# DFI®

# AL053
## Embedded SBC 2.5"
## User's Manual

Preliminary
Version

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## FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.  However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

## Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

# Table of Contents

## Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.

2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.

3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.

4. We will not be liable for any indirect, special, incidental or consequencial damages to the product that has been modified or altered.

## Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.

2. Wear an antistatic wrist strap.

3. Do all preparation work on a static-free surface.

4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.

5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.

> **Important:**
> Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

## Safety Measures

To avoid damage to the system:
• Use the correct AC input voltage range.

To reduce the risk of electric shock:
• Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

## About the Package

The package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- One AL053 board
- One Serial ATA data cable (Length: 500mm)
- One Y cable for SATA and inverter power (Length: 155mm)
- One Heat spreader (Height: 11mm)

## Optional Items

- USB port cable (Length: 200mm)
- COM port cable (Length: 300mm)
- Power adapter (60W, 12V, DC Jack)
- 2-pole terminal to DC Jack cable
- Heat sink for 0 to 60°C (Height: 19mm)
- Audio cable (Length: 160mm)
- Heat sink for E series CPU/ wide temp (Height: 22.6mm)

The board and accessories in the package may not come similar to the information listed above. This may differ in accordance to the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

## Before Using the System Board

Before using the system board, prepare basic system components.
If you are installing the system board in a new system, you will need at least the following internal components.

- Storage devices such as hard disk drive, etc.

You will also need external system peripherals you intend to use which will normally include at least a keyboard, a mouse and a video display monitor.

# Chapter 1 - Introduction

## Specifications

| SYSTEM | Processor | Intel Atom® Processor E3900 Series, BGA 1296 |
|---|---|---|
| | | Intel Atom® x7-E3950 Processor, Quad Core, 2M Cache, 1.6GHz (2.0GHz), 12W<br>Intel Atom® x5-E3940 Processor, Quad Core, 2M Cache, 1.6GHz (1.8GHz), 9.5W<br>Intel Atom® x5-E3930 Processor, Dual Core, 2M Cache, 1.3GHz (1.8GHz), 6.5W<br>Intel® Pentium® Processor N4200, Quad Core, 2M Cache, 1.1GHz (2.5GHz), 6W<br>Intel® Celeron® Processor N3350, Dual Core, 2M Cache, 1.1GHz (2.4GHz), 6W |
| | Memory | One 204-pin SODIMM up to 8GB<br>Single Channel DDR3L 1866MHz |
| | BIOS | Insyde SPI 64Mbit (supports UEFI boot only) |
| GRAPHICS | Controller | Intel® HD Graphics |
| | Feature | OpenGL 4.2, Direct X 11.1, OpenCL 1.2, OGL ES 3.0<br>HW Decode: H.264, MPEG2, VC1, VP8, H.265, MPEG4<br>HW Encode: H.264, MPEG2, MPEG4 |
| | Display | 1 x Mini DP++<br>1 x LVDS<br>Mini DP++: resolution up to 4096x2160 @ 60Hz<br>LVDS: dual channel 18/24-bit, resolution up to 1920x1200 @ 60Hz |
| | Dual Displays | LVDS + Mini DP++ |
| EXPANSION | Interface | 1 x Full-size Mini PCIe (PCIe/USB 2.0/USB 3.1 Gen1 optional) |
| STORAGE | Storage | 1 x M.2 B key 2242 (PCIe/USB 2.0/SATA 3.0) |
| AUDIO | Audio Codec | Realtek ALC262-VC2-GR |
| ETHERNET | Controller | 1 x Intel® I211AT PCIe (10/100/1000Mbps) or<br>1 x Intel® I210IT PCIe (10/100/1000Mbps) |
| REAR I/O | Ethernet | 1 x GbE (RJ-45) |
| | USB | 2 x USB 3.0 |
| | Display | 1 x Mini DP++ |
| INTERNAL I/O | Serial | 1 x RS-232/422/485 (1.27mm pitch, right angle type) |
| | USB | 2 x USB 2.0 (1.27mm pitch) |
| | Display | 1 x LVDS LCD Panel Connector<br>1 x LCD/Inverter Power |
| | Audio | 1 x Audio (Line-out/Mic-in) |
| | DIO | 1 x 8-bit DIO |
| | SMBus | 1 x SMBus |
| WATCHDOG TIMER | Output & Interval | System Reset, Programmable via Software from 1 to 255 Seconds |
| SECURITY | TPM | fTPM2.0 |

| POWER | Type | 9~36V DC |
|---|---|---|
| | Connector | 2-pin Terminal Block |
| | RTC Battery | CR2032 Coin Cell |
| OS SUPPORT (UEFI ONLY) | Microsoft/Linux | Windows 10 IoT Enterprise (64-bit)<br>Ubuntu 16.04 |
| ENVIRONMENT | Temperature | Operating: 0 to 60°C, -20 to 70°C, -40 to 85°C<br>Storage: -40 to 85°C |
| | Humidity | Operating: 5 to 90% RH<br>Storage: 5 to 90% RH |
| MECHANICAL | Dimensions | 2.5" Pico-ITX Form Factor<br>100mm (3.94") x 72mm (2.83") |
| | Height | PCB: 1.6mm<br>Top Side: 15mm, Bottom Side: 8mm |

## Features

- ### Watchdog Timer

The Watchdog Timer function allows your application to regularly "clear" the system at the set time interval. If the system hangs or fails to function, it will reset at the set time interval so that your system will continue to operate.

- ### DDR3L

DDR3L SDRAM provides backward compatibility to DDR3 memory modules but can operate at the same or at a lower power level.

- ### Graphics

The integrated Intel® HD graphics engine delivers an excellent blend of graphics performance and features to meet business needs. It provides excellent video and 3D graphics with outstanding graphics responsiveness. These enhancements deliver the performance and compatibility needed for today's and tomorrow's business applications. Supports 1 x Mini DP++ and 1 x LVDS interfaces for dual display outputs.

- ### Serial ATA

Serial ATA is a storage interface that is compliant with SATA 1.0a specification. With speed of up to 6Gb/s (SATA 3.0), it improves hard drive performance faster than the standard parallel ATA whose data transfer rate is 100MB/s.

- ### Gigabit LAN

One Intel® I211AT PCI Express Gigabit Ethernet controller or one Intel® I210IT PCI Express Gigabit Ethernet controller supports up to 1Gbps data transmission.

- ### Audio

The Realtek ALC262-VC2-GR audio codec provides 4-channel DAC and 6-channel ADC High Definition audio output.

- ### Power Failure Recovery

When power returns after an AC power failure, you may choose to either power-on the system manually or let the system power-on automatically.

- ### USB

The system board supports the new USB 3.0. It is capable of running at a maximum transmission speed of up to 5 Gbit/s (625 MB/s) and is faster than USB 2.0 (480 Mbit/s, or 60 MB/s) and USB 1.1 (12Mb/s). USB 3.0 reduces the time required for data transmission, reduces power consumption, and is backward compatible with USB 2.0. It is a marked improvement in device transfer speeds between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

- ### Wake-On-LAN

This feature allows the network to remotely wake up a Soft Power Down (Soft-Off) PC. It is supported via the onboard LAN port or via a PCI LAN card that uses the PCI PME (Power Management Event) signal. However, if your system is in the Suspend mode, you can power-on the system only through an IRQ or DMA interrupt.

- ### Wake-On-USB

This function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.

- ### ACPI STR

The system board is designed to meet the ACPI (Advanced Configuration and Power Interface) specification. ACPI has energy saving features that enable PCs to implement power management and plug-and-play with operating systems that support power management features.

With ACPI, the system can further utilize the Ethernet adapter's wake-on-LAN (WOL) capability that enables remote wake-up if the Ethernet adapter supports such feature.

- ### RTC Timer

The RTC installed on the system board allows your system to automatically power-on on the set date and time.

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# Chapter 2 - Hardware Installation

## Board Layout



USB 0-1
USB 3.0
DC-in
SPI
Flash
BIOS
Mini PCIe
LAN 1
LCD/Inverter
& SATA Power
5
1
Panel Power Select (JP2) 5 6 1 2
2 1 Battery
USB 2.0
1 2
9 10
USB 6-7
M.2 Signal Select
(JP5)
3
1
Realtek
ALC262
Mini
DP++
PTN3460
1 2
LVDS
LCD
Panel
39 40
M.2 B Key
9 1
10 2
Front Audio
79 1
90 83
80 2
EIO (optional)

Top View

Buzzer

DDR3L_SODIMM

Intel I211AT
or I210IT

Intel
Atom
E3900 Series

F81803

Standby
Power
LED

2 6 Front
Panel
1 5

DIO
2 10
1 9

COM1
2 10
1 9

SMBus
2 6
1 5

Bottom View

## Block Diagram



Mini DP++

GLAN 1 — I211AT — PCIe x1

I210IT (opt.)

Intel Atom® Processor E3900 Series

USB 3.0/2.0 2x — USB 3.0 / USB 2.0

USB 2.0 2x — USB 2.0

HD Audio (Line-out, Mic-in)

SPI

Channel A — DDR3L 1866MHz SODIMM

eDP — PTN3460 — LVDS

SATA 3.0 / PCIe x1 / USB 2.0 — M.2 1x

PCIe x1 (USB 3.1 Gen1 opt.) / USB 2.0 — Full-size Mini PCIe

SMBus — Digital I/O 8-bit / SMBus

LPC Bus

Super IO with WDT

RS-232/422/485 1x

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**Important:**
Electrostatic discharge (ESD) can damage your board, processor, disk drives, add-in boards, and other components. Perfor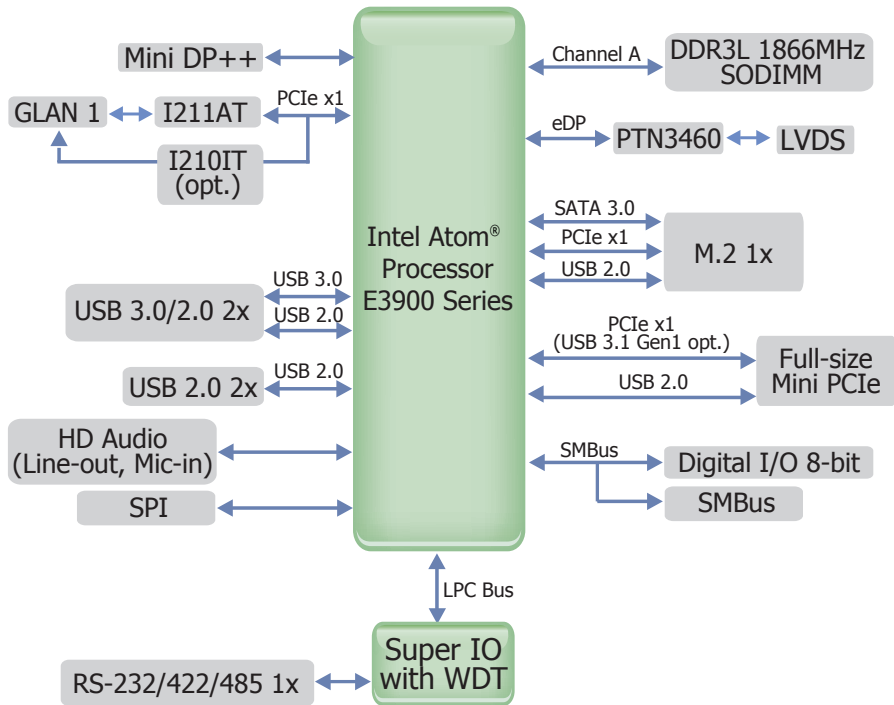m installation procedures at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

## System Memory

**Important:**
When the Standby Power LED lights red, it indicates that there is power on the system board. Power-off the PC then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.



DDR3L

Standby Power LED
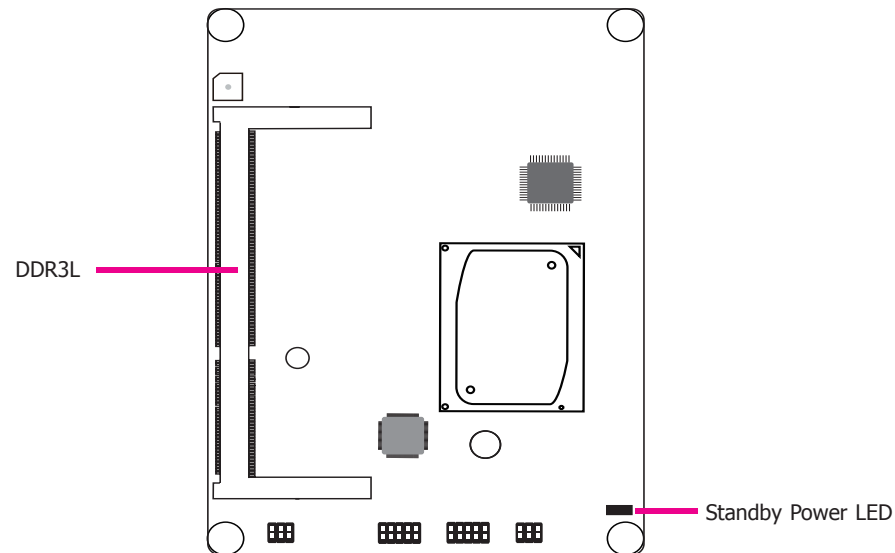
### Features

- One 204-pin SODIMM up to 8GB
- Single Channel DDR3L 1866MHz

## Installing the SODIMM Module

**Note:**
The system board used in the following illustrations may not resemble the actual board. These illustrations are for reference only.

1. Make sure the PC and all other peripheral devices connected to it has been powered down.

2. Disconnect all power cords and cables.

3. Locate the SODIMM socket on the system board.

4. Note the key on the socket. The key ensures the module can be plugged into the socket in only one direction.



10
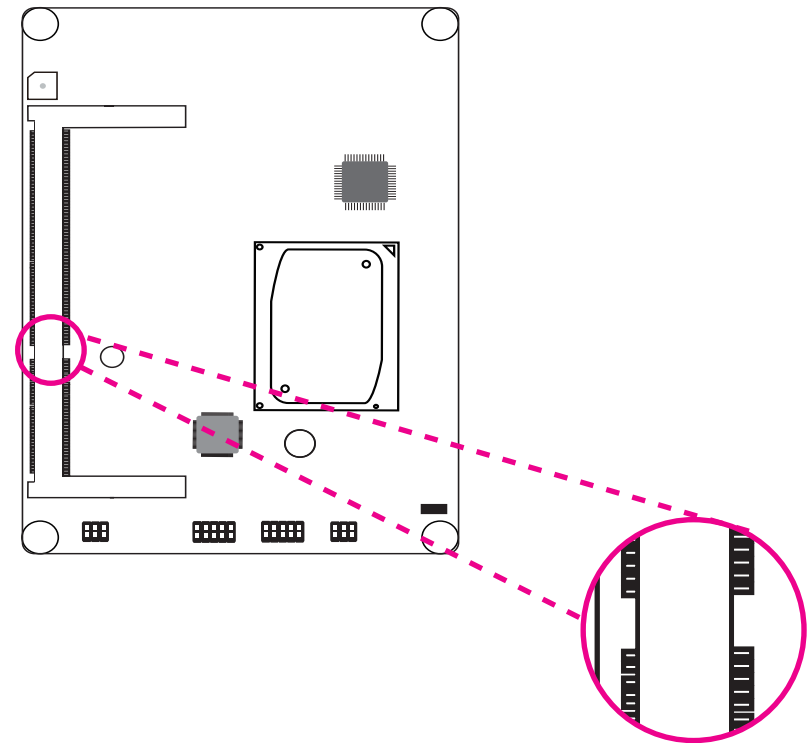
5.  Grasping the module by its edges, align the module into the socket at an approximately 30 degrees angle. Apply firm even pressure to each end of the module until it slips down into the socket. The contact fingers on the edge of the module will almost completely disappear inside the socket.
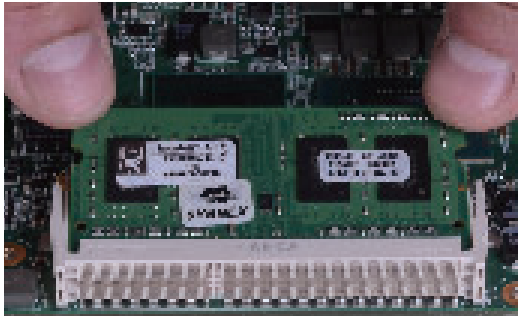
6.  Push down the module until the clips at each end of the socket lock into position. You will hear a distinctive "click", indicating the module is correctly locked into position.

Clip          Clip

## Jumper Settings

### Panel Power Select



JP2

5 3 1
6 4 2
1-3 On: +5V

5 3 1
6 4 2
3-5 On: +3.3V
(default)
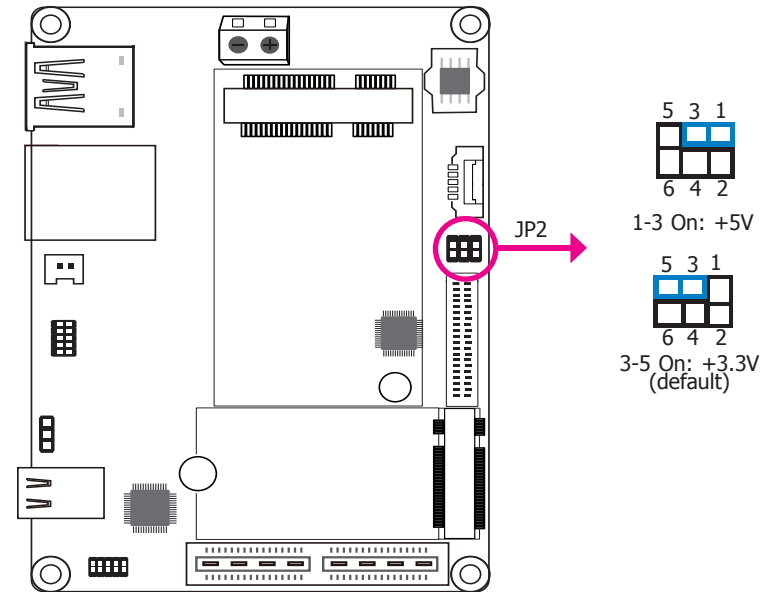
JP2 is used to select the power supplied with the LCD panel.

**Important:**
Before powering-on the system, make sure that the power settings of JP2 match the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

## M.2 Signal Select



3
2
1
1-2 On: SATA
(default)

3
2
1
2-3 On: PCIe

JP5
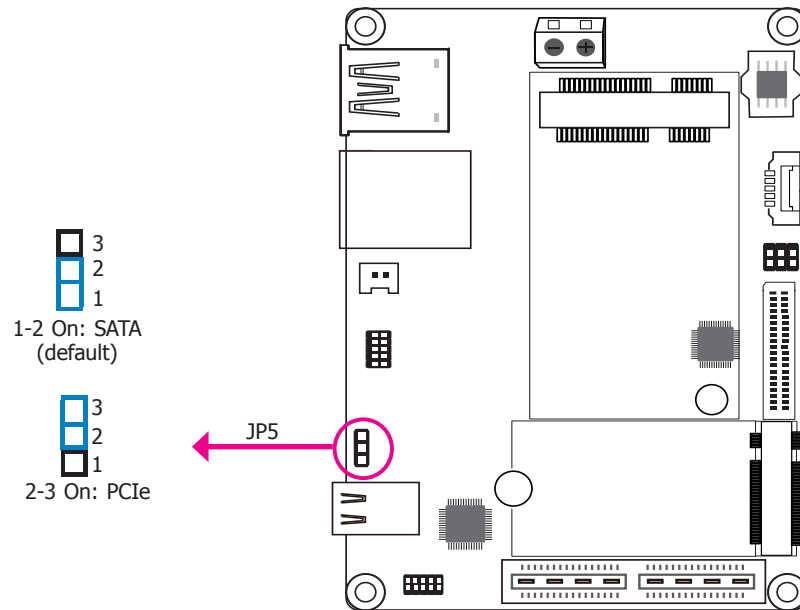
JP5 is used to select the M.2 signal: SATA (default) or PCIe.

## Rear Panel I/O Ports

DC-in +
−

USB 3.0    LAN1                    Mini DP++
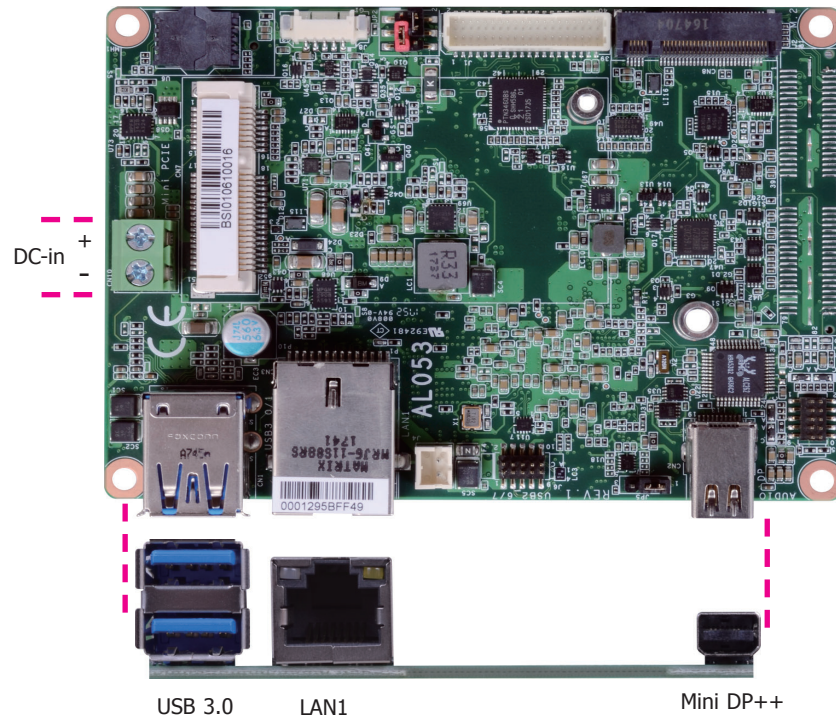
The rear panel I/O consists of the following ports:

• 1 9~36V DC-in 2-pin terminal block
• 2 USB 3.0 ports
• 1 GbE (RJ-45)
• 1 Mini DP++ port

## 9~36V DC-in

DC-in  −  +
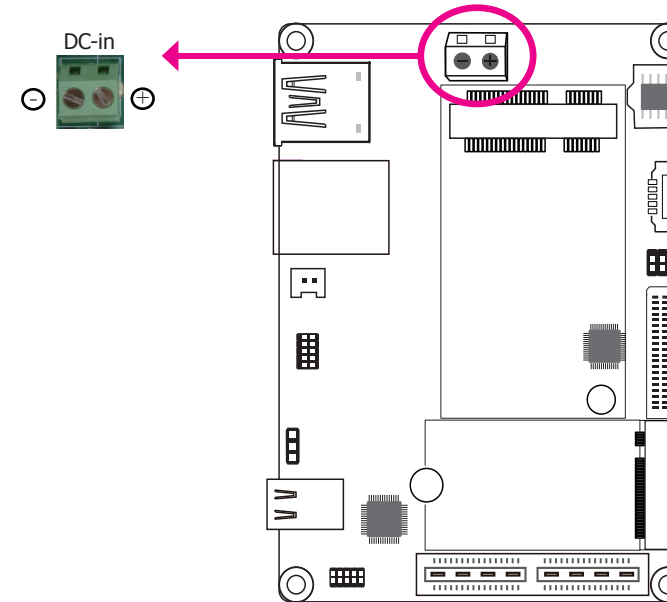
This 2-pin terminal block is considered a low power solution. Connect a DC power cord to this terminal block. Using a voltage more than the recommended range may fail to boot the system or cause damage to the system board.

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## Graphics Interface

The display port consists of the following:

- 1 Mini DP++ port
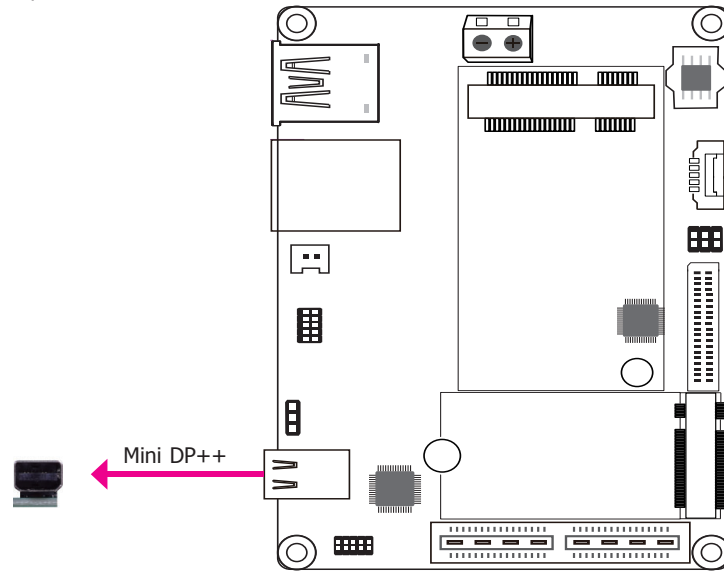
Mini DP++

### Mini DP++ Port

The Mini DP++ port is a digital display interface used to connect a display device such as a computer monitor. It is used to transmit audio and video simultaneously. The interface, which is developed by VESA, delivers higher performance features than any other digital interfaces.

**Driver Installation**

Install the graphics driver. Refer to Chapter 4 for more information.

## RJ45 LAN Port

LAN 1
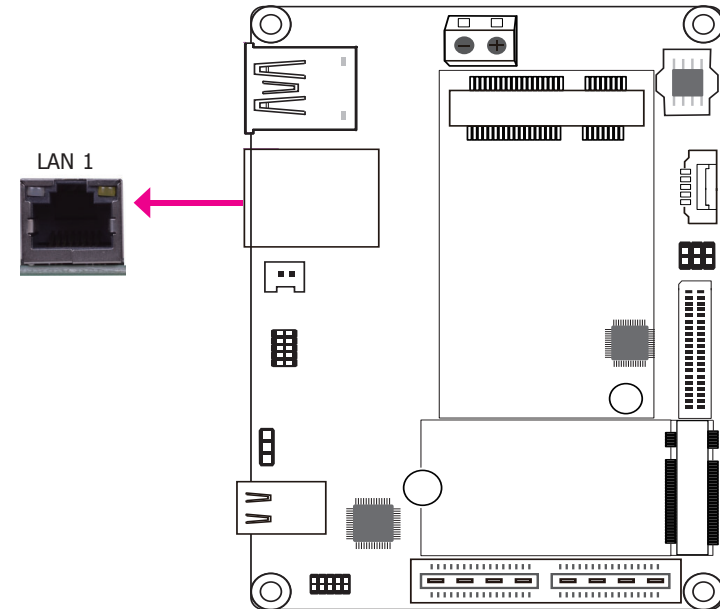
**Features**

- 1 Intel® I211AT PCI Express Gigabit Ethernet controller or 1 optional Intel® I210IT PCI Express Gigabit Ethernet controller

The LAN port enables the system board to connect to a local area network by means of a network hub.

**BIOS Setting**

Configure the onboard LAN in the "ACPI Configuration" submenu of the Advanced menu in the BIOS. Refer to Chapter 3 for more information.

**Driver Installation**

Install the LAN drivers. Refer to Chapter 4 for more information.

## USB Ports



USB 1
USB 0

USB 3.0

1 2
VCC      VCC
-Data6   -Data7
+Data6   +Data7
GND      GND
N.C.     N.C.
9 10
USB 2.0

USB 6-7
(J6)

The USB device allows data exchange between your computer and a wide range of simultane-ously accessible external Plug and Play peripherals.

The system board is equipped with 2 onboard USB 3.0 ports (USB 0-1). The 10-pin connector allows you to connect 2 additional USB 2.0 ports (USB 6-7). The additional USB ports may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis and then insert the USB port cables to a connector.

### BIOS Settings

Configure the onboard USB in the "USB Boot" field of the Boot menu in the BIOS. Refer to Chapter 3 for more information.

### Wake-On-USB Keyboard/Mouse

The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state.

# I/O Connectors

## Digital I/O Connector



Digital I/O
(J11)

2  10
1  9
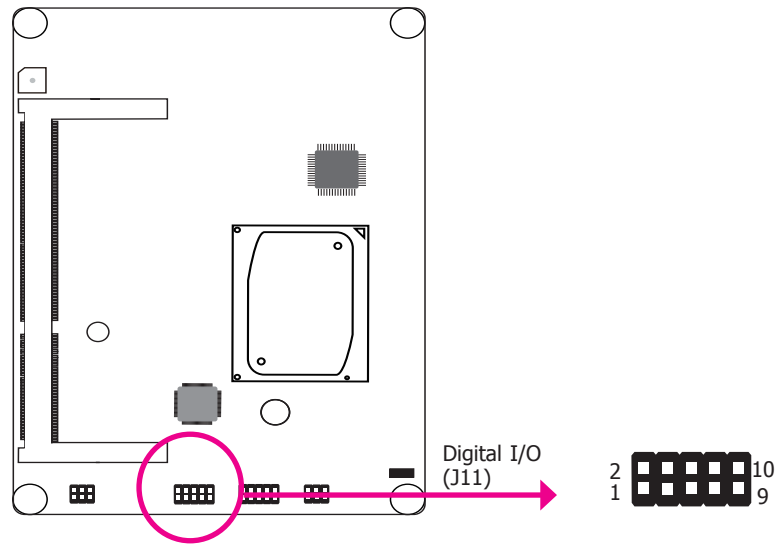
The Digital I/O connector supports 8-bit digital input/output signals to provide the ability of monitoring and controlling the states of the connected external devices.

### Digital I/O Connector

| Pin | Pin Name |
|-----|----------|
| 1 | DIO7 |
| 2 | DIO6 |
| 3 | DIO5 |
| 4 | DIO4 |
| 5 | DIO3 |
| 6 | DIO2 |
| 7 | DIO1 |
| 8 | DIO0 |
| 9 | 5V |
| 10 | GND |

# Front Audio Connector



Front
Audio
(J5)

Mic-L
Mic-R
Line-R
GND
Line-L

GND
NC
Mic-JD (sense)
NC
Line-JD (sense)

9  1
10  2
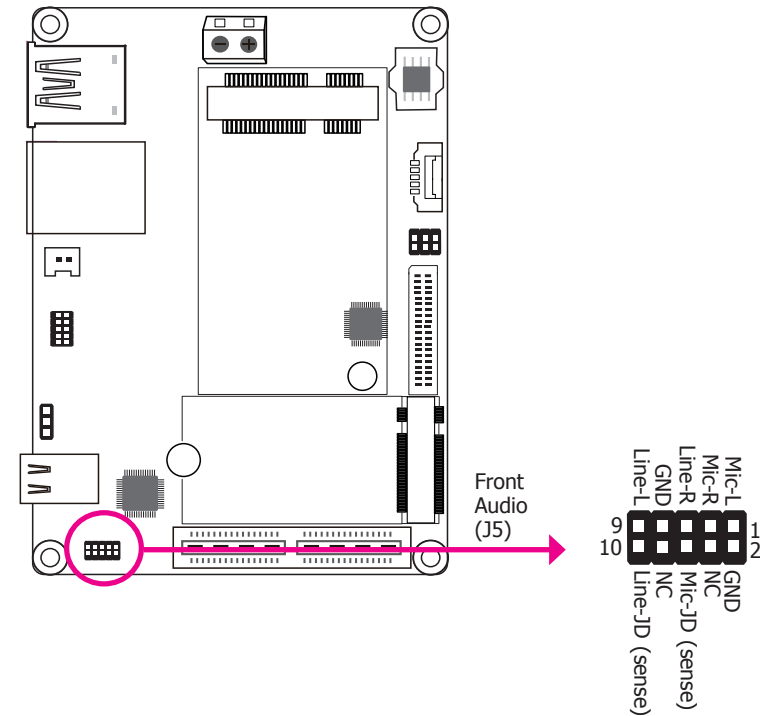
### Front Audio

The front audio connector allows you to connect to line-out and mic-in jacks that are at the front panel of your system.

### Driver Installation

Install the audio driver. Refer to Chapter 4 for more information.

## COM (Serial) Port



COM 1
(J10)

COM 1: RS232/422/485

2 ▪▪▪▪▪ 10
1 ▪▪▪▪▪ 9
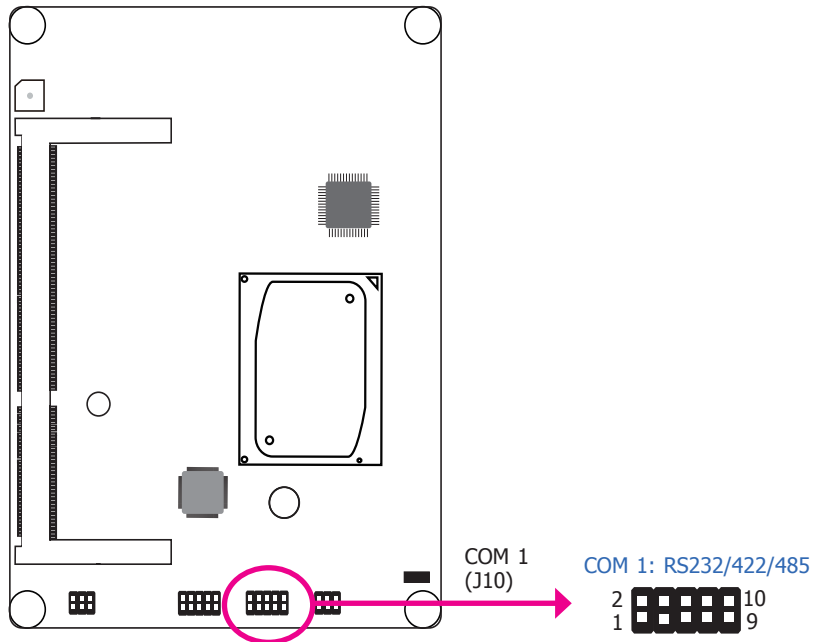
COM 1 can be selected among RS232, RS422 and RS485 via BIOS setting.

The serial port is asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.
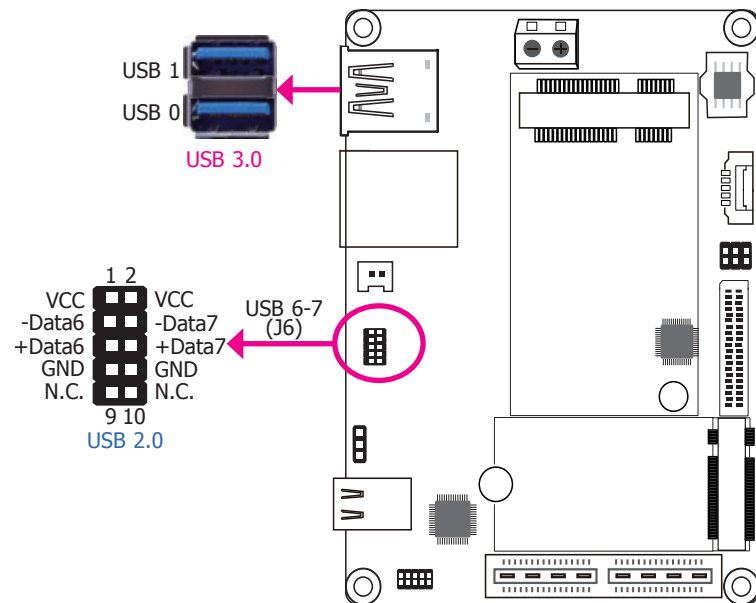
### BIOS Setting

Configure the serial port in the "SIO FINTEK81803" submenu of the Advanced menu in the BIOS. Refer to Chapter 3 for more information.

### COM 1

| Pin | RS232 | RS422 Full Duplex | RS485 |
|-----|-------|-------------------|-------|
| 1 | DCD- | TX- | DATA- |
| 2 | RD | TX+ | DATA+ |
| 3 | TD | RX+ | N.C. |
| 4 | DTR- | RX- | N.C. |
| 5 | GND | GND | GND |
| 6 | DSR- | N.C. | N.C. |
| 7 | RTS- | N.C. | N.C. |
| 8 | CTS- | N.C. | N.C. |
| 9 | RI- | N.C. | N.C. |
| 10 | GND | GND | GND |

## SMBus Connector
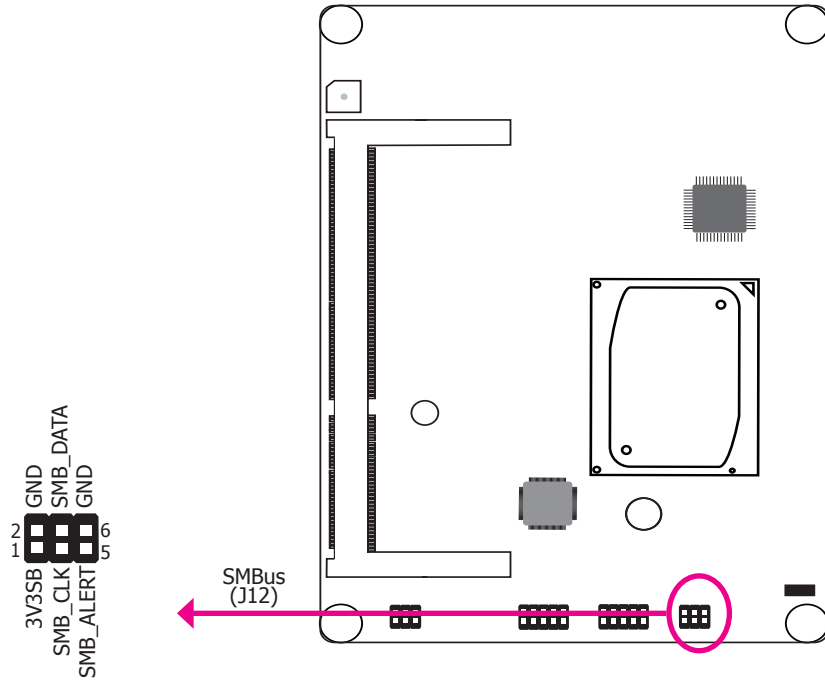


The System Management Bus (SMBus) connector is used to connect SMBus devices. It is a multiple device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

## Front Panel Connector
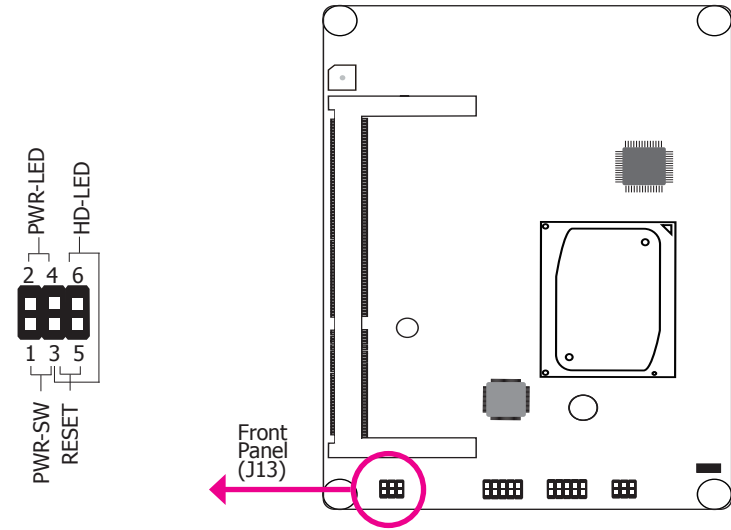


### PWR-LED - Power/Standby LED

When the system's power is on, this LED will light. When the system is in the S1 (POS - Power On Suspend) state, it will blink every second. When the system is in the S3 (STR - Suspend To RAM) state, it will blink every 4 seconds.

### HD-LED - Hard Drive LED

This LED will light when the hard drive is being accessed.

### PWR-SW - Power Switch

This switch is used to power on or off the system.

### RESET - Reset Switch

This switch allows you to reboot without having to power off the system.

|  | Pin | Pin Name |  | Pin | Pin Name |
|---|---|---|---|---|---|
| **PWR-LED** | 2 | LED Power | **PWR-SW** | 1 | Signal |
|  | 4 | Signal |  | 3 | GND |
| **HD-LED** | 3 | GND | **RESET** | 3 | GND |
|  | 6 | Signal |  | 5 | RST signal |

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## LVDS LCD Panel Connector

## LCD/Inverter & SATA Power Connector



LCD/Inverter
& SATA Power (J8)

LVDS LCD Panel
(J1)

1    2

39    40
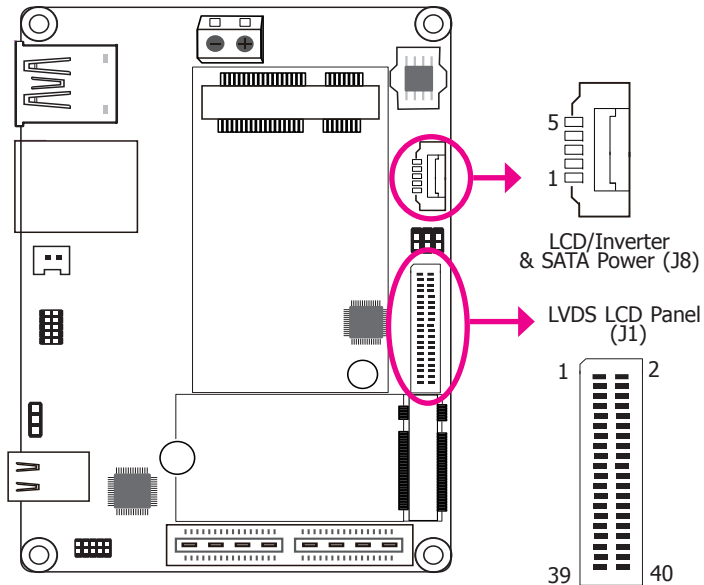
The system board allows you to connect a LCD Display Panel by means of the LVDS LCD panel connector and the LCD/Inverter power connector. These connectors transmit video signals and power from the system board to the LCD Display Panel.

Refer to the right side for the pin functions of these connectors.

### BIOS Setting

Configure the LCD panel in the Advanced menu of the BIOS. Refer to Chapter 3 for more information.

**Note:**
1. DFI board's LVDS LCD panel connector:

Manufacturer: V-STAR
Part No.: W100V40TP2
Description: 2*20, 1.0mm, BOX header

2. DFI board's LCD/Inverter & SATA power connector:

Manufacturer: E-call
Part No.: 0110-3221050
Description: 1*5pin, 1.25mm, Wafer

### LVDS LCD Panel Connector

| Pin | Function | Pin | Function |
|---|---|---|---|
| 1 | GND | 2 | GND |
| 3 | LVDS_Out3+ (Odd_3+) | 4 | LVDS_Out7+ (Even_3+) |
| 5 | LVDS_Out3- (Odd_3-) | 6 | LVDS_Out7- (Even_3-) |
| 7 | GND | 8 | GND |
| 9 | LVDS_Out2+ (Odd_2+) | 10 | LVDS_Out6+ (Even_2+) |
| 11 | LVDS_Out2- (Odd_2-) | 12 | LVDS_Out6- (Even_2-) |
| 13 | GND | 14 | GND |
| 15 | LVDS_Out1+ (Odd_1+) | 16 | LVDS_Out5+ (Even_1+) |
| 17 | LVDS_Out1- (Odd_1-) | 18 | LVDS_Out5- (Even_1-) |
| 19 | GND | 20 | GND |
| 21 | LVDS_Out0+ (Odd_0+) | 22 | LVDS_Out4+ (Even_0+) |
| 23 | LVDS_Out0- (Odd_0-) | 24 | LVDS_Out4- (Even_0-) |
| 25 | GND | 26 | GND |
| 27 | LVDS_CLK1+ (Odd_CLK+) | 28 | LVDS_CLK2+ (Even_CLK+) |
| 29 | LVDS_CLK1- (Odd_CLK-) | 30 | LVDS_CLK2- (Even_CLK-) |
| 31 | GND | 32 | GND |
| 33 | DDC_CLK | 34 | N.C. |
| 35 | DDC_DATA | 36 | +3.3V |
| 37 | Panel Power | 38 | Panel Power |
| 39 | Panel Power | 40 | Panel Power |

### LCD/Inverter & SATA Power Connector

| Pin | Pin Name |
|---|---|
| 1 | +12V |
| 2 | GND |
| 3 | Panel Backlight On/Off Control |
| 4 | Dimming Control |
| 5 | +5V |

## Battery



GND
+3.3V

2 ▪▪ 1

Battery Connector



Connect to the battery connector

Battery

The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

### Safety Measures

• Danger of explosion if battery incorrectly replaced.

• Replace only with the same or equivalent type recommended by the manufacturer.

• Dispose of used batteries according to local ordinance.

## Expansion Slots



Full-size Mni PCIe
with PCIe x1 (USB 3.1 Gen1 opt.)/USB 2.0 signals

M.2 with PCIe x1/USB 2.0/SATA 3.0 signals

Extension I/O (Optional)

79 ▪ 1
90 ▪ 83
80 ▪ 2
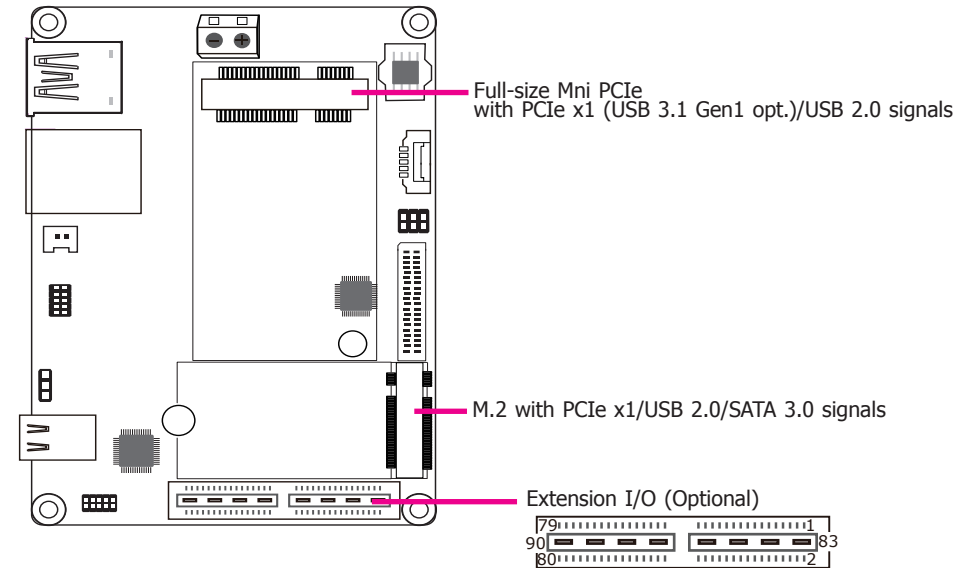
### Mini PCI Express Slot

The full-size Mini PCIe socket supports PCIe x1 (USB 3.1 Gen1 opt.) and USB 2.0 signals and is used to install a Mini PCIe card.

### M.2 B Key 2242 Socket

The M.2 B key 2242 socket is the Next Generation Form Factor (NGFF) which is designed to support multiple modules and make the M.2 more suitable in application for solid-state storage.

### Extension I/O Connector (Optional)

The Extension I/O connector supports a multitude of signals such as PCIe, DDI, USB, LPC, and SMBus. It can expand the system's internal I/O connectivity. Please refer to the following table for pin assignment.

**E I/O Connector**

| Pin | Pin Name | Pin | Pin Name |
|-----|----------|-----|----------|
| 1 | PCIE_RX0+ | 2 | PCIE_TX0+ |
| 3 | PCIE_RX0- | 4 | PCIE_TX0- |
| 5 | GND | 6 | GND |
| 7 | PCIE_RX1+ | 8 | PCIE_TX1+ |
| 9 | PCIE_RX1- | 10 | PCIE_TX1- |
| 11 | GND | 12 | GND |
| 13 | PCIE_CLK+ | 14 | NC |
| 15 | PCIE_CLK- | 16 | NC |
| 17 | GND | 18 | GND |
| 19 | USB_SSRX0+ | 20 | NC |
| 21 | USB_SSRX0- | 22 | NC |
| 23 | GND | 24 | GND |
| 25 | USB_SSTX0+ | 26 | NC |
| 27 | USB_SSTX0- | 28 | NC |
| 29 | GND | 30 | NC |
| 31 | SATA0_RX+ | 32 | NC |
| 33 | SATA0_RX- | 34 | GND |
| 35 | GND | 36 | PCIE_WAKE# |
| 37 | SATA0_TX+ | 38 | NC |
| 39 | SATA0_TX- | 40 | NC |
| 41 | GND | 42 | SMB_STB_CK |
| 43 | DDI0_CTRLCLK_AUX+ | 44 | SMB_STB_DAT |
| 45 | DDI0_CTRLCLK_AUX- | 46 | GND |
| 47 | GND | 48 | CLK33M |
| 49 | DDI0_PAIR0+ | 50 | LPC_AD0 |

| Pin | Pin Name | Pin | Pin Name |
|-----|----------|-----|----------|
| 51 | DDI0_PAIR0- | 52 | LPC_AD1 |
| 53 | GND | 54 | LPC_AD2 |
| 55 | DDI0_PAIR1+ | 56 | LPC_AD3 |
| 57 | DDI0_PAIR1- | 58 | LPC_SERIRQ |
| 59 | GND | 60 | LPC_FRAME# |
| 61 | DDI0_PAIR2+ | 62 | DDI0_HPD |
| 63 | DDI0_PAIR2- | 64 | DDI0_AUX_Detect |
| 65 | GND | 66 | GND |
| 67 | DDI0_PAIR3+ | 68 | GPIO_STB (INT) |
| 69 | DDI0_PAIR3- | 70 | PLT_RESET# |
| 71 | GND | 72 | NC |
| 73 | 3V3SB_1 | 74 | NC |
| 75 | 3V3SB_2 | 76 | PS_ON |
| 77 | AUD_GND | 78 | LINE_JD |
| 79 | LINE1_L | 80 | LINE1_R |
| 83 | GND | 84 | GND |
| 85 | GND | 86 | GND |
| 87 | 5VSB | 88 | 5VSB |
| 89 | 5VSB | 90 | 5VSB |

**Note:**
DFI board's E I/O connector:

Manufacturer: Samtec
Part No.: QSE-040-01-L-D-A-K-TR
Description: Board-to-board connector, 2*40 pin, 0.8mm (pitch), 3.25mm (height), SMD type, 180 degree

# Chapter 3 - BIOS Setup

## Overview

The BIOS is a program that takes care of the basic level of communication between the CPU and peripherals. It contains codes for various advanced features found in this system board. The BIOS allows you to configure the system and save the configuration in a battery-backed CMOS so that the data retains even when the power is off. In general, the information stored in the CMOS RAM of the EEPROM will stay unchanged unless a configuration change has been made such as a hard drive replaced or a device added.

It is possible that the CMOS battery will fail causing CMOS data loss. If this happens, you need to install a new CMOS battery and reconfigure the BIOS settings.

**Note:**
The BIOS is constantly updated to improve the performance of the system board; therefore the BIOS screens in this chapter may not appear the same as the actual one. These screens are for reference purpose only.

## Default Configuration

Most of the configuration settings are either predefined according to the Load Optimal Defaults settings which are stored in the BIOS or are automatically detected and configured without requiring any actions. There are a few settings that you may need to change depending on your system configuration.

## Entering the BIOS Setup Utility

The BIOS Setup Utility can only be operated from the keyboard and all commands are key-board commands. The commands are available at the right side of each setup screen.

The BIOS Setup Utility does not require an operating system to run. After you power up the system, the BIOS message appears on the screen and the memory count begins. After the memory test, the message "Press DEL to run setup" will appear on the screen. If the message disappears before you respond, restart the system or press the "Reset" button. You may also restart the system by pressing the <Ctrl> <Alt> and <Del> keys simultaneously.

## Legends

| Keys | Function |
|---|---|
| Right and Left arrows | Moves the highlight left or right to select a menu. |
| Up and Down arrows | Moves the hightlight up or down between submenu or fields. |
| <Esc> | Exit to the BIOS Setup Utility. |
| <F5> | Scrolls forward through the values or options of the highlighted field. |
| <F6> | Scrolls backward through the values or options of the highlighted field. |
| <F1> | Displays general help |
| <F9> | Optimized defaults |
| <F10> | Saves and resets the setup program. |
| <Enter> | Press <Enter> to enter the highlighted submenu. |

## Scroll Bar

When a scroll bar appears to the right of the setup screen, it indicates that there are more available fields not shown on the screen. Use the up and down arrow keys to scroll through all the available fields.

## Submenu

When "▶" appears on the left of a particular field, it indicates that a submenu which contains additional options are available for that field. To display the submenu, move the highlight to that field and press <Enter>.

# Insyde BIOS Setup Utility

## Main

The Main menu is the first screen that you will see when you enter the BIOS Setup Utility.

```
                         InsydeH2O Setup Utility              Rev. 5.0
    Main     Advanced    Security    Boot    Exit

    Project Name                    AL053                This is the help for the
    BIOS Version                    B191.03A             hour, minute, second field.
                                                         Valid range is from 0 to
    Intel(R) Atom(TM) Processor E3950 @ 1.60GHz          23, 0 to 59, 0 to 59. IN-
    CPU Speed                       1600 MHz             CREASE/REDUCE: +/-.
    CPUID                           0x506C9
    L1 Data Cache                   24 KB
    L1 Instruction Cache            32 KB
    L2 Cache                        1024 KB
    L3 Cache                        0 KB
    Number Of Processors            4 Core(s) / 4 Thread(s)
    BXT SOC                         B1 Stepping
    Microcode Rev                   00000032

    Total Memory                    4096 MB
    System Memory Speed             1600 MHz
    SODIMM 0                        4096 MB

    TXE FW Version                  3.1.55.2269

    System Time                     [10:28:05]
    System Date                     [02/12/2019]



    F1  Help          ↑/↓   Select Item      F5/F6 Change Values    F9  Setup Defaults
    Esc Exit          ←/→   Select Item      Enter Select ▶ SubMenu F10 Save and Exit
```

### System Time

The time format is <hour>, <minute>, <second>. The time is based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00. Hour displays hours from 00 to 23. Minute displays minutes from 00 to 59. Second displays seconds from 00 to 59.

### System Date

The date format is <month>, <date>, <year>. Month displays the month, from 01 to 12. Date displays the date, from 01 to 31. Year displays the year, from 2000 to 2099.

## Advanced

The Advanced menu allows you to configure your system for basic operation. Some entries are defaults required by the system board, while others, if enabled, will improve the performance of your system or let you set some features according to your preference.

> **Important:**
> Setting incorrect field values may cause the system to malfunction.

```
                         InsydeH2O Setup Utility              Rev. 5.0
    Main    Advanced    Security    Boot    Exit

    ▶ACPI Configuration                                  ACPI Configuration Setting
    ▶CPU Configuration
    ▶Video Configuration
    ▶Audio Configuration
    ▶SATA Configuration
    ▶PCI Express Configuration
    ▶Console Redirection
    ▶SIO FINTEK81803



    F1  Help          ↑/↓   Select Item      F5/F6 Change Values    F9  Setup Defaults
    Esc Exit          ←/→   Select Item      Enter Select ▶ SubMenu F10 Save and Exit
```

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## ACPI Configuration

This section configures the system ACPI parameters.

```
                    InsydeH2O Setup Utility                    Rev. 5.0
    Advanced
    Wake On LAN                  <Disabled>          Enable/Disable Wake On
    After G3                     <Always On>         LAN capability




    F1   Help          ↑/↓   Select Item      F5/F6 Change Values        F9   Setup Defaults
    Esc  Exit          ←/→   Select Item      Enter Select ▶ SubMenu     F10  Save and Exit
```
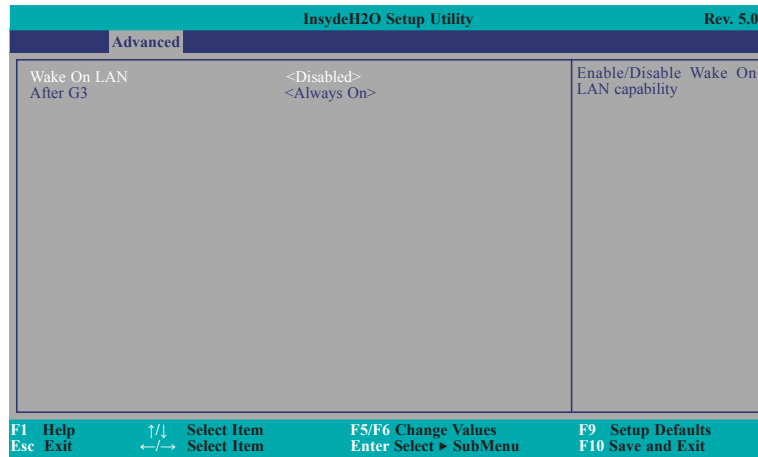
### Wake On LAN

This field is used to enable or disable the LAN signal to wake up the system.

### After G3

This field is to specify what state the system should be in when power is re-applied after a power failure (G3, the mechanical-off, state).

**Always On**    The system working state.

**Always Off**    Off, except for trickle current to devices such as the power button.

**Note:**
If "Quiet Boot" of Boot menu is set to enabled, "BGRT Logo" will appear for configuration. Refer to the Boot menu in this chapter for more information.

```
                    InsydeH2O Setup Utility                    Rev. 5.0
    Advanced
    Wake On LAN                  <Disabled>          Support display logo with
    After G3                     <Always On>         ACPI BGRT table.
    BGRT Logo                    <Enabled>




    F1   Help          ↑/↓   Select Item      F5/F6 Change Values        F9   Setup Defaults
    Esc  Exit          ←/→   Select Item      Enter Select ▶ SubMenu     F10  Save and Exit
```
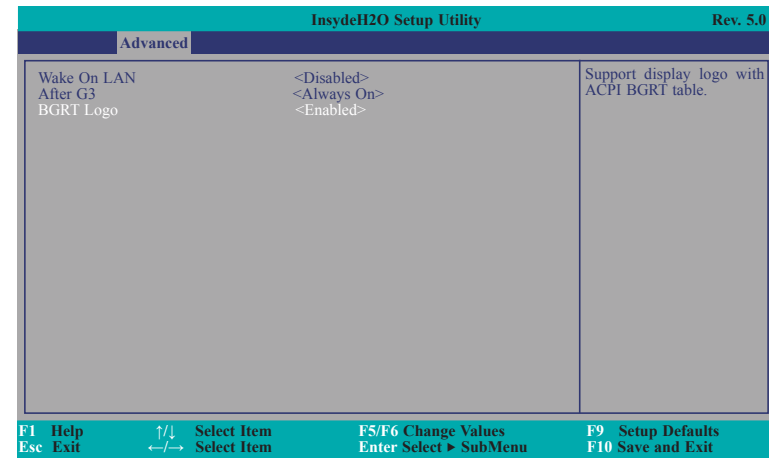
### BGRT Logo

This field is used to enable or disable to support display logo with ACPI BGRT table.

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## CPU Configuration

This section is used to configure the CPU.

```
                    InsydeH2O Setup Utility                    Rev. 5.0
    Advanced
    EIST                    <Enabled>          Enable/Disable  Intel
    Turbo Mode              <Enabled>          SpeedStep
    C-States                <Enabled>




    F1  Help        ↑/↓   Select Item     F5/F6 Change Values    F9   Setup Defaults
    Esc Exit        ←/→   Select Item     Enter Select ▶ SubMenu F10 Save and Exit
```
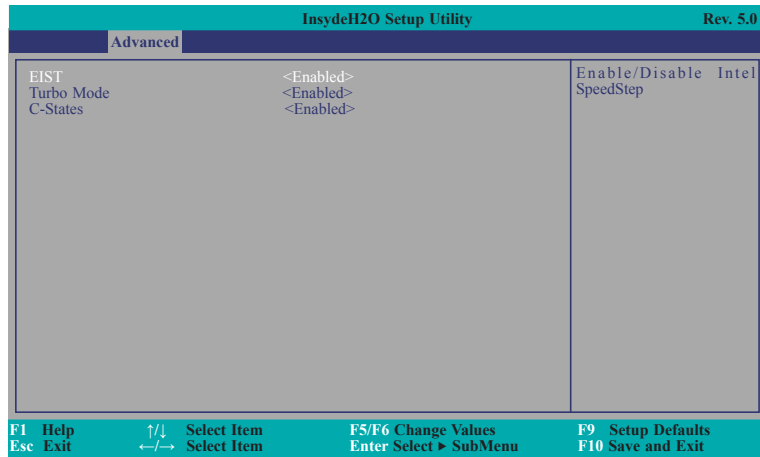
### EIST

This field is used to enable or disable the Enhanced Intel SpeedStep® Technology, which helps optimize the balance between system's power consumption and performance. After it is enabled in the BIOS, you can enable the EIST feature using the operating system's power management.
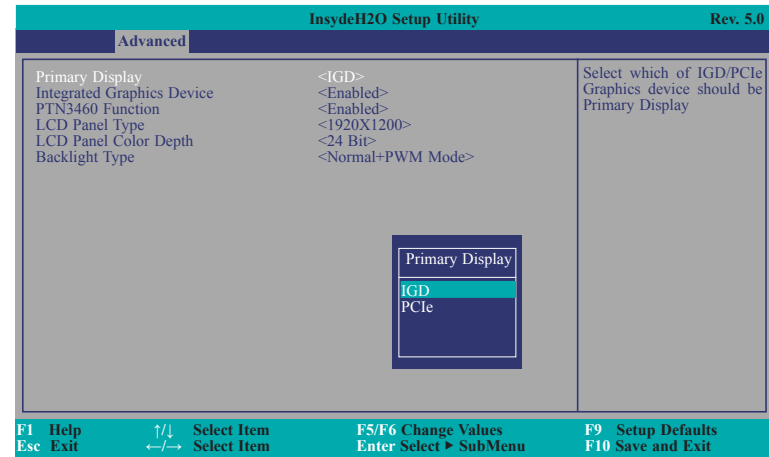
### Turbo Mode

This field is used to enable or disable processor turbo mode (requires that EIST is enabled too), which allows the processor core to automatically run faster than the base frequency when the processor's power, temperature, and specification are within the limits of TDP.

### C-States

Enable or disable CPU Power Management. It allows CPU to go to C States when it's not 100% utilized.

## Video Configuration

This section configures the video settings.

```
                    InsydeH2O Setup Utility                    Rev. 5.0
    Advanced
    Primary Display              <IGD>              Select which of IGD/PCIe
    Integrated Graphics Device   <Enabled>          Graphics device should be
    PTN3460 Function             <Enabled>          Primary Display
    LCD Panel Type               <1920X1200>
    LCD Panel Color Depth        <24 Bit>
    Backlight Type               <Normal+PWM Mode>

                              Primary Display
                              IGD
                              PCIe


    F1  Help        ↑/↓   Select Item     F5/F6 Change Values    F9   Setup Defaults
    Esc Exit        ←/→   Select Item     Enter Select ▶ SubMenu F10 Save and Exit
```

### Primary Display

Select either IGD or PCIe Graphics device to be the primary display.

### Integrated Graphics Device

Keep IGD enabled or disabled based on the setup options.

### PTN3460 Function

Enable or disable PTN3460 LCD features.

### LCD Panel Type

Please check the specifications of your LCD monitor. Select the type of LCD panel connected to the system's LCD connector: 800X480, 800X600, 1024X768, 1366X768, 1280X1024, 1920X1080 or 1920X1200.
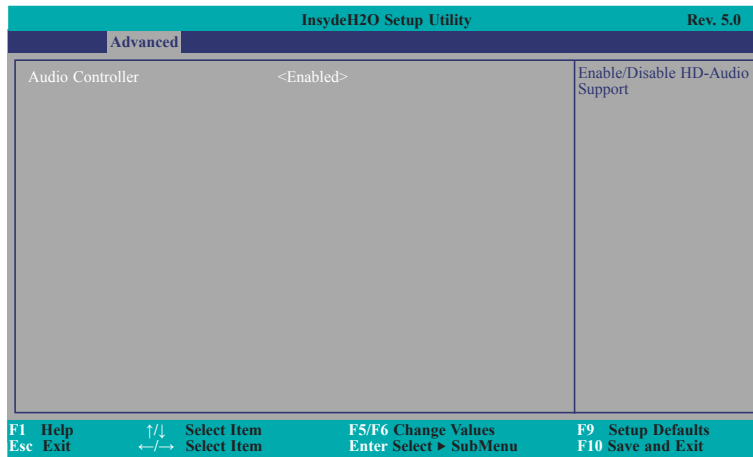
### LCD Panel Color Depth

Select the LCD panel color depth: 18 Bit, 24 Bit, 36 Bit or 48 Bit.

### Backlight Type

Set the backlight type: Normal+PWM Mode, Normal+DC Mode, Invert+PWM Mode or Invert+DC Mode.

## Audio Configuration

This section is used to configure the audio settings.

```
                         InsydeH2O Setup Utility                    Rev. 5.0
        Advanced
  Audio Controller            <Enabled>              Enable/Disable HD-Audio
                                                     Support




  F1  Help         ↑/↓   Select Item     F5/F6 Change Values      F9   Setup Defaults
  Esc Exit         ←/→   Select Item     Enter Select ▶ SubMenu   F10 Save and Exit
```

### Audio Controller
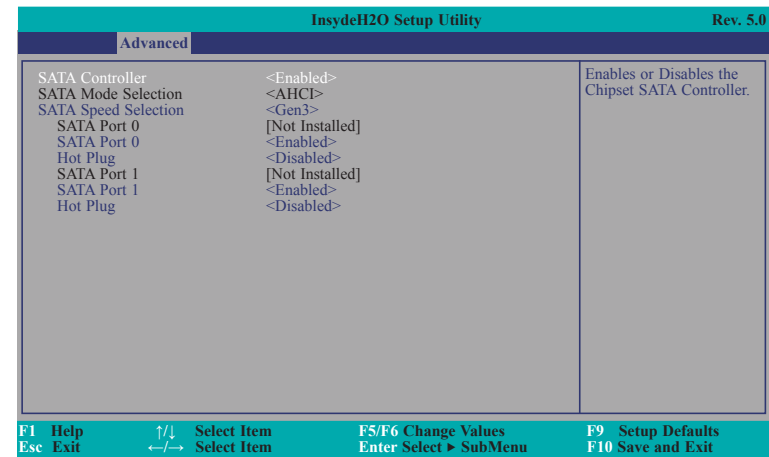
Control the support of the high-definition audio device.

**Disabled**
HD Audio will be disabled.

**Enabled**
HD Audio will be enabled.

## SATA Configuration

This section configures the SATA controller.

```
                         InsydeH2O Setup Utility                    Rev. 5.0
        Advanced
  SATA Controller            <Enabled>              Enables or Disables the
  SATA Mode Selection        <AHCI>                 Chipset SATA Controller.
  SATA Speed Selection       <Gen3>
    SATA Port 0              [Not Installed]
    SATA Port 0              <Enabled>
    Hot Plug                <Disabled>
    SATA Port 1              [Not Installed]
    SATA Port 1              <Enabled>
    Hot Plug                <Disabled>


  F1  Help         ↑/↓   Select Item     F5/F6 Change Values      F9   Setup Defaults
  Esc Exit         ←/→   Select Item     Enter Select ▶ SubMenu   F10 Save and Exit
```

### SATA Controller

This field is used to enable or disable the Serial ATA controller.

### SATA Mode Selection

The mode selection determines how the SATA controller(s) operates.

**AHCI**
This option allows the Serial ATA devices to use AHCI (Advanced Host Controller Interface).
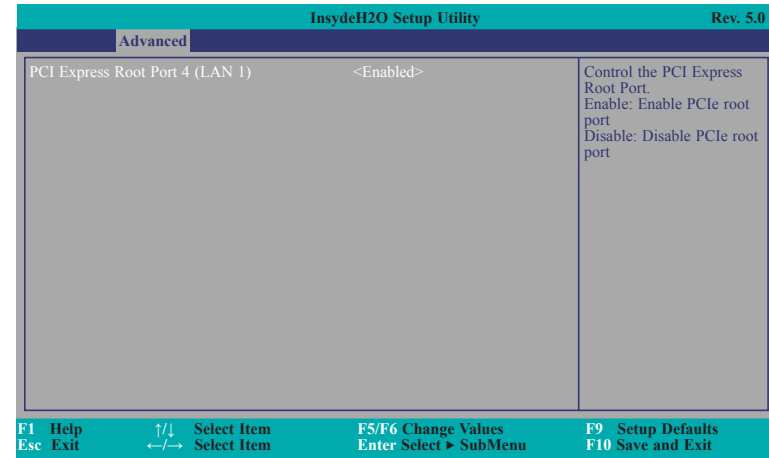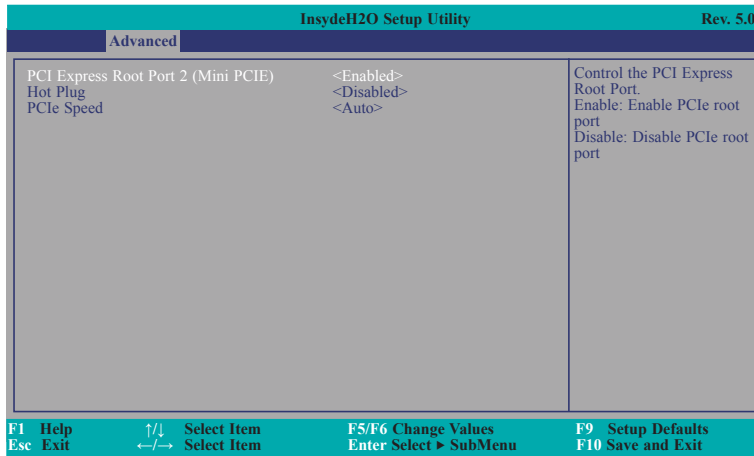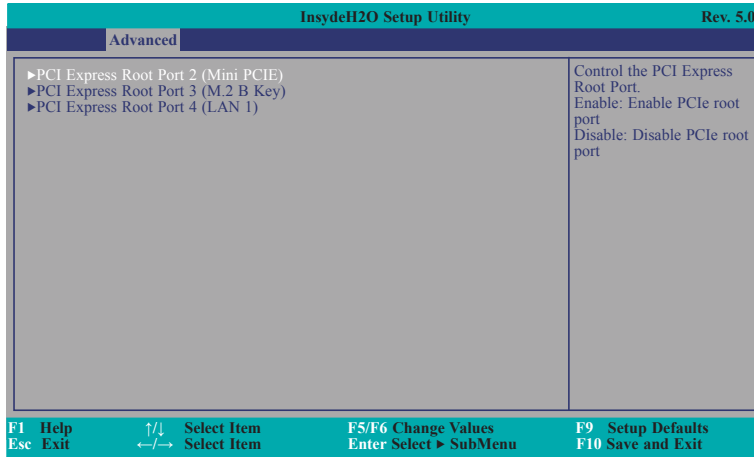
### SATA Speed Selection

Select Serial ATA controller(s) speed from Gen1 (1.5 Gbit/s), Gen2 (3.0 Gbit/s) or Gen 3 (6.0 Gbit/s).

### Serial ATA Port 0/1 and Hot Plug

These fields are used to enable or disable the serial ATA ports and their hot plug function.

## PCI Express Configuration

This section configures settings relevant to PCI Express root ports.

```
                        InsydeH2O Setup Utility                    Rev. 5.0
        Advanced

   ►PCI Express Root Port 2 (Mini PCIE)          Control the PCI Express
   ►PCI Express Root Port 3 (M.2 B Key)          Root Port.
   ►PCI Express Root Port 4 (LAN 1)              Enable: Enable PCIe root
                                                 port
                                                 Disable: Disable PCIe root
                                                 port




   F1   Help        ↑/↓    Select Item      F5/F6 Change Values    F9   Setup Defaults
   Esc  Exit        ←/→    Select Item      Enter Select ► SubMenu F10 Save and Exit
```

```
                        InsydeH2O Setup Utility                    Rev. 5.0
        Advanced

   PCI Express Root Port 2 (Mini PCIE)    <Enabled>    Control the PCI Express
   Hot Plug                               <Disabled>   Root Port.
   PCIe Speed                             <Auto>       Enable: Enable PCIe root
                                                       port
                                                       Disable: Disable PCIe root
                                                       port




   F1   Help        ↑/↓    Select Item      F5/F6 Change Values    F9   Setup Defaults
   Esc  Exit        ←/→    Select Item      Enter Select ► SubMenu F10 Save and Exit
```

```
                        InsydeH2O Setup Utility                    Rev. 5.0
        Advanced

   PCI Express Root Port 4 (LAN 1)        <Enabled>    Control the PCI Express
                                                       Root Port.
                                                       Enable: Enable PCIe root
                                                       port
                                                       Disable: Disable PCIe root
                                                       port




   F1   Help        ↑/↓    Select Item      F5/F6 Change Values    F9   Setup Defaults
   Esc  Exit        ←/→    Select Item      Enter Select ► SubMenu F10 Save and Exit
```

### PCI Express Root Port 2/3/4

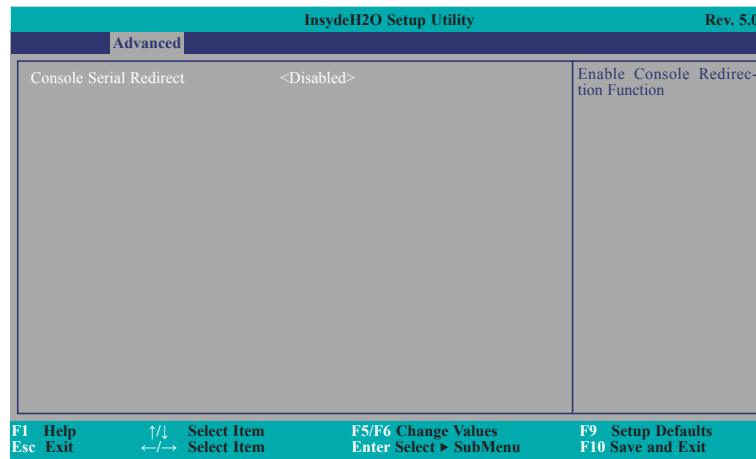This field is used to enable or disable the PCI Express Root Port.

### Hot Plug

This field is used to enable or disable the PCI Express Hot Plug.

### PCIe Speed

Select the speed of the PCI Express Root Port: Auto, Gen1 or Gen2.
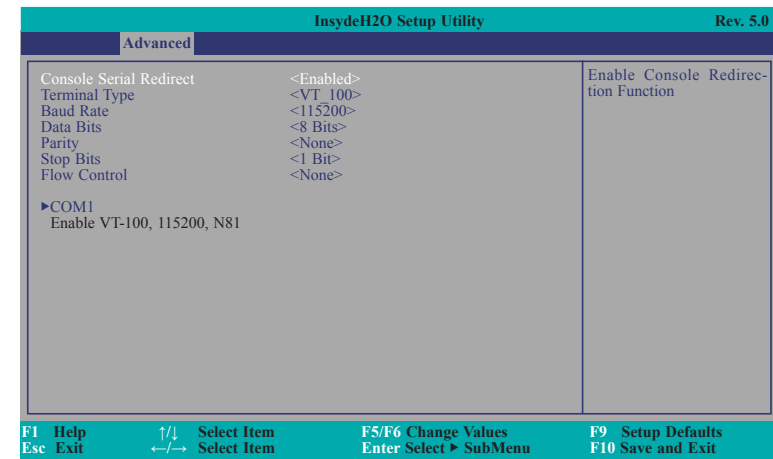
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## Console Redirection

This section configures settings relevant to console redirection.

```
                        InsydeH2O Setup Utility                    Rev. 5.0
        Advanced

   Console Serial Redirect          <Disabled>          Enable Console Redirec-
                                                        tion Function




F1   Help          ↑/↓    Select Item       F5/F6 Change Values      F9   Setup Defaults
Esc  Exit          ←/→    Select Item       Enter Select ▶ SubMenu   F10 Save and Exit
```

### Console Serial Redirect

This field is used to enable or disable the console serial redirection function.

When Console Serial Redirect is set to enabled, the screen will appear like below:

```
                        InsydeH2O Setup Utility                    Rev. 5.0
        Advanced

   Console Serial Redirect          <Enabled>           Enable Console Redirec-
   Terminal Type                    <VT_100>            tion Function
   Baud Rate                        <115200>
   Data Bits                        <8 Bits>
   Parity                           <None>
   Stop Bits                        <1 Bit>
   Flow Control                     <None>

   ▶COM1
     Enable VT-100, 115200, N81




F1   Help          ↑/↓    Select Item       F5/F6 Change Values      F9   Setup Defaults
Esc  Exit          ←/→    Select Item       Enter Select ▶ SubMenu   F10 Save and Exit
```

### Terminal Type

Select terminal type: VT_100, VT_100+, VT_UTF8 or PC_ANSI.

### Baud Rate

Select baud rate: 115200, 57600, 38400, 19200 or 9600.

### Data Bits

Select data bits: 7 Bits or 8 Bits.

### Parity

Select parity bits: None, Even or Odd.

### Stop Bits

Select stop bits: 1 Bit or 2 Bits.

### Flow Control

Select flow control type: None, RTS/CTS or XON/XOFF.

## COM1
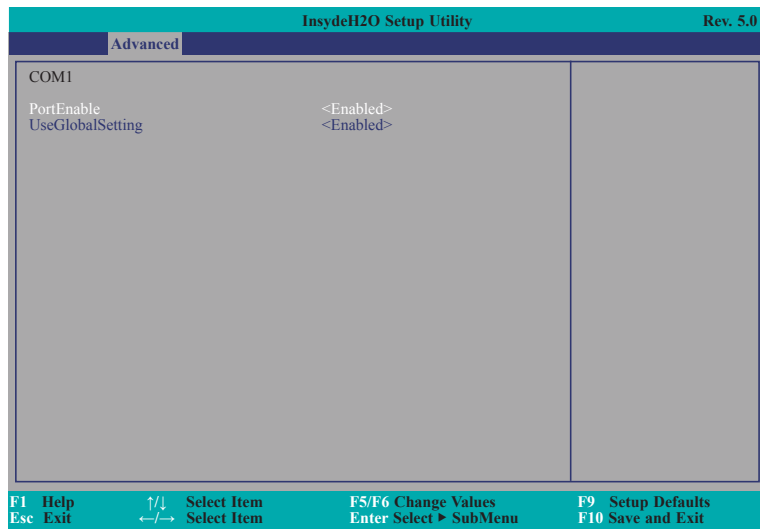
When UseGlobalSetting is set to disabled, the screen will appear like below:

```
                    InsydeH2O Setup Utility                      Rev. 5.0
    Advanced
  COM1

  PortEnable                          <Enabled>
  UseGlobalSetting                    <Enabled>








  F1  Help          ↑/↓   Select Item      F5/F6 Change Values      F9   Setup Defaults
  Esc Exit          ←/→   Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```

```
                    InsydeH2O Setup Utility                      Rev. 5.0
    Advanced
  COM1

  PortEnable                          <Enabled>
  UseGlobalSetting                    <Disabled>
  Terminal Type                       <VT_100>
  Baud Rate                           <115200>
  Data Bits                           <8 Bits>
  Parity                              <None>
  Stop Bits                           <1 Bit>
  Flow Control                        <None>




  F1  Help          ↑/↓   Select Item      F5/F6 Change Values      F9   Setup Defaults
  Esc Exit          ←/→   Select Item      Enter Select ▶ SubMenu   F10 Save and Exit
```

### PortEnable

This field is used to enable or disable the COM port to redirect the console.

### UseGlobalSetting

This field is to enable or disable to use global setting. When enabled the global setting, setting of the COM port will be the same as those in Console Redirection section. When disabled the global setting, setting of the COM port can be configured independently in this section.

## SIO FINTEK81803

This section configures the system super I/O chip parameters.

```
                    InsydeH2O Setup Utility                          Rev. 5.0
       Advanced

  COM Port 1                  <Enable>              Configure Serial port using
     Base I/O Address         <3F8>                 options: [Disable] No Con-
     Interrupt                <IRQ4>                figuration [Enable] User
     Type                     <RS232>              Configuration
  WDT                         <Disable>
  ►PC Health Status




 F1  Help          ↑/↓    Select Item      F5/F6 Change Values       F9   Setup Defaults
 Esc  Exit         ←/→   Select Item       Enter Select ► SubMenu    F10 Save and Exit
```
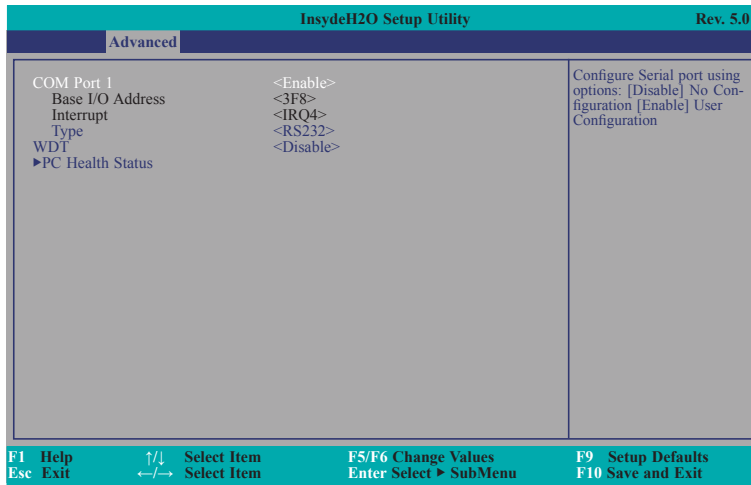
### COM Port 1

Configure the settings to use the serial port.

**Disable**  No configuration
**Enable**    User configuration

### Type

Choose RS232/RS422/RS485 (Peer-to-Peer) for COM type.

### WDT

Enable or disable the watchdog function. A counter will appear if you select to enable WDT. Input any value between 1 to 255 seconds.

## PC Health Status

This section displays the PC health status.

```
                    InsydeH2O Setup Utility                          Rev. 5.0
       Advanced

  Voltage
    VCORE                     0.784  V
    VDDQ                      1.360  V
    3VSB                      3.296  V
    3VCC                      3.296  V
    5VA                       4.944  V
    3VA                       3.280  V

  Temperature
    CPU (ºC/ºF)               43 C/109 F
    System (ºC/ºF)            45 C/113 F



 F1  Help          ↑/↓    Select Item      F5/F6 Change Values       F9   Setup Defaults
 Esc  Exit         ←/→   Select Item       Enter Select ► SubMenu    F10 Save and Exit
```

30
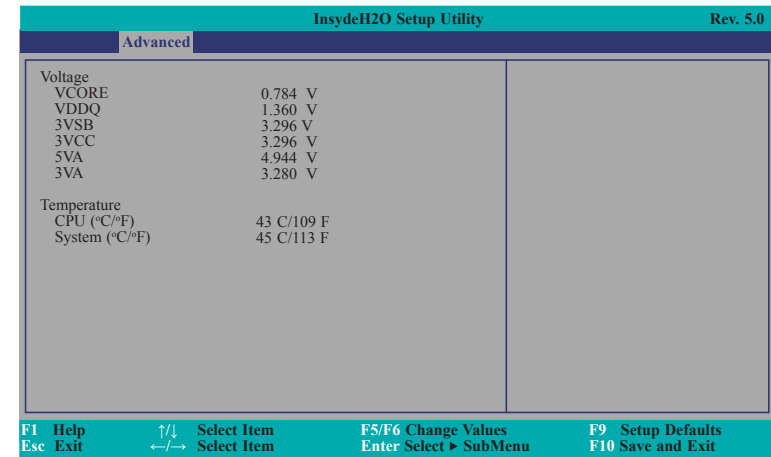
## Security
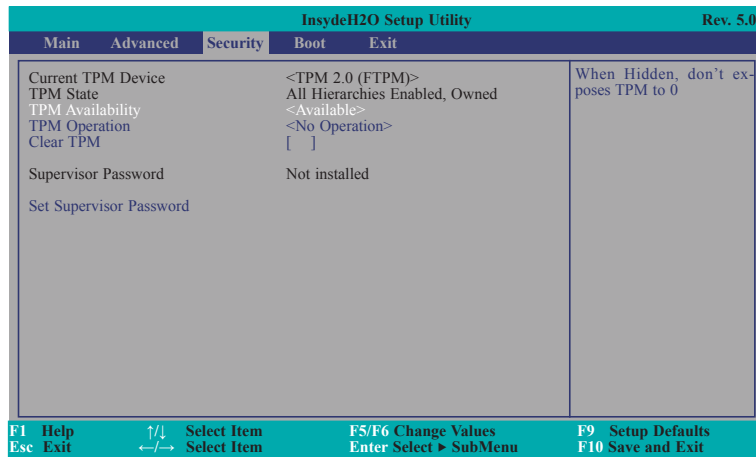


### TPM Availability

Show or hide the TPM availability and its configurations.

### TPM Operation

Enable or disable the TPM function. It displays the following options:

**No Operation** No changes to current state.

**Enable** Enable and activate TPM.

**Disable** Disable and activate TPM.

### Clear TPM

Remove all TPM context associated with a specific owner.

### Set Supervisor Password

Set the supervisor's password and the length of the password must be greater than one character.

## Boot
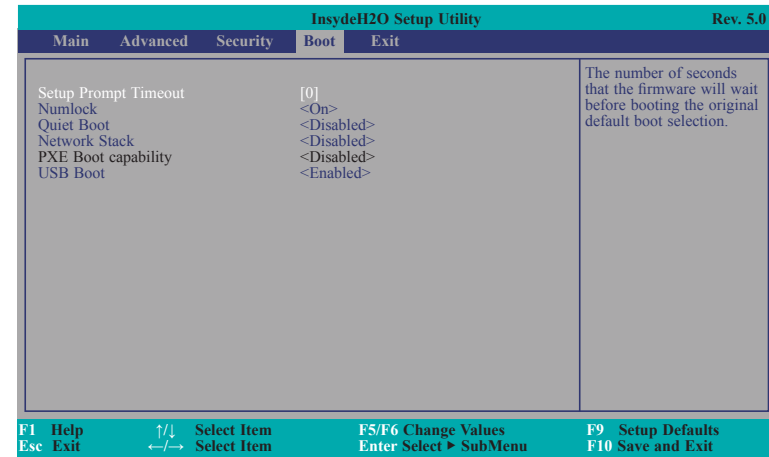


### Setup Prompt Timeout

Setup the number of seconds that the firmware will wait before booting the original default boot selection.

### Numlock

Select the power-on state for numlock.

### Quiet Boot

Enable or disable booting in text mode.

### Network Stack

This field is used to enable or disable network stack.

### PXE Boot capability

**Disabled** Suppoort Network Stack
**UEFI** IPv4/IPv6

### USB Boot

Enable or disable booting to USB boot devices.

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**Note:**
AL053 only support UEFI boot, no Legacy boot.

## Exit

```
                            InsydeH2O Setup Utility                          Rev. 5.0
    Main     Advanced     Security     Boot     Exit

                                                         Exit system setup and save
    Exit Saving Changes                                  your changes.
    Load Optimal Defaults
    Discard Changes
    Save Setting to file


    F1  Help          ↑/↓   Select Item      F5/F6 Change Values        F9  Setup Defaults
    Esc Exit          ←–/→  Select Item      Enter Select ▶ SubMenu     F10 Save and Exit
```
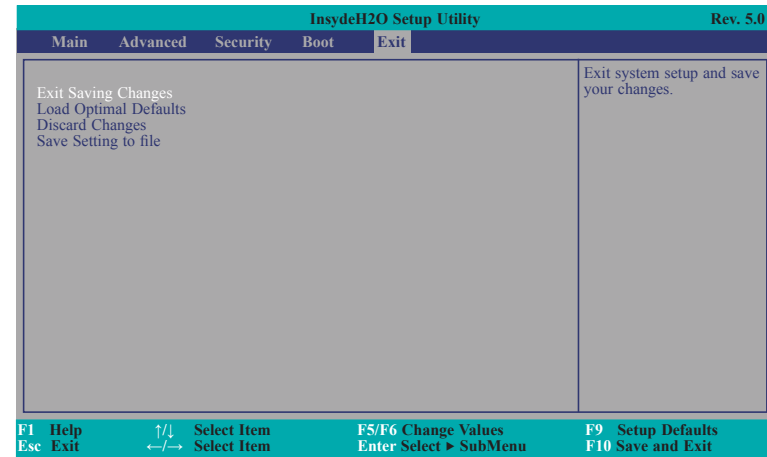
### Exit Saving Changes

Select Yes and press <Enter> to exit the system setup and save your changes.

### Load Optimal Defaults

Select YES and press <Enter> to load optimal defaults.

### Discard Changes

Select YES and press <Enter> to exit the system setup without saving your changes.

### Save Setting to file

Select this option to save BIOS configuration settings to a USB flash device.

### Restore Setting from file

This field will appear only when a USB flash device is detected. Select this field to restore setting from the USB flash device.

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## Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility. Please contact technical support or your sales representative for the files. For updating Insyde BIOS in UEFI mode, you may refer to the how-to-video at https://www.dfi.com/Knowledge/Video/31 .

## Notice: BIOS SPI ROM

1. The Intel® Trusted Execution Engine has already been integrated into this system board. Due to the safety concerns, the BIOS (SPI ROM) chip cannot be removed from this system board and used on another system board of the same model.

2. The BIOS (SPI ROM) on this system board must be the original equipment from the factory and cannot be used to replace one which has been utilized on other system boards.

3. If you do not follow the methods above, the Intel® Trusted Execution Engine will not be updated and will cease to be effective.

> **Note:**
> a. You can take advantage of flash tools to update the default configuration of the BIOS (SPI ROM) to the latest version anytime.
> b. When the BIOS IC needs to be replaced, you have to populate it properly onto the system board after the EEPROM programmer has been burned and follow the technical person's instructions to confirm that the MAC address should be burned or not.

# Chapter 4 - Supported Software

Please download drivers, utilities and software applications required to enhance the performance of AL053 at https://www.dfi.com/product/index/374#download.

## Intel Chipset Software Installation Utility

The Intel Chipset Software Installation Utility is used for updating Windows® INF files so that the Intel chipset can be recognized and configured properly in the system.

To install the utility, download "AL053 Chipset Driver" zip file at our website.

1. Setup is ready to install the utility. Click "Next".
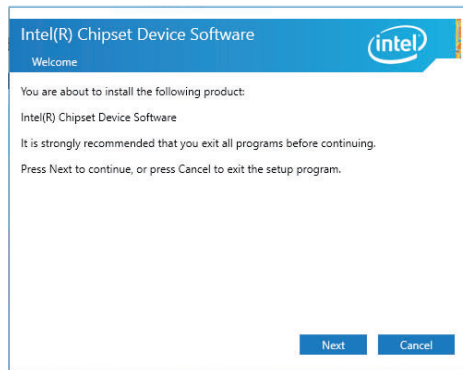
2. Read the license agreement then click "Accept".
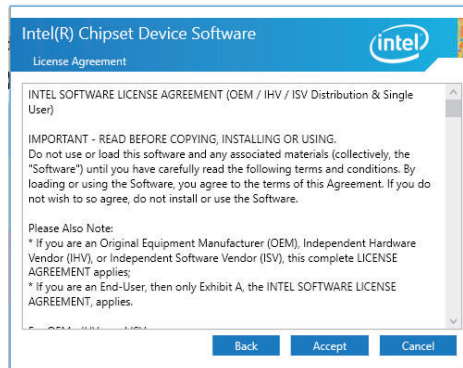
3. Go through the readme document for more installation tips then click "Install".
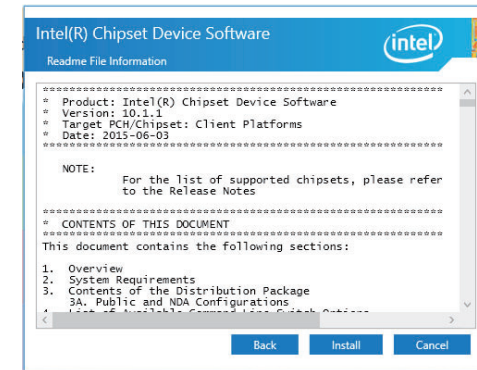
4. The step displays the installing status in the progress.
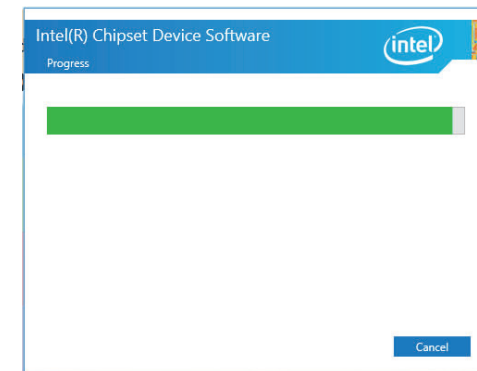
5. After completing installation, click "Restart Now" to exit setup.

   Restarting the system will allow the new software installation to take effect.

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## Intel Graphics Driver

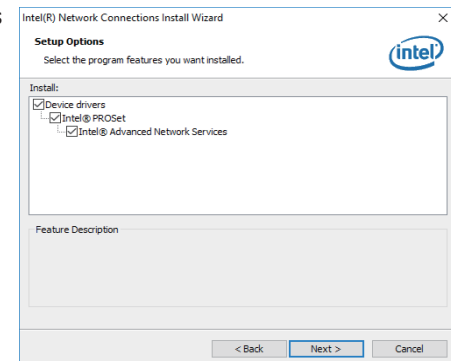To install the driver, download "AL053 Graphics Driver" zip file at our website.

1. Setup is now ready to install the graphics driver. Click "Next".
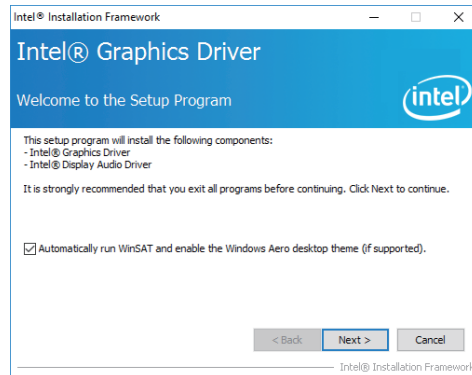
By default, the "Automatically run WinSAT and enable the Windows Aero desktop theme" is enabled. With this enabled, after installing the graphics driver and the system rebooted, the screen will turn blank for 1 to 2 minutes (while WinSAT is running) before the Windows 10 desktop appears. The "blank screen" period is the time Windows is testing the graphics performance.

We recommend that you skip this process by disabling this function then click "Next".

2. Read the license agreement then click "Yes".
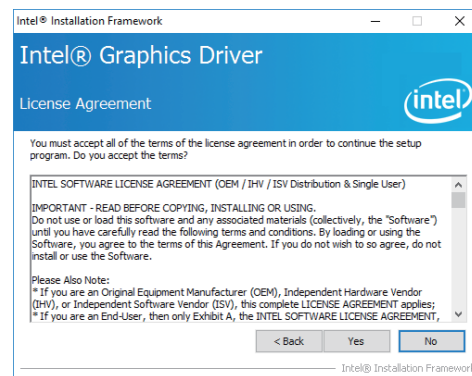
3. Go through the readme document for system requirements and installation tips then click "Next".
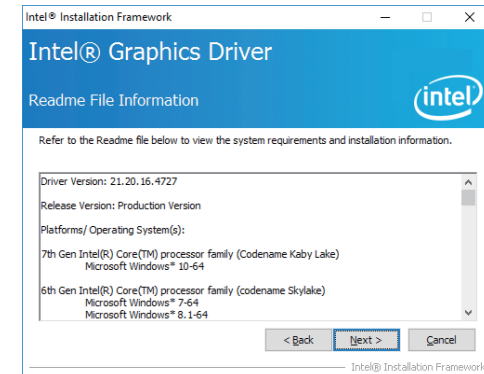
4. Setup is now installing the driver. Click "Next" to continue.
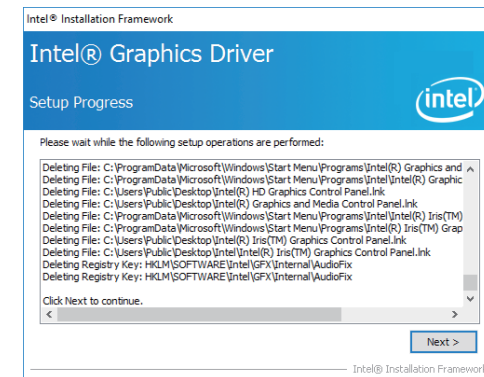
5. Click "Yes, I want to restart this computer now" then click "Finish".

   Restarting the system will allow the new software installation to take effect.

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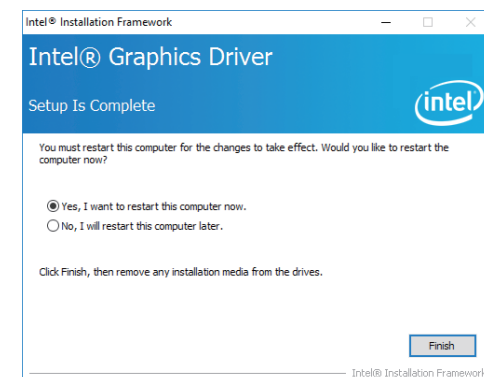
## Audio Driver

To install the driver, download "AL053 Audio Driver" zip file at our website.

1. Setup is ready to install the driver. Click "Next".
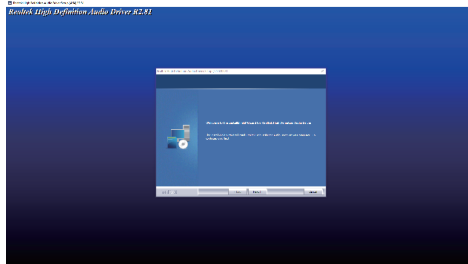
2. Click "Yes, I want to restart my computer now" then click "Finish".

   Restarting the system will allow the new software installation to take effect.
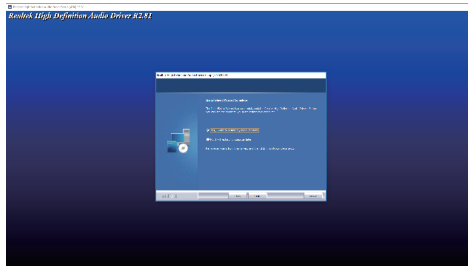
## Intel LAN Driver

To install the driver, download "AL053 LAN Driver" zip file at our website.

1. Setup is ready to install the driver. Click "Next".
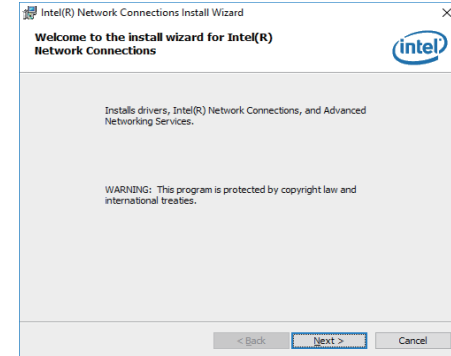
2. Click "I accept the terms in the license agreement" then click "Next".
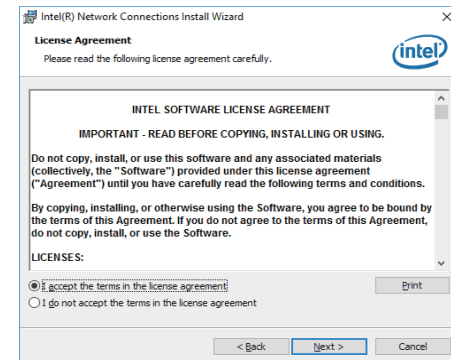
3. Select the program features you want installed then click "Next".

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4. Click "Install" to begin the installation.
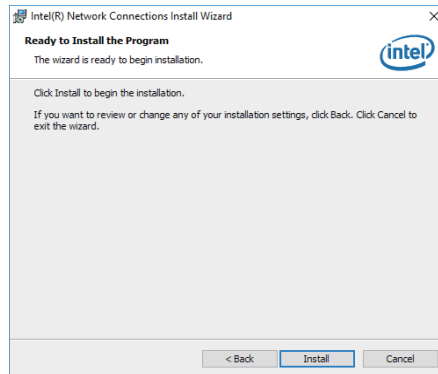
5. The step displays the installing status in the progress.
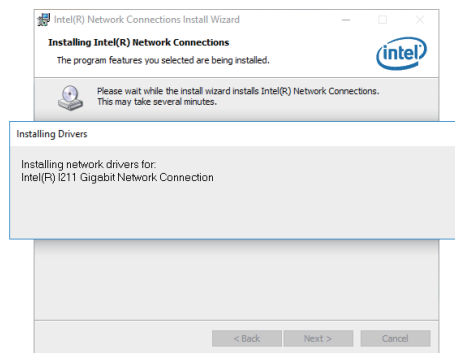
6. After completing installation, click "Finish".
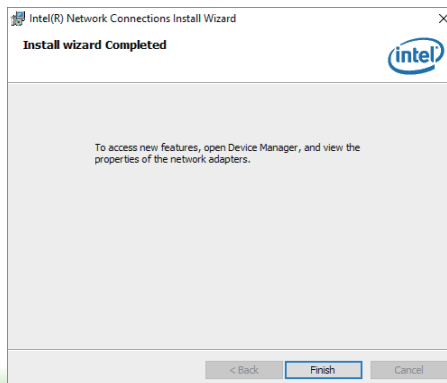
## Intel Trusted Execution Engine Driver

To install the driver, download "AL053 TXE Driver" zip file at our website.

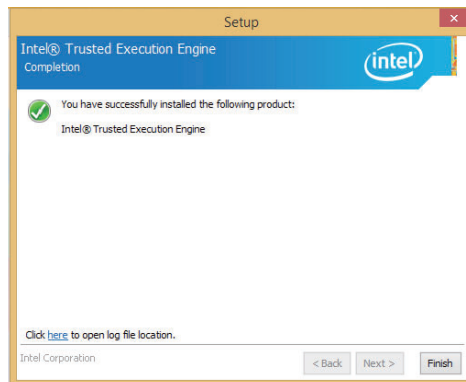1. Tick "I accept the terms in the License Agreement" and then click "Next."
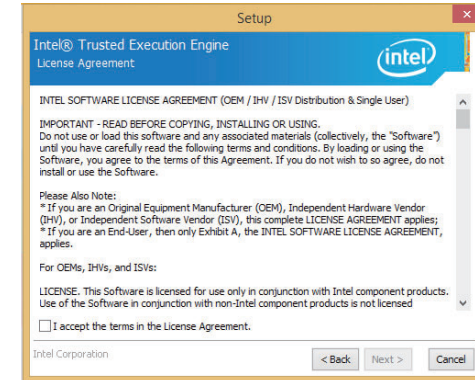
2. The step shows the components which will be installed. Then, Click Next.
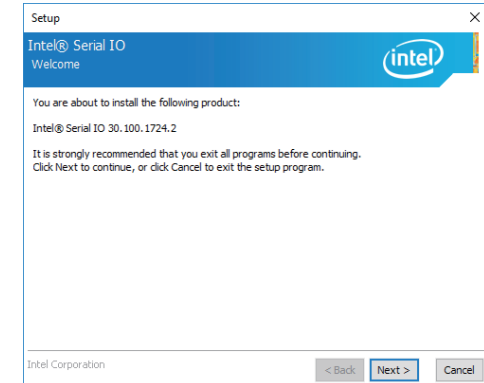
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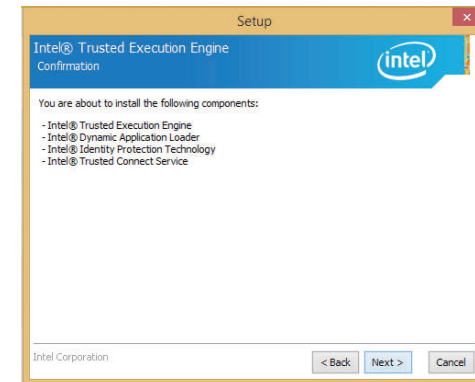
3. The step displays the installing status in the progress.
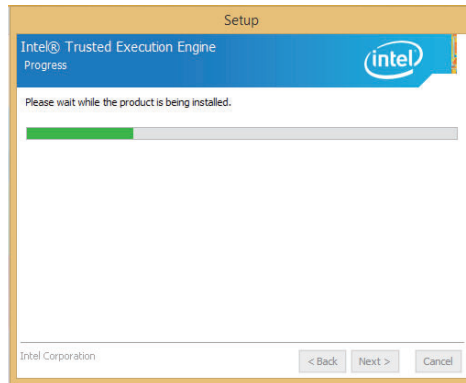
4. Click "Finish" when the installation is complete.

## SIO Driver

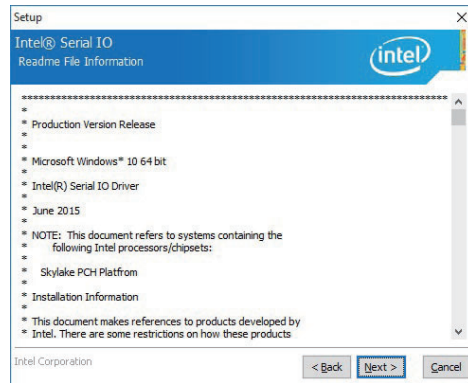To install the driver, download "AL053 SIO Driver" zip file at our website.

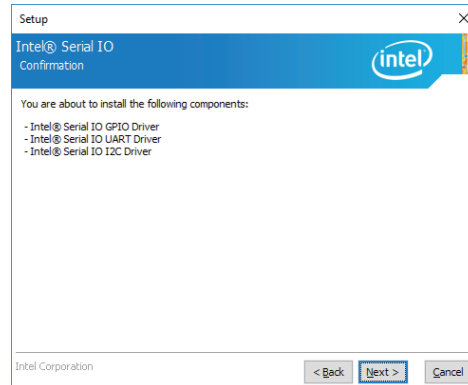1. Setup is ready to install the driver. Click "Next".

2. Read the license agreement carefully.

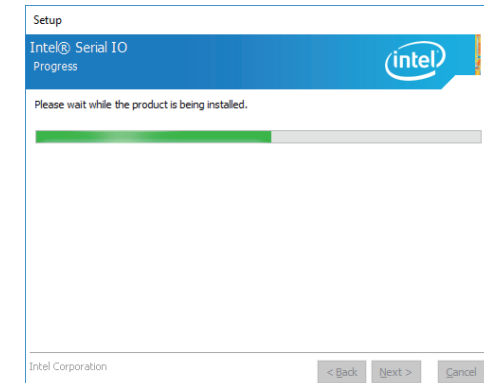   Tick "I accept the terms in the License Agreement" then click "Next".

3. Go through the readme docu-
   ment for system requirements and
   installation tips then click "Next".

4. Setup is ready to install the driver.
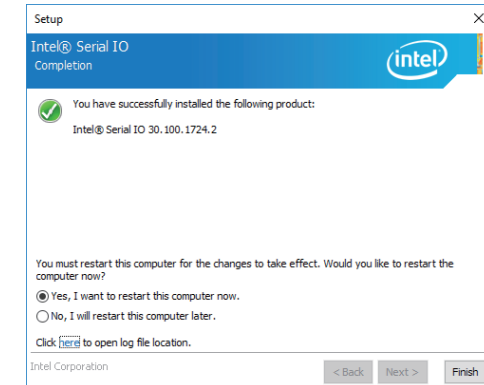   Click "Next".

5. Setup is now installing the
   driver.

6. Click "Yes, I want to restart
   this computer now" then
   click "Finish".

   Restarting the system will
   allow the new software
   installation to take effect.

## Appendix A - List of Connectors

### List of Connectors

| Function | Connector | Connector Information | Rate Output |
|---|---|---|---|
| LVDS LCD Panel | J1 | V-STAR W100V40TP2: 2*20pin, 1.0mm, BOX HEADER | +3.3V or +5V/1.5A |
| Front Audio | J5 | V-STAR JCL20161228017: 2*5pin, 1.27mm, PIN PLUG, H= 5mm | N/A |
| USB 6-7 | J6 | V-STAR JCL20161228017: 2*5pin, 1.27mm, PIN PLUG, H= 5mm | +5V/0.5A (per channel) |
| LCD/Inverter & SATA Power | J8 | E-CALL 0110-3221050: 1*5pin, 1.25mm, WAFER | +12V/1A +5V/1A |
| COM 1 | J10 | V-STAR JCL20161228017: 2*5pin, 1.27mm, PIN PLUG, H= 5mm | N/A |
| Digital I/O | J11 | V-STAR JCL20161228017: 2*5pin, 1.27mm, PIN PLUG, H= 5mm | +5V/1A |
| SMBus | J12 | V-STAR JCL20161228019: 2*3pin, 1.27mm, PIN PLUG, H= 5mm | +3.3VSB/0.5A |
| Front Panel | J13 | V-STAR JCL20161228019: 2*3pin, 1.27mm, PIN PLUG, H= 5mm | N/A |