

# COM33 I-B

## System Board User's Manual

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## Trademarks

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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.

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## About this Manual

This manual can be downloaded from the website, or acquired as an electronic file included in the optional CD/DVD. The manual is subject to change and update without notice, and may be based on editions that do not resemble your actual products. Please visit our website or contact our sales representatives for the latest editions.

## 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 consequential 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.

Battery:

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

## About the Package

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

- One COM331-B board
- Two Serial ATA data cables
- One COM port cable (with bracket)
- One I/O shield
- One QR (Quick Reference)

## Optional Items

- Serial ATA data cable
- Serial ATA power cable
- COM port cable
- I/O shield

The system 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.

- A CPU
- Memory module
- Storage devices such as hard disk drive, CD-ROM, 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

---

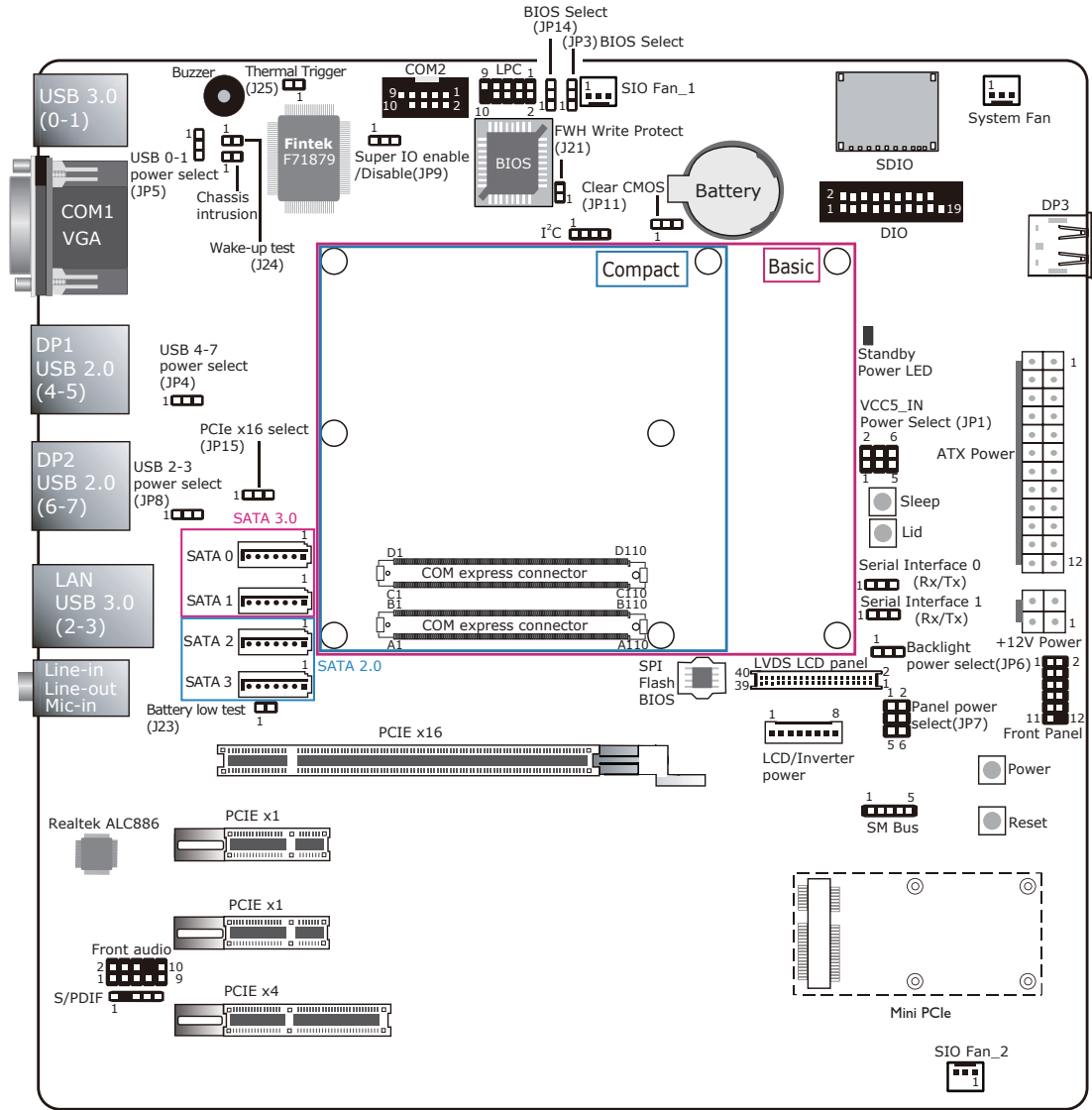
## Specifications

|                      |   |
|----------------------|---|
| Audio                | <ul style="list-style-type: none"><li>• Realtek ALC886 5.1-channel High Definition Audio</li><li>• Audio outputs: Mic-in/Center+Subwoofer, Line-in/Surround and Line-out</li><li>• S/PDIF audio interface</li></ul>   |
| Storage              | <ul style="list-style-type: none"><li>• 4 Serial ATA ports</li><li>- 2 SATA 3.0 ports with data transfer rate up to 6Gb/s</li><li>- 2 SATA 2.0 ports with data transfer rate up to 3Gb/s</li></ul>  |
| Digital I/O          | <ul style="list-style-type: none"><li>• 8-bit Digital I/O connector</li><li>- 4-bit GPI (General Purpose Input)</li><li>- 4-bit GPO (General Purpose Output)</li></ul>  |
| Rear Panel I/O Ports | <ul style="list-style-type: none"><li>• 1 DB-9 RS232 serial port</li><li>• 1 DB-15 VGA port</li><li>• 2 DisplayPort</li><li>• 1 RJ45 LAN port</li><li>• 4 USB 3.0 ports</li><li>• 4 USB 2.0 ports</li><li>• Line-in/Surround, Line-out, Mic-in/Center+Subwoofer jacks</li></ul>   |
| I/O Connectors       | <ul style="list-style-type: none"><li>• 1 connector for 1 external RS232 serial port</li><li>• 2 serial interface connectors (TX/RX)</li><li>• 1 SDIO slot</li><li>• 1 DisplayPort</li><li>• 1 LVDS LCD panel connector</li><li>• 1 LCD/inverter power connector</li><li>• 1 8-bit Digital I/O connector</li><li>• 1 front audio connector for line-out and mic-in jacks</li><li>• 1 S/PDIF connector</li><li>• 4 Serial ATA ports</li><li>• 1 LPC connector</li><li>• 1 I<sup>2</sup>C connector</li><li>• 1 SMBus connector</li><li>• 1 24-pin ATX power connector</li><li>• 1 4-pin 12V power connector</li><li>• 1 chassis intrusion connector</li><li>• 1 front panel connector</li><li>• 3 fan connectors</li></ul> |
| Expansion Slots      | <ul style="list-style-type: none"><li>• 1 PCIe x16 Gen 3 slot</li><li>• 1 PCIe x4 Gen 2 slot</li><li>• 2 PCIe x1 slots (PCIe 2.0)</li><li>• 1 Mini PCIe slot (PCIe 2.0) (PCIe signal only)</li><li>- USB signal: optional</li><li>- Supports half/full size Mini PCIe card</li></ul>  |

|                          |   |
|--------------------------|---|
| COM EXPRESS MODULES      | <ul style="list-style-type: none"> <li>• Basic</li> <li>• Compact</li> </ul>  |
| Damage Free Intelligence | <ul style="list-style-type: none"> <li>• Legacy Super I/O support (option) <ul style="list-style-type: none"> <li>- Monitors 5V/1.5V/12V/3.3V</li> <li>- Monitors SIO_Fan 1/SIO_Fan 2/System fan</li> </ul> </li> </ul>   |
| ROM Interface            | <ul style="list-style-type: none"> <li>• 1 SPI interface <ul style="list-style-type: none"> <li>- Supports up to 64Mbit</li> </ul> </li> <li>• 1 LPC/FWH interface</li> </ul>   |
| Temperature              | <ul style="list-style-type: none"> <li>• Operating: 0°C to 60°C</li> <li>• Storage: -20°C to 85°C</li> </ul>  |
| Humidity                 | <ul style="list-style-type: none"> <li>• 10% to 90%</li> </ul>  |
| Power Input              | <ul style="list-style-type: none"> <li>• 12V, 5VSB, VCC_RTC (ATX mode)</li> <li>• 12V, 5V, VCC_RTC (AT mode)</li> <li>• 12V, VCC_RTC (AT mode)</li> </ul>   |
| Certification            | <ul style="list-style-type: none"> <li>• CE, FCC Class B, RoHS</li> </ul>   |
| PCB                      | <ul style="list-style-type: none"> <li>• Dimensions <ul style="list-style-type: none"> <li>- microATX form factor</li> <li>- 244mm (9.6") x 244mm (9.6")</li> </ul> </li> <li>• Compliance <ul style="list-style-type: none"> <li>- PICMG COM Express R2.0, Type 6</li> </ul> </li> </ul> |

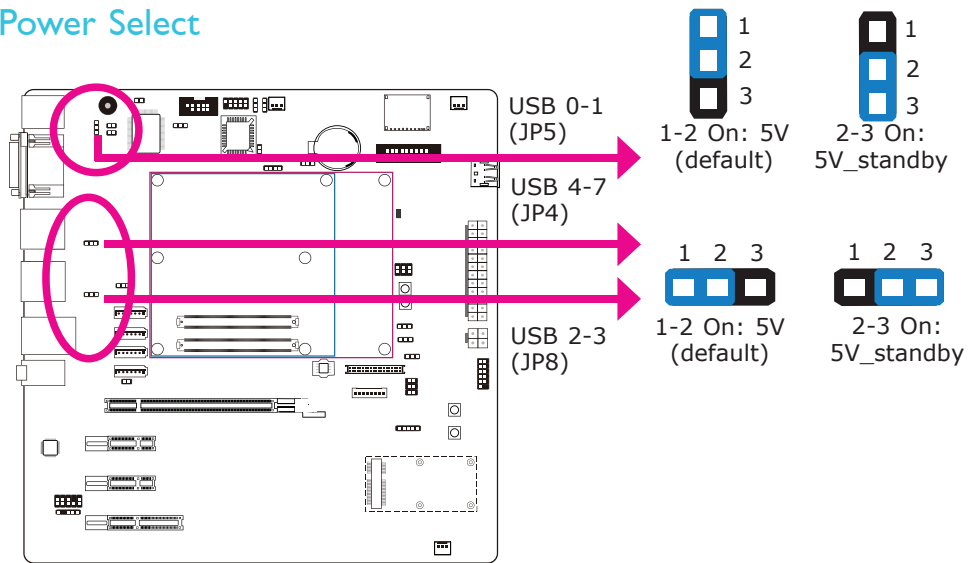
# Chapter 2 - Hardware Installation

## System Board Layout



## Jumper Settings

### USB Power Select



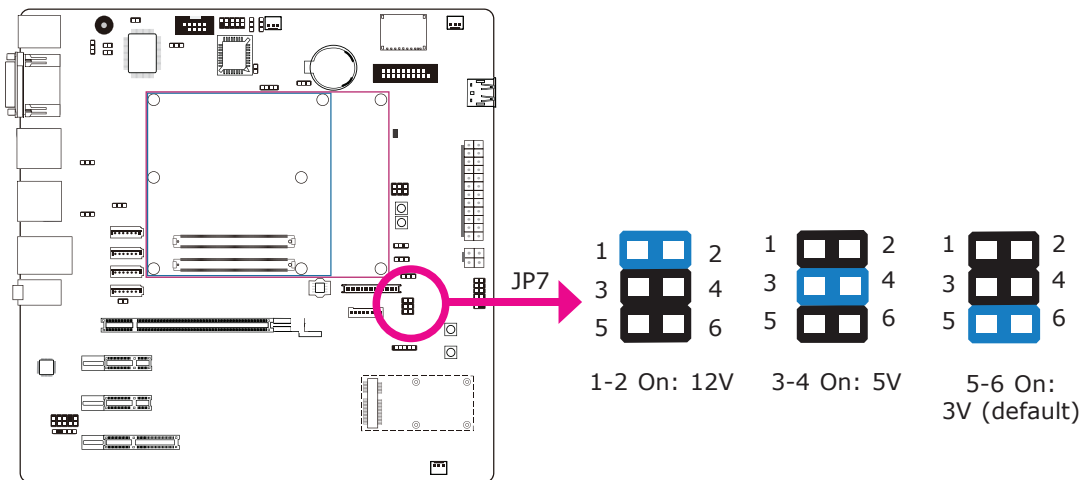
JP5 (for USB 0-1), JP4 (for USB 4-7) and JP8 (for USB 2-3) are used to select the power of the USB ports. Selecting 5V\_standby will allow you to use a USB keyboard to wake up the system.



#### Important:

If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V\_standby power source of your power supply must support  $\geq 1.5A$ . For 3 or more USB ports, the 5V\_standby power source of your power supply must support  $\geq 2A$ .

## Panel Power Select



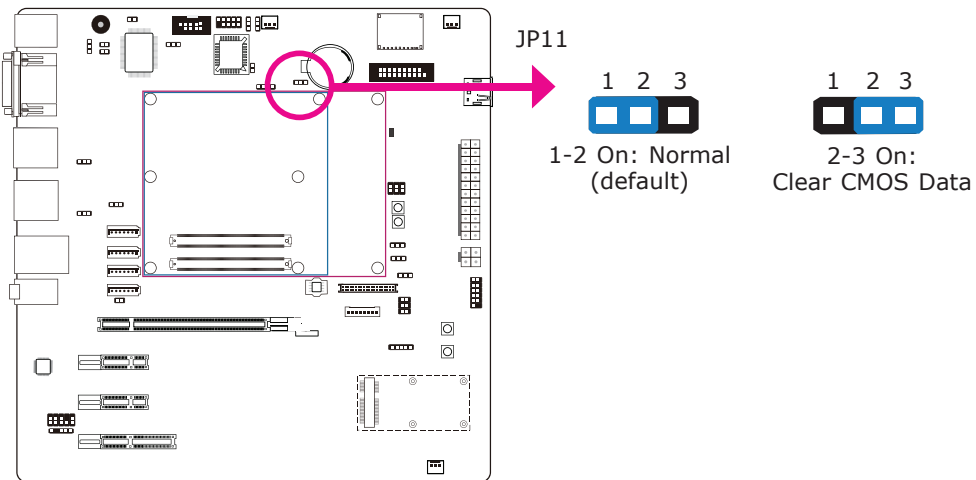
JP7 is used to select the power supplied to the LCD panel.



**Important:**

Before powering-on the system, make sure JP7's setting matches the LCD panel's specification. Selecting the incorrect voltage will seriously damage the LCD panel.

## Clear CMOS



If you encounter the following,

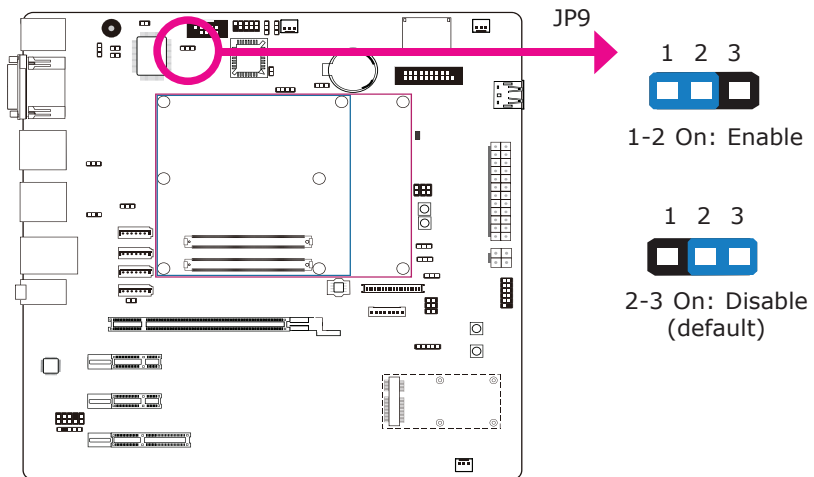
- a) CMOS data becomes corrupted.
- b) You forgot the supervisor or user password.

you can reconfigure the system with the default values stored in the ROM BIOS.

To load the default values stored in the ROM BIOS, please follow the steps below.

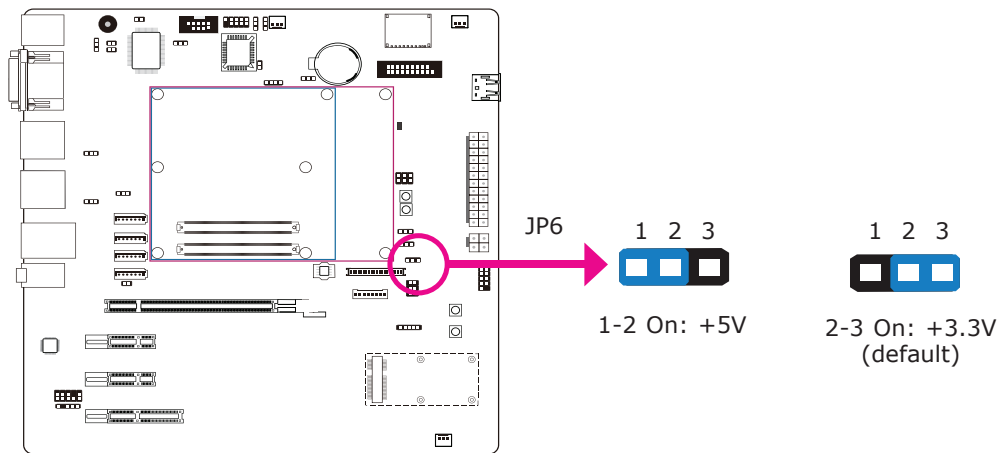
1. Power-off the system and unplug the power cord.
2. Set JP11 pins 2 and 3 to On. Wait for a few seconds and set JP11 back to its default setting, pins 1 and 2 On.
3. Now plug the power cord and power-on the system.

## Super IO Enable/ Disable



JP9 is used to select enable or disable the super IO select.

## Backlight Power Select



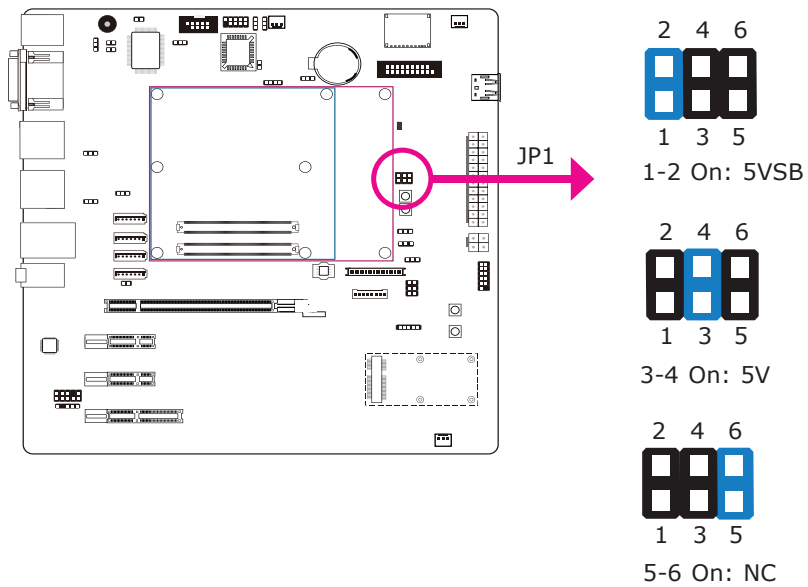
JP6 is used to select the backlight control level +5V or +3.3V.

**Important:**

Before powering-on the system, make sure JP6's setting matches the backlight power's specification. Selecting the incorrect voltage will seriously damage the backlight.

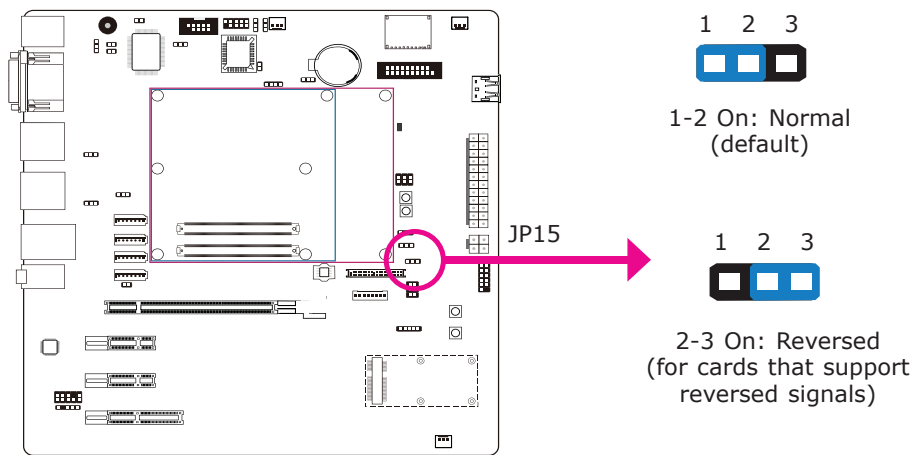


## VCC5\_IN Power Select



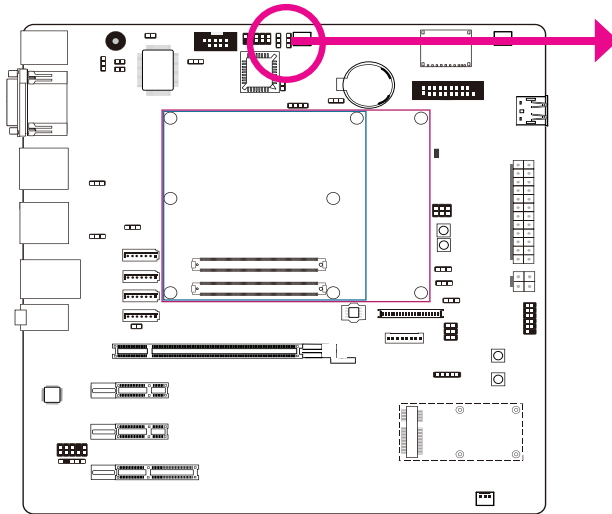
JP1 is used to select the power of the COM Express connector.

## PCIe x16 Normal/ Reversed



IF you are installing a PCIe x16 card who's signal is reversed, set JP15 pins 2 and 3 to on.

## BIOS Select



JP14: 1-2 On    JP3: 1-2 On



Module SPI BIOS

JP14: 2-3 On    JP3: 1-2 On



Carrier LPC FWH

JP14: 1-2 On    JP3: 2-3 On



Carrier SPI0

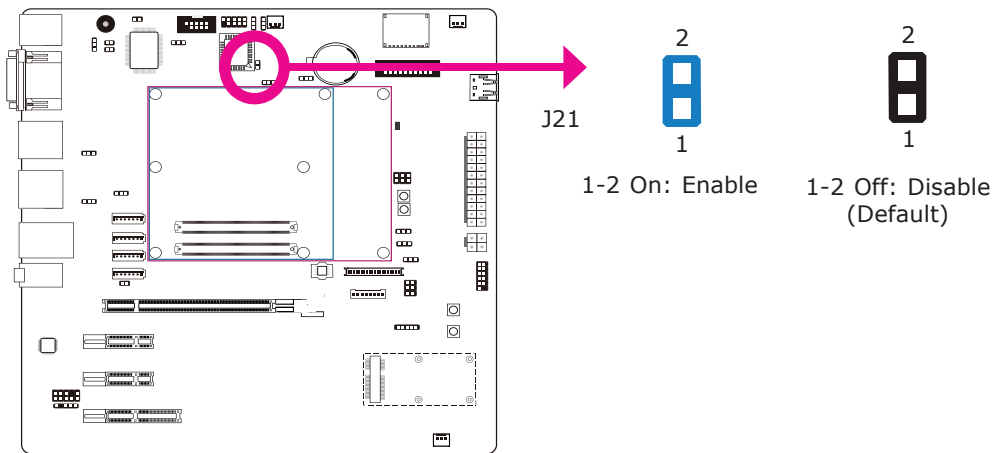
JP14: 2-3 On    JP3: 2-3 On



Module SPI0 (Default)

JP3 and JP14 are used to determine the BIOS boot device.

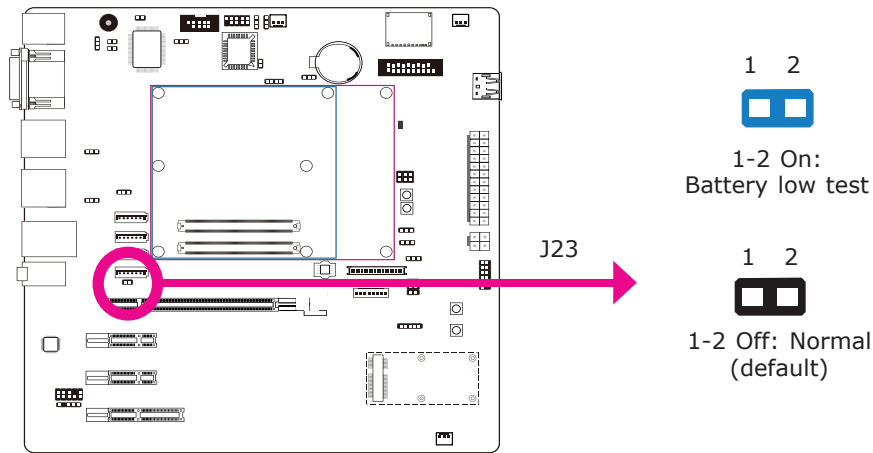
## FWH Write Protect



J21 is used to configure the BIOS Write Protect function. When this function is enabled, the system will be protected from unnecessary updating or flashing of the BIOS. It secures the BIOS therefore any updates to it will not take effect.

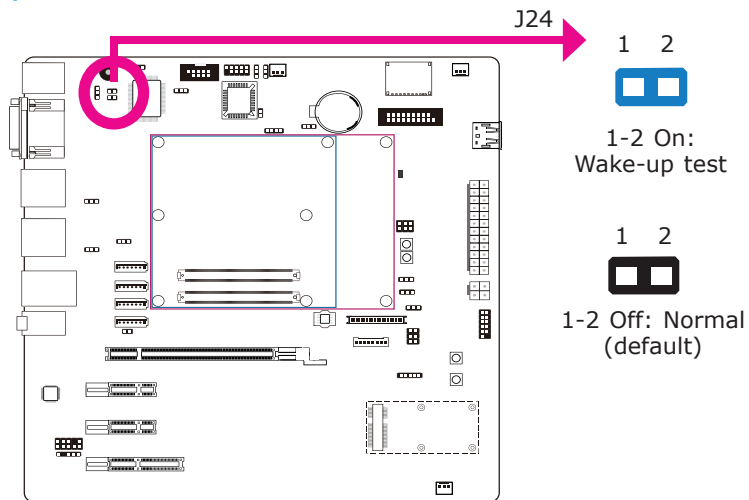
## Function Test Jumpers

### Battery Low Test



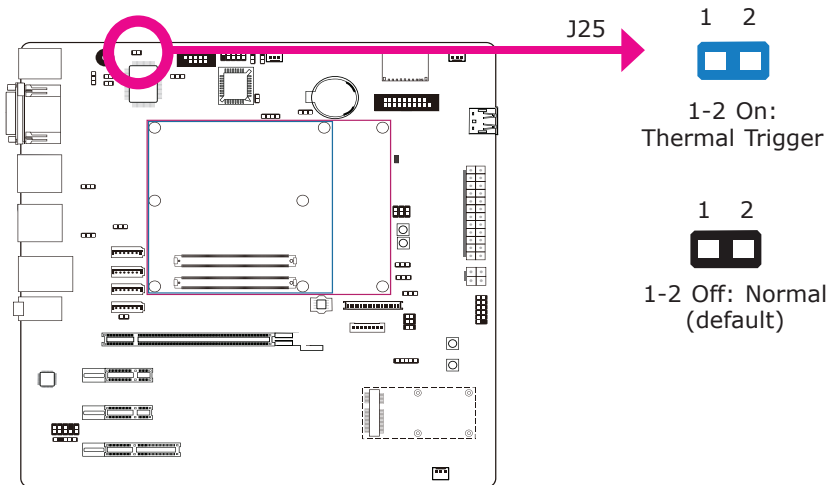
This jumper is used to simulate the signal status that indicates the external battery is low. By setting J23 pins 1 and 2 to On, it sends a battery low signal to the module.

## Wake-up Test



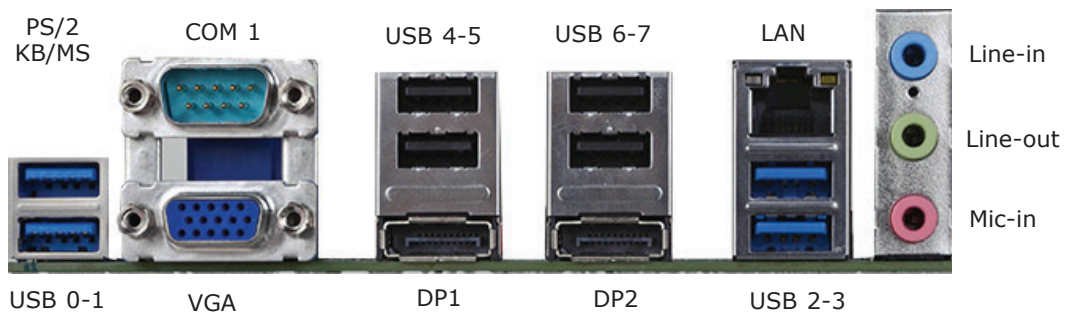
This jumper is used to simulate the signal status that indicates the wake-on-ring or PME# event from the Super I/O. It is also used to simulate a general purpose wake-up signal such as wake-up on PS/2 keyboard or PS/2 mouse. Set J24 pins 1 and 2 to On to use this function.

## Thermal Trigger



This jumper is used to simulate the signal status that indicates the Over Temperature Signal (OVT) output from the Super I/O F71879. When monitored temperature exceeds the OVT value, OVT# will be asserted until the temperature goes below the hysteresis temperature. Set J25 pins 1 and 2 to On to send THRM# signal to the module.

## Rear Panel I/O Ports

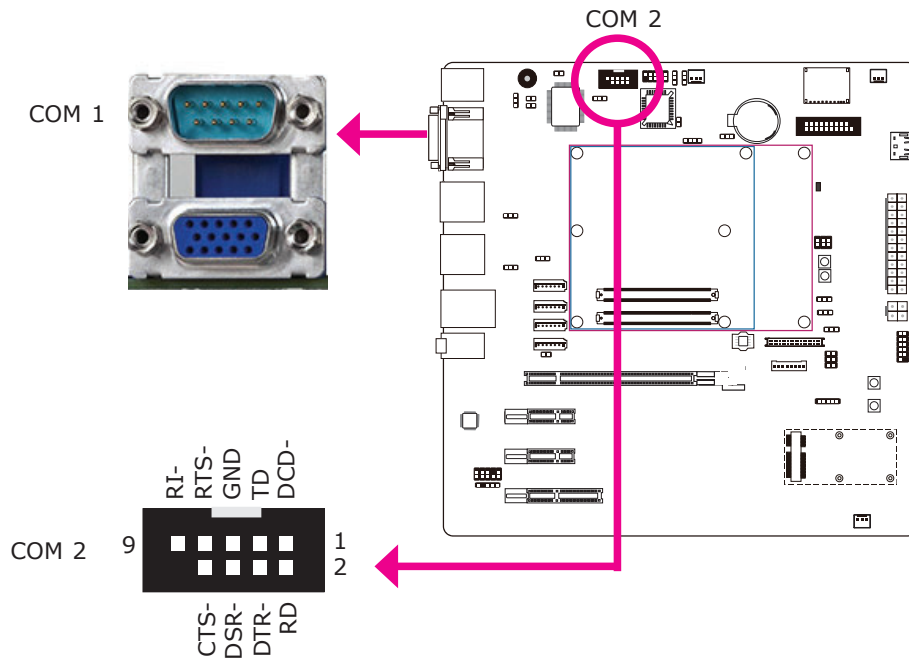


The rear panel I/O ports consist of the following:

- 2 Display ports
- 1 COM port
- VGA port
- LAN port
- 8 USB ports
- Mic-in jack
- Line-in jack
- Line-out jack



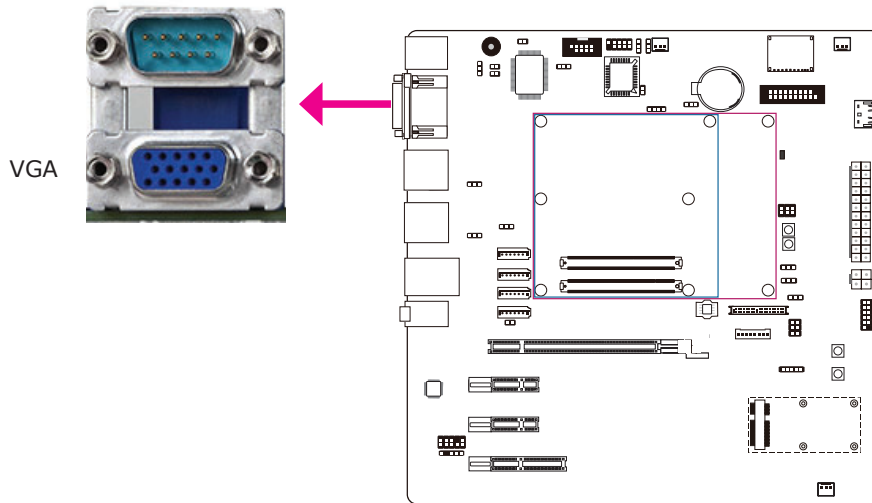
## Serial (COM) Ports



The system board is equipped with 1 onboard serial port (COM 1). It is also equipped with a 9-pin connector for connecting an external serial port (COM 2).

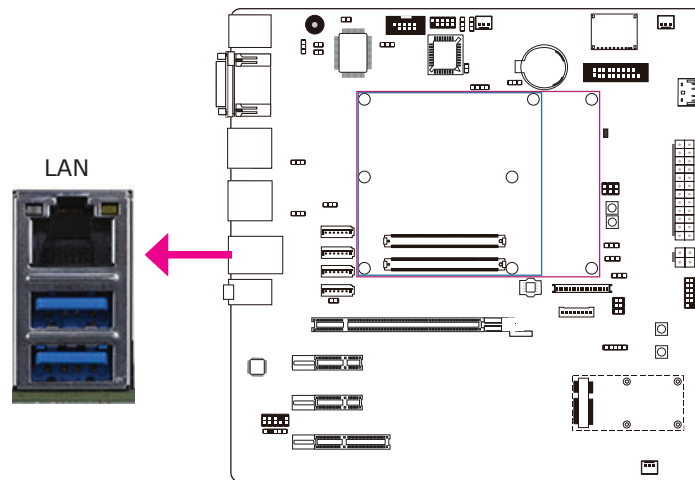
The serial ports are RS-232 asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices. To connect COM 2, please refer to the following description. The serial port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then insert the cable connector to the 9-pin connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the connector.

## VGA Port



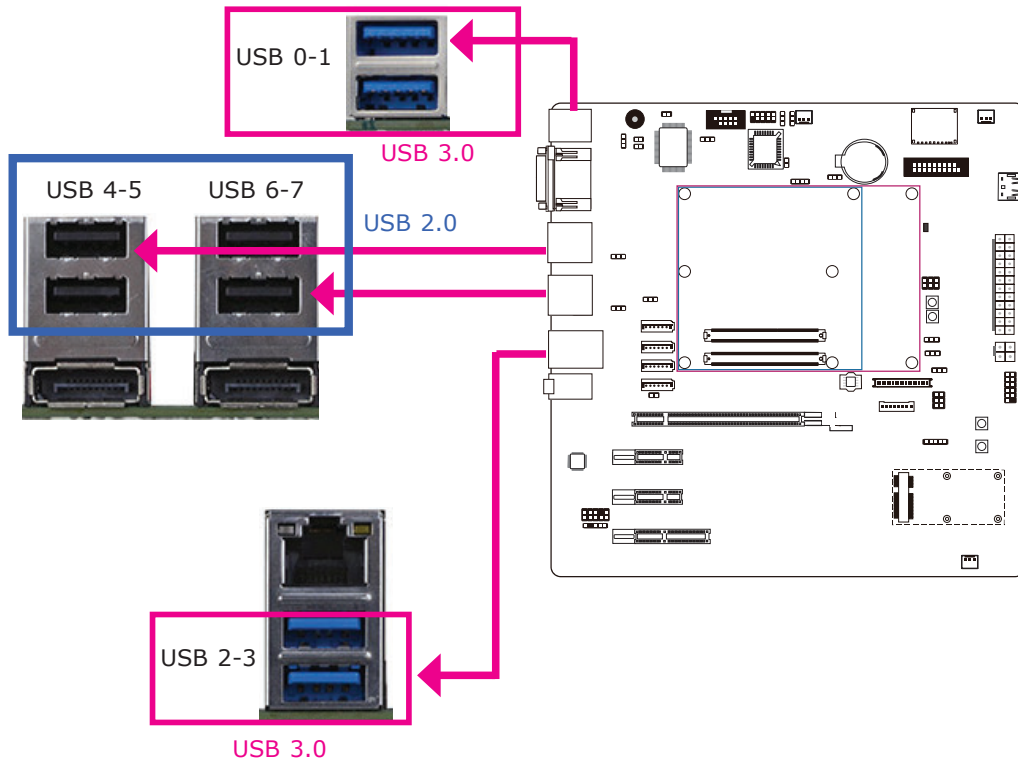
The VGA port is used for connecting a VGA monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port. After you plug the monitor's cable connector into the VGA port, gently tighten the cable screws to hold the connector in place.

## RJ45 LAN Port



The onboard RJ45 LAN port allows the system board to connect to a local area network by means of a network hub.

## Universal Serial Bus Connectors



USB allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with four onboard USB 3.0/2.0/1.1 ports (USB 0-3) and four onboard USB 2.0/1.1 ports (USB 4-7).

### BIOS Setting

Configure the onboard USB in the Advanced menu ("USB Configuration" sub-menu) of the BIOS. Refer to chapter 3 for more information.

### Driver Installation

You may need to install the proper drivers in your operating system to use the USB device. Refer to your operating system's manual or documentation 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. To use this function:

- **Jumper Setting**

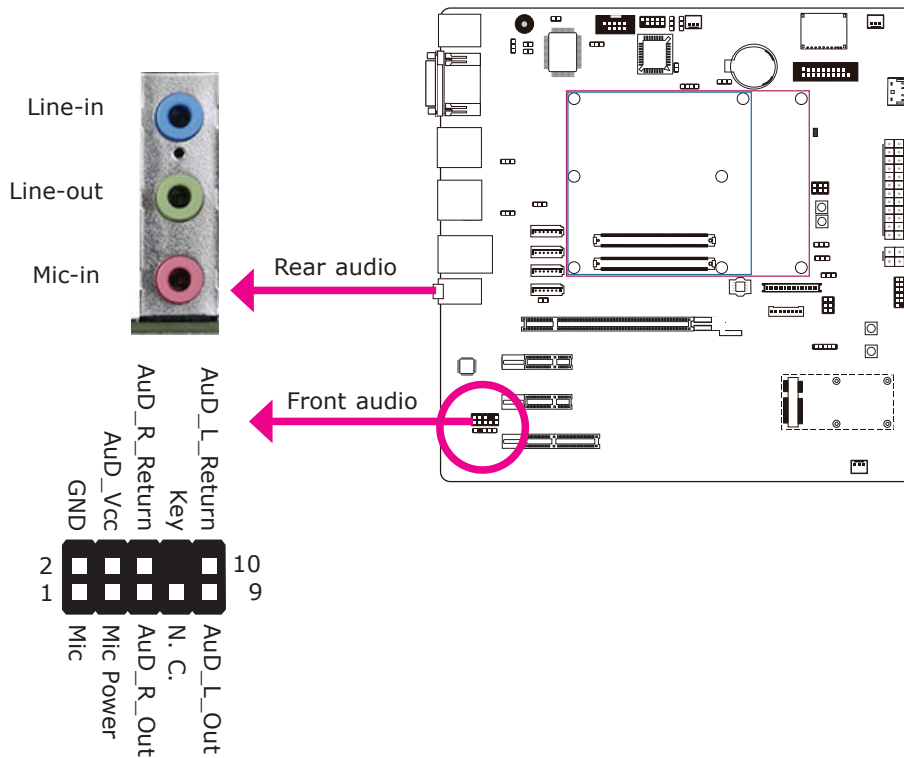
JP4, JP5 and/or JP8 must be set to "2-3 On: 5V\_standby". Refer to "USB Power Select" in this chapter for more information.



**Important:**

If you are using the Wake-On-USB Keyboard/Mouse function for 2 USB ports, the 5V\_standby power source of your power supply must support  $\geq 1.5A$ . For 3 or more USB ports, the 5V\_standby power source of your power supply must support  $\geq 2A$ .

## Audio



### Rear Audio

The system board is equipped with 3 audio jacks. A jack is a one-hole connecting interface for inserting a plug.

- **Line-in Jack (Light Blue)**  
This jack is used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.
- **Line-out Jack (Lime)**  
This jack is used to connect a headphone or external speakers.
- **Mic-in Jack (Pink)**  
This jack is used to connect an external microphone.

### Front Audio

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

### BIOS Setting

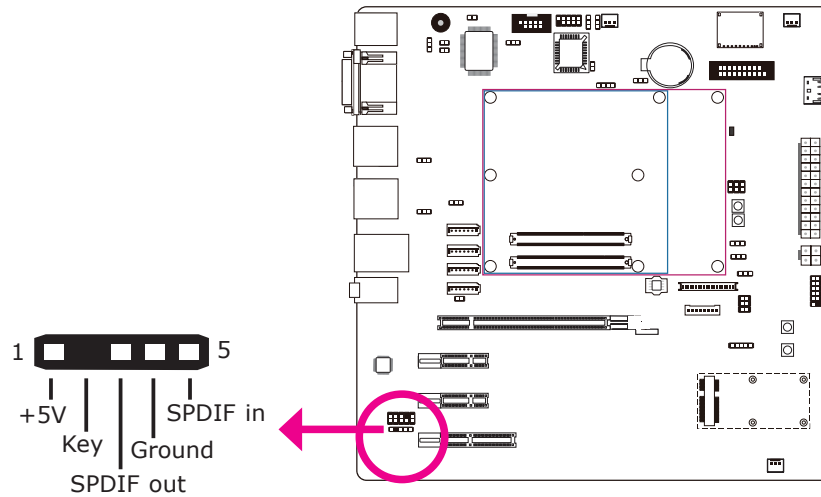
Refer to the module's BIOS for more information.

### Driver Installation

Install the audio driver. Refer to chapter 3 for more information.

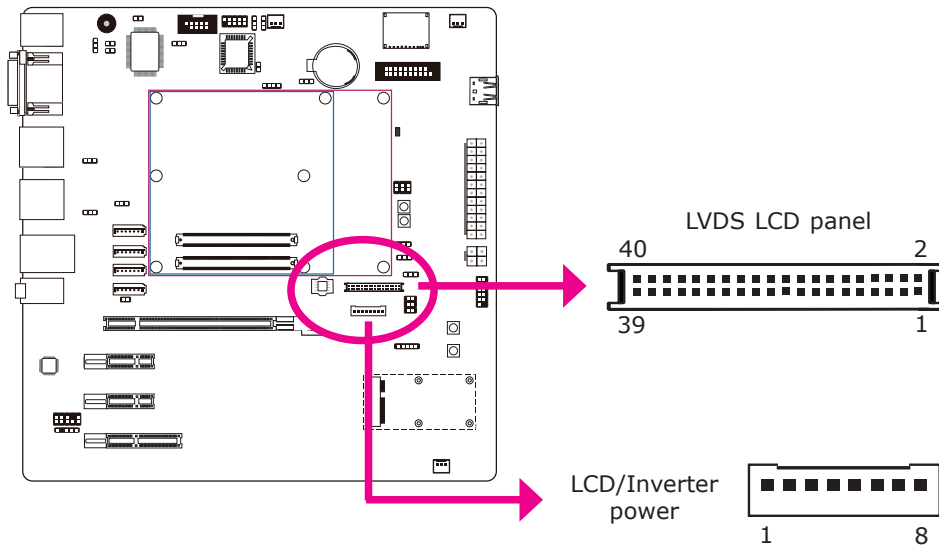
## I/O Connectors

### S/PDIF Connector



The S/PDIF connector is used to connect external S/PDIF ports. Your S/PDIF 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 then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the connector.

## LVDS LCD Panel Connector LCD/Inverter Power Connector



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 next page for the pin functions of these connectors.

### Jumper Settings

Refer to the "Jumper Settings" section in this chapter for settings relevant to the LCD panel.



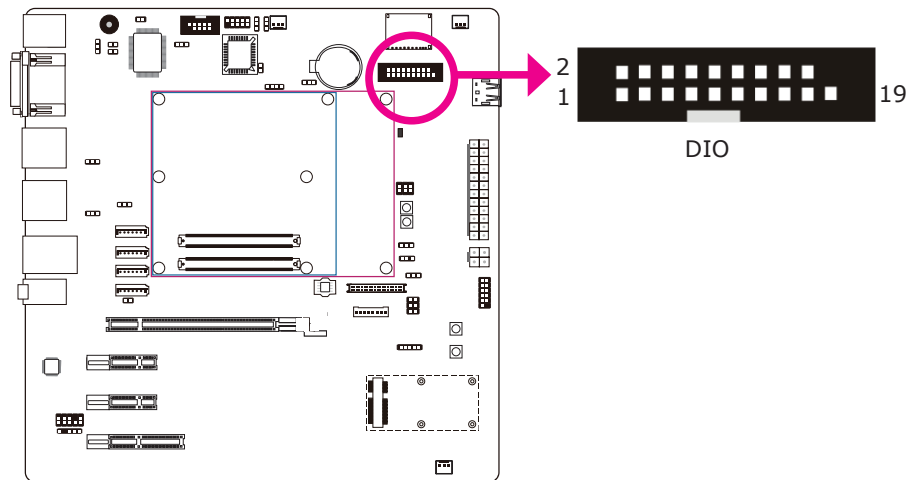
## LVDS LCD Panel Connector

| Pins | Function    | Pins | Function    |
|------|-------------|------|-------------|
| 1    | GND         | 2    | GND         |
| 3    | LVDS_Out3+  | 4    | LVDS_Out7+  |
| 5    | LVDS_Out3-  | 6    | LVDS_Out7-  |
| 7    | GND         | 8    | GND         |
| 9    | LVDS_Out2+  | 10   | LVDS_Out6+  |
| 11   | LVDS_Out2-  | 12   | LVDS_Out6-  |
| 13   | GND         | 14   | GND         |
| 15   | LVDS_Out1+  | 16   | LVDS_Out5+  |
| 17   | LVDS_Out1-  | 18   | LVDS_Out5-  |
| 19   | GND         | 20   | GND         |
| 21   | LVDS_Out0+  | 22   | LVDS_Out4+  |
| 23   | LVDS_Out0-  | 24   | LVDS_Out4-  |
| 25   | GND         | 26   | GND         |
| 27   | LVDS_CLK1+  | 28   | LVDS_CLK2+  |
| 29   | LVDS_CLK1-  | 30   | LVDS_CLK2-  |
| 31   | GND         | 32   | GND         |
| 33   | LVDS_DDCCLK | 34   | N. C.       |
| 35   | LVDS_DDCDAA | 36   | N. C.       |
| 37   | Panel Power | 38   | Panel Power |
| 39   | Panel Power | 40   | Panel Power |

## LCD/Inverter Power Connector

| Pins | Function                                  |
|------|---|
| 1    | GND                                       |
| 2    | GND                                       |
| 3    | Panel Inverter Brightness Voltage Control |
| 4    | Panel Power                               |
| 5    | +3.3V                                     |
| 6    | Panel Backlight On/Off Control            |
| 7    | +12V                                      |
| 8    | +12V                                      |

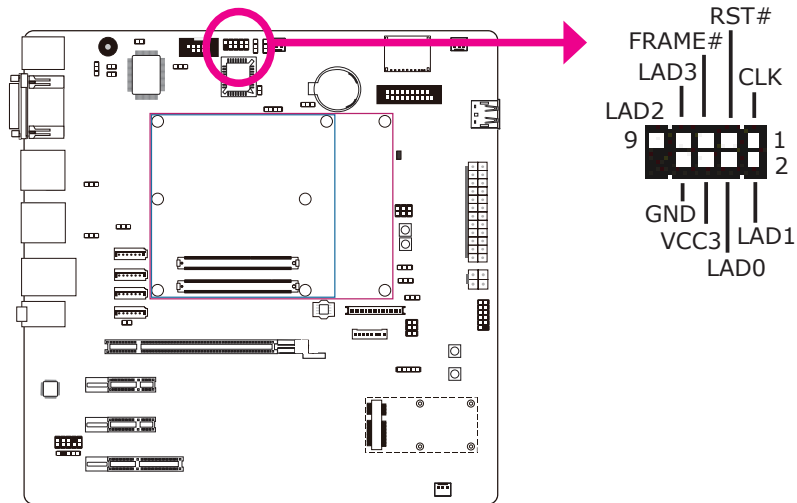
## Digital I/O Connector



The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

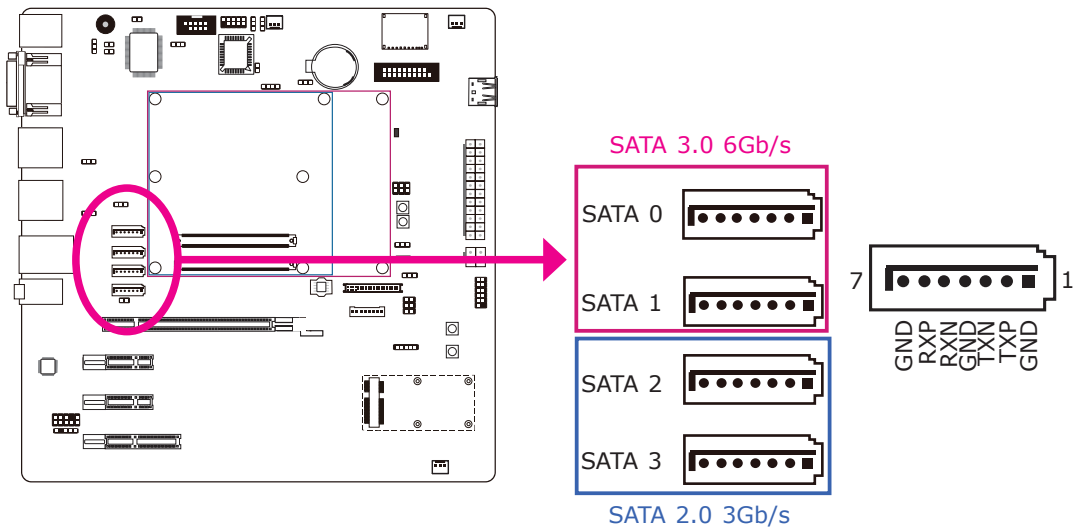
| Pin | Pin Assignment | Pin | Pin Assignment |
|-----|----------------|-----|----------------|
| 1   | GND            | 2   | +12V           |
| 3   | DIO7(GPO3)     | 4   | +12V           |
| 5   | DIO6(GPO2)     | 6   | GND            |
| 7   | DIO5(GPO1)     | 8   | +5V            |
| 9   | DIO4(GPO0)     | 10  | +5V            |
| 11  | DIO3(GPI3)     | 12  | GND            |
| 13  | DIO2(GPI2)     | 14  | 5VSB           |
| 15  | DIO1(GPI1)     | 16  | 5VSB           |
| 17  | DIO0(GPI0)     | 18  | GND            |
| 19  | GND            |     |                |

## LPC connector



The Low Pin Count Interface was defined by Intel® Corporation to facilitate the industry's transition towards legacy free systems. It allows the integration of low-bandwidth legacy I/O components within the system, which are typically provided by a Super I/O controller. Furthermore, it can be used to interface firmware hubs, Trusted Platform Module (TPM) devices and embedded controller solutions. Data transfer on the LPC bus is implemented over a 4 bit serialized data interface, which uses a 33MHz LPC bus clock. For more information about LPC bus refer to the Intel® Low Pin Count Interface Specification Revision 1.1'.

## SATA (Serial ATA) Connectors



### Features

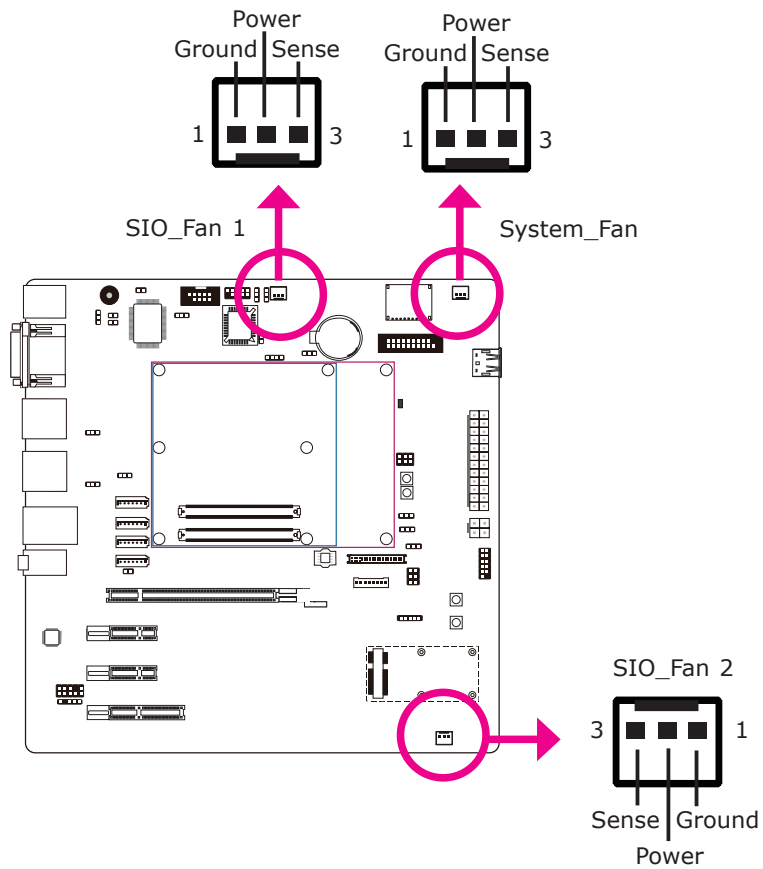
- SATA 0 and SATA 1 support data transfer rate up to 6Gb/s
- SATA 2 to SATA 3 support data transfer rate up to 3Gb/s
- Integrated Advanced Host Controller Interface (AHCI) controller
- Supports RAID 0, RAID 1, RAID 5 and RAID 10

The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA cable to a SATA connector and the other end to your Serial ATA device.

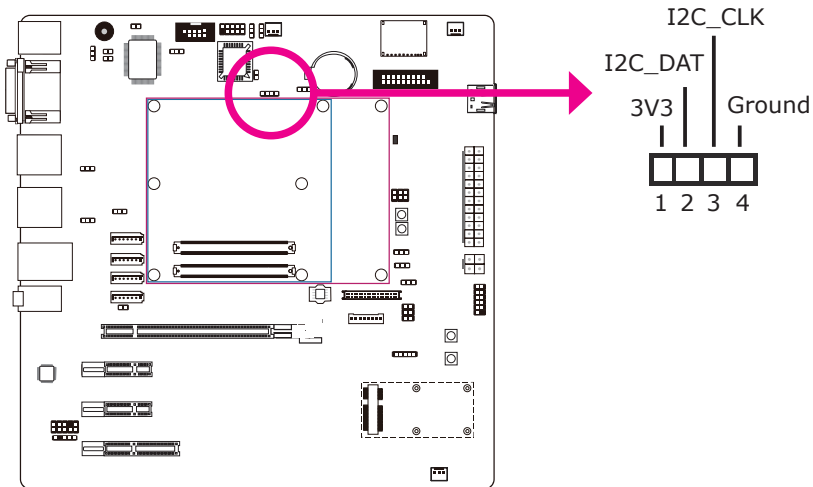
### BIOS Setting

Refer to the module's BIOS for more information.

## Cooling Fan Connectors

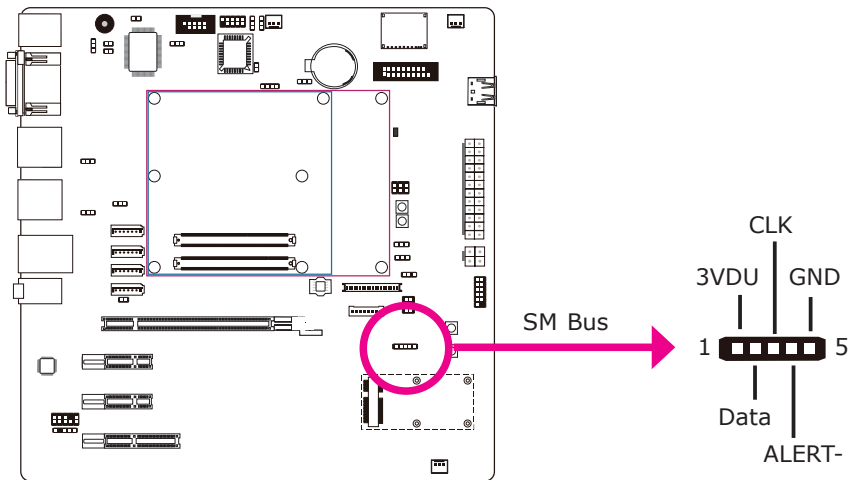


The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the module and system board components.

I<sup>2</sup>C Connector

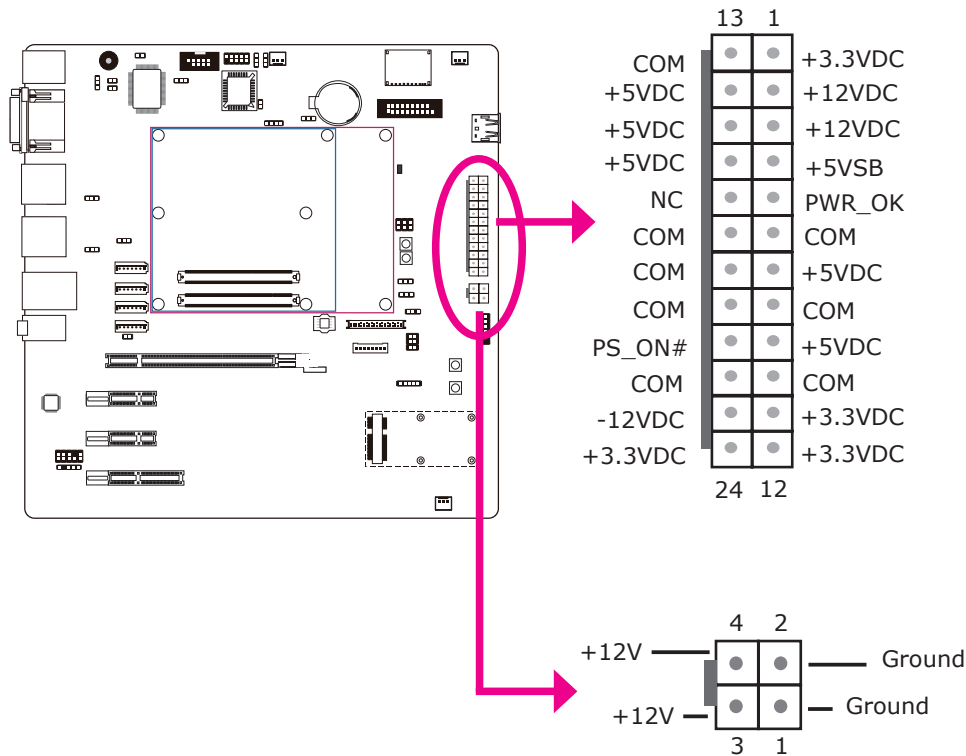
The 1-channel I<sup>2</sup>C bus interface conforms to the version 2.1 I<sup>2</sup>C bus specification. It operates as a master or slave device and supports a multi-master bus.

## SM bus



The SMBus (System Management Bus) 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.

## Power Connectors



Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 4-pin +12V power connector enables the delivery of more +12VDC current to the COM express module board and carrier board's PCIe device.

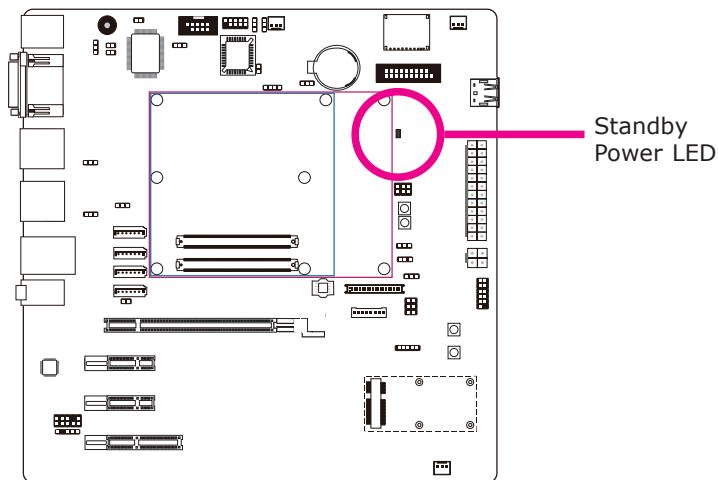
The power connectors from the power supply unit are designed to fit the 24-pin and 4-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.

**Important**

The system board consumes a minimal amount of power. Due to its low power consumption, you only need a 120W to 150W power supply. Every power supply has its minimum load of power. If you use a greater than 150W power supply, the power consumed by the system board may not attain its minimum load causing instability to the entire system.

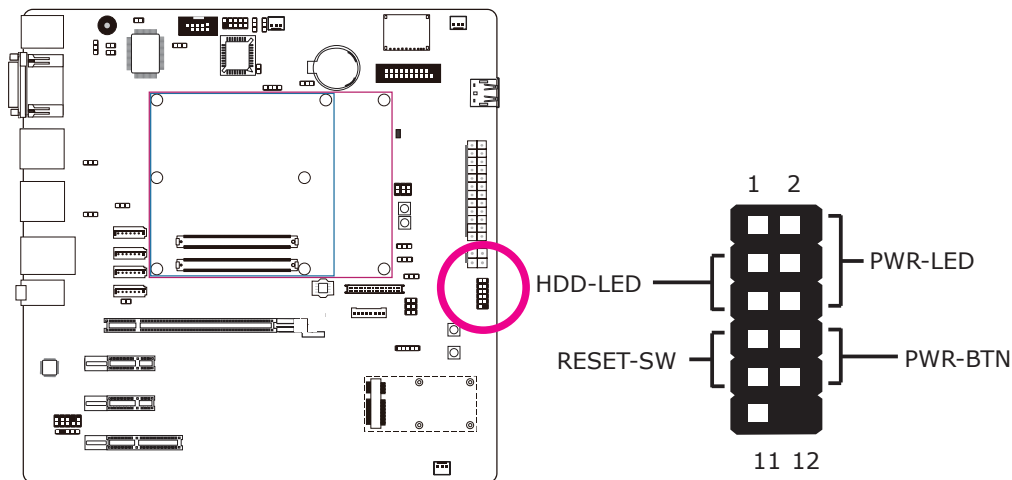


## Standby Power LED



This LED will lit red when the system is in the standby mode. 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.

## Front Panel Connectors



## HDD-LED - HDD LED

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

## RESET SW - Reset Switch

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

## PWR-BTN - Power Switch

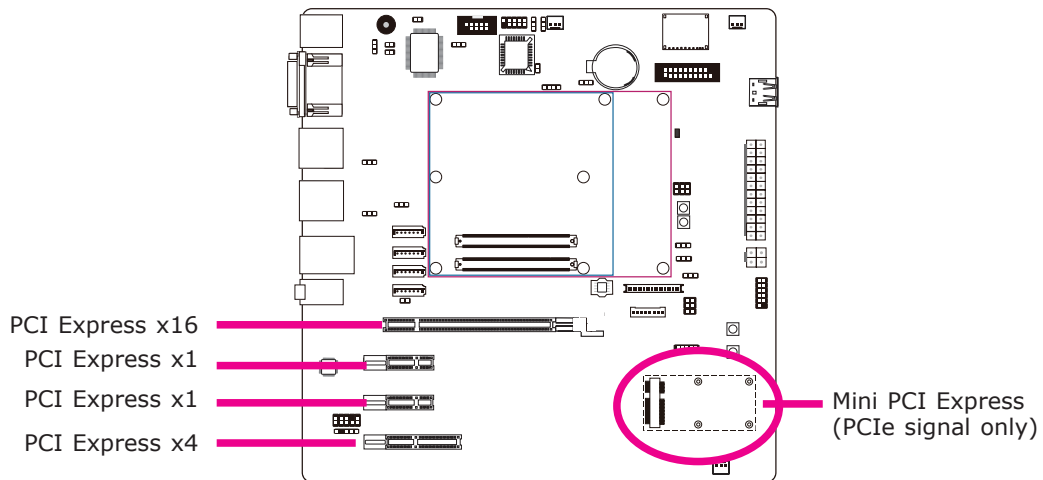
This switch is used to power on or off the system.

## 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.

|          | Pin | Pin Assignment |         | Pin | Pin Assignment |
|----------|-----|----------------|---------|-----|----------------|
| N. C.    | 1   | N. C.          | PWR-LED | 2   | LED Power      |
|          |     |                |         | 4   | LED Power      |
|          |     |                |         | 6   | Signal         |
| HDD-LED  | 3   | HDD Power      | PWR-BTN | 8   | Signal         |
|          | 5   | Signal         |         | 10  | Ground         |
| RESET SW | 7   | Ground         |         |     |                |
|          | 9   | RST Signal     |         |     |                |
| N. C.    | 11  | N. C.          | Key     | 12  | Key            |

## Expansion Slots



### PCI Express x16 Slot

Install PCI Express x16 graphics card, that comply to the PCI Express specifications, into the PCI Express x16 slot. To install a graphics card into the x16 slot, align the graphics card above the slot then press it down firmly until it is completely seated in the slot. The retaining clip of the slot will automatically hold the graphics card in place.

### PCI Express x1 Slots

Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x1 slot.

### PCI Express x4 Slots

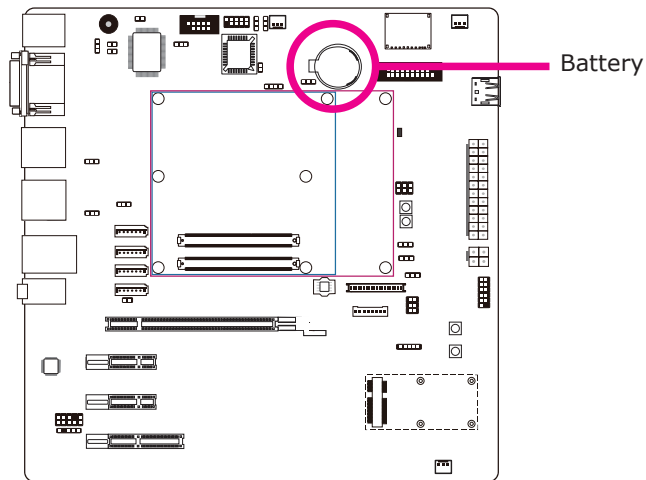
Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x4 slot.

### Mini PCIe Slot

The Mini PCIe socket is used to install a Mini PCIe card. Mini PCIe card is a small form factor PCI card with the same signal protocol, electrical definitions, and configuration definitions as the conventional PCI.

The Mini PCIe socket supports PCIe signal only. To support both PCIe and USB signals, another version will be provided upon request. Since the USB signal for this slot is shared with USB 6, the said version will not support the USB 6 connector.

## Battery

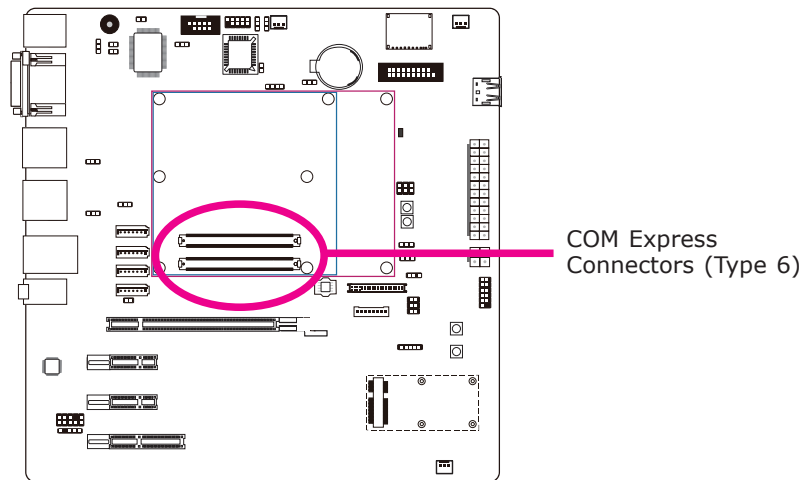


The lithium ion battery powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

### Safety Measures

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

## COM Express Connectors



The COM Express connectors are used to interface the carrier board with a COM Express board. Refer to the following pages for the pin functions of these connectors.

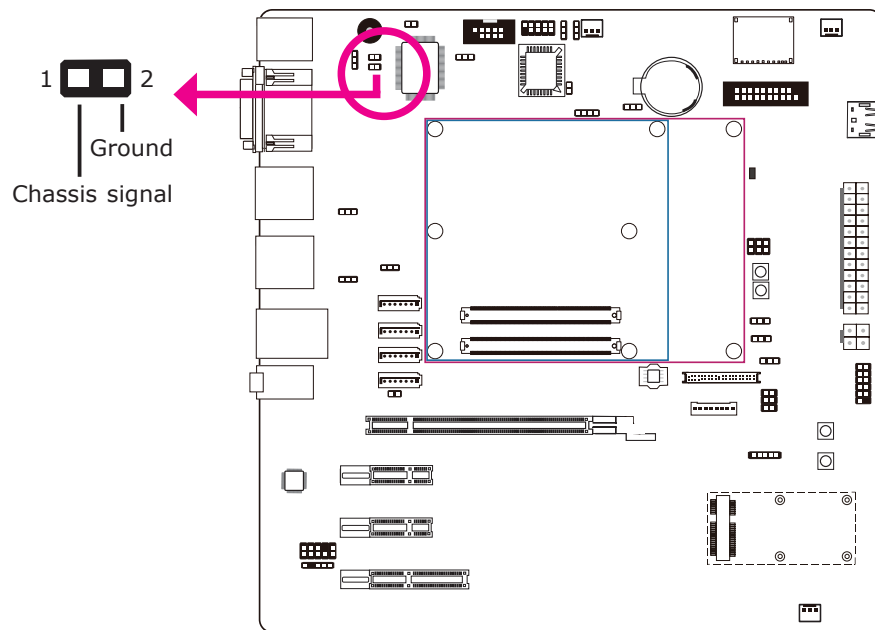
| Pin | Row A          | Row B        | Row C              | Row D              |
|-----|----------------|--------------|--------------------|--------------------|
| 1   | GND(FIXED)     | GND(FIXED)   | GND(FIXED)         | GND(FIXED)         |
| 2   | GBE0_MDI3-     | GBE0_ACT#    | GND                | GND                |
| 3   | GBE0_MDI3+     | LPC_FRAME#   | USB_SSRX0-         | USB_SSTX0-         |
| 4   | GBE0_LINK100#  | LPC_AD0      | USB_SSRX0+         | USB_SSTX0+         |
| 5   | GBE0_LINK1000# | LPC_AD1      | GND                | GND                |
| 6   | GBE0_MDI2-     | LPC_AD2      | USB_SSRX1-         | USB_SSTX1-         |
| 7   | GBE0_MDI2+     | LPC_AD3      | USB_SSRX1+         | USB_SSTX1+         |
| 8   | GBE0_LINK#     | LPC_DRQ0#    | GND                | GND                |
| 9   | GBE0_MDI1-     | LPC_DRQ1#    | USB_SSRX2-         | USB_SSTX2-         |
| 10  | GBE0_MDI1+     | LPC_CLK      | USB_SSRX2+         | USB_SSTX2+         |
| 11  | GND(FIXED)     | GND(FIXED)   | GND(FIXED)         | GND(FIXED)         |
| 12  | GBE0_MDI0-     | PWRBTN#      | USB_SSRX3-         | USB_SSTX3-         |
| 13  | GBE0_MDI0+     | SMB_CK       | USB_SSRX3+         | USB_SSTX3+         |
| 14  | GBE0_CTREF     | SMB_DAT      | GND                | GND                |
| 15  | SUS_S3#        | SMB_ALERT#   | DDI1_PAIR6+        | DDI1_CTRLCLK_AUX+  |
| 16  | SATA0_TX+      | SATA1_TX+    | DDI1_PAIR6-        | DDI1_CTRLDATA_AUX- |
| 17  | SATA0_TX-      | SATA1_TX-    | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 18  | SUS_S4#        | SUS_STAT#    | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 19  | SATA0_RX+      | SATA1_RX+    | PCIE_RX6+          | PCIE_TX6+          |
| 20  | SATA0_RX-      | SATA1_RX-    | PCIE_RX6-          | PCIE_TX6-          |
| 21  | GND(FIXED)     | GND(FIXED)   | GND(FIXED)         | GND(FIXED)         |
| 22  | SATA2_TX+      | SATA3_TX+    | PCIE_RX7+          | PCIE_TX7+          |
| 23  | SATA2_TX-      | SATA3_TX-    | PCIE_RX7-          | PCIE_TX7-          |
| 24  | SUS_S5#        | PWR_OK       | DDI1_HPD           | RSVD <sup>19</sup> |
| 25  | SATA2_RX+      | SATA3_RX+    | DDI1_PAIR4+        | RSVD <sup>19</sup> |
| 26  | SATA2_RX-      | SATA3_RX-    | DDI1_PAIR4-        | DDI1_PAIR0+        |
| 27  | BATLOW#        | WDT          | RSVD <sup>19</sup> | DDI1_PAIR0-        |
| 28  | (S)ATA_ACT#    | AC/HDA_SDIN2 | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 29  | AC/HDA_SYNC    | AC/HDA_SDIN1 | DDI1_PAIR5+        | DDI1_PAIR1+        |
| 30  | AC/HDA_RST#    | AC/HDA_SDIN0 | DDI1_PAIR5-        | DDI1_PAIR1-        |
| 31  | GND(FIXED)     | GND(FIXED)   | GND(FIXED)         | GND(FIXED)         |
| 32  | AC/HDA_BITCLK  | SPKR         | DDI2_CTRLCLK_AUX+  | DDI1_PAIR2+        |
| 33  | AC/HDA_SDOUT   | I2C_CK       | DDI2_CTRLDATA_AUX- | DDI1_PAIR2-        |
| 34  | BIOS_DIS0#     | I2C_DAT      | DDI2_DDC_AUX_SEL   | DDI1_DDC_AUX_SEL   |
| 35  | THRMTRIP#      | THRM#        | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 36  | USB6-          | USB7-        | DDI3_CTRLCLK_AUX+  | DDI1_PAIR3+        |
| 37  | USB6+          | USB7+        | DDI3_CTRLDATA_AUX- | DDI1_PAIR3-        |
| 38  | USB_6_7_OC#    | USB_4_5_OC#  | DDI3_DDC_AUX_SEL   | RSVD <sup>19</sup> |
| 39  | USB4-          | USB5-        | DDI3_PAIR0+        | DDI2_PAIR0+        |
| 40  | USB4+          | USB5+        | DDI3_PAIR0-        | DDI2_PAIR0-        |
| 41  | GND(FIXED)     | GND(FIXED)   | GND(FIXED)         | GND(FIXED)         |

| Pin | Row A              | Row B          | Row C              | Row D              |
|-----|--------------------|----------------|--------------------|--------------------|
| 42  | USB2-              | USB3-          | DDI3_PAIR1+        | DDI2_PAIR1+        |
| 43  | USB2+              | USB3+          | DDI3_PAIR1-        | DDI2_PAIR1-        |
| 44  | USB_2_3_OC#        | USB_0_1_OC#    | DDI3_HPD           | DDI2_HPD           |
| 45  | USB0-              | USB1-          | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 46  | USB0+              | USB1+          | DDI3_PAIR2+        | DDI2_PAIR2+        |
| 47  | VCC_RTC            | EXCD1_PERST#   | DDI3_PAIR2-        | DDI2_PAIR2-        |
| 48  | EXCD0_PERST#       | EXCD1_CPPE#    | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 49  | EXCD0_CPPE#        | SYS_RESET#     | DDI3_PAIR3+        | DDI2_PAIR3+        |
| 50  | LPC_SERIRQ         | CB_RESET#      | DDI3_PAIR3-        | DDI2_PAIR3-        |
| 51  | GND(FIXED)         | GND(FIXED)     | GND(FIXED)         | GND(FIXED)         |
| 52  | PCIE_TX5+          | PCIE_RX5+      | PEG_RX0+           | PEG_TX0+           |
| 53  | PCIE_TX5-          | PCIE_RX5-      | PEG_RX0-           | PEG_TX0-           |
| 54  | GPI0               | GPO1           | TYPE0#             | PEG_LANE_RV#       |
| 55  | PCIE_TX4+          | PCIE_RX4+      | PEG_RX1+           | PEG_TX1+           |
| 56  | PCIE_TX4-          | PCIE_RX4-      | PEG_RX1-           | PEG_TX1-           |
| 57  | GND                | GPO2           | TYPE1#             | TYPE2#             |
| 58  | PCIE_TX3+          | PCIE_RX3+      | PEG_RX2+           | PEG_TX2+           |
| 59  | PCIE_TX3-          | PCIE_RX3-      | PEG_RX2-           | PEG_TX2-           |
| 60  | GND(FIXED)         | GND(FIXED)     | GND(FIXED)         | GND(FIXED)         |
| 61  | PCIE_TX2+          | PCIE_RX2+      | PEG_RX3+           | PEG_TX3+           |
| 62  | PCIE_TX2-          | PCIE_RX2-      | PEG_RX3-           | PEG_TX3-           |
| 63  | GPI1               | GPO3           | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 64  | PCIE_TX1+          | PCIE_RX1+      | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 65  | PCIE_TX1-          | PCIE_RX1-      | PEG_RX4+           | PEG_TX4+           |
| 66  | GND                | WAKE0#         | PEG_RX4-           | PEG_TX4-           |
| 67  | GPI2               | WAKE1#         | RSVD <sup>19</sup> | GND                |
| 68  | PCIE_TX0+          | PCIE_RX0+      | PEG_RX5+           | PEG_TX5+           |
| 69  | PCIE_TX0-          | PCIE_RX0-      | PEG_RX5-           | PEG_TX5-           |
| 70  | GND(FIXED)         | GND(FIXED)     | GND(FIXED)         | GND(FIXED)         |
| 71  | LVDS_A0+           | LVDS_B0+       | PEG_RX6+           | PEG_TX6+           |
| 72  | LVDS_A0-           | LVDS_B0-       | PEG_RX6-           | PEG_TX6-           |
| 73  | LVDS_A1+           | LVDS_B1+       | GND                | GND                |
| 74  | LVDS_A1-           | LVDS_B1-       | PEG_RX7+           | PEG_TX7+           |
| 75  | LVDS_A2+           | LVDS_B2+       | PEG_RX7-           | PEG_TX7-           |
| 76  | LVDS_A2-           | LVDS_B2-       | GND                | GND                |
| 77  | LVDS_VDD_EN        | LVDS_B3+       | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 78  | LVDS_A3+           | LVDS_B3-       | PEG_RX8+           | PEG_TX8+           |
| 79  | LVDS_A3-           | LVDS_BKLT_EN   | PEG_RX8-           | PEG_TX8-           |
| 80  | GND(FIXED)         | GND(FIXED)     | GND(FIXED)         | GND(FIXED)         |
| 81  | LVDS_A_CK+         | LVDS_B_CK+     | PEG_RX9+           | PEG_TX9+           |
| 82  | LVDS_A_CK-         | LVDS_B_CK-     | PEG_RX9-           | PEG_TX9-           |
| 83  | LVDS_I2C_CK        | LVDS_BKLT_CTRL | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 84  | LVDS_I2C_DAT       | VCC_5V_SBY     | GND                | GND                |
| 85  | GPI3               | VCC_5V_SBY     | PEG_RX10+          | PEG_TX10+          |
| 86  | RSVD <sup>19</sup> | VCC_5V_SBY     | PEG_RX10-          | PEG_TX10-          |
| 87  | eDP_HPD            | VCC_5V_SBY     | GND                | GND                |
| 88  | PCIE_CLK_REF+      | BIOS_DIS1#     | PEG_RX11+          | PEG_TX11+          |
| 89  | PCIE_CLK_REF-      | VGA_RED        | PEG_RX11-          | PEG_TX11-          |
| 90  | GND(FIXED)         | GND(FIXED)     | GND(FIXED)         | GND(FIXED)         |

| Pin | Row A      | Row B              | Row C              | Row D              |
|-----|------------|--------------------|--------------------|--------------------|
| 91  | SPI_POWER  | VGA_GRN            | PEG_RX12+          | PEG_TX12+          |
| 92  | SPI_MISO   | VGA_BLU            | PEG_RX12-          | PEG_TX12-          |
| 93  | GPO0       | VGA_HSYNC          | GND                | GND                |
| 94  | SPI_CLK    | VGA_VSYNC          | PEG_RX13+          | PEG_TX13+          |
| 95  | SPI_MOSI   | VGA_I2C_CK         | PEG_RX13-          | PEG_TX13-          |
| 96  | TPM_PP     | VGA_I2C_DAT        | GND                | GND                |
| 97  | TYPE10#    | SPI_CS#            | RSVD <sup>19</sup> | RSVD <sup>19</sup> |
| 98  | SER0_TX    | RSVD <sup>19</sup> | PEG_RX14+          | PEG_TX14+          |
| 99  | SER0_RX    | RSVD <sup>19</sup> | PEG_RX14-          | PEG_TX14-          |
| 100 | GND(FIXED) | GND(FIXED)         | GND(FIXED)         | GND(FIXED)         |
| 101 | SER1_TX    | FAN_PWNOUT         | PEG_RX15+          | PEG_TX15+          |
| 102 | SER1_RX    | FAN_TACHIN         | PEG_RX15-          | PEG_TX15-          |
| 103 | LID#       | SLEEP#             | GND                | GND                |
| 104 | VCC_12V    | VCC_12V            | VCC_12V            | VCC_12V            |
| 105 | VCC_12V    | VCC_12V            | VCC_12V            | VCC_12V            |
| 106 | VCC_12V    | VCC_12V            | VCC_12V            | VCC_12V            |
| 107 | VCC_12V    | VCC_12V            | VCC_12V            | VCC_12V            |
| 108 | VCC_12V    | VCC_12V            | VCC_12V            | VCC_12V            |
| 109 | VCC_12V    | VCC_12V            | VCC_12V            | VCC_12V            |
| 110 | GND(FIXED) | GND(FIXED)         | GND(FIXED)         | GND(FIXED)         |

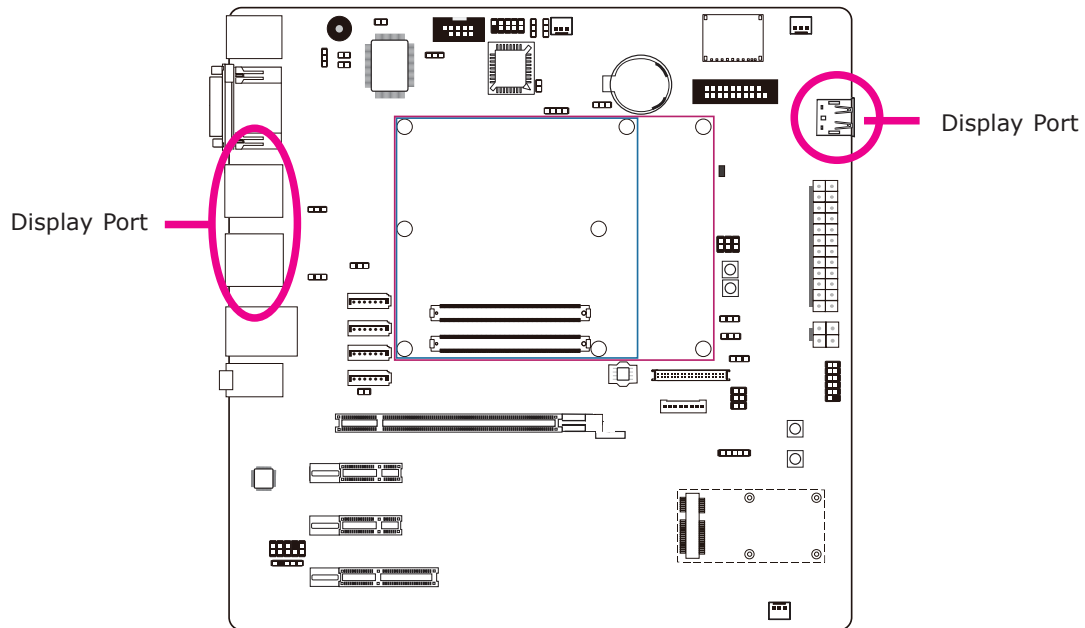


## Chassis Intrusion Connector



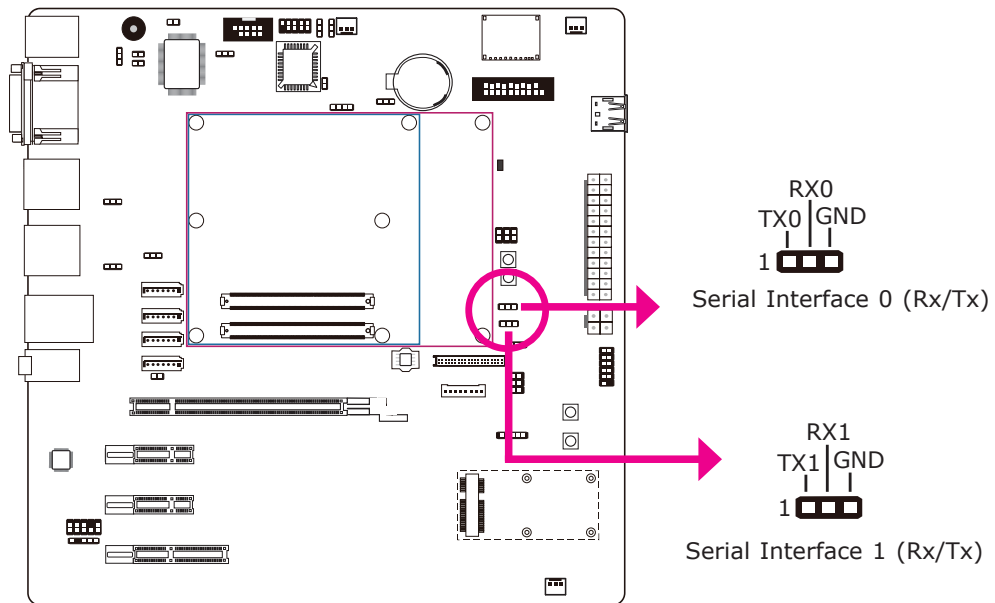
The board supports the chassis intrusion detection function. Connect the chassis intrusion sensor cable from the chassis to this connector. When the system's power is on and a chassis intrusion occurred, an alarm will sound. When the system's power is off and a chassis intrusion occurred, the alarm will sound only when the system restarts.

## Display Port



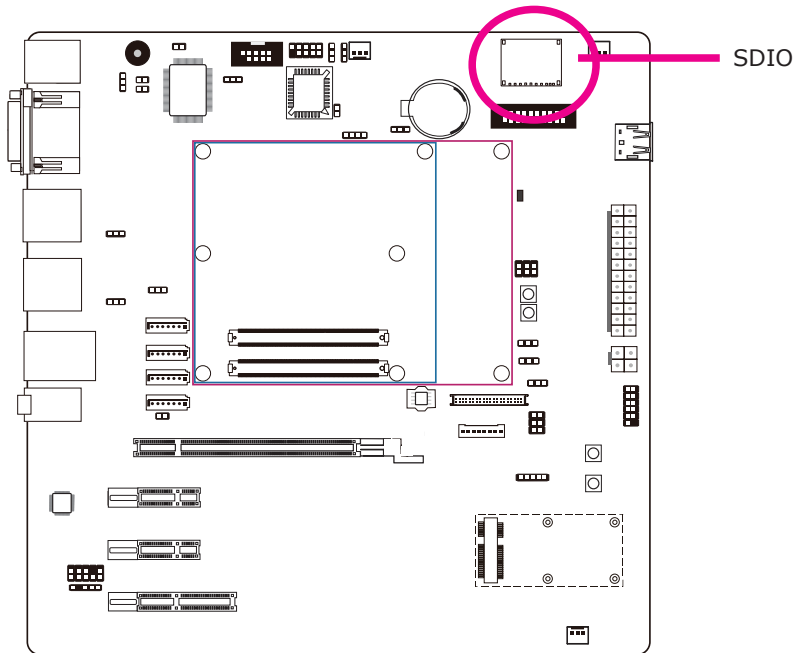
DisplayPort is a digital display interface used to connect a display device such as a computer monitor. It is used to transmit audio and video simultaneously. The interface, which is developed by VESA, delivers higher performance features than any other digital interface.

## Serial Interface Connector



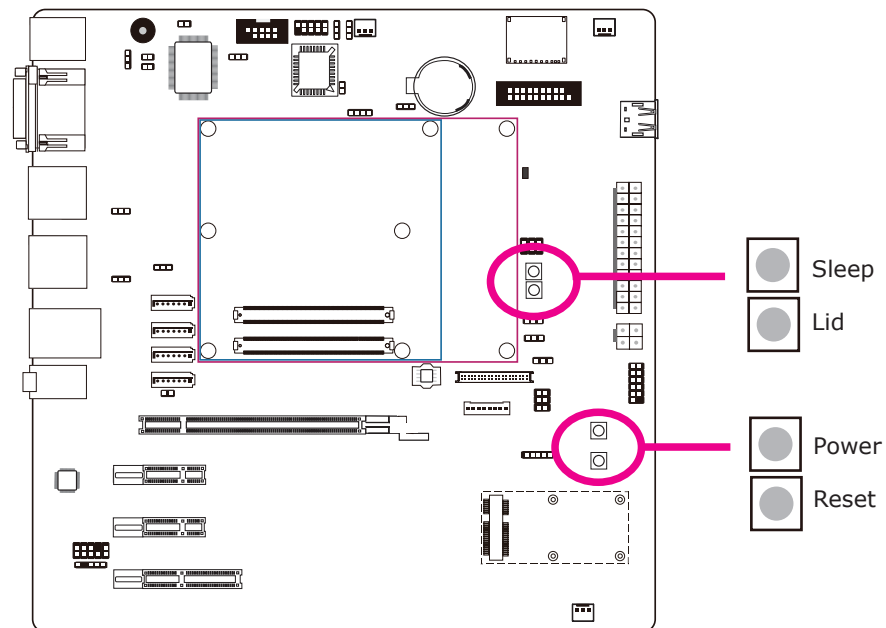
This serial interface connectors are used to any device supported Tx and Rx signal.

## SDIO



This expansion port is used to insert a Secure Digital Input/Output (SDIO) or Multimedia Card (MMC) device. Aside from storing data files, an SDIO card is also capable of storing powerful software applications.

## Switches

**Note:**

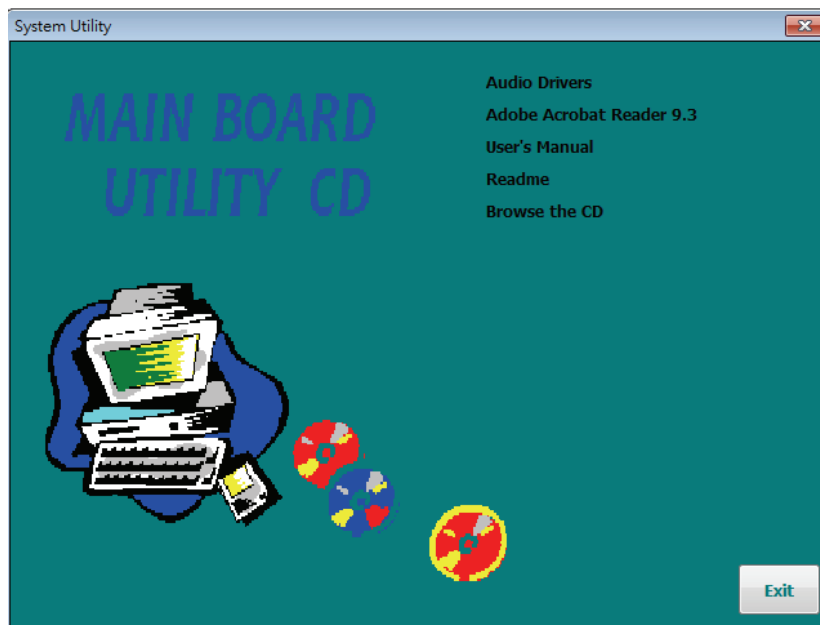
The Sleep and Lid functions are supported only when your operating system supports ACPI.

- Sleep: it is used to set the system to "sleep" or "wake-up" mode.
- Lid: it is used to turn the LVDS on or off.

## Chapter 3 - Supported Software

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Install drivers, utilities and software applications that are required to facilitate and enhance the performance of the system board. You may acquire the software from your sales representatives, from an optional DVD included in the shipment, or from the website download page at <https://www.dfi.com/DownloadCenter>.



**Note:**

This step can be ignored if the applications are downloaded standalone files.

## Audio Drivers

To install the driver, click "Audio Drivers" on the main menu.

1. Setup is now ready to install the audio driver. Click Next.
2. Follow the remainder of the steps on the screen; clicking "Next" each time you finish a step.



3. Click "Yes, I want to restart my computer now" then click Finish.

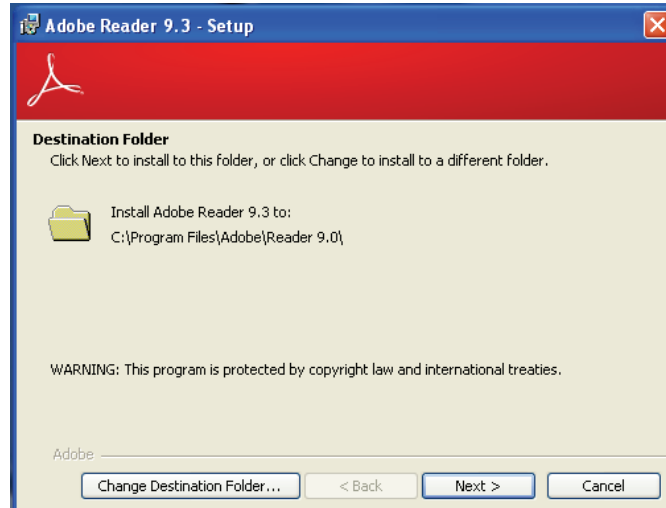
Restarting the system will allow the new software installation to take effect.



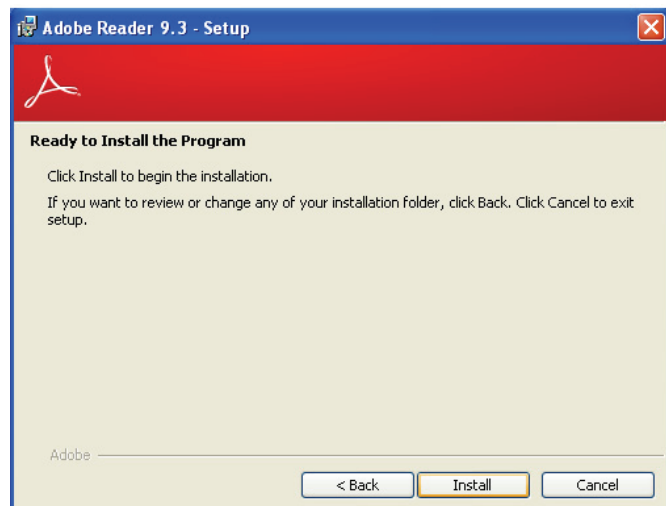
## Adobe Acrobat Reader 9.3

To install the reader, click "Adobe Acrobat Reader 9.3" on the main menu.

1. Click Next to install or click Change Destination Folder to select another folder.



2. Click Install to begin installation.



3. Click Finish to exit installation.

