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MODEL:

WSB-Q354

Intel® Q35 Northbridge PICMG 1.0 CPU Card Supports LGA 775 Intel® Core™2 Quad/Core™2 Duo/Celeron® CPU, 8 GB DDR2, Six SATA 3Gb/s, Seven USB 2.0 and Dual PCIe GbE

User Manual

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RoHS Lead Free

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Chapter

1

Introduction

1.1 Overview

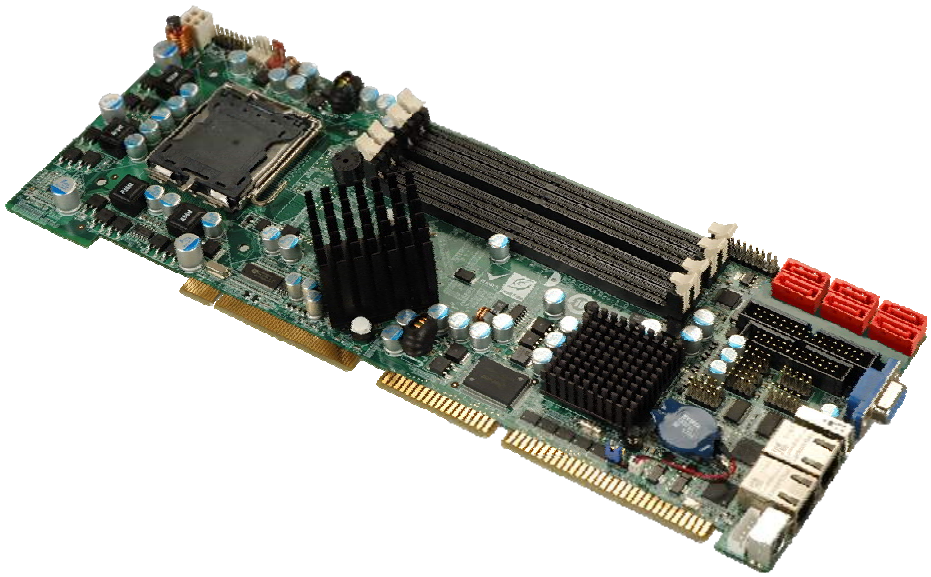


Figure 1-1: WSB-Q354 PICMG 1.0 CPU Card

The WSB-Q354 also comes with dual PCI Express (PCIe) Gigabit Ethernet (GbE) and has flexible storage options including support for six second-generation serial ATA (SATA) with SATA RAID configuration and a floppy disk drive (FDD). The WSB-Q354 provides additional connectivity for one parallel, two RS-232 serial and up to seven USB 2.0 devices. Support for a (optional) trusted platform module (TPM) provides additional system security during system boot-up.

1.1.1 WSB-Q354 Features

Some of the WSB-Q354 features are listed below.

- Supports the following Intel® LGA775 processors:
  - Intel® Core™2 Duo (45nm and 65nm)
  - Intel® Core™2 Quad (45nm and 65nm)
  - Intel® Celeron® (65nm, with a 800 MHz FSB or above)
- Supports four 240-pin 2 GB 667 MHz or 800 MHz DDR2 DIMMs
- Six SATA 3Gb/s drives with transfer rates of 3.0 Gbps supported
- Seven USB 2.0 devices supported (six onboard and one on the rear panel)
- Dual GbE Ethernet connectors
- PICMG 1.0 form factor

- RoHS compliant
- Supports ATX power supplies

1.2 WSB-Q354 Overview

1.2.1 WSB-Q354 Overview Photo

The WSB-Q354 has a wide variety of peripheral interface connectors. **Figure 1-2** is a labeled photo of the peripheral interface connectors on the WSB-Q354.

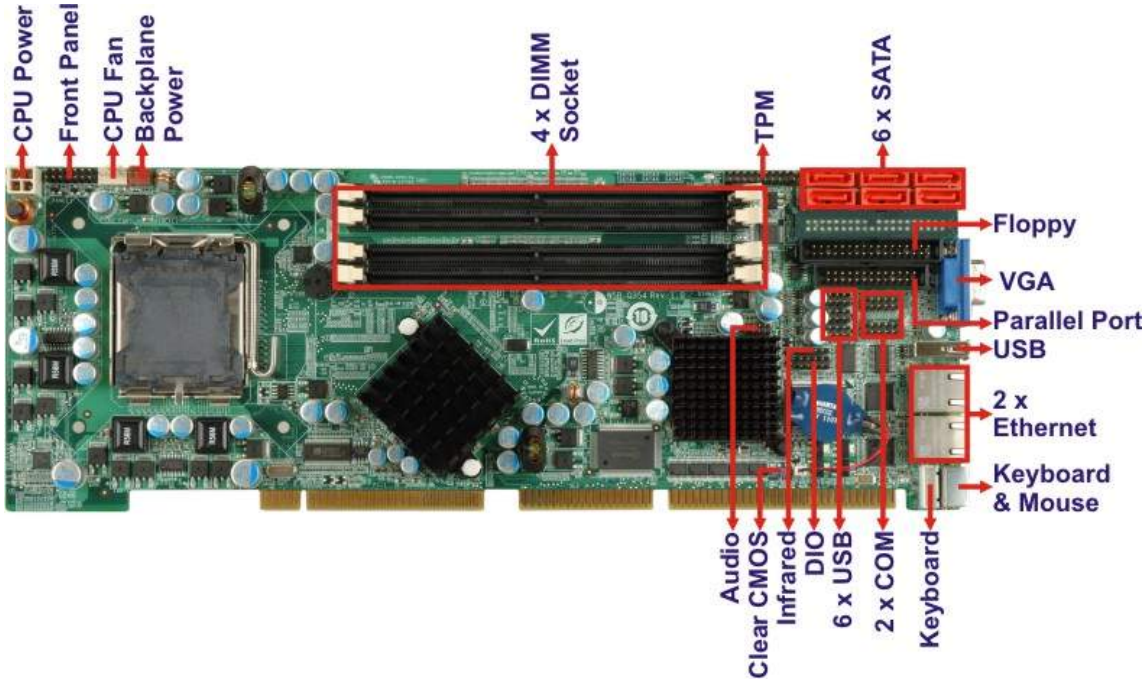


Figure 1-2: WSB-Q354 Overview [Front View]

1.2.2 WSB-Q354 Peripheral Connectors and Jumpers

The WSB-Q354 has the following connectors on-board:

- 1 x Backplane to mainboard connector
- 1 x Cooling fan connector, CPU
- 1 x CPU power connector
- 1 x Digital input/output connector
- 4 x DIMM sockets
- 1 x Floppy drive connector

- 1 x Front panel connector
- 1 x Infrared (IrDA) connector
- 1 x Keyboard connector
- 1 x Parallel port connector
- 6 x Serial ATA drive connectors
- 2 x Serial port connectors
- 1 x TPM connector
- 3 x USB connectors (support six USB devices)

The WSB-Q354 has the following external peripheral interface connectors on the board rear panel.

- 1 x Keyboard/mouse connectors
- 2 x RJ-45 Ethernet connectors
- 1 x USB 2.0 connectors
- 1 x VGA connector

The WSB-Q354 has the following on-board jumpers:

- Clear CMOS

1.2.3 Technical Specifications

WSB-Q354 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	WSB-Q354
Form Factor	PICMG 1.0
System CPU	LGA775 Intel® Core™2 Quad LGA775 Intel® Core™2 Duo LGA775 Intel® Celeron®
Front Side Bus (FSB)	800 MHz, 1066 MHz or 1333 MHz
System Chipset	**Northbridge**: Intel® Q35 Express Chipset **Southbridge**: Intel® ICH9R

Memory	Four 240-pin DDR2 DIMM sockets support 2.0 GB 667 MHz or 800 MHz DDR2 DIMMs
Super I/O	ITE IT8718F Rev. I
Display	Analog VGA display through external DB-15 connector
BIOS	AMI BIOS label SPI EEPROM 8.0 MB
Audio	10-pin header supports 7.1 channel HD Audio by IEI audio kit (AC-KIT-888HD)
LAN	Dual Realtek RTL8111E GbE controllers with ASF 2.0
COM	Two RS-232 serial connectors (onboard pin-headers)
USB2.0	Seven USB 2.0 devices supported: ▪ Six by onboard pin-headers ▪ One by external connectors
SATA	Six SATA 3Gb/s drives supported
SATA RAID Levels	RAID 0, RAID 1, RAID 5 and RAID 10
Keyboard/mouse	One external PS/2 keyboard/mouse connector One onboard 5-pin header for keyboard
Digital I/O	One 8-bit digital input/output connector; 4-bit input/4-bit output through the ITE IT8718F super I/O
Watchdog Timer	Software programmable 1-255 sec. through the ITE IT8718F super I/O
Infrared	One IrDA connector through the ITE IT8718F super I/O.
Power Supply	ATX power supply
TPM	Supports TPM v1.2 with 20-pin onboard pin-header

Fan Connector	4-pin CPU fan connector
Buzzer	Yes
Power Consumption	5V@5.97A, +12V@0.29A , Vcore@2.97 and 5VSB@0.07A (Intel® Core™2 Duo E8500 CPU with four 2.0 GB, 800 MHz DDR2 DIMM running 3Dmark® 2001SE)
Temperature	0ºC – 60ºC (32ºF - 140ºF)
Humidity (operating)	5%~95% non-condensing
Dimensions (LxW)	338 mm x 126 mm
Weight (GW)	1.1 kg

Table 1-1: Technical Specifications

Chapter

2

Detailed Specifications

2.1 Dimensions

2.1.1 Board Dimensions

The dimensions of the board are listed below:

- **Length**: 338 mm
- **Width**: 126 mm

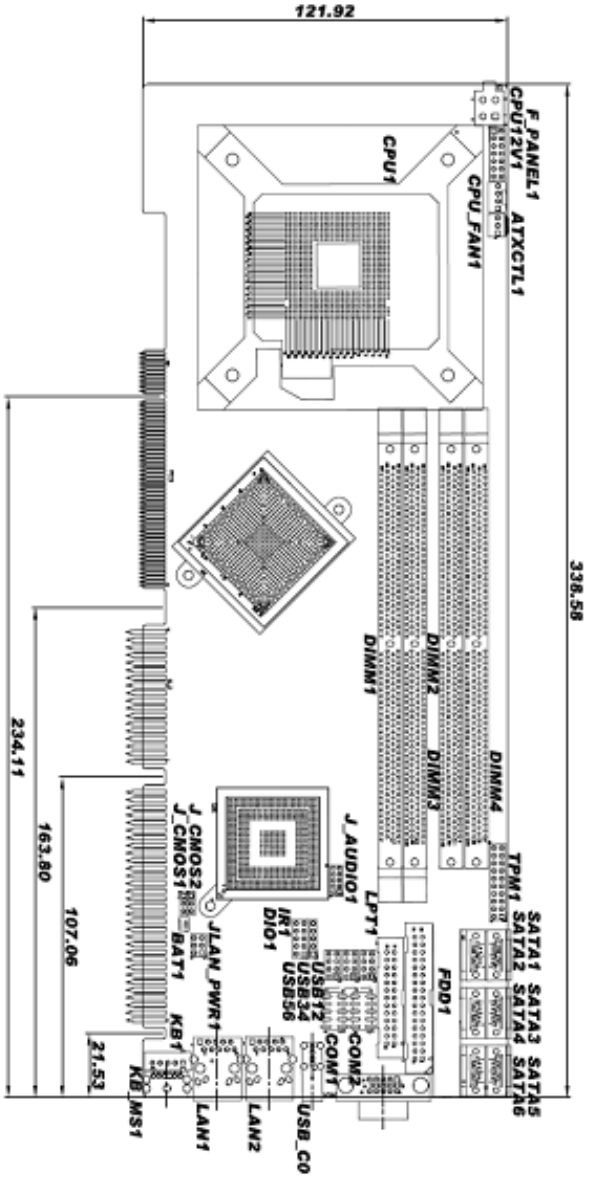


Figure 2-1: WSB-Q354 Dimensions (mm)

2.1.2 External Interface Panel Dimensions

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

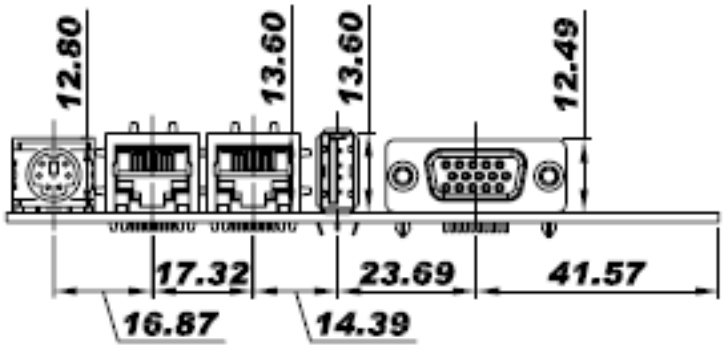


Figure 2-2: External Interface Panel Dimensions (mm)

2.2 Data Flow

Figure 2-3 shows the data flow between the two on-board chipsets and other components installed on the CPU card and described in the following sections of this chapter.

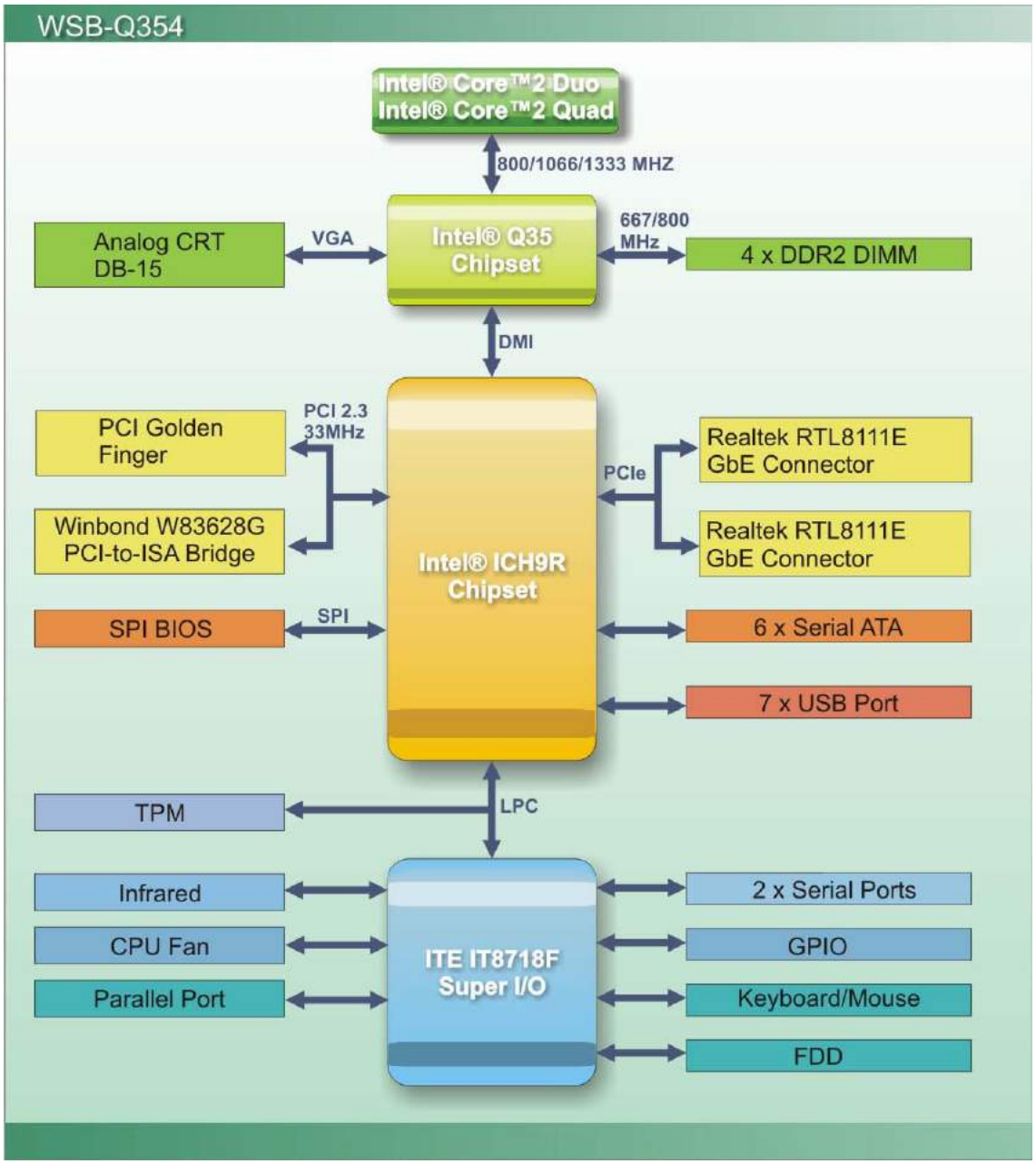


Figure 2-3: Data Flow Block Diagram

2.3 Compatible Processors

2.3.1 Supported Processors Overview

The WSB-Q354 supports the following Intel® LGA775 processors

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

2.3.2 Supported Intel® Core™2 Quad (Yorkfield) Processors

Table 2-3 lists the Yorkfield core Intel® Core™2 Quad processors supported on the WSB-Q354. All the processors in **Table 2-3** are 45nm LGA775 processors.

Processor #	CPU Speed	FSB Speed	Cache Size
Q9550	2.83 GHz	1333 MHz	12 MB
Q9450	2.66 GHz	1333 MHz	12 MB
Q9300	2.50 GHz	1333 MHz	6 MB

Table 2-1: Supported Intel® Core™2 Quad (Yorkfield) Processors

2.3.3 Supported Intel® Core™2 Duo (Wolfdale) Processors

Table 2-3 lists the Wolfdale core Intel® Core™2 Duo processors supported on the WSB-Q354. All the processors in **Table 2-3** are 45nm LGA775 processors.

Processor #	CPU Speed	FSB Speed	Cache Size
E8500	3.16 GHz	1333 MHz	6 MB L2
E8400	3.00 GHz	1333 MHz	6 MB L2
E8200	2.66 GHz	1333 MHz	6 MB L2
E8190	2.66 GHz	1333 MHz	6 MB L2

Table 2-2: Supported Intel® Core™2 Quad (Yorkfield) Processors

2.3.4 Supported Intel® Core™2 Duo (Conroe) Processors

Table 2-3 lists the Conroe core Intel® Core™2 Duo processors supported on the WSB-Q354. All the processors in Table 2-3 are 65nm LGA775 processors with the following features:

- Enhanced Halt State (C1E)
- Enhance Intel® Speedstep® Technology
- Execute Disable Bit
- Intel® 64
- Intel® Thermal Monitor 2
- Intel® Virtualization Technology
- Intel® Dual Core Technology

Processor #	CPU Speed	FSB Speed	Cache Size
E6850	3.0 GHz	1333 MHz	4 MB

Table 2-3: Supported Intel® Core™2 Duo (Conroe) Processors

2.3.5 Supported Intel® Celeron® (Conroe) Processors

Table 2-3 lists the Conroe core Intel® Celeron® processors supported on the WSB-Q354. The processor in **Table 2-3** is 65nm LGA775 processors with the following features:

- Execute Disable Bit
- Intel® 64

Processor #	CPU Speed	FSB Speed	Cache Size
440	2.0 GHz	800 MHz	512kB

Table 2-4: Supported Intel® Celeron® Processors

2.4 Intel® Q35 Northbridge Chipset

2.4.1 Intel® Q35 Northbridge Chipset

The Intel® Q35 Northbridge chipset is an advanced Graphics and Memory Controller Hub (GMCH) that supports a range of Intel® processors including 45nm Wolfdale dual core and Yorkfield quad core and 65nm Conroe core processors. The Intel® Q35 Northbridge supports 1333 MHz, 1066 MHz, or 800 MHz FSB and up to 8.0 GB of 667 MHz or 800 MHz DDR2 SDRAM. The Intel® Q35 Northbridge is interfaced to an Intel® ICH9R Southbridge chipset through a Direct Media Interface (DMI) communications link.

2.4.2 Intel® Q35 Front Side Bus (FSB) Support

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

- 800 MHz
- 1066 MHz
- 1333 MHz

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

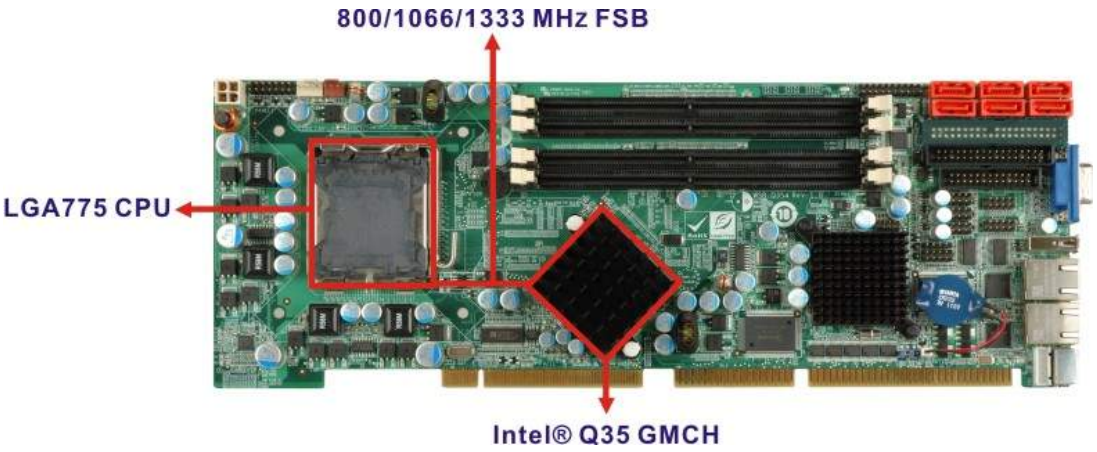


Figure 2-4: Front Side Bus (FSB)

2.4.3 Intel® Q35 Memory Controller

The memory controller on the Intel® Q35 Northbridge can support up to 8.0 GB of DDR2 SDRAM. Four DDR2 SDRAM DIMM sockets on the WSB-Q354 are interfaced to the Intel® Q35 Northbridge memory controller. The DDR2 sockets are shown in **Figure 2-5.**

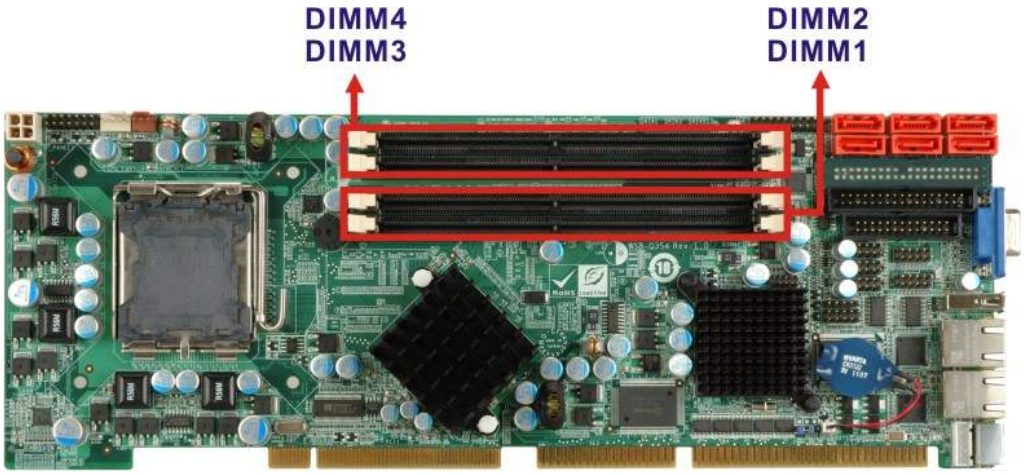


Figure 2-5: DDR2 DIMM Sockets

CAUTION:

If more than one DDR2 DIMM is being installed in the system, please purchase two DIMM that have the same capacity and operating frequency.

Each DIMM socket can support DIMMs with the following specifications:

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

2.4.4 Intel® Q35 Analog Display Capability

A single external female DB-15 (VGA) connector interfaces an analog display to an analog CRT port on the Intel® Q35 GMCH. The VGA connector is shown in **Figure 2-6**.



Figure 2-6: VGA Connector

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

- 400 MHz Integrated 24-bit RAMDAC
- Up to 2048x1536 @ 75 Hz refresh
- Hardware Color Cursor Support
- DDC2B Compliant Interface

2.4.5 Intel® Q35 Direct Media Interface (DMI)

The Direct Media Interface (DMI) is the communication bus between the Intel® Q35 GMCH and the ICH9R I/O controller hub (ICH). The DMI is a high-speed interface that integrates advanced priority-based servicing and allows for concurrent traffic and true isochronous transfer capabilities. The DMI is shown in **Figure 2-7**.

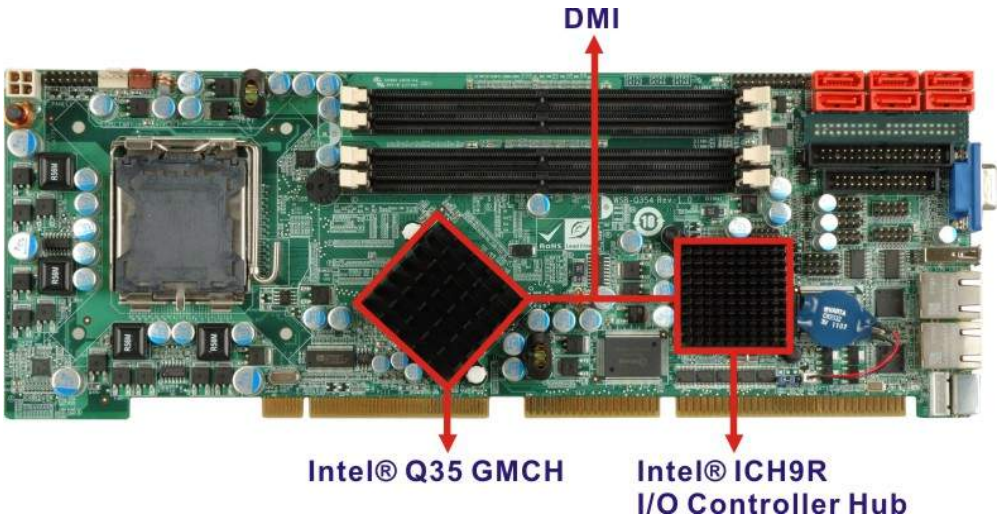


Figure 2-7: DMI Chip-to-Chip Connection

Some of the features of the DMI include:

- 2.0 GBps point-to-point DMI to ICH9R (1.0 GBps in each direction)
- 100 MHz reference clock (shared with PCI Express* Graphics Attach)
- 32-bit downstream addressing
- APIC and MSI interrupt messaging support
- Message Signaled Interrupt (MSI) messages
- SMI, SCI and SERR error indication

2.5 Intel® ICH9R Southbridge Chipset

2.5.1 Intel® ICH9R Overview

The Intel® ICH9R Southbridge chipset is connected to the Intel® Q35 GMCH through the chip-to-chip Direct Media Interface (DMI).The ICH9R Southbridge chipset on the WSB-Q354 has the features listed below.

- Complies with PCI Express Base Specification, Revision 1.1
- Complies with PCI Local Bus Specification, Revision 2.3 and supports 33MHz PCI operations
- Supports ACPI Power Management Logic
- Contains:
  - Enhanced DMA controller

- Interrupt controller
- Timer functions

- Integrated SATA host controller with DMA operations on six ports with data transfer rates up to 3.0 Gbps
- Supports seven USB 2.0 devices
- Complies with System Management Bus (SMBus) Specification, Version 2.0
- Supports Intel® High Definition Audio
- Supports Intel® Matrix storage technology
- Contains Low Pin Count (LPC) interface
- Serial Peripheral Interface (SPI) for Serial and Shared Flash

2.5.2 Intel® ICH9R High Definition Audio Implementation

The Intel® High Definition Audio controller integrated into the ICH9R is connected to the on-board audio connector. The audio connector is connected to an optional 7.1 channel (ALC-KIT-888HD) High Definition Audio codec. The audio controllers support up to six PCM audio output channels. Complete surround sound requires six-channel audio consisting of:

- Front left
- Front right
- Back left
- Back right
- Center
- Subwoofer

In addition to the basic surround sound features, the High Definition audio kit also features multi-streaming functionality.

2.5.3 Intel® ICH9R Real Time Clock

256 bytes of battery backed RAM is provided by the Motorola MC146818B real time clock (RTC) integrated into the ICH9R. The RTC operates on a 3V battery and 32.768KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

2.5.4 Intel® ICH9R SATA Controller

NOTE:

That SATA drive mode is set in the BIOS. Please refer to the **Section 6.3.2** on **IDE Configuration** on **page 89** and **Section 6.3.7**on **AHCI Configuration** on **page 104**.

The ICH9R SATA supports three modes of operation:

- ***Native IDE enabled operating system***: Two controllers enable all six ports on the bus. Controller 1 supports Port 0, Port 1, Port 2 and Port 3. Controller 2 supports Ports 4 and Port 5.
- ***Legacy operating system is used***: One controller is enabled and only supports Port 0, Port 1, Port 2 and Port 3.
- ***AHCI or RAID mode***: One controller supports all six ports including, Port 0, Port 1, Port 2, Port 3, Port 4 and Port 5.

In the AHCI or RAID mode, 3.0 Gbps data transfer speeds are supported. The SATA drive connectors are shown in **Figure 2-8**.



Figure 2-8: SATA Drive Connectors

2.5.5 Intel® ICH9R PCI Interface

The PCI interface on the ICH9R is compliant with the PCI Revision 2.3 implementation. Some of the features of the PCI interface are listed below.

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

The PCI bus is connected to an interface gold finger on the bottom of the CPU card. For more detailed information, please refer to **Section 2.6.2**.

2.5.6 Intel® ICH9R Serial Peripheral Interface (SPI) BIOS

The SPI is connected to an SPI BIOS chip. A licensed copy of AMI BIOS is preinstalled on the SPI BIOS chip.

2.5.7 Intel® ICH9R USB Controller

2.5.7.1 Intel® ICH9R USB Controller Overview

Up to twelve high-speed, full-speed or low-speed USB devices are supported by the ICH9R on the WSB-Q354. High-speed USB 2.0, with data transfers of up to 480MB/s, is enabled with the ICH9R integrated Enhanced Host Controller Interface (EHCI) compliant

host controller. USB full-speed and low-speed signaling is supported by the ICH9R integrated Universal Host Controller Interface (UHCI) controllers.

2.5.7.2 WSB-Q354 USB Implementation

Seven of the Intel® ICH9R USB ports are implemented on the WSB-Q354. One USB port (USB Port 0) is connected to one external connector and six USB ports (USB Port 1 to USB Port 6) are connected to three 8-pin onboard pin-headers. See **Figure 2-9**.



Figure 2-9: Onboard USB Implementation

2.6 PCI Bus Components

2.6.1 PCI Bus Overview

The PCI bus is connected to the components listed below:

- One PCI interface golden finger
- One ISA bus golden finger

The PCI bus complies with PCI Local Bus Specification, Revision 2.3 and supports 33 MHz PCI operations.

2.6.2 PCI Interface Golden Finger

The PCI interface golden finger is connected to the PCI bus on the backplane and connects the PCI backplane expansion boards with connectivity to the Intel® ICH9R. The PCI bus golden finger is shown in **Figure 2-10.**



Figure 2-10: PCI Slots

2.6.3 Winbond PCI-to-ISA Bridge Interface

The Winbond PCI-to-ISA Bridge (**Figure 2-11**) enables legacy ISA expansion devices to be installed on the backplane and connected to the system through the ISA connector (**Figure 2-11**) on the bottom of the CPU card.

Some of the features of the Winbond PCI-to-ISA Bridge are listed below:

- Full ISA bus support including ISA masters
- 5V ISA and 3.3V PCI interfaces
- Supports three ISA compatible slots without buffering
- External BIOS ROM address decode output

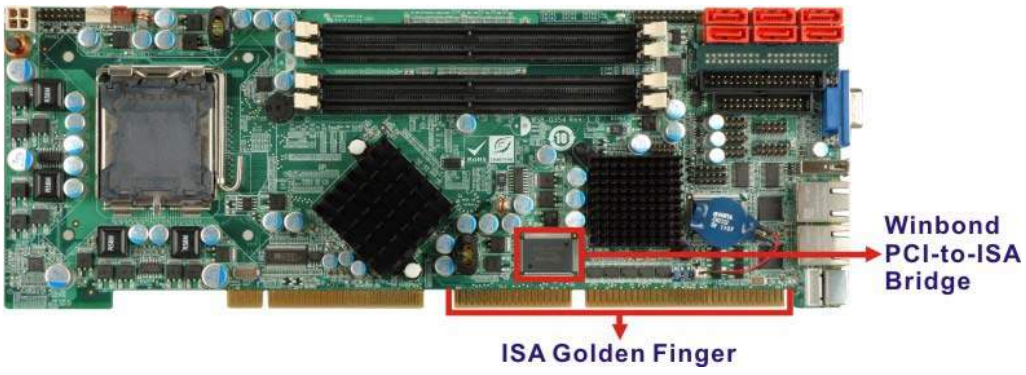


Figure 2-11: PCI-to-ISA Bridge and ISA Slot Connector

2.7 LPC Bus Components

2.7.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- TPM module connector
- Super I/O chipset

2.7.2 TPM Module

A TPM connector on the WSB-Q354 is interfaced to the Intel® ICH9R Southbridge through the LPC bus. The TPM connector is shown in **Figure 2-12** below.



Figure 2-12: TPM Connector

The Intel® ICH9R Southbridge supports TPM version 1.1 and TPM version 1.2 devices for enhanced security. Three TPM are available from IEI. The three IEI TPM are listed below:

- Infineon TPM module
- Sinosun TPM module
- Winbond TPM module

For more information about these modules please refer to **Chapter 3** or contact the WSB-Q354 reseller or vendor. Alternatively, please contact IEI at sales@iei.com.tw.

2.7.3 Super I/O chipset

The ITE IT8718F Super I/O chipset is connected to the Intel® ICH9R Southbridge through the LPC bus. ITE IT8718F Super I/O chipset is shown in **Figure 2-13** below.



Figure 2-13: ITE IT8718F Super I/O

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

- PC98/99/2001, ACPI and LANDesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- Single +5V Power Supply
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Keyboard Controller
- Watchdog Timer
- Serial IRQ Support
- Vbat & Vcch Support
- Single +5V Power Supply

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

2.7.3.1 Super I/O LPC Interface

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

2.7.3.2 Super I/O 16C550 UARTs

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

- one standard serial port (COM1 and COM2)
- IrDa 1.0 and ASKIR protocols(IR1)

2.7.3.3 Super I/O Enhanced Hardware Monitor

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

2.7.3.4 Super I/O Floppy Disk Drive (FDD) Controller

The Super I/O FDD controller is compatible with the following specifications.

- Enhanced digital data separator
- Supports automatic write protection via software
- Supported capacities:
  - 360K
  - 720K
  - 1.2M
  - 1.44M
  - 2.88M
- 3-mode FDD supported

The FDD controller is interfaced to a FDD connected to the FDD connector on the WSB-Q354.

2.7.3.5 Super I/O Fan Speed Controller

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

2.7.3.6 Super I/O Keyboard/Mouse Controller

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

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

Supports mouse double-click and/or mouse move power on events.

2.7.3.7 Super I/O GPIO Ports

The Super I/O has 48 programmable GPIO ports of which 8 are implemented on the WSB-Q354. The GPIO connector has 8 programmable bits, 4-bit input and 4-bit output.

2.7.3.8 Super I/O Infrared

The Super I/O has dedicated infrared (IrDA) pins that are interfaced to an IrDA connector. The IrDA connector is compatible with the following standards:

- ASKIR
- SIR

2.7.3.9 Super I/O Parallel Port

The Super I/O parallel port (LPT) is compatible with the following LPT specifications.

- SPP compatible bi-directional parallel port
- Enhanced Parallel Port (EPP) mode supported. Compatible with IEEE 1284 specifications
- Extended Capability Port (ECP) mode supported. Compatible with IEEE 1284 specifications

- Enhanced printer port back-drive current reduction
- Printer power-on damage reduction
- Supports POST (Power-On Self Test) Data Port

The parallel port controller is connected to an external DB-26 LPT connector.

2.7.3.10 Super I/O Watchdog Timer

The super I/O watchdog timer has a maximum time resolution of 1 minute or 1 second with a maximum or either 65,535 minutes or 65,535 seconds.

2.8 Environmental and Power Specifications

2.8.1 System Monitoring

Three thermal inputs on the WSB-Q354 Super I/O Enhanced Hardware Monitor monitor the following temperatures:

- CPU Temperature
- System Temperature

Five voltage inputs on the WSB-Q354 Super I/O Enhanced Hardware Monitor monitors the following voltages:

- CPU Core
- +1.25V
- +3.3V
- +12V
- 5VSB
- VBAT

The WSB-Q354 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- CPU Fan Speed

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

2.8.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the WSB-Q354 are listed below.

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

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

2.8.3 Power Consumption

Table 2-5 shows the power consumption parameters for the WSB-Q354 running 3D Mark® 2001 SE with a 3.0 GHz E8500 Intel® Core™2 Duo processor with four 2.0 GB 800MHz DDR2 DIMMs.

Status	Operation			
3D Mark 2001SE	+5 V	+5 VSB	+12 V	Vcore
	5.97 A	0.07 A	0.29 A	2.97 A

Table 2-5: Power Consumption

Chapter

3

Unpacking

3.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the WSB-Q354 may result in permanent damage to the WSB-Q354 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WSB-Q354. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WSB-Q354, 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 WSB-Q354, place it on an antic-static pad. This reduces the possibility of ESD damaging the WSB-Q354.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the WSB-Q354 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the WSB-Q354 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

3.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the WSB-Q354 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

3.3.1 Package Contents

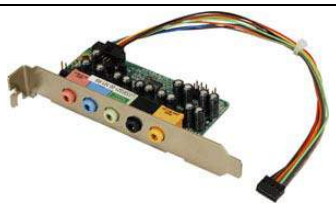
The WSB-Q354 is shipped with the following components:

Quantity	Item and Part Number	Image
1	WSB-Q354 CPU card	
1	Dual RS-232 cable (**P/N**: 19800-000051-RS)	
1	KB/MS PS/2 Y-cable (**P/N**: 32006-000300-100-RS)	
6	SATA cables (**P/N**: 32801-000703-RS)	

3	SATA power cables (**P/N**: 32102-000100-200-RS)	
1	USB cable (**P/N**: 19800-003100-200-RS)	
1	Mini jumper Pack	
1	Quick Installation Guide	
1	Utility CD	

Table 3-1: Package List Contents

3.4 Optional Items

7.1 channel HD audio kit with Realtek ALC888 supports dual audio streams (**P/N**: AC-KIT-888HD-R10)	
CPU cooling kit (**P/N**: CF-520-RS-R11)	

CPU cooling kit (**P/N**: CF-775A-RS)	
Infineon TPM module (**P/N**: TPM-IN01-R11)	

Table 3-2: Package List Contents

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

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

4.1.1 WSB-Q354 Layout

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

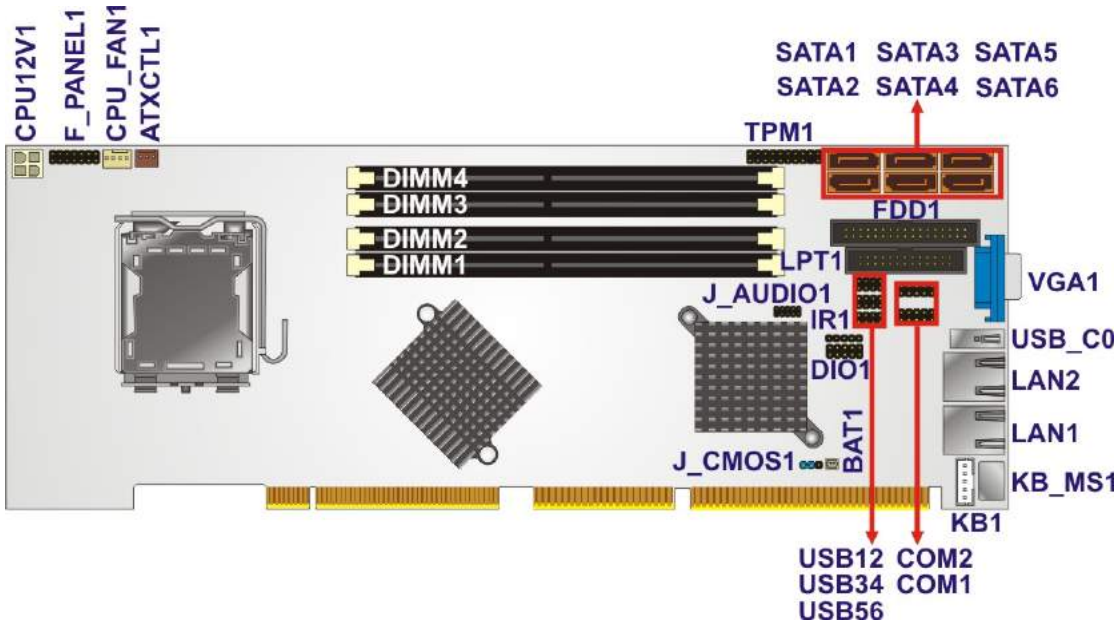


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the WSB-Q354. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
Audio connector	9-pin header	J_AUDIO1
Backplane power connector	3-pin wafer	ATXCTL1
Cooling fan connector, CPU	4-pin wafer	CPU_FAN1

CPU power connector	4-pin wafer	CPU12V1
Digital input/output connector	10-pin header	DIO1
DIMM socket	240-pin socket	DIMM1
DIMM socket	240-pin socket	DIMM2
DIMM socket	240-pin socket	DIMM3
DIMM socket	240-pin socket	DIMM4
Floppy drive connector	34-pin box header	FDD1
Front panel connector	14-pin header	F_PANEL1
Infrared (IrDA) connector	5-pin header	IR1
Keyboard connector	5-pin wafer	KB1
Parallel port connector	26-pin box header	LPT1
Serial ATA drive connector	7-pin SATA	SATA1
Serial ATA drive connector	7-pin SATA	SATA2
Serial ATA drive connector	7-pin SATA	SATA3
Serial ATA drive connector	7-pin SATA	SATA4
Serial ATA drive connector	7-pin SATA	SATA5
Serial ATA drive connector	7-pin SATA	SATA6
Serial port connector (COM1)	10-pin header	COM1
Serial port connector (COM2)	10-pin header	COM2
TPM connector	20-pin header	TPM1
USB connector	8-pin header	USB12
USB connector	8-pin header	USB34
USB connector	8-pin header	USB56

Table 4-1: Peripheral Interface Connectors

4.1.3 External Interface Panel Connectors

Table 4-2 lists the rear panel connectors on the WSB-Q354. Detailed descriptions of these connectors can be found in **Section 4.3**.

Connector	Type	Label
Ethernet connector	RJ-45	LAN1
Ethernet connector	RJ-45	LAN2
Mouse or keyboard connector	PS/2	KB_MS1
USB connector	USB	USB_C0
VGA connector	DB-15	VGA1

Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the CPU card and are only accessible when the CPU card is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the WSB-Q354.

4.2.1 Audio Connector

CN Label: **J_AUDIO1**

CN Type: 9-pin header (2x5)

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

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

Optional module can be connected to the 10-pin audio connector to provide the system with a High Definition Audio codec that provides a complete integrated audio solution.

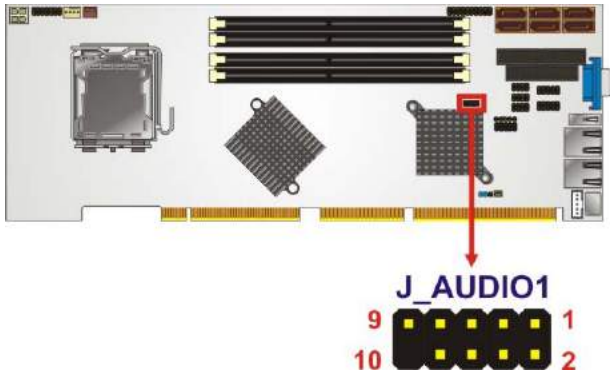


Figure 4-2: Audio Connector Pinouts (4-pin)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	ACZ_SYNC	2	ACZ_BITCLK
3	ACZ_SDOUT	4	ACZ_PCBEEP
5	ACZ_SDIN	6	ACZ_RST#
7	ACZ_VCC	8	ACZ_GND
9	ACZ_12V	10	ACZ_GND

Table 4-3: Audio Connector Pinouts

4.2.2 Backplane Power Connector

CN Label: **ATXCTL1**

CN Type: 3-pin wafer (1x3)

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

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

The connector is for enabling an ATX power supply. When connected to the power supply, the power can be turned on and off with the front panel switch.

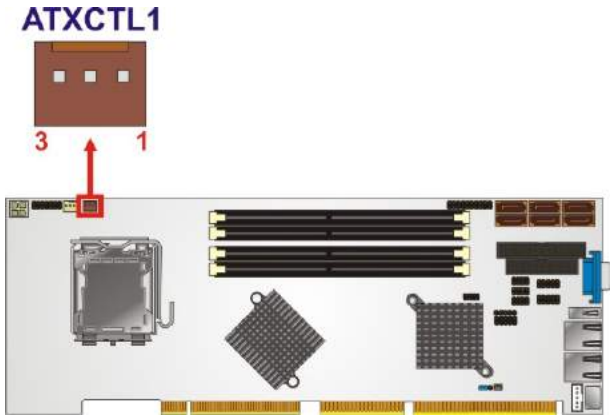


Figure 4-3: Backplane Power Connector Location

PIN NO.	DESCRIPTION
1	GND
2	PS_ON
3	+5V Dual

Table 4-4: Backplane Power Connector Pinouts

4.2.3 CPU Power Connector

CN Label: **CPU12V1**

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

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

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

The 4-pin CPU power connector is connected to an ATX power supply and powers the CPU.

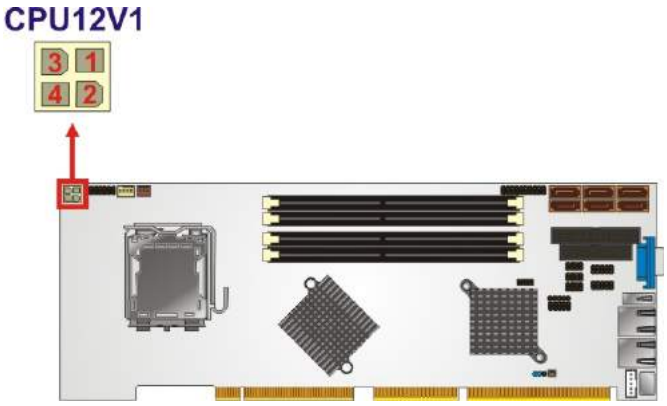


Figure 4-4: CPU Power Connector Location

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

Table 4-5: CPU Power Connector Pinouts

4.2.4 Digital Input/Output (DIO) Connector

CN Label: **DIO1**

CN Type: 10-pin header (2x5)

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

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

The digital input/output connector is managed through a Super I/O chip. The DIO connector pins are user programmable. To see details on how to program the DIO chip, please refer to **Appendix C**.

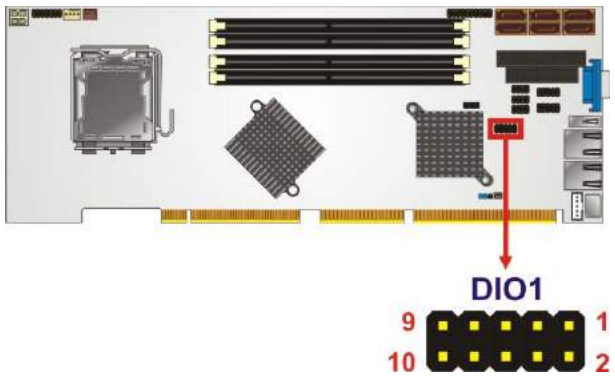


Figure 4-5: DIO Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Ground	2	VCC
3	Output 3	4	Output 2
5	Output 1	6	Output 0
7	Input 3	8	Input 2
9	Input 1	10	Input 0

Table 4-6: DIO Connector Pinouts

4.2.5 Fan Connector, CPU (12V, 4-pin)

CN Label: **CPU_FAN1**

CN Type: 4-pin wafer (1x4)

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

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

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

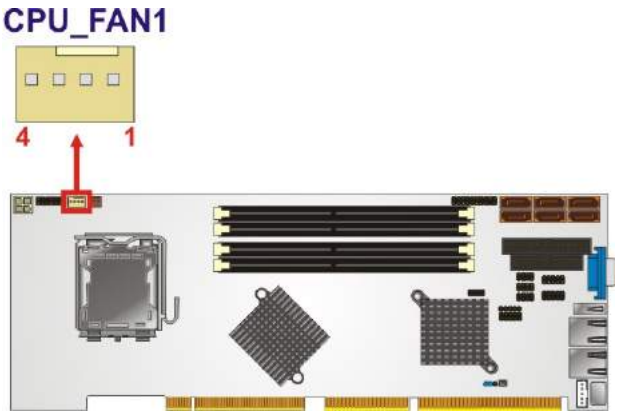


Figure 4-6: +12V Fan Connector Location

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

Table 4-7: +12V Fan Connector Pinouts

4.2.6 Floppy Disk Connector (34-pin)

CN Label: **FDD1**

CN Type: 34-pin box header (2x17)

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

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

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

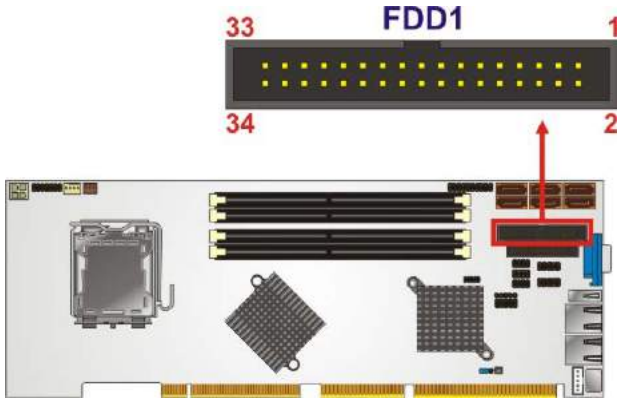


Figure 4-7: 34-pin FDD Connector Location

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

Table 4-8: 34-pin FDD Connector Pinouts

4.2.7 Front Panel Connector

CN Label: **F_PANEL1**

CN Type: 14-pin header (2x7)

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

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

The front panel connector connects to external switches and indicators to monitor and controls the CPU card. These indicators and switches include:

- Power LED
- Speaker
- Power button
- Reset
- HDD LED

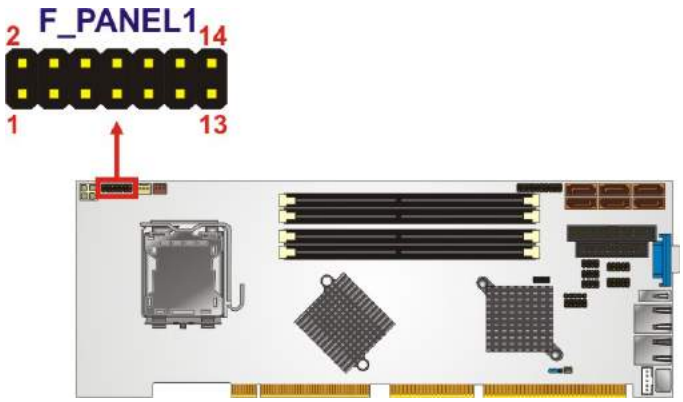


Figure 4-8: Front Panel Connector Pinout Locations (14-pin)

FUNCTION	PIN	DESCRIPTION	FUNCTION	PIN	DESCRIPTION
Power LED	1	+5V	Speaker	2	+5V
	3	N/C		4	N/C
	5	GROUND		6	N/C
Power	7	PWRBTN+		8	SPEAKER
Button	9	PWRBTN-	Reset	10	N/C
HDD LED	11	+5V		12	RESET-

	13	IDE LED-		14	GROUND

Table 4-9: Front Panel Connector Pinouts (14-pin)

4.2.8 Infrared Interface Connector

CN Label: **IR1**

CN Type: 5-pin header (1x5)

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

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

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

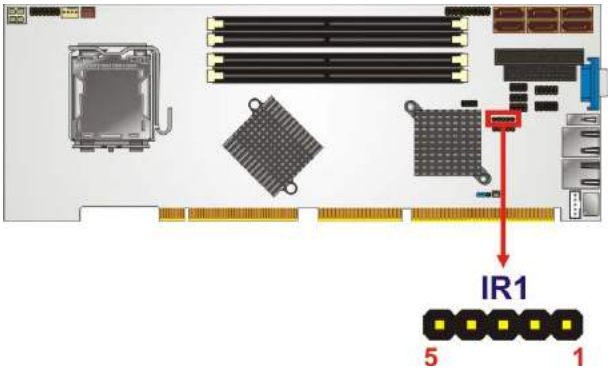


Figure 4-9: Infrared Connector Location

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

Table 4-10: Infrared Connector Pinouts

4.2.9 Keyboard Connector

CN Label: **KB1**

CN Type: 5-pin wafer (1x5)

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

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

The keyboard connector can be connected to a standard PS/2 cable or PS/2 cable to add keyboard and mouse functionality to the system.

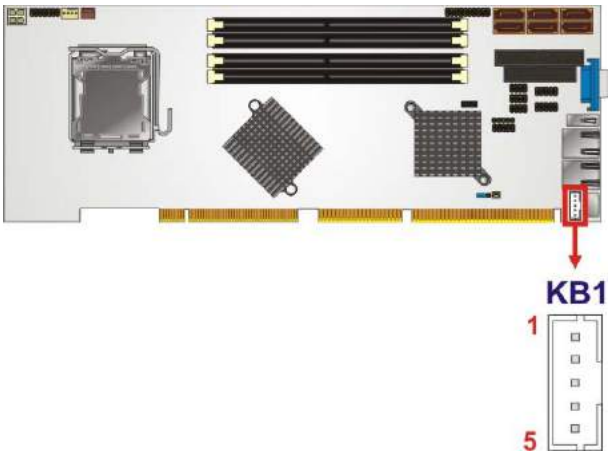


Figure 4-10: Keyboard Connector Location

PIN NO.	DESCRIPTION
1	KEYBOARD CLOCK
2	KEYBOARD DATA
3	N/C
4	GROUND
5	VCC

Table 4-11: Keyboard Connector Pinouts

4.2.10 Parallel Port Connector

CN Label: **LPT1**

CN Type: 26-pin box header (2x13)

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

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

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

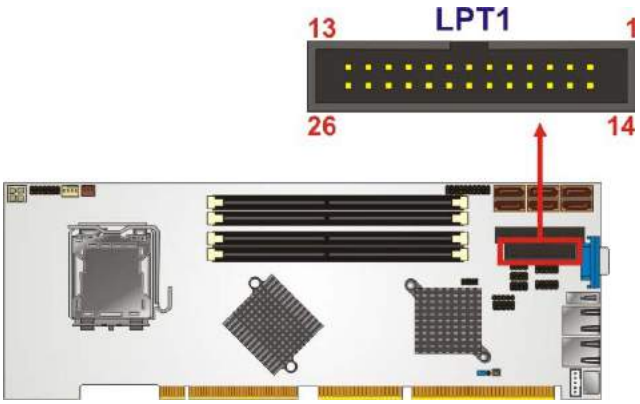


Figure 4-11: Parallel Port Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	STROBE#	2	DATA 0
3	DATA 1	4	DATA 2
5	DATA 3	6	DATA 4
7	DATA 5	8	DATA 6
9	DATA 7	10	ACKNOWLEDGE
11	BUSY	12	PAPER EMPTY
13	PRINTER SELECT	14	AUTO FORM FEED #
15	ERROR#	16	INITIALIZE
17	PRINTER SELECT LN#	18	GROUND
19	GROUND	20	GROUND
21	GROUND	22	GROUND
23	GROUND	24	GROUND
25	GROUND	26	NC

Table 4-12: Parallel Port Connector Pinouts

4.2.11 SATA Drive Connectors

CN Label:	**SATA1**, **SATA2**, **SATA3**, **SATA4**, **SATA5** and **SATA6**
CN Type:	7-pin SATA drive connectors (1x7)
CN Location:	See **Figure 4-12**
CN Pinouts:	See **Table 4-13**

The six SATA drive connectors are each connected to second generation SATA drives. Second generation SATA drives transfer data at speeds as high as 3.0 Gbps. The SATA drives can be configured in a RAID configuration.

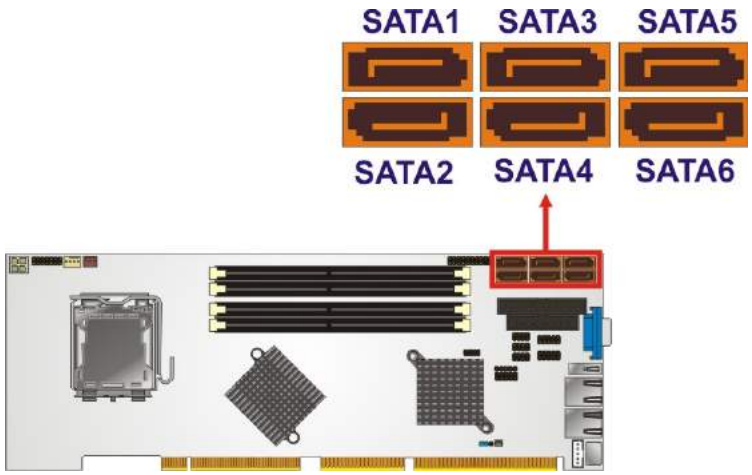


Figure 4-12: SATA Drive Connector Locations

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

Table 4-13: SATA Drive Connector Pinouts

4.2.12 Serial Port Connector (COM 1 and COM2)

CN Label:	**COM1** and **COM2**
CN Type:	10-pin header (2x5)
CN Location:	See **Figure 4-13**
CN Pinouts:	See **Table 4-14**

The 10-pin serial port connector provides a second RS-232 serial communications channel. The serial port connectors can be connected to external RS-232 serial port devices.

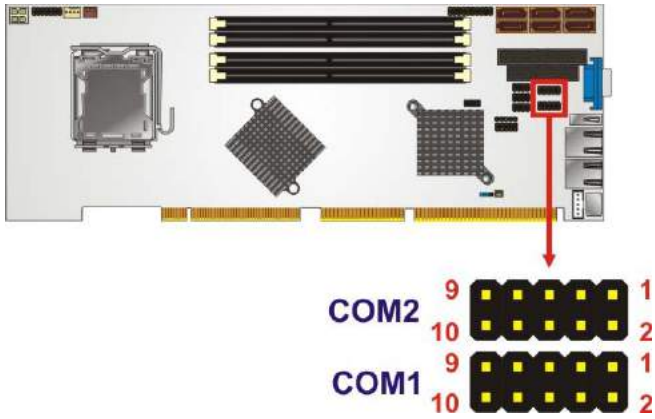


Figure 4-13: Serial Connector Location

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

Table 4-14: Serial Connector Pinouts

4.2.13 SPI Flash Connector (Optional)

CN Label: **JSPI1**

CN Type: 8-pin header (2x4)

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

CN Pinouts: See **Table 4-15**

The 8-pin SPI Flash connector is used to flash the BIOS. The JSPI1 connector is an optional connector. It will only be available upon request.



Figure 4-14: SPI Flash Connector Location (Solder Side)

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC	5	GND
2	CS#	6	CLOCK
3	SO	7	SI
4	NC	8	NC

Table 4-15: SPI Flash Connector Pinouts

4.2.14 Trusted Platform Module (TPM) Connector

CN Label: **TPM1**

CN Type: 40-pin header (2x20)

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

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

The Trusted Platform Module (TPM) connector secures the system on bootup. An optional TPM (see packing list in **Chapter 3**) can be connected to the TPM connector.

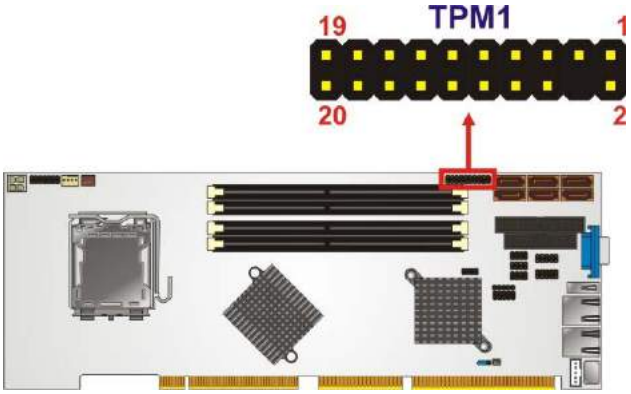


Figure 4-15: TPM Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	FWHPCLK	2	GND
3	LFRAME#	4	KEY
5	PCIRST#	6	VCC
7	LAD3	8	LAD2
9	VCC3	10	LAD1
11	LAD0	12	GND
13	SMBCLK	14	SMBDATA
15	3VDUAL	16	SERIRQ
17	GND	18	CLKRUN#
19	LPCPD#	20	LDRQ#

Table 4-16: TPM Connector Pinouts

4.2.15 USB Connectors (Internal)

CN Label: **USB12**, **USB34** and **USB56**

CN Type: 8-pin header (2x4)

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

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

The 2x4 USB pin connectors each provide connectivity to two USB 1.1 or two USB 2.0 ports. Each USB connector can support two USB devices. Additional external USB ports are found on the rear panel. The USB ports are used for I/O bus expansion.

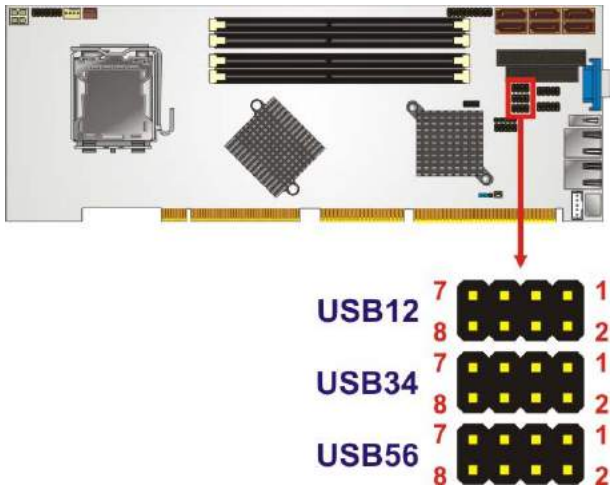


Figure 4-16: USB Connector Locations

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

Table 4-17: USB Port Connector Pinouts

4.3 External Peripheral Interface Connector Panel

Figure 4-17 shows the WSB-Q354 external peripheral interface connector (EPIC) panel. The WSB-Q354 EPIC panel consists of the following:

- 1 x PS/2 keyboard/mouse connector
- 2 x RJ-45 LAN connectors
- 1 x USB 2.0 ports
- 1 x VGA connector

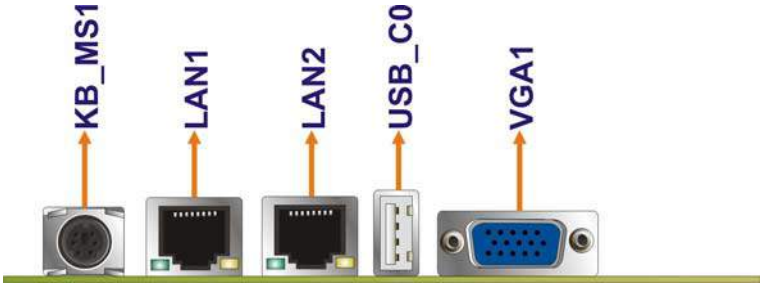


Figure 4-17: WSB-Q354 External Peripheral Interface Connector

4.3.1 Keyboard/Mouse Connector

CN Label: **KB_MS1**

CN Type: PS/2

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

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

The WSB-Q354 keyboard and mouse connector is a standard PS/2 connector.

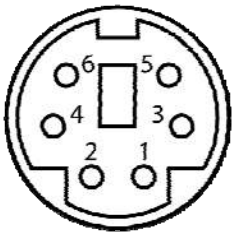


Figure 4-18: PS/2 Pinouts

PIN	DESCRIPTION
1	K_DAT
2	M_DAT
3	GND
4	VCC5
5	K_CLK
6	M_CLK

Table 4-18: PS/2 Connector Pinouts

4.3.2 LAN and Dual USB Combo Connectors

CN Label: **LAN1** and **LAN2**

CN Type: RJ-45

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

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

The WSB-Q354 is equipped with two built-in RJ-45 Ethernet controllers. The controllers can connect to the LAN through two RJ-45 LAN connectors. There are two LEDs on the connector indicating the status of LAN. The pin assignments are listed in the following table:

PIN	DESCRIPTION	PIN	DESCRIPTION
1	MDIA3-	5	MDIA1+
2	MDIA3+	6	MDIA2+-
3.	MDIA2-	7	MDIA0-
4.	MDIA1-	8	MDIA0+

Table 4-19: LAN Pinouts

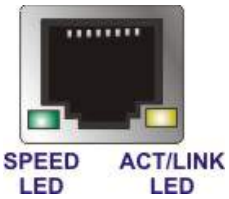


Figure 4-19: RJ-45 Ethernet Connector

The RJ-45 Ethernet connector has two status LEDs, one green and one yellow. The green LED indicates activity on the port and the yellow LED indicates the port is linked. See **Table 4-20**.

SPEED LED		ACT/LINK LED	
Status	**Description**	**Status**	**Description**
Off	10 Mbps	**Off**	Not linked
Green	100 Mbps	**Yellow**	Linked
Orange	1 GbE	**Blinking**	Data activity

Table 4-20: RJ-45 Ethernet Connector LEDs

4.3.3 USB Connector

CN Label: **USB_C0**

CN Type: USB port

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

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

The WSB-Q354 has one external USB 2.0 ports. The port connects to both USB 2.0 and USB 1.1 devices.

PIN NO.	DESCRIPTION
1	VCC
3	DATA-
5	DATA+
7	GND

Table 4-21: USB Port Pinouts

4.3.4 VGA Connector

CN Label: **VGA1**

CN Type: 15-pin Female

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

CN Pinouts: See **Figure 4-20** and **Table 4-22**

The WSB-Q354 has a single 15-pin female connector for connectivity to standard display devices.

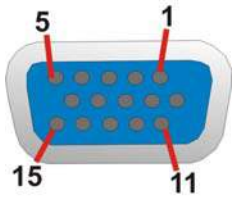


Figure 4-20: VGA Connector

PIN	DESCRIPTION	PIN	DESCRIPTION
1	RED	2	GREEN
3	BLUE	4	NC
5	GND	6	GND
7	GND	8	GND
9	VCC / NC	10	GND
11	NC	12	DDC DAT
13	HSYNC	14	VSYNC
15	DDCCLK		

Table 4-22: VGA Connector Pinouts

Chapter

5

Installation

5.1 Anti-static Precautions



WARNING:

Failure to take ESD precautions during the installation of the WSB-Q354 may result in permanent damage to the WSB-Q354 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WSB-Q354. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WSB-Q354, 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 WSB-Q354, place it on an antic-static pad. This reduces the possibility of ESD damaging the WSB-Q354.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

5.2 Installation Considerations



NOTE:

The following installation notices and installation considerations should be read and understood before the WSB-Q354 is installed. All installation notices pertaining to the installation of the WSB-Q354 should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the WSB-Q354 and injury to the person installing the CPU card.

5.2.1 Installation Notices



WARNING:

The installation instructions described in this manual should be carefully followed in order to prevent damage to the WSB-Q354, WSB-Q354 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 WSB-Q354 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 WSB-Q354 on an antistatic pad:
  - When installing or configuring the CPU card, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the WSB-Q354 off:

- When working with the WSB-Q354, 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 WSB-Q354 **DO NOT:**

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

5.2.2 Installation Checklist

The following checklist is provided to ensure the WSB-Q354 is properly installed.

- All the items in the packing list are present
- The CPU is installed
- The CPU cooling kit is properly installed
- A compatible memory module is properly inserted into the slot
- The jumpers have been properly configured
- The WSB-Q354 is inserted into a chassis with adequate ventilation
- The correct power supply is being used
- The following devices are properly connected
  - SATA drives
  - Power supply
  - USB cable
  - Serial port cable
- The following external peripheral devices are properly connected to the chassis:
  - Keyboard/Mouse
  - VGA screen
  - USB devices
  - LAN

5.3 Unpacking

5.3.1 Unpacking Precautions

When the WSB-Q354 is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 5.1**.
- Make sure the packing box is facing upwards so the WSB-Q354 does not fall out of the box.
- Make sure all the components in the checklist shown in **Chapter 3** are present.

NOTE:

If some of the components listed in the checklist in **Chapter 3** are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the WSB-Q354 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

5.4 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, WSB-Q354 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 WSB-Q354. If one of these components is not installed the WSB-Q354 cannot run.

5.4.1 Socket LGA775 CPU Installation

NOTE:

Enabling Hyper-Threading Technology on your system requires meeting all of the platform requirements listed below:

- **CPU**: An Intel® Processor with HT Technology must be installed
- **Chipset**: An Intel® Chipset that supports HT Technology (that has been met by the WSB-Q354)
- **OS**: An operating system that has optimizations for HT Technology

WARNING:

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

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

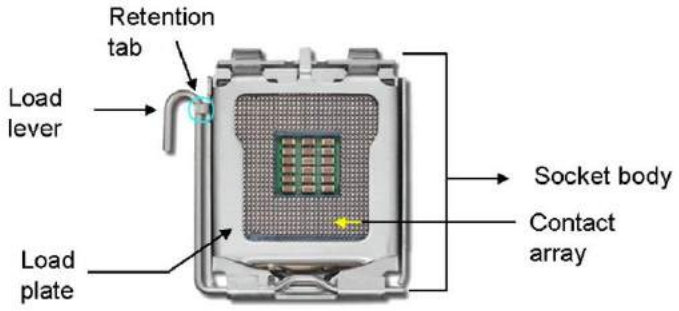


Figure 5-1: Intel® LGA775 Socket

To install a socket LGA775 CPU onto the WSB-Q354, follow the steps below:

WARNING:

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

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

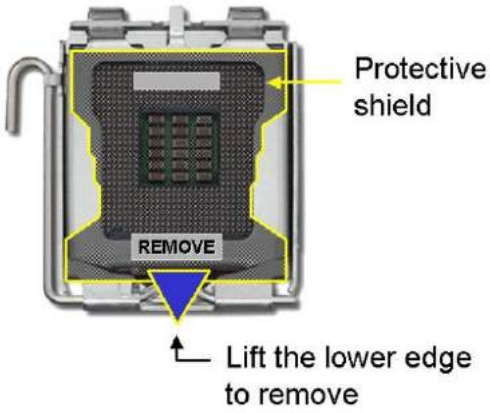


Figure 5-2: Remove the CPU Socket Protective Shield

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

See **Figure 5-3**.

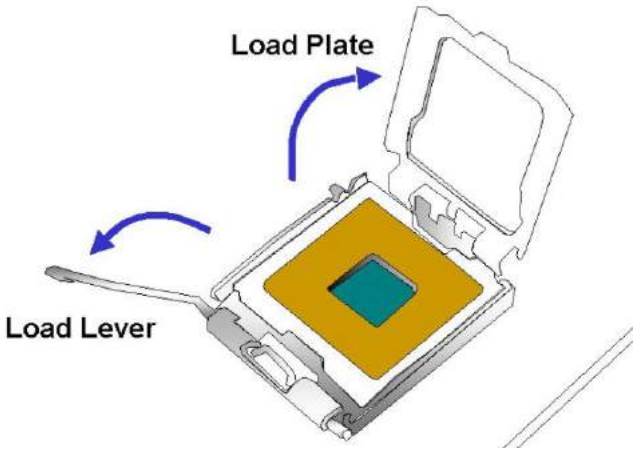


Figure 5-3: Open the CPU Socket Load Plate

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

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

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

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

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

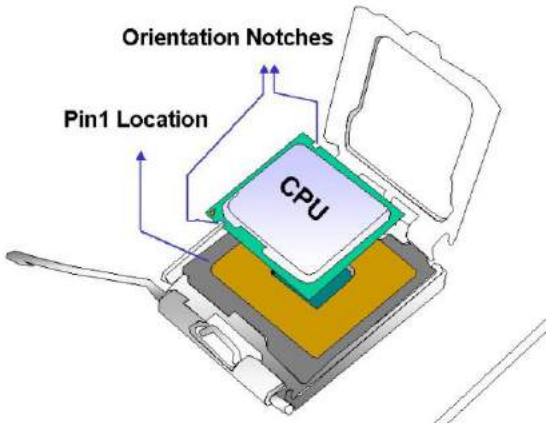


Figure 5-4: Insert the Socket LGA775 CPU

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

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

5.4.2 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 WSB-Q354.

IEI's cooling kit (CF-520) includes a support bracket that is combined with the heat sink mounted on the CPU to counterweigh and balance the load on both sides of the PCB.



Figure 5-5: IEI CF-520 Cooling Kit

An IEI Socket LGA775 CPU cooling kit shown in **Figure 5-5** can be purchased separately. The cooling kit comprises a CPU heat sink and a cooling fan.

WARNING:

Do not wipe off (accidentally or otherwise) the pre-sprayed layer of thermal paste on the bottom of the CF-520 heat sink. The thermal paste between the CPU and the heat sink is important for optimum heat dissipation.

To install the cooling kit, follow the instructions below.

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

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

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

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

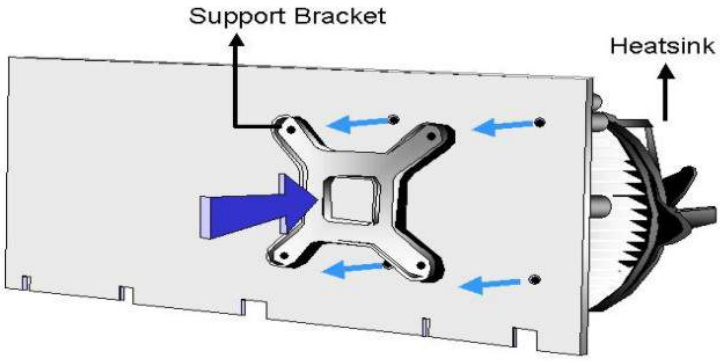


Figure 5-6: Securing the Heat sink to the PCB Board

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

Step 6: **Connect the fan cable**. Connect the cooling kit fan cable to the fan connector on the WSB-Q354. Carefully route the cable and avoid heat generating chips and fan blades.

5.4.3 DIMM Installation

WARNING:

Using incorrectly specified DIMM may cause permanently damage the WSB-Q354. Please make sure the purchased DIMM complies with the memory specifications of the WSB-Q354. DIMM specifications compliant with the WSB-Q354 are listed in **Chapter 2**.

5.4.3.1 DIMM Purchasing Guidelines

WARNING:

Only use DDR2 DIMMs. If DDR DIMMs are used the system may be irreparably damaged.

When purchasing the DDR2 DIMM, please follow the guidelines below:

- ONLY purchase DDR2 DIMM
- Have a frequency of 667 MHz or 800 MHz
- Have a maximum capacity of 2.0 GB
- If more than one DDR2 DIMM is being installed in the system, please purchase DIMM that have the same capacity and operating frequency.

5.4.3.2 DIMM Installation Order

There are two 64-bit wide DDR2 channels on the Intel® Q35 Northbridge, Channel A and Channel B. DDR2 Channel A and DDR2 Channel B are shown in **Figure 5-7** below.

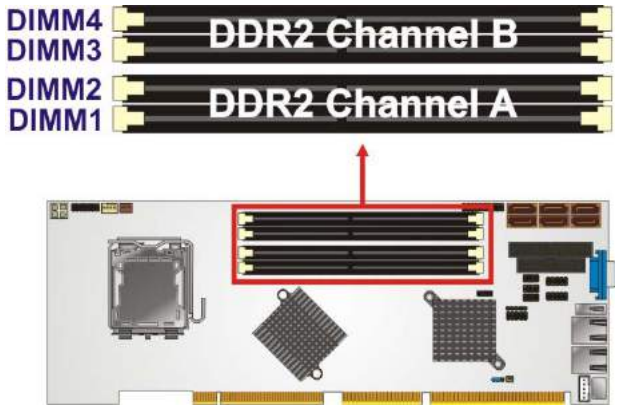


Figure 5-7: DDR2 Channels

On the WSB-Q354, each channel is interfaced to two 240-pin DIMM sockets in the following order (see **Figure 5-7** above):

- **Channel A**: DIMM1 and DIMM2

- **Channel B**: DIMM3 and DIMM4

When populating the DDR2 DIMM sockets, populate them in the following order to optimize the memory performance:

Step 1: **DIMM1**. Install the first DDR2 DIMM into the DIMM1 DDR2 DIMM socket.

Step 2: **DIMM3**. Install the second DDR2 DIMM into the DIMM3 DDR2 DIMM socket.

Step 3: **DIMM2**. Install the third DDR2 DIMM into the DIMM2 DDR2 DIMM socket.

Step 4: **DIMM4**. Install the fourth DDR2 DIMM into the DIMM4 DDR2 DIMM socket.

5.4.3.3 DIMM Installation Guidelines

To install a DIMM into a DIMM socket, please follow the steps below and refer to **Figure 5-8**.

Step 1: **Open the DIMM socket handles**. The DIMM socket has two handles that secure the DIMM into the socket. Before the DIMM can be inserted into the socket, the handles must be opened. See **Figure 5-8**.

Step 2: **Align the DIMM with the socket**. The DIMM must be oriented in such a way that the notch in the middle of the DIMM must be aligned with the plastic bridge in the socket. See **Figure 5-8**.

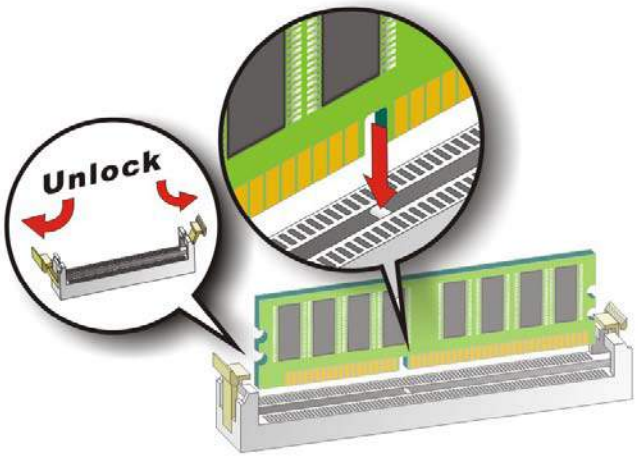


Figure 5-8: Installing a DIMM

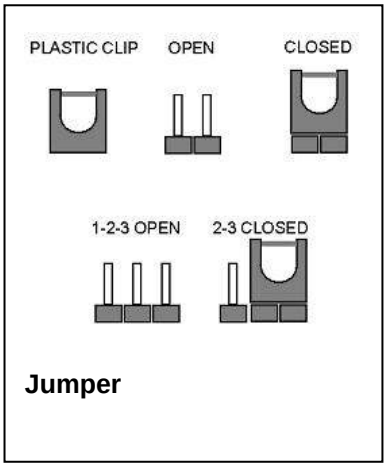
Step 3: **Insert the DIMM**. Once properly aligned, the DIMM can be inserted into the socket. As the DIMM is inserted, the white handles on the side of the socket will close automatically and secure the DIMM to the socket. See **Figure 5-8**.

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

5.5 Jumper Settings

NOTE:

A jumper is a metal bridge 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 WSB-Q354 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumper on the WSB-Q354 is listed in **Table 5-1**.

Description	Label	Type
Clear CMOS	J_CMOS1	3-pin header

Table 5-1: Jumpers

5.5.1 Clear CMOS Jumper

Jumper Label: **J_CMOS1**

Jumper Type: 3-pin header

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

Jumper Location: See **Figure 5-9**

If the WSB-Q354 fails to boot due to improper BIOS settings, the clear CMOS jumper clears the CMOS data and resets the system BIOS information. To do this, use the jumper cap to close pins 2 and 3 for a few seconds then reinstall the jumper clip back to pins 1 and 2.

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

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

After having done one of the above, save the changes and exit the CMOS Setup menu. The clear CMOS jumper settings are shown in **Table 5-2**.

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

Table 5-2: Clear CMOS Jumper Settings

The location of the clear CMOS jumper is shown in **Figure 5-9** below.

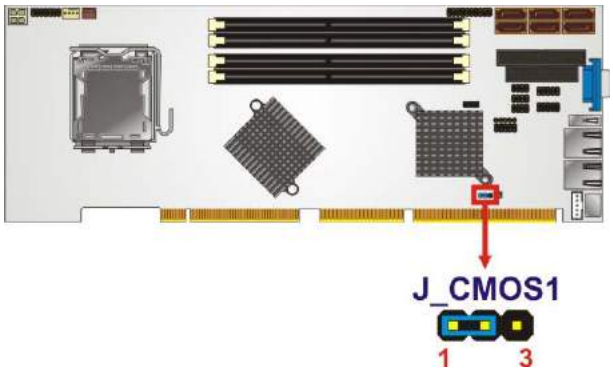


Figure 5-9: Clear CMOS Jumper

5.6 Chassis Installation

5.6.1 Airflow

WARNING:

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the WSB-Q354 must have air vents to allow cool air to move into the system and hot air to move out.

The WSB-Q354 must be installed in a chassis with ventilation holes on the sides allowing airflow to travel through the heat sink surface. In a system with an individual power supply unit, the cooling fan of a power supply can also help generate airflow through the board surface.

5.6.2 CPU Card Installation

To install the WSB-Q354 CPU card onto the backplane, carefully align the CPU card interface connectors with the corresponding socket on the backplane. To do this, please refer to the reference material that came with the backplane. Next, secure the CPU card to the chassis. To do this, please refer to the reference material that came with the chassis..

5.7 Internal Peripheral Device Connections

5.7.1 Peripheral Device Cables

The cables listed in **Table 5-3** are shipped with the WSB-Q354.

Quantity	Type
1	Dual RS-232 cable
6	SATA drive cables
3	SATA drive power cables
1	USB cable

Table 5-3: IEI Provided Cables

Separately purchased optional IEI items that can be installed are listed below:

- Audio kit
- Keyboard/mouse cable with bracket
- TPM Module

For more details about the items listed above, please refer to **Chapter 3**. Installation of the accessories listed above are described in detail below.

5.7.2 Dual RS-232 Cable Connection

The dual RS-232 cable 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 bracket. To install the dual RS-232 cable, please follow the steps below.

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

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

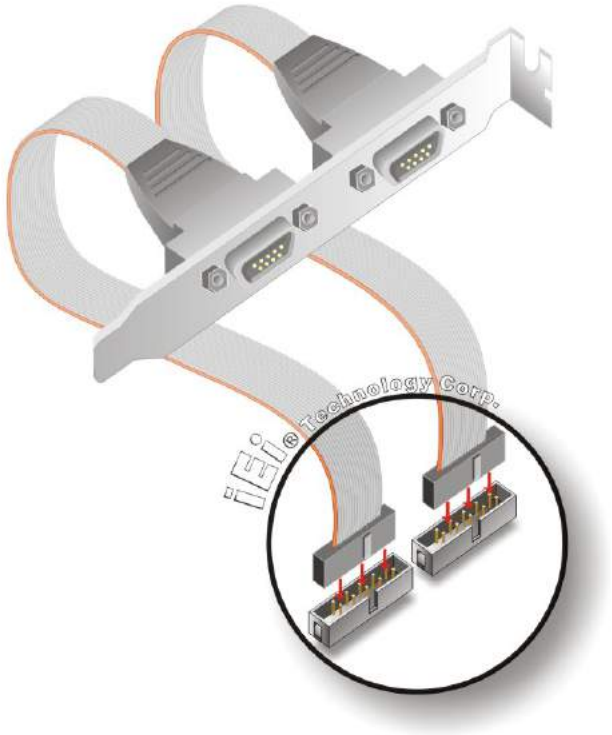


Figure 5-10: Dual RS-232 Cable Installation

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

5.7.3 SATA Drive Connection

The WSB-Q354 is shipped with two SATA drive cables and one SATA drive power cable. To connect the SATA drives to the connectors, please follow the steps below.

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

Step 2: **Insert the cable connector**. Press the clip on the connector at the end of the SATA cable and insert the cable connector into the onboard SATA drive connector. See **Figure 5-11**.

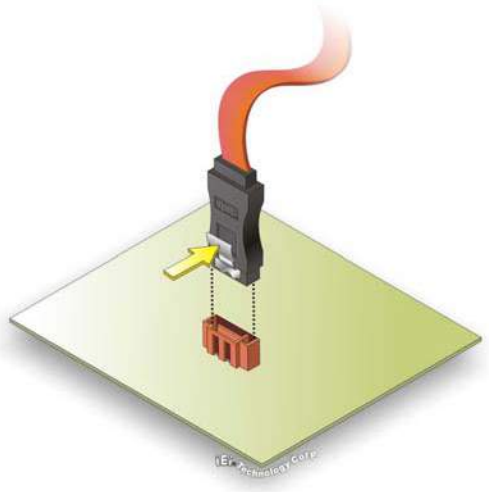


Figure 5-11: SATA Drive Cable Connection

Step 3: **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 5-12**.

Step 4: **Connect the SATA power cable**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-12**.

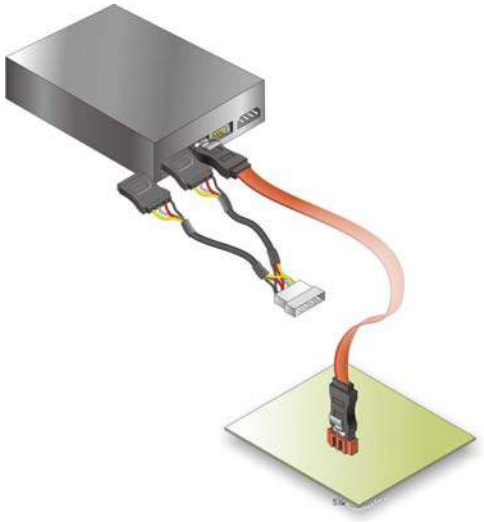


Figure 5-12: SATA Power Drive Connection

5.7.4 USB Cable (Dual Port)

The WSB-Q354 is shipped with a dual port USB 2.0 cable. To connect the USB cable connector, please follow the steps below.

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

WARNING:

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

Step 2: **Align the connectors**. The cable has two connectors. Correctly align pin 1on each cable connector with pin 1 on the WSB-Q354 USB connector.

Step 3: **Insert the cable connectors**. Once the cable connectors are properly aligned with the USB connectors on the WSB-Q354, connect the cable connectors to the onboard connectors. See **Figure 5-13**.

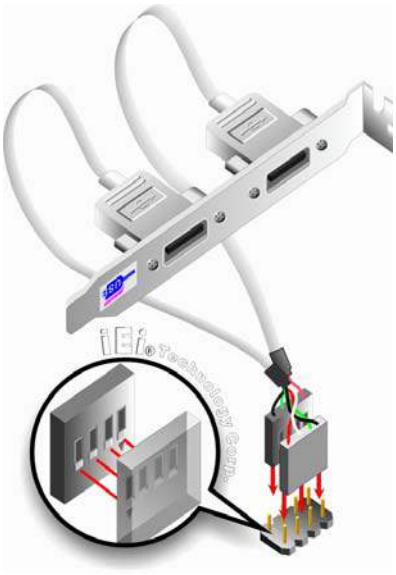


Figure 5-13: Dual USB Cable Connection

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

5.7.5 7.1 Channel Audio Kit Installation

NOTE:

This is an optional item that must be ordered separately. For further information please contact the nearest WSB-Q354 distributor, reseller or vendor or contact an iEi sales representative directly. Send any queries to sales@iei.com.tw.

The optional 7.1 channel audio kit connects to the 10-pin audio connector on the WSB-Q354. The audio kit consists of five audio jacks. One audio jack, Mic In, connects to a microphone. The remaining four audio jacks, Line-In, Front-Out, Rear-Out, and Center Subwoofer, connect to speakers. To install the audio kit, please refer to the steps below:

Step 1: **Connect the audio kit cable.** The audio kit is shipped with a cable that connects the audio kit to the WSB-Q354. Connect the cable to the connector on

the back of the audio kit. Make sure the pins are properly aligned (i.e. pin 1 connects to pin 1).

Step 2: **Locate the audio connector**. The location of the 10-pin audio connector is shown in **Chapter 3**.

Step 3: **Align pin 1**. Align pin 1 on the on-board connector with pin 1 on the audio kit cable connector. Pin 1 on the audio kit cable connector is indicated with a white dot.

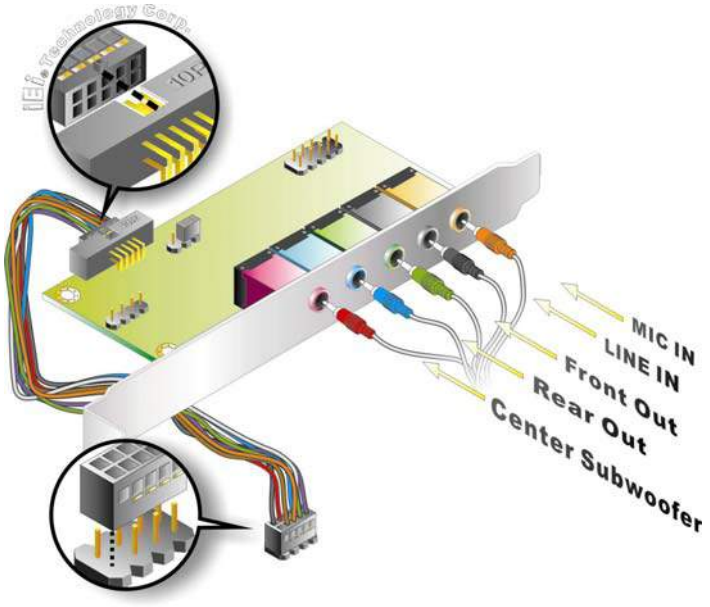


Figure 5-14: 7.1 Channel Audio Kit

Step 4: **Mount the audio kit onto the chassis**. Once the audio kit is connected to the WSB-Q354, secure the audio kit bracket to the system chassis.

Step 5: **Connect the audio devices**. Connect one speaker to the line-in audio jack, one speaker to the line-out audio jack and a microphone to the mic-in audio jack.

Step 6: **Install the driver**. If the 5.1 channel audio kit is used, the ALC888 Realtek codec driver must be installed. Refer to **Chapter 7** for driver installation instructions.

5.8 External Peripheral Interface Connection

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

- RJ-45 Ethernet cable connectors
- Keyboard/mouse
- USB devices
- VGA monitors

To install these devices, connect the corresponding cable connector from the actual device to the corresponding WSB-Q354 external peripheral interface connector making sure the pins are properly aligned.

5.8.1 LAN Connection (Single Connector)

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

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

Step 2: **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the WSB-Q354. See **Figure 5-15**.

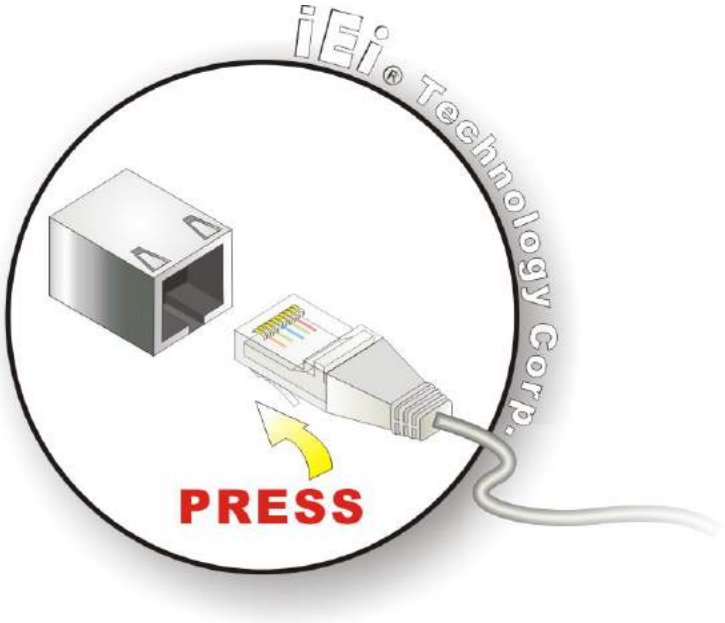


Figure 5-15: LAN Connection

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

5.8.2 PS/2 Keyboard and Mouse Connection

The WSB-Q354 has a single PS/2 connector on the external peripheral interface panel. The 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 WSB-Q354.

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

Step 2: **Insert the keyboard/mouse connector**. Insert the PS/2 connector on the end of the PS/2 y-cable into the external PS/2 connector. See **Figure 5-16**.

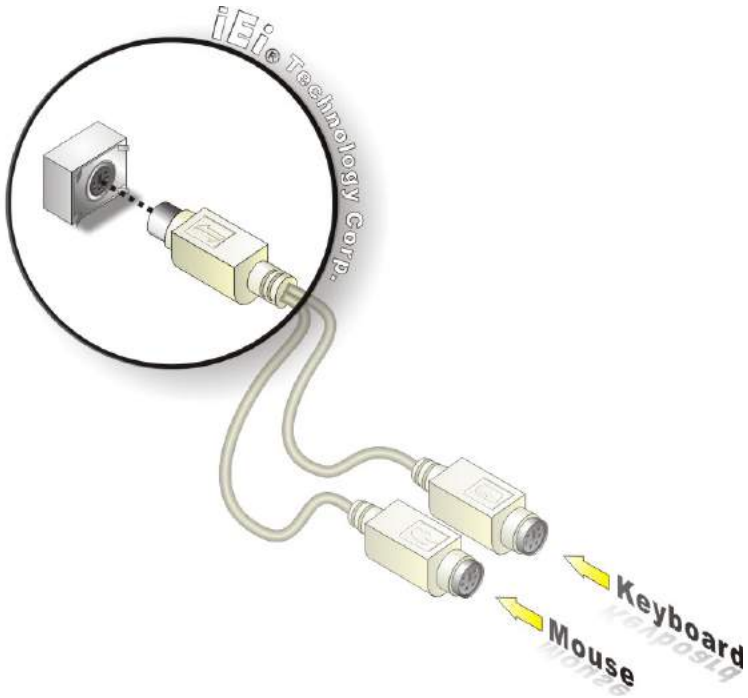


Figure 5-16: PS/2 Keyboard/Mouse Connector

5.8.3 USB Device Connection

There is one external USB 2.0 connector. The USB connector is perpendicular to the WSB-Q354. To connect a USB 2.0 or USB 1.1 device, please follow the instructions below.

Step 1: **Located the USB connector**. The location of the USB connectors is shown in **Chapter 4**.

Step 2: **Align the connector.** Align the USB device connector with the connector on the WSB-Q354. See **Figure 5-17**.

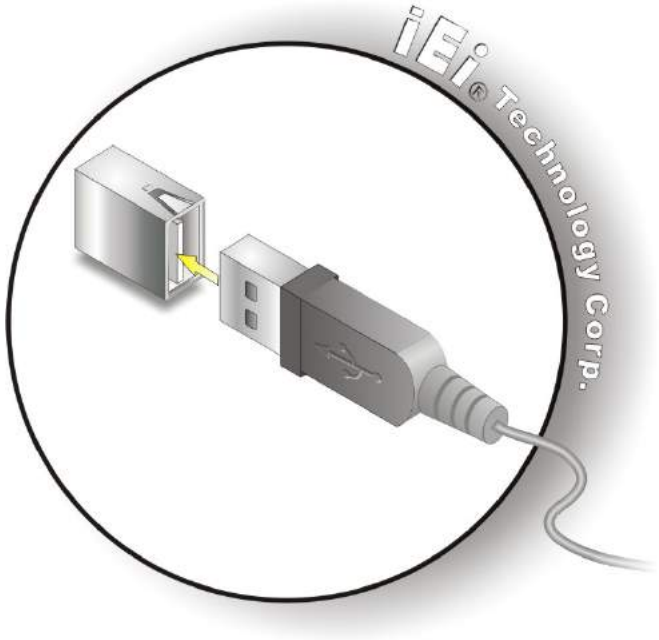


Figure 5-17: USB Device Connection

Step 3: **Insert the device connector.** Once aligned, gently insert the USB device connector into the onboard connector.

5.8.4 VGA Monitor Connection

The WSB-Q354 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the WSB-Q354, please follow the instructions below.

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

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

Step 3: **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the WSB-Q354. See **Figure 5-18**.

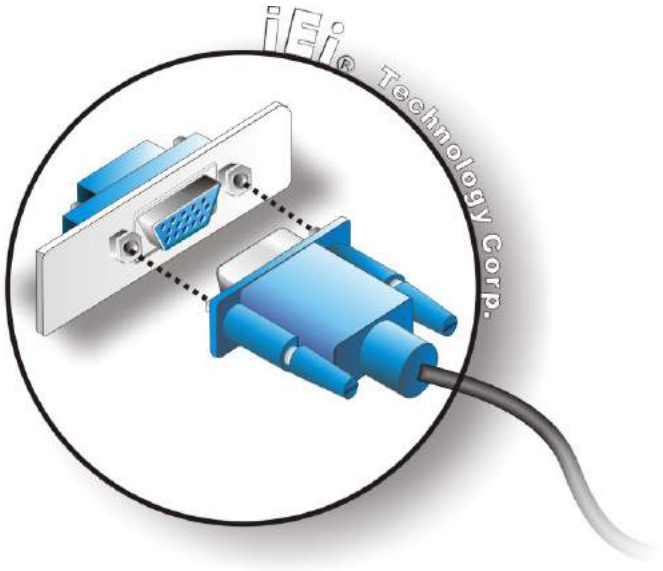


Figure 5-18: VGA Connector

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

Chapter

6

AMI BIOS

6.1 Introduction

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

6.1.1 Starting Setup

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

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

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

6.1.2 Using Setup

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

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

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

Table 6-1: BIOS Navigation Keys

6.1.3 Getting Help

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

6.1.4 Unable to Reboot After Configuration Changes

If the computer cannot boot after changes to the system configuration is made, CMOS defaults. Use the jumper described in **Chapter 5.5.1**.

6.1.5 BIOS Menu Bar

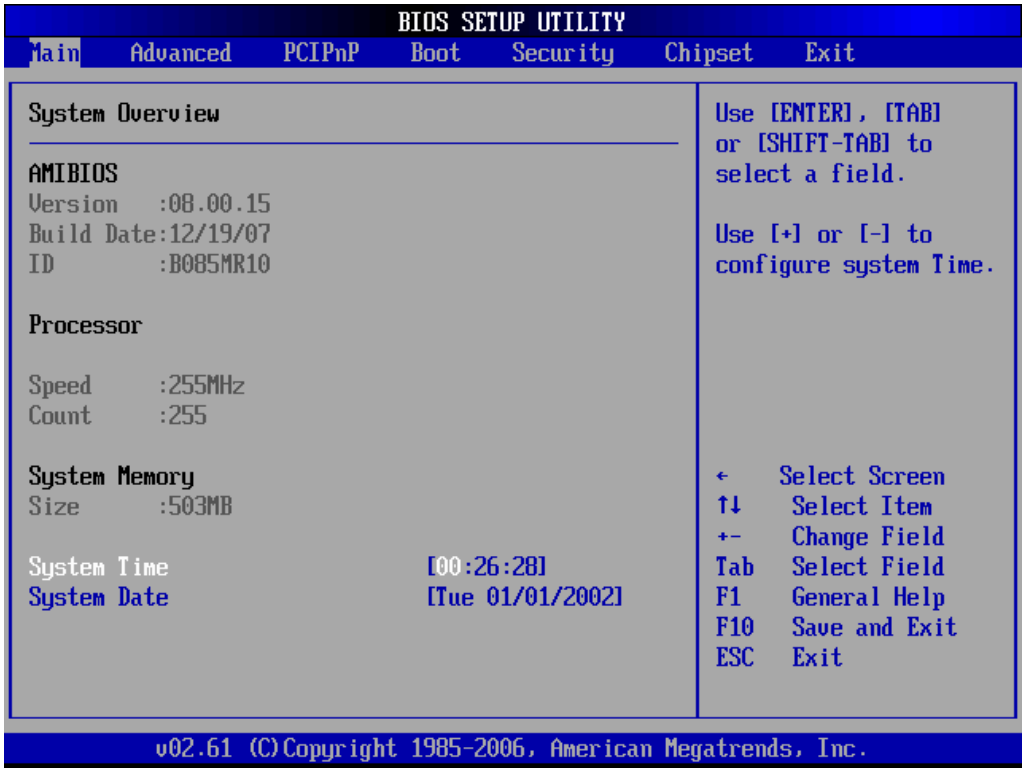
The **menu bar** on top of the BIOS screen has the following main items:

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

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

6.2 Main

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



BIOS Menu 1: Main

➔ System Overview

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

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

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

The System Overview field also has two user configurable fields:

➔ **System Time [xx:xx:xx]**

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

➔ **System Date [xx/xx/xx]**

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

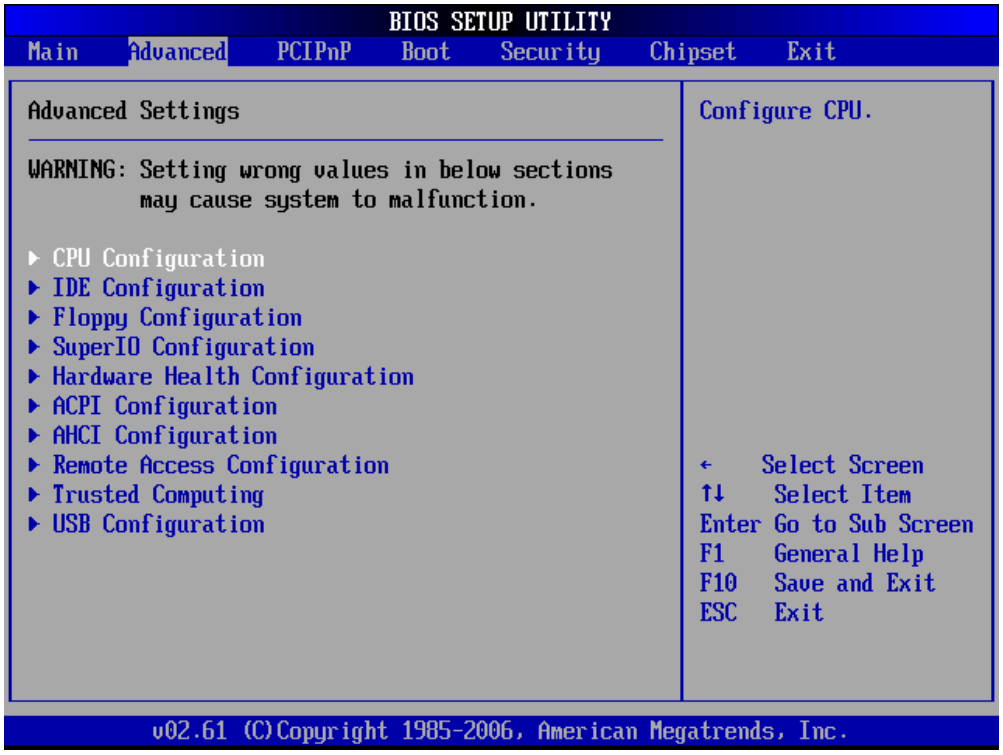
6.3 Advanced

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

WARNING!

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

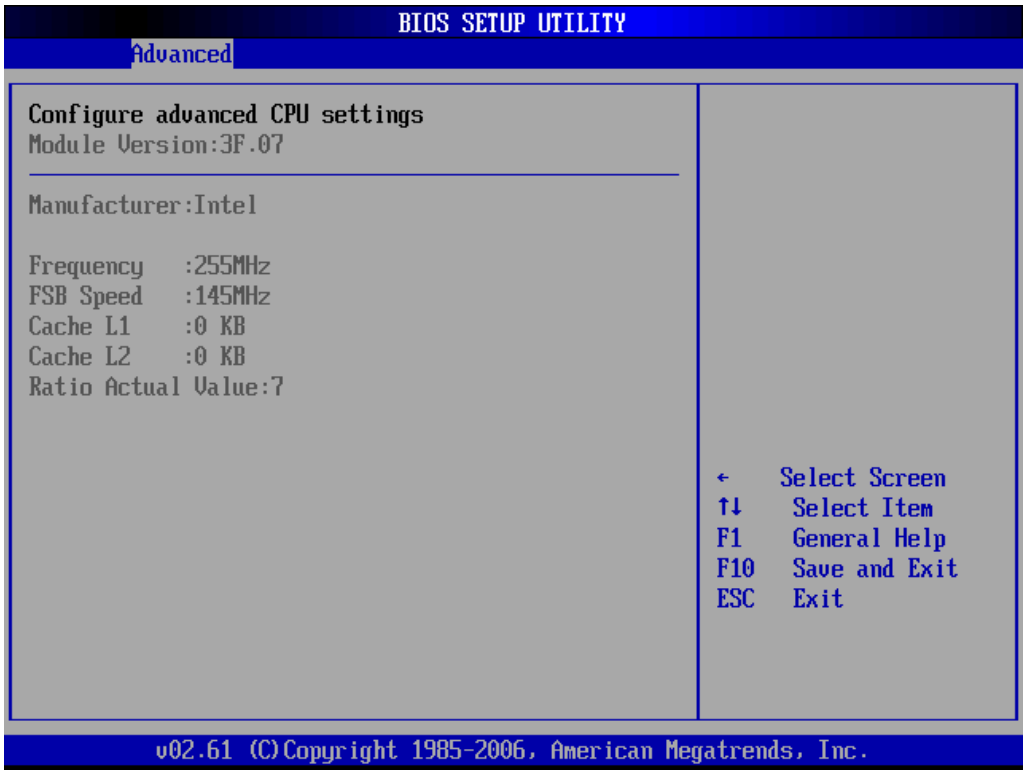
- CPU Configuration (see **Section 6.3.1**)
- IDE Configuration (see **Section 6.3.2**)
- Floppy Configuration (see **Section 6.3.3**)
- Super IO Configuration (see **Section 6.3.4**)
- Hardware Health Configuration (see **Section**)
- ACPI Configuration (see **Section 6.3.6**)
- AHCI Configuration (see **Section 6.3.7**)
- Remote Access Configuration (see **Section 6.3.8**)
- Trusted Computing (see **Section 6.3.9**)
- USB Configuration (see **Section 6.3.10**)



BIOS Menu 2: Advanced

6.3.1 CPU Configuration

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



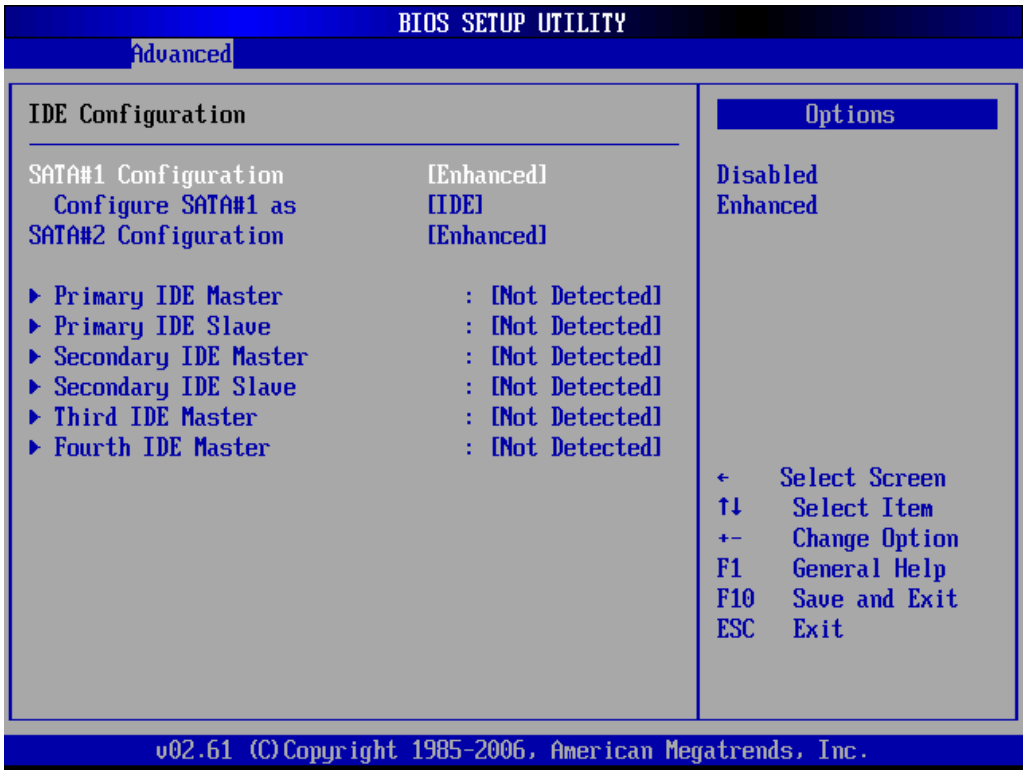
BIOS Menu 3: CPU Configuration

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

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

6.3.2 IDE Configuration

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



BIOS Menu 4: IDE Configuration

➔ **SATA#n Configuration [Enhanced]**

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

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

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

➔ **Configure SATA as [IDE]**

Use the **Configure SATA as** option to configure SATA devices as normal IDE devices.

➔ **IDE** **DEFAULT** Configures SATA devices as normal IDE device.

➔ **RAID** Configures SATA devices as RAID device.

➔ **AHCI** Configures SATA devices as AHCI device.

➔ **IDE Master and IDE Slave**

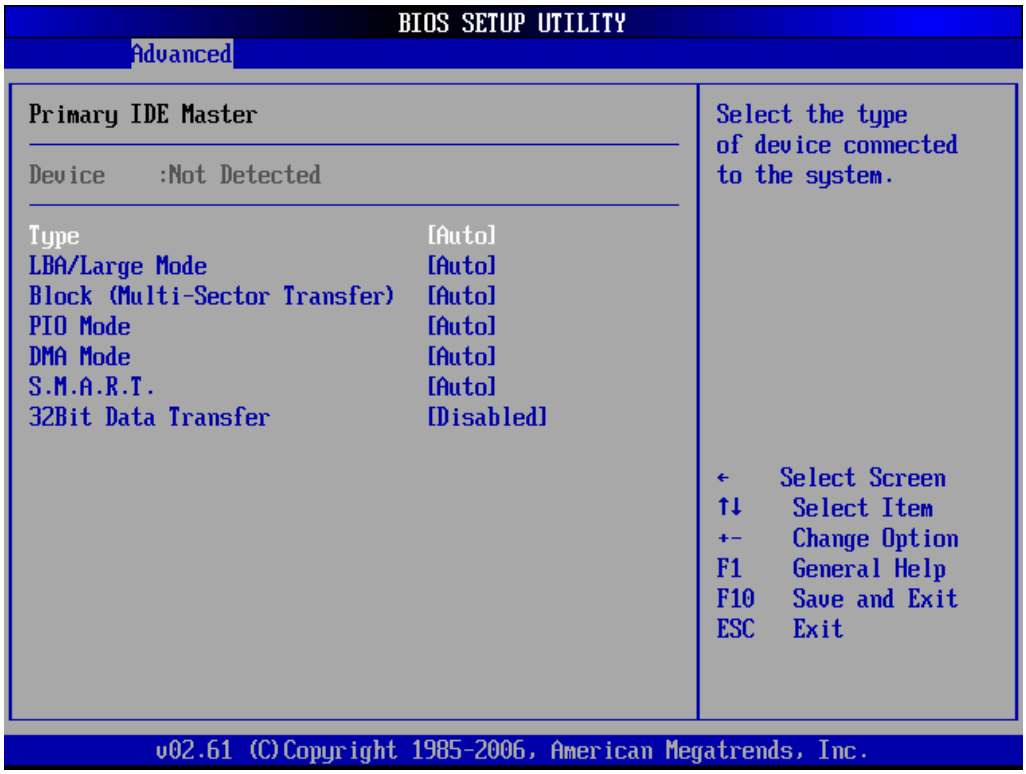
When entering setup, BIOS auto detects the presence of IDE devices. BIOS displays the status of the auto detected IDE devices. The following IDE devices are detected and are shown in the **IDE Configuration** menu:

- 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 6.3.2.1** appear.

6.3.2.1 IDE Master, IDE Slave

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



BIOS Menu 5: IDE Master and IDE Slave Configuration

➔ Auto-Detected Drive Parameters

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

- Device: Lists the device type (e.g. hard disk, CD-ROM etc.)
- Type: Indicates the type of devices a user can manually select
- Vendor: Lists the device manufacturer
- Size: List the storage capacity of the device.
- LBA Mode: Indicates whether the LBA (Logical Block Addressing) is a method of addressing data on a disk drive is supported or not.
- Block Mode: Block mode boosts IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if block mode is not used. Block mode allows transfers of up to 64 KB per interrupt.
- PIO Mode: Indicates the PIO mode of the installed device.

- Async DMA: Indicates the highest Asynchronous DMA Mode that is supported.
- Ultra DMA: Indicates the highest Synchronous DMA Mode that is supported.
- S.M.A.R.T.: Indicates whether or not the Self-Monitoring Analysis and Reporting Technology protocol is supported.
- 32Bit Data Transfer: Enables 32-bit data transfer.

➔ **Type [Auto]**

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

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

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

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

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

➔ **ZIP**

➔ **LS-120**

➔ **LBA/Large Mode [Auto]**

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

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

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

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

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

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

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

➔ **PIO Mode [Auto]**

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

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

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

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

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

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

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

(This setting generally works with all hard disk drives manufactured after 1999. For other disk drives, such as IDE

CD-ROM drives, check the specifications of the drive.)

➔ **DMA Mode [Auto]**

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

➔ **Auto**	**DEFAULT**	BIOS auto detects the DMA mode. Use this value if the IDE disk drive support cannot be determined.
➔ **SWDMA0**		Single Word DMA mode 0 selected with a maximum data transfer rate of 2.1MBps
➔ **SWDMA1**		Single Word DMA mode 1 selected with a maximum data transfer rate of 4.2MBps
➔ **SWDMA2**		Single Word DMA mode 2 selected with a maximum data transfer rate of 8.3MBps
➔ **MWDMA0**		Multi Word DMA mode 0 selected with a maximum data transfer rate of 4.2MBps
➔ **MWDMA1**		Multi Word DMA mode 1 selected with a maximum data transfer rate of 13.3MBps
➔ **MWDMA2**		Multi Word DMA mode 2 selected with a maximum data transfer rate of 16.6MBps
➔ **UDMA1**		Ultra DMA mode 0 selected with a maximum data transfer rate of 16.6MBps
➔ **UDMA1**		Ultra DMA mode 1 selected with a maximum data transfer rate of 25MBps
➔ **UDMA2**		Ultra DMA mode 2 selected with a maximum data transfer rate of 33.3MBps
➔ **UDMA3**		Ultra DMA mode 3 selected with a maximum data transfer rate of 44MBps (To use this mode, it is required that an 80-conductor ATA cable is used.)
➔ **UDMA4**		Ultra DMA mode 4 selected with a maximum data transfer rate of 66.6MBps (To use this mode, it is required that an

80-conductor ATA cable is used.)

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

➔ **S.M.A.R.T [Auto]**

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

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

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

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

➔ **32Bit Data Transfer [Enabled]**

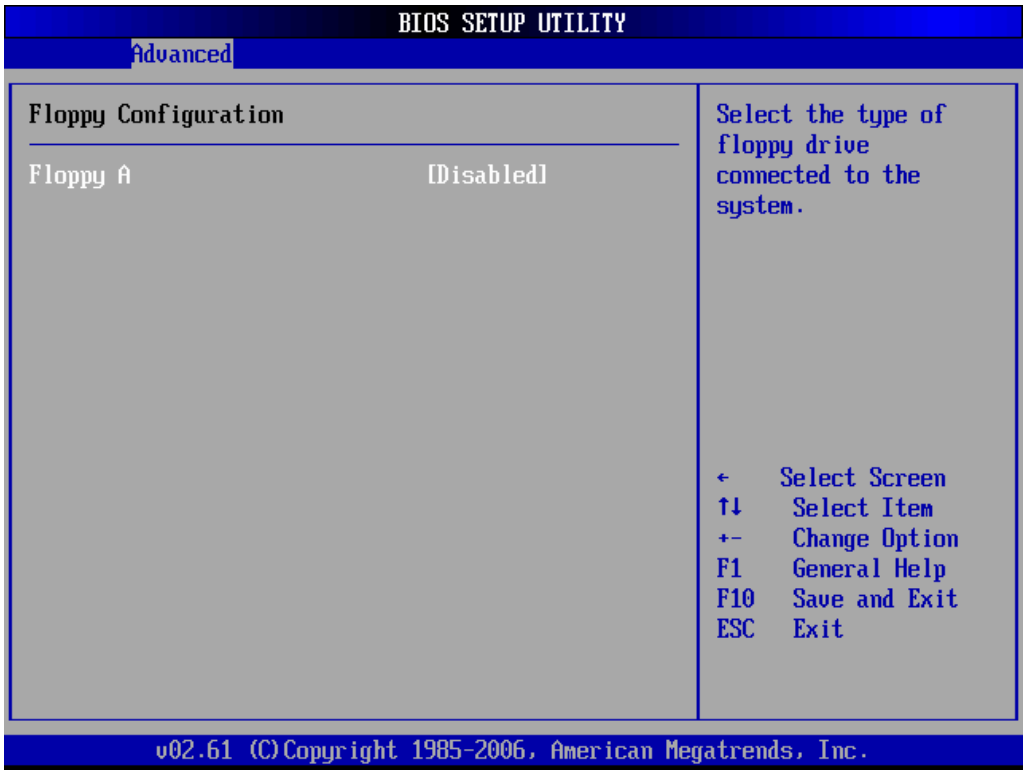
Use the **32Bit Data Transfer** BIOS option to enables or disable 32-bit data transfers.

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

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

6.3.3 Floppy Configuration

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



BIOS Menu 6: IDE Master and IDE Slave Configuration

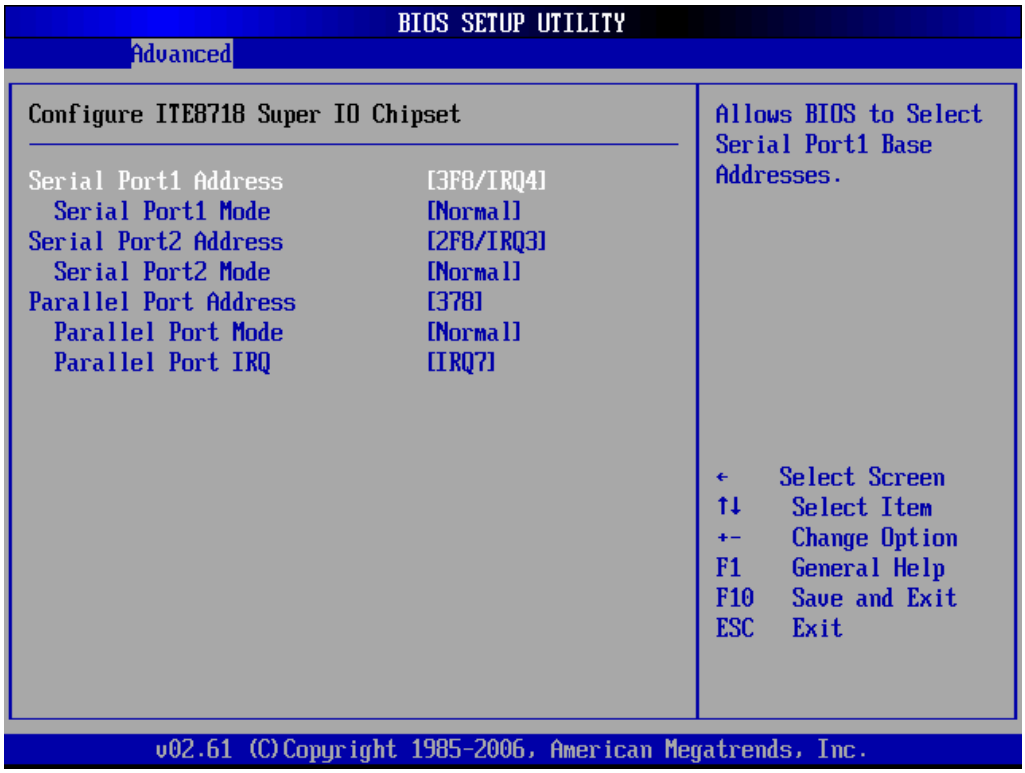
➔ **Floppy A**

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

- Disabled
- 1.44 MB 31/2”

6.3.4 Super IO Configuration

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



BIOS Menu 7: Super IO Configuration

➔ **Serial Port1 Address [3F8/IRQ4]**

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

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

➔ **Serial Port1 Mode [Normal]**

Use the **Serial Port1 Mode** option to select the transmitting and receiving mode for the first serial port.

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

➔ **Serial Port2 Address [2F8/IRQ3]**

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

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

➔ **Serial Port2 Mode [Normal]**

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

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

➔ **Parallel Port Address [378]**

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

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

➔ **Parallel Port Mode [Normal]**

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

➔ **Normal**	**DEFAULT**	The normal parallel port mode is the standard mode for parallel port operation.
➔ **EPP**		The parallel port operates in the enhanced parallel port mode (EPP). The EPP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode.
➔ **ECP**		The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode
➔ **ECP+EPP**		The parallel port operates in the extended capabilities port (ECP) mode. The ECP mode supports bi-directional communication between the system and the parallel port device and the transmission rates between the two are much faster than the Normal mode The parallel port is also be compatible with EPP devices described above

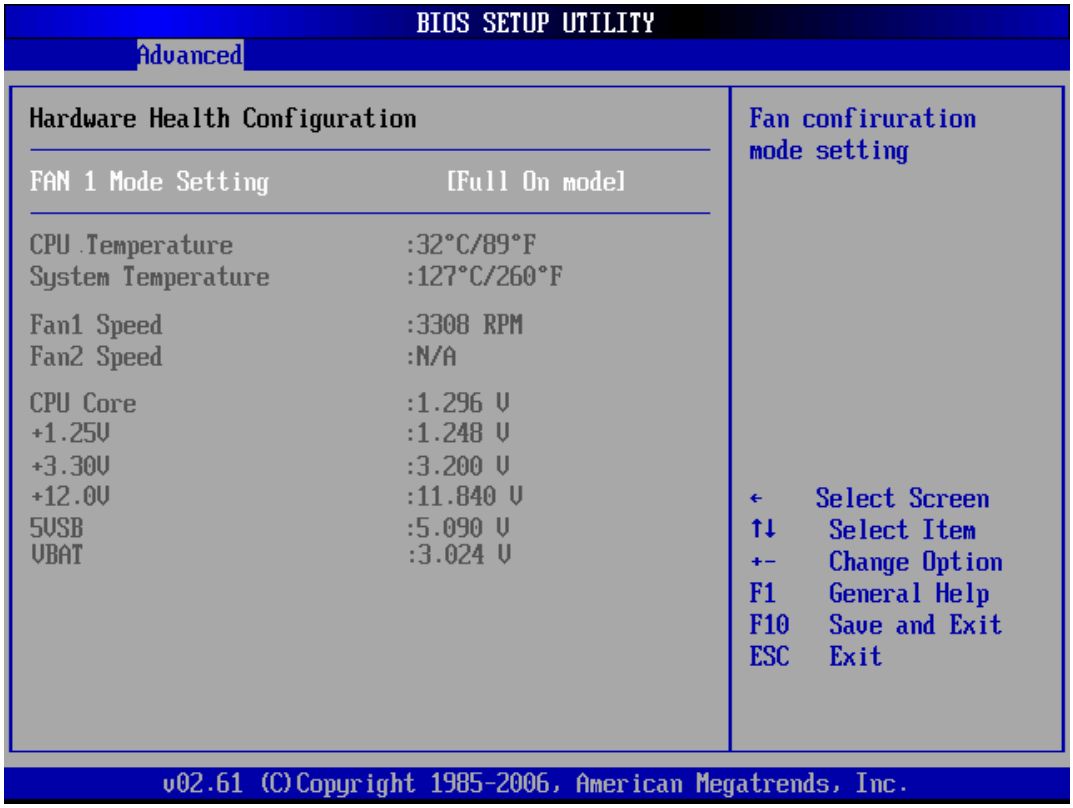
➔ **Parallel Port IRQ [IRQ7]**

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

➔ **IRQ5**		IRQ5 is assigned as the parallel port interrupt address
➔ **IRQ7**	**DEFAULT**	IRQ7 is assigned as the parallel port interrupt address

6.3.5 Hardware Health Configuration

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



BIOS Menu 8: Hardware Health Configuration

➔ **FAN 1 Mode Setting [Full On Mode]**

Use the **FAN 1 Mode Setting** option to configure the second fan.

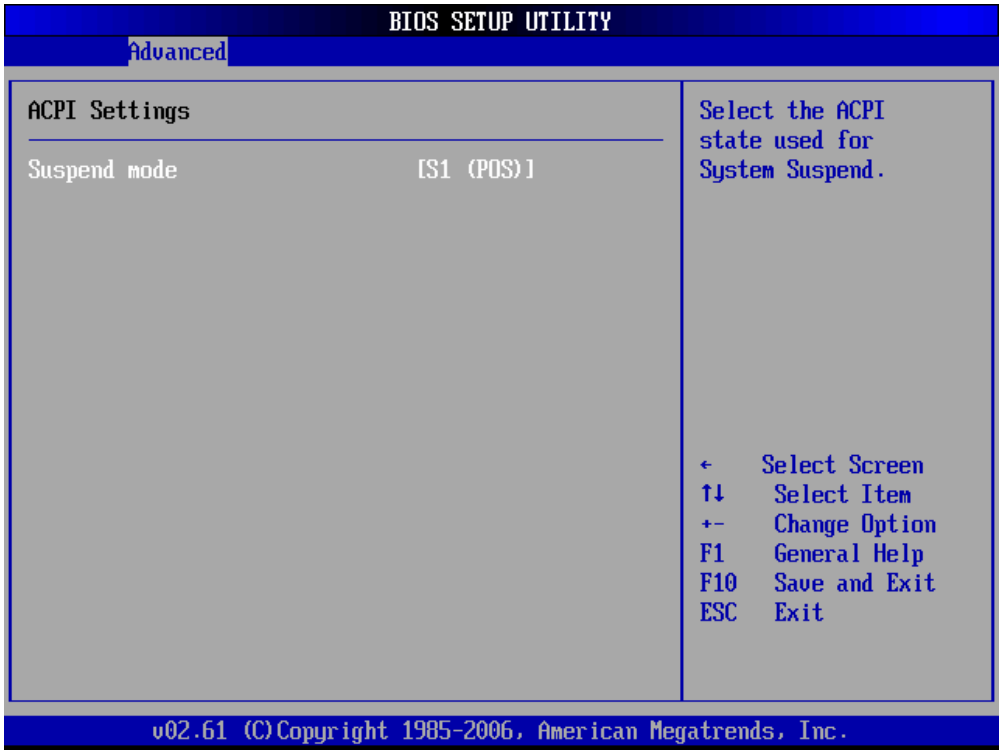
➔ **Full On Mode**	**DEFAULT**	Fan is on all the time
➔ **Automatic mode**		Fan is off when the temperature is low enough. Parameters must be set by the user.
➔ **PWM Manual mode**		Pulse width modulation set manually

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
- Fan Speeds: The CPU cooling fan speed is monitored.
  - Fan1 Speed
  - Fan2 Speed
- Voltages: The following system voltages are monitored
  - CPU Core
  - +1.25V
  - +3.3V
  - +12V
  - 5VSB
  - VBAT

6.3.6 ACPI Configuration

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



BIOS Menu 9: ACPI Configuration

➔ **Suspend Mode [S1(POS)]**

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

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

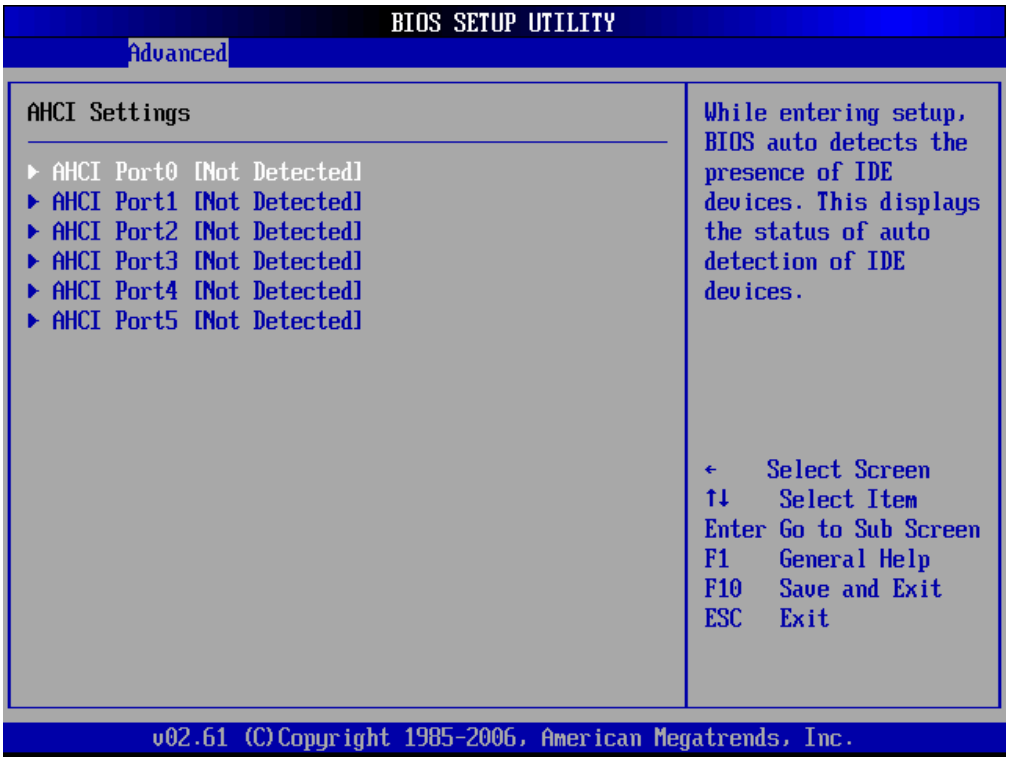
➔ **S3 (STR)** System appears off. The CPU has no power; RAM is in slow refresh; the power supply is in a reduced power mode.

6.3.7 AHCI Configuration

NOTE:

Advanced Host Controller Interface (AHCI) is a new programming interface for SATA host controllers. AHCI systems do not have master/slave designation for SATA devices, each device is treated as a master, and hardware-assisted native command queuing.

Use the **AHCI Settings** menu (**BIOS Menu 10**) to report on the auto-detection of devices connected to the onboard SATA drive connectors.



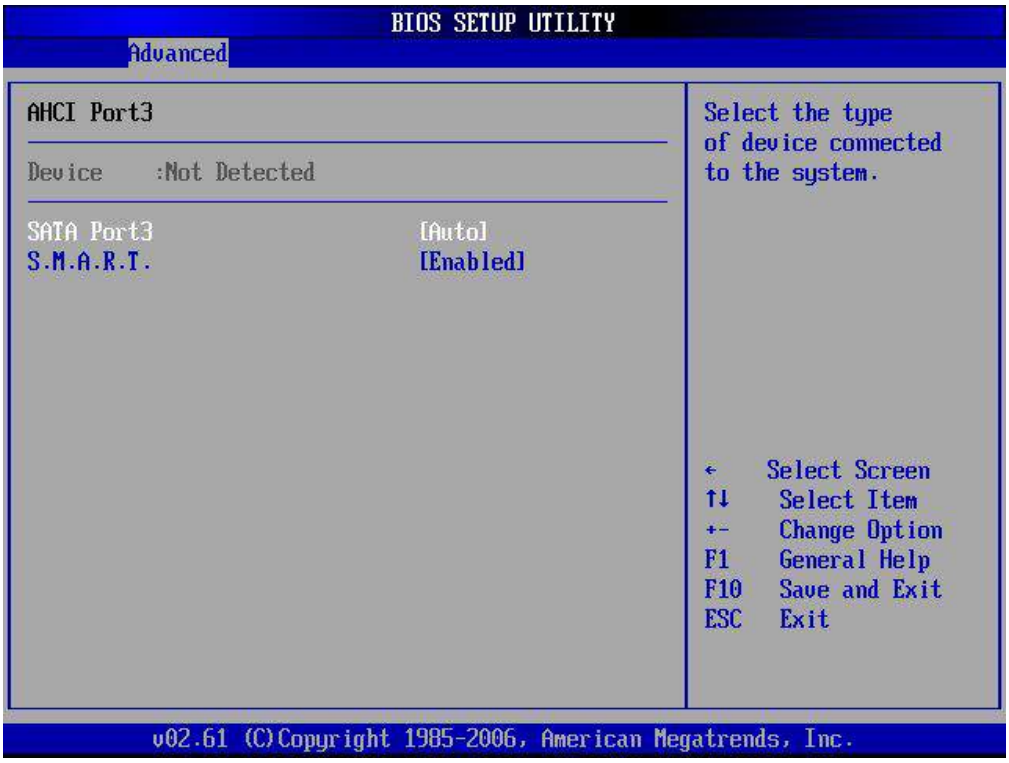
BIOS Menu 10: AHCI Configuration

➔ **AHCI Port n [Not Detected]**

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

6.3.7.1 AHCI Port n

Use the **AHCI Port n** configuration menu (**BIOS Menu 11**) to configure the drive connected to SATA connector n.



BIOS Menu 11: AHCI Port n Configuration Menu

➔ **SATA Port n [Auto]**

Use the **SATA Port n** option to enable the system to auto-detect the type of drive connected to SATA drive connector n.

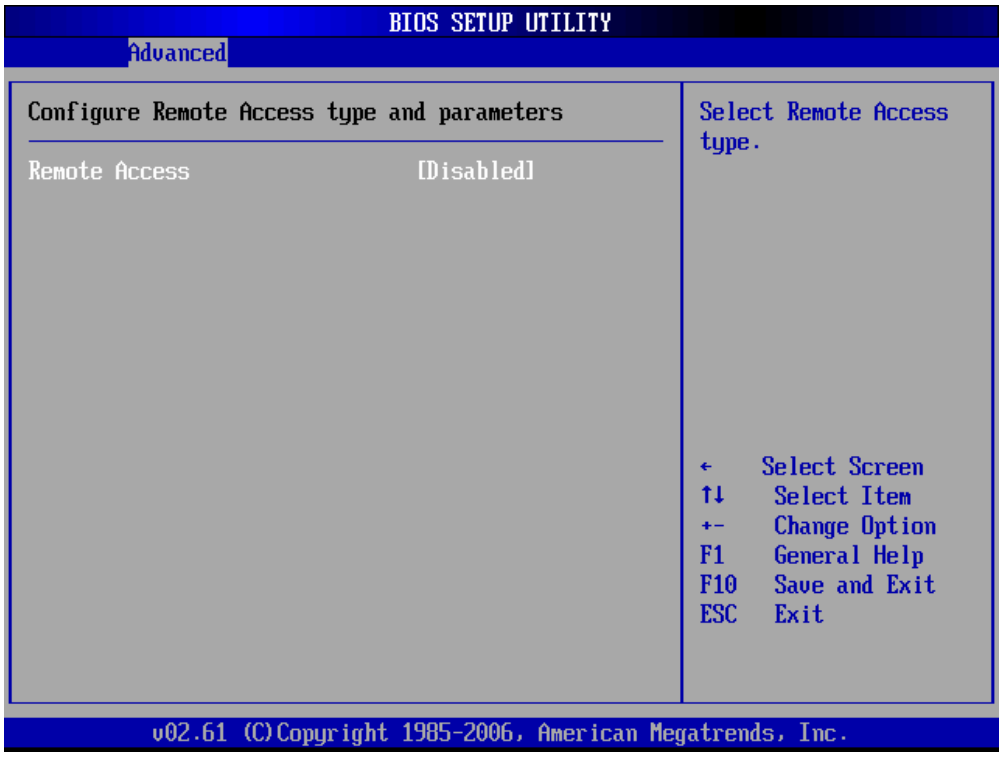
➔ **S.M.A.R.T [Enabled]**

Use the **S.M.A.R.T** option to enable S.M.A.R.T (Self-Monitoring, Analysis, and Reporting Technology) on the drive connected to SATA drive connector n.

➔ **Enabled**	**DEFAULT**	S.M.A.R.T is enabled on the drive connected to SATA drive connector n on the system
➔ **Disabled**		S.M.A.R.T is disabled on the drive connected to SATA drive connector n on the system

6.3.8 Remote Access Configuration

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



BIOS Menu 12: Remote Access Configuration [Advanced]

➔ **Remote Access [Disabled]**

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

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

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

- ➔ **Serial Port Number**
- ➔ **Serial Port Mode**
- ➔ **Redirection after BIOS POST**
- ➔ **Terminal Type**

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

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

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

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

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

➔ **Base Address, IRQ [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

NOTE:

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

➔ **Redirection After BIOS POST [Always]**

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

➔	**Disabled**		The console is not redirected after POST
➔	**Boot Loader**		Redirection is active during POST and during Boot Loader
➔	**Always**	**DEFAULT**	Redirection is always active (Some OSes may not work if set to Always)

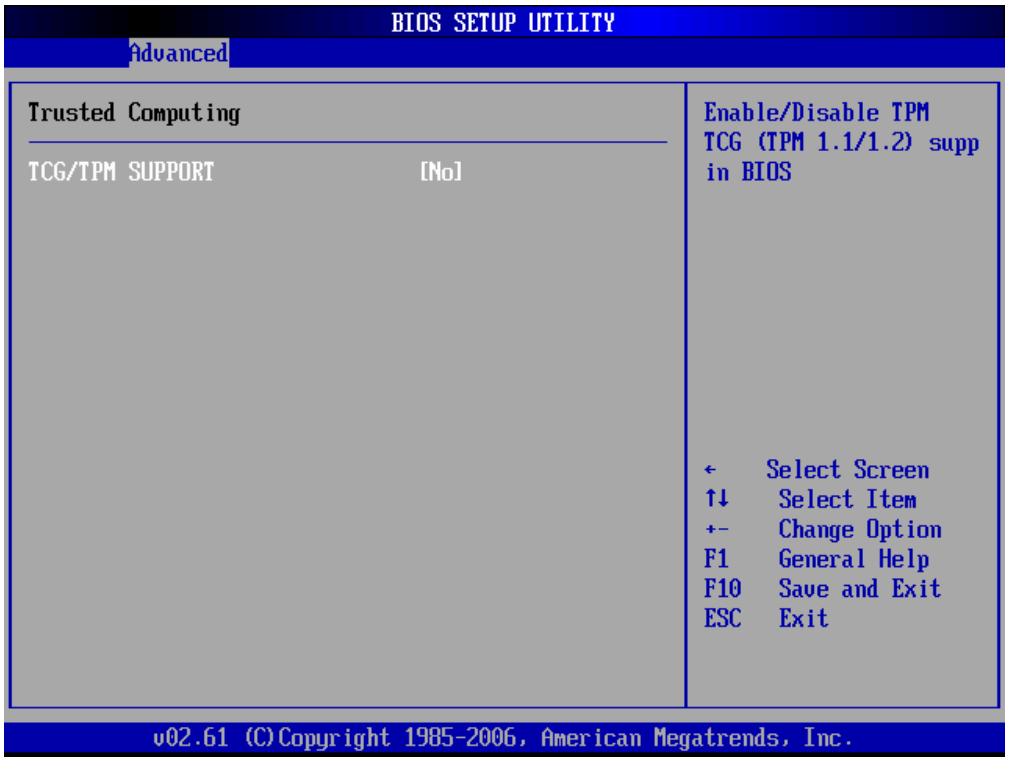
➔ **Terminal Type [ANSI]**

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

➔	**ANSI**	**DEFAULT**	The target terminal type is ANSI
➔	**VT100**		The target terminal type is VT100
➔	**VT-UTF8**		The target terminal type is VT-UTF8

6.3.9 Trusted Computing

Use the **Trusted Computing** menu (**BIOS Menu 13**) to configure settings related to the Trusted Computing Group (TCG) Trusted Platform Module (TPM).



BIOS Menu 13: Trusted Computing

➔ **TCG/TPM Support [No]**

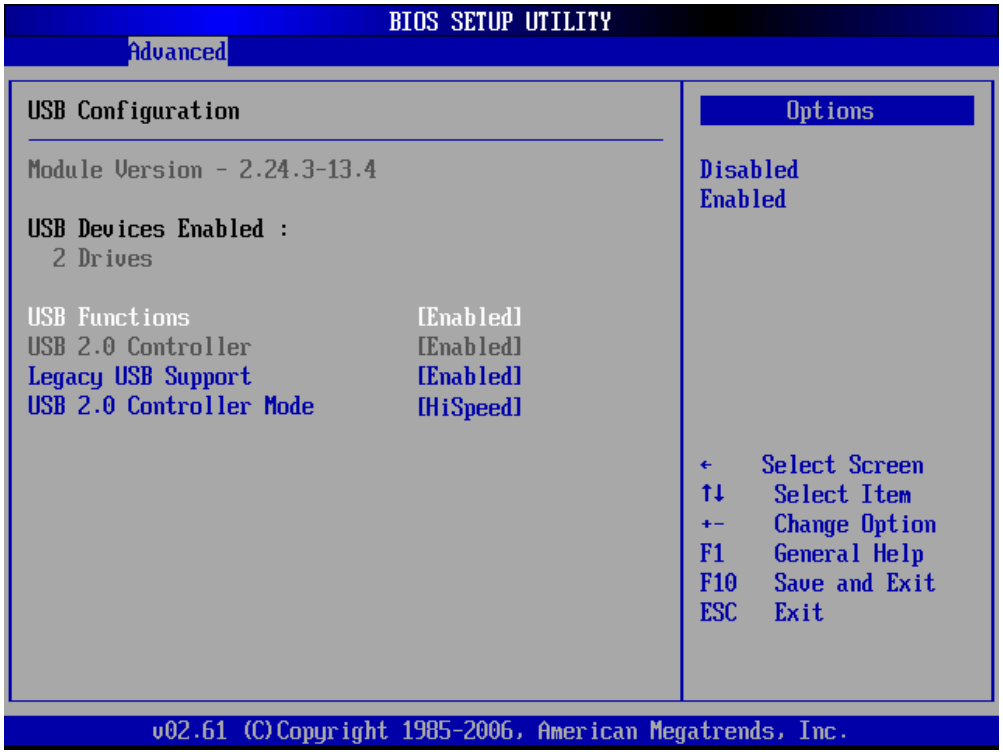
Use the **TCG/TPM Support** option to configure support for the TPM.

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

➔ **Yes** TPM support is enabled.

6.3.10 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 14**) to read USB configuration information and configure the USB settings.



BIOS Menu 14: USB Configuration

➔ **USB Configuration**

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

- Module Version: x.xxxxx.xxxxx

➔ **USB Devices Enabled**

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

➔ **USB Function [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

➔ **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

➔ **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

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

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

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

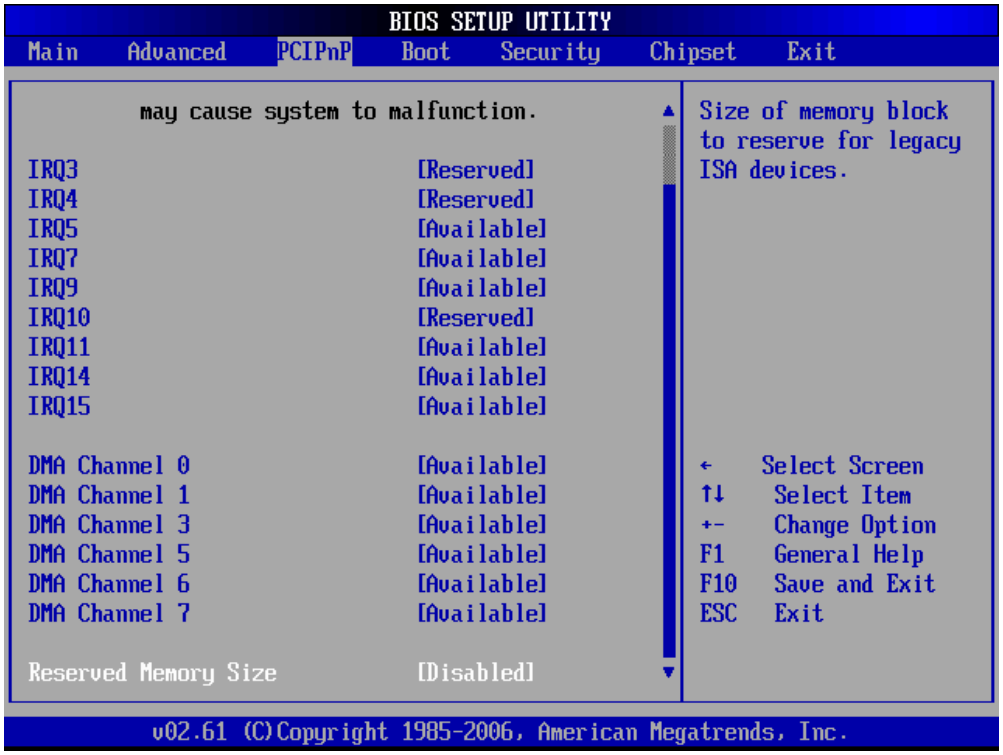
6.4 PCI/PnP

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

WARNING!

Setting wrong values for the BIOS selections in the PCIPnP BIOS menu

may cause the system to malfunction.



BIOS Menu 15: PCI/PnP Configuration

➔ **IRQ# [Available]**

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

Available	**DEFAULT**	The specified IRQ is available to be used by PCI/PnP devices
Reserved		The specified IRQ is reserved for use by Legacy ISA devices

Available IRQ addresses are:

- IRQ3
- IRQ4
- IRQ5

- IRQ7
- IRQ9
- IRQ10
- IRQ 11
- IRQ 14
- IRQ 15

➔ **DMA Channel# [Available]**

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

➔ **Available**	**DEFAULT**	The specified DMA is available to be used by PCI/PnP devices
➔ **Reserved**		The specified DMA is reserved for use by Legacy ISA devices

Available DMA Channels are:

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

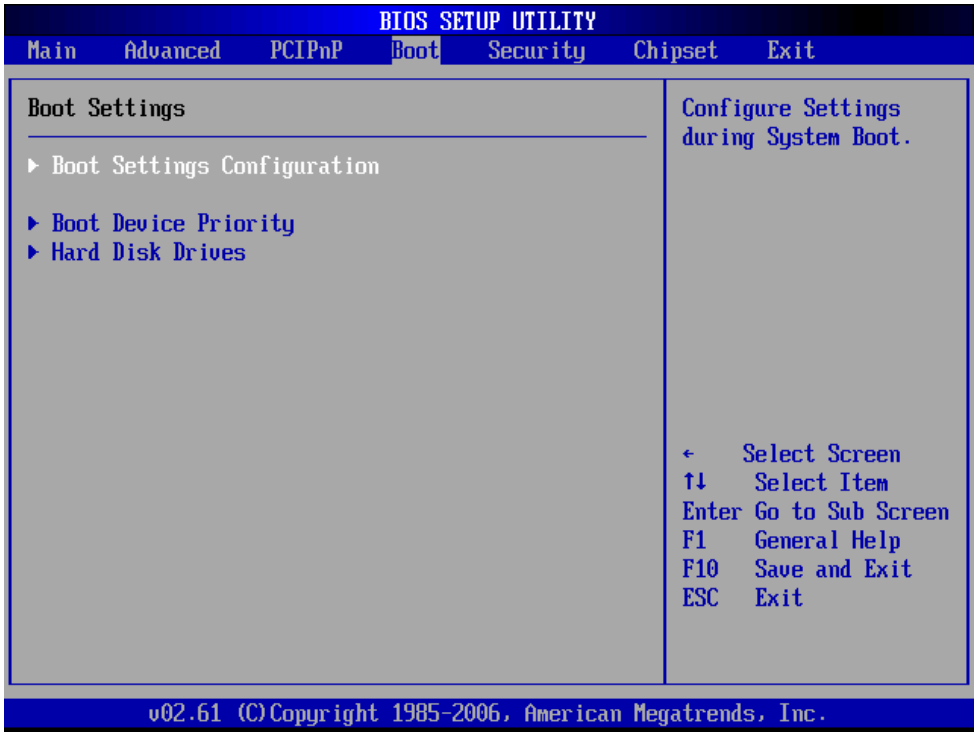
➔ **Reserved Memory Size [Disabled]**

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

➔ **Disabled**	**DEFAULT**	No memory block reserved for legacy ISA devices
➔ **16K**		16KB reserved for legacy ISA devices
➔ **32K**		32KB reserved for legacy ISA devices
➔ **64K**		54KB reserved for legacy ISA devices

6.5 Boot

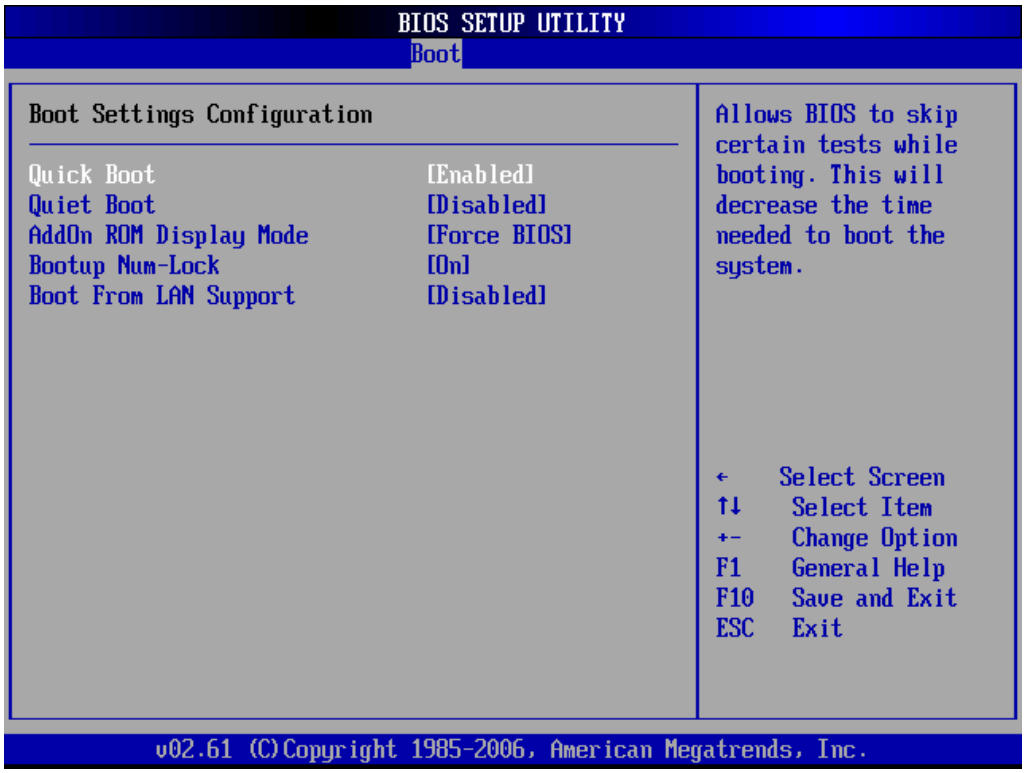
Use the **Boot** menu (**BIOS Menu 16**) to configure system boot options.



BIOS Menu 16: Boot

6.5.1 Boot Settings Configuration

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



BIOS Menu 17: Boot Settings Configuration

➔ **Quick Boot [Enabled]**

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

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

➔ **Quiet Boot [Disabled]**

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

➔ **Disabled**	**DEFAULT**	Normal POST messages displayed
➔ **Enabled**		OEM Logo displayed instead of POST messages

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

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

➔ **Force BIOS**	**DEFAULT**	The system forces third party BIOS to display during system boot.
➔ **Keep Current**		The system displays normal information during system boot.

➔ **Bootup Num-Lock [On]**

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

➔ **Off**		Does not enable the keyboard Number Lock automatically. To use the 10-keys on the keyboard, press the Number Lock key located on the upper left-hand corner of the 10-key pad. The Number Lock LED on the keyboard lights up when the Number Lock is engaged.
➔ **On**	**DEFAULT**	Allows the Number Lock on the keyboard to be enabled automatically when the computer system boots up. This allows the immediate use of the 10-key numeric keypad located on the right side of the keyboard. To confirm this, the Number Lock LED light on the keyboard is lit.

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

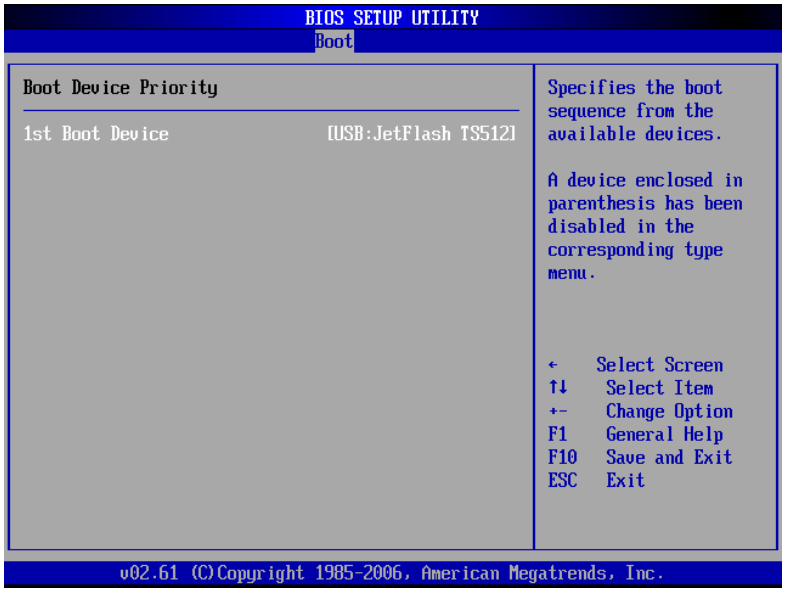
Use the **BOOT From LAN Support** option to enable the LAN controller to boot the system.

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

6.5.2 Boot Device Priority

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

- 1st FLOPPY DRIVE
- HDD
- CD/DVD



BIOS Menu 18: Boot Device Priority Settings

6.5.3 Removable Drives

Use the **Removable Drives** menu 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 [1st FLOPPY DRIVE]
- 2nd Drive [2nd FLOPPY DRIVE]

NOTE:

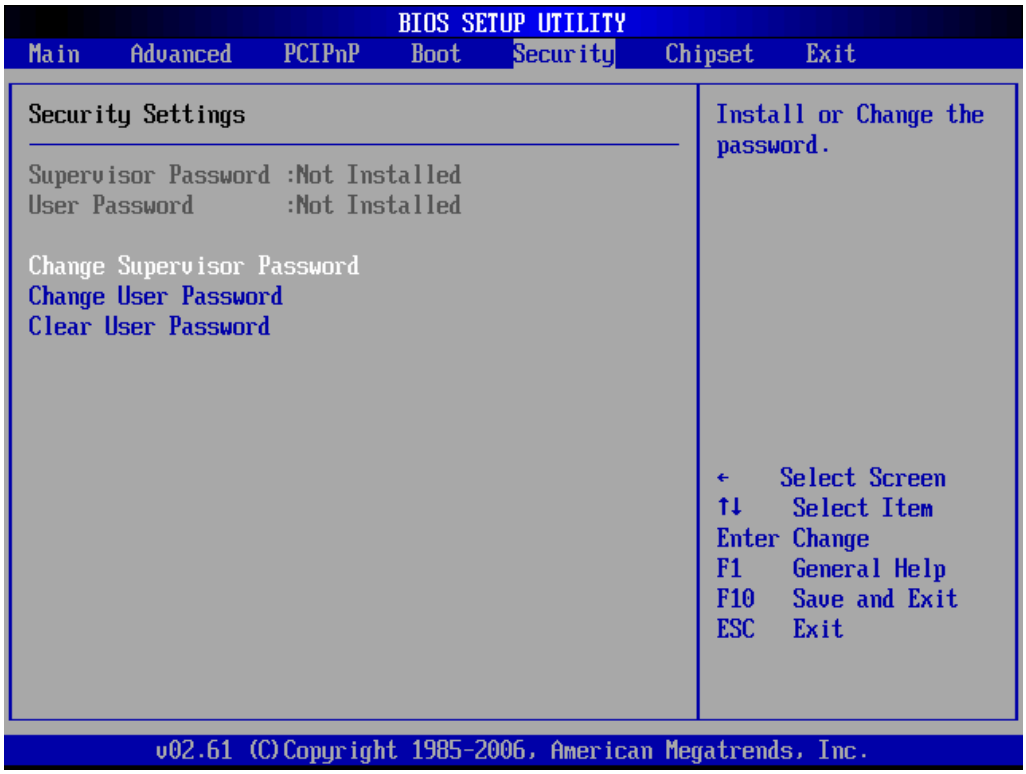
Only the drives connected to the system are shown. For example, if only

one FDD is connected only "**1st Drive**" is listed.

The boot sequence from the available devices is selected. If the "**1st Drive**" option is selected a list of available FDDs is shown. Select the first FDD the system boots from. If the "**1st Drive**" is not used for booting this option may be disabled.

6.6 Security

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



BIOS Menu 19: Security

➔ **Change Supervisor Password**

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

➔ **Change User Password**

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

➔ **Clear User Password**

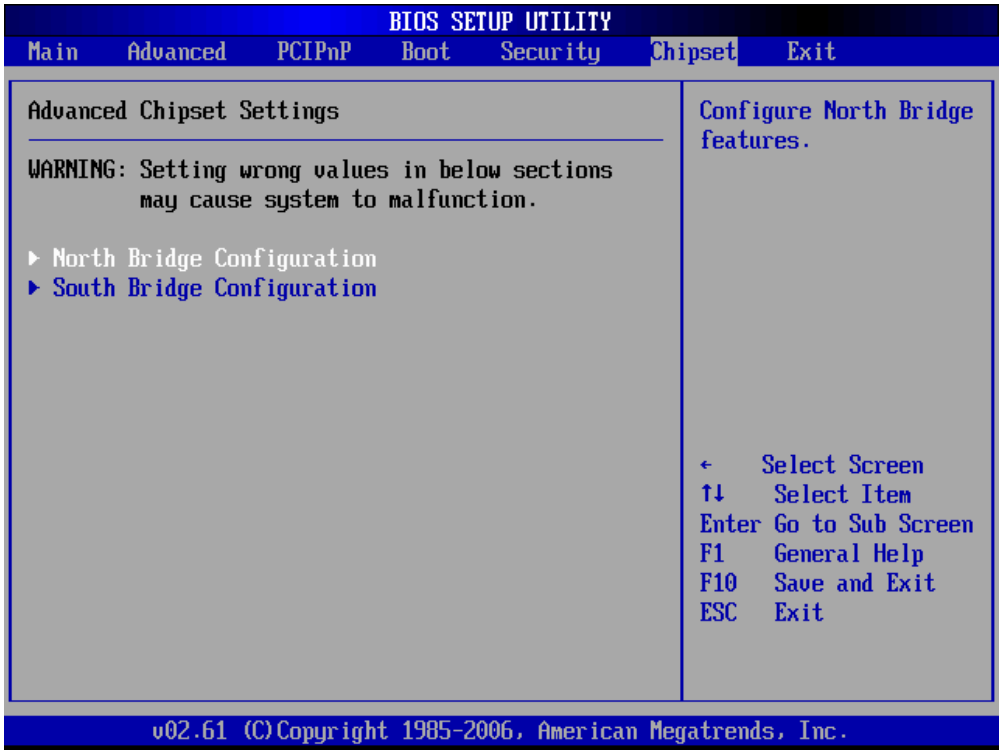
Use the **Clear User Password** to clear a user's password. The default for this option is **Not Installed**. If a user password must be cleared, use this option.

6.7 Chipset

Use the **Chipset** menu (**BIOS Menu 20**) to access the Northbridge and Southbridge configuration menus

WARNING!

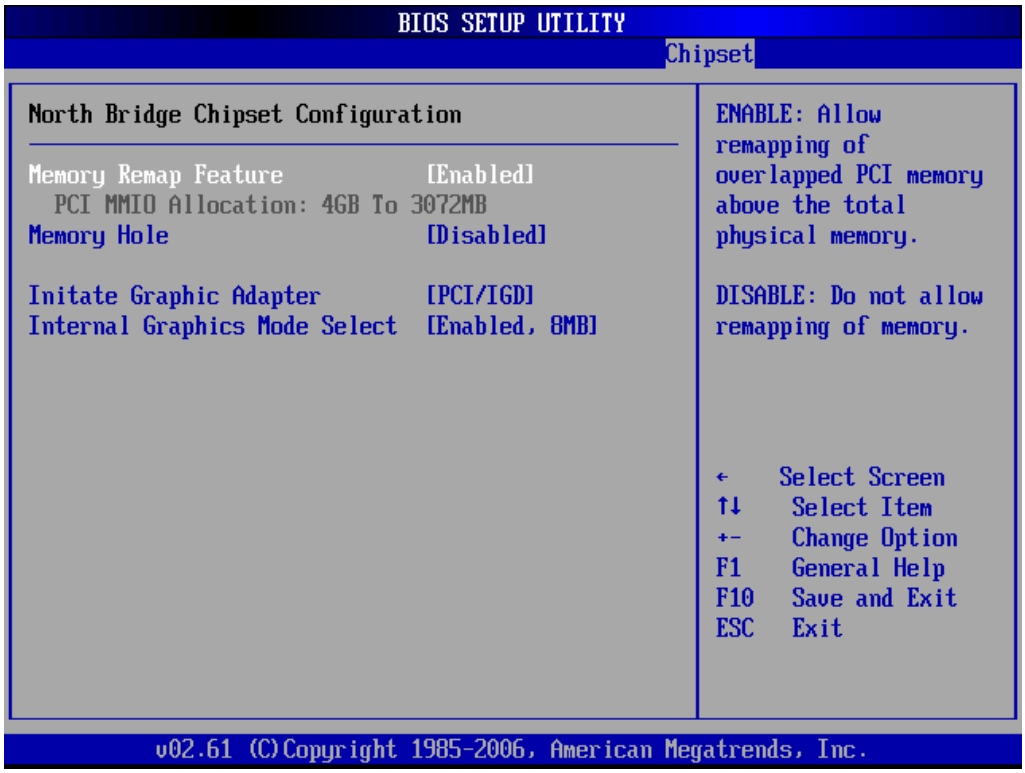
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



BIOS Menu 20: Chipset

6.7.1 NorthBridge Configuration

Use the **Northbridge Chipset Configuration** menu (**BIOS Menu 21**) to configure the Northbridge chipset.



BIOS Menu 21: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.

➔ **Enabled** **DEFAULT** Overlapped PCI memory can be remapped

➔ **Disabled** Overlapped PCI memory cannor be remapped

➔ **Memory Hole [Disabled]**

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

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

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

ISA expansion cards

➔ **Initiate Graphic Adapter [PCI/IGD]**

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
- PCI/IGD **DEFAULT**

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

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

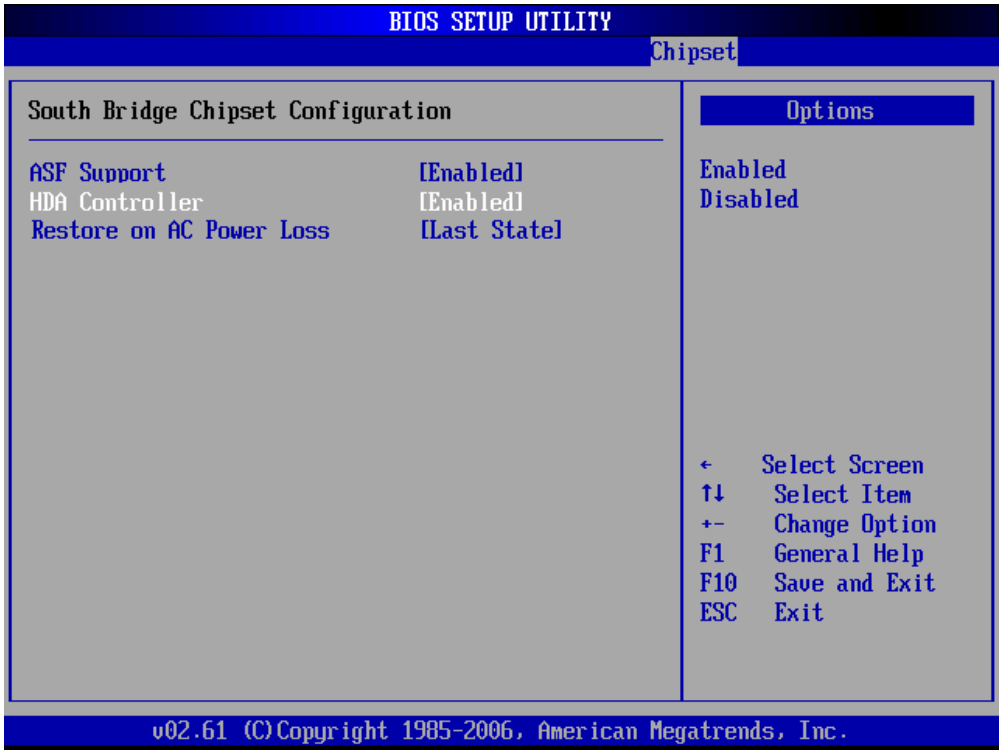
➔ **Disable**

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

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

6.7.2 Southbridge Configuration

The **Southbridge Configuration** menu (**BIOS Menu 22**) the Southbridge chipset to be configured.



BIOS Menu 22:Southbridge Chipset Configuration

➔ **ASF Support [Enabled]**

Use the **ASF Support** BIOS option to control the system's ability to connect to a remote management server.

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

➔ **HDA Controller [Disabled]**

Use the **HDA Controller** option to enable or disable the High Definition audio codec.

➔ **Disabled** **DEFAULT** The onboard High Definition audio codec is disabled

➔ **Enabled** The onboard High Definition audio codec automatically detected and enabled

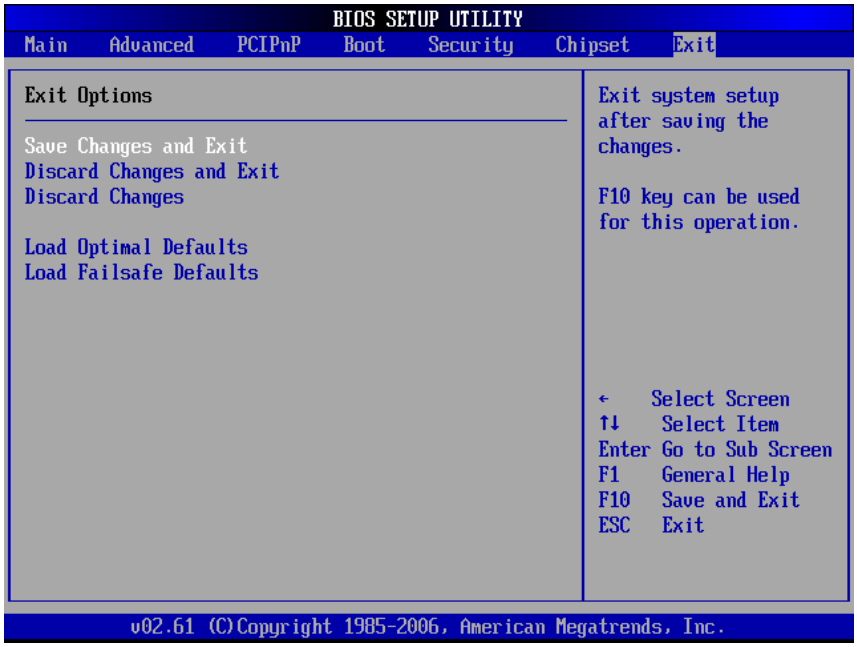
➔ **Restore on AC Power Loss [Last State]**

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.

6.8 Exit

Use the **Exit** menu (**BIOS Menu 23**) to load default BIOS values, optimal failsafe values and to save configuration changes.



BIOS Menu 23:Exit

➔ **Save Changes and Exit**

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

➔ **Discard Changes and Exit**

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

➔ **Discard Changes**

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

➔ **Load Optimal Defaults**

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

➔ **Load Failsafe Defaults**

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

Chapter

7

Software Drivers

7.1 Available Software Drivers

NOTE:

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

The following drivers can be installed on the system:

- Intel® chipset driver
- LAN driver
- Audio driver

Installation instructions are given below.

7.2 Driver CD Auto-run

All the drivers for the WSB-Q354 are on the CD that came with the system. To install the drivers, please follow the steps below.

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

NOTE:

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

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

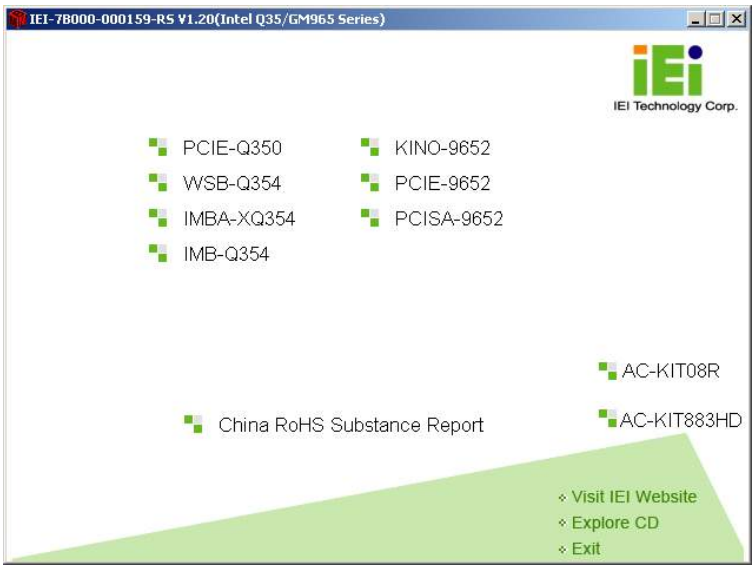


Figure 7-1: Introduction Screen

Step 3: Click WSB-Q354.

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



Figure 7-2: Available Drivers

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

7.3 Intel® Chipset Driver

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

Step 1: Select WSB-Q354 from the list in Figure 7-1.

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

Step 3: The window shown in **Figure 7-3** appears.

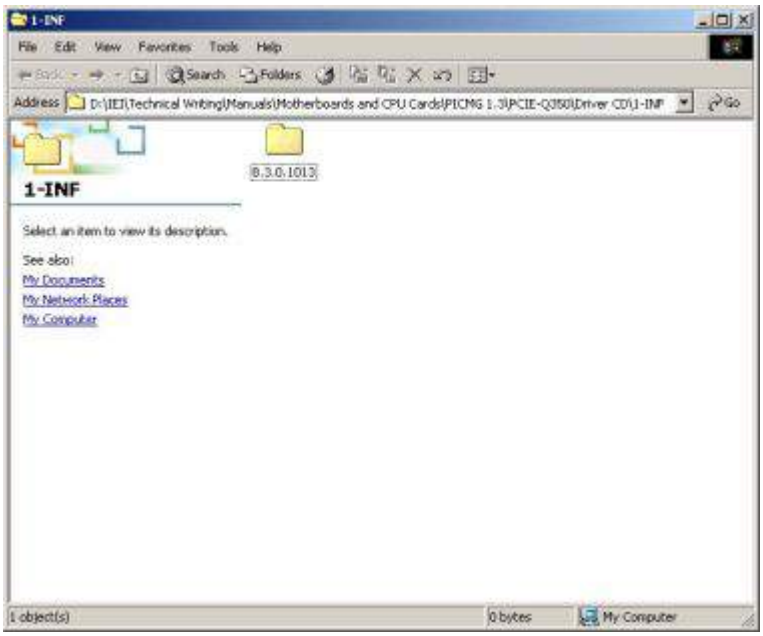


Figure 7-3: Intel® Chipset Driver Directory

Step 4: Click on the directory icon in **Figure 7-3**.

Step 5: The window in **Figure 7-4** appears.

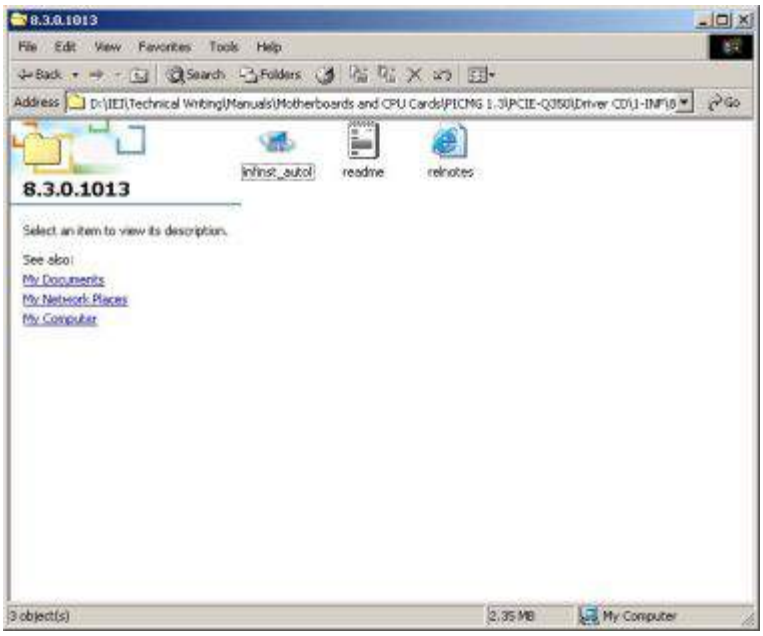


Figure 7-4: Intel® Chipset Driver Setup Icon

Step 6: Click on the **infinst_autol** setup icon in **Figure 7-4**.

Step 7: The **Intel® Package Manager** begins to extract the installation files. See **Figure 7-5**.



Figure 7-5: Intel® Package Manager

Step 8: The **Intel® Setup Welcome** screen. See **Figure 7-6**.



Figure 7-6: Intel® Setup Welcome Screen

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

Step 10: The Intel® license agreement in appears.



Figure 7-7: Intel® Chipset Driver License Agreement

Step 11: Accept the terms and conditions by clicking **YES**.

Step 12: The **Readme** file in **Figure 7-8** appears.



Figure 7-8: Readme File

Step 13: Click **NEXT** to continue.

Step 14: The driver is then installed.

Step 15: When the installation process is complete, the Setup Complete screen appears. See **Figure 7-9**.



Figure 7-9: Intel® Chipset Driver Complete Installation Screen

Step 16: To complete the chipset driver installation, click **FINISH**.

7.4 Intel® Graphics Media Accelerator Driver

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

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

Step 2: A new window opens. See **Figure 7-10**.

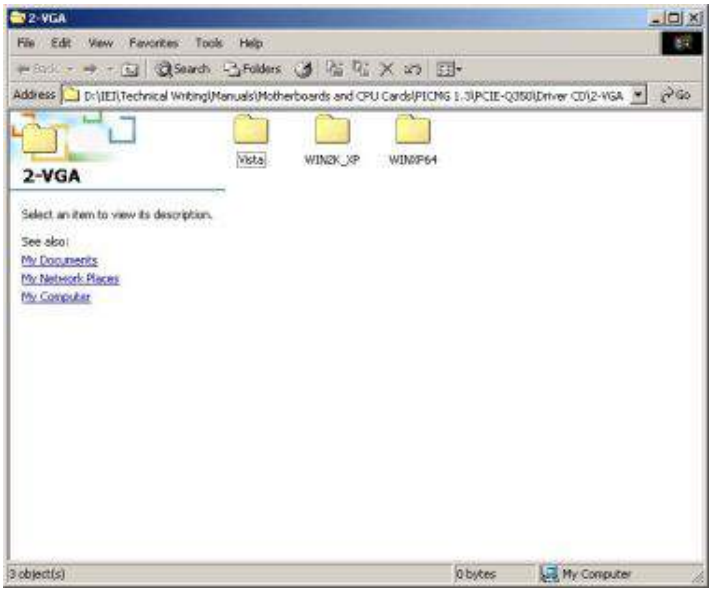


Figure 7-10: Select the Operating System

Step 3: Select the operating system from those shown in **Figure 7-10**.

Step 4: A new window appears. See **Figure 7-11**.

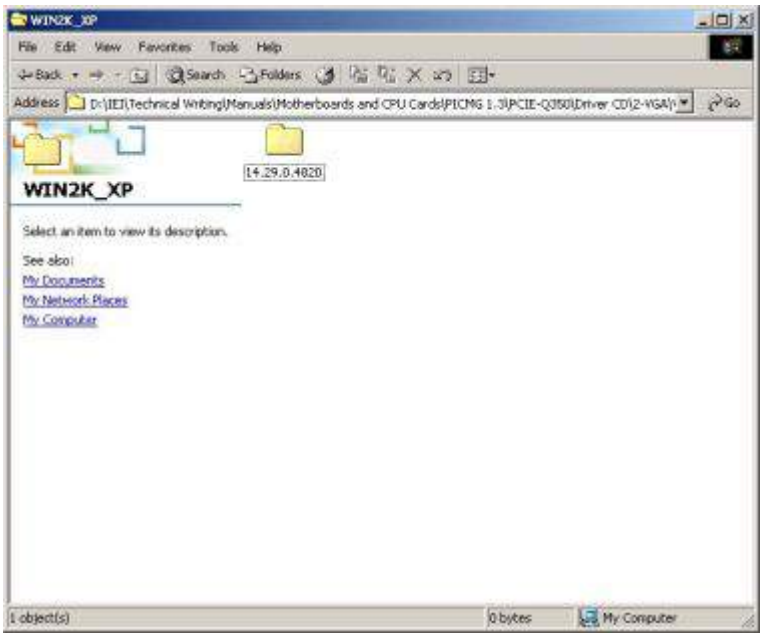


Figure 7-11: Intel® Driver Directory

Step 5: Click the directory icon in **Figure 7-11**.

Step 6: A new window appears. See **Figure 7-12**.

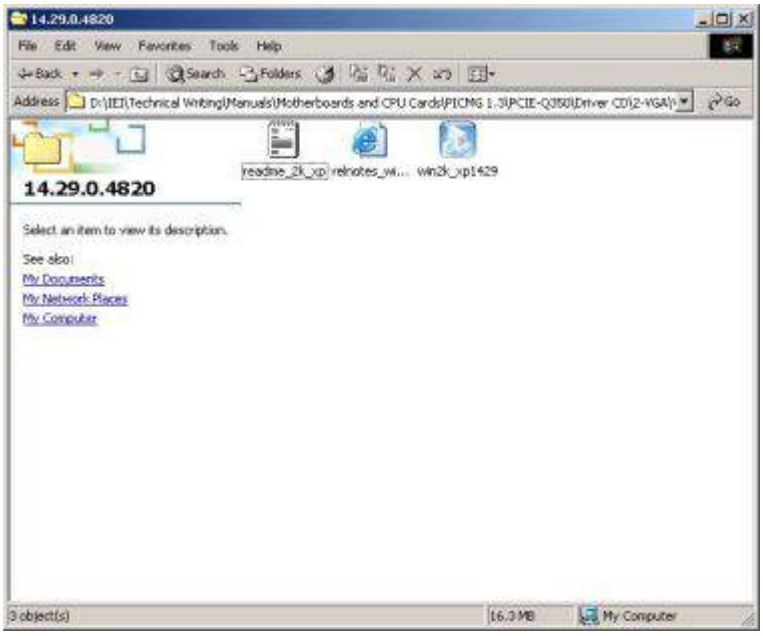


Figure 7-12: Intel® VGA Driver Setup Icon

Step 7: Click on the VGA driver installation icon in See **Figure 7-12**.

Step 8: The Readme information file shown in **Figure 7-13** appears.

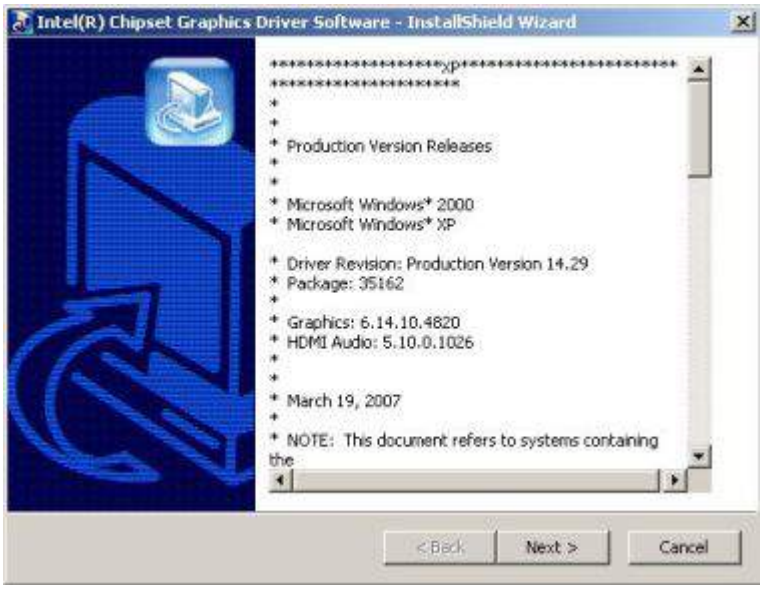


Figure 7-13: GMA Driver Readme File

Step 9: Click **NEXT** to extract the GMA driver files. See **Figure 7-14**.

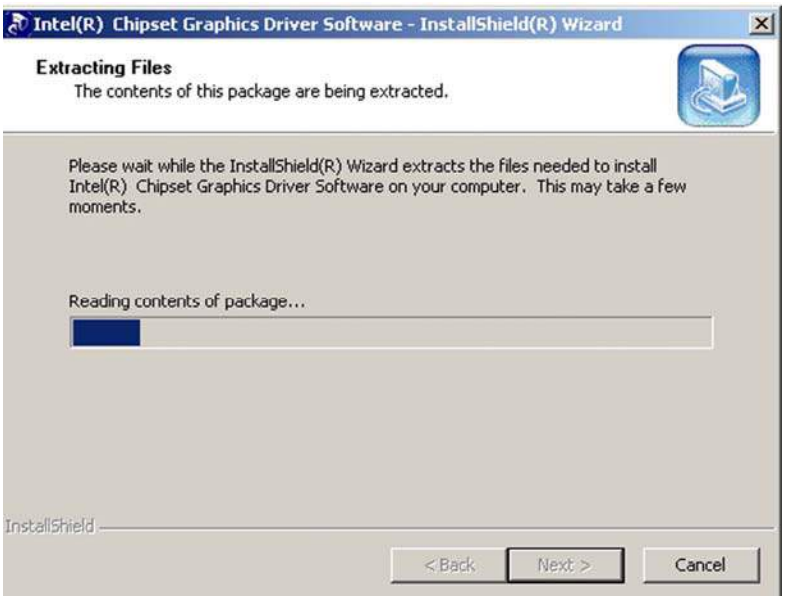


Figure 7-14: GMA Driver File Extraction

Step 10: The welcome screen shown in **Figure 7-15** appears.

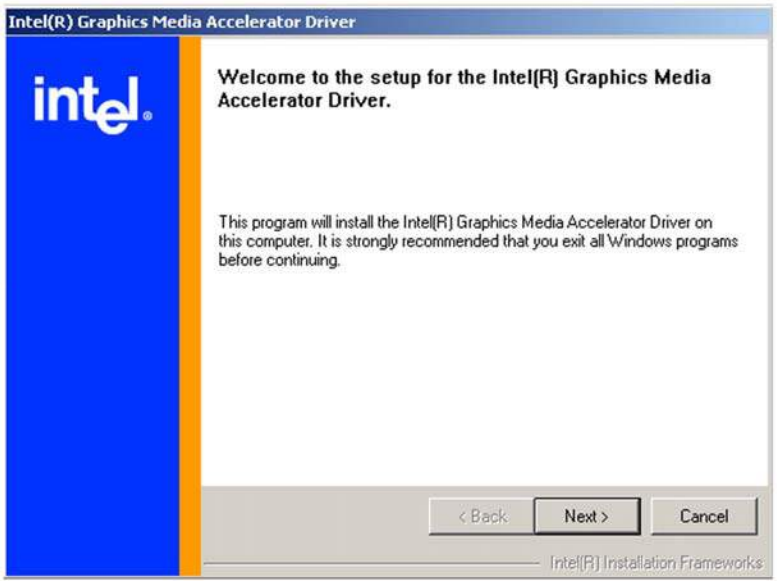


Figure 7-15: GMA Driver Installation Welcome Screen

Step 11: To continue the installation process, click **NEXT**.

Step 12: The license agreement in **Figure 7-16** appears.

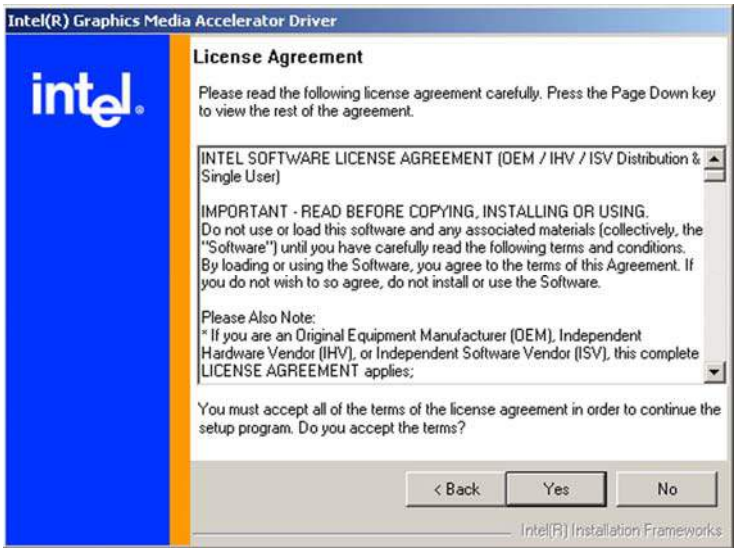


Figure 7-16: GMA Driver License Agreement

Step 13: Click the **YES** in **Figure 7-16** to continue.

Step 14: The installation notice shown in **Figure 7-17** appears.



Figure 7-17: GMA Driver Installing Notice

Step 15: A confirmation screen shown in **Figure 7-18** appears.

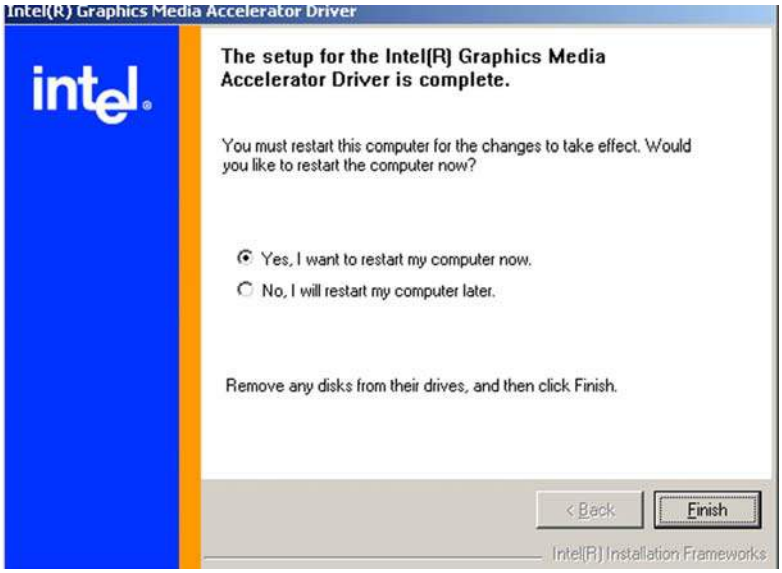


Figure 7-18: GMA Driver Installation Complete

Step 16: After selecting when to restart the computer in **Figure 7-18**, click **FINISH**.

7.5 Realtek LAN Driver (for GbE LAN) Installation

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

Step 1: Open Windows Control Panel (Figure 7-19).

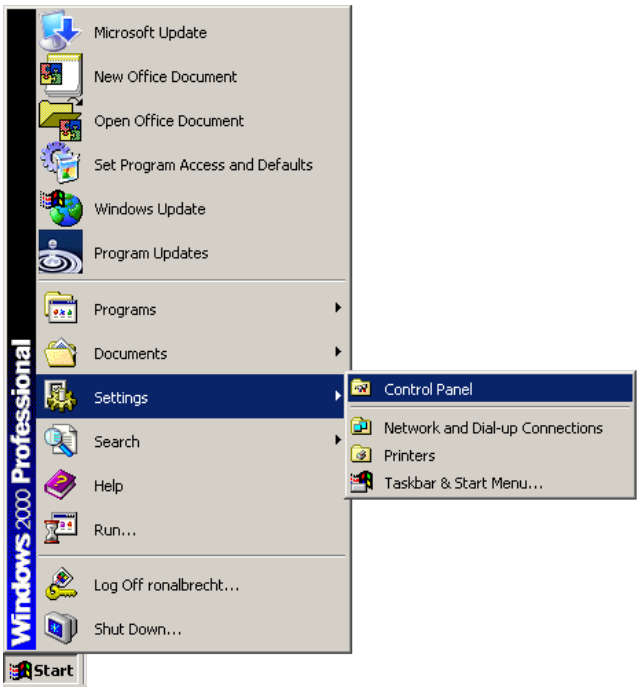


Figure 7-19: Windows Control Panel

Step 2: Double-click the **System** icon (**Figure 7-20**).

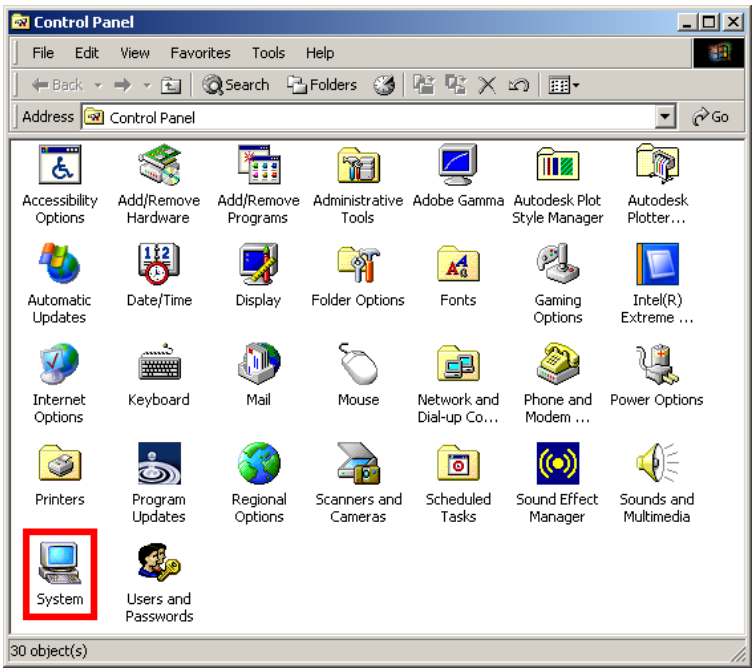


Figure 7-20: System Icon

Step 3: Click the **Device Manager** tab (Figure 7-21).

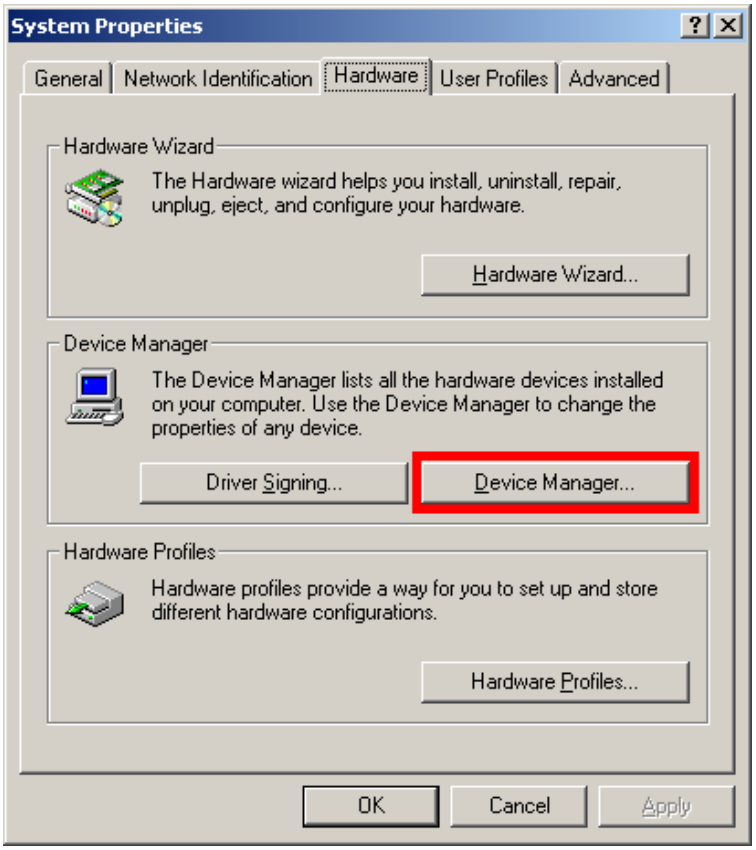


Figure 7-21: Device Manager Tab

Step 4: A list of system hardware devices appears (**Figure 7-22**).

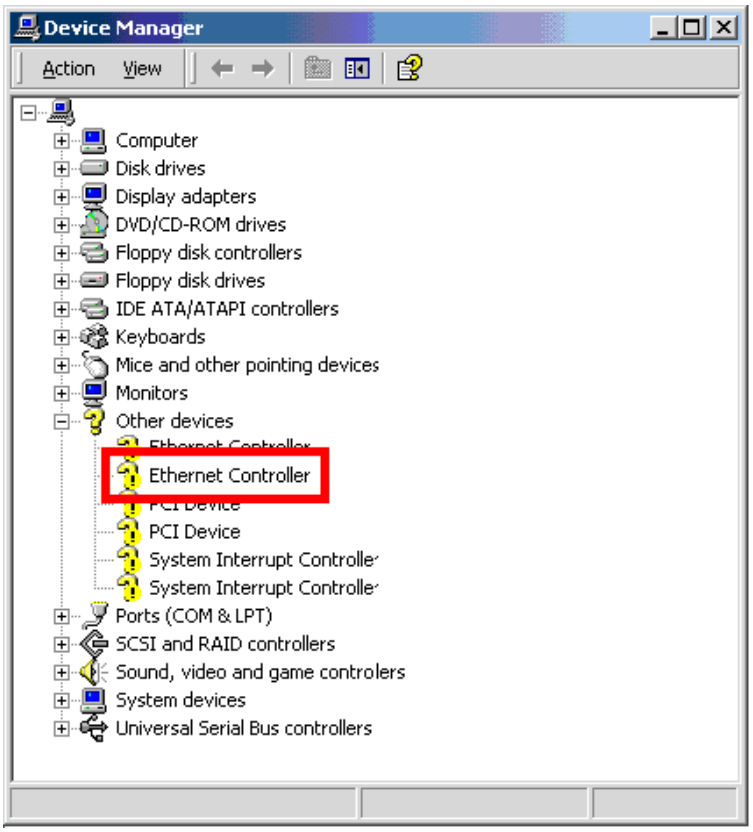


Figure 7-22: Device Manager List

Step 5: Double-click the listed device that has question marks next to it (this means Windows does not recognize the device).

Step 6: The **Device Driver Wizard** appears (**Figure 7-23**).

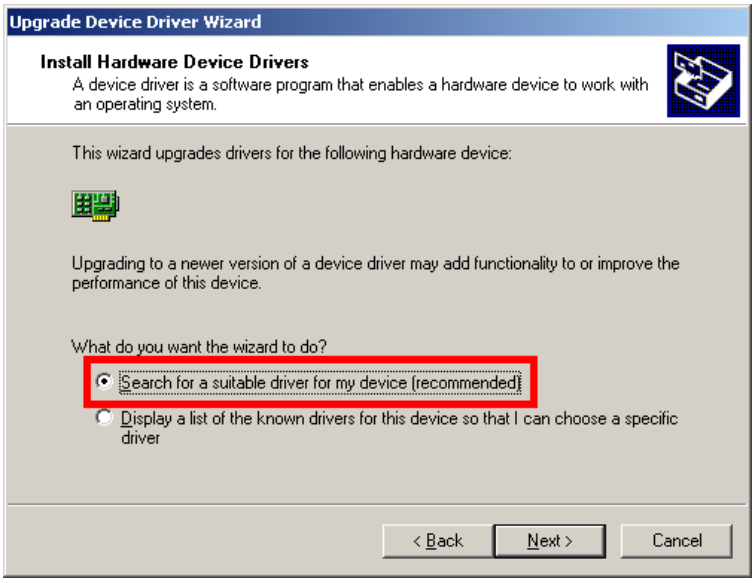


Figure 7-23: Search for Suitable Driver

Step 7: Select "**Search for a suitable driver for my device (recommended)**," and click **NEXT** to continue.

Step 8: Select "**Specify a Location**" in the **Locate Driver Files** window (**Figure 7-24**).

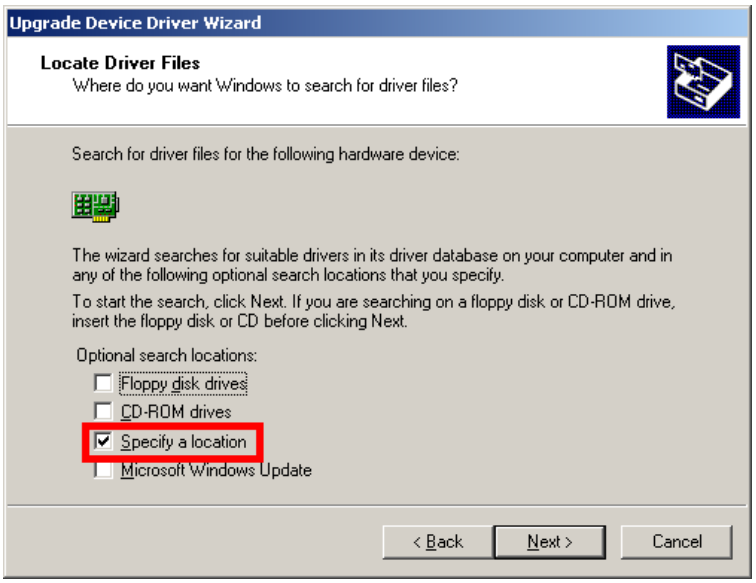


Figure 7-24: Locate Driver Files

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

Step 10: The **Locate File** window appears (**Figure 7-25**).

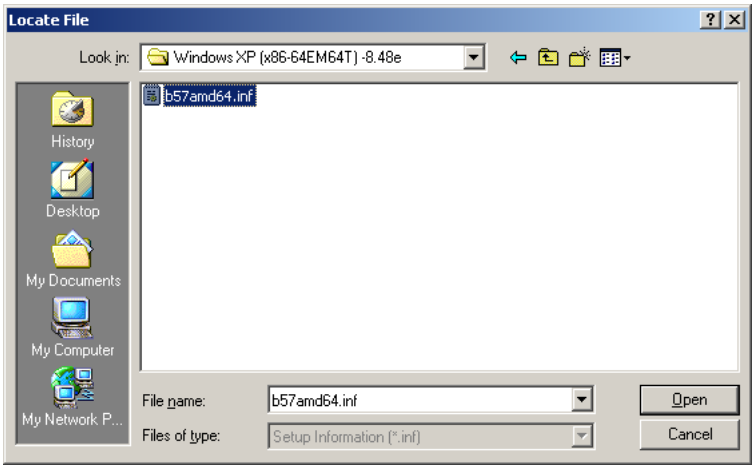


Figure 7-25: Location Browsing Window

Step 11: Select the proper OS folder under the "**X:\3-LAN\Realtek RTL8111E**" directory in the **Locate File** window, where "**X:\"** is the system CD drive.

Step 12: Click **OPEN** and the driver is installed.

7.6 Realtek HD Audio Driver (ALC888) Installation

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

NOTE:

This driver only needs to be installed if an external audio kit with a RealTek ALC888 codec is installed.

7.6.1 BIOS Setup

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

Step 2: Go to the Southbridge Configuration menu. Enable the High Definition Audio controller.

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

7.6.2 Driver Installation

To install the audio driver please follow the steps below.

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

Step 2: A new window opens (**Figure 7-26**).

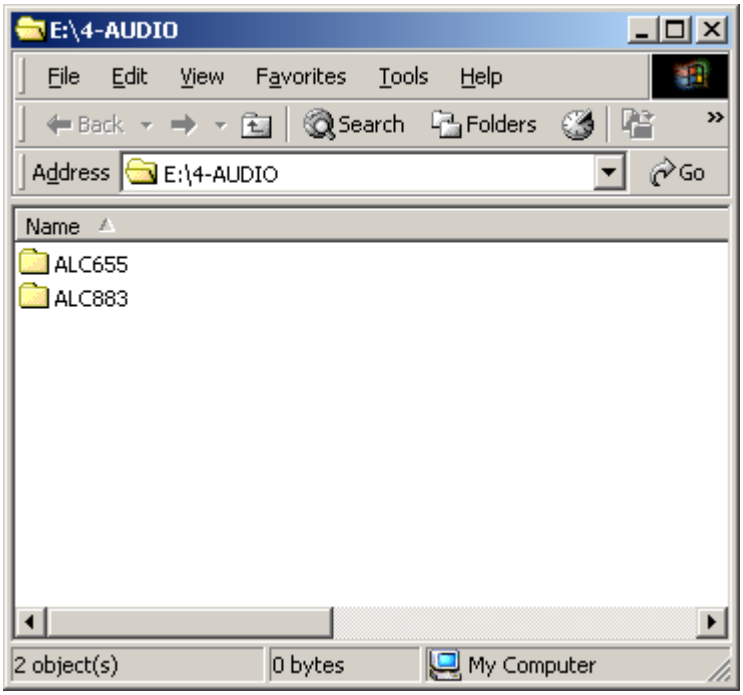


Figure 7-26: Select the Audio CODEC

Step 3: Double-click the ALC888 folder.

Step 4: Double-click the appropriate operating system folder (**Figure 7-27**).

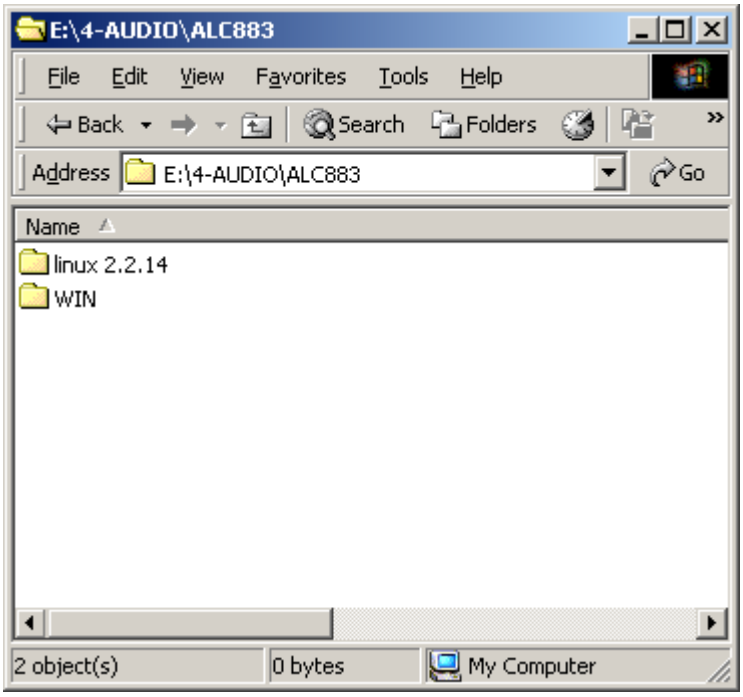


Figure 7-27: Select the OS

Step 5: Double-click the appropriate operating system version folder (**Figure 7-28**).

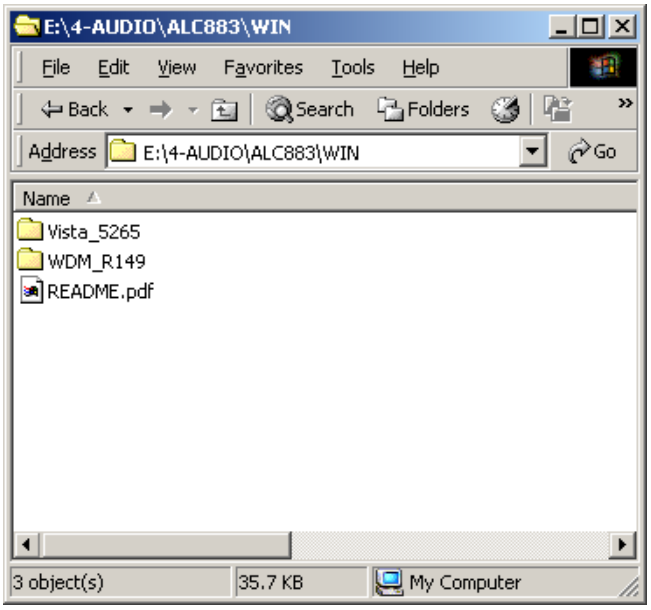


Figure 7-28: Select the OS Version

Step 6: Double-click the **Setup.exe** program icon in **Figure 7-29**.

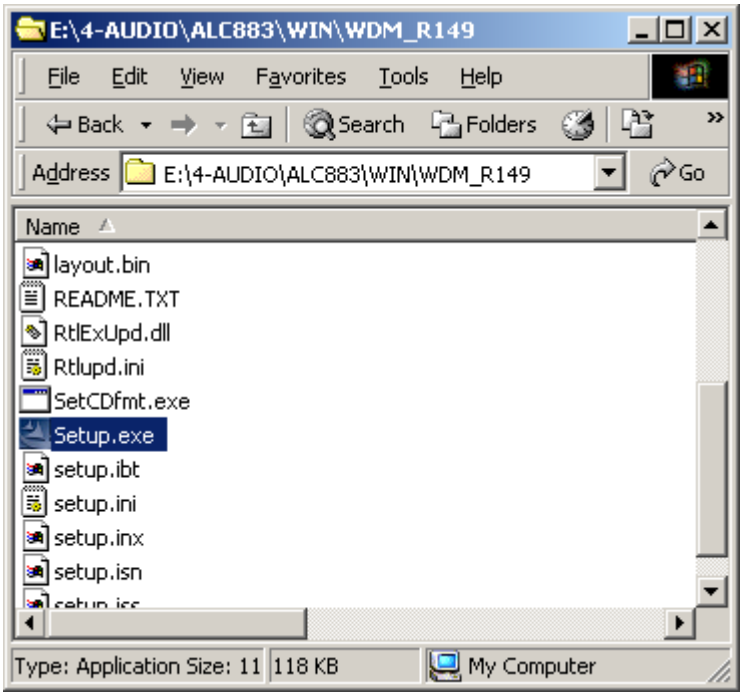


Figure 7-29: Locate the Setup Program Icon

Step 7: The **InstallShield Wizard** starts (**Figure 7-30**).

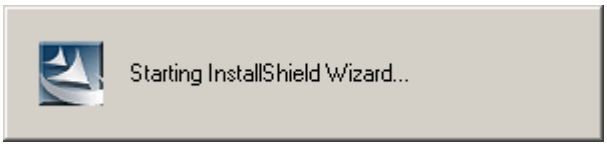


Figure 7-30: The InstallShield Wizard Starts

Step 8: The **InstallShield Wizard** is prepared to guide the user through the rest of the process (**Figure 7-31**).

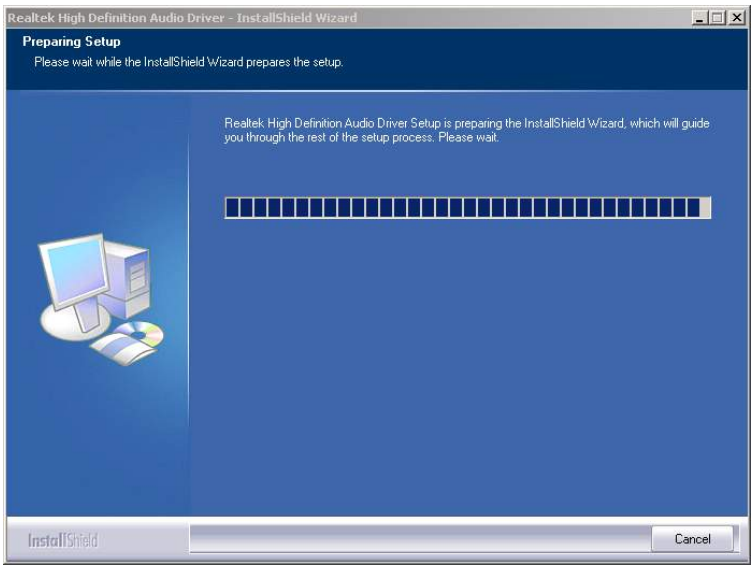


Figure 7-31: Preparing Setup Screen

Step 9: Once initialized, the **InstallShield Wizard** welcome screen appears (**Figure 7-32**).

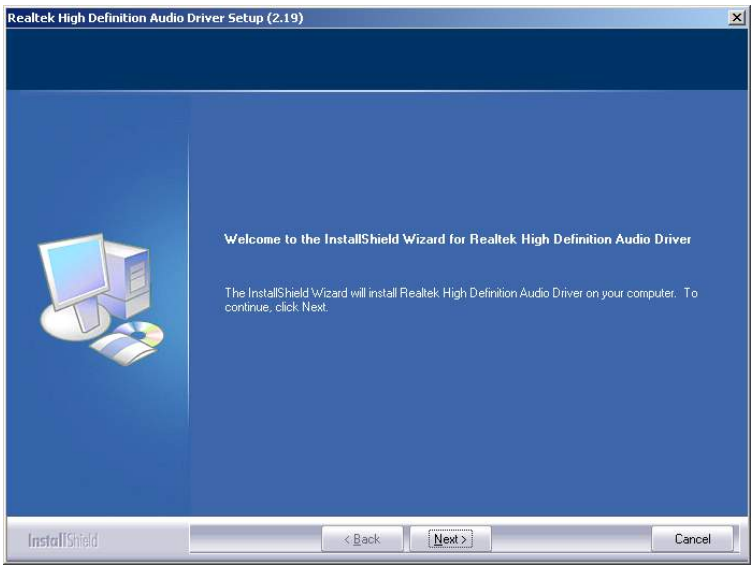


Figure 7-32: InstallShield Wizard Welcome Screen

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

Step 11: InstallShield starts to install the new software as shown in **Figure 7-33**.

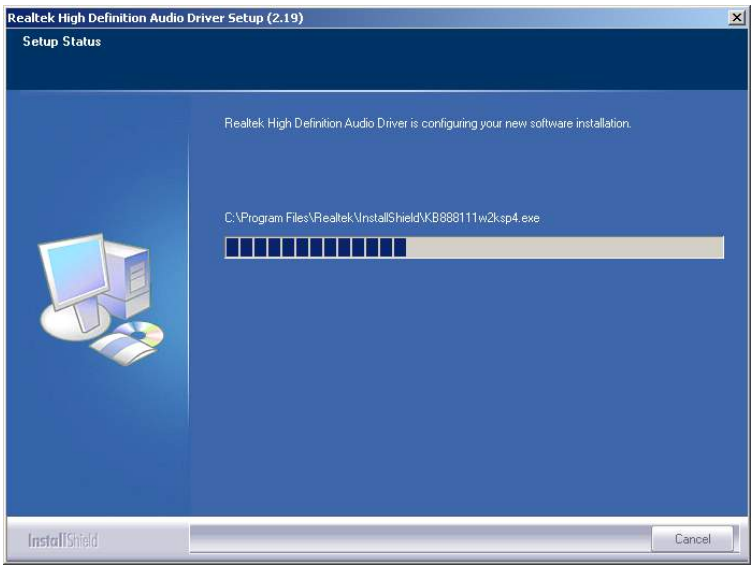


Figure 7-33: Audio Driver Software Configuration

Step 12: The Installation Wizard updates the system as shown in **Figure 7-34**.

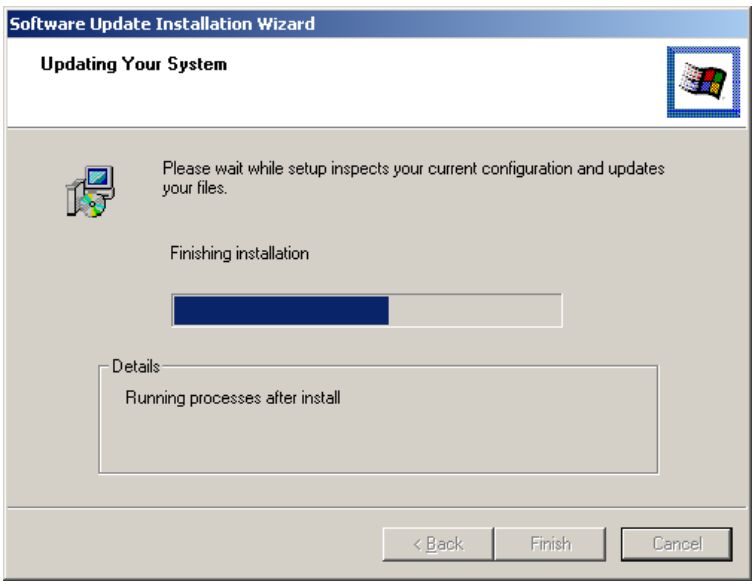


Figure 7-34: Installation Wizard Updates the System

Step 13: After the driver installation process is complete, a confirmation screen appears (**Figure 7-35**).

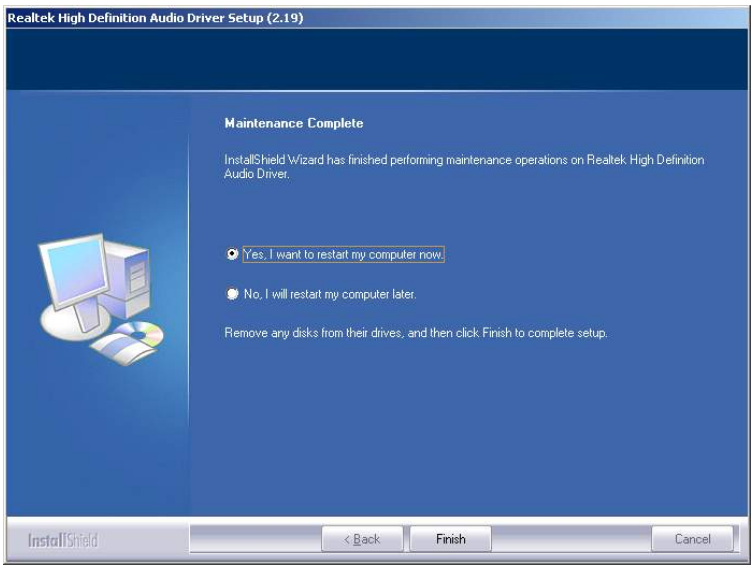


Figure 7-35: Restart the Computer

Step 14: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

7.7 Intel® Matrix Storage Manager Driver Installation

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

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

Step 2: A new window opens (**Figure 7-36**).

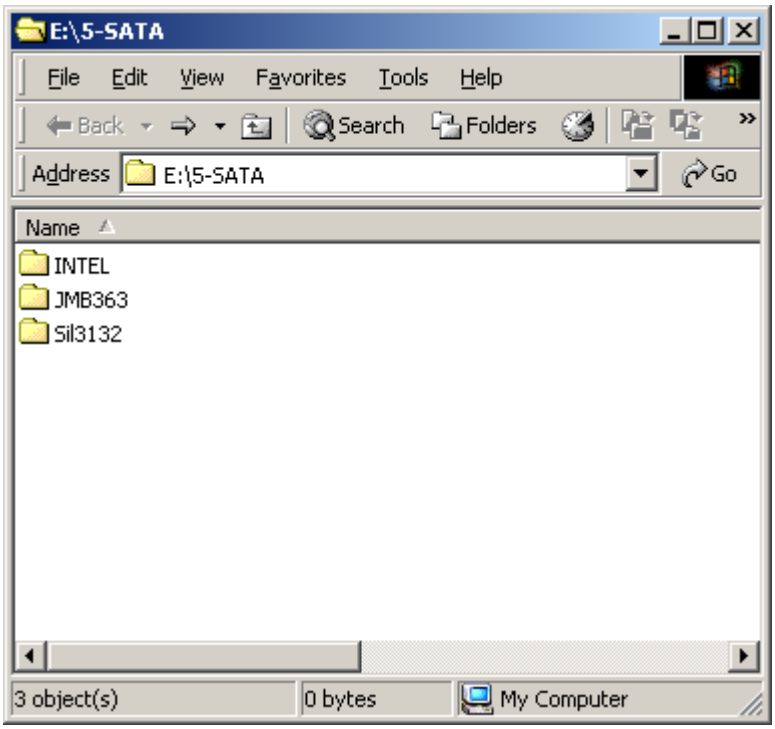


Figure 7-36: SATA RAID Driver Installation Program

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

Step 4: Double-click the **iata62_cd.exe** program icon in **Figure 7-37**.

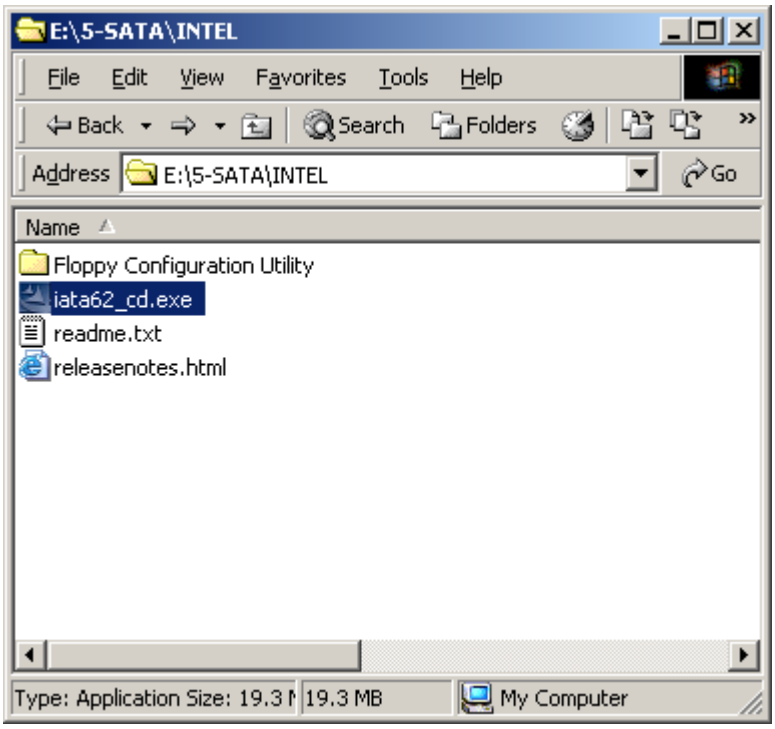


Figure 7-37: SATA RAID Setup Program Icon

Step 5: **Figure 7-38** shows the **InstallShield Wizard** preparing to guide the user through the rest of the process.

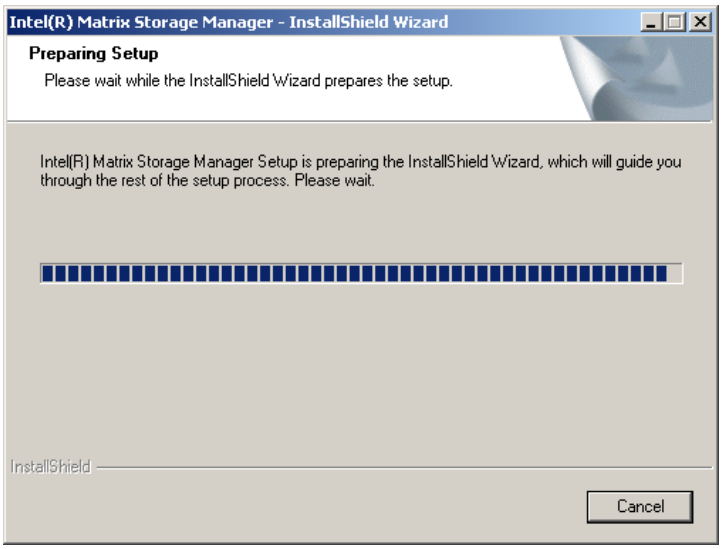


Figure 7-38: InstallShield Wizard Setup Screen

Step 6: **Figure 7-39** shows the **Matrix Storage Manager** software configuring the installation process.

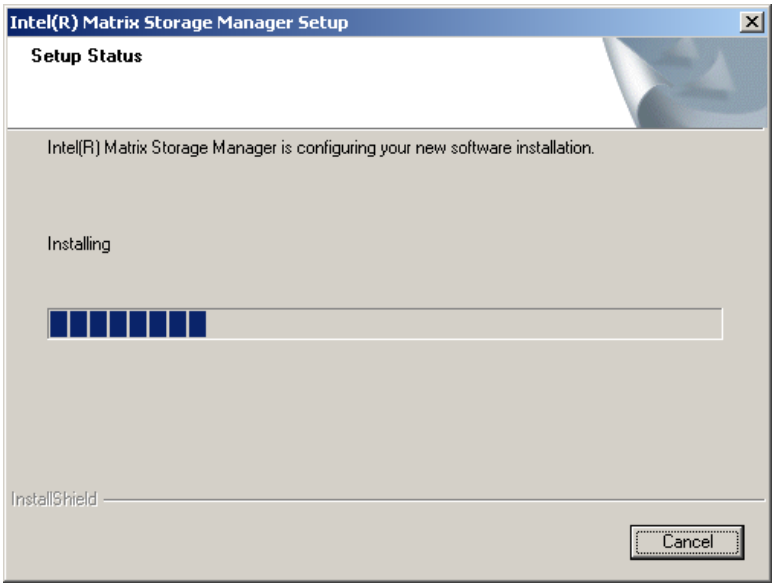


Figure 7-39: Matrix Storage Manager Setup Screen

Step 7: **Figure 7-40** shows the **Matrix Storage Manager** welcome screen.

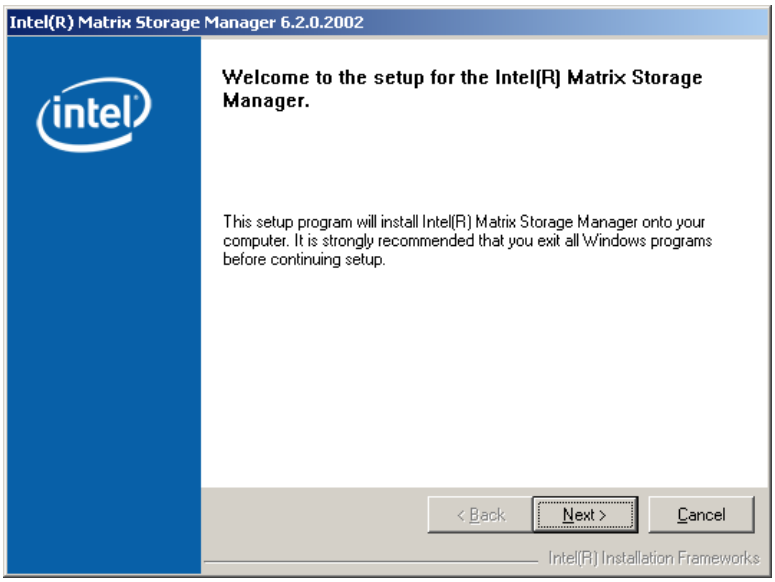


Figure 7-40: Matrix Storage Manager Welcome Screen

Step 8: Click **NEXT** and a warning appears (**Figure 7-41**). Read the warning carefully and decide whether or not to continue the installation process.

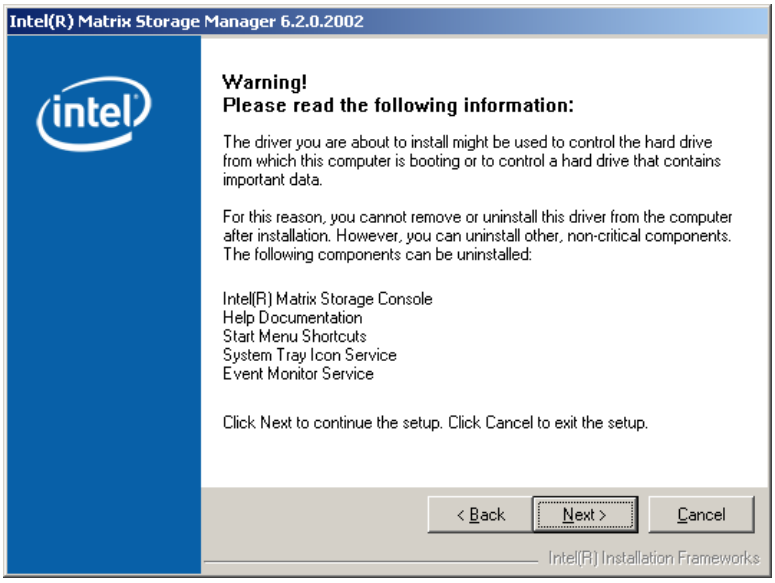


Figure 7-41: Matrix Storage Manager Warning Screen

Step 9: Click **NEXT** and a license agreement appears (**Figure 7-42**).

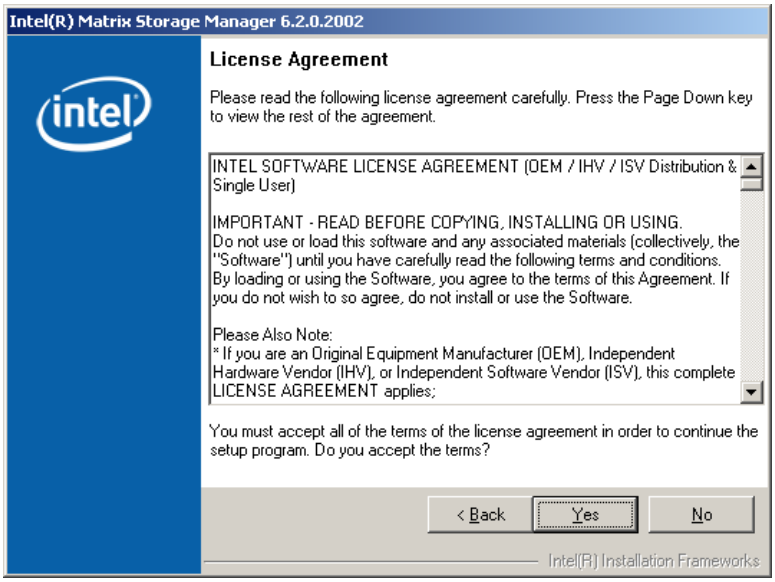


Figure 7-42: Matrix Storage Manager License Agreement

Step 10: Read the license agreement. To accept the terms and conditions stipulated in the license agreement shown, click **YES** and the Readme information file shown in **Figure 7-43** appears.

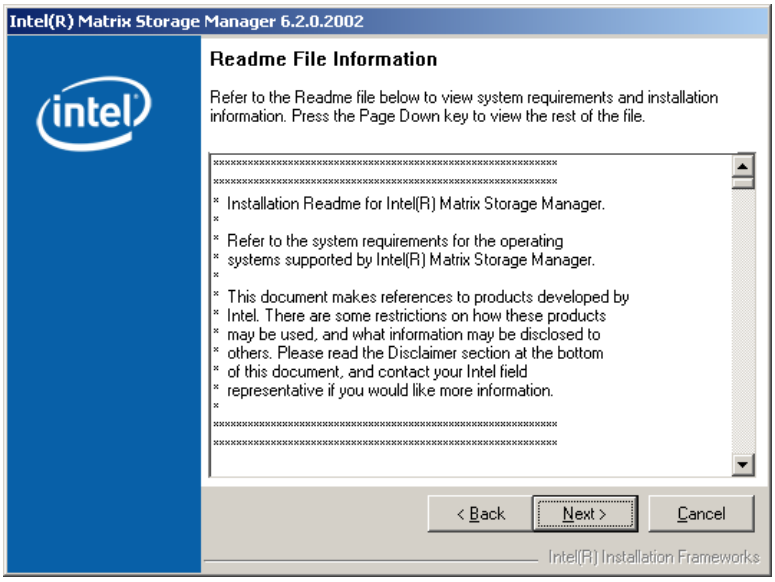


Figure 7-43: Matrix Storage Manager Readme File

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

Step 12: After the driver installation process is complete, a confirmation screen appears (**Figure 7-44**).

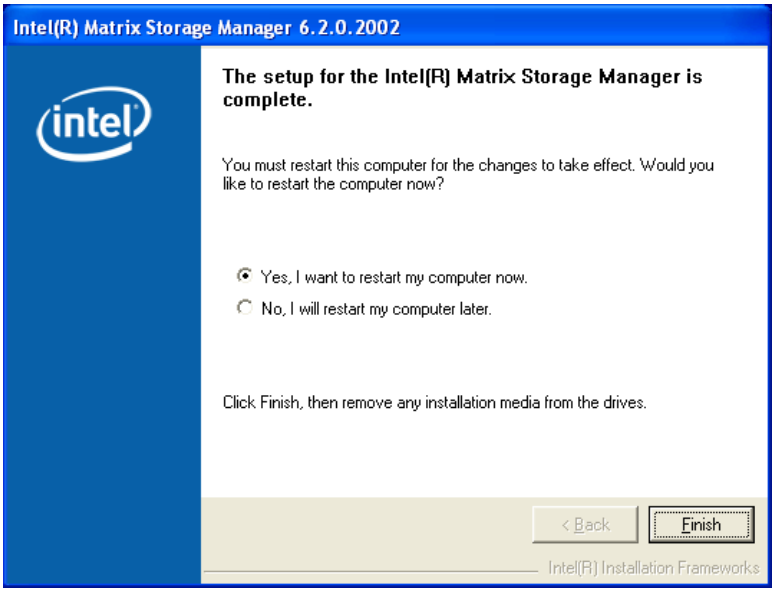


Figure 7-44: Matrix Storage Manager Setup Complete

Step 13: The confirmation screen offers the option of restarting the computer now or later. For the settings to take effect, the computer must be restarted. Click **FINISH** to restart the computer.

Appendix

A

BIOS Options

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Appendix

B

Terminology

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.
APM	The Advanced Power Management (APM) application program interface (API) enables the inclusion of power management in the BIOS.
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.
CMOS	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
COM	COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male DB-9 connector.
DAC	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
DDR	Double Data Rate refers to a data bus transferring data on both the rising

	and falling edges of the clock signal.
DMA	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
DIMM	Dual Inline Memory Modules are a type of RAM that offer a 64-bit data bus and have separate electrical contacts on each side of the module.
DIO	The digital inputs and digital outputs are general control signals that control the on/off circuit of external devices or TTL devices. Data can be read or written to the selected address to enable the DIO functions.
EHCI	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
EIDE	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
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 Gbps 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.
MAC	The Media Access Control (MAC) protocol enables several terminals or network nodes to communicate in a LAN, or other multipoint networks.
PCIe	PCI Express (PCIe) is a communications bus that uses dual data lines for full-duplex (two-way) serial (point-to-point) communications between the SBC components and/or expansion cards and the SBC chipsets. Each line has a 2.5 Gbps data transmission rate and a 250 MBps sustained data transfer rate.
POST	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
RAID	Redundant Array of Inexpensive Disks (RAID) refers to redundantly backing up data on multiple disks to ensure that if one disk fails, the data is not lost and can be restored from the remaining disks in the array.
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 Gbps and the SATA 3Gb/s bus has data transfer speeds of up to 3.0 Gbps.
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 12Mbps data transfer rates, while USB 2.0 supports 480Mbps data transfer rates.
VGA	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

DIO Interface

C.1 DIO Interface Introduction

The DIO connector on the WSB-Q354 is interfaced to GPIO ports on the ITE IT8718F 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 ITE IT8718F Super I/O chipset.

C.2 DIO Connector Pinouts

The following table describes how the DIO connector pins are connected to the Super I/O GPIO port 1.

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

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 EMI or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

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

INT 15H:

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

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

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

NOTE:

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

Compatibility

NOTE:

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the WSB-Q354.

E.1 Compatible Operating Systems

The following operating systems have been successfully run on the WSB-Q354.

- Microsoft Windows XP (SP2)
- Microsoft Windows 2000 (SP4)
- Microsoft Windows Vista Business (32-bit English version)
- Microsoft Windows Vista Business (64-bit English version)
- Linux Mandriva 2008
- Linux Fedora Core 8

E.2 Compatible Processors

The following Intel® LGA775 processors have been successfully tested on the WSB-Q354.

CPU	Model Number	Frequency	FSB
45nm Intel® Core™ 2 Quad	Q9300	2.50 GHz	1333 MHz
45nm Intel® Core™ 2 Duo	E8500	3.16 GHz	1333 MHz
65nm Intel® Core™ 2 Duo	E6850	3.00 GHz	1333 MHz
65nm Intel® Core™ 2 Duo	E6700	2.66 GHz	1066 MHz
65nm Intel® Core™ 2 Duo	E6550	2.33 GHz	1333 MHz
65nm Intel® Core™ 2 Duo	E2180	2.00 GHz	800 MHz

E.3 Compatible Memory Modules

NOTE:

The memory modules listed below have been tested on the WSB-Q354 other memory modules that comply with the specifications may also work on the WSB-Q354 but have not been tested.

The following memory modules have been successfully tested on the WSB-Q354.

Manufacturer	Model No.	Capacity	Speed
ADATA	DDR2 667(5) 512MX8	512 MB	667 MHz
Apacer	AU512E800C5KBGC	512 MB	800 MHz
DSL	512MB DDRII 800MHz CL5	512 MB	800 MHz
Kingston	KVR800D2N5/512	512 MB	800 MHz
Kingbox	512MB 800MHz	512 MB	800 MHz
PK	512MB DDR2 800MHz	512 MB	800 MHz
Transcend	512MB DDR2 667	512 MB	667 MHz
Transcend	512MB DDR2 800	512 MB	800 MHz
Twinmos	8DP25JK5MTETP	512 MB	800 MHz
Unigen	512MB DDR2 667	512 MB	667 MHz
UMAX	DIMM, 512MB, DDRII800, 64X8	512 MB	800 MHz

Appendix

F

Intel® Matrix Storage Manager

F.1 Introduction

The Intel® ICH9R chipset 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.

F.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.

F.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

F.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 **SATA** support for all IDE devices. Refer to the applicable BIOS configuration section in this user manual.

Step 3: **Save and Exit BIOS**. After the **SATA** support option is enabled, save and exit the **BIOS**.

Step 4: **Reboot the system**. Reboot the system after saving and exiting the **BIOS**.

Step 5: **Press Ctrl+I**. During the system boot process, press **Ctrl+I** when prompted to enter the RAID configuration software.

Step 6: **Configure the RAID settings**. Use the Intel® Matrix Storage Manager to configure the RAID array. Brief descriptions of configuration options are given below.

Step 7: **Install the OS**. After the RAID array has been configured, install the OS. To do this, please refer to the documentation that came with the OS.

F.4 RAID Configuration

F.4.1 Creating a RAID Volume



WARNING!

All data previously stored on the member drives of a RAID configuration are destroyed during the RAID initialization process. If “used” drives are used to create a RAID array, make sure the data has been moved or backed up before creating a RAID array out of the disk drives.

Step 1: **Select** “**Create RAID Volume**”. Use the arrow keys to highlight **Create RAID Volume** and press **ENTER**. See **Figure F-1**.

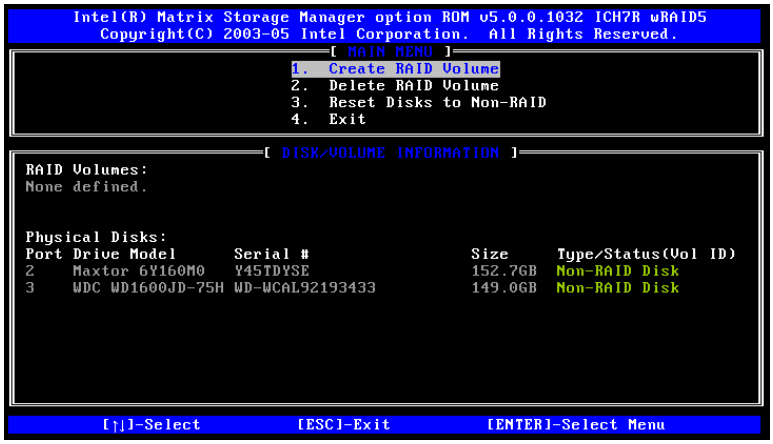


Figure F-1: Matrix Storage Manager Main Menu

Step 2: **Name the RAID volume**. Enter a name for the RAID volume, or press **ENTER** to accept the default volume name. Upper and lower case alphabetic, numeric, space, and underscore characters are all applicable for naming an array. See **Figure F-2**.

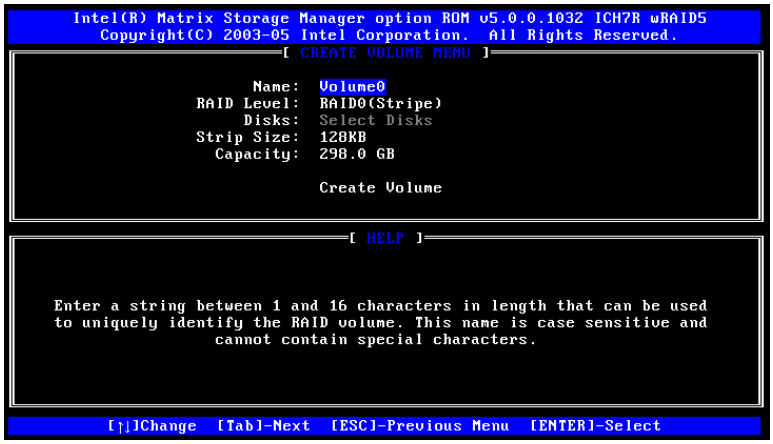


Figure F-2: Create RAID Volume Name

Step 3: **Choose the RAID level**. Select a RAID level from the list. RAID levels include RAID 0, 1, 5 and 10. See **Figure F-3**.

NOTE:

RAID 0 and RAID1 levels require a minimum of two hard drives.

RAID5 level requires a minimum of three hard drives.

RAID10 level requires a minimum of four hard drives.

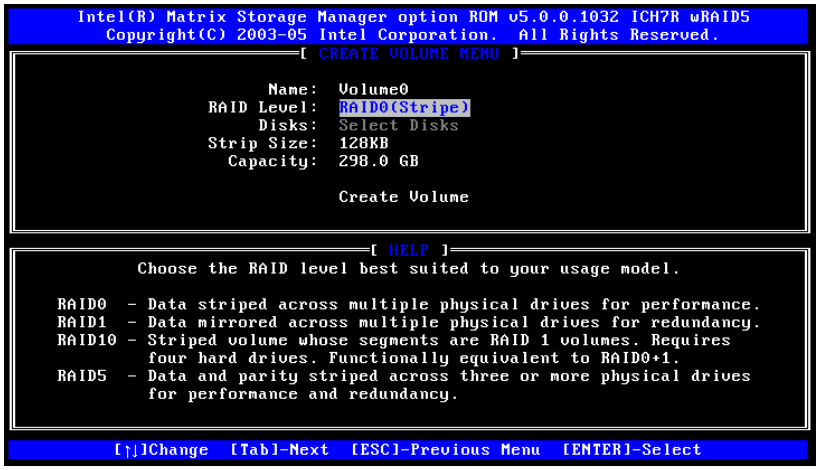


Figure F-3: Choose the Raid Level

Step 4: **Select the Stripe Size**. Select a stripe size from the list. See **Figure F-4**.

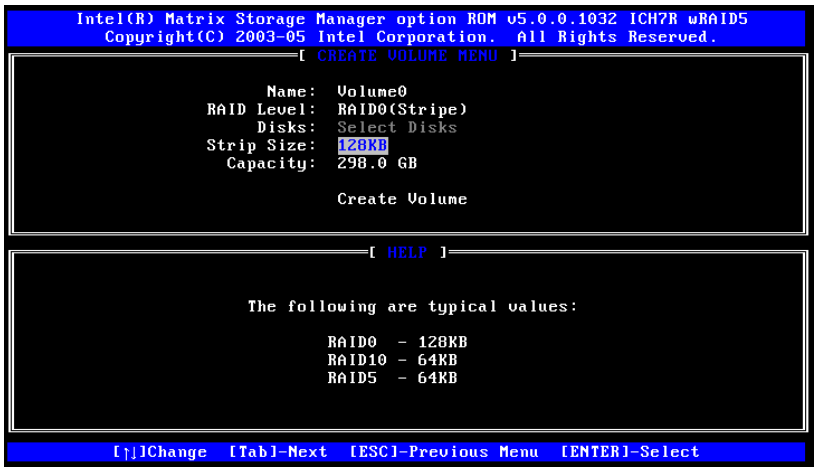


Figure F-4: Select the Stripe Size

Step 5: **Enter the Volume Capacity**. Enter the volume capacity, or press **ENTER** to accept the default capacity. See **Figure F-5**.

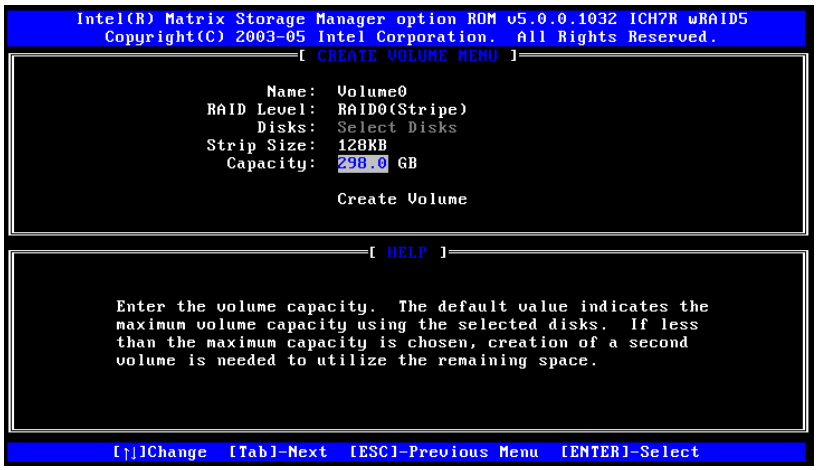


Figure F-5: Enter the Volume Capacity

Step 6: **Create the RAID Volume**. Press **ENTER** to create the RAID volume as specified. See **Figure F-6**.

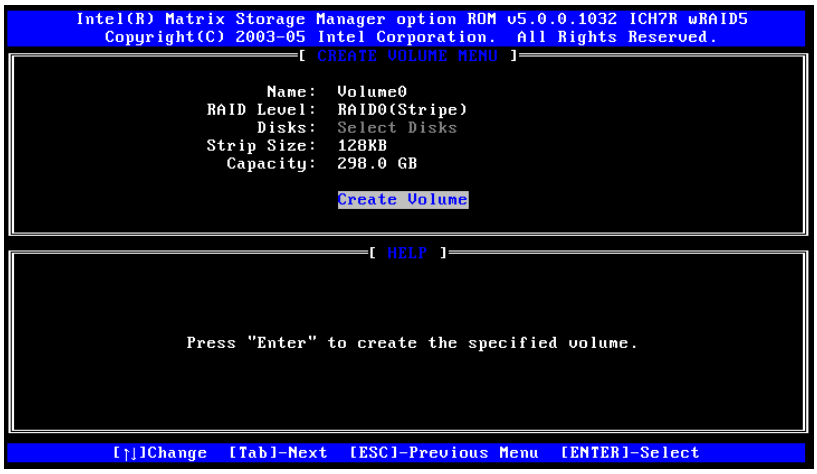


Figure F-6: Create the RAID Volume

Step 7: **Create RAID Volume Verification**. After reading the warning, press **Y** to create the RAID volume as specified, or **N** to return to the **Create RAID Volume** menu. See **Figure F-7**.

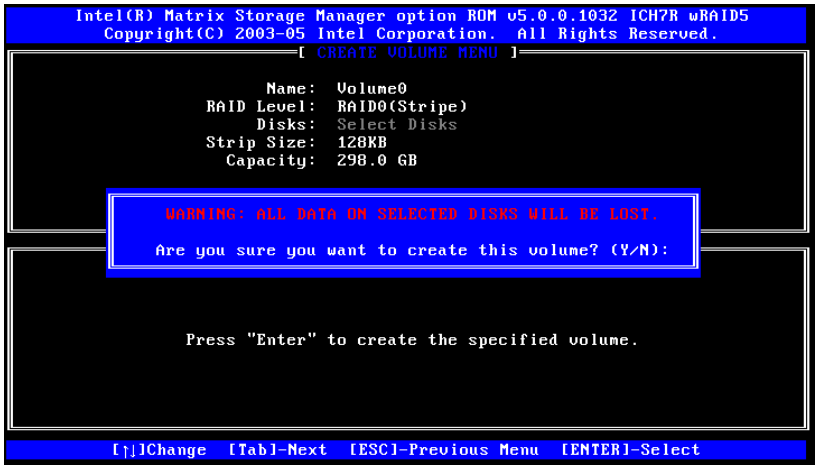


Figure F-7: Create RAID Volume Verification

F.4.2 Deleting a RAID Volume

WARNING!

All data stored on the member drives of a RAID volume are destroyed during the RAID deletion process. Make sure any data to be saved has been moved or backed up before deleting a RAID volume.

Step 1: Select “Delete RAID Volume.” Use the arrow keys to highlight Delete RAID Volume and press ENTER. See Figure F-8.

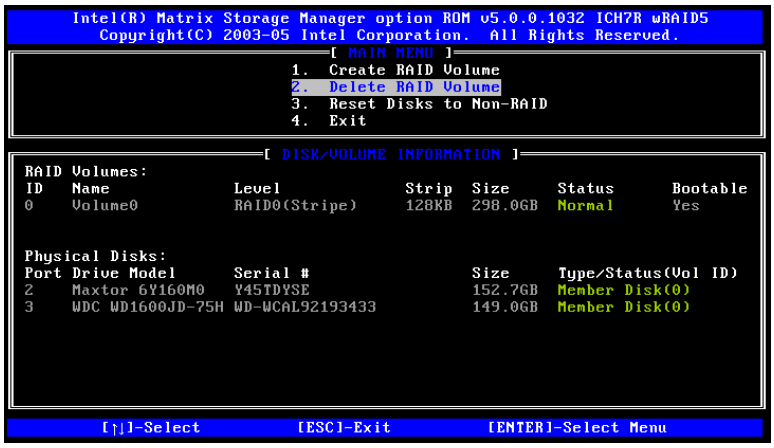


Figure F-8: Delete RAID Volume Menu

Step 2: **Select RAID Volume to be Deleted**. Use the arrow keys to highlight the RAID volume to be deleted and press **ENTER**. See **Figure F-9**.

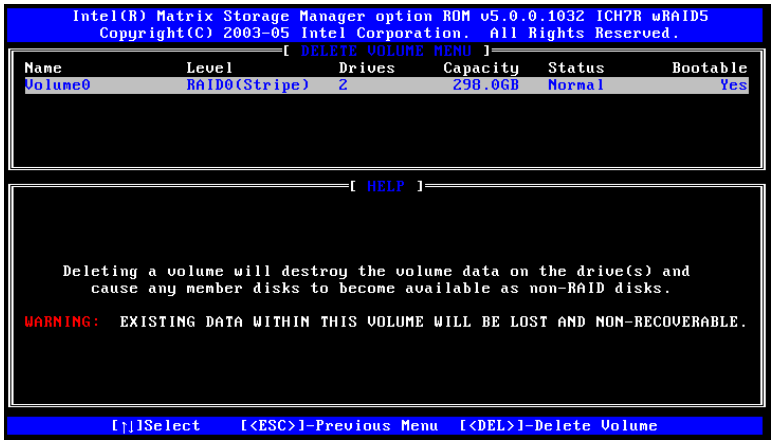


Figure F-9: Select RAID Volume to be Deleted

Step 3: **Delete Volume Verification**. After reading the warning, press **Y** to delete the specified RAID volume, or **N** to return to the **Delete Volume** menu. See **Figure F-10**.

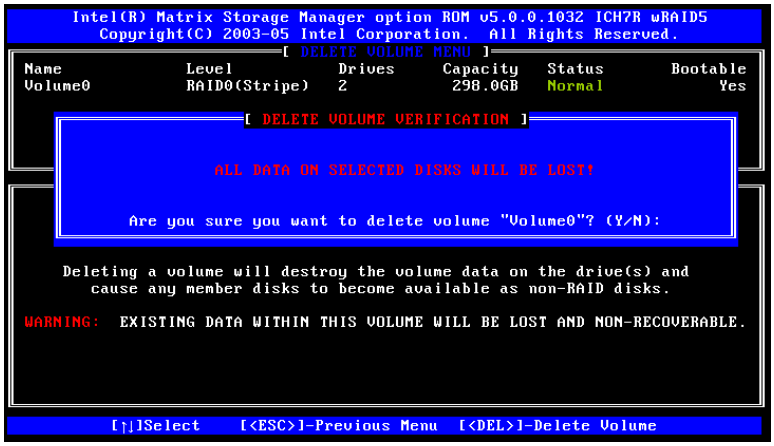


Figure F-10: Delete Volume Verification

Step 4: **Non-RAID Disks**. After deleting the RAID volume, the disks belonging to the volume will be shown as non-RAID disks. See **Figure F-11**.

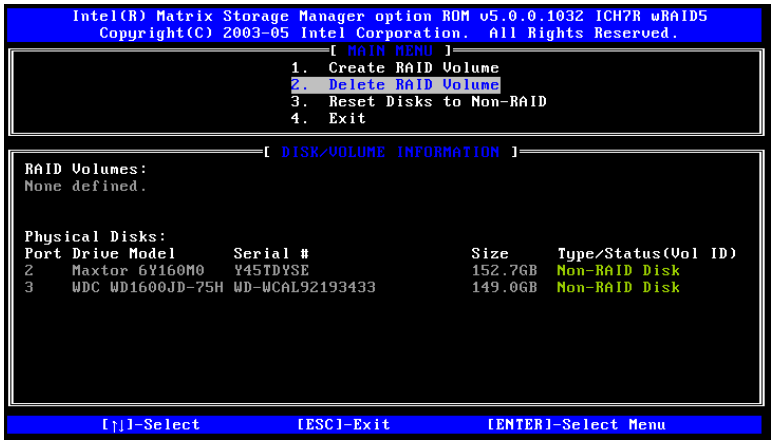


Figure F-11: Non-RAID Disks

F.4.3 Resetting a Disk to Non-RAID

WARNING!

All data stored on the disk drive of a RAID volume is destroyed when resetting it to non-RAID. Make sure any data to be saved has been moved or backed up before resetting a disk to non-RAID.

Step 1: Select “Reset Disk to Non-RAID.” Use the arrow keys to highlight Reset Disk to Non-RAID and press ENTER. See Figure F-12.

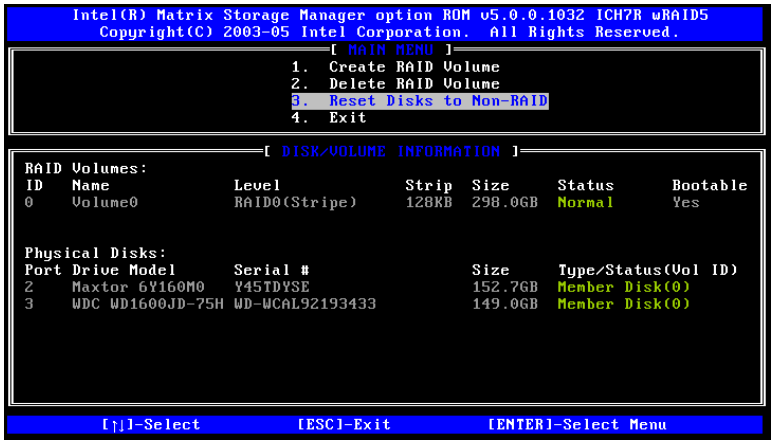


Figure F-12: Reset Disk to Non-RAID Menu

Step 2: **Select Disks to Reset**. Use the arrow keys to scroll through the disk drives and press **SPACE** to select which drives are to be reset as non-RAID. After all the disks to be reset have been chosen, press **ENTER**. See **Figure F-13**.

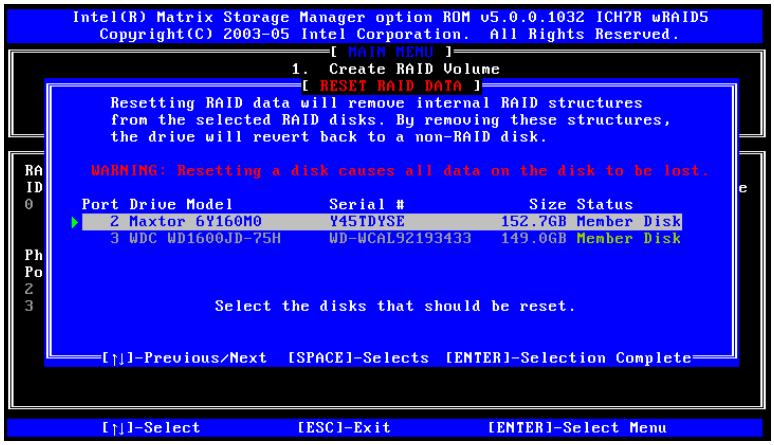


Figure F-13: Select Disk to Reset

Step 3: **Reset Disk Verification**. After reading the warning, press **Y** to reset the selected disks as non-RAID, or **N** to return to the **Reset RAID Data** menu. See **Figure F-14**.

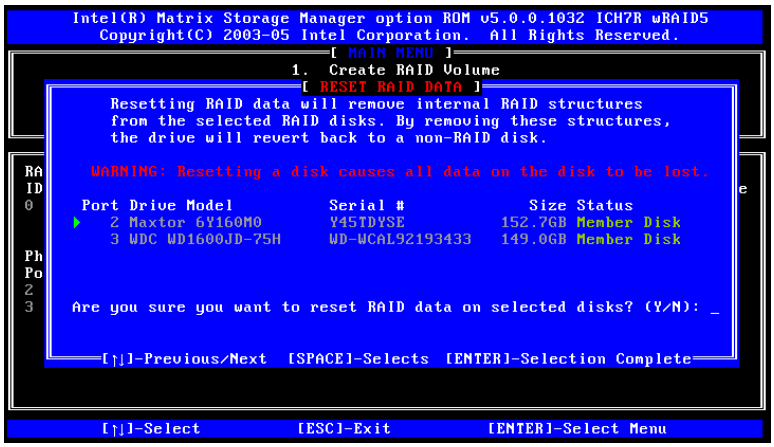


Figure F-14: Reset Disk Verification

Step 4: **Disk Drive and RAID Volume Status**. After the disk drives have been reset, the **Matrix Storage Manager Main** menu is shown indicating the status of the RAID volumes and disk drives. See **Figure F-15**.

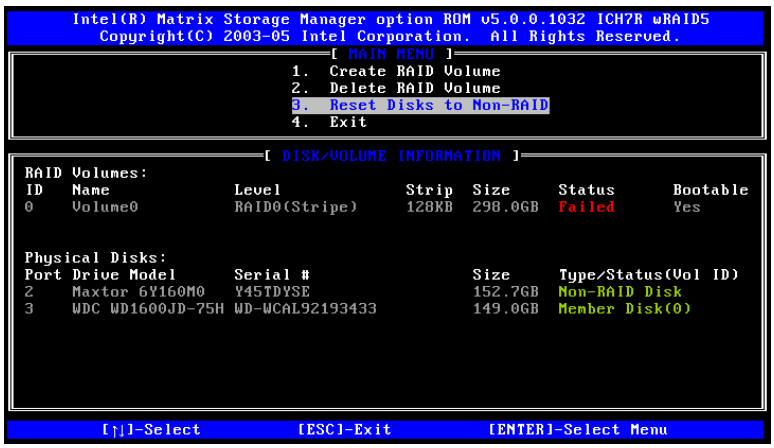


Figure F-15: Disk Drive and RAID Volume Status

F.4.4 Exiting the Matrix Storage Manager

Step 1: Select “Exit.” Use the arrow keys to highlight Exit and press ENTER.

See Figure F-16.

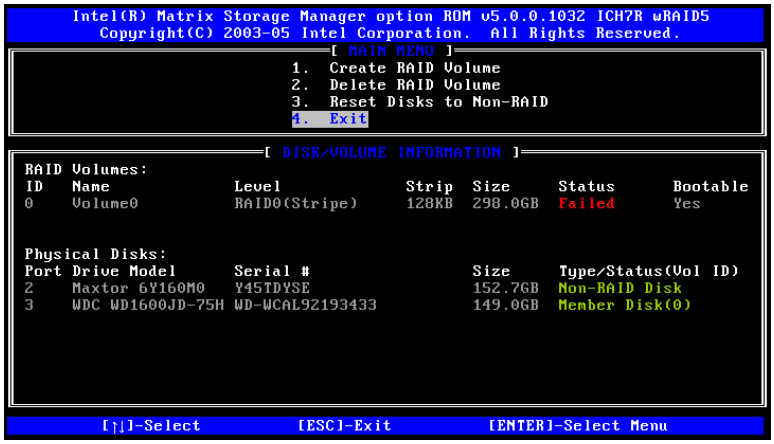


Figure F-16: Exit Menu

Step 2: **Exit Verification**. Press **Y** to exit the **Matrix Storage Manager**, or **N** to return to the **Main** menu. See **Figure F-17**.

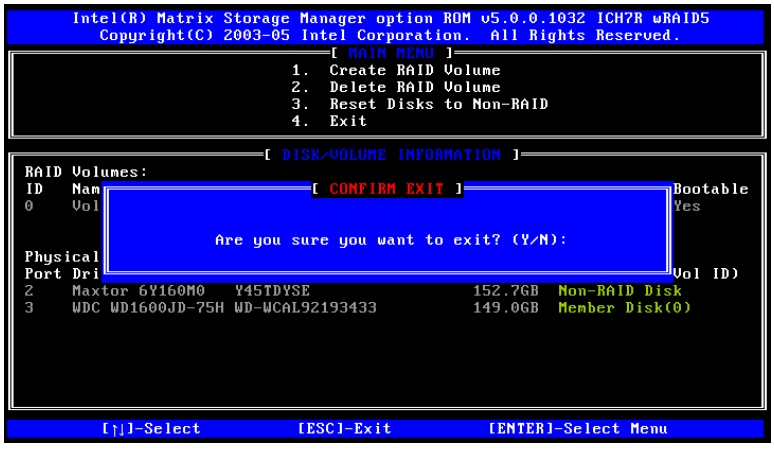


Figure F-17: Exit Verification

Appendix

G

Hazardous Materials Disclosure

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

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

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

Please refer to the table on the next page.

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

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

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

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

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

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (CR(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
壳体	X	O	O	O	O	X
显示	X	O	O	O	O	X
印刷电路板	X	O	O	O	O	X
金属螺帽	X	O	O	O	O	O
电缆组装	X	O	O	O	O	X
风扇组装	X	O	O	O	O	X
电力供应组装	X	O	O	O	O	X
电池	O	O	O	O	O	O

O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。

X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

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