DFI®

DT122-BE
Desktop Box IPC
User's Manual

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FCC and DOC Statement on Class A

This equipment has been tested and found to comply with the limits for a Class A 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

About this Manual

An electronic file of this manual can be obtained from the DFI website at www.dfi.com.
To download the user's manual from our website, please go to "Support" > "Download Center."
On the Download Center page, select your product or type the model name and click "Search"
to find all technical documents including the user's manual for a specific product.

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 con nectors 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.

Safety Precautions

- Use the correct DC input voltage range.

- 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.

- 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.

- Keep this system away from humidity.

- Place the system on a stable surface. Dropping it or letting it fall may cause damage.

- The openings on the system are for air ventilation to protect the system from overheating. DO NOT COVER THE OPENINGS.

- Place the power cord in such a way that it will not be stepped on. Do not place anything on top of the power cord. Use a power cord that has been approved for use with the system and that it matches the voltage and current marked on the system's electrical range label.

- If the system will not be used for a long time, disconnect it from the power source to avoid damage by transient overvoltage.

- If one of the following occurs, consult a service personnel:

  - The power cord or plug is damaged.

  - Liquid has penetrated the system.

  - The system has been exposed to moisture.

  - The system is not working properly.

  - The system dropped or is damaged.

  - The system has obvious signs of breakage.

- The unit uses a three-wire ground cable which is equipped with a third pin to ground the unit and prevent electric shock. Do not defeat the purpose of this pin. If your outlet does not support this kind of plug, contact your electrician to replace the outlet.

- Disconnect the system from the DC outlet before cleaning. Use a damp cloth. Do not use liquid or spray detergents for cleaning.

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.

- 1 DT122-BE system unit
- 1 CPU cooler
- 1 HDD drive bay kit
- 1 Quick Installation Guide

Optional Items

- Power Cord
- Wall Mount

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

Before powering-on the system, prepare the basic system components.

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

- 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

Overview

Front View

Rear View

Key Features

Model Name	DT122-BE
Processor	2nd Generation AMD® Embedded R-Series APU FP3 BGA
Chipset	AMD® A77E Fusion Controller Hub
LAN	2 LAN ports
Displays	4 DP ports support DP++
USB	4 USB 3.0 ports
Audio	Mic-in, Line-in, Line-out jacks

6

Specifications

Processor System	• CPU
	  - 2nd Generation AMD® Embedded R-Series APU FP3 BGA
	    (28nm process technology)
	  : AMD® RX-427BB, Quad Core, 4M Cache, 2.7GHz (3.6GHz), 35W
	• Chipset: AMD® A77E Fusion Controller Hub

Memory	• Two 204-pin SODIMM sockets • Supports DDR3/DDR3L 1600/1866/2133MHz • Supports up to 16GB system memory • Supports dual channel memory interface
Graphics	• AMD Radeon™ HD 9000 Series Graphics • Display ports: 4 DP (supports DP++) • DP: resolution up to 3840x2160 @ 30Hz
Storage	• Up to 2x 2.5" or 1x 3.5" SATA drive bay - SATA 3.0 port with data transfer rate up to 6Gb/s
Ethernet	• 1 Intel® I210 PCI Express Gigabit Ethernet controller • 1 Realtek RTL8111EP Ethernet controller • Integrated 10/100/1000 transceiver • Fully compliant with IEEE 802.3, IEEE 802.3u, IEEE 802.3ab

Expansion Slots	• 1 expansion slot
	  - 1 PCIe x16
	• 1 Mini PCIe slot
	  - Supports USB and PCIe signals
	  - Supports mSATA
	  - Supports half size or full size Mini PCIe card

Audio	• Realtek ALC888 7.1-channel High Definition Audio

Power	• Power type
	  - Flex ATX
	• Power input voltage
	  - AC 100-240V, 250W

Cooling System	• 1 system fan

I/O Ports	• Front Panel
	  - 1 Power button
	  - 1 Reset button
	  - 2 LED indicators: Power, HDD
	• Rear Panel
	  - 4 USB 3.0
	  - 4 DP
	  - 2 RJ45 LAN
	  - Mic-in, line-in and line-out jacks

Environment	• Temperature
	  - Operating: 0ºC~45ºC
	  - Storage: -20ºC~60ºC
	 • Humidity
	  - 85% RH at 45ºC, 1 week
	• Operating Vibration
	  - Operating: sine 5~500Hz, 1G
	  - Non-operating: sine 10~500Hz, 3G
	• Operating Shock
	  - Operating: 3G
	  - Non-operating: 5G

Construction	• Front panel: aluminum • Rear chassis: sheet metal
Mounting	• 2 types of wall mount bracket - Type A - Type B • Brackets and screws* (optional)
Dimensions	• 300mm x 75mm x 217mm (W x H x D)
Weight	• 3.7 kg
OS Support	• Windows 7 Ultimate x86 & SP1 (32-bit) • Windows 7 Ultimate x64 & SP1 (64-bit) • Windows 8.1 Embedded Pro x64 (64-bit)
Certification	• CE • FCC Class A • RoHS
Other Features	• Watchdog Timer function

7

Getting to Know the DT122-BE

Front View

Reset Button
Power LED
Power Button
HDD LED

Rear View

LAN 1-2   DP 2-3
DP 0-1   Line-in

USB 3.0   Mic-in
USB 3.0   Line-out
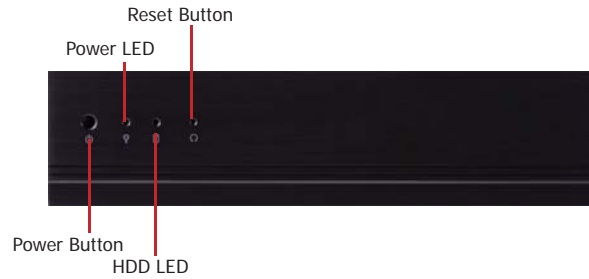
Power Button
Press to power-on or power-off the system.

Reset Button
Press to reset the system.

HDD LED
Indicates the status of the hard drive.

Power LED
Indicates the power status of the system.
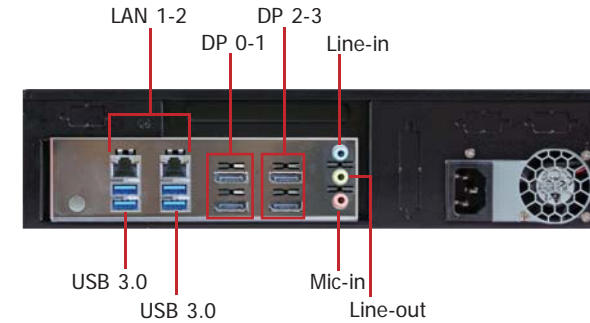
DP Ports
Used to connect a DP device.

USB Ports
Used to connect USB 3.0 devices.

LAN Ports
Used to connect the system to a local area network.

Line-out
Used to connect to a speaker.

Line-in
Used to connect any audio devices such as Hi-fi set, CD player, tape player, AM/FM radio tuner, synthesizer, etc.

Mic-in
Used to connect an external microphone.

Mechanical Dimensions

Rear View

Left View

Right View

217.20

300.00

74.00
78.00

Front View
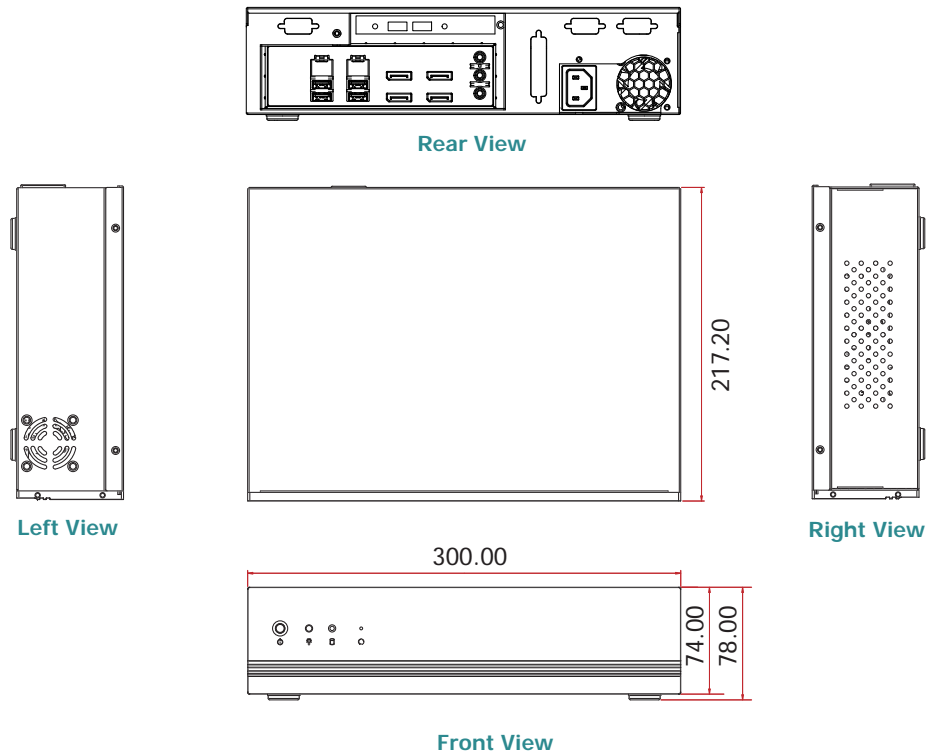
Motherboard Dimensions

0.00
33.02
65.35
89.97
98.31
141.41
165.10
170.00

0.00
6.17
19.49
36.23
43.64
61.23
89.60
92.43
117.60
143.43
145.42
162.07
163.65
170.00

41.25
71.71
148.00

10.16
57.13
82.83
133.83
151.24
163.58
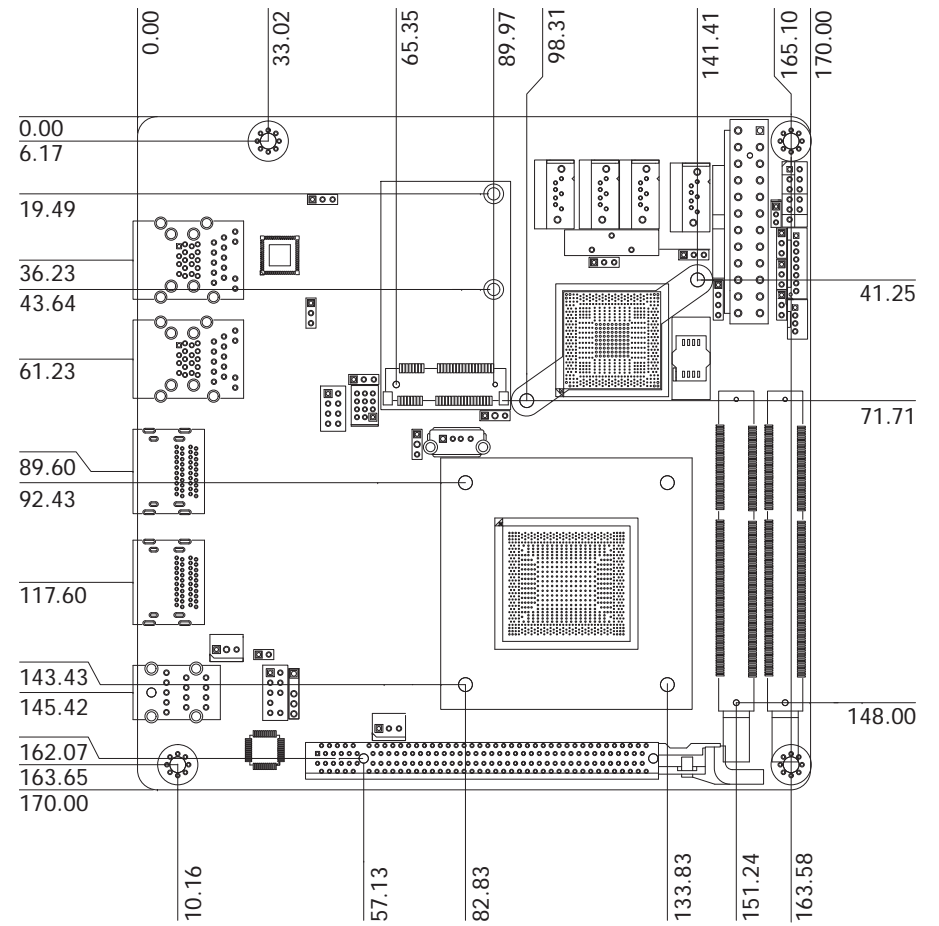
Chapter 2 - Getting Started

Preparing the System

Before you start using the system, you need the following items:

- SATA hard drive
- AC power adapter
- PS/2 or USB keyboard
- PS/2 or USB mouse
- CD-ROM drive (for installing software/drivers)
- Screwdriver
- Memory module (optional)

Installing Devices

The following are devices that can be installed in the system.

- Memory module
- SATA hard drive

Configuring the BIOS

To get you started, you may need to change configurations such as the date, time and the type of hard disk drive.

1. Power-on the system.
2. After the memory test, the message "Press DEL to run setup" will appear on the screen. Press the Delete key to enter the AMI BIOS setup utility.

Installing the Operating System

Most operating system software can be installed using a DVD (and DVD burner) or bootable USB drive.
Please refer to your operating system manual for instructions on installing an operating system.

Installing the Drivers

The system requires you to install drivers for some devices to operate properly. Refer to the Supported Software chapter for instructions on installing the drivers.

Chapter 3 - Installing Devices

Removing the Chassis Cover

1. Make sure the system and all other peripheral devices connected to it have been powered-off.

2. Disconnect all power cords and cables.

3. The 4 mounting screws on the sides of the system are used to secure the cover to the chassis. Remove these screws and then put them in a safe place for later use.

Mounting screw

Mounting screw

4. After removing these mounting screws, slide the cover backwards.

Slide the Cover Backward

5. The SODIMM sockets, Mini PCIe slot and SATA drive bay are readily accessible after removing the chassis cover.

2.5"/3.5" SATA drive bay

Mini PCIe slot
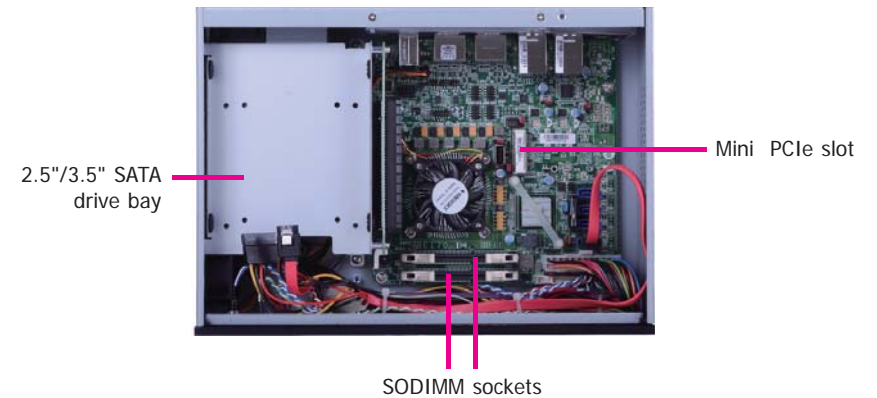
SODIMM sockets

Installing the SODIMM Module

1. There are two SODIMM sockets on the system board.
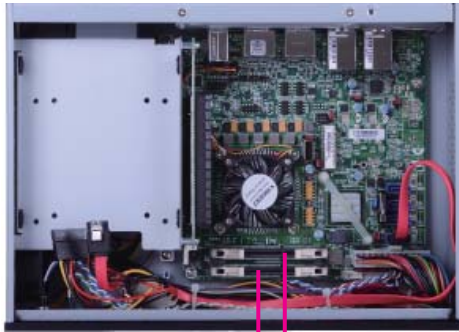
SODIMM sockets

2. Push the "ejector tabs" which are at the ends of the socket to the side.

Ejector tab

Ejector tab

3. Note how the module is keyed to the socket.

Notch

Key

4. Seat the module vertically, pressing it down firmly until it is completely seated in the socket. The ejector tabs at the ends of the socket will automatically snap into the locked position to hold the module in place.

Installing the Mini PCIe Card

1. The Mini PCIe slot is located on the system board.

Mini PCIe slot

2. The system board is equipped with 1 Mini PCIe slot. The Mini PCIe slot supports a half length or a full length Mini PCIe card. Note the key on the slot. The key ensures the Mini PCIe card can be plugged into the slot in one direction only.
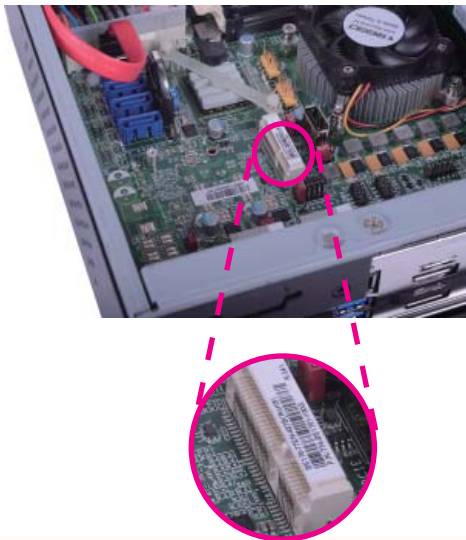
3. Grasping the Mini PCIe card by its edges, align the card into the slot at an approximately 30 degrees angle. Apply firm even pressure to each end of the card until it slips down into the slot. The contact fingers on the edge of the card will almost completely disappear inside the slot.

Mini PCIe card

4. Push the Mini PCIe card down and use the provided mounting screws to secure the card on the system board.
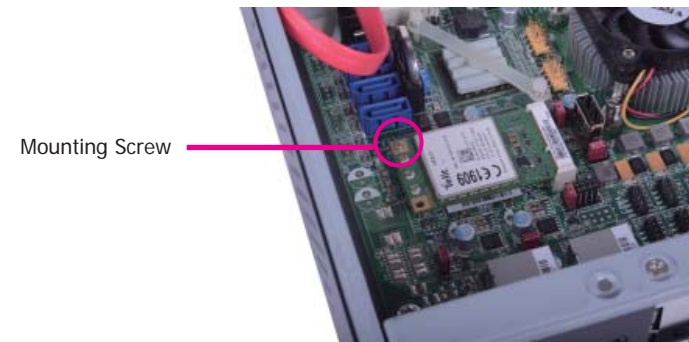
Mounting Screw

Installing a 2.5" or 3.5" SATA Drive

Installing a 2.5″ SATA Drive

1. Remove the 4 mounting screws that secure the drive bay to the chassis and then remove the drive bay.

Mounting screw

Drive bay
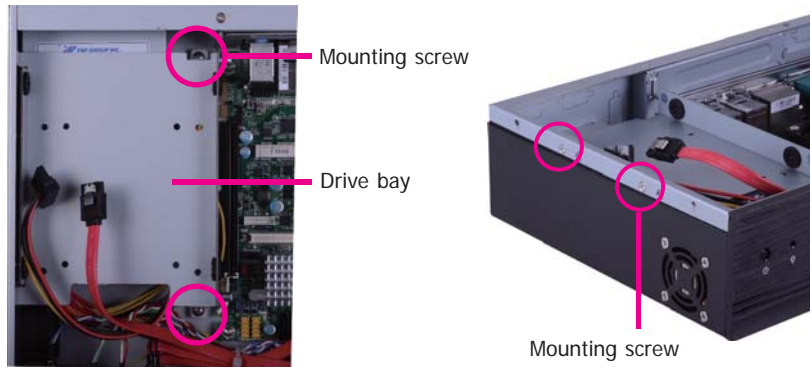
Mounting screw

2. Turn to the other side of the drive bay and remove the 4 mounting screws that secure the HDD brackets to the drive bay.

Drive bay
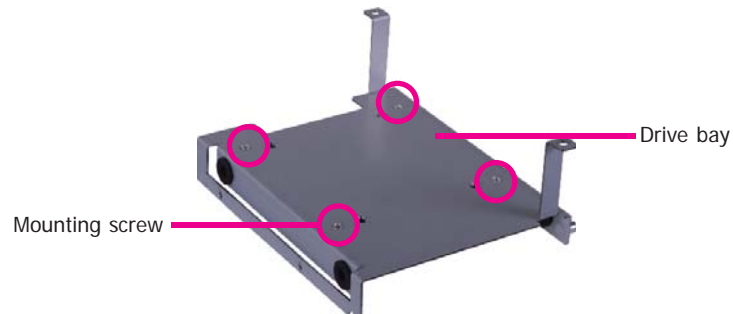
Mounting screw

3. Align the mounting holes of the SATA drive with the mounting holes on the HDD bracket and then use the provided mounting screws to secure the drive in place.

Mounting screw

Mounting screw

SATA drive

HDD bracket

14
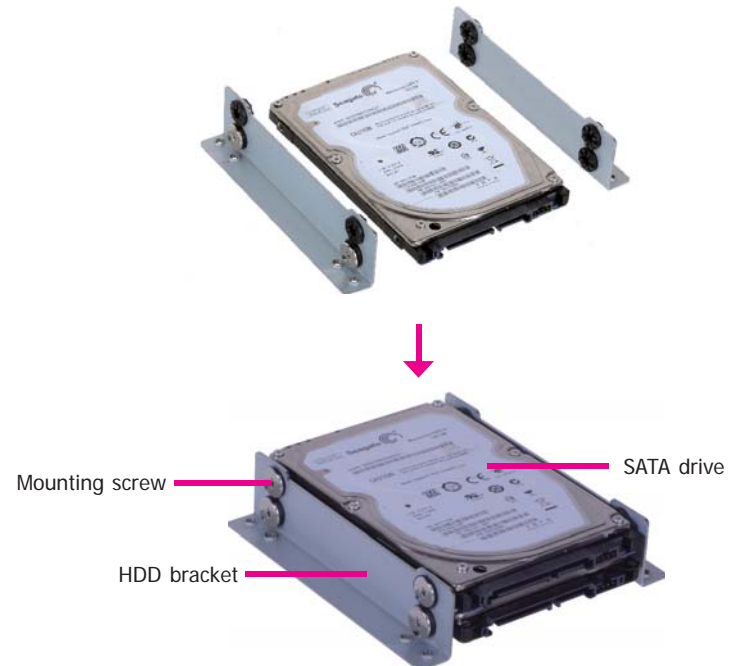
4. Turn to the other side of the drive bay. Use the provided mounting screws from step 2 to secure the SATA drive (with the HDD) onto the drive bay.
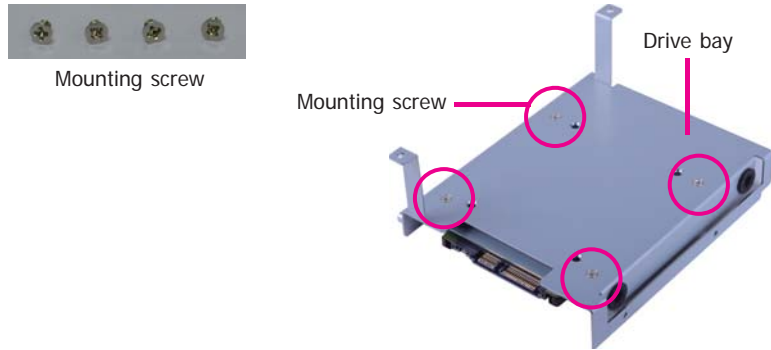
Mounting screw

Mounting screw
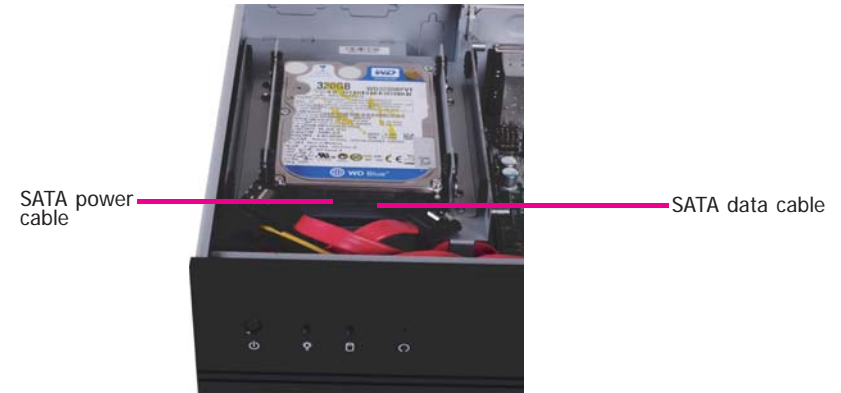
Drive bay

5. Place the SATA drive bay assembly into the chassis. Secure the SATA drive bay with the mounting screws you removed in step 1.

Mounting screw

Mounting screw

6. Connect the SATA data cable and SATA power cable to the connectors on the SATA drive.

SATA power cable

SATA data cable
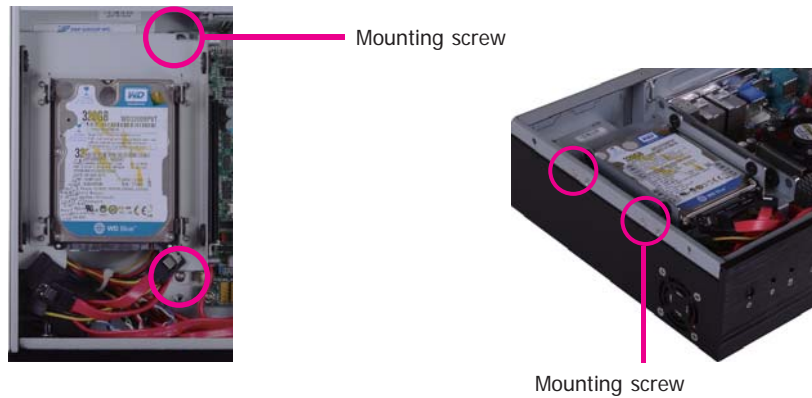
Installing a 3.5" SATA Drive

1. Remove the 4 mounting screws that secure the drive bay to the system.

Mounting screw

Drive bay

Mounting screw
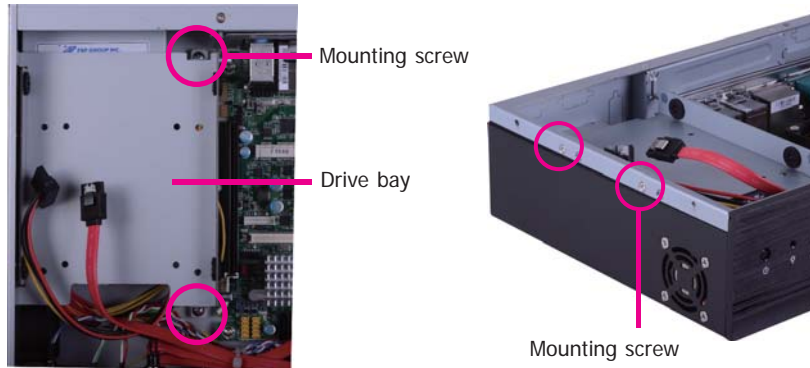
2. Insert the spacer into the anti-shock bumper. You will find the spacers in the HDD drive bay kit that comes with the DT122 package.

spacer

spacer
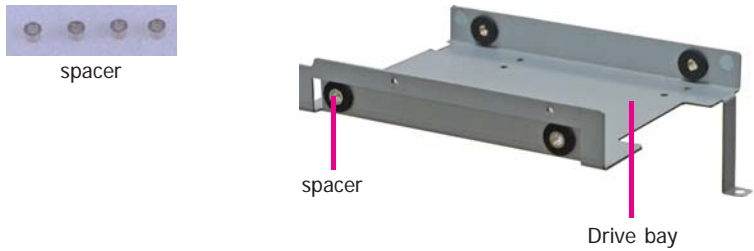
Drive bay

3. Place the SATA drive on the drive bay. Align the mounting holes of the SATA drive with the mounting holes on the drive bay.

SATA drive

Drive bay

4. Use the provided mounting screws to secure the SATA drive onto the drive bay.

Mounting screw

Mounting screw

Drive bay

5. Place the drive bay into the chassis. Secure the drive bay with the mounting screws you removed in step 1.
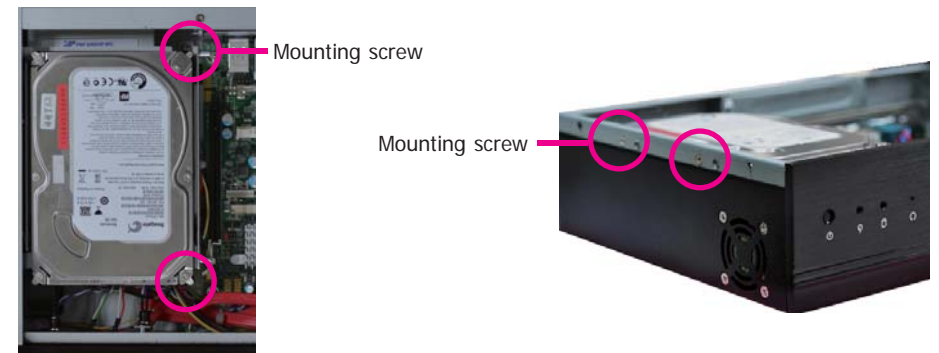
Mounting screw

Mounting screw

6. Connect the SATA data cable and SATA power cable to the connectors on the SATA drive.

SATA data cable

SATA power cable

16
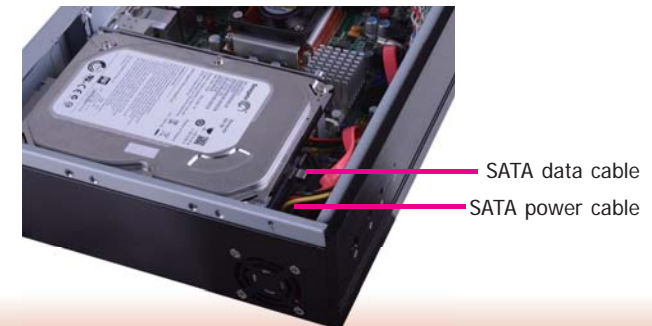
Installing the PCI or PCIe x16 Expansion Card

> ⚠️ **Important:**
> When inserting the riser card, please select a card within 175mm (as shown on the next picture).

1. The PCIe x16 on the motherboard is used to insert a T200-1P or T200-1E riser card.

   To install the expansion card, you need to remove the mounting bracket and the mounting screw that secure the bracket to the chassis and then remove the bracket. Put the screw and the bracket in a safe place for later use.
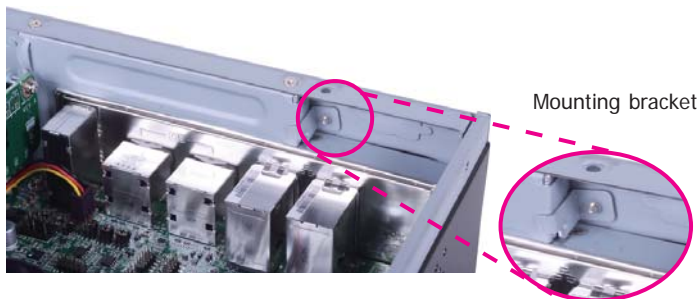
Mounting screw

Mounting bracket
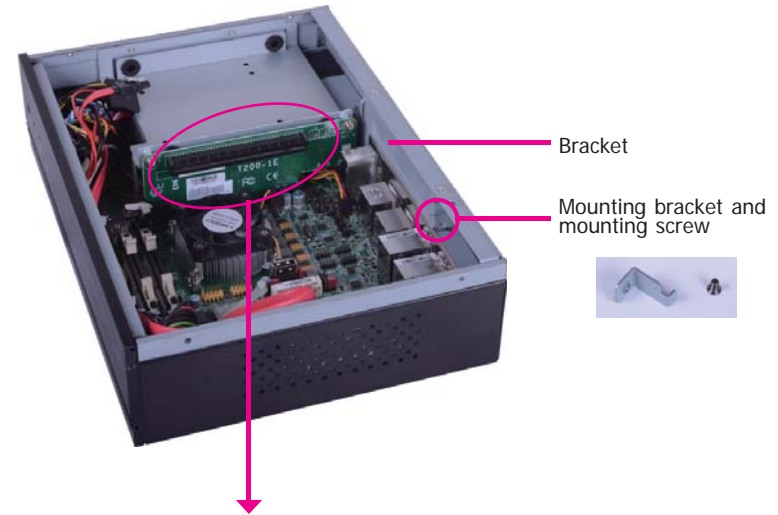
Bracket

Mounting bracket and mounting screw
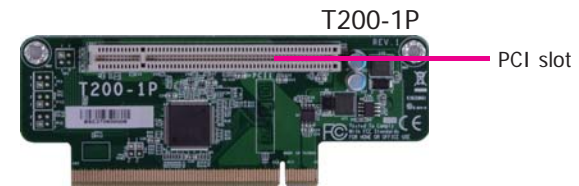
T200-1P

PCI slot
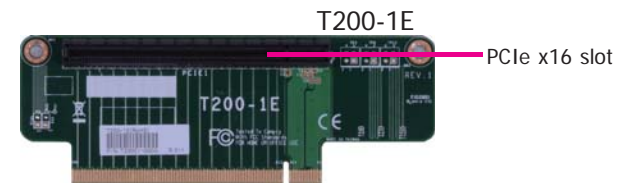
T200-1E

PCIe x16 slot

17

2. Insert the Expansion card with a bracket into the PCI or PCIe x16 slot that is on the riser card.
   Replace the screw you removed in step 1 to secure the bracket in place.

Bracket

Mounting bracket
and mounting
screw

PCIe x16

Expansion card

Rear view
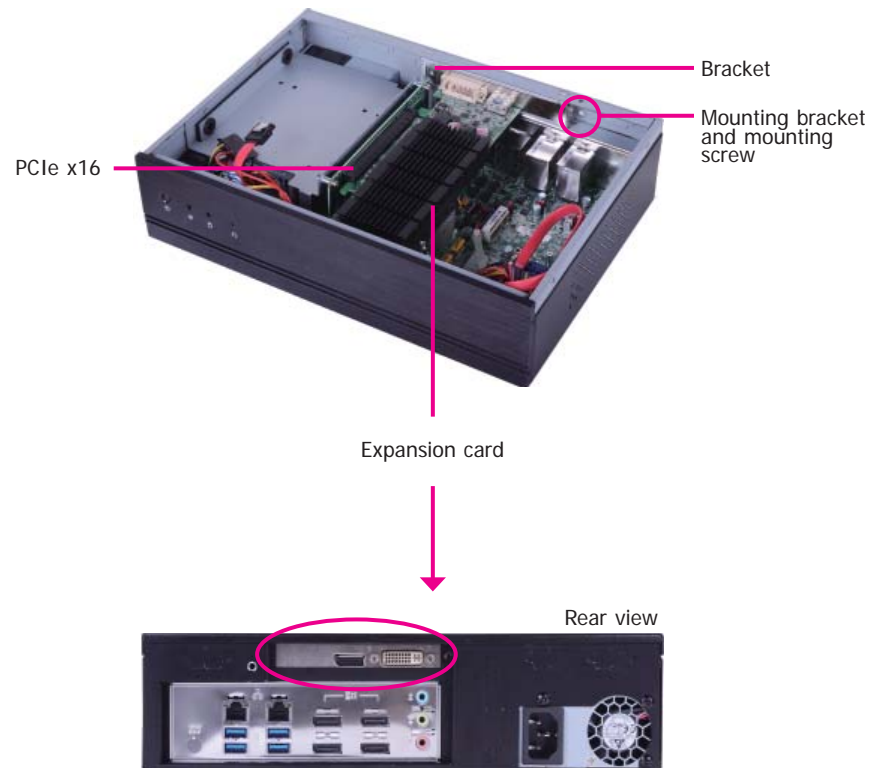
Note:
The Expansion card used in the above illustrations may not resemble the actual cards.
These illustrations are for reference purpose only.

Chapter 4 - Jumper Settings

Clear CMOS Data

JP1

1 2 3

1-2 On:
Normal (default)

1 2 3

2-3 On:
Clear CMOS Data
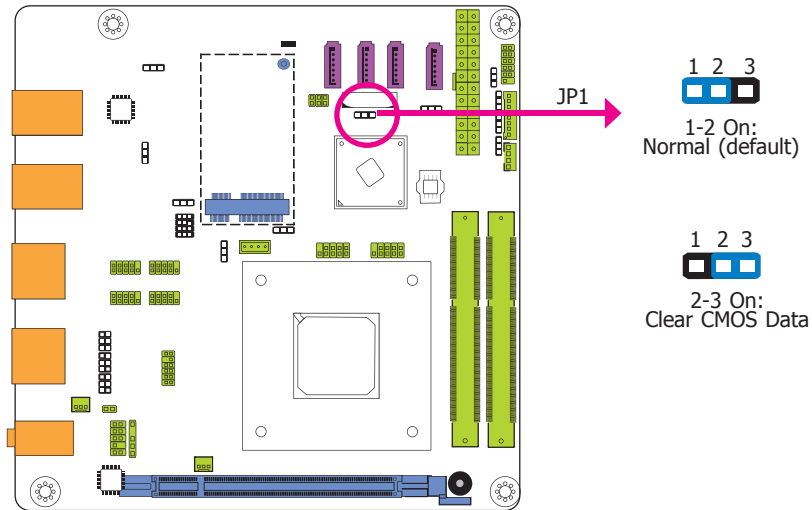
If you encounter the following,

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 JP1 pins 2 and 3 to On. Wait for a few seconds and set JP1 back to its default setting, pins 1 and 2 On.

3. Now plug the power cord and power-on the system.

Auto Power-on Select

JP15

1
2
3

1-2 On:
Power-on via power button
(default)

1
2
3

2-3 On:
Power-on via AC power
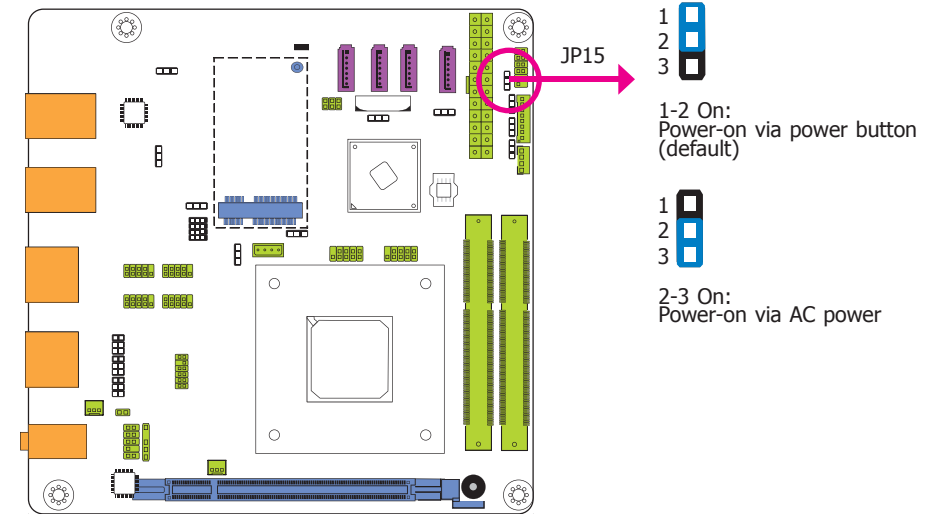
JP15 is used to select the method of powering on the system. If you want the system to power-on whenever AC power comes in, set JP15 pins 2 and 3 to On. If you want to use the power button, set pins 1 and 2 to On.

When using the JP15 "Power On" feature to power the system back on after a power failure occurs, the system may not power on if the power lost is resumed within 5 seconds (power flicker).

19

USB Power Select

1-2 On: +5V
(default)

2-3 On:
+5V_standby

USB 3.0 0-1
(JP8)

USB 2.0 0-1/2-3
(JP10)

USB 3.0 2-3
(JP9)

1-2 On: +5V
(default)

USB 2.0 5
(JP11)

2-3 On:
+5V_standby
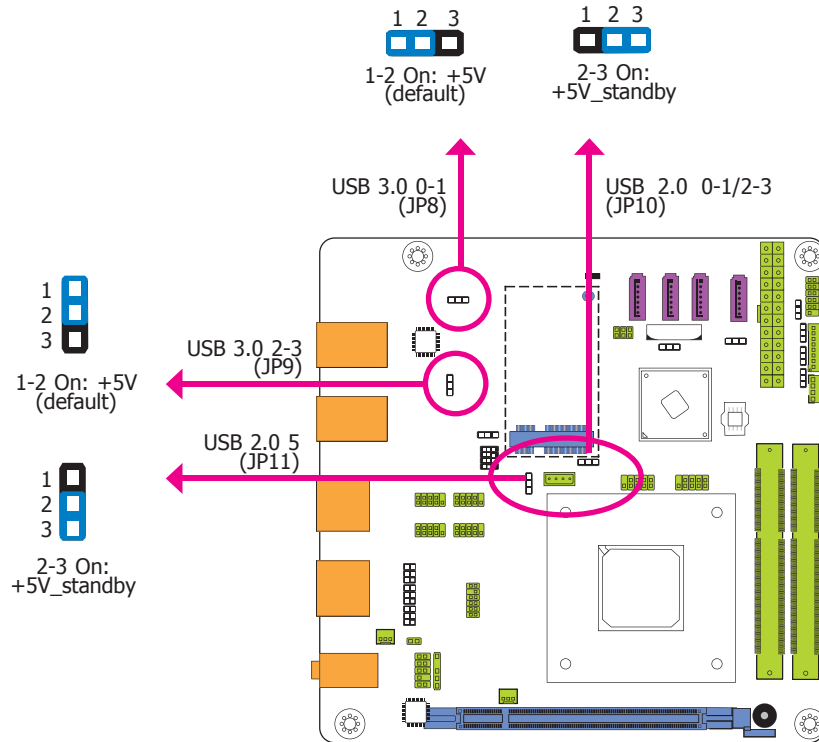
JP8, JP9, JP10 and JP11 are used to select the power of the USB ports. Selecting +5V_standby will allow you to use a USB device to wake up the system.

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 ≥1.5A. For 3 or more USB ports, the +5V_standby power source of your power supply must support ≥2A.

SATA DOM Power Select

SATA 0

JP2

1-2 On: GND (default)

2-3 On: +5V
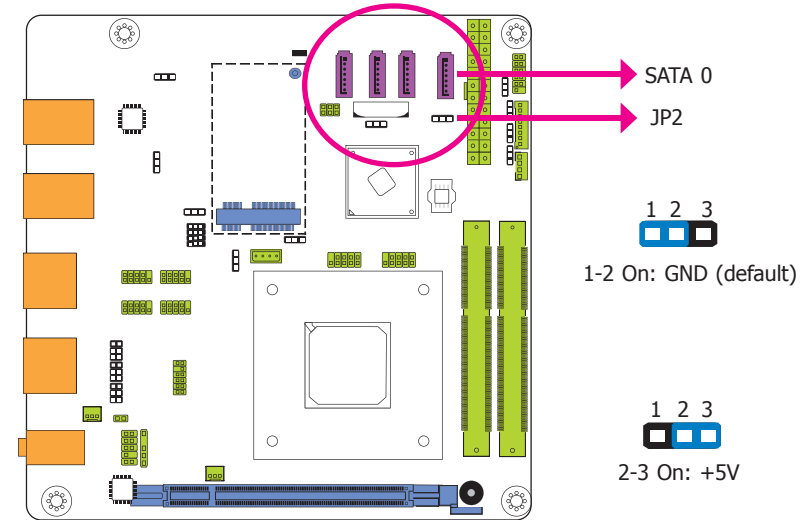
JP2 is used to select the power level of SATA DOM.

Note:
SATA port 0 provides adequate space for SATA DOM.

COM 1 RS232/422/485 Select

COM 1: RS232/422/485

JP4
JP5
JP3
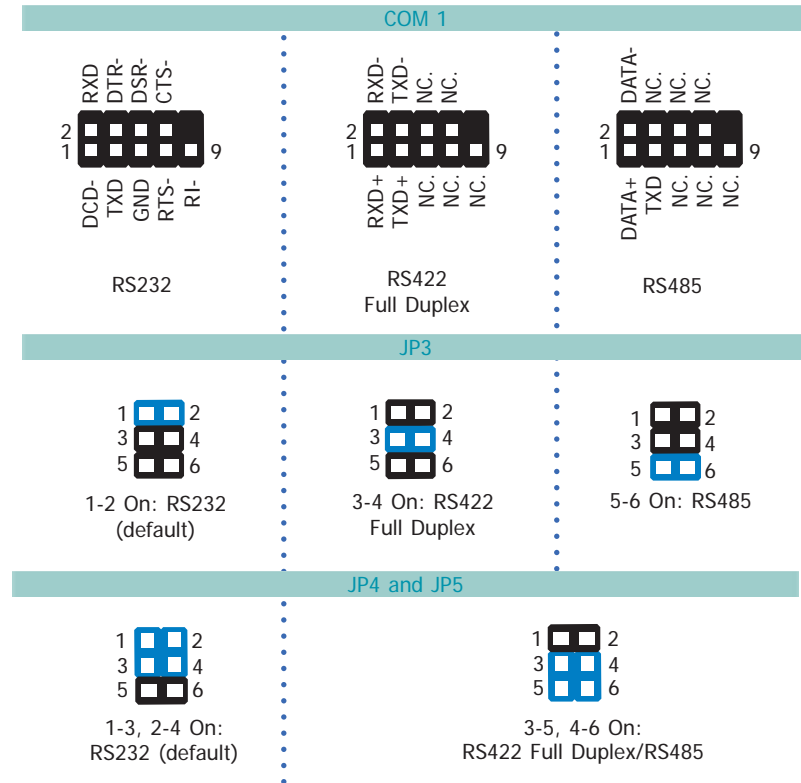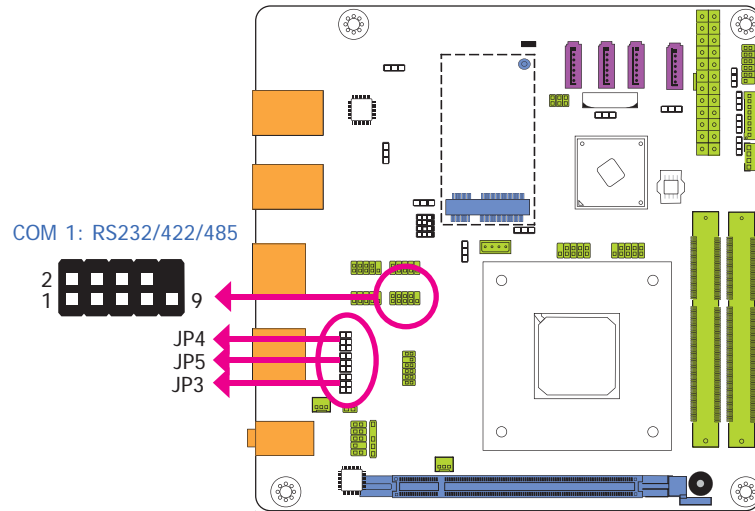
JP3, JP4 and JP5 allow you to configure the Serial COM port 1 to RS232, RS422 (Full Duplex) or RS485. The pin functions of Serial COM port 1 will vary according to these jumpers' setting.

COM 1

RS232	RS422 Full Duplex	RS485
RXD DTR- DSR- CTS- / DCD- TXD GND RTS- RI-	RXD- TXD- NC. NC. / RXD+ TXD+ NC. NC. NC.	DATA- NC. NC. NC. / DATA+ TXD NC. NC. NC.

JP3

1-2 On: RS232 (default)

3-4 On: RS422 Full Duplex

5-6 On: RS485

JP4 and JP5

1-3, 2-4 On: RS232 (default)

3-5, 4-6 On: RS422 Full Duplex/RS485

Note:
When COM 1 RS232/422/485 is selected, JP4 and JP5 must be set in accordance to JP3.

Digital I/O Power Select

JP12

1
2
3

1-2 On: +5V_standby
(default)

1
2
3

2-3 On: +5V
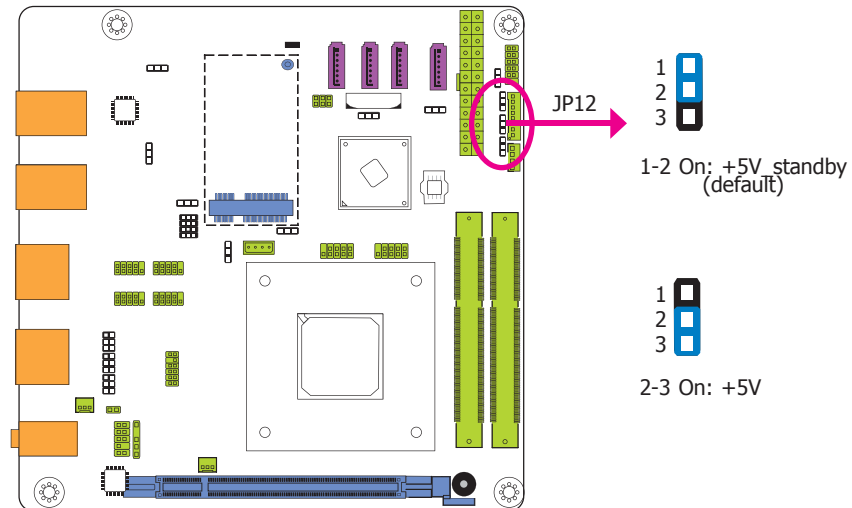
JP12 is used to select the power of DIO (Digital I/O) signal.

Digital I/O Output State

DIO 4-7
(JP14)

DIO 0-3
(JP13)

1
2
3

1-2 On: +5V or
+5V_standby
(default)

1
2
3

2-3 On: GND
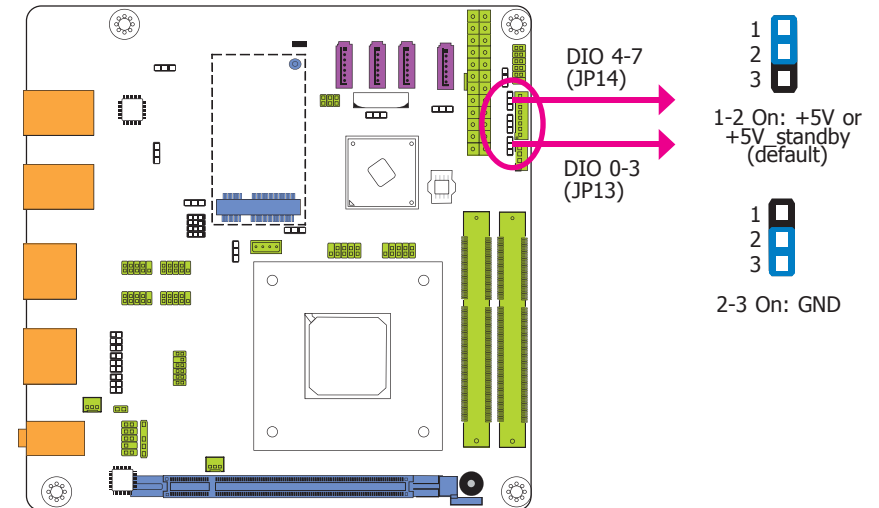
Based on the power level of DIO (Digital I/O) selected on JP12, JP13 (DIO pin 0-3) and JP14 (DIO pin 4-7) are used to select the state of DIO output: pull high or pull low. When selecting pull high, the power selection will be the same as JP12's setting.

22

Mini PCIe Signal Select

12 10

3 1

1-4-7-10, 2-5-8-11 On:
PCIe (default)

12 10

3 1

2-5-8-11, 3-6-9-12 On:
mSATA

JP6
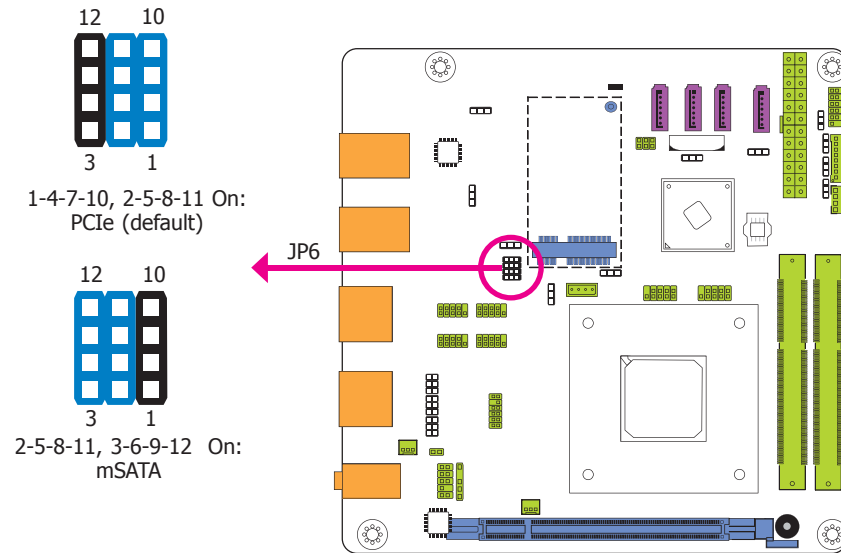
JP6 is used to select the Mini PCIe signal: PCIe or mSATA.

Mini PCIe Power Select

1 2 3

1-2 On: +3.3V_standby (Mini PCIe)
(default)

JP7

1 2 3

2-3 On: +3.3V (mSATA)
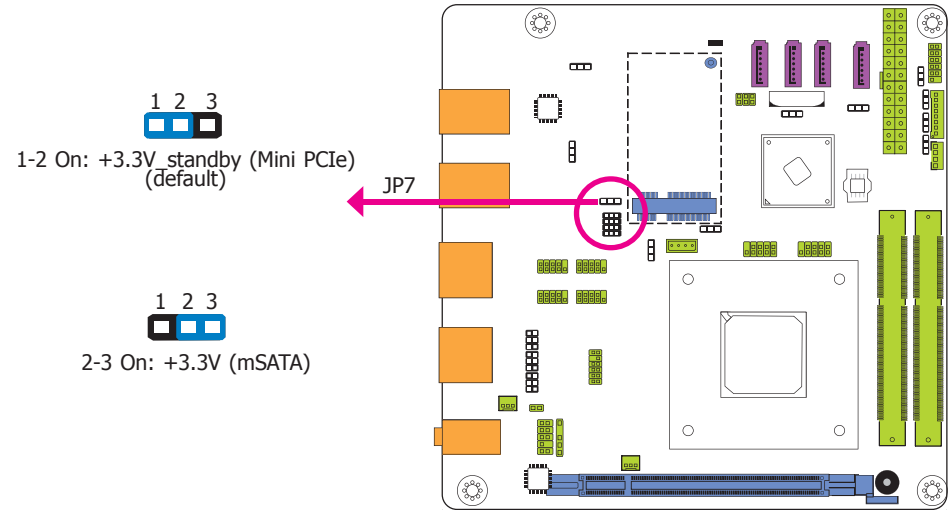
JP7 is used to select the power supplied with the Mini PCIe.

23

Chapter 5 - Ports and Connectors

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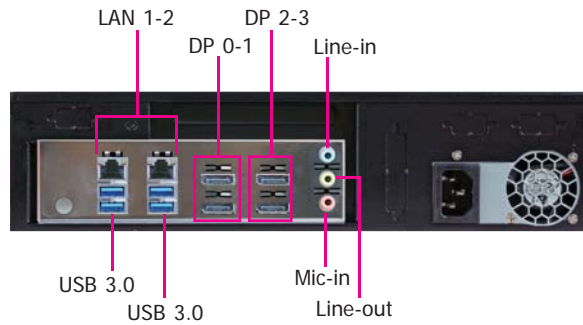
The rear panel I/O ports consist of the following:

- 4 DP ports
- 2 RJ45 LAN ports
- 4 USB 3.0 ports
- Line-out jack
- Line-in jack
- Mic-in jack

Graphics Interfaces

The display ports consist of the followings:

- 4 DP ports
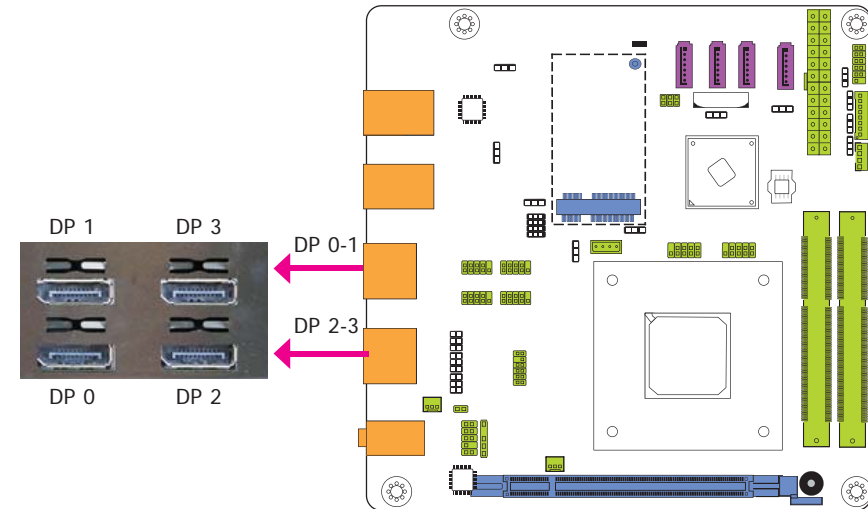
DP Port

The 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 interface.

24

RJ45 LAN Ports

LAN 1   LAN 2

LAN 1

LAN 2
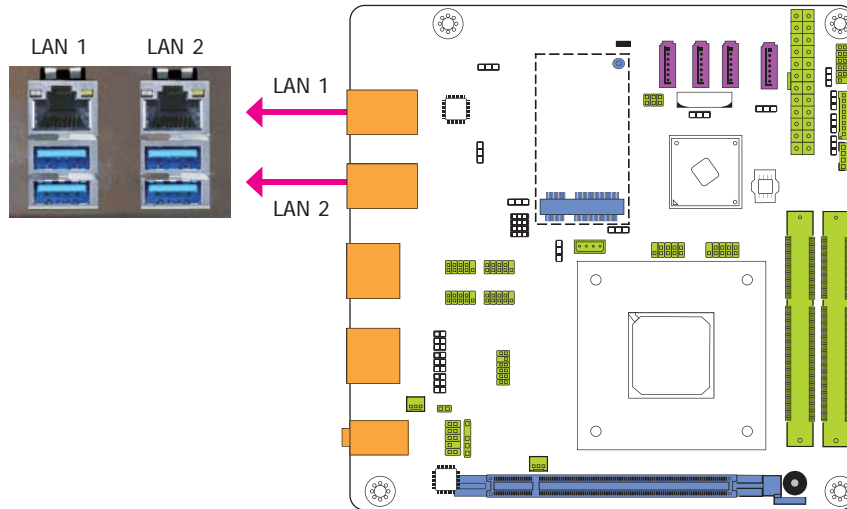
Features

• 1 Intel® I210 PCI Express Gigabit Ethernet controller

• 1 Realtek RTL8111EP Ethernet controller

The two LAN ports allow the system board to connect to a local area network by means of a network hub.

BIOS Setting

Configure the onboard LAN ports in the Chipset menu ("PCH-IO Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

Driver Installation

Install the LAN drivers. Refer to the chapter 8 for more information.

USB Ports

USB 1   USB 3
USB 0   USB 2

USB 3.0   USB 3.0

USB 5

VCC
+Data
-Data
GND

1   4

USB 2.0

USB 2-3   USB 0-1

N.C.   Key
GND   GND
+Data +Data
-Data -Data
VCC   VCC

USB 2.0   2   10
           1   9
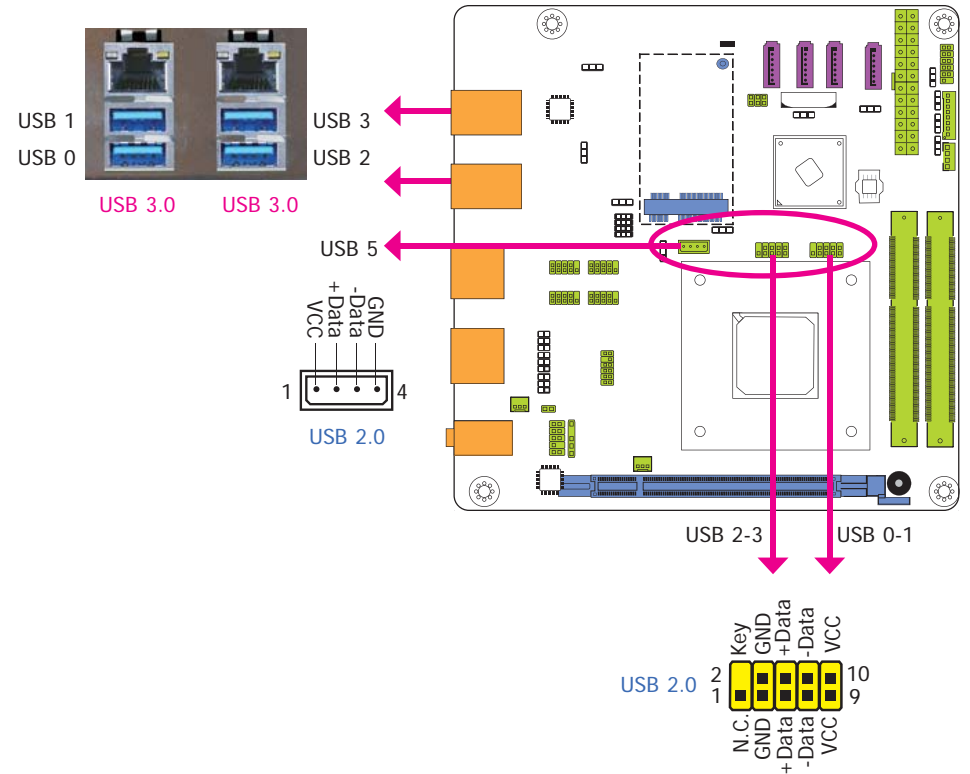
The USB device allows data exchange between your computer and a wide range of simultaneously accessible external Plug and Play peripherals.

The system board is equipped with four onboard USB 3.0 ports (USB 0-1/2-3) and one vertical USB 2.0 port (USB 5) for security drive. The 10-pin connectors allow you to connect 4 additional USB 2.0 ports (USB 0-1/2-3). 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 Setting

Configure these onboard USB devices in the Advanced menu ("USB Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

25

Driver Installation

You may need to install the proper drivers in your system operation 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**

JP8, JP9, JP10 and JP11 must be set to "2-3 On: +5V_standby". Refer to "USB Power Select" in this chapter for more information.

Audio

Rear audio

Line-in
Line-out
Mic-in

Front Audio

```
        1 2
Mic2-L  ██  GND
Mic2-R  ██  NC
Line2-R ██  Mic2-JD
GND     ██  Key
Line2-L ██  Line2-JD
        9 10
```

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.

Driver Installation

Install the audio driver. Refer to the chapter 8 for more information.

26

I/O Connectors

SATA (Serial ATA) Connectors

SATA 3   SATA 2   SATA 1   SATA 0

SATA 3.0 6Gb/s

GND
TXP
TXN
GND
RXN
RXP
GND

1

7
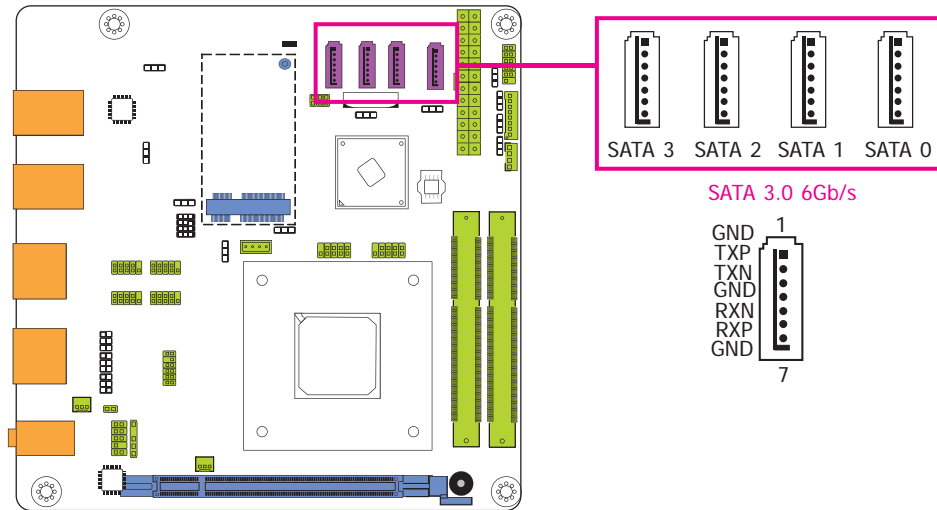
Features

- 4 Serial ATA 3.0 ports with data transfer rate up to 6Gb/s

- Integrated Advanced Host Controller Interface (AHCI) controller

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

BIOS Setting

Configure the Serial ATA drives in the Advanced menu ("SATA Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

Note:
SATA port 0 provides adequate space for SATA DOM.

Digital I/O Connector

Digital I/O Power Connector

Digital I/O

Digital I/O power

1   +12V
    Ground
    +5V_standby
4   +5V
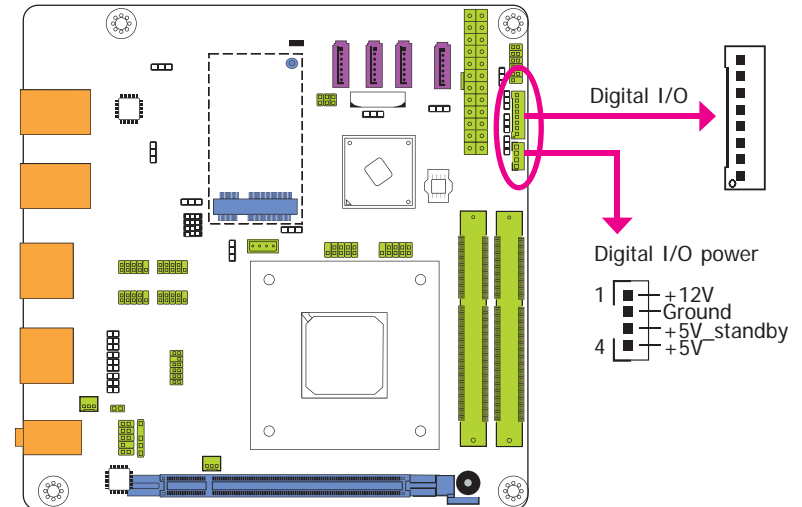
The 8-bit Digital I/O connector provides powering-on function to external devices that are connected to these connectors.

Digital I/O Connector

Pins	Function
0	DIO7
1	DIO6
2	DIO5
3	DIO4
4	DIO3
5	DIO2
6	DIO1
7	DIO0

27

Cooling Fan Connectors

System Fan
Ground
Power
Sense
1   3

CPU Fan
Ground
Power
Sense
1   3
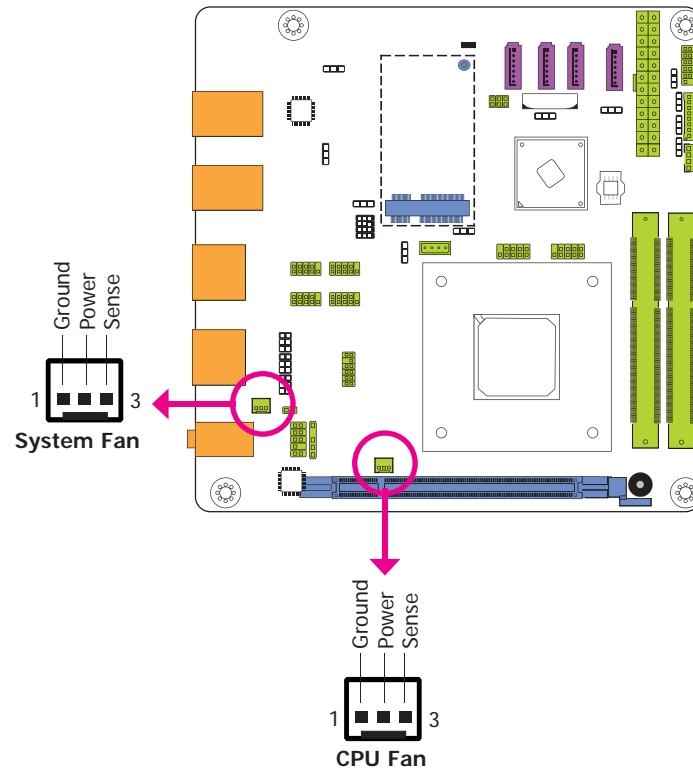
The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

BIOS Setting

The Advanced menu ("PC Health Status" submenu) of the BIOS will display the current speed of the cooling fans. Refer to the chapter 7 for more information.

COM (Serial) Ports

RXD DTR- DSR- CTS-
2
1   9
DCD- TXD GND RTS- RI-

COM 2/COM 3/COM 4: RS232

COM 4
COM 3

COM 2

COM 1: RS232/422/485
2
1   9
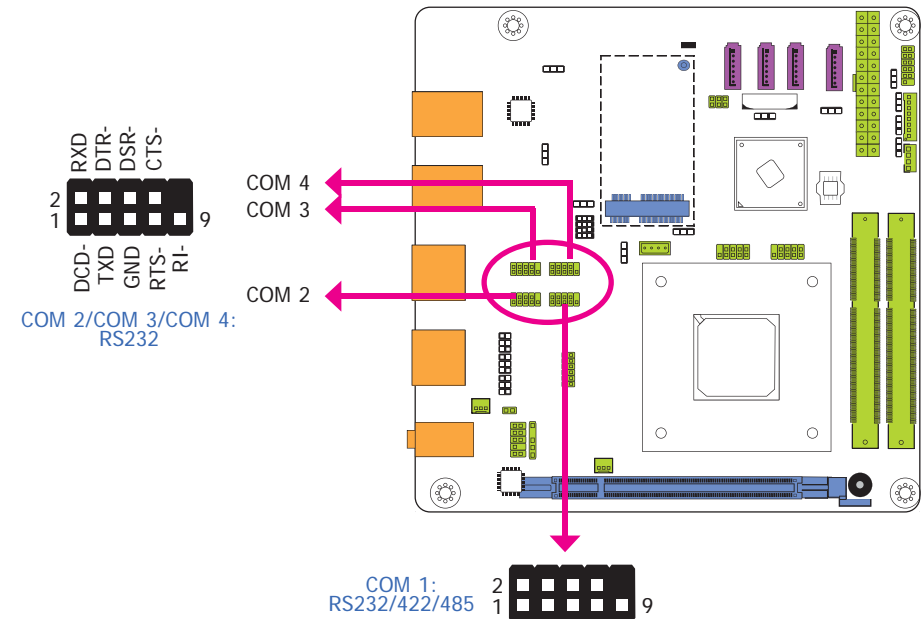
COM 2 to COM 4 are fixed at RS232.

The pin functions of COM port 1 will vary according to JP3's, JP4's and JP5's setting. They are used to configure the Serial COM port 1 to pure RS232, RS422 Full Duplex or RS485. Refer to "COM 1 RS232/422/485 Select" in this chapter for more information.

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

Connecting External Serial Ports

Your COM port may come 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 serial port cable to the COM connector. Make sure the colored stripe on the ribbon cable is aligned with pin 1 of the COM connector.

BIOS Setting

Configure the serial COM ports in the Advanced menu ("Super IO Configuration" submenu) of the BIOS. Refer to the chapter 7 for more information.

Important:
When COM 1 RS232/422/485 is selected, JP4 and JP5 must be set in accordance to JP3.

28

Front Panel Connector

Front Panel

1 2

HDD-LED — PWR-LED

RESET-SW — PWR-BTN

11 12
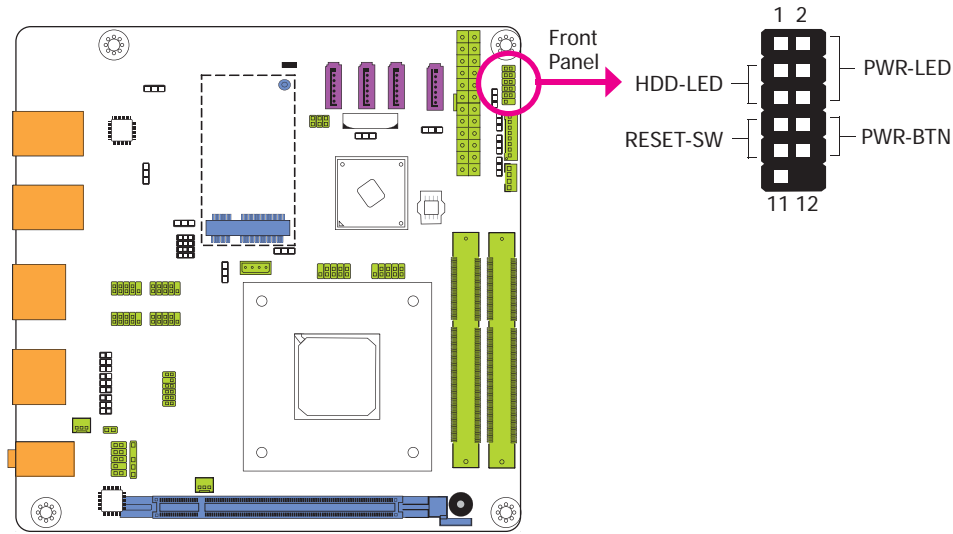
HDD-LED - HDD LED

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

SMBus Connector

SMBUS Data

GND | NC

2 [ ] 6
1 [ ] 5

+3.3V_standby | SMBUS_Alert

SMBUS Clock
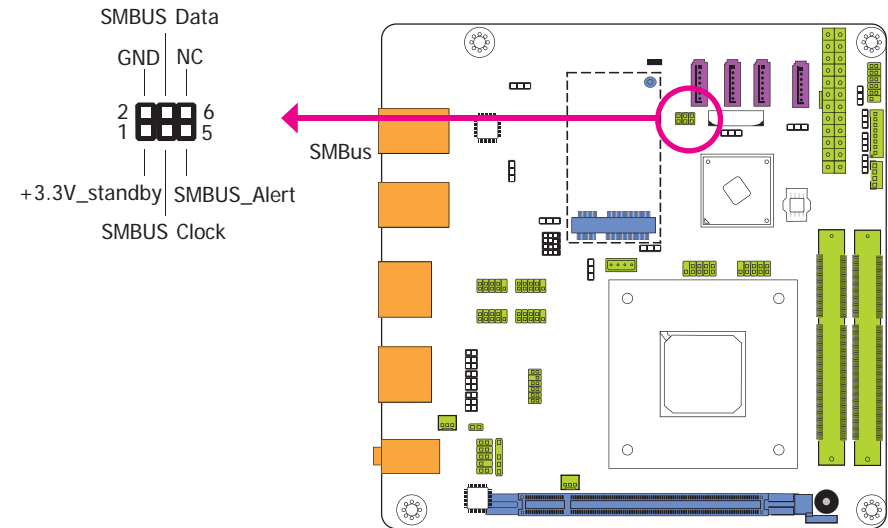
SMBus

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.

29

S/PDIF Connector

S/PDIF

1
— +5V
— Key
— SPDIF out
— Ground
— SPDIF in
5
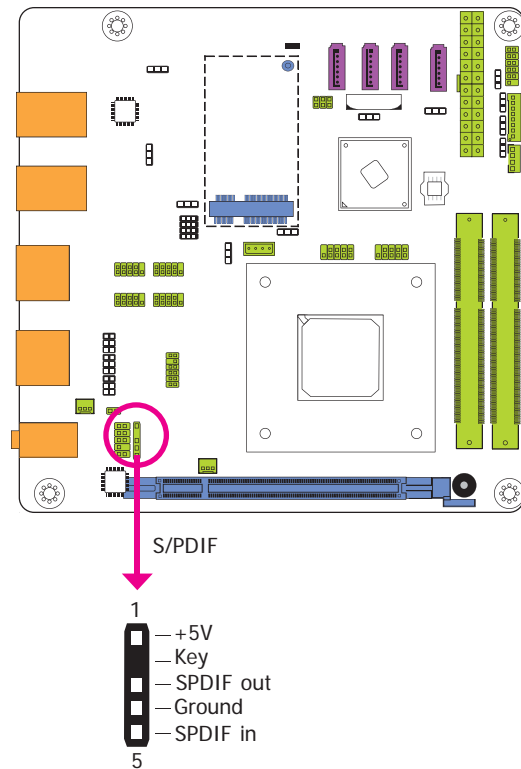
The S/PDIF connector is used to connect an external S/PDIF port. Your S/PDIF port may be mounted on a card-edge bracket. Install the card-edge bracket to an available slot at the rear of the system chassis then connect the audio cable to the S/PDIF connector. Make sure pin 1 of the audio cable is aligned with pin 1 of the S/PDIF connector.

ATX Power Connector

ATX power

13	1		
+3.3V			+3.3V
-12V			+3.3V
GND			GND
PS_ON#			+5V
GND			GND
GND			+5V
GND			GND
NC			PWR_OK
+5V			+5VSB
+5V			+12V
+5V			+12V
GND			+3.3V
24	12		
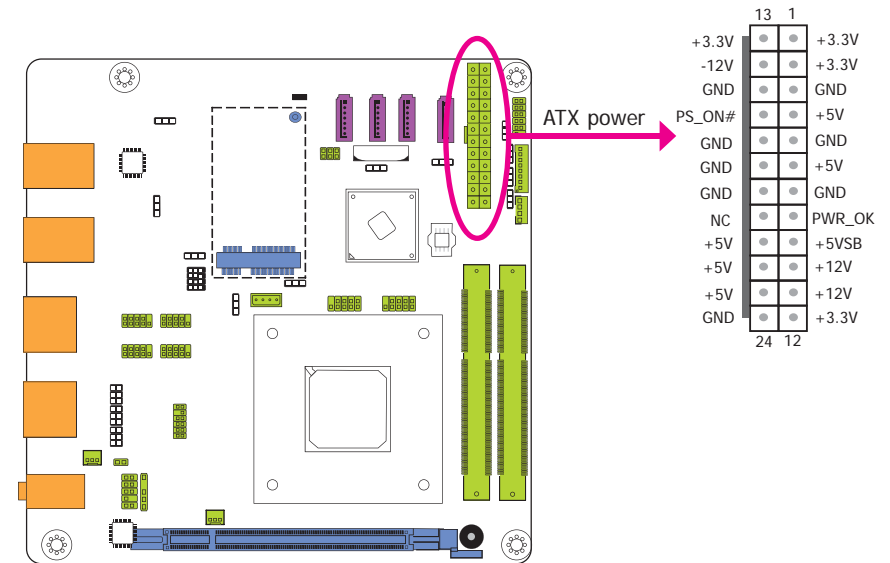
Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector.

The power connector from the power supply unit is designed to fit the 24-pin connector in only one orientation. Make sure to find the proper orientation before plugging the connector.

The system board requires a minimum of 300Watt power supply to operate. Your system configuration (CPU power, amount of memory, add-in cards, peripherals, etc.) may exceed the minimum power requirement. To ensure that adequate power is provided, we strongly recommend that you use a minimum of 400Watt (or greater) power supply.

Important:
Insufficient power supplied to the system may result in instability or the add-in boards and peripherals not functioning properly. Calculating the system's approximate power usage is important to ensure that the power supply meets the system's consumption requirements.

30

Expansion Slots

Mini PCI Express

PCI Express x16

Chassis Intrusion Connector

1 2

Chassis
Intrusion

Ground

Signal
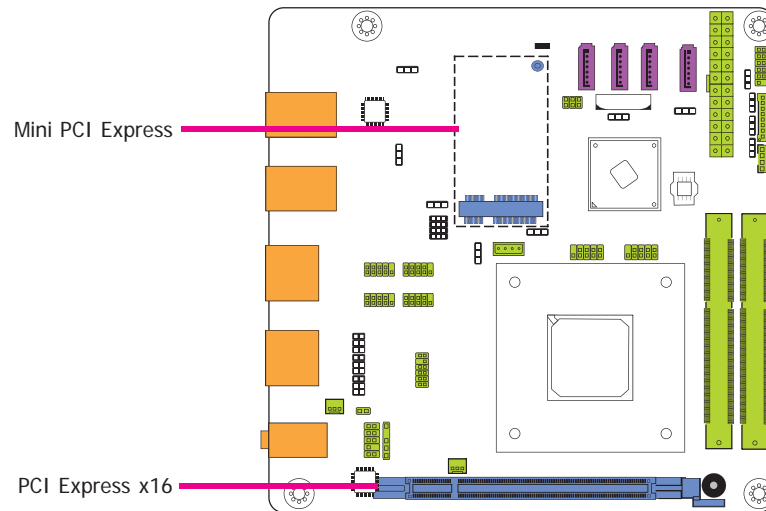
PCI Express x16 Slot

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.

Mini PCI Express 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 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.

31

LPC Connector

1211

LPC

2 1
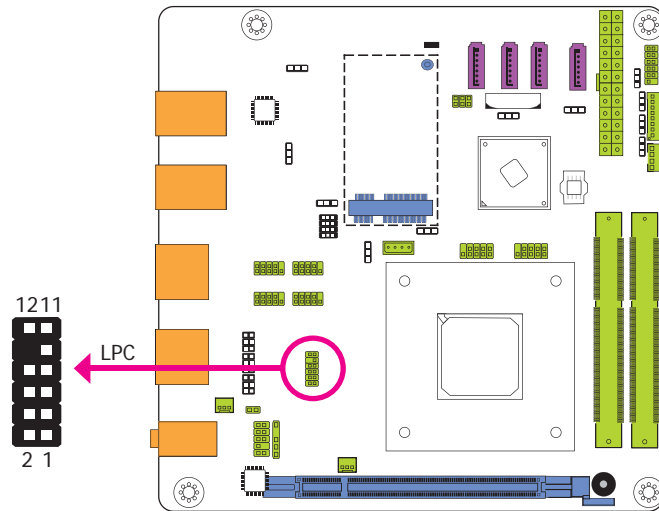
The LPC connector is used for the debug function and its pin functions are listed below.

Pins	Pin Assignment	Pins	Pin Assignment
1	CLK	2	LAD1
3	RST#	4	LAD0
5	FRAME#	6	VCC_+3V
7	LAD3	8	GND
9	LAD2	10	x
11	SERIRQ	12	48MHz

Standby Power LED

Standby Power LED
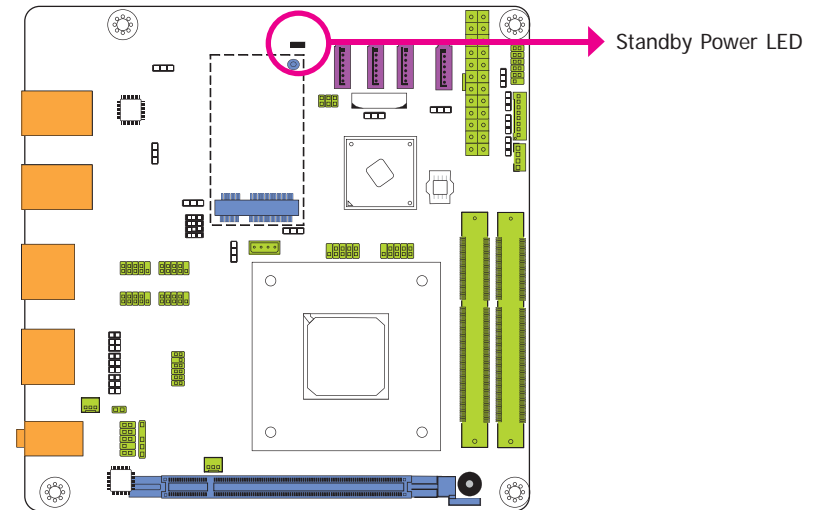
This LED will lit red when the system is in the standby mode. It indicates that there is power on the system board. Power-off the PC and then unplug the power cord prior to installing any devices. Failure to do so will cause severe damage to the motherboard and components.

Battery
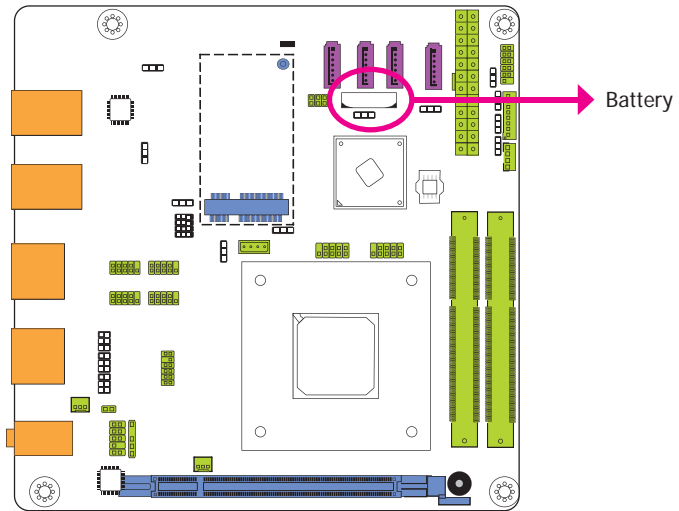
Battery

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.

Chapter 6 - Mounting Options

Wall Mount

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

There are 2 types of wall mount brackets:
- Type A
- Type B

Type A wall mount kit include:
- 2 type A wall mount brackets

1. If the mounting screw has been previously attached to the top cover of the system, please remove them first.

Mounting screw

Mounting screw

2. At the sides of the system, use the mounting screws removed in step 1 to secure the wall mount brackets on each side of the system.

Wall mount bracket

Wall mount bracket

Mounting screw

319.00

4-#6-32
Ø4.00
Ø8.50
Ø5.00
Ø3.60

28.60
160.00
120.00
80.00
16
16
2
2
180.00

74.00
78.00
300.00
4.00

34

Type B wall mount kit include:
- •   2 type B wall mount brackets
- •   Bracket screws

1. The 4 mounting holes on the sides of the system are used to mount the type B wall mount bracket.
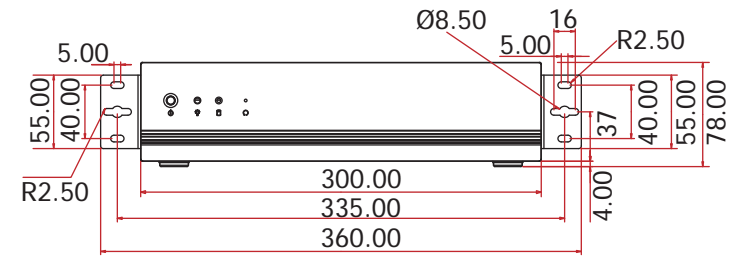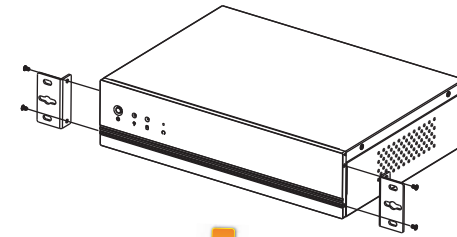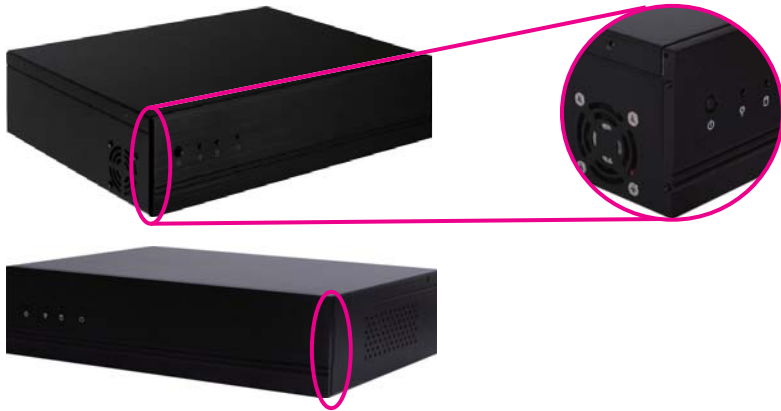
2. Use the provided mounting screws to secure the type B wall mount brackets on each side of the system.

Wall mount bracket

Wall mount bracket

Ø8.50
16
5.00
R2.50
5.00
55.00
40.00
37
40.00
55.00
78.00
R2.50
300.00
335.00
360.00
4.00

35

Chapter 7 - 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 keyboard 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.
+ (plus key)	Scrolls forward through the values or options of the highlighted field.
- (minus key)	Scrolls backward through the values or options of the highlighted field.
Tab	Select a field.
<F1>	Displays general help
<F2>	Pervious values
<F3>	Optimized defaults
<F4>	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>.

AMI BIOS Setup Utility

Main

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

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
  Main    Advanced   Chipset   Boot   Security   Save & Exit

  BIOS Information                                    Choose the system default
  Project Name                 BE17x                  language
  BIOS Version                 56.16A

  Memory Information
  Total Memory                 4080 MB (DDR3)

  System Language              [English]

  System Date                  [Tue 07/28/2015]
  System Time                  [09:39:23]             → ←:  Select Screen
                                                      ↑↓:     Select Item
  Access Level                 Administrator          Enter: Select
                                                      +/-:    Change Opt.
                                                      F1:     General Help
                                                      F2:     Previous Values
                                                      F3:     Optimized Defaults
                                                      F4:    Save Changes and
                                                              Reset
                                                      ESC:  Exit

            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

System Date

The date format is <day>, <month>, <date>, <year>. Day displays a day, from Sunday to Saturday. Month displays the month, from January to December. Date displays the date, from 1 to 31. Year displays the year, from 1980 to 2099.

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.

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.

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
  Main    Advanced   Chipset   Boot   Security   Save & Exit

  ▶ ACPI Settings                                     System ACPI Parameters.
  ▶ Trusted Computing
  ▶ DFI Wakeup Configuration
  ▶ CPU Configuration
  ▶ DDR3 Voltage Setting
  ▶ IDE Configuration
  ▶ MCTP Configuration
  ▶ USB Computing
  ▶ NCT6106D Super IO Configuration
  ▶ NCT6106D HW Monitor
  ▶ NCT6106D Super IO Features
  ▶ Serial Port Console Redirection                   → ←:  Select Screen
  ▶ Network Stack Configuration                       ↑↓:     Select Item
                                                      Enter: Select
                                                      +/-:    Change Opt.
                                                      F1:     General Help
                                                      F2:     Previous Values
                                                      F3:     Optimized Defaults
                                                      F4:    Save Changes and
                                                              Reset
                                                      ESC:  Exit

            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

37

ACPI Settings

This section is used to configure the ACPI Settings.

```
          Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
    Advanced

 ACPI Settings                                          Enables or Disables BIOS
                                                        ACPI Auto Configuration.
 Enable ACPI Auto Configuration       [Disable]

 Enable Hibernation                   [Enable]
 ACPI Sleep State                     [S3 only (Suspend to ...) ]




                                                        →←:  Select Screen
                                                        ↑↓:   Select Item
                                                        Enter: Select
                                                        +/-:   Change Opt.
                                                        F1:    General Help
                                                        F2:    Previous Values
                                                        F3:    Optimized Defaults
                                                        F4:    Save Changes and
                                                               Reset
                                                        ESC:  Exit
          Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Enable ACPI Auto Configuration

Enable or disable BIOS ACPI auto configuration.

Enable Hibernation

Enable or disable System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

Select the ACPI sleep state that the system will enter when the Suspend button is pressed.

S3(STR) Enable the Suspend to RAM function.

Trusted Computing

This section configures settings relevant to Trusted Computing innovations.

```
          Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
    Advanced

 Configuration                                          Enables or Disables
    Security Device Support           [Disable]         BIOS support for security
                                                        device. O.S. will not show
 Current Status Information                             Security Device. TCG
    SUPPORT TURNED OFF                                  EFI protocol and INT1A
                                                        interface will not be
                                                        available.



                                                        →←:  Select Screen
                                                        ↑↓:   Select Item
                                                        Enter: Select
                                                        +/-:   Change Opt.
                                                        F1:    General Help
                                                        F2:    Previous Values
                                                        F3:    Optimized Defaults
                                                        F4:    Save Changes and
                                                               Reset
                                                        ESC:  Exit
          Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Security Device Support

This field is used to enable or disable BIOS supporting for the security device. O.S will not show the security device. TCG EFI protocol and INT1A interface will not be available.

DFI Wakeup Configuration

This section configures the DFI Wakeup ACPI Power Managemnet Coniguration.

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

   DFI Wakeup ACPI Power Management Configuration          About Resume by PME
                                                           (PCI, PCIE, LAN).

   Resume by PME                    [Disabled]
   Resume by USB                    [Disabled]




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

              Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```
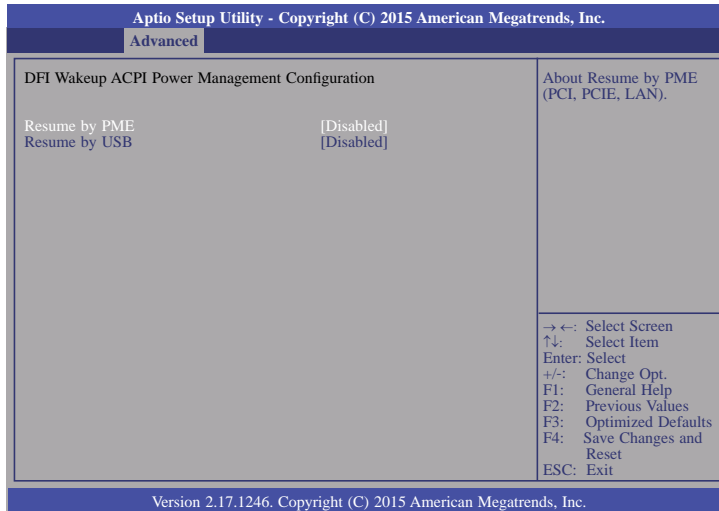
Resume by PME

Enable this field to use the PME signal to wake up the system (via PCI, PCIE and LAN).

Resume by USB

When Enabled, this system uses the USB signal to carry out a wakeup event.

CPU Configuration

This section is used to configure the CPU. It will also display the detected CPU information.

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

   CPU Configuration                                       Enabled/Disable No-
                                                           execute page protection
   NX Mode                        [Enabled]                Function.
   SVM Mode                       [Enabled]
   ► Node 0 Information



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

              Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

NX Mode

Enable or disable No-execute page protection function.

SVM Mode

Enable or disable the CPU vertualization.

Node 0 Information

View the memory information related to Node 0.

```
              Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

   Socket 0: AMD RX-225FB with AMD Radeon(tm) R4 Graphics
   Dual Core Running @ 2231 MHz 1050 mV
   Processor Family: 15h
   Processor Model: 30h~30Fh
   Max Speed: 2200 MHz   Intended Speed: 2200 MHz
   Min Speed: 1100 MHz
   Microcode Patch Level: 6003106


   ---------- Cache per Core -----------
   L1 Instruction Cache: 48 KB/-way
        L1 Data Cache: 16 KB/4-way
            L2 Cache: 512 KB/16-way            → ←:  Select Screen
   No L3 Cache Present                          ↑↓:    Select Item
                                                Enter: Select
                                                +/-:   Change Opt.
                                                F1:    General Help
                                                F2:    Previous Values
                                                F3:    Optimized Defaults
                                                F4:    Save Changes and
                                                       Reset
                                                ESC:  Exit

              Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

DDR3 Voltage Setting

This section is used to configure the DDR3 Voltage Setting.

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
     Advanced

                                                           DDR3 Voltage Setting.
     DDR3 Voltage Setting              [Auto]




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

                Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```
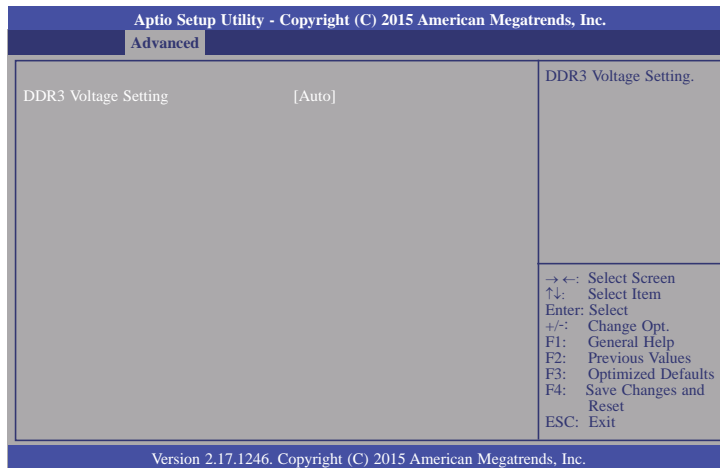
DDR3 Voltage Setting

Select the DDR3 Voltage Setting. The options are Auto, 1.5V, 1.35V and 1.25V.

IDE Configuration

This section is used to configure the IDE device.

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
     Advanced

     IDE Configuration

     SATA Port0               Not present
     SATA Port1               Not present
     SATA Port2               Not present
     SATA Port3               Not present
     SATA Port4               Not present




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

                Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

MCTP Configuration

This section is used to configure the Management Component Transport Protocol (MCTP).
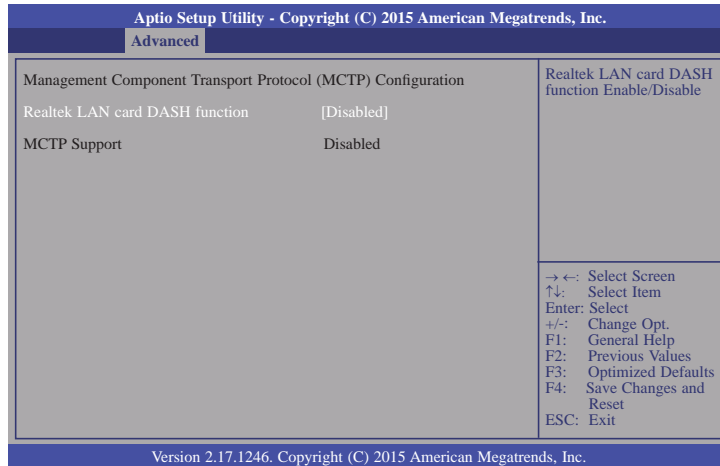
Realtek LAN card DASH function

Enable or disable the Realtek LAN card DASH function.

When the Realtek LAN card DASH function is enabled, you will enable or disable the MCTP support.
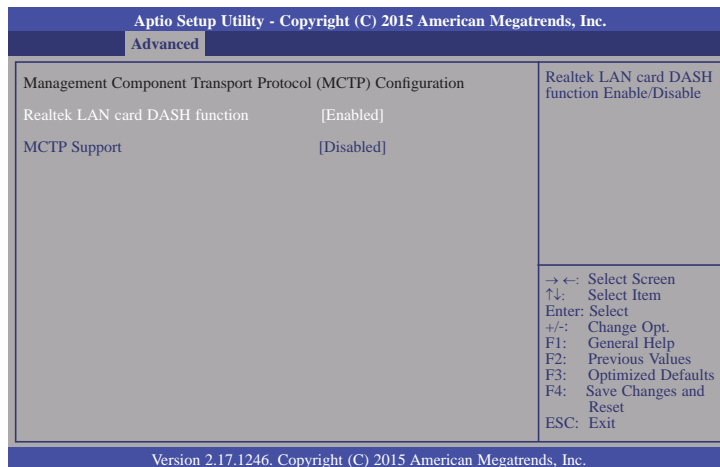
MCTP Support

Enable or disable the MCTP support.
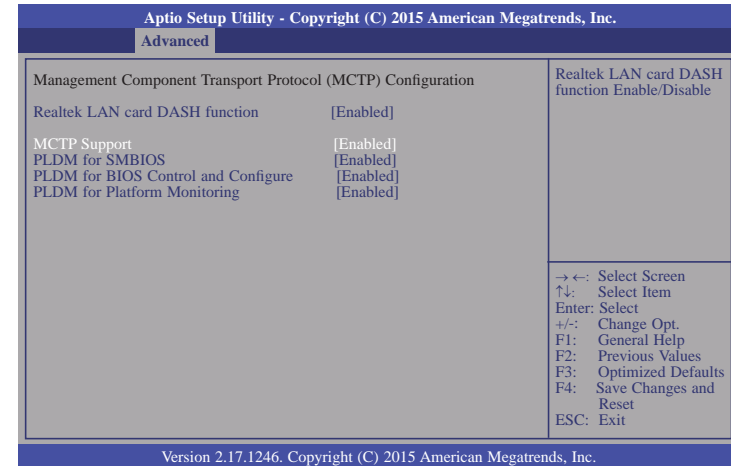
PLDM for SMBIOS

Enable or disable the PLDM support for SMBIOS.

PLDM for BIOS Control and Configure

Enable or disable the PLDM support for BIOS control and configuration.

PLDM for Platform Monitoring

Enable or disable the PLDM support for platform monitoring.

USB Configuration

This section is used to configure USB parameters.

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

   USB Configuration                                              Enables Legacy USB
                                                                  support. AUTO option
   USB Devices:                                                   disables legacy support if
          1 Keyboard, 1 Mouse                                     no USB devices are
                                                                  connected. DISABLE
   Legacy USB Support                     [Enabled]               option will keep USB
   USB Mass Storage Driver Support        [Enabled]               devices available only for
   Port 60/64 Emulaiton                   [Enabled]               EFI applications.


                                                                  → ←:  Select Screen
                                                                  ↑↓:    Select Item
                                                                  Enter: Select
                                                                  +/-:   Change Opt.
                                                                  F1:    General Help
                                                                  F2:    Previous Values
                                                                  F3:    Optimized Defaults
                                                                  F4:    Save Changes and
                                                                         Reset
                                                                  ESC:  Exit
                Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Legacy USB Support

Enabled
Enable legacy USB.

Auto
Disable support for legacy when no USB devices are connected.

Disabled
Keeps USB devices available only for EFI applications.

USB Mass Storage Driver Support

Enable or disable the USB mass storage driver support.

Port 60/64 Emulation

Enable I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

NCT6106D Super IO Configuration

This section is used to set the serial port functions.

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

   NCT6106D Super IO Configuration                                Set Parameters of Serial
                                                                  Port 1 (COMA).
   NCT6106D Super IO Chip              NCT6106D
 ► Serial Port 1 Configuration
 ► Serial Port 2 Configuration
 ► Serial Port 3 Configuration
 ► Serial Port 4 Configuration


                                                                  → ←:  Select Screen
                                                                  ↑↓:    Select Item
                                                                  Enter: Select
                                                                  +/-:   Change Opt.
                                                                  F1:    General Help
                                                                  F2:    Previous Values
                                                                  F3:    Optimized Defaults
                                                                  F4:    Save Changes and
                                                                         Reset
                                                                  ESC:  Exit
                Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Serial Port 1 Configuration to Serial Port 4 Configuration

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

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

   Change Settings                    [Auto]
   RS485 Auto Flow Support            [Disable]



                                                                  → ←:  Select Screen
                                                                  ↑↓:    Select Item
                                                                  Enter: Select
                                                                  +/-:   Change Opt.
                                                                  F1:    General Help
                                                                  F2:    Previous Values
                                                                  F3:    Optimized Defaults
                                                                  F4:    Save Changes and
                                                                         Reset
                                                                  ESC:  Exit
                Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

42

```
Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
 Advanced

Serial Port 2 Configuration                              Enable or Disable Serial
                                                         Port (COM).
Serial Port                        [Enabled]
Device Settings                    IO=2F8h; IRQ=3;

Change Settings                    [Auto]




                                                         → ←:  Select Screen
                                                         ↑↓:   Select Item
                                                         Enter: Select
                                                         +/-:   Change Opt.
                                                         F1:    General Help
                                                         F2:    Previous Values
                                                         F3:    Optimized Defaults
                                                         F4:    Save Changes and
                                                                Reset
                                                         ESC:  Exit
        Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

```
Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
 Advanced

Serial Port 4 Configuration                              Enable or Disable Serial
                                                         Port (COM).
Serial Port                        [Enabled]
Device Settings                    IO=2E8h; IRQ=11;

Change Settings                    [Auto]




                                                         → ←:  Select Screen
                                                         ↑↓:   Select Item
                                                         Enter: Select
                                                         +/-:   Change Opt.
                                                         F1:    General Help
                                                         F2:    Previous Values
                                                         F3:    Optimized Defaults
                                                         F4:    Save Changes and
                                                                Reset
                                                         ESC:  Exit
        Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

```
Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
 Advanced

Serial Port 3 Configuration                              Enable or Disable Serial
                                                         Port (COM).
Serial Port                        [Enabled]
Device Settings                    IO=3E8h; IRQ=10;

Change Settings                    [Auto]




                                                         → ←:  Select Screen
                                                         ↑↓:   Select Item
                                                         Enter: Select
                                                         +/-:   Change Opt.
                                                         F1:    General Help
                                                         F2:    Previous Values
                                                         F3:    Optimized Defaults
                                                         F4:    Save Changes and
                                                                Reset
                                                         ESC:  Exit
        Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Serial Port

Enable or disable the serial port (COM).

Change Settings

Select an optimal setting for the super I/O device.

RS485 Auto Flow Support

Enable or disable the RS485 auto flow support.

43

NCT6106D HW Monitor

This section monitors the hardware status.

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

   PC Health Status                                        Enable or Disable Smart
                                                           Fan.
   Smart Fan Function              [Enabled]
 ► Smart Fan Mode Configuration

   SYS Temperature                 : +40.5 C
   CPU Temperature                 : +39.0 C
   SysFan Speed                    : N/A
   CPUFan Speed                    : 8385 RPM
   VCore                           : +0.920 V
   APU VDDNB                       : +1.064 V
   DDR3 Voltage                    : +1.520 V
   +12V                            : +11.968 V           →←: Select Screen
                                                         ↑↓:   Select Item
                                                         Enter: Select
                                                         +/-:   Change Opt.
                                                         F1:    General Help
                                                         F2:    Previous Values
                                                         F3:    Optimized Defaults
                                                         F4:    Save Changes and
                                                                Reset
                                                         ESC:  Exit

            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Smart Fan Mode Configuration

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

   Smart Fan Mode Configuration                            Smart Fan Moe Select.

   System Fan Mode                 [Thermal CruiseTM Mode]
   SysFan Temp Target              55
   SysFan Temp Tolerance           3

   CPU Fan Mode                    [Thermal CruiseTM Mode]
   CpuFan Temp Target              55
   CpuFan Temp Tolerance           3

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

            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

System/CPU Fan Mode

Select the smart fan mode.

SysFan Temp Target

Enter the value for the system fan target temperature.

SysFan Temp Tolerance

Enter the value for the system fan tolerance temperature.

CpuFan Temp Target

Enter the value for the CPU fan target temperature.

CpuFan Temp Tolerance

Enter the value for the CPU fan tolerance temperature.

NCT6106D Super IO Features

This section is used to configure some control functions.

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
      Advanced

   NCT6106D Super IO Features                              Control the status when
                                                           power loss occurs.
   Power-Loss State                    [Always off]
   Case Open Warning                   [Disabled]
   WatchDog Count Mode                 [Second]
   WatchDog TimeOut Value              0




                                                           → ←:  Select Screen
                                                           ↑↓:    Select Item
                                                           Enter: Select
                                                           +/-:   Change Opt.
                                                           F1:    General Help
                                                           F2:    Previous Values
                                                           F3:    Optimized Defaults
                                                           F4:    Save Changes and
                                                                  Reset
                                                           ESC:  Exit
                Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Power-Loss State

Control the status when the power loss occurs.

Power Off
When power returns after an AC power failure, the system's power is off. You **must** press the Power button to power-on the system.

Power On
When power returns after an AC power failure, the system will automatically power-on.

Last State
When power returns after an AC power failure, the system will return to the state where you left off before power failure occurs. If the system's power is off when AC power failure occurs, it will remain off when power returns. If the system's power is on when AC power failure occurs, the system will power-on when power returns.

Case Open Warning

Enable or disable the function of the case open warning.

WatchDog Count Mode

Select the watchdog count mode: second or minute.

WatchDog TimeOut Value

Enter the value to fill the watchdog timeout value. 0 means Disabled.

Serial Port Console Redirection

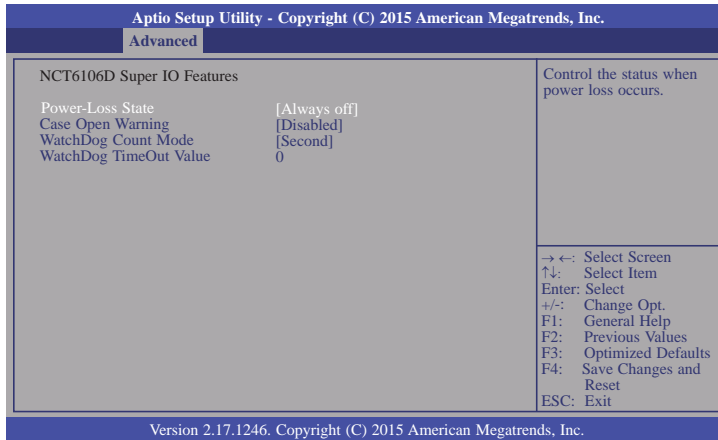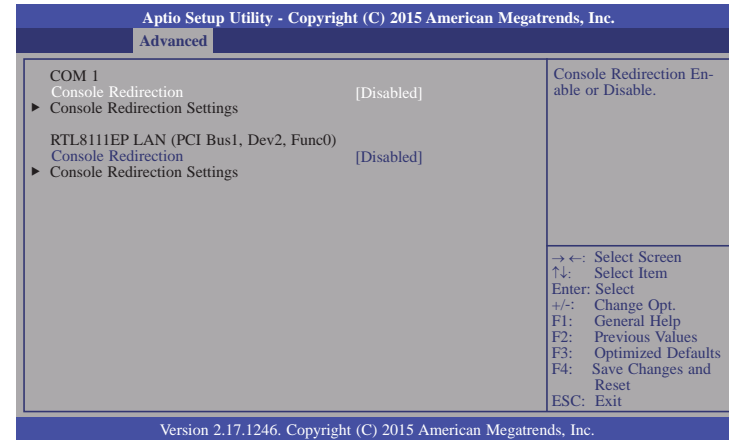This section is used to configure the console redirection of serial COM port 1.

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
      Advanced

   COM 1                                                   Console Redirection En-
   Console Redirection                 [Disabled]          able or Disable.
 ▶ Console Redirection Settings

   RTL8111EP LAN (PCI Bus1, Dev2, Func0)
   Console Redirection                 [Disabled]
 ▶ Console Redirection Settings



                                                           → ←:  Select Screen
                                                           ↑↓:    Select Item
                                                           Enter: Select
                                                           +/-:   Change Opt.
                                                           F1:    General Help
                                                           F2:    Previous Values
                                                           F3:    Optimized Defaults
                                                           F4:    Save Changes and
                                                                  Reset
                                                           ESC:  Exit
                Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```
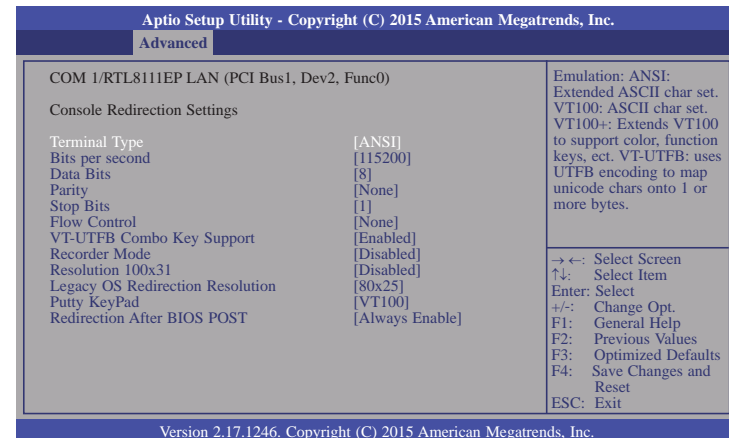
Console Redirection

Enable or disable the function of console redirection. When the console redirection is enabled, you will be able to configure the console redirection settings.

Console Redirection Settings

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
      Advanced

   COM 1/RTL8111EP LAN (PCI Bus1, Dev2, Func0)             Emulation: ANSI:
                                                           Extended ASCII char set.
   Console Redirection Settings                            VT100: ASCII char set.
                                                           VT100+: Extends VT100
   Terminal Type                       [ANSI]              to support color, function
   Bits per second                     [115200]           keys, ect. VT-UTFB: uses
   Data Bits                           [8]                 UTFB encoding to map
   Parity                              [None]              unicode chars onto 1 or
   Stop Bits                           [1]                 more bytes.
   Flow Control                        [None]
   VT-UTFB Combo Key Support           [Enabled]
   Recorder Mode                       [Disabled]          → ←:  Select Screen
   Resolution 100x31                   [Disabled]          ↑↓:    Select Item
   Legacy OS Redirection Resolution    [80x25]             Enter: Select
   Putty KeyPad                        [VT100]             +/-:   Change Opt.
   Redirection After BIOS POST         [Always Enable]     F1:    General Help
                                                           F2:    Previous Values
                                                           F3:    Optimized Defaults
                                                           F4:    Save Changes and
                                                                  Reset
                                                           ESC:  Exit
                Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

45

Terminal Type

Select the terminal types.

VT100
ASCII char set

VT100+
Extend VT100+ to support color, function keys, etc.

VT-UTFB
Use UTFB encoding to map the unicode chars onto 1 or more bytes.

ANSI
Extend ASCII char set

Bits per second

Select the transmission speed of the serial port. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

Data Bits

Enter the value for data bits.

Parity

A parity bit can be sent with the data bits to detect some transmission errors.

Even
Parity bit is 0 if the num of 1's in the data bits is even.

Odd
Parity bit is 0 if the num of 1's in the data bits is odd.

Mark
Parity bit is always 1.

Space
Parity bit is always 0.

Mark and Space parity do not allow for error detection.

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning.) The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

Flow Control

Flow control can prevent the data losss from the buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. The hardware flow control uses two wires to send start/stop signals.

VT-UTFB Combo Key Support

Enable or disable the support of VT-UTFB combination key for ANSI/VT100 terminals.

Recorder Mode

Text will be sent on the Enabled mode to capture the terminal data.

Resolution 100x31

Enable or disable the extended terminal resolution.

Legacy OS Redirection Resolution

On the Legacy OS, the number of Rows and Columns supported redirection.
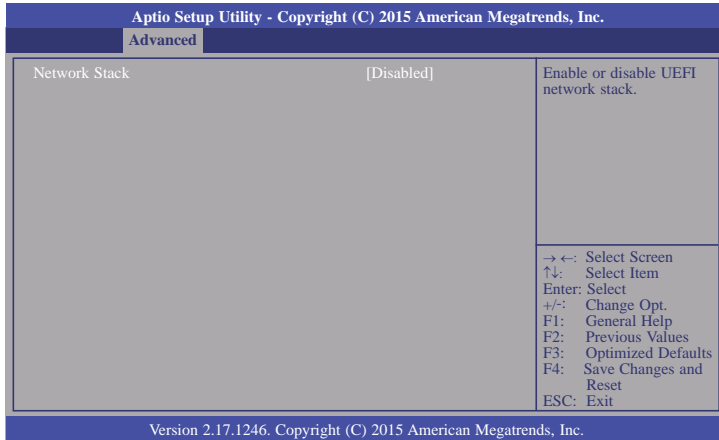
Putty KeyPad

Select the function key and key pad on Putty.

Redirection After BIOS POST

The settings specify if BootLoader is selected than Legacy console redirection which is disabled before booting to the Legacy OS. Default value is Always Enable which means that Legacy Console Redirection is enabled for the Legacy OS.
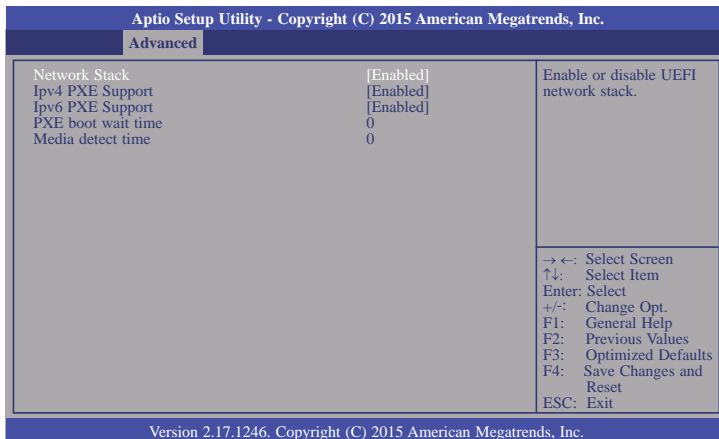
Network Stack

This section configures settings relevant to the network stack.

```
         Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

  Network Stack                      [Disabled]            Enable or disable UEFI
                                                           network stack.




                                                           →←:  Select Screen
                                                           ↑↓:    Select Item
                                                           Enter: Select
                                                           +/-:    Change Opt.
                                                           F1:    General Help
                                                           F2:    Previous Values
                                                           F3:    Optimized Defaults
                                                           F4:    Save Changes and
                                                                  Reset
                                                           ESC:  Exit
         Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Network Stack

Enable or disable UEFI network stack.

```
         Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Advanced

  Network Stack                      [Enabled]             Enable or disable UEFI
  Ipv4 PXE Support                   [Enabled]             network stack.
  Ipv6 PXE Support                   [Enabled]
  PXE boot wait time                 0
  Media detect time                  0




                                                           →←:  Select Screen
                                                           ↑↓:    Select Item
                                                           Enter: Select
                                                           +/-:    Change Opt.
                                                           F1:    General Help
                                                           F2:    Previous Values
                                                           F3:    Optimized Defaults
                                                           F4:    Save Changes and
                                                                  Reset
                                                           ESC:  Exit
         Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Network Stack

Enable or disable UEFI network stack.

Ipv4 PXE Support

When enabled, Ipv4 PXE boot supports. When disabled, Ipv4 PXE boot option will not be created.

Ipv6 PXE Support

When enabled, Ipv6 PXE boot supports. When disabled, Ipv6 PXE boot option will not be created.

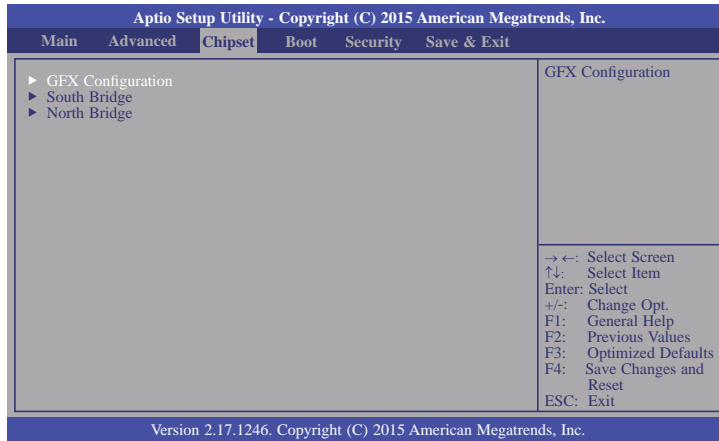### PXE boot wait Time

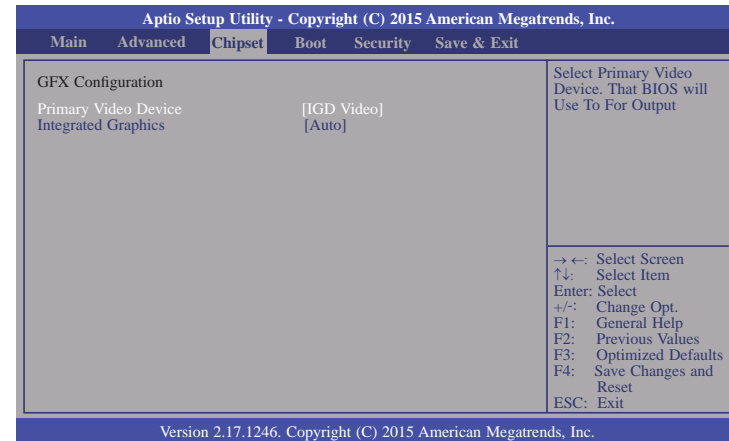Enter the value for the wait time to press <ESC> key to abort the PXE boot.

Media detect Time

Enter the value for the wait time in second to detect the PXE media.

47

Chipset

This section configures relevant chipset functions.

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Main     Advanced     Chipset     Boot     Security     Save & Exit

  ▶ GFX Configuration                                    GFX Configuration
  ▶ South Bridge
  ▶ North Bridge




                                                   → ←:  Select Screen
                                                   ↑↓:    Select Item
                                                   Enter: Select
                                                   +/-:    Change Opt.
                                                   F1:     General Help
                                                   F2:     Previous Values
                                                   F3:     Optimized Defaults
                                                   F4:     Save Changes and
                                                           Reset
                                                   ESC:  Exit
            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```
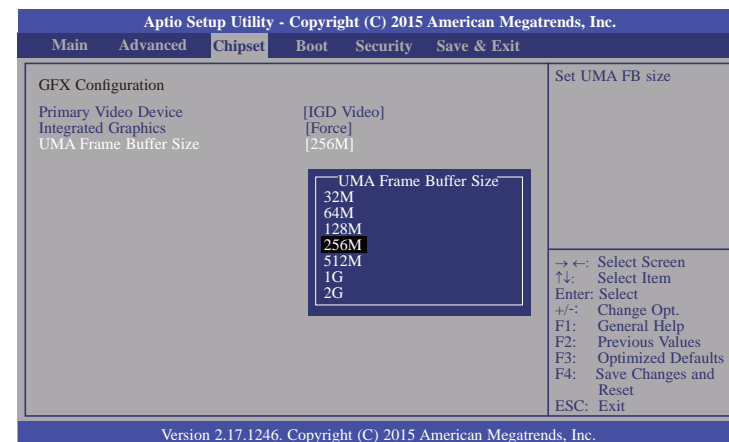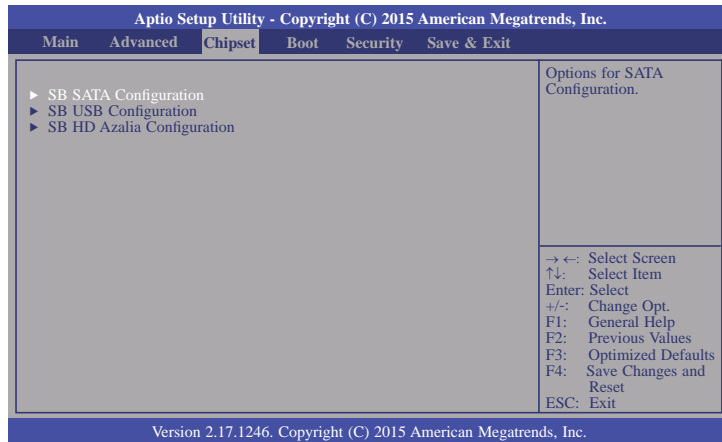
GFX Configuration

```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Main     Advanced     Chipset     Boot     Security     Save & Exit

  GFX Configuration                                      Select Primary Video
                                                         Device. That BIOS will
  Primary Video Device          [IGD Video]              Use To For Output
  Integrated Graphics           [Auto]



                                                   → ←:  Select Screen
                                                   ↑↓:    Select Item
                                                   Enter: Select
                                                   +/-:    Change Opt.
                                                   F1:     General Help
                                                   F2:     Previous Values
                                                   F3:     Optimized Defaults
                                                   F4:     Save Changes and
                                                           Reset
                                                   ESC:  Exit
            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Primary Video Device

Select the primary video device: IGD Video or NB PCIe Slot Video. That BIOS will be used for display output.
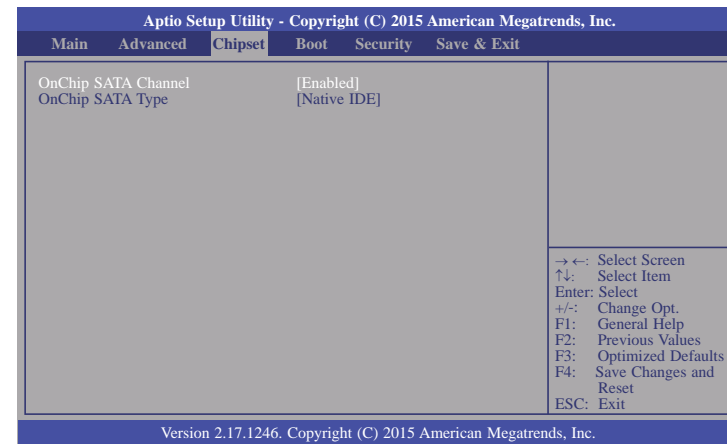
Integrated Graphics

Enable the integrated graphics controller: Disabled, Auto or Force. When the integrated graphics controller is forced, you will be able to choose the UMA Frame Buffer Size.
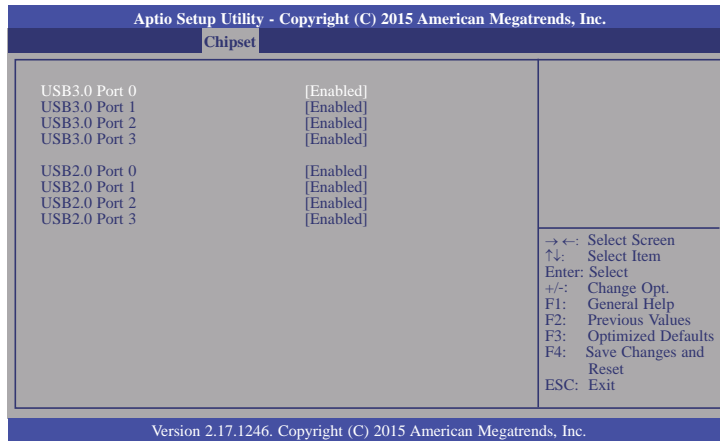
```
            Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
   Main     Advanced     Chipset     Boot     Security     Save & Exit

  GFX Configuration                                      Set UMA FB size

  Primary Video Device          [IGD Video]
  Integrated Graphics           [Force]
  UMA Frame Buffer Size         [256M]

               ┌─── UMA Frame Buffer Size ───┐
               │ 32M                          │
               │ 64M                          │
               │ 128M                         │
               │ 256M                         │          → ←:  Select Screen
               │ 512M                         │          ↑↓:    Select Item
               │ 1G                           │          Enter: Select
               │ 2G                           │          +/-:    Change Opt.
               └──────────────────────────────┘          F1:     General Help
                                                   F2:     Previous Values
                                                   F3:     Optimized Defaults
                                                   F4:     Save Changes and
                                                           Reset
                                                   ESC:  Exit
            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

48

South Bridge

```
          Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
  Main     Advanced    Chipset    Boot    Security    Save & Exit

  ▶ SB SATA Configuration                        Options for SATA
  ▶ SB USB Configuration                         Configuration.
  ▶ SB HD Azalia Configuration




                                                 →←:  Select Screen
                                                 ↑↓:    Select Item
                                                 Enter: Select
                                                 +/-:    Change Opt.
                                                 F1:    General Help
                                                 F2:    Previous Values
                                                 F3:    Optimized Defaults
                                                 F4:    Save Changes and
                                                          Reset
                                                 ESC:  Exit
          Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

SB SATA Configuration

```
          Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
  Main     Advanced    Chipset    Boot    Security    Save & Exit

  OnChip SATA Channel          [Enabled]
  OnChip SATA Type             [Native IDE]




                                                 →←:  Select Screen
                                                 ↑↓:    Select Item
                                                 Enter: Select
                                                 +/-:    Change Opt.
                                                 F1:    General Help
                                                 F2:    Previous Values
                                                 F3:    Optimized Defaults
                                                 F4:    Save Changes and
                                                          Reset
                                                 ESC:  Exit
          Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

OnChip SATA Channel

This field is used to enable or disable the SATA function.

OnChip SATA Type

This field is used to configure the SATA drives in the Native IDE or AHCI mode.

SB USB Configuration

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
                                     Chipset

    USB3.0 Port 0              [Enabled]
    USB3.0 Port 1              [Enabled]
    USB3.0 Port 2              [Enabled]
    USB3.0 Port 3              [Enabled]

    USB2.0 Port 0              [Enabled]
    USB2.0 Port 1              [Enabled]
    USB2.0 Port 2              [Enabled]
    USB2.0 Port 3              [Enabled]

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

            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

North Bridge

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
        Main     Advanced     Chipset     Boot     Security     Save & Exit

    North Bridge Configuration                    View Information related
                                                  to Socket 0.
    Memory Information

    Total Memory: 4080MB (DDR3)
  ▶ Socket 0 Information

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

            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

SB HD Azalia Configuration

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
        Main     Advanced     Chipset     Boot     Security     Save & Exit

    HD Audio Azalia Device         [Enabled]

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

            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Socket 0 Information

```
                Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
        Main     Advanced     Chipset     Boot     Security     Save & Exit

    Socket 0 Information

      Starting Address: 0 KB
      Ending Address: 4194303 KB

    DDR3_1: size=4096 MB; Dimm speed=1333 MHz, conf speed=1333 MHz
    DDR3_2: Not Present

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

            Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Boot

```
                    Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
       Main    Advanced    Chipset    Boot    Security    Save & Exit

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

       Boot Option Priorities

       ▶  CSM Parameters

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

                    Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Setup Prompt Timeout

Select the number of seconds to wait for the setup activation key. 65535(0xFFFF) denotes indefinite waiting.

Bootup NumLock State

This allows you to determine the default state of the numeric keypad. By default, the system boots up with NumLock on wherein the function of the numeric keypad is the number keys. When set to Off, the function of the numeric keypad is the arrow keys.

Quiet Boot

Enable or disable the quiet boot function.

CSM Parameters

```
                    Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.
       Main    Advanced    Chipset    Boot    Security    Save & Exit

       Launch CSM                              [Enabled]         This option controls if
       Boot Option Filter                      [UEFI and Legacy] CSM will be launched.
       Launch PXE OpROM policy                 [Do not launch]
       Launch Storage OpROM policy             [Legacy only]
       Launch Video OpROM policy               [Legacy only]

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

                    Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.
```

Boot Option Filter

This option controls what devices system can boot to.

Launch PXE OpROM policy

Controls the execution of UEFI and Legacy PXE OpROM.

Launch Storage OpROM policy

Controls the execution of UEFI and Legacy storage OpROM.

Launch Video OpROM policy

Controls the execution of UEFI and Legacy video OpROM.

51

Security

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.

| Main | Advanced | Chipset | Boot | Security | Save & Exit |

Password Description

If ONLY the Administrator's password is set,
then this only limits access to Setup and is
only asked for when entering Setup.
If ONLY the User's password is set, then this
is a power on password and must be entered to
boot or enter Setup. In Setup the User will
have Administrator rights.
The password length must be
in the following range:
Minimum length   3
Maximum length   20

Administrator Password
User Password

Set Administrator
Password.

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

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Administrator Password

Sets the administrator password.

User Password

Sets the user password.

Save & Exit

Aptio Setup Utility - Copyright (C) 2015 American Megatrends, Inc.

| Main | Advanced | Chipset | Boot | Security | Save & Exit |

Save Changes and Reset
Discard Changes and Reset

Save Options
Save Changes
Discard Changes

Restore Defaults
Save as User Defaults
Restore User Defaults

Boot Override

Reset the system after sav-
ing the changes.

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

Version 2.17.1246. Copyright (C) 2015 American Megatrends, Inc.

Save Changes and Reset

To save the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system after saving all changes made.

Discard Changes and Reset

To discard the changes, select this field and then press <Enter>. A dialog box will appear. Select Yes to reset the system setup without saving any changes.

Save Changes

Save the changes done so far to any of the setup options.

Discard Changes

Discard changes done so far to any of the setup options.

Restore Defaults

To restore and load the optimized default values, select this field and then press <Enter>. A dialog box will appear. Select Yes to restore the default values of all the setup options.

52

Save as User Defaults

To save changes done so far as user default, select this field and then press <Enter>.
A dialog box will appear. Select Yes to save values as user default.

Restore User Defaults

To restore user default to all the setup options, select this field and then press <Enter>.
A dialog box will appear. Select Yes to restore user default.

Updating the BIOS

To update the BIOS, you will need the new BIOS file and a flash utility, AFUDOS.EXE.
Please contact technical support or your sales representative for the files.
To execute the utility, type:

A:> AFUDOS BIOS_File_Name /b /p /n

then press <Enter>.

```
C:\AFU\AFUDOS>afudos filename /B /P /N

   +---------------------------------------------------------------------------+
   |                    AMI Firmware Update Utility(APTIO) v2.25                |
   |           Copyright (C)2011 American Megatrends Inc. All Rights Reserved.  |
   +---------------------------------------------------------------------------+

        Reading file .............................   done
        Erasing flash ............................   done
        Writing flash ............................   done
        Verifying flash ..........................   done
        Erasing BootBlock ....................   done
        Writing BootBlock ....................   done
        Verifying BootBlock .................   done

C:\AFU\AFUDOS>
```

Chapter 8 - Supported Software

Some devices of the system require drivers from hardware manufactures to operate properly. The system may come with a CD/DVD that contains drivers, utilities and software applications. Insert the CD into a CD-ROM drive. The auto-run screen (Mainboard Utility CD) will appear. If the "Autorun" does not automatically start, please go to the root directory of the CD and double-click "Setup".

If your product package does not include a CD/DVD, you can download the latest drivers from the DFI Download Center:

http://www.dfi.com/DownloadCenter

Once you are in the Download Center page, select your product or type the model name and click "Search" to find product-related resources such as documentation and drivers.

For Windows 8.1
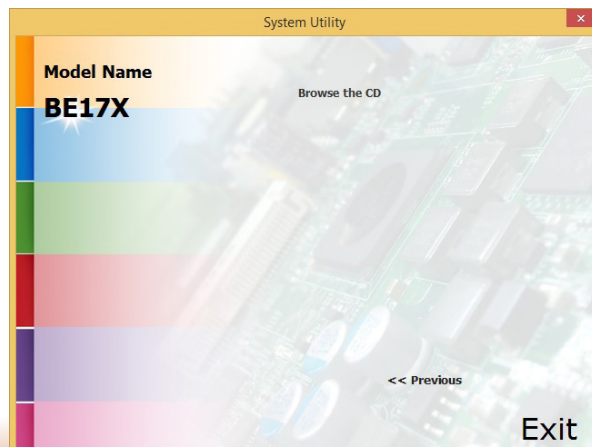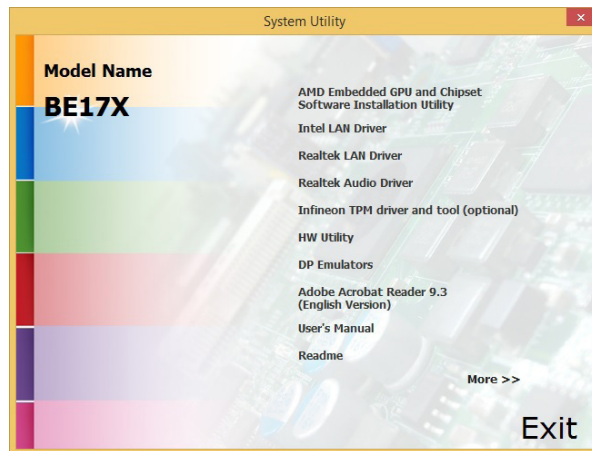
For Windows 7
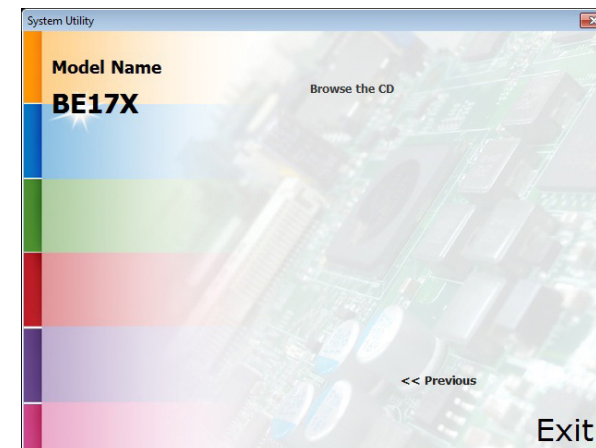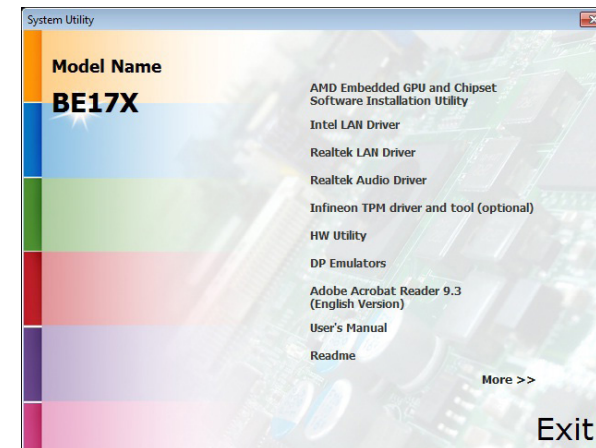
AMD Embedded GPU and Chipset Software Installation Utility

To install the driver, click "AMD Embedded GPU and Chipset Software Installation Utility" on the main menu.

1. Select the language you would like the installation to display and then click Next.

2. Click Express and then click Next.

3. After completing installation, click Finish.

Intel LAN Driver

To install the driver, click "Intel LAN Driver" on the main menu.

1. Setup is now ready to install the LAN driver. Click Next.
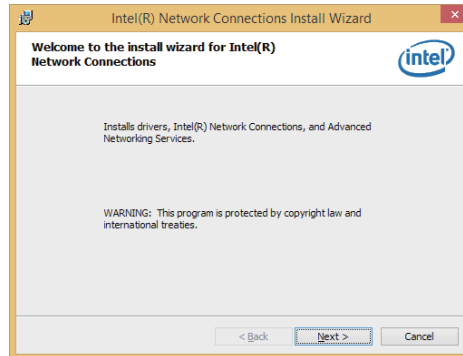
2. Click "I accept the terms in the license agreement" then click Next.
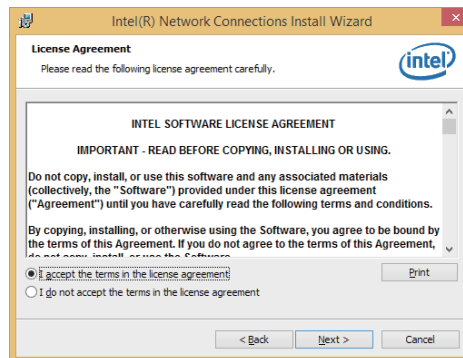
4. Click Install to begin the installation.
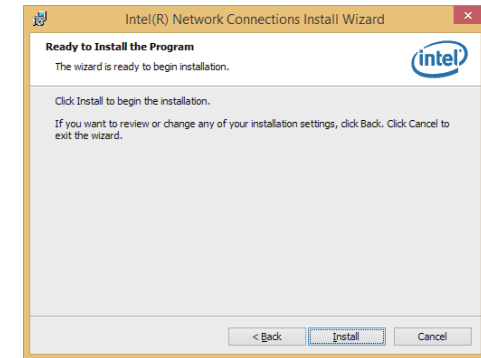
5. After completing installation, click Finish.
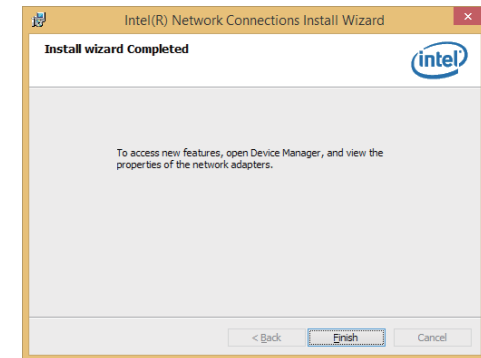
Realtek LAN Drivers

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

1. Setup is ready to install the driver. Click Next.
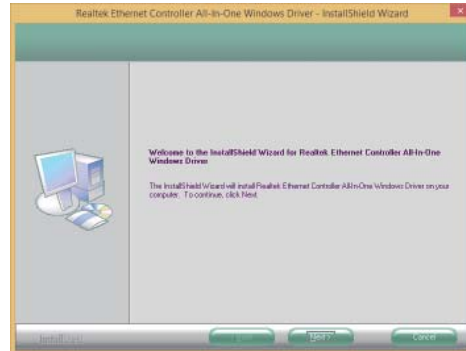
3. Select the program features you want to install then click Next.
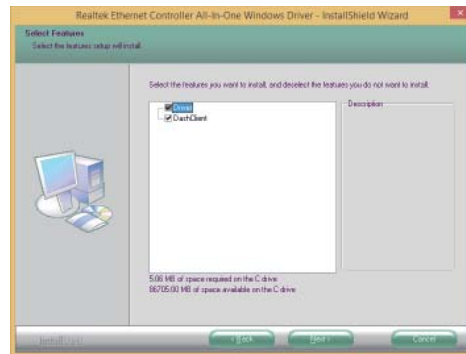
3. Click Install to begin the installation.
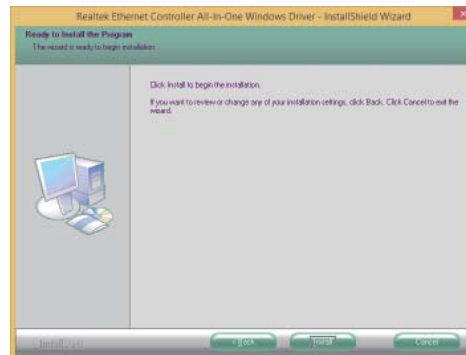
4. After completing installation, click Finish.

57

Realtek Audio Driver

To install the driver, click "Realtek Audio Driver" 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.

TPM Driver and Tool (optional)

To install the driver, click "Infineon TPM driver and tool (optional)" on the main menu.

1. Read the message and click Yes.
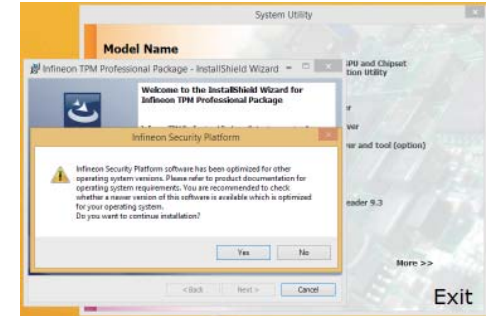
2. The setup program is preparing to install the driver.
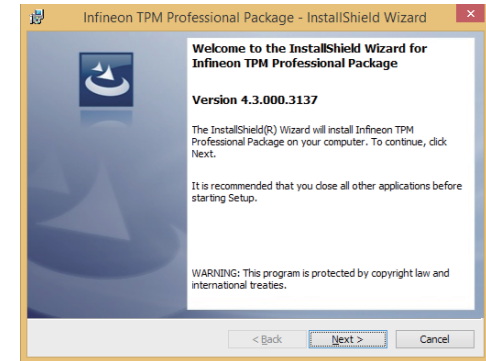
3. Click "I accept the terms in the license agreement" and then click "Next".
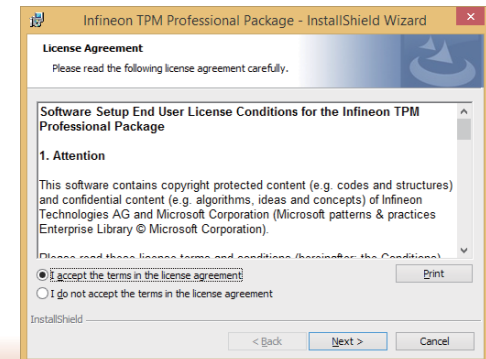
4. Enter the necessary information and then click Next.

5. Select a setup type and then click Next.

6. Click Install to begin the installation.

8. The installation is completed and click Finish.

59
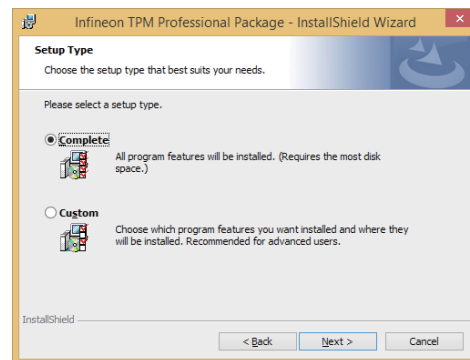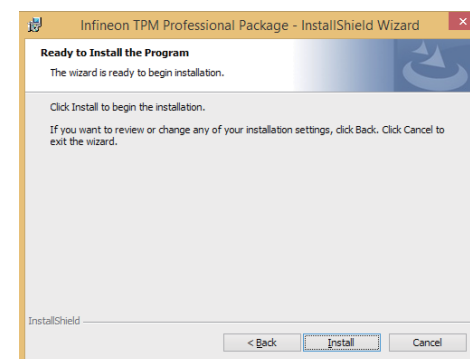
HW Utility

HW Utility provides information about the board, HW Health, Watchdog, and DIO. To access the utility, click "HW Utility" on the main menu.

> **Note:**
> If you are using Windows 7, you need to access the operating system as an administrator to be able to install the utility.

1. Setup is ready to install the HW Utility drifer. Click Next.

2. Click "I accept the terms in the license agreement" and then click Next.
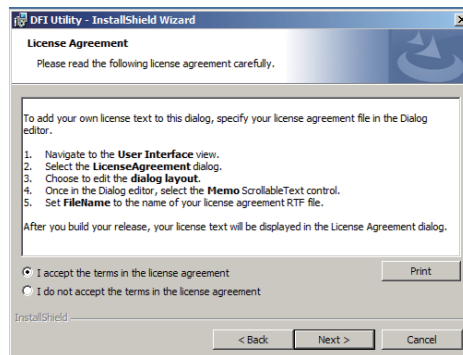
3. Enter "User Name" and "Organization" information and then click Next.
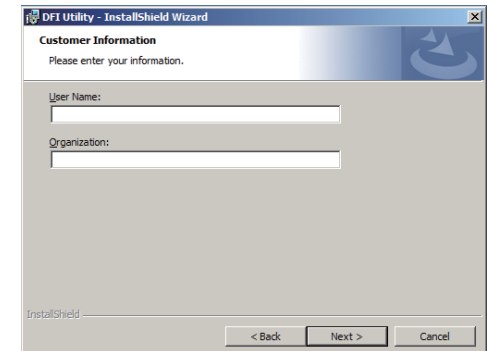
4. Click Install to begin the installation.
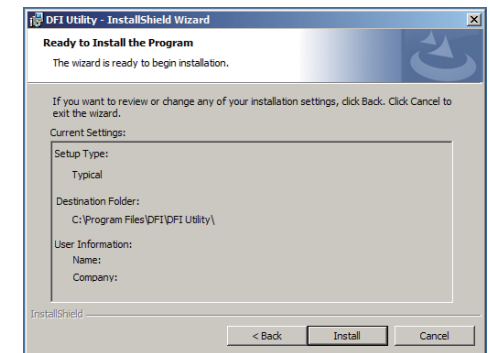
5. After completing installation, click Finish.
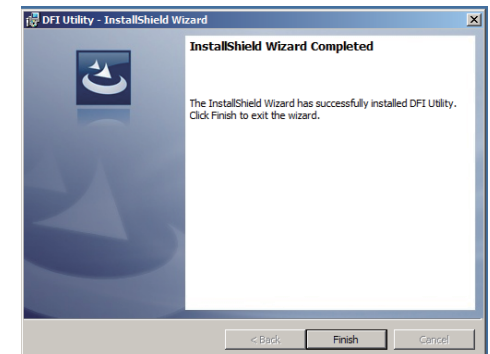
The DFI Utility icon will appear on the desktop. Double-click the icon to open the utility.

Information

HW Health Set

HW Health

WatchDog

DIO

DP Emulators

1. Introduction
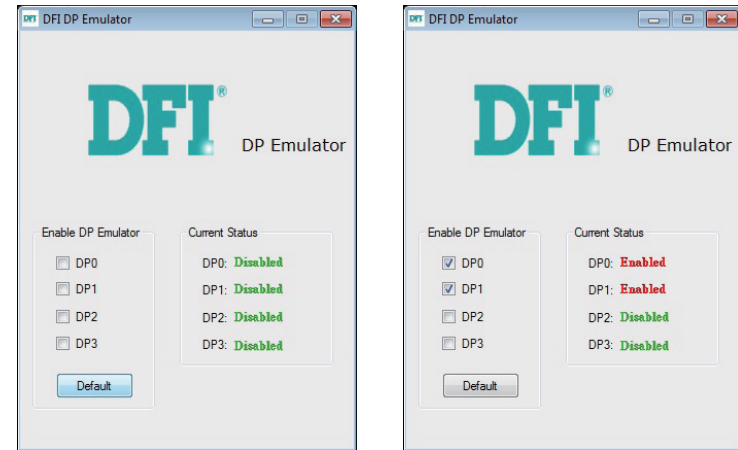
DP Emulator carries out the simulation on four DP ports of BE170/BE171/BE173 respectively. Current Status indicates that the simulation on all DP ports is enabled or disabled.

Disable: means the simulation does not work. All DP ports will not be simulated and stay on the usual status.
Enable: means the simulation works. The signal of the specific DP port will be simulated.

I. When the simulation works on the specific DP port, the signal will be simulated. Even though the DP port is disconnected to the screen, the system still detects the connection between them.

II. If you use more than one DP port and enable the DP Emulator on the specific DP port, even though the cable connected the DP port to the screen is removed, the system still detects the connection between the DP port and the screen and will not rearrange the order of all DP ports.

III. Customers' settings will be memorized when the DP Emulator is disabled. While restarting the system or shutting down and restarting the system, this tool will automatically carry out the memorized settings.

2. Status
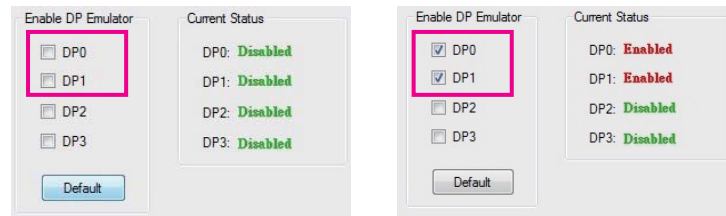
I. The block of Enable DP Emulator is used to set the present status of the specific DP port. Checked means the simulation on the DP port is enabled; unchecked means disabled.
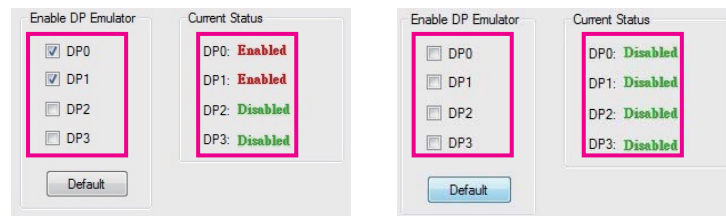
II. When you click the "Default" button, all DP ports will be set to **Disabled**.

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.
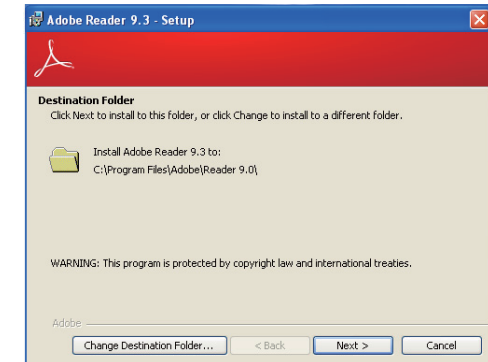
2. Click Install to begin installation.
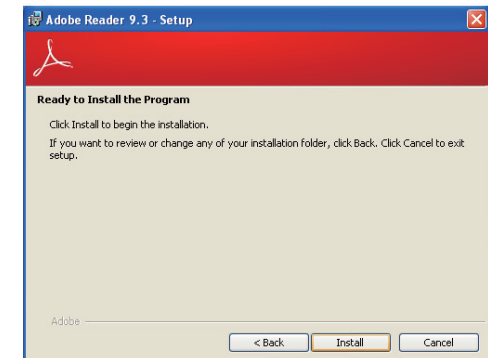
3. Click Finish to exit installation.

63
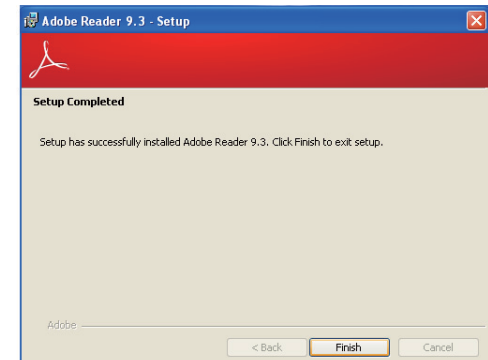
Chapter 9 - Digital I/O Programming Guide

Register Description

The Input Port Register (register 0) reflects the incoming logic levels of the pins, regardless of whether the pin if defined as an input or output by the Configuration Register. They act only on the red operation. Writes to this register have no effect. The default value (X) is determined by the externally applied logic level. Before a red operation, a write transmission is sent with the command byte to indicate to the I²C device that the Input Port Regiser will be accessed next.

Register 0 (Input Port Register)

BIT	I-7	I-6	I-5	I-4	I-3	I-2	I-1	I-0
DEFAULT	X	X	X	X	X	X	X	X

The Onput Port Register (register 1) shows the outgoing logic levels of the pins defined as outputs by the Configuration Register. Bit values in this register have no effect on pins defined as inputs. In turns, reads from this register reflect the value that is in the flip-flop contolling the output selection, not the actual pin value.

Register 1 (Onput Port Register)

BIT	O-7	O-6	O-5	O-4	O-3	O-2	O-1	O-0
DEFAULT	1	1	1	1	1	1	1	1

The Polarity Inversion Register (register 2) allows polarity inversion of the pins defined as inputs by the Configuration Register. If a bit in this register is set (written with 1), the corresponding port pin's polarity is inverted. If a bit in this register is clear (written with a 0), the corresponding port pin's original polarity is retained.

Register 2 (Polarity Inversion Register)

BIT	N-7	N-6	N-5	N-4	N-3	N-2	N-1	N-0
DEFAULT	0	0	0	0	0	0	0	0

The Configuration Register (register 3) configures the direction of the I/O pins. If a bit in this register is set to 1, the corresponding port pin is enabled as an input with a high-impedence output driver. If a bit in this register is cleared to 0, the corresponding port is enabled as an input.

Register 3 (Configuration Register)

BIT	C-7	C-6	C-5	C-4	C-3	C-2	C-1	C-0
DEFAULT	1	1	1	1	1	1	1	1

Function Description

I2CWriteByte(SlaveAddr, SubAddr, Data):
Write a Byte data to a specified I2C Device.

I2CReadByte(SlaveAddr, SubAddr, *Data):
Read a Byte data from a specified I2C Device.

SetBit(*Data, Bit) :
Set Data bit n as "1".

ClrBit(*Data, Bit) :
Set Data bit n as "0".

GetBit(Data, Bit) :
Return the value of data bit n.

Sample Code

GPIO Configuration

```
#define SLAVE_ADDR              0x42
#define INPUT_PORT              0x00
#define OUTPUT_PORT             0x01
#define INVERSION_PORT          0x02
#define COMFIG_PORT             0x03

GpioConfig(int PinNum, int Mode)
{
    BYTE Data;
    BYTE TempPinNum = PinNum%8;

    //Pin0-7 Input/Output Configuration
    I2C_ReadByte(SLAVE_ADDR, CONFIG_PORT, &Data);
    if(Mode == 1){SetBit(&Data, TempPinNum);} //Input
    else            {ClrBit(&Data, TempPinNum);} //Output
    I2C_WriteByte(SLAVE_ADDR, CONFIG_PORT, Data);

    return 1;
}
```

GPIO Output Process

```
#define SLAVE_ADDR              0x42
#define INPUT_PORT              0x00
#define OUTPUT_PORT             0x01
#define INVERSION_PORT          0x02
#define COMFIG_PORT             0x03

GpioOut(int PinNum, int Level)
{
    BYTE Data;
    BYTE TempPinNum = PinNum%8;

    //Pin0-7
    I2C_ReadByte(SLAVE_ADDR, OUTPUT_PORT, &Data);
    if(Level == 0){ClrBit(&Data, TempPinNum);}
    else            {SetBit(&Data, TempPinNum);}
    I2C_WriteByte(SLAVE_ADDR, OUTPUT_PORT, Data);

    return 1;
}
```

GPIO Iutput Process

```
#define SLAVE_ADDR              0x42
#define INPUT_PORT              0x00
#define OUTPUT_PORT             0x01
#define INVERSION_PORT          0x02
#define COMFIG_PORT             0x03

GpioIn(int PinNum, int *Status)
{
    BYTE Data;
    BYTE Group = PinNum/8;
    BYTE TempPinNum = PinNum%8;

    //Pin0-7
    I2C_ReadByte(SLAVE_ADDR, INPUT_PORT, &Data);
    *Status = GetBit(Data, TempPinNum);

    return 1;
}
```

Appendix A - Watchdog Sample Code

;Software programming example:

```
;-------------------------------------------
;(1) Enter Super IO Configuration mode
;-------------------------------------------
MOV        DX,4EH
MOV        AL,87H
OUT        DX,AL
OUT        DX,AL


;--------------------------------------------------------------------------------------
;(2) Configuration Logical Device 8, register CRF0/CRF1 (WDT Control/WDT
timer)
;--------------------------------------------------------------------------------------
MOV        DX,4EH
MOV        AL,07H             ;Ready to Program Logical Device
OUT        DX,AL

MOV        DX,4FH
MOV        AL,08H             ;Select Logical Device 8
OUT        DX,AL

MOV        DX,4EH
MOV        AL, F1H            ;Select watchdog timer register
OUT        DX,AL

MOV        DX,4FH
MOV        AL,10H             ;Set watchdog timer value
OUT        DX,AL

MOV        DX,4EH
MOV        AL, F0H            ;Select watchdog Control Register
OUT        DX,AL

MOV        DX,4FH
MOV        AL,02H             ;Set Watchdog Control Value
OUT        DX,AL

;-------------------------------------------------------------
;(1) Exit extended function mode
;-------------------------------------------------------------
MOV        DX,4EH
MOV        AL,AAH
OUT        DX,AL
```

Appendix B - System Error Message

When the BIOS encounters an error that requires the user to correct something, either a beep code will sound or a message will be displayed in a box in the middle of the screen and the message, PRESS F1 TO CONTINUE, CTRL-ALT-ESC or DEL TO ENTER SETUP, will be shown in the information box at the bottom. Enter Setup to correct the error.

Error Messages

One or more of the following messages may be displayed if the BIOS detects an error during the POST. This list indicates the error messages for all Awards BIOSes:

CMOS BATTERY HAS FAILED

The CMOS battery is no longer functional. It should be replaced.

> **Important**
> 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 the battery manufacturer's instructions.

CMOS CHECKSUM ERROR

Checksum of CMOS is incorrect. This can indicate that CMOS has become corrupt. This error may have been caused by a weak battery. Check the battery and replace if necessary.

DISPLAY SWITCH IS SET INCORRECTLY

The display switch on the motherboard can be set to either monochrome or color. This indicates the switch is set to a different setting than indicated in Setup. Determine which setting is correct, either turn off the system and change the jumper or enter Setup and change the VIDEO selection.

FLOPPY DISK(S) fail (80)

Unable to reset floppy subsystem.

FLOPPY DISK(S) fail (40)

Floppy type mismatch.

Hard Disk(s) fail (80)

HDD reset failed.

Hard Disk(s) fail (40)

HDD controller diagnostics failed.

Hard Disk(s) fail (20)

HDD initialization error.

Hard Disk(s) fail (10)

Unable to recalibrate fixed disk.

Hard Disk(s) fail (08)

Sector Verify failed.

Keyboard is locked out - Unlock the key

The BIOS detects that the keyboard is locked. Keyboard controller is pulled low.

Keyboard error or no keyboard present

Cannot initialize the keyboard. Make sure the keyboard is attached   correctly and no keys are being pressed during the boot.

Manufacturing POST loop

System will repeat POST procedure infinitely while the keyboard controller is pull low. This is also used for the M/B burn in test at the factory.

BIOS ROM checksum error - System halted

The checksum of ROM address F0000H-FFFFFH is bad.

Memory test fail

The BIOS reports memory test fail if the memory has error(s).

Appendix C - Troubleshooting Checklist

Troubleshooting Checklist

This chapter of the manual is designed to help you with problems that you may encounter with your personal computer. To efficiently troubleshoot your system, treat each problem individually. This is to ensure an accurate diagnosis of the problem in case a problem has multiple causes.

Some of the most common things to check when you encounter problems while using your system are listed below.

1. The power switch of each peripheral device is turned on.

2. All cables and power cords are tightly connected.

3. The electrical outlet to which your peripheral devices are connected is working. Test the outlet by plugging in a lamp or other electrical device.

4. The monitor is turned on.

5. The display's brightness and contrast controls are adjusted properly.

6. All add-in boards in the expansion slots are seated securely.

7. Any add-in board you have installed is designed for your system and is set up correctly.

Monitor/Display

If the display screen remains dark after the system is turned on:

1. Make sure that the monitor's power switch is on.

2. Check that one end of the monitor's power cord is properly attached to the monitor and the other end is plugged into a working AC outlet. If necessary, try another outlet.

3. Check that the video input cable is properly attached to the monitor and the system's display adapter.

4. Adjust the brightness of the display by turning the monitor's brightness control knob.

The picture seems to be constantly moving.

1. The monitor has lost its vertical sync. Adjust the monitor's vertical sync.

2. Move away any objects, such as another monitor or fan, that may be creating a magnetic field around the display.

3. Make sure your video card's output frequencies are supported by this monitor.

The screen seems to be constantly wavering.

1. If the monitor is close to another monitor, the adjacent monitor may need to be turned off. Fluorescent lights adjacent to the monitor may also cause screen wavering.

Power Supply

When the computer is turned on, nothing happens.

1. Check that one end of the AC power cord is plugged into a live outlet and the other end properly plugged into the back of the system.

2. Make sure that the voltage selection switch on the back panel is set for the correct type of voltage you are using.

3. The power cord may have a "short" or "open". Inspect the cord and install a new one if necessary.

Floppy Drive

The computer cannot access the floppy drive.

1. The floppy diskette may not be formatted. Format the diskette and try again.

2. The diskette may be write-protected. Use a diskette that is not write-protected.

3. You may be writing to the wrong drive. Check the path statement to make sure you are writing to the targeted drive.

4. There is not enough space left on the diskette. Use another diskette with adequate storage space.

Hard Drive

Hard disk failure.

1. Make sure the correct drive type for the hard disk drive has been entered in the BIOS.

2. If the system is configured with two hard drives, make sure the bootable (first) hard drive is configured as Master and the second hard drive is configured as Slave. The master hard drive must have an active/bootable partition.

Excessively long formatting period.

If your hard drive takes an excessively long period of time to format, it is likely a cable connection problem. However, if your hard drive has a large capacity, it will take a longer time to format.

Serial Port

The serial device (modem, printer) doesn't output anything or is outputting garbled characters.

1. Make sure that the serial device's power is turned on and that the device is on-line.

2. Verify that the device is plugged into the correct serial port on the rear of the computer.

3. Verify that the attached serial device works by attaching it to a serial port that is working and configured correctly. If the serial device does not work, either the cable or the serial device has a problem. If the serial device works, the problem may be due to the onboard I/O or the address setting.

4. Make sure the COM settings and I/O address are configured correctly.

Keyboard

Nothing happens when a key on the keyboard was pressed.

1. Make sure the keyboard is properly connected.

2. Make sure there are no objects resting on the keyboard and that no keys are pressed during the booting process.

System Board

1. Make sure the add-in card is seated securely in the expansion slot. If the add-in card is loose, power off the system, re-install the card and power up the system.

2. Check the jumper settings to ensure that the jumpers are properly set.

3. Verify that all memory modules are seated securely into the memory sockets.

4. Make sure the memory modules are in the correct locations.

5. If the board fails to function, place the board on a flat surface and seat all socketed components. Gently press each component into the socket.

6. If you made changes to the BIOS settings, re-enter setup and load the BIOS defaults.