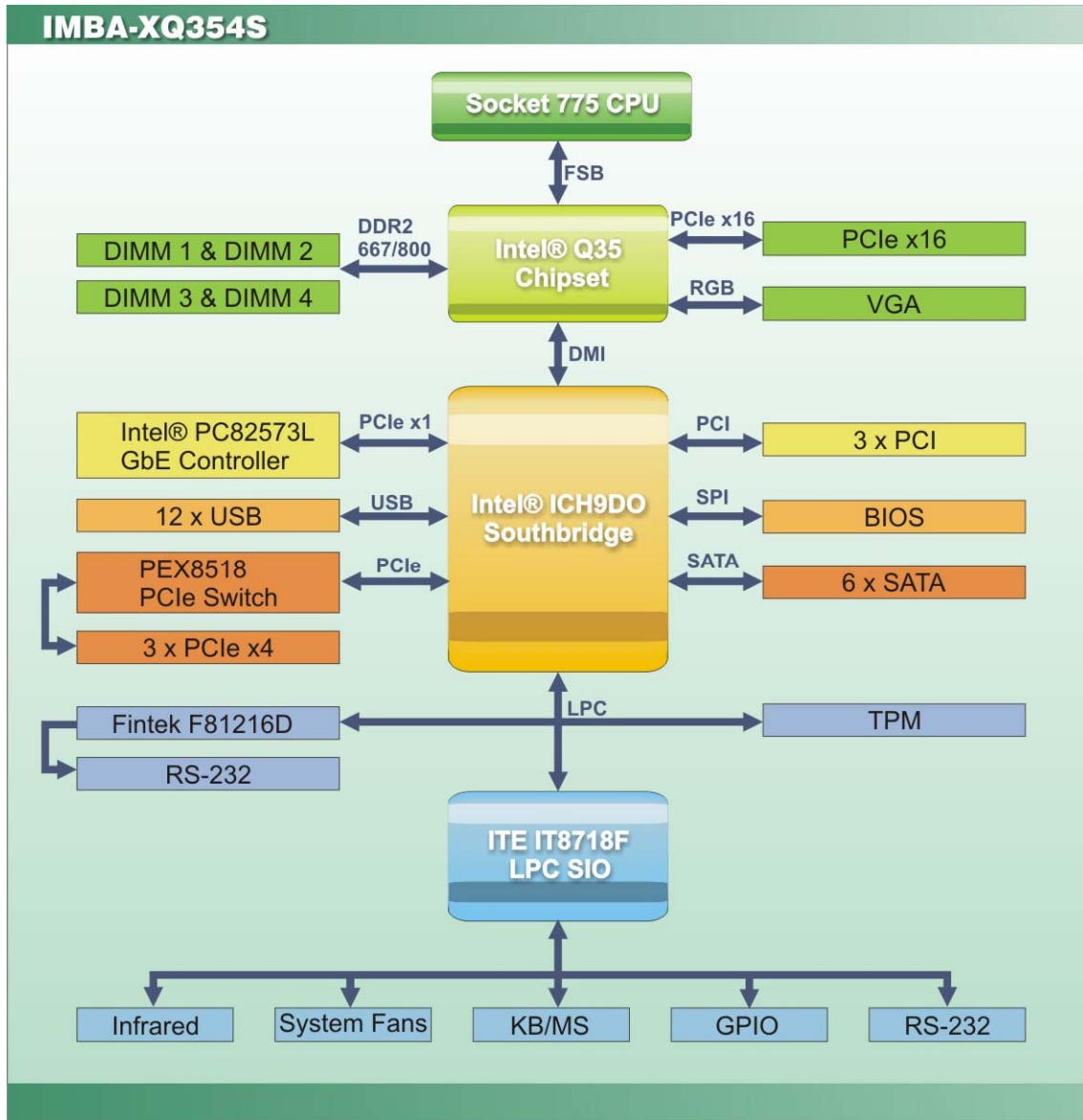


**Figure 1-4: Data Flow Block Diagram**

## 1.7 Technical Specifications

IMBA-XQ354S motherboard technical specifications are listed in **Table 1-1**.

| Specification | IMBA-XQ354S |
|---|---|
| **Form Factor** | ATX |
| **CPU Supported** | LGA775 Intel® Core™2 Quad<br>LGA775 Intel® Core™2 Duo<br>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<br>3 x PCIe x4 slot<br>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<br>12 x USB 2.0/1.1 ports<br>1 x Dual PS/2 connector (for keyboard and mouse) |
| **USB 2.0/1.1 port** | Four External<br>Eight via internal pin header |
| **Serial ATA** | Supports six independent serial ATA (SATA) channels with 3.0 Gb/s data transfer rates |
| **Ethernet** | Intel® 82573L (MAC+PHY) through the PCIe x1 interface |

| Specification | IMBA-XQ354S |
|---|---|
| Digital I/O | 8-bit, 4-bit input/4-bit output |
| Super I/O Controller | iTE IT8718F |
| Audio | Realtek ALC888 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<br>2 x 3-pin system cooling fans |
| Power Consumption | 3.3 V @ 2.96 A<br>5 V @ 6.92 A<br>5 VSB @ 1.61 A<br>12 V @ 2.77 A<br>(2.66 GHz Intel® Core™2 Duo E6850CPU 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

# Packing List

## 2.1 Anti-static Precautions

> ⚠️ **WARNING!**
>
> Failure to take ESD precautions during the installation of the IMBA-XQ354S may result in permanent damage to the IMBA-XQ354S and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-XQ354S. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-XQ354S, 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-XQ354S, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-XQ354S.
- **Only handle the edges of the PCB**:- When handling the PCB, hold the PCB by the edges.

## 2.2 Unpacking Precautions

When the IMBA-XQ354S is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 2.1**.
- Make sure the packing box is facing upwards so the IMBA-XQ354S does not fall out of the box.
- Make sure all the components shown in **Section 2.3** are present.

## 2.3 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-XQ354S was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com.

### 2.3.1 Package Contents

The IMBA-XQ354S is shipped with the following components:
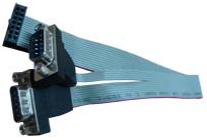
| Quantity | Item and Part Number | Image |
|---|---|---|
| 1 | IMBA-XQ354S | |
| 2 | Dual RS-232 cable (**P/N**: 19800-003600-100-RS) | |
| 1 | Single RS-232 cable (**P/N**: 19800-010900-200-RS) | |
| 6 | SATA cable (**P/N**: 32801-000703-400-RS) | |
| 1 | I/O Shielding (**P/N**: 45014-0025C0-00-RS) | |
| 1 | Mini jumper pack (2.54 mm) (**P/N**:33100-000656-RS) | |

| Quantity | Item and Part Number | Image |
|---|---|---|
| 1 | One Key Recovery CD<br>(P/N: IEI-7B000-000478-RS) | |
| 1 | Utility CD | |
| 1 | Quick Installation Guide | |

**Table 2-1: Packing List**

## 2.3.2 Optional Items

The IMBA-XQ354S is shipped with the following components:

| Item and Part Number | Image |
|---|---|
| Dual USB cable (w bracket)<br>(**P/N**: 19800-003100-300-RS) | |
| 4-port USB cable<br>(**P/N**: 19800-000100-200-RS) | |
| RS-232/422/485 cable<br>(**P/N**: 3200-000063-RS) | |
| CPU cooler<br>(**P/N**: CF-775A-RS) | |

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

**Table 2-2: Optional Items**

Chapter

3

# Connector Pinouts

## 3.1 Peripheral Interface Connectors

Section **3.1.2** shows peripheral interface connector locations. **Section 3.1.2** lists all the peripheral interface connectors seen in **Section 3.1.2**.

### 3.1.1 IMBA-XQ354S Layout

**Figure 3-1** shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.
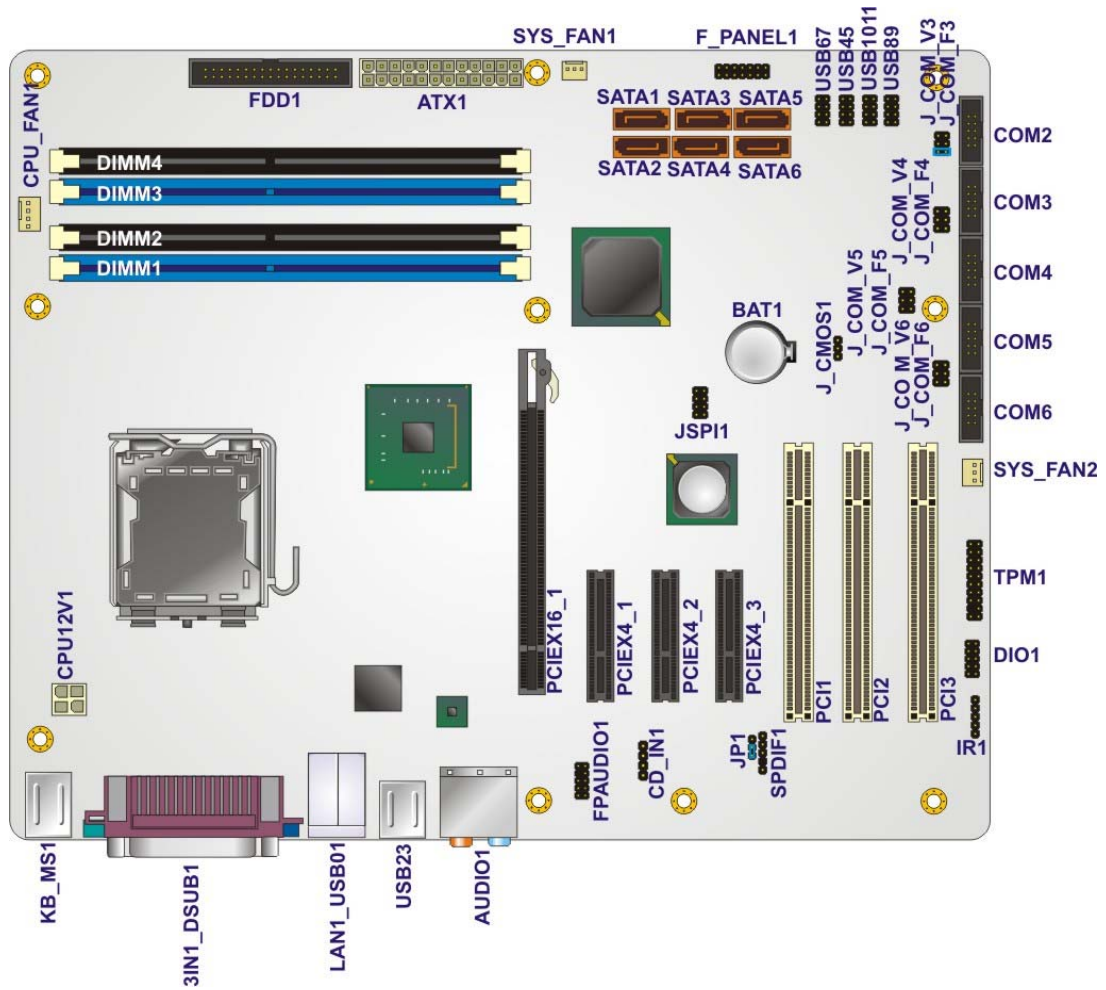


**Figure 3-1: Connector and Jumper Locations**

### 3.1.2 Peripheral Interface Connectors

**Table 3-1** shows a list of the peripheral interface connectors on the IMBA-XQ354S. 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 connectors | 7-pin SATA | SATA1 SATA2 SATA3 SATA4 SATA5 SATA6 |
| SPDIF connector | 5-pin header | SPDIF1 |

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

**Table 3-1: Peripheral Interface Connectors**

### 3.1.3 External Interface Panel Connectors

**Table 3-2** lists the rear panel connectors on the IMBA-XQ354S. Detailed descriptions of these connectors can be found in **Section 3.1**.

| Connector | Type | Label |
|---|---|---|
| Audio jacks (six) | Audio jacks | AUDIO1 |
| Keyboard and mouse connectors | Dual PS/2 | KB_MS1 |
| LAN connector | RJ-45 | LAN1_USB01 |
| Parallel port connector | D-sub 26 female | 3IN1_DSUB1 |
| RS-232 serial port connector | D-sub 9 male | 3IN1_DSUB1 |
| USB 2.0 ports | Dual USB ports | LAN1_USB01 USB23 |
| VGA port connector | D-sub 15 female | 3IN1_DSUB1 |

**Table 3-2: Rear Panel Connectors**

## 3.2 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-XQ354S.

### 3.2.1 ATX CPU Power Connector

**CN Label:** CPU12 V1

**CN Type:** 4-pin ATX power connector

**CN Location:** See **Figure 3-2**

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

The 4-pin ATX power connector is connected to an ATX power supply.
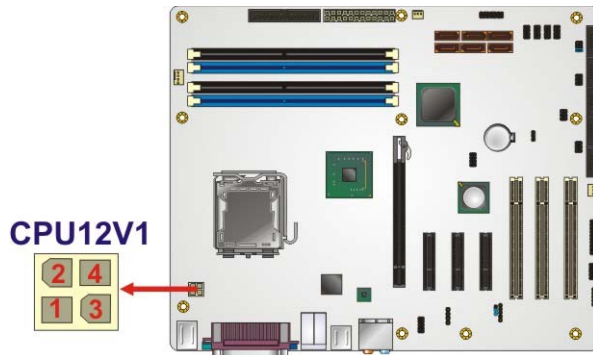


**Figure 3-2: AT Power Connector Location**

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

**Table 3-3: ATX Power Connector Pinouts**

### 3.2.2 ATX Power Connector

| | |
|---|---|
| **CN Label:** | **ATX1** |
| **CN Type:** | 24-pin ATX |
| **CN Location:** | See **Figure 3-3** |
| **CN Pinouts:** | See **Table 3-4** |

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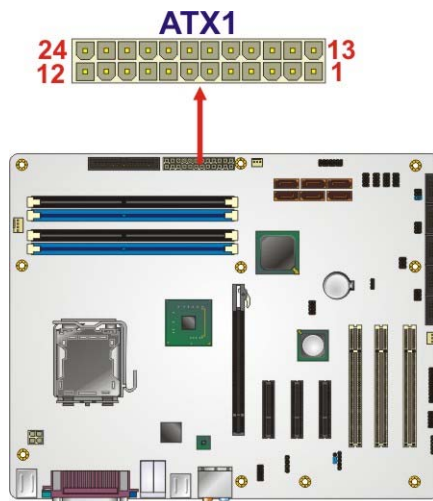


**Figure 3-3: ATX Power Connector Pinout Locations**

| 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 3-4: ATX Power Connector Pinouts**

## 3.2.3 Audio Connector

**CN Label:**      **FPAUDIO1**

**CN Type:**       10-pin header

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

**CN Pinouts:**    See **Table 3-5**

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.
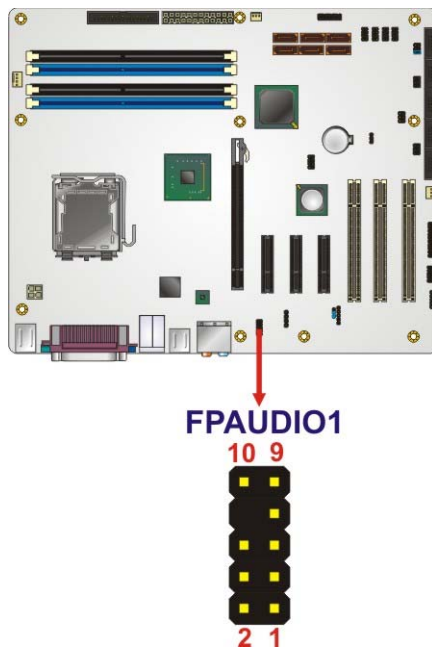


**Figure 3-4: Audio Connector Pinouts**

| 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 3-5: Audio Connector Pinouts**

## 3.2.4 CD In Connector

| | |
|---|---|
| **CN Label:** | **CD_IN1** |
| **CN Type:** | 4-pin header |
| **CN Location:** | See **Figure 3-5** |
| **CN Pinouts:** | See **Table 3-6** |

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.
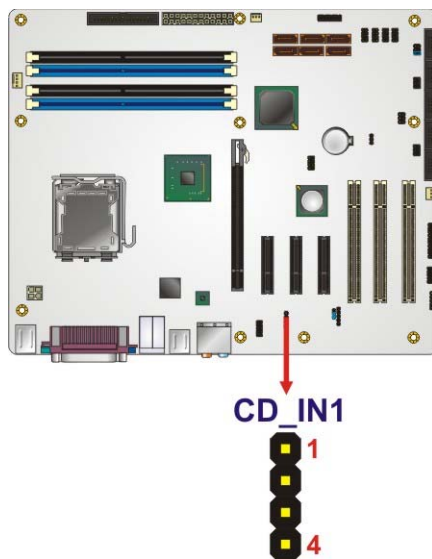


**Figure 3-5: Audio CD In Connector Location**

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

**Table 3-6: Audio CD In Connector Pinouts**

## 3.2.5 Digital I/O Connector

**CN Label:** DIO1

**CN Type:** 10-pin header

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

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

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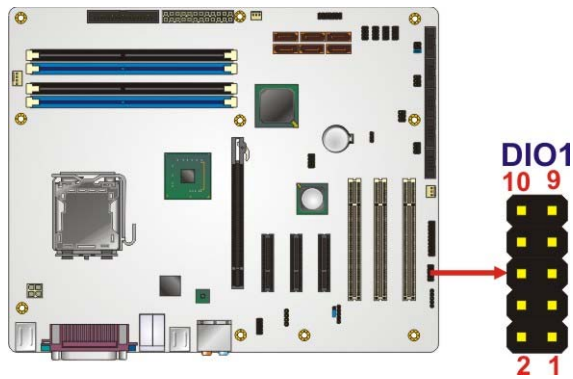


**Figure 3-6: Digital I/O Connector Locations**

| 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 3-7: Digital I/O Connector Pinouts**

## 3.2.6 CPU Fan Connector

| | |
|---|---|
| **CN Label:** | CPU_FAN1 |
| **CN Type:** | 4-pin wafer |
| **CN Location:** | See **Figure 3-7** |
| **CN Pinouts:** | See **Table 3-8** |

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.
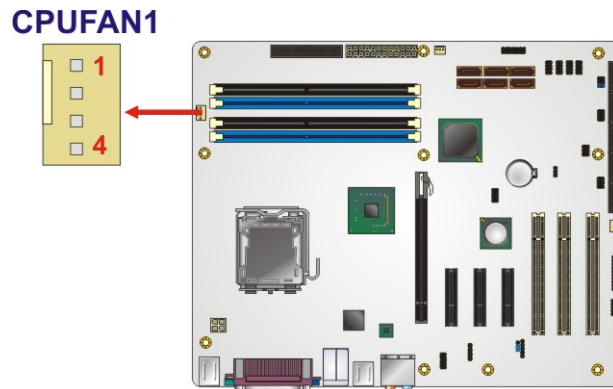


**Figure 3-7: CPU Fan Connector Location**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | GND |
| 2 | +12 VCC |
| 3 | Rotation Signal |
| 4 | Control |

**Table 3-8: CPU Fan Connector Pinouts**

### 3.2.7 System Fan Connectors

| | |
|---|---|
| **CN Label:** | **SYS_FAN1, SYS_FAN2** |
| **CN Type:** | 3-pin header |
| **CN Location:** | See **Figure 3-8** |
| **CN Pinouts:** | See **Table 3-9** |

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.
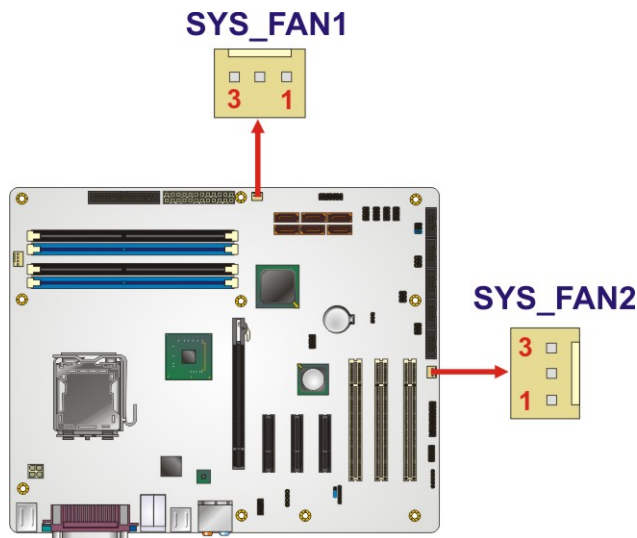


**Figure 3-8: System Fan Connector Location**

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

**Table 3-9: System Fan Connector Pinouts**

### 3.2.8 Floppy Disk Connector

| | |
|---|---|
| **CN Label:** | FDD1 |
| **CN Type:** | 34-pin box header |
| **CN Location:** | See **Figure 3-9** |
| **CN Pinouts:** | See **Table 3-10** |

The floppy disk connector is connected to a floppy disk drive. The IMBA-XQ354S supports the following floppy disk drives:

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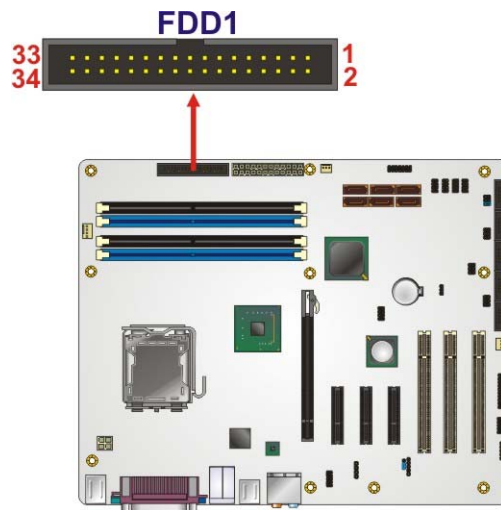


**Figure 3-9: 34-pin FDD Connector Location**

| 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# |

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 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 3-10: 34-pin FDD Connector Pinouts**

## 3.2.9 Front Panel Connector

**CN Label:**　　　**F_PANEL1**

**CN Type:**　　　14-pin header

**CN Location:**　　See **Figure 3-10**

**CN Pinouts:**　　See **Table 3-11**

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
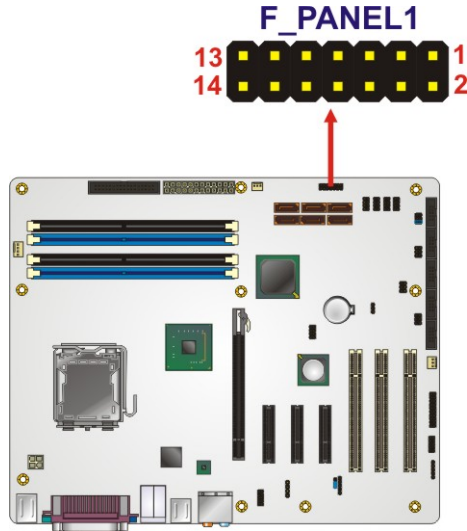
**Figure 3-10: Front Panel Connector Pinout Locations**

| FUNCTION | PIN NO. | DESCRIPTION | FUNCTION | PIN NO. | 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 3-11: Front Panel Connector Pinouts**

## 3.2.10 Infrared Interface Connector

**CN Label:**     **IR1**

**CN Type:**      5-pin header

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

**CN Pinouts:**   See **Table 3-12**

The infrared interface connector supports both Serial Infrared (SIR) and Amplitude Shift Key Infrared (ASKIR) interfaces.
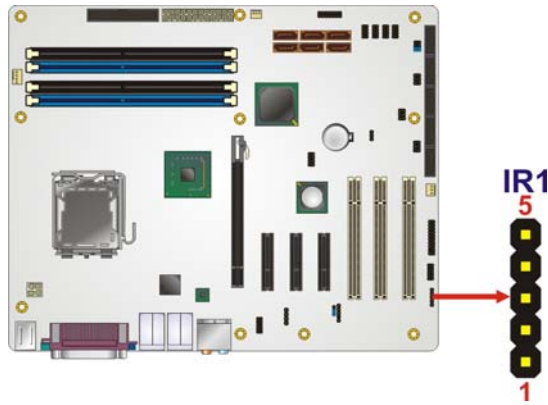
**Figure 3-11: Infrared Connector Pinout Locations**

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

**Table 3-12: Infrared Connector Pinouts**

## 3.2.11 PCI Express x4 Slots

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

    **CN Type:**        PCIe x4 slots

    **CN Location:**    See **Figure 3-12**

    **CN Pinouts:**    See **Table 3-13**

PCIe x4 expansion devices can be inserted into the PCIe x4 slots.
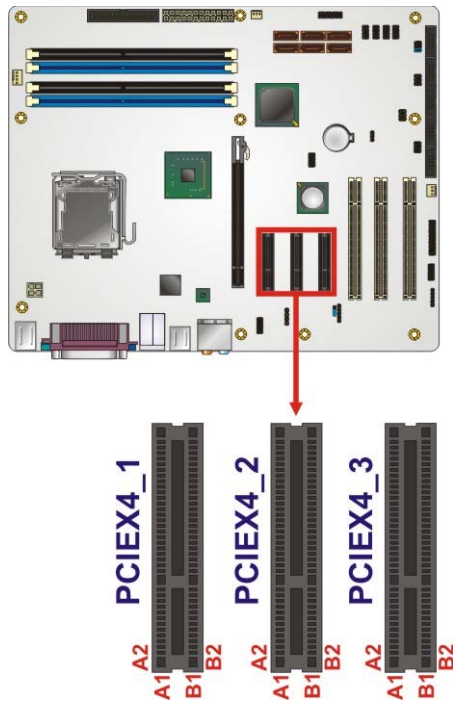
**Figure 3-12: PCIe x4 Connector Locations**

| 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 3-13: PCIe x4 Pinouts**

## 3.2.12 PCI Express x16 Slot

**CN Label:**     **PCIEX16_1**

**CN Type:**      PCIe x16 slot

**CN Location:**  See **Figure 3-13**

**CN Pinouts:**   See **Table 3-14** (Side A) **Table 3-15** (Side B)

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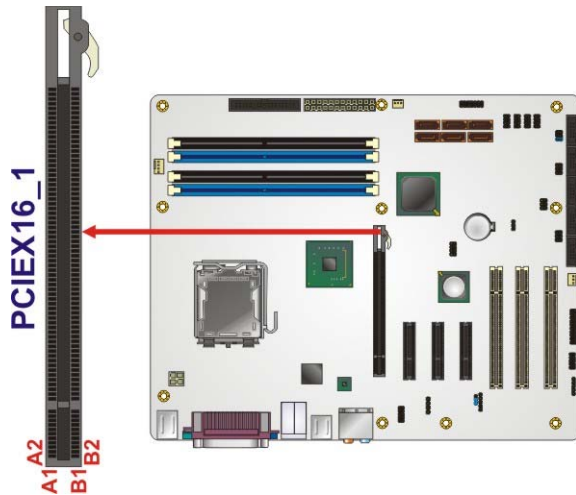


**Figure 3-13: PCIe x16 Connector Location**

| 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 3-14: 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 3-15: PCIe x16 Side B Pinouts**

### 3.2.13 PCI Slots

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

**CN Type:**   PCI Slot

**CN Location:**   See **Figure 3-14**

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

The PCI slot enables a PCI expansion module to be connected to the board.
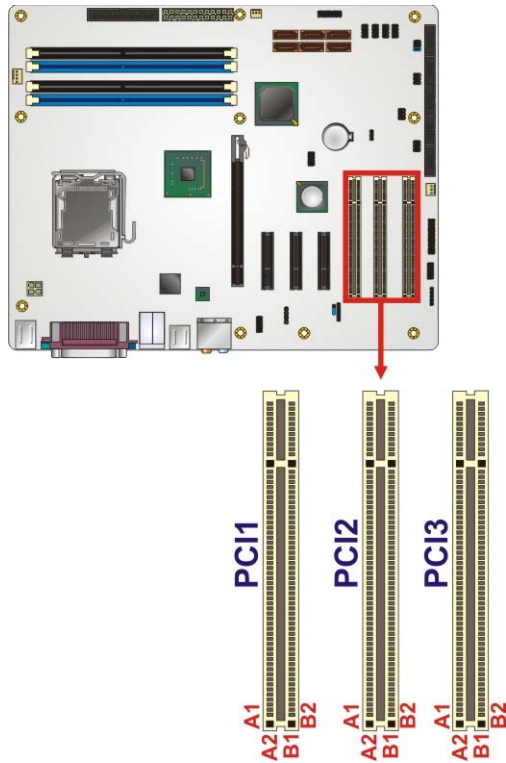
**Figure 3-14: PCI Slot Location**

| 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 3-16: PCI Slot**

## 3.2.14 SATA Drive Connectors

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

**CN Type:**  SATA drive connectors

**CN Location:**  See **Figure 3-15**

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

The six SATA drive connectors are each connected to a SATA drive. SATA drives transfer data at speeds as high as 3Gb/s. The SATA drives can be configured in a RAID configuration.
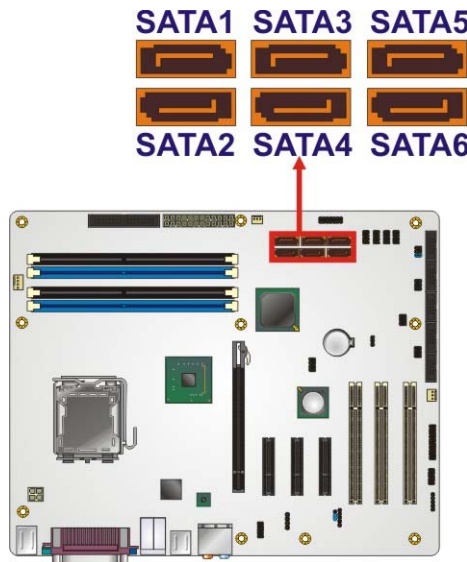
**Figure 3-15: SATA Drive Connector Locations**

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

**Table 3-17: SATA Drive Connector Pinouts**

## 3.2.15 SPDIF Connector

| | |
|---|---|
| **CN Label:** | **SPDIF1** |
| **CN Type:** | 5-pin header |
| **CN Location:** | See **Figure 3-16** |
| **CN Pinouts:** | See **Table 3-18** |

Use the SPDIF connector to connect digital audio devices to the system.
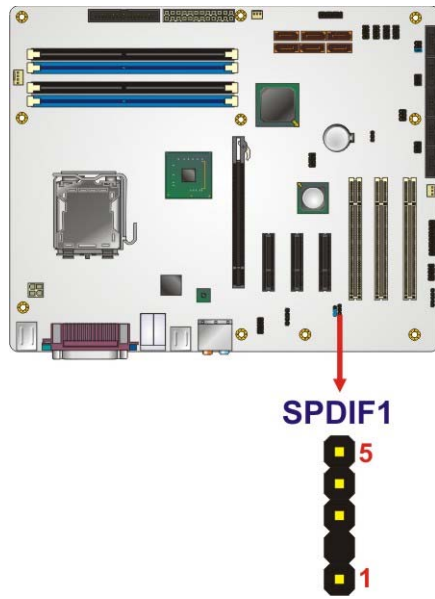
**Figure 3-16: SPDIF Connector Pinout Locations**

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

**Table 3-18: SPDIF Connector Pinouts**

## 3.2.16 Serial Port Connectors

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

**CN Type:**      9-pin box headers

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

**CN Pinouts:**      See **Table 3-19**

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.
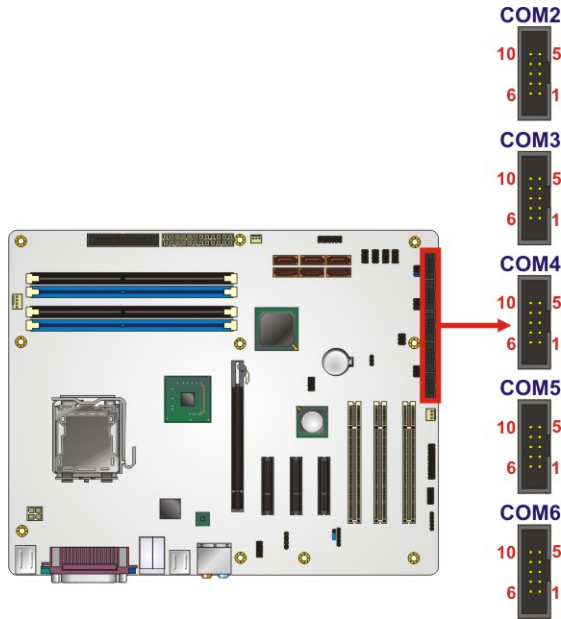
**Figure 3-17: Serial Port Connectors Pinout Locations**

| 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 3-19: Serial Port Connector Pinouts**

## 3.2.17 SPI Flash Connector

**CN Label:**       **JSPI1**

**CN Type:**        8-pin header

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

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

The SPI connector is for flashing the SPI BIOS.
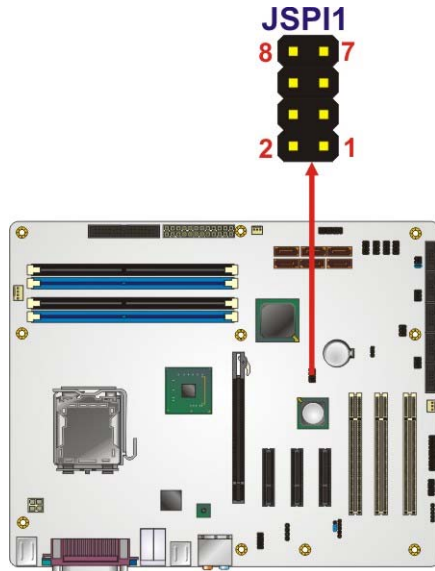
**Figure 3-18: SPI Flash Connector Pinouts**

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

**Table 3-20: SPI Flash Connector**

## 3.2.18 Trusted Platform Module (TPM) Connector

**CN Label:**      **TPM1**

**CN Type:**       20-pin header

**CN Location:**   See **Figure 3-19**

**CN Pinouts:**    See **Table 3-21**

The Trusted Platform Module (TPM) connector secures the system on boot.
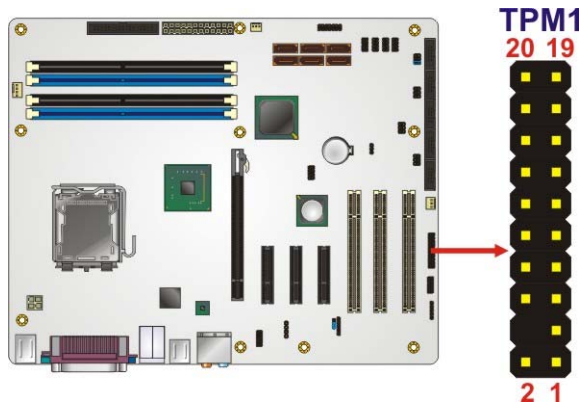
**Figure 3-19: TPM Connector Pinout Locations**

| 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 3-21: TPM Connector Pinouts**

## 3.2.19 USB Connectors

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

**CN Type:**       8-pin header

**CN Location:**   See **Figure 3-20**

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

The 10-pin USB connector each provides 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.
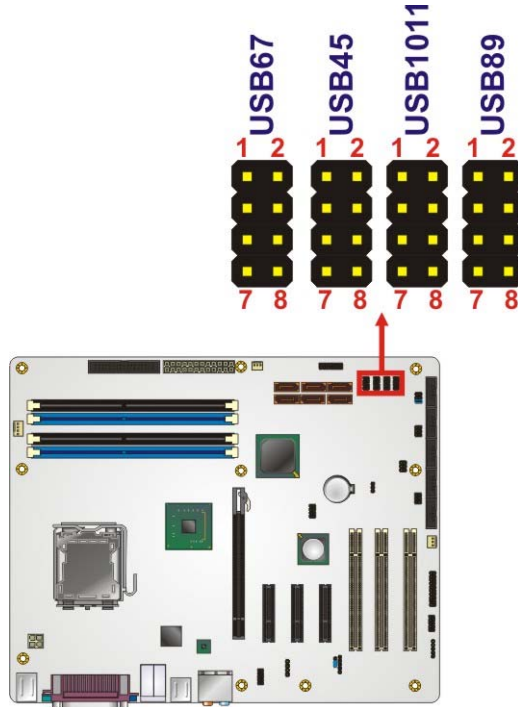


**Figure 3-20: USB Connector Pinout Locations**

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

**Table 3-22: USB Port Connector Pinouts**

## 3.3 External Interface Connectors

**Figure 3-21** shows the IMBA-XQ354S motherboard external interface connectors. The IMBA-XQ354S on-board external interface connectors are shown in **Figure 3-21**:
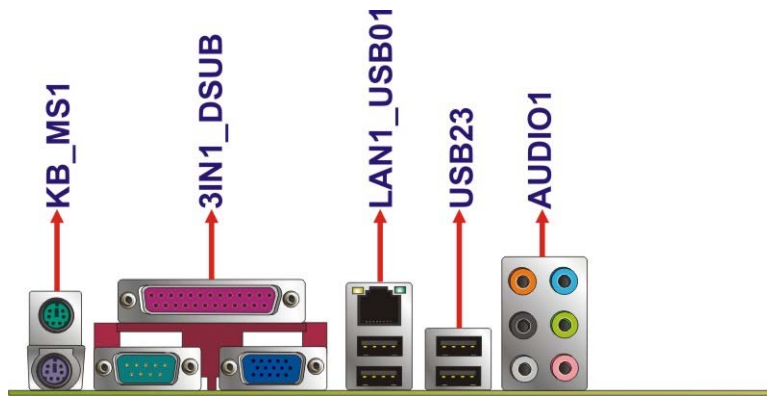
**Figure 3-21: IMBA-XQ354S External Interface Connectors**

### 3.3.1 Audio Connector

| | |
|---|---|
| **CN Label:** | **AUDIO1** |
| **CN Type:** | Audio jacks |
| **CN Location:** | See **Figure 3-21** |

The six audio jacks on the external audio connector enable the IMBA-XQ354S 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 3-22: Audio Connector**

## 3.3.2 Ethernet Connector

| | |
|---|---|
| **CN Label:** | LAN1 |
| **CN Type:** | RJ-45 |
| **CN Location:** | See **Figure 3-21** |
| **CN Pinouts:** | See **Table 3-23** |

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 3-23: Ethernet Connector Pinouts**
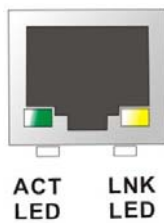


**Figure 3-23: Ethernet Connector**

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 3-24: Connector LEDs**

### 3.3.3 Keyboard and Mouse Connector

**CN Label:**       **KB_MS1**

**CN Type:**       PS/2

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

**CN Pinouts:**     See **Table 3-25** and **Figure 3-24**

The IMBA-XQ354S has two PS/2 connectors on the mounting bracket for easy connection to a PS/2 keyboard and PS/2 mouse.
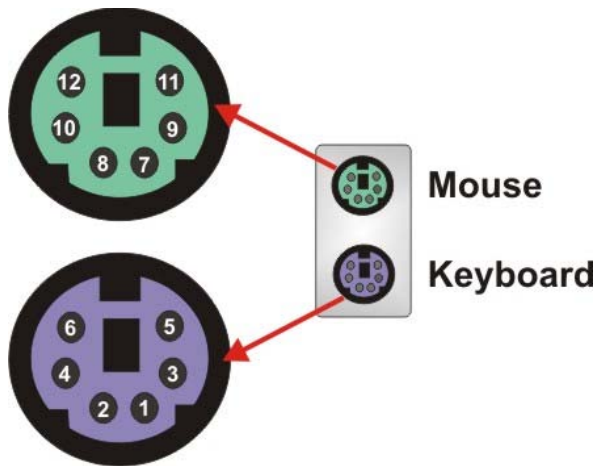


**Figure 3-24: PS/2 Connector**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---|---|---|---|
| 1 | KEYBOARD DATA | 7 | MOUSE DATA |
| 2 | NC | 8 | NC |

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 3 | GND | 9 | GND |
| 4 | +5 V | 10 | +5 V |
| 5 | KEYBOARD CLOCK | 11 | MOUSE DATA |
| 6 | NC | 12 | NC |

**Table 3-25: PS/2 Connectors**

## 3.3.4 Parallel Port Connector

**CN Label:**       **LPT**

**CN Type:**        26-pin box header

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

**CN Pinouts:**     See **Table 3-26**

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 |
| 13 | PRINTER SELECT | | |

**Table 3-26: Parallel Port Connector Pinouts**
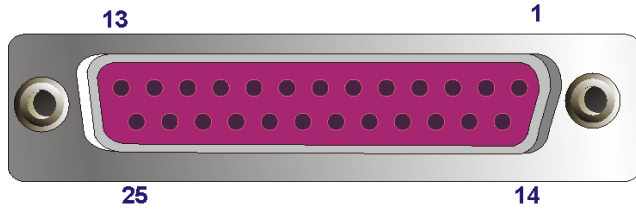
**Figure 3-25: Parallel Port Connector Location**

## 3.3.5 Serial Port Connector

**CN Label:**       **COM1**

**CN Type:**        D-sub 9 connector

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

**CN Pinouts:**     See **Table 3-27** and **Figure 3-26**

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 3-27: Serial Port Pinouts**
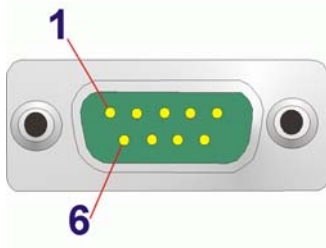


**Figure 3-26: Serial Port Pinout Locations**

### 3.3.6 USB Ports

**CN Label:**　　　**USB01** and **USB23**

**CN Type:**　　　USB Combo ports

**CN Location:**　　See **Figure 3-21**

**CN Pinouts:**　　See **Table 3-28**

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 3-28: USB Connector Pinouts**

### 3.3.7 VGA Connector

**CN Label:**　　　**VGA**

**CN Type:**　　　D-sub 15-pin female connector

**CN Location:**　　See **Figure 3-21**

**CN Pinouts:**　　See **Figure 3-27** and **Table 3-29**

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 3-29: VGA Connector Pinouts**
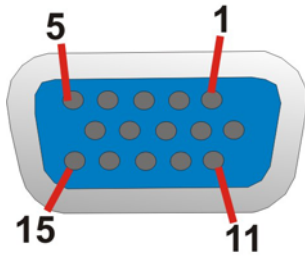
**Figure 3-27: VGA Connector**

**Chapter**

**4**

# Installation

## 4.1 Anti-static Precautions

> ⚠ **WARNING:**
>
> Failure to take ESD precautions during the installation of the
> IMBA-XQ354S may result in permanent damage to IMBA-XQ354S and
> severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IMBA-XQ354S. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IMBA-XQ354S, 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-XQ354S, place it on an antic-static pad. This reduces the possibility of ESD damaging the IMBA-XQ354S.
- **Only handle the edges of the PCB**:-: When handling the PCB, hold the PCB by the edges.

## 4.2 Installation Considerations

**NOTE:**

The following installation notices and installation considerations should be read and understood before the IMBA-XQ354S is installed. All installation notices pertaining to the installation of IMBA-XQ354S should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the IMBA-XQ354S and injury to the person installing the motherboard.

### 4.2.1 Installation Notices

**WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the IMBA-XQ354S, IMBA-XQ354S 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-XQ354S 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-XQ354S 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-XQ354S off**:
  ○ When working with the IMBA-XQ354S, 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-XQ354S **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.

## 4.2.2 Installation Checklist

The following checklist is provided to ensure the IMBA-XQ354S 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-XQ354S 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

## 4.3 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-XQ354S 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-XQ354S. If one of these component is not installed the IMBA-XQ354S cannot run.

### 4.3.1 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 4-1**.
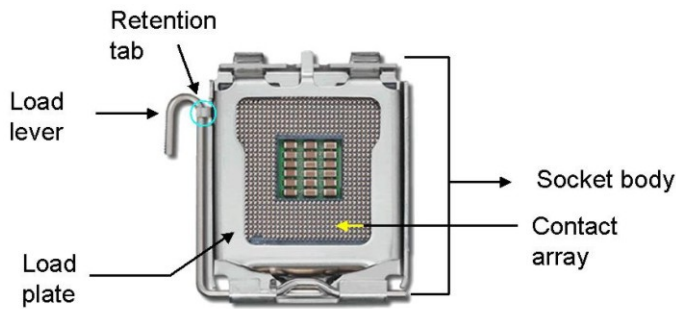
**Figure 4-1: Intel LGA775 Socket**

To install a socket LGA775 CPU onto the IMBA-XQ354S, follow the steps below:

![warning icon] **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 4-2**.
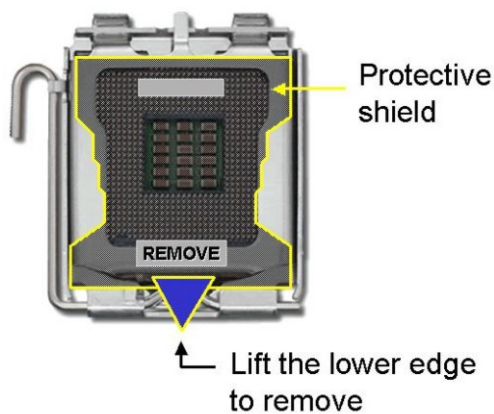


**Figure 4-2: Remove the CPU Socket Protective Shield**

**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 4-3**.
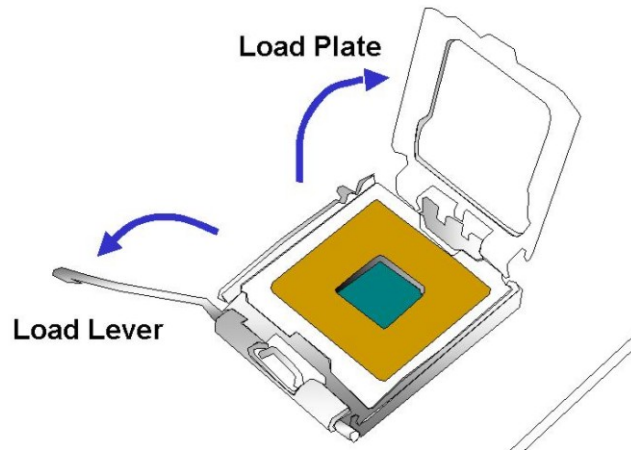


**Figure 4-3: Open the CPU Socket Load Plate**

**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 4-4**.
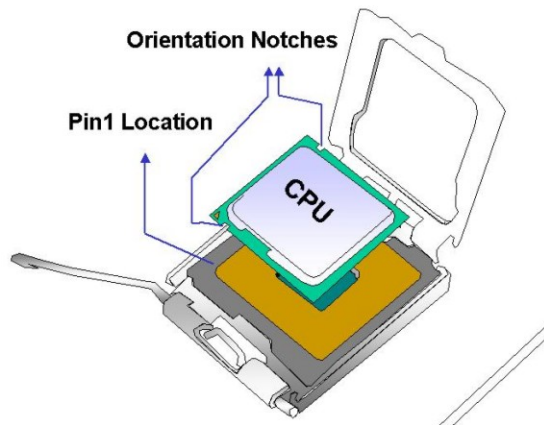
**Figure 4-4: Insert the Socket LGA775 CPU**

**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.

## 4.3.2 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-XQ354S.**

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 4-5: Cooling Kit**

A Socket LGA775 CPU cooling kit shown in **Figure 4-5** 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 4-6**)
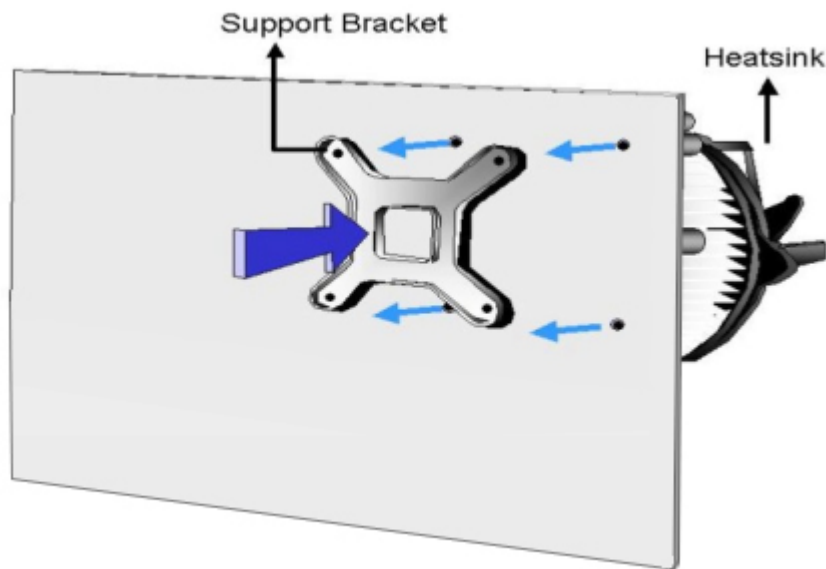
**Figure 4-6: Securing the Heat sink to the PCB Board**

**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-XQ354S. Carefully route the cable and avoid heat generating chips and fan blades.

## 4.3.3 DIMM Installation

**WARNING:**

Using incorrectly specified memory modules may cause permanent damage the IMBA-XQ354S. 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 4-7**.
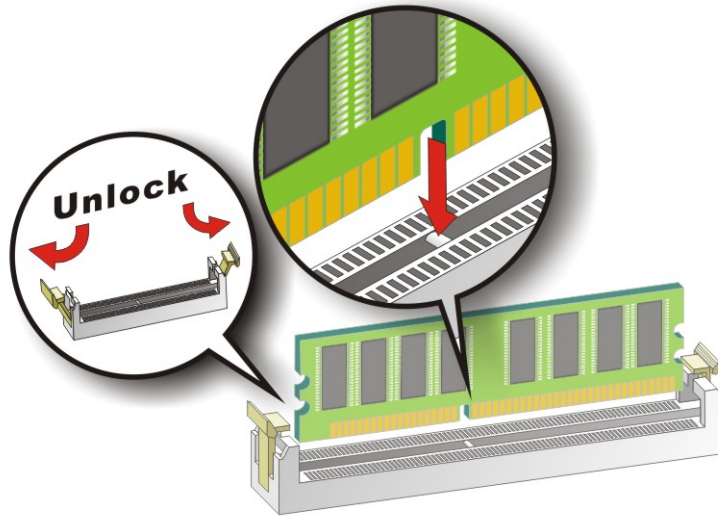
**Figure 4-7: Installing a DIMM**

**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 4-7**.

**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 4-7**.

**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 4-7**.

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

## 4.4 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.
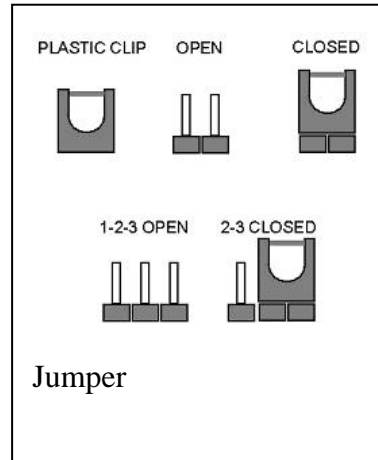
Jumper

Before the IMBA-XQ354S is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the IMBA-XQ354S are listed in **Table 4-1**.

| 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 4-1: Jumpers**

## 4.4.1 Clear CMOS Jumper

| | |
|---|---|
| **Jumper Label:** | **J_CMOS1** |
| **Jumper Type:** | 3-pin header |
| **Jumper Settings:** | See **Table 4-2** |
| **Jumper Location:** | See **Figure 4-8** |

If the IMBA-XQ354S 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 4-2**.

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

**Table 4-2: Clear CMOS Jumper Settings**

The location of the clear CMOS jumper is shown in **Figure 4-8** below.
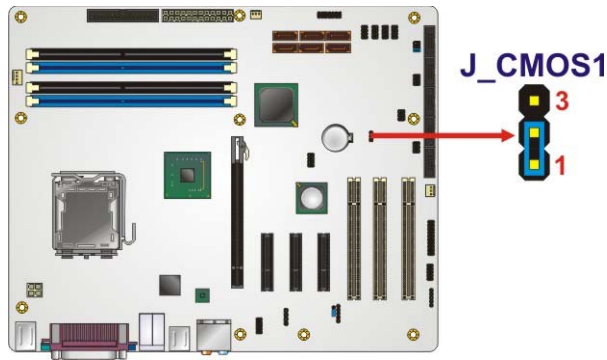
**Figure 4-8: Clear CMOS Jumper**

## 4.4.2 COM Port Pin 9 Function Select

| | |
|---|---|
| **Jumper Label:** | **J_COM_F3, J_COM_F4, J_COM_F5 and J_COM_F6** |
| **Jumper Type:** | 3-pin header |
| **Jumper Settings:** | See **Table 4-3** |
| **Jumper Location:** | See **Figure 4-9** |

> **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 4-3**.

| 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 4-3: COM Port Pin 9 Function Select Jumper Settings**

The COM Port Pin 9 Function Select jumper location is shown in **Figure 4-9** below.
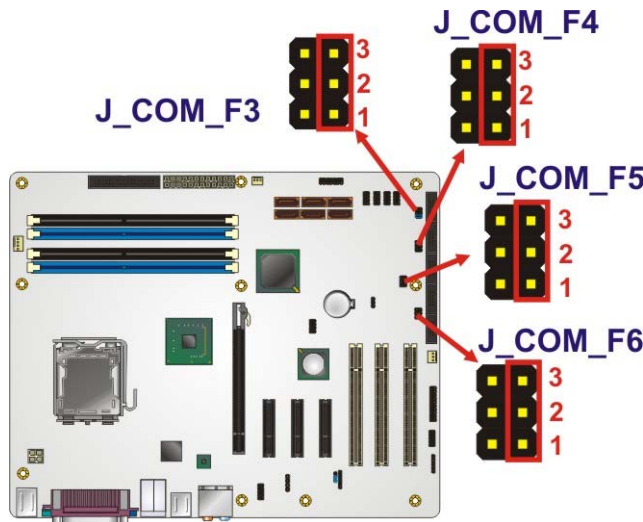


**Figure 4-9: COM Port Pin 9 Function Select Jumper Location**

## 4.4.3 COM Port Pin 9 Voltage Setting Select

| | |
|---|---|
| **Jumper Label:** | **J_COM_V3, J_COM_V4, J_COM_V5 and J_COM_V6** |
| **Jumper Type:** | 3-pin header |
| **Jumper Settings:** | See **Table 4-4** |
| **Jumper Location:** | See **Figure 4-10** |

⚠️ **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 4-4**.

| 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 4-4: COM Port Pin 9 Voltage Setting Select Jumper Settings**

The COM Port Pin 9 Voltage Setting Select jumper location is shown in **Figure 4-10** below.
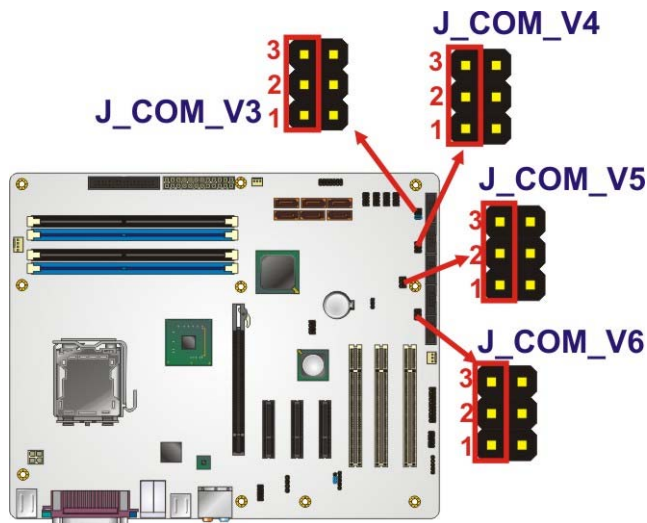


**Figure 4-10: COM Port Pin 9 Voltage Setting Select Jumper Location**

## 4.4.4 SPDIF Out Selection

**Jumper Label:**      **JP1**

**Jumper Type:**      3-pin header

**Jumper Settings:**      See **Table 4-5**

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

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 4-5** and the jumper location is shown in **Figure 4-11**.

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

**Table 4-5: SPDIF Out Selection Jumper Settings**
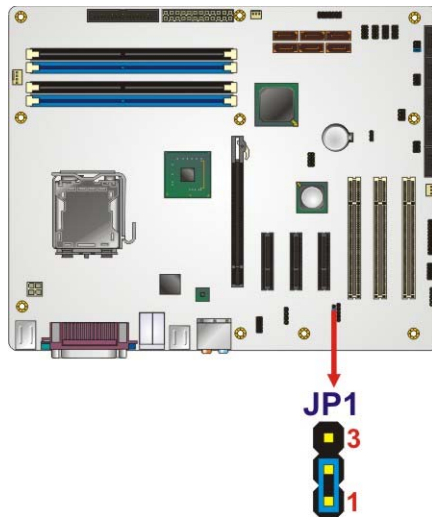


**Figure 4-11: SPDIF Out Selection Jumper Pinout Location**

## 4.5 Chassis Installation

### 4.5.1 Airflow

**⚠ WARNING:**

> Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the IMBA-XQ354S must have air vents to allow cool air to move into the system and hot air to move out.

The IMBA-XQ354S 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.

### 4.5.2 IMBA-XQ354S Installation

To install the IMBA-XQ354S motherboard into the chassis please refer to the reference material that came with the chassis.

### 4.5.3 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 4-12**. A key on the front of the cable connectors ensures the connector can only be installed in one direction.
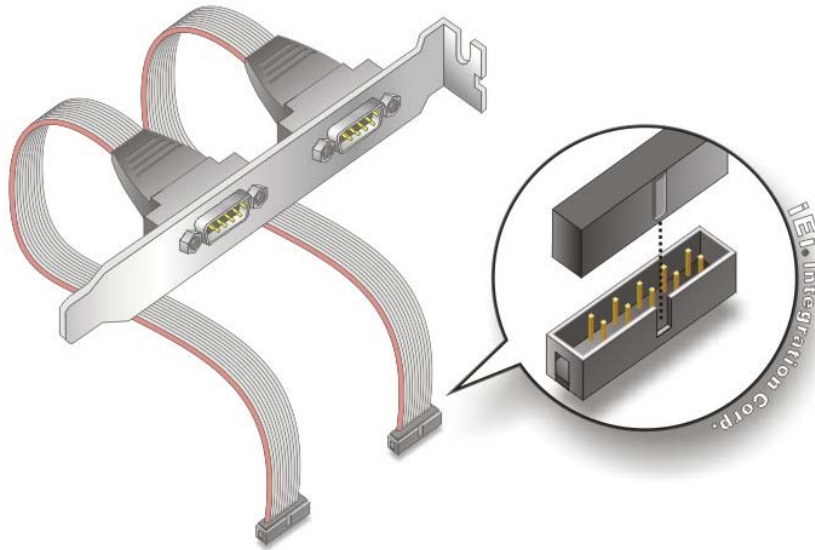
**Figure 4-12: Dual RS-232 Cable Installation**

**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

## 4.5.4 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 4-13**. A key on the front of the cable connectors ensures the

connector can only be installed in one direction.
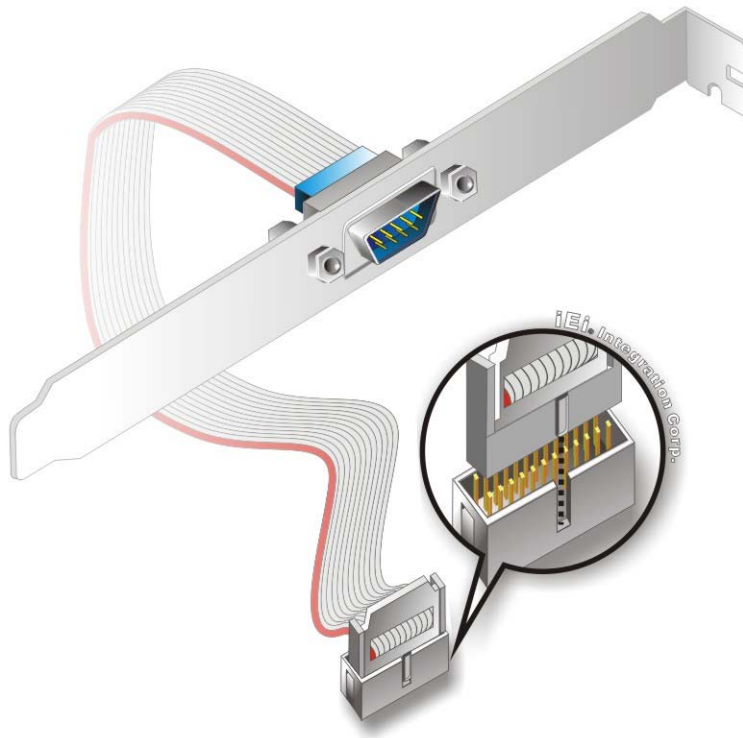
**Figure 4-13: Single RS-232 Cable Installation**

**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

### 4.5.5 SATA Drive Connection (Two Cables)

The IMBA-XQ354S is shipped with six SATA drive cables. 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**. Insert the cable connector into the on-board SATA

drive connector until it clips into place. See Figure 4-14.
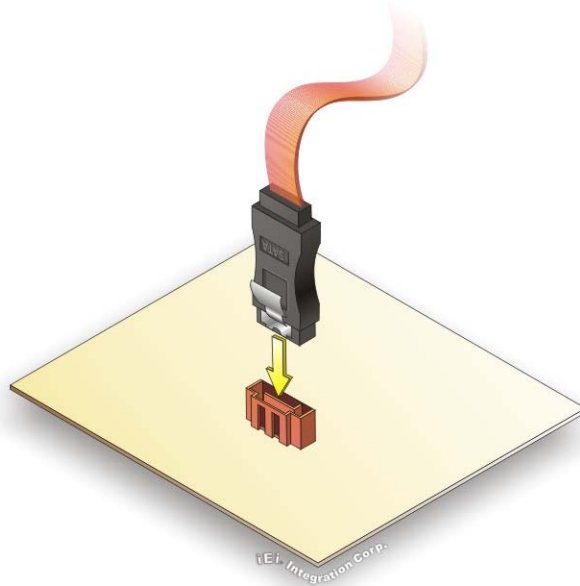
**Figure 4-14: SATA Drive Cable Connection**

**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 4-15.

**Step 4:   Connect the SATA power cable**. Connect the SATA power connector to the

back of the SATA drive. See Figure 4-15.
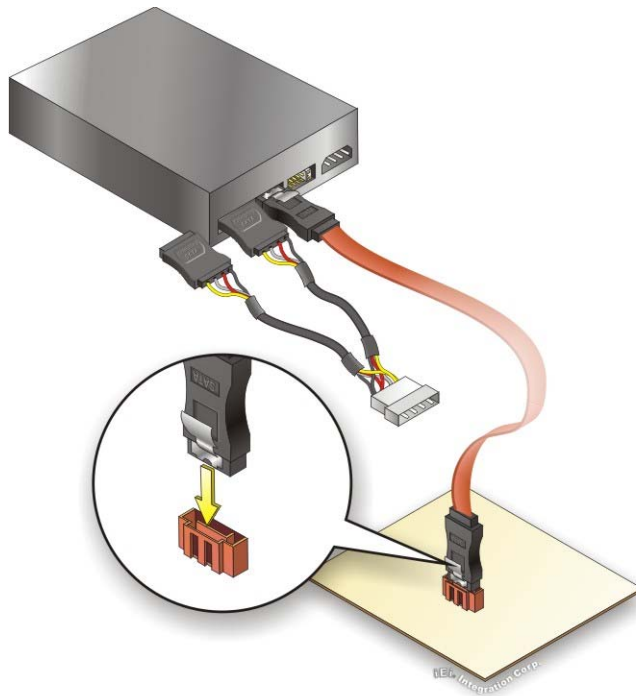
**Figure 4-15: SATA Power Drive Connection**

## 4.6 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-XQ354S external peripheral interface connector making sure the pins are properly aligned.

### 4.6.1 Keyboard and Mouse

The IMBA-XQ354S 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-XQ354S.

**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 4-16**.
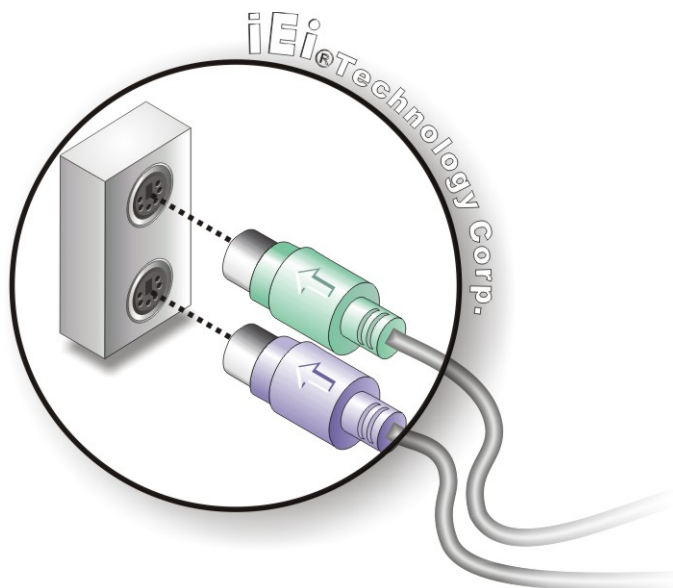


**Figure 4-16: PS/2 Keyboard/Mouse Connector**

### 4.6.2 LAN

There is one external RJ-45 LAN connector. The RJ-45 connector enables 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 connector**. The location of the USB connector is shown in

**Chapter 3**.

**Step 2:** **Align the connectors.** Align the RJ-45 connector on the LAN cable with the

RJ-45 connector on the IMBA-XQ354S. See **Figure 4-17**.
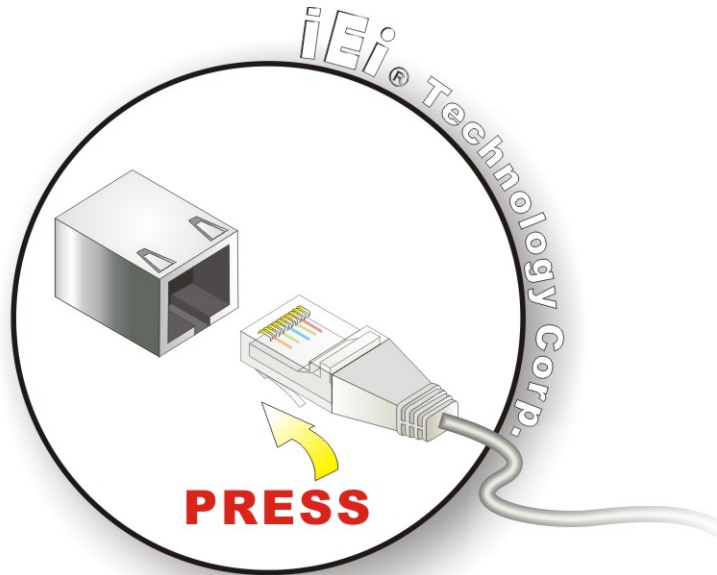


**Figure 4-17: LAN Connection**

**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.

## 4.6.3 Parallel Device Connection

The IMBA-XQ354S has a single female D-sub 25 connector on the external peripheral
interface panel for parallel devices. Follow the steps below to connect a parallel device to
the IMBA-XQ354S.

**Step 1:** **Locate the D-sub 25 connector**. The location of the D-sub 25 connector is

shown in **Chapter 3**.

**Step 2:** **Insert the D-sub 25 connector**. Insert the D-sub 25 connector of a parallel

device into the D-sub 25 connector on the external peripheral interface. See

**Figure 4-18**.
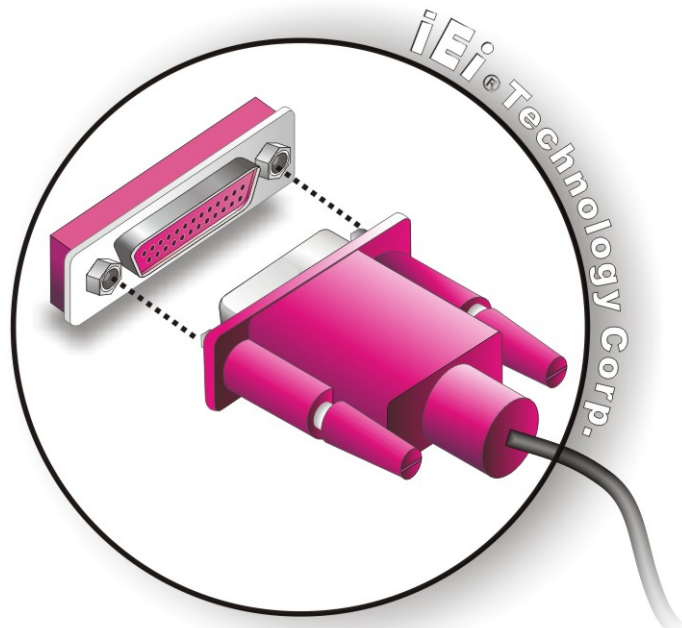
**Figure 4-18: Parallel Device Connector**

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

## 4.6.4 Serial Device

The IMBA-XQ354S has a single male D-sub 9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the IMBA-XQ354S.

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

**Step 2:** **Insert the serial connector**. Insert the D-sub 9 connector of a serial device into the D-sub 9 connector on the external peripheral interface. See **Figure 4-19**.
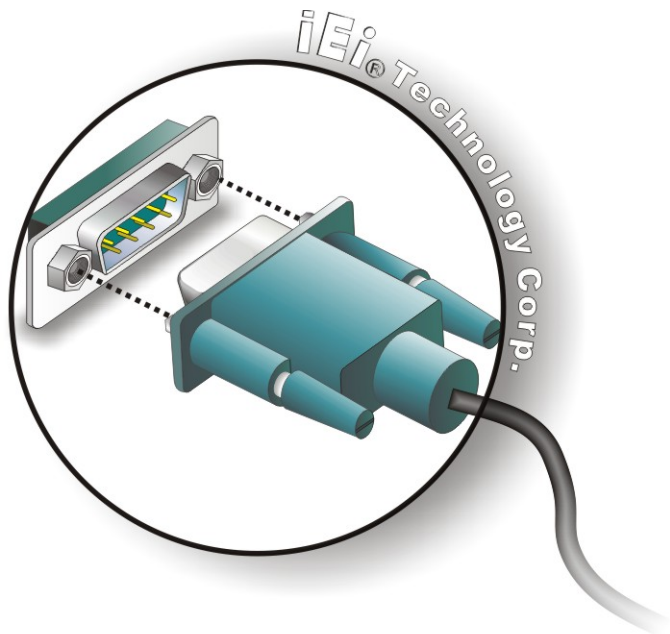
**Figure 4-19: Serial Device Connector**

**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.

## 4.6.5 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-XQ354S.

**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 4-20**.
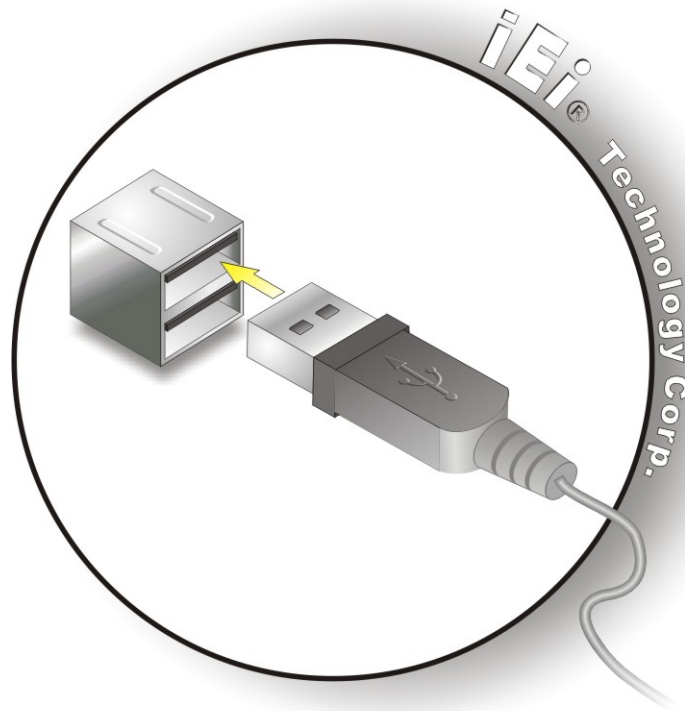
**Figure 4-20: USB Connector**

## 4.6.6 VGA Monitor

The IMBA-XQ354S has a single female D-sub 15 connector on the external peripheral interface panel. The D-sub 15 connector is connected to a CRT or VGA monitor. To connect a monitor to the IMBA-XQ354S, please follow the instructions below.

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

**Step 2:** **Align the VGA connector**. Align the male D-sub 15 connector on the VGA screen cable with the female D-sub 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-XQ354S. See **Figure 4-21**.
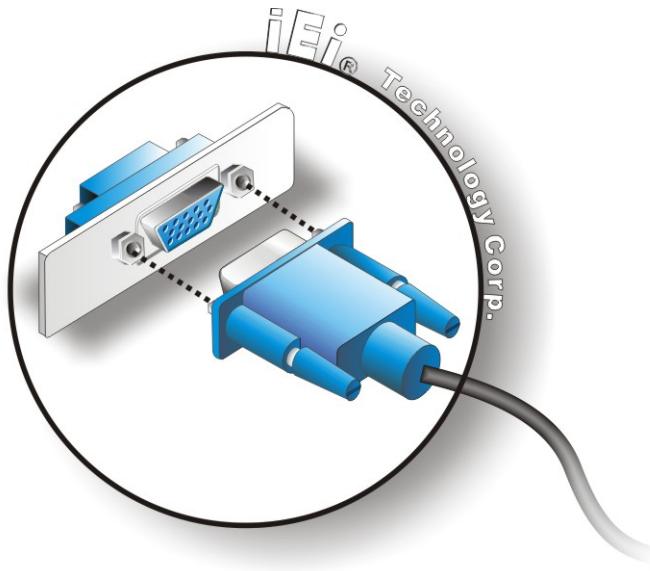
**Figure 4-21: VGA Connector**

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

## 4.6.7 Audio Connector

The six audio jacks on the external audio connector enable the IMBA-XQ354S 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.
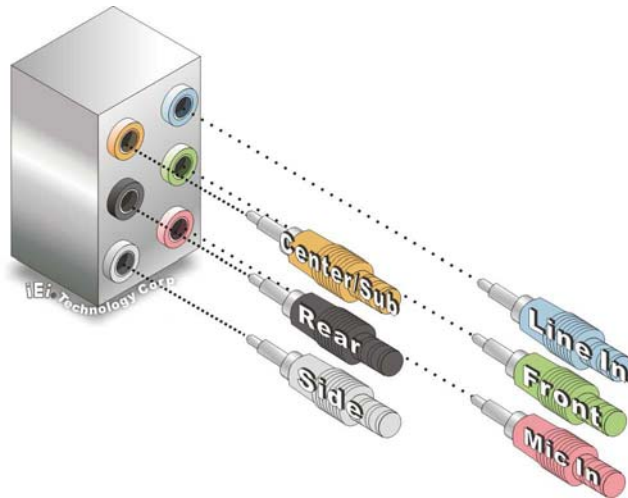


**Figure 4-22: Audio Connector**

**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

5

# BIOS Setup

## 5.1 Introduction

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

![NOTE icon]  **NOTE:**

> Some of the BIOS options may vary throughout the life cycle of the product and are subject to change without prior notice.

### 5.1.1 Starting Setup

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

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

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

### 5.1.2 Using Setup

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

| Key | Function |
|-----|----------|
| Up arrow | Move to previous item |
| Down arrow | Move to next item |

| Key | Function |
|---|---|
| Left arrow | Move to the item on the left hand side |
| Right arrow | Move to the item on the right hand side |
| Esc key | Main Menu – Quit and not save changes into CMOS<br>Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu |
| Page Up key | Increase the numeric value or make changes |
| Page Dn key | Decrease the numeric value or make changes |
| F1 key | General help, only for Status Page Setup Menu and Option Page Setup Menu |
| F2 /F3 key | Change color from total 16 colors.    F2 to select color forward. |
| F10 key | Save all the CMOS changes, only for Main Menu |

**Table 5-1: BIOS Navigation Keys**

## 5.1.3 Getting Help

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

## 5.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 5**.

## 5.1.5 BIOS Menu Bar

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

- **Main** Changes the basic system configuration.
- **Advanced** Changes the advanced system settings.
- **PCIPnP** Changes the advanced PCI/PnP Settings
- **Boot** Changes the system boot configuration.

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

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

## 5.2 Main

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

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

  System Overview                                   Use [ENTER], [TAB] or
                                                    [SHIFT-TAB] to select
  AMIBIOS                                           a field.
  Version    :08.00.15
  Build Date:08/26/08                               Use [+] or [-] to
  ID         :E200MR14                              configure system
                                                    Time.
  Processor
  Intel Core2 CPU            6300 @ 1.86GHz
  Speed      :1866MHz
  Count      :1

  System Memory                                     ←→    Select Screen
  Size       :2039MB                                ↑↓    Select Item
                                                    +-    Change Field
  System Time                [14:20:27]             Tab   Select Field
  System Date                [Tue 05/06/2008]       F1    General Help
                                                    F10   Save and Exit
                                                    ESC   Exit

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```

BIOS Menu 1: Main

➔ **System Overview**

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

- **AMI BIOS**: Displays auto-detected BIOS information

  - O **Version**: Current BIOS version

  - O **Build Date**: Date the current BIOS version was made

  - O **ID**: Installed BIOS ID

- **Processor**: Displays auto-detected CPU specifications

  - O **Type**: Names the currently installed processor

  - O **Speed**: Lists the processor speed

  - O **Count**: The number of CPUs on the motherboard

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

  - O **Size**: Lists memory size

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

➔ **System Time [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.

## 5.3 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 SETUP UTILITY
  Main   Advanced   PCIPnP    Boot    Security   Chipset    Exit

 Advanced Settings                           Configure CPU

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

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



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```
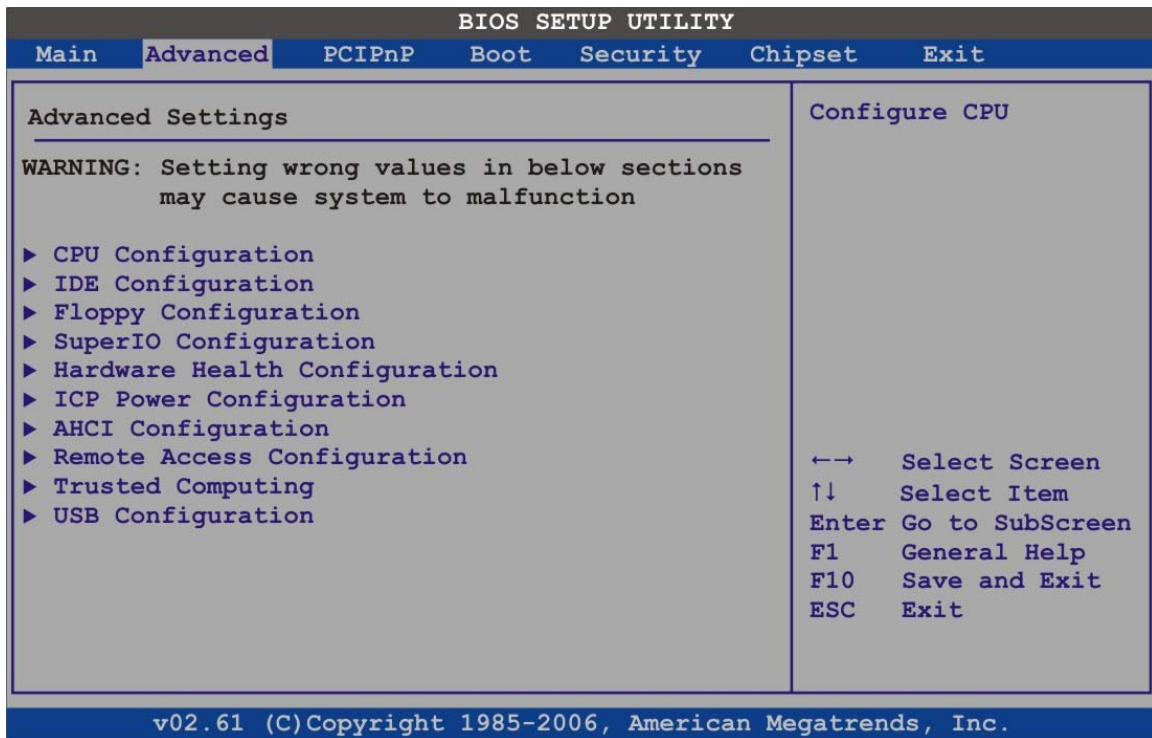
**BIOS Menu 2: Advanced**

## 5.3.1 CPU Configuration

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

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

  Configure advanced CPU settings
   Module Version - 11.05

  Manufacturer:Intel
  Intel Core2 CPU              6300 @ 1.86GHz
  Frequency   :1.86GHz
  FSB Speed   :1068MHz
  Cache L1    :64 KB
  Cache L2    :2048 KB
  Ratio Actual Value:7


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



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```

BIOS Menu 3: CPU Configuration

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

- **Manufacturer**: Lists the name of the CPU manufacturer
- **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

### 5.3.2 IDE Configuration

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

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

   IDE Configuration                                   Options

 SATA#1 Configuration            [Enhanced]            Disabled
   Configure SATA#1 as           [IDE]                 Enabled
 SATA#2 Configuration            [Enhanced]

 ▶ Primary IDE Master              : [Not Detected]
 ▶ Primary IDE Slave               : [Not Detected]
 ▶ Secondary IDE Master            : [Not Detected]
 ▶ Secondary IDE Slave             : [Not Detected]
 ▶ Third IDE Master                : [Not Detected]
 ▶ Fourth IDE Master               : [Not Detected]
                                                       ←→    Select Screen
                                                       ↑↓    Select Item
                                                       +-    Change Option
                                                       F1    General Help
                                                       F10   Save and Exit
                                                       ESC   Exit


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```

**BIOS Menu 4: IDE Configuration**

➔ **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**   D<small>EFAULT</small>    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 5.3.2.1** appear.

### 5.3.2.1 IDE Master, IDE Slave

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

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

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

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

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

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```

**BIOS Menu 5: IDE Master and IDE Slave Configuration**

➔ **Auto-Detected Drive Parameters**

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

- **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

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

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

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

è **S.M.A.R.T [Auto]**

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

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

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

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

è **32Bit Data Transfer [Enabled]**

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

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

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

### 5.3.3 Floppy Configuration

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

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

   Floppy Configuration                                Select the type of
                                                       floppy drive
   Floppy A                          [1.44 MB 3½"]     connected to the
                                                       sytem.




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


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```
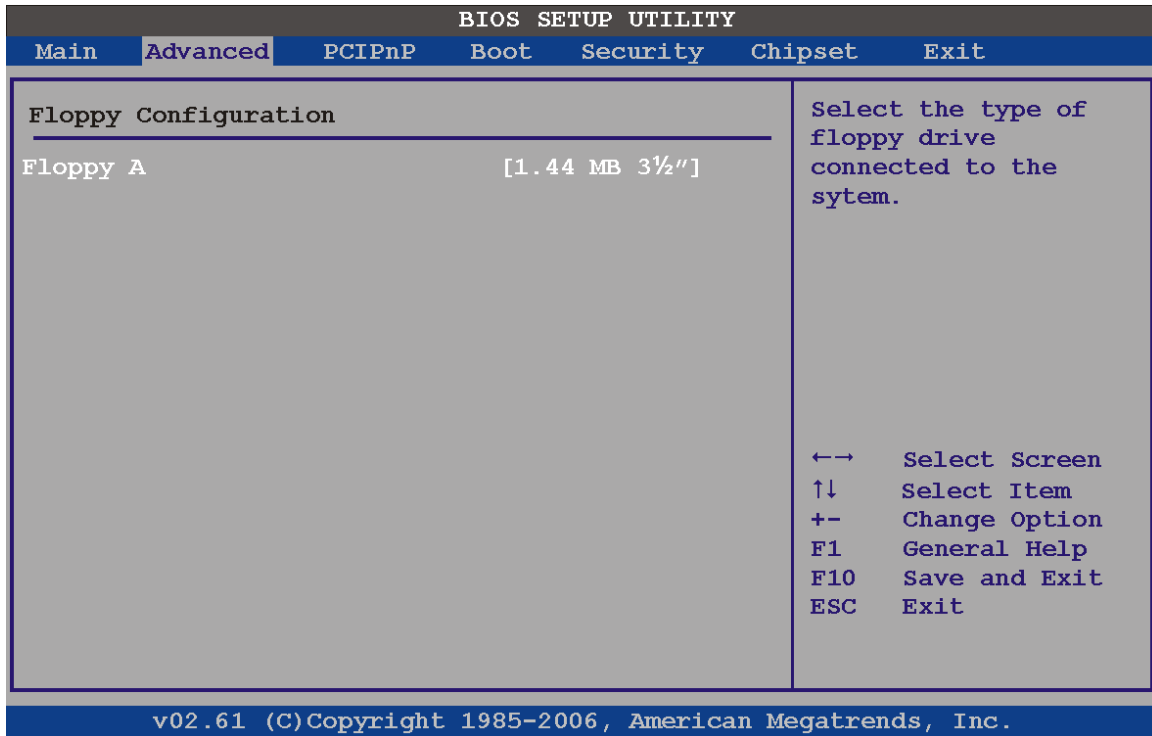
**BIOS Menu 6: IDE Master and IDE Slave Configuration**

➔ **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"

## 5.3.4 Super IO Configuration

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

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

    Configure ITE8718 Super IO Chipset            Allows BIOS to select
    ───────────────────────────────────          Serial Port1 Base
    Serial Port1 Address         [3F8/IRQ4]       Addresses.
      Serial Port1 Mode          [Normal]
    Serial Port2 Address         [2F8/IRQ3]
      Serial Port2 Mode          [Normal]
    Parallel Port Address        [378]
      Parallel Port Mode         [Normal]
      Parallel Port IRQ          [IRQ7]
    Serial Port3 Address         [3E8]
      Serial Port3 IRQ           [10]
    Serial Port4 Address         [2E8]
      Serial Port4 IRQ           [10]            ←→    Select Screen
    Serial Port5 Address         [2F0]          ↑↓    Select Item
      Serial Port5 IRQ           [10]           +-    Change Option
    Serial Port6 Address         [2E0]          F1    General Help
      Serial Port6 IRQ           [10]           F10   Save and Exit
                                                ESC   Exit


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```

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.

è **Normal**   DEFAULT   Serial Port 1 mode is normal

è **IrDA**                     Serial Port 1 mode is IrDA

è **ASK IR**             Serial Port 1 mode is ASK IR

è **Serial Port2 Address [2F8/IRQ3]**

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

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

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

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

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

è **Serial Port2 Mode [Normal]**

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

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

è **IrDA**                     Serial Port 2 mode is IrDA

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

è **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:

è **Disabled**                No I/O port address is assigned to the parallel port

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

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

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

è **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

### 5.3.5 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 SETUP UTILITY
   Main    Advanced    PCIPnP    Boot    Security   Chipset    Exit

 Hardware Health Event Monitoring                    Fan configuration
                                                     mode setting
CPU_FAN1 Mode Setting            [Automatic mode]
   CPU Temp. Limit of OFF        [000]
   CPU Temp. Limit of Start      [020]
   CPU_FAN1 Start PWM            [070]
   Slope PWM 1                   [0.5    PWM]
SYS_FAN1 Mode Setting            [Automatic mode]
   PWM Temp. Limit of OFF        [000]
   PWM Temp. Limit of Start      [020]
   SYS_FAN1 Start PWM            [070]
   Slope PWM 2                   [0.5    PWM]
SYS_FAN2 Mode Setting            [Automatic mode]
   System Temp. Limit of OFF     [000]          ←→    Select Screen
   System Temp. Limit of Start   [020]          ↑↓    Select Item
   SYS_FAN2 Start PWM            [070]          F1    General Help
   Slope PWM 3                   [0.5    PWM]   F10   Save and Exit
                                                ESC   Exit


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```

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 SETUP UTILITY
   Main     Advanced    PCIPnP    Boot    Security   Chipset    Exit

  Hardware Health Event Monitoring

  CPU Temperature              :43C/109F
  System Temperature #1        :33C/91F
  System Temperature #2        :33C/91F

  CPU Fan Speed                :4821 RPM
  SYS Fan Speed                :N/A
  SYS Fan2 Speed               :N/A

  CPU Core                     :1.306 V
  DDR2 1.8V                    :1.920 V
  +3.30V                       :3.376 V          ←→    Select Screen
  +5.00V                       :5.080 V          ↑↓    Select Item
  +12.0V                       :12.160 V         F1    General Help
  FSB VTT                      :1.136 V          F10   Save and Exit
  +1.5V                        :1.440 V          ESC   Exit
  +1.25V                       :1.248 V
  VBAT                         :3.106 V


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```

    **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

o +12.0 V

o FSB VTT

o +1.5 V

o +1.25 V

o VBAT

## 5.3.6 APM Configuration

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

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

 APM Configuration

 ▶ ACPI Configuration

 Power Configuration
 ----------------------------------------
 Restore on AC Power Loss      [Last State]

 Advanced Resume Event Controls
 Resume On Keyboard/Mouse      [Disabled]
 Resume On PCI-Express WAKE#   [Enabled]


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



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```

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

### 5.3.6.1 ACPI Configuration

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

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

 APM Configuration                                 Go into On/Off, or
 ─────────────────────────────────────             Suspend when Power
 Suspend mode                  [S1 (POS)]          button is pressed.




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


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```
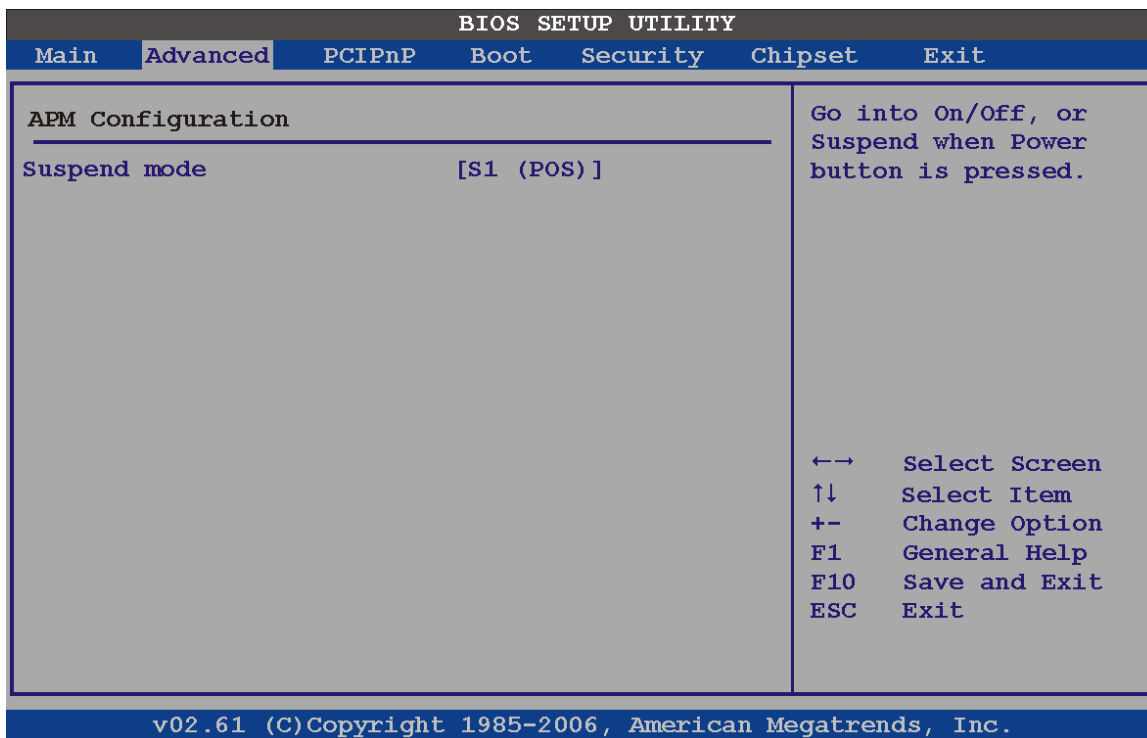
BIOS Menu 11: Advanced ACPI Configuration

➔ **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.

## 5.3.7 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 SETUP UTILITY
    Main    Advanced    PCIPnP    Boot    Security   Chipset    Exit

    AHCI Settings                                   While entering setup,
                                                    BIOS auto detects the
  ▶ AHCI  Port0  [Not Detected]                     presence of IDE
  ▶ AHCI  Port1  [Not Detected]                     devices. This
  ▶ AHCI  Port2  [Not Detected]                     displays the status
  ▶ AHCI  Port3  [Not Detected]                     of auto detection of
  ▶ AHCI  Port4  [Not Detected]                     IDE devices.
  ▶ AHCI  Port5  [Not Detected]



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


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```

**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.

### 5.3.8 Remote Access Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 13**) to configure remote access parameters. The **Remote Access Configuration** is an AMIBIOS feature and allows a remote host running a terminal program to display and configure the BIOS settings.

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

   Configure Remote Access type and parameters        Select Remote Access
   _____           type.

   Remote Access                  [Enabled]

   Serial port number             [COM1]
       Base Address, IRQ          [3F8H, 4]
   Serial Port Mode               [115200 8,n,1]
   Redirection After BIOS POST    [Always]
   Terminal Type                  [ANSI]


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


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```

BIOS Menu 13: 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

## 5.3.9 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 14**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).

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

  Trusted Computing                                  Enable/Disable TPM
                                                     TCG (TPM 1.1/1.2)
  TCG/TPM Support               [No]                 supp in BIOS




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


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```
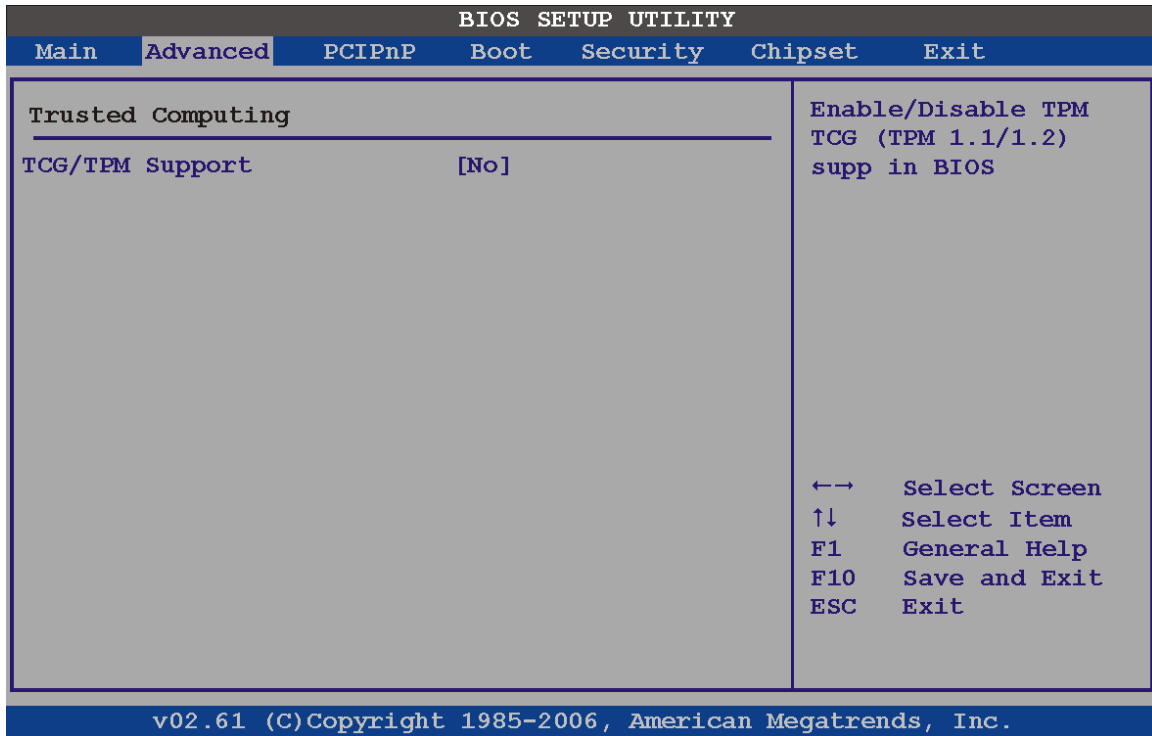
**BIOS Menu 14: Trusted Computing**

➔ **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.

### 5.3.10 USB Configuration

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

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

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

  USB Devices Enabled :
              None

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

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


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```

BIOS Menu 15: 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

## 5.4 PCI/PnP

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

⚠️ **WARNING:**

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

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

   Advanced PCI/PnP Settings                        Available: Specified
                                                     IRQ is available to
   WARNING: Setting wrong values in below sections   be use by PCI/PnP
            may cause system to malfunction          devices.
   IRQ3                           [Reserved]         Reserved: Specified
   IRQ4                           [Reserved]         IRQ is reserved for
   IRQ5                           [Available]        use by legacy ISA
   IRQ7                           [Available]        devices.
   IRQ9                           [Available]
   IRQ10                          [Reserved]
   IRQ11                          [Available]
   IRQ14                          [Available]
   IRQ15                          [Available]         ←→    Select Screen
                                                      ↑↓    Select Item
   DMA Channel 0                  [Available]         +-    Change Option
   DMA Channel 1                  [Available]         F1    General Help
   DMA Channel 3                  [Available]         F10   Save and Exit
   DMA Channel 5                  [Available]         ESC   Exit
   DMA Channel 6                  [Available]
   DMA Channel 7                  [Available]

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```

BIOS Menu 16: 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

## 5.5 Boot

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

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

  Boot Settings                                Configure Settings
                                               during System Boot
  ▶ Boot Settings Configuration

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




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


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```
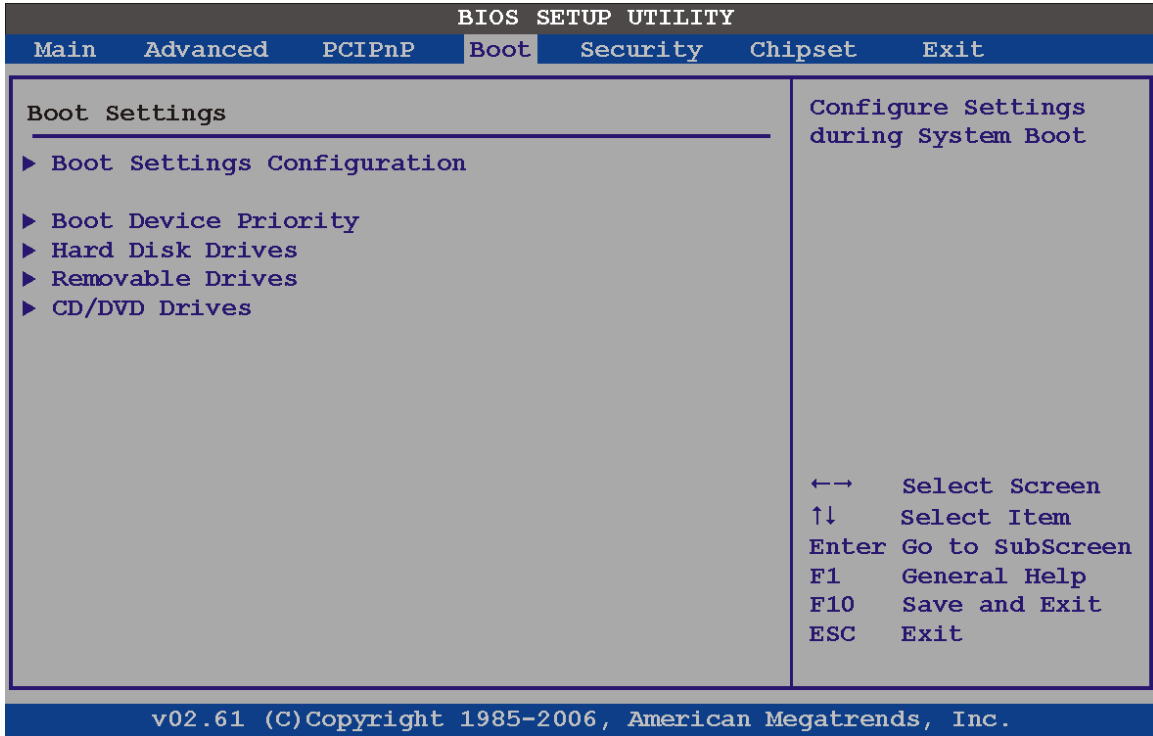
**BIOS Menu 17: Boot**

## 5.5.1 Boot Settings Configuration

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

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

  Boot Settings Configuration                    Allows BIOS to skip
  _____    certain tests while
                                                 booting. This will
  Quick Boot                  [Enabled]          decrease the time
  Quiet Boot                  [Disabled]         needed to boot the
  AddOn ROM Display Mode       [Force BIOS]      system.
  Bootup Num-Lock             [On]
  Boot From LAN Support (82573L)[Disabled]


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

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```
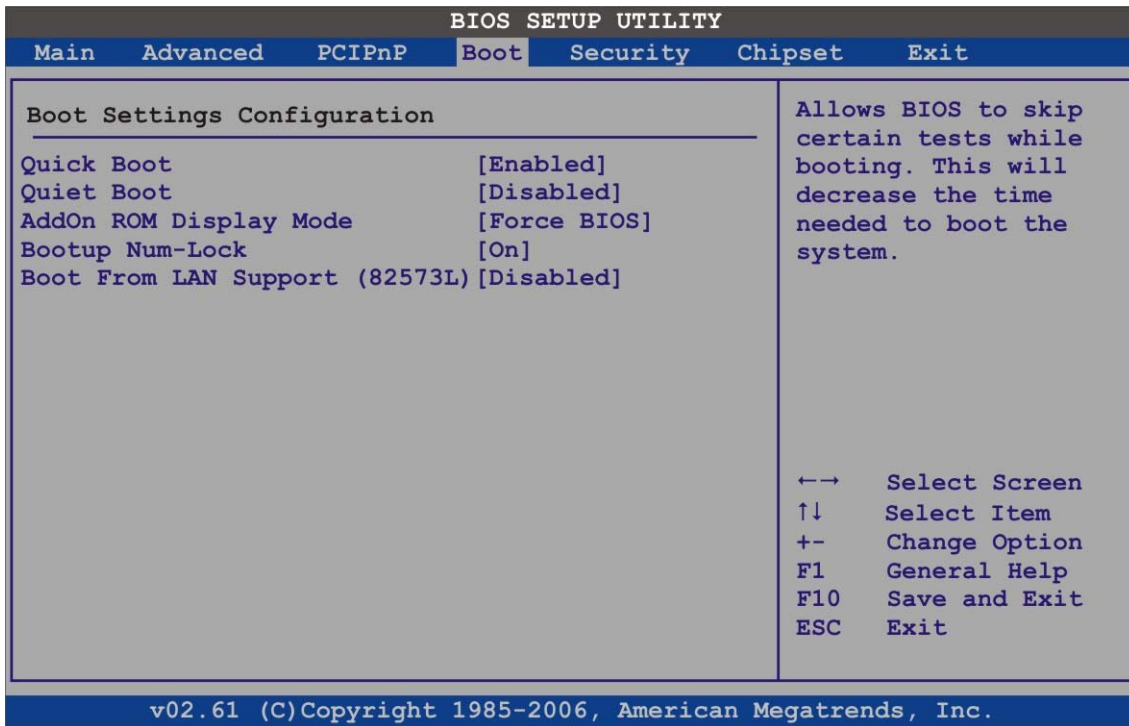
**BIOS Menu 18: Boot Settings Configuration**

➔ **Quick Boot [Enabled]**

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

➔ **Disabled** — No POST procedures are skipped

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

➔ **Quiet Boot [Disabled]**

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

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

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

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

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

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

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

➔ **Bootup Num-Lock [Off]**

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

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

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

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

The **BOOT From LAN Support** allows the system to be booted remotely over a network through LAN1.

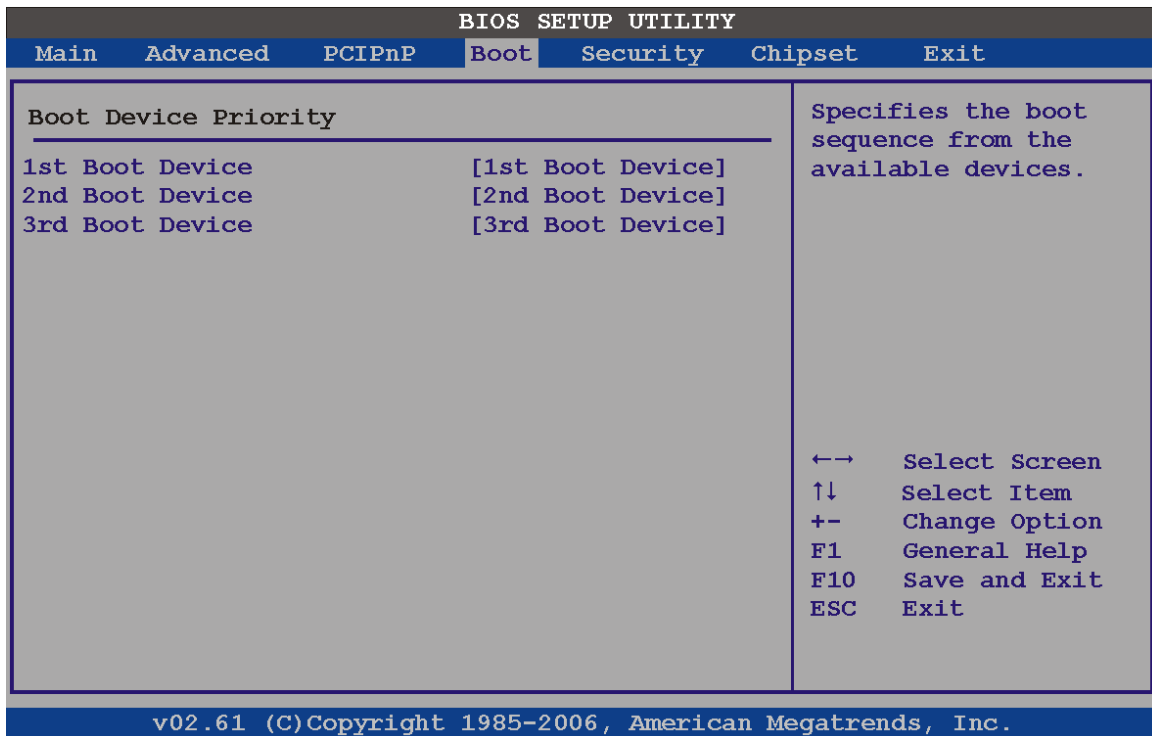➔ **Disabled** DEFAULT Cannot be booted remotely through this port

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

### 5.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 19**) to specify the boot sequence from the available devices. The following options are available:

▪ 1$^{st}$ Boot Device

▪ 2$^{nd}$ Boot Device

▪ 3$^{rd}$ Boot Device

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

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




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


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```

**BIOS Menu 19: Boot Device Priority Settings**

### 5.5.3 Hard Disk Drives

Use the **Hard Disk Drives** menu to specify the boot sequence of the available HDDs. When the menu is opened, the HDDs connected to the system are listed as shown below:
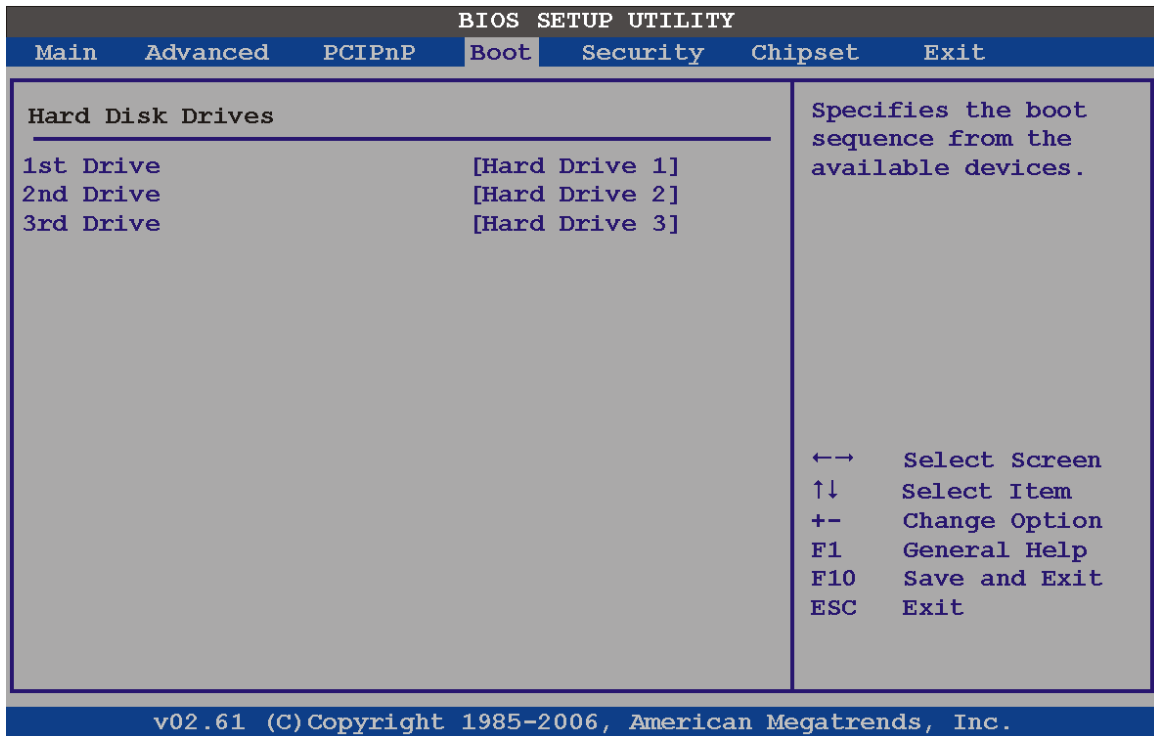
▪ 1st Drive

▪ 2nd Drive

▪ 3rd Drive

**NOTE:**

Only installed drives are shown in the list.

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

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




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


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```

**BIOS Menu 20: Hard Disk Drives**

## 5.5.4 CD/DVD Drives

Use the **CD/DVD Drives** menu to specify the boot sequence of the available CD/DVD drives. When the menu is opened, the CD drives and DVD drives connected to the system are listed as shown below:
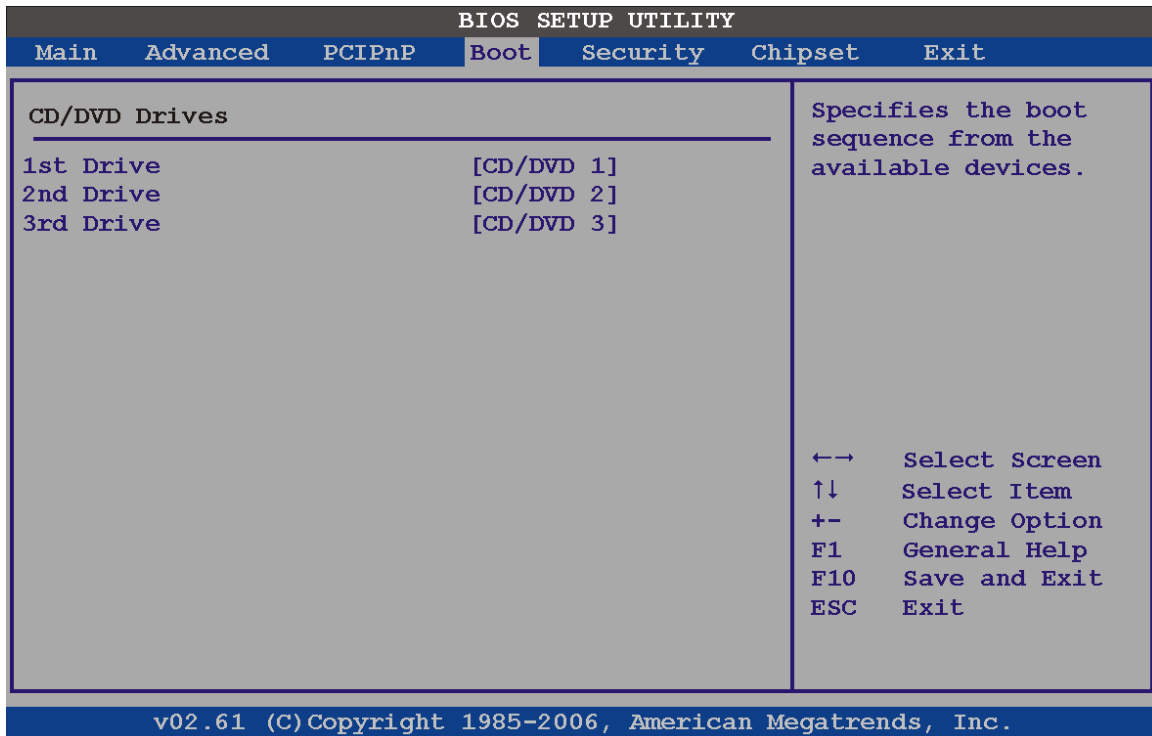
- 1st Drive
- 2nd Drive
- 3rd Drive

---

**NOTE:**

Only installed CD and DVD drives are shown in the list

---

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

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




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


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```
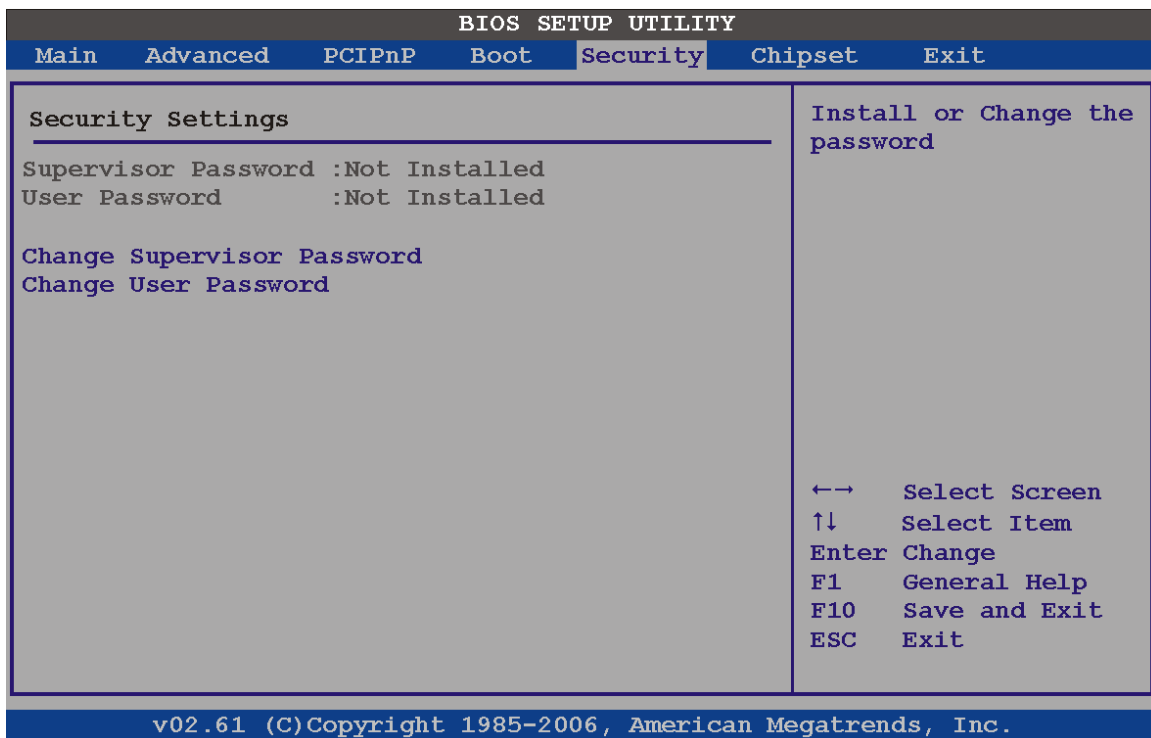
**BIOS Menu 21: CD/DVD Drives**

## 5.5.5 Removable Drives

Use the **Removable Drives** menu (**BIOS Menu 22**) to specify the boot sequence of the available FDDs. When the menu is opened, the FDDs connected to the system are listed as shown below:

- 1st Drive
- 2nd Drive

**NOTE:**

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

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

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




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


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```

**BIOS Menu 22: Removable Drives**

## 5.6 Security

Use the Security menu (**BIOS Menu 23**) to set system and user passwords.

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

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

  Change Supervisor Password
  Change User Password





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

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```

BIOS Menu 23: 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**.

## 5.7 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 SETUP UTILITY
   Main    Advanced   PCIPnP    Boot   Security  Chipset    Exit

 Advanced Chipset Settings                      Options for NB

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

 ▶ Northbridge Configuration
 ▶ Southbridge Configuration




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

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```
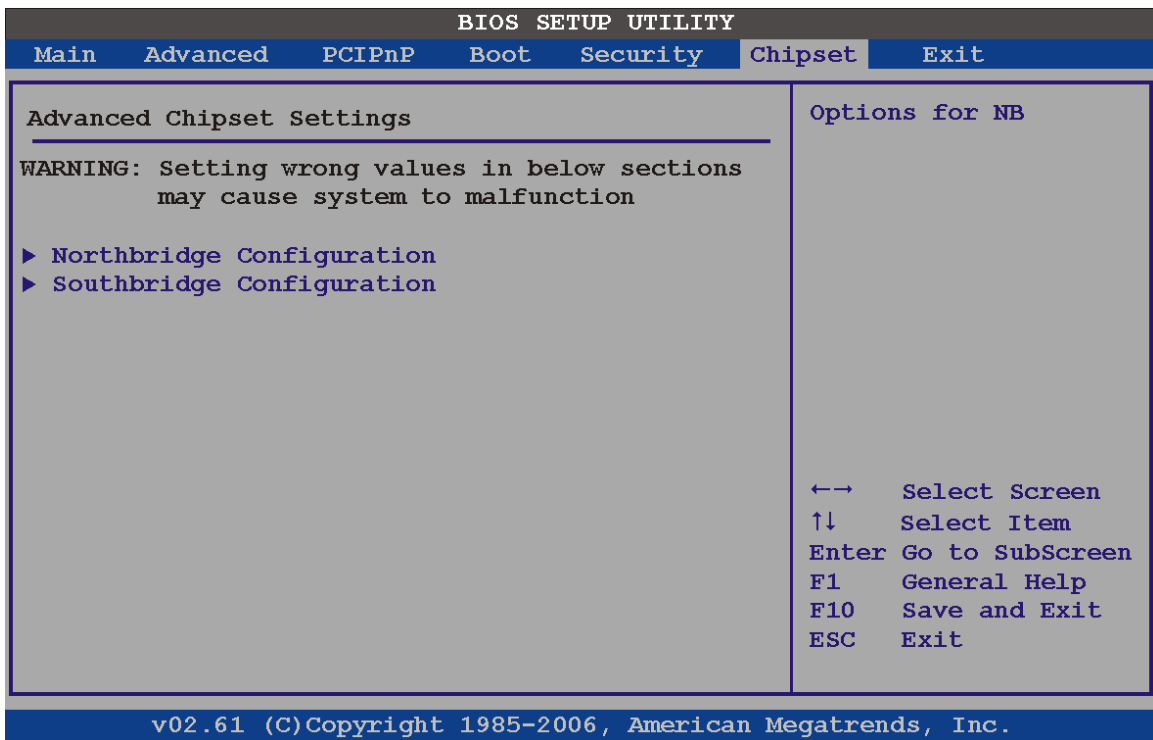
**BIOS Menu 24: Chipset**

## 5.7.1 Northbridge Chipset Configuration

Use the Northbridge Chipset Configuration menu (**BIOS Menu 25**) to configure the Northbridge chipset settings.

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

 Northbridge Chipset Configuration          ENABLE: Allow
 ─────────────────────────────────         remapping of
 Memory Remap Feature         [Enabled]     overlapped PCI memory
   PCI MMIO Allocation: 4GB To 3072MB       above the total
 Memory Hole                  [Disabled]    physical memory.

 Initate Graphic Adapter      [PEG/PCI]     DISABLE: Do not allow
 Internal Graphics Mode Select [Enabled, 8MB] remapping of memory



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


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```

**BIOS Menu 25: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

## 5.7.2 Southbridge Chipset Configuration

Use the Southbridge Configuration menu (**BIOS Menu 26**) to configure the Southbridge chipset.

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

   Southbridge Chipset Configuration              Options

   HDA Controller                  [Enabled]      Enabled
   ASF Support                     [Enabled]      Disabled








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


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```
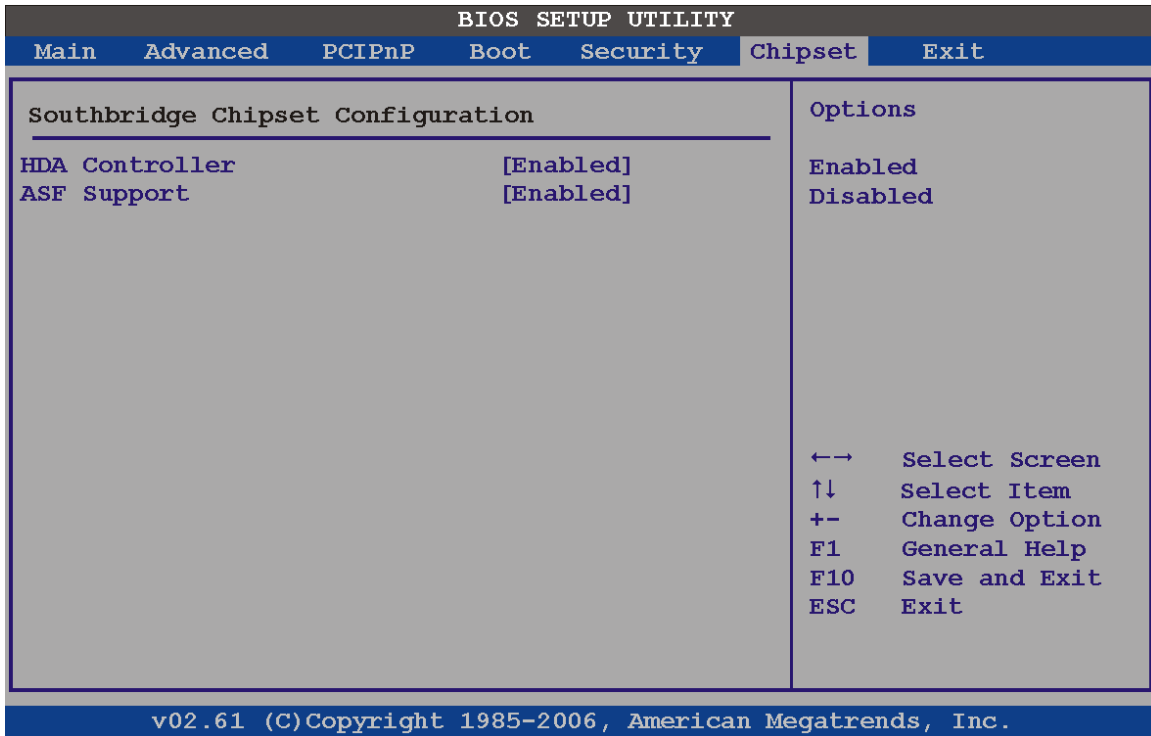
**BIOS Menu 26:Southbridge Chipset Configuration**

➔ **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.

## 5.8 Exit

Use the **Exit** menu (**BIOS Menu 27**) to load default BIOS values, optimal failsafe values
and to save configuration changes.

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

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




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


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```

BIOS Menu 27: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**

**6**

# Software Drivers

## 6.1 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.

## 6.2 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 6-1** appears.
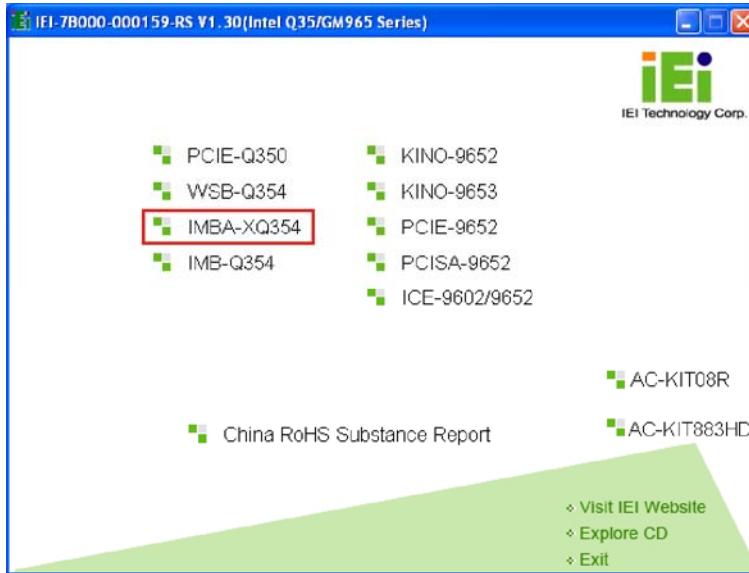
**Figure 6-1: Start Up Screen**

**Step 3:** Click **IMBA-XQ354S**.

**Step 4:** The list of drivers in **Figure 6-2** appears.
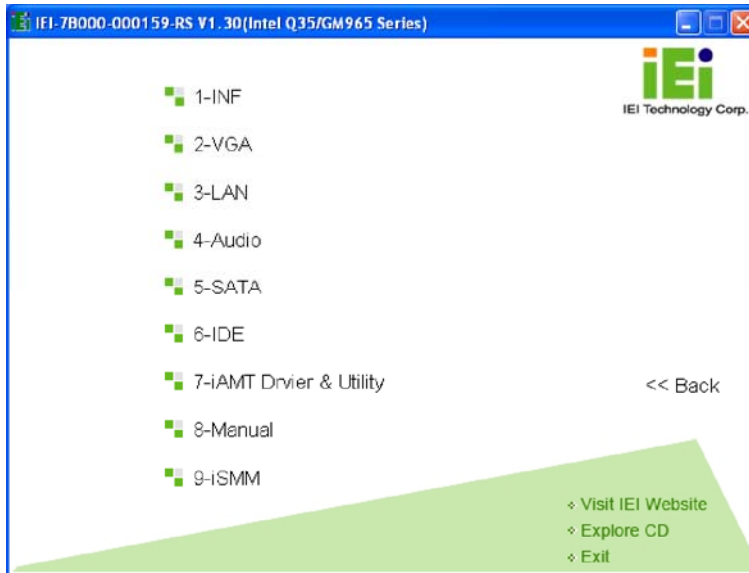
**Figure 6-2: Drivers**

## 6.3 Chipset Driver

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

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

**Step 2:** Browse through the folders and double-click "**infinst911 autol**".

**Step 3:** The Welcome screen appears (**Figure 6-3**).



**Figure 6-3: Intel® Setup Welcome Screen**

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

**Step 5:** The Intel® license agreement screen appears (**Figure 6-4**).

**Figure 6-4: Intel® Chipset Driver License Agreement**

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

**Step 7:** The Readme file contents are displayed (**Figure 6-5**).
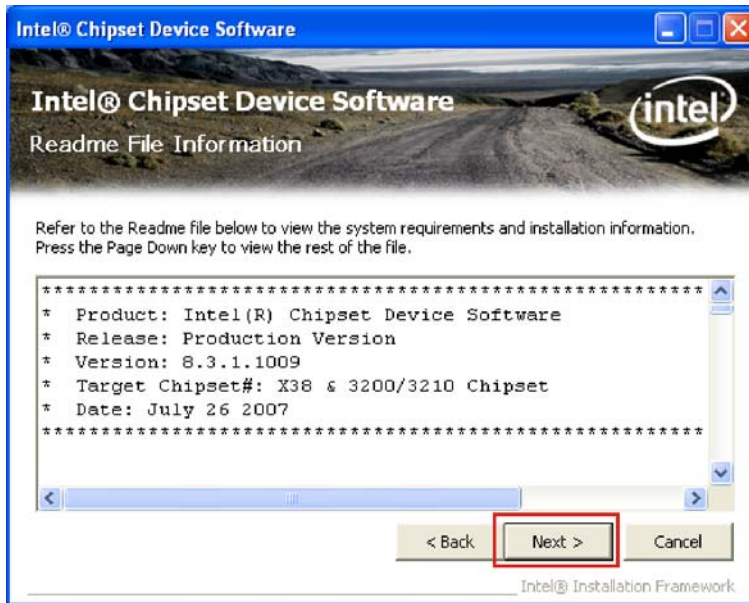


**Figure 6-5: Readme File**

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

**Step 9:** When the setup is complete, the final screen appears (**Figure 6-6**).



**Figure 6-6: Intel® Chipset Driver Complete Installation Screen**

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

## 6.4 Graphics Driver

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

**Step 1:** Click "**VGA**" in the driver menu and select the folder which corresponds to the operating system.

**Step 2:** Double-click the driver file.

**Step 3:** The version information file appears (**Figure 6-7**).
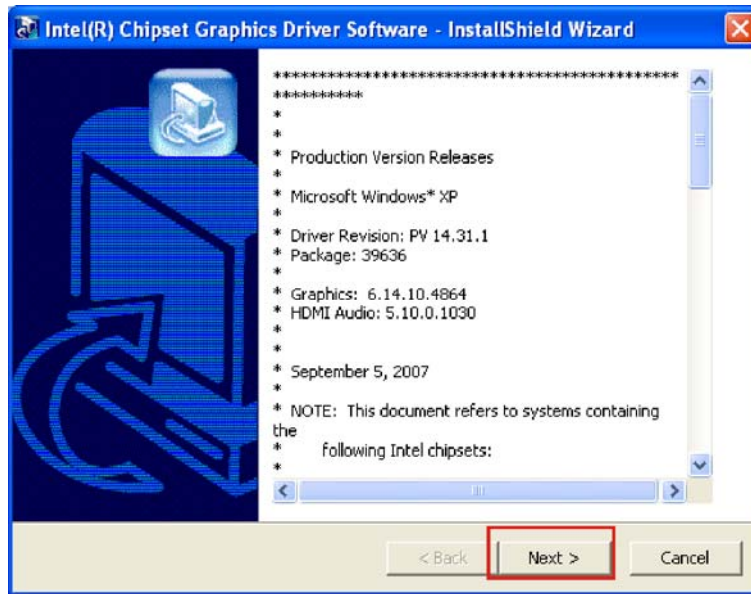
**Figure 6-7: Graphics Driver Readme File**

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

**Step 5:** The welcome screen appears (**Figure 6-8**).
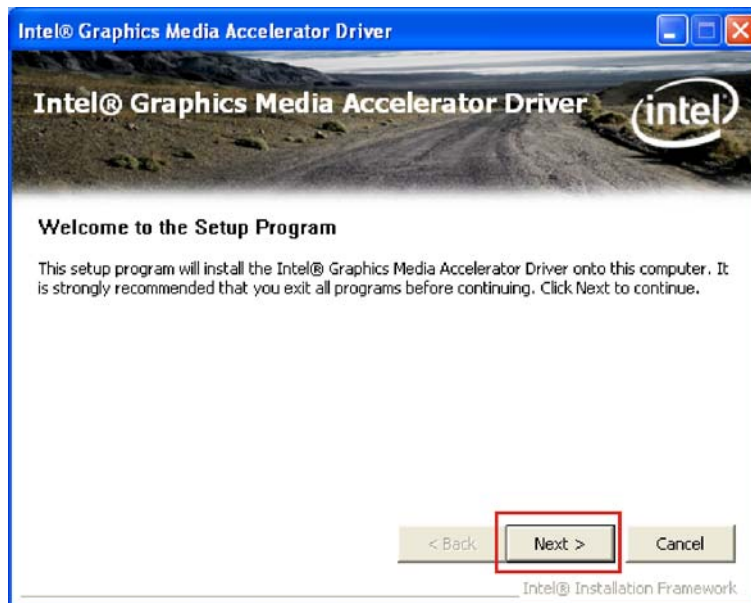


**Figure 6-8: Graphics Driver Installation Welcome Screen**

**Step 6:** Click **NEXT** to continue.

**Step 7:** The license agreement appears (**Figure 6-9**).
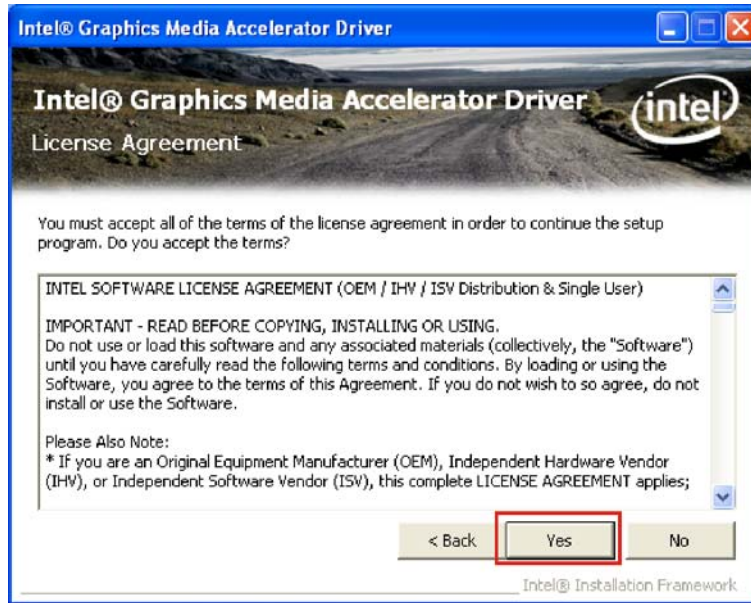


**Figure 6-9: GMA Driver License Agreement**

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

**Step 9:** The Readme file appears (**Figure 6-10**).
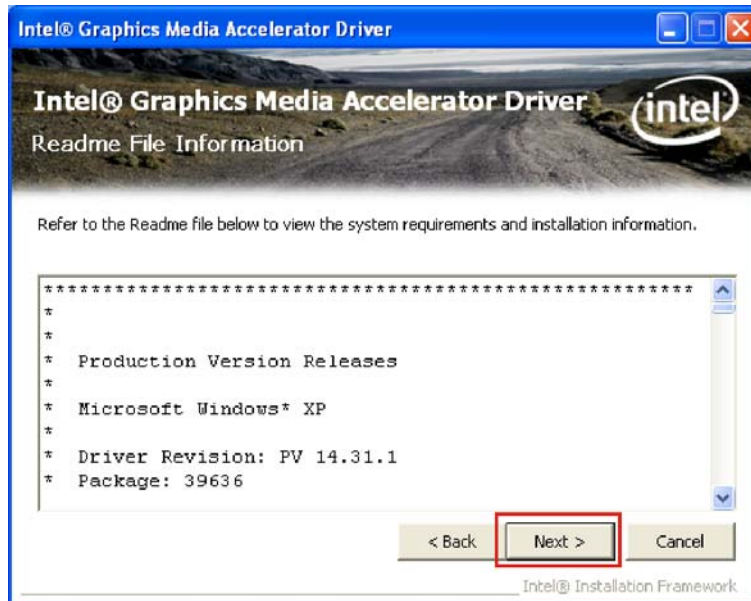


**Figure 6-10: GMA Driver Installing Notice**

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

**Step 11:** The driver installation progress is shown (**Figure 6-11**).



**Figure 6-11: GMA Driver Installation Complete**

**Step 12:** Click NEXT to continue to the final screen.
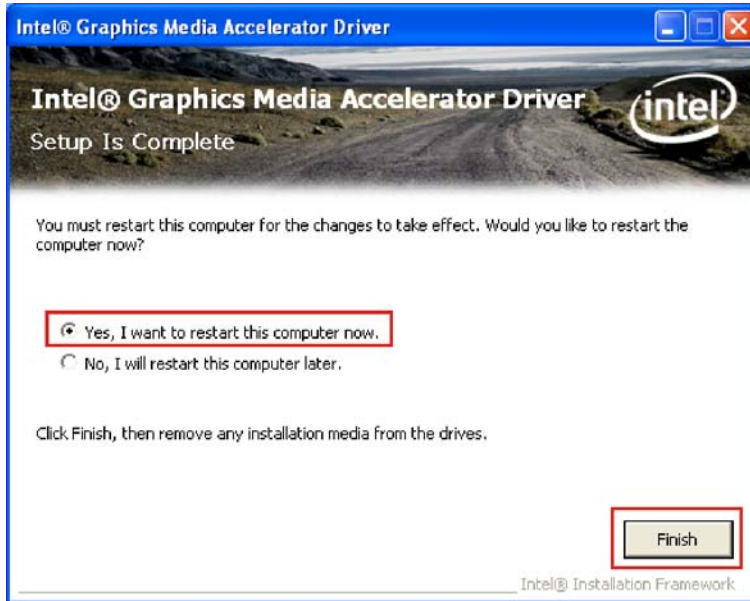


**Figure 6-12: GMA Driver Installing Notice**

**Step 13:** 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.

## 6.5 LAN Driver

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

**Step 1:** Click "**LAN**" in the driver menu and click the **Intel** folder.

**Step 2:** Select the folder which corresponds to the operating system.

**Step 3:** Double-click the driver file.

**Step 4:** The welcome screen appears (**Figure 6-13**).
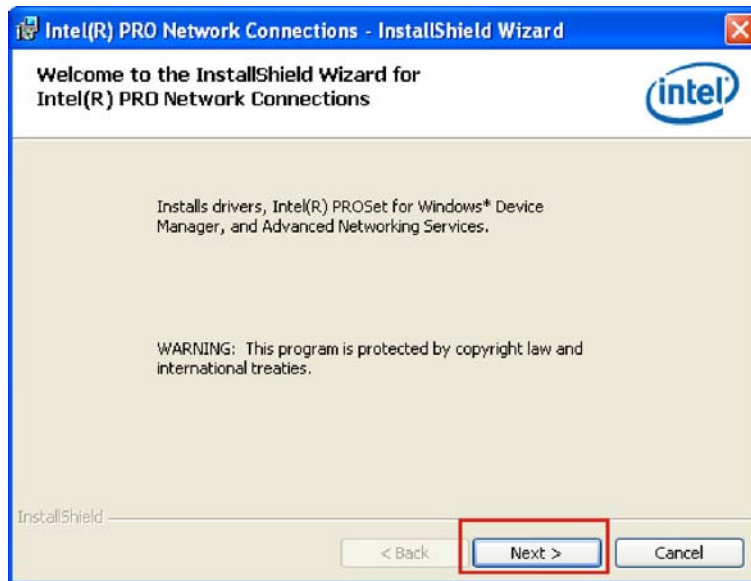


**Figure 6-13: LAN Driver Welcome Screen**

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

**Step 6:** The license agreement appears (**Figure 6-14**).
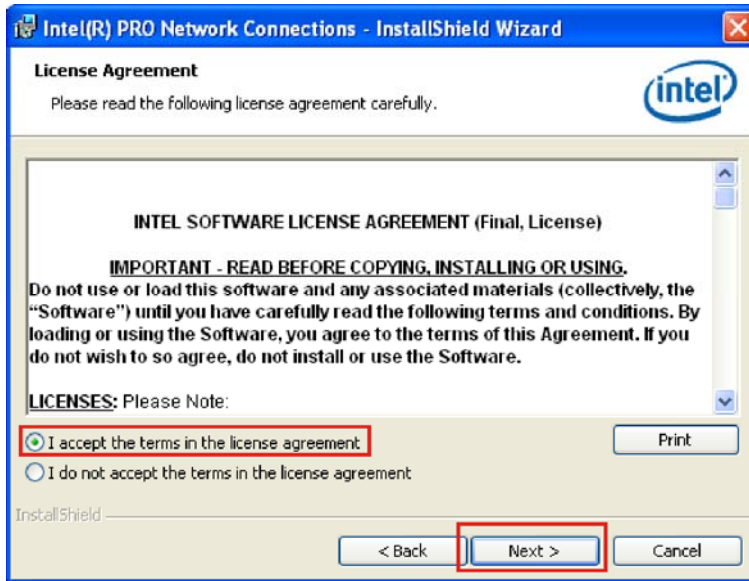
**Figure 6-14: LAN Driver License Agreement**

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

**Step 8:** The Setup Options screen appears (**Figure 6-15**).
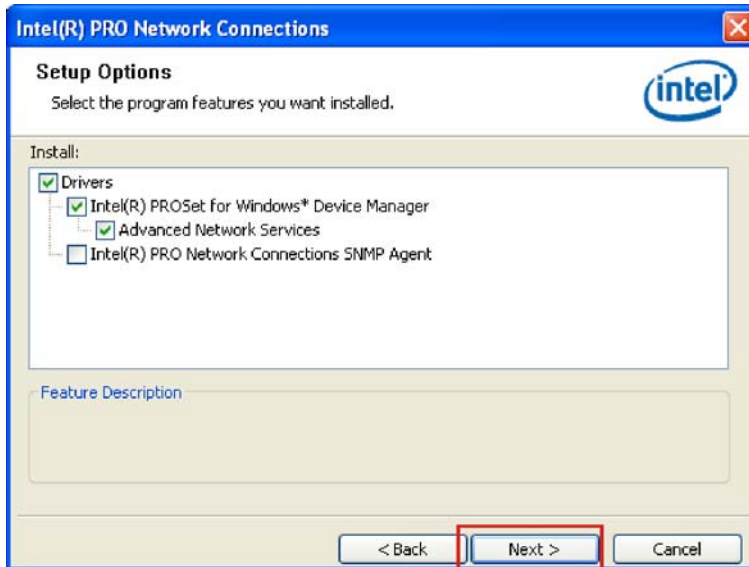


**Figure 6-15: LAN Driver Setup Options**

**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 6-16**).
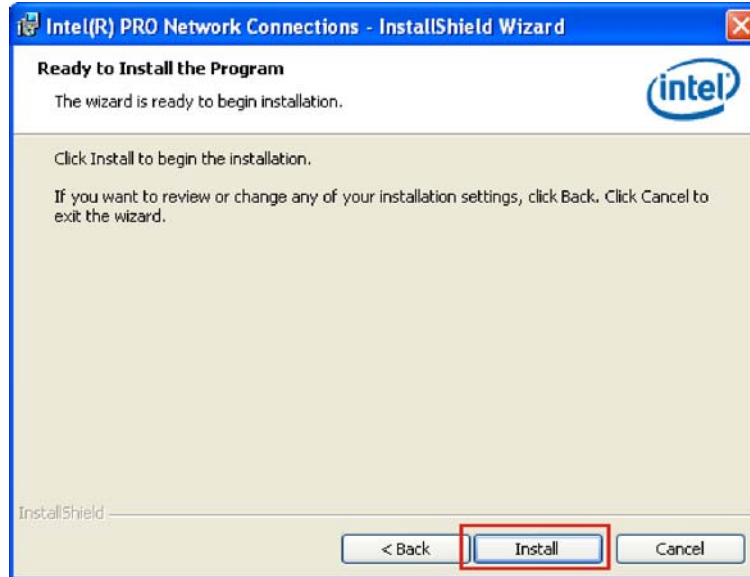


**Figure 6-16: LAN Driver Installation Ready Window**

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

**Step 12:** The window shows the installation is complete (**Figure 6-17**).
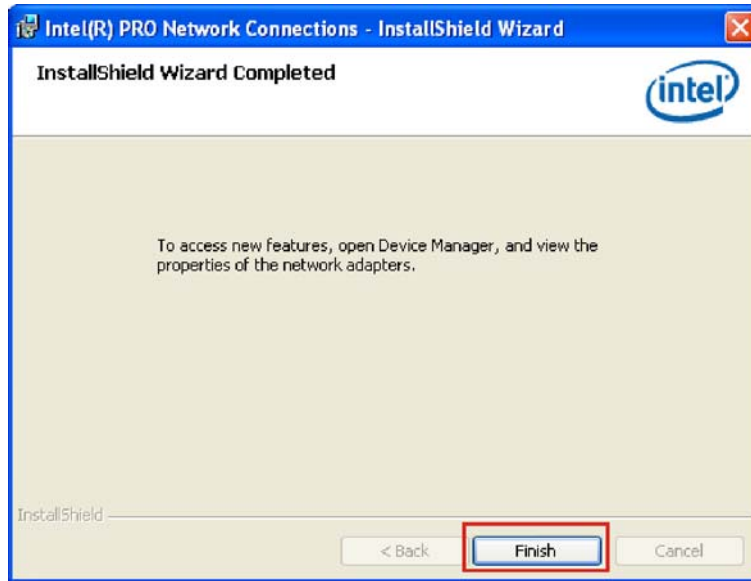
**Figure 6-17: LAN Driver Installation Progress**

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

## 6.6 Audio Driver

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

### 6.6.1 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.

### 6.6.2 Driver Installation

To install the audio driver please follow the steps below.

**Step 1:** Select "**AUDIO**" in the driver menu and select the **ALC888** folder.

**Step 2:** Select the folder which corresponds to the operating system.

**Step 3:** Double-click the driver file.

**Step 4:** The audio driver InstallShield wizard begins (**Figure 6-18**).
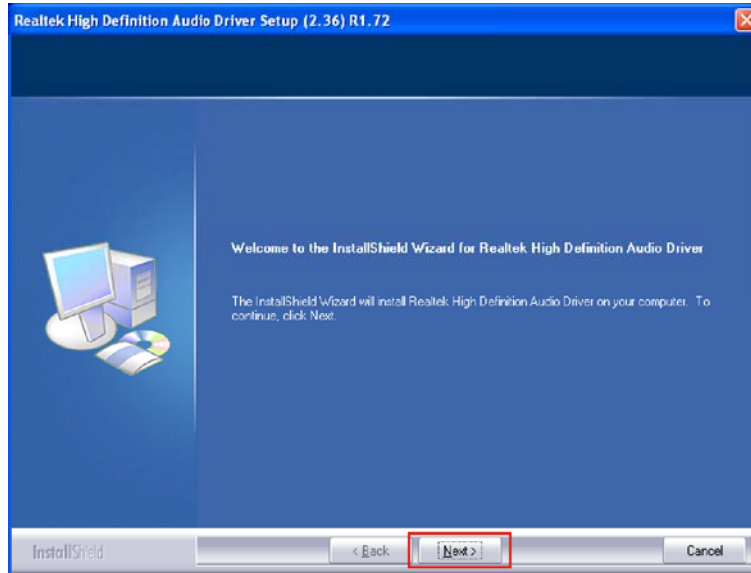


*Figure 6-18: InstallShield Wizard Welcome Screen*

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

**Step 6:** Don't click on any screens until the final screen appears (**Figure 6-19**).
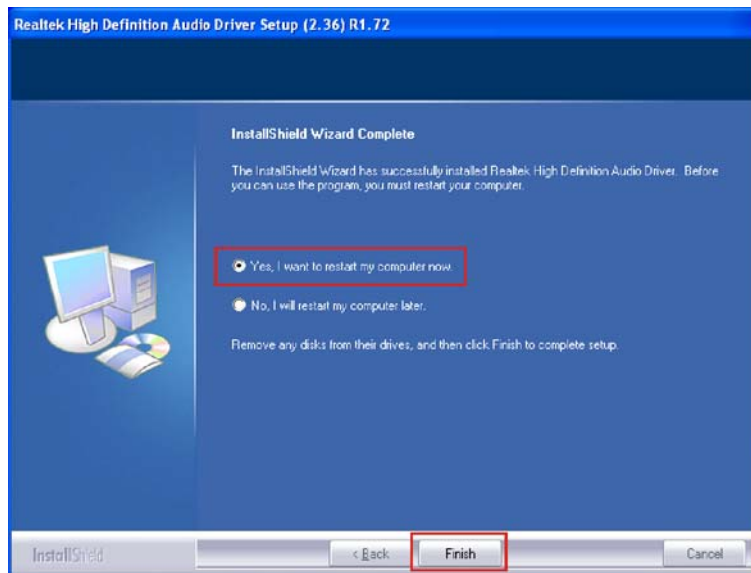


*Figure 6-19: Installation Wizard Finished*

**Step 7:** 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.

# 6.7 Intel® Matrix Storage Manager Driver

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

**Step 1:** Select **SATA** in the driver menu.

**Step 2:** Double-click the **Intel Matrix Storage Manager** folder.

**Step 3:** Double-click the **IATA89CD.exe** program icon.

**Step 4:** **Figure 6-20** shows the InstallShield Wizard preparing to guide the user through the rest of the process.
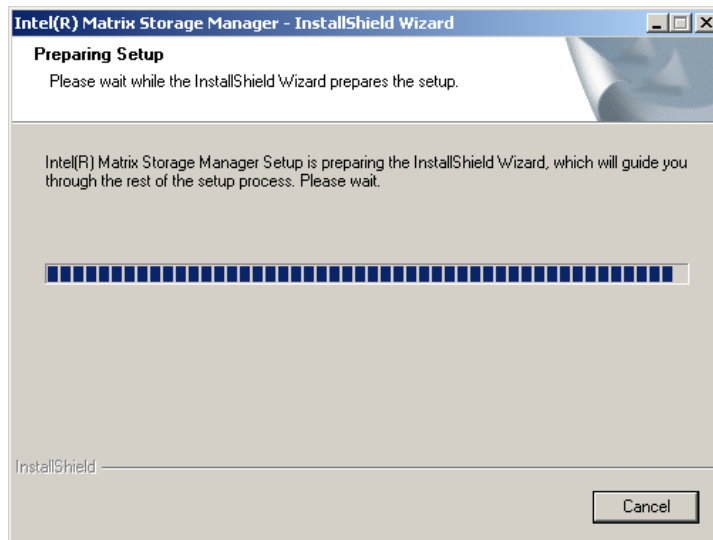


**Figure 6-20: InstallShield Wizard Setup Screen**

**Step 5:** **Figure 6-21** shows the Matrix Storage Manager software configuring the installation process.
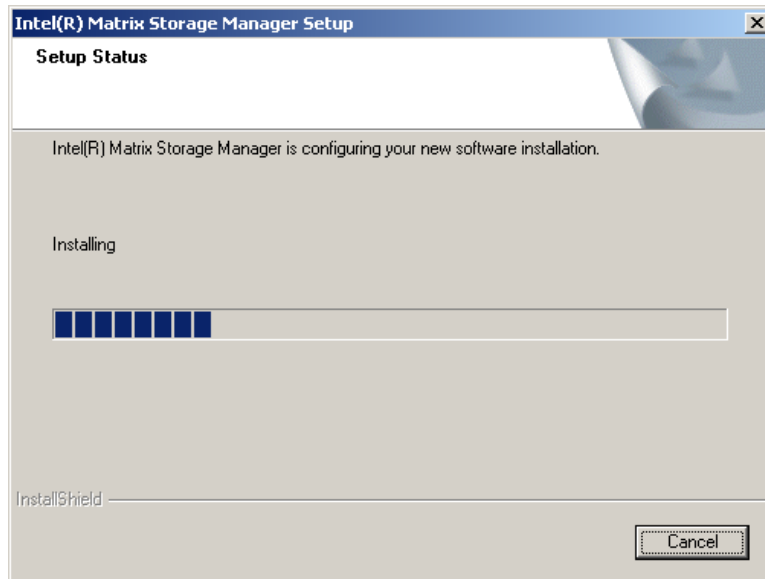
**Figure 6-21: Matrix Storage Manager Setup Screen**

**Step 6:** **Figure 6-22** shows the Matrix Storage Manager welcome screen.
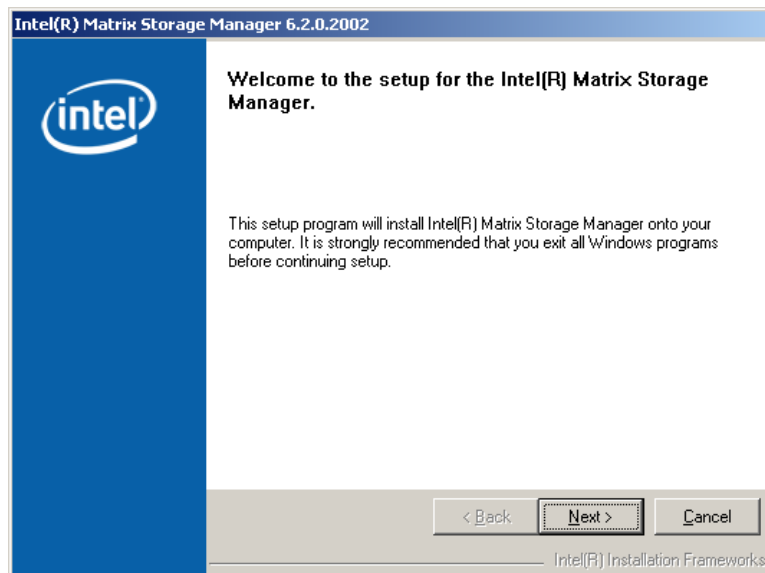


**Figure 6-22: Matrix Storage Manager Welcome Screen**

**Step 7:** Click **NEXT** and a warning appears (**Figure 6-23**). Read the warning carefully

and decide whether or not to continue the installation process.
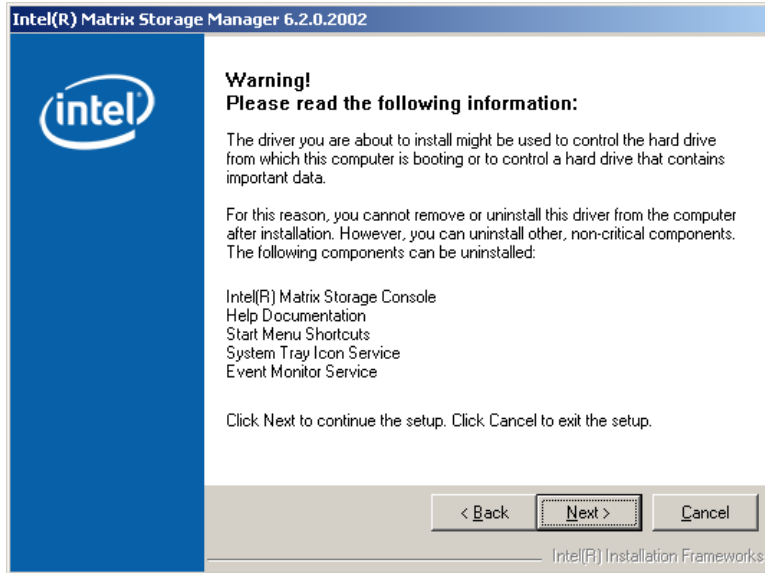
**Figure 6-23: Matrix Storage Manager Warning Screen**

**Step 8:** Click **NEXT** and a license agreement appears (**Figure 6-24**).
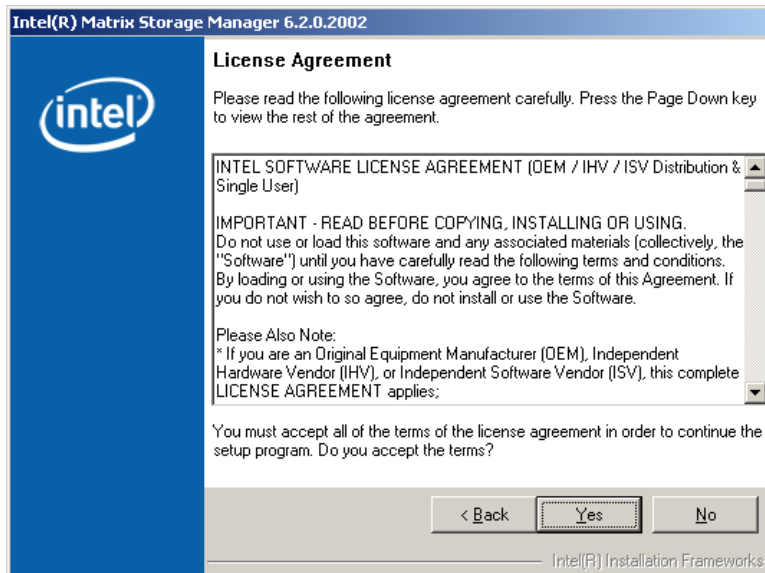


**Figure 6-24: Matrix Storage Manager License Agreement**

**Step 9:** 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 6-25** appears.
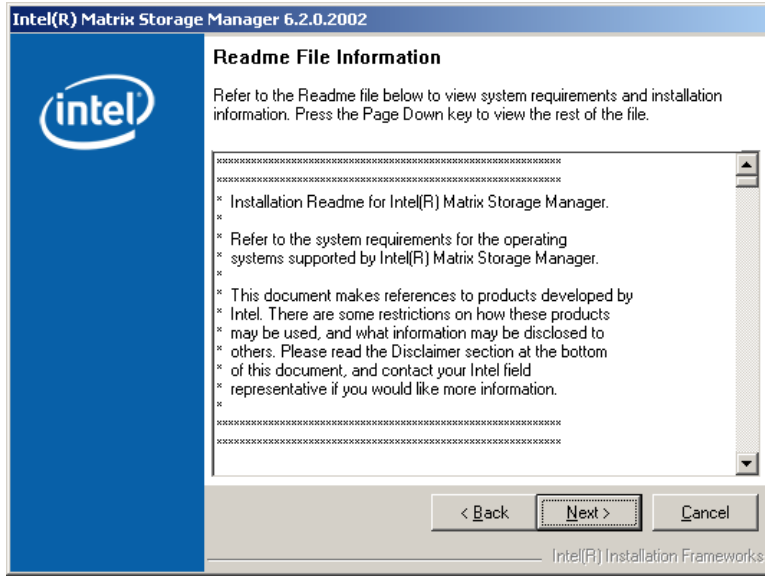
**Figure 6-25: Matrix Storage Manager Readme File**

**Step 10:** Read the Readme file information and click NEXT.

**Step 11:** After the driver installation process is complete, a confirmation screen appears
(**Figure 6-26**).
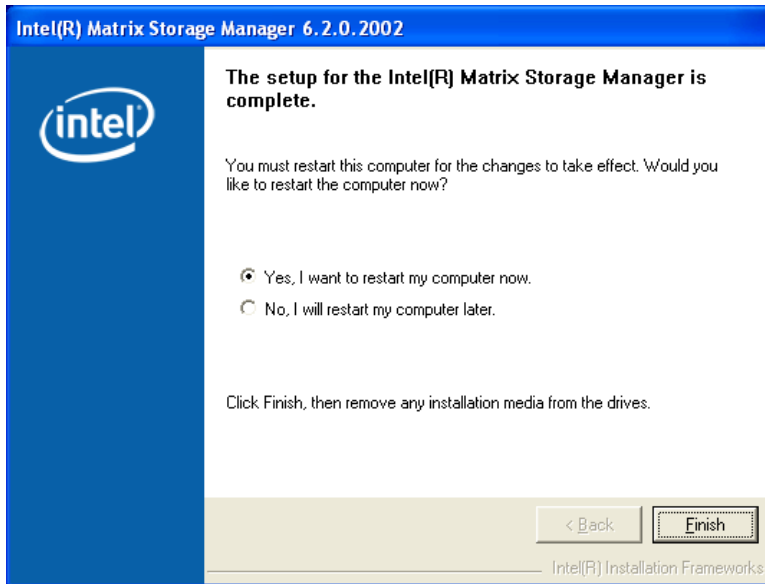


**Figure 6-26: Matrix Storage Manager Setup Complete**

**Step 12:** 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.

**Appendix**

# A

# BIOS Options

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

# 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 D-sub 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.

![IEI Integration Corp. logo]

**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

# Intel® Matrix Storage Manager

## E.1 Introduction

The IMBA-XQ354S can provide data protection for serial ATA (SATA) disks via the Intel® Matrix Storage Manager using one of three fault-tolerant RAID levels: RAID 1, 5 or 10. When using two hard drives, matrix RAID allows RAID 0 and RAID 1 functions to be combined, where critical files can be stored on RAID 1, and RAID 0 can be used for non-critical items such as software. RAID 5 and RAID 0 can be combined to provide higher performance, capacity, and fault tolerance.

⚠️ **CAUTION!**

A configured RAID volume (which may consist of multiple hard drives) appears to an operating system as a contingent storage space. The operating system will not be able to distinguish the physical disk drives contained in a RAID configuration.

### E.1.1 Precautions

One key benefit a RAID configuration brings is that a single hard drive can fail within a RAID array without damaging data. With RAID1 array, a failed drive can be replaced and the RAID configuration restored.

⚡ **WARNING!**

Irrecoverable data loss occurs if a working drive is removed when trying to remove a failed drive. It is strongly recommended to mark the physical connections of all SATA disk drives. Drive locations can be identified by attaching stickers to the drive bays. If a drive member of a RAID array should fail, the failed drive can then be correctly identified.

 **CAUTION!**

Do not accidentally disconnect the SATA drive cables. Carefully route the cables within the chassis to avoid system down time.

## E.2 Features and Benefits

- Supports RAID levels 0, 1, 5 and 10
- Supports connectivity to two or more disk drives
- Supported Operating Systems include: Windows XP, Windows Server 2003 and Windows Vista

## E.3 Accessing the Intel® Matrix Storage Manager

To access the Intel® Matrix Storage Manager, please follow the steps below.

**Step 1:** **Connect SATA drives to the system**. Connect two or more SATA drives to the system. Make sure the drives have the same capacity, are the same type and have the same speed.

 **NOTE:**

Make sure the SATA drives are EXACTLY the same when they are configured in a RAID configuration. If they are not the same size, disk drive capacity is sacrificed and overall performance affected.

**Step 2:** **Enable SATA drives in BIOS**. Start the computer and access the BIOS setup program. Enable RAID support for all SATA devices. Refer to the applicable BIOS configuration section in this user manual.

**Step 3:** **Configure "Option ROM Messages"** BIOS option to **Force BIOS**. This is to allow the "Press <CTRL+I> to enter Configuration Utility……" message to appear during the POST.

**Step 4:** **Save and Exit BIOS**. After the SATA support option is enabled, save and exit the BIOS.

**Step 5:** **Reboot the system**. Reboot the system after saving and exiting the BIOS.

**Step 6:** **Press Ctrl+I. during the system boot process**, press Ctrl+I when prompted to enter the RAID configuration software.

**Step 7:** **Configure the RAID settings**. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

## E.4 Installing the Operating System to the RAID Array

To install the operating system to the RAID array some extra steps are necessary during the installation process.

**Step 1:** **Prepare a RAID driver floppy disk on another computer**. If installing on the RAID array a RAID driver floppy disk must be made. The RAID driver floppy disk utility is on the CD in the "5-SATA/Floppy Configuration Utility" folder. The floppy disk will be formatted and the drivers installed.

**Step 2:** **Restart the system with a floppy drive attached**. Attach a normal floppy drive or USB floppy drive to the system.

**Step 3:** **Press F6 when prompted**. During the installation process, Windows OS prompts the user to press F6 to install the RAID drivers. Press F6 and choose from the drivers on the floppy disk.

**Step 4:** **Install the OS**. Continue with OS installation as usual.

# Appendix

# F

# Hazardous Materials Disclosure

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

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

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

| 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 | O | O | O | O | O | O |
| Display | O | O | O | O | O | O |
| Printed Circuit Board | O | O | O | O | O | O |
| Metal Fasteners | O | O | O | O | O | O |
| Cable Assembly | O | O | O | O | O | O |
| Fan Assembly | O | O | O | O | O | O |
| Power Supply Assemblies | O | O | O | O | O | O |
| 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<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(CR(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| 壳体 | O | O | O | O | O | O |
| 显示 | O | O | O | O | O | O |
| 印刷电路板 | O | O | O | O | O | O |
| 金属螺帽 | O | O | O | O | O | O |
| 电缆组装 | O | O | O | O | O | O |
| 风扇组装 | O | O | O | O | O | O |
| 电力供应组装 | O | O | O | O | O | O |
| 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。<br>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。 | | | | | | |