**MODEL:**

# NANO-BT-i1 Series

**EPIC SBC with 22nm Intel® Atom™ or Celeron® SoC, Dual GbE, DDR3, HDMI, VGA, LVDS, USB 2.0/3.0, COM Ports Two SATA 3Gb/s Ports, IPMI 2.0 and RoHS**

# User Manual

RoHS Lead Free

# Revision

| Date | Version | Changes |
|------|---------|---------|
| June 27, 2014 | 1.02 | Updated supported memory specifications in Chapter 1. |
| May 7, 2014 | 1.01 | Updated **Section 1.6: Dimensions**<br>Updated **Chapter 6: Software Drivers**<br>Updated **Table 3-15: LVDS Connector Pinouts** |
| April 3, 2014 | 1.00 | Initial release |

# Copyright

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## TRADEMARKS

# Table of Contents

# List of Figures

# List of Tables

# BIOS Menus

**Chapter**

**1**

# Introduction

## 1.1 Introduction
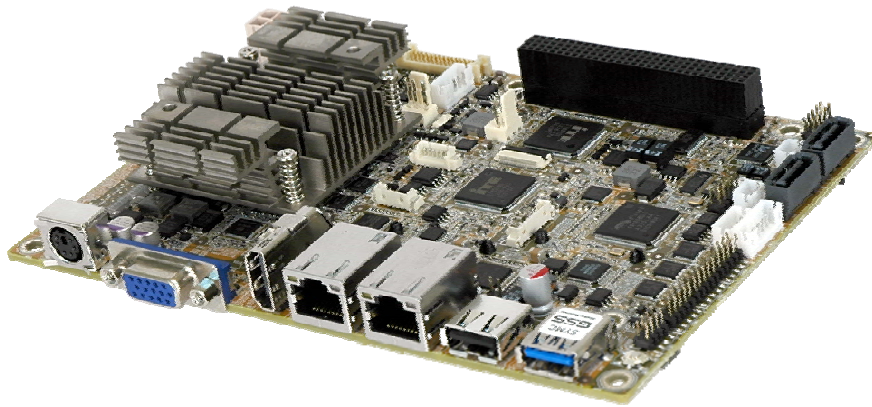


**Figure 1-1: NANO-BT-i1**

The NANO-BT-i1 is an EPIC form factor single bard computer. It has an on-board 22nm Intel® Atom™ or Celeron® processor, and supports one 204-pin 1333/1066 MHz dual-channel unbuffered DDR3 Low Voltage (DDR3L) SDRAM SO-DIMM with up to 8.0 GB of memory.

The NANO-BT-i1 features Intelligent Platform Management Interface (IPMI) that helps lower the overall costs of server management by enabling users to maximize IT resource, save time and manage multiple systems. The NANO-BT-i1 supports IPMI 2.0 through the optional iRIS-1010 module.

The NANO-BT-i1 includes one VGA port and one HDMI port for dual independent display It also has an internal 18-bit/24-bit dual-channel LVDS connector supporting up to 1920 x 1200 resolutions. Expansion and I/O include one PCI-104 slot, one PCIe Mini slot, one USB 3.0 port plus one USB 2.0 on the rear panel, two USB 2.0 by pin header, two SATA 3Gb/s connectors, three RS-232 serial ports, and one PS/2 keyboard/mouse connector.

## 1.2 Model Variations

There are eight models of the NANO-BT-i1 series. The model variations are listed in **Table 1-1**.

| Model | On-board SoC | Max. Memory Size |
|---|---|---|
| NANO-BT-i1-E38151 | Intel® Atom™ processor E3815 (1.46 GHz, single-core, 512 KB cache) | 4 GB |
| NANO-BT-i1-E38251 | Intel® Atom™ processor E3825 (1.33 GHz, dual-core, 1 MB cache) | 4 GB |
| NANO-BT-i1-E38261 | Intel® Atom™ processor E3826 (1.46 GHz, dual-core, 1 MB cache) | 8 GB |
| NANO-BT-i1-E38271 | Intel® Atom™ processor E3827 (1.75 GHz, dual-core, 1 MB cache) | 8 GB |
| NANO-BT-i1-E38451 | Intel® Atom™ processor E3845 (1.91 GHz, quad-core, 2 MB cache) | 8 GB |
| NANO-BT-i1-J19001 | Intel® Celeron® processor J1900 (2 GHz, quad-core, 2 MB cache) | 8 GB |
| NANO-BT-i1-N28071 | Intel® Celeron® processor N2807 (1.58 GHz, dual-core, 2 MB cache) | 4 GB |
| NANO-BT-i1-N29301 | Intel® Celeron® processor N2930 (1.83 GHz, quad-core, 2 MB cache) | 8 GB |

**Table 1-1: Model Variations**

## 1.3 Benefits

Some of the NANO-BT-i1 motherboard benefits include:

- Powerful graphics with multiple monitors
- Staying connected with both wired LAN connections
- Speedy running of multiple programs and applications

## 1.4 Features

Some of the NANO-BT-i1 motherboard features are listed below:

- EPIC form factor

- RoHS compliant

- On-board 22nm Intel® Atom™ or Celeron® processor

- One 204-pin 1333/1066 MHz dual-channel unbuffered DDR3L (1.35 V) SDRAM SO-DIMM slot supports up to 8.0 GB of memory

- LVDS, VGA and HDMI interfaces for dual independent display

- Supports IPMI 2.0 via IEI iRIS-1010 module

- Two Intel® PCIe GbE connectors

- Two SATA 3Gb/s connectors

- One PCIe Mini card expansion slot

- One PCI-104 expansion slot

- One USB 3.0 port and three USB 2.0 ports

- Three RS-232 serial ports and one RS-422/485 serial port

- High Definition Audio

## 1.5 Connectors

The connectors on the NANO-BT-i1 are shown in the figure below.
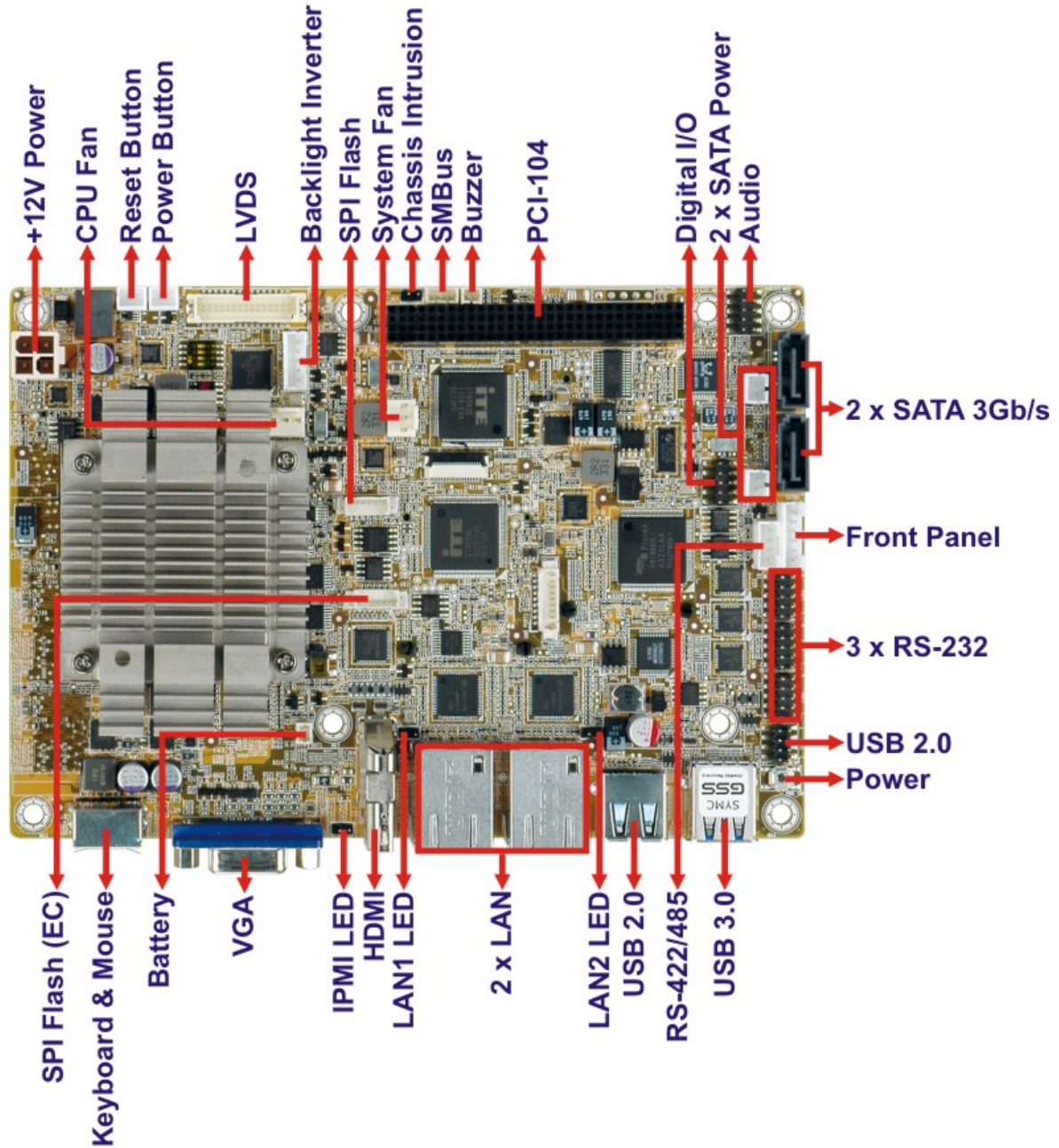


**Figure 1-2: Connectors (Front Side)**
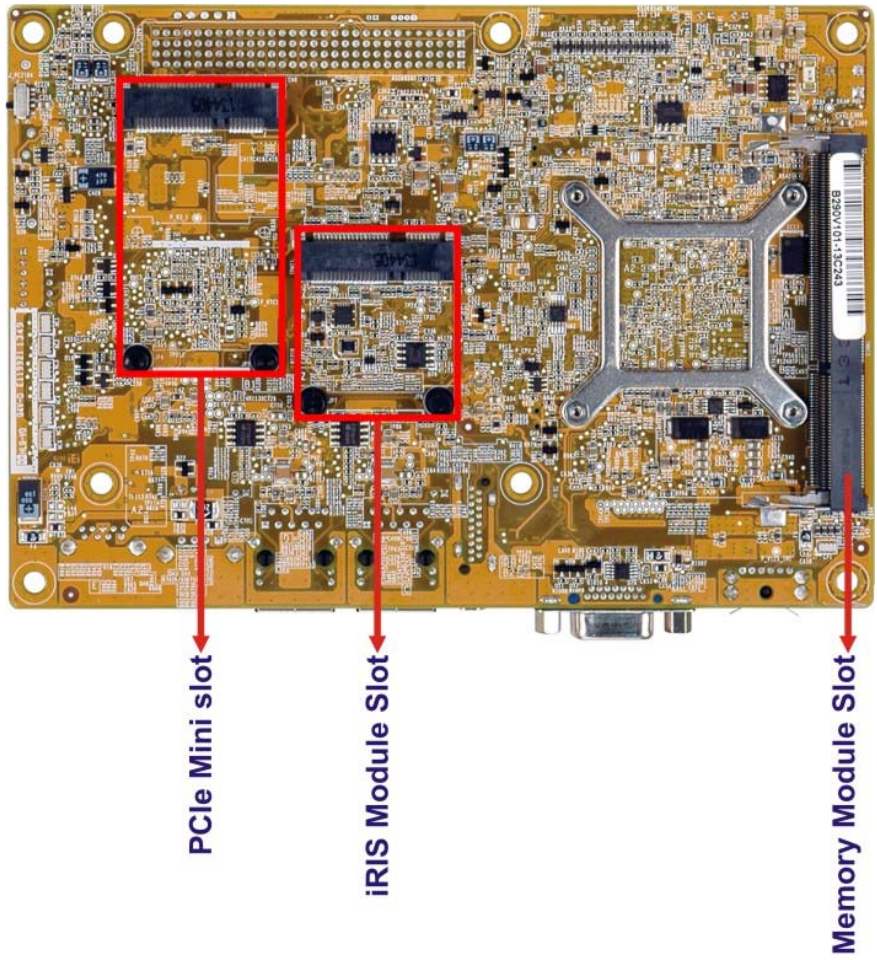
**Figure 1-3: Connectors (Solder Side)**

## 1.6 Dimensions

The main dimensions of the NANO-BT-i1 are shown in the diagram below.
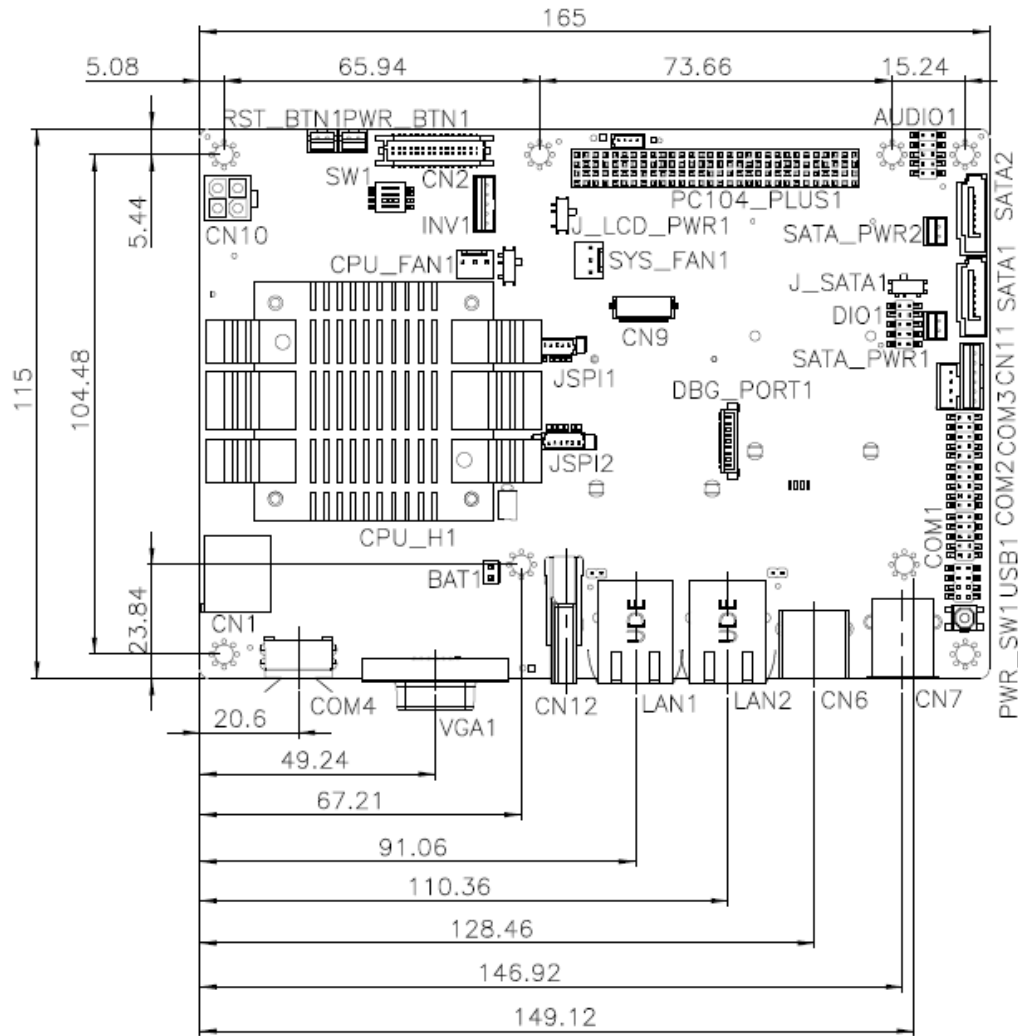


**Figure 1-4: NANO-BT-i1 Main Dimensions (mm)**

The height of the NANO-BT-i1 series varies depending on the heatsink installed on the board. **Figure 1-5** shows the height dimensions of the following models:

- ▪ NANO-BT-i1-E38271
- ▪ NANO-BT-i1-E38261
- ▪ NANO-BT-i1-E38251
- ▪ NANO-BT-i1-E38151

▪ NANO-BT-i1-N28071
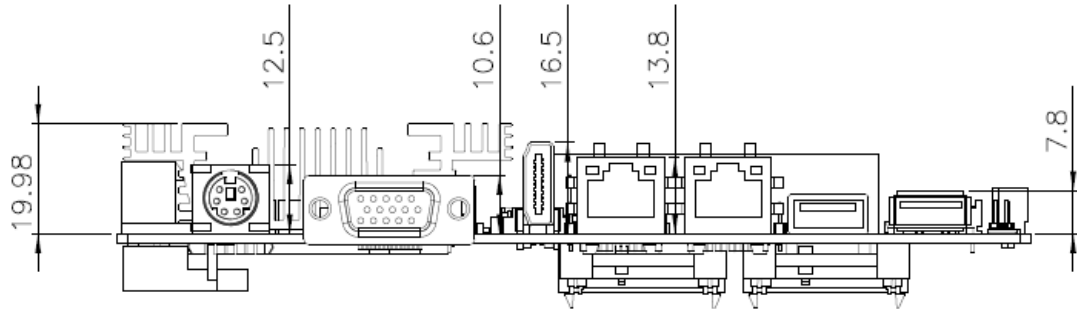
**Figure 1-5: NANO-BT-i1 Height Dimensions 1 (mm)**

**Figure 1-6** shows the height dimensions of the following models:

▪ NANO-BT-i1-E38451

▪ NANO-BT-i1-J19001

▪ NANO-BT-i1-N29301
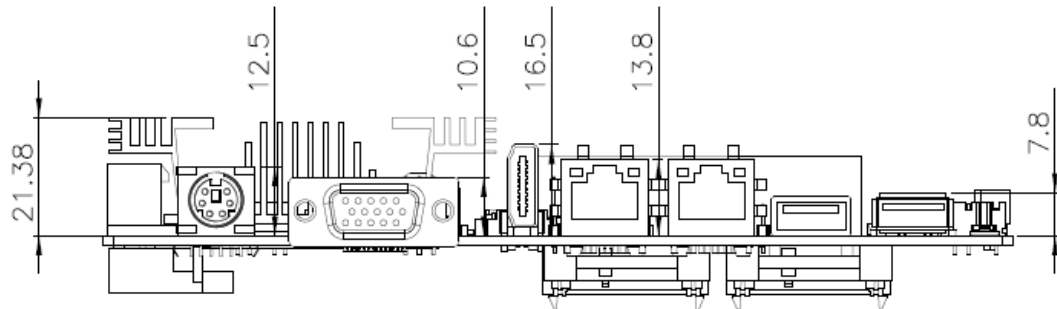
**Figure 1-6: NANO-BT-i1 Height Dimensions 2 (mm)**

## 1.7 Data Flow

**Figure 1-7** shows the data flow between the system chipset, the CPU and other components installed on the motherboard.
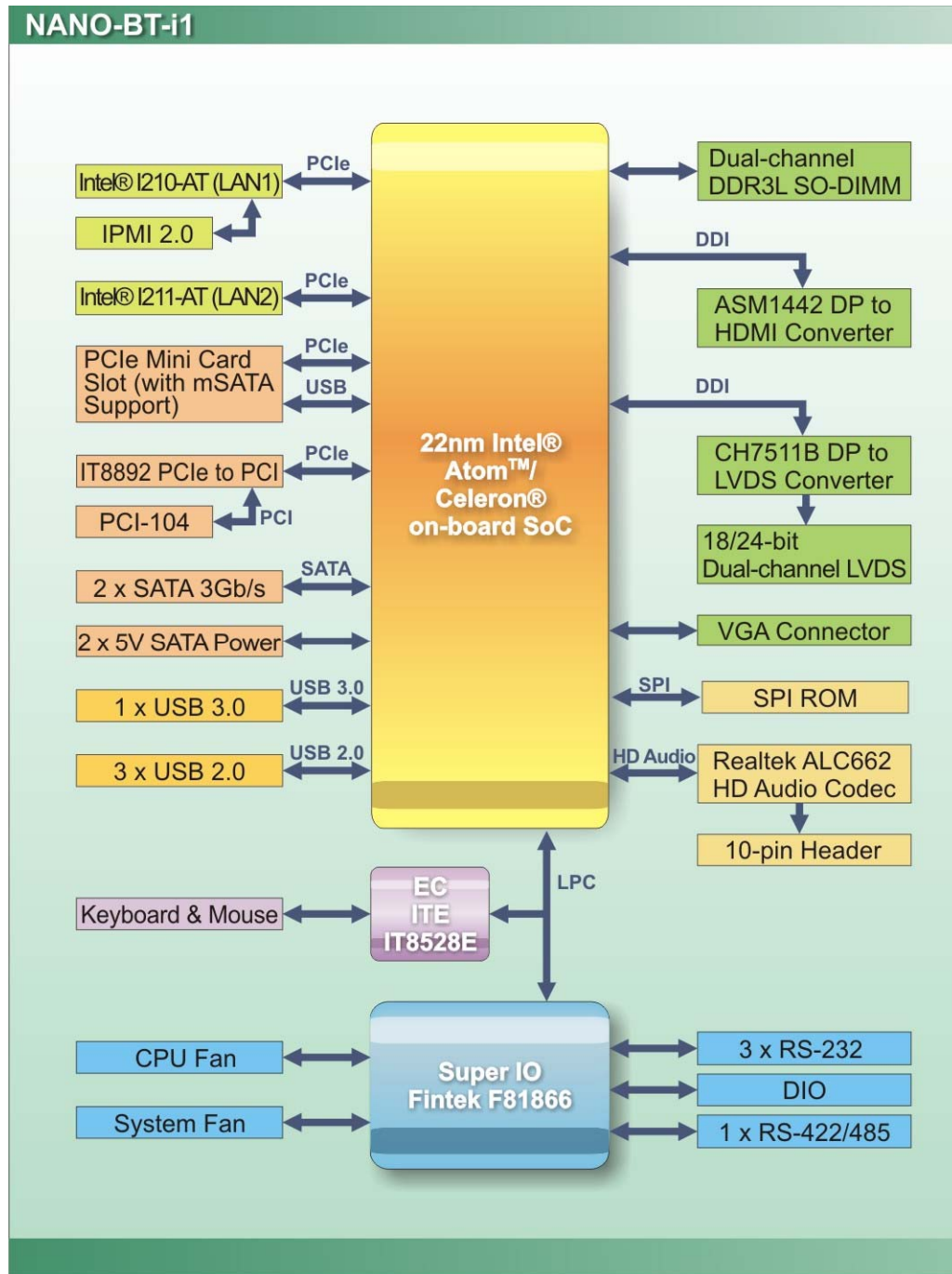


**Figure 1-7: Data Flow Diagram**

## 1.8 Technical Specifications

NANO-BT-i1 technical specifications are listed below.

| Specification/Model | NANO-BT-i1 |
|---|---|
| **Form Factor** | EPIC |
| **On-board SoC** | Intel® Atom™ processor E3845 (1.91GHz, quad-core, 2MB cache, TDP=10W)<br><br>Intel® Atom™ processor E3827 (1.75GHz, dual-core, 1MB cache, TDP=8W)<br><br>Intel® Atom™ processor E3826 (1.46GHz, dual-core, 1MB cache, TDP=7W)<br><br>Intel® Atom™ processor E3825 (1.33GHz, dual-core, 1MB cache, TDP=6W)<br><br>Intel® Atom™ processor E3815 (1.46GHz, single-core, 512KB cache, TDP=5W)<br><br>Intel® Celeron® processor J1900 (2GHz, quad-core, 2MB cache, TDP=10W)<br><br>Intel® Celeron® processor N2930 (1.83GHz, quad-core, 2MB cache, TDP=7.5W)<br><br>Intel® Celeron® processor N2807 (1.58GHz, dual-core, 2MB cache, TDP=4.5W) |
| **Integrated Graphics** | Intel® HD Graphics Gen7 with 4 execution units, supporting DirectX 11.1, OpenCL 1.2 and OpenGL 4.2 |
| **Memory** | One 204-pin 1066/1333MHz single-channel unbuffered DDR3L (1.35 V) SDRAM SO-DIMM supports up to 8 GB (J1900, N2930, E3845, E3827, E3826) or 4 GB (N2807, E3825, E3815) |
| **Audio** | Realtek ALC662 HD Audio codec |
| **BIOS** | UEFI BIOS |
| **Ethernet Controllers** | **LAN1:** Intel® I210-AT PCIe Ethernet controller with NCSI and IPMI 2.0 support<br><br>**LAN2**: Intel® I211-AT PCIe Ethernet controller |
| **Digital I/O** | 8-bit digital I/O (4-bit input, 4-bit output) |
| **IPMI 2.0** | Supported by the optional iRIS-1010 module |
| **Super I/O Controller** | Fintek F81866 |
| **Embedded Controller** | ITE IT8528E |
| **Watchdog Timer** | Software programmable supports 1 sec – 255 sec system reset |
| **Expansion** | |
| **PCI** | One PCI-104 slot |

| Specification/Model | NANO-BT-i1 |
|---|---|
| **PCIe** | One PCIe Mini card slot |
| **I/O Interface Connectors** | |
| **Audio Connector** | One internal audio connector (10-pin) |
| **Display Ports** | One VGA port (up to 2560 x 1600, 60Hz) |
| | One HDMI port (up to 2560 x 1600, 60Hz) |
| | 18-bit/24-bit dual-channel LVDS (up to 1920 x 1200, 60Hz) |
| **Ethernet** | Two RJ-45 GbE ports |
| **Keyboard/Mouse** | One PS/2 keyboard/mouse connector |
| **Serial Ports** | One RS-422/485 via internal wafer connector |
| | Three RS-232 via internal pin headers |
| **USB ports** | One external USB 3.0 port and one external USB 2.0 port on rear IO |
| | Two internal USB 2.0 ports by pin header |
| **Serial ATA** | Two SATA 3Gb/s connectors |
| **LAN LED** | Two 2-pin LAN active LED connectors |
| **SMBus** | Supported by one 4-pin wafer connector |
| **Environmental and Power Specifications** | |
| **Power Supply** | 12 V only DC input through the internal 4-pin (2x2) power connector |
| | AT/ATX power supported |
| **Power Consumption** | 12 V @ 1.52 A (1.91 GHz Intel® Atom™ processor J1900 with one 8 GB 1600 MHz DDR3 memory) |
| **Operating Temperature** | -20ºC ‒ 60ºC |
| **Storage Temperature** | -30ºC ‒ 70ºC |
| **Humidity** | 5% ‒ 95% (non-condensing) |
| **Physical Specifications** | |
| **Dimensions** | 115 mm x 165 mm |
| **Weight GW/NW** | 850 g / 350 g |

**Table 1-2: NANO-BT-i1 Specifications**

Chapter

**2**

# Packing List

## 2.1 Anti-static Precautions

**WARNING!**

Static electricity can destroy certain electronics. Make sure to follow the ESD precautions to prevent damage to the product, and injury to the user.

Make sure to adhere to the following guidelines:

- **Wear an anti-static wristband**: Wearing an anti-static wristband can prevent electrostatic discharge.
- **Self-grounding**: Touch a grounded conductor every few minutes to discharge any excess static buildup.
- **Use an anti-static pad**: When configuring any circuit board, place it on an anti-static mat.
- **Only handle the edges of the PCB**: Don't touch the surface of the motherboard. Hold the motherboard by the edges when handling.

## 2.2 Unpacking Precautions

When the NANO-BT-i1 is unpacked, please do the following:

- Follow the antistatic guidelines above.
- Make sure the packing box is facing upwards when opening.
- Make sure all the packing list items are present.
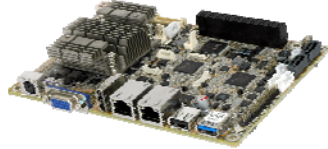
## 2.3 Packing List

> ![NOTE icon] **NOTE:**
>
> If any of the components listed in the checklist below are missing, do not proceed with the installation. Contact the IEI reseller or vendor the NANO-BT-i1 was purchased from or contact an IEI sales representative directly by sending an email to sales@ieiworld.com

The NANO-BT-i1 is shipped with the following components:

| Quantity | Item and Part Number | Image |
|---|---|---|
| 1 | NANO-BT-i1 single board computer | |
| 2 | SATA and power cable (**P/N:** 32801-000201-300-RS) | |
| 2 | Single RS-232 cable (**P/N**: 19800-000300-200-RS) | |
| 1 | 12 V AT power cable (**P/N**: 32100-087100-RS) | |
| 1 | Utility CD | |

| Quantity | Item and Part Number | Image |
|---|---|---|
| 1 | One Key Recovery CD | |
| 1 | Quick Installation Guide | |

**Table 2-1: Packing List**

## 2.4 Optional Items

The following are optional components which may be separately purchased:

| Item and Part Number | Image |
|---|---|
| IPMI 2.0 adapter card with AST1010 BMC chip (without KVM over IP function) for PCIe Mini socket interface (**P/N**: iRIS-1010-R10) | |
| Dual USB cable (**P/N**: 32000-070301-RS) | |
| RS-422/485 cable, 200mm (**P/N**: 32205-003800-300-RS) | |
| Keyboard and mouse Y cable (**P/N**: 32006-000300-100-RS) | |

**Table 2-2: Optional Items**

Chapter

3

# Connectors

# 3.1 Peripheral Interface Connectors

This chapter details all the jumpers and connectors.

## 3.1.1 NANO-BT-i1 Layout

The figures below show all the connectors and jumpers.
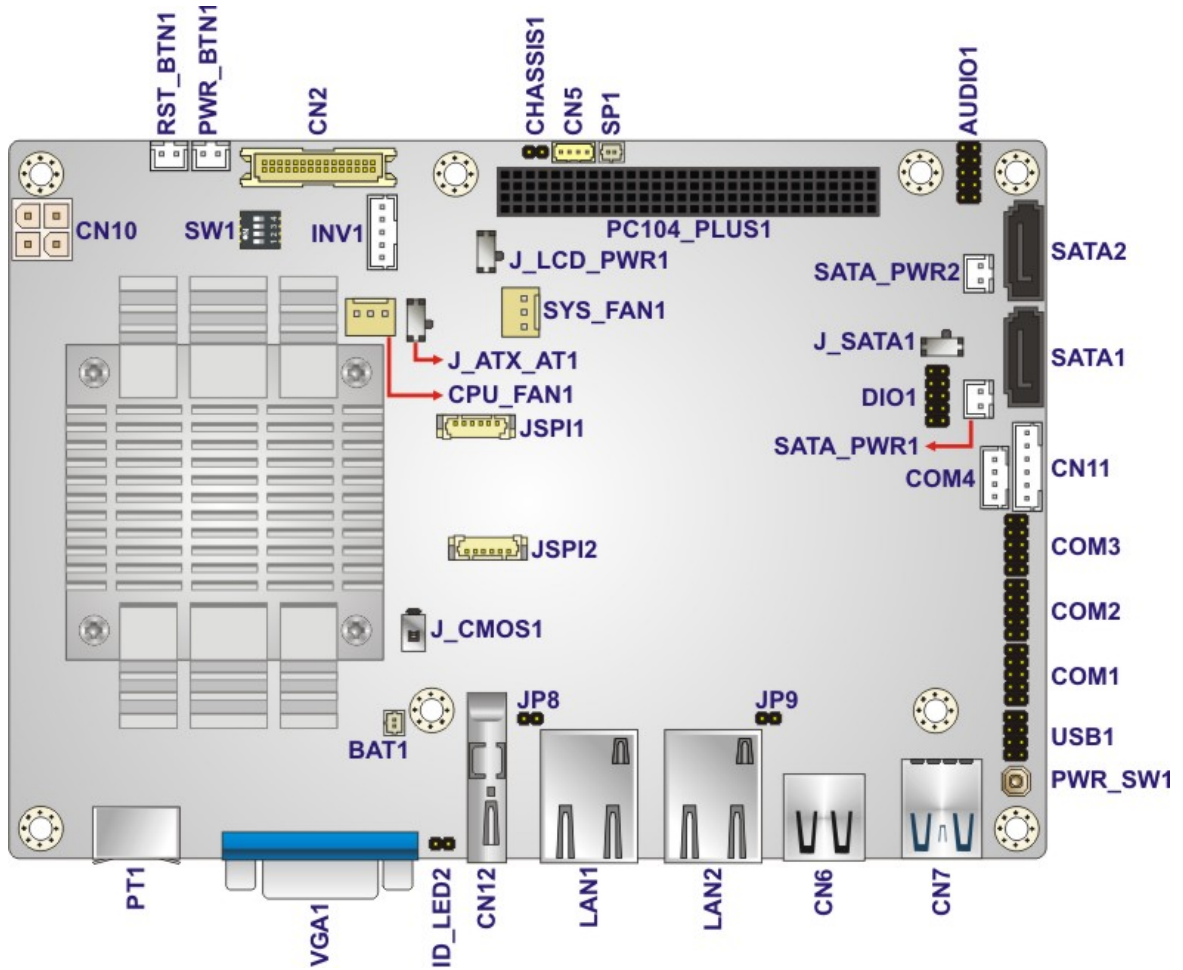


**Figure 3-1: Connectors and Jumpers (Front Side)**
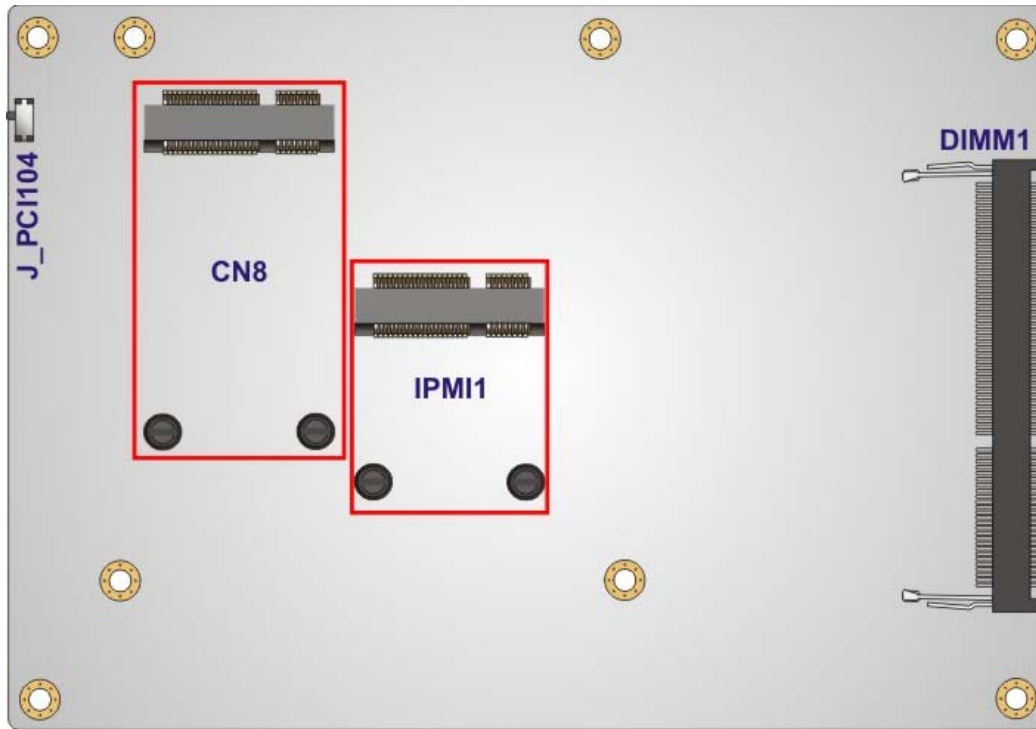
**Figure 3-2: Connectors and Jumpers (Solder Side)**

## 3.1.2 Peripheral Interface Connectors

The table below lists all the connectors on the board.

| Connector | Type | Label |
|---|---|---|
| 12 V DC input connector | 4-pin connector | CN10 |
| Audio connector | 10-pin header | AUDIO1 |
| Battery connector | 2-pin wafer | BAT1 |
| Backlight inverter connector | 5-pin wafer | INV1 |
| Buzzer connector | 2-pin wafer | SP1 |
| Chassis intrusion connector | 2-pin header | CHASSIS1 |
| Digital I/O connector | 10-pin header | DIO1 |
| Fan connector (CPU) | 3-pin wafer | CPU_FAN1 |

| Connector | Type | Label |
|---|---|---|
| Fan connector (system) | 3-pin wafer | SYS_FAN1 |
| Front panel connector | 6-pin wafer | CN11 |
| iRIS module connector | Half-size PCIe Mini slot | IPMI1 |
| IPMI LED connector | 2-pin header | ID_LED2 |
| LAN1 LED connector | 2-pin header | JP8 |
| LAN2 LED connector | 2-pin header | JP9 |
| LVDS connector | 30-pin crimp | CN2 |
| Memory card slot | DIMM slot | DIMM1 |
| PCI-104 slot | PCI-104 slot | PC104_PLUS1 |
| PCIe Mini slot | Full-size PCIe Mini | CN8 |
| Power button connector | 2-pin wafer | PWR_BTN1 |
| Power button | Push button | PWR_SW1 |
| Reset button connector | 2-pin wafer | RST_BTN1 |
| SATA 3Gb/s drive connectors | 7-pin SATA connector | SATA1, SATA2 |
| SATA power connectors (5 V) | 2-pin wafer | SATA_PWR1, SATA_PWR2 |
| Serial ports, RS-232 | 10-pin header | COM1, COM2, COM3 |
| Serial port, RS-422/485 | 4-pin wafer | COM4 |
| SMBus connector | 4-pin wafer | CN5 |
| SPI flash connector | 6-pin header | JSPI1 |
| SPI flash connector (EC) | 6-pin header | JSPI2 |
| USB 2.0 connector | 8-pin header | USB1 |

**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 |
|---|---|---|
| Ethernet ports | RJ-45 | LAN1, LAN2 |
| HDMI connector | HDMI | CN12 |
| Keyboard/Mouse connector | PS/2 | PT1 |
| USB 2.0 connector | USB 2.0 | CN6 |
| USB 3.0 connector | USB 3.0 | CN7 |
| 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 NANO-BT-i1.

### 3.2.1 +12 V Power Connector

| | |
|---|---|
| **CN Label:** | **CN10** |
| **CN Type:** | 4-pin connector |
| **CN Location:** | See **Figure 3-3** |
| **CN Pinouts:** | See **Table 3-3** |

The +12 V power input connector provides power to the system.
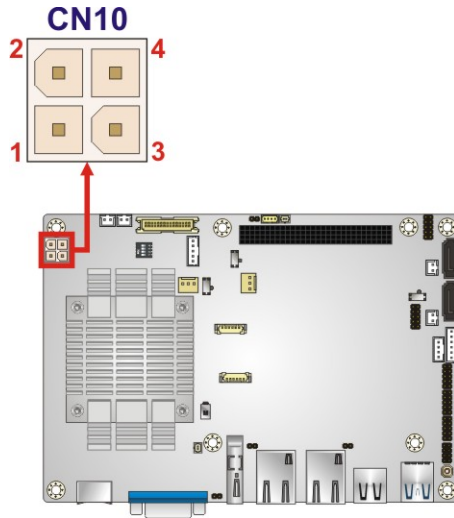
**Figure 3-3: CPU Power Connector Location**

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

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

## 3.2.2 Audio Connector

| | |
|---|---|
| **CN Label:** | **AUDIO1** |
| **CN Type:** | 10-pin header |
| **CN Location:** | See **Figure 3-4** |
| **CN Pinouts:** | See **Table 3-4** |

This connector connects to speakers, a microphone and an audio input.
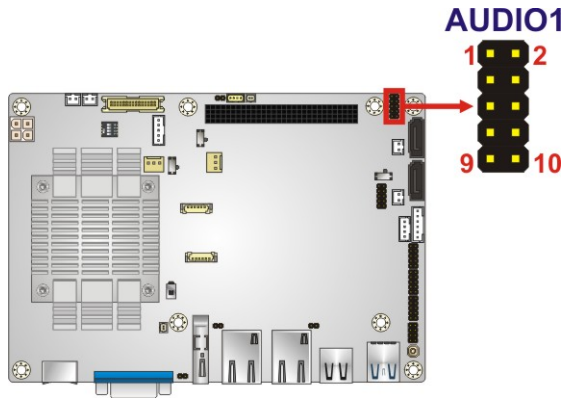
**Figure 3-4: Audio Connector Location**

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | LINE_OUTR | 2 | LINEIN_R |
| 3 | ANALOG_GND | 4 | ANALOG_GND |
| 5 | LINE_OUTL | 6 | LINEIN_L |
| 7 | ANALOG_GND | 8 | ANALOG_GND |
| 9 | MICIN1 | 10 | MICIN2 |

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

## 3.2.3 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:** **BAT1**

**CN Type:** 2-pin wafer

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

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

A system battery is placed in the battery holder. The battery provides power to the system clock to retain the time when power is turned off.
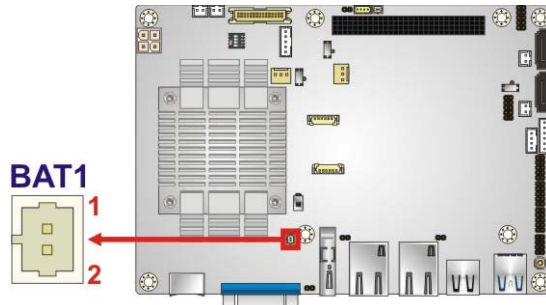


**Figure 3-5: Battery Connector Location**

| Pin | Description |
|-----|-------------|
| 1 | VBATT |
| 2 | GND |

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

## 3.2.4 Backlight Inverter Connector

**CN Label:** **INV1**

**CN Type:** 5-pin wafer

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

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

The backlight inverter connector provides power to an LCD panel.
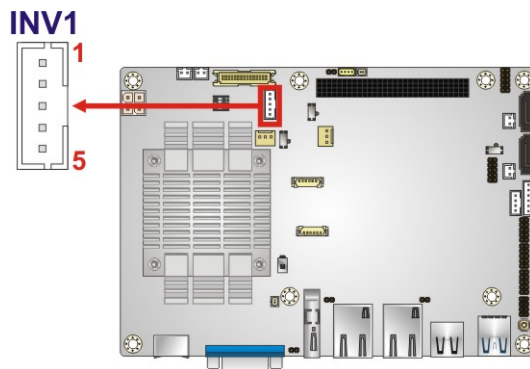


**Figure 3-6: Backlight Inverter Connector Location**

| Pin | Description |
|-----|-------------|
| 1 | BRIGHTNESS2 |
| 2 | GND |
| 3 | VCC |
| 4 | GND |
| 5 | ENABKL2 |

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

## 3.2.5 Buzzer Connector

**CN Label:** SP1

**CN Type:** 2-pin wafer

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

The connector is connected to a buzzer.
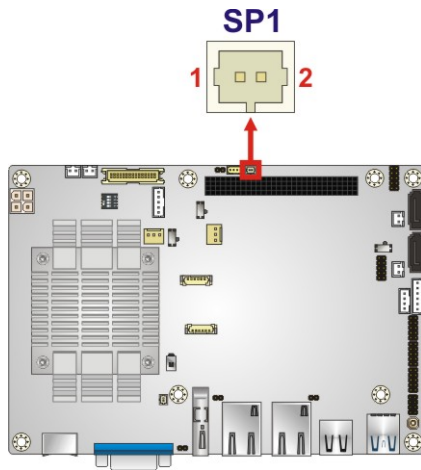


**Figure 3-7: Buzzer Connector Location**

### 3.2.6 Chassis Intrusion Connector

| | |
|---|---|
| **CN Label:** | **CHASSIS1** |
| **CN Type:** | 2-pin header |
| **CN Location:** | See **Figure 3-8** |
| **CN Pinouts:** | See **Table 3-7** |

The chassis intrusion connector is for a chassis intrusion detection sensor or switch that detects if a chassis component is removed or replaced.
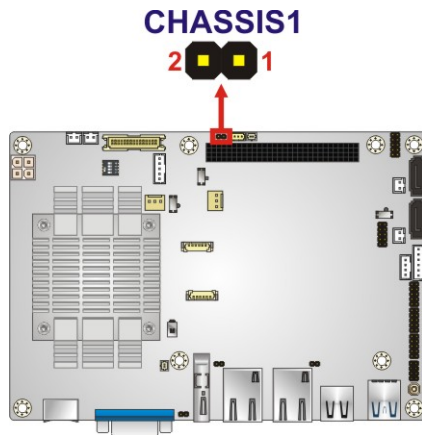
**Figure 3-8: Chassis Intrusion Connector Location**

| Pin | Description |
|---|---|
| 1 | +V3.3A_EC |
| 2 | CHASSIS_EC |

**Table 3-7: Chassis Intrusion Connector Pinouts**

### 3.2.7 Digital I/O Connector

| | |
|---|---|
| **CN Label:** | **DIO1** |
| **CN Type:** | 10-pin header |
| **CN Location:** | See **Figure 3-9** |
| **CN Pinouts:** | See **Table 3-8** |

The digital I/O connector provides programmable input and output for external devices. The digital I/O provides 4-bit output and 4-bit input.
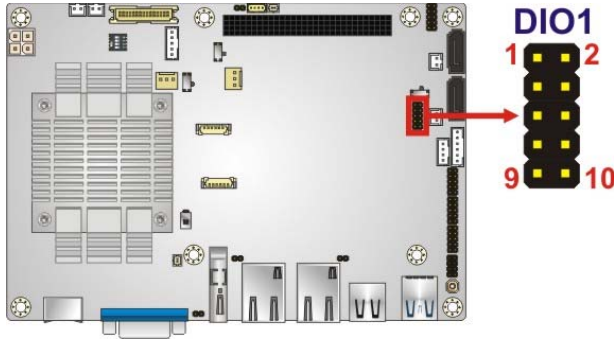
**Figure 3-9: Digital I/O Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | GND | 2 | +5V |
| 3 | DOUT3 | 4 | DOUT2 |
| 5 | DOUT1 | 6 | DOUT0 |
| 7 | DIN3 | 8 | DIN2 |
| 9 | DIN1 | 10 | DIN0 |

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

## 3.2.8 Fan Connector (CPU)

**CN Label:** CPU_FAN1

**CN Type:** 3-pin wafer

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

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

The fan connector attaches to a CPU cooling fan.
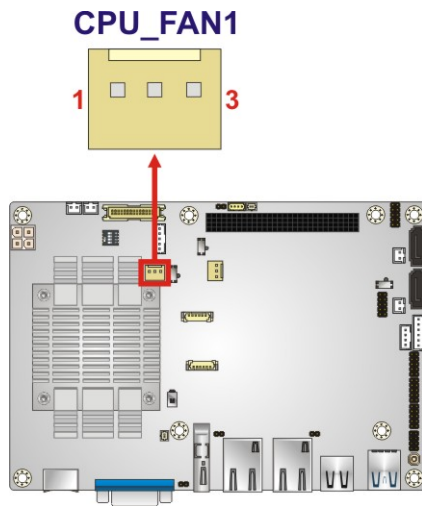
**CPU_FAN1**



**Figure 3-10: CPU Fan Connector Location**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | FAN_IN |
| 2 | VCC (+12 V) |
| 3 | GND |

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

## 3.2.9 Fan Connector (System)

**CN Label:** **SYS_FAN1**

**CN Type:** 3-pin wafer

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

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

Each fan connector attaches to a system cooling fan.
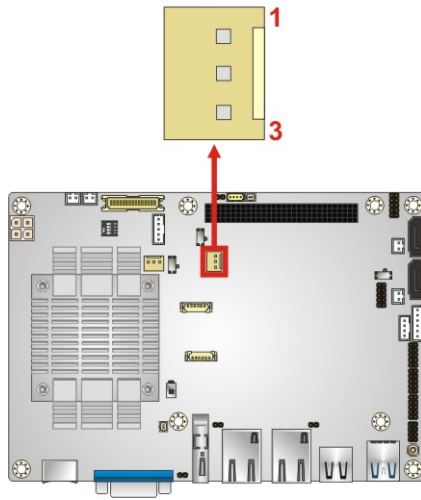
**Figure 3-11: System Fan Connector Location**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | FAN_IN |
| 2 | VCC (+12 V) |
| 3 | GND |

**Table 3-10: System Fan Connector Pinouts**

## 3.2.10 Front Panel Connector

**CN Label:** **CN11**

**CN Type:** 6-pin wafer

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

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

The front panel connector connects to the indicator LEDs on the computer's front panel.
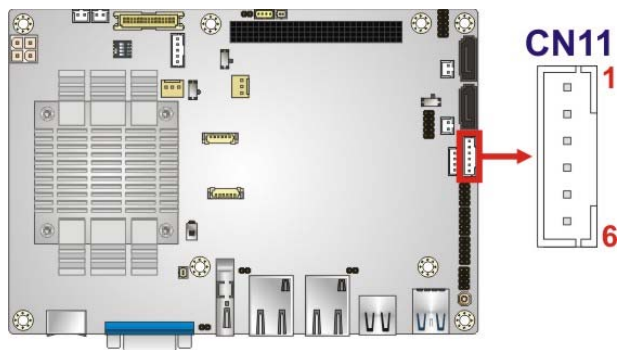
**Figure 3-12: Front Panel Connector Location**

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-------------|
| 1 | VCC | 4 | PWR_LED- |
| 2 | GND | 5 | HDD_LED+ |
| 3 | PWR_LED+ | 6 | HDD_LED- |

**Table 3-11: Front Panel Connector Pinouts**

## 3.2.11 IPMI LED Connector

**CN Label:**        **ID_LED2**

**CN Type:**        2-pin header

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

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

The IPMI LED connector is used to connect to the IPMI LED indicator on the chassis.
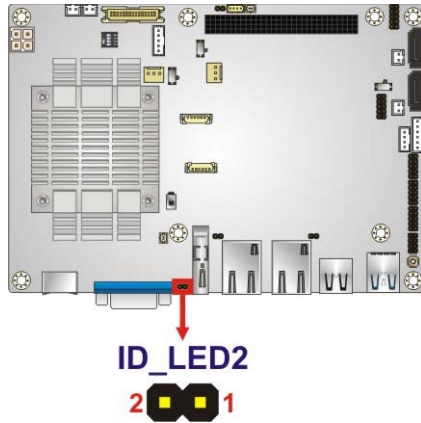
**Figure 3-13: IPMI LED Connector Location**

| Pin | Description |
| --- | --- |
| 1 | ID_LED+ |
| 2 | ID_LED- |

**Table 3-12: IPMI LED Connector Pinouts**

## 3.2.12 iRIS Module Slot

**CN Label:** **IPMI1**

**CN Type:** Half-size PCIe Mini slot

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

The iRIS module slot is used to install the IEI iRIS-1010 IPMI 2.0 module.

**WARNING:**

The iRIS module slot is designed to install the IEI iRIS-1010 IPMI 2.0 module only. DO NOT install other modules into the iRIS module slot. Doing so may cause damage to the NANO-BT-i1.
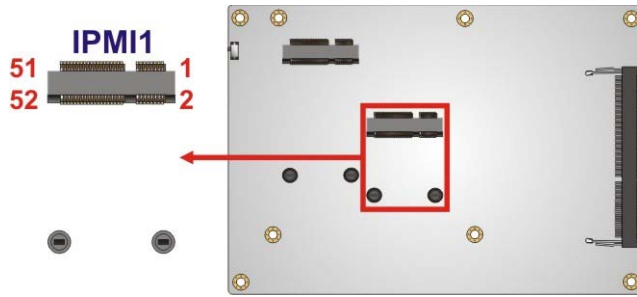
**Figure 3-14: iRIS Module Slot Location**

## 3.2.13 LAN LED Connectors

| | |
|---|---|
| **CN Label:** | **JP8, JP9** |
| **CN Type:** | 2-pin header |
| **CN Location:** | See **Figure 3-15** |
| **CN Pinouts:** | See **Table 3-13** and **Table 3-14** |

The LAN LED connectors are used to connect to the LAN LED indicators on the chassis to indicate users the link activities of the two LAN ports.
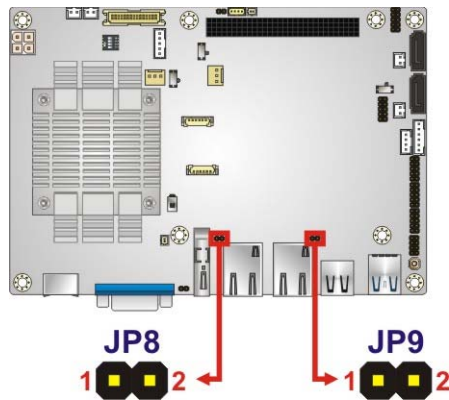


**Figure 3-15: LAN LED Connector Locations**

| Pin | Description |
|---|---|
| 1 | VCC |
| 2 | L1_LINK_ACT- |

**Table 3-13: LAN1 LED Connector (JP8) Pinouts**

| Pin | Description |
|-----|-------------|
| 1 | VCC |
| 2 | L2_LINK_ACT- |

**Table 3-14: LAN2 LED Connector (JP9) Pinouts**

## 3.2.14 LVDS Connector

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

**CN Type:**      30-pin crimp

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

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

The LVDS connector is for an LCD panel connected to the board.
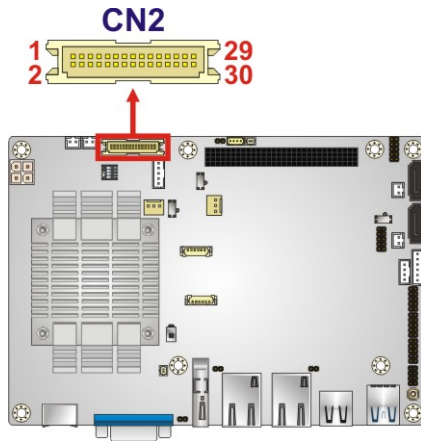


**Figure 3-16: LVDS Connector Location**

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | GND | 2 | GND |
| 3 | LVDS_A_TX0-P | 4 | LVDS_ A_TX0-N |
| 5 | LVDS_ A_TX1-P | 6 | LVDS_ A_TX1-N |
| 7 | LVDS_ A_TX2-P | 8 | LVDS_ A_TX2-N |
| 9 | LVDS_ A_TXCLK-P | 10 | LVDS_ A_TXCLK-N |

| Pin | Description | Pin | Description |
|---|---|---|---|
| 11 | LVDS_ A_TX3-P | 12 | LVDS_ A_TX3-N |
| 13 | GND | 14 | GND |
| 15 | LVDS_B_TX0-P | 16 | LVDS_ B_TX0-N |
| 17 | LVDS_ B_TX1-P | 18 | LVDS_ B_TX1-N |
| 19 | LVDS_ B_TX2-P | 20 | LVDS_ B_TX2-N |
| 21 | LVDS_ B_TXCLK-P | 22 | LVDS_ B_TXCLK-N |
| 23 | LVDS_ B_TX3-P | 24 | LVDS_ B_TX3-N |
| 25 | GND | 26 | GND |
| 27 | +LCD VCC | 28 | +LCD VCC |
| 29 | +LCD VCC | 30 | +LCD VCC |

**Table 3-15: LVDS Connector Pinouts**

## 3.2.15 Memory Card Slot

**CN Label:** DIMM1

**CN Type:** DDR3 SO-DIMM slot

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

The SO-DIMM slot is for installing DDR3 Low Voltage SO-DIMM memory modules.
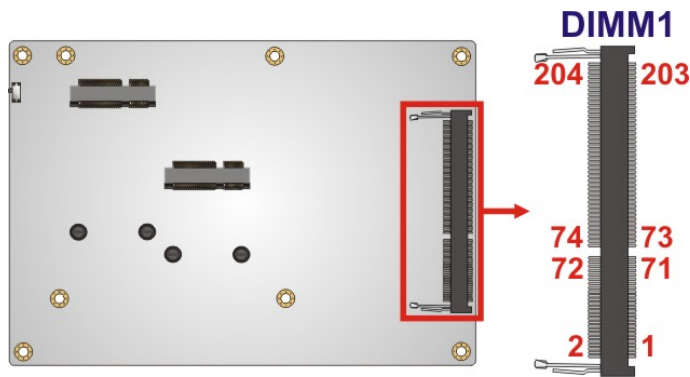


**Figure 3-17: Memory Card Slot Location**

### 3.2.16 PCI-104 Connector

| | |
|---|---|
| **CN Label:** | **PC104_PLUS1** |
| **CN Type:** | PCI-104 connector |
| **CN Location:** | See **Figure 3-18** |
| **CN Pinouts:** | See **Table 3-16** |

The PCI-104 connector is for installing a PCI-104 expansion card.
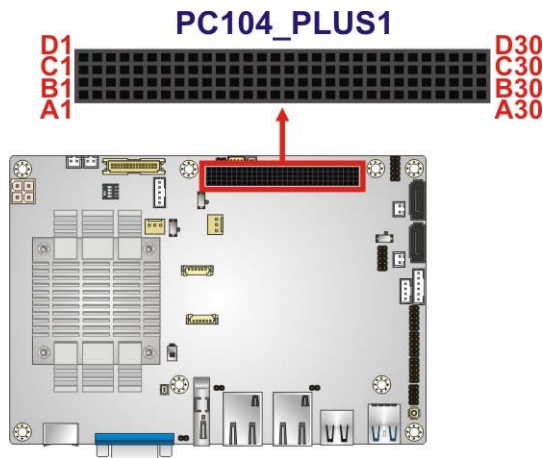


**Figure 3-18: PCI-104 Connector Location**

| Pin | Row A | Row B | Row C | Row D |
|---|---|---|---|---|
| 1 | GND/5 V | TBD1 | 5 V | AD00 |
| 2 | VI/O1 | AD02 | AD01 | +5 V |
| 3 | AD05 | GND | AD04 | AD03 |
| 4 | C/BE0# | AD07 | GND | AD06 |
| 5 | GND | AD09 | AD08 | GND |
| 6 | AD11 | VI/O2 | AD10 | M66EN |
| 7 | AD14 | AD13 | GND | AD12 |
| 8 | +3.3 V | C/BE1# | AD15 | +3.3 V |
| 9 | SERR# | GND | SB0# | PAR |
| 10 | GND | PERR# | +3.3 V | SDONE |
| 11 | STOP# | +3.3 V | LOCK# | GND |
| 12 | +3.3 V | TRDY# | GND | DEVSEL# |

| Pin | Row A | Row B | Row C | Row D |
|-----|-------|-------|-------|-------|
| 13 | FRAME# | GND | IRDY# | +3.3 V |
| 14 | GND | AD16 | +3.3 V | C/BE2# |
| 15 | AD18 | +3.3 V | AD17 | GND |
| 16 | AD21 | AD20 | GND | AD19 |
| 17 | +3.3 V | AD23 | AD22 | +3.3 V |
| 18 | IDSEL0 | GND | IDSEL1 | IDSEL2 |
| 19 | AD24 | C/BE3# | VI/O1 | IDSEL3 |
| 20 | GND | AD26 | AD25 | GND |
| 21 | AD29 | +5 V | AD28 | AD27 |
| 22 | +5 V | AD30 | GND | AD31 |
| 23 | REQ0# | GND | REQ1# | VI/O2 |
| 24 | GND | REQ2# | +5 V | GNT0# |
| 25 | GNT1# | VI/O3 | GNT2# | GND |
| 26 | +5 V | CLK0 | GND | CLK1 |
| 27 | CLK2 | +5 V | CLK3 | GND |
| 28 | GND | INTD# | +5 V | RST# |
| 29 | +12 V | INTA# | INTB# | INTC# |
| 30 | -12 V | TBD2 | TBD | GND/3.3 V |

**Table 3-16: PCI-104 Connector Pinouts**

## 3.2.17 PCIe Mini Card Slot

| | |
|---|---|
| **CN Label:** | **CN8** |
| **CN Type:** | PCIe Mini card slot |
| **CN Location:** | See **Figure 3-19** |
| **CN Pinouts:** | See **Table 3-17** |

The PCIe Mini card slot is for installing PCIe Mini expansion cards, such as mSATA modules or Wi-Fi modules.
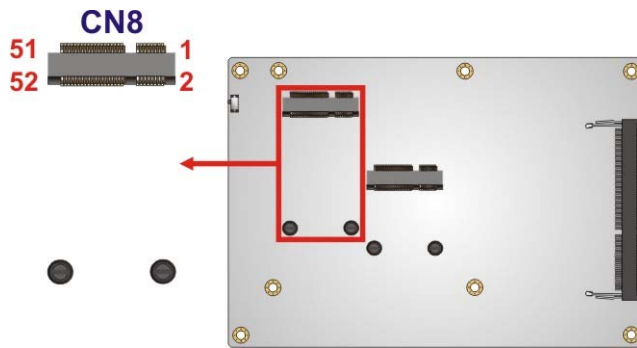
**Figure 3-19: PCIe Mini Card Slot Location**

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | PCIE_WAKE# | 2 | VCC3 |
| 3 | N/C | 4 | GND |
| 5 | N/C | 6 | 1.5 V |
| 7 | VCC3 | 8 | N/C |
| 9 | GND | 10 | N/C |
| 11 | CLK- | 12 | N/C |
| 13 | CLK+ | 14 | N/C |
| 15 | GND | 16 | N/C |
| 17 | BUF_PLT_RST# | 18 | GND |
| 19 | N/C | 20 | VCC3 |
| 21 | GND | 22 | BUF_PLT_RST# |
| 23 | PCIE_RX4DN_M | 24 | VCC3 |
| 25 | PCIE_RX4DP_M | 26 | GND |
| 27 | GND | 28 | 1.5 V |
| 29 | GND | 30 | SMBCLK |
| 31 | PCIE_TX4DN_CM | 32 | SMBDATA |
| 33 | PCIE_TX4DP_CM | 34 | GND |
| 35 | GND | 36 | USBD3- |
| 37 | GND | 38 | USBD3+ |
| 39 | VCC3 | 40 | GND |
| 41 | VCC3 | 42 | N/C |
| 43 | GND | 44 | RF_LINK# |

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 45 | N/C | 46 | BLUELED# |
| 47 | N/C | 48 | 1.5 V |
| 49 | N/C | 50 | GND |
| 51 | M-SATADET | 52 | VCC3 |

**Table 3-17: PCIe Mini Card Slot Pinouts**

## 3.2.18 Power Button Connector

**CN Label:**　　　**PWR_BTN1**

**CN Type:**　　　2-pin wafer

**CN Location:**　See **Figure 3-20**

**CN Pinouts:**　　See **Table 3-18**

The power button connector is connected to a power switch on the system chassis.
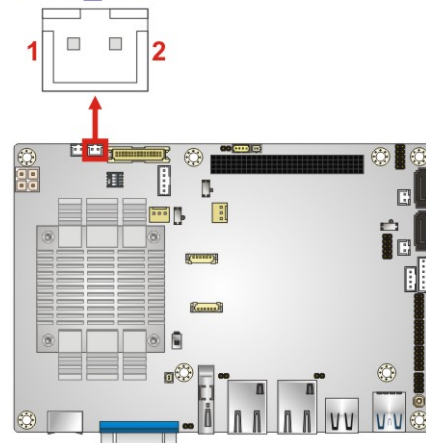


**Figure 3-20: Power Button Location**

| Pin | Description |
|-----|-------------|
| 1 | PWRBTN_SW# |
| 2 | GND |

**Table 3-18: Power Button Pinouts**

### 3.2.19 Power Button

| | |
|---|---|
| **CN Label:** | **PWR_SW1** |
| **CN Type:** | Push button |
| **CN Location:** | See **Figure 3-21** |

The on-board power button controls system power.
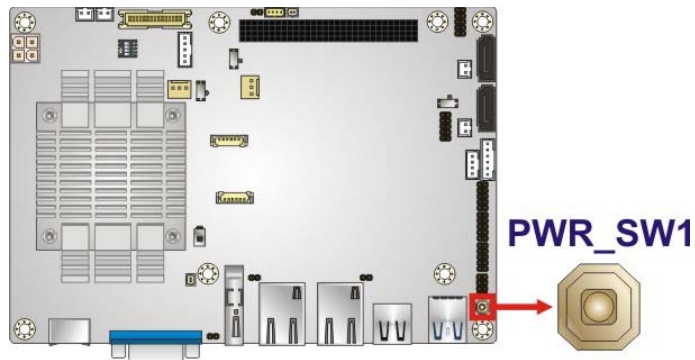


**Figure 3-21: Power Button Location**

### 3.2.20 Reset Button Connector

| | |
|---|---|
| **CN Label:** | **RST_BTN1** |
| **CN Type:** | 2-pin wafer |
| **CN Location:** | See **Figure 3-22** |
| **CN Pinouts:** | See **Table 3-19** |

The reset button connector is connected to a reset switch on the system chassis.

**RST_BTN1**
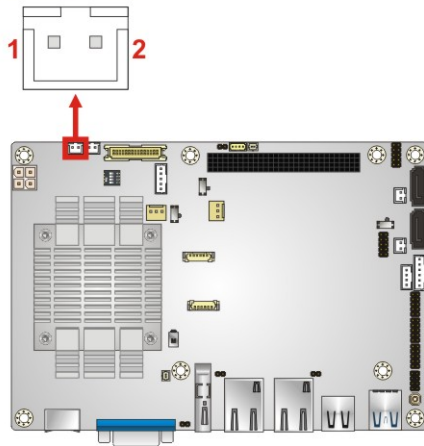


**Figure 3-22: Reset Button Connector Location**

| Pin | Description |
|-----|-------------|
| 1 | PM_SYSRST_R# |
| 2 | GND |

**Table 3-19: Reset Button Connector Pinouts**

## 3.2.21 SATA 3Gb/s Drive Connectors

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

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

**CN Location:**   See **Figure 3-23**

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

The SATA drive connectors can be connected to SATA drives.
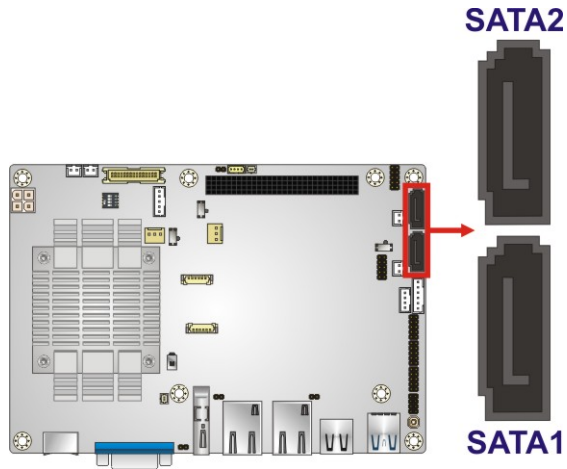
**Figure 3-23: SATA 3Gb/s Drive Connector Locations**

| Pin | Description |
| --- | --- |
| 1 | GND |
| 2 | SATA_TX+ |
| 3 | SATA_TX- |
| 4 | GND |
| 5 | SATA_RX- |
| 6 | SATA_RX+ |
| 7 | GND |

**Table 3-20: SATA 3Gb/s Drive Connector Pinouts**

### 3.2.22 SATA Power Connectors

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

**CN Type:** 2-pin wafer

**CN Location:** See **Figure 3-24**

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

Use the SATA Power Connector to connect to SATA device power connections.
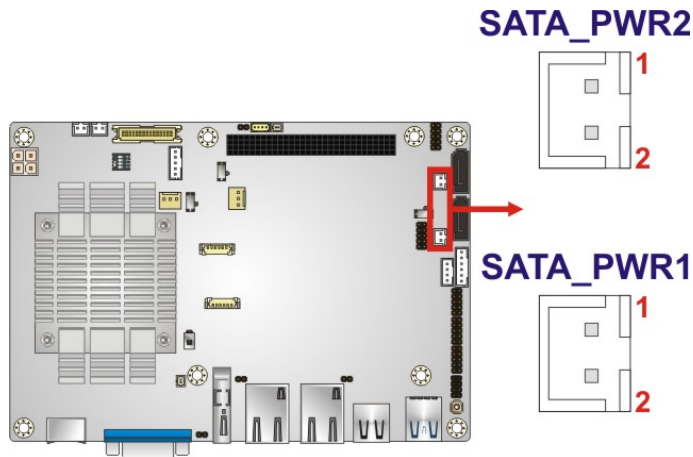
**Figure 3-24: SATA Power Connector Locations**

| Pin | Description |
| --- | --- |
| 1 | +5VS |
| 2 | GND |

**Table 3-21: SATA Power Connector Pinouts**

## 3.2.23 Serial Port Connectors, RS-232

**CN Label:**      **COM1, COM2, COM3**

**CN Type:**      10-pin header

**CN Location:**   See **Figure 3-25**

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

The connector provides RS-232 port connection.
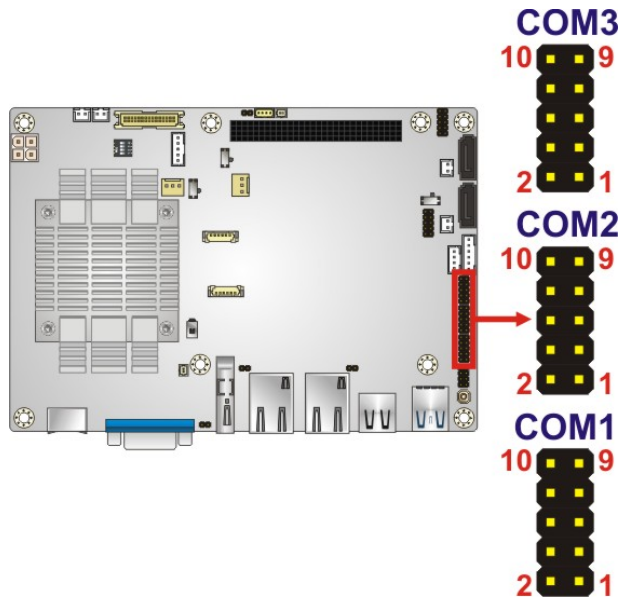
**Figure 3-25: RS-232 Serial Port Connector Locations**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | DCD | 2 | DSR |
| 3 | SIN | 4 | RTS |
| 5 | SOUT | 6 | CTS |
| 7 | DTR | 8 | RI |
| 9 | GND | 10 | GND |

**Table 3-22: RS-232 Serial Port Connector Pinouts**

## 3.2.24 Serial Port Connector, RS-422/485

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

**CN Type:**       4-pin wafer

**CN Location:**    See **Figure 3-26**

**CN Pinouts:**     See **Table 3-23**

Used for RS-422/485 communications.
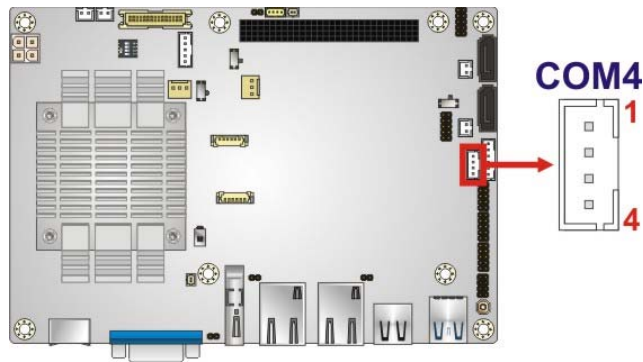
**Figure 3-26: RS-422/485 Connector Location**

| PIN NO. | DESCRIPTION |
|---------|-------------|
| 1 | RXD422- |
| 2 | RXD422+ |
| 3 | TXD422+/TXD485+ |
| 4 | TXD422-/TXD485- |

**Table 3-23: RS-422/485 Connector Pinouts**

Use the optional RS-422/485 cable to connect to a serial device. The pinouts of the D-sub 9 connector are listed below.

| RS-422 Pinouts | RS-485 Pinouts |
|----------------|----------------|
|  |  |

**Table 3-24: RS-422/485 Pinouts of D-sub 9 Connector**

## 3.2.25 SMBus Connector

**CN Label:** CN5

**CN Type:** 4-pin wafer

**CN Location:** See **Figure 3-27**

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

The SMBus (System Management Bus) connector provides low-speed system management communications.
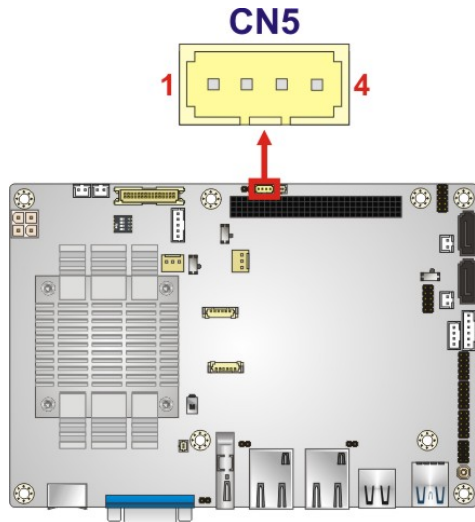


**Figure 3-27: SMBus Connector Location**

| PIN | DESCRIPTION |
|-----|-------------|
| 1 | GND |
| 2 | SMB_DATA |
| 3 | SMB_CLK |
| 4 | +5 V |

**Table 3-25: SMBus Connector Pinouts**

## 3.2.26 SPI Flash Connector

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

**CN Type:**    6-pin wafer

**CN Location:**    See **Figure 3-28**

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

The SPI flash connector is used to flash the SPI ROM.
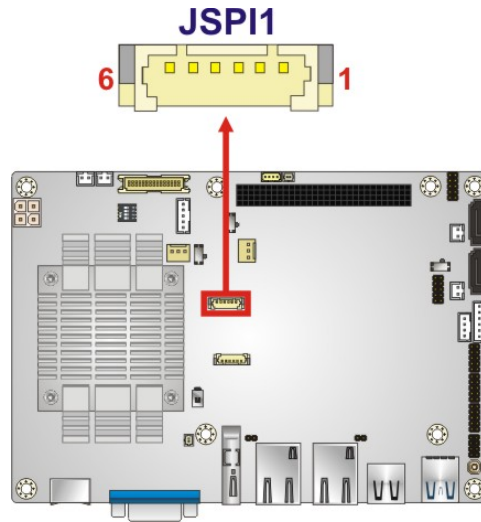
**Figure 3-28: SPI Flash Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | +1.8 VA | 4 | SPI_CLK_SW |
| 2 | SPI_CS | 5 | SPI_SI_SW |
| 3 | SPI_SO_SW | 6 | GND |

**Table 3-26: SPI Flash Connector Pinouts**

## 3.2.27 SPI Flash Connector, EC

  **CN Label:**   **JSPI2**

  **CN Type:**   6-pin wafer

  **CN Location:**  See **Figure 3-29**

  **CN Pinouts:**  See **Table 3-27**

The SPI flash connector is used to flash the EC ROM.
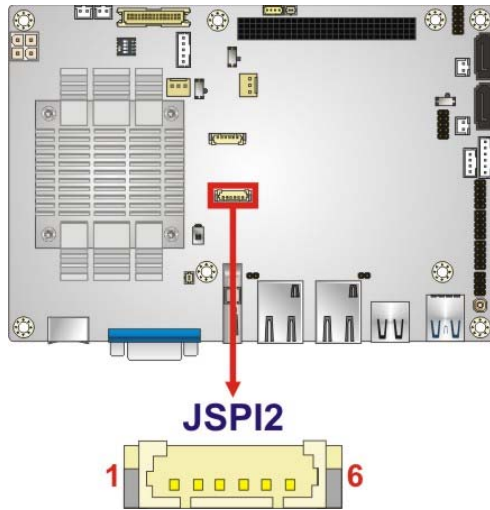
**Figure 3-29: SPI EC Flash Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | +3.3 A | 4 | SPI_CLK_SW_EC |
| 2 | SPI_CS#0_CN_EC | 5 | SPI_SI_SW_EC |
| 3 | SPI_SO_SW_EC | 6 | GND |

**Table 3-27: SPI EC Flash Connector Pinouts**

## 3.2.28 USB 2.0 Connector

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

**CN Type:**      8-pin header

**CN Location:**   See **Figure 3-30**

**CN Pinouts:**    See **Table 3-28**

The USB 2.0 connector connects to USB 2.0 devices. Each pin header provides two USB 2.0 ports.
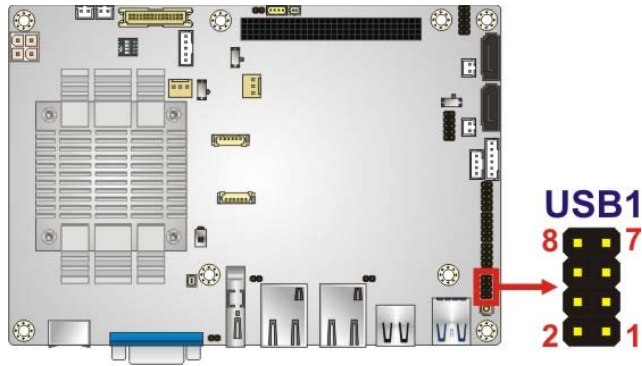
**Figure 3-30: USB 2.0 Connector Location**

| PIN NO. | DESCRIPTION | PIN NO. | DESCRIPTION |
|---------|-------------|---------|-------------|
| 1 | +VCC_USB45 | 2 | GND |
| 3 | DATA4- | 4 | DATA5+ |
| 5 | DATA4+ | 6 | DATA5- |
| 7 | GND | 8 | +VCC_USB45 |

**Table 3-28: USB 2.0 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:
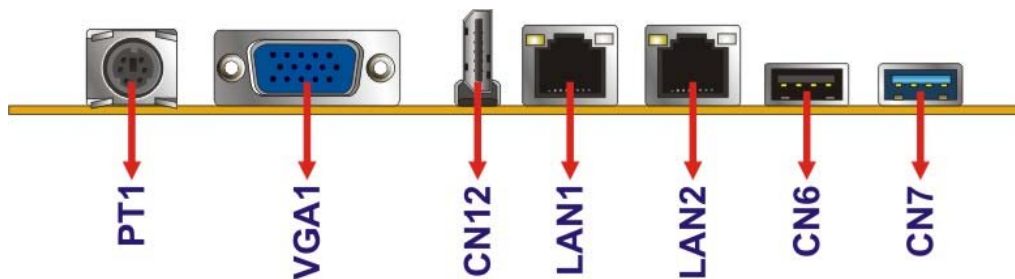


**Figure 3-31: External Peripheral Interface Connector**

### 3.3.1 Ethernet Connectors

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

**CN Type:**      RJ-45

**CN Location:**     See **Figure 3-31**

**CN Pinouts:**     See **Table 3-29** and **Table 3-30**

A  10/100/1000 Mb/s  connection  can  be  made  to  a  Local  Area  Network.  The  LAN1 Ethernet connector supports IPMI 2.0.

| Pin | Description | Pin | Description |
| --- | --- | --- | --- |
| G1 | IO_GND | R2 | TRD1N0 |
| G2 | IO_GND | R3 | TRD1P1 |
| L1 | L1_100- | R4 | TRD1N1 |
| L2 | L1_1000- | R5 | N95788738 |
| L3 | L1_LINK_ACT- | R6 | N95788617 |
| L4 | N100494685 | R7 | TRD1P2 |
| N1 | NC | R8 | TRD1N2 |
| N2 | NC | R9 | TRD1P3 |
| R1 | TRD1P0 | R10 | TRD1N3 |

**Table 3-29: LAN1 Ethernet Connector Pinouts**

| Pin | Description | Pin | Description |
| --- | --- | --- | --- |
| G1 | IO_GND_1 | R2 | TRD2N0 |
| G2 | IO_GND_1 | R3 | TRD2P1 |
| L1 | L2_100- | R4 | TRD2N1 |
| L2 | L2_1000- | R5 | N95934519 |
| L3 | L2_LINK_ACT- | R6 | N95934513 |
| L4 | N100495197 | R7 | TRD2P2 |
| N1 | NC | R8 | TRD2N2 |
| N2 | NC | R9 | TRD2P3 |
| R1 | TRD2P0 | R10 | TRD2N3 |

**Table 3-30: LAN2 Ethernet Connector Pinouts**
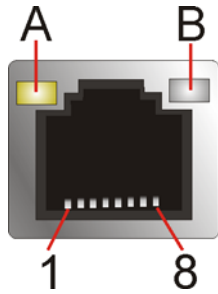
**Figure 3-32: Ethernet Connector**

| 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 3-31: Connector LEDs**

## 3.3.2 HDMI Connector

**CN Label:**     **CN12**

**CN Type:**     23-pin HDMI port

**CN Location:**     See **Figure 3-31**

**CN Pinouts:**     See **Table 3-32**

The HDMI connector can connect to an HDMI device.

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 1 | HDMI_DATA2 | 2 | GND |
| 3 | HDMI_DATA2# | 4 | HDMI_DATA1 |
| 5 | GND | 6 | HDMI_DATA1# |
| 7 | HDMI_DATA0 | 8 | GND |
| 9 | HDMI_DATA0# | 10 | HDMI_CLK |
| 11 | GND | 12 | HDMI_CLK# |
| 13 | N/C | 14 | N/C |
| 15 | HDMI_SCL | 16 | HDMI_SDA |
| 17 | GND | 18 | +5V |
| 19 | HDMI_HPD | 20 | HDMI_GND |

| Pin | Description | Pin | Description |
|---|---|---|---|
| 21 | HDMI_GND | 22 | HDMI_GND |
| 23 | HDMI_GND |  |  |

**Table 3-32: HDMI Connector Pinouts**
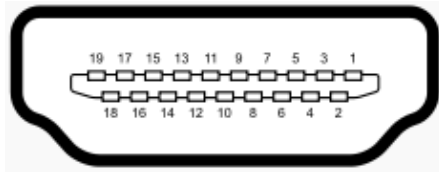


**Figure 3-33: HDMI Connector**

## 3.3.3 Keyboard/Mouse Connector

**CN Label:**     **PT1**

**CN Type:**      PS/2

**CN Location:**   See **Figure 3-31**

**CN Pinouts:**    See **Table 3-33**

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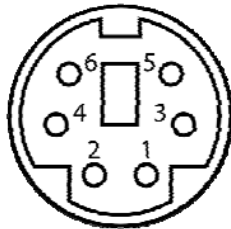


**Figure 3-34: PS/2 Pinout and Configuration**

| Pin | Description |
|---|---|
| 1 | KB DATA |
| 2 | MS DATA |
| 3 | GND |
| 4 | VCC |
| 5 | KB CLOCK |

| Pin | Description |
|---|---|
| 6 | MS CLOCK |

**Table 3-33: Keyboard Connector Pinouts**

### 3.3.4 USB 2.0 Connector

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

**CN Type:**  USB 2.0 port

**CN Location:**  See **Figure 3-31**

**CN Pinouts:**  See **Table 3-34**

The USB connector can be connected to a USB device.

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | USB3_PWR1 | 4 | GND |
| 2 | DATA1_N | 5 | USB_GND |
| 3 | DATA1_P | 6 | USB_GND |

**Table 3-34: USB 2.0 Port Pinouts**

### 3.3.5 USB 3.0 Connector

**CN Label:**  **CN7**

**CN Type:**  USB 3.0 port

**CN Location:**  See **Figure 3-31**

**CN Pinouts:**  See **Table 3-35**

The USB connector can be connected to a USB device.

| Pin | Description | Pin | Description |
|---|---|---|---|
| 1 | USB3_PWR1 | 6 | USB3P0_RXDP1 |
| 2 | USB2P0_DM1_L | 7 | USB_GND |
| 3 | USB2P0_DP1_L | 8 | USB3P0_TXDN1_C |
| 4 | GND | 9 | USB3P0_TXDP1_C |

| Pin | Description | Pin | Description |
|-----|-------------|-----|-------------|
| 5 | USB3P0_RXDN1 | | |

**Table 3-35: USB 3.0 Port Pinouts**

## 3.3.6 VGA Connector

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

**CN Type:**       15-pin Female

**CN Location:**   See **Figure 3-31**

**CN Pinouts:**    See **Table 3-36** and **Figure 3-35**

Both VGA connectors can be connected to monitors that accept standard VGA input for easy dual display setup. The VGA connectors support up to 1920 x 1200 resolutions.

| PIN | DESCRIPTION | PIN | DESCRIPTION |
|-----|-------------|-----|-------------|
| V1 | RED | V2 | GREEN |
| V3 | BLUE | V4 | NC |
| V5 | GND | V6 | GND |
| V7 | GND | V8 | GND |
| V9 | VCC | V10 | GND |
| V11 | NC | V12 | DDCDA |
| V13 | HSYNC | V14 | VSYNC |
| V15 | DDCCLK | | |

**Table 3-36: VGA Connector Pinouts**
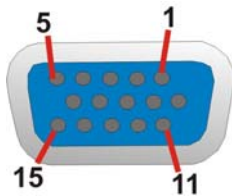


**Figure 3-35: VGA Connector**

Chapter

4

# Installation

## 4.1 Anti-static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the NANO-BT-i1 may result in permanent damage to the NANO-BT-i1 and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the NANO-BT-i1. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the NANO-BT-i1 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 NANO-BT-i1, place it on an antic-static pad. This reduces the possibility of ESD damaging the NANO-BT-i1.
- *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 NANO-BT-i1 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 NANO-BT-i1 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 NANO-BT-i1 off:
  - ○ When working with the NANO-BT-i1, 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 NANO-BT-i1 **DO NOT:**

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

### 4.2.1 SO-DIMM Installation

To install an SO-DIMM, please follow the steps below and refer to Figure 4-1.
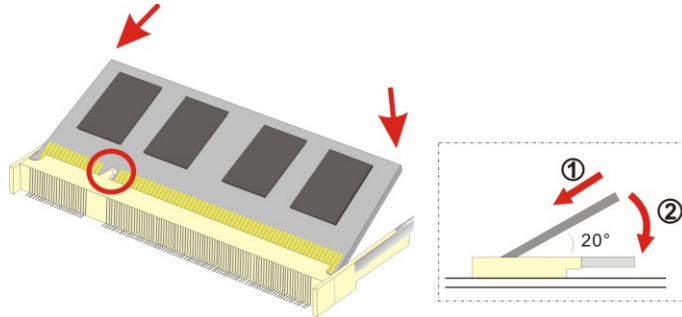


**Figure 4-1: SO-DIMM Installation**

**Step 1:** **Locate the SO-DIMM socket** on the solder side of the NANO-BT-i1. Place the board on an anti-static mat.

**Step 2:** **Align the SO-DIMM with the socket**. Align the notch on the memory with the notch on the memory socket.

**Step 3:** **Insert the SO-DIMM**. Push the memory in at a 20º angle. (See **Figure 4-1**)

**Step 4:** **Seat the SO-DIMM**. Gently push downwards and the arms clip into place. (See **Figure 4-1**)

## 4.2.2 iRIS-1010 Module Installation

⚠️ **WARNING:**

The iRIS module slot is designed to install the IEI iRIS-1010 IPMI 2.0 module only. DO NOT install other modules into the iRIS module slot. Doing so may cause damage to the NANO-BT-i1.

To install the iRIS-1010 module, please follow the steps below and refer to **Figure 4-2**.
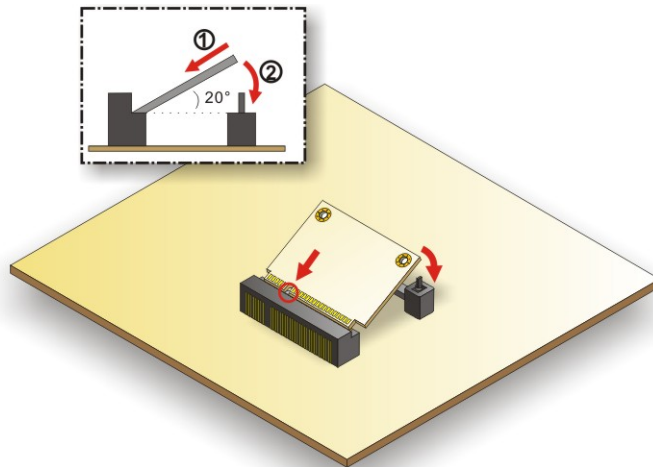
**Figure 4-2: iRIS-1010 Module Installation**

**Step 1:** **Locate the iRIS module slot on the solder side**. See **Figure 3-14**.

**Step 2:** **Insert into the socket at an angle**. Line up the notch on the RIS-1010 module with the notch on the connector. Slide the RIS-1010 module into the socket at an angle of about 20º.

**Step 3:** **Push down until the RIS-1010 module clips into place**. Push the other end of the RIS-1010 module down until it clips into place on the plastic connector.

![NOTE icon] **NOTE:**

After installing the iRIS-1010 module, use **LAN1** port to establish a network connection. Please refer to **Section 4.6** for IPMI setup procedures.

### 4.2.3 PCIe Mini Card Installation

To install the PCIe Mini card, please refer to the diagram and instructions below.
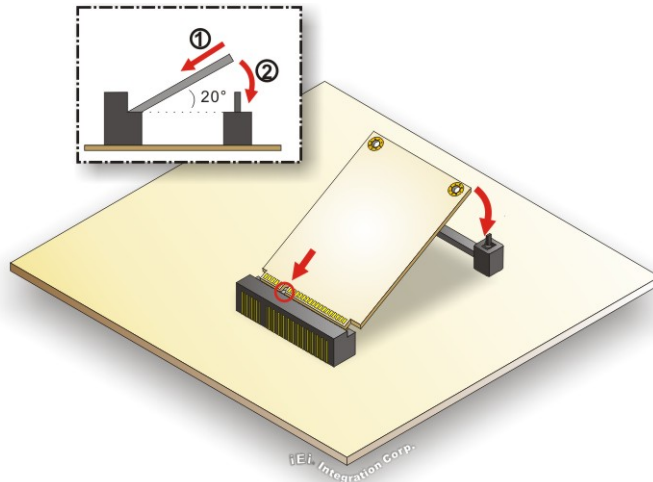


**Figure 4-3: PCIe Mini Card Installation**

**Step 1:** **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 20⁰.

**Step 2:** **Push down until the card clips into place**. Push the other end of the card down until it clips into place on the plastic connector.

## 4.3 System Configuration

The NANO-BT-i1 is a jumperless single board computer. The system configuration is controlled by buttons and switches. The system configuration must be performed before installation.

### 4.3.1 AT/ATX Power Mode Setting

The AT and ATX power mode selection is made through the AT/ATX power mode switch which is shown in **Figure 4-4**.
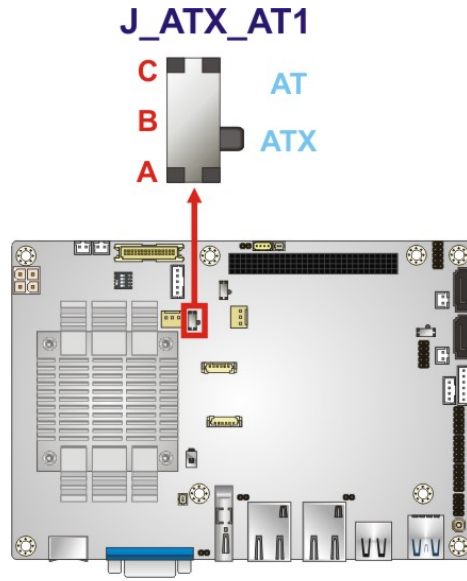
**Figure 4-4: AT/ATX Power Mode Switch Location**

### 4.3.2 Clear CMOS Button

To reset the BIOS, remove the on-board battery and press the clear CMOS button for three seconds or more. The clear CMOS button location is shown in **Figure 4-5**.
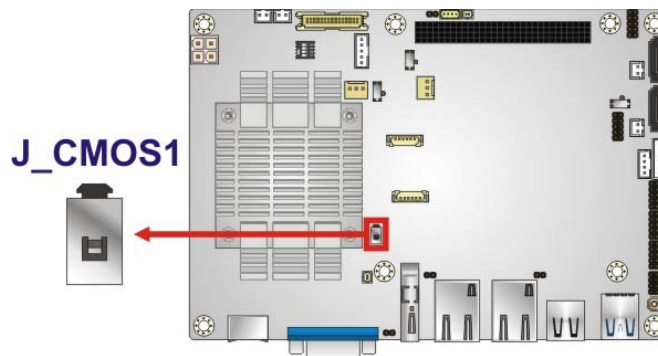


**Figure 4-5: Clear CMOS Button Location**

### 4.3.3 LVDS Panel Resolution Selection

Use the SW1 DIP switch to select the resolution of the LCD panel connected to the LVDS connector.

| SW1 (4-3-2-1) | Description |
|---|---|
| 0000 | 800x600 18-bit   (Default) |
| 0001 | 1024x768 18-bit |
| 0010 | 1024x768 24-bit |
| 0011 | 1280x768 18-bit |
| 0100 | 1280x800 18-bit |
| 0101 | 1280x960 18-bit |
| 0110 | 1280x1024 48-bit |
| 0111 | 1366x768 18-bit |
| 1000 | 1366x768 24-bit |
| 1001 | 1440x900 48-bit |
| 1010 | 1400x1050 48-bit |
| 1011 | 1600x900 48-bit |
| 1100 | 1680x1050 48-bit |
| 1101 | 1600x1200 48-bit |
| 1110 | 1920x1080 48-bit |
| 1111 | 1920x1200 48-bit |

*ON=0, OFF=1

**Table 4-1: LVDS Panel Resolution Selection**
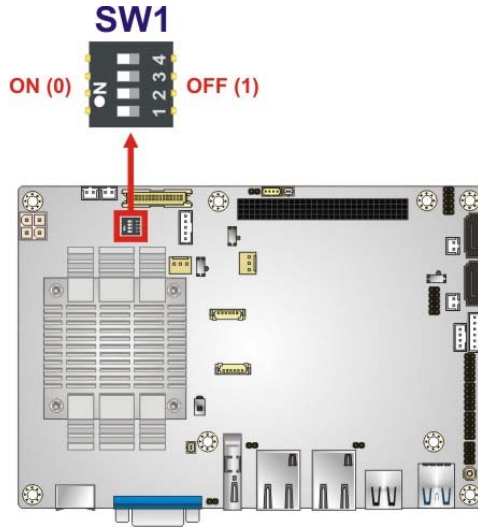
**Figure 4-6: LVDS Panel Resolution Selection Switch Location**

## 4.3.4 LCD Voltage Selection

The LCD voltage selection switch sets the voltage of the power supplied to the LCD panel.

The LCD Voltage Selection settings are shown in **Table 4-2**.

| Setting | Description |
|---------|-------------|
| A-B | +3.3 V (Default) |
| B-C | +5.0 V |

**Table 4-2: LCD Voltage Selection Switch Settings**
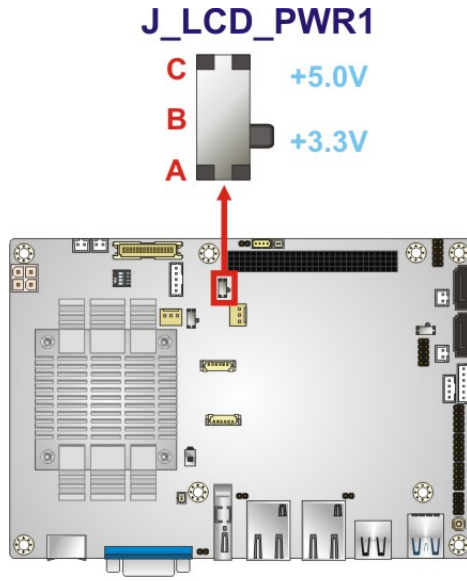
**Figure 4-7: LCD Voltage Selection Switch Location**

## 4.3.5 mSATA/SATA Selection

Use the J_SATA1 switch to select whether to automatically detect mSATA devices.

| Setting | Description |
|---------|-------------|
| A-B | Automatically detect mSATA device (Default) |
| B-C | Enable mSATA device |

**Table 4-3: mSATA/SATA Switch Settings**
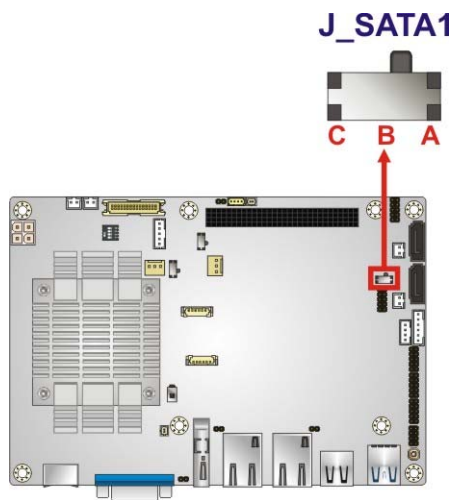


**Figure 4-8: mSATA/SATA Switch Location**

### 4.3.6 PCI-104 Voltage Selection

Use the J_PCI104 switch to select the voltage supplied to the PCI-104 expansion module.

| Setting | Description |
|---------|-------------|
| A-B | +3.3 V (Default) |
| B-C | +5.0 V |

**Table 4-4: PCI-104 Voltage Switch Settings**
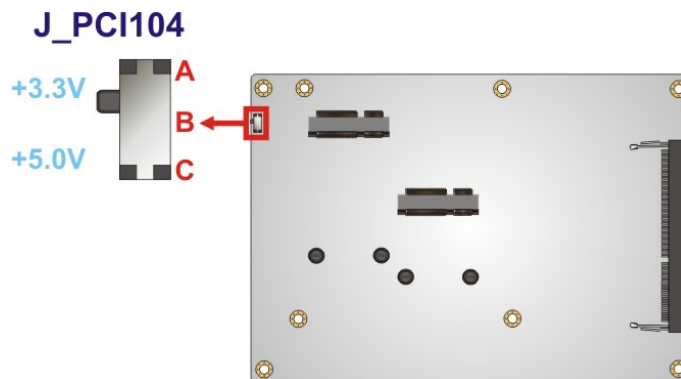


**Figure 4-9: PCI-104 Voltage Switch Location**

## 4.4 Internal Peripheral Device Connections

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

### 4.4.1 AT Power Connection

Follow the instructions below to connect the NANO-BT-i1 to an AT power supply.

**WARNING:**

Disconnect the power supply power cord from its AC power source to prevent a sudden power surge to the NANO-BT-i1.

**Step 1:** **Locate the power cable**. The power cable is shown in the packing list in **Chapter 2**.

**Step 2:** **Connect the Power Cable to the Motherboard**. Connect the 4-pin (2x2) Molex

type power cable connector to the +12V power connector on the motherboard.

See **Figure 4-10**.
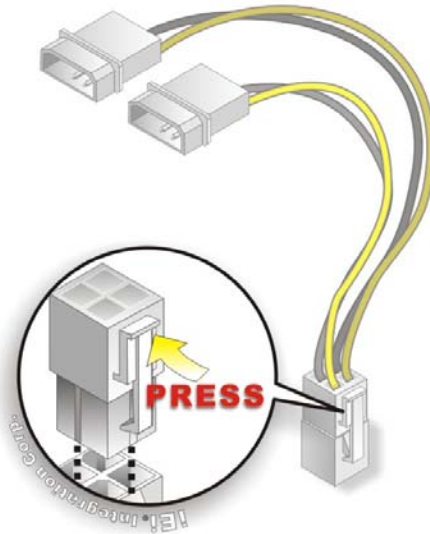


**Figure 4-10: Power Cable to Motherboard Connection**

**Step 3:** **Connect Power Cable to Power Supply**. Connect one of the 4-pin (1x4) Molex

type power cable connectors to an AT power supply. See **Figure 4-11**.
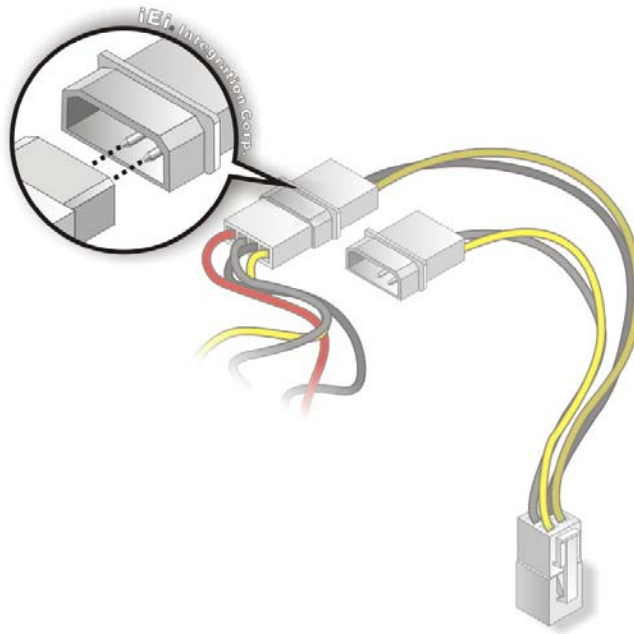
**Figure 4-11: Connect Power Cable to Power Supply**

## 4.4.2 SATA Drive Connection

The NANO-BT-i1 is shipped with two SATA drive cables. 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 4-12**.
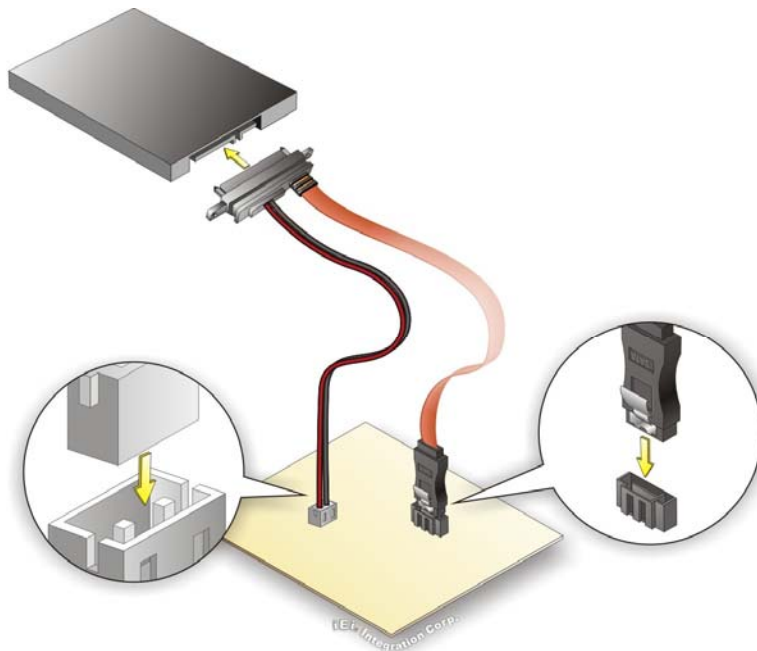
**Figure 4-12: SATA Drive Cable Connection**

**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 4-12**.

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

## 4.4.3 Single RS-232 Cable Connection

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 that is mounted onto a bracket. To install the single RS-232 cable, please follow the steps below.

**Step 1:** **Locate the RS-232 connector**. The location of the RS-232 connector is shown in **Chapter 3**.

**Step 2:** **Insert the cable connector**. Align pin 1 on the on-board serial port pin header with pin 1 on the serial port connector. Pin 1 on the serial port connector is indicated with a white dot. Insert the connector into the serial port pin header. See Figure 4-13.
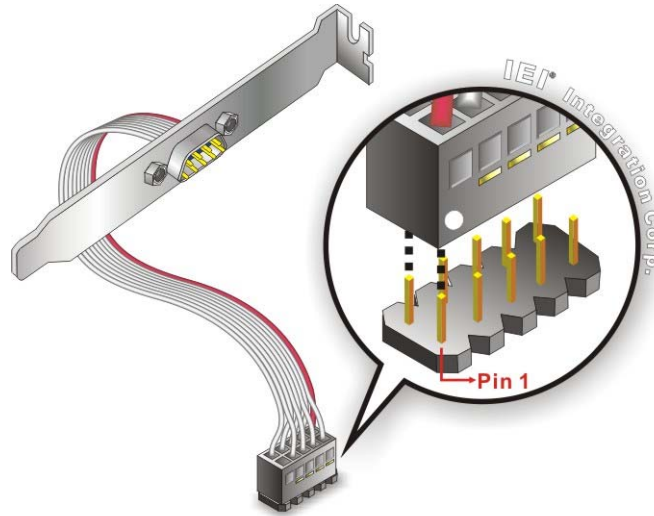
**Figure 4-13: Single RS-232 Cable Installation**

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

## 4.5 External Peripheral Interface Connection

This section describes connecting devices to the external connectors on the NANO-BT-i1.

### 4.5.1 LAN Connection

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

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

**Step 2:** **Align the connectors.** Align the RJ-45 connector on the LAN cable with one of the RJ-45 connectors on the NANO-BT-i1. See **Figure 4-14**.
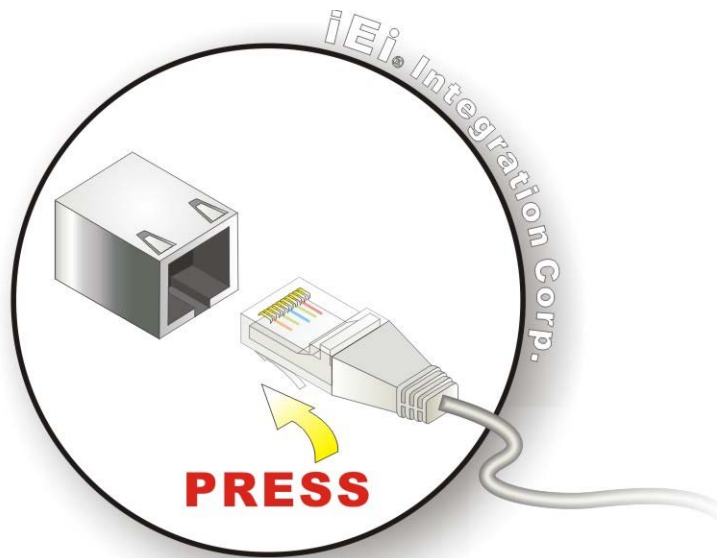
**Figure 4-14: LAN Connection**

**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.

## 4.5.2 PS/2 Keyboard/Mouse Connection

The NANO-BT-i1 has a single PS/2 connector on the external peripheral interface panel. The PS/2 connector is connected to the optional PS/2 Y-cable which can be purchased separately. One of the PS/2 cables is connected to a keyboard and the other to a mouse to the system. Follow the steps below to connect a keyboard and mouse to the NANO-BT-i1.

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

**Step 2:** **Insert the keyboard/mouse connector**. Insert the PS/2 connector on the end of the PS/2 Y-cable into the external PS/2 connector. See Figure 4-15.
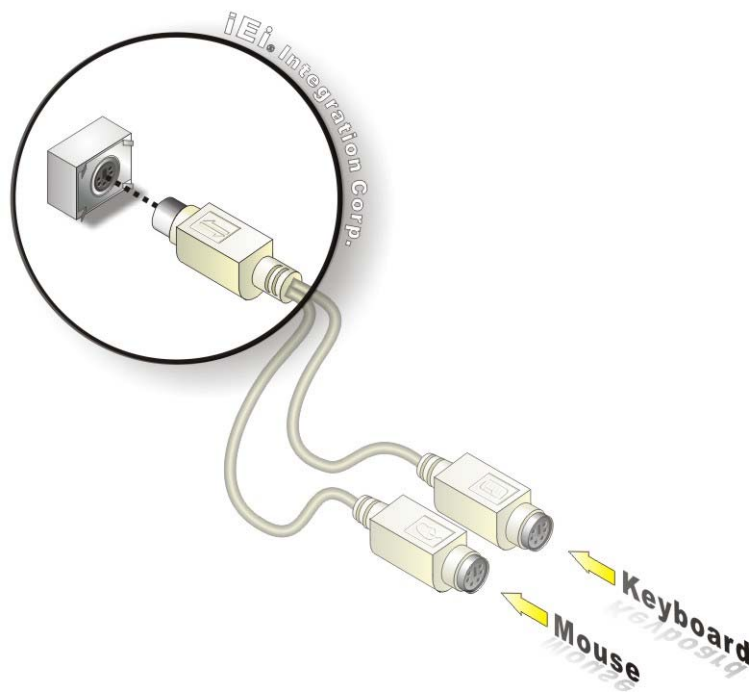
**Figure 4-15: PS/2 Keyboard/Mouse Connector**

**Step 3:** **Connect the keyboard and mouse**. Connect the keyboard and mouse to the appropriate connector. The keyboard and mouse connectors can be distinguished from each other by looking at the small graphic at the top of the connector.

## 4.5.3 USB Connection

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 NANO-BT-i1.

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

**Step 2:** **Insert a USB Series "A" plug**. Insert the USB Series "A" plug of a device into the USB Series "A" receptacle on the external peripheral interface. See **Figure 4-16**.
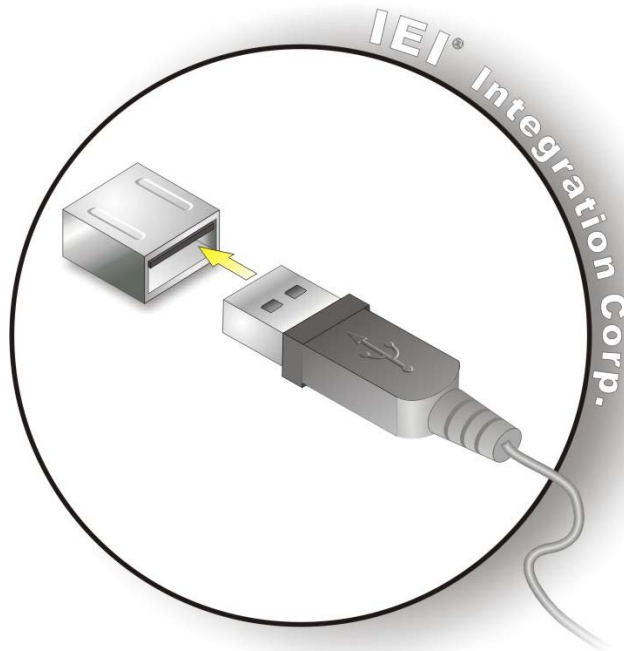


**Figure 4-16: USB Connector**

## 4.5.4 VGA Monitor Connection

The NANO-BT-i1 has one single female D-sub 15 connector on the external peripheral interface panel. The D-sub 15 connector is connected to a CRT or VGA monitor. To connect a monitor to the NANO-BT-i1, please follow the instructions below.

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

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

**Step 3:** **Insert the VGA connector**  Once the connectors are properly aligned, insert the male connector from the VGA screen into the female connector on the NANO-BT-i1. See **Figure 4-17**.
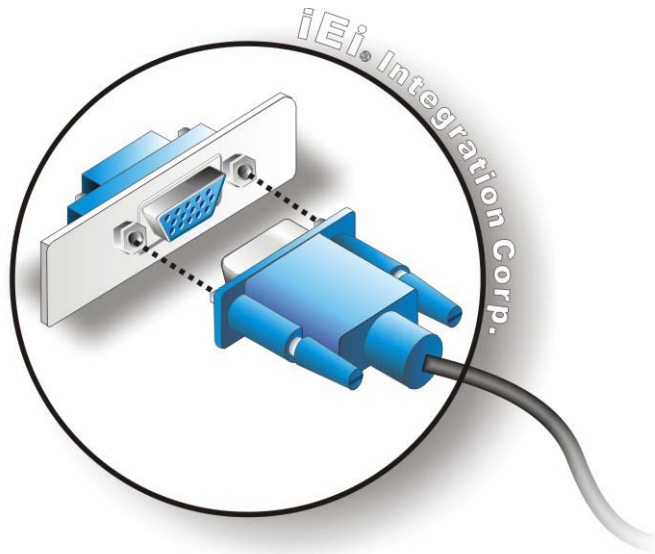


**Figure 4-17: VGA Connector**

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

## 4.6 IPMI Setup Procedure

The NANO-BT-i1 features Intelligent Platform Management Interface (IPMI) that helps lower the overall costs of server management by enabling users to maximize IT resources, save time and manage multiple systems. The NANO-BT-i1 supports IPMI 2.0 through the optional iRIS-1010 module. Follow the steps below to setup IPMI.

### 4.6.1 Managed System Hardware Setup

The hardware configuration of the managed system (NANO-BT-i1) is described below.

**Step 1:**   Install an iRIS-1010 module to the IPMI module socket (refer to **Section 4.2.2**).

**Step 2:**   Make sure a DDR3L SO-DIMM is installed in the SO-DIMM socket.

**Step 3:**   Connect an Ethernet cable to the RJ-45 connector labeled **LAN1** (**Figure 3-31**).

**Chapter**

**5**

# 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.

![NOTE icon] **NOTE:**

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

### 5.1.1 Starting Setup

The 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 **Table 5-1**.

| 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 |

| Key | Function |
|-----|----------|
| - | Decrease the numeric value or make changes |
| Esc key | Main Menu – Quit and not save changes into CMOS Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu |
| F1 key | General help, only for Status Page Setup Menu and Option Page Setup Menu |
| F2 key | Load previous values |
| F3 key | Load optimized defaults |
| F4 key | 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 is made, CMOS defaults. Use the clear CMOS button 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.

```
          Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
    Main    Advanced   Chipset   Security    Boot    Save & Exit

 BIOS Information                                         Set the Date. Use Tab to
 BIOS Vendor                American Megatrends           switch between Data
 Core Version               5.009                         elements.
 Compliency                 UEFI 2.3;PI1.2
 Project Version            B290AR0E.ROM
 Build Date                 02/10/2014 10:03:10

 iWDD Vendor                iEi
 iWDD Version               B290ER00.bin

 CPU Configuration
 Microcode Patch            31e
 BayTrail SoC               B2 Stepping

 Memory Information
 Total Memory               4096 MB (LPDDR3)
 Memory Frequency           1333 Mhz
                                                         ---------------------
 G0P Information
 Intel(R) G0P Driver        [N/A]                        ←→: Select Screen
                                                         ↑↓: Select Item
 TXE Information                                          Enter Select
 Sec RC Version             00.05.00.00                   + -: Change Opt.
 TXE FW Version             01.00.02.1060                 F1:  General Help
                                                          F2:  Previous Values
 System Date                [Tue 03/05/2014]             F3:  Optimized Defaults
 System Time                [15:10:27]                   F4:  Save & Exit
                                                         ESC: Exit
          Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 1: Main**

The System Overview field 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) 2013 American Megatrends, Inc.
   Main    Advanced   Chipset   Security    Boot    Save & Exit

 > ACPI Settings                                        System ACPI Parameters
 > Super IO Configuration
 > Hardware Monitor
 > iWDD H/W Monitor
 > RTC Wake Settings                                    ---------------------
 > Serial Port Console Redirection
 > CPU Configuration                                    ←→: Select Screen
 > IDE Configuration                                    ↑↓: Select Item
 > USB Configuration                                    Enter Select
 > ICP Board                                            + -  Change Opt.
                                                        F1   General Help
                                                        F2   Previous Values
                                                        F3   Optimized Defaults
                                                        F4   Save & Exit
                                                        ESC  Exit
        Version 2.16.1242. Copyright (C) 2013 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.

```
            Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
                Advanced

        ACPI Settings                                         Select the highest ACPI
                                                              sleep state the system
        ACPI Sleep State                  [S3 (Suspend to RAM)]   will enter when the
                                                              SUSPEND button is
                                                              pressed.


                                                              ----------------------

                                                              ←→: Select Screen
                                                              ↑ ↓: Select Item
                                                              Enter Select
                                                              + -  Change Opt.
                                                              F1   General Help
                                                              F2   Previous Values
                                                              F3   Optimized Defaults
                                                              F4   Save & Exit
                                                              ESC  Exit
            Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 3: ACPI Configuration**

➔ **ACPI Sleep State [S3 (Suspend to RAM)]**

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

➔ **S3 (Suspend to RAM)** DEFAULT    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 Super IO Configuration

Use the **Super IO Configuration** menu (**BIOS Menu 4**) to set or change the configurations for the serial ports.

```
        Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
        Advanced

F81866 Super IO Configuration                      Set Parameters of Serial
                                                   Port 1 (COMA)
F81866 Super IO Chip            F81866
> Serial Port 1 Configuration
> Serial Port 2 Configuration                      --------------------
> Serial Port 3 Configuration                      ←→: Select Screen
> Serial Port 4 Configuration                      ↑ ↓: Select Item
                                                   EnterSelect
                                                   + -   Change Opt.
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3   Optimized Defaults
                                                   F4   Save & Exit
                                                   ESC  Exit
         Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 4: Super IO Configuration**

### 5.3.2.1 Serial Port n Configuration

Use the **Serial Port n Configuration** menu (**BIOS Menu 5**) to configure the serial port n.

```
        Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
        Advanced

Serial Port n Configuration                        Enable or Disable Serial
                                                   Port (COM)
Serial Port                   [Enabled]
Device Settings               IO=3F8h;IRQ=4
                                                   --------------------
Change Settings               [Auto]               ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   EnterSelect
                                                   = -   Change Opt.
                                                   F1   General Help
                                                   F2   Previous Values
                                                   F3   Optimized Defaults
                                                   F4   Save & Exit
                                                   ESC  Exit
         Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 5: Serial Port n Configuration Menu**

### 5.3.2.1.1 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;**               Serial Port I/O port address is 3F8h and the interrupt
     **IRQ=4**                 address is IRQ4

➔ **IO=3F8h;**               Serial Port I/O port address is 3F8h and the interrupt
     **IRQ=3, 4,**            address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
     **5, 6, 7, 9,**
     **10, 11, 12**

➔ **IO=2F8h;**               Serial Port I/O port address is 2F8h and the interrupt
     **IRQ=3, 4,**            address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
     **5, 6, 7, 9,**
     **10, 11, 12**

➔ **IO=3E8h;**               Serial Port I/O port address is 3E8h and the interrupt
     **IRQ=3, 4,**            address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
     **5, 6, 7, 9,**
     **10, 11, 12**

➔ **IO=2E8h;**               Serial Port I/O port address is 2E8h and the interrupt
     **IRQ=3, 4,**            address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
     **5, 6, 7, 9,**
     **10, 11, 12**

### 5.3.2.1.2 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;**             Serial Port I/O port address is 2F8h and the interrupt
**IRQ=3**                address is IRQ3

➔ **IO=3F8h;**             Serial Port I/O port address is 3F8h and the interrupt
**IRQ=3, 4,**           address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
**5, 6, 7, 9,**
**10, 11, 12**

➔ **IO=2F8h;**             Serial Port I/O port address is 2F8h and the interrupt
**IRQ=3, 4,**           address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
**5, 6, 7, 9,**
**10, 11, 12**

➔ **IO=3E8h;**             Serial Port I/O port address is 3E8h and the interrupt
**IRQ=3, 4,**           address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
**5, 6, 7, 9,**
**10, 11, 12**

➔ **IO=2E8h;**
**IRQ=3, 4,**
**5, 6, 7, 9,**
**10, 11, 12**

Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

### 5.3.2.1.3 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=7**

Serial Port I/O port address is 3E8h and the interrupt address is IRQ7

➔ **IO=3F8h;**
**IRQ=3, 4,**
**5, 6, 7, 9,**
**10, 11, 12**

Serial Port I/O port address is 3F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ **IO=2F8h;**
**IRQ=3, 4,**
**5, 6, 7, 9,**
**10, 11, 12**

Serial Port I/O port address is 2F8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ **IO=3E8h;**
**IRQ=3, 4,**
**5, 6, 7, 9,**
**10, 11, 12**

Serial Port I/O port address is 3E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ **IO=2E8h;**
**IRQ=3, 4,**
**5, 6, 7, 9,**
**10, 11, 12**

Serial Port I/O port address is 2E8h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ **IO=2F0h;**
**IRQ=3, 4,**
**5, 6, 7, 9,**
**10, 11, 12**

Serial Port I/O port address is 2F0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

➔ **IO=2E0h;**
**IRQ=3, 4,**
**5, 6, 7, 9,**
**10, 11, 12**

Serial Port I/O port address is 2E0h and the interrupt address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12

### 5.3.2.1.4 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;**        Serial Port I/O port address is 2E8h and the interrupt
**IRQ=7**        address is IRQ7

➔ **IO=3F8h;**        Serial Port I/O port address is 3F8h and the interrupt
**IRQ=3, 4,**        address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
**5, 6, 7, 9,**
**10, 11, 12**

➔ **IO=2F8h;**        Serial Port I/O port address is 2F8h and the interrupt
**IRQ=3, 4,**        address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
**5, 6, 7, 9,**
**10, 11, 12**

➔ **IO=3E8h;**        Serial Port I/O port address is 3E8h and the interrupt
**IRQ=3, 4,**        address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
**5, 6, 7, 9,**
**10, 11, 12**

➔ **IO=2E8h;**        Serial Port I/O port address is 2E8h and the interrupt
**IRQ=3, 4,**        address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
**5, 6, 7, 9,**
**10, 11, 12**

➔ **IO=2F0h;**        Serial Port I/O port address is 2F0h and the interrupt
**IRQ=3, 4,**        address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
**5, 6, 7, 9,**
**10, 11, 12**

➔ **IO=2E0h;**        Serial Port I/O port address is 2E0h and the interrupt
**IRQ=3, 4,**        address is IRQ3, 4, 5, 6, 7, 9, 10, 11, 12
**5, 6, 7, 9,**
**10, 11, 12**

### 5.3.3 Hardware Monitor

The **Hardware Monitor** menu (**BIOS Menu 6**) contains the fan configuration submenus and displays operating temperature and system voltages.

```
         Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
            Advanced

PC Health Status                                        Enable or Disable Smart
                                                        Fan
  Smart Fan Function              [Enabled]
> Smart Fan Mode Configuration
SYS Temperature                  :+42 C
CPU_FAN1                         :N/A
SYS_FAN1                         :N/A                   --------------------
VIN1                             :+0.864 V
VIN2                             :+1.096 V              ←→: Select Screen
VIN3                             :+3.060 V              ↑ ↓: Select Item
VIN4                             :+1.513 V              Enter Select
VCC3V                            :+3.312 V              + -   Change Opt.
VSB3V                            :+3.328 V              F1   General Help
VSB5V                            :+5.112 V              F2   Previous Values
                                                        F3   Optimized Defaults
                                                        F4   Save & Exit
                                                        ESC  Exit
         Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 6: Hardware Monitor**

➔  **Smart Fan Function**

Use the **Smart Fan Function** BIOS option to enable or disable the smart fan connected to the system.

➔  **Disabled**          Disables the smart fan.

➔  **Enabled**  DEFAULT   Enables the smart fan.

➔  **PC Health Status**

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

- System Temperatures:
  - o  System Temperature
- Fan Speeds:
  - o  CPU Fan
  - o  System Fan
- Voltages:
  - o  VIN1
  - o  VIN2

o  VIN3

o  VIN4

o  VCC3V

o  VSB3V

o  VSB5V

### 5.3.3.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 7**) to configure smart fan temperature and speed settings.

```
Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
     Advanced

Smart Fan Mode Configuration                         Smart Fan Mode Select

CPU_FAN1 Smart Fan Control      [Auto Duty-Cycle Mode]
CPU Temperature 1               60
CPU Temperature 2               50
CPU Temperature 3               40                    --------------------
CPU Temperature 4               30                    ←→: Select Screen
SYS_FAN1 Smart Fan Control      [Auto Duty-Cycle Mode] ↑ ↓: Select Item
System Temperature 1            60                    Enter Select
System Temperature 2            50                    + -  Change Opt.
System Temperature 3            40                    F1   General Help
System Temperature 4            30                    F2   Previous Values
                                                      F3   Optimized Defaults
                                                      F4   Save & Exit
                                                      ESC  Exit
     Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 7: Smart Fan Mode Configuration**

➔  **CPU_FAN1 Smart Fan Control/SYS_FAN1 Smart Fan Control [Auto Duty-Cycle Mode]**

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

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

➔ **CPU/System Temperature 1**

Use the + or – key to change the **CPU/System Temperature 1** value. Enter a decimal number between 1 and 100. If CPU/System temperature is higher than this setting, the fan duty cycle is 100.

➔ **CPU/System Temperature 2**

Use the + or – key to change the **CPU/System Temperature 2** value. Enter a decimal number between 1 and 100. If CPU/System temperature is higher than this setting, the fan duty cycle is 85.

➔ **CPU/System Temperature 3**

Use the + or – key to change the **CPU/System Temperature 3** value. Enter a decimal number between 1 and 100. If CPU/System temperature is higher than this setting, the fan duty cycle is 70.

➔ **CPU/System Temperature 4**

Use the + or – key to change the **CPU/System Temperature 4** value. Enter a decimal number between 1 and 100. If CPU/System temperature is higher than this setting, the fan duty cycle is 60. If CPU/System temperature is lower than this setting, the fan duty cycle is 50.

## 5.3.4 iWDD H/W Monitor

The **iWDD H/W Monitor** menu (**BIOS Menu 8**) contains the fan configuration submenus and displays operating temperature, fan speeds and system voltages.

```
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
        Advanced

PC Health Status                                          Smart Fan Mode Select

SYS Temperature                     :+42 C

CPU_FAN1 Speed                      :N/A
SYS_FAN1 Speed                      :N/A
                                                          ---------------------
CPU_CORE                            :+1.864 V             ←→: Select Screen
+5V                                 :+5.106 V             ↑ ↓: Select Item
+12V                                :+12.175 V            Enter Select
+DDR                                :+1.502 V             + -  Change Opt.
+5VSB                               :+4.896 V             F1   General Help
+3.3V                               :+3.357 V             F2   Previous Values
+3.3VSB                             :+3.27 V              F3   Optimized Defaults
                                                          F4   Save & Exit
> Smart Fan Mode Configuration                            ESC  Exit

        Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 8: iWDD H/W Monitor**

➔  **PC Health Status**

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

- System Temperatures:
  ○ System Temperature
- Fan Speeds:
  ○ CPU Fan Speed
  ○ System Fan Speed
- Voltages:
  ○ CPU_CORE
  ○ +5V
  ○ +12V
  ○ +DDR
  ○ +5VSB
  ○ +3.3V
  ○ +3.3VSB

### 5.3.4.1 Smart Fan Mode Configuration

Use the **Smart Fan Mode Configuration** submenu (**BIOS Menu 9**) to configure smart fan temperature and speed settings.

```
        Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
        Advanced

Smart Fan Mode Configuration                          Smart Fan Mode Select

CPU_FAN1 Smart Fan Control       [Auto Mode]
Auto mode fan start temperature  50
Auto mode fan off temperature    40
Auto mode fan start PWM          30                  ----------------------
Auto mode fan slope PWM          1
SYS_FAN1 Smart Fan Control       [Auto Mode]         ←→: Select Screen
Auto mode fan start temperature  50                  ↑ ↓: Select Item
Auto mode fan off temperature    40                  Enter Select
Auto mode fan start PWM          30                  + -   Change Opt.
Auto mode fan slope PWM          1                   F1   General Help
                                                     F2   Previous Values
                                                     F3   Optimized Defaults
                                                     F4   Save & Exit
                                                     ESC  Exit
        Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```
**BIOS Menu 9: Smart Fan Mode Configuration**

➔ **CPU_FAN1 Smart Fan Control/SYS_FAN1 Smart Fan Control [Auto Mode]**

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

➔ **Manual Mode** The fan spins at the speed set in Manual Mode settings.

➔ **Auto Mode** DEFAULT The fan adjusts its speed using Auto Mode settings.

➔ **Auto mode fan start/off temperature**

Use the **+** or **–** key to change the **Auto mode fan start/off temperature** value. Enter a decimal number between 1 and 100.

➔ **Auto mode fan start PWM**

Use the + or – key to change the **Auto mode fan start PWM** value. Enter a decimal number between 1 and 100.

➔ **Auto mode fan slope PWM**

Use the + or – key to change the **Auto mode fan slope PWM** value. Enter a decimal number between 1 and 64.

## 5.3.5 RTC Wake Settings

The **RTC Wake Settings** menu (**BIOS Menu 10**) configures RTC wake event. The RTC wake function is supported in ACPI (S3/S4/S5) and APM soft off modes.

```
          Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
            Advanced

Wake System with Fixed Time        [Disabled]            Enables or Disables
                                                         system wake on alarm
                                                         event. When enabled,
                                                         system will wake on the
                                                         date: hr: min: sec
                                                         specified.


                                                         ----------------------

                                                         ←→: Select Screen
                                                         ↑↓: Select Item
                                                         Enter Select
                                                         + -   Change Opt.
                                                         F1    General Help
                                                         F2    Previous Values
                                                         F3    Optimized Defaults
                                                         F4    Save & Exit
                                                         ESC   Exit
          Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```
   **BIOS Menu 10: RTC Wake Settings**

➔ **Wake System with Fixed Time [Disabled]**

Use the **Wake System with Fixed Time** option to specify the time the system should be roused from a suspended state.

➔ **Disabled**   DEFAULT   The real time clock (RTC) cannot generate a wake event

➔ **Enabled**   If selected, the following appears with values that can be selected:

*Wake up every day

*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.

## 5.3.6 Serial Port Console Redirection

The **Serial Port Console Redirection** menu (**BIOS Menu 11**) 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.

```
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
     Advanced

COM1                                             Console Redirection
Console Redirection          [Disabled]          Enable or Disable
> Console Redirection Settings

COM2
Console Redirection          [Disabled]
> Console Redirection Settings                   --------------------
                                                 ←→: Select Screen
COM3                                             ↑ ↓: Select Item
Console Redirection          [Disabled]          Enter Select
> Console Redirection Settings                   +/-: Change Opt.
                                                 F1   General Help
COM4                                             F2   Previous Values
Console Redirection          [Disabled]          F3   Optimized Defaults
> Console Redirection Settings                   F4   Save & Exit
                                                 ESC  Exit

     Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 11: 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

The following options are available in the **Console Redirection Settings** submenu when the Console Redirection option is enabled.

➔ **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.

## 5.3.7 CPU Configuration

Use the **CPU Configuration** BIOS menu (**BIOS Menu 12**) to view detailed CPU specifications and configure the CPU.

```
Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
      Advanced

CPU Configuration                                      Number of cores to enable
                                                       in each processor
CPU Signature                  30673                   package.
Microcode Patch                31e
Max CPU Speed                  1910 MHz
Min CPU Speed                  500 MHz
Processor Cores                4
Intel HT Technology            Not Supported
Intel VT-x Technology          Supported              ----------------------

L1 Data Cache                  24 kB x 4              ←→: Select Screen
L1 Code Cache                  32 kB x 4              ↑ ↓: Select Item
L2 Cache                       1024 kB x 2            Enter Select
L3 Cache                       Not Present            + -   Change Opt.
64-bit                         Supported              F1    General Help
                                                      F2    Previous Values
Active Processor Cores         [All]                  F3    Optimized Defaults
Intel Virtualization Technology [Enabled]             F4    Save & Exit
EIST                           [Enabled]              ESC   Exit

      Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 12: CPU Configuration**

The CPU Configuration menu (**BIOS Menu 12**) lists the following CPU details:

- CPU Signature: Lists the CPU signature value.
- Microcode Patch: Lists the microcode patch being used.
- Max CPU Speed: Lists the maximum CPU processing speed.
- Min CPU Speed: Lists the minimum CPU processing speed.
- Processor Cores: Lists the number of the processor core
- Intel HT Technology: Indicates if Intel HT Technology is supported by the CPU.
- Intel VT-x Technology: Indicates if Intel VT-x Technology is supported by the CPU.
- L1 Data Cache: Lists the amount of data storage space on the L1 cache.
- L1 Code Cache: Lists the amount of code storage space on the L1 cache.
- L2 Cache: Lists the amount of storage space on the L2 cache.
- L3 Cache: Lists the amount of storage space on the L3 cache.

➔ **Active Processor Cores [All]**

Use the **Active Processor Cores** BIOS option to enable numbers of cores in the processor package.

➔ **All**          DEFAULT          Enable all cores in the processor package.

➔ **1**          Enable one core in the processor package.

➔ **Intel Virtualization Technology [Enabled]**

Use the **Intel Virtualization Technology** option to enable or disable virtualization on the system. When combined with third party software, Intel® Virtualization technology allows several OSs to run on the same system at the same time.

➔ **Disabled**          Disables Intel Virtualization Technology.

➔ **Enabled**          DEFAULT          Enables Intel Virtualization Technology.

➔ **EIST [Enabled]**

Use the **EIST** option to enable or disable Enhanced Intel SpeedStep® Techonology (EIST).

➔ **Disabled**          Disables Enhanced Intel SpeedStep® Techonology.

➔ **Enabled**          DEFAULT          Enables Enhanced Intel SpeedStep® Techonology.

**5.3.8 IDE Configuration**

Use the **IDE Configuration** menu (**BIOS Menu 13**) to change and/or set the configuration of the SATA devices installed in the system.

```
          Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
             Advanced

Serial-ATA (SATA)                    [Enabled]            Enable/Disable Serial
SATA Mode                            [IDE Mode]           ATA

SATA1                                                     ---------------------
Not Present

SATA2                                                     ←→: Select Screen
Not Present                                               ↑ ↓: Select Item
                                                          Enter Select
                                                          + -   Change Opt.
                                                          F1   General Help
                                                          F2   Previous Values
                                                          F3   Optimized Defaults
                                                          F4   Save & Exit
                                                          ESC  Exit
          Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 13: IDE Configuration**

➔ **Serial-ATA (SATA) [Enabled]**

Use the **Serial-ATA (SATA)** option to enable or disable the serial ATA controller.

➔ **Enabled** DEFAULT Enables the on-board SATA controller.

➔ **Disabled** Disables the on-board SATA controller.

➔ **SATA Mode Selection [IDE Mode]**

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

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

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

### 5.3.9 USB Configuration

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

```
             Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
              Advanced

USB Configuration                                        Enables Legacy USB
                                                         support. AUTO option
USB Devices:                                             disables legacy support
        1 Keyboard, 3 Hubs                               if no USB devices are
                                                         connected. DISABLE
Legacy USB Support                    [Enabled]          option will keep USB
                                                         devices available only
                                                         for EFI applications.

                                                         ---------------------
                                                         ←→: Select Screen
                                                         ↑↓: Select Item
                                                         Enter Select
                                                         + -   Change Opt.
                                                         F1   General Help
                                                         F2   Previous Values
                                                         F3   Optimized Defaults
                                                         F4   Save & Exit
                                                         ESC  Exit
             Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

   **BIOS Menu 14: USB Configuration**

➔ **USB Devices**

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

➔ **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.

➔ **Enabled**     **DEFAULT**     Legacy USB support enabled

è  **Disabled**                    Legacy USB support disabled

è  **Auto**                        Legacy USB support disabled if no USB devices are
                                  connected

## 5.4 Chipset

Use the **Chipset** menu (**BIOS Menu 15**) to access the North Bridge and South Bridge
subsystem configuration menus.

---

WARNING!

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

---

```
       Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
   Main     Advanced   Chipset   Security    Boot    Save & Exit

 > North Bridge                                    North Bridge Parameters.
 > South Bridge


                                                   ---------------------
                                                   ←→: Select Screen
                                                   ↑ ↓: Select Item
                                                   Enter Select
                                                   + -   Change Opt.
                                                   F1    General Help
                                                   F2    Previous Values
                                                   F3    Optimized Defaults
                                                   F4    Save & Exit
                                                   ESC   Exit

       Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 15: Chipset**

### 5.4.1 North Bridge

Use the **North Bridge** menu (**BIOS Menu 16**) to configure the north bridge parameters.

```
        Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
                   Chipset

> Intel IGD Configuration                              Configure Intel IGD
                                                       Settings.
Memory Information

Total Memory                      4096 MB (LPDDR3)
                                                       ---------------------
DIMM1                             4096 MB (LPDDR3)     ←→: Select Screen
                                                       ↑ ↓: Select Item
                                                       EnterSelect
                                                       + -   Change Opt.
                                                       F1   General Help
                                                       F2   Previous Values
                                                       F3   Optimized Defaults
                                                       F4   Save & Exit
                                                       ESC  Exit
        Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 16: North Bridge**

### 5.4.1.1 Intel IGD Configuration

Use the **Intel IGD Configuration** submenu (**BIOS Menu 17**) to configure the graphics settings.

```
         Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                       Chipset

Intel IGD Configuration                                      Select which of IGD/PCI
                                                             Graphics device should
Primary Display                    [IGD]                     be Primary Display.
DVMT Pre-Allocated                 [64M]
DVMT Total Gfx Mem                 [256MB]
                                                             --------------------
                                                             ←→: Select Screen
                                                             ↑ ↓: Select Item
                                                             EnterSelect
                                                             + -  Change Opt.
                                                             F1   General Help
                                                             F2   Previous Values
                                                             F3   Optimized Defaults
                                                             F4   Save & Exit
                                                             ESC  Exit
         Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```
   **BIOS Menu 17: Intel IGD Configuration**

➔ **Primary Display [IGD]**

Use the **Primary Display** option to select the display device used by the system when it boots. Configuration options are listed below.

   ▪ Auto
   ▪ IGD              **DEFAULT**
   ▪ PCI
   ▪ SG

➔ **DVMT Pre-Allocated [64M]**

Use the **DVMT Pre-Allocated** option to specify the amount of system memory that can be used by the internal graphics device.

➔ **64M**              **DEFAULT**    64 MB of memory used by internal graphics device

➔  **128M**                    128 MB of memory used by internal graphics
device

➔  **256M**                    256 MB of memory used by internal graphics
device

➔  **512M**                    512 MB of memory used by internal graphics
device

➔  **DVMT Total Gfx Mem [256MB]**

Use the **DVMT Total Gfx Mem** option to specify the maximum amount of memory that can
be allocated as graphics memory. Configuration options are listed below.

- 128MB
- 256MB          **Default**
- Max

## 5.4.2 South Bridge

Use the **South Bridge** menu (**BIOS Menu 18**) to configure the south bridge parameters.

```
        Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
                         Chipset

Auto Power Button Status      [Disabled (ATX)]      Select AC power state
                                                    when power is re-applied
Restore AC Power Loss         [Last State]          after a power failure.

> PCI Express Configuration

Audio Configuration                                 ---------------------
Audio Controller              [Enabled]             ←→: Select Screen
                                                    ↑ ↓: Select Item
USB Configuration                                   Enter Select
USB 2.0(EHCI) Support         [Enabled]             + -  Change Opt.
XHCI Mode                     [Disabled]            F1   General Help
                                                    F2   Previous Values
                                                    F3   Optimized Defaults
                                                    F4   Save & Exit
                                                    ESC  Exit
        Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 18: South Bridge**

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

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

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

➔ **Power On**          The system turns on

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

➔ **Audio Controller [Enabled]**

Use the **Audio Controller** BIOS option to enable or disable the High Definition Audio controller.

➔ **Disabled**          The High Definition Audio controller is disabled.

➔ **Enabled**   DEFAULT   The High Definition Audio controller is enabled.
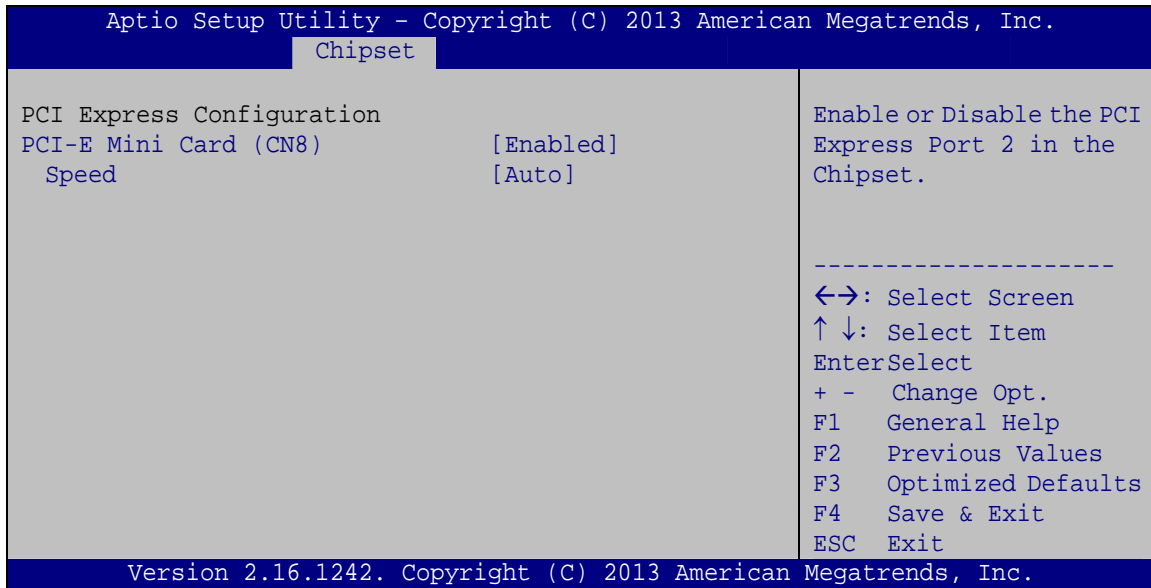
➔ **USB 2.0(EHCI) Support [Enabled]**

Use the **USB 2.0(EHCI) Support** BIOS option to enable or disable the USB EHCI (USB 2.0). One EHCI controller must always be enabled.

➔ **Enabled**   DEFAULT   The USB EHCI is enabled.

➔ **Disabled**          The USB EHCI is disabled.

## 5.4.2.1 PCI Express Configuration

Use the **PCI Express Configuration** submenu (**BIOS Menu 19**) to configure the PCI Express slots.

```
           Aptio Setup Utility - Copyright (C) 2013 American Megatrends, Inc.
                         Chipset

PCI Express Configuration                                Enable or Disable the PCI
PCI-E Mini Card (CN8)               [Enabled]            Express Port 2 in the
  Speed                             [Auto]               Chipset.


                                                         --------------------
                                                         ←→: Select Screen
                                                         ↑ ↓: Select Item
                                                         Enter Select
                                                         + -  Change Opt.
                                                         F1   General Help
                                                         F2   Previous Values
                                                         F3   Optimized Defaults
                                                         F4   Save & Exit
                                                         ESC  Exit
           Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```
   **BIOS Menu 19: PCI Express Configuration**

➔ **PCI-E Mini Card (CN8) [Enabled]**

Use the **PCI-E Mini Card (CN8)** option to enable or disable the PCIe Mini card slot (CN8).

➔ **Enabled**      **DEFAULT**   The PCIe Mini card slot (CN8) is enabled.

➔ **Disabled**                   The PCIe Mini card slot (CN8) is disabled.
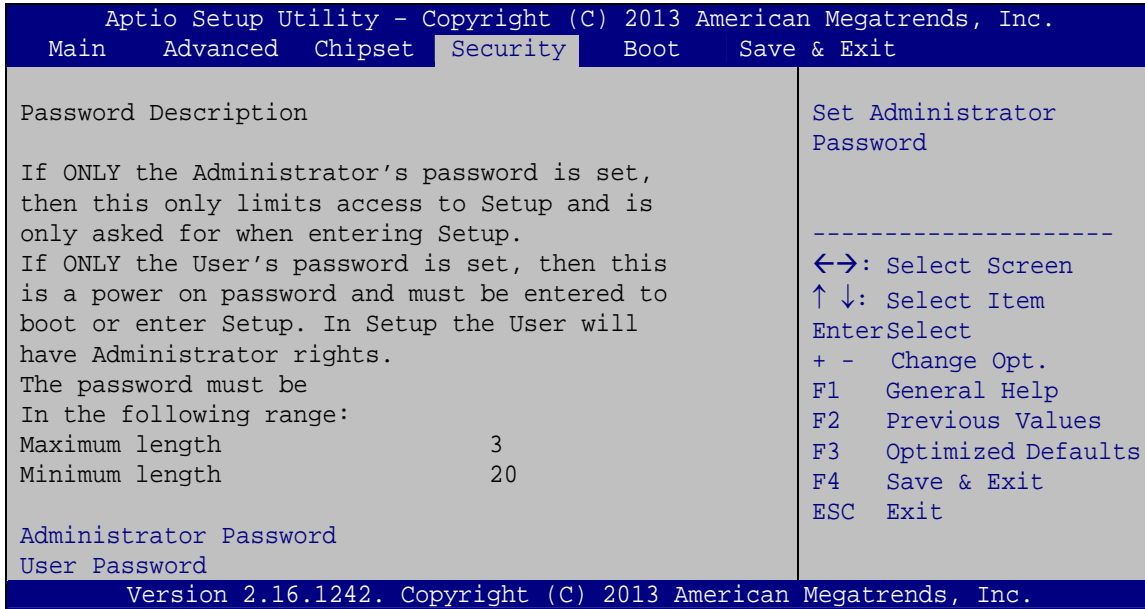
➔ **Speed [Auto]**

Use the **Speed** option to configure the PCIe Mini card slot (CN8) speed.

▪ Auto          **DEFAULT**
▪ Gen 2
▪ Gen 1

## 5.5 Security

Use the **Security** menu (**BIOS Menu 20**) to set system and user passwords.

```
        Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
   Main    Advanced   Chipset   Security    Boot    Save & Exit

 Password Description                                   Set Administrator
                                                        Password
 If ONLY the Administrator's password is set,
 then this only limits access to Setup and is
 only asked for when entering Setup.                    --------------------
 If ONLY the User's password is set, then this          ←→: Select Screen
 is a power on password and must be entered to          ↑ ↓: Select Item
 boot or enter Setup. In Setup the User will            Enter Select
 have Administrator rights.                             + -  Change Opt.
 The password must be                                   F1   General Help
 In the following range:                                F2   Previous Values
 Maximum length                   3                     F3   Optimized Defaults
 Minimum length                  20                     F4   Save & Exit
                                                        ESC  Exit
 Administrator Password
 User Password
        Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 20: Security**

➔  **Administrator Password**

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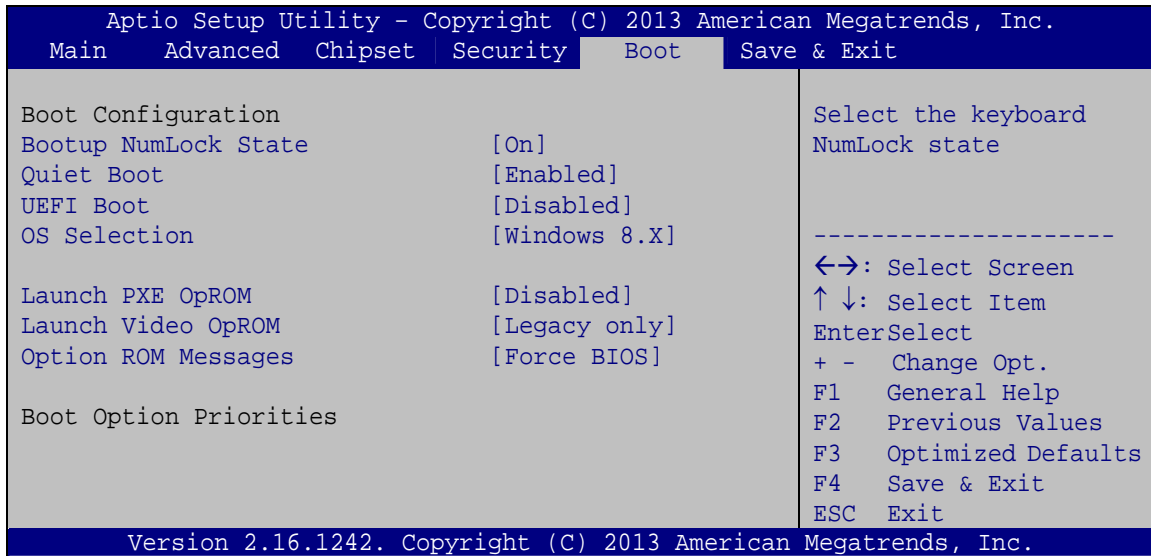
➔  **User Password**

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

## 5.6 Boot

Use the **Boot** menu (**BIOS Menu 21**) to configure system boot options.

```
        Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
   Main    Advanced   Chipset   Security     Boot    Save & Exit

Boot Configuration                                          Select the keyboard
Bootup NumLock State              [On]                      NumLock state
Quiet Boot                        [Enabled]
UEFI Boot                         [Disabled]
OS Selection                      [Windows 8.X]
                                                            --------------------
Launch PXE OpROM                  [Disabled]                ←→: Select Screen
Launch Video OpROM                [Legacy only]             ↑ ↓: Select Item
Option ROM Messages               [Force BIOS]              Enter Select
                                                            + -   Change Opt.
Boot Option Priorities                                      F1   General Help
                                                            F2   Previous Values
                                                            F3   Optimized Defaults
                                                            F4   Save & Exit
                                                            ESC  Exit
        Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 21: 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

➔ **UEFI Boot [Disabled]**

Use the **UEFI Boot** option to enable or disable to boot from a UEFI device.

➔ **Enabled**       Enable to boot from a UEFI device.

➔ **Disabled**    **DEFAULT**    Disable to boot from a UEFI device.

➔ **OS Selection [Windows 8.X]**

Use the **OS Selection** option to select an operating system for the system.

- Windows 8.X   **DEFAULT**
- Android
- Windows 7

➔ **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

➔ **Launch Video OpROM [Legacy only]**

Use the **Launch Video OpROM** option to launch UEFI or legacy video OpROM.

➔ **Do not launch**      Do not launch video OpROM.

➔ **UEFI only**       Launch UEFI video OpROM.

➔ **Legacy only**   DEFAULT   Launch legacy video OpROM.

➔ **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.

## 5.7 Exit

Use the **Exit** menu (**BIOS Menu 22**) to load default BIOS values, optimal failsafe values and to save configuration changes.

```
        Aptio Setup Utility – Copyright (C) 2013 American Megatrends, Inc.
   Main    Advanced   Chipset   Security    Boot   Save & Exit

   Save Changes and Reset                           Exit the system after
   Discard Changes and Reset                        saving the changes.

   Restore Defaults
   Save as User Defaults
   Restore User Defaults

                                                    --------------------
                                                    ←→: Select Screen
                                                    ↑ ↓: Select Item
                                                    Enter Select
                                                    + -   Change Opt.
                                                    F1   General Help
                                                    F2   Previous Values
                                                    F3   Optimized Defaults
                                                    F4   Save & Exit
                                                    ESC  Exit
        Version 2.16.1242. Copyright (C) 2013 American Megatrends, Inc.
```

**BIOS Menu 22: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.

Chapter

6

# Software Drivers

## 6.1 Available Software Drivers

> ![NOTE icon] **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

Installation instructions are given below.

## 6.2 Software Installation

All the drivers for the NANO-BT-i1 are on the CD that came with the system. To install the drivers, please follow the steps below.

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

> ![NOTE icon] **NOTE:**
>
> If the installation program doesn't start automatically:
> Click "Start->My Computer->CD Drive->autorun.exe"

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

**Step 3:** Click **NANO-BT-i1**.

**Figure 6-1: Driver CD Main Menu**

**Step 4:** A new screen with a list of available drivers appears (**Figure 6-2**).



**Figure 6-2: Available Drivers**

**Step 5:** Install all of the necessary drivers in the menu.

## 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-Bay Trail SOC**" and select the folder which corresponds to the operating system.

![NOTE icon] **NOTE:**

The remainder of this installation assumes Windows 8 as the operating system.

**Step 3:** Locate the setup file (infinst_autol_9.4.4.1006.exe) and double click on it.

**Step 4:** When the setup files are completely extracted, the **Welcome Screen** in **Figure 6-3** appears. Click **Next** to continue.



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

**Step 5:**    The **License Agreement** in **Figure 6-4** appears.

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



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

**Step 7:**    The **Read Me** file in **Figure 6-5** appears.

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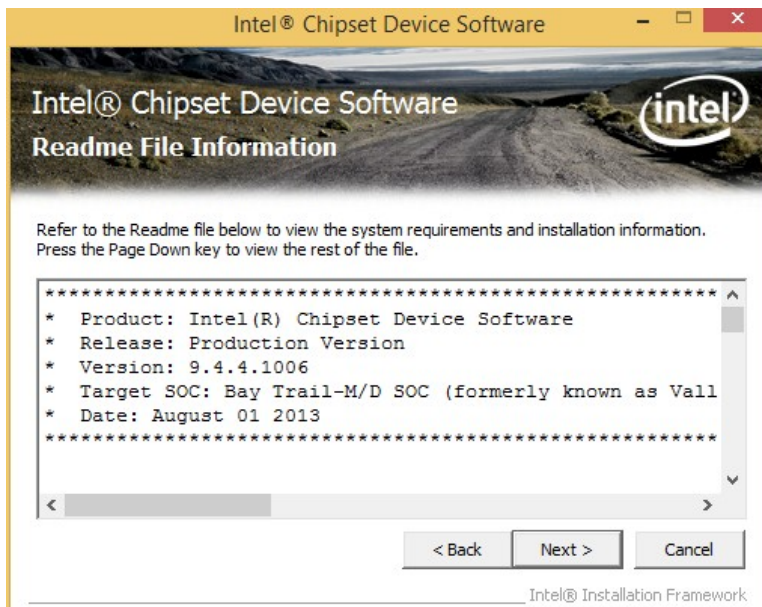


**Figure 6-5: Chipset Driver Read Me File**

**Step 9:** **Setup Operations** are performed as shown in **Figure 6-6**.

**Step 10:** Once the **Setup Operations** are complete, click **Next** to continue.
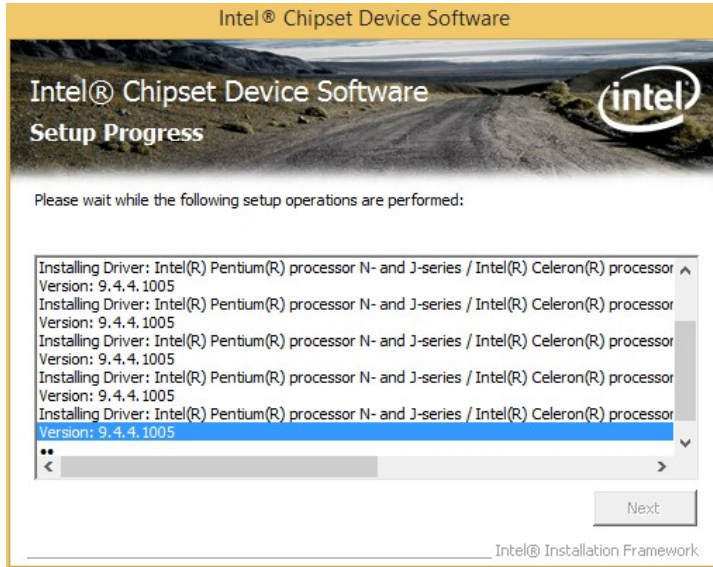


**Figure 6-6: Chipset Driver Setup Operations**

**Step 11:** The **Finish** screen in **Figure 6-7** appears.

**Step 12:** Select "**Yes, I want to restart this computer now**" and click **Finish**.



**Figure 6-7: Chipset Driver Installation Finish Screen**

## 6.4 Graphics Driver Installation

To install the Graphics driver, please do the following.

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

**Step 2:** Click "**1-Bay Trail SOC**" and select the folder which corresponds to the operating system.

![NOTE icon] **NOTE:**

The remainder of this installation assumes Windows 8 as the operating system.

**Step 3:** Unzip the file called **15.33.7.3366.zip**, and then locate the setup file and double click on it to start the installation. If a 64-bit operating system is installed, please unzip the 15.33.7.64.336.zip file to install the graphics driver.

![NOTE icon] **NOTE:**

To install graphics driver on a **32-bit** Windows 7 system, unzip INTEL_EMGD.WIN7_PC_VERSION_36_15_0_1064.7Z.

To install graphics driver on a **64-bit** Windows 7 system, unzip INTEL_EMGD.WIN7_BETA_VERSION_37_15_0_1055.7Z.

**Step 4:** The **Welcome Screen** in **Figure 6-8** appears.

**Step 5:** Click **Next** to continue.
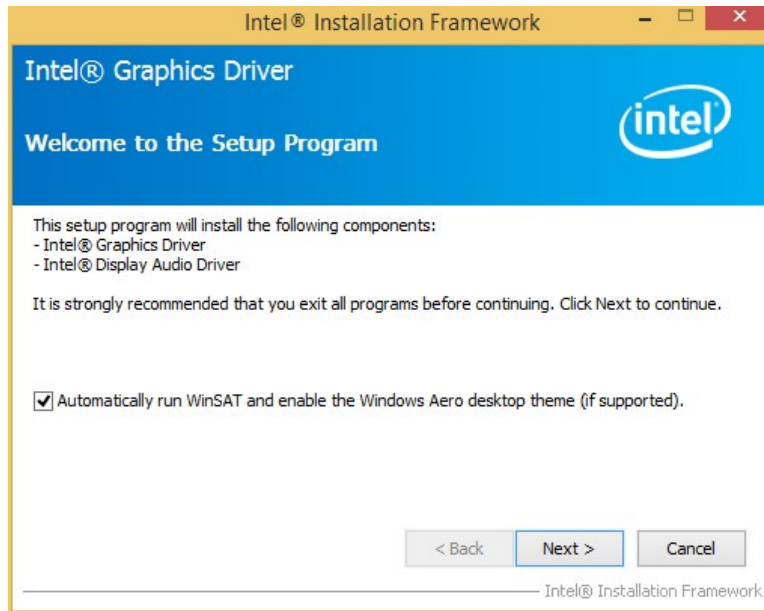
**Figure 6-8: Graphics Driver Welcome Screen**

**Step 6:** The **License Agreement** in **Figure 6-9** appears.

**Step 7:** Click **Yes** to accept the agreement and continue.
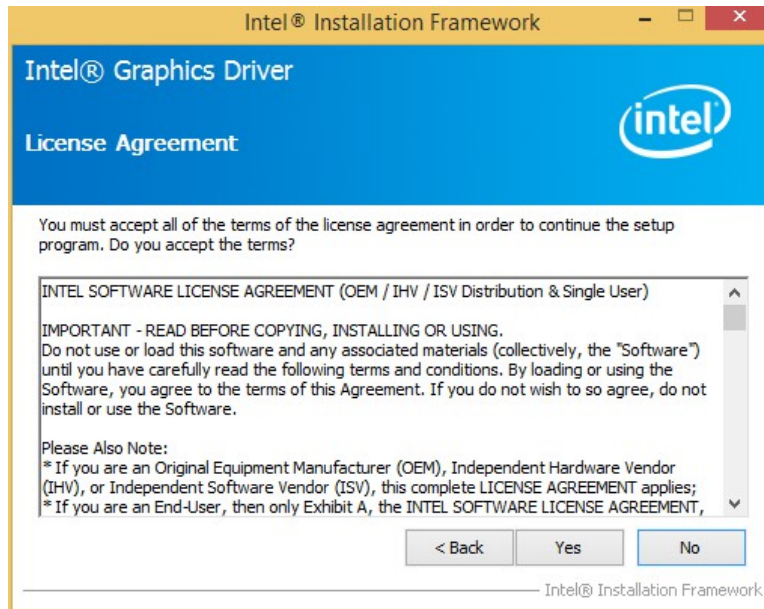


**Figure 6-9: Graphics Driver License Agreement**

**Step 8:** The **Read Me** file in **Figure 6-10** appears. Click **Next** to continue.
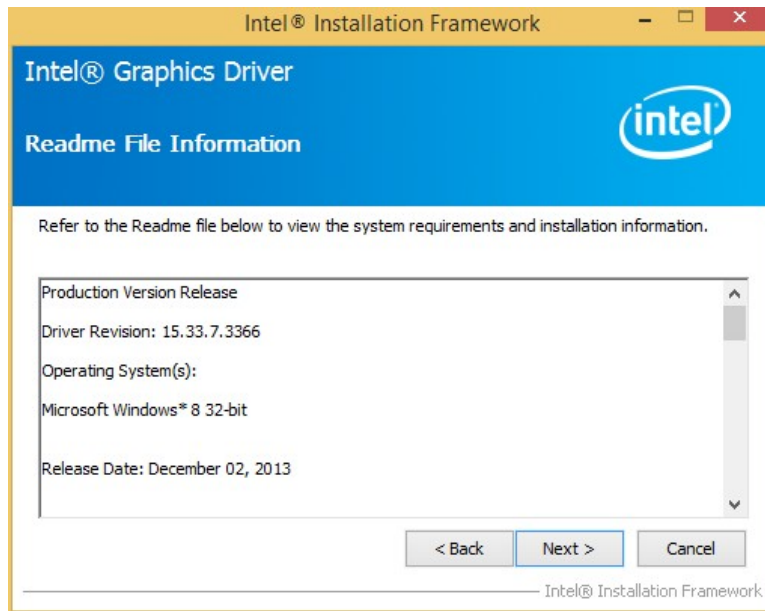
**Figure 6-10: Graphics Driver Read Me File**

**Step 9:** **Setup Operations** are performed as shown in **Figure 6-11**.

**Step 10:** Once the **Setup Operations** are complete, click **Next** to continue.
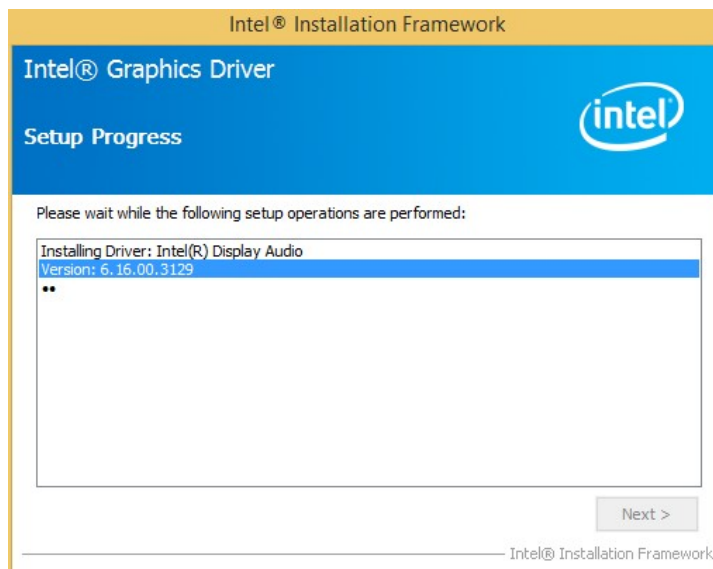


**Figure 6-11: Graphics Driver Setup Operations**

**Step 11:** The system starts installing the Graphics Driver.

**Step 12:** The **Finish** screen in **Figure 6-12** appears.

**Step 13:** Select "**Yes, I want to restart this computer now**" and click **Finish**.
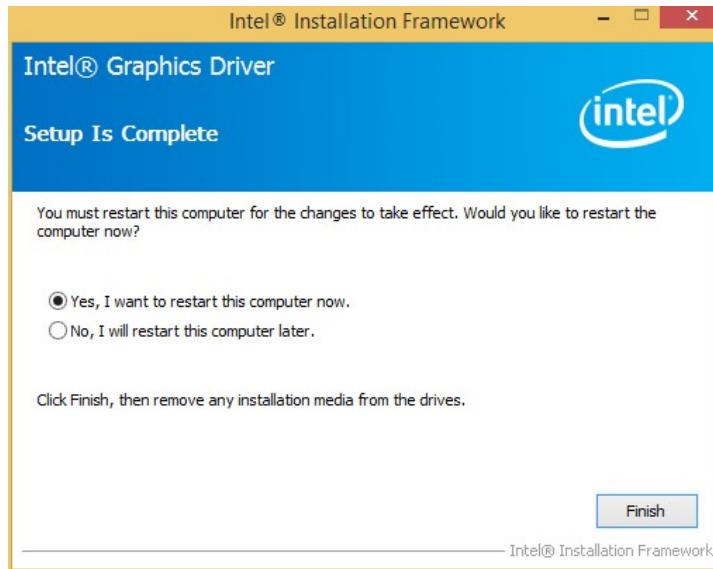


**Figure 6-12: Graphics Driver Installation Finish Screen**

## 6.5 LAN Driver Installation

To install the LAN driver, please do the following.

**Step 1:** Right-click This PC icon on the desktop and select **Properties**.   (**Figure 6-13**).
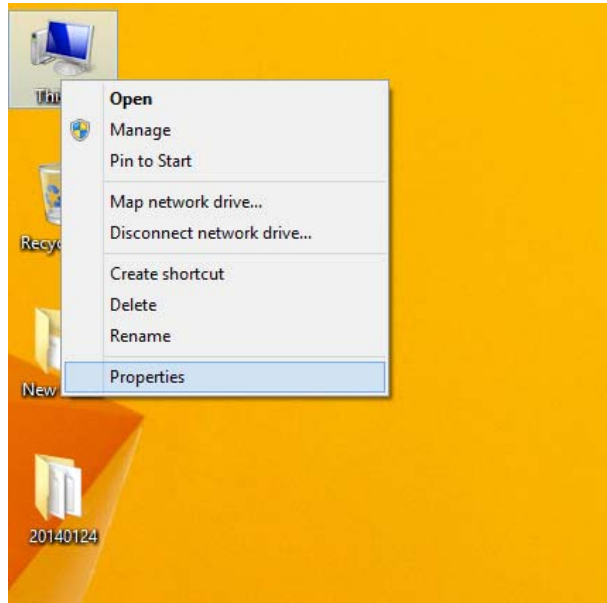
**Figure 6-13: PC Properties**

**Step 2:**   The system control panel window in **Figure 6-14** appears.

**Step 3:**   Click the Device Manager link (**Figure 6-14**).
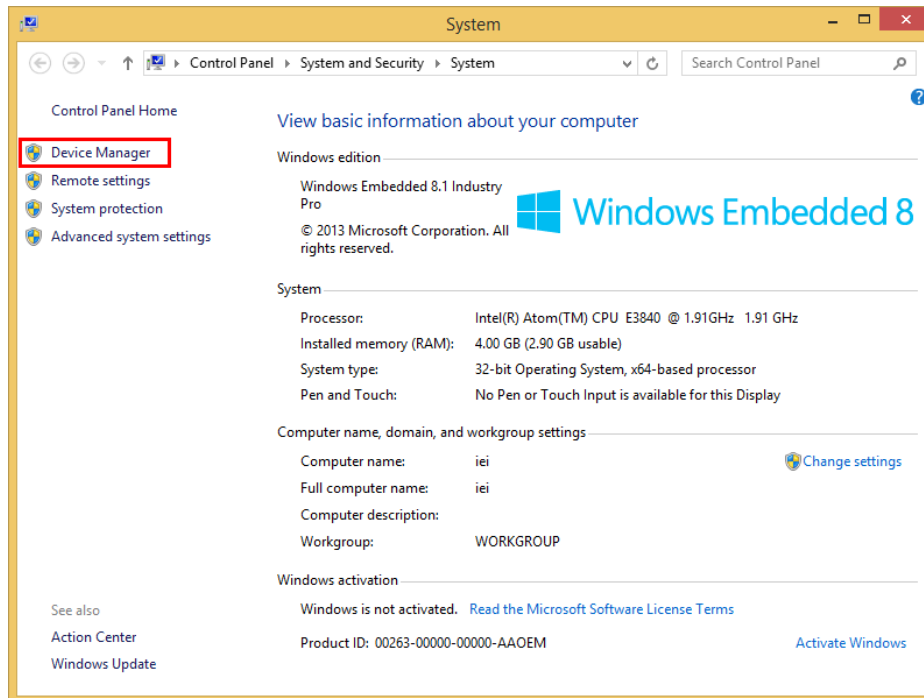


**Figure 6-14: System Control Panel**

**Step 4:** A list of system hardware devices appears (**Figure 6-15**).

**Step 5:** Right-click one of the Ethernet controllers that has question marks next to it (this means Windows does not recognize the device).

**Step 6:** Select **Update Driver Software**. See **Figure 6-15**.
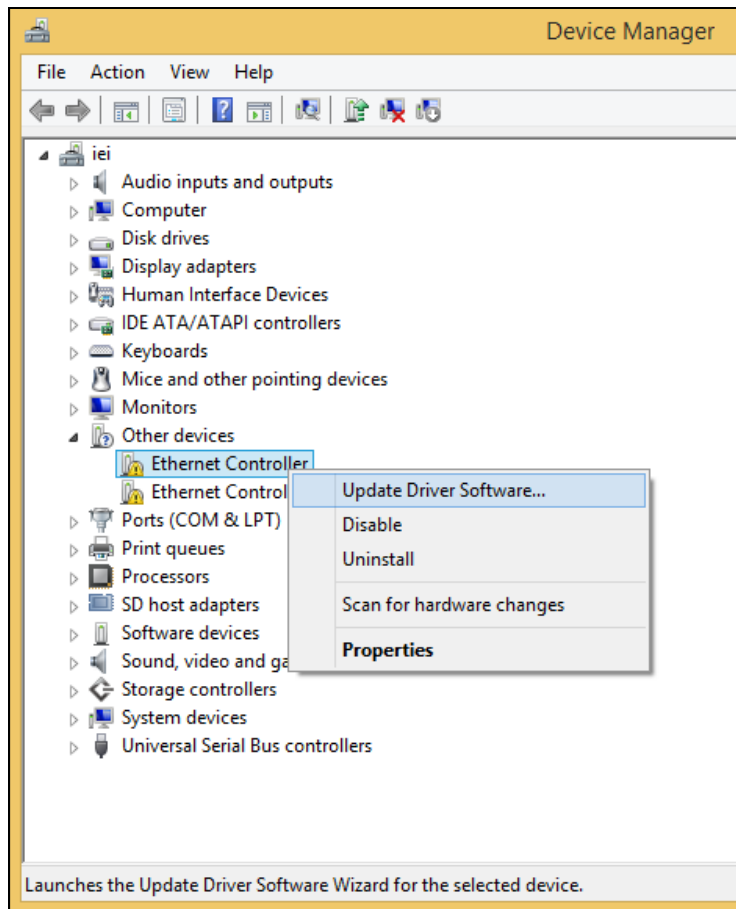


**Figure 6-15: Device Manager List**

**Step 7:** The Update Driver Software Window appears (**Figure 6-16**).
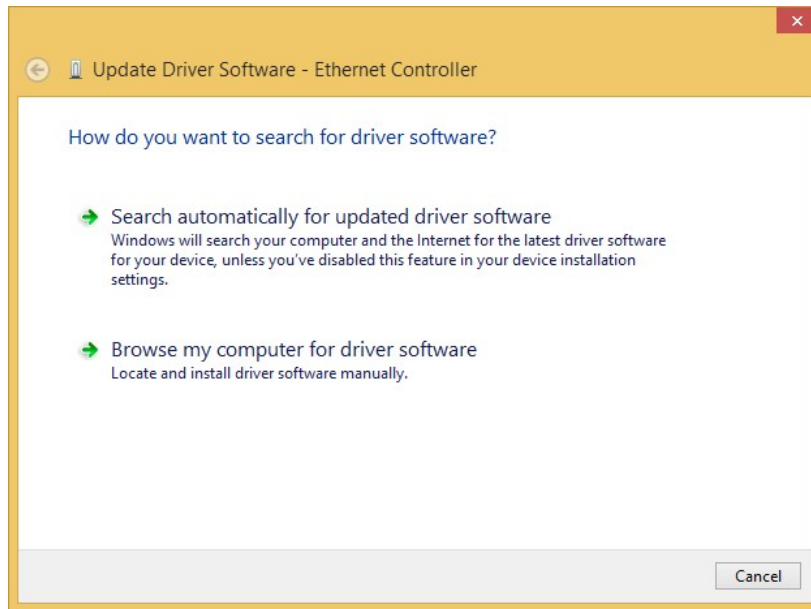
**Figure 6-16: Update Driver Software Window**

**Step 8:** Select "Browse my computer for driver software" and click **NEXT** to continue.

**Step 9:** Click Browse to select "**X:\2-LAN\Intel**" directory in the **Locate File** window, where "**X:\**" is the system CD drive. (**Figure 6-17**).
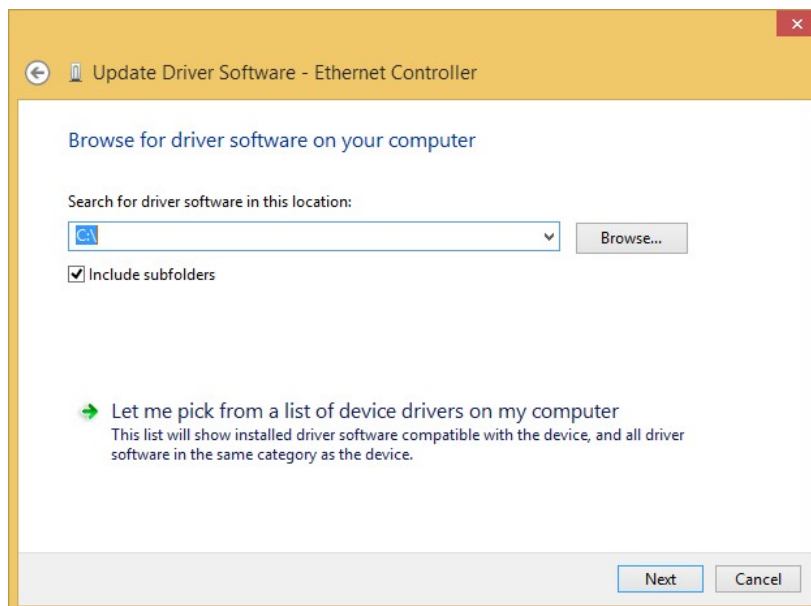


**Figure 6-17: Locate Driver Files**

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

**Step 11:** Driver Installation is performed. When the **Finish** screen appears, click **Close** to exit.

**Step 12:** Right-click the other Ethernet controller that has question marks next to it as shown in **Figure 6-15**. Repeat **Step 6** – **Step 11** to install the second Ethernet controller driver.

Appendix

A

# BIOS Options

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

<div align="right">

Appendix

**B**

</div>

# Terminology

**AC '97**　　　　Audio Codec 97 (AC'97) refers to a codec standard developed by Intel® in 1997.

**ACPI**　　　　Advanced Configuration and Power Interface (ACPI) is an OS-directed configuration, power management, and thermal management interface.

**AHCI**　　　　Advanced Host Controller Interface (AHCI) is a SATA Host controller register-level interface.

**ATA**　　　　The Advanced Technology Attachment (ATA) interface connects storage devices including hard disks and CD-ROM drives to a computer.

**ARMD**　　　　An ATAPI Removable Media Device (ARMD) is any ATAPI device that supports removable media, besides CD and DVD drives.

**ASKIR**　　　　Amplitude Shift Keyed Infrared (ASKIR) is a form of modulation that represents a digital signal by varying the amplitude ("volume") of the signal. A low amplitude signal represents a binary 0, while a high amplitude signal represents a binary 1.

**BIOS**　　　　The Basic Input/Output System (BIOS) is firmware that is first run when the computer is turned on and can be configured by the end user

**CODEC**　　　　The Compressor-Decompressor (CODEC) encodes and decodes digital audio data on the system.

**CMOS**　　　　Complimentary metal-oxide-conductor is an integrated circuit used in chips like static RAM and microprocessors.

**COM**　　　　COM refers to serial ports. Serial ports offer serial communication to expansion devices. The serial port on a personal computer is usually a male D-sub 9 connector.

**DAC**　　　　The Digital-to-Analog Converter (DAC) converts digital signals to analog signals.

**DDR**　　　　Double Data Rate refers to a data bus transferring data on both the rising and falling edges of the clock signal.

**DMA**　　　　Direct Memory Access (DMA) enables some peripheral devices to bypass the system processor and communicate directly with the system memory.

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

**LVDS**    Low-voltage differential signaling (LVDS) is a dual-wire, high-speed differential electrical signaling system commonly used to connect LCD displays to a computer.

**POST**    The Power-on Self Test (POST) is the pre-boot actions the system performs when the system is turned-on.

**RAM**     Random Access Memory (RAM) is volatile memory that loses data when power is lost. RAM has very fast data transfer rates compared to other storage like hard drives.

**SATA**    Serial ATA (SATA) is a serial communications bus designed for data transfers between storage devices and the computer chipsets. The SATA bus has transfer speeds up to 1.5 Gbps and the SATA II bus has data transfer speeds of up to 3.0 Gbps.

**S.M.A.R.T**    Self Monitoring Analysis and Reporting Technology (S.M.A.R.T) refers to automatic status checking technology implemented on hard disk drives.

**UART**    Universal Asynchronous Receiver-transmitter (UART) is responsible for asynchronous communications on the system and manages the system's serial communication (COM) ports.

**UHCI**    The Universal Host Controller Interface (UHCI) specification is a register-level interface description for USB 1.1 Host Controllers.

**USB**     The Universal Serial Bus (USB) is an external bus standard for interfacing devices. USB 1.1 supports 12Mbps data transfer rates and USB 2.0 supports 480Mbps data transfer rates.

**VGA**     The Video Graphics Array (VGA) is a graphics display system developed by IBM.

Appendix

C

# Watchdog Timer

> **NOTE:**
>
> The following discussion applies to DOS environment. 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 C-1: AH-6FH Sub-function**

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

**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 ;**

# D

# Hazardous Materials Disclosure

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

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

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

Please refer to the table on the next page.

| Part Name | Toxic or Hazardous Substances and Elements | | | | | |
|---|---|---|---|---|---|---|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (CR(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) |
| Housing | O | O | O | O | O | O |
| Display | O | O | O | O | O | O |
| Printed Circuit Board | O | O | O | O | O | O |
| Metal Fasteners | O | O | O | O | O | O |
| Cable Assembly | O | O | O | O | O | O |
| Fan Assembly | O | O | O | O | O | O |
| Power Supply Assemblies | O | O | O | O | O | O |
| Battery | O | O | O | O | O | O |
| O:   This toxic or hazardous substance is contained in all of the homogeneous materials for the part is below the limit requirement in SJ/T11363-2006 <br> X:   This toxic or hazardous substance is contained in at least one of the homogeneous materials for this part is above the limit requirement in SJ/T11363-2006 | | | | | | |

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

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

| 部件名称 | 有毒有害物质或元素 | | | | | |
|---|---|---|---|---|---|---|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (CR(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 壳体 | O | O | O | O | O | O |
| 显示 | O | O | O | O | O | O |
| 印刷电路板 | O | O | O | O | O | O |
| 金属螺帽 | O | O | O | O | O | O |
| 电缆组装 | O | O | O | O | O | O |
| 风扇组装 | O | O | O | O | O | O |
| 电力供应组装 | O | O | O | O | O | O |
| 电池 | O | O | O | O | O | O |
| O: 表示该有毒有害物质在该部件所有物质材料中的含量均在 SJ/T11363-2006 标准规定的限量要求以下。 X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。 | | | | | | |