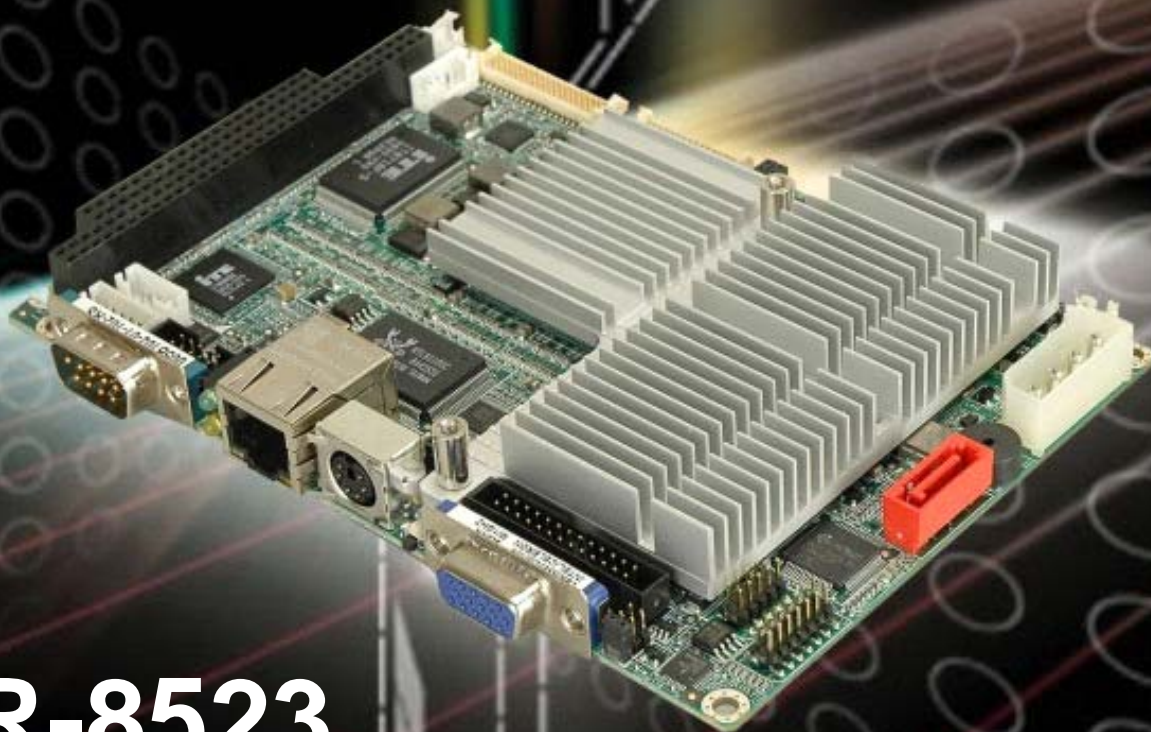




IEI Technology Corp .



**MODEL:  
WAFER-8523**

**3.5" SBC with Intel® Celeron® M CPU with VGA/LVDS/TTL,  
GbE, USB 2.0 and Audio**

## **User Manual**

Rev. 1.01 24 July, 2009



# Revision

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Date	Version	Changes
24 July, 2009	1.01	Minor edit
14 April, 2009	1.00	Initial release

# Copyright

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# Packing List

**NOTE:**

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the WAFER-8523 from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to [sales@iei.com.tw](mailto:sales@iei.com.tw).

The items listed below should all be included in the WAFER-8523 package.

- 1 x WAFER-8523
- 1 x SATA Cable (P/N: 32000-062800-RS)
- 1 x KB/MS Cable (P/N: 32000-000138-RS)
- 1 x Audio Cable (P/N: 32000-072100-RS)
- 1 x Mini Jumper pack
- 1 x USB cable (P/N: 32000-073400-RS)
- 1 x Utility CD
- 1 x QIG (quick installation guide)

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

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Chapter

1

# Introduction

---



## 1.1 Overview

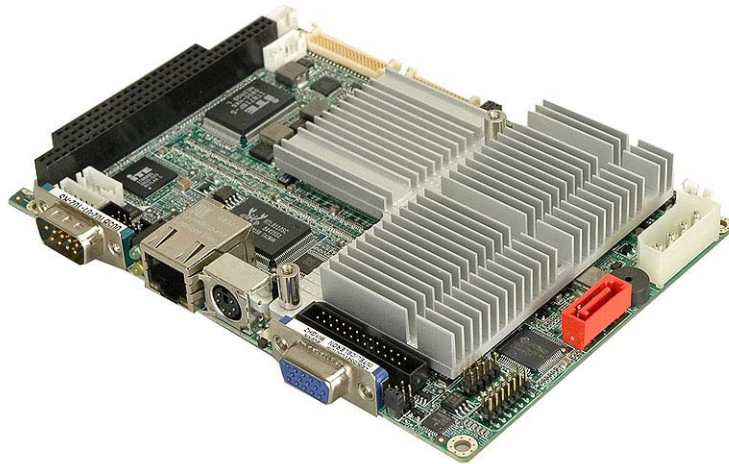


Figure 1-1: WAFER-8523

### 1.1.1 WAFER-8523 Introduction

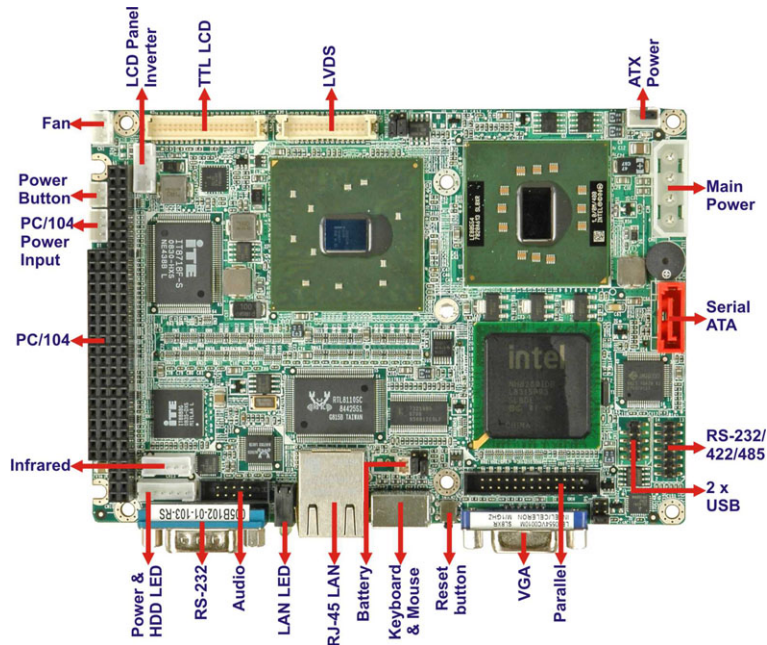
WAFER-8523 3.5" motherboards are embedded Intel® ULV Celeron® M processor platforms. The Intel® ULV Celeron® M embedded on the WAFER-8523-600-R10 has a 600 MHz clock speed, a 400 MHz FSB and a 512 KB cache, while the processor on the WAFER-8523-1GZ-R10 has a 1.00 GHz clock speed and a zero KB cache. The WAFER-8523 also includes 1.0 GB DDR SDRAM preinstalled. The board comes with an LVDS connector and supports both 18-bit and 36-bit single channel LVDS screens. The WAFER-8523 also comes with one Gigabit Ethernet (GbE) connectors, a CompactFlash® socket on the solder side, and a PC/104 slot for expansion and increased connectivity.

## 1.2 WAFER-8523 Overview

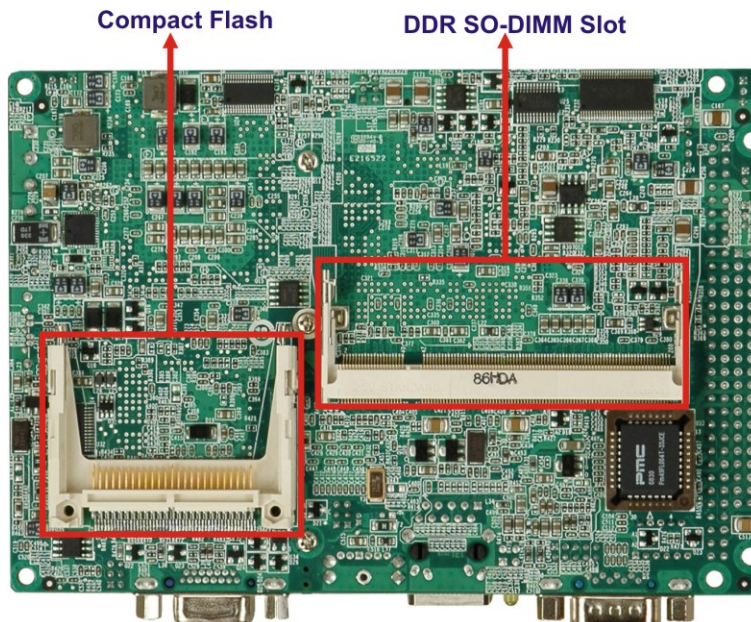
### 1.2.1 WAFER-8523 Overview Photo

The WAFER-8523 has a wide variety of peripheral interface connectors. **Figure 1-2** and **Figure 1-3** are labeled photos of the peripheral interface connectors on the WAFER-8523.

**WAFER-8523 User Manual**



**Figure 1-2: WAFER-8523 Overview [Front View]**



**Figure 1-3: WAFER-8523 Overview [Rear View]**

## 1.2.2 WAFER-8523 Peripheral Connectors and Jumpers

The WAFER-8523 has the following connectors on-board:

- 1 x ATX power connector
- 1 x ATX enable connector
- 1 x Audio connector
- 1 x Backlight inverter connector
- 1 x CompactFlash® socket
- 1 x DDR SO-DIMM slot
- 1 x Fan connector
- 1 x Keyboard and mouse connector
- 1 x LED connector
- 1 x LVDS connector
- 1 x PC/104 ISA connector
- 1 x Power button connector
- 1 x Reset button connector
- 1 x RS-232 serial port connector
- 1 x Serial ATA (SATA) drive connector
- 1 x USB 2.0 connector (supports two USB 2.0 devices)

The WAFER-8523 has the following external peripheral interface connectors on the board rear panel.

- 1 x Ethernet connector
- 1 x PS/2 keyboard/mouse port
- 1 x RS-232 serial port
- 1 x VGA connector

The WAFER-8523 has the following onboard jumpers:

- CF card select setting
- Clear CMOS
- COM2 port mode setting
- LCD panel type setting
- LCD voltage selection

### 1.2.3 Technical Specifications

WAFER-8523 technical specifications are listed in **Table 1-1**. See **Chapter 2** for details.

Specification	WAFER-8523
<b>Form Factor</b>	3.5"
<b>System CPU</b>	1.0 GHz ULV Intel® Celeron® M 600 MHz ULV Intel® Celeron® M
<b>Front Side Bus (FSB)</b>	400 MHz
<b>System Chipset</b>	Northbridge: Intel® 825GM Southbridge: Intel® ICH4
<b>Memory</b>	One 200-pin 266/200 MHz 1.0 GB DDR SDRAM SO-DIMM
<b>CompactFlash®</b>	One CompactFlash® Type II socket
<b>Super I/O</b>	ITE IT8718
<b>Display</b>	18-bit dual channel LVDS integrated in Intel® 825GM Dual-display supported (VGA and LVDS)
<b>BIOS</b>	AMI BIOS
<b>Audio</b>	Realtek ALC655 AC'97 codec
<b>LAN</b>	One Realtek RTL8110SC GbE controller
<b>COM</b>	One RS-232 serial port One RS-232/422/485 serial port pin-header
<b>LPT</b>	One LPT pin-header
<b>USB2.0</b>	Two USB 2.0 devices supported by onboard pin-headers
<b>SATA</b>	One 1.5 Gbps SATA drive supported (IDE to SATA)
<b>Keyboard/mouse</b>	One external PS/2 connector
<b>Expansion</b>	One PC/104 ISA slot
<b>Watchdog Timer</b>	Software programmable 1-255 sec. through the ITE IT8718 super I/O

<b>Power Supply</b>	5V only or 5V/12V, 12V for LCD AT/ATX support
<b>Power Consumption</b>	5V @ 2.93A (Intel Celeron M 1GHz/Zero Cache Processor, 512MB DDR DRAM) 5V @ 2.57A (Intel Celeron M 600MHz/512MB Cache Processor, 512MB DDR DRAM)
<b>Temperature</b>	0°C – 60°C (32°F - 140°F)
<b>Humidity (operating)</b>	5%~95% non-condensing
<b>Dimensions (LxW)</b>	146 mm x 102 mm
<b>Weight (GW/NW)</b>	670g/240g

**Table 1-1: Technical Specifications**

Chapter

2

# Detailed Specifications

---

## 2.1 Overview

This chapter describes the specifications and on-board features of the WAFER-8523 in detail.

## 2.2 Dimensions

### 2.2.1 Board Dimensions

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

- **Length:** 146 mm
- **Width:** 102 mm

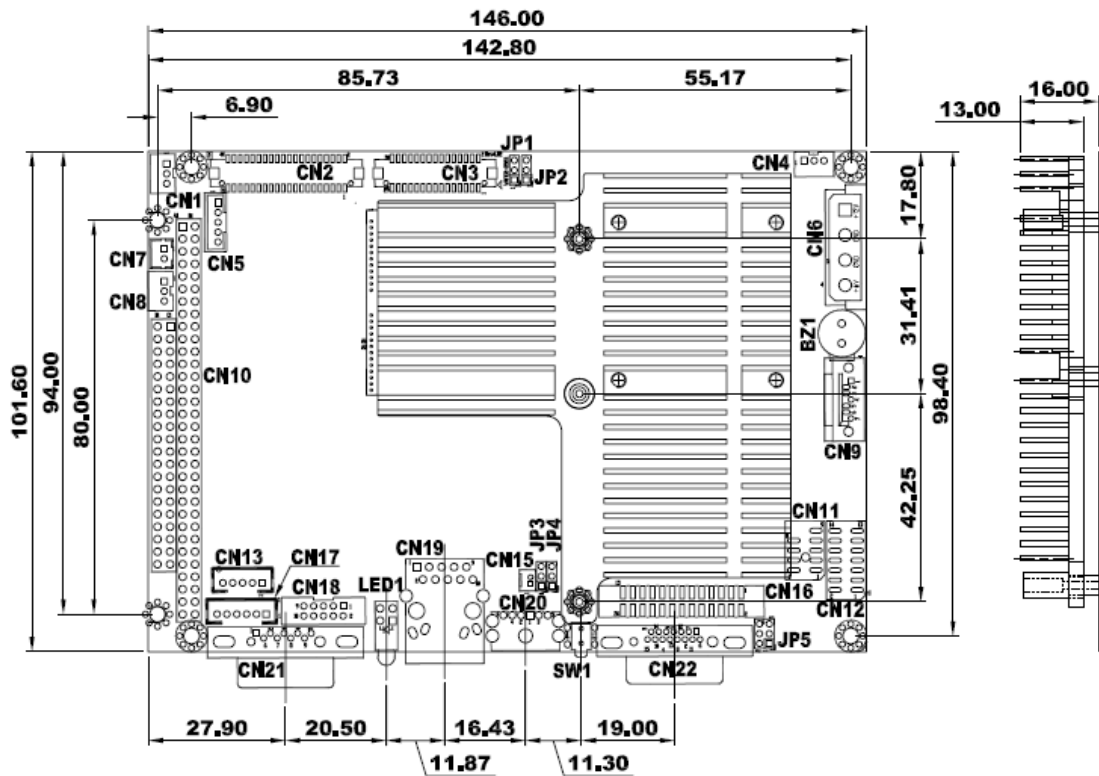


Figure 2-1: WAFER-8523 Dimensions (mm)

### 2.2.2 External Interface Panel Dimensions

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

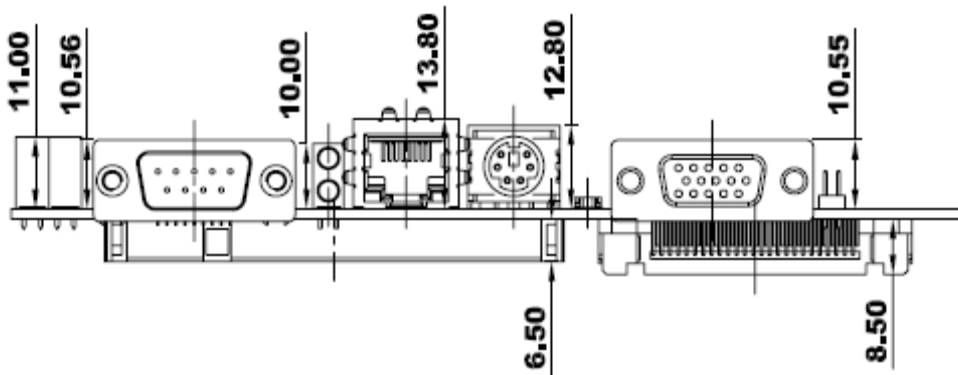


Figure 2-2: External Interface Panel Dimensions (mm)



## 2.3 Data Flow

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

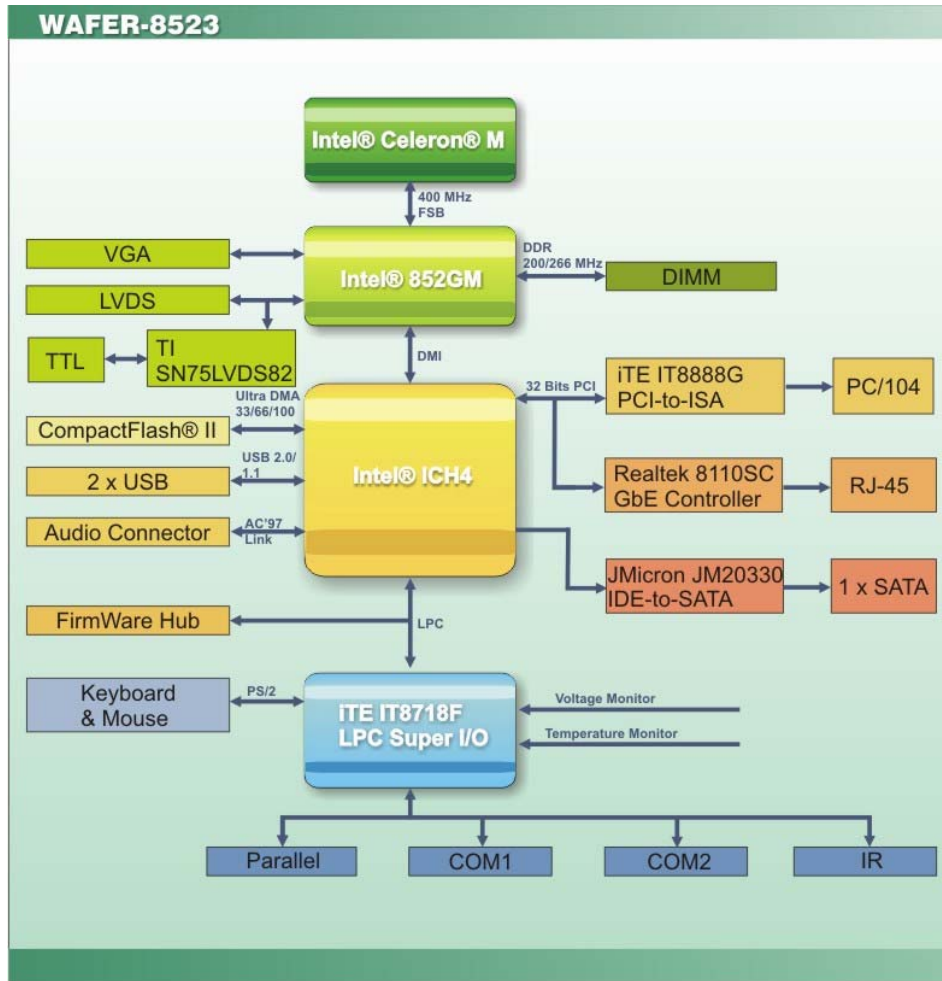


Figure 2-3: Data Flow Block Diagram

## 2.4 Compatible Processors

### 2.4.1 CPU Overview

Ultra Low Voltage Intel® Celeron® M processors are preinstalled on the WAFER-8523 motherboard.



**NOTE:**

The WAFER-8523-1GZ-R10 and WAFER-8523-600-R10 models are preinstalled with an Intel® ULV Celeron® M CPU on-board.

## 2.4.2 Preinstalled Intel® Celeron® M Processors

Specifications for the compatible Intel® Celeron® M processors are listed in **Table 2-1**.

CPU Speed	Bus Speed	Cache
1.00 GHz	400 MHz	Zero
600 MHz	400 MHz	512 KB

**Table 2-1: Preinstalled Intel® Celeron® M Processors**

## 2.5 Intel® 852GM Northbridge Chipset

### 2.5.1 Intel® 852GM Overview

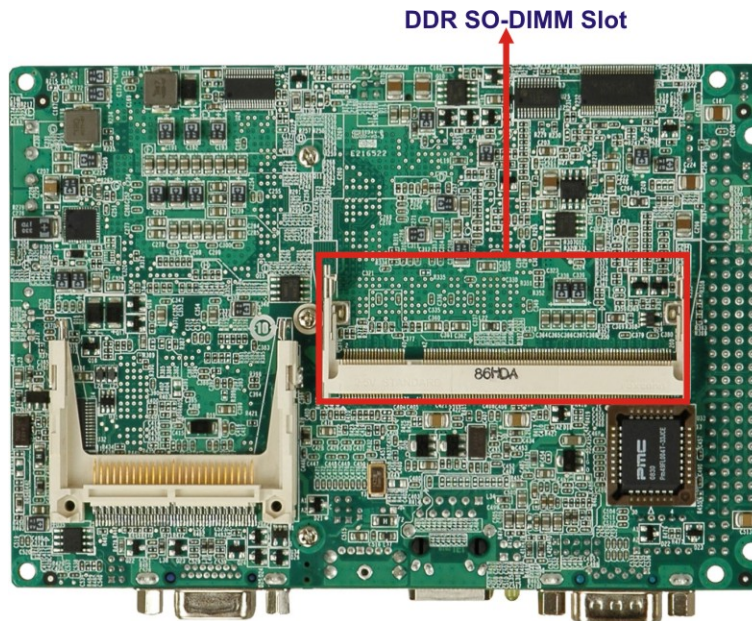
The Intel 852GM GMCH is a graphics memory controller hub (GMCH) component for mobile platforms. It provides the processor interface, system memory interface (DDR-SDRAM), Hub interface, CRT, LVDS, and one DVO port. An ACPI-compliant Intel 852GM chipset platform can support the Full-On (S0), Power On Suspend (S1-M), Suspend to RAM (S3), Suspend to Disk (S4), and Soft-Off (S5) power management states. Through the use of an appropriate LAN device, the chipset also supports wake-on LAN for remote administration and troubleshooting. The Intel 852GM GMCH integrates the following:

- 400-MHz processor Front Side Bus (FSB) controller
- Graphics controller interface
- Dual Channel 18 bit LVDS interface for TFT panel support
- One Digital Video Out Port (DVO)
- Supports DDR200/266 MHz memory technology
- High-speed Accelerated Hub Architecture interface for communication with

the ICH4-M

## 2.5.2 Intel® 852GM Memory Support

The Intel® 852GM supports one 200-pin 1 GB (max.) 266/200 MHz single channel DDR SO-DIMM. The memory socket is shown in **Figure 2-4**.



**Figure 2-4: 200-pin SO-DIMM Socket**

## 2.5.3 Intel® 852GM Integrated Graphics Controller

The Intel® 852GM has a graphics controller integrated into the chipset. Some of the features of the Intel® 852GM Integrated Graphics Controller are listed below.

- Graphics Core Frequency of 133 MHz
- 3D Graphics Engine
  - 3D Setup and Render Engine
  - High quality performance Texture Engine
- Analog Display Support
  - 350-MHz integrated 24-bit RAMDAC
  - Hardware color cursor support
  - Accompanying I2C and DDC channels provided through multiplexed interface

- Hotplug and display support
- Dual independent pipe for dual independent display
- Digital Video Out Port (DVO) support
  - Single channel DVO Port with 165-MHz dot clock support for a 12-bit interface
  - Compliant with DVI Specification 1.0
- Dedicated LFP (local flat panel) interface
  - Single or dual channel LVDS TFT panel support up to SXGA+ panel resolution with frequency range from 25 MHz to 112 MHz per channel
  - SSC support of 0.5%, 1.0%, and 2.5% center and down spread with external SSC clock
  - Dual Display Twin (Single pipe LVDS+CRT) is not supported if SSC is enabled
  - Supports data format of 18 bpp
  - LCD panel power sequencing compliant with SPWG timing specification
  - Compliant with ANSI/TIA/EIA –644-1995 spec
  - Integrated PWM interface for LCD backlight inverter control
  - Compliant with CPIS Specification 1.5

## 2.6 Intel® ICH4 Southbridge Chipset

### 2.6.1 Intel® ICH4 Overview

The ICH4 Southbridge chipset features are listed below.

- PCI Bus Interface supports PCI Revision 2.2 Specification at 33 MHz and 133 MB/sec maximum throughput
- Integrated LAN Controller with 10/100 Mbit/sec Ethernet support
- Integrated IDE Controller supports Ultra ATA/100/66/33, BMIDE and PIO modes
- USB includes one EHCI high-speed USB 2.0 Host Controller and supports legacy keyboard/mouse software
- AC-Link for Audio supports AC '97 2.3
- Interrupt Controller
- 1.5 V operation with 3.3 V I/O
- Timers Based on 82C54

- Power Management Logic is ACPI 2.0 compliant
- Enhanced Hub Interface
- Firmware Hub (FWH) Interface supports BIOS memory size up to 8 MB
- Low Pin Count (LPC) Interface supports two Master/DMA devices
- Enhanced DMA Controller
- Real-Time Clock 256-byte battery-backed CMOS RAM
- Supports SMBus 2.0 Specification
- GPIO

### **2.6.2 Intel<sup>®</sup> ICH4 Audio Codec '97 Controller**

The Audio Codec '97 (AC'97) controller integrated into the ICH4 complies with AC'97 Component Specification, Version 2.3. The AC'97 controller is connected to the onboard audio connector. The audio connector is connected to an optional 5.1 channel or 7.1 channel audio kit with an embedded AC'97 audio codec. The AC'97 controller supports 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

### **2.6.3 Intel<sup>®</sup> ICH4 Low Pin Count (LPC) Interface**

The ICH4 LPC interface complies with the LPC 1.0 specifications. The LPC bus from the ICH4 is connected to the following components:

- BIOS chipset
- Super I/O chipset

### 2.6.4 Intel® ICH4 PCI Interface

The ICH4 PCI interface provides a 33 MHz, Rev. 2.2 compliant implementation. All PCI signals are 5 V tolerant, except PME#. The ICH4 integrates a PCI arbiter that supports up to six external PCI bus masters in addition to the internal ICH4 requests.

### 2.6.5 Intel® ICH4 Real Time Clock

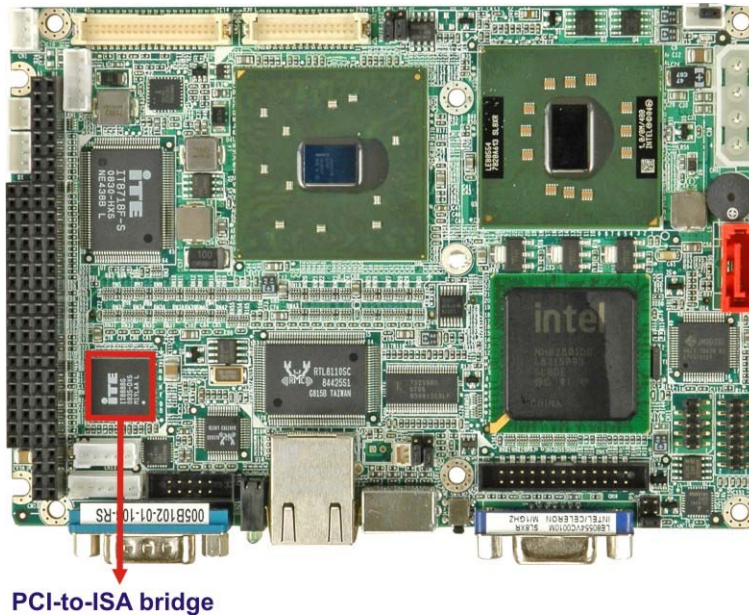
256 bytes of battery backed RAM is provided by the Motorola MC146818A real time clock (RTC) integrated into the ICH4. The RTC operates on a 3V battery and 32.768 KHz crystal. The RTC keeps track of the time and stores system data even when the system is turned off.

### 2.6.6 Intel® ICH4 USB Controller

Up to six high-speed, full-speed or low-speed USB devices are supported by the ICH4. High-speed USB 2.0, with data transfers of up to 480Mb/s, is enabled with the ICH4 integrated Enhanced Host Controller Interface (EHCI) compliant host controller. USB full-speed and low-speed signaling is supported by the four ICH4 integrated Universal Host Controller Interface (UHCI) controller.

### 2.6.7 PCI-to-ISA Bridge

A PC/104 expansion connector on the WAFER-8523 facilitates ISA bus expansion. The PC/104 connector is interfaced to the CPU, through an ITE IT8888G PCI to ISA bridge single function device. The ITE IT8888G is a bridge between the PCI bus and the ISA bus. The 32-bit PCI bus interface on the IT8888G is compliant with PCI Specification v2.1 and supports both PCI Bus Master and Slave.



**Figure 2-5: PCI-to-ISA-Bridge**

Some of the ITE IT8888G features include:

- PCI Interface
- Programmable PCI Address Decoders
- PC/PCI DMA Controller
- Distributed DMA Controller
- ISA Interface
- SM Bus
- One analog line-level mono output: MONO\_OUT
- Power-on Serial Bus Configuration
- Serial IRQ
- Optional FLASH ROM Interface
- Versatile power-on strapping options
- Supports NOGO function
- Single 33 MHz Clock Input
- +3.3V PCI I/F with +5V tolerant I/O buffers
- +5V ISA I/F and core Power Supply

## 2.7 PCI Bus

The PCI bus controller on the ICH4 Southbridge is compliant with PCI Revision 2.2 specifications and has a 33 MHz PCI clock.

## 2.8 LPC Bus Components

### 2.8.1 LPC Bus Overview

The LPC bus is connected to components listed below:

- BIOS chipset
- Super I/O chipset

### 2.8.2 BIOS Chipset

The BIOS chipset has a licensed copy of AMI BIOS installed on the chipset. Some of the BIOS features are listed below:

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

### 2.8.3 iTE IT8718F Super I/O chipset

The iTE IT8718F Super I/O chipset is connected to the ICH4 Southbridge through the LPC bus. The iTE IT8718F is an LPC interface-based Super I/O device that comes with Environment Controller integration. Some of the features of the iTE IT8718F chipset are listed below:

- ACPI and LANDesk Compliant
- Enhanced Hardware Monitor
- Fan Speed Controller
- Two 16C550 UARTs for serial port control
- One IEEE 1284 Parallel Port
- Keyboard Controller



- Watchdog Timer

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

### **2.8.3.1 Super I/O LPC Interface**

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

### **2.8.3.2 Super I/O 16C550 UARTs**

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

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

### **2.8.3.3 Super I/O Digital Input/Output**

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

### **2.8.3.4 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.

### **2.8.3.5 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.

### **2.8.3.6 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

### 2.8.3.7 Super I/O Parallel Port

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

## 2.9 Environmental and Power Specifications

### 2.9.1 System Monitoring

Three thermal inputs on the WAFER-8523 Super I/O Enhanced Hardware Monitor the following temperatures:

- System temperature
- Vcore temperature
- CPU temperature

Voltage inputs on the WAFER-8523 Super I/O Enhanced Hardware Monitor the following voltages:

- CPU core
- +2.5V
- +3.3V
- +5.0V
- +1.2V
- +1.5V
- +1.25V
- 5VSB
- VBAT

The WAFER-8523 Super I/O Enhanced Hardware Monitor also monitors the following fan speeds:

- Fan speed

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

### 2.9.2 Operating Temperature and Temperature Control

The maximum and minimum operating temperatures for the WAFER-8523 are listed below.

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

A 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. A heat sink is also mounted on the Northbridge chipset to ensure the operating temperature of the chip remains low.

### 2.9.3 Power Consumption

**Table 2-2** shows the power consumption parameters of the WAFER-8523 with an Intel® Celeron® M, 1.0 GHz CPU with 512MB of 266 MHz DDR memory and zero cache.

Voltage	Current
+12V	0.05A
5VSB	0.28A
5V	2.93A

**Table 2-2: Power Consumption**

**Table 2-3** shows the power consumption parameters of the WAFER-8523 with an Intel® Celeron® M, 600 MHz CPU with 512MB of 266 MHz DDR memory and 512 MB cache.

Voltage	Current
+12V	0.05A
5VSB	0.30A
5V	2.57A

**Table 2-3: Power Consumption**

Chapter

3

# Unpacking

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## 3.1 Anti-static Precautions

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### WARNING!

Failure to take ESD precautions during the installation of the WAFER-8523 may result in permanent damage to the WAFER-8523 and severe injury to the user.

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Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER-8523. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WAFER-8523 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 WAFER-8523, place it on an anti-static pad. This reduces the possibility of ESD damaging the WAFER-8523.
- **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 WAFER-8523 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 WAFER-8523 does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

### 3.3 Unpacking Checklist











**NOTE:**

If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the WAFER-8523 was purchased from or contact an IEI sales representative directly by sending an email to [sales@iei.com.tw](mailto:sales@iei.com.tw).

#### 3.3.1 Package Contents





The WAFER-8523 is shipped with the following components:

Quantity	Item and Part Number	Image
1	WAFER-8523	
1	SATA cable (P/N: 32000-062800-RS)	
1	KB/MS cable (P/N: 32000-000138-RS)	
1	Audio cable (P/N: 32000-072100-RS)	
1	Mini jumper pack (2.0mm) (P/N: 33100-000033-RS)	
1	USB cable (P/N: 32000-073400-RS)	

1	Utility CD	
1	Quick Installation Guide	

### 3.3.2 Optional Items

The following components are optional for WAFER-8523:

Item and Part Number	Image
ATX power cable (P/N:32100-052100-RS)	
LPT Cable (P/N:32200-015100-RS)	
RS-232/422/485 cable (P/N:32200-026500-RS)	
SATA power cable (P/N: 32100-088600-RS)	

Chapter

4

# Connectors

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## 4.1 Peripheral Interface Connectors

Section 4.1.1 shows the peripheral interface connector locations. Section 4.2 lists all the peripheral interface connectors seen in Section 4.1.1.

### 4.1.1 WAFER-8523 Layout

Figure 4-1 and Figure 4-2 show the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

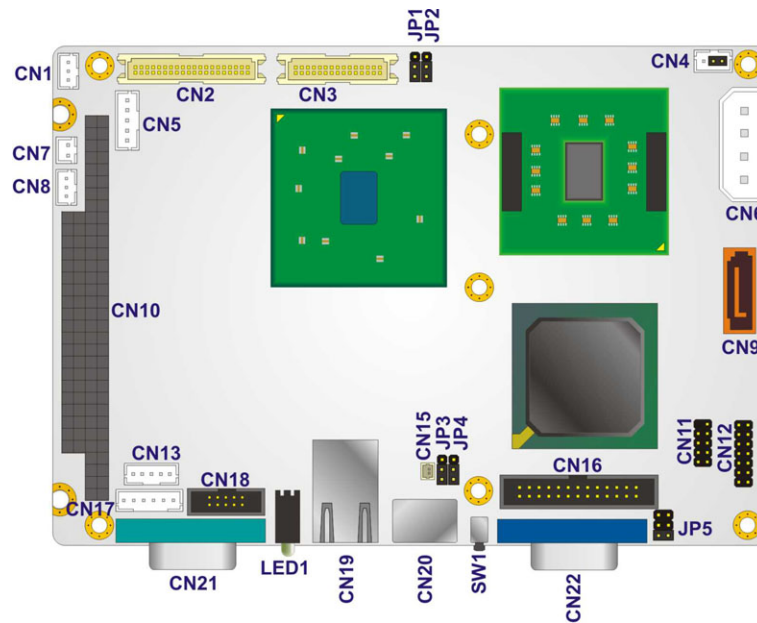


Figure 4-1: Connector and Jumper Locations [Front Side]

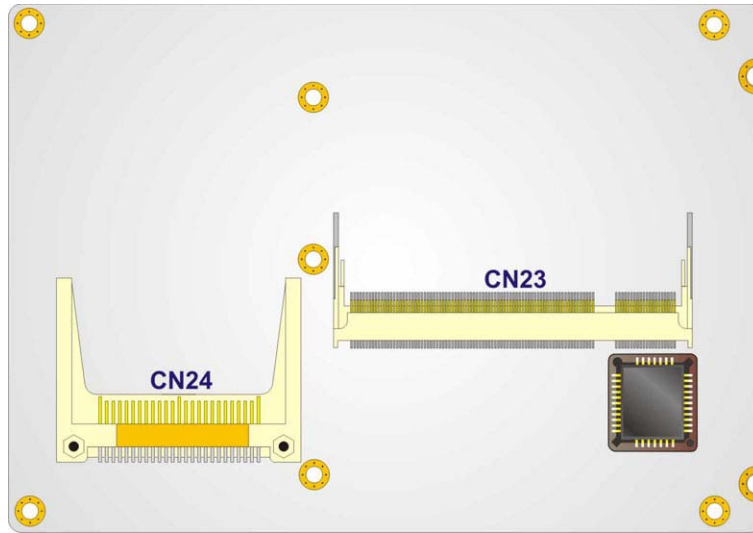


Figure 4-2: Connector and Jumper Locations [solder side]

## 4.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the WAFER-8523. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
ATX power connector	4-pin ATX	CN6
Audio connector	10-pin header	CN18
Backlight inverter connector	5-pin wafer	CN5
Battery connector	2-pin wafer	CN15
CompactFlash® socket	50-pin CF socket	CN24
DDR SO-DIMM slot	SO-DIMM socket	CN23
Fan connector	3-pin wafer	CN1
Infrared interface connector	5-pin wafer	CN13
LPT parallel port connector	26-pin	CN16
LVDS connector	30-pin crimp	CN3
PC/104 connector	104-pin ISA bus	CN10
PC/104 power input connector	3-pin	CN8

Power and HDD LED and +5V output connector	6-pin header	CN17
Power button connector	2-pin wafer	CN7
RS-232/422/485 serial port connector	14-pin header	CN12
Serial ATA (SATA) drive connector	7-pin SATA	CN9
TTL LCD connector	40-pin crimp	CN2
USB 2.0 connector	8-pin header	CN11

**Table 4-1: Peripheral Interface Connectors**

### 4.2.1 External Interface Panel Connectors

**Table 4-2** lists the rear panel connectors on the WAFER-8523. Detailed descriptions of these connectors can be found in **Section 4.4** on **page 45**.

Connector	Type	Label
Ethernet connector	RJ-45	CN19
Keyboard/Mouse connector	PS/2	CN20
LAN (Active/Link) LED indicator		LED1
Power reset button		SW1
RS-232 serial port connector	Male DB-9	CN21
VGA port connector	15-pin female	CN22

**Table 4-2: Rear Panel Connectors**

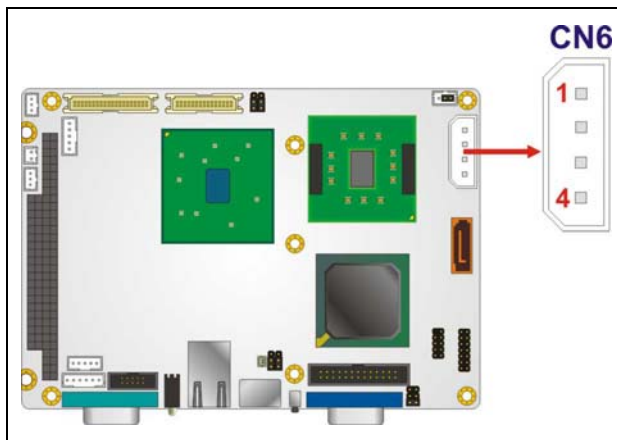
### 4.3 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the WAFER-8523.

### 4.3.1 ATX Power Connector

- CN Label:** CN6
- CN Type:** 4-pin AT power connector (1x4)
- CN Location:** See **Figure 4-3**
- CN Pinouts:** See **Table 4-3**

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



**Figure 4-3: ATX Power Connector Location**

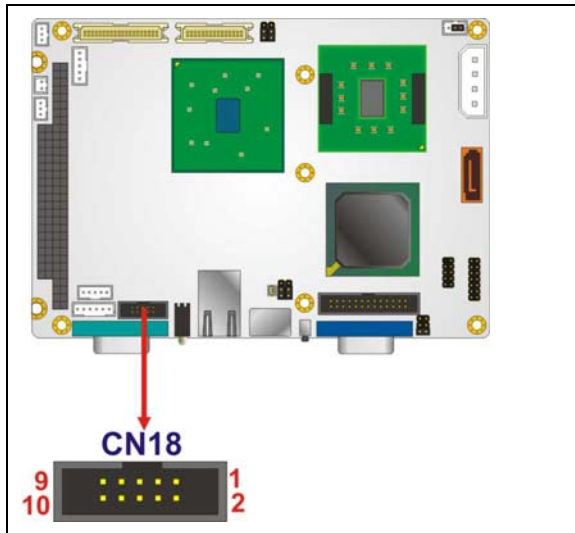
PIN NO.	DESCRIPTION
1	+12V
2	GND
3	GND
4	+5V

**Table 4-3: ATX Power Connector Pinouts**

### 4.3.2 Audio Connector (10-pin)

- CN Label:** CN18
- CN Type:** 10-pin (2x5) header
- CN Location:** See **Figure 4-4**
- CN Pinouts:** See **Table 4-4**

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



**Figure 4-4: Audio Connector Pinouts (10-pin)**

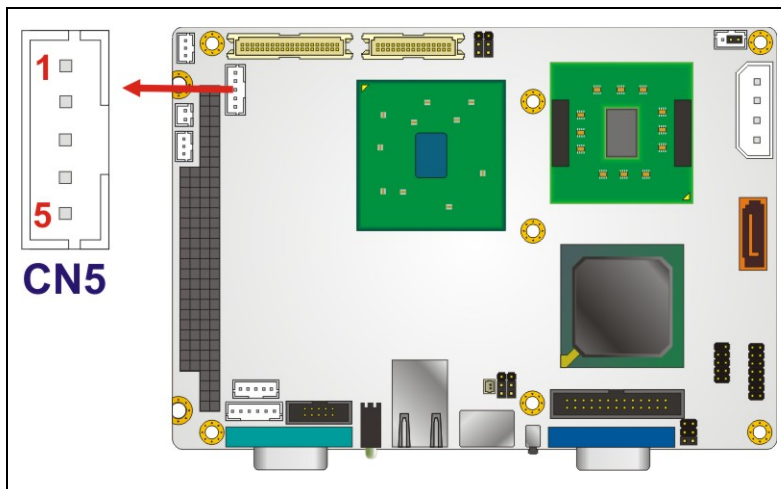
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	Line out R	2	Line in R
3	GND	4	GND
5	Line out L	6	Line in L
7	GND	8	GND
9	Mic-in	10	Mic-in

**Table 4-4: Audio Connector Pinouts (10-pin)**

### 4.3.3 Backlight Inverter Connector

- CN Label:** CN5
- CN Type:** 5-pin wafer (1x5)
- CN Location:** See **Figure 4-5**
- CN Pinouts:** See **Table 4-5**

The backlight inverter connectors provide the backlights on the LCD display connected to the WAFER-8523 with +12V of power.



**Figure 4-5: Panel Backlight Connector Pinout Locations**

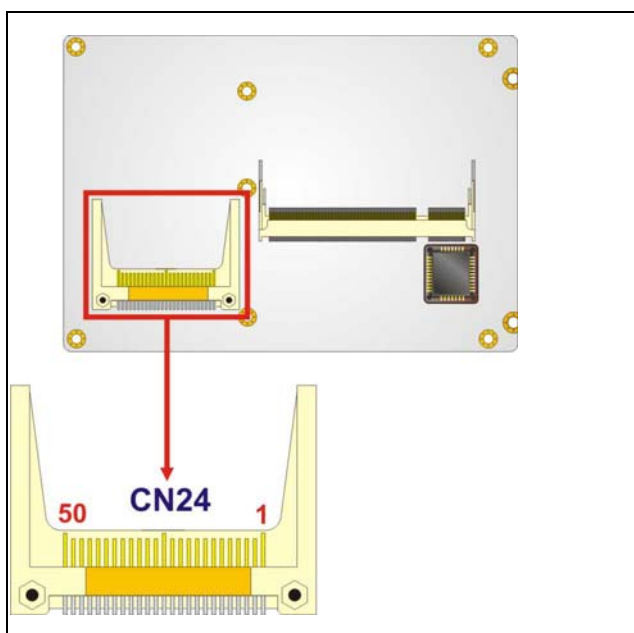
PIN NO.	DESCRIPTION
1	+12V
2	Ground
3	Backlight Enable
4	Backlight Control
5	+5V

**Table 4-5: Panel Backlight Connector Pinouts**

#### 4.3.4 CompactFlash® Socket

- CN Label:** CN24
- CN Type:** 50-pin header (2x25)
- CN Location:** See **Figure 4-6**
- CN Pinouts:** See **Table 4-6**

A CF Type I or Type II memory card is inserted to the CF socket on the solder side of the WAFER-8523.



**Figure 4-6: CF Card Socket Location (solder side)**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND	26	CD1#
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	CE#	32	CE2#
8	A10	33	VS1#

<b>PIN NO.</b>	<b>DESCRIPTION</b>	<b>PIN NO.</b>	<b>DESCRIPTION</b>
9	OE#	34	IOR#
10	A9	35	IOW#
11	A8	36	WE#
12	A7	37	IRQ
13	VCC	38	VCC
14	A6	39	CSEL#
15	A5	40	VS2#
16	A4	41	RESET#
17	A3	42	WAIT#
18	A2	43	INPACK#
19	A1	44	REG#
20	A0	45	BVD2
21	D0	46	BVD1
22	D1	47	D8
23	D2	48	D9
24	IOCS16#	49	D10
25	CD2#	50	GND2

**Table 4-6: CF Card Socket Pinouts**

### **4.3.5 Fan Connector (+12V, 3-pin)**

- CN Label:** CN1
- CN Type:** 3-pin header
- CN Location:** See **Figure 4-7**
- CN Pinouts:** See **Table 4-7**

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



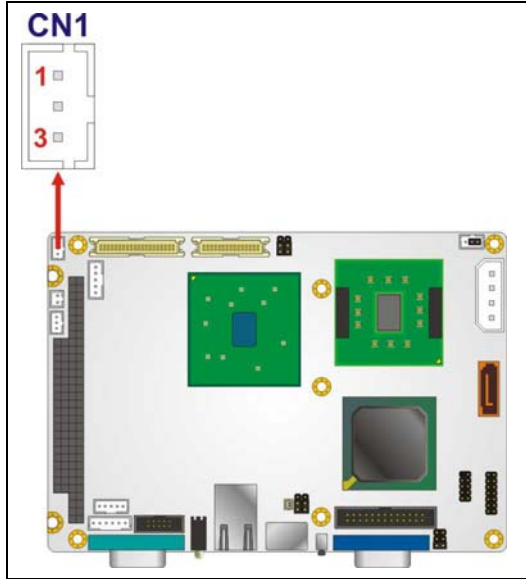


Figure 4-7: +12V Fan Connector Location

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

Table 4-7: +12V Fan Connector Pinouts

#### 4.3.6 IR Sensor Connector

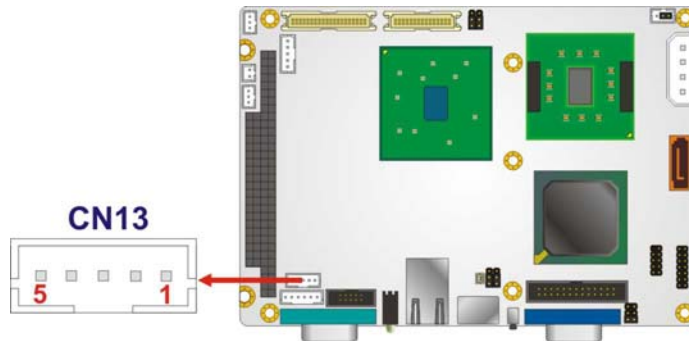
- CN Label:** CN13
- CN Type:** 5-pin wafer connector
- CN Pinouts:** See Table 4-8
- CN Location:** See Figure 4-8

The IR sensor connector connects to the body IR sensor.

PIN	DESCRIPTION
1	+5V
3	N/C
5	IRRX
7	GND

9	IRTX
---	------

**Table 4-8: IR Sensor Connector Pinouts**

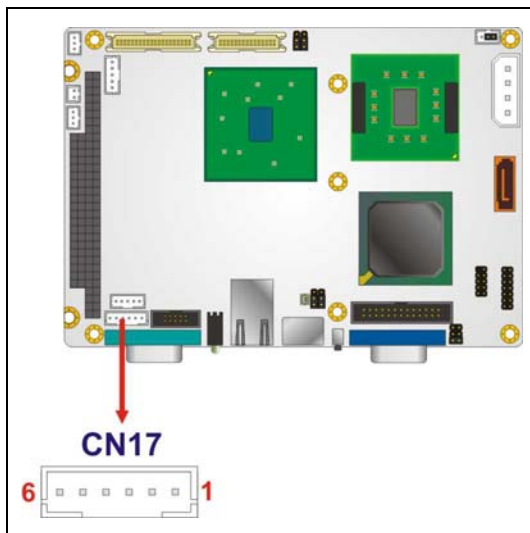


**Figure 4-8: IR Sensor Connector Location**

### 4.3.7 LED Connector

- CN Label:** CN17
- CN Type:** 6-pin wafer (1x6)
- CN Location:** See Figure 4-9
- CN Pinouts:** See Table 4-9

The LED connector connects to an HDD indicator LED and a power LED on the system chassis to inform the user about HDD activity and the power on/off status of the system.



**Figure 4-9: LED Connector Locations**

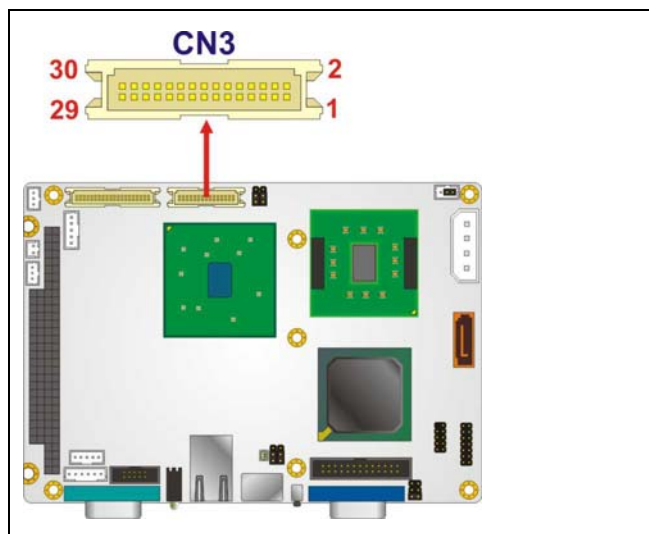
PIN NO.	DESCRIPTION
1	+5V
2	GND
3	Power LED+
4	Power LED-(GND)
5	HDD LED+
6	HDD LED-

**Table 4-9: LED Connector Pinouts**

### 4.3.8 LVDS LCD Connector

- CN Label:** CN3
- CN Type:** 30-pin crimp (2x10)
- CN Location:** See **Figure 4-10**
- CN Pinouts:** See **Table 4-10**

The 30-pin LVDS LCD connector can be connected to single channel or dual channel, 24-bit or 36-bit LVDS panel.



**Figure 4-10: LVDS LCD Connector Pinout Location**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	GND1	2	GND2
3	A_Y0	4	A_Y0#
5	A_Y1	6	A_Y1#
7	A_Y2	8	A_Y2#
9	A_CK	10	A_CK#
11	A_Y3	12	A_Y3#
13	GND3	14	GND4
15	B_Y0	16	B_Y0#
17	B_Y1	18	B_Y1#
19	B_Y2	20	B_Y2#
21	B_CK	22	B_CK#
23	B_Y3	24	B_Y3#
25	GND5	26	GND6
27	VCC_LCD	28	VCC_LCD
29	VCC_LCD	30	VCC_LCD

**Table 4-10: LVDS LCD Port Connector Pinouts**

### 4.3.9 PC/104 Connector

- CN Label:** CN10
- CN Type:** 104-pin PC/104 slot
- CN Location:** See **Figure 4-11**
- CN Pinouts:** See **Table 4-11** and **Table 4-12**

The PC/104 slot enables a PC/104 compatible expansion module to be connected to the board.

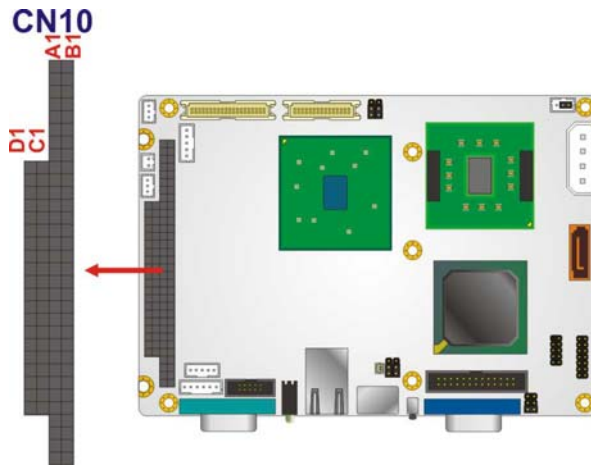


Figure 4-11: PC/104 Connector

PIN	Description	PIN	Description	PIN	Description	PIN	Description
A1	-IOCHK	A17	SA14	B1	GND	B17	-DACK1
A2	SD7	A18	SA13	B2	RSTDRV	B18	DRQ1
A3	SD6	A19	SA12	B3	VCC	B19	-REFRESH
A4	SD5	A20	SA11	B4	IRQ9	B20	BCLK
A5	SD4	A21	SA10	B5	NC	B21	IRQ7
A6	SD3	A22	SA9	B6	DRQ2	B22	IRQ6
A7	SD2	A23	SA8	B7	NC	B23	IRQ5
A8	SD1	A24	SA7	B8	-NOWS	B24	IRQ4
A9	SD0	A25	SA6	B9	+12V	B25	IRQ3
A10	IOCHRDY	A26	SA5	B10	GND	B26	-DACK2
A11	AEN	A27	SA4	B11	-SMEMW	B27	TC
A12	SA19	A28	SA3	B12	-SMEMR	B28	BALE
A13	SA18	A29	SA2	B13	-IOW	B29	VCC
A14	SA17	A30	SA1	B14	-IOR	B30	ISAOSC
A15	SA16	A31	SA0	B15	-DACK3	B31	GND
A16	SA15	A32	GND	B16	DRQ3	B32	GND

Table 4-11: PC/104 Connector Pinouts (1 of 2)

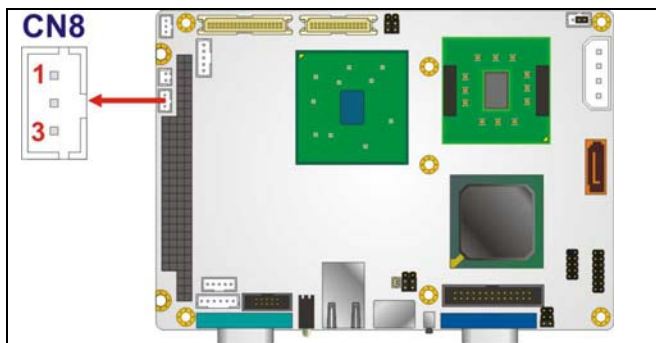
PIN	Description	PIN	Description	PIN	Description	PIN	Description
C1	GND	C11	-MEMW	D1	GND	D11	-DACK5
C2	-SBHE	C12	SD8	D2	-MEMCS16	D12	DRQ5
C3	SA23	C13	SD9	D3	-IOCS16	D13	-DACK6
C4	SA22	C14	SD10	D4	IRQ10	D14	DRQ6
C5	SA21	C15	SD11	D5	IRQ11	D15	-DACK7
C6	SA20	C16	SD12	D6	IRQ12	D16	DRQ7
C7	SA19	C17	SD13	D7	IRQ15	D17	VCC
C8	SA18	C18	SD14	D8	IRQ14	D18	-MASTER
C9	SA17	C19	SD15	D9	-DACK0	D19	GND
C10	-MEMR	C20	NC	D10	DRQ0	D20	GND

**Table 4-12: PC/104 Connector Pinouts (2 of 2)**

### 4.3.10 PC/104 Power Input Connector

- CN Label:** CN8
- CN Type:** 3-pin wafer (1x3)
- CN Location:** See **Figure 4-12**
- CN Pinouts:** See **Table 4-13**

The PC/104 power input connector provides power to the PC/104 expansion module installed on the PC/104 slot.



**Figure 4-12: PC/104 Power Input Connector Pinouts**

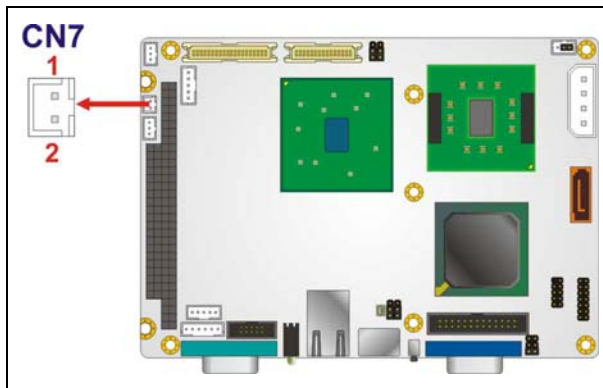
PIN NO.	DESCRIPTION
1	-5V
2	GND
3	-12V

**Table 4-13: PC/104 Power Input Connector Pinouts**

### 4.3.11 Power Button Connector

- CN Label:** CN7
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See **Figure 4-13**
- CN Pinouts:** See **Table 4-14**

The power button connector is connected to a power switch on the system chassis to enable users to turn the system on and off.


**Figure 4-13: Power Button Connector Location**

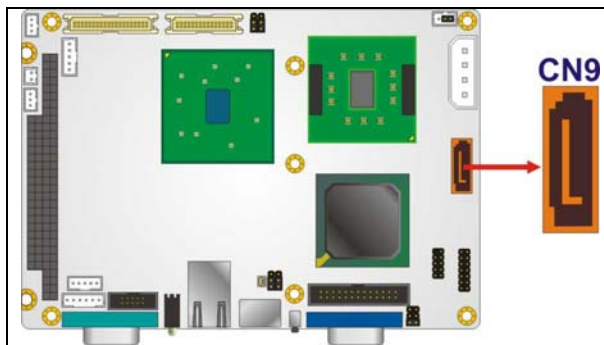
PIN NO.	DESCRIPTION
1	Power Switch
2	GND

**Table 4-14: Power Button Connector Pinouts**

**4.3.12 SATA Drive Connector**

- CN Label:** CN9
- CN Type:** 7-pin SATA drive connector
- CN Location:** See **Figure 4-14**
- CN Pinouts:** See **Table 4-15**

The SATA drive connector can be connected to a first generation SATA drive. First generation SATA drives transfer data at speeds as high as 150Mb/s.



**Figure 4-14: SATA Drive Connector Location**

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

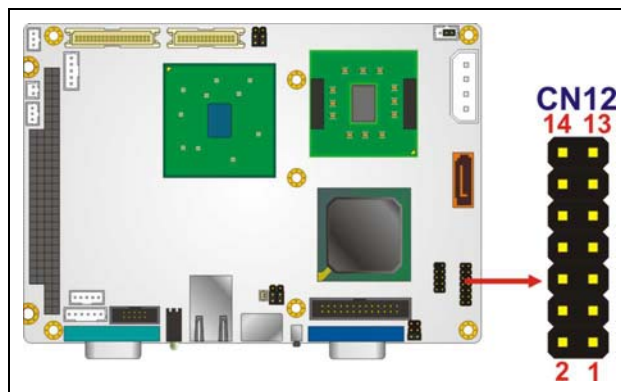
**Table 4-15: SATA Drive Connector Pinouts**



### 4.3.13 Serial Port Connector (COM2)

- CN Label:** CN12
- CN Type:** 14-pin header (2x7)
- CN Location:** See **Figure 4-15**
- CN Pinouts:** See **Table 4-16**

The 14-pin serial port connector connects to the COM2 serial communications channels. COM2 is a multifunction channel. In default mode COM2 is an RS-232 serial communication channel but, with the COM2 function select jumper, can be configured as either an RS-422 or RS-485 serial communications channel.



**Figure 4-15: COM2 Connector Pinout Locations**

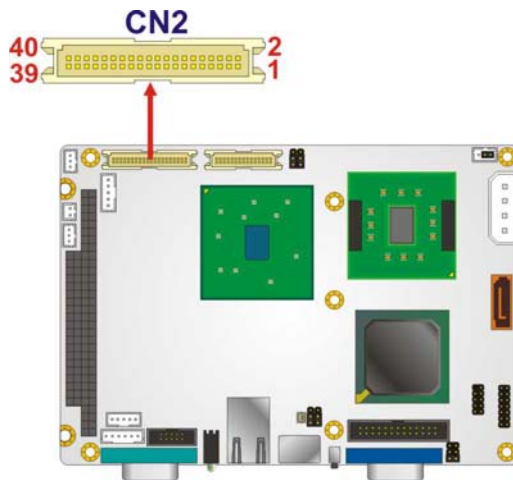
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DATA CARRIER DETECT (DCD)	2	DATA SET READY (DSR)
3	RECEIVE DATA (RXD)	4	REQUEST TO SEND (RTS)
5	TRANSMIT DATA (TXD)	6	CLEAR TO SEND (CTS)
7	DATA TERMINAL READY (DTR)	8	RING INDICATOR (RI)
9	GND	10	N/C
11	TXD485+	12	TXD485#
13	RXD485+	14	RXD485#

**Table 4-16: COM2 Connector Pinouts**

**4.3.14 TFT LCD TTL Connector**

- CN Label:** CN2
- CN Type:** 40-pin crimp (2x20)
- CN Location:** See **Figure 4-16**
- CN Pinouts:** See **Table 4-17**

The TFT LCD LVDS can be connected to a TFT LCD screen directly.



**Figure 4-16: TFT LCD TTL Connector Pinout Locations**

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	VCC_LCD	2	VCC_LCD
3	GND	4	GND
5	VCC_LCD	6	VCC_LCD
7	N/C	8	GND
9	TFT_B0	10	TFT_B1
11	TFT_B2	12	TFT_B3
13	TFT_B4	14	TFT_B5
15	TFT_B6	16	TFT_B7
17	TFT_G0	18	TFT_G1
19	TFT_G2	20	TFT_G3
21	TFT_G4	22	TFT_G5
23	TFT_G6	24	TFT_G7

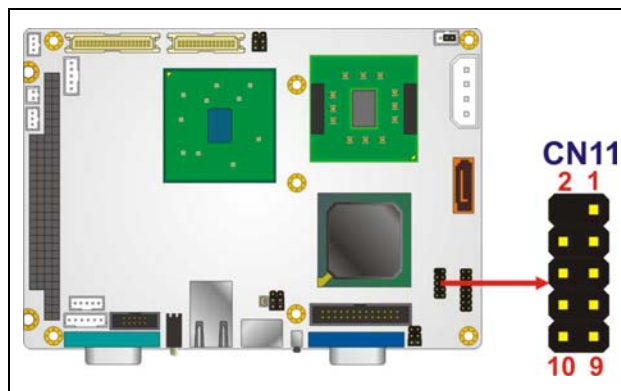
PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
25	TFT_R0	26	TFT_R1
26	TFT_R2	28	TFT_R3
29	TFT_R4	30	TFT_R5
31	TFT_R6	32	TFT_R7
33	GND	34	GND
35	FPCLK	36	T_VSYNC
37	TFT_EN	38	T_HSYNC
39	N/C	40	L_VDDEN

**Table 4-17: TFT LCD TTL Port Connector Pinouts**

### 4.3.15 USB Connector (Internal)

- CN Label:** CN11
- CN Type:** 9-pin header (2x4)
- CN Location:** See **Figure 4-17**
- CN Pinouts:** See **Table 4-18**

The 9-pin USB connector provides connectivity to two USB 1.1 or two USB 2.0 ports. The USB connector can support two USB devices. The USB ports are used for I/O bus expansion.



**Figure 4-17: USB Connector Pinout Locations**

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

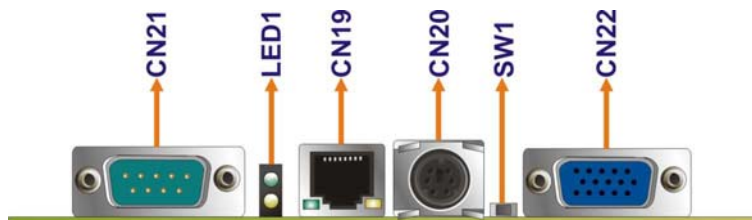
**Table 4-18: USB Port Connector Pinouts**

## 4.4 External Peripheral Interface Connector Panel

**Figure 4-18** shows the WAFER-8523 external peripheral interface connector (EPIC) panel.

The WAFER-8523 EPIC panel consists of the following:

- 1 x Keyboard/Mouse connector
- 1 x LAN connector
- 1 x LED indicator
- 1 x Reset button switch
- 1 x Serial port connector
- 1 x VGA connector

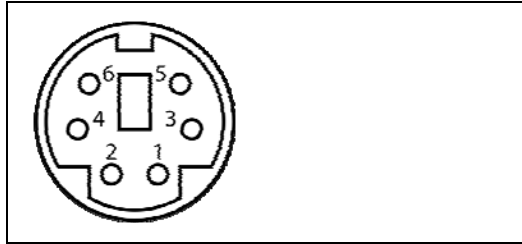


**Figure 4-18: WAFER-8523 External Peripheral Interface Connector**

### 4.4.1 Keyboard/Mouse Connector

- CN Label:** CN20
- CN Type:** PS/2 MINI-DIN
- CN Location:** See **Figure 4-19**
- CN Pinouts:** See **Table 4-19**

A keyboard and mouse can be connected to the standard PS/2 port using the supplied PS/2 Y-cable to add keyboard and mouse functionality to the system.



**Figure 4-19: Keyboard/Mouse Connector**

<b>PIN NO.</b>	<b>DESCRIPTION</b>
1	KB DATA
2	MS DATA
3	GROUND
4	VCC (+5V)
5	KB CLK
6	MS CLK

**Table 4-19: Keyboard/Mouse Connector Pinouts**

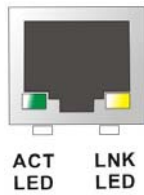
#### 4.4.2 LAN Connectors

- CN Label:** CN19
- CN Type:** RJ-45
- CN Location:** See **Figure 4-18**
- CN Pinouts:** See **Table 4-20**

The WAFER-8523 is equipped with one built-in RJ-45 Ethernet controller. The controllers can connect to the LAN through one RJ-45 LAN connector. There are two LEDs on the RJ-45 connector indicating the status of LAN. The pin assignments are listed in the following table:

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

**Table 4-20: LAN Pinouts**



**Figure 4-20: 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 4-21**.

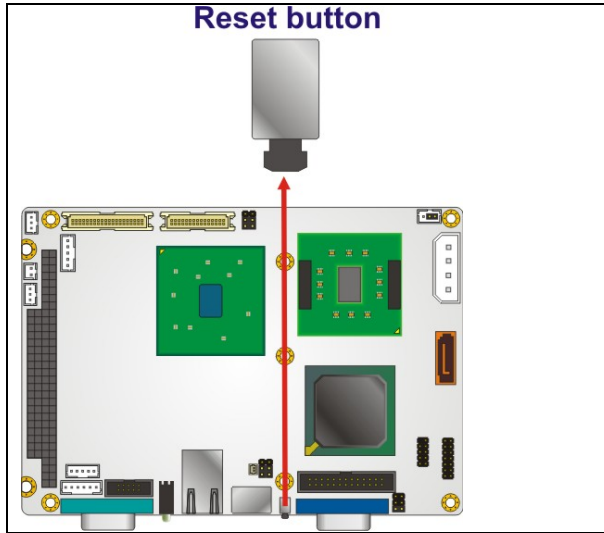
STATUS	DESCRIPTION	STATUS	DESCRIPTION
GREEN	Activity	YELLOW	Linked

**Table 4-21: RJ-45 Ethernet Connector LEDs**

#### 4.4.3 Reset Button Switch

- CN Label:** SW1
- CN Type:** 2-pin wafer (1x2)
- CN Location:** See **Figure 4-21**
- CN Pinouts:** See **Table 4-22**

The reset button switch enables users to reboot the system when the system is turned on.



**Figure 4-21: Reset Button Connector Locations**

PIN NO.	DESCRIPTION
1	Reset Switch
2	GND

**Table 4-22: Reset Button Connector Pinouts**

#### 4.4.4 Serial Port Connector (COM1)

- CN Label:** CN21
- CN Type:** DB-9 connectors
- CN Location:** See **Figure 4-18** (see 2)
- CN Pinouts:** See **Table 4-23** and **Figure 4-22**

The 9-pin DB-9 serial port connector is connected to RS-232 serial communications devices.

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	DCD	6	DSR
2	RX	7	RTS
3	TX	8	CTS
4	DTR	9	RI
5	GND		

Table 4-23: RS-232 Serial Port (COM 1) Pinouts

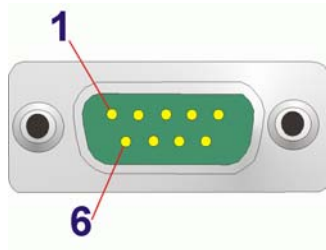


Figure 4-22: COM1 Pinout Locations

#### 4.4.5 VGA Connector

- CN Label:** CN22
- CN Type:** 15-pin Female
- CN Location:** See **Figure 4-18**
- CN Pinouts:** See **Figure 4-23** and **Table 4-24**

The WAFER-8523 has a single 15-pin female connector for connectivity to standard display devices.

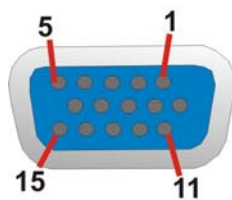


Figure 4-23: VGA Connector



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

**Table 4-24: VGA Connector Pinouts**

Chapter

5

# Installation

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## 5.1 Anti-static Precautions

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### WARNING:

Failure to take ESD precautions during the installation of the WAFER-8523 may result in permanent damage to the WAFER-8523 and severe injury to the user.

---

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER-8523. Dry climates are especially susceptible to ESD. It is therefore critical to strictly adhere to the following anti-static precautions whenever the WAFER-8523, or any other electrical component, is handled.

- **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 WAFER-8523, place it on an anti-static pad. This reduces the possibility of ESD damaging the WAFER-8523.
- **Only handle the edges of the PCB:** When handling the PCB, hold the PCB by the edges.

## Installation Considerations

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### NOTE:

The following installation notices and installation considerations should be read and understood before the WAFER-8523 is installed. All installation notices should be strictly adhered to. Failing to adhere to these precautions may lead to severe damage of the WAFER-8523 and injury to the person installing the motherboard.

---

### 5.1.1 Installation Notices

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**WARNING:**

The installation instructions described in this manual should be carefully followed in order to prevent damage to the WAFER-8523, WAFER-8523 components and injury to the user.

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Before and during the installation please **DO** the following:

- Read the user manual:
  - The user manual provides a complete description of the WAFER-8523 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 WAFER-8523 on an antistatic pad:
  - When installing or configuring the motherboard, place it on an antistatic pad. This helps to prevent potential ESD damage.
- Turn all power to the WAFER-8523 off:
  - When working with the WAFER-8523, 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 WAFER-8523 **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.

### 5.1.2 Installation Checklist

The following checklist is provided to ensure the WAFER-8523 is properly installed.

- All the items in the packing list are present
- A compatible memory module is properly inserted into the slot
- The CF Type I or CF Type II card is properly installed into the CF socket
- The jumpers have been properly configured
- The WAFER-8523 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
  - PS/104 modules
- The following external peripheral devices are properly connected to the chassis:
  - Keyboard and mouse cable
  - VGA screen
  - USB devices

## 5.2 Unpacking

When the WAFER-8523 is unpacked, please check all the unpacking list items listed in Chapter 3 are indeed present. If any of the unpacking list items are not available please contact the WAFER-8523 vendor reseller/vendor where the WAFER-8523 was purchased or contact an IEI sales representative.

## 5.3 SO-DIMM and CF Card Installation

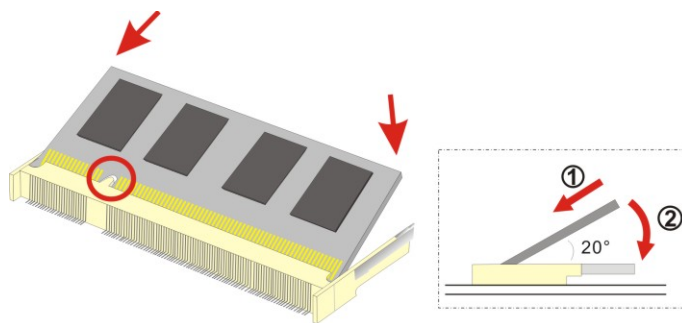
### 5.3.1 SO-DIMM Installation



#### WARNING:

Using incorrectly specified SO-DIMM may cause permanently damage the WAFER-8523. Please make sure the purchased SO-DIMM complies with the memory specifications of the WAFER-8523. SO-DIMM specifications compliant with the WAFER-8523 are listed in Chapter 2.

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



**Figure 5-1: SO-DIMM Installation**

- Step 1:** **Locate the SO-DIMM socket.** Place the WAFER-8523 on an anti-static pad with the solder side facing up.
- Step 2:** **Align the SO-DIMM with the socket.** The SO-DIMM must be oriented in such a way that the notch in the middle of the SO-DIMM must be aligned with the plastic bridge in the socket.
- Step 3:** **Insert the SO-DIMM.** Push the SO-DIMM chip into the socket at an angle. (See **Figure 5-1**)

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

### 5.3.2 CF Card Installation



#### NOTE:

The WAFER-8523 can support both CF Type I cards and CF Type II cards. For the complete specifications of the supported CF cards please refer to **Chapter 2**.

---

To install the CF card (Type 1 or Type 2) onto the WAFER-8523, please follow the steps below:

- Step 1:** **Locate the CF card socket**. Place the WAFER-8523 on an anti-static pad with the solder side facing up. Locate the CF card.
- Step 2:** **Align the CF card**. Make sure the CF card is properly aligned with the CF socket.
- Step 3:** **Insert the CF card**. Gently insert the CF card into the socket making sure the socket pins are properly inserted into the socket. See **Figure 5-2**.

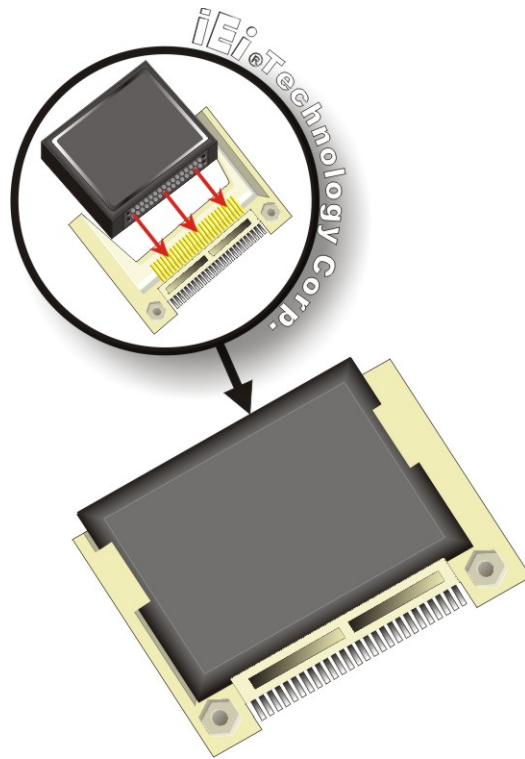


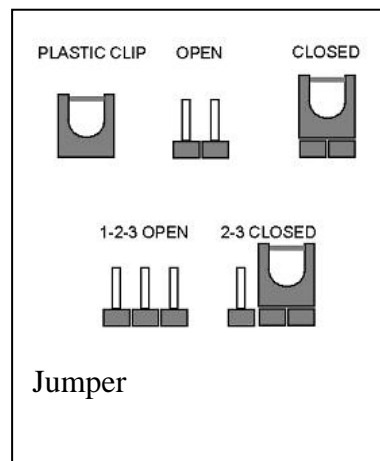
Figure 5-2: CF Card Installation

## 5.4 Jumper Settings



**NOTE:**

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



Jumper



Before the WAFER-8523 is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the WAFER-8523 are listed in **Table 5-1**.

Description	Label	Type
AT/ATX power mode setting	CN4	3-pin header
CF card setting	JP4	3-pin header
Clear CMOS setup	JP3	3-pin header
COM2 mode setting	JP5	6-pin header
LCD panel type setting	JP2	3-pin header
LCD power setting	JP1	3-pin header

**Table 5-1: Jumpers**

### 5.4.1 AT/ATX Power Select Jumper Settings



**NOTE:**

The AT Power Select Jumper is the same as the ATX Enable connector.

- 
- Jumper Label:** CN4
  - Jumper Type:** 3-pin header
  - Jumper Settings:** See **Table 5-2**
  - Jumper Location:** See **Figure 5-3**

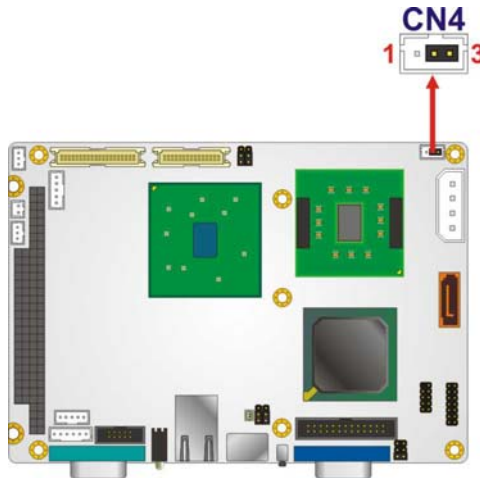
The AT/ATX Power Select jumper specifies the systems power mode as AT or ATX. Use a jumper cap to short pin 1 - pin 2 on the CN4 connector to enable the AT Power mode on the system. In the ATX mode use the PS\_ON- and 5VSB cable. AT/ATX Power Select jumper settings are shown in **Table 5-2**.

## WAFER-8523 User Manual

AT Power Select	Description	
Short 2 – 3	Use AT power	Default
OFF	Use ATX power	

**Table 5-2: AT/ATX Power Select Jumper Settings**

The location of the AT Power Select jumper is shown in **Figure 5-3** below.



**Figure 5-3: AT/ATX Power Select Jumper Location**

### 5.4.2 CF Card Setup

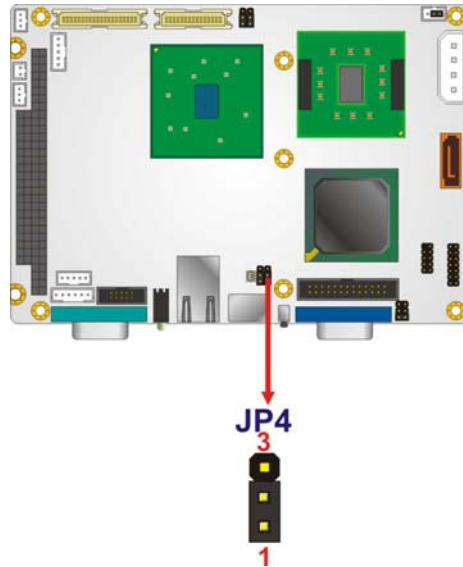
<b>Jumper Label:</b>	<b>JP4</b>
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See <b>Table 5-3</b>
<b>Jumper Location:</b>	See <b>Figure 5-4</b>

The CF Card Setup jumper sets the CF Type I card or CF Type II cards as either the slave device or the master device. CF Card Setup jumper settings are shown in **Table 5-3**.

CF Card Setup	Description	
Short 1-2	Slave	Default
Short 2-3	Master	

**Table 5-3: CF Card Setup Jumper Settings**

The CF Card Setup jumper location is shown in **Figure 5-4**.



**Figure 5-4: CF Card Setup Jumper Location**

### 5.4.3 Clear CMOS Jumper

<b>Jumper Label:</b>	<b>JP3</b>
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See <b>Table 5-4</b>
<b>Jumper Location:</b>	See <b>Figure 5-5</b>

If the WAFER-8523 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.

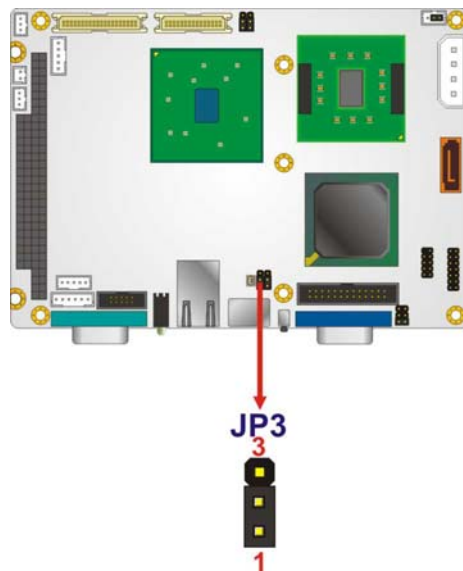
After having done one of the above, save the changes and exit the CMOS Setup menu.

The clear CMOS jumper settings are shown in **Table 5-4**.

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

**Table 5-4: Clear CMOS Jumper Settings**

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



**Figure 5-5: Clear CMOS Jumper**

#### 5.4.4 COM 2 Function Select Jumper

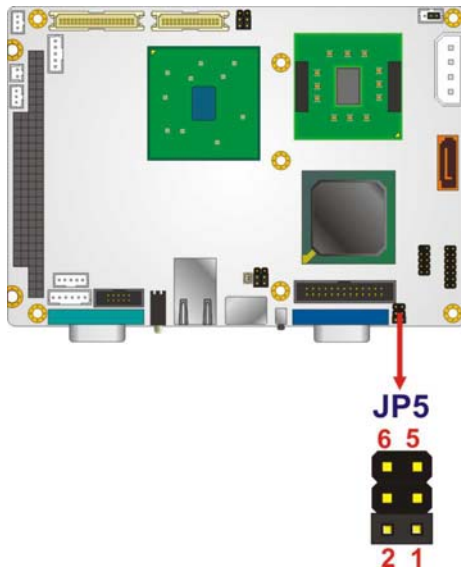
- Jumper Label:** JP5
- Jumper Type:** 6-pin header
- Jumper Settings:** See **Table 5-5**
- Jumper Location:** See **Figure 5-6**

The COM 2 Function Select jumper sets the communication protocol used by the second serial communications port (COM 2) as RS-232, RS-422 or RS-485. The COM 2 Function Select settings are shown in **Table 5-5**.

COM 2 Function Select	Description	
Short 1-2	RS-232	Default
Short 3-4	RS-422	
Short 5-6	RS-485	

**Table 5-5: COM 2 Function Select Jumper Settings**

The COM 2 Function Select jumper location is shown in **Figure 5-6**.



**Figure 5-6: COM 2 Function Select Jumper Location**

#### 5.4.5 TTL/LVDS LCD Mode Select Jumper

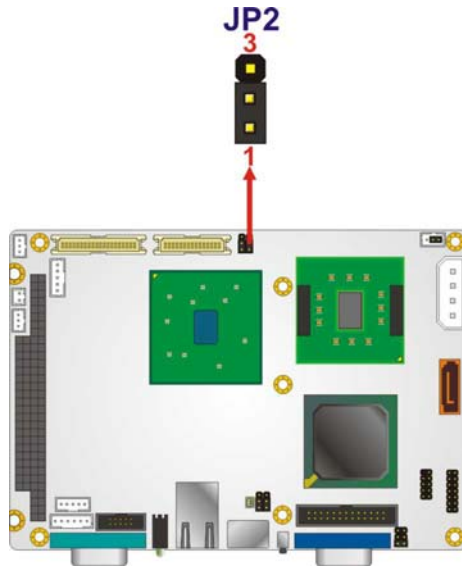
- Jumper Label:** JP2
- Jumper Type:** 3-pin header
- Jumper Settings:** See **Table 5-6**
- Jumper Location:** See **Figure 5-7**

The TTL/LVDS Mode Select jumper selects the video mode. The TTL/LVDS Mode Select jumper settings are shown in **Table 5-6**.

Setting	Description
1-2	LVDS MODE (default)
2-3	TTL MODE

**Table 5-6: CRT/LCD Mode Select Jumper Settings**

The TTL/LVDS Mode Select jumper location is shown in **Figure 5-7**.



**Figure 5-7: TTL/LVDS Mode Select Jumper Settings**

#### 5.4.6 LVDS Voltage Selection



**WARNING:**

Permanent damage to the screen and WAFER-8523 may occur if the wrong voltage is selected with this jumper. Please refer to the user guide that came with the monitor to select the correct voltage.

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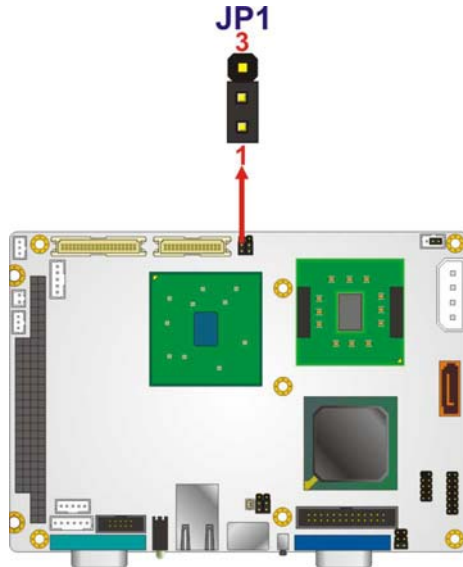
<b>Jumper Label:</b>	<b>JP1</b>
<b>Jumper Type:</b>	3-pin header
<b>Jumper Settings:</b>	See <b>Table 5-7</b>
<b>Jumper Location:</b>	See <b>Figure 5-8</b>

The **LVDS Voltage Selection** jumpers allow the LVDS screen voltages to be set. J\_VLVDS1 sets the voltage connected to LVDS1 and J\_VLVDS2 sets the voltage for the screen connected to LVDS2. The **LVDS Voltage Selection** jumper settings are shown in **Table 5-7**.

LCD Voltage Select	Description	
Short 1-2	+3.3V LVDS	Default
Short 2-3	+5V LVDS	

**Table 5-7: LVDS Voltage Selection Jumper Settings**

The LVDS Voltage Selection jumper location is shown in **Figure 5-8**.



**Figure 5-8: LVDS Voltage Selection Jumper Pinout Locations**

## 5.5 Chassis Installation



### **WARNING:**

Airflow is critical to the cooling of the CPU and other onboard components. The chassis in which the WAFER-8523 must have air vents to allow cool air to move into the system and hot air to move out.

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The WAFER-8523 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.



### NOTE:

IEI has a wide range of backplanes available. Please contact your WAFER-8523 vendor, reseller or an IEI sales representative at [sales@iei.com.tw](mailto:sales@iei.com.tw) or visit the IEI website (<http://www.ieworld.com.tw>) to find out more about the available chassis.

### 5.5.1 Motherboard Installation

To install the WAFER-8523 motherboard into the chassis please refer to the reference material that came with the chassis.

## 5.6 Internal Peripheral Device Connections

### 5.6.1 Peripheral Device Cables

The cables listed in **Table 5-8** are shipped with the WAFER-8523.

Quantity	Type
1	Keyboard and Mouse Y cable
2	SATA drive cable
1	Audio cable
1	USB cable

**Table 5-8: IEI Provided Cables**

Some optional items that can be purchased separately and installed on the WAFER-8523 include:

- Dual port USB cable



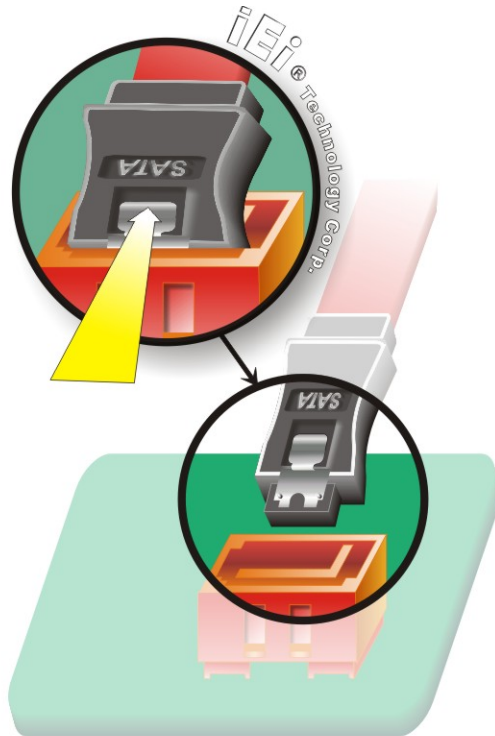
- RS-232/422/485 cable
- ATX power cable
- SATA power cable

### 5.6.2 SATA Drive Connection

The WAFER-8523 is shipped with two SATA drive cables. To connect the SATA drives to the connectors, please follow the steps below.

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

**Step 2:** **Insert the cable connector.** 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 5-9**.



**Figure 5-9: 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 5-10**.

**NOTE:**

The SATA power cable described below is an optional item and must be pre-ordered. The SATA power cable is not shipped with the system.

**Step 4:** Connect the **SATA power cable (optional)**. Connect the SATA power connector to the back of the SATA drive. See **Figure 5-10**.



**Figure 5-10: SATA Power Drive Connection**

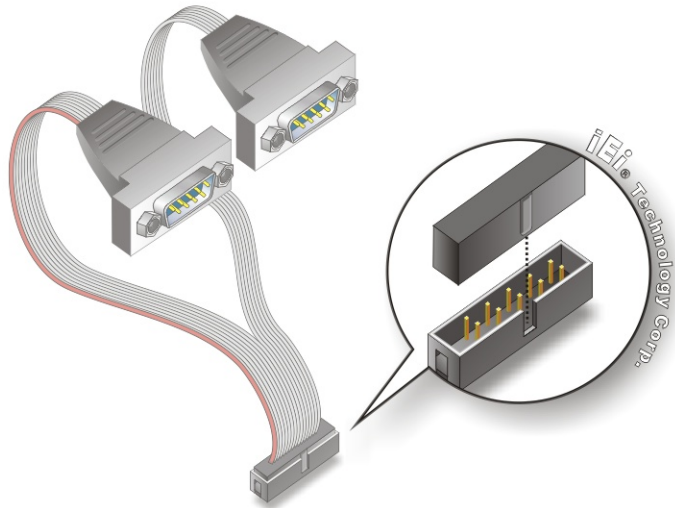
### 5.6.3 Dual RS-232 Cable Connection (w/o bracket) (Optional)

The dual RS-232 cable consists of two connectors attached to two independent cables. Each cable is then attached to a D-sub 9-pin male connector. 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 5-11**. A key on the front of the cable connectors ensures

the connector can only be installed in one direction.



**Figure 5-11: Dual RS-232 Cable Installation**

- Step 3: Secure the connectors.** Both single RS-232 connectors have two retention screws that must be secured to a chassis or bracket.
- Step 4: Connect the serial device.** Once the single RS-232 connectors are connected to a chassis or bracket, a serial communications device can be connected to the system.

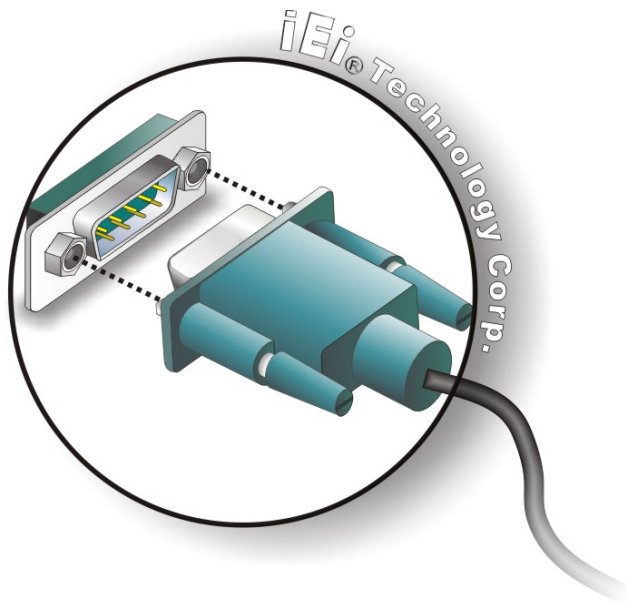


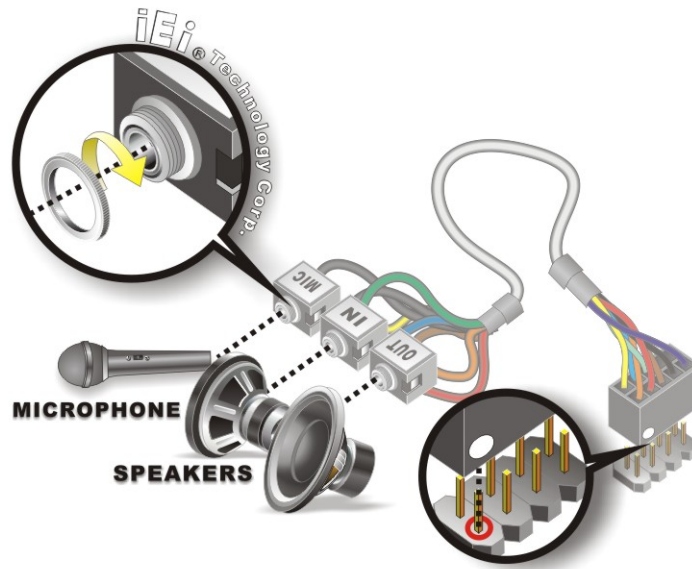
Figure 5-12: Serial Device Connector

#### 5.6.4 Audio Kit Installation

The Audio Kit that came with the WAFER-8523 connects to the audio connector on the WAFER-8523. The audio kit consists of three audio jacks. Mic-in connects to a microphone. Line-in provides a stereo line-level input to connect to the output of an audio device. Line-out, a stereo line-level output, connects to two amplified speakers. To install the audio kit, please refer to the steps below:

**Step 1: Locate the audio connector.** The location of the 10-pin audio connector is shown in **Chapter 3**.

**Step 2: Align pin 1.** Align pin 1 on the on-board connector with pin 1 on the audio kit connector. Pin 1 on the audio kit connector is indicated with a white dot. See **Figure 5-13**.



**Figure 5-13: Audio Kit Cable Connection**

**Step 3:** **Connect the audio devices.** Connect speakers to the line-out audio jack. Connect the output of an audio device to the line-in audio jack. Connect a microphone to the mic-in audio jack.

### 5.6.5 USB Cable (Dual Port without Bracket) (Optional)

The WAFER-8523 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.



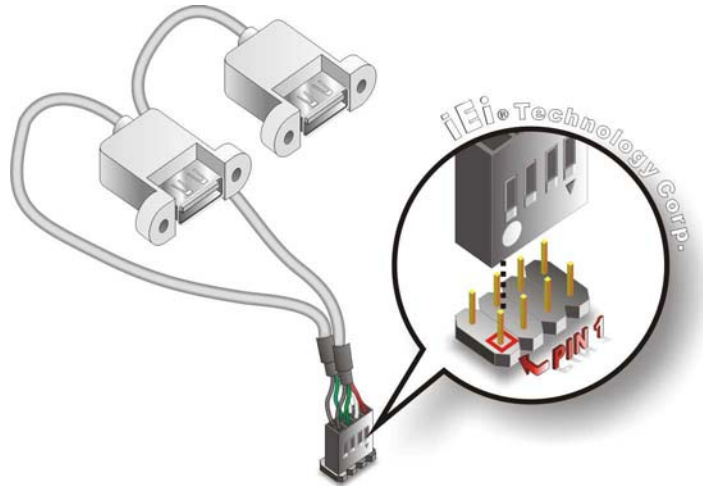
**WARNING:**

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 1 on each cable connector with pin 1 on the WAFER-8523 USB connector.

**Step 3:** **Insert the cable connectors.** Once the cable connectors are properly aligned

with the USB connectors on the WAFER-8523, connect the cable connectors to the on-board connectors. See **Figure 5-14**.



**Figure 5-14: Dual USB Cable Connection**

**Step 4:** Attach the USB connectors to the chassis. The USB 2.0 connectors each of two retention screw holes. To secure the connectors to the chassis please refer to the installation instructions that came with the chassis.

## 5.7 External Peripheral Interface Connection

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

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

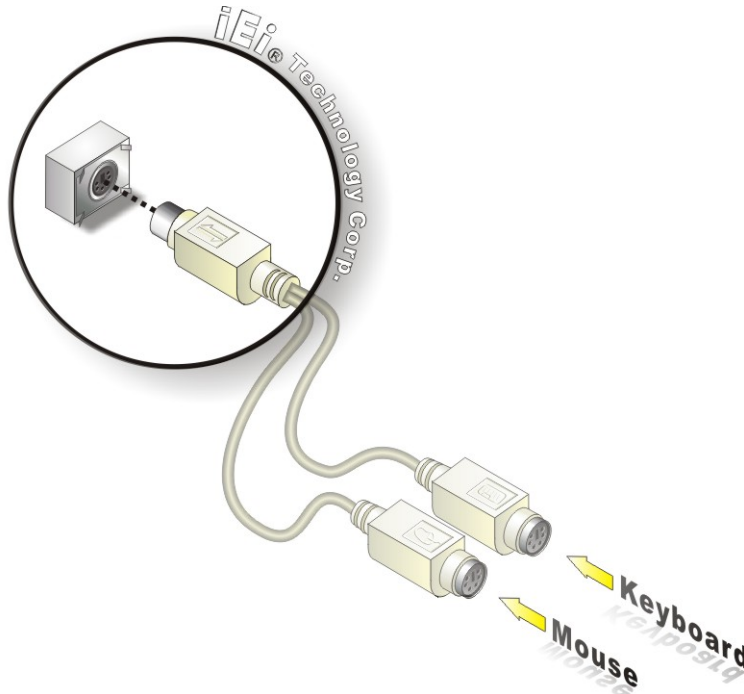
To install these devices, connect the corresponding cable connector from the actual device to the corresponding WAFER-8523 external peripheral interface connector making sure the pins are properly aligned.

### 5.7.1 PS/2 Y-Cable Connection

The WAFER-8523 has a PS/2 connector on the external peripheral interface panel. The dual PS/2 connector is connected to the PS/2 Y-cable that came with the WAFER-8523. One of the PS/2 cables is connected to a keyboard and the other to a mouse to the system. Follow the steps below to connect a keyboard and mouse to the WAFER-8523.

**Step 1:** Locate the dual PS/2 connector. The location of the 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 5-15**.



**Figure 5-15: PS/2 Keyboard/Mouse Connector**

**Connect the keyboard and mouse.** Connect the keyboard and mouse to the appropriate connector. The keyboard and mouse connectors can be distinguished from each other by looking at the small graphic at the top of the connector.

### 5.7.2 LAN Connection (Single Connector)

There is one external RJ-45 LAN connector. The RJ-45 connector enables connection to an external network. To connect a LAN cable with an RJ-45 connector, please follow the instructions below.

**Step 3:** **Locate the RJ-45 connectors.** The location of the RJ-45 connector is shown in Chapter 4.

**Step 4:** **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connector on the WAFER-8523. See **Figure 5-16**.

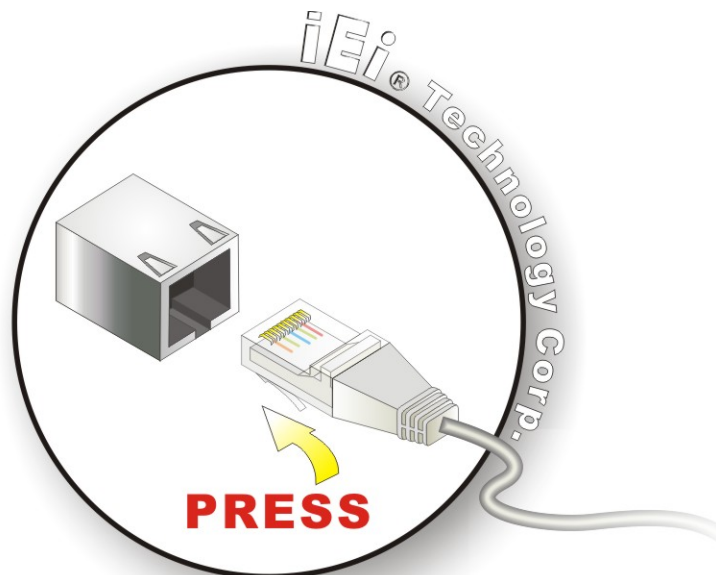


Figure 5-16: LAN Connection

**Step 5:** **Insert the LAN cable RJ-45 connector.** Once aligned, gently insert the LAN cable RJ-45 connector into the onboard RJ-45 connector.

### 5.7.3 Serial Device Connection

The WAFER-8523 has a single female DB-9 connector on the external peripheral interface panel for a serial device. Follow the steps below to connect a serial device to the WAFER-8523.



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

**Step 2:** Insert the serial connector. Insert the DB-9 connector of a serial device into the DB-9 connector on the external peripheral interface. See Figure 5-17.

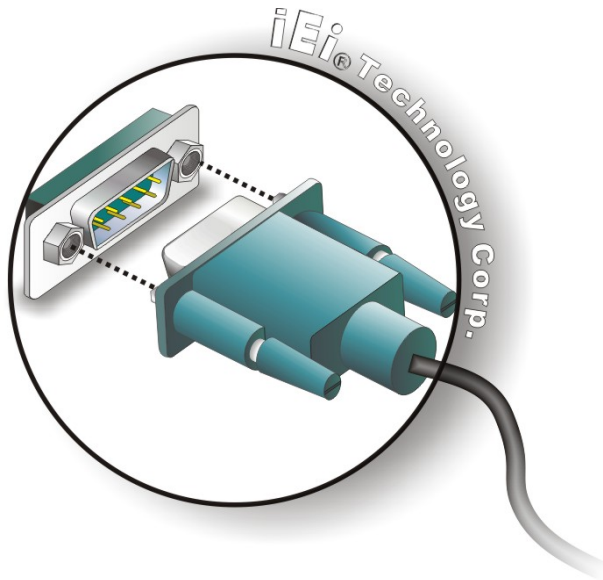


Figure 5-17: Serial Device Connector

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

#### 5.7.4 VGA Monitor Connection

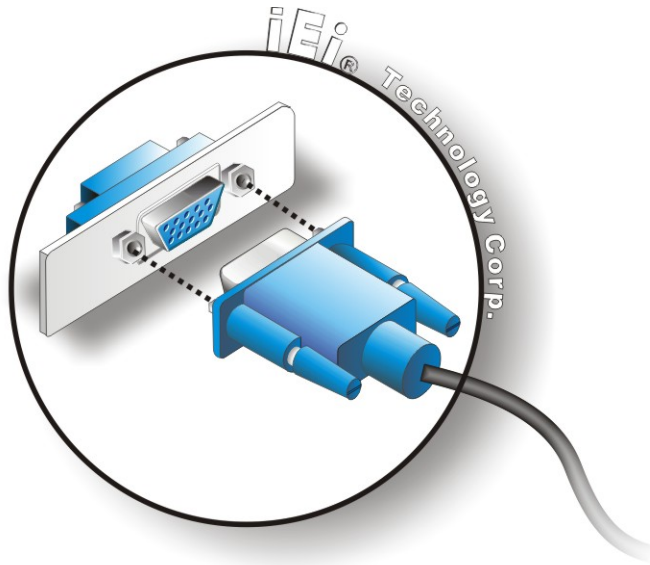
The WAFER-8523 has a single female DB-15 connector on the external peripheral interface panel. The DB-15 connector is connected to a CRT or VGA monitor. To connect a monitor to the WAFER-8523, please follow the instructions below.

**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.

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**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 WAFER-8523. 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

# BIOS Screens

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## 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 below.

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 16 colors. F2 to select color forward.
F10 key	Save all the CMOS changes, only for Main Menu

**Table 6-1: BIOS Navigation Keys**

### 6.1.3 Getting Help

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

### 6.1.4 Unable to Reboot After Configuration Changes

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

### 6.1.5 BIOS Menu Bar

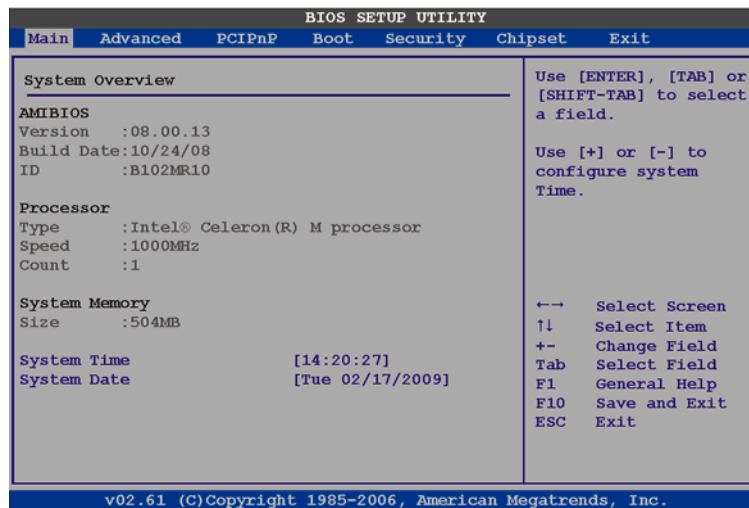
The **menu bar** on top of the BIOS screen has the following main items:

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

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

## 6.2 Main

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



### BIOS Menu 1: Main

#### → System Overview

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

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

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

#### → System Time [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:

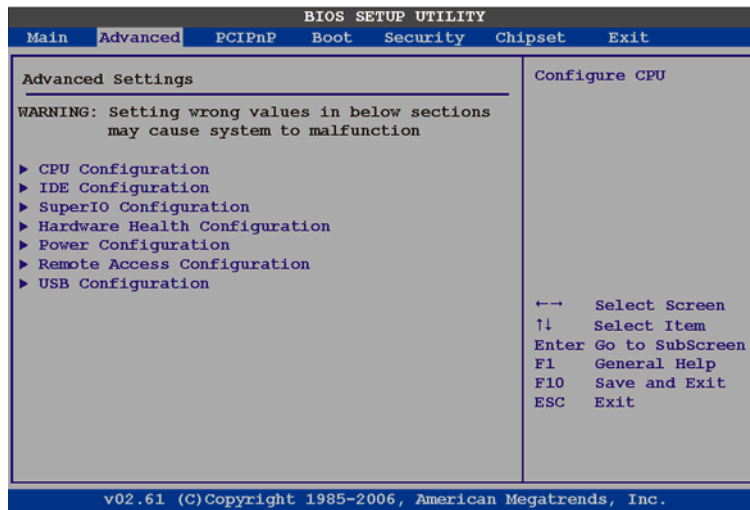


**WARNING:**

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.

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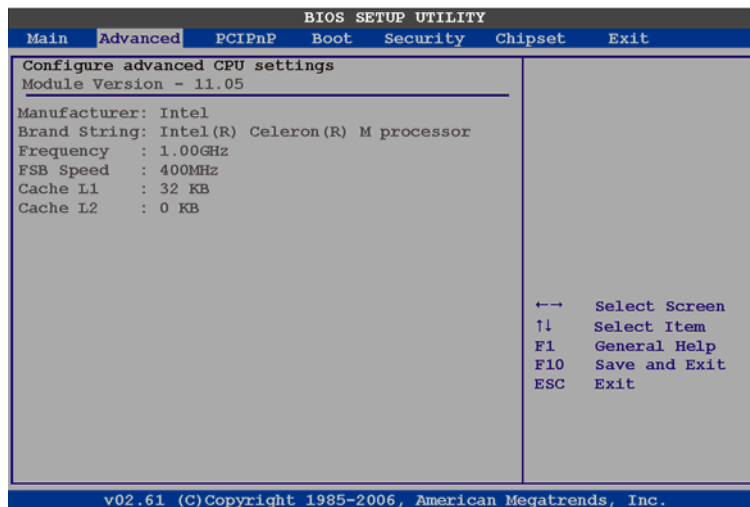
- CPU Configuration (see **Section 6.3.1**)
- IDE Configuration (see **Section 6.3.2**)
- Super I/O Configuration (see **Section 6.3.3**)
- Hardware Health Configuration (see **Section 6.3.4**)
- Power Configuration (see **Section 6.3.5**)
- Remote Access Configuration (see **Section 6.3.5.1**)
- USB Configuration (see **Section 6.3.7**)



## 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:

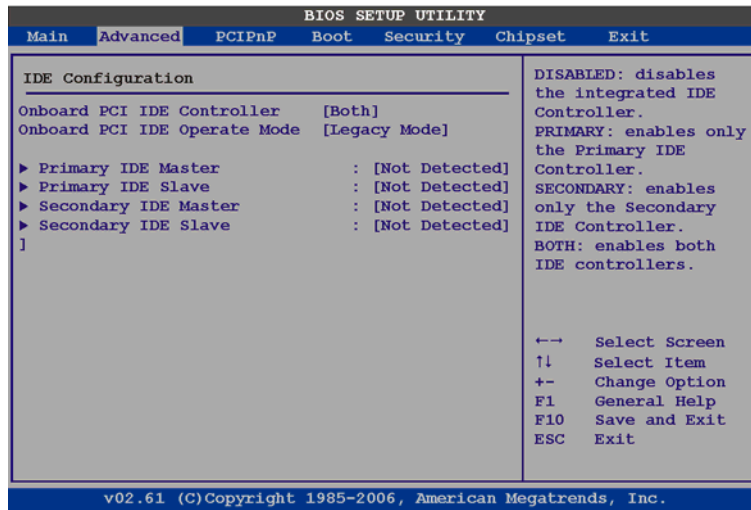
- **Manufacturer:** Lists the name of the CPU manufacturer
- **Brand String:** Lists the brand name of the CPU being used



- **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.



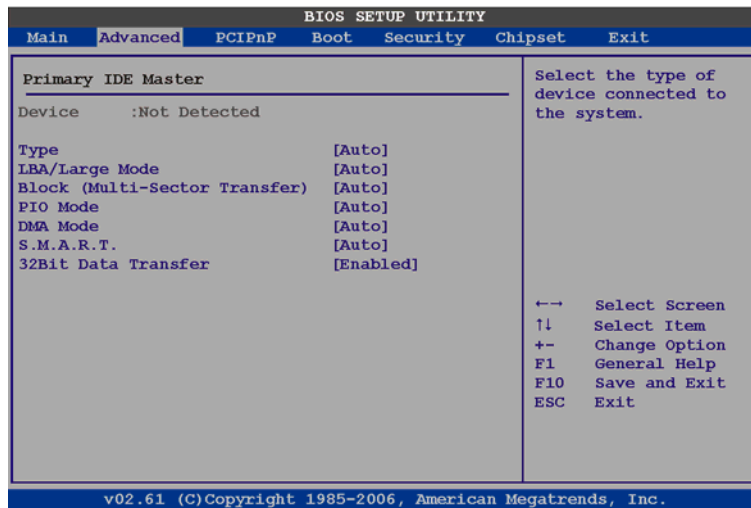
#### BIOS Menu 4: IDE Configuration

#### → ATA/IDE Configurations [Compatible]

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

- **Disabled**                      Disables the on-board ATA/IDE controller.
- **Compatible**                      Configures the on-board ATA/IDE controller to be in compatible mode. In this mode, a SATA channel will replace one of the IDE channels. This mode supports up to 4 storage devices.
- **Enhanced      DEFAULT**              Configures the on-board ATA/IDE controller to be in Enhanced mode. In this mode, IDE channels and SATA channels are separated. This mode supports up to 6





### 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.

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- **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

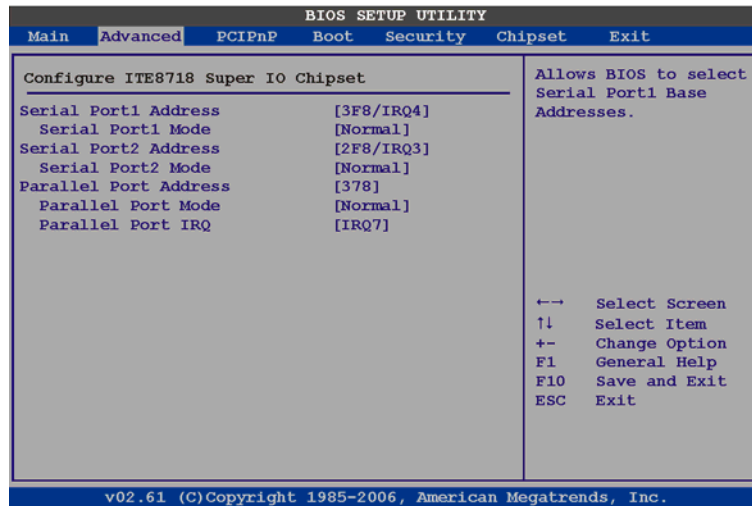
**→ 32Bit Data Transfer [Enabled]**

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 Super I/O Configuration

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



**BIOS Menu 6: Super I/O Configuration**

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### → 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 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

### → Parallel Address [378]

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

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



**→ Parallel Port Mode [Normal]**

The Parallel Port Mode selection selects the mode the parallel port operates in.

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

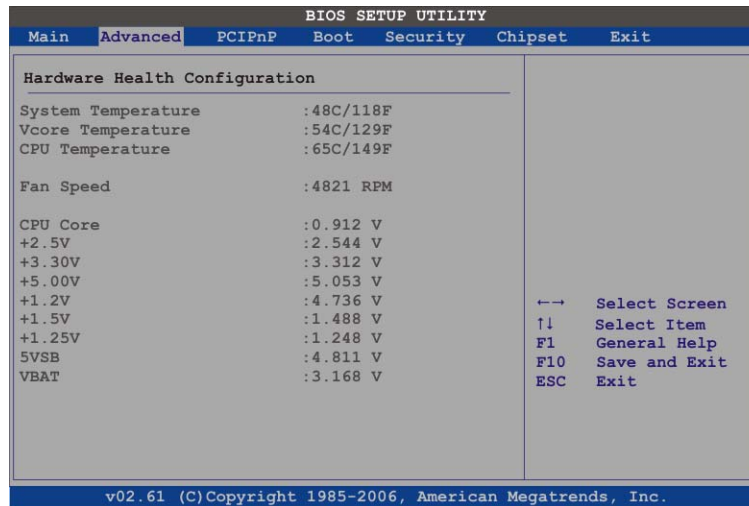
**→ Parallel Port IRQ [IRQ7]**

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

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

## 6.3.4 Hardware Health Configuration

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



### BIOS Menu 7: Hardware Health Configuration

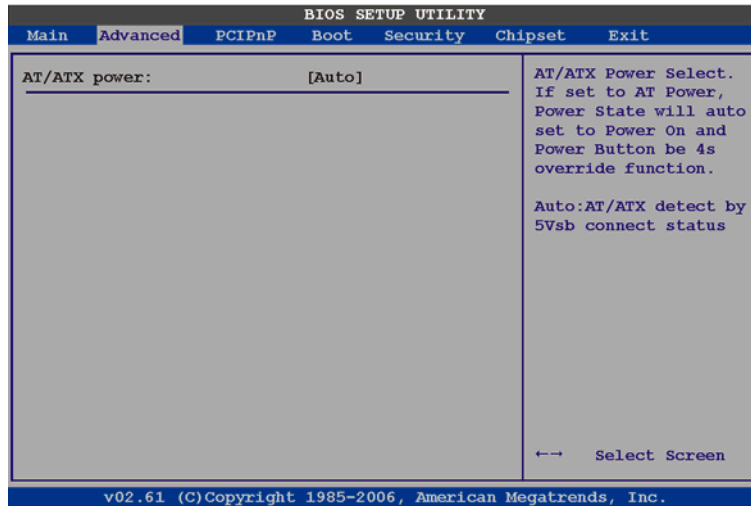
The following system parameters and values are shown. The system parameters that are monitored are:

- **System Temperatures:** The following system temperatures are monitored
  - System Temperature
  - Vcore Temperature
  - CPU Temperature
- **Fan Speeds:** The CPU cooling fan speed is monitored.
  - Fan Speed
- **Voltages:** The following system voltages are monitored
  - CPU Core
  - +2.5V
  - +3.30V
  - +5.00V
  - +1.2V
  - +1.5V
  - +1.25V

- 5VSB
- VBAT

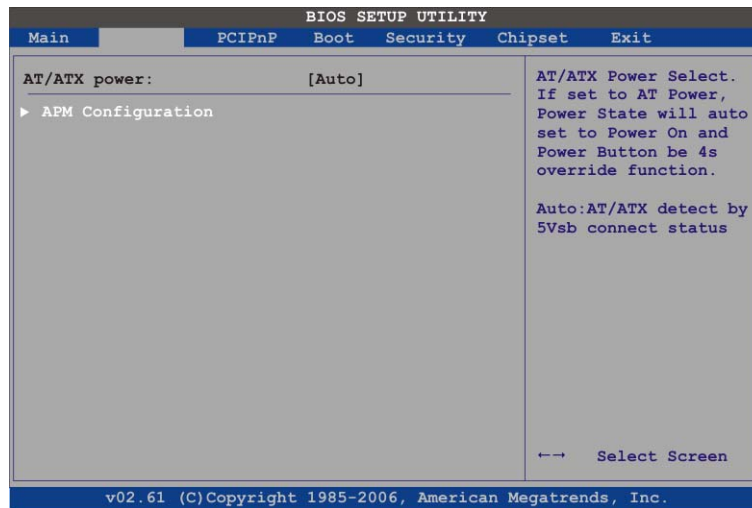
### 6.3.5 Power Configuration

Use the Power Configuration Menu to set select AT or ATX power modes. This menu also displays the current AT/ATX jumper setting.



#### BIOS Menu 8: Power Configuration

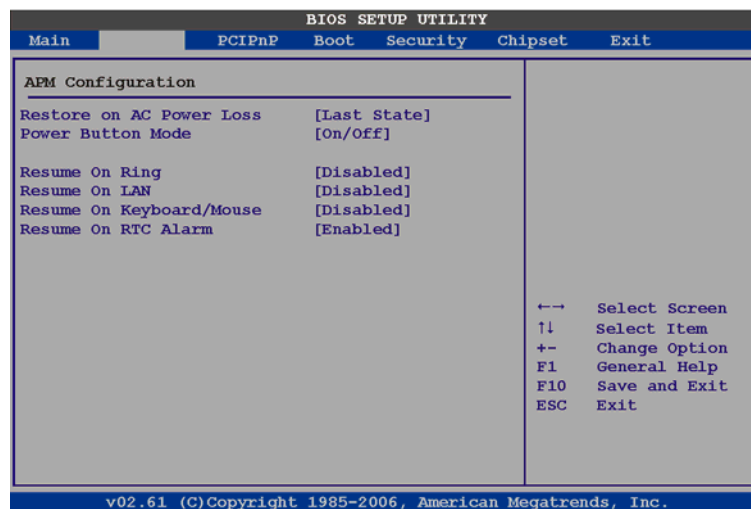
When ATX power is selected the following menu appears (BIOS Menu 9). The Advanced **Power Configuration** menu (BIOS Menu 9) configures the Advanced Configuration and Power Interface (ACPI) and Power Management (APM) options.



## BIOS Menu 9: Advanced Power Configuration

### 6.3.5.1 APM Configuration

The **APM Configuration** menu (**BIOS Menu 10**) allows the advanced power management options to be configured.



## BIOS Menu 10: Advanced Power Management Configuration

### → Restore on AC Power Loss [Last State]

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

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

→ **Power Button Mode [On/Off]**

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

- **On/Off**    **DEFAULT**    When the power button is pressed the system is either turned on or off
- **Suspend**                      When the power button is pressed the system goes into suspend mode

→ **Resume on Keyboard/Mouse [Disabled]**

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

- **Disabled**    (Default)    Wake event not generated by activity on the keyboard or mouse
- **Enabled**                      Wake event generated by activity on the keyboard or mouse

→ **Resume on Ring [Disabled]**

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

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

→ **Resume on LAN [Enabled]**

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Use the **Resume On LAN** BIOS option to enable activity on the LAN to rouse the system from a suspend or standby state.

- **Disabled** Wake event not generated by LAN signal activity
- **Enabled** **DEFAULT** Wake event generated by LAN signal activity

### → **Resume On RTC Alarm [Disabled]**

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

- **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event
- **Enabled** If selected, the following appears with values that can be selected:

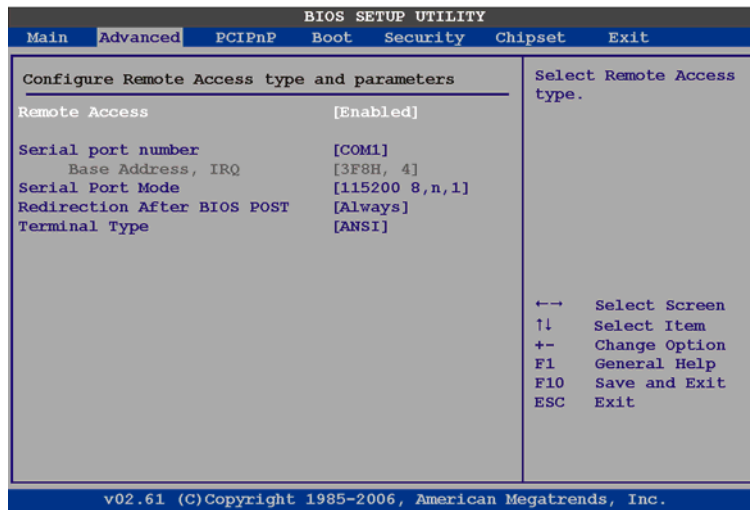
#### → **RTC Alarm Date (Days)**

#### → **System Time**

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

### 6.3.6 Remote Configuration

Use the **Remote Access Configuration** menu (**BIOS Menu 11**) 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 11: Remote Access Configuration [Advanced]**

➔ **Remote Access [Disabled]**

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

- ➔ **Disabled**      **DEFAULT**      Remote access is disabled.
- ➔ **Enabled**      Remote access configuration options shown below appear:

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

These configuration options are discussed below.

➔ **Serial Port Number [COM1]**

## WAFER-8523 User Manual

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

- **COM1**    **DEFAULT**    System is remotely accessed through COM1
- **COM2**                    System is remotely accessed through COM2

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

### → **Base Address, IRQ [2F8h,3]**

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

### → **Serial Port Mode [115200 8,n,1]**

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

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



#### **NOTE:**

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

### → **Flow Control [None]**

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

- **None**            **DEFAULT**    No control flow,
- **Hardware**                    Hardware is set as the console redirection
- **Software**                    Software is set as the console redirection



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

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

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

**→ Terminal Type [ANSI]**

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

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

**→ VT-UTF8 Combo Key Support [Disabled]**

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

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

- **Disabled**    **DEFAULT**                      Disables the VT-UTF8 terminal keys
- **Enabled**                      Enables the VT-UTF8 combination key. Support for ANSI/VT100 terminals

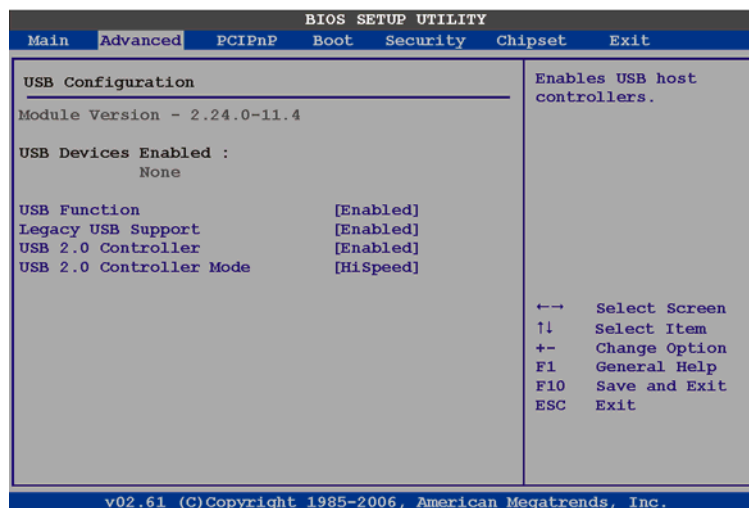
**→ Sredir Memory Display Delay [Disabled]**

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

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

### 6.3.7 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 12**) to read USB configuration information and configure the USB settings.



#### BIOS Menu 12: USB Configuration

##### ➔ USB Functions [Enabled]

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

- ➔ Disabled                            USB controllers are enabled
- ➔ Enabled                            DEFAULT    USB controllers are disabled

##### ➔ USB 2.0 Controller [Enabled]

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

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

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

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

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

➔ **Legacy USB Support [Enabled]**

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

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

## 6.4 PCI/PnP

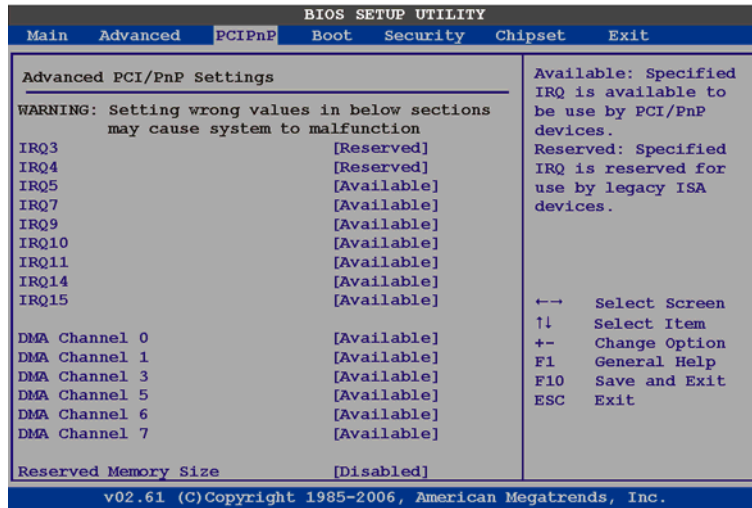
Use the PCI/PnP menu (BIOS Menu 13) to configure advanced PCI and PnP settings.



**WARNING:**

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

---



## BIOS Menu 13: 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

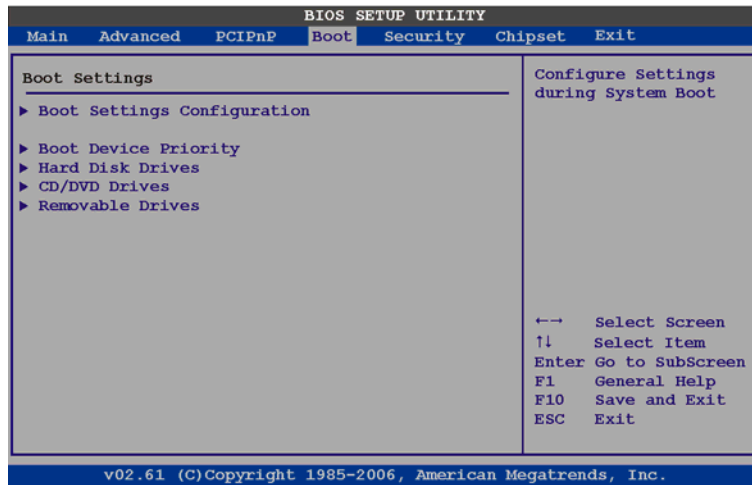
**→ Reserved Memory Size [Disabled]**

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

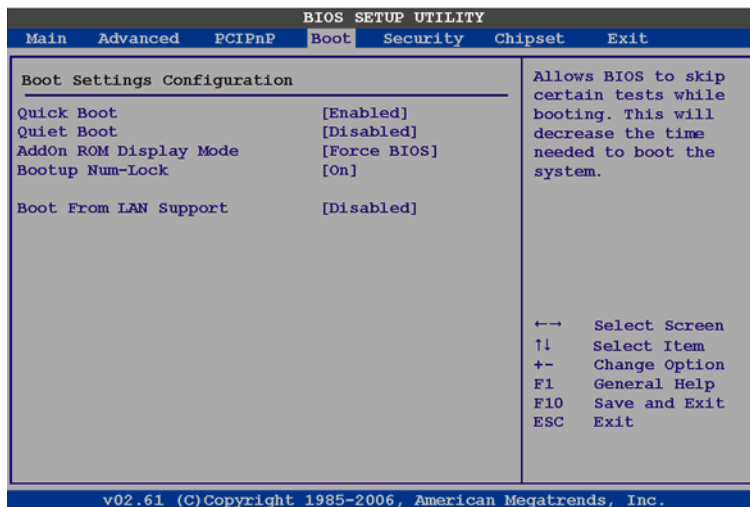
Use the Boot menu (BIOS Menu 14) to configure system boot options.



## BIOS Menu 14: Boot

### 6.5.1 Boot Settings Configuration

Use the Boot Settings Configuration menu (BIOS Menu 14) to configure advanced system boot options.



## BIOS Menu 15: Boot Settings Configuration

### → Quick Boot [Enabled]

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

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

→ **Quiet Boot [Disabled]**

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

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

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

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

- **Force BIOS**      **DEFAULT**      Allows the computer system to force a third party BIOS to display during system boot.
- **Keep Current**                      Allows the computer system to display the information during system boot.

→ **Bootup Num-Lock [Off]**

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

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

Lock LED light on the keyboard is lit.

## → Boot From LAN Support [Disabled]

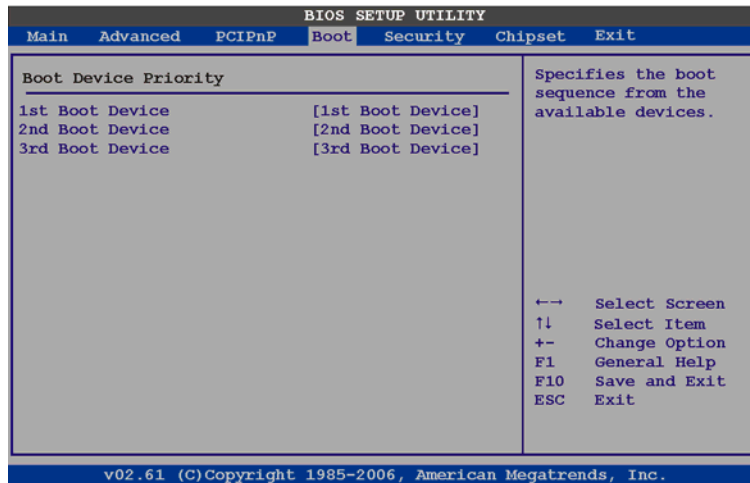
The **BOOT From LAN Support** option enables the system to be booted from a remote system.

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

## 6.5.2 Boot Device Priority

Use the **Boot Device Priority** menu (**BIOS Menu 16**) to specify the boot sequence from the available devices. The following options are available:

- 1<sup>st</sup> Boot Device
- 2<sup>nd</sup> Boot Device
- 3<sup>rd</sup> Boot Device

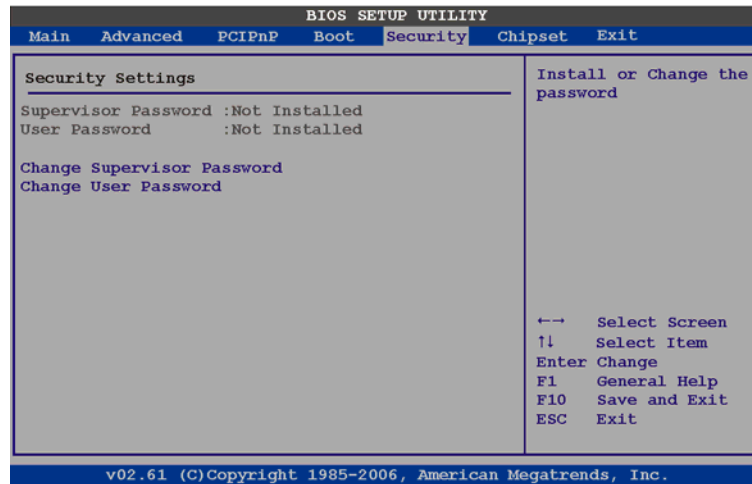


**BIOS Menu 16: Boot Device Priority Settings**



## 6.6 Security

Use the Security menu (BIOS Menu 17) to set system and user passwords.



### BIOS Menu 17: Security

#### → Change Supervisor Password

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

#### → Change User Password

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

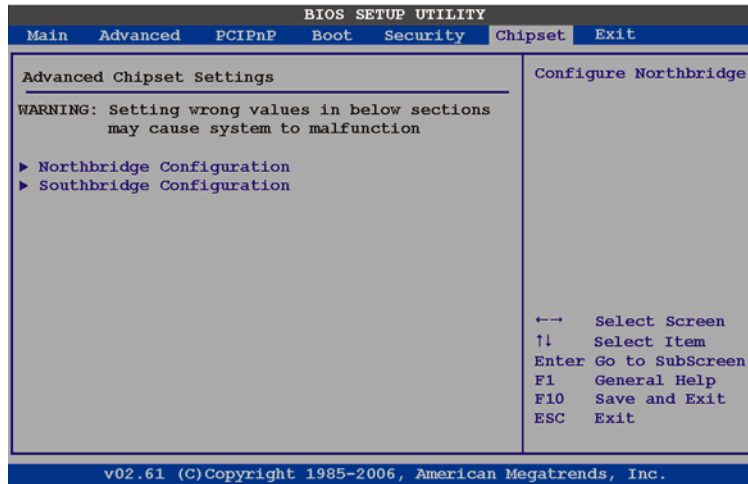
## 6.7 Chipset

Use the **Chipset** menu (**BIOS Menu 18**) to access the Northbridge and Southbridge configuration menus



## WARNING!

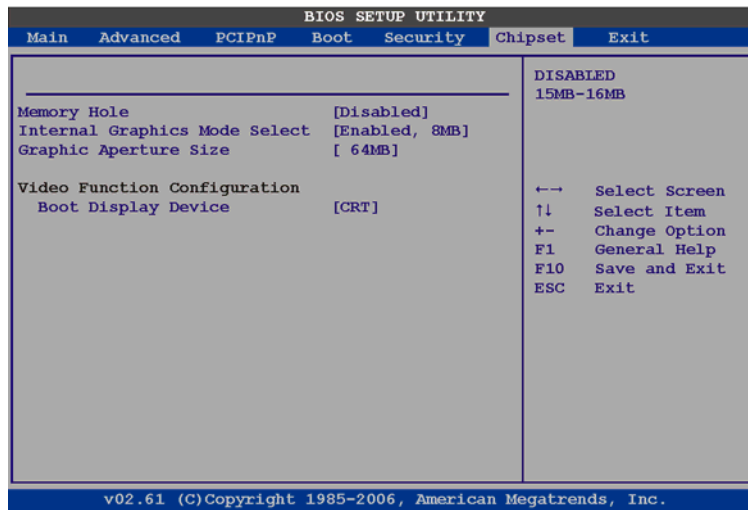
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.



**BIOS Menu 18: Chipset**

### 6.7.1 Northbridge Chipset Configuration

Use the **Northbridge Chipset Configuration** menu (BIOS Menu 18) to configure the Northbridge chipset settings.


**BIOS Menu 19: Northbridge Chipset Configuration**
**→ Memory Hole [Disabled]**

The **Memory Hole** reserves the 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**                      Memory is reserved for ISA expansion cards

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

The **Internal Graphic Mode Select** option determines 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

**→ Graphics Aperture Size [64MB]**

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Use the **Graphics Aperture Size** option to specify the amount of system memory that can be allocated for the AGP aperture.

- ➔ **64MB**                      **DEFAULT**                      64MB of memory use for AGP aperture
- ➔ **128MB**                                           128MB of memory use for AGP aperture
- ➔ **256MB**                                           256MB of memory use for AGP aperture

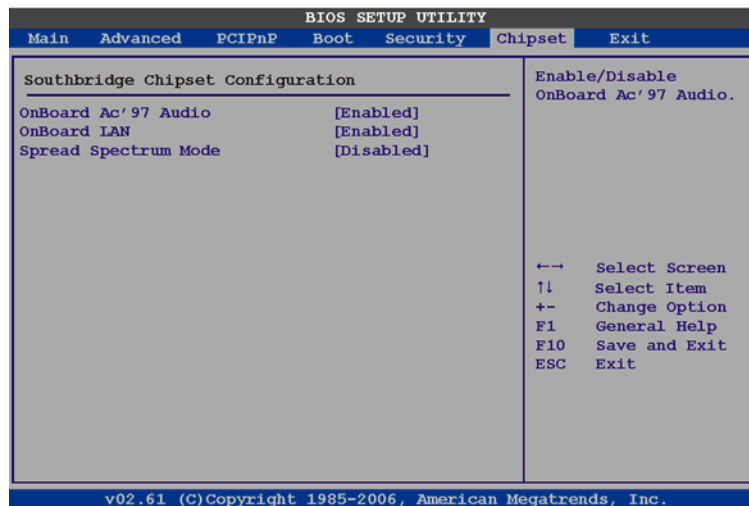
### ➔ **Boot Display Device [Auto]**

The **Boot Display Device** BIOS option selects the display device the system uses when it boots. The available options are listed below:

- **CRT**                      **DEFAULT**
- **LFP**
- **CRT+LFP**

## 6.7.2 Southbridge Configuration

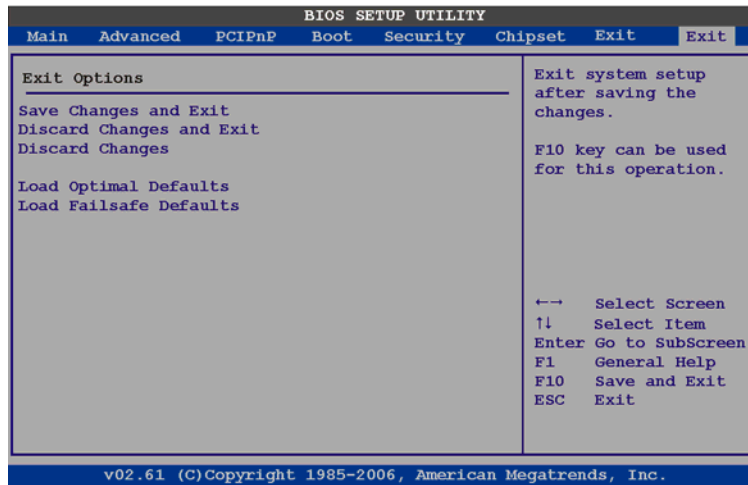
The **Southbridge Configuration** menu (BIOS Menu 20) configures the Southbridge chipset.



**BIOS Menu 20: Southbridge Chipset Configuration**

### ➔ **Audio Controller [All Disabled]**





## BIOS Menu 21: 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

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## 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:

▪ 7.3 Chipset Driver Installation .....	115
▪ 7.4 VGA Driver Installation .....	118
▪ 7.5 LAN Driver Installation .....	123
▪ 7.6 USB Driver Installation .....	125
▪ 7.7 Audio Driver Installation .....	129
▪ 7.8 iSMM Installation.....	132

Installation instructions are given below.

## 7.2 Starting the Driver Program

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

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



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



**Figure 7-1: Start Up Screen**

**Step 3:** Click **WAFER-8523**.

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



**Figure 7-2: Drivers**

## 7.3 Chipset Driver Installation

To install the chipset driver, please do the following.

**Step 1:** Access the driver list shown in **Figure 7-2**. (See **Section 7.2**)

**Step 2:** Click “1-Chipset Driver”

**Step 3:** When the setup files are completely extracted the **Welcome Screen** in **Figure 7-3** appears.



**Figure 7-3: Chipset Driver Welcome Screen**

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

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



**Figure 7-4: Chipset Driver License Agreement**

**Step 6:** Read the **License Agreement**.

**Step 7:** Click the **YES** button to accept the license agreement and continue.

**Step 8:** The Read Me file in **Figure 7-5** appears.



**Figure 7-5: Chipset Driver Read Me File**

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

**Step 10:** **Setup Operations** are performed as shown in **Figure 7-6**.



**Figure 7-6: Chipset Driver Setup Operations**

**Step 11:** Once the **Setup Operations** are complete, click the **NEXT** icon to continue.

**Step 12:** The **Finish** screen appears.



**Figure 7-7: Chipset Driver Installation Finish Screen**

**Step 13:** Select “Yes, I want to restart the computer now” and click the **Finish** icon.

See **Figure 7-7**.

## 7.4 VGA Driver Installation

To install the VGA driver, please do the following.

**Step 1:** Access the driver list shown in **Figure 7-2**. (See **Section 7.2**)

**Step 2:** Click “**2-VGA**”

**Step 3:** The VGA Read Me file in **Figure 7-8** appears.

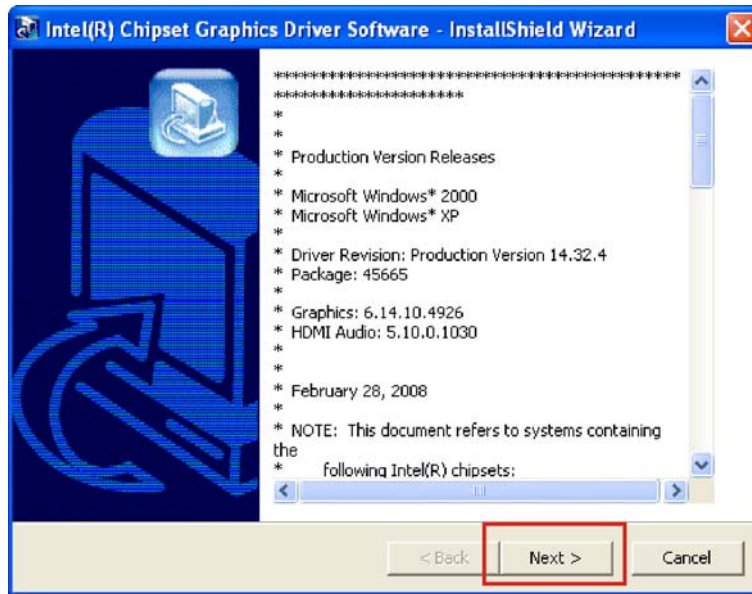


Figure 7-8: VGA Driver Read Me File

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

**Step 5:** The installation files are extracted. See **Figure 7-9**.

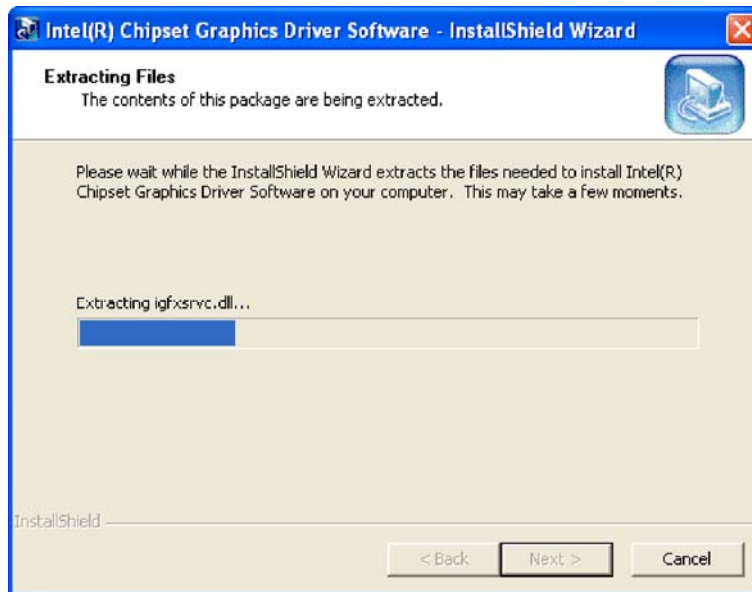


Figure 7-9: VGA Driver Setup Files Extracted

**Step 6:** The **Welcome Screen** in **Figure 7-10** appears.



Figure 7-10: VGA Driver Welcome Screen

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

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

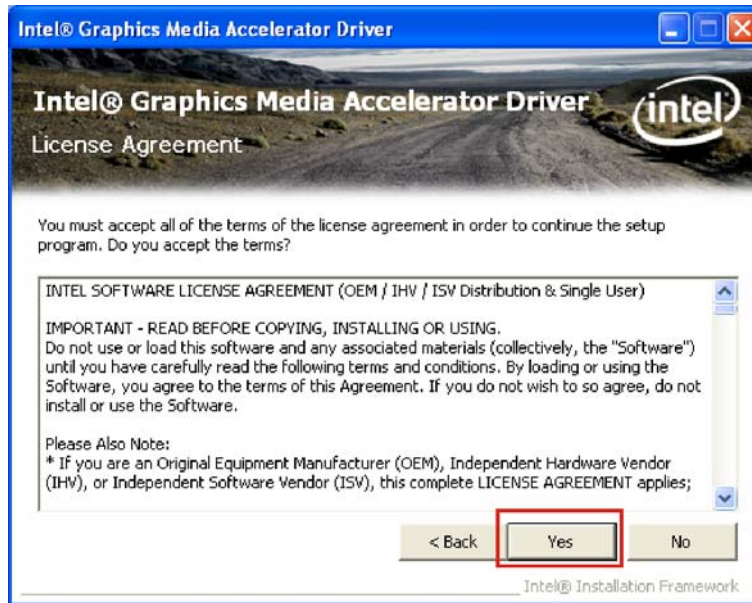
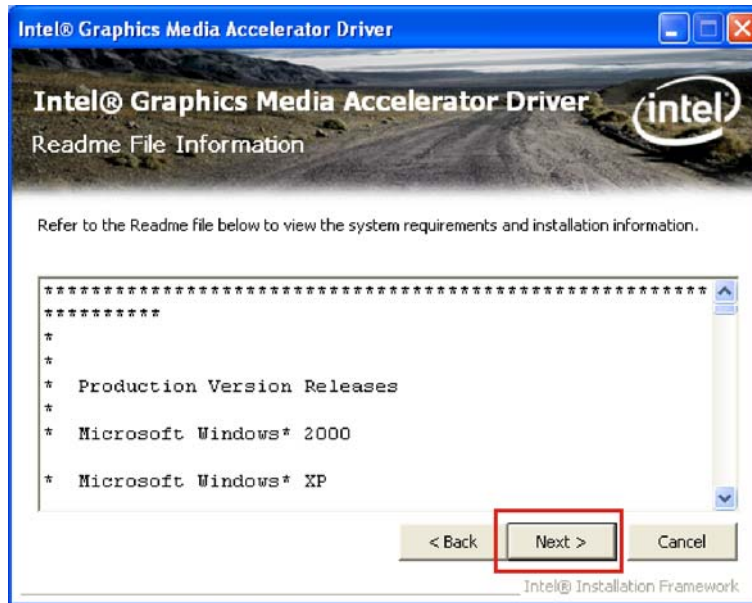


Figure 7-11: VGA Driver License Agreement

**Step 9:** Read the License Agreement.

**Step 10:** Click **YES** to accept the license agreement and continue.

**Step 11:** The Readme file in **Figure 7-12** appears.



**Figure 7-12: VGA Driver Read Me File**

**Step 12:** Click **NEXT** to continue.

**Step 13: Setup Operations** are performed as shown in **Figure 7-13**.



**NOTE:**

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



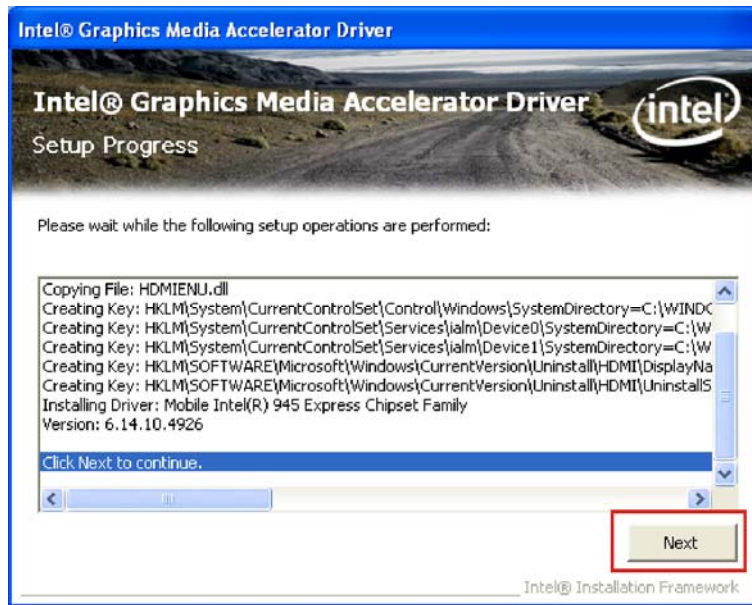


Figure 7-13: VGA Driver Setup Operations

**Step 14:** Once the **Setup Operations** are complete, click **NEXT** to continue.

**Step 15:** The **Finish** screen appears.

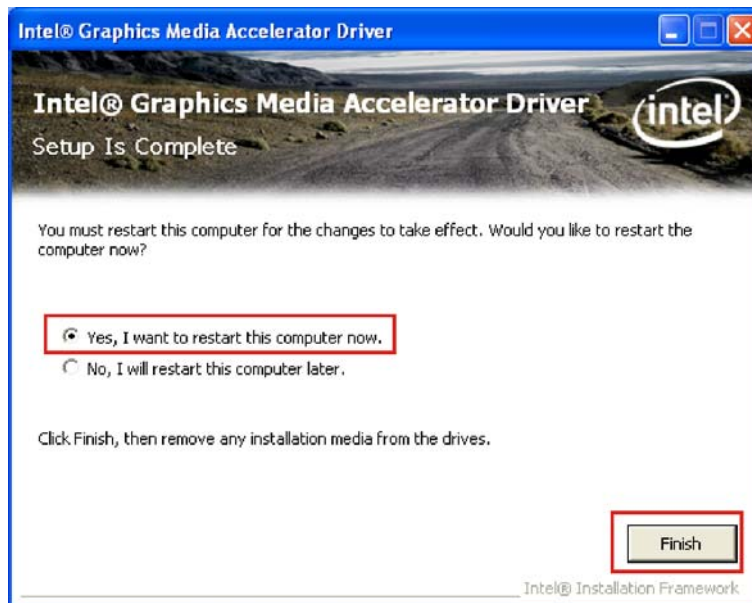


Figure 7-14: VGA Driver Installation Finish Screen

**Step 16:** Select “Yes, I want to restart the computer now” and click **FINISH**. See

Figure 7-14.

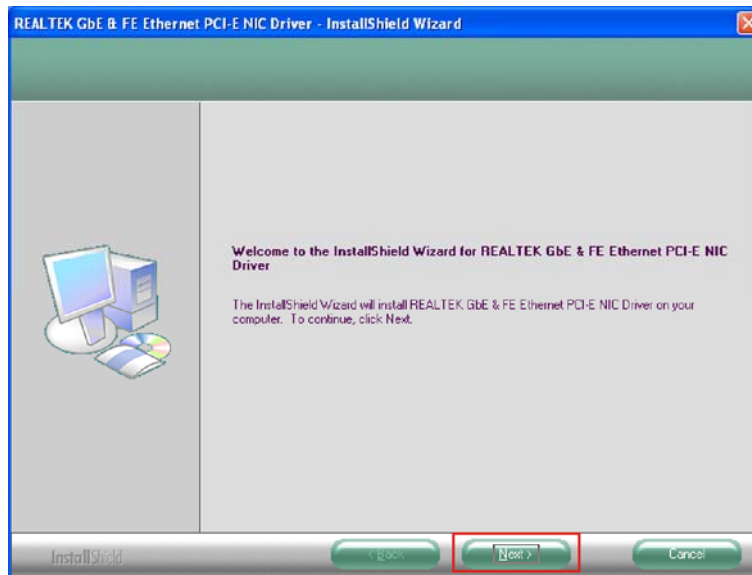
## 7.5 LAN Driver Installation

To install the chipset driver, please do the following.

**Step 1:** Access the driver list shown in **Figure 7-2**. (See **Section 7.2**)

**Step 2:** Click “3-LAN”

**Step 3:** The **Welcome** screen in **Figure 7-15** appears.



**Figure 7-15: LAN Driver Welcome Screen**

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

**Step 5:** The **Ready to Install** screen in **Figure 7-16** appears.

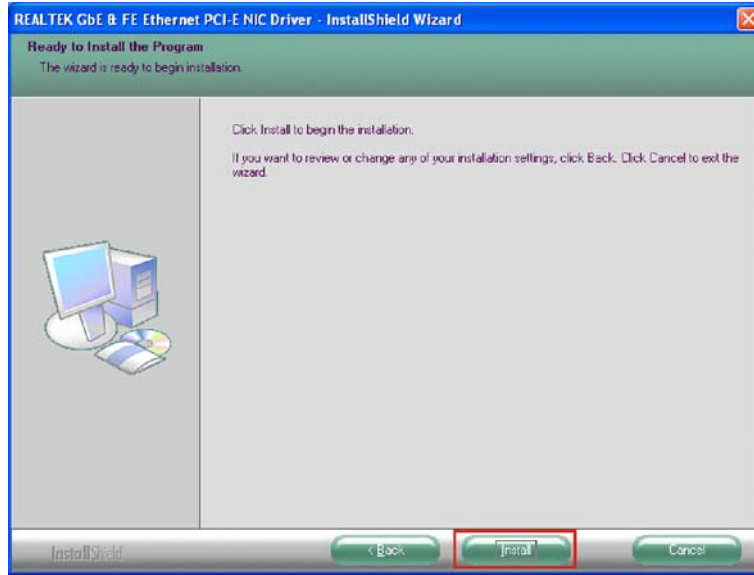


Figure 7-16: LAN Driver Welcome Screen

**Step 6:** Click **NEXT** to proceed with the installation.

**Step 7:** The program begins to install.

**Step 8:** The installation progress can be monitored in the progress bar shown in

Figure 7-17.

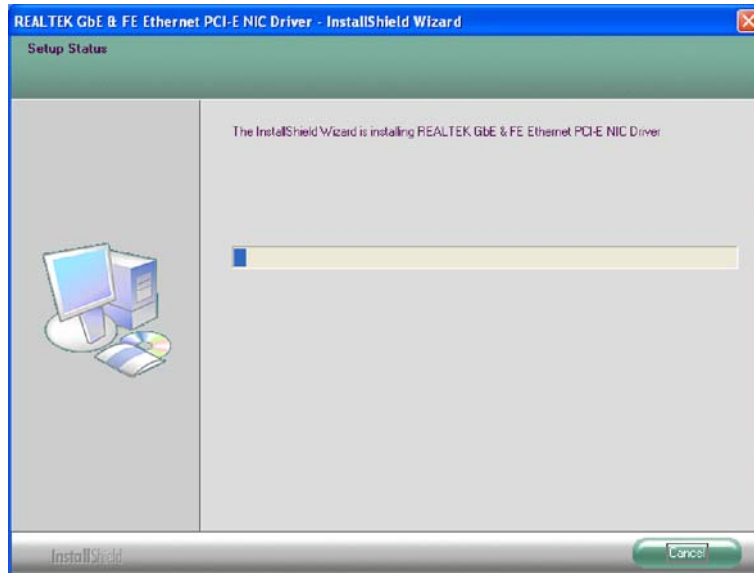


Figure 7-17: LAN Driver Installation

**Step 9:** When the driver installation is complete, the screen in **Figure 7-18** appears.

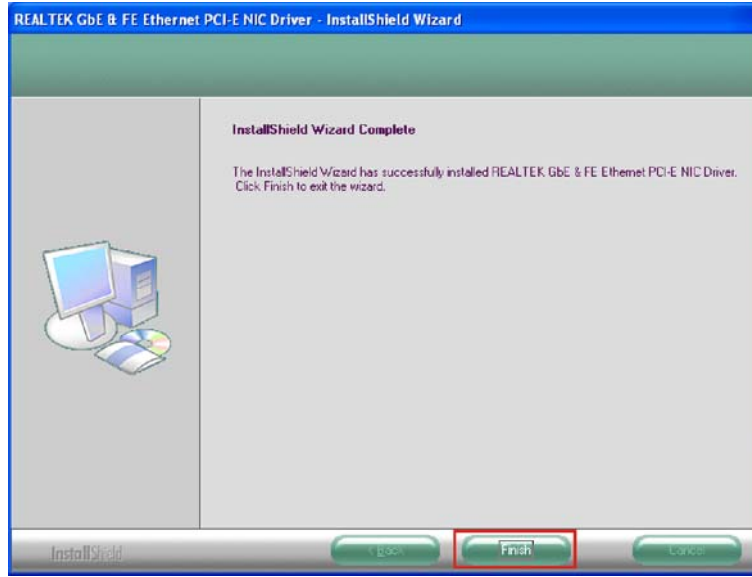


Figure 7-18: LAN Driver Installation Complete

**Step 10:** Click **FINISH** to exit the InstallShield Wizard (Figure 7-18).

## 7.6 USB Driver Installation

To install the USB driver, please do the following.

**Step 1:** Access the driver list shown in **Figure 7-2**. (See **Section 7.2**)

**Step 2:** Click “4-USB2.0”

**Step 3:** The USB2.0 directory appears. (**Figure 7-19**)

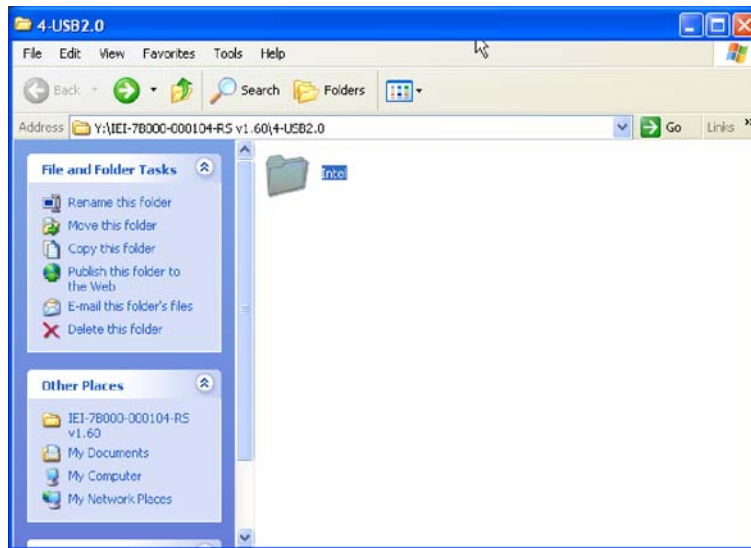


Figure 7-19: USB Directory

**Step 4:** Double click the Intel directory icon. (Figure 7-19)

**Step 5:** The contents of the directory are displayed. (Figure 7-20)

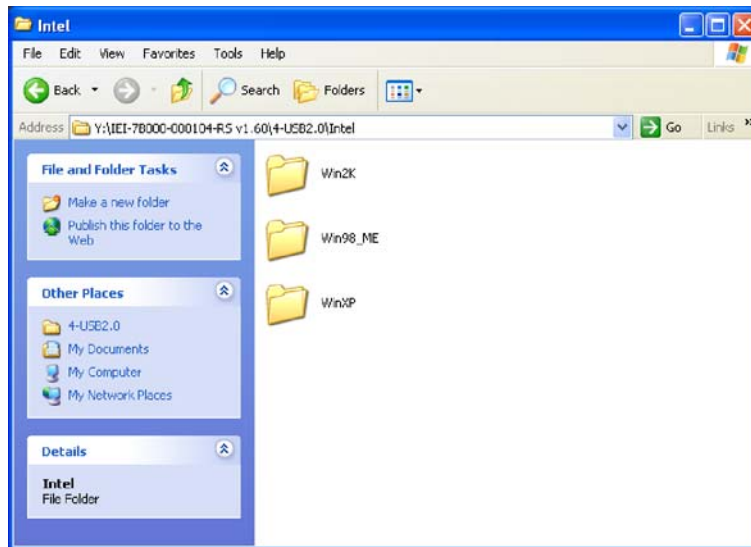


Figure 7-20: Operating System Directory

**Step 6:** Choose the Operating System. Double click the folder icon. (Figure 7-20)

**Step 7:** The contents of the directory are displayed. (Figure 7-21)

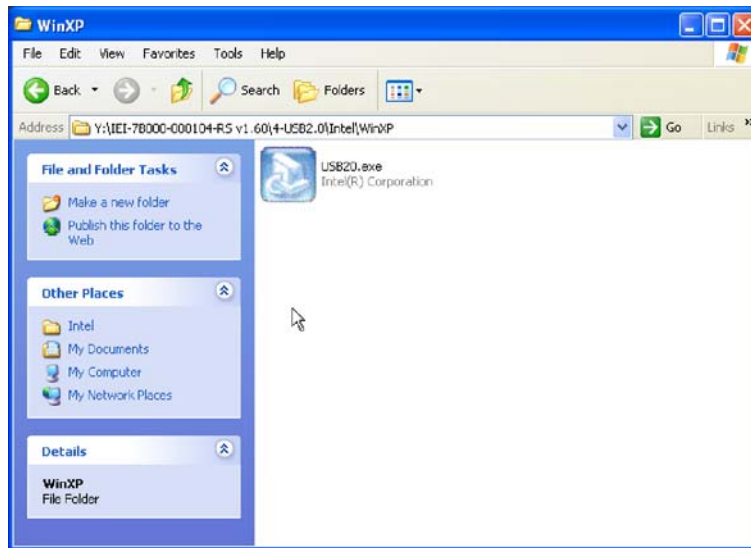


Figure 7-21: USB Installation File

**Step 8:** Double click the **USB20.exe** file icon. (Figure 7-21)

**Step 9:** When the setup files are completely extracted the **Welcome Screen** in **Figure 7-22** appears.



Figure 7-22: USB Driver Welcome Screen

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

**Step 11:** The license agreement in **Figure 7-23** appears.



**Figure 7-23: USB Driver License Agreement**

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

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

**Step 14:** After setup operations are performed, the **Finish** screen appears.

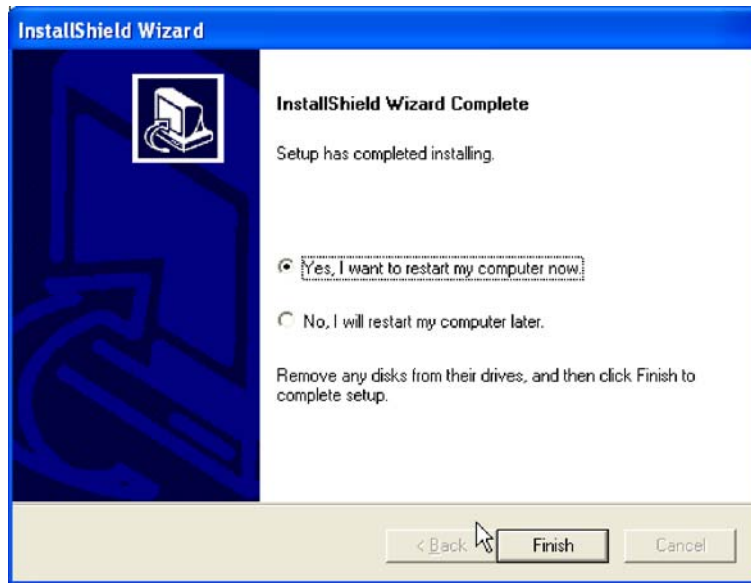


Figure 7-24: USB Driver Installation Finish Screen

**Step 15:** Select “Yes, I want to restart the computer now” and click the **Finish** icon.

See **Figure 7-24**.

## 7.7 Audio Driver Installation

There is no audio driver on the WAFER-8523. To add audio capabilities to the WAFER-8523, connect an AC’97 audio kit available from IEI. Follow the installation instructions applicable to the installed audio kit.

### 7.7.1 AC’97 Driver Installation

To install the chipset driver, please do the following.

**Step 1:** Access the driver list shown in **Figure 7-2**. (See **Section 7.2**)

**Step 2:** Click “**4-Audio**”



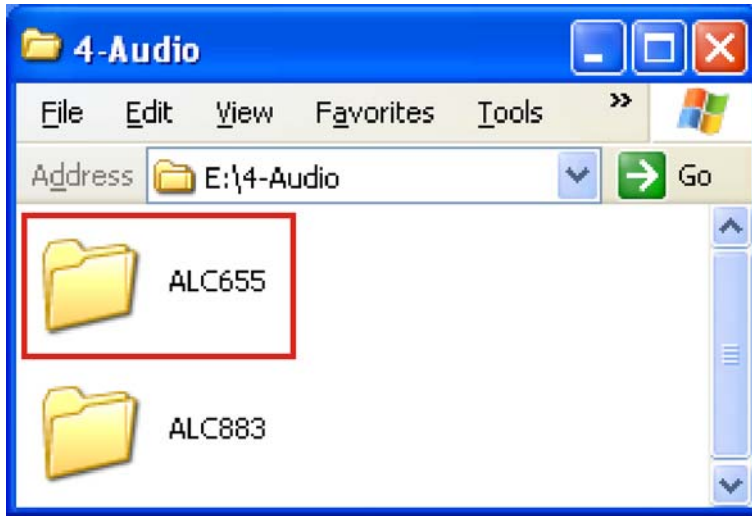


Figure 7-25: AC'97 Audio

**Step 3:** Browse to "E:\4-Audio\ALC655\Windows\Windows 98Gold, 98se, Me, 2000, XP, 2003(32,64 bits)\A3.84" Figure 7-26

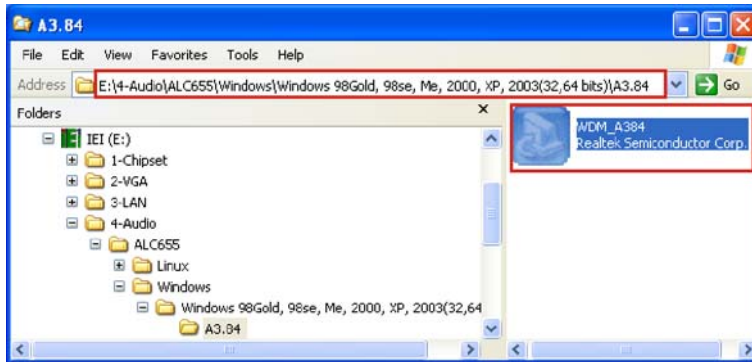
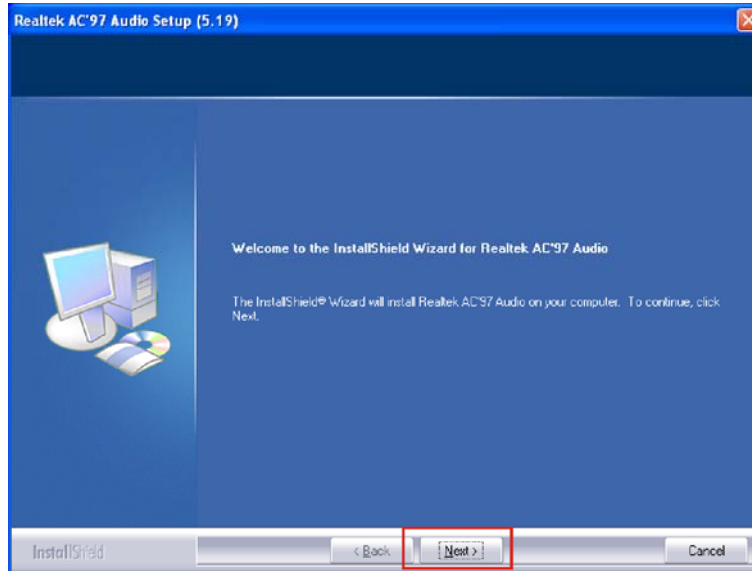


Figure 7-26: AC'97 Audio Driver Options

**Step 4:** Double-click the installation file in **Figure 7-26**.

**Step 5:** The AC'97 Driver Installation screen in **Figure 7-27** appears.



**Figure 7-27: AC'97 Driver Installation Welcome Screen**

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

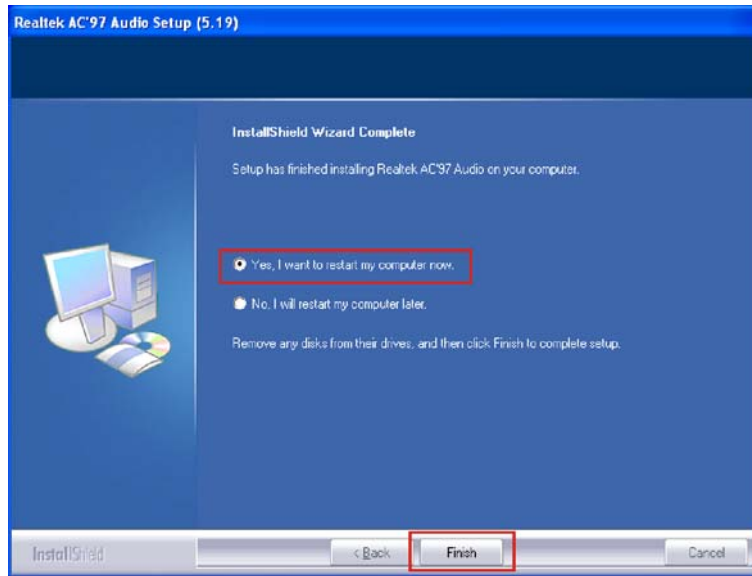
**Step 7:** The Verification window in **Figure 7-28** may appear.



**Figure 7-28: AC'97 Driver Installation Verification**

**Step 8:** Click **CONTINUE ANYWAY**.

**Step 9:** When the driver is installed, the driver installation finish screen in **Figure 7-29** appears.



**Figure 7-29: AC'97 Driver Installation Complete**

**Step 10:** Select “**Yes, I wish to restart my computer now**” And click **FINISH** to exit the InstallShield Wizard and restart the computer.

## 7.8 iSMM Installation

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

**Step 1:** Access the driver list shown in **Figure 7-2**. (See **Section 7.2**)

**Step 2:** Click “**6-iSMM**”

**Step 3:** The iSMM directory appears. (**Figure 7-30**)

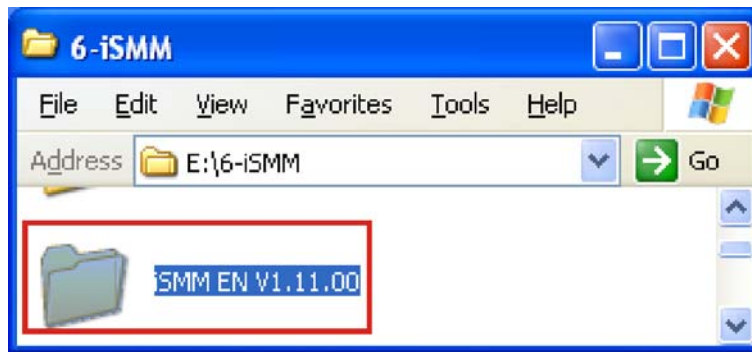


Figure 7-30: iSMM Directory

**Step 4:** Double click the **iSMM EN V1.11.00** directory icon. (Figure 7-30)

**Step 5:** The contents of the directory are displayed. (Figure 7-31)

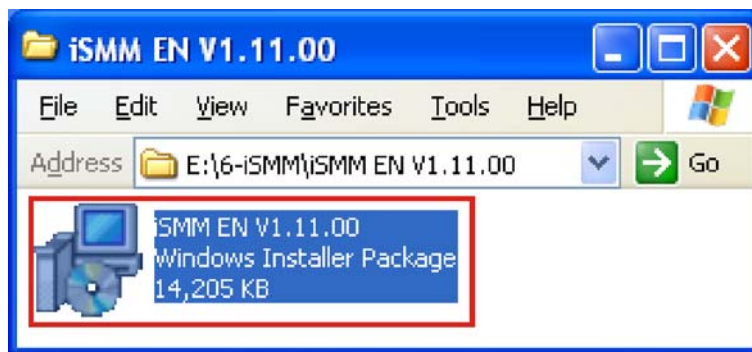
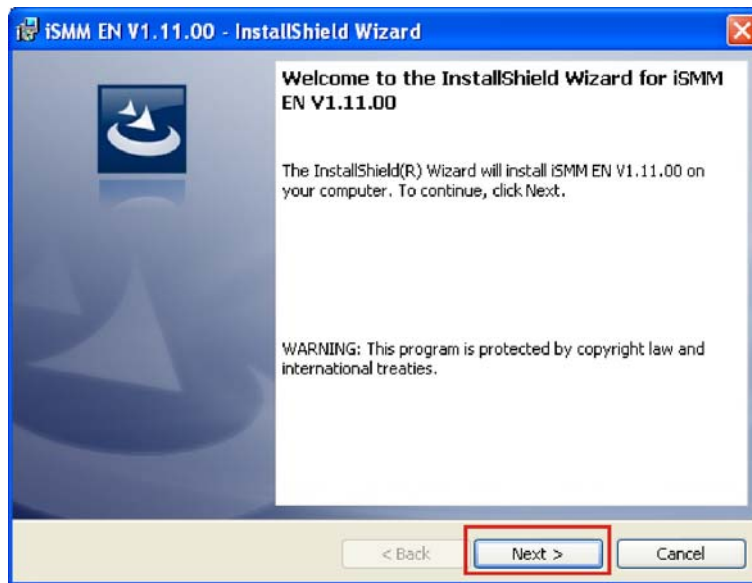


Figure 7-31: iSMM Installation File

**Step 6:** Double click the **iSMM EN V1.11.00** setup file. (Figure 7-31)

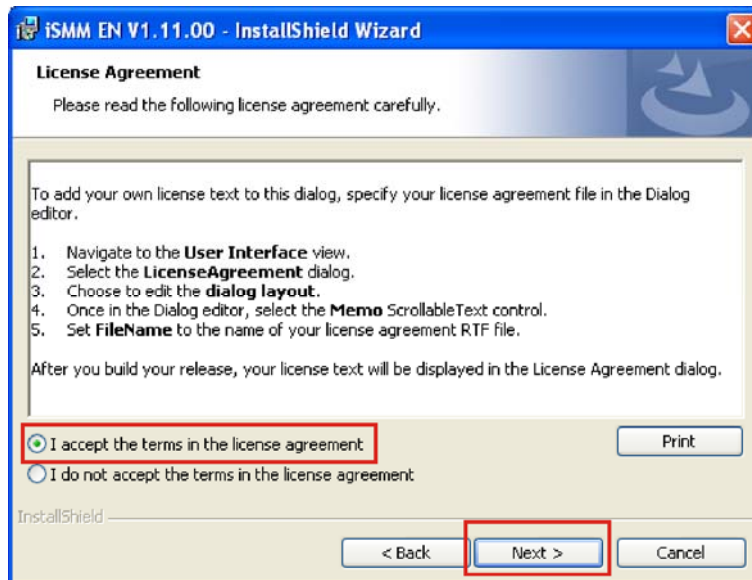
**Step 7:** The iSMM InstallShield Welcome Screen appears. (Figure 7-32)



**Figure 7-32: iSMM InstallShield Welcome Screen**

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

**Step 9:** The **License Agreement** screen appears. (Figure 7-33)



**Figure 7-33: iSMM License Agreement**

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**Step 10:** Select “I accept the terms of the license agreement.” (Figure 7-33)

**Step 11:** Click **NEXT** to continue.(Figure 7-33)

**Step 12:** The **Customer Information** screen appears.(Figure 7-34)

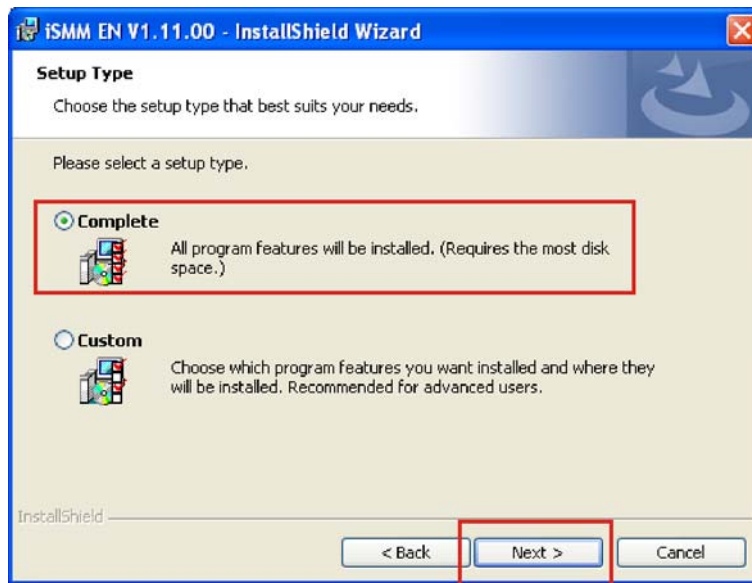
The screenshot shows a Windows-style dialog box titled "iSMM EN V1.11.00 - InstallShield Wizard". The dialog has a blue header bar with the title and a close button. Below the header, the text "Customer Information" is displayed, followed by the instruction "Please enter your information.". There are two text input fields: "User Name:" which contains the text "John Doe", and "Organization:". At the bottom of the dialog, there are three buttons: "< Back", "Next >", and "Cancel". Red rectangular boxes are drawn around the "User Name:" field, the "Organization:" field, and the "Next >" button.

**Figure 7-34: iSMM Customer Information**

**Step 13:** Fill in the “User Name” and “Organization” fields, which will be automatically filled with the settings for the current user.(Figure 7-34)

**Step 14:** Click **Next** to continue.(Figure 7-34)

**Step 15:** The **Setup Type** screen appears. (Figure 7-35)

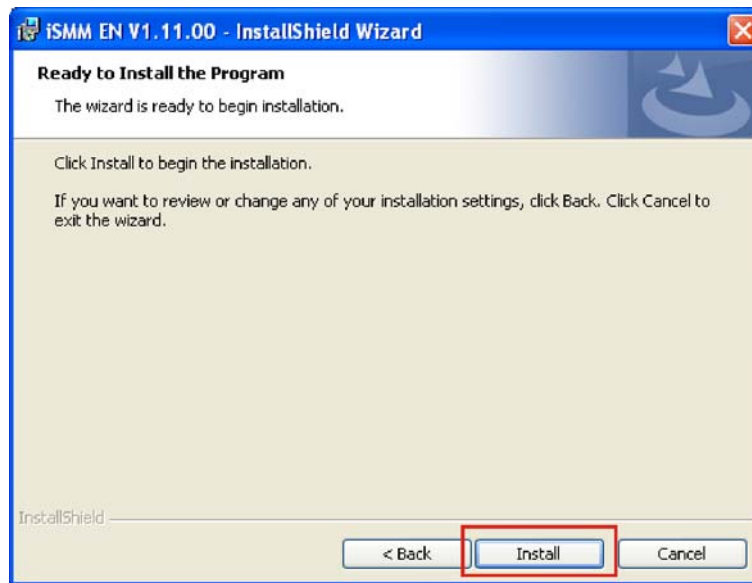


**Figure 7-35:** iSM Setup Type

**Step 16:** Select **“Complete”** (Figure 7-35)

**Step 17:** Click **NEXT** to continue. (Figure 7-35)

**Step 18:** The Installation Confirmation screen appears. (Figure 7-36)



**Figure 7-36:** iSMM Installation Confirmation

**Step 19:** Click **INSTALL** to begin installing the drivers. (Figure 7-36)



**Step 20:** The InstallShield Wizard Completed appears when the drivers are finished installing. (Figure 7-37)

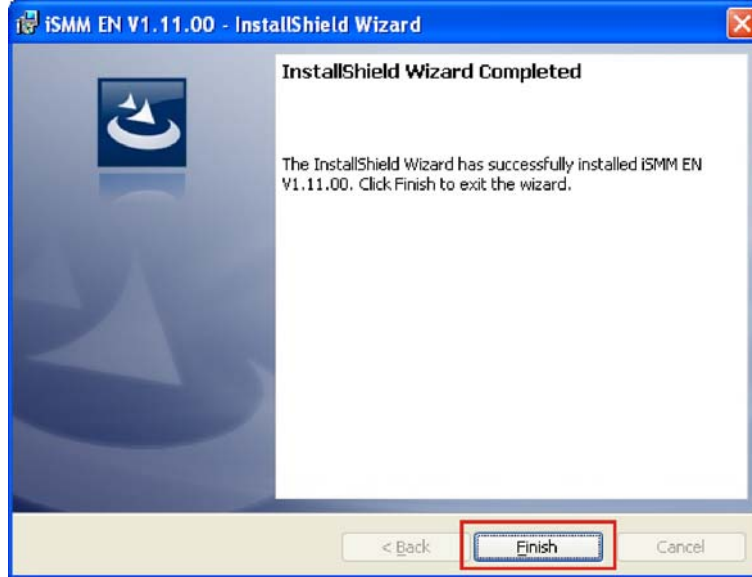


Figure 7-37: iSMM InstallShield Wizard Complete

**Step 21:** Click **FINISH** to exit the installation program.(Figure 7-37)

**Step 22:** The **Restart Confirmation** screen appears.(Figure 7-38)

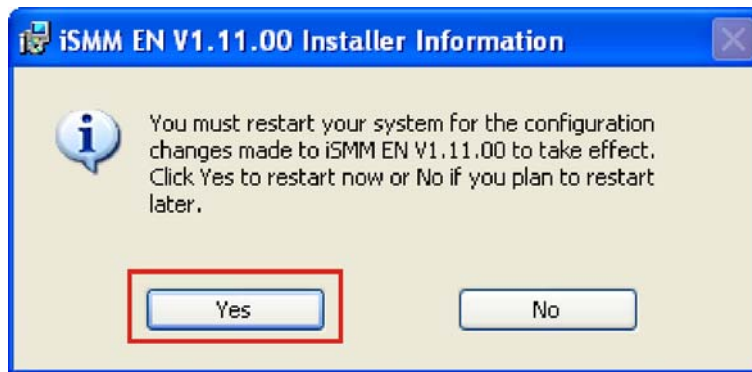


Figure 7-38: iSMM Restart Confirmation

**Step 23:** Select **YES** to restart the system, or **NO** to restart the system manually later.

Appendix

A

# BIOS Options

---

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

<b>System Overview .....</b>	<b>79</b>
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<b>System Date [xx/xx/xx] .....</b>	<b>80</b>
<b>ATA/IDE Configurations [Compatible] .....</b>	<b>82</b>
<b>Legacy IDE Channels [PATA Pri, SATA Sec] .....</b>	<b>83</b>
<b>IDE Master and IDE Slave .....</b>	<b>83</b>
<b>Auto-Detected Drive Parameters .....</b>	<b>84</b>
<b>Type [Auto] .....</b>	<b>85</b>
<b>ZIP .....</b>	<b>85</b>
<b>LS-120 .....</b>	<b>85</b>
<b>LBA/Large Mode [Auto] .....</b>	<b>85</b>
<b>Block (Multi Sector Transfer) [Auto] .....</b>	<b>85</b>
<b>PIO Mode [Auto] .....</b>	<b>86</b>
<b>DMA Mode [Auto] .....</b>	<b>86</b>
<b>S.M.A.R.T [Auto] .....</b>	<b>88</b>
<b>32Bit Data Transfer [Enabled] .....</b>	<b>88</b>
<b>Serial Port1 Address [3F8/IRQ4] .....</b>	<b>89</b>
<b>Serial Port2 Address [2F8/IRQ3] .....</b>	<b>89</b>
<b>Parallel Address [378] .....</b>	<b>89</b>
<b>Parallel Port Mode [Normal] .....</b>	<b>90</b>
<b>Parallel Port IRQ [IRQ7] .....</b>	<b>90</b>
<b>Restore on AC Power Loss [Last State] .....</b>	<b>93</b>
<b>Power Button Mode [On/Off] .....</b>	<b>94</b>
<b>Resume on Keyboard/Mouse [Disabled] .....</b>	<b>94</b>
<b>Resume on Ring [Disabled] .....</b>	<b>94</b>
<b>Resume on LAN [Enabled] .....</b>	<b>94</b>
<b>Resume On RTC Alarm [Disabled] .....</b>	<b>95</b>
<b>RTC Alarm Date (Days) .....</b>	<b>95</b>
<b>System Time .....</b>	<b>95</b>
<b>Remote Access [Disabled] .....</b>	<b>96</b>
<b>Serial Port Number .....</b>	<b>96</b>
<b>Serial Port Mode .....</b>	<b>96</b>
<b>Flow Control .....</b>	<b>96</b>

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VT-UTF8 Combo Key Support .....	96
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Base Address, IRQ [2F8h,3].....	97
Serial Port Mode [115200 8,n,1].....	97
Flow Control [None].....	97
Redirection After BIOS POST [Always] .....	98
Terminal Type [ANSI].....	98
VT-UTF8 Combo Key Support [Disabled].....	98
Sredir Memory Display Delay [Disabled].....	98
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USB 2.0 Controller [Enabled].....	99
USB2.0 Controller Mode [HiSpeed].....	100
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Quiet Boot [Disabled] .....	104
AddOn ROM Display Mode [Force BIOS] .....	104
Bootup Num-Lock [Off] .....	104
Boot From LAN Support [Disabled] .....	105
Change Supervisor Password.....	106
Change User Password.....	106
Memory Hole [Disabled].....	108
Internal Graphics Mode Select [Enable, 8MB] .....	108
Graphics Aperture Size [ 64MB] .....	108
Boot Display Device [Auto].....	109
Audio Controller [All Disabled].....	109
Onboard LAN.....	110
Spread Spectrum Mode.....	110
Save Changes and Exit .....	111
Discard Changes and Exit.....	111
Discard Changes.....	111

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<b>Load Failsafe Defaults.....</b>	<b>111</b>

Appendix

**B**

# Terminology

---

<b>AC '97</b>	Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.
<b>ACPI</b>	Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.
<b>AHCI</b>	Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.
<b>ATA</b>	The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.
<b>ARMD</b>	An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.
<b>ASKIR</b>	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.
<b>BIOS</b>	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
<b>CODEC</b>	The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.
<b>CompactFlash®</b>	CompactFlash® is a solid-state storage device. CompactFlash® devices use flash memory in a standard size enclosure. Type II is thicker than Type I, but a Type II slot can support both types.
<b>CMOS</b>	Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.
<b>COM</b>	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.
<b>DAC</b>	The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.
<b>DDR</b>	Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

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<b>DMA</b>	Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.
<b>DIMM</b>	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.
<b>EHCI</b>	The Enhanced Host Controller Interface (EHCI) specification is a register-level interface description for USB 2.0 Host Controllers.
<b>EIDE</b>	Enhanced IDE (EIDE) is a newer IDE interface standard that has data transfer rates between 4.0 MBps and 16.6 MBps.
<b>EIST</b>	Enhanced Intel® SpeedStep Technology (EIST) allows users to modify the power consumption levels and processor performance through application software. The application software changes the bus-to-core frequency ratio and the processor core voltage.
<b>FSB</b>	The Front Side Bus (FSB) is the bi-directional communication channel between the processor and the Northbridge chipset.
<b>GbE</b>	Gigabit Ethernet (GbE) is an Ethernet version that transfers data at 1.0 Gbps and complies with the IEEE 802.3-2005 standard.
<b>GPIO</b>	General purpose input
<b>HDD</b>	Hard disk drive (HDD) is a type of magnetic, non-volatile computer storage device that stores digitally encoded data.
<b>ICH</b>	The Input/Output Control Hub (ICH) is an Intel® Southbridge chipset.
<b>IrDA</b>	Infrared Data Association (IrDA) specify infrared data transmission protocols used to enable electronic devices to wirelessly communicate with each other.
<b>L1 Cache</b>	The Level 1 Cache (L1 Cache) is a small memory cache built into the system processor.
<b>L2 Cache</b>	The Level 2 Cache (L2 Cache) is an external processor memory cache.
<b>LCD</b>	Liquid crystal display (LCD) is a flat, low-power display device that consists of two polarizing plates with a liquid crystal panel in between.



<b>LVDS</b>	Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.
<b>POST</b>	The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.
<b>RAM</b>	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.
<b>SATA</b>	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 II bus has data transfer speeds of up to 3.0 Gbps.
<b>S.M.A.R.T</b>	Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.
<b>UART</b>	Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.
<b>UHCI</b>	The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.
<b>USB</b>	The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.
<b>VGA</b>	The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

# Watchdog Timer

---


**NOTE:**

The following discussion applies to DOS environment. IEI support is contacted or the IEI website visited for specific drivers for more sophisticated operating systems, e.g., Windows and Linux.

The Watchdog Timer is provided to ensure that standalone systems can always recover from catastrophic conditions that cause the CPU to crash. This condition may have occurred by external EMIs or a software bug. When the CPU stops working correctly, Watchdog Timer either performs a hardware reset (cold boot) or a Non-Maskable Interrupt (NMI) to bring the system back to a known state.

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

INT 15H:

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

**Table C-1: AH-6FH Sub-function**

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur; call 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

D

# Compatibility

---



**NOTE:**

The compatible items described here have been tested by the IEI R&D team and found to be compatible with the WAFER-8523

## **D.1 Compatible Operating Systems**

The following operating systems have been successfully run on the WAFER-8523.

- MS-DOS 6.22
- Microsoft Windows XP (32-bit)
- Microsoft Windows 2000
- Microsoft Vista Business (32-bit)
- Fedora Core 6
- Ubuntu 8.04.1

## **D.2 Compatible Processors**

The following Intel® Celeron® M processors have been successfully tested on the WAFER-8523

<b>CPU</b>	<b>FSB</b>	<b>Frequency</b>
Intel® Celeron® M	400 MHz	1.0 GHz
Intel® Celeron® M	400 MHz	600 MHz

**Table D-1: Compatible Processors**

## D.3 Compatible Memory Modules


**NOTE:**

The memory modules listed below have been tested on the WAFER-8523 other memory modules that comply with the specifications may also work on the WAFER-8523 but have not been tested.

The following memory modules have been successfully tested on the WAFER-8523.

Manufacturer	Model No.	Capacity	Speed	Type
A-DATA	K4H510838D-UCCC	512 MB	400 MHz	DDR
A-DATA	K4H511638C-UC83	512 MB	333 MHz	DDR
Apacer	AM3A5708B PK-5B0707D	512 MB	400 MHz	DDR
Apacer	AM3A5708B PK-5B0717F	512 MB	400 MHz	DDR
DSL	534A HY5DU1216 22CTP-D43KOR	256 MB	400 MHz	DDR
DSL	534A HY5DU1216 22CTP-D43KOR	512 MB	400 MHz	DDR
Kingston	5471 HY5DU1216	512 MB	400 MHz	DDR
Transcend	711A HY5DUT282	512 MB	400 MHz	DDR
Transcend	K4H560838F-UCCC	256 MB	266 MHz	DDR
TwinMOS	TMD6208F8 E50M	512 MB	400 MHz	DDR
UG	0710SRV58C 2512164SBI5	512 MB	333 MHz	DDR
UG	0714PR V58C225616 4SC15	256 MB	333 MHz	DDR

**Table D-2: Compatible Memory Modules**

Appendix

**E**

# Hazardous Materials Disclosure

---



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

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

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

Please refer to the table on the next page.

## WAFER-8523 User Manual

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)
<b>Housing</b>	X	O	O	O	O	X
<b>Display</b>	X	O	O	O	O	X
<b>Printed Circuit Board</b>	X	O	O	O	O	X
<b>Metal Fasteners</b>	X	O	O	O	O	O
<b>Cable Assembly</b>	X	O	O	O	O	X
<b>Fan Assembly</b>	X	O	O	O	O	X
<b>Power Supply Assemblies</b>	X	O	O	O	O	X
<b>Battery</b>	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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