# AXIOMTEK

# CAPA848

Intel® Celeron® Processor N2807
Capa Board

User's Manual

RoHS

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# CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

## ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.

- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.

- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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# Table of Contents

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# Chapter 1
# Introduction
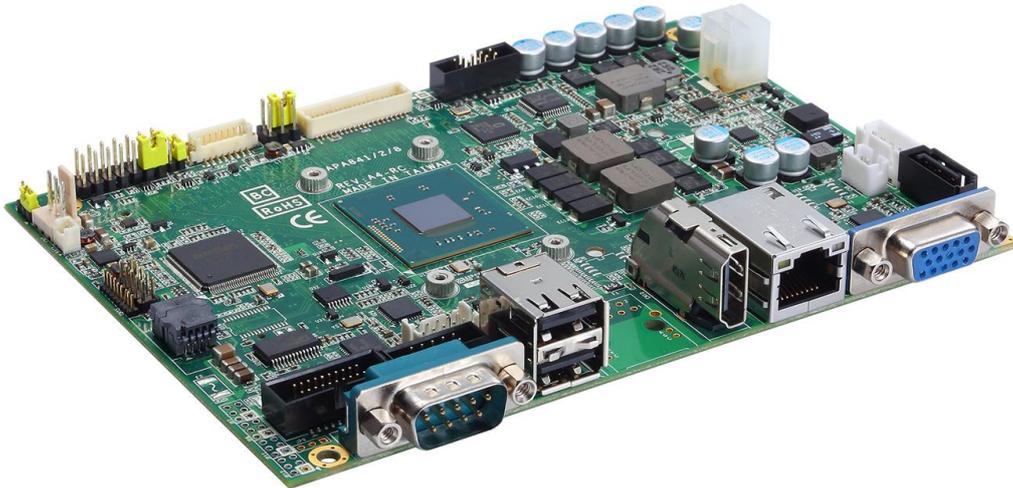


The CAPA848, a 3.5" board, supports Intel® Celeron® N2807 processor. It delivers outstanding system performance through high-bandwidth interfaces, multiple I/O functions for interactive applications and various embedded computing solutions.

The CAPA848 comes with one 204-pin unbuffered SO-DIMM socket for single channel DDR3L 1333MHz memory, maximum memory capacity up to 8GB. There is one Gigabit/Fast Ethernet port, one SATA port with transfer rate up to 3Gb/s, four USB 2.0 high speed compliant, and built-in HD audio codec that can achieve the best stability and reliability for industrial applications. Additionally, they provide you with unique embedded features, such as four serial ports (two RS-232/422/485 and two RS-232) and 3.5" form factor that applies an extensive array of PC peripherals.

## 1.1 Features

- Intel® Celeron® dual core N2807 (1.58GHz)
- 1 DDR3L SO-DIMM supports up to 8 GB memory capacity
- 4 USB 2.0 ports
- 4 COM ports
- 2 PCI-Express Mini Card
- +12V only DC-in supported
- Wide operating temperature supported

## 1.2 Specifications

- **CPU**
  - Intel® Celeron® dual core N2807 1.58GHz.

- **Thermal Solution**
  - Passive.

- **Operating Temperature**
  - -20°C~70°C.

- **BIOS**
  - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface) BIOS.
  - 16Mbit SPI Flash, DMI, Plug and Play.
  - PXE Ethernet Boot ROM.

- **System Memory**
  - One 204-pin unbuffered DDR3L SO-DIMM socket.
  - Maximum up to 8GB DDR3L 1333MHz memory.

- **Onboard Multi I/O**
  - Controller: Nuvoton NCT6106D.
  - Serial Ports: Two ports for RS-232/422/485 and two ports for RS-232.

- **Serial ATA**
  - One SATA-300 connector.
  - mSATA supported (Optional).

- **USB Interface**
  - Four USB ports with fuse protection and complies with USB Spec. Rev. 2.0.

- **Display**
  - One 15-pin D-Sub as VGA connector.
  - One 2x20-pin connector for 18/24-bit single/dual channel LVDS and one 8-pin inverter connector. LVDS resolution is up to 1920x1200 in 24-bit dual channels.
  - One HDMI.

- **Watchdog Timer**
  - 1~255 seconds or minutes; up to 255 levels.

- **Ethernet**
  - One RJ-45 LAN port: Intel® i211AT supports 1000/100/10Mbps Gigabit/Fast Ethernet with Wake-on-LAN and PXE Boot ROM.

- **Audio**
  - HD audio compliant with Realtek ALC662.
  - Line-out and line-in/MIC-in via box header connector.

- **Expansion Interface**
  - One full-size PCI-Express Mini Card socket complies with PCI-Express Mini Card Spec. V1.2.
  - One half-size PCI-Express Mini Card socket complies with PCI-Express Mini Card Spec. V1.2.

- **Power Input**
  - One 2x2-pin connector
  - +12V only DC-in
  - AT auto power on function supported

- **Power Management**
  - ACPI (Advanced Configuration and Power Interface).

- **Form Factor**
  - 3.5" form factor.

|  | *All specifications and images are subject to change without notice.* |
|---|---|
| **Note** | |

## 1.3    Utilities Supported

- Chipset and graphics driver
- Ethernet driver
- Audio driver
- Trusted Execution Engine
- Sideband Fabric Device

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# Chapter 2
# Board and Pin Assignments

## 2.1 Board Dimensions and Fixing Holes
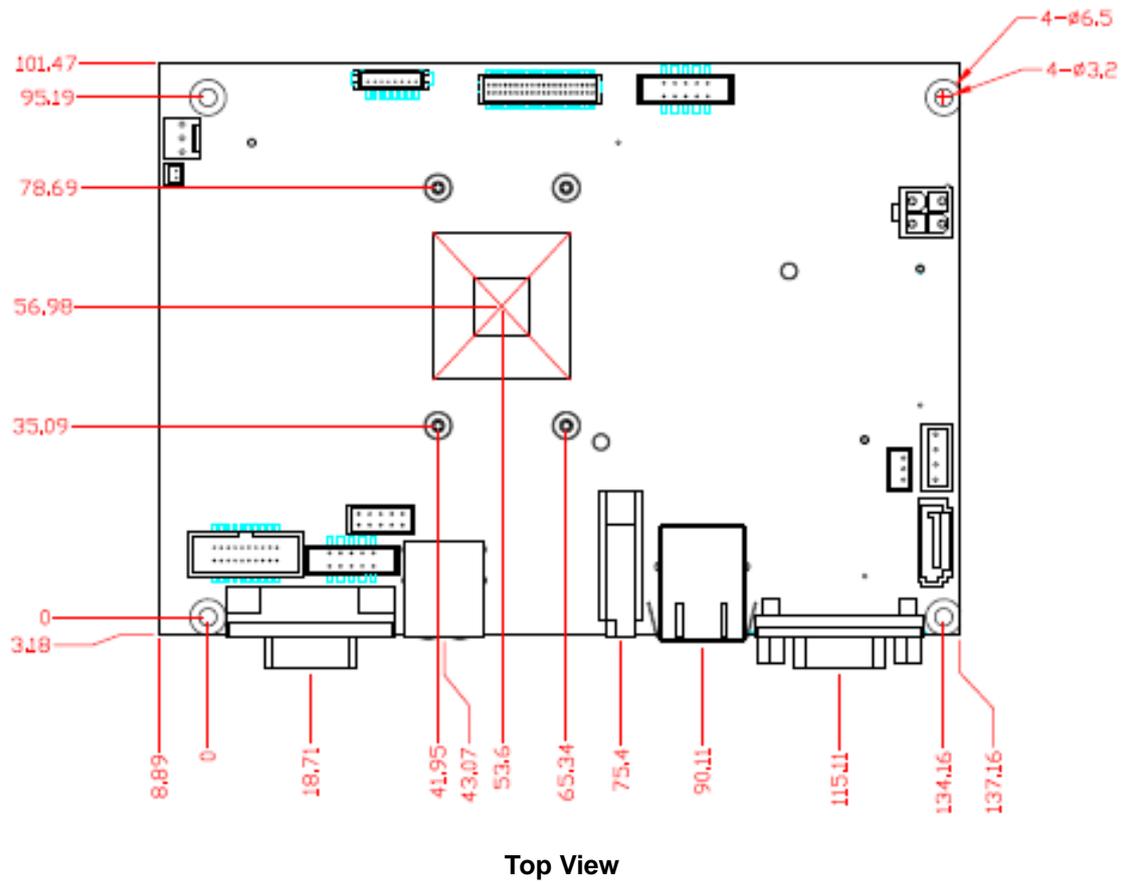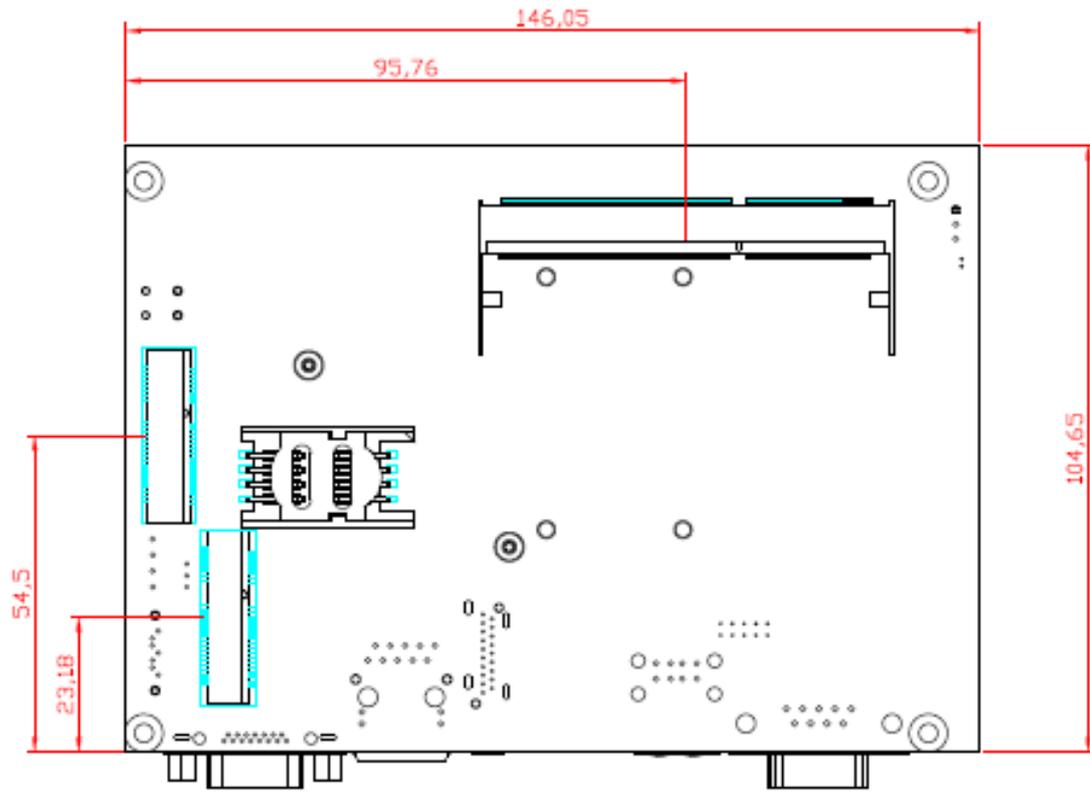


**Top View**
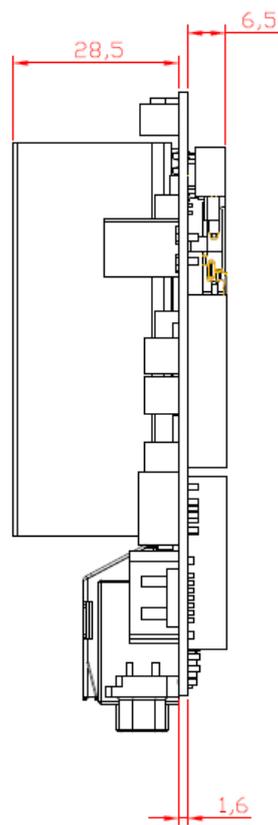
**Bottom View**

**Side View**

## 2.2 Board Layout
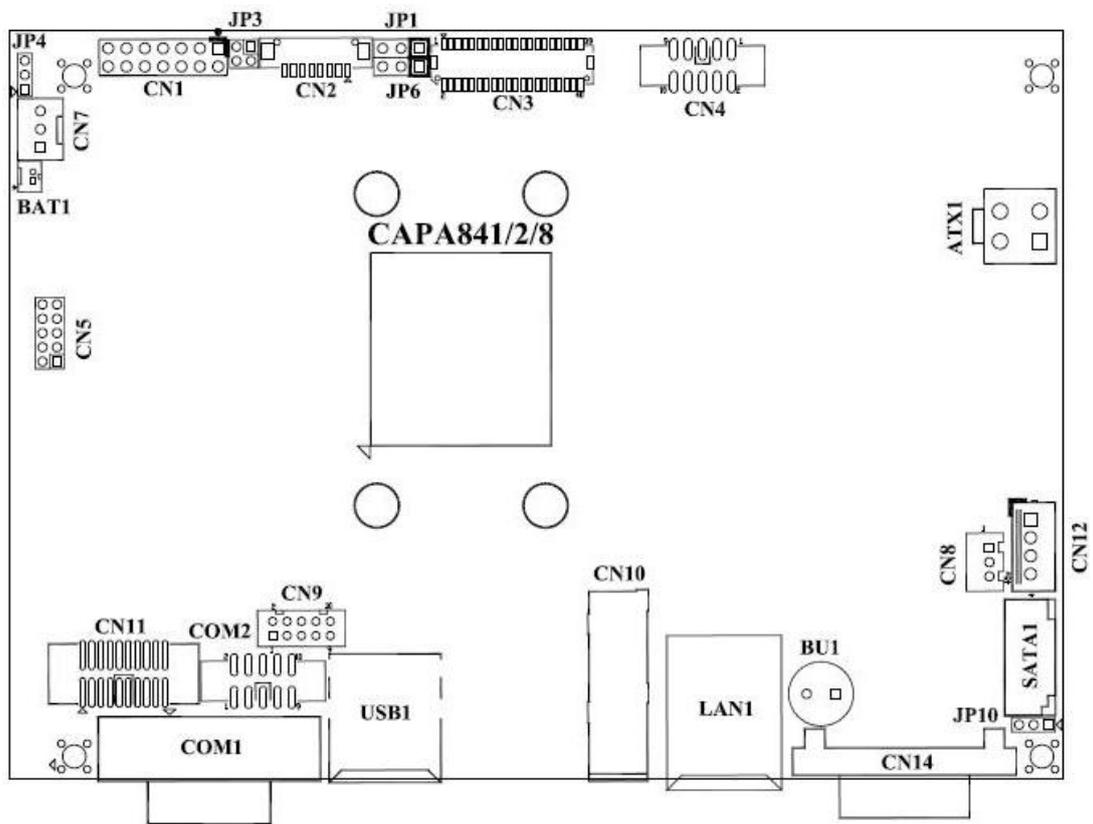


**Top View**
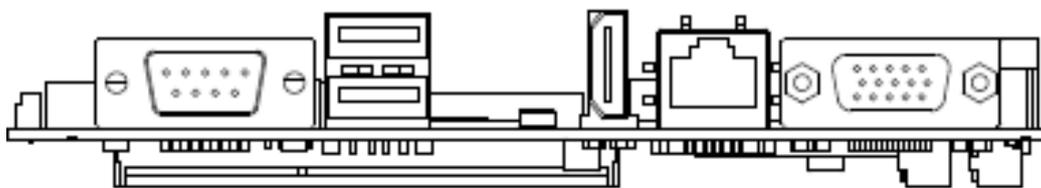


**Side View**
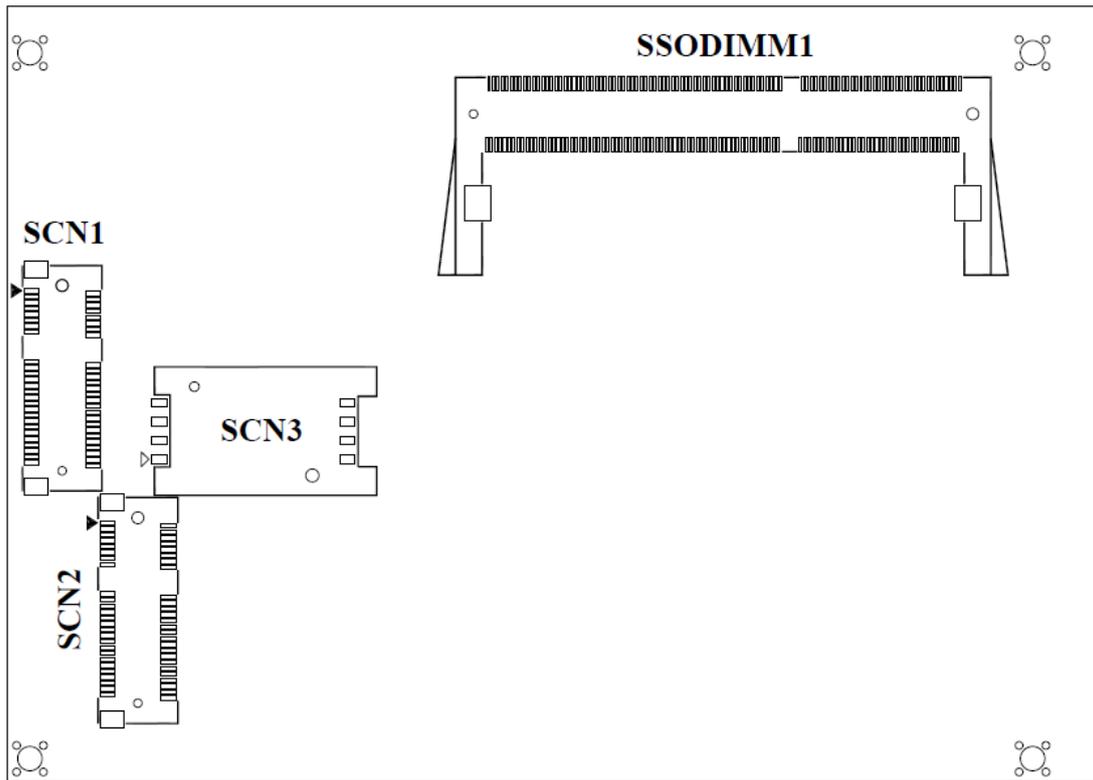
**Bottom View**

## 2.3    Jumper Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. Below illustration shows how to set up jumper.

jumper clip    open

close    pin 1-2 close    all open
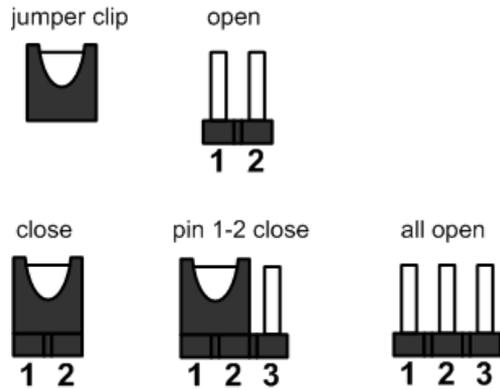
Properly configure jumper settings on the CAPA848 to meet your application purpose. Below you can find a summary table of all jumpers and onboard default settings.

> *Once the default jumper setting needs to be changed, please do it under power-off condition.*
>
> **Note**

| Jumper | Description | Setting |
|--------|-------------|---------|
| JP1 | LVDS +3.3V/+5V Voltage Selection<br>Default: +3.3V | 1-2 Close |
| JP3 | LVDS Brightness Control Mode Setting<br>Default: PWM Mode | 1-2 Close |
| JP4 | Restore BIOS Optimal Defaults<br>Default: Normal Operation | 1-2 Close |
| JP6 | LVDS +12V Voltage Selection<br>Default: N/A | N/A |
| JP10 | Auto Power On<br>Default: Disable | 1-2 Close |

### 2.3.1 LVDS Voltage Selection (JP1 and JP6)

The board supports voltage selection for flat panel displays. Use these jumpers to set LVDS connector (CN3) pin 1~6 VCCM to +3.3V, +5V or +12V. To prevent hardware damage, before connecting please make sure that input voltage of flat panel is correct.

| Function | JP1 Setting |
|----------|-------------|
| +3.3V level (Default) | 1-2 close |
| +5V level | 2-3 close |

**JP1**
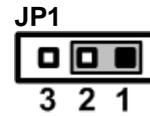
| Function | JP6 Setting |
|----------|-------------|
| +12V level | 1-2 close |
| N/A | 2-3 close |

**JP6**
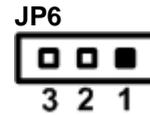
### 2.3.2 LVDS Brightness Control Mode Setting (JP3)

The JP3 enables you to select PWM or voltage control mode for inverter connector (CN2). These two control modes are for adjusting the brightness of LVDS panel.

| Function | Setting |
|----------|---------|
| PWM mode (Default) | 1-2 close |
| Voltage mode | 3-4 close |

### 2.3.3 Restore BIOS Optimal Defaults (JP4)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. Doing this procedure can restore BIOS optimal defaults.

| Function | Setting |
|----------|---------|
| Normal (Default) | 1-2 close |
| Restore BIOS optimal defaults | 2-3 close |

### 2.3.4 Auto Power On (JP10)

If JP10 is enabled for AC power input, the system will be automatically power on without pressing soft power button. If JP10 is disabled for AC power input, it is necessary to manually press soft power button to power on the system.

| Function | Setting |
|----------|---------|
| Disable auto power on (Default) | 1-2 close |
| Enable auto power on | 2-3 close |

> ***This function is similar to the feature of power on after power failure, which is controlled by hardware circuitry instead of BIOS.***
>
> **Note**

## 2.4 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table of connectors on the hardware.

| Connector | Description |
|---|---|
| CN1 | Front Panel Connector |
| CN2 | Inverter Connector |
| CN3 | LVDS Connector |
| CN4 | Audio Connector |
| CN5 | Digital I/O Port Connector |
| CN7 | Fan Connector |
| CN8 | SMBus Connector |
| CN9 | USB Wafer Port 2 and 3 |
| CN10 | HDMI Connector |
| CN11 | COM3 and COM4 Connector |
| CN12 | SATA Power Connector |
| CN14 | VGA Connector |
| ATX1 | Power Connector |
| SATA1 | SATA Connector |
| USB1 | USB Port 0 and 1 |
| LAN1 | Ethernet Port 1 |
| COM1 | COM1 Connector |
| COM2 | COM2 Connector |
| BAT1 | CMOS Battery Connector |
| SCN1 | Half-size PCI-Express Mini Card Connector |
| SCN2 | Full-size PCI-Express Mini Card Connector |
| SCN3 | SIM Card Slot |
| SSODIMM1 | DDR3L SO-DIMM Connector |

## 2.4.1 Front Panel Connector (CN1)

| Pin | Signal |
|-----|--------|
| 1 | PWRLED+ |
| 2 | EXT SPK- |
| 3 | N.C. |
| 4 | Buzzer |
| 5 | PWRLED- |
| 6 | N.C. |
| 7 | N.C. |
| 8 | EXT SPK+ |
| 9 | PWRSW- |
| 10 | PWRSW+ |
| 11 | HW RST- |
| 12 | HW RST+ |
| 13 | HDDLED- |
| 14 | HDDLED+ |
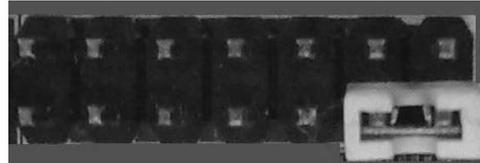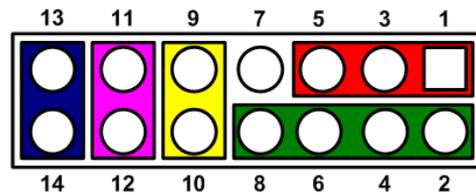
**Power LED**
Pin 1 connects anode(+) of LED and pin 5 connects cathode(-) of LED. The power LED lights up when the system is powered on.

**External Speaker and Internal Buzzer**
Pin 2, 4, 6 and 8 connect the case-mounted speaker unit or internal buzzer. While connecting the CPU board to an internal buzzer, please set pin 2 and 4 closed; while connecting to an external speaker, you need to set pins 2 and 4 opened and connect the speaker cable to pin 8(+) and pin 2(-).

**Power On/Off Button**
Pin 9 and 10 connect the power button on front panel to the CPU board, which allows users to turn on or off power supply.

**System Reset Switch**
Pin 11 and 12 connect the case-mounted reset switch that reboots your computer without turning off the power switch. It is a better way to reboot your system for a longer life of system power supply.

**HDD Activity LED**
This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 13 and 14 connect the hard disk drive to the front panel HDD LED, pin 13 is assigned as cathode(-) and pin 14 is assigned as anode(+).

### 2.4.2    Inverter Connector (CN2)

This is a DF13-8S-1.25C 8-pin connector for inverter. We strongly recommend you to use the matching DF13-8S-1.25C connector to avoid malfunction.

| Pin | Signal |
|-----|--------|
| 1 | VBL1 (+12V level) |
| 2 | VBL1 (+12V level) |
| 3 | VBL2 (+5V level) |
| 4 | VBL_ENABLE |
| 5 | GND |
| 6 | GND |
| 7 | GND |
| 8 | VBL Brightness Control |
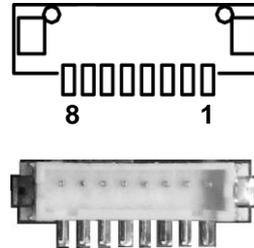
### 2.4.3    LVDS Connector (CN3)

This board has a 2x20-pin connector for LVDS LCD interface. It is strongly recommended to use the matching JST SHDR-40VS-B connector for LVDS interface. Pin 1~6 VCCM can be set to +3.3V, +5V or +12V by setting JP1 or JP6 (see section 2.3.1).

**18-bit single channel**

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | VCCM | 2 | VCCM |
| 3 | VCCM | 4 | VCCM |
| 5 | VCCM | 6 | VCCM |
| 7 | N.C. | 8 | N.C. |
| 9 | GND | 10 | GND |
| 11 | N.C. | 12 | N.C. |
| 13 | N.C. | 14 | N.C. |
| 15 | GND | 16 | GND |
| 17 | N.C. | 18 | N.C. |
| 19 | N.C. | 20 | N.C. |
| 21 | GND | 22 | GND |
| 23 | Channel A D0- | 24 | N.C. |
| 25 | Channel A D0+ | 26 | N.C. |
| 27 | GND | 28 | GND |
| 29 | Channel A D1- | 30 | N.C. |
| 31 | Channel A D1+ | 32 | N.C. |
| 33 | GND | 34 | GND |
| 35 | Channel A D2- | 36 | Channel A CLK- |
| 37 | Channel A D2+ | 38 | Channel A CLK+ |
| 39 | GND | 40 | GND |

**24-bit single channel**

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | VCCM | 2 | VCCM |
| 3 | VCCM | 4 | VCCM |
| 5 | VCCM | 6 | VCCM |
| 7 | N.C. | 8 | N.C. |
| 9 | GND | 10 | GND |
| 11 | N.C. | 12 | N.C. |
| 13 | N.C. | 14 | N.C. |
| 15 | GND | 16 | GND |
| 17 | N.C. | 18 | N.C. |
| 19 | N.C. | 20 | N.C. |
| 21 | GND | 22 | GND |
| 23 | Channel A D0- | 24 | N.C. |
| 25 | Channel A D0+ | 26 | N.C. |
| 27 | GND | 28 | GND |
| 29 | Channel A D1- | 30 | Channel A D3- |
| 31 | Channel A D1+ | 32 | Channel A D3+ |
| 33 | GND | 34 | GND |
| 35 | Channel A D2- | 36 | Channel A CLK- |
| 37 | Channel A D2+ | 38 | Channel A CLK+ |
| 39 | GND | 40 | GND |

**18-bit dual channel**

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | VCCM | 2 | VCCM |
| 3 | VCCM | 4 | VCCM |
| 5 | VCCM | 6 | VCCM |
| 7 | N.C. | 8 | N.C. |
| 9 | GND | 10 | GND |
| 11 | N.C. | 12 | Channel B D0- |
| 13 | N.C. | 14 | Channel B D0+ |
| 15 | GND | 16 | GND |
| 17 | Channel B CLK- | 18 | Channel B D1- |
| 19 | Channel B CLK+ | 20 | Channel B D1+ |
| 21 | GND | 22 | GND |
| 23 | Channel A D0- | 24 | Channel B D2- |
| 25 | Channel A D0+ | 26 | Channel B D2+ |
| 27 | GND | 28 | GND |
| 29 | Channel A D1- | 30 | N.C. |
| 31 | Channel A D1+ | 32 | N.C. |
| 33 | GND | 34 | GND |
| 35 | Channel A D2- | 36 | Channel A CLK- |
| 37 | Channel A D2+ | 38 | Channel A CLK+ |
| 39 | GND | 40 | GND |

**24-bit dual channel**

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | VCCM | 2 | VCCM |
| 3 | VCCM | 4 | VCCM |
| 5 | VCCM | 6 | VCCM |
| 7 | N.C. | 8 | N.C. |
| 9 | GND | 10 | GND |
| 11 | Channel B D3- | 12 | Channel B D0- |
| 13 | Channel B D3+ | 14 | Channel B D0+ |
| 15 | GND | 16 | GND |
| 17 | Channel B CLK- | 18 | Channel B D1- |
| 19 | Channel B CLK+ | 20 | Channel B D1+ |
| 21 | GND | 22 | GND |
| 23 | Channel A D0- | 24 | Channel B D2- |
| 25 | Channel A D0+ | 26 | Channel B D2+ |
| 27 | GND | 28 | GND |
| 29 | Channel A D1- | 30 | Channel A D3- |
| 31 | Channel A D1+ | 32 | Channel A D3+ |
| 33 | GND | 34 | GND |
| 35 | Channel A D2- | 36 | Channel A CLK- |
| 37 | Channel A D2+ | 38 | Channel A CLK+ |
| 39 | GND | 40 | GND |

### 2.4.4 Audio Connector (CN4)

| Pin | Signal | Pin | Signal |
| --- | --- | --- | --- |
| 1 | MIC_IN | 2 | GND |
| 3 | LINE_IN_L | 4 | GND |
| 5 | LINE_IN_R | 6 | GND |
| 7 | AUDIO_OUT_L | 8 | GND |
| 9 | AUDIO_OUT_R | 10 | GND |
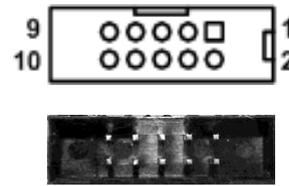
### 2.4.5 Digital I/O Port Connector (CN5)

The board is equipped with an 8-channel (3 inputs and 5 outputs) digital I/O connector that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. You may use software programming to control these digital signals.

| Pin | Signal | Pin | Signal |
| --- | --- | --- | --- |
| 1 | Digital Input 0 | 2 | Digital Output 0 |
| 3 | Digital Input 1 | 4 | Digital Output 1 |
| 5 | Digital Input 2 | 6 | Digital Output 2 |
| 7 | GND | 8 | Digital Output 3 |
| 9 | GND | 10 | Digital Output 4 |
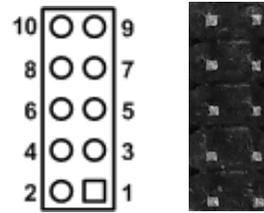
### 2.4.6 Fan Connector (CN7)

A fan interface is available through this connector with +12V.

| Pin | Signal |
| --- | --- |
| 1 | GND |
| 2 | +12V level |
| 3 | Fan speed feedback |
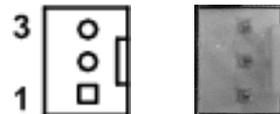
### 2.4.7 SMBus Connector (CN8)

This connector is for SMBus interface. The SMBus (System Management Bus) is a simple 2-wire bus for the purpose of lightweight communication.

| Pin | Signal |
| --- | --- |
| 1 | CLK |
| 2 | DATA |
| 3 | GND |
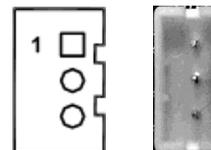
### 2.4.8 USB Wafer Connector (CN9)

This 2x5 pin wafer is a Universal Serial Bus (USB) connector for installing versatile USB 2.0 compliant interface peripherals.

The CN9 carries USB port 2 and 3.

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | USB VCC (+5V_SBY) | 2 | USB VCC (+5V_SBY) |
| 3 | USB #2_D- | 4 | USB #3_D- |
| 5 | USB #2_D+ | 6 | USB #3_D+ |
| 7 | GND | 8 | GND |
| 9 | GND | 10 | GND |
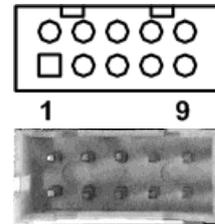
### 2.4.9 HDMI Connector (CN10)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable. Its interface is available through connector CN10.

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | HDMI OUT_DATA2+ | 2 | GND |
| 3 | HDMI OUT_DATA2- | 4 | HDMI OUT_DATA1+ |
| 5 | GND | 6 | HDMI OUT_DATA1- |
| 7 | HDMI OUT_DATA0+ | 8 | GND |
| 9 | HDMI OUT_DATA0- | 10 | HDMI OUT_Clock+ |
| 11 | GND | 12 | HDMI OUT_Clock- |
| 13 | CEC | 14 | N.C. |
| 15 | HDMI OUT_SCL | 16 | HDMI OUT_SDA |
| 17 | GND | 18 | +5V |
| 19 | HDMI_HTPLG | | |
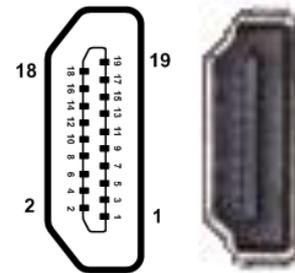
### 2.4.10 COM3 and COM4 Connector (CN11)

This is a 2x10-pin pitch=1.27mm wafer connector for COM3 and COM4. The pin assignments are listed in table below.

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | DCD3 | 2 | DSR3 |
| 3 | RXD3 | 4 | RTS3 |
| 5 | TXD3 | 6 | CTS3 |
| 7 | DTR3 | 8 | RI3 |
| 9 | GND | 10 | N.C. |
| 11 | DCD4 | 12 | DSR4 |
| 13 | RXD4 | 14 | RTS4 |
| 15 | TXD4 | 16 | CTS4 |
| 17 | DTR4 | 18 | RI4 |
| 19 | GND | 20 | N.C. |
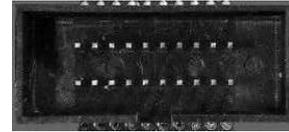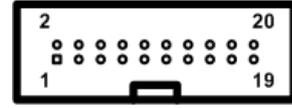
### 2.4.11 SATA Power Connector (CN12)

Use CN12 for interfacing to SATA 2.5" HDD power supply.

| Pin | Signal |
|-----|--------|
| 1 | +12V level |
| 2 | GND |
| 3 | GND |
| 4 | +5V level |
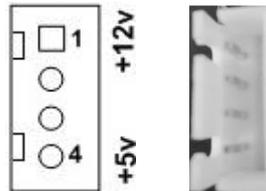
### 2.4.12 VGA Connector (CN14)

This is a 15-pin D-Sub connector which is commonly used for VGA display. This VGA interface configuration can be configured via software utility.

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | Red | 2 | Green |
| 3 | Blue | 4 | N.C. |
| 5 | GND | 6 | DETECT |
| 7 | GND | 8 | GND |
| 9 | VCC | 10 | GND |
| 11 | N.C. | 12 | DDC DATA |
| 13 | Horizontal Sync | 14 | Vertical Sync |
| 15 | DDC CLK | | |
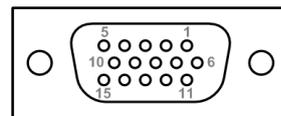
### 2.4.13    Power Connector (ATX1)

Steady and sufficient power can be supplied to all components on the board by connecting the power connector. Please make sure all components and devices are properly installed before connecting the power connector.

The ATX1 is a 4-pin power supply interface. External power supply plug fits into ATX1 in only one orientation. Properly press down power supply plug until it completely and firmly fits into this connector. Loose connection may cause system instability.

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

### 2.4.14    SATA Connector (SATA1)

This Serial Advanced Technology Attachment (Serial ATA or SATA) connector is for high-speed SATA interface. It is a computer bus interface for connecting to devices such as hard disk drive.

| Pin | Signal |
|-----|--------|
| 1 | GND |
| 2 | SATA_TX+ |
| 3 | SATA_TX- |
| 4 | GND |
| 5 | SATA_RX- |
| 6 | SATA_RX+ |
| 7 | GND |
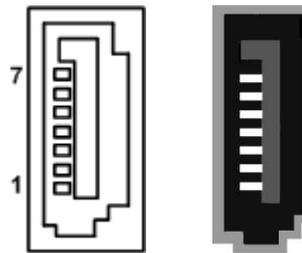
### 2.4.15 USB Port (USB1)

The USB1 is a Universal Serial Bus (compliant with USB 2.0 (480Mbps)) connector on the rear I/O. It is commonly used for installing USB peripherals such as keyboard, mouse, scanner, etc.

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | USB VCC (+5V) | 5 | USB VCC (+5V) |
| 2 | USB #0_D- | 6 | USB #1_D- |
| 3 | USB #0_D+ | 7 | USB #1_D+ |
| 4 | GND | 8 | GND |
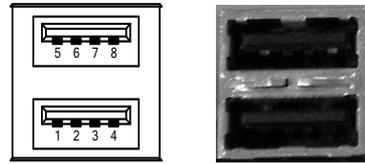
### 2.4.16 Ethernet Ports (LAN1)

The board has one RJ-45 connector: LAN1. Ethernet connection can be established by plugging one end of the ethernet cable into this RJ-45 connector and the other end (phone jack) to a 1000/100/10-Base-T hub.

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| L1 | MDI0+ | L5 | MDI2- |
| L2 | MDI0- | L6 | MDI1- |
| L3 | MDI1+ | L7 | MDI3+ |
| L4 | MDI2+ | L8 | MDI3- |
| A | Active LED (Yellow) | | |
| B | 100 LAN LED (Green) / 1000 LAN LED (Orange) | | |
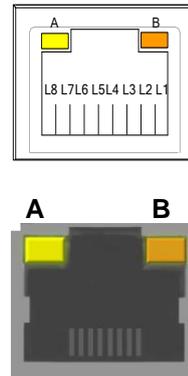
### 2.4.17 COM1 Connector (COM1)

This is a standard DB-9 connector. The pin assignments of RS-232/RS-422/RS-485 are listed in table below. If you need COM1 port to support RS-422 or RS-485, please refer to BIOS setting in section 4.4.

| Pin | RS-232 | RS-422 | RS-485 |
|-----|--------|--------|--------|
| 1 | DCD | TX- | Data- |
| 2 | RXD | TX+ | Data+ |
| 3 | TXD | RX+ | No use |
| 4 | DTR | RX- | No use |
| 5 | GND | No use | No use |
| 6 | DSR | No use | No use |
| 7 | RTS | No use | No use |
| 8 | CTS | No use | No use |
| 9 | RI | No use | No use |
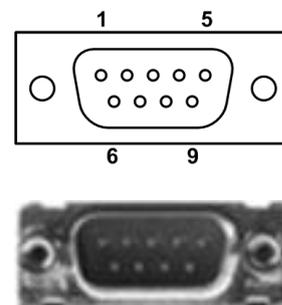
### 2.4.18    COM2 Connector (COM2)

This connector is a 2x5-pin wafer connector. The pin assignments of RS-232/RS-422/RS-485 are listed in table below. If you need COM2 port to support RS-422 or RS-485, please refer to BIOS setting in section 4.4.

| Pin | RS-232 | RS-422 | RS-485 |
|-----|--------|--------|--------|
| 1 | DCD | TX- | Data- |
| 2 | DSR | No use | No use |
| 3 | RXD | TX+ | Data+ |
| 4 | RTS | No use | No use |
| 5 | TXD | RX+ | No use |
| 6 | CTS | No use | No use |
| 7 | DTR | RX- | No use |
| 8 | RI | No use | No use |
| 9 | GND | No use | No use |
| 10 | No use | No use | No use |
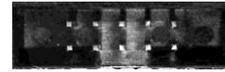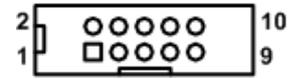
### 2.4.19    CMOS Battery Connector (BAT1)

This connector is for CMOS battery interface.

| Pin | Signal |
|-----|--------|
| 1 | +3.3V |
| 2 | GND |
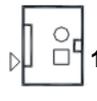
### 2.4.20 Half-size PCI-Express Mini Card Connector (SCN1)

The SCN1 is a half-size PCI-Express Mini Card connector. It supports the PCI-Express Mini Cards which are applied to either PCI-Express x1 or USB. It complies with PCI-Express Mini Card Spec. V1.2.

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | WAKE# | 2 | +3.3VSB |
| 3 | No use | 4 | GND |
| 5 | No use | 6 | +1.5V |
| 7 | CLKREQ# | 8 | No use |
| 9 | GND | 10 | No use |
| 11 | REFCLK- | 12 | No use |
| 13 | REFCLK+ | 14 | No use |
| 15 | GND | 16 | No use |
| 17 | No use | 18 | GND |
| 19 | No use | 20 | W_DISABLE# |
| 21 | GND | 22 | PERST# |
| 23 | PE_RXN3 | 24 | +3.3VSB |
| 25 | PE_RXP3 | 26 | GND |
| 27 | GND | 28 | +1.5V |
| 29 | GND | 30 | SMB_CLK |
| 31 | PE_TXN3 | 32 | SMB_DATA |
| 33 | PE_TXP3 | 34 | GND |
| 35 | GND | 36 | USB_D8- |
| 37 | GND | 38 | USB_D8+ |
| 39 | +3.3VSB | 40 | GND |
| 41 | +3.3VSB | 42 | No use |
| 43 | GND | 44 | No use |
| 45 | No use | 46 | No use |
| 47 | No use | 48 | +1.5V |
| 49 | No use | 50 | GND |
| 51 | No use | 52 | +3.3VSB |
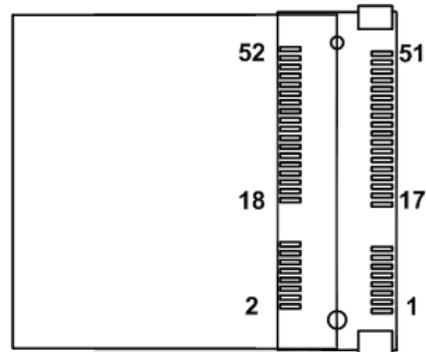
### 2.4.21 Full-size PCI-Express Mini Card Connector (SCN2)

This is a PCI-Express Mini Card connector on the bottom side applying to either PCI-Express or USB 2.0 or SATA (mSATA). It complies with PCI-Express Mini Card Spec. V1.2. It can also support mSATA cards. Please refer to BIOS setting in section 4.4 to enable or disable mSATA support

|  | Signal | Pin | Signal |
|---|---|---|---|
| 1 | WAKE# | 2 | +3.3VSB |
| 3 | No use | 4 | GND |
| 5 | No use | 6 | +1.5V |
| 7 | CLKREQ# | 8 | No use |
| 9 | GND | 10 | No use |
| 11 | REFCLK- | 12 | No use |
| 13 | REFCLK+ | 14 | No use |
| 15 | GND | 16 | No use |
| 17 | No use | 18 | GND |
| 19 | No use | 20 | W_DISABLE# |
| 21 | GND | 22 | PERST# |
| 23 | PE_RXN3/ SATA_RXP | 24 | +3.3VSB |
| 25 | PE_RXP3/ SATA_RXN | 26 | GND |
| 27 | GND | 28 | +1.5V |
| 29 | GND | 30 | SMB_CLK |
| 31 | PE_TXN3/ SATA_TXN | 32 | SMB_DATA |
| 33 | PE_TXP3/ SATA_TXP | 34 | GND |
| 35 | GND | 36 | USB_D8- |
| 37 | GND | 38 | USB_D8+ |
| 39 | +3.3VSB | 40 | GND |
| 41 | +3.3VSB | 42 | No use |
| 43 | GND | 44 | No use |
| 45 | No use | 46 | No use |
| 47 | No use | 48 | +1.5V |
| 49 | No use | 50 | GND |
| 51 | No use | 52 | +3.3VSB |
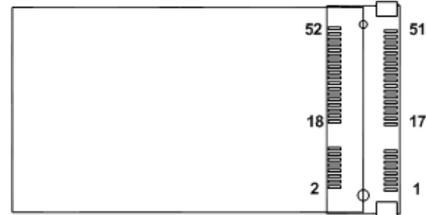
## 2.4.22    SIM Card Socket (SCN3)

This board has SCN3 socket on the bottom side for inserting SIM Card. In order to work properly, the SIM Card must be used together with 3G module which is inserted to SCN1 or SCN2. It is mainly used in 3G wireless network application.

| Pin | Signal |
|-----|--------|
| 1 | PWR |
| 2 | RST |
| 3 | CLK |
| 4 | NC |
| 5 | GND |
| 6 | VPP |
| 7 | I/O |
| 8 | NC |
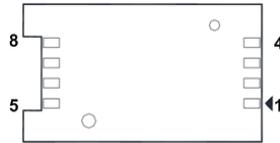
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# Chapter 3
# Hardware Description

## 3.1 Microprocessors

The CAPA848 supports Intel® Celeron® N2807 processor, which enable your system to operate under Windows® 7 and Windows® 8.1 environments. The system performance depends on the microprocessor. Make sure all correct settings are arranged for your installed microprocessor to prevent the CPU from damages.

## 3.2 BIOS

The CAPA848 uses AMI Plug and Play BIOS with a single 16Mbit SPI Flash.

## 3.3 System Memory

The CAPA848 supports one 204-pin DDR3L SO-DIMM socket for a maximum memory of 8GB DDR3L SDRAMs. The memory module comes in sizes of 1GB, 2GB, 4GB and 8GB.

## 3.4    I/O Port Address Map

The Intel® Celeron® N2807 processor communicate via I/O ports.

```
Input/output (IO)
    [00000000 - 0000006F] PCI Express Root Complex
    [00000020 - 00000021] Programmable interrupt controller
    [00000024 - 00000025] Programmable interrupt controller
    [00000028 - 00000029] Programmable interrupt controller
    [0000002C - 0000002D] Programmable interrupt controller
    [0000002E - 0000002F] Motherboard resources
    [00000030 - 00000031] Programmable interrupt controller
    [00000034 - 00000035] Programmable interrupt controller
    [00000038 - 00000039] Programmable interrupt controller
    [0000003C - 0000003D] Programmable interrupt controller
    [00000040 - 00000043] System timer
    [0000004E - 0000004F] Motherboard resources
    [00000050 - 00000053] System timer
    [00000061 - 00000061] Motherboard resources
    [00000063 - 00000063] Motherboard resources
    [00000065 - 00000065] Motherboard resources
    [00000067 - 00000067] Motherboard resources
    [00000070 - 00000070] Motherboard resources
    [00000070 - 00000077] System CMOS/real time clock
    [00000078 - 00000CF7] PCI Express Root Complex
    [00000080 - 0000008F] Motherboard resources
    [00000092 - 00000092] Motherboard resources
    [000000A0 - 000000A1] Programmable interrupt controller
    [000000A4 - 000000A5] Programmable interrupt controller
    [000000A8 - 000000A9] Programmable interrupt controller
    [000000AC - 000000AD] Programmable interrupt controller
    [000000B0 - 000000B1] Programmable interrupt controller
    [000000B2 - 000000B3] Motherboard resources
    [000000B4 - 000000B5] Programmable interrupt controller
    [000000B8 - 000000B9] Programmable interrupt controller
    [000000BC - 000000BD] Programmable interrupt controller
    [000002E8 - 000002EF] Communications Port (COM4)
```

[000002F8 - 000002FF] Communications Port (COM2)
[000003B0 - 000003BB] Intel(R) HD Graphics
[000003C0 - 000003DF] Intel(R) HD Graphics
[000003E8 - 000003EF] Communications Port (COM3)
[000003F8 - 000003FF] Communications Port (COM1)
[00000400 - 0000047F] Motherboard resources
[000004D0 - 000004D1] Programmable interrupt controller
[00000500 - 000005FE] Motherboard resources
[00000600 - 0000061F] Motherboard resources
[00000680 - 0000069F] Motherboard resources
[00000A00 - 00000A0F] Motherboard resources
[00000A10 - 00000A1F] Motherboard resources
[00000A20 - 00000A2F] Motherboard resources
[00000A30 - 00000A3F] Motherboard resources
[00000D00 - 0000FFFF] PCI Express Root Complex
[0000164E - 0000164F] Motherboard resources
[0000C000 - 0000CFFF] Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series PCI Express - Root Port 2 - 0
[0000D000 - 0000DFFF] Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series PCI Express - Root Port 1 - 0
[0000E000 - 0000E01F] Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series Platform Control Unit - SMB
[0000E020 - 0000E03F] Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series AHCI - 0F23
[0000E040 - 0000E043] Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series AHCI - 0F23
[0000E050 - 0000E057] Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series AHCI - 0F23
[0000E060 - 0000E063] Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series AHCI - 0F23
[0000E070 - 0000E077] Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series AHCI - 0F23
[0000E080 - 0000E087] Intel(R) HD Graphics

## 3.5 Interrupt Controller (IRQ) Map

The interrupt controller (IRQ) mapping list is shown as follows:

```
▲ ▮ Interrupt request (IRQ)
    ▮ (ISA) 0x00000000 (00)    System timer
    ▼ (ISA) 0x00000003 (03)    Communications Port (COM2)
    ▼ (ISA) 0x00000004 (04)    Communications Port (COM1)
    ▼ (ISA) 0x00000006 (06)    Communications Port (COM3)
    ▼ (ISA) 0x00000007 (07)    Communications Port (COM4)
    ▮ (ISA) 0x00000008 (08)    High precision event timer
    ▮ (ISA) 0x00000051 (81)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000052 (82)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000053 (83)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000054 (84)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000055 (85)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000056 (86)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000057 (87)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000058 (88)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000059 (89)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000005A (90)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000005B (91)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000005C (92)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000005D (93)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000005E (94)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000005F (95)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000060 (96)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000061 (97)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000062 (98)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000063 (99)    Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000064 (100)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000065 (101)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000066 (102)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000067 (103)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000068 (104)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000069 (105)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000006A (106)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000006B (107)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000006C (108)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000006D (109)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000006E (110)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000006F (111)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000070 (112)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000071 (113)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000072 (114)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000073 (115)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000074 (116)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000075 (117)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000076 (118)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000077 (119)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000078 (120)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000079 (121)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000007A (122)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000007B (123)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000007C (124)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000007D (125)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000007E (126)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000007F (127)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000080 (128)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000081 (129)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000082 (130)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000083 (131)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000084 (132)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000085 (133)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000086 (134)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000087 (135)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000088 (136)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x00000089 (137)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000008A (138)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000008B (139)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000008C (140)   Microsoft ACPI-Compliant System
    ▮ (ISA) 0x0000008D (141)   Microsoft ACPI-Compliant System
```

| | |
|---|---|
| (ISA) 0x0000008E (142) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000008F (143) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000090 (144) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000091 (145) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000092 (146) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000093 (147) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000094 (148) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000095 (149) | Microsoft ACPI-Compliant System |
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| (ISA) 0x00000097 (151) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000098 (152) | Microsoft ACPI-Compliant System |
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| (ISA) 0x0000009B (155) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000009C (156) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000009D (157) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000009E (158) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000009F (159) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A0 (160) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A1 (161) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A2 (162) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A3 (163) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A4 (164) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A5 (165) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A6 (166) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A7 (167) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A8 (168) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000A9 (169) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000AA (170) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000AB (171) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000AC (172) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000AD (173) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000AE (174) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000AF (175) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B0 (176) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B1 (177) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B2 (178) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B3 (179) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B4 (180) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B5 (181) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B6 (182) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B7 (183) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B8 (184) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000B9 (185) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000BA (186) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000BB (187) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000BC (188) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000BD (189) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000BE (190) | Microsoft ACPI-Compliant System |
| (ISA) 0x000000BF (191) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000100 (256) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000101 (257) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000102 (258) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000103 (259) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000104 (260) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000105 (261) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000106 (262) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000107 (263) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000108 (264) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000109 (265) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000010A (266) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000010B (267) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000010C (268) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000010D (269) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000010E (270) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000010F (271) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000110 (272) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000111 (273) | Microsoft ACPI-Compliant System |

| | | |
|---|---|---|
| (ISA) 0x00000112 (274) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000113 (275) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000114 (276) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000115 (277) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000116 (278) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000117 (279) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000118 (280) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000119 (281) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000011A (282) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000011B (283) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000011C (284) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000011D (285) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000011E (286) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000011F (287) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000120 (288) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000121 (289) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000122 (290) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000123 (291) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000124 (292) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000125 (293) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000126 (294) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000127 (295) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000128 (296) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000129 (297) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000012A (298) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000012B (299) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000012C (300) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000012D (301) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000012E (302) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000012F (303) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000130 (304) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000131 (305) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000132 (306) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000133 (307) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000134 (308) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000135 (309) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000136 (310) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000137 (311) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000138 (312) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000139 (313) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000013A (314) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000013B (315) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000013C (316) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000013D (317) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000013E (318) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000013F (319) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000140 (320) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000141 (321) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000142 (322) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000143 (323) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000144 (324) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000145 (325) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000146 (326) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000147 (327) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000148 (328) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000149 (329) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000014A (330) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000014B (331) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000014C (332) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000014D (333) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000014E (334) | Microsoft ACPI-Compliant System |
| (ISA) 0x0000014F (335) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000150 (336) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000151 (337) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000152 (338) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000153 (339) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000154 (340) | Microsoft ACPI-Compliant System |
| (ISA) 0x00000155 (341) | Microsoft ACPI-Compliant System |

(ISA) 0x00000157 (343)    Microsoft ACPI-Compliant System
(ISA) 0x00000158 (344)    Microsoft ACPI-Compliant System
(ISA) 0x00000159 (345)    Microsoft ACPI-Compliant System
(ISA) 0x0000015A (346)    Microsoft ACPI-Compliant System
(ISA) 0x0000015B (347)    Microsoft ACPI-Compliant System
(ISA) 0x0000015C (348)    Microsoft ACPI-Compliant System
(ISA) 0x0000015D (349)    Microsoft ACPI-Compliant System
(ISA) 0x0000015E (350)    Microsoft ACPI-Compliant System
(ISA) 0x0000015F (351)    Microsoft ACPI-Compliant System
(ISA) 0x00000160 (352)    Microsoft ACPI-Compliant System
(ISA) 0x00000161 (353)    Microsoft ACPI-Compliant System
(ISA) 0x00000162 (354)    Microsoft ACPI-Compliant System
(ISA) 0x00000163 (355)    Microsoft ACPI-Compliant System
(ISA) 0x00000164 (356)    Microsoft ACPI-Compliant System
(ISA) 0x00000165 (357)    Microsoft ACPI-Compliant System
(ISA) 0x00000166 (358)    Microsoft ACPI-Compliant System
(ISA) 0x00000167 (359)    Microsoft ACPI-Compliant System
(ISA) 0x00000168 (360)    Microsoft ACPI-Compliant System
(ISA) 0x00000169 (361)    Microsoft ACPI-Compliant System
(ISA) 0x0000016A (362)    Microsoft ACPI-Compliant System
(ISA) 0x0000016B (363)    Microsoft ACPI-Compliant System
(ISA) 0x0000016C (364)    Microsoft ACPI-Compliant System
(ISA) 0x0000016D (365)    Microsoft ACPI-Compliant System
(ISA) 0x0000016E (366)    Microsoft ACPI-Compliant System
(ISA) 0x0000016F (367)    Microsoft ACPI-Compliant System
(ISA) 0x00000170 (368)    Microsoft ACPI-Compliant System
(ISA) 0x00000171 (369)    Microsoft ACPI-Compliant System
(ISA) 0x00000172 (370)    Microsoft ACPI-Compliant System
(ISA) 0x00000173 (371)    Microsoft ACPI-Compliant System
(ISA) 0x00000174 (372)    Microsoft ACPI-Compliant System
(ISA) 0x00000175 (373)    Microsoft ACPI-Compliant System
(ISA) 0x00000176 (374)    Microsoft ACPI-Compliant System
(ISA) 0x00000177 (375)    Microsoft ACPI-Compliant System
(ISA) 0x00000178 (376)    Microsoft ACPI-Compliant System
(ISA) 0x00000179 (377)    Microsoft ACPI-Compliant System
(ISA) 0x0000017A (378)    Microsoft ACPI-Compliant System
(ISA) 0x0000017B (379)    Microsoft ACPI-Compliant System
(ISA) 0x0000017C (380)    Microsoft ACPI-Compliant System
(ISA) 0x0000017D (381)    Microsoft ACPI-Compliant System
(ISA) 0x0000017E (382)    Microsoft ACPI-Compliant System
(ISA) 0x0000017F (383)    Microsoft ACPI-Compliant System
(ISA) 0x00000180 (384)    Microsoft ACPI-Compliant System
(ISA) 0x00000181 (385)    Microsoft ACPI-Compliant System
(ISA) 0x00000182 (386)    Microsoft ACPI-Compliant System
(ISA) 0x00000183 (387)    Microsoft ACPI-Compliant System
(ISA) 0x00000184 (388)    Microsoft ACPI-Compliant System
(ISA) 0x00000185 (389)    Microsoft ACPI-Compliant System
(ISA) 0x00000186 (390)    Microsoft ACPI-Compliant System
(ISA) 0x00000187 (391)    Microsoft ACPI-Compliant System
(ISA) 0x00000188 (392)    Microsoft ACPI-Compliant System
(ISA) 0x00000189 (393)    Microsoft ACPI-Compliant System
(ISA) 0x0000018A (394)    Microsoft ACPI-Compliant System
(ISA) 0x0000018B (395)    Microsoft ACPI-Compliant System
(ISA) 0x0000018C (396)    Microsoft ACPI-Compliant System
(ISA) 0x0000018D (397)    Microsoft ACPI-Compliant System
(ISA) 0x0000018E (398)    Microsoft ACPI-Compliant System
(ISA) 0x0000018F (399)    Microsoft ACPI-Compliant System
(ISA) 0x00000190 (400)    Microsoft ACPI-Compliant System
(ISA) 0x00000191 (401)    Microsoft ACPI-Compliant System
(ISA) 0x00000192 (402)    Microsoft ACPI-Compliant System
(ISA) 0x00000193 (403)    Microsoft ACPI-Compliant System
(ISA) 0x00000194 (404)    Microsoft ACPI-Compliant System
(ISA) 0x00000195 (405)    Microsoft ACPI-Compliant System
(ISA) 0x00000196 (406)    Microsoft ACPI-Compliant System
(ISA) 0x00000197 (407)    Microsoft ACPI-Compliant System
(ISA) 0x00000198 (408)    Microsoft ACPI-Compliant System
(ISA) 0x00000199 (409)    Microsoft ACPI-Compliant System

(ISA) 0x0000019A (410)   Microsoft ACPI-Compliant System
(ISA) 0x0000019B (411)   Microsoft ACPI-Compliant System
(ISA) 0x0000019C (412)   Microsoft ACPI-Compliant System
(ISA) 0x0000019D (413)   Microsoft ACPI-Compliant System
(ISA) 0x0000019E (414)   Microsoft ACPI-Compliant System
(ISA) 0x0000019F (415)   Microsoft ACPI-Compliant System
(ISA) 0x000001A0 (416)   Microsoft ACPI-Compliant System
(ISA) 0x000001A1 (417)   Microsoft ACPI-Compliant System
(ISA) 0x000001A2 (418)   Microsoft ACPI-Compliant System
(ISA) 0x000001A3 (419)   Microsoft ACPI-Compliant System
(ISA) 0x000001A4 (420)   Microsoft ACPI-Compliant System
(ISA) 0x000001A5 (421)   Microsoft ACPI-Compliant System
(ISA) 0x000001A6 (422)   Microsoft ACPI-Compliant System
(ISA) 0x000001A7 (423)   Microsoft ACPI-Compliant System
(ISA) 0x000001A8 (424)   Microsoft ACPI-Compliant System
(ISA) 0x000001A9 (425)   Microsoft ACPI-Compliant System
(ISA) 0x000001AA (426)   Microsoft ACPI-Compliant System
(ISA) 0x000001AB (427)   Microsoft ACPI-Compliant System
(ISA) 0x000001AC (428)   Microsoft ACPI-Compliant System
(ISA) 0x000001AD (429)   Microsoft ACPI-Compliant System
(ISA) 0x000001AE (430)   Microsoft ACPI-Compliant System
(ISA) 0x000001AF (431)   Microsoft ACPI-Compliant System
(ISA) 0x000001B0 (432)   Microsoft ACPI-Compliant System
(ISA) 0x000001B1 (433)   Microsoft ACPI-Compliant System
(ISA) 0x000001B2 (434)   Microsoft ACPI-Compliant System
(ISA) 0x000001B3 (435)   Microsoft ACPI-Compliant System
(ISA) 0x000001B4 (436)   Microsoft ACPI-Compliant System
(ISA) 0x000001B5 (437)   Microsoft ACPI-Compliant System
(ISA) 0x000001B6 (438)   Microsoft ACPI-Compliant System
(ISA) 0x000001B7 (439)   Microsoft ACPI-Compliant System
(ISA) 0x000001B8 (440)   Microsoft ACPI-Compliant System
(ISA) 0x000001B9 (441)   Microsoft ACPI-Compliant System
(ISA) 0x000001BA (442)   Microsoft ACPI-Compliant System
(ISA) 0x000001BB (443)   Microsoft ACPI-Compliant System
(ISA) 0x000001BC (444)   Microsoft ACPI-Compliant System
(ISA) 0x000001BD (445)   Microsoft ACPI-Compliant System
(ISA) 0x000001BE (446)   Microsoft ACPI-Compliant System
(ISA) 0x000001BF (447)   Microsoft ACPI-Compliant System
(ISA) 0x000001C0 (448)   Microsoft ACPI-Compliant System
(ISA) 0x000001C1 (449)   Microsoft ACPI-Compliant System
(ISA) 0x000001C2 (450)   Microsoft ACPI-Compliant System
(ISA) 0x000001C3 (451)   Microsoft ACPI-Compliant System
(ISA) 0x000001C4 (452)   Microsoft ACPI-Compliant System
(ISA) 0x000001C5 (453)   Microsoft ACPI-Compliant System
(ISA) 0x000001C6 (454)   Microsoft ACPI-Compliant System
(ISA) 0x000001C7 (455)   Microsoft ACPI-Compliant System
(ISA) 0x000001C8 (456)   Microsoft ACPI-Compliant System
(ISA) 0x000001C9 (457)   Microsoft ACPI-Compliant System
(ISA) 0x000001CA (458)   Microsoft ACPI-Compliant System
(ISA) 0x000001CB (459)   Microsoft ACPI-Compliant System
(ISA) 0x000001CC (460)   Microsoft ACPI-Compliant System
(ISA) 0x000001CD (461)   Microsoft ACPI-Compliant System
(ISA) 0x000001CE (462)   Microsoft ACPI-Compliant System
(ISA) 0x000001CF (463)   Microsoft ACPI-Compliant System
(ISA) 0x000001D0 (464)   Microsoft ACPI-Compliant System
(ISA) 0x000001D1 (465)   Microsoft ACPI-Compliant System
(ISA) 0x000001D2 (466)   Microsoft ACPI-Compliant System
(ISA) 0x000001D3 (467)   Microsoft ACPI-Compliant System
(ISA) 0x000001D4 (468)   Microsoft ACPI-Compliant System
(ISA) 0x000001D5 (469)   Microsoft ACPI-Compliant System
(ISA) 0x000001D6 (470)   Microsoft ACPI-Compliant System
(ISA) 0x000001D7 (471)   Microsoft ACPI-Compliant System
(ISA) 0x000001D8 (472)   Microsoft ACPI-Compliant System
(ISA) 0x000001D9 (473)   Microsoft ACPI-Compliant System
(ISA) 0x000001DA (474)   Microsoft ACPI-Compliant System
(ISA) 0x000001DB (475)   Microsoft ACPI-Compliant System
(ISA) 0x000001DC (476)   Microsoft ACPI-Compliant System
(ISA) 0x000001DD (477)   Microsoft ACPI-Compliant System

| | | |
|---|---|---|
| (ISA) 0x000001DE (478) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001DF (479) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E0 (480) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E1 (481) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E2 (482) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E3 (483) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E4 (484) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E5 (485) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E6 (486) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E7 (487) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E8 (488) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001E9 (489) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001EA (490) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001EB (491) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001EC (492) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001ED (493) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001EE (494) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001EF (495) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F0 (496) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F1 (497) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F2 (498) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F3 (499) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F4 (500) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F5 (501) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F6 (502) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F7 (503) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F8 (504) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001F9 (505) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001FA (506) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001FB (507) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001FC (508) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001FD (509) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001FE (510) | Microsoft ACPI-Compliant System |
| (ISA) 0x000001FF (511) | Microsoft ACPI-Compliant System |
| (PCI) 0x00000005 (05) | Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series Platform Control |
| (PCI) 0x00000010 (16) | Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series PCI Express - Roc |
| (PCI) 0x00000011 (17) | Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series PCI Express - Roc |
| (PCI) 0x00000012 (18) | Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series PCI Express - Roc |
| (PCI) 0x00000013 (19) | Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series AHCI - 0F23 |
| (PCI) 0x00000013 (19) | Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series PCI Express - Roc |
| (PCI) 0x00000016 (22) | High Definition Audio Controller |
| (PCI) 0x00000017 (23) | Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series EHCI USB - 0F34 |
| (PCI) 0xFFFFFFF1 (-15) | Intel(R) Trusted Execution Engine Interface |
| (PCI) 0xFFFFFFF2 (-14) | Intel(R) HD Graphics |
| (PCI) 0xFFFFFFF3 (-13) | Intel(R) I210 Gigabit Network Connection #2 |
| (PCI) 0xFFFFFFF4 (-12) | Intel(R) I210 Gigabit Network Connection #2 |
| (PCI) 0xFFFFFFF5 (-11) | Intel(R) I210 Gigabit Network Connection #2 |
| (PCI) 0xFFFFFFF6 (-10) | Intel(R) I210 Gigabit Network Connection #2 |
| (PCI) 0xFFFFFFF7 (-9) | Intel(R) I210 Gigabit Network Connection #2 |
| (PCI) 0xFFFFFFF8 (-8) | Intel(R) I210 Gigabit Network Connection #2 |
| (PCI) 0xFFFFFFF9 (-7) | Intel(R) I210 Gigabit Network Connection |
| (PCI) 0xFFFFFFFA (-6) | Intel(R) I210 Gigabit Network Connection |
| (PCI) 0xFFFFFFFB (-5) | Intel(R) I210 Gigabit Network Connection |
| (PCI) 0xFFFFFFFC (-4) | Intel(R) I210 Gigabit Network Connection |
| (PCI) 0xFFFFFFFD (-3) | Intel(R) I210 Gigabit Network Connection |
| (PCI) 0xFFFFFFFE (-2) | Intel(R) I210 Gigabit Network Connection |

## 3.6 Memory Map

The memory mapping list is shown as follows:

```
Memory
    [000A0000 - 000BFFFF]  Intel(R) HD Graphics
    [000A0000 - 000BFFFF]  PCI Express Root Complex
    [000C0000 - 000DFFFF]  PCI Express Root Complex
    [000E0000 - 000FFFFF]  PCI Express Root Complex
    [C0000000 - CFFFFFFF]  Intel(R) HD Graphics
    [C0000000 - FFFFFFFF]  PCI Express Root Complex
    [D0000000 - D03FFFFF]  Intel(R) HD Graphics
    [D0400000 - D04FFFFF]  Intel(R) Trusted Execution Engine Interface
    [D0500000 - D05FFFFF]  Intel(R) Trusted Execution Engine Interface
    [D0600000 - D06FFFFF]  Intel(R) I210 Gigabit Network Connection
    [D0600000 - D07FFFFF]  Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series PCI Express - Root
    [D0700000 - D0703FFF]  Intel(R) I210 Gigabit Network Connection
    [D0800000 - D08FFFFF]  Intel(R) I210 Gigabit Network Connection #2
    [D0800000 - D09FFFFF]  Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series PCI Express - Root
    [D0900000 - D0903FFF]  Intel(R) I210 Gigabit Network Connection #2
    [D0A00000 - D0A03FFF]  High Definition Audio Controller
    [D0A04000 - D0A0401F]  Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series Platform Control
    [D0A05000 - D0A053FF]  Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series EHCI USB - 0F34
    [D0A06000 - D0A067FF]  Intel(R) Pentium(R) processor N- and J-series / Intel(R) Celeron(R) processor N- and J-series AHCI - 0F23
    [E0000000 - EFFFFFFF]  Motherboard resources
    [FED00000 - FED003FF]  High precision event timer
    [FED01000 - FED01FFF]  Motherboard resources
    [FED03000 - FED03FFF]  Motherboard resources
    [FED04000 - FED04FFF]  Motherboard resources
    [FED08000 - FED08FFF]  Motherboard resources
    [FED1C000 - FED1CFFF]  Motherboard resources
    [FED40000 - FED44FFF]  Trusted Platform Module 1.2
    [FEE00000 - FEEFFFFF]  Motherboard resources
    [FEF00000 - FEFFFFFF]  Motherboard resources
    [FF000000 - FFFFFFFF]  Intel(R) 82802 Firmware Hub Device
```

# Chapter 4
# AMI BIOS Setup Utility

The AMI UEFI BIOS provides users with a built-in setup program to modify basic system configuration. All configured parameters are stored in a flash chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about how to set up basic system configuration through the AMI BIOS setup utility.

## 4.1     Starting

To enter the setup screens, follow the steps below:

1.    Turn on the computer and press the <Del> key immediately.
2.    After you press the <Del> key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Advanced and Chipset menus.

> **Note**
> *If your computer cannot boot after making and saving system changes with BIOS setup, you can restore BIOS optimal defaults by setting JP4 (see section 2.3.3).*

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

## 4.2     Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

> **Note**
> *Some of the navigation keys differ from one screen to another.*

| Hot Keys | Description |
|---|---|
| →← Left/Right | The Left and Right <Arrow> keys allow you to select a setup screen. |
| ↑↓ Up/Down | The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen. |
| +– Plus/Minus | The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item. |
| Tab | The <Tab> key allows you to select setup fields. |
| F1 | The <F1> key allows you to display the General Help screen. |
| F2 | The <F2> key allows you to Load Previous Values. |
| F3 | The <F3> key allows you to Load Optimized Defaults. |
| F4 | The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes. |
| Esc | The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes. |
| Enter | The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens. |

## 4.3    Main Menu

When you first enter the setup utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. System Time/Date can be set up as described below. The Main BIOS setup screen is shown below.

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

    BIOS Information                                        Choose the system default
    BIOS Version                 CAPA848 X002               language.
    Build Date                   07/20/2015

    System Language              [English]


    System Date                  [Sun 01/01/2012]
    System Time                  [04:03:25]

    Access Level                 Administrator

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


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```

- **BIOS Information**
  Display the BIOS information.

- **System Language**
  Choose the system default language.

- **System Date/Time**
  Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

- **Access Level**
  Display the access level of current user.

## 4.4    Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

> ►    ACPI Settings
> ►    NCT6106D Super IO Configuration
> ►    NCT6106D HW Monitor
> ►    CPU Configuration
> ►    IDE Configuration
> ►    USB Configuration

For items marked with "►", please press <Enter> for more options.

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

  ▶ ACPI Settings                                        System ACPI Parameters.
  ▶ NCT6106D Super IO Configuration
  ▶ NCT6106D HW Monitor
  ▶ CPU Configuration
  ▶ IDE Configuration
  ▶ USB Configuration




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


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```

● **ACPI Settings**
   You can use this screen to select options for the ACPI configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

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

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


                         ┌──────── ACPI Sleep State ────────┐
                         │ Suspend Disabled                 │
                         │ S3 (Suspend to RAM)              │
                         │                                  │
                         └──────────────────────────────────┘
                                                        ←→: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit



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```
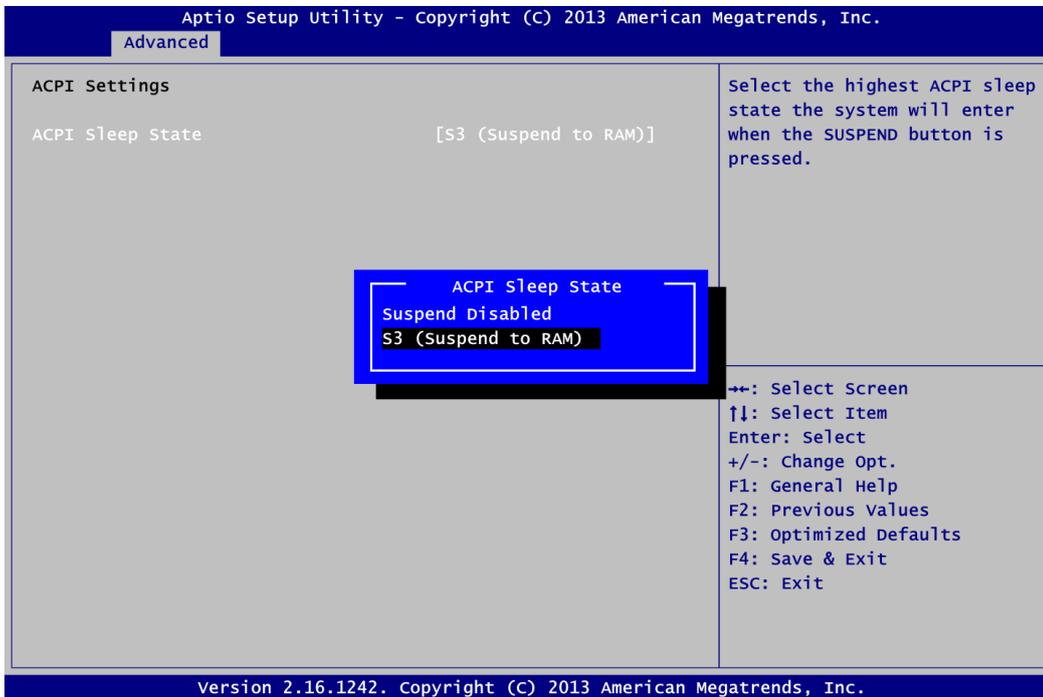
**ACPI Sleep State**
Select the ACPI (Advanced Configuration and Power Interface) sleep state. Configuration options are Suspend Disabled and S3 (Suspend to RAM). The default setting is S3 (Suspend to RAM); this option selects ACPI sleep state the system will enter when suspend button is pressed.

● **NCT6106D Super IO Configuration**
You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "►", please press <Enter> for more options.

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

  NCT6106D Super IO Configuration                            Set Parameters of Serial Port
                                                             1 (COM1)
   Super IO Chip                        NCT6106D
 ►Serial Port 1 (COM1)
 ►Serial Port 2 (COM2)
 ►Serial Port 3 (COM3)
 ►Serial Port 4 (COM4)



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



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```

**Serial Port 1~4 (COM1~4)**
Use these items to set parameters related to serial port 1~4.

- **Serial Port 1 (COM1)**

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

  Serial Port 1 (COM1)                                  Enable or Disable Serial Port
                                                        (COM)
  Serial Port                    [Enabled]
  Device Settings                IO=3F8h; IRQ=4;

  COM Port Type                  [RS232]

                          ┌──── Serial Port ────┐
                          │ Disabled             │
                          │ Enabled              │
                          └──────────────────────┘
                                                        →←: Select Screen
                                                        ↑↓: Select Item
                                                        Enter: Select
                                                        +/-: Change Opt.
                                                        F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit

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```

**Serial Port**
Enable or disable serial port 1. The optimal setting for base I/O address is 3F8h and for interrupt request address is IRQ4.

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

  Serial Port 1 (COM1)                                  COM Port Type: RS232, RS422,
                                                        RS485
  Serial Port                    [Enabled]
  Device Settings                IO=3F8h; IRQ=4;

  COM Port Type                  [RS232]

                          ┌──── COM Port Type ────┐
                          │ RS232                  │
                          │ RS422                  │
                          │ RS485                  │
                          └────────────────────────┘
                                                        →←: 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.
```

**COM Port Type**
Use this item to set RS-232/RS-422/RS-485 mode.

● **NCT6106D HW Monitor**
  This screen monitors hardware health status.

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

  Pc Health Status

  System temperature                  : +31.0 C
  CPU temperature                     : +41.0 C
  CPU Fan Speed                       : N/A
  VCORE                               : +0.776 V
  +3.3V                               : +3.276 V
  +12V                                : +12.000 V
  +5V                                 : +5.120 V

                                                    →←: 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.
```

This screen displays the temperature of system and CPU, cooling fan speed in RPM and system voltages (VCORE, +3.3V, +12V and +5V).

● **CPU Configuration**
   This screen shows the CPU Configuration.

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

   CPU Configuration                                          Socket specific CPU
                                                              Information.
  ▶ Socket 0 CPU Information

   CPU Speed                       1584 MHz
   64-bit                          Supported

   Intel Virtualization Technology    [Enabled]

                                                              →←: 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.
```

**Socket 0 CPU Information**
This item is for CPU information.

● **Socket 0 CPU Information**

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

  Socket 0 CPU Information

  Intel(R) Celeron(R) CPU N2807  @ 1.58GHz
  CPU Signature                  30678
  Microcode Patch                815
  Max CPU Speed                  1580 MHz
  Min CPU Speed                  500 MHz
  Processor Cores                2
  Intel HT Technology            Not Supported
  Intel VT-x Technology          Supported

  L1 Data Cache                  24 kB x 4
  L1 Code Cache                  32 kB x 4                 →←: Select Screen
  L2 Cache                       1024 kB x 2               ↑↓: Select Item
  L3 Cache                       Not Present               Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit



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```

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

  CPU Configuration                                        When enabled, a VMM can
                                                           utilize the additional
  ► Socket 0 CPU Information                               hardware capabilities provided
                                                           by Vanderpool Technology
  CPU Speed                      1584 MHz
  64-bit                         Supported

  Intel Virtualization Technology     [Enabled]

              ┌─── Intel Virtualization Technology ───┐
              │ Disabled                              │
              │ Enabled                               │
              │                                       │    →←: 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.
```
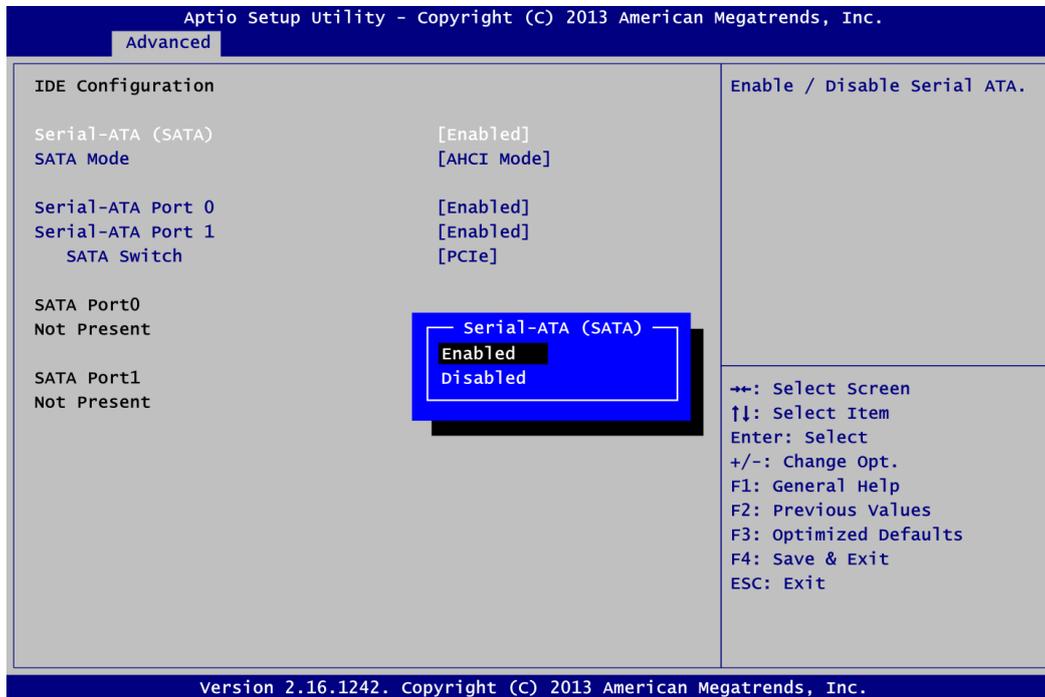
**Intel Virtualization Technology**
Enable or disable Intel Virtualization Technology. When enabled, a VMM (Virtual Machine Mode) can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a computer system to work as several virtual systems.

● **IDE Configuration**
In the IDE Configuration menu, you can see the currently installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.

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

  IDE Configuration                                   Enable / Disable Serial ATA.

  Serial-ATA (SATA)              [Enabled]
  SATA Mode                      [AHCI Mode]

  Serial-ATA Port 0             [Enabled]
  Serial-ATA Port 1             [Enabled]
     SATA Switch                [PCIe]

  SATA Port0
  Not Present               ┌─── Serial-ATA (SATA) ───┐
                            │ Enabled                  │
  SATA Port1                │ Disabled                 │     →←: 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.
```

**Serial-ATA (SATA)**
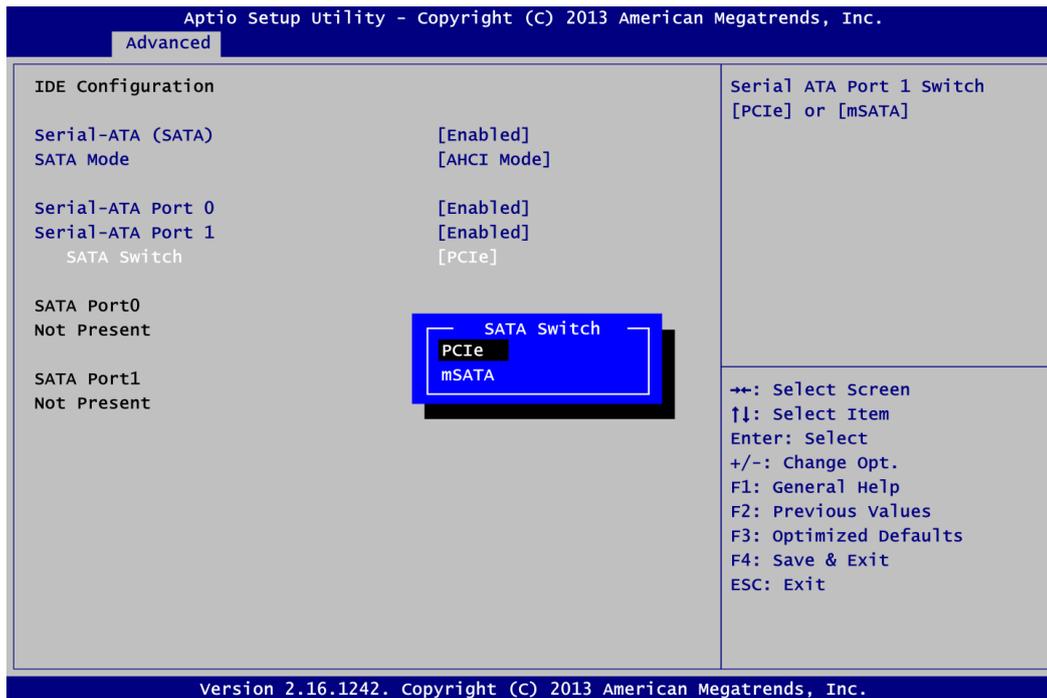Enable or disable the SATA Controller feature. The default is Enabled.

**SATA Mode**
Determine how SATA controller(s) operate. Operation mode options are IDE Mode and AHCI (Advanced Host Controller Interface) Mode. The default is AHCI Mode.

**Serial-ATA Port 0**
When SATA1 (see section 2.4.14) is intended to install a device, please enable the Serial-ATA port 0.
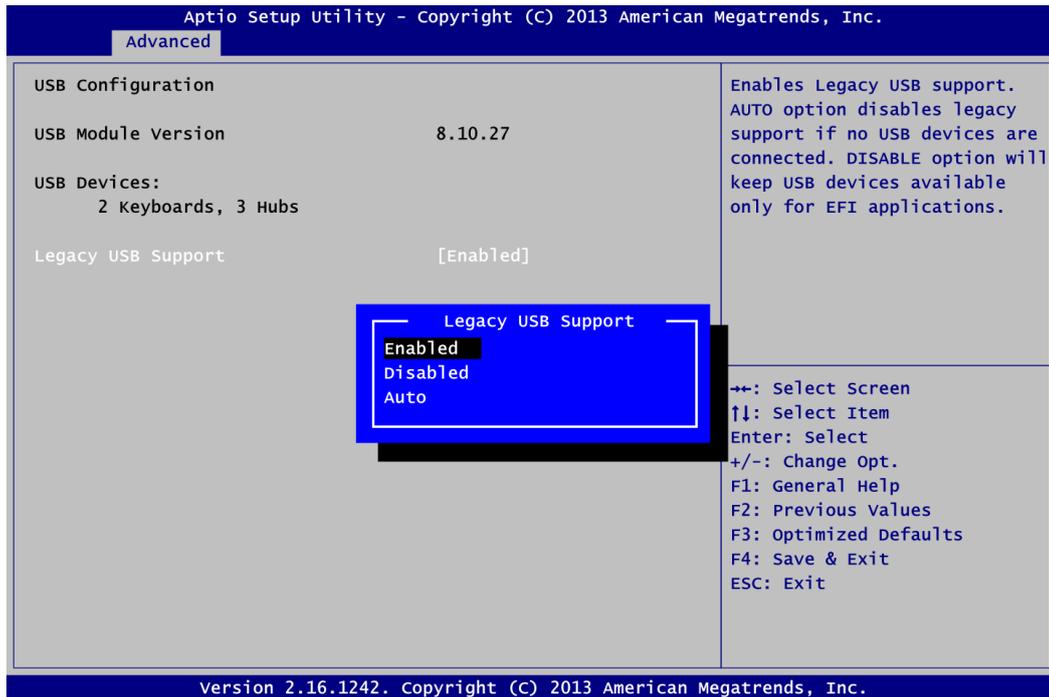
**Serial-ATA Port 1**
Enable or disable the onboard SATA port 1.

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

   IDE Configuration                                      Serial ATA Port 1 Switch
                                                          [PCIe] or [mSATA]
   Serial-ATA (SATA)             [Enabled]
   SATA Mode                     [AHCI Mode]

   Serial-ATA Port 0             [Enabled]
   Serial-ATA Port 1             [Enabled]
      SATA Switch                [PCIe]

   SATA Port0
   Not Present                ┌──────── SATA Switch ────────┐
                              │ PCIe                        │
   SATA Port1                 │ mSATA                       │
   Not Present                └─────────────────────────────┘
                                                          →←: 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.
```

**SATA Switch**
This option appears only after SATA Port 1 is enabled. The default is PCIe. If you intend to insert mSATA card to SCN2 (see section 2.4.21), please change setting to mSATA.

● **USB Configuration**

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

   USB Configuration                                             Enables Legacy USB support.
                                                                 AUTO option disables legacy
   USB Module Version                 8.10.27                    support if no USB devices are
                                                                 connected. DISABLE option will
   USB Devices:                                                  keep USB devices available
         2 Keyboards, 3 Hubs                                     only for EFI applications.

   Legacy USB Support                 [Enabled]

                         ┌──────    Legacy USB Support    ──────┐
                         │ Enabled                              │
                         │ Disabled                             │     →←: Select Screen
                         │ Auto                                 │     ↑↓: 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.
```

**USB Devices**
Display all detected USB devices.

**Legacy USB Support**
Use this item to enable or disable support for USB device on legacy operating system. The default setting is Enabled. Auto option disables legacy support if no USB devices are connected. Disable option will keep USB devices available only for EFI applications.

## 4.5 Chipset Menu

The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

 ► North Bridge
 ► South Bridge

For items marked with "►", please press <Enter> for more options.

```
           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.
```
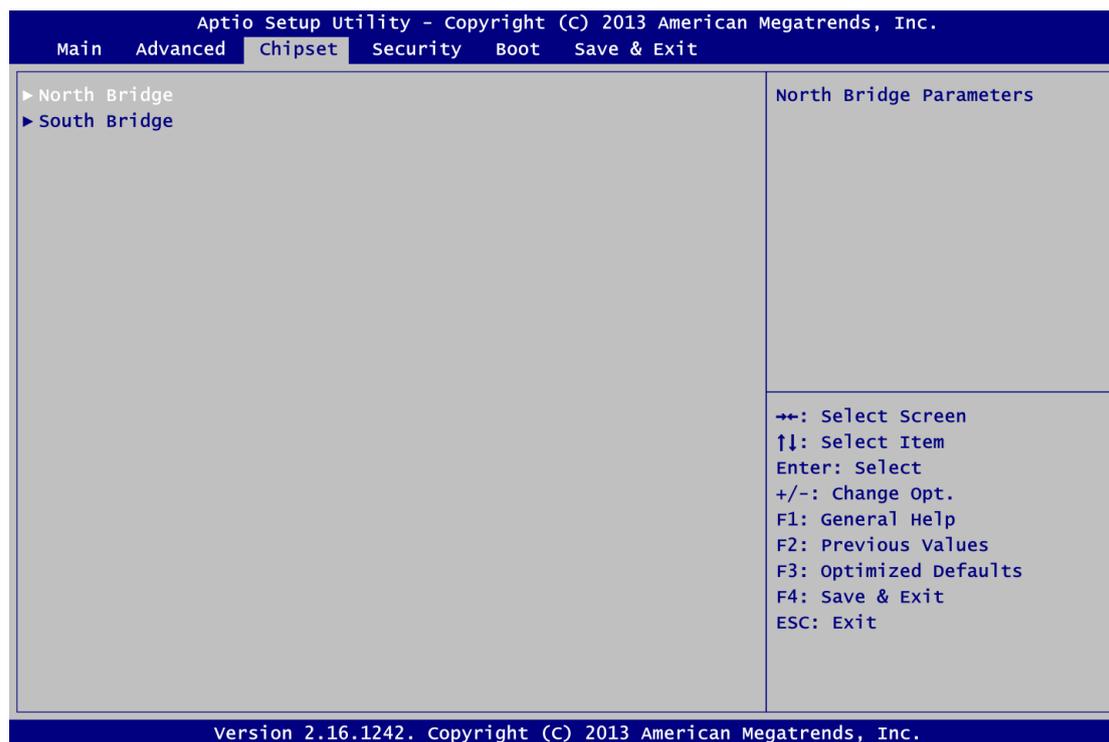
● **North Bridge**
  This screen shows system memory information and allows users to configure parameters of North Bridge chipset.

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

  IGD - LCD Control                                        Select LCD panel used by DP
                                                           Device by selecting the
  LVDS Panel Type                    [1024x768    24Bit]   appropriate setup item.
                          ┌──────── LVDS Panel Type ───────┐
  Memory Information      │ 800x600      18Bit             │
                         │ 1024x768     18Bit             │
  Total Memory           │ 1024x768     24Bit             │
  Memory Slot0           │ 1280x768     18Bit             │
                         │ 1280x800     18Bit             │
                         │ 1280x960     18Bit             │
                         │ 1280x1024    48Bit             │
                         │ 1366x768     18Bit             │
                         │ 1366x768     24Bit             │→←: Select Screen
                         │ 1440x900     48Bit             │↑↓: Select Item
                         │ 1440x1050    48Bit             │Enter: Select
                         │ 1600x900     48Bit             │+/-: Change Opt.
                         │ 1680x1050    48Bit             │F1: General Help
                         │ 1600x1200    48Bit             │F2: Previous Values
                         │ 1920x1080    48Bit             │F3: Optimized Defaults
                         │ 1920x1200    48Bit             │F4: Save & Exit
                         └────────────────────────────────┘ESC: Exit


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

**LVDS Panel Type**
Select LVDS panel resolution.

● **South Bridge**
This screen allows users to configure parameters of South Bridge chipset.

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

    Audio Controller                    [Enabled]              Control Detection of the
                                                               Azalia Device.   Disabled =
                                                               Azalia will be unconditionally
                                                               disabled.  Enabled = Azalia
                                                               will be unconditionally
                                                               Enabled.


                        ┌──── Audio Controller ────┐
                        │ Disabled                 │
                        │ Enabled                  │
                        └──────────────────────────┘
                                                               →←: 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.
```

**Audio Controller**
Control detection of the HD Audio device.
- Disabled: Audio device will be unconditionally disabled.
- Enabled: Audio device will be unconditionally enabled.

## 4.6 Security Menu

The Security menu allows users to change the security settings for the system.

```
                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
   is a power on password and must be entered to
   boot or enter Setup. In Setup the User will
   have Administrator rights.
   The password length must be
   in the following range:
   Minimum length                    3
   Maximum length                    20          →←: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
   Administrator Password                        +/-: Change Opt.
   User Password                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit


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

●   **Administrator Password**
    This item indicates whether an administrator password has been set (installed or uninstalled).

●   **User Password**
    This item indicates whether an user password has been set (installed or uninstalled).

## 4.7    Boot Menu

The Boot menu allows users to change boot options of the system.

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

  Boot Configuration                                       Number of seconds to wait for
  Setup Prompt Timeout            1                        setup activation key.
  Bootup Numlock State            [On]                     65535(0xFFFF) means indefinite
                                                           waiting.
  Quiet Boot                      [Disabled]
  Legacy PXE OpROM                [Disabled]


  Boot Option Priorities
  Boot Option #1                  [UEFI: Built-in EFI ...]

                                                           →←: 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.
```

- **Setup Prompt Timeout**
  Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.

- **Bootup NumLock State**
  Use this item to select the power-on state for the keyboard NumLock.

- **Quiet Boot**
  Select to display either POST output messages or a splash screen during boot-up.

- **Launch PXE OpROM**
  Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

- **Boot Option Priorities [Boot Option #1, …]**
  These are settings for boot priority. Specify the boot device priority sequence from the available devices.

# 4.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or fail-safe default values.

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

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

    Save Options
    Save Changes
    Discard Changes

    Restore Defaults
    Save as User Defaults
    Restore User Defaults
                                                        →←: Select Screen
    Boot Override                                       ↑↓: Select Item
    UEFI: Built-in EFI Shell                            Enter: Select
                                                        +/-: Change Opt.
    Launch EFI Shell from filesystem device             F1: General Help
                                                        F2: Previous Values
                                                        F3: Optimized Defaults
                                                        F4: Save & Exit
                                                        ESC: Exit


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

● **Save Changes and Exit**
  When you have completed the system configuration changes, select this option to leave Setup and return to Main Menu. Select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit.

● **Discard Changes and Exit**
  Select this option to quit Setup without making any permanent changes to the system configuration and return to Main Menu. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit.

● **Save Changes and Reset**
  When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

● **Discard Changes and Reset**
  Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

● **Save Changes**
  When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

- **Discard Changes**
  Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

- **Restore Defaults**
  It automatically sets all Setup options to a complete set of default settings when you select this option. Select Restore Defaults from the Save & Exit menu and press <Enter>.

- **Save as User Defaults**
  Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

- **Restore User Defaults**
  It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

- **Boot Override**
  Select a drive to immediately boot that device regardless of the current boot order.

- **Launch EFI Shell from filesystem device**
  Attempt to launch EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

# Chapter 5
# Drivers Installation

The device drivers are located on the product information CD that comes with the CAPA848 Series package. The auto-run function of drivers will guide you to install the utilities and device drivers under Windows® system. You can follow the onscreen instructions to install these devices:

● Chipset
● Graphics
● Ethernet
● Audio
● Trusted Execution Engine for Windows® 8
● Sideband Fabric Device for Windows® 8

## 5.1    Installing Chipset Driver

1.    Run setup program from driver directory in product information CD. Click "Next" to next step.

2.    When the following License Agreement screen appears, please click "Yes" to next step.



3.    A Readme File Information screen appears to show you the system requirements and installation information. Click "Next" to next step.
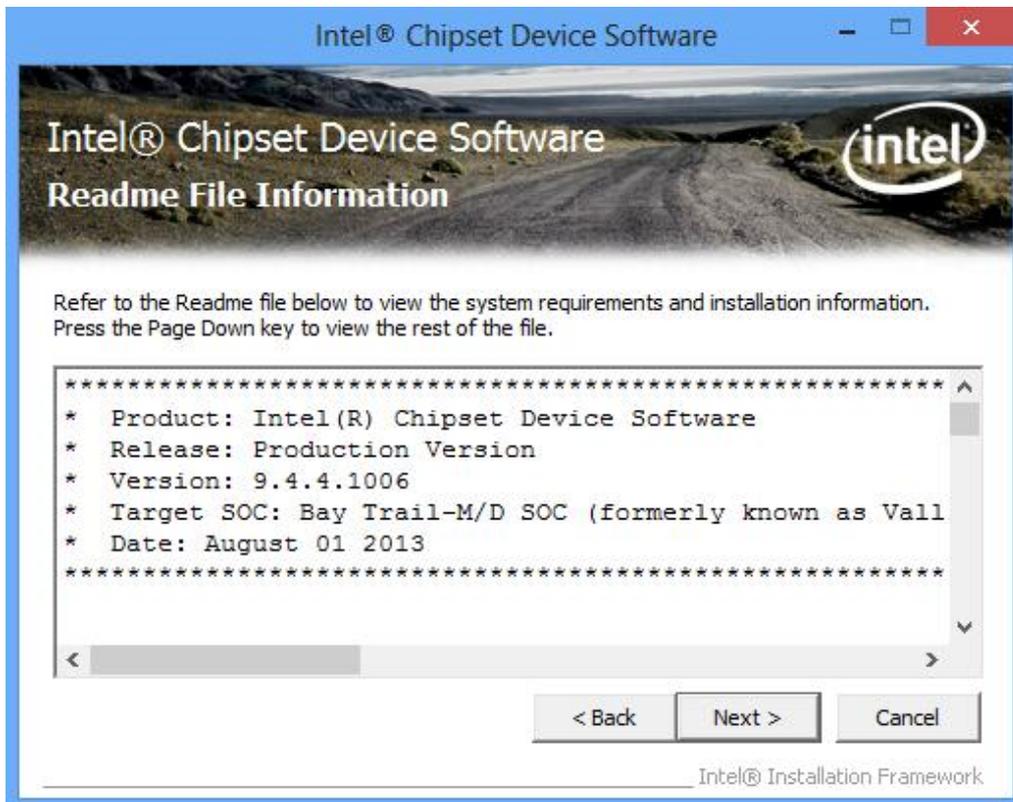
4.   Please wait while setup processes the following operations.
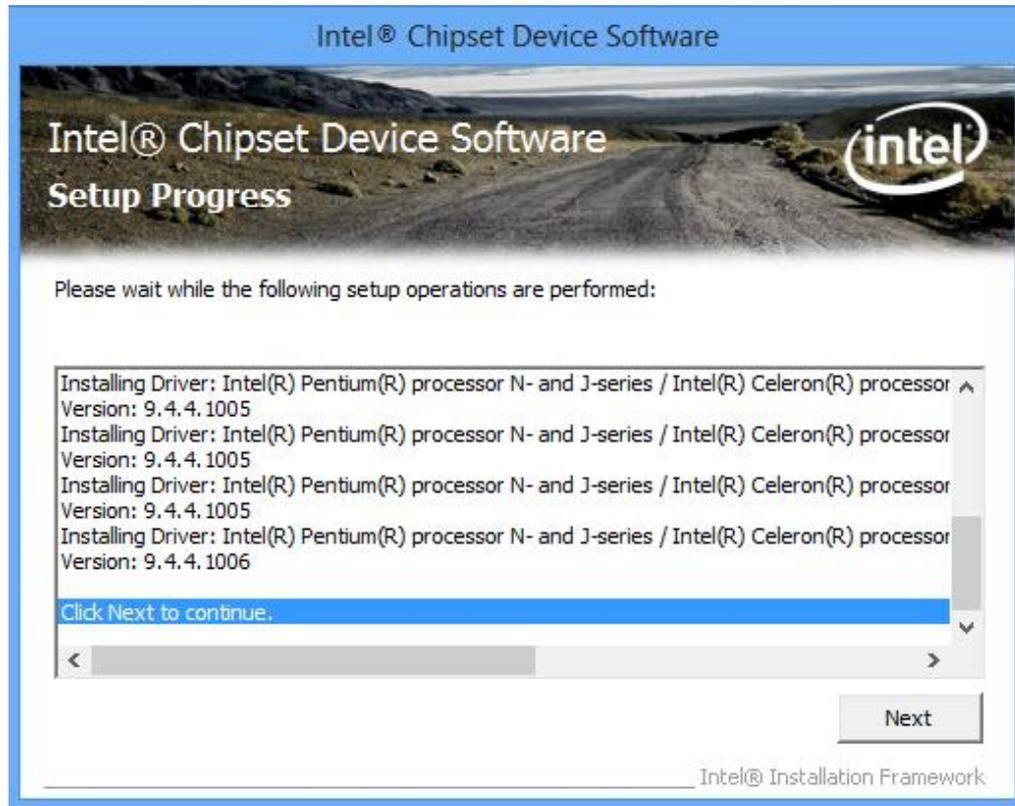


5.   You are suggested to select "Yes, I want to restart this computer now". Click "Finish" to complete the setup process and reboot.

## 5.2    Installing Graphics Driver

1.    Run setup program from driver directory in product information CD. Click "Next" to start the installation.
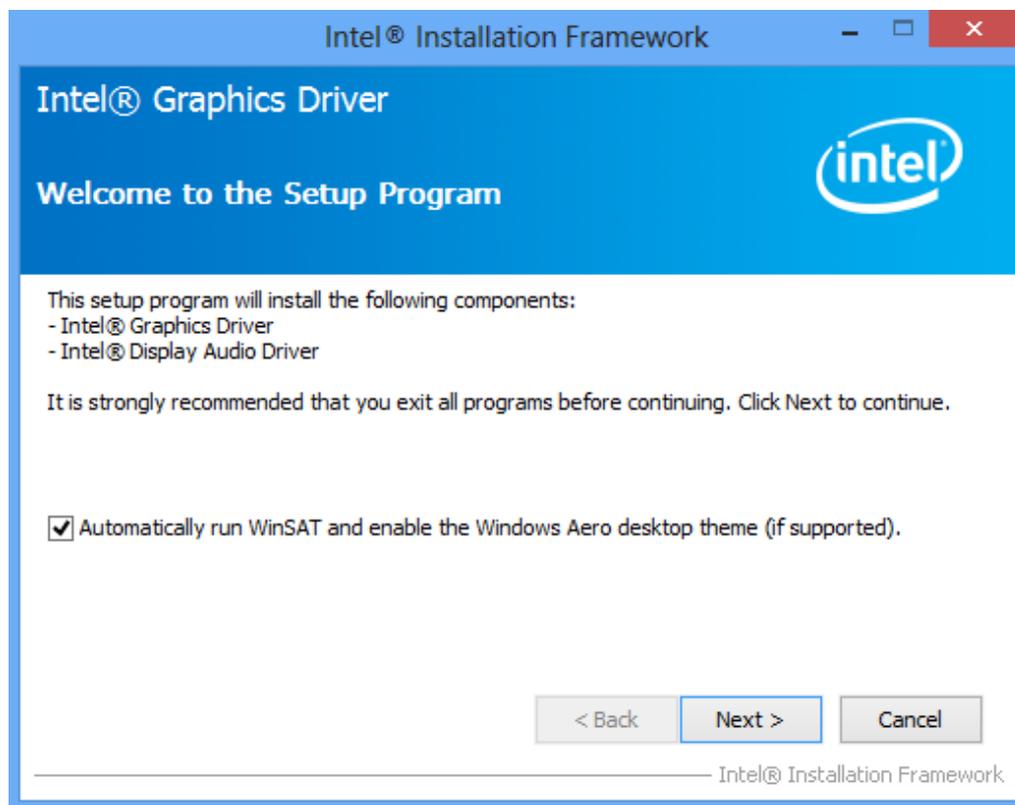
2.  When Intel® License Agreement screen appears, please click "Yes" to next step.
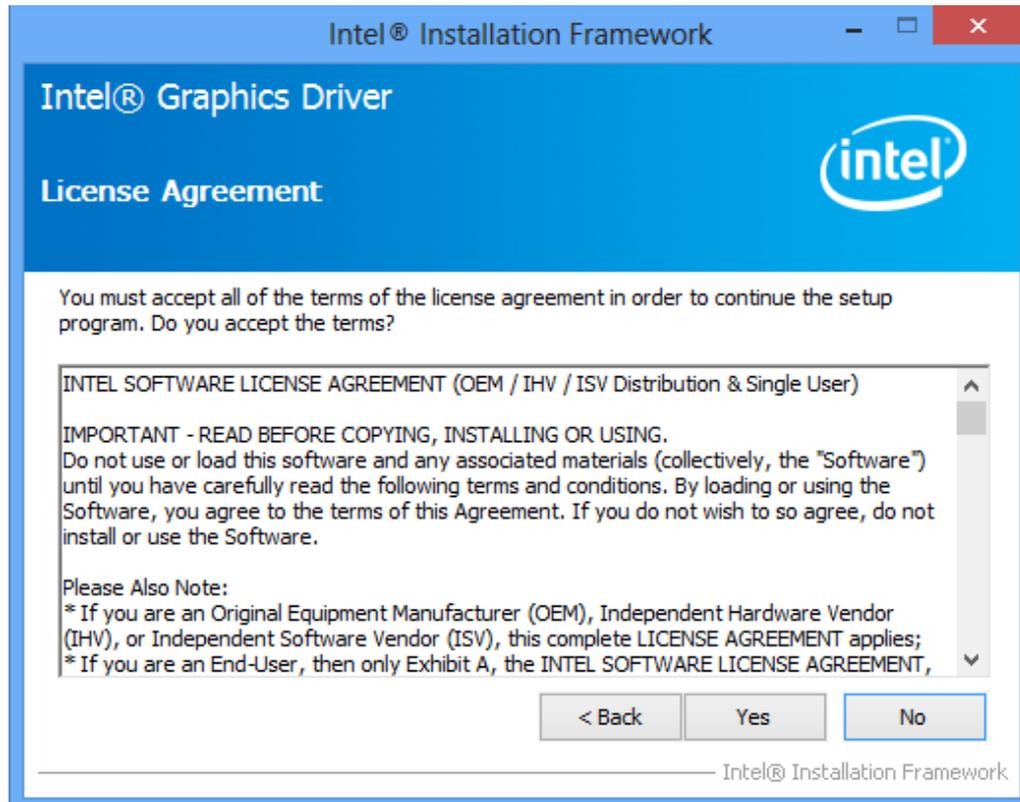


3.  A Readme File Information screen appears to show you the system requirements and installation information. Click "Next" to next step.
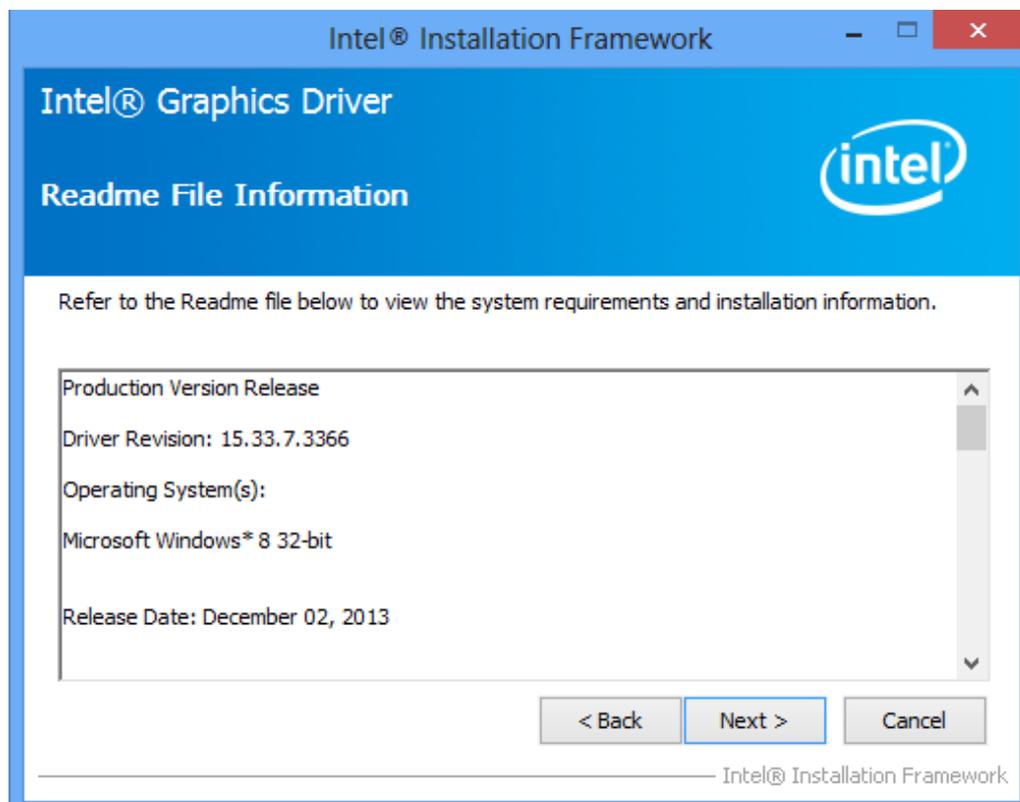
4. Please wait while setup processes the following operations.
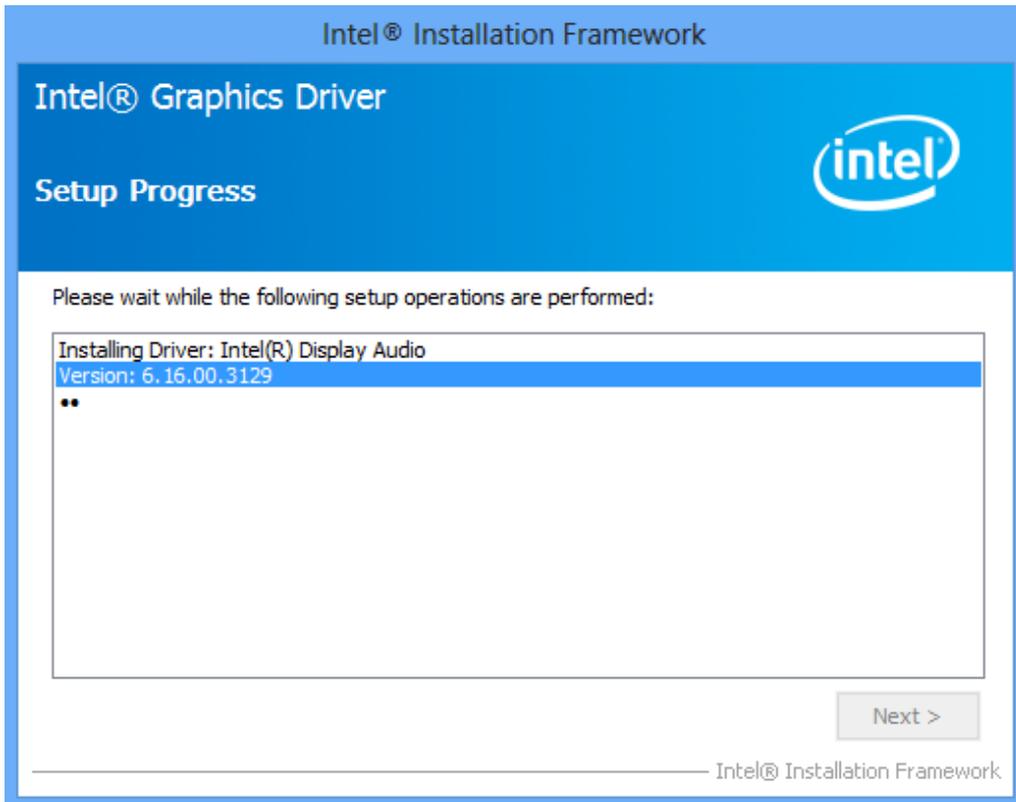


5. When the following screen appears, please click "Next".
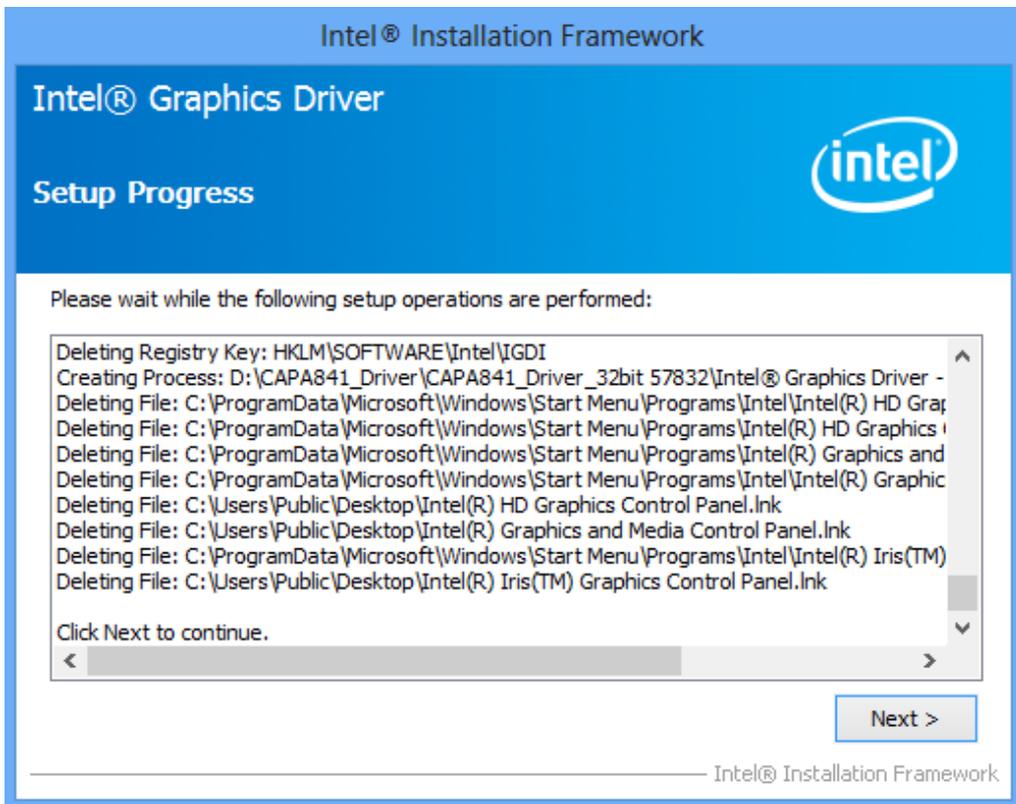
6.  You are suggested to select "Yes, I want to restart this computer now". Click "Finish" to complete the setup process and reboot.
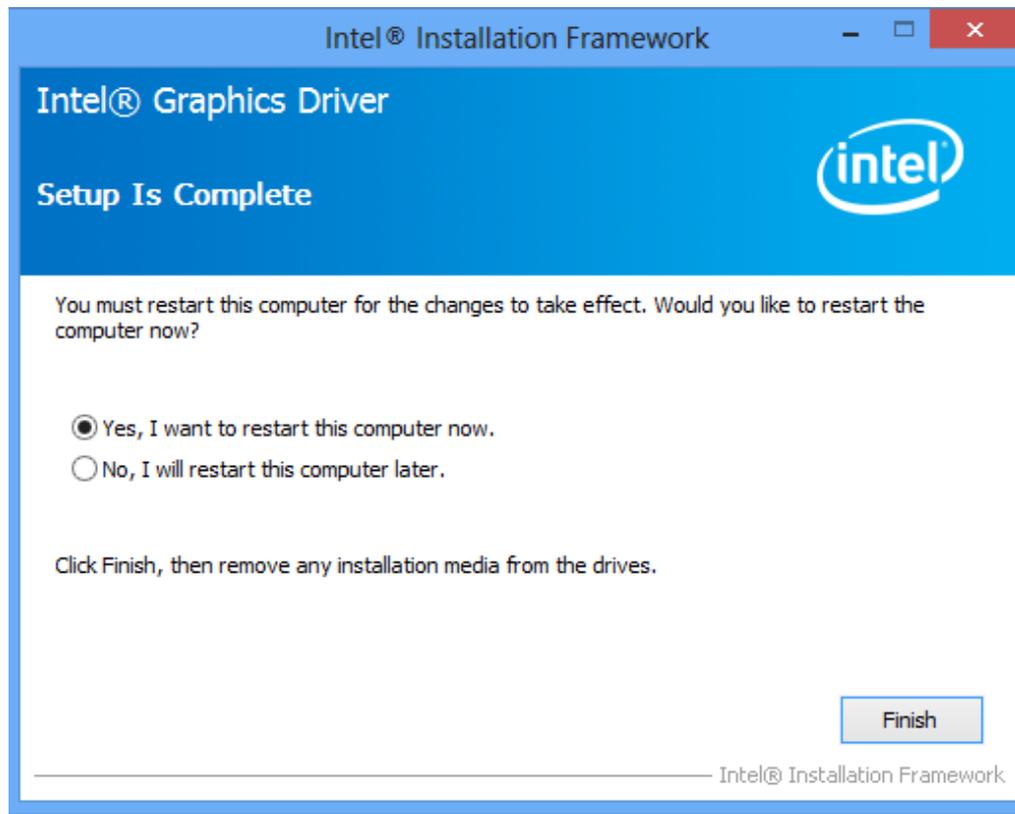
## 5.3　　　Installing Ethernet Driver

1.　Run setup program from driver directory in product information CD. When the following screen appears, please wait while setup prepares the install wizard.
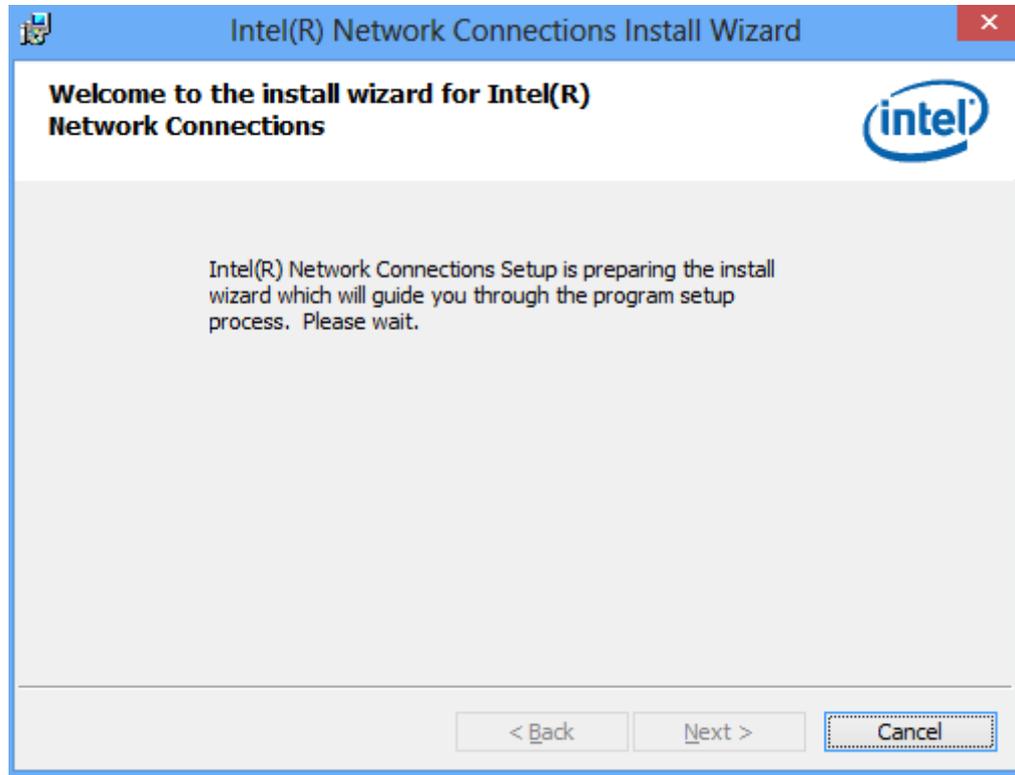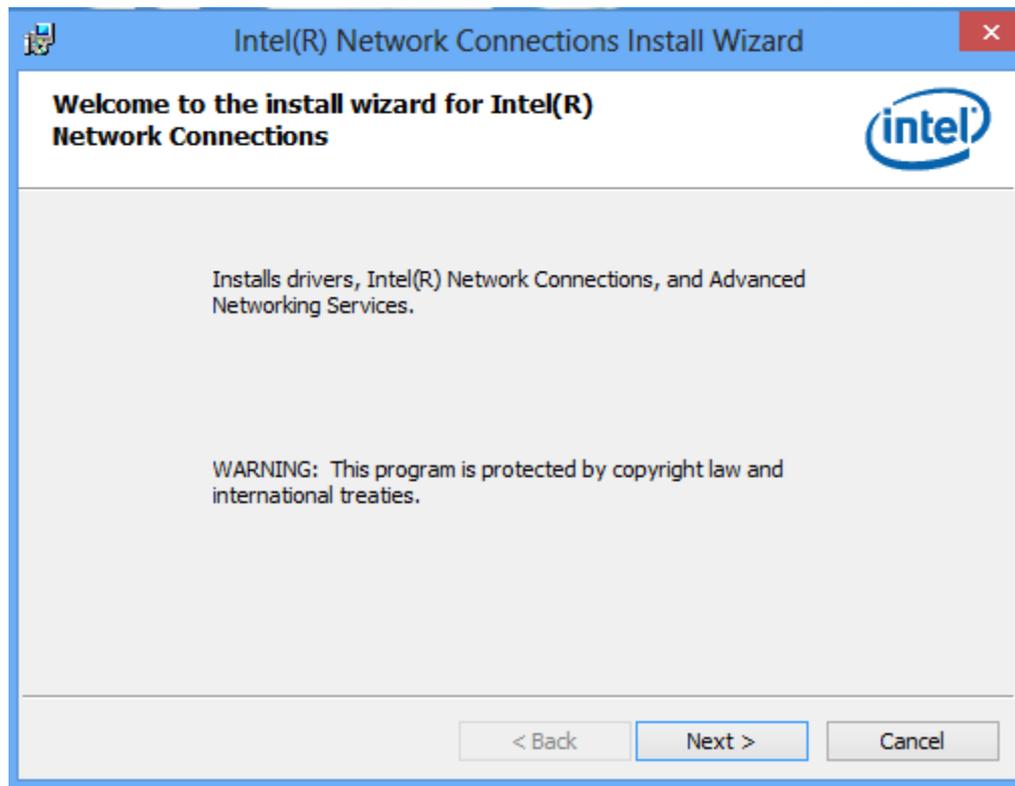
2.  Click "Next" to continue.



3.  When Intel® License Agreement screen appears, read it carefully. You are suggested to select "I accept the terms in the license agreement". Click "Next" to continue.

4.  When the following screen appears, please select the program features you want to install. Click "Next" to continue.
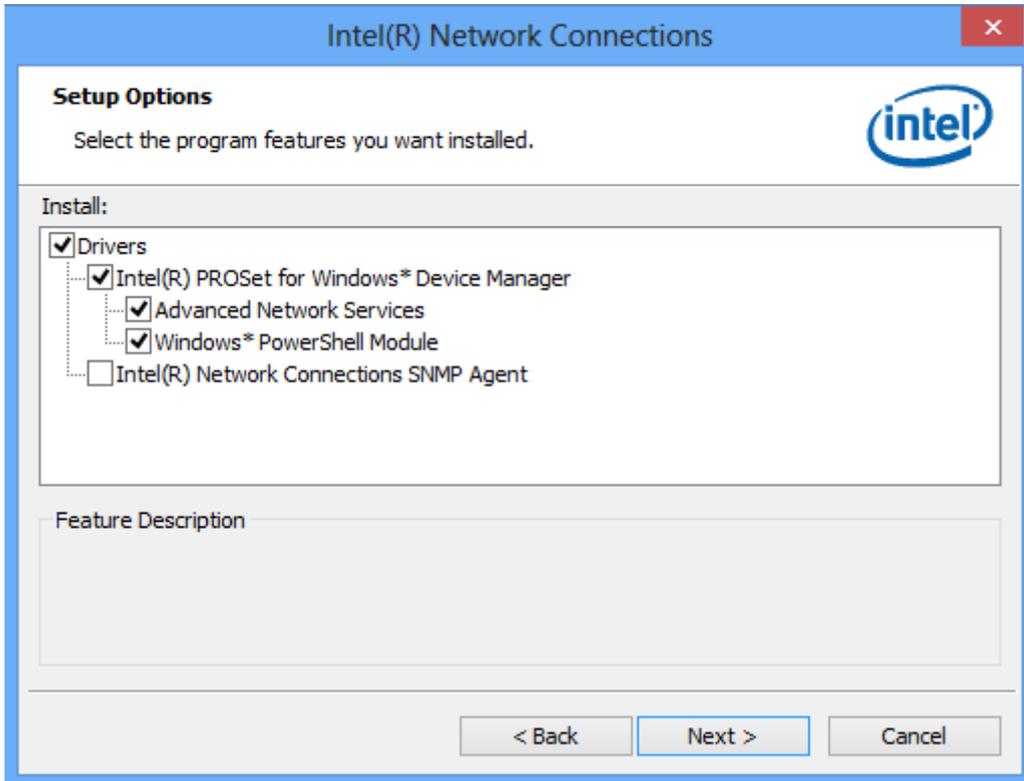


5.  Now install wizard is ready. Click "Install" to begin installation.
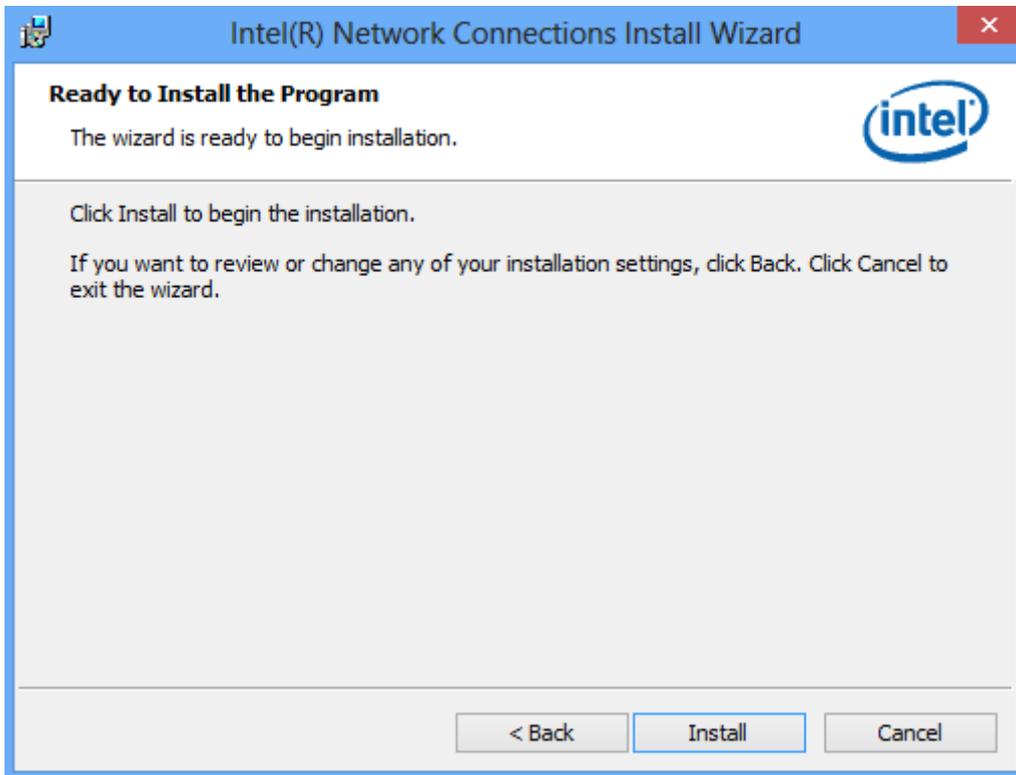
6.    Please wait while setup processes the following operations.
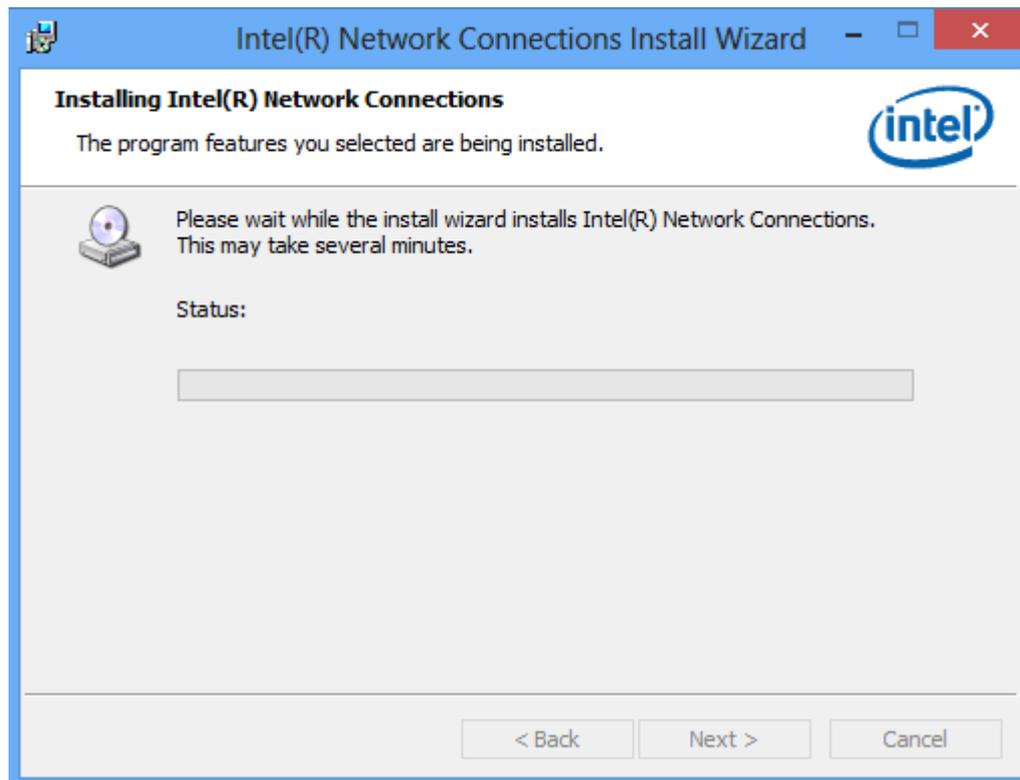


7.    When driver installation is complete, the following screen appears. Click "Finish" to exit.
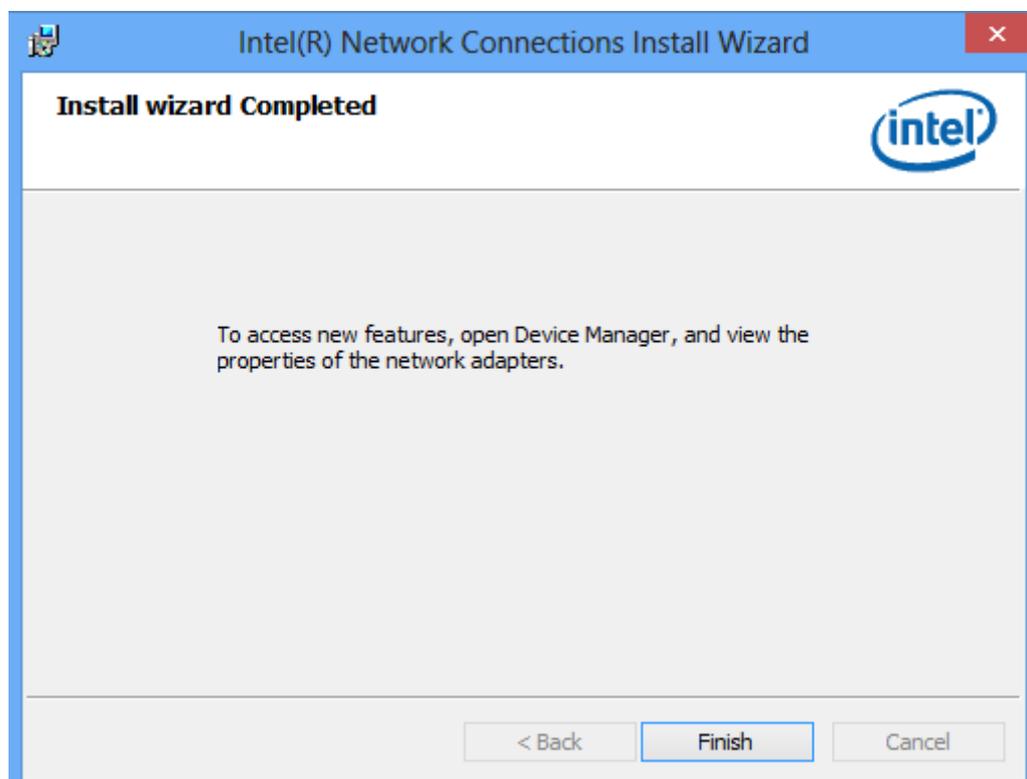
## 5.4 Installing Audio Driver

1. Run setup program from driver directory in product information CD. Click "Next" to continue.
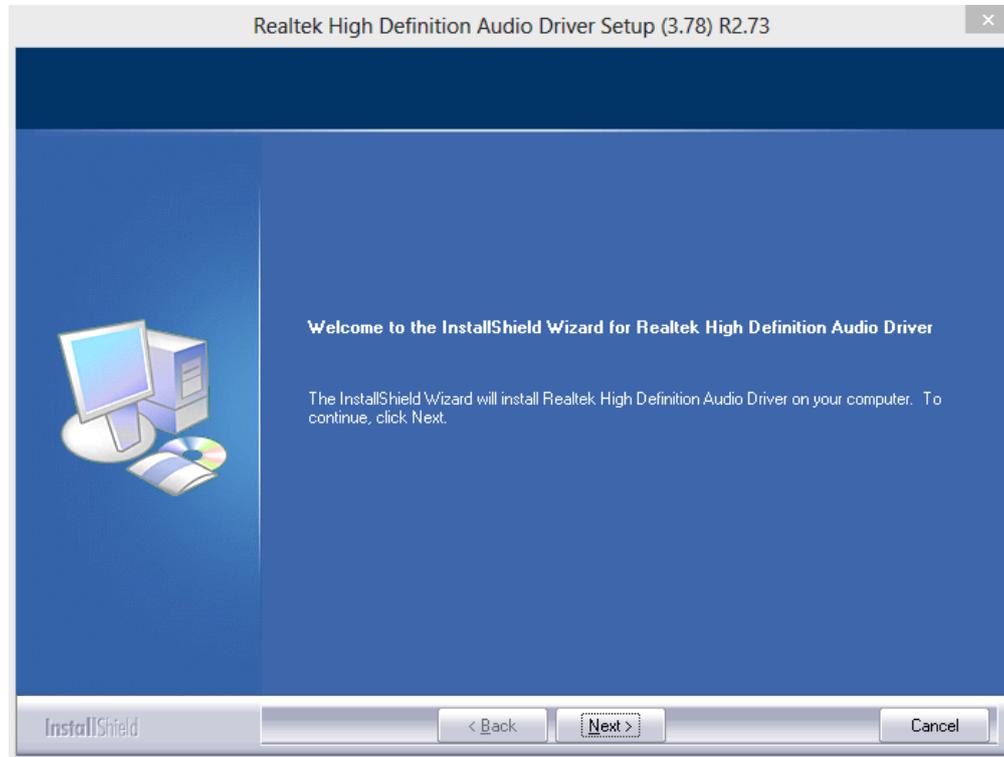
2.   You are suggested to select "Yes, I want to restart my computer now". Click "Finish" to complete setup and reboot.
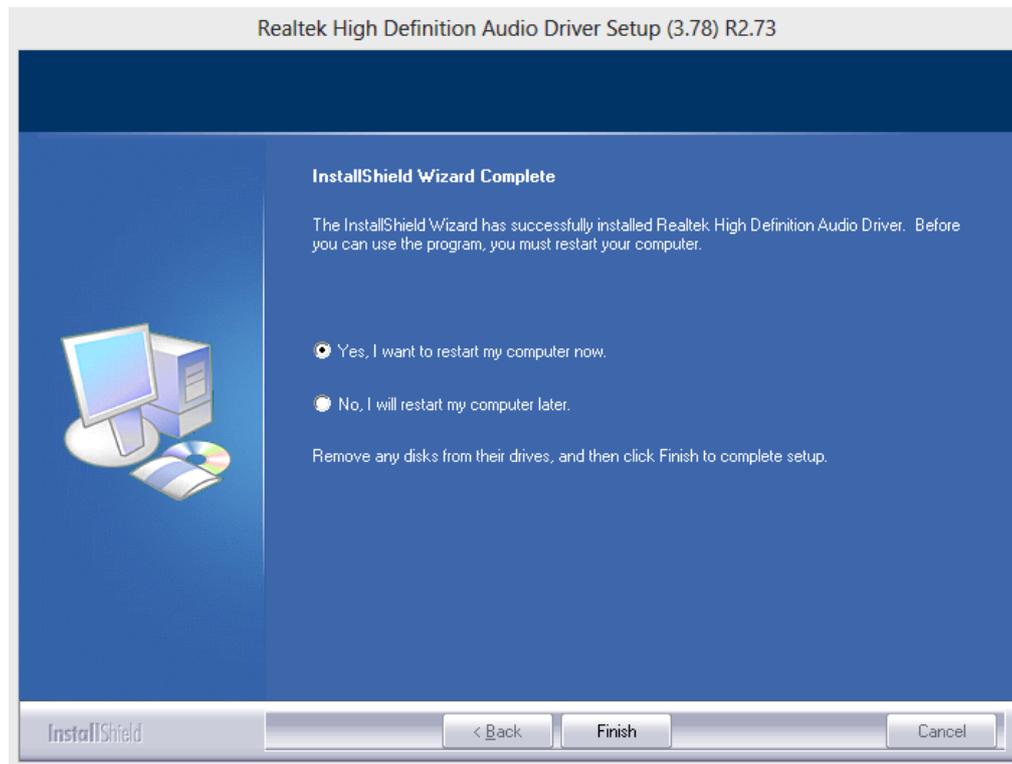
## 5.5 Installing Trusted Execution Engine

1. Run setup program from driver directory in product information CD. When the following screen appears, click "Next" to continue.
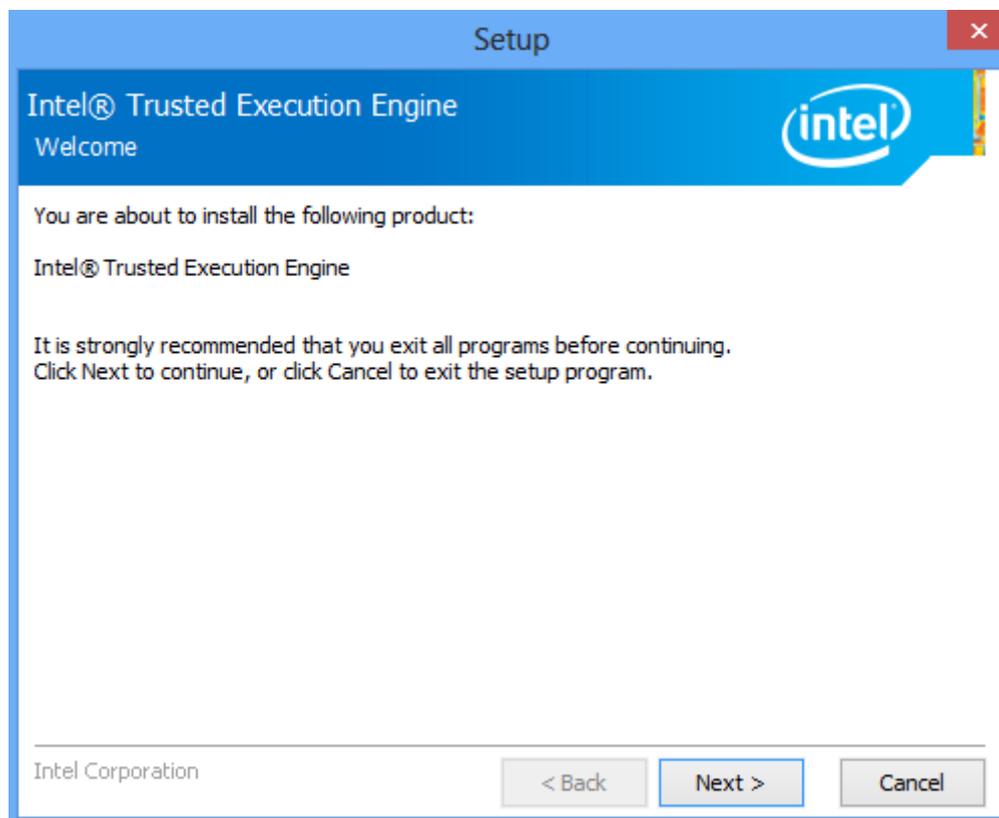
2. When Intel® License Agreement screen appears, read it carefully. You are suggested to select "I accept the terms in the License Agreement". Click "Next" to continue.
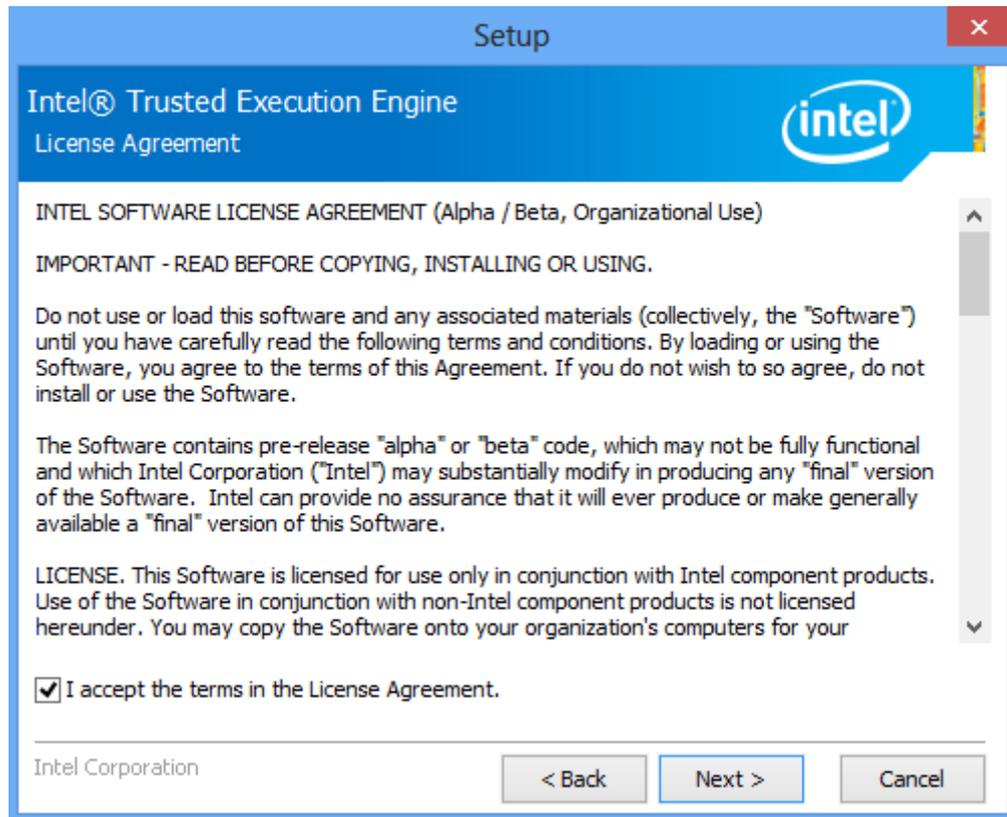


3. Now install wizard is ready. Click "Next" to begin installation.
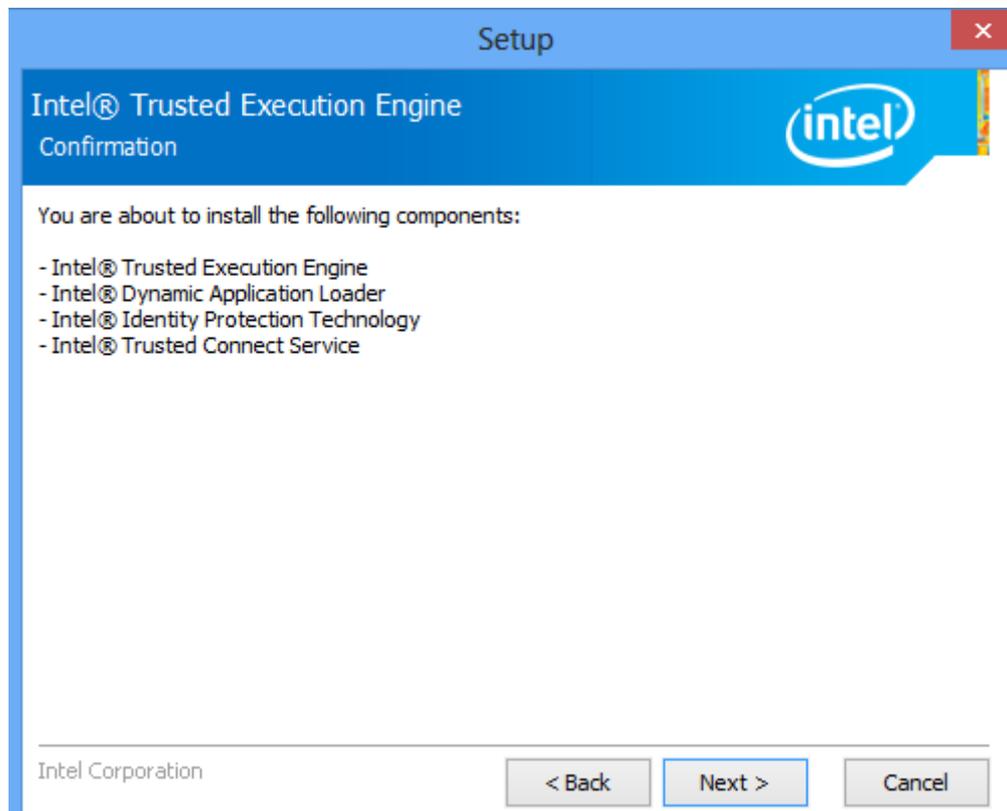
4. Please wait while setup processes the following operations.
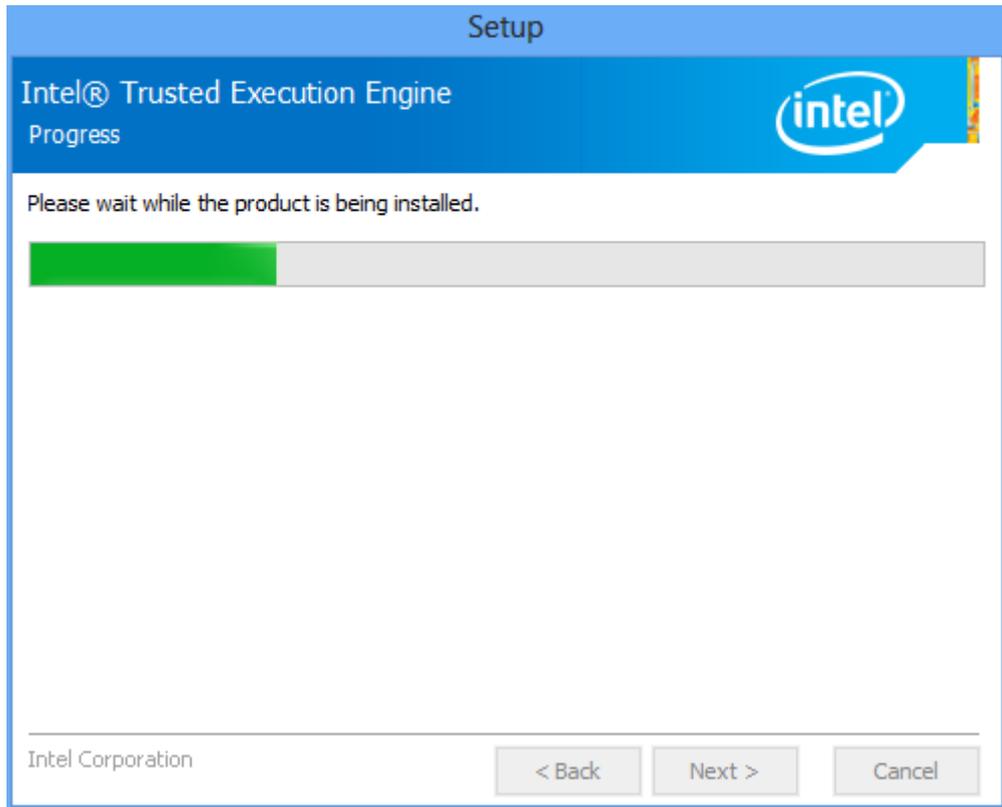


5. When installation is complete, the following screen appears. Click "Finish" to exit.
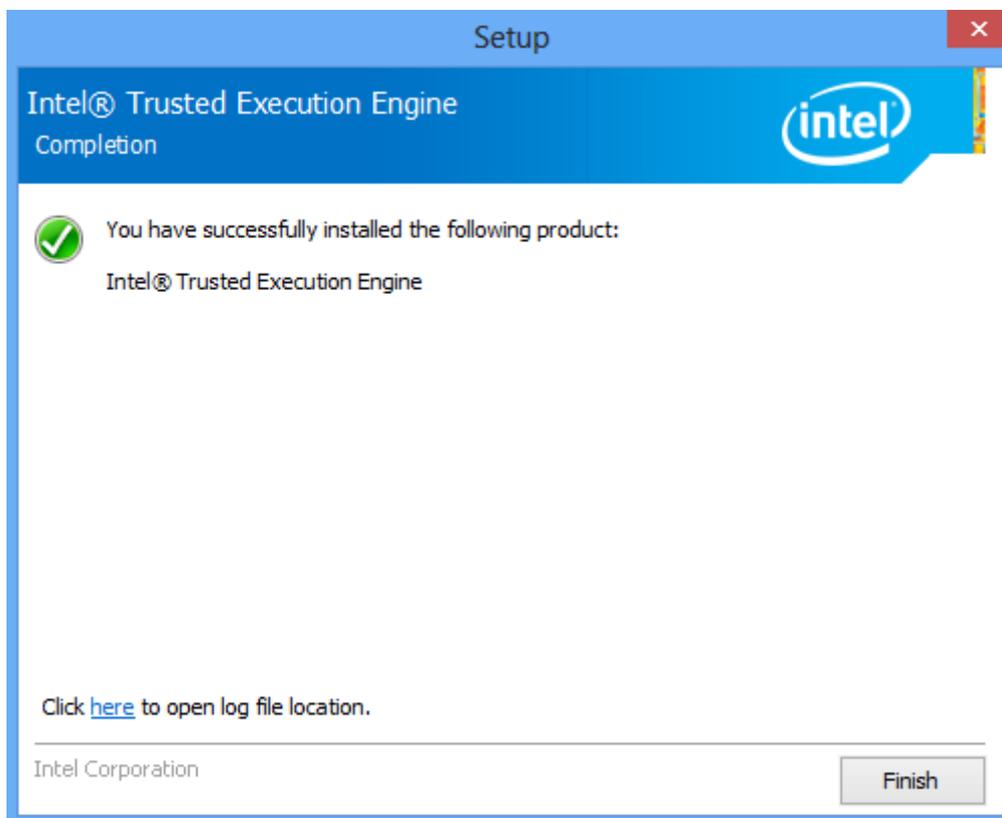
## 5.6    Installing Sideband Fabric Device

1.    Run setup program from driver directory in product information CD. When the following screen appears, click "Next" to continue.
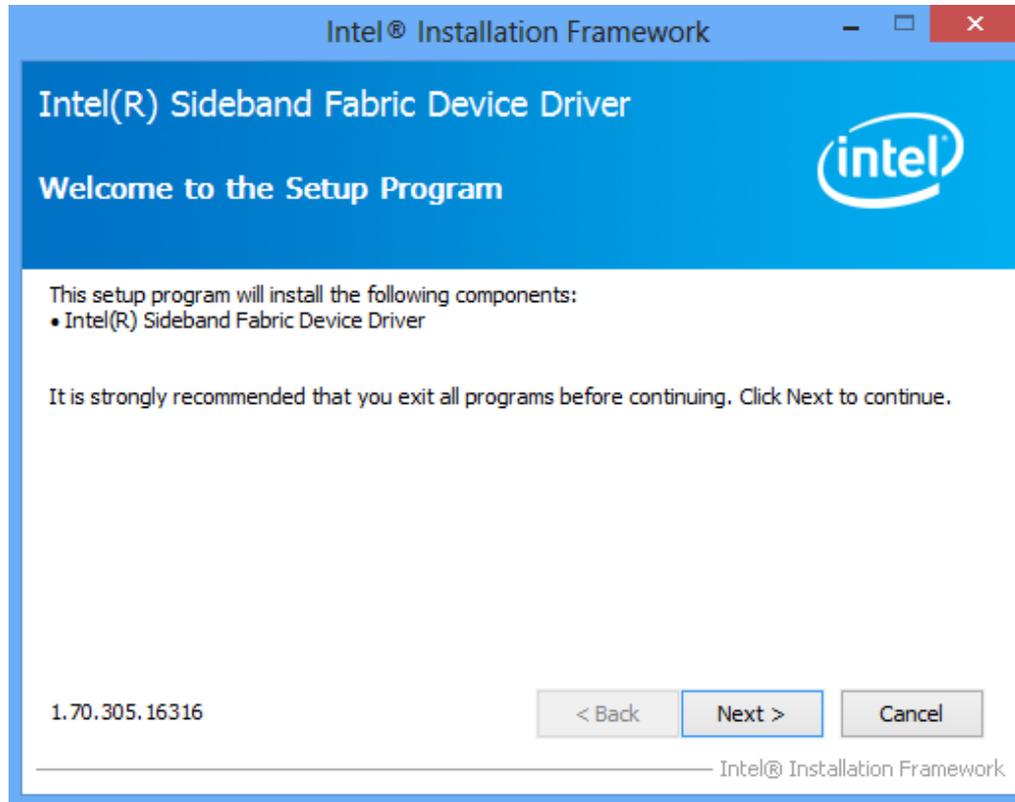
2.  When Intel® License Agreement screen appears, read it carefully. You are suggested to select "I accept the terms in the License Agreement". Click "Yes" to continue.
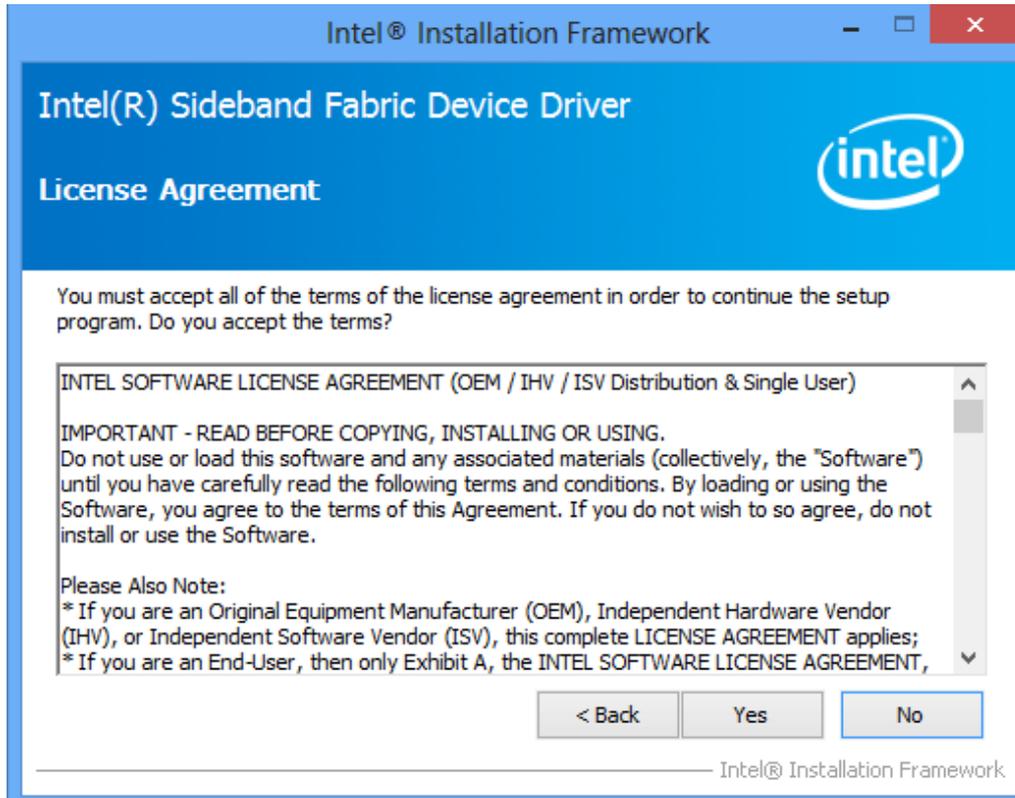
3.  Please wait while setup processes the following operations.
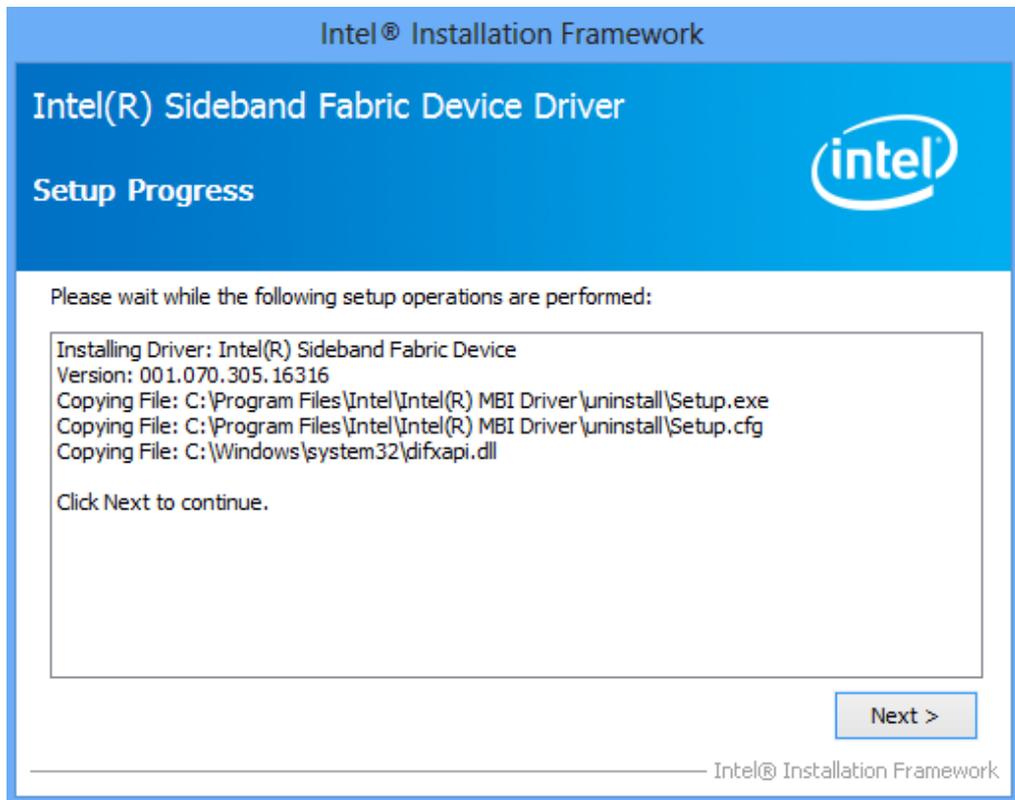
4. When installation is complete, you are suggested to select "Yes, I want to restart my computer now". Click "Finish" to complete setup and reboot.

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# Appendix A
# Watchdog Timer

## A.1    About Watchdog Timer

After the system stops working for a while, it can be auto-reset by the watchdog timer. The integrated watchdog timer can be set up in the system reset mode by program.

## A.2    How to Use Watchdog Timer

The following example enables configuration using debug tool.

**Enable WDT**
↓
**Enable configuration:**

        **O 2E 87    ; Un-lock super I/O**
        **O 2E 87**

↓
**Select logic device:**

        **O 2E 07**
        **O 2F 08**

↓
**WDT device enable:**

        **O 2E 30**
        **O 2F 01**

↓
**Set timer unit:**

        **O 2E F0**
        **O 2F 00    ; (00: Sec; 08:Minute)**

↓
**Set base timer:**

        **O 2E F1**
        **O 2F 0A    ; Set reset time (where 0A (hex) = 10sec)**

**Disable WDT**
↓
**Enable configuration:**

        **O 2E 87    ; Un-lock super I/O**
        **O 2E 87**

↓
**Select logic device:**

        **O 2E 07**
        **O 2F 08**

↓
**WDT device disable:**

        **O 2E 30**
        **O 2F 00**

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# Appendix B
# Digital I/O

## B.1　About Digital I/O

The onboard digital I/O has 8 bits (DIO0~7). Each bit can be set to function as input or output by software programming. In default, all pins are pulled high with +5V level (according to main power). The BIOS default settings are 3 inputs and 5 outputs where all of these pins are set to 1.

**CN5**
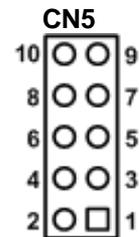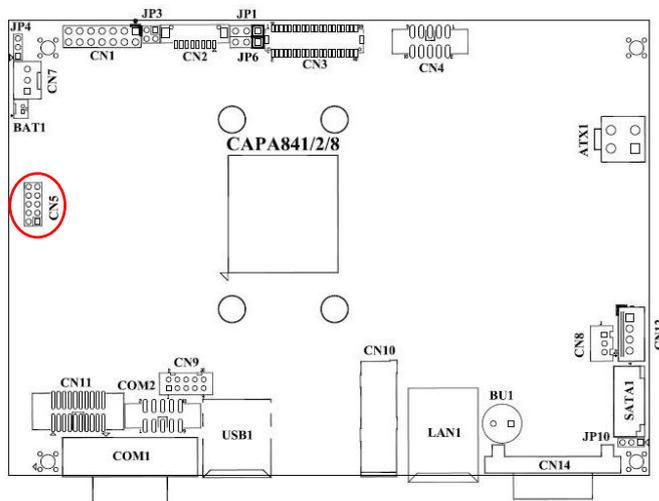
| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | DI0 (Bit0) | 2 | DO0 (Bit 3) |
| 3 | DI1 (Bit1) | 4 | DO1 (Bit 4) |
| 5 | DI2 (Bit2) | 6 | DO2 (Bit 5) |
| 7 | GND | 8 | DO3 (Bit 6) |
| 9 | GND | 10 | DO4 (Bit 7) |

## B.2  Digital I/O Programming

The following example enables configuration using debug tool.

**Start digital I/O programming**
↓
**Enable configuration:**

                                         **O 2E 87**   **; Un-lock super I/O**
                                         **O 2E 87**
↓
**Select logic device:**

                                         **O 2E 07**
                                         **O 2F 07**
↓
**Set multi-function selection:**

                                         **O 2E 1C**
                                         **O 2F 1C**   **; Open GPIO2 and close UART**
↓
**Set GPIO2 I/O register:**

                                         **O 2E E8**
                                         **O 2F 00**   **; 00: Programmed to function as output port**
                                                   **; FF: Programmed to function as input port**
↓
**Set GPIO2 data register:**
**; Set digital output pins value**

                                         **O 2E E9**
                                         **O 2F 00**   **; 00: Set digital output to low level**
                                                   **; FF: Set digital output to high level**
↓
**Digital Input:**
**; Read digital input data**

                                         **O 2E E9**
                                         **i 2F**       **; FF: Digital input data is high (default state)**