
# Panel-IPC

# USER MANUAL


**Rev: 14.07.2014**

# Index



## Correction Overview

| Amendment to Chapter/ Page output | Issue date | Reason for change |
|---|---|---|
| | 14.07.2014 | preperation of this document |
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| | | |

# General

This manual will help you in installation, assembly and use of the flat panel. Please read the entire manual once, since information relating to several chapters will only be given once. Keep this manual. Follow all instuctions and warnings noted on the product itself, Do not use liquid or caustic cleaning agents, Use a moist, lint-free cloth for cleaning. Never operate the unit near water.

Never place the unit on an unstable surface. All the slots and openings on the underside and back of the device are used for ventilation, to protect it from overheating adequately. These vents must never be covered. The device shall never be placed near or on a radiator or any other source of heat. The unit always has to be connected to a power supply according to the badge on the back side of the case. Do not insert objects through the vents. Do not spill liquids on the device. Leave all repairs to qualified technical personnel.

Do not expose the device to direct sunlight.

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# Introduction

The Panel PC is designed for mounting on VESA compatible mounts. The robust metal housing protects the electronic components in harsh environments.

The panel PC has the following properties:

- Extremely compact design
- Rugged, industrial-grade construction
- optionally equipped with anti-reflective safety glass or resistive touch screen
- access to all controls from a page.
- EMC compliant design for increased noise immunity and reduced interference, CE mark and Declaration of Conformity for tested variants.
- Compatible with industry standard.

# Definitions, abbreviations and reference documents

## Definitions

## Abbreviations

**OSD** On Screen Display

**MHz** Number of oscillation processes in millions of cycles per seconds

**KHz** Numbers of oscillation processes in thousands of cycles per seconds

**Hz** Number of oscillations processes in cycles per second

**H-Sync** Displays the beginning of the broadcast of a new line. Serves synchronization between a picture source and a receiver.

**V-Sync** Displays the beginning of the broadcast of a new picture. Serves synchronization between a picture source an a receiver.

CE European Union Declaration of Conformity

 Direct current DC

~ Alternating current ACSicherheitshinweise

# Safety instructions

The TFT monitor is designed for use in industrial and commercial sectors. The one installing the device is responsible for safety and compliance with occupational safety and accident prevention regulations as well as any other statutory regulations.

Installation, setup and repair work must therefore be performed by qualified personnel only. In doing so, the following safety instructions have to be followed by all means:

- By opening the backside of the panel, live parts can be exposed. Therefore the monitor unit has to be turned off and disconnected from the power grid through appropriate measures first.
- If operating the opened device is inevitable in line with set-up and repairs, use particular caution. No modifications must be made in this situation. Thus causing short-circuits resulting in damage to various components cannot be excluded.
- For manufacturing reasons, potruding edges and surfaces on ircuit boards and sheet metal parts cannot be excluded. Please handle with care to avoid injury.
- When opening the unit, make sure that no electrically conductive foreign objects, such as cuttings and screws, can enter the unit, as this may cause short-circuits resulting in serious consequences.
- The torque of the fastening screws on LCD panels should never exceed 0.39 Nm.
- For cleaning the surface of the LCD panel use a soft, dry cloth and do not use any chemical cleaning agents!
- CAUTION when changing the button battery on the motherboard! There is Danger of explosion if battery replacement. Replace only with the same or an equivalent recommended by SR equivalent type. Disposal, according to SR.

# Putting the Panel-PC into service

## Unpacking equipment

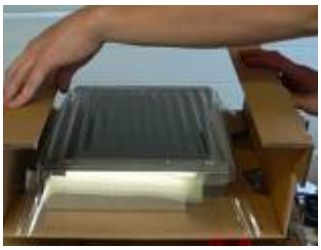
The TFT monitor is shipped in a sturdy cardboard box. The monitor is fixed by a swing-foil and secured against damage during transport. Keep all the parts at first to have a suitable transport packaging in case of a necessary return.

Check the TFT monitor and the included accessories for shipping damage. If there is noticeable damage to the device, it must not be put into service because the security could be compromised. Please contact the sender immediately.

Check the package using the delivery note.

## Installing the unit

The TFT monitor must not be exposed to excessive cold, heat, moisture or dirt. The ambient conditions given in the “Technical data” must be met to maintian operational safety.



Before fixing the unit to a VESA mount check if the permissible maximum weight for the bracket indicated by the manufacturer is observed.

When mountig the device take care that adequate ventilation of the equipment unit is guaranteed.
Also, remember that the temperature in a closed housing may be much higher than the outside temperature. The termal situation can be improved by appropriate arrangement of the installations as well as forced ventilation. Make sure the specified temperature limits are never exceeded when the unit installed.

**Make sure there is enough space for the connections and no sharp edges or corners protrude in that area. This may cause damage to the cable connections and result in a loss of function and performance.**

## Information on compliance with the EMC directive (CE mark)

**Within the EU, there are laws regarding the observance of uniform limits concerning interference radiation and interference immunitiy. The Panel-PC is designed to comply with these limits. It is therefore equipped with the CE mark and comes with a certificate of conformity. Outside the EU, the relevant national regulations have to be observed.**

**Devices to be connected to the Panel-PC also have to comply with the regulatory limits. Only this will ensure that the entire installation complies with the statutory requirements. Make sure all devices are equipped with an appropriate mark or a manufacturer´s declaration.**

**The connection to the connected devices must be provided via shielded cables. Cables with foil shields are less suitable than cables with braided shields and a high degree of coverage. The connector housing must be round to have connection to the cable screen.**

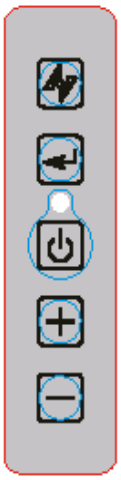
## Computer test

**Before the application software is installed, you should make sure that the device is working properly. By installations instabilities can occur, the cause is otherwise hard to determine.**

**Make the connection to supply mains. The unit turns off after a short delay independently (Auto Start).**

**Each time the computer first tests the essential functions (POST). You can track on the screen and the fact that the computer briefly accesses all drives this process through various messages of the BIOS. The computer then boots the operating system from the hard disk.**

## OSD Menu-Functions:



| |
|---|
| |
| |
| ON / OFF (blue = ON) |
| |
| |

**Bei der Version WAVER-CV ist nur die Taste EIN / AUS belegt.**

**Has up to this point everything works, connecting other peripherals, and installing application programs, nothing stands in the way.**

**The assignment of the computer ports at the bottom you will find outlined below. Additional information is listed in the specifications of computer components that are kept in the Documentation folder.**

## Turn off computer, standby mode

**If the computer is shut down, it switches to stand-by mode in which all power-intensive components are switched off.**

**In standby mode, the computer takes only a little power.**

# Set-up and repair work

The Panel PC is designed for use in industrial and commercial areas. Set-up and maintenance may only be carried out by properly trained personnel. The following safety precautions must be observed!

The old battery must not be disposed of with normal household waste! Bring the battery to a collection point, to a recycling center or send the battery back to SR.

## Opening the tailgate

The rear wall is opened to gain access to the set-up battery, for storing the BIOS settings.

Leaving your application program. There are programs in which an abnormal termination to data losses.

Back up all data. The application programs you can install necessary new.

Shut down the operating system and turn off the panel PC from.

Disconnect the device from the mains.

To open the device are the screws located on the back unscrewed. You can then lift the cover to the rear.

**changing the battery**

**The battery on the motherboard is used to supply the clock, which also continues to run when the computer is turned off or unplugged. In addition lich makes the battery for the preservation of the setup data that can be entered using the BIOS setup and changed.**

**If the battery is too weak to go to the setup data is lost. This often means that the computer is running at reduced power, certain components no longer work or the operating system can not be booted anymore. Often announces a disturbance of the clock (is not, date wrong) the end of the battery capacity.**

**Watch out! Note Replace the battery with the safety instructions!**

**The battery can after opening the device (see previous section) are taken down by the little safety clip aside and the button cell is pulled upwards from its base. The installation of the new battery is done in the reverse order.**

## Operation and Repair

- Dg a freeze-frame for a longer period may cause image-sticking-problems (see our notes in the support area on our website in FAQ)
- Before opening the device has to be switched off and disconnected from the supply voltage.
  Opening the device must be performed by authorized personnel only!
- Note that even after switching off the supply voltage or pulling the plug high residual stresses may remain in the device. Accidental contact with charged parts and contacts may cause electrical shock and damage to the device.
- Do not insert any objects into the device. Foreign objects of any kind inserted through the housing, can lead to operational hazards and cause damage to equipment and persons.
- Do not spill any liquids into the interior. Should this happen anyhow, immediately unplug the unit from the power supply. Continued operation poses a fire hazard.
- Install extensions compatible to your system only. Other extensions can damage the device or change the EMC behavior.

Important:

- Subsequent installation of additional components or other modifications to the device lead to invalidity of the declaration of confimity for CE marking and the operator is responsible for any occuring problems.
- Immediately stop operating the device if you notice anything abnormal, such as smoke, noise or smell. Unplug the power cord and clarify the cause of malfunction before operating the device again.

## EMC

- This is a class A device (industrial use). It may cause radio interference in housing areas. In this case, the operator might be charged to take adequate measures and be held responsible for it.
- This device serves as an installation component in an industrial application. The operator of the entire system is encouraged to maintain electromagnetic compatibility in accordance with the EMC Act.

## Electrostatically sensitive components

Electronic components can be damaged or destroyed by electrostatic discharges. This doesn't have cause a breakdown of the module, it may also result in malfunctions! The following directions must therefore be followed strictly:

- Before working on an opened device a potenial charge of the body has to be unloaded by touching the grounded housing parts.
- The same applies to (insulated) tools to be used, of course. They also have to be discharged by touching a grounded object.
- If you remove or add modules from the system, the device has to be switched off or disconnected from the power supply every time.
- You should always touch modules on the edge only. Touching the conductors and connector pins has to be avoided by any means.

# Cleaning

- Disconnect the device from the supply voltage before cleaning. A dry cloth is sufficent for cleaning regularly. In case of stronger contamination, the main unit can be cleaned with a damp cloth and mild detergent (for CRT´s only). No liquid must reach the inside of the case (open device).

- The use of scouring powder and dissolving detergent is strictly forbidden.

- The interior must be cleaned by the service technican only.

- Before getting the device into service it has to be completely dry (short-circuit, fire hazard).

- Since the surfaces of LCD´s ary very soft and easily scratched, please use a soft dry cloth ofr cleaning and do not use chemical cleaning agents.

- The torque of the fixing screw on LCD panels should never exceed 0:39 Nm.

- Please never expose the surface of a LCD to shock or friction as it could result in damage or scratch marks left on the surface.

MODEL:

# WAFER-CV-D25501/N26001

**3.5" SBC with Intel® Atom™ D2550/N2600 Processor, DDR3, VGA/Dual LVDS, Dual PCIe GbE, USB 2.0, PCIe Mini, SATA 3Gb/s, Audio and RoHS**

# User Manual

**Rev. 1.03 – 11 December, 2012**

RoHS Lead Free

# Revision

| Date | Version | Changes |
|---|---|---|
| 11 December, 2012 | 1.03 | Added CN6 connector information |
| 23 November, 2012 | 1.02 | Updated the note for the Intel® GMA driver limitation |
| 13 August, 2012 | 1.01 | Added a note for the Intel® GMA driver limitation |
| 26 June, 20 | 1.00 | Initial release |

# Copyright

## COPYRIGHT NOTICE



## TRADEMARKS

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# BIOS Menus

# Introduction

## 1.1 Introduction

**Figure 1-1: WAFER-CV-D25501/N26001**

The WAFER-CV-D25501/N26001 3.5" motherboard is an Intel® Atom™ D2550/N2600 processor platform that supports one 1066 MHz or 800 MHz DDR3 SO-DIMM memory. The WAFER-CV-D25501/N26001 supports VGA display output and comes with two LVDS connectors supporting 24-bit or 18-bit LVDS screens. Maximum six USB ports, two SATA 3Gb/s connectors, two PCIe Mini card slots, four COM ports, and one audio connector provide flexible expansion options.

## 1.2 Model Variations

The model variations of the WAFER-CV-D25501/N26001 are listed below.

| Model No. | CPU |
|---|---|
| WAFER-CV-D25501-R10 | Intel® Atom™ D2550 1.86 GHz |
| WAFER-CV-N26001-R10 | Intel® Atom™ N2600 1.6 GHz |

**Table 1-1: WAFER-CV-D25501/N26001 Model Variations**

## 1.3 Connectors

The connectors on the WAFER-CV-D25501/N26001 are shown in the figure below.

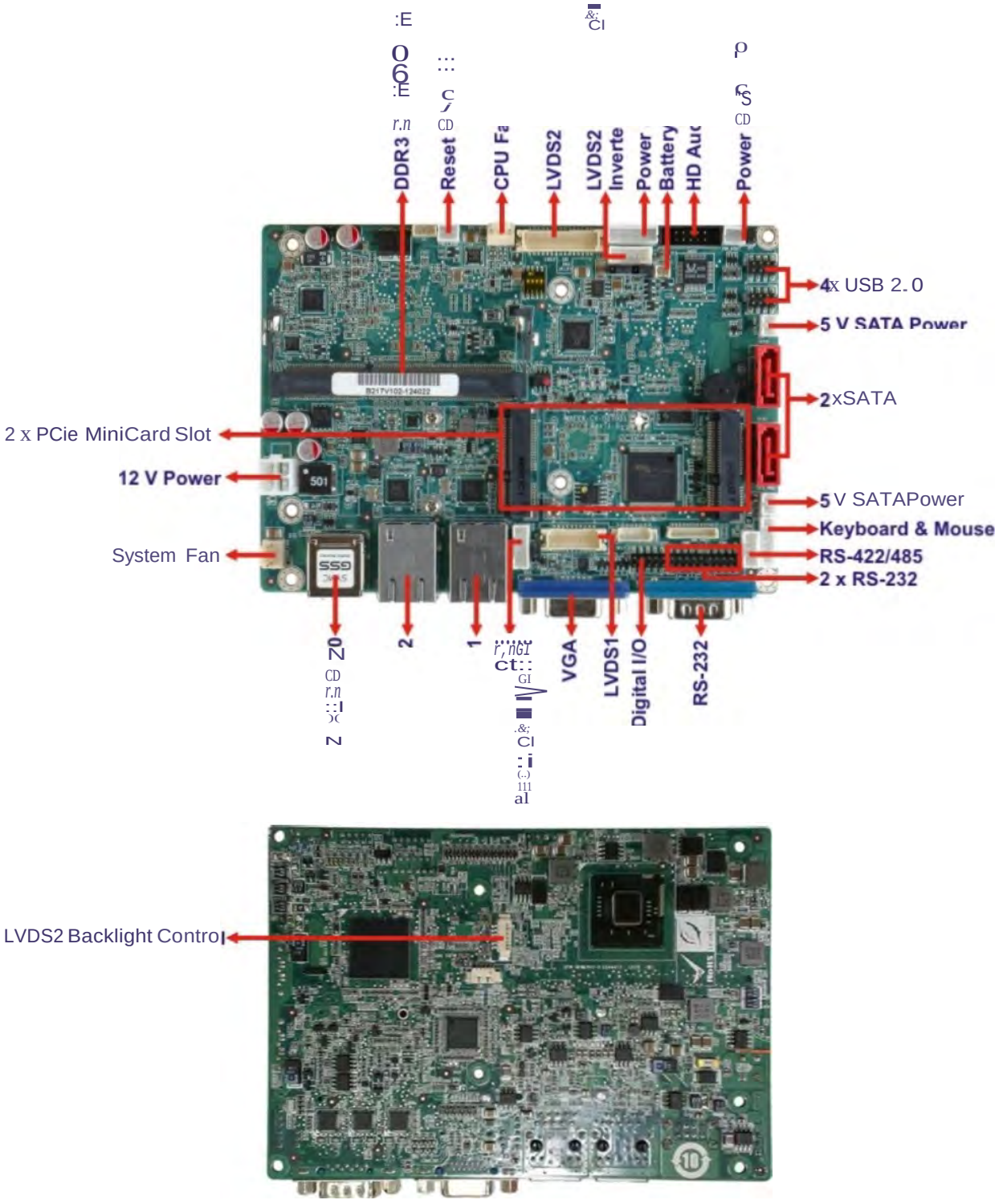


Figure 1-2: Connectors

## 1.4 Dimensions

The main dimensions of the WAFER-CV-025501/N26001 are shown 1n the diagram below.

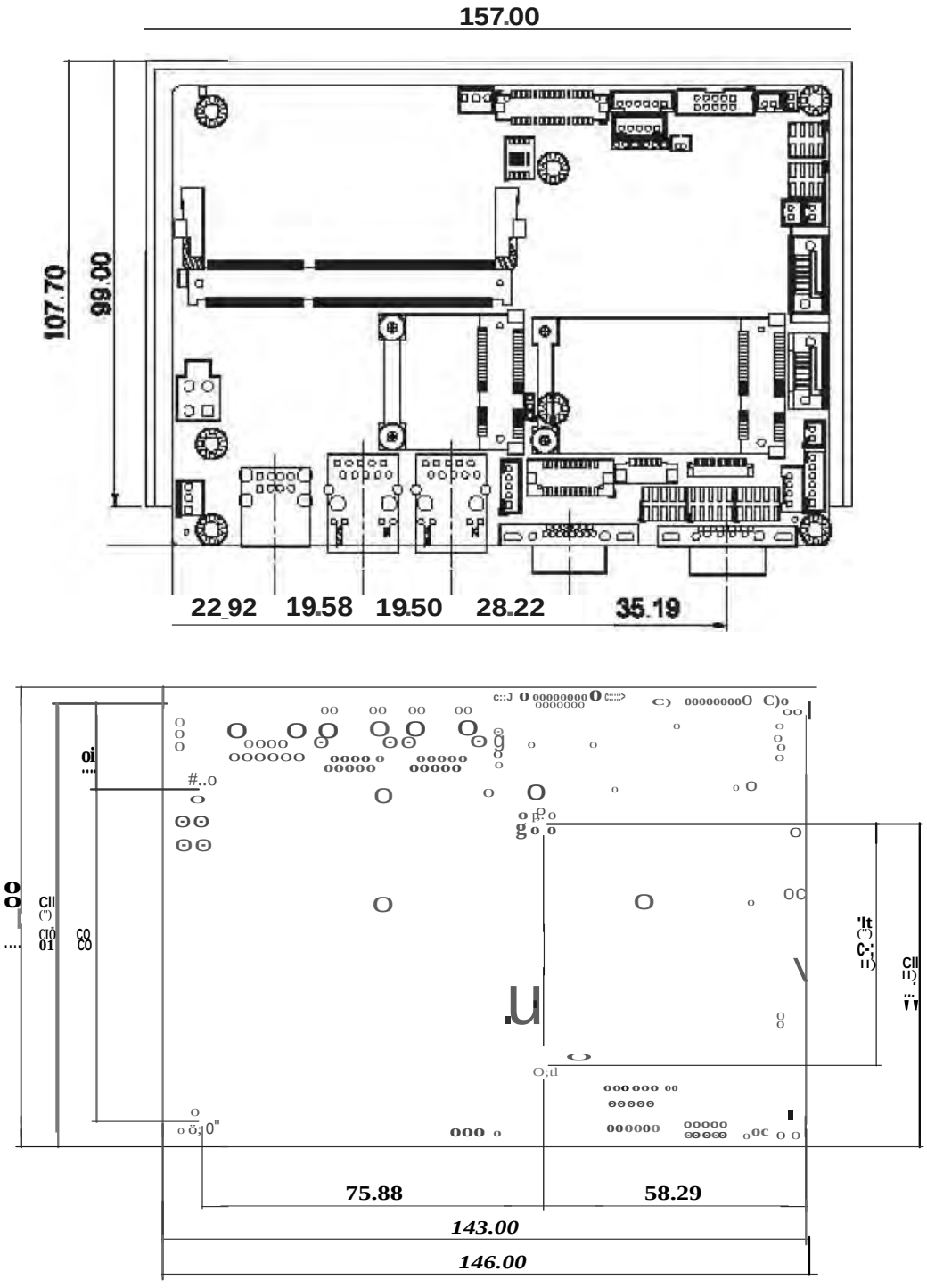


**Figure 1-3: WAFER-CV-D25501/N26001 Dimensions (mm)**

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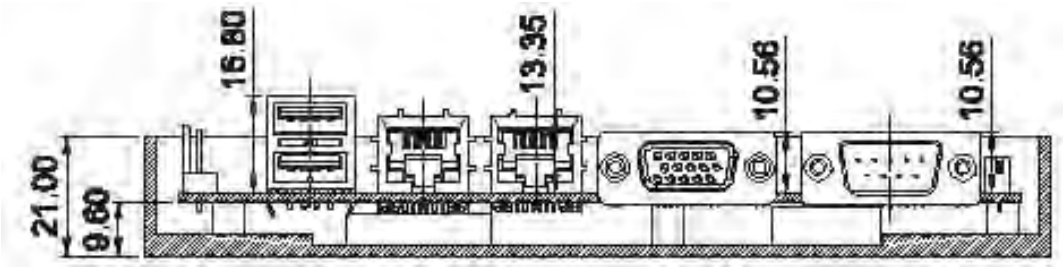



**Figure 1-4: External Interface Panel Dimensions (mm)**

## 1.5 Data Flow

Figure1-5 shows the data flow between the system chipset, the CPU and other components installed on the motherboard.

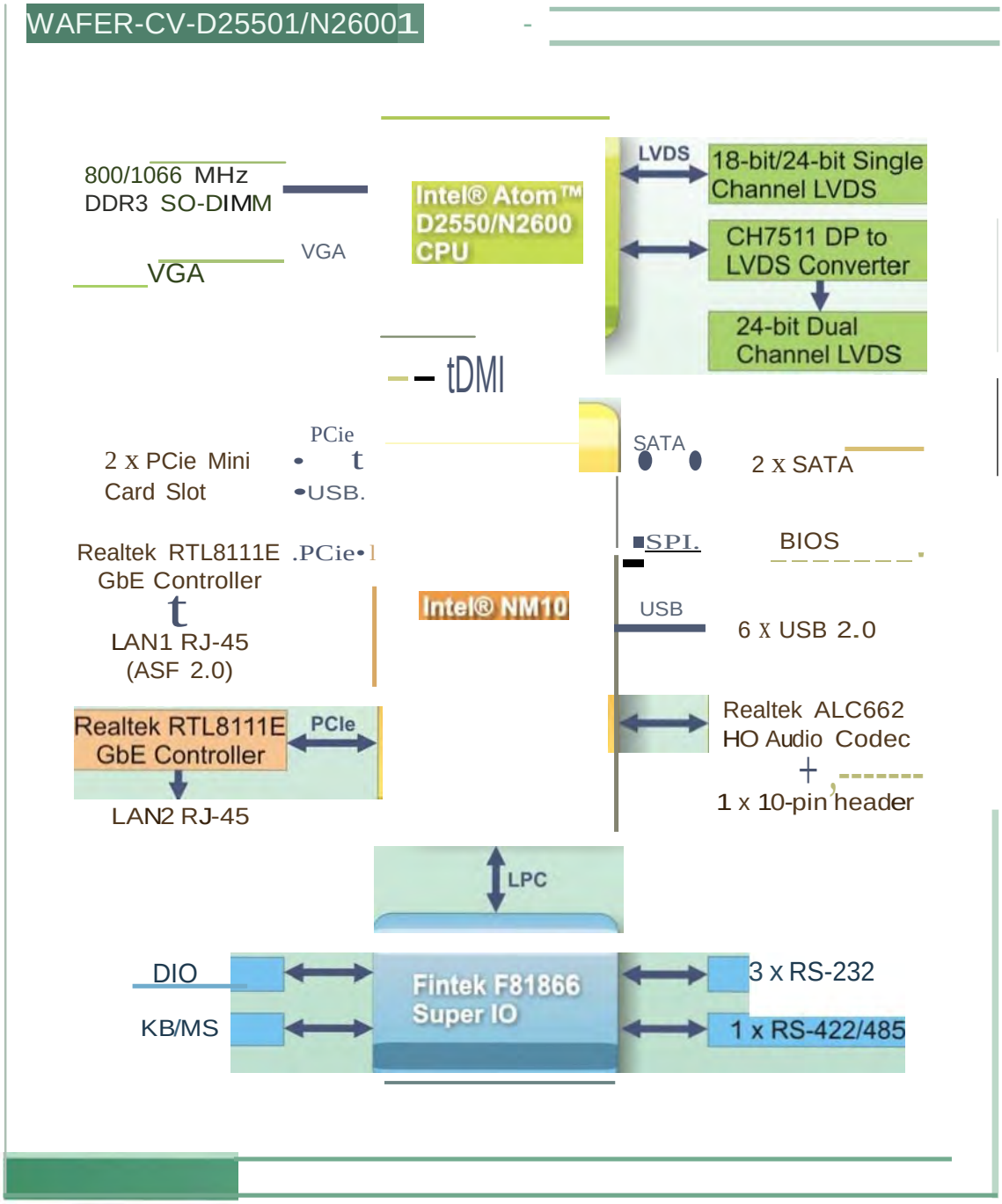



Figure 1-5: Data Flow Diagram

## 1.6 Technical Specifications

The WAFER-CV-D25501/N26001 technical specifications are listed below.

| Specification/Model | WAFER-CV-D25501 | WAFER-CV-N26001 |
|---|---|---|
| **Form Factor** | 3.5” | |
| **System CPU** | Intel® Atom™ D2550 1.86 GHz | Intel® Atom™ N2600 1.6 GHz |
| **System Chipset** | Intel® NM10 | |
| **Memory** | One 1066 MHz DDR3/DDR3L (1.35V) SO-DIMM support (up to 4 GB) | One 800 MHz DDR3/DDR3L (1.35V) SO-DIMM support (up to 2 GB) |
| **Graphics Engine** | Intel® GMA 3650 with a 640 MHz graphics core | Intel® GMA 3600 with a 400 MHz graphics core |
| **Display** | Dual display supported<br>One VGA<br>One LVDS1 is integrated in the Intel® Atom™ D2550/N2600 processor<br>One LVDS2 is driven by the Chrontel CH7511 DP to LVDS converter | |
| | 24-bit single-channel LVDS1 with up to 1440x900 resolution | 18-bit single-channel LVDS1 with up to 1366x768 resolution |
| | 24-bit dual-channel LVDS2 with up to 1920x1200 resolution | 24-bit dual-channel LVDS2 with up to 1600x1200 resolution |
| **Ethernet** | Dual Realtek RTL8111E PCIe GbE controller (LAN1 with ASF 2.0 support) | |
| **BIOS** | UEFI BIOS | |
| **Super I/O Controller** | Fintek F81866 | |
| **Watchdog Timer** | Software programmable supports 1~255 sec. system reset | |
| **Expansion** | One full-size PCIe Mini card slot with mSATA support<br>One half-size PCIe Mini card slot | |
| **Audio** | Realtek ALC662 HD Audio codec | |
| **COM** | Three RS-232 (one by external connector; two by on-board pin headers)<br>One RS-422/485 by internal 4-pin wafer connector | |
| **Digital I/O** | One 8-bit digital input/output connector (4-bit input/4-bit output) | |

| Specification/Model | WAFER-CV-D25501 | WAFER-CV-N26001 |
|---|---|---|
| **Fan** | One 3-pin CPU fan connector<br>One 3-pin system fan connector | |
| **Keyboard/mouse** | One internal pin-header connector | |
| **SATA** | Two SATA 3Gb/s ports with 5V power | |
| **USB** | Six USB 2.0/1.1 devices supported:<br>Two by external connectors<br>Four by on-board pin headers | |
| **Power Supply** | 12 V only<br>AT and ATX support<br>One internal 4-pin (2x2) power connector | |
| **Power Consumption** | 12V @ 1.53 A (1.86 GHz Intel® Atom™ D2550 with 1 GB 1066 MHz DDR3 SO-DIMM memory) | 12V @ 1.15 A (1.6 GHz Intel® Atom™ N2600 with 1 GB 1066 MHz DDR3 SO-DIMM memory) |
| **Operating Temperature** | -20ºC ~ 60ºC with free air<br>-20ºC ~ 70ºC with force air | -20ºC ~ 70ºC with free air<br>-20ºC ~ 75ºC with force air |
| **Storage Temperature** | -30ºC ~ 80ºC | -30ºC ~ 85ºC |
| **Humidity (Operating)** | 5% ~ 95% (non-condensing) | |
| **Dimensions (LxW)** | 146 mm x 102 mm | |
| **Weight (GW/NW)** | 600 g/250 g | |

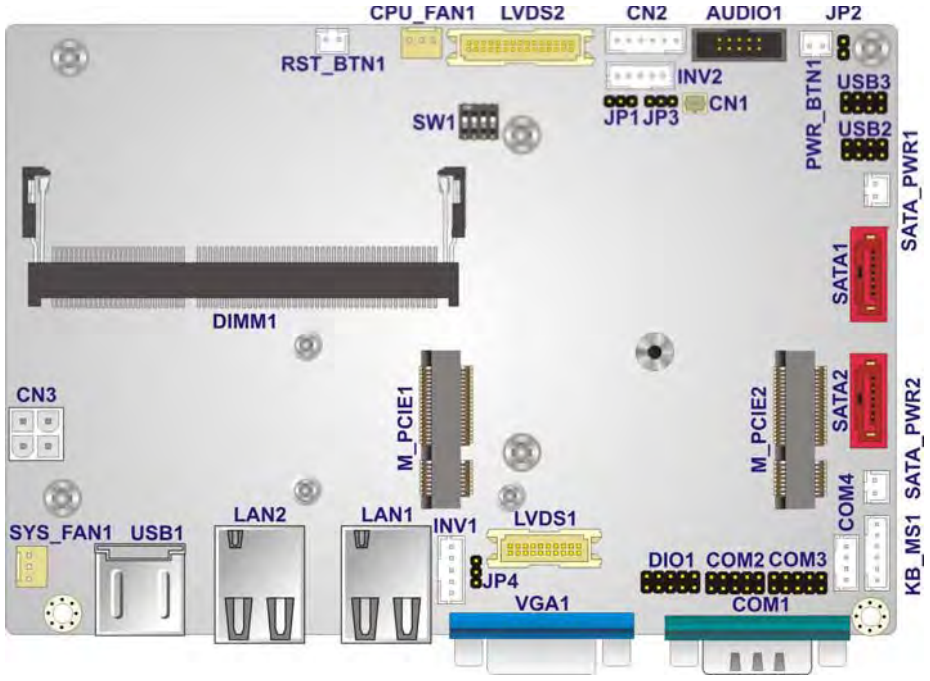
**Table 1-2: WAFER-CV-D25501/N26001 Specifications**

## 3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

### 3.1.1 WAFER-CV-D25501/N26001 Layout

The figure below shows all the connectors and jumpers.



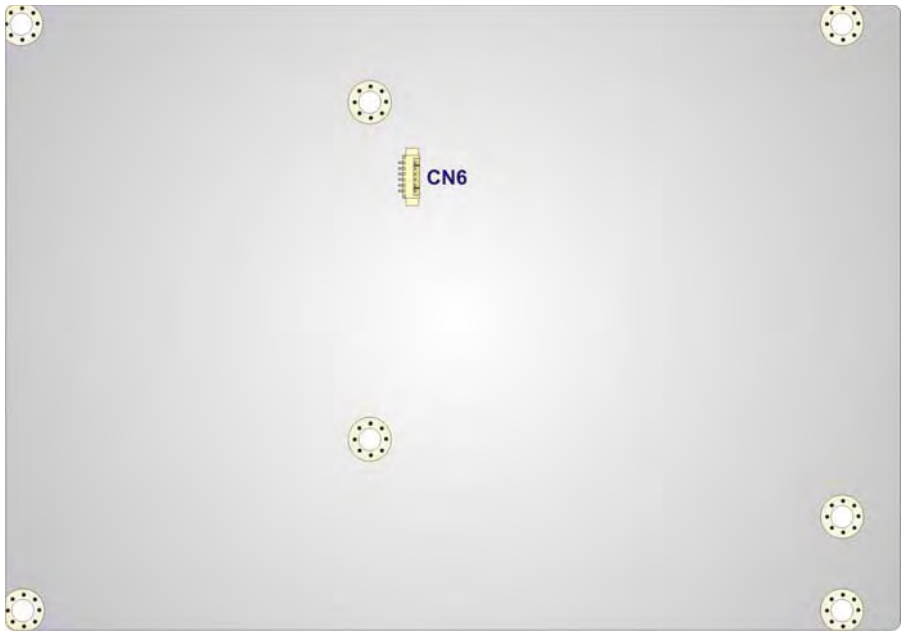



**Figure 3-1: Connectors and Jumpers**

### 3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

| Connector | Type | Label |
|---|---|---|
| 5 V SATA power connectors | 2-pin wafer | SATA_PWR1, SATA_PWR2 |
| 12 V power connector | 4-pin Molex power connector | CN3 |
| Audio connector | 10-pin box header | AUDIO1 |
| Backlight inverter connectors | 5-pin wafer | INV1, INV2 |
| Battery connector | 2-pin wafer | CN1 |
| Digital Input/Output (DIO) connector | 10-pin header | DIO1 |
| Fan connectors | 3-pin wafer | CPU_FAN1, SYS_FAN2 |
| Keyboard and mouse connector | 6-pin wafer | KB_MS1 |
| LVDS connectors | 20-pin/30-pin crimp | LVDS1, LVDS2 |
| LVDS2 backlight control connector | 6-pin wafer | CN6 |
| PCIe Mini card slots | 52-pin PCIe Mini | M_PCIE1, M_PCIE2 |
| Power & HDD LED connector | 6-pin header | CN2 |
| Power button connector | 2-pin wafer | PWR_BTN1 |
| Reset button connector | 2-pin wafer | RST_BTN1 |
| RS-232 serial port connectors | 10-pin header | COM2, COM3 |
| RS-422/485 serial port connector | 4-pin wafer | COM4 |
| Serial ATA (SATA) drive connectors | 7-pin SATA | SATA1, SATA2 |
| USB 2.0 connectors | 8-pin header | USB2, USB3 |

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

### 3.1.3 External Interface Panel Connectors

The table below lists the connectors on the external I/O panel.

| Connector | Type | Label |
|---|---|---|
| Dual USB port | Dual USB port | USB1 |
| Ethernet connectors | RJ-45 | LAN1, LAN2 |
| RS-232 serial port connector | Male DB-9 | COM1 |
| VGA connector | 15-pin female | VGA1 |

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

## 3.2 Internal Peripheral Connectors

The section describes all of the connectors on the WAFER-CV-D25501/N26001.

### 3.2.1 5 V SATA Power Connectors

**CN Label:** **SATA_PWR1, SATA_PWR2**

**CN Type:** 2-pin wafer

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

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

Use the 5 V SATA power connectors to connect to SATA device power connection.

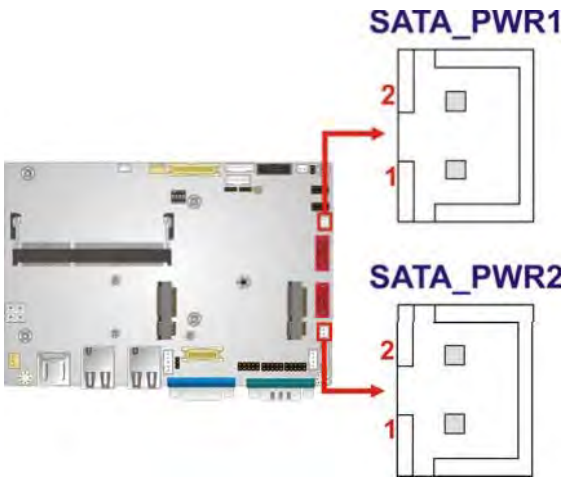



**Figure 3-2: 5 V SATA Power Connector Locations**

| Pin No. | Description |
|---|---|
| 1 | +5V |
| 2 | Ground |

**Table 3-3: 5 V SATA Power Connector Pinouts**

### 3.2.2 12 V Power Connector

**CN Label:** **CN3**

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

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

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

The ATX power connector connects to an ATX power supply.

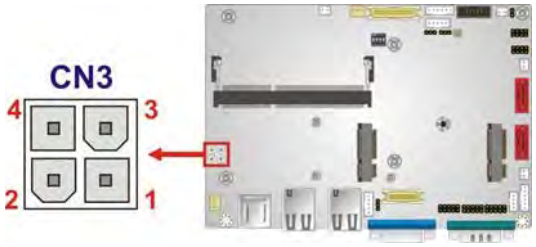



**Figure 3-3: 12 V Power Connector Location**

| Pin | Description |
|---|---|
| 1 | GND |
| 2 | GND |
| 3 | +12V |
| 4 | +12V |

**Table 3-4: 12 V Power Connector Pinouts**

### 3.2.3 Audio Connector

**CN Label:** **AUDIO1**

**CN Type:** 10-pin box header

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

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

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

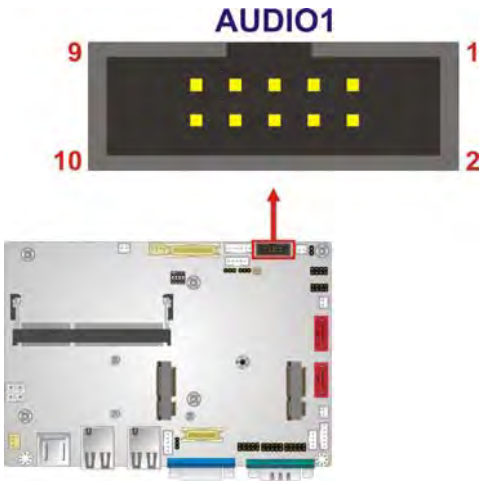



**Figure 3-4: Audio Connector Location**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | Line-out_R | 2 | Line-in_R |
| 3 | AUD_GND | 4 | AUD_GND |
| 5 | Line-out _L | 6 | Line-in _L |
| 7 | AUD_GND | 8 | AUD_GND |
| 9 | MIC1_R | 10 | MIC1_L |

**Table 3-5: Audio Connector Pinouts**

## 3.2.4 Backlight Inverter Connectors

**CN Label:** **INV1**, **INV2**

**CN Type:** 5-pin wafer

**CN Location:** See **Figure 3-5**

**CN Pinouts:** See **Table 3-6**

The backlight inverter connectors provide the backlights on the LCD display connected to the WAFER-CV-D25501/N26001 with +12V of power.

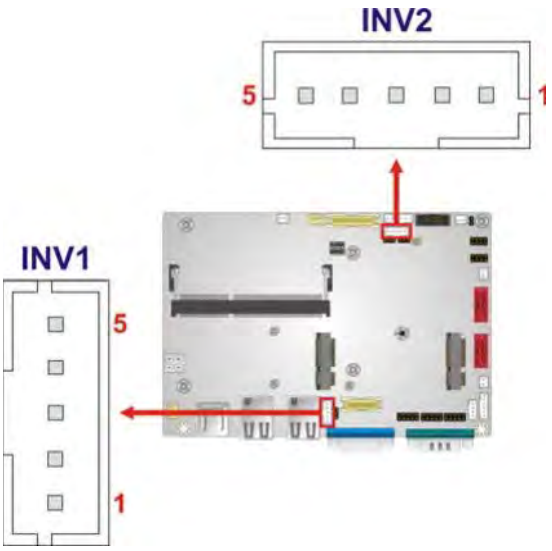



**Figure 3-5: Backlight Inverter Connector Locations**

| Pin | Description |
|---|---|
| 1 | LCD_BKLTCTL |
| 2 | GROUND |
| 3 | +12V |
| 4 | GROUND |
| 5 | LCD_BKLEN |

**Table 3-6: Backlight Inverter Connector Pinouts**

### 3.2.5 Battery Connector

**CAUTION:**

Risk of explosion if battery is replaced by an incorrect type. Only certified engineers should replace the on-board battery.

Dispose of used batteries according to instructions and local regulations.

**CN Label:** **CN1**

**CN Type:** 2-pin wafer

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

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

This is connected to the system battery. The battery provides power to the system clock to retain the time when power is turned off.

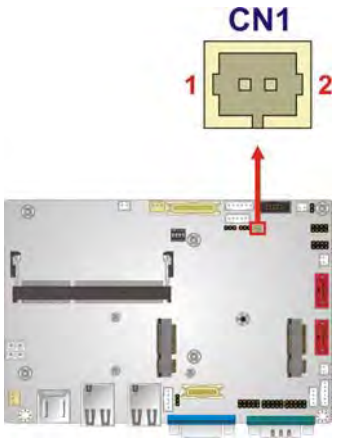



**Figure 3-6: Battery Connector Location**

| Pin | Description |
|---|---|
| 1 | Battery+ |
| 2 | GND |

**Table 3-7: Battery Connector Pinouts**

### 3.2.6 Digital Input/Output (DIO) Connector

**CN Label:** **DIO1**

**CN Type:** 10-pin header

**CN Location:** See **Figure 3-7**

**CN Pinouts:** See **Table 3-8**

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

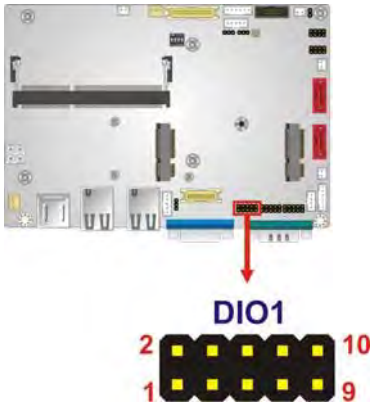



**Figure 3-7: Digital I/O Connector Location**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | GND | 2 | VCC |
| 3 | Output 3 | 4 | Output 2 |
| 5 | Output 1 | 6 | Output 0 |
| 7 | Input 3 | 8 | Input 2 |
| 9 | Input 1 | 10 | Input 0 |

**Table 3-8: Digital I/O Connector Pinouts**

### 3.2.7 Fan Connectors

**CN Label:** **CPU_FAN1, SYS_FAN1**

**CN Type:** 3-pin wafer

**CN Location:** See **Figure 3-8**

**CN Pinouts:** See **Table 3-9**

The fan connectors attach to the CPU/system cooling fans.

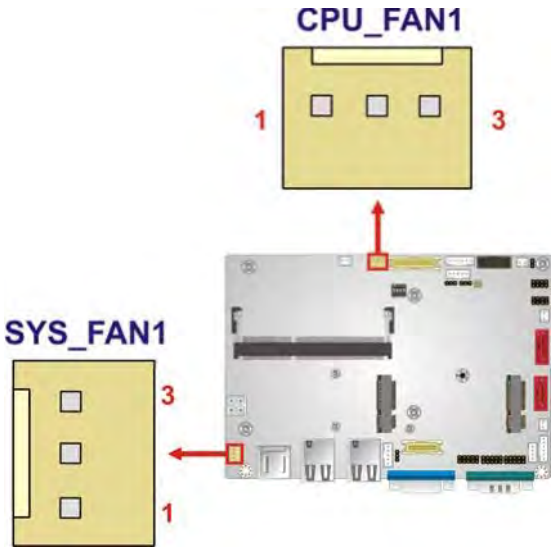



**Figure 3-8: Fan Connector Locations**

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

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

### 3.2.8 Keyboard/Mouse Connector

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

**CN Type:** 6-pin wafer

**CN Location:** See **Figure 3-9**

**CN Pinouts:** See **Table 3-10**

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

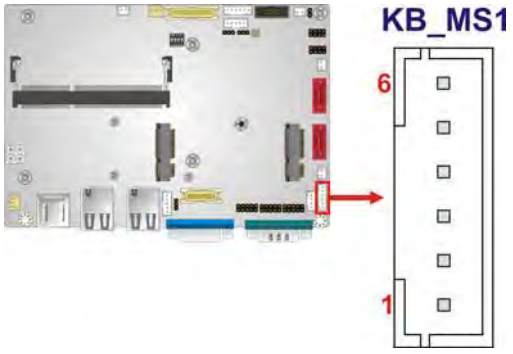



**Figure 3-9: Keyboard/Mouse Connector Location**

| Pin | Description |
|---|---|
| 1 | +5 V KB DATA |
| 2 | MS DATA |
| 3 | MS CLK |
| 4 | KB DATA |
| 5 | KB CLK |
| 6 | GROUND |

**Table 3-10: Keyboard/Mouse Connector Pinouts**

### 3.2.9 LVDS1 Connector

**CN Label:** **LVDS1**

**CN Type:** 20-pin crimp

**CN Location:** See **Figure 3-10**

**CN Pinouts:** See **Table 3-11**

The 20-pin LVDS LCD connector can be connected to an 18-bit/24-bit single-channel LVDS panel.

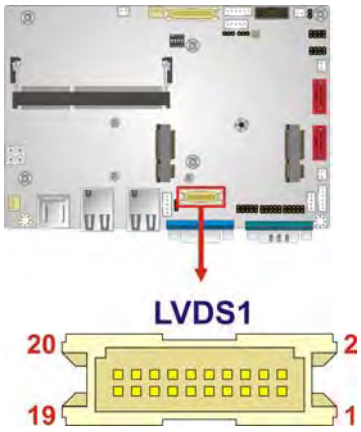



**Figure 3-10: LVDS1 Connector Location**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | LVDS_DATA0 | 4 | LVDS_DATA0# |
| 5 | LVDS_DATA1 | 6 | LVDS_DATA1# |
| 7 | LVDS_DATA2 | 8 | LVDS_DATA2# |
| 9 | LVDS_CLK | 10 | LVDS_CLK# |
| 11 | LVDS_DATA3 | 12 | LVDS_DATA3# |
| 13 | GND | 14 | GND |
| 15 | LDDC_DATA | 16 | LDDC_CLK |
| 17 | VCC_LCD | 18 | VCC_LCD |
| 19 | VCC_LCD | 20 | VCC_LCD |

**Table 3-11: LVDS1 Connector Pinouts**

## 3.2.10 LVDS2 Connector

**CN Label:** **LVDS2**

**CN Type:** 30-pin crimp

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

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

The 30-pin LVDS LCD connector can be connected to a 24-bit dual-channel LVDS panel.

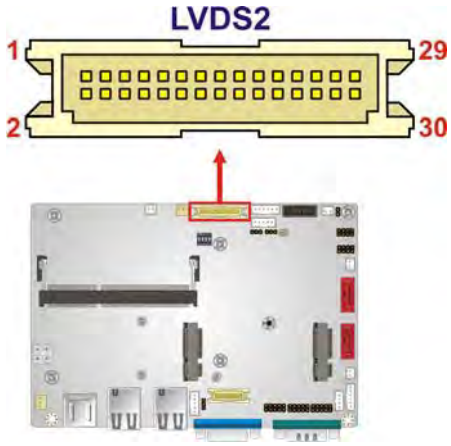



**Figure 3-11: LVDS2 Connector Location**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | LVDS_DATA0 | 4 | LVDS_DATA0# |
| 5 | LVDS_DATA1 | 6 | LVDS_DATA1# |
| 7 | LVDS_DATA2 | 8 | LVDS_DATA2# |
| 9 | LVDS_CLK1 | 10 | LVDS_CLK1# |
| 11 | LVDS_DATA3 | 12 | LVDS_DATA3# |
| 13 | GND | 14 | GND |
| 15 | LVDS_DATA4 | 16 | LVDS_DATA4# |
| 17 | LVDS_DATA5 | 18 | LVDS_DATA5# |
| 19 | LVDS_DATA6 | 20 | LVDS_DATA6# |
| 21 | LVDS_CLK2 | 22 | LVDS_CLK2# |
| 23 | LVDS_DATA7 | 24 | LVDS_DATA7# |
| 25 | GND | 26 | GND |
| 27 | VCC_LCD | 28 | VCC_LCD |
| 29 | VCC_LCD | 30 | VCC_LCD |

**Table 3-12: LVDS2 Connector Pinouts**

### 3.2.11 LVDS2 Backlight Control Connector

**CN Label:** **CN6**

**CN Type:** 6-pin wafer

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

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

This connector allows control of the LVDS2 panel backlight.

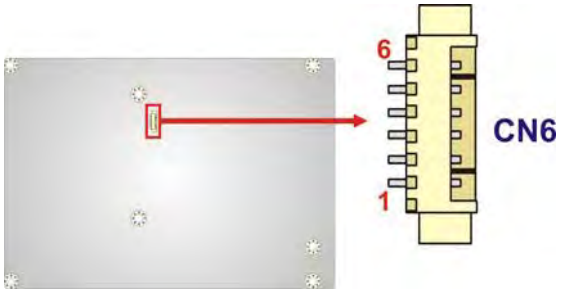



**Figure 3-12: LVDS2 Backlight Control Connector Location**

| Function | Pin | Description |
|---|---|---|
| Panel power button | 1 | PWRDN |
| | 2 | GND |
| Panel brightness + | 3 | BLUP |
| | 4 | GND |
| Panel brightness - | 5 | BLDN |
| | 6 | GND |

**Table 3-13: LVDS2 Backlight Control Connector Pinouts**

### 3.2.12 PCIe Mini Card Slots

**CN Label:** **M_PCIE1, M_PCIE2**

**CN Type:** 52-pin PCIe Mini card slot

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

**CN Pinouts:** See **Table 3-14**

The **M_PCIE2** slot can be connected to a full-size PCIe Mini card while the **M_PCIE1** slot can be connected to a half-size PCIe Mini card.

**NOTE:**

The **M_PCIE2** slot supports mSATA devices.

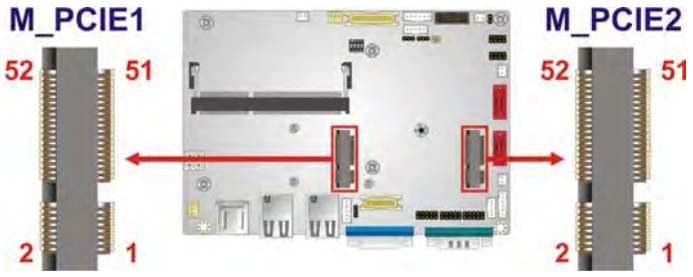



**Figure 3-13: PCIe Mini Card Slot Locations**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | PCIE_WAKE# | 2 | VCC3 |
| 3 | N/C | 4 | GND |
| 5 | N/C | 6 | 1.5V |
| 7 | N/C | 8 | N/C |
| 9 | GND | 10 | N/C |
| 11 | PCIE_CLK# | 12 | N/C |
| 13 | PCIE_CLK | 14 | N/C |
| 15 | GND | 16 | N/C |
| 17 | N/C | 18 | GND |
| 19 | N/C | 20 | N/C |
| 21 | GND | 22 | PCIRST# |
| 23 | PCIE_RXN | 24 | VCC3 |
| 25 | PCIE_RXP | 26 | GND |
| 27 | GND | 28 | 1.5V |
| 29 | GND | 30 | SMBCLK |
| 31 | PCIE_TXN | 32 | SMBDATA |
| 33 | PCIE_TXP | 34 | GND |
| 35 | GND | 36 | USBD- |

| Pin | Description | Pin | Description |
|---|---|---|---|
| 37 | GND | 38 | USBD+ |
| 39 | VCC3 | 40 | GND |
| 41 | VCC3 | 42 | N/C |
| 43 | GND | 44 | N/C |
| 45 | N/C | 46 | N/C |
| 47 | N/C | 48 | 1.5V |
| 49 | N/C | 50 | GND |
| 51 | N/C | 52 | VCC3 |

**Table 3-14: PCIe Mini Card Slot Pinouts**

### 3.2.13 Power & HDD LED Connector

**CN Label:** **CN2**

**CN Type:** 6-pin wafer

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

**CN Pinouts:** See **Table 3-15**

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.

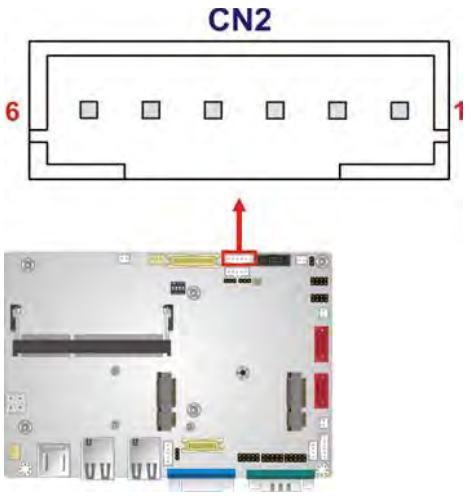



**Figure 3-14: Power & HDD LED Connector Location**

| Pin | Description |
|---|---|
| 1 | +5V |
| 2 | GND |
| 3 | Power LED+ |
| 4 | Power LED- |
| 5 | HDD LED+ |
| 6 | HDD LED- |

**Table 3-15: Power & HDD LED Connector Pinouts**

### 3.2.14 Power Button Connector

**CN Label:** **PWR_BTN1**

**CN Type:** 2-pin wafer

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

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

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

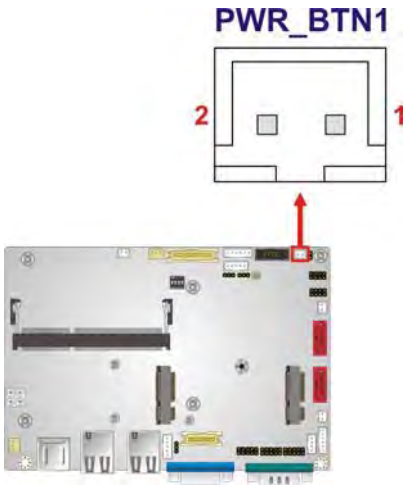



**Figure 3-15: Power Button Connector Location**

| Pin | Description |
|---|---|
| 1 | PWR_BTN+ |
| 2 | PWR_BTN- |

**Table 3-16: Power Button Connector Pinouts**

### 3.2.15 Reset Button Connector

**CN Label:** **RST_BTN1**

**CN Type:** 2-pin wafer

**CN Location:** See **Figure 3-16**

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

The reset button connector is connected to a reset switch on the system chassis to enable users to reboot the system when the system is turned on.

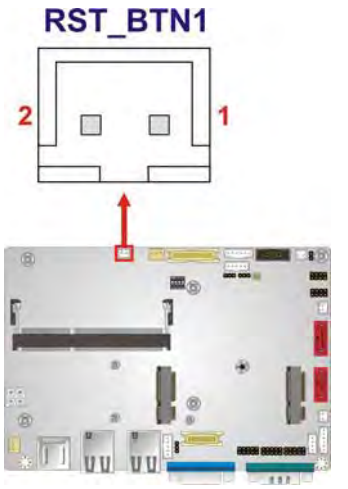



**Figure 3-16: Reset Button Connector Location**

| Pin | Description |
|---|---|
| 1 | RESET+ |
| 2 | RESET- |

**Table 3-17: Reset Button Connector Pinouts**

### 3.2.16 RS-232 Serial Port Connectors

**CN Label:** **COM2, COM3**

**CN Type:** 10-pin header

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

**CN Pinouts:** See **Table 3-18**

Each of these connectors provides RS-232 connections.

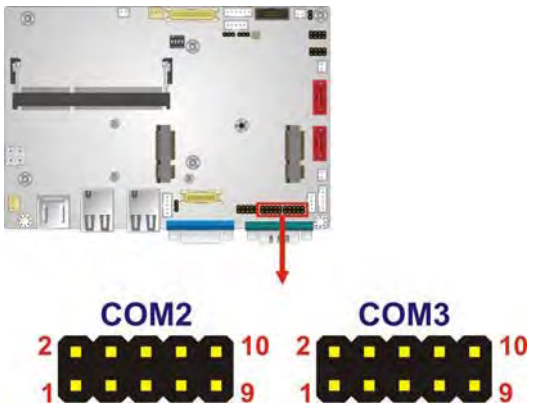



**Figure 3-17: RS-232 Serial Port Connector Locations**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | DCD | 2 | DSR |
| 3 | RXD | 4 | RTS |
| 5 | TXD | 6 | CTS |
| 7 | DTR | 8 | RI |
| 9 | GND | 10 | GND |

**Table 3-18: RS-232 Serial Port Connector Pinouts**

### 3.2.17 RS-422/485 Serial Port Connector

**CN Label:** **COM4**

**CN Type:** 4-pin wafer

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

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

**NOTE:**

These pins are shared with those on the main serial port. Use either the pins on the main connector, or on this connector, but not both.

This connector provides RS-422 or RS-485 communications.

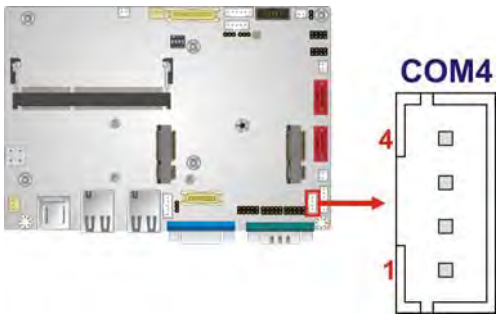



**Figure 3-18: RS-422/485 Connector Location**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | RXD422- | 3 | TXD422+/TXD485+ |
| 2 | RXD422+ | 4 | TXD422-/TXD485- |

**Table 3-19: RS-422/485Connector Pinouts**

### 3.2.18 SATA Drive Connectors

**CN Label:** **SATA1, SATA2**

**CN Type:** 7-pin SATA drive connector

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

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

The SATA drive connectors can be connected to SATA drives and support up to 3Gb/s data transfer rate.

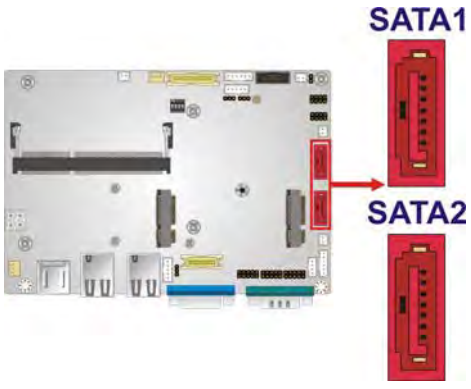



**Figure 3-19: SATA Drive Connector Locations**

| Pin | Description |
|---|---|
| 1 | GND |
| 2 | TX+ |
| 3 | TX- |
| 4 | GND |
| 5 | RX- |
| 6 | RX+ |
| 7 | GND |

**Table 3-20: SATA Drive Connector Pinouts**

## 3.2.19 USB Connectors

**CN Label:** **USB2, USB3**

**CN Type:** 8-pin header

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

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

Each USB connector provides connectivity to two USB 1.1/2.0 ports.

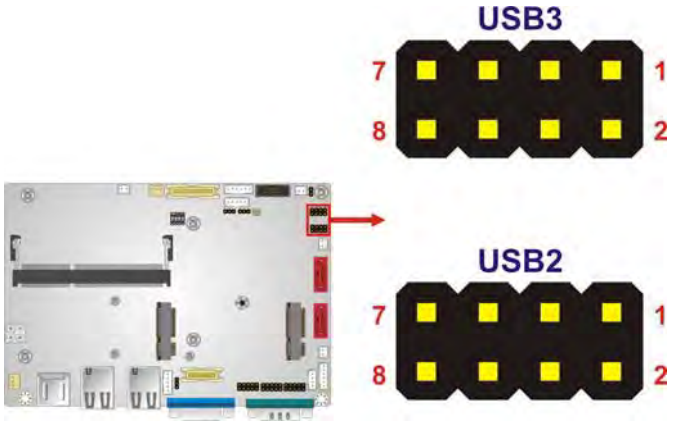



**Figure 3-20: USB Connector Locations**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | USB_VCC | 2 | GND |
| 3 | DATA- | 4 | DATA+ |
| 5 | DATA+ | 6 | DATA- |

| Pin | Description | Pin | Description |
|---|---|---|---|
| 7 | GND | 8 | USB_VCC |

**Table 3-21: USB Connector Pinouts**

## 3.3 External Peripheral Interface Connector Panel

The figure below shows the external peripheral interface connector (EPIC) panel. The EPIC panel consists of the following:

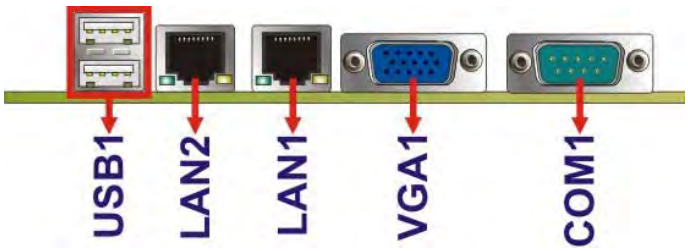



**Figure 3-21: External Peripheral Interface Connector**

### 3.3.1 Ethernet Connectors

**CN Label:** **LAN1, LAN2**

**CN Type:** RJ-45 connector

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

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

The WAFER-CV-D25501/N26001 is equipped with two built-in RJ-45 Ethernet controllers. Each controller can connect to the LAN through one RJ-45 LAN connector.

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | LAN1_MDI0+ | 5 | LAN1_MDI2+ |
| 2 | LAN1_MDI0- | 6 | LAN1_MDI2- |
| 3 | LAN1_MDI1+ | 7 | LAN1_MDI3+ |
| 4 | LAN1_MDI1- | 8 | LAN1_MDI3- |

**Table 3-22: LAN Pinouts**

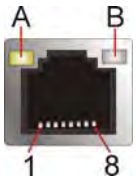



**Figure 3-22: RJ-45 Ethernet Connector**

| LED | Description | LED | Description |
|---|---|---|---|
| A | on: linked<br>blinking: data is being sent/received | B | off: 10 Mb/s<br>green: 100 Mb/s<br>orange: 1000 Mb/s |

**Table 3-23: RJ-45 Ethernet Connector LEDs**

## 3.3.2 Serial Port Connector (COM1)

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

**CN Type:** Male DB-9 connector

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

**CN Pinouts:** See **Table 3-24** and **Figure 3-23**

The serial port connects to a RS-232 serial communications device.

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | DATA CARRIER DETECT (DCD) | 6 | DATA SET READY (DSR) |
| 2 | RECEIVE DATA (RXD) | 7 | REQUEST TO SEND (RTS) |
| 3 | TRANSMIT DATA (TXD) | 8 | CLEAR TO SEND (CTS) |
| 4 | DATA TERMINAL READY (DTR) | 9 | RING INDICATOR (RI) |
| 5 | GND | | |

**Table 3-24: RS-232 Serial Port (COM 1) Pinouts**

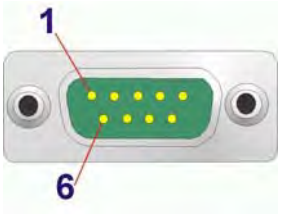



**Figure 3-23: COM1 Pinout Locations**

### 3.3.3 USB Connectors

**CN Label:** **USB1**

**CN Type:** Dual USB port

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

**CN Pinouts:** See **Table 3-25**

The ports connect to both USB 2.0 and USB 1.1 devices.

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | USB_VCC | 2 | USB_VCC |
| 3 | DATA- | 4 | DATA- |
| 5 | DATA+ | 6 | DATA+ |
| 7 | GND | 8 | GND |

**Table 3-25: USB Port Pinouts**

### 3.3.4 VGA Connector

**CN Label:** **VGA1**

**CN Type:** 15-pin Female

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

**CN Pinouts:** See **Figure 3-24** and **Table 3-26**

The VGA connector connects to a monitor that accepts a standard VGA input.

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | RED | 2 | GREEN |
| 3 | BLUE | 4 | NC |
| 5 | GND | 6 | GND |
| 7 | GND | 8 | GND |
| 9 | VGAVCC | 10 | GND |
| 11 | NC | 12 | DDCDAT |
| 13 | HSYNC | 14 | VSYNC |
| 15 | DDCCLK | | |

**Table 3-26: VGA Connector Pinouts**

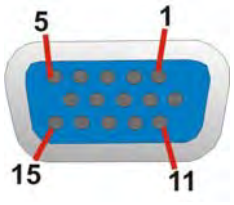



**Figure 3-24: VGA Connector**

**NOTE:**

Due to Intel® GMA driver limitation, the monitor connected to the VGA connector may become extended desktop or not have signal to it after restarting from the graphics driver installation. To work out this limitation, press the Ctrl+Alt+F1 hotkey to switch the primary display to CRT mode.

# Installation

## 4.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the WAFER-CV-D25501/N26001 may result in permanent damage to the WAFER-CV-D25501/N26001 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the WAFER-CV-D25501/N26001. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the WAFER-CV-D25501/N26001 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-CV-D25501/N26001, place it on an antic-static pad. This reduces the possibility of ESD damaging the WAFER-CV-D25501/N26001.
- ***Only handle the edges of the PCB***:-: When handling the PCB, hold the PCB by the edges.

## 4.2 Installation Considerations

**NOTE:**

The following installation notices and installation considerations should be read and understood before installation. All installation notices must be strictly adhered to. Failing to adhere to these precautions may lead to severe damage and injury to the person performing the installation.

**WARNING:**

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

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

- Read the user manual:
  - The user manual provides a complete description of the WAFER-CV-D25501/N26001 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-CV-D25501/N26001 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-CV-D25501/N26001 off:
  - When working with the WAFER-CV-D25501/N26001, 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-CV-D25501/N26001 **DO NOT:**

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

## 4.3 SO-DIMM Installation

**WARNING:**

Using incorrectly specified SO-DIMM may cause permanent damage to the WAFER-CV-D25501/N26001. Please make sure the purchased SO-DIMM complies with the memory specifications of the WAFER-CV-D25501/N26001. SO-DIMM specifications compliant with the WAFER-CV-D25501/N26001 are listed in Chapter 1.

To install a SO-DIMM into a SO-DIMM socket, please follow the steps below and refer to **Figure 4-1**.

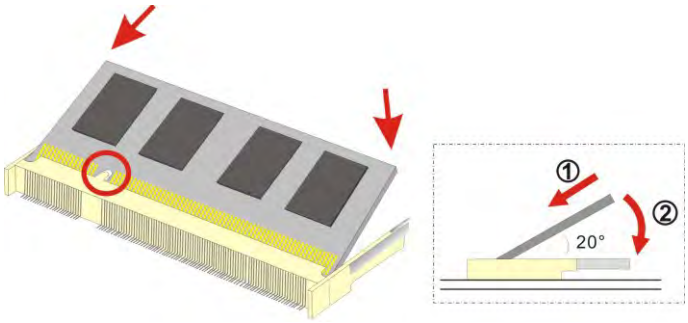



**Figure 4-1: SO-DIMM Installation**

**Step 1:** **Locate the SO-DIMM socket**. Place the WAFER-CV-D25501/N26001 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.

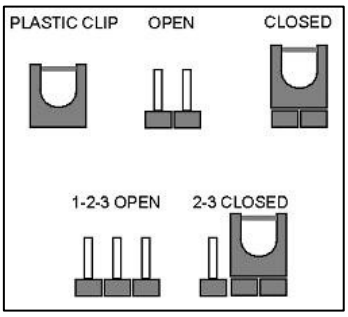
**Step 3:** **Insert the SO-DIMM**. Push the SO-DIMM chip into the socket at an angle. (See **Figure 4-1**)

**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 4-1**)

**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.

## 4.4 Jumper Settings

**NOTE:**




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

The hardware jumpers must be set before installation. Jumpers are shown in **Table 4-1**.

| Description | Label | Type |
|---|---|---|
| AT/ATX power selection | JP2 | 2-pin header |
| Clear CMOS | JP3 | 3-pin header |
| LVDS1 voltage selection | JP4 | 3-pin header |
| LVDS2 voltage selection | JP1 | 3-pin header |
| LVDS2 panel type selection | SW1 | 4-pin switch |

**Table 4-1: Jumpers**

### 4.4.1 AT/ATX Power Selection Jumper

**Jumper Label:** **JP2**

**Jumper Type:** 2-pin header

**Jumper Settings:** See **Table 4-2**

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

The AT/ATX power selection jumper specifies the system power mode as AT or ATX.

| Setting | Description |
|---|---|
| Short 1-2 | Use ATX power (Default) |
| Off | Use AT power |

**Table 4-2: AT/ATX Power Selection Jumper Settings**

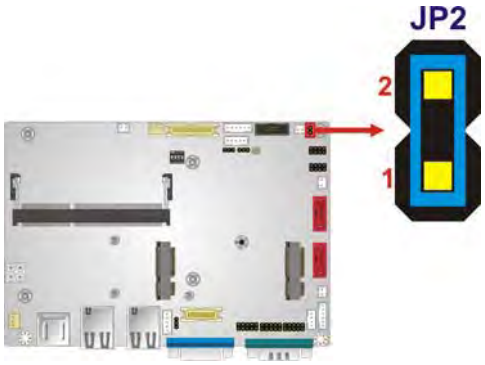



**Figure 4-2: AT/ATX Power Selection Jumper Location**

### 4.4.2 Clear CMOS Jumper

**Jumper Label:** **JP3**

**Jumper Type:** 3-pin header

**Jumper Settings:** See **Table 4-3**

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

To reset the BIOS, move the jumper to the "Clear BIOS" position for 3 seconds or more, and then move back to the default position.

| Setting | Description |
|---|---|
| Short 1-2 | Normal |
| Short 2-3 | Clear BIOS |

**Table 4-3: Clear CMOS Jumper Settings**

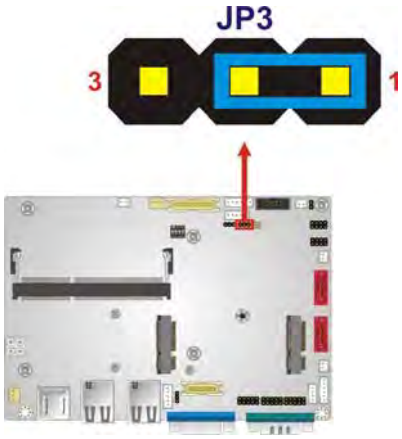



**Figure 4-3: Clear CMOS Jumper Location**

### 4.4.3 LVDS1 Voltage Selection

**WARNING:**

Permanent damage to the screen and WAFER-CV-D25501/N26001 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.

**Jumper Label:** **JP4**

**Jumper Type:** 3-pin header

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

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

Sets the voltage provided to the monitor by LVDS1.

| Setting | Description |
|---|---|
| Short 1-2 | +3.3V LVDS (Default) |
| Short 2-3 | +5V LVDS |

**Table 4-4: LVDS1 Voltage Selection Jumper Settings**

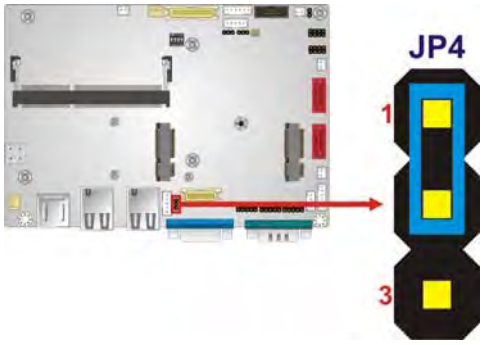



**Figure 4-4: LVDS1 Voltage Selection Jumper Location**

### 4.4.4 LVDS2 Voltage Selection

**WARNING:**

Permanent damage to the screen and WAFER-CV-D25501/N26001 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.

| | |
|---|---|
| **Jumper Label:** | **JP1** |
| **Jumper Type:** | 3-pin header |
| **Jumper Settings:** | See **Table 4-5** |
| **Jumper Location:** | See **Figure 4-5** |

Sets the voltage provided to the monitor connected to LVDS2.

| Setting | Description |
|---|---|
| Short 1-2 | +3.3V LVDS (Default) |
| Short 2-3 | +5V LVDS |

**Table 4-5: LVDS2 Voltage Selection Jumper Settings**

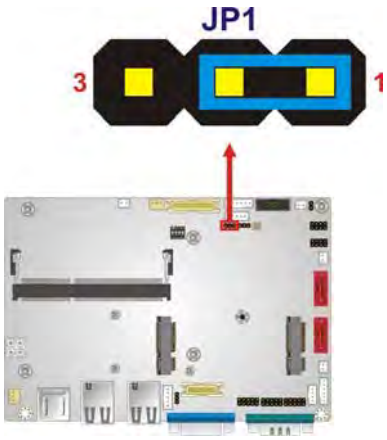



**Figure 4-5: LVDS2 Voltage Selection Jumper Location**

### 4.4.5 LVDS2 Panel Type Selection Jumper

**Jumper Label:** **SW1**

**Jumper Type:** 4-pin switch

**Jumper Settings:** See Table 4-6

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

Sets the panel type of the LVDS2 video channel.

| Pin No. 4321 | EDID Resolution | Color Depth | Channel |
|---|---|---|---|
| 0000 | 800 x 600 @ 60 Hz | 18-bit | Single |
| 0001 | 1024 x 768 @ 60Hz | 18-bit | Single |
| 0010 | 1024 x 768 @ 60Hz | 24-bit | Single |
| 0011 | 1280 x 768 @ 60Hz | 18-bit | Single |
| 0100 | 1280 x 800 @ 60Hz | 18-bit | Single |
| 0101 | 1280 x 960 @ 60Hz | 18-bit | Single |
| 0110 | 1280 x 1024 @ 60Hz | 24-bit | Dual |
| 0111 | 1366 x 768 @ 60Hz | 18-bit | Single |
| 1000 | 1366 x 768 @ 60Hz | 24-bit | Single |
| 1001 | 1440 x 900 @ 60Hz | 24-bit | Dual |
| 1010 | 1440 x 1050 @ 60Hz | 24-bit | Dual |
| 1011 | 1600 x 900 @ 60Hz | 24-bit | Dual |

| Pin No. 4321 | EDID Resolution | Color Depth | Channel |
|---|---|---|---|
| 1100 | 1680 x 1050 @ 60Hz | 24-bit | Dual |
| 1101 | 1600 x 1200 @ 60Hz | 24-bit | Dual |
| 1110 | 1920 x 1080 @ 60Hz | 24-bit | Dual |
| 1111 | 1920 x 1200 @ 60Hz | 24-bit | Dual |

**Table 4-6: LVDS2 Panel Resolution**

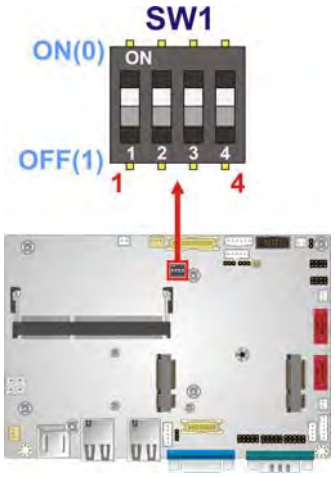



**Figure 4-6: LVDS2 Panel Type Selection Switch Location**

## 4.5 Chassis Installation

### 4.5.1 Airflow

**WARNING:**

Airflow is critical to the cooling of the CPU and other on-board components. The chassis in which the WAFER-CV-D25501/N26001 must have air vents to allow cool air to move into the system and hot air to move out.

The WAFER-CV-D25501/N26001 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 chassis available. Please contact your WAFER-CV-D25501/N26001 vendor, reseller or an IEI sales representative at sales@iei.com.tw or visit the IEI website (http://www.ieiworld.com.tw) to find out more about the available chassis.

### 4.5.2 Motherboard Installation

To install the WAFER-CV-D25501/N26001 motherboard into the chassis please refer to the reference material that came with the chassis.

## 4.6 Internal Peripheral Device Connections

This section outlines the installation of peripheral devices to the on-board connectors.

### 4.6.1 Audio Kit Installation

The Audio Kit that came with the WAFER-CV-D25501/N26001 connects to the 10-pin audio connector on the WAFER-CV-D25501/N26001. The audio kit consists of three audio jacks. One audio jack, Mic In, connects to a microphone. The remaining two audio jacks, Line-In and Line-Out, connect to two 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 4-7**.

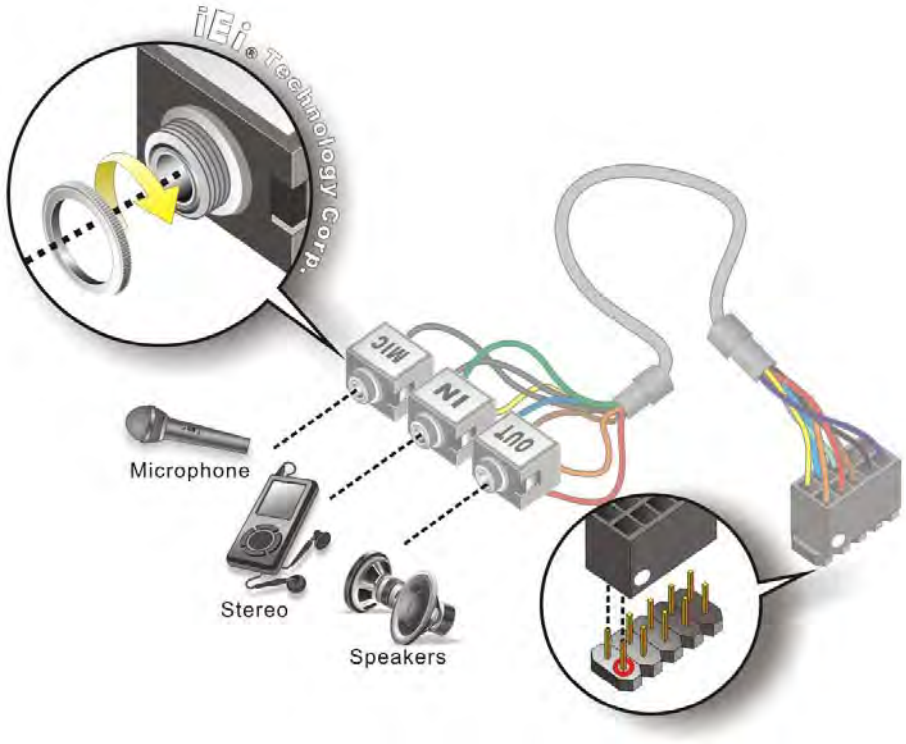



**Figure 4-7: Audio Kit Cable Connection**

**Step 3:** **Connect the audio devices**. Connect one speaker to the line-in audio jack, one speaker to the line-out audio jack and a microphone to the mic-in audio jack.

### 4.6.2 LVDS LCD Installation

The WAFER-CV-D25501/N26001 can be connected to a TFT LCD screen through the LVDS crimp connectors on the board. To connect a TFT LCD to the WAFER-CV-D25501/N26001, please follow the steps below.

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

**Step 2:** **Insert the cable connector**. Insert the connector from the LVDS PCB driving board to the LVDS connector as shown in **Figure 4-8**. When connecting the connectors, make sure the pins are properly aligned.

**WARNING:**

The diagram below is merely for illustration. The configuration and connection of the cables from the TFT LCD screen being installed may be different. Please refer to the installation manual that came with the TFT LCD screen.

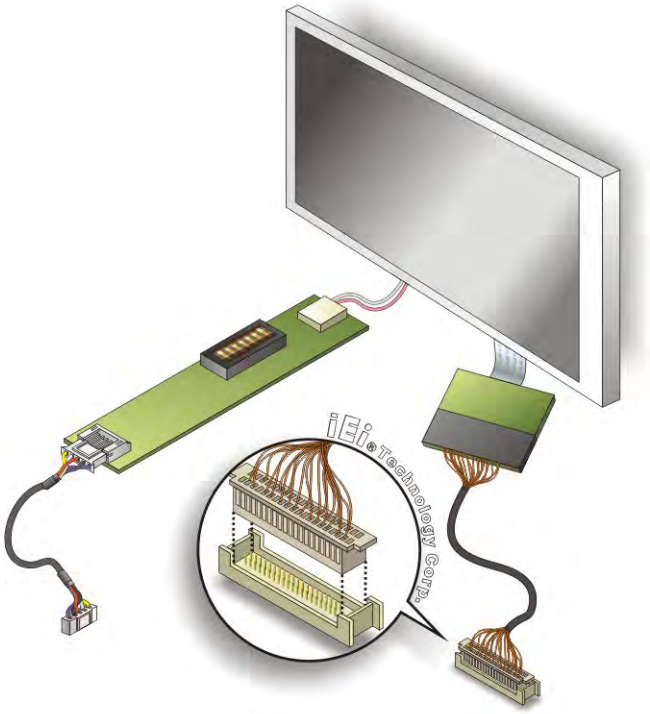



**Figure 4-8: LVDS Connector**

**Step 3:** **Locate the backlight inverter connector.** The locations of the backlight inverter connectors are shown in **Chapter 3**.

**Step 4:** **Connect backlight connector**. Connect the backlight connector to the driver TFT LCD PCB as shown in **Figure 4-9**. When inserting the cable connector, make sure the pins are properly aligned.

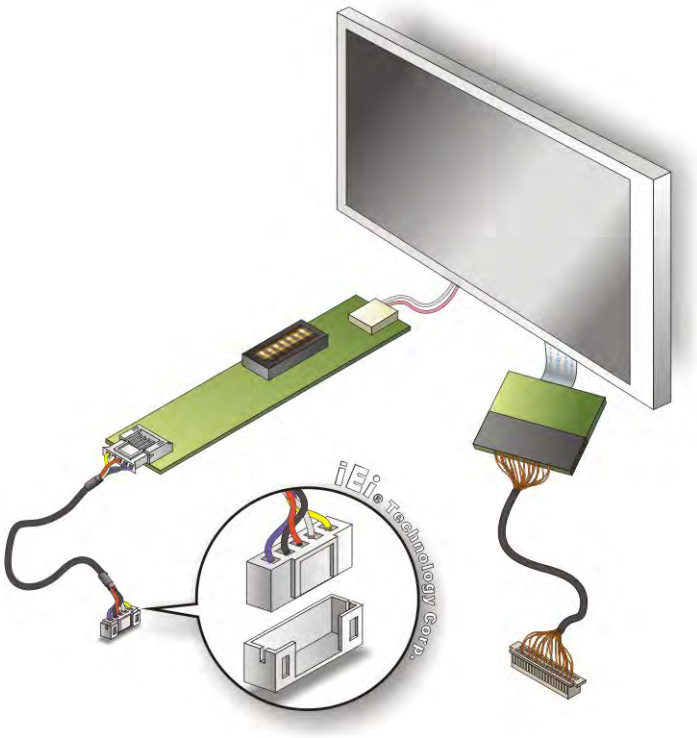



**Figure 4-9: Backlight Inverter Connection**

### 4.6.3 Full-size PCIe Mini Card Installation

To install a full-size PCIe Mini card, please follow the steps below.

**Step 1:** **Locate the full-size PCIe Mini card slot**. The location of the full-size PCIe Mini card slot is shown in **Chapter 3**.

**Step 2:** **Remove the retention screw**. Remove the retention screw secured on the motherboard as shown in **Figure 4-10**.

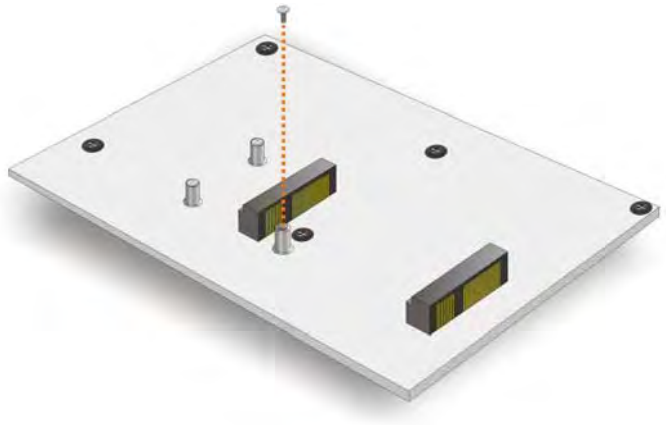


**Figure 4-10: Remove the Retention Screw for the Full-size PCIe Mini Card**

**Step 3:** **Insert into the socket at an angle**. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20º (**Figure 4-11**).


**Figure 4-11: Insert the Full-size PCIe Mini Card into the Socket at an Angle**

**Step 4:** **Secure the full-size PCIe Mini card**. Secure the full-size PCIe Mini card with the retention screw previously removed (**Figure 4-12**).

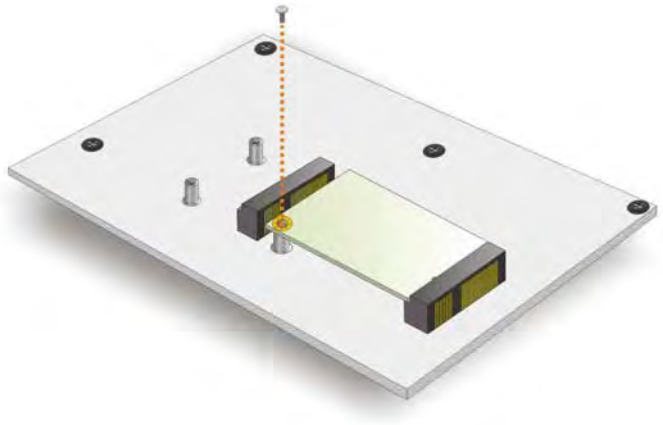


**Figure 4-12: Secure the Full-size PCIe Mini Card**

### 4.6.4 Half-size PCIe Mini Card Installation

To install a half-size PCIe Mini card, please follow the steps below.

**Step 1:** **Locate the half-size PCIe Mini card slot**. The location of the half-size PCIe Mini card slot is shown in **Chapter 3**.

**Step 2:** **Remove the retention screws**. Remove the two retention screws secured on the motherboard as shown in **Figure 4-13**.

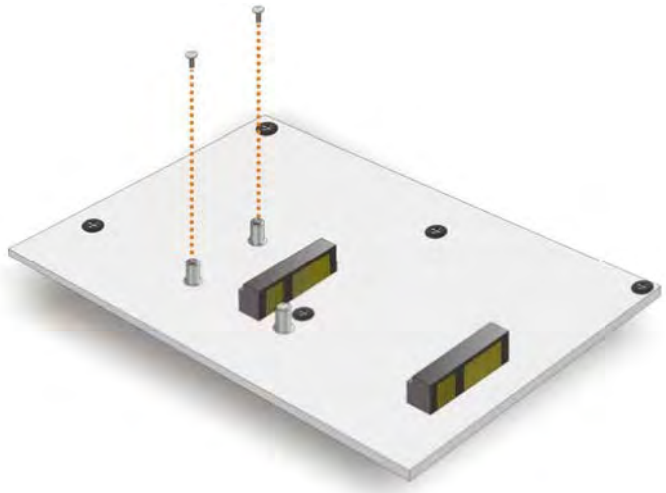


**Figure 4-13: Remove the Retention Screws for the Half-size PCIe Mini Card**

**Step 3:** **Insert into the socket at an angle**. Line up the notch on the card with the notch on the connector. Slide the PCIe Mini card into the socket at an angle of about 20º (**Figure 4-14**).

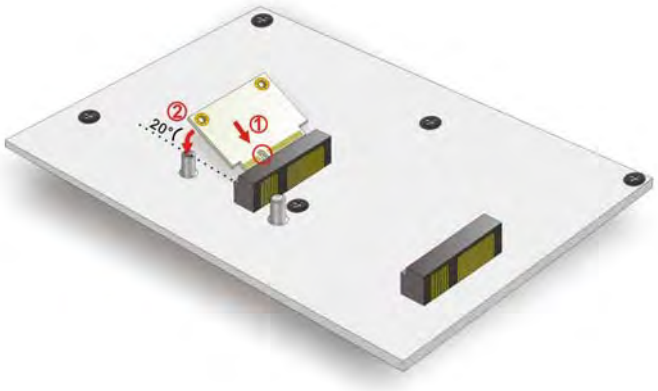



**Figure 4-14: Insert the Half-size PCIe Mini Card into the Socket at an Angle**

**Step 4:** **Secure the half-size PCIe Mini card**. Secure the half-size PCIe Mini card with the two retention screws previously removed (**Figure 4-15**).

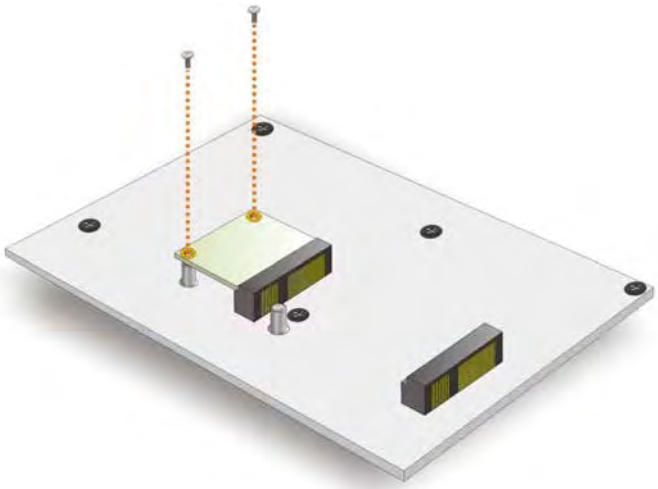


**Figure 4-15: Secure the Half-size PCIe Mini Card**

### 4.6.5 SATA Drive Connection

The WAFER-CV-D25501/N26001 is shipped with a SATA drive cable. To connect the SATA drive to the connector, please follow the steps below.

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

**Step 2:** **Insert the cable connector**. Insert the cable connector into the on-board SATA drive connector and the SATA power connector. See **Figure 4-16**.

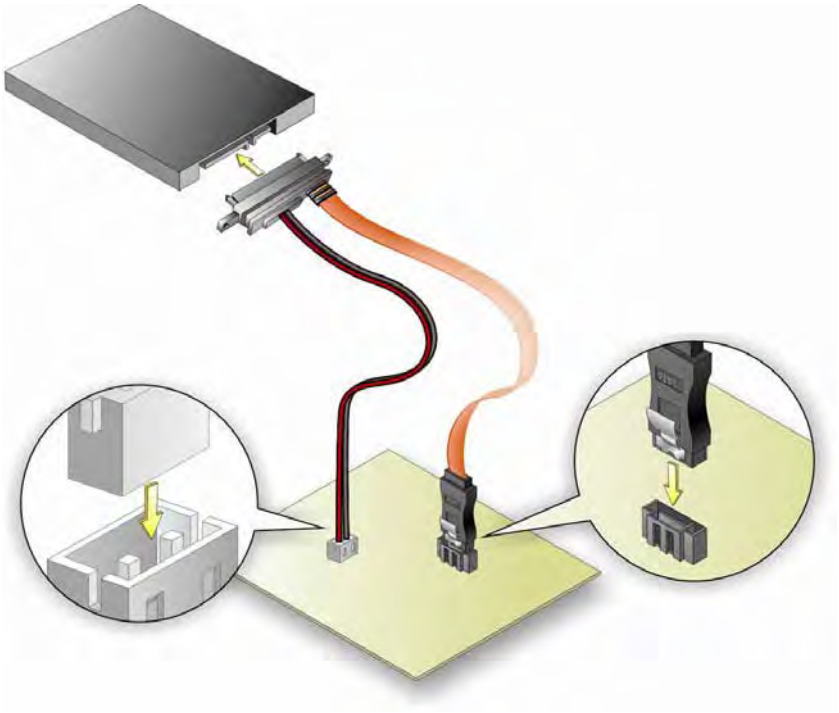


**Figure 4-16: SATA Drive Cable Connection**

**Step 3:** **Connect the cable to the SATA disk**. Connect the connector on the other end of the cable to the connector at the back of the SATA drive. See **Figure 4-16**.

**Step 4:** To remove the SATA cable from the SATA connector, press the clip on the connector at the end of the cable.

### 4.6.6 Single RS-232 Cable

The single RS-232 cable consists of one serial port connector attached to a serial communications cable that is then attached to a D-sub 9 male connector. To install the single RS-232 cable, please follow the steps below.

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

**Step 2:** **Insert the cable connector**. Insert the connector into the serial port header. See **Figure 4-17**. A key on the front of the cable connector ensures the connector can only be installed in one direction.

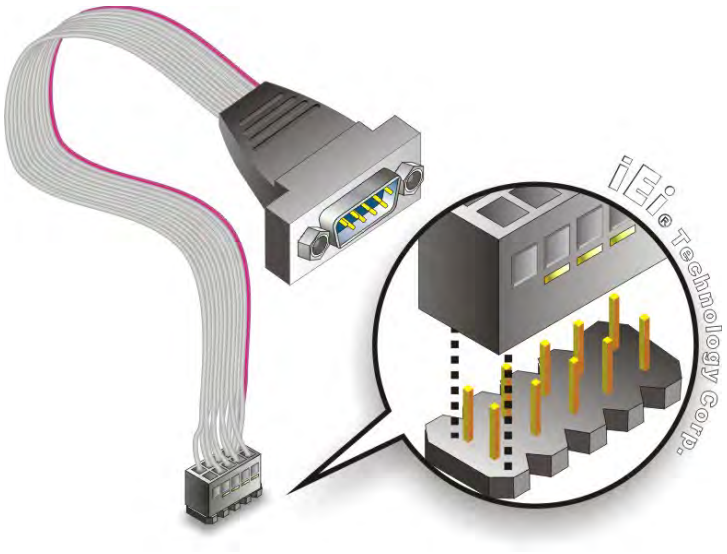



**Figure 4-17: Single RS-232 Cable Installation**

**Step 3:** **Secure the bracket**. The single RS-232 connector has two retention screws that must be secured to a chassis or bracket.

**Step 4:** **Connect the serial device**. Once the single RS-232 connector is connected to a chassis or bracket, a serial communications device can be connected to the system.

### 4.6.7 Keyboard/Mouse Y-cable Connector

The WAFER-CV-D25501/N26001 is shipped with a keyboard/mouse Y-cable connector. The keyboard/mouse Y-cable connector connects to a keyboard/mouse connector on the WAFER-CV-D25501/N26001 and branches into two cables that are each connected to a PS/2 connector, one for a mouse and one for a keyboard. To connect the keyboard/mouse Y-cable connector, please follow the steps below.

**Step 1:** **Locate the connector**. The location of the keyboard/mouse Y-cable connector is shown in **Chapter 3**.

**Step 2:** **Align the connectors**. Correctly align pin 1 on the cable connector with pin 1 on the WAFER-CV-D25501/N26001 keyboard/mouse connector. See **Figure 4-18**.

**Step 3:** **Insert the cable connectors** Once the cable connector is properly aligned with the keyboard/mouse connector on the WAFER-CV-D25501/N26001, connect the cable connector to the on-board connector. See **Figure 4-18**.

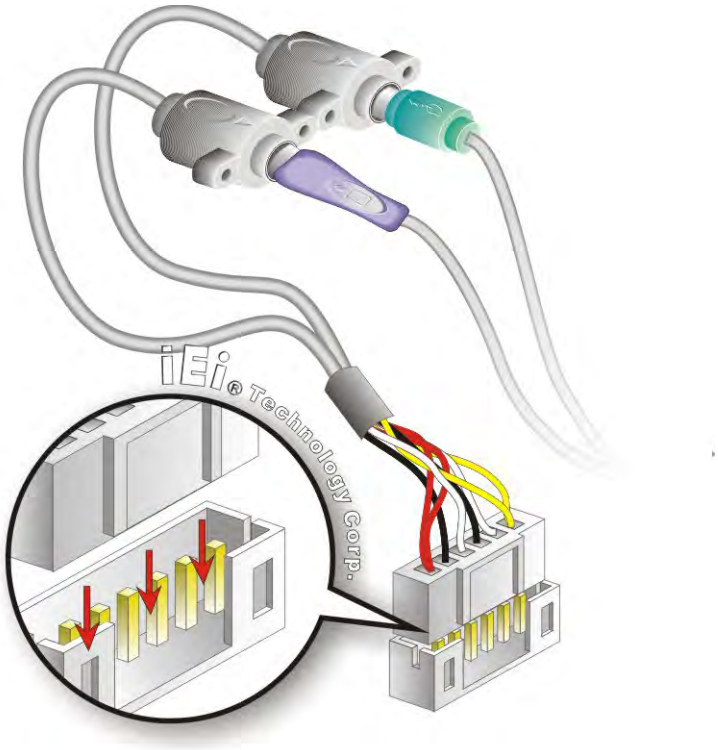



**Figure 4-18: Keyboard/mouse Y-cable Connection**

**Step 4:** **Attach PS/2 connectors to the chassis**. The keyboard/mouse Y-cable connector is connected to two PS/2 connectors. To secure the PS/2 connectors to the chassis please refer to the installation instructions that came with the chassis.

**Step 5:** **Connect the keyboard and mouse**. Once the PS/2 connectors are connected to the chassis, a keyboard and mouse can each be connected to one of the

PS/2 connectors. The keyboard PS/2 connector and mouse PS/2 connector are both marked. Please make sure the keyboard and mouse are connected to the correct PS/2 connector.

## 4.7 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the WAFER-CV-D25501/N26001.

### 4.7.1 LAN Connection

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

**Step 1:** **Locate the RJ-45 connector**. The locations of the RJ-45 connectors are shown in **Chapter 3**.

**Step 2:** **Align the connectors.** Align the RJ-45 connector on the LAN cable with the RJ-45 connector on the WAFER-CV-D25501/N26001. See **Figure 4-19**.

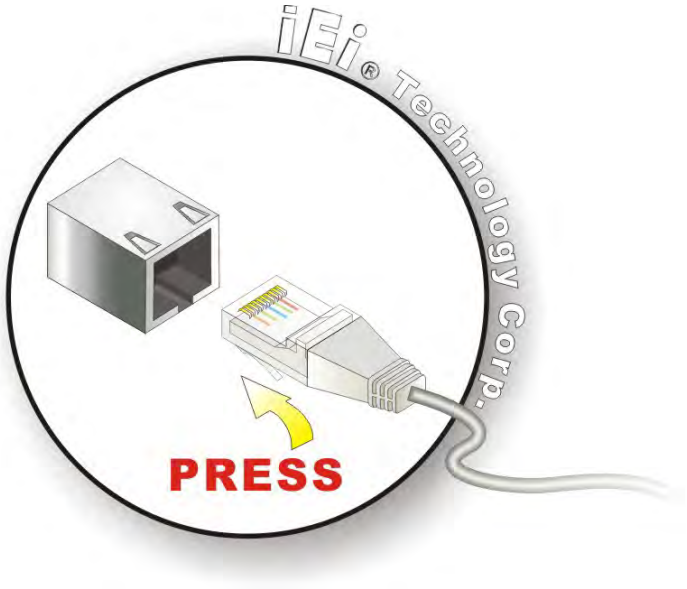



**Figure 4-19: LAN Connection**

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

### 4.7.2 Serial Device Connection

The WAFER-CV-D25501/N26001 has a single male 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-CV-D25501/N26001.

**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 4-20**.

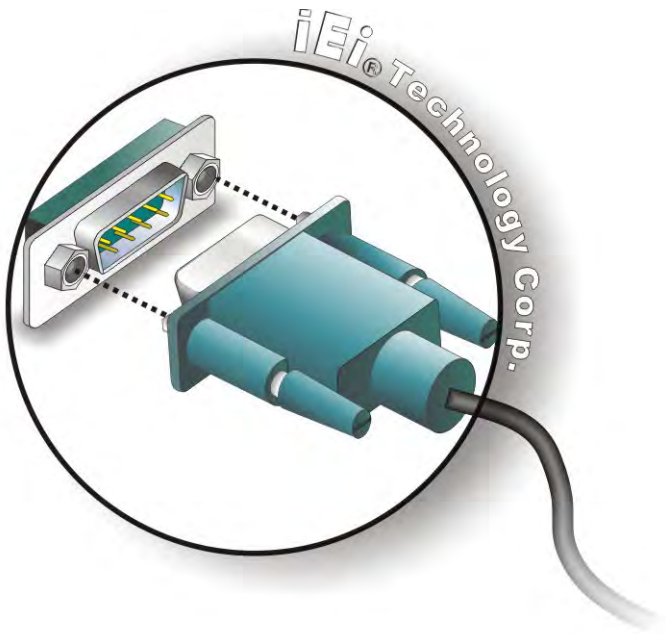



**Figure 4-20: Serial Device Connector**

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

### 4.7.3 USB Connection (Dual Connector)

The external USB Series "A" receptacle connectors provide easier and quicker access to external USB devices. Follow the steps below to connect USB devices to the WAFER-CV-D25501/N26001.

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

**Step 2:** **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure 4-21**.

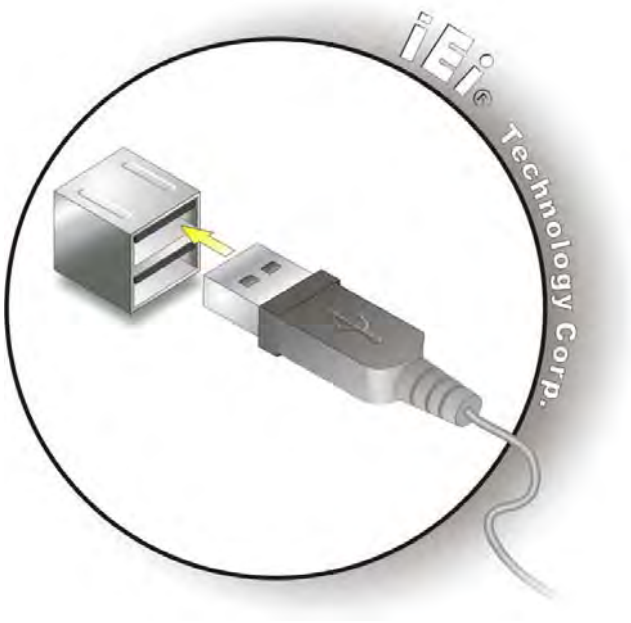



**Figure 4-21: USB Connector**

### 4.7.4 VGA Monitor Connection

The WAFER-CV-D25501/N26001 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-CV-D25501/N26001, please follow the instructions below.

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

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

**Step 3:** **Insert the VGA connector** Once the connectors are properly aligned with the insert the male connector from the VGA screen into the female connector on the WAFER-CV-D25501/N26001. See **Figure 4-22**.

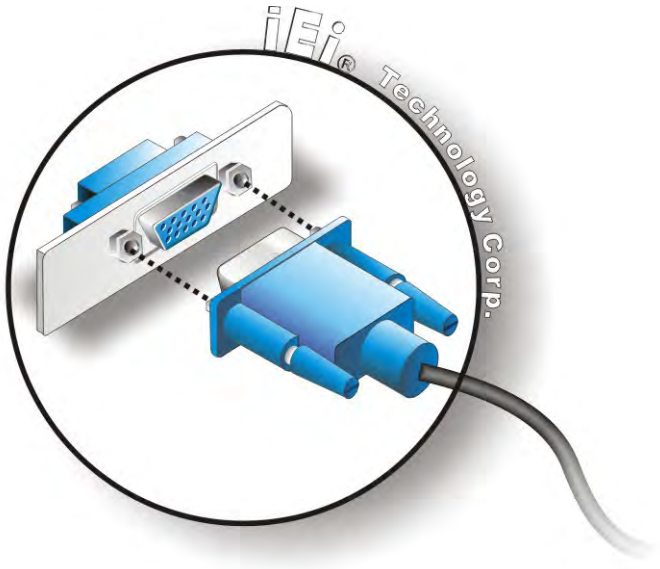



**Figure 4-22: VGA Connector**

**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.

## 4.8 Heat Sink Enclosure

**WARNING:**

Never run the WAFER-CV-D25501/N26001 without the heat sink secured to the board. The heat sink ensures the system remains cool and does not need addition heat sinks to cool the system.

**WARNING:**

When running the WAFER-CV-D25501/N26001, do not put the WAFER-CV-D25501/N26001 directly on a surface that can not dissipate system heat, especially the wooden or plastic desk. It is highly recommended to run the WAFER-CV-D25501/N26001

Æ on a heat dissipation surface or

Æ using copper pillars to hold the board up from the desk below

When the WAFER-CV-D25501/N26001 is shipped it is secured to a heat sink with five retention screws. If the WAFER-CV-D25501/N26001 must be removed from the heat sink, the five retention screws must be removed.

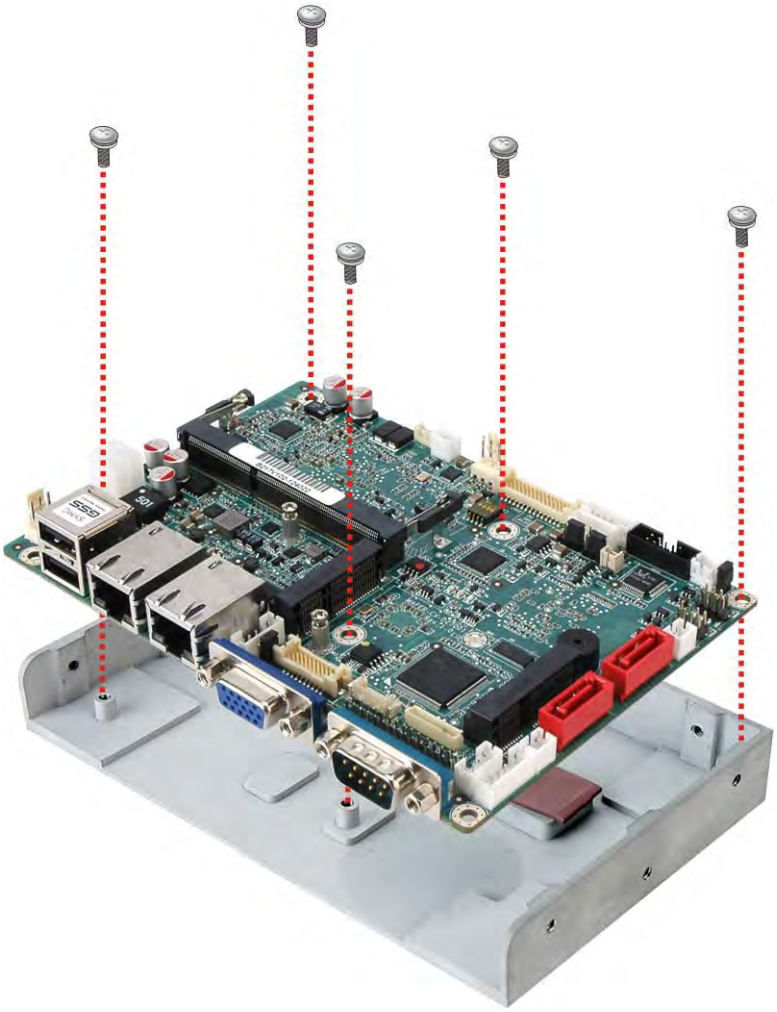


**Figure 4-23: Heat Sink Retention Screws**

# BIOS

# 5.1 Introduction

The BIOS is programmed onto the BIOS chip. The BIOS setup program allows changes to certain system settings. This chapter outlines the options that can be changed.

## 5.1.1 Starting Setup

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

1. Press the **DEL** or **F2** key as soon as the system is turned on or
2. Press the **DEL** or **F2** key when the "**Press DEL or F2 to enter SETUP**" message appears on the screen.

If the message disappears before the **DEL or F2** key is pressed, restart the computer and try again.

## 5.1.2 Using Setup

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

| 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 |
| + | Increase the numeric value or make changes |
| - | Decrease the numeric value or make changes |
| Page Up key | Move to the next page |
| Page Dn key | Move to the previous page |

| Key | Function |
|---|---|
| Esc key | Main Menu – Quit and not save changes into CMOS<br>Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu |
| F1 | General help, only for Status Page Setup Menu and Option Page Setup Menu |
| F2 | Load previous values |
| F3 | Load optimized defaults |
| F4 | Save changes and Exit BIOS |

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

### 5.1.3 Getting Help

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

### 5.1.4 Unable to Reboot after Configuration Changes

If the computer cannot boot after changes to the system configuration are made, CMOS defaults. Use the jumper described in Chapter **4**.

### 5.1.5 BIOS Menu Bar

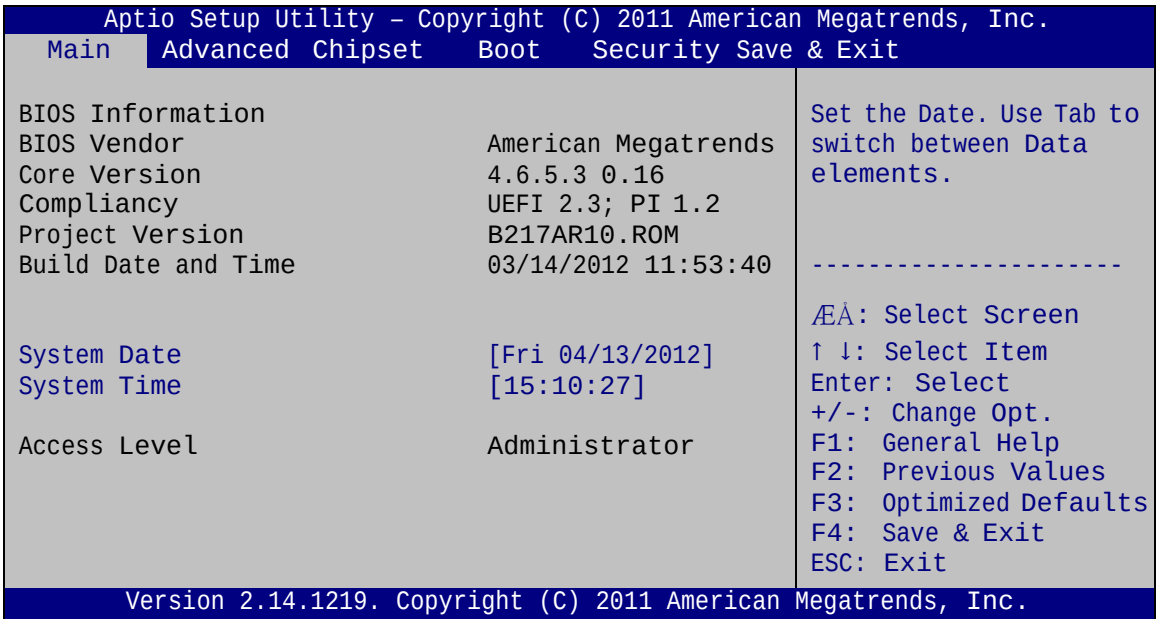
The **menu bar** on top of the BIOS screen has the following main items:

- Main – Changes the basic system configuration.
- Advanced – Changes the advanced system settings.
- Chipset – Changes the chipset settings.
- Boot – Changes the system boot configuration.
- Security – Sets User and Supervisor Passwords.
- Save & Exit – Selects exit options and loads default settings

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

## 5.2 Main

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




**BIOS Menu 1: Main**

### System Overview

The **BIOS Information** lists a brief summary of the BIOS. The fields in **BIOS Information** cannot be changed. The items shown in the system overview include:

- **BIOS Vendor:** Installed BIOS vendor
- **Core Version:** Current BIOS version
- **Project Version:** the board version
- **Build Date and Time:** Date and time the current BIOS version was made

The System Overview field also has two user configurable fields:

### System Date [xx/xx/xx]

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

- **System Time [xx:xx:xx]**

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

## 5.3 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.

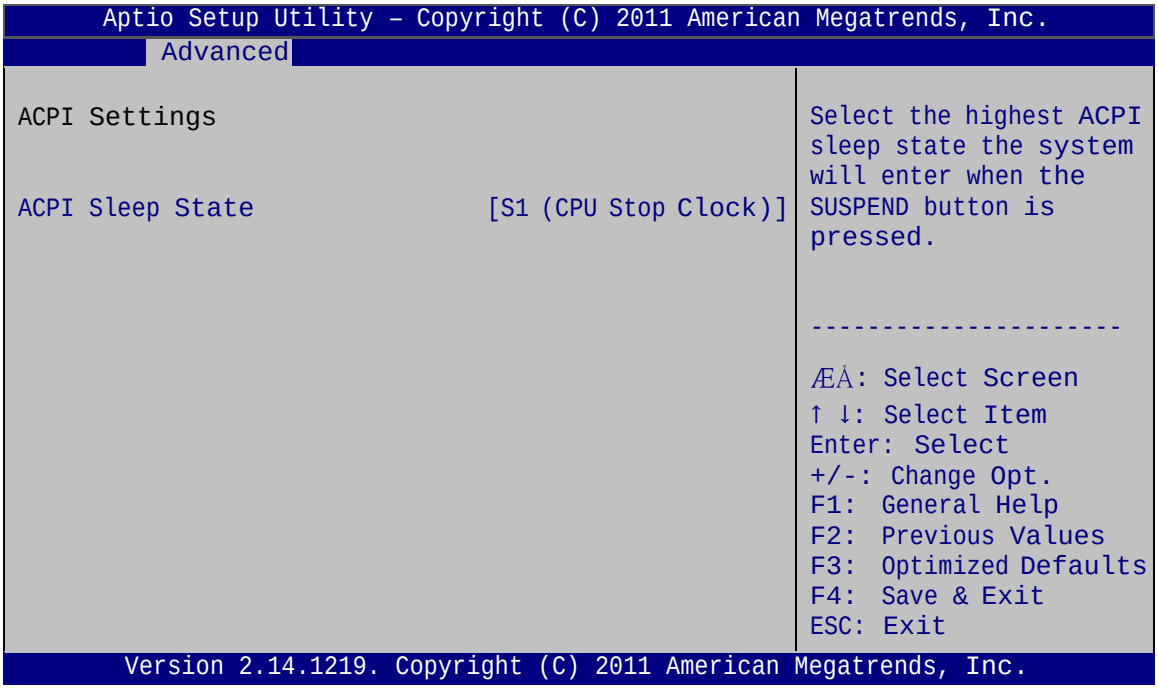
```
      Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
  Main   Advanced  Chipset   Boot   Security Save & Exit

> ACPI Settings                          System ACPI Parameters
> RTC Wake Settings
> CPU Configuration
> IDE Configuration                      ----------------------
> USB Configuration
> F81866 Super IO Configuration          ÆÅ: Select Screen
> F81866 H/W Monitor                     ↑ ↓: Select Item
> Serial Port Console Redirection        Enter: Select
> iEi Feature                            +/-: Change Opt.
                                         F1:  General Help
                                         F2:  Previous Values
                                         F3:  Optimized Defaults
                                         F4:  Save & Exit
                                         ESC: Exit
       Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 2: Advanced**

### 5.3.1 ACPI Settings

The **ACPI Settings** menu (**BIOS Menu 3**) configures the Advanced Configuration and Power Interface (ACPI) options.




**BIOS Menu 3: ACPI Settings**

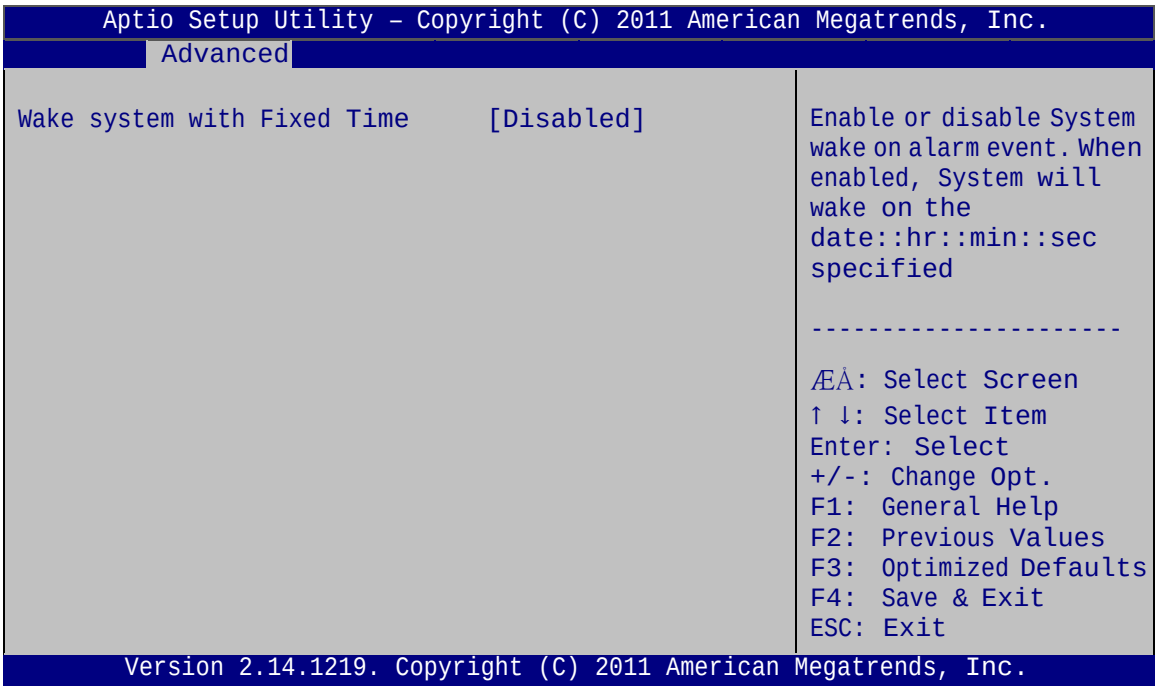
- **ACPI Sleep State [S1 (CPU Stop Clock)]**

Use the **ACPI Sleep State** option to specify the sleep state the system enters when it is not being used.

- **S1 (CPU Stop Clock)** **DEFAULT** The system enters S1 (POS) sleep state. The system appears off. The CPU is stopped; RAM is refreshed; the system is running in a low power mode.
- **S3 (Suspend to RAM)** The caches are flushed and the CPU is powered off. Power to the RAM is maintained. The computer returns slower to a working state, but more power is saved.

## 5.3.2 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 4**) enables the system to wake at the specified time.




**BIOS Menu 4: RTC Wake Settings**

- **Wake system with Fixed Time [Disabled]**

Use the **Wake system with Fixed Time** option to enable or disable the system wake on alarm event.

- **Disabled** **DEFAULT** The real time clock (RTC) cannot generate a wake event
- **Enabled** If selected, the **Wake up every day** option appears allowing you to enable to disable the system to wake every day at the specified time. Besides, the following options appear with values that can be selected:

  Wake up date

  Wake up hour

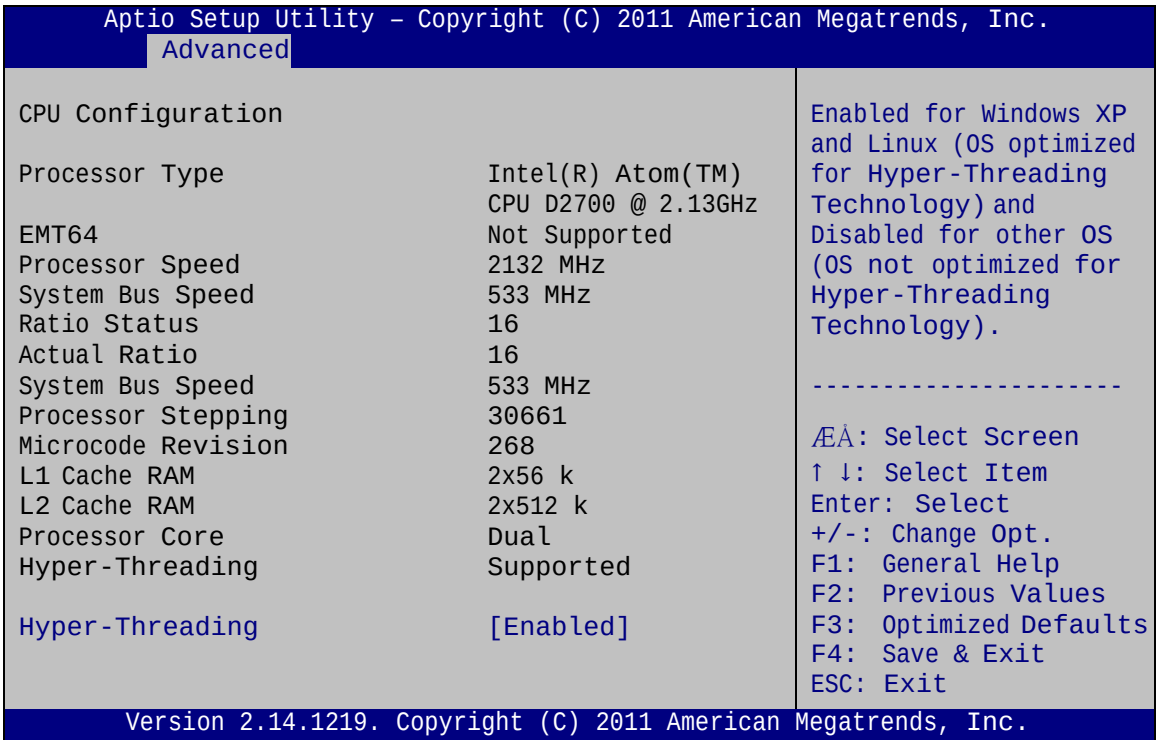
  Wake up minute

  Wake up second

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

### 5.3.3 CPU Configuration

Use the **CPU Configuration** menu (**BIOS Menu 5**) to view detailed CPU specifications and configure the CPU.




**BIOS Menu 5: CPU Configuration**

The CPU Configuration menu (**BIOS Menu 5**) lists the following CPU details:

- **Processor Type**: Lists the brand name of the CPU being used.
- **EMT64**: Indicates if EMT64 is supported by the CPU.
- **Processor Speed**: Lists the CPU processing speed.
- **System Bus Speed**: Lists the system bus speed.
- **Ratio Status**: Lists the ratio status.
- **Actual Ratio**: Lists the ratio of the frequency to the clock speed.
- **Processor Stepping**: Lists the CPU ID.
- **Microcode Revision**: Lists the microcode revision.
- **L1 Cache RAM**: Lists the CPU L1 cache size.
- **L2 Cache RAM**: Lists the CPU L2 cache size.
- **Processor Core**: Lists the number of the processor core.
- **Hyper-Threading**: Indicates if Intel HT Technology is supported by the CPU.

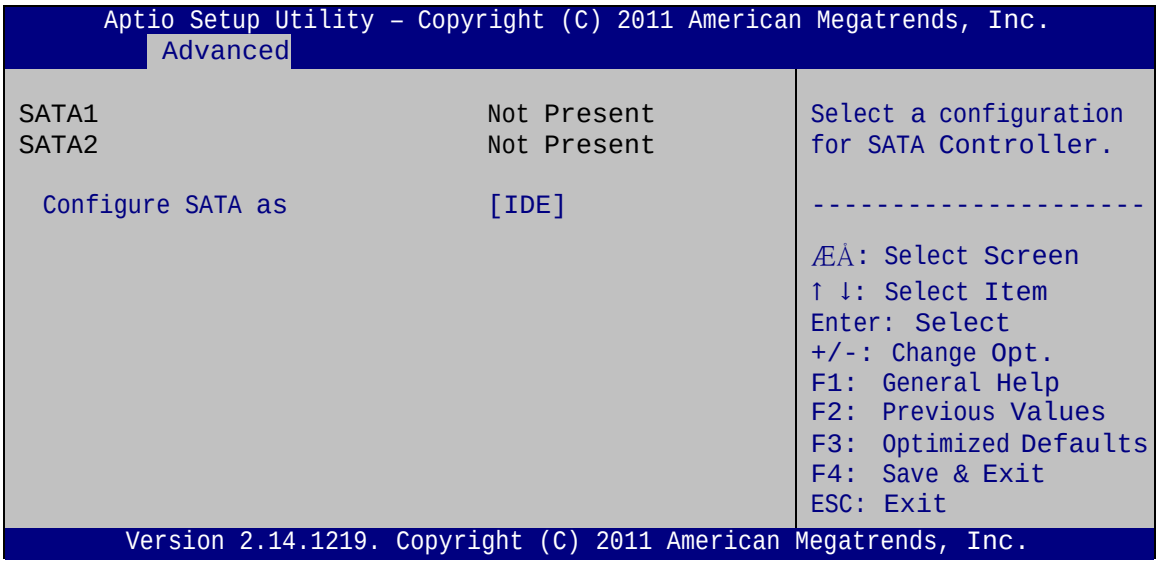
- **Hyper-Threading [Enabled]**

Use the **Hyper-Threading** BIOS option to enable or disable the Intel Hyper-Threading Technology.

- **Disabled** Disables the Intel Hyper-Threading Technology.
- **Enabled** **DEFAULT** Enables the Intel Hyper-Threading Technology.

### 5.3.4 IDE Configuration

Use the **IDE Configuration** menu (**BIOS Menu 6**) to change and/or set the configuration of the SATA devices installed in the system.




**BIOS Menu 6: IDE Configuration**

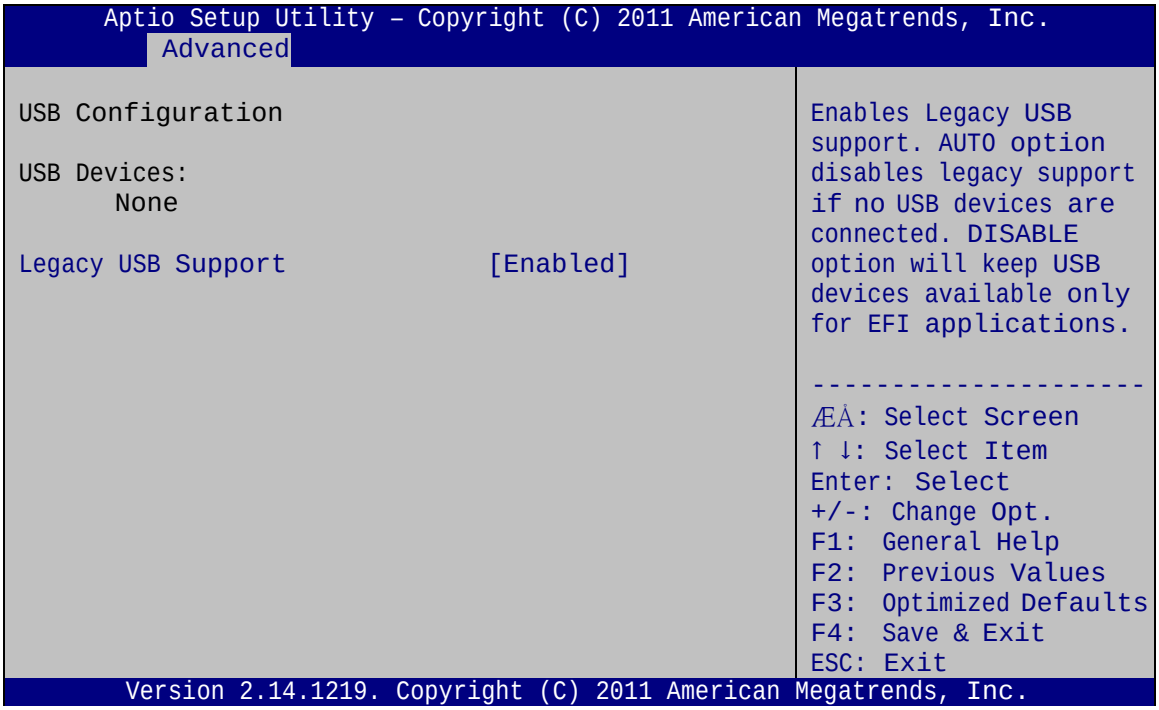
- **Configure SATA as [IDE]**

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

- **IDE** **DEFAULT** Configures SATA devices as normal IDE device.
- **AHCI** Configures SATA devices as AHCI device.

### 5.3.5 USB Configuration

Use the **USB Configuration** menu (**BIOS Menu 7**) to read USB configuration information and configure the USB settings.




**BIOS Menu 7: USB Configuration**

- **Legacy USB Support [Enabled]**

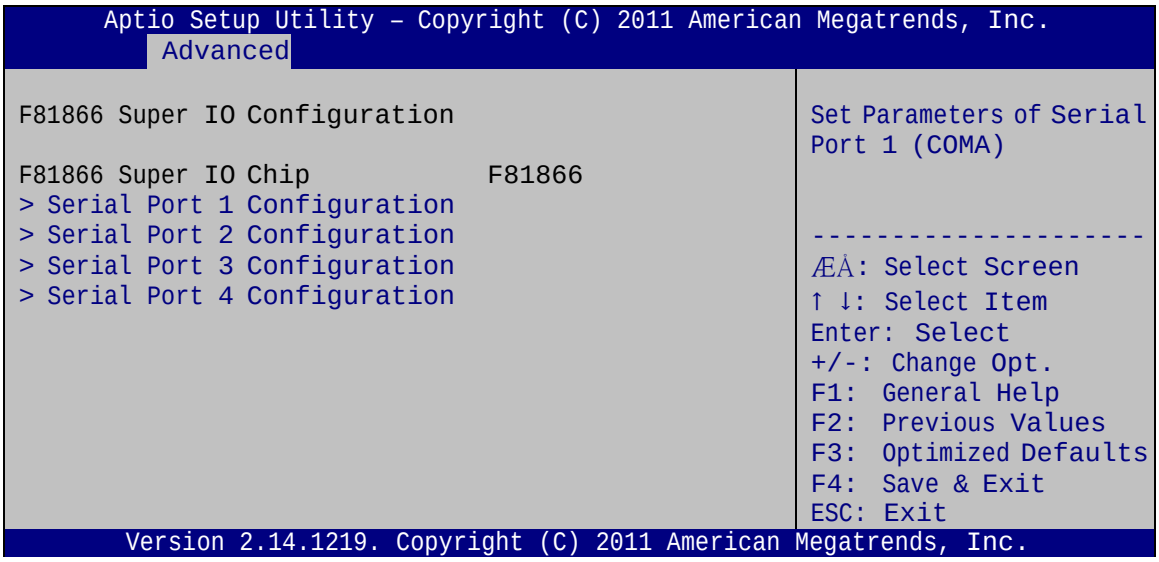
Use the **Legacy USB Support** BIOS option to enable USB mouse and USB keyboard support.

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 |

### 5.3.6 F81866 Super IO Configuration

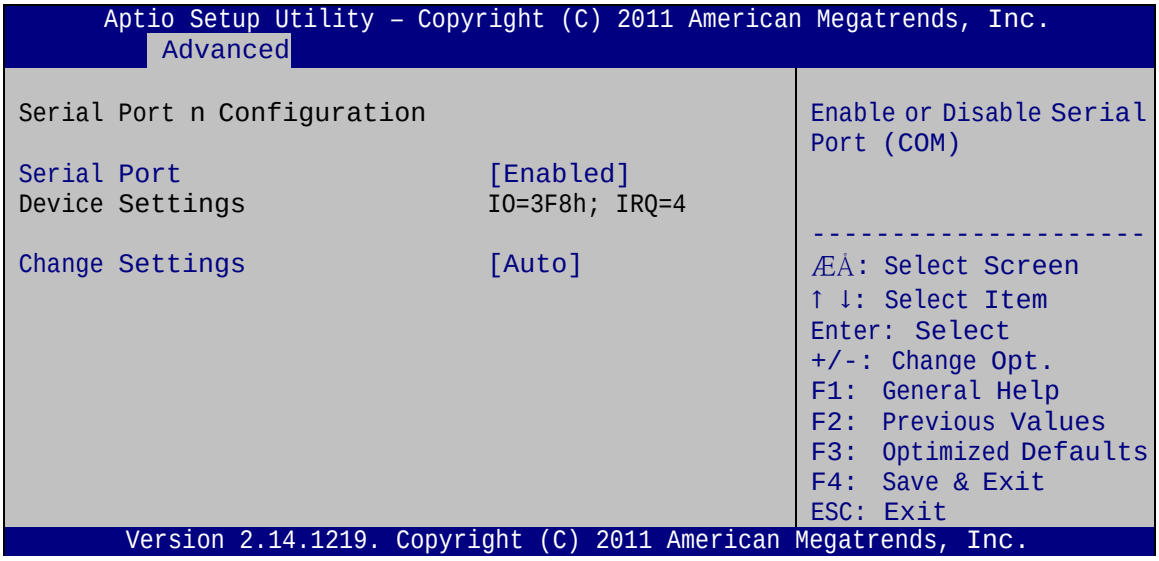
Use the **F81866 Super IO Configuration** menu (**BIOS Menu 8**) to set or change the configurations for the serial ports.




**BIOS Menu 8: Super IO Configuration**

#### 5.3.6.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 9**) to configure the serial port n.




**BIOS Menu 9: Serial Port n Configuration Menu**

### 5.3.6.1.1 Serial Port 1 Configuration

- **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

| | | |
|---|---|---|
| **Disabled** | | Disable the serial port |
| **Enabled** | **DEFAULT** | Enable the serial port |

- **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

| | | |
|---|---|---|
| **Auto** | **DEFAULT** | The serial port IO port address and interrupt address are automatically detected. |
| **IO=3F8h; IRQ=4** | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ4 |
| **IO=3F8h; IRQ=3, 4** | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4 |
| **IO=2F8h; IRQ=3, 4** | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4 |
| **IO=3E8h; IRQ=3, 4** | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4 |
| **IO=2E8h; IRQ=3, 4** | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4 |

### 5.3.6.1.2 Serial Port 2 Configuration

- **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

| | | |
|---|---|---|
| **Disabled** | | Disable the serial port |
| **Enabled** | **DEFAULT** | Enable the serial port |

- **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

| | | |
|---|---|---|
| **Auto** | **DEFAULT** | The serial port IO port address and interrupt address are automatically detected. |
| **IO=2F8h; IRQ=3** | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3 |
| **IO=3F8h; IRQ=3, 4** | | Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4 |
| **IO=2F8h; IRQ=3, 4** | | Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4 |
| **IO=3E8h; IRQ=3, 4** | | Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4 |
| **IO=2E8h; IRQ=3, 4** | | Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4 |

### 5.3.6.1.3 Serial Port 3 Configuration

- **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

| | | |
|---|---|---|
| **Disabled** | | Disable the serial port |
| **Enabled** | **DEFAULT** | Enable the serial port |

- **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

| | | |
|---|---|---|
| **Auto** | **DEFAULT** | The serial port IO port address and interrupt address are automatically detected. |

- **IO=3E8h; IRQ=10** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ10
- **IO=3F8h; IRQ=10, 11** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11
- **IO=2F8h; IRQ=10, 11** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11
- **IO=3E8h; IRQ=10, 11** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- **IO=2E8h; IRQ=10, 11** — Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- **IO=250h; IRQ=10, 11** — Serial Port I/O port address is 250h and the interrupt address is IRQ10, 11
- **IO=2E0h; IRQ=10, 11** — Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

### 5.3.6.1.4 Serial Port 4 Configuration

- **Serial Port [Enabled]**

Use the **Serial Port** option to enable or disable the serial port.

- **Disabled** — Disable the serial port
- **Enabled** **DEFAULT** — Enable the serial port

- **Change Settings [Auto]**

Use the **Change Settings** option to change the serial port IO port address and interrupt address.

- **Auto** **DEFAULT** — The serial port IO port address and interrupt address are automatically detected.
- **IO=2E8h; IRQ=10** — Serial Port I/O port address is 2E8h and the interrupt address is IRQ10

- **IO=3F8h; IRQ=10, 11** — Serial Port I/O port address is 3F8h and the interrupt address is IRQ10, 11
- **IO=2F8h; IRQ=10, 11** — Serial Port I/O port address is 2F8h and the interrupt address is IRQ10, 11
- **IO=3E8h; IRQ=10, 11** — Serial Port I/O port address is 3E8h and the interrupt address is IRQ10, 11
- **IO=2E8h; IRQ=10, 11** — Serial Port I/O port address is 2E8h and the interrupt address is IRQ10, 11
- **IO=250h; IRQ=10, 11** — Serial Port I/O port address is 250h and the interrupt address is IRQ10, 11
- **IO=2E0h; IRQ=10, 11** — Serial Port I/O port address is 2E0h and the interrupt address is IRQ10, 11

### 5.3.7 F81866 H/W Monitor

The **F81866 H/W Monitor** menu (**BIOS Menu 10**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.

```
        Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
                Advanced
 PC Health Status                                  | Smart Fan Mode Select
                                                   |
 > Smart Fan Mode Configuration                    |
 CPU Temperature                : +52 C            |
 System Temperature             : +51 C            |
 CPU_FAN1 Speed                 : N/A              |
 SYS_FAN1 Speed                 : N/A              | ---------------------
 +VCC_CPU                       : +1.488 V         | ÆÅ: Select Screen
 +VCC_GFX                       : +0.968 V         | ↑ ↓: Select Item
 +V1.05S                        : +1.056 V         | Enter: Select
 +V1.5_DDR3                     : +1.504 V         | +/-: Change Opt.
 VSB5V                          : +5.040 V         | F1: General Help
 +V3.3S                         : +3.344 V         | F2: Previous Values
 VSB3V                          : +3.344 V         | F3: Optimized Defaults
 VBAT                           : +3.264 V         | F4: Save & Exit
                                                   | ESC: Exit
        Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.
```

**BIOS Menu 10: F81866 H/W Monitor**

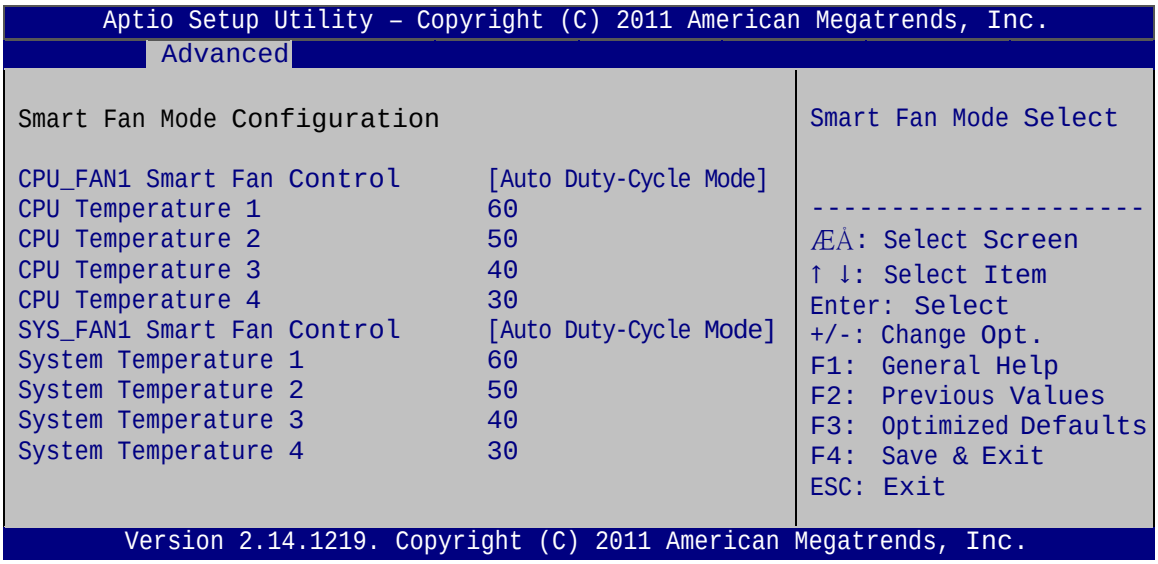
**PC Health Status**

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

- System Temperatures:
  - CPU Temperature
  - System Temperature
- Fan Speeds:
  - CPU Fan Speed
  - System Fan Speed
- Voltages:
  - +VCC_CPU
  - +VCC_GFX
  - +V1.05S
  - +1.5_DDR3
  - VSB5V
  - +V3.3S
  - VSB3V
  - VBAT

### 5.3.7.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 11**) to configure fan temperature and speed settings.




**BIOS Menu 11: Smart Fan Mode Configuration**

- **CPU_FAN1/SYS_FAN Smart Fan Control [Auto Duty-Cycle Mode]**

Use the **CPU_FAN1** or **SYS_FAN1 Smart Fan Control** option to configure the CPU or System Smart Fan.

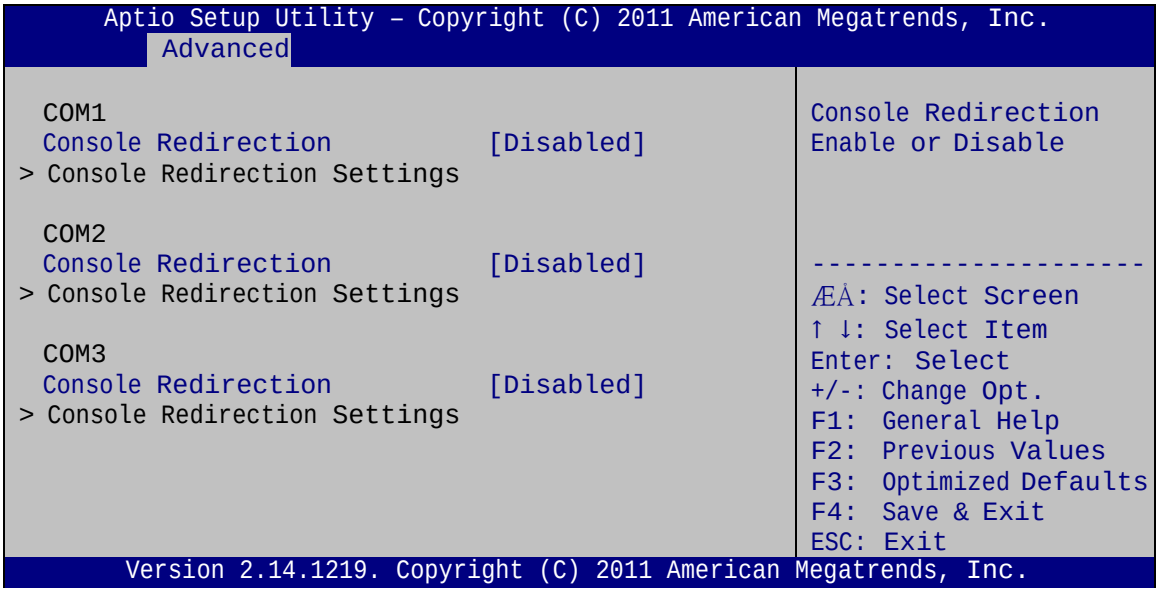
| | | |
|---|---|---|
| **Auto Duty-Cycle Mode** | **DEFAULT** | The fan adjusts its speed using Auto Duty-Cycle settings |
| **Manual Duty Mode** | | The fan spins at the speed set in Manual Duty Mode settings |

- **CPU/System Temperature n**

Use the + or – key to change the fan **CPU** or **System Temperature n** value. Enter a decimal number between 1 and 100.

## 5.3.8 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 12**) allows the console redirection options to be configured. Console redirection allows users to maintain a system remotely by re-directing keyboard input and text output through the serial port.




**BIOS Menu 12: Serial Port Console Redirection**

- **Console Redirection [Disabled]**

Use **Console Redirection** option to enable or disable the console redirection function.

- **Disabled** **DEFAULT** Disabled the console redirection function
- **Enabled** Enabled the console redirection function

- **Terminal Type [ANSI]**

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

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

- **Bits per second [115200]**

Use the **Bits per second** option to specify the serial port transmission speed. The speed must match the other side. Long or noisy lines may require lower speeds.

- **9600** — Sets the serial port transmission speed at 9600.
- **19200** — Sets the serial port transmission speed at 19200.
- **38400** — Sets the serial port transmission speed at 38400.
- **57600** — Sets the serial port transmission speed at 57600.
- **115200** **DEFAULT** — Sets the serial port transmission speed at 115200.

**Data Bits [8]**

Use the **Data Bits** option to specify the number of data bits.

- **7** — Sets the data bits at 7.
- **8** **DEFAULT** — Sets the data bits at 8.

**Parity [None]**

Use the **Parity** option to specify the parity bit that can be sent with the data bits for detecting the transmission errors.

- **None** **DEFAULT** — No parity bit is sent with the data bits.
- **Even** — The parity bit is 0 if the number of ones in the data bits is even.
- **Odd** — The parity bit is 0 if the number of ones in the data bits is odd.
- **Mark** — The parity bit is always 1. This option does not provide error detection.
- **Space** — The parity bit is always 0. This option does not provide error detection.

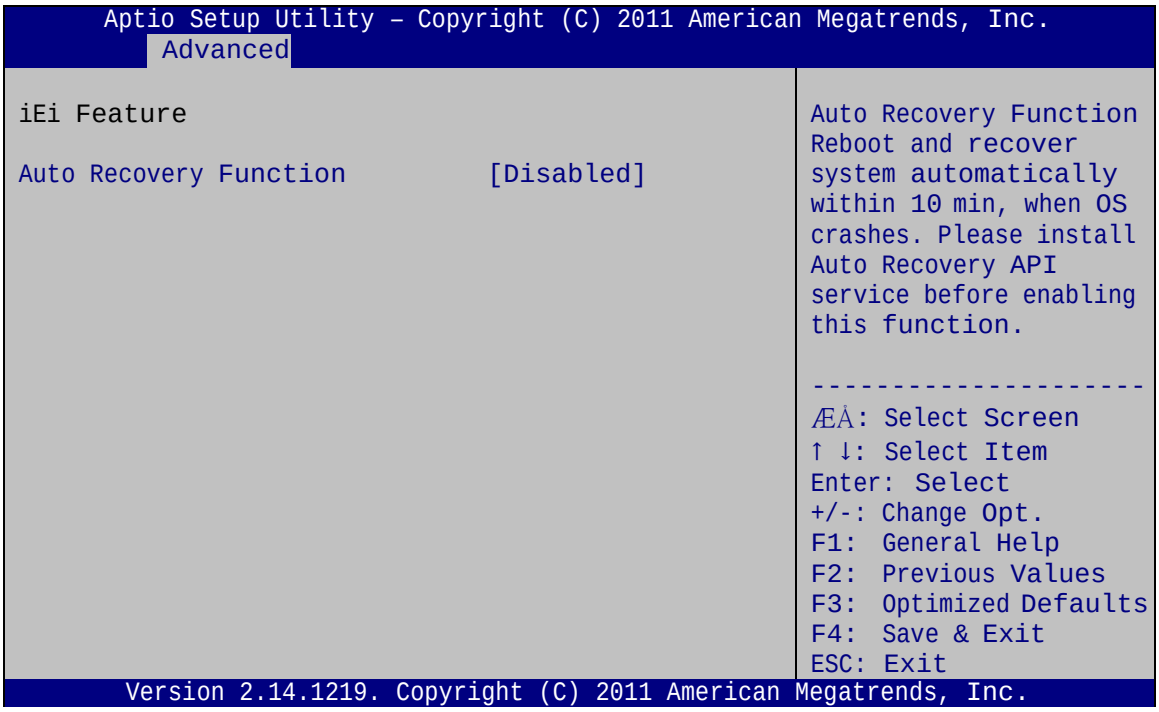
**Stop Bits [1]**

Use the **Stop Bits** option to specify the number of stop bits used to indicate the end of a serial data packet. Communication with slow devices may require more than 1 stop bit.

- **1** **DEFAULT** Sets the number of stop bits at 1.
- **2** Sets the number of stop bits at 2.

### 5.3.9 iEi Feature

Use the **iEi Feature** menu (**BIOS Menu 13**) to configure One Key Recovery function.




**BIOS Menu 13: IEI Feature**

- **Auto Recovery Function [Disabled]**

Use the **Auto Recovery Function** BIOS option to enable or disable the auto recovery function of the IEI One Key Recovery.

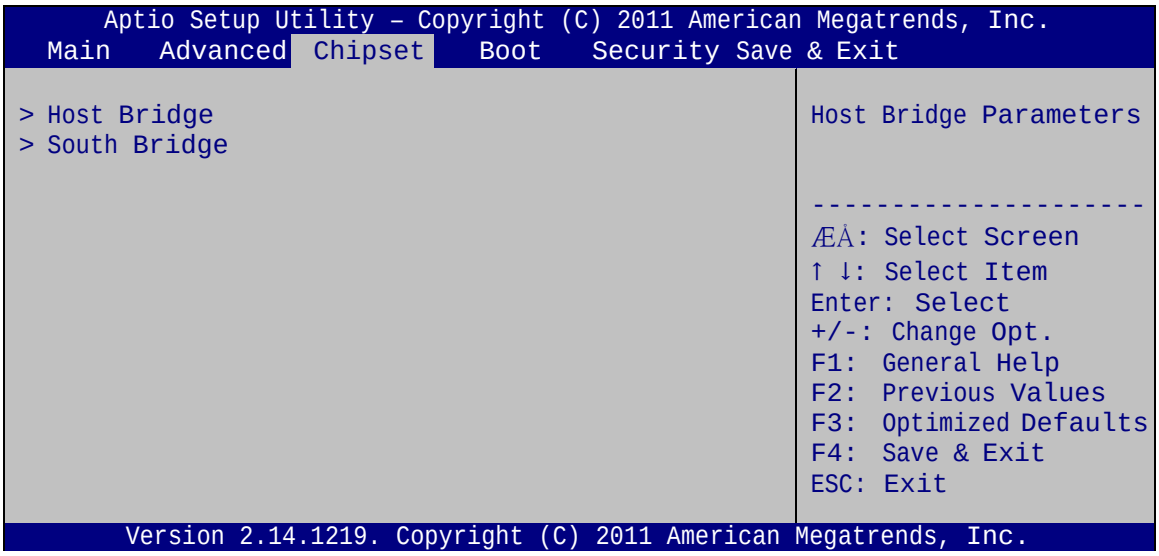
- **Disabled** **DEFAULT** Auto recovery function disabled
- **Enabled** Auto recovery function enabled

## 5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 14**) to access the Host Bridge and Southbridge configuration menus.

**WARNING!**

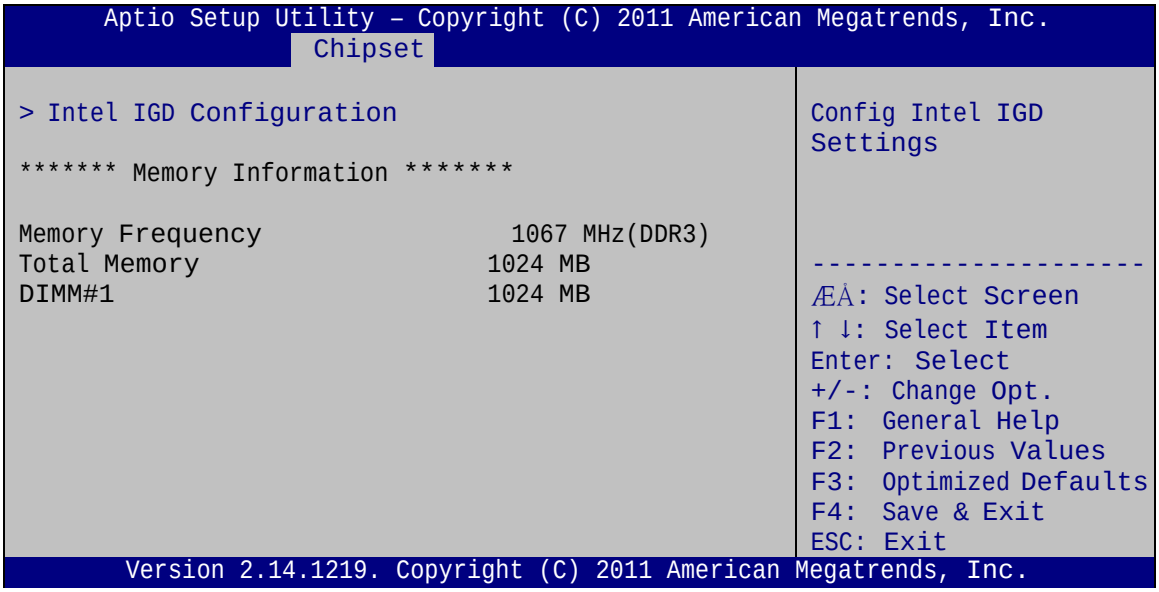
Setting the wrong values for the Chipset BIOS selections in the Chipset BIOS menu may cause the system to malfunction.




**BIOS Menu 14: Chipset**

### 5.4.1 Host Bridge Configuration

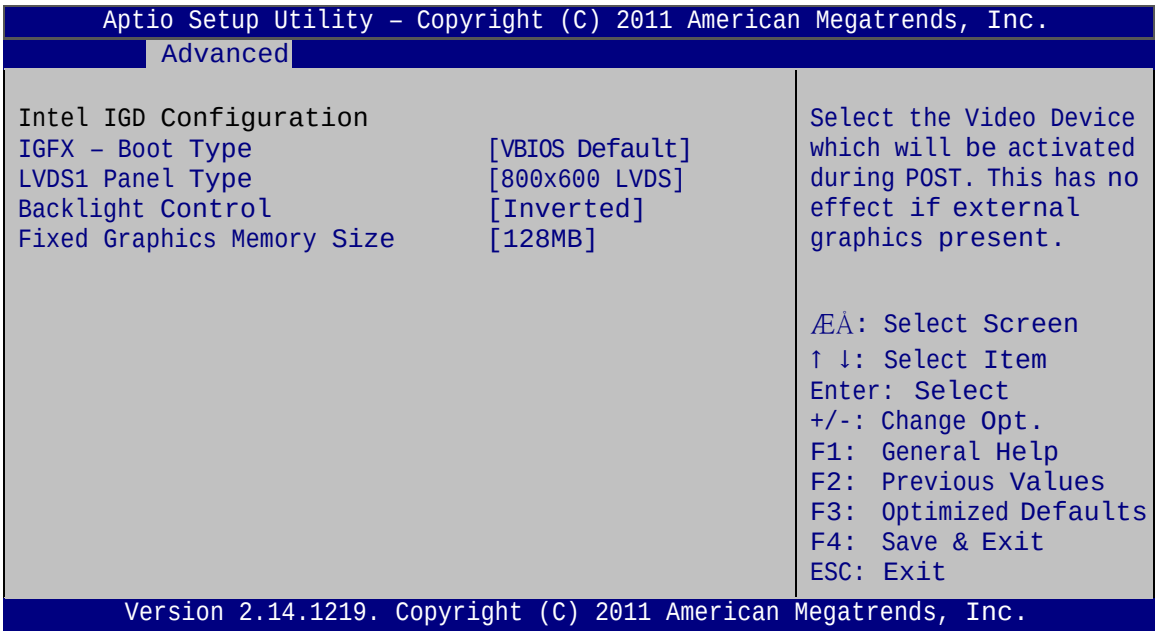
Use the **Host Bridge Configuration** menu (**BIOS Menu 15**) to configure the Intel IGD Configuration and display the memory information.




**BIOS Menu 15: Host Bridge Configuration**

### 5.4.1.1 Intel IGD Configuration

Use the **Intel IGD Configuration** submenu (**BIOS Menu 16**) to configure the video device connected to the system.




**BIOS Menu 16: Intel IGD Configuration**

- **IGFX - Boot Type [VBIOS Default]**

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

- VBIOS Default **DEFAULT**
- CRT
- LVDS1
- LVDS2

- **LVDS1 Panel Type [800x600 LVDS]**

Use the **LVDS1 Panel Type** option to select the type of flat panel connected to the system. Configuration options are listed below.

- 640x480 LVDS
- 800x600 LVDS **DEFAULT**
- 1024x768 LVDS
- 1280x1024 LVDS
- 1366x768 LVDS
- 1224x600 LVDS
- 1280x800 LVDS

- **Backlight Control [Inverted]**

Use the **Backlight Control** option to select the backlight control mode.

- **Normal** Brightest at high voltage level
- **Inverted** **DEFAULT** Brightest at low voltage level

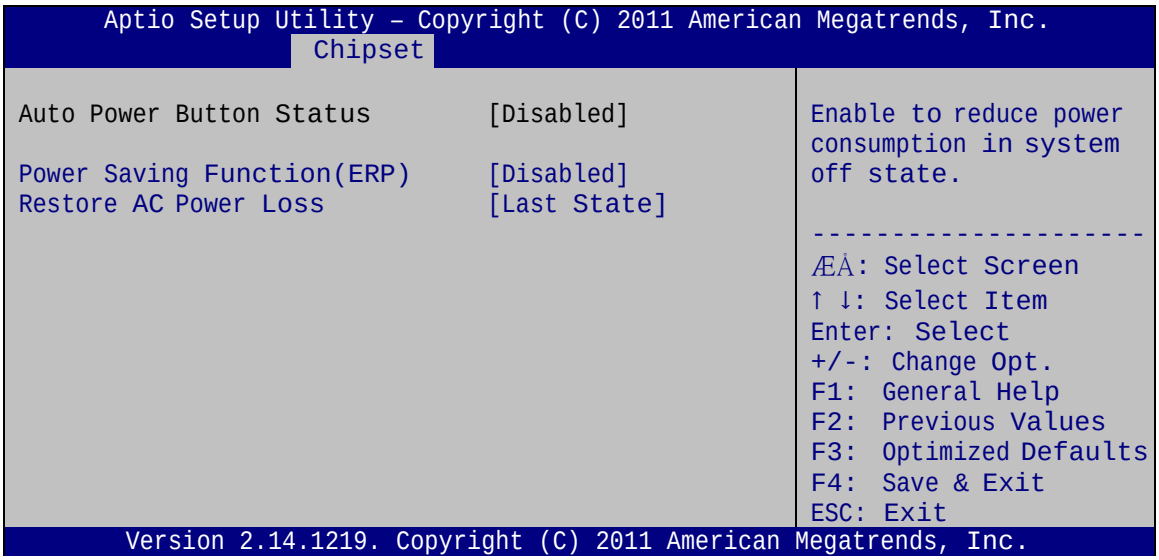
- **Fixed Graphics Memory Size [128MB]**

Use the **Fixed Graphics Memory Size** option to specify the maximum amount of memory that can be allocated as graphics memory. Configuration options are listed below.

- 128MB **DEFAULT**
- 256MB

### 5.4.2 South Bridge Configuration

Use the **South Bridge Configuration** menu (**BIOS Menu 17**) to configure the Southbridge chipset.




**BIOS Menu 17: Southbridge Chipset Configuration**

- **Power Saving Function(ERP) [Disabled]**

Use the **Power Saving Function(ERP)** option to enable or disable the power saving function.

- **Disabled** **DEFAULT** Disables the power saving function.
- **Enabled** Enables the power saving function.

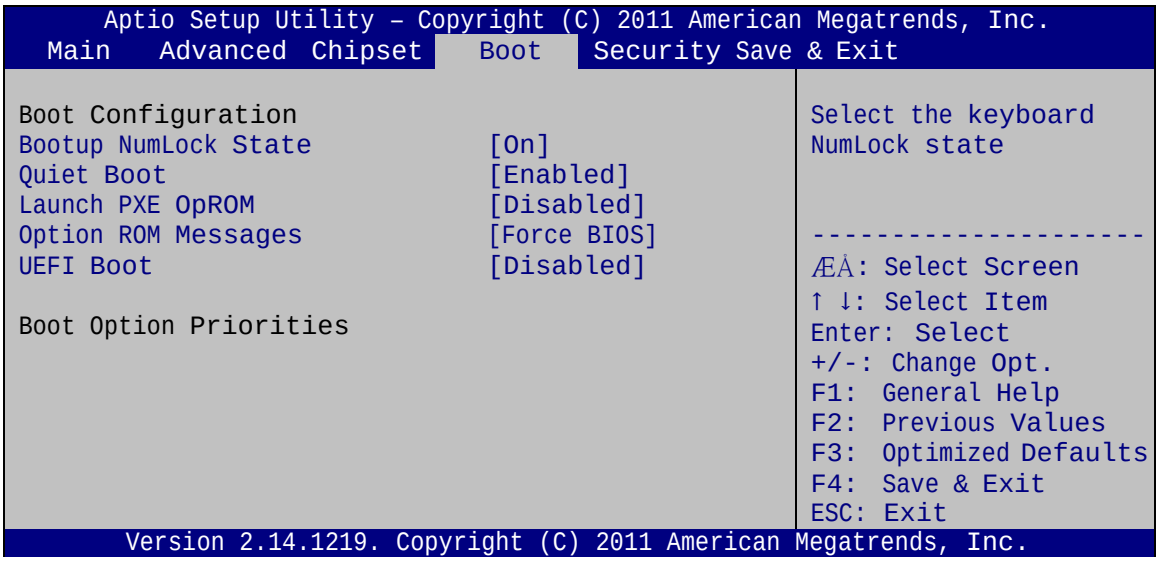
- **Restore AC Power Loss [Last State]**

Use the **Restore 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.

## 5.5 Boot

Use the **Boot menu** (**BIOS Menu 18**) to configure system boot options.




**BIOS Menu 18: Boot**

- **Bootup NumLock State [On]**

Use the **Bootup NumLock State** BIOS option to specify if the number lock setting must be modified during boot up.

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

- **Quiet Boot [Enabled]**

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

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

- **Launch PXE OpROM [Disabled]**

Use the **Launch PXE OpROM** option to enable or disable boot option for legacy network devices.

| | | |
|---|---|---|
| **Disabled** | **DEFAULT** | Ignore all PXE Option ROMs |
| **Enabled** | | Load PXE Option ROMs. |

- **Option ROM Messages [Force BIOS]**

Use the **Option ROM Messages** option to set the Option ROM display mode.

| | | |
|---|---|---|
| **Force BIOS** | **DEFAULT** | Sets display mode to force BIOS. |
| **Keep Current** | | Sets display mode to current. |

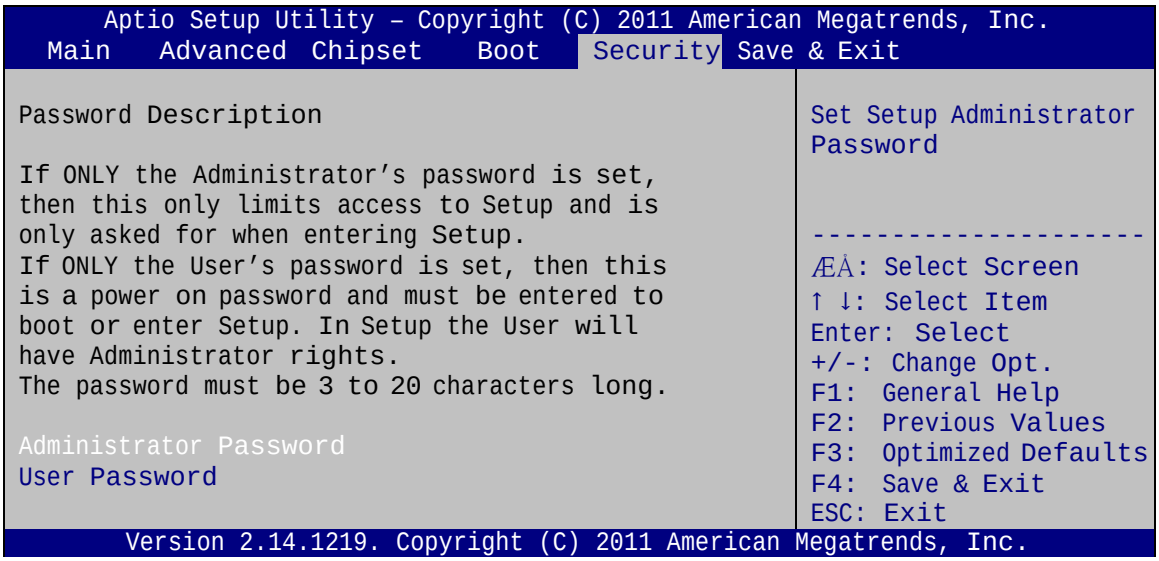
- **UEFI Boot [Disabled]**

Use the **UEFI Boot** BIOS option to allow the system to boot from the UEFI devices.

| | | |
|---|---|---|
| **Disabled** | **DEFAULT** | Disables to boot from the UEFI devices. |
| **Enabled** | | Enables to boot from the UEFI devices. |

## 5.6 Security

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




**BIOS Menu 19: Security**

- **Administrator Password**

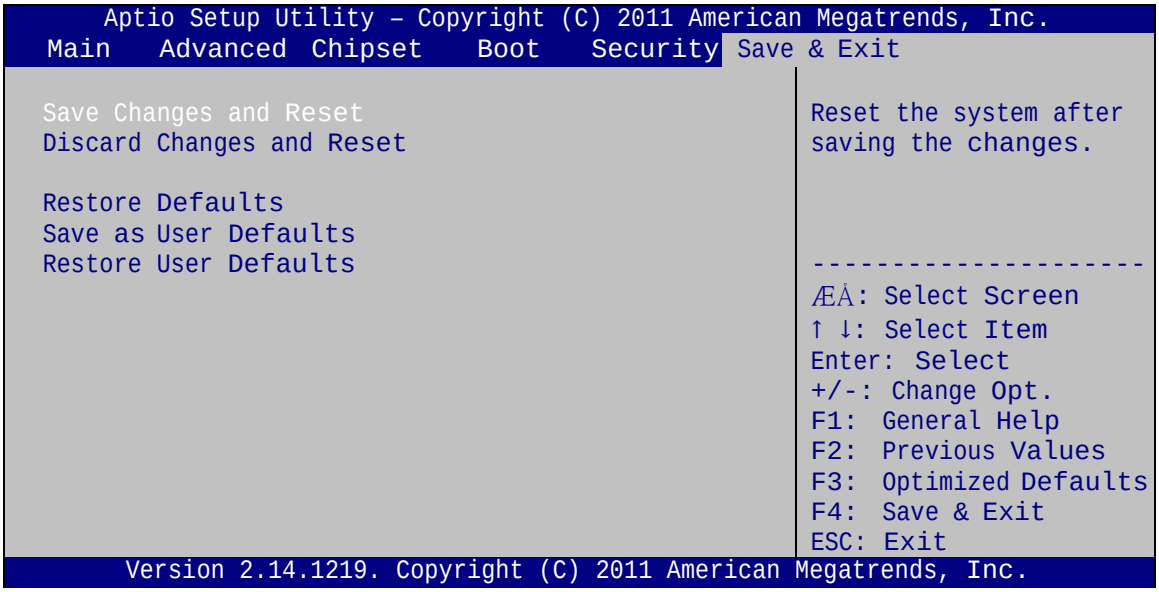
Use the **Administrator Password** to set or change a administrator password.

- **User Password**

Use the **User Password** to set or change a user password.

## 5.7 Exit

Use the **Exit** menu (**BIOS Menu 20**) to load default BIOS values, optimal failsafe values and to save configuration changes.




**BIOS Menu 20:Exit**

- **Save Changes and Reset**

Use the **Save Changes and Reset** option to save the changes made to the BIOS options and reset the system.

- **Discard Changes and Reset**

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

- **Restore Defaults**

Use the **Restore Defaults** option to load the optimal default values for each of the parameters on the Setup menus. **F3 key can be used for this operation.**

- **Save as User Defaults**

Use the **Save as User Defaults** option to save the changes done so far as user defaults.

- **Restore User Defaults**

Use the **Restore User Defaults** option to restore the user defaults to all the setup options.

# Software Drivers

## 6.1 Available Software Drivers

**NOTE:**

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

The following drivers can be installed on the system:

- Chipset
- Graphics
- LAN
- Audio

Installation instructions are given below.

## 6.2 Starting the Driver Program

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

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

**NOTE:**

If the installation program doesn't start automatically:
Click "Start->Computer->CD Drive->autorun.exe"

**Step 2:** The driver main menu appears (**Figure 6-1**).


**Figure 6-1: Start Up Screen**

**Step 3:** Click WAFER-CV-D25501/N26001.

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


**Figure 6-2: Drivers**

## 6.3 Chipset Driver Installation

To install the chipset driver, please do the following.

**Step 1:** Access the driver list. (See **Section 6.2**)

**Step 2:** Click "**1-Chipset**".

**Step 3:** Go to the 32-bit or 64-bit folder that corresponds to your OS version.

**Step 4:** Open the **Intel Chipset Software Installation Utility** folder.

**Step 5:** Double click the **infinst_autol** icon.

**Step 6:** The setup files are extracted as shown in **Figure 6-3**.

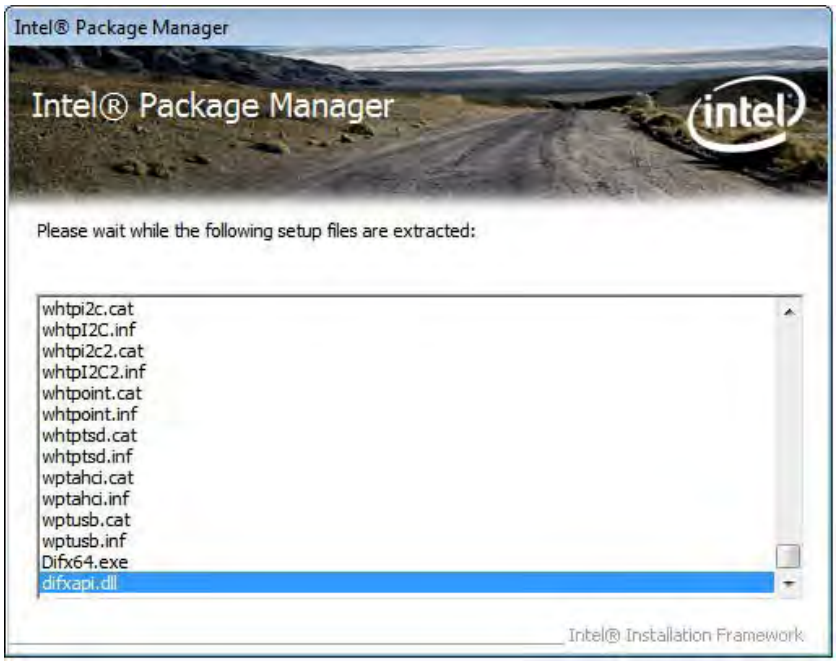



**Figure 6-3: Chipset Driver Screen**

**Step 7:** When the setup files are completely extracted, the **Welcome Screen** in **Figure 6-4** appears.


**Figure 6-4: Chipset Driver Welcome Screen**

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

**Step 9:** The license agreement in **Figure 6-5** appears.

**Step 10:** Read the **License Agreement**.

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


**Figure 6-5: Chipset Driver License Agreement**

**Step 12:** The Read Me file in **Figure 6-6** appears.

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


**Figure 6-6: Chipset Driver Read Me File**

**Step 14:** **Setup Operations** are performed as shown in **Figure 6-7**.


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

**Step 15:** Once the **Setup Operations** are complete, click **Next** to continue.

**Step 16:** The **Finish** screen appears.

**Step 17:** Select "**Yes, I want to restart the computer now**" and click the **Finish** icon.

See **Figure 6-8**.


**Figure 6-8: Chipset Driver Installation Finish Screen**

## 6.4 Graphics Driver Installation

**NOTE:**

Due to Intel® GMA driver limitation, the monitor connected to the VGA connector may become extended desktop or not have signal to it after restarting from the graphics driver installation. To work out this limitation, press the Ctrl+Alt+F1 hotkey to switch the primary display to CRT mode.

To install the graphics driver, please do the following.

**Step 1:** Access the driver list. (See **Section 6.2**)

**Step 2:** Click "**2-Graphics**".

**Step 3:** Open the 32-bit or 64-bit folder that corresponds to your OS version.

**Step 4:** Double click the **Setup** icon.

**Step 5:** The **Welcome Screen** in **Figure 6-9** appears.


**Figure 6-9: Graphics Driver Welcome Screen**

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

**Step 7:** The license agreement in **Figure 6-10** appears.

**Step 8:** Read the **License Agreement**.

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


**Figure 6-10: Graphics Driver License Agreement**

**Step 10:** The Read Me file in **Figure 6-11** appears.

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


**Figure 6-11: Graphics Driver Read Me File**

**Step 12:** **Setup Operations** are performed as shown in **Figure 6-12**.

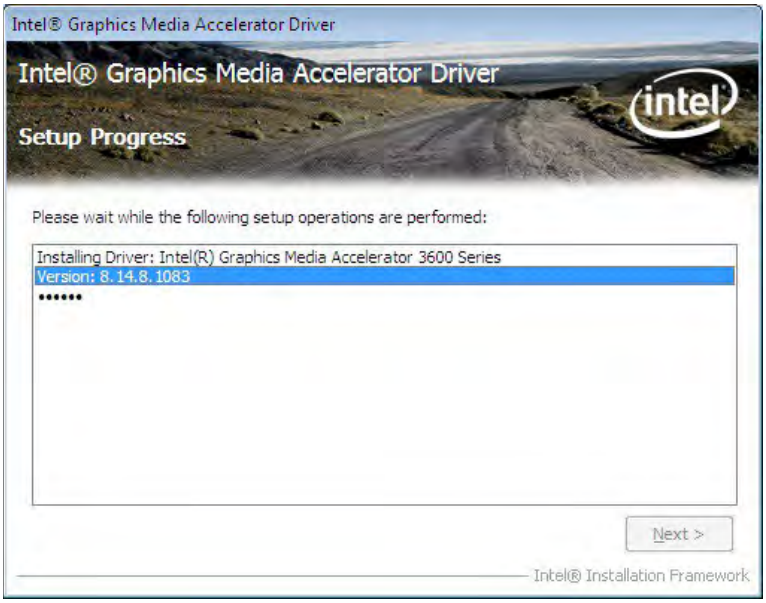



**Figure 6-12: Graphics Driver Setup Operations**

**Step 13:** Once the **Setup Operations** are complete, click the **Next** icon to continue.

**Step 14:** The **Finish** screen appears.

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

See **Figure 6-13**.


**Figure 6-13: Graphics Driver Installation Finish Screen**

## 6.5 LAN Driver Installation

To install the LAN driver, please do the following.

**Step 1:** Access the driver list shown in Figure 6-2. (See **Section 6.2**)

**Step 2:** Click "**3-LAN**".

**Step 3:** Go to the **Win7 > Install_Win7_7048_09162011** folder.

**Step 4:** Double click the **setup** icon.

**Step 5:** The **Welcome** screen in **Figure 6-14** appears.

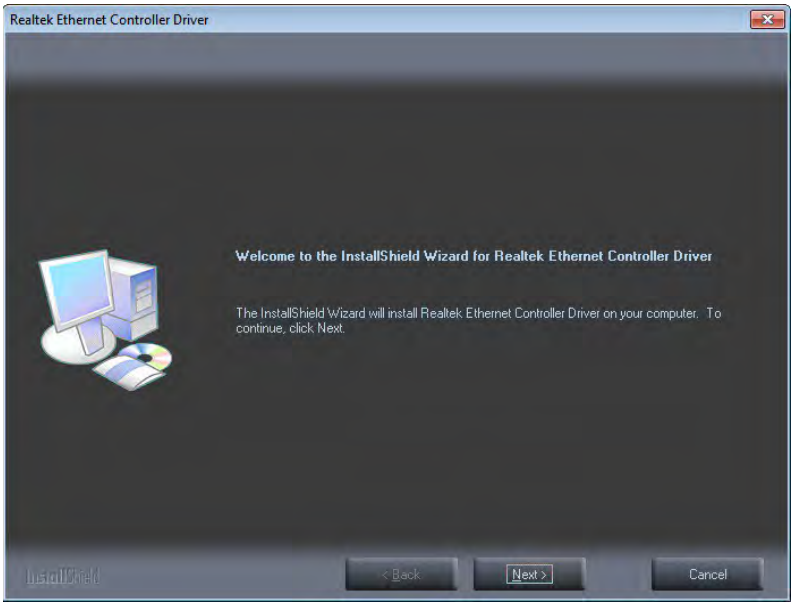



**Figure 6-14: LAN Driver Welcome Screen**

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

**Step 7:** The **Ready to Install** screen in **Figure 6-15** appears.

**Step 8:** Click **Install** to proceed with the installation.

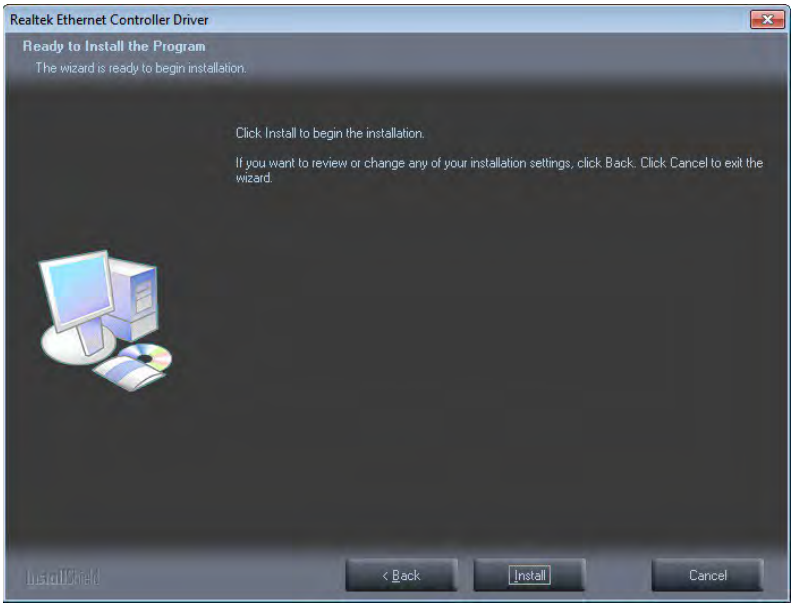



**Figure 6-15: LAN Driver Installation**

**Step 9:** The program begins to install.

**Step 10:** When the driver installation is complete, the screen in **Figure 6-16** appears.

**Step 11:** Click **Finish** to exit.

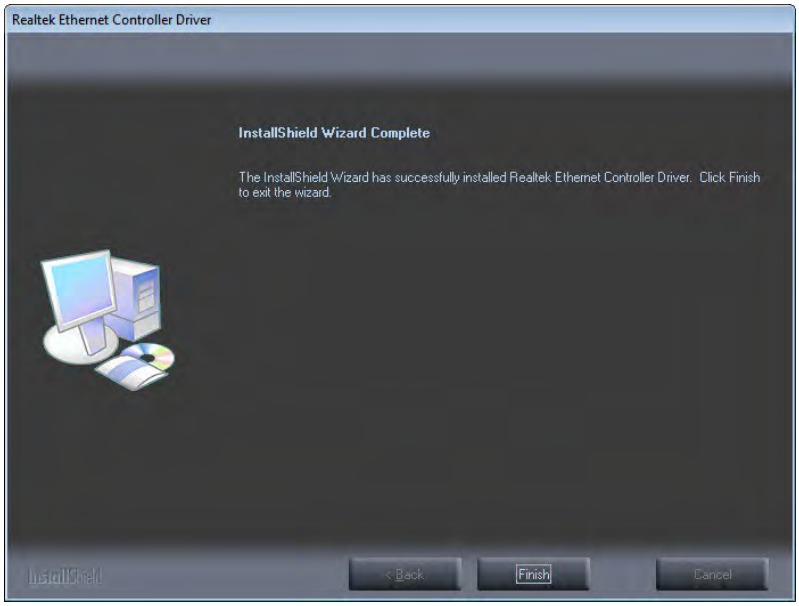



**Figure 6-16: LAN Driver Installation Complete**

## 6.6 Audio Driver Installation

To install the Audio driver, please do the following.

**Step 1:** Access the driver list. (See **Section 6.2**)

**Step 2:** Click "**4-Audio**".

**Step 3:** Open the **Win7** folder.

**Step 4:** Double click the **Vista_Win7_R263** icon.

**Step 5:** The installation files are extracted as shown in **Figure 6-17**.


**Figure 6-17: Audio Driver Installation File Extraction**

**Step 6:** The **Welcome** screen in **Figure 6-18** appears.

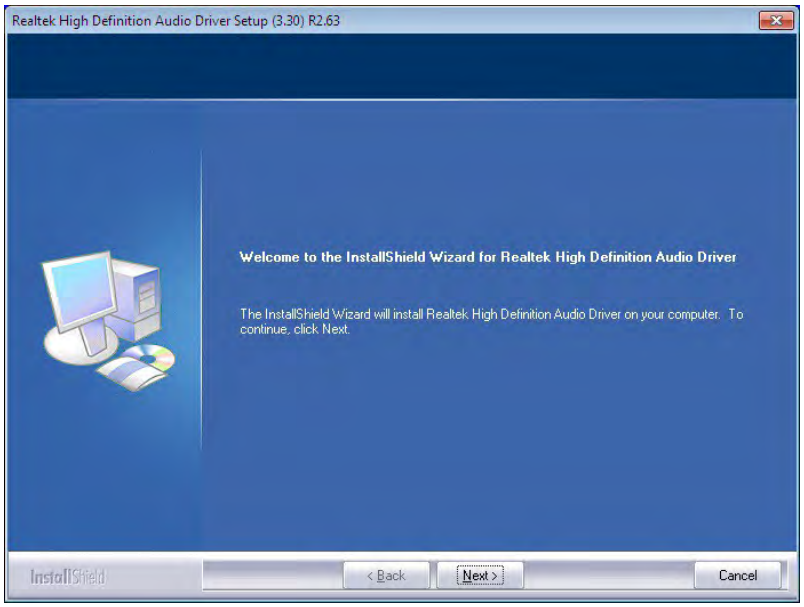



**Figure 6-18: Audio Driver Welcome Screen**

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

**Step 8:** The program begins to install.

**Step 9:** The installation progress can be monitored in the progress bar shown in **Figure 6-19**.

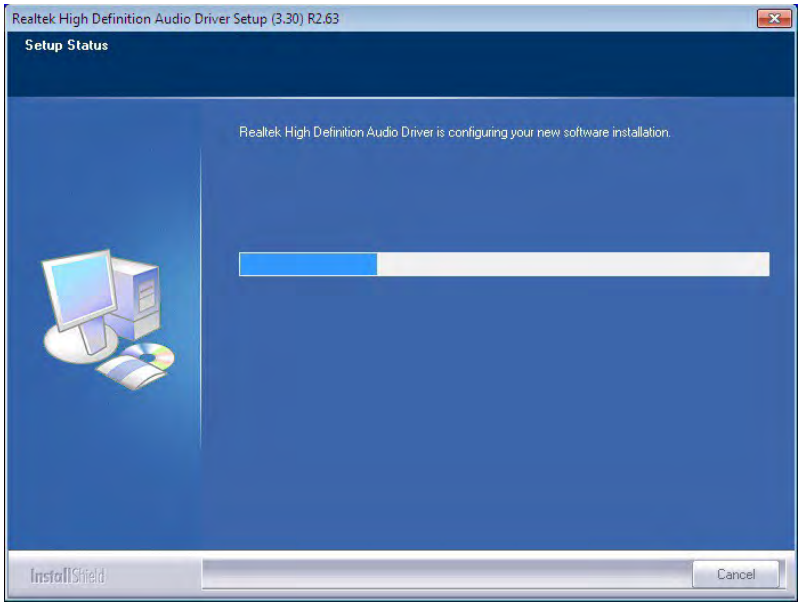



**Figure 6-19: Audio Driver Installation**

**Step 10:** When the driver installation is complete, the screen in **Figure 6-20** appears.

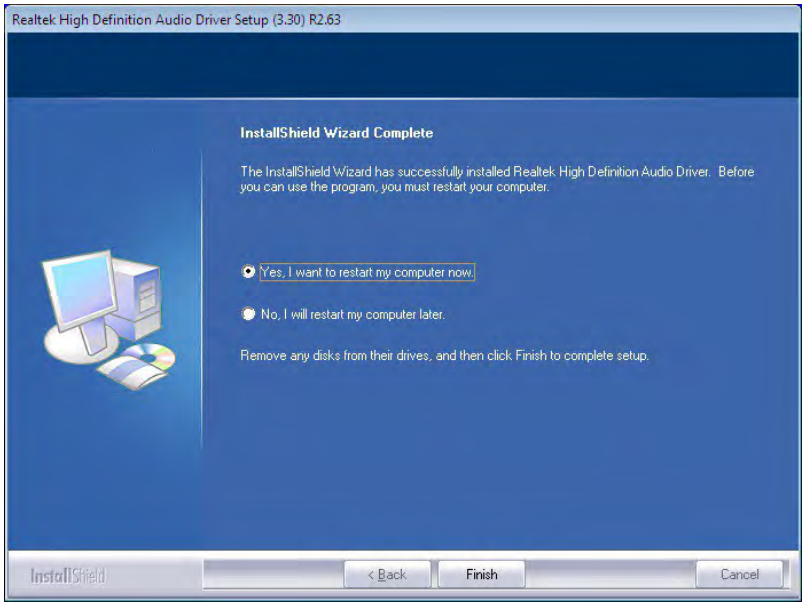



**Figure 6-20: Audio Driver Installation Complete**

**Step 11:** Select "**Yes, I want to restart my computer now**" and click **Finish**.

**Step 12:** The system reboots.

# BIOS Options

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

# Watchdog Timer

**NOTE:**

The following discussion applies to DOS environment. Contact IEI support or visit the IEI website for specific drivers for other operating systems.

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

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

INT 15H:

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

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

Call sub-function 2 to set the time-out period of Watchdog Timer first. If the time-out value is not zero, the Watchdog Timer starts counting down. When the timer value reaches zero, the system resets. To ensure that this reset condition does not occur, calling sub-function 2 must periodically refresh the Watchdog Timer. However, the watchdog timer is disabled if the time-out value is set to zero.

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

**NOTE:**

When exiting a program it is necessary to disable the Watchdog Timer, otherwise the system resets.

## EXAMPLE PROGRAM:

```
; INITIAL TIMER PERIOD COUNTER

;
W_LOOP:
;

        MOV     AX, 6F02H       ;setting the time-out value
        MOV     BL, 30          ;time-out value is 48 seconds
        INT     15H

;
; ADD THE APPLICATION PROGRAM HERE
;

        CMP     EXIT_AP, 1      ;is the application over?
        JNE     W_LOOP          ;No, restart the application

        MOV     AX, 6F02H       ;disable Watchdog Timer
        MOV     BL, 0           ;
        INT     15H

;
; EXIT ;
```