AXIOMTEK

eBOX623-831-FL Series

Embedded System

User's Manual

Disclaimers

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Safety Precautions

Before getting started, please read the following important safety precautions.

1. The eBOX623-831-FL does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the eBOX623-831-FL before making any installation. Be sure both the system and the external devices are turned OFF. Sudden surge of power could ruin sensitive components. Make sure the eBOX623-831-FL is properly grounded.
4. Make sure the voltage of the power source is correct before connecting the equipment to the power outlet.
5. Turn OFF the system power before cleaning. Clean the system using a cloth only. Do not spray any liquid cleaner directly onto the screen.
6. Do not leave this equipment in an uncontrolled environment where the storage temperature is below -20℃ or above 80℃. It may damage the equipment.
7. Do not open the system's back cover. If opening the cover for maintenance is a must, only a trained technician is allowed to do so. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
   - Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.
   - When handling boards and components, wear a wrist-grounding strap, available from most electronic component stores.

Classification

1. Degree of production against electric shock : not classified
2. Degree of protection against the ingress of water : IP40
3. Equipment not suitable for use in the presence of a flammable anesthetic mixture with air or with oxygen or nitrous oxide.
4. Mode of operation : Continuous

General Cleaning Tips

You may need the following precautions before you begin to clean the computer. When you clean any single part or component for the computer, please read and understand the details below fully.

When you need to clean the device, please rub it with a piece of dry cloth.

1. Be cautious of the tiny removable components when you use a vacuum cleaner to absorb the dirt on the floor.
2. Turn the system off before you start to clean up the component or computer.
3. Never drop the components inside the computer or get circuit board damp or wet.
4. Be cautious of all kinds of cleaning solvents or chemicals when you use it for the sake of cleaning. Some individuals may be allergic to the ingredients.
5. Try not to put any food, drink or cigarette around the computer.

Cleaning Tools:

Although many companies have created products to help improve the process of cleaning your computer and peripherals users can also use household items to clean their computers and peripherals. Below is a listing of items you may need or want to use while cleaning your computer or computer peripherals.

Keep in mind that some components in your computer may only be able to be cleaned using a product designed for cleaning that component, if this is the case it will be mentioned in the cleaning.

- Cloth: A piece of cloth is the best tool to use when rubbing up a component. Although paper towels or tissues can be used on most hardware as well, we still recommend you to rub it with a piece of cloth.
- Water or rubbing alcohol: You may moisten a piece of cloth a bit with some water or rubbing alcohol and rub it on the computer. Unknown solvents may be harmful to the plastics parts.
- Vacuum cleaner: Absorb the dust, dirt, hair, cigarette particles, and other particles out of a computer can be one of the best methods of cleaning a computer. Over time these items can restrict the airflow in a computer and cause circuitry to corrode.
- Cotton swabs: Cotton swaps moistened with rubbing alcohol or water are excellent tools for wiping hard to reach areas in your keyboard, mouse, and other locations.
- Foam swabs: Whenever possible it is better to use lint free swabs such as foam swabs.

NOTE: ***We strongly recommended that you should shut down the system before you start to clean any single components.***

Please follow the steps below:

1. Close all application programs
2. Close operating software
3. Turn off power switch
4. Remove all device
5. Pull out power cable

Scrap Computer Recycling

If the computer equipment's need the maintenance or are beyond repair, we strongly recommended that you should inform your Axiomtek distributor as soon as possible for the suitable solution. For the computers that are no longer useful or no longer working well, please contact your Axiomtek distributor for recycling and we will make the proper arrangement.

Trademarks Acknowledgments

Table of Contents

CHAPTER 1
INTRODUCTION

This chapter contains general information and detailed specifications of the eBOX623-831-FL. The Chapter 1 includes the following sections:

- General Description
- System Specification
- Dimensions
- I/O Outlets
- Packing List

1.1 General Description

The eBOX623-831-FL is an embedded system that supports onboard dual core Intel® Atom™ processor D2550 (1.86 GHz) or N2600 (1.6GHz) processor to provide Windows 7, Windows 7 Embedded or Linux, suitable for the most endurable operation. It features fan less design with full feature I/O, one 204-pin unbuffered SODIMM socket for singe channel DDR3-800/1066 MHz memory, and enhanced system dependability by built-in Watchdog Timer.

- Features
  1. Intel® NM10 chipset
  2. Support Intel® Atom™ Processor D2550 (1.86 GHz) or N2600 (1.6GHz)
  3. Maximum to 4GB DDR3 800/1066 MHz memory for D2550; 2GB DDR3 800MHz memory for N2600.
  4. Ultra slim and compact design
  5. Supports 6 USB 2.0 ports
  6. Supports 2 RS-232/422/485 and 2 RS-232
  7. Supports dual 10/100/1000Mbps Ethernet port
  8. One 2.5" SATA HDD drive bay
  9. One front access CFast
  10. Watchdog timer
  11. 60W AC-DC Adapter
  12. Din-rail mount (optional)
  13. Wall mount (optional)
  14. VESA mount (optional)
  15. Express Mini Card Module (optional)
  16. Antenna (optional)

- Reliable and Stable Design
  The eBOX623-831-FL adopts the advanced cooling system and supporting the CFast™, which makes it especially suitable for vibration environments, best for industrial automation, digital signage and gaming application.

- Embedded O.S. Supported
  The eBOX623-831-FL not only supports Windows 7, Windows Vista, Windows XP, but also supports embedded OS, such as Windows 7 Embedded, Windows XP Embedded, WinCE and Linux .

- Various Storage devices supported
  For storage device, the eBOX623-831-FL supports one 2.5" SATA storage drive bay, and one CFast™ slot.

1.2 System Specifications

1.2.1 CPU

- **CPU**
  - Intel® Atom™ dual core D2550 1.86 GHz.
  - Intel® Atom™ dual core N2600 1.6 GHz

- **Chipset**
  - Intel® NM10 chipset

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

- **System Memory**
  - One 204-pin unbuffered DDR3 SO-DIMM socket.
  - Maximum to 4GB DDR3 1066MHz memory for D2550/N2800.
  - Maximum to 2GB DDR3 800MHz memory for N2600.

1.2.2 I/O System

- Four 9-pin D-Sub male connectors, COM1~COM2 for RS-232/422/485, COM3~COM4 for RS-232
- One 15-pin D-Sub female connector for VGA
- One DisplayPort
- Two Audio connector (Mic-IN, Line-OUT)
- Two RJ-45 connector for 10/100/1000Base-T Ethernet
- Six USB 2.0 connectors
- One 12V DC Jack for power input connector
- Two Indicators (System Power, HDD Active)

1.2.3 System Specification

- **Watchdog Timer**
  - 1~255 seconds or minutes; up to 255 levels.
- **Power Supply**
  - External 12V@5A, 60W AC/DC power adapter
- **Operation Temperature**
  - -10℃ ~ 60℃ (14 ºF ~ 140ºF), D2550 with W.T. SSD
- **Storage Temperature**
  - -20℃ ~ 80℃ (-4 ºF ~ 176ºF)
- **Humidity**
  - 10% ~ 90% (non-condensation)
- **Vibration Endurance**
  - 3Grm w/ CFast (5-500Hz, X, Y, Z directions)

- **Weight**
  - 1.98 kg (4.36 lb) without package
  - 2.6 kg (17.64 lb) with package
- **Dimensions**
  - 200mm(7.87") (W) x 120mm(4.72") (D) x 55.8mm(2.2") (H)

1.2.4 Driver CD Content

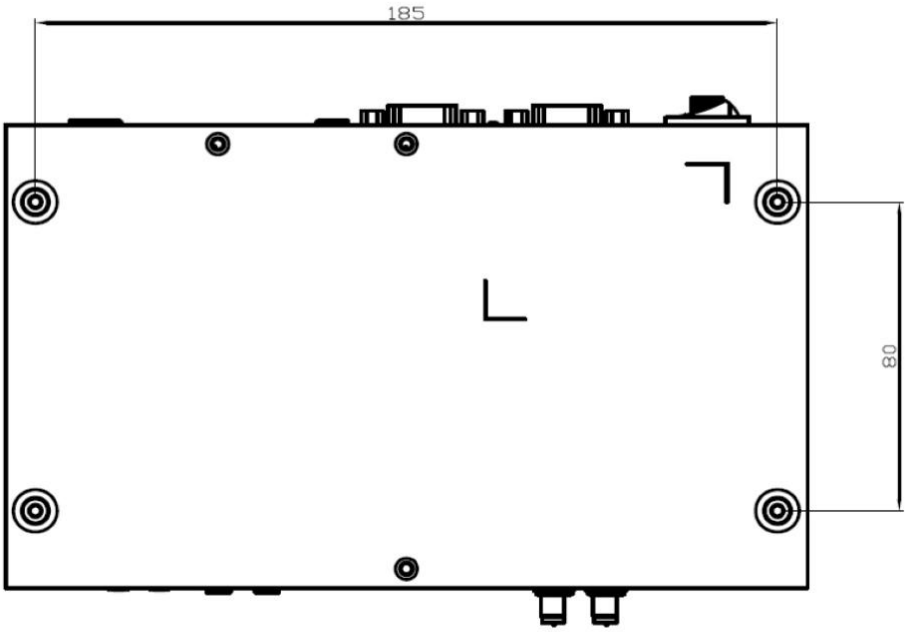
- **Driver**
  - Audio
  - Chipset
  - Ethernet
  - Graphic
  - TPM
  - uAPI
- **Manual**
  - User Manual
  - Quick Manual

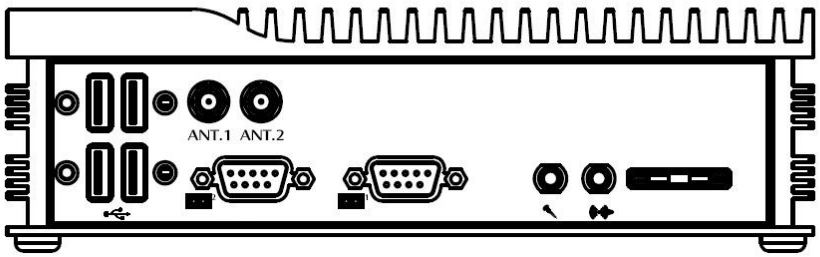
NOTE: All specifications and images are subject to change without notice.

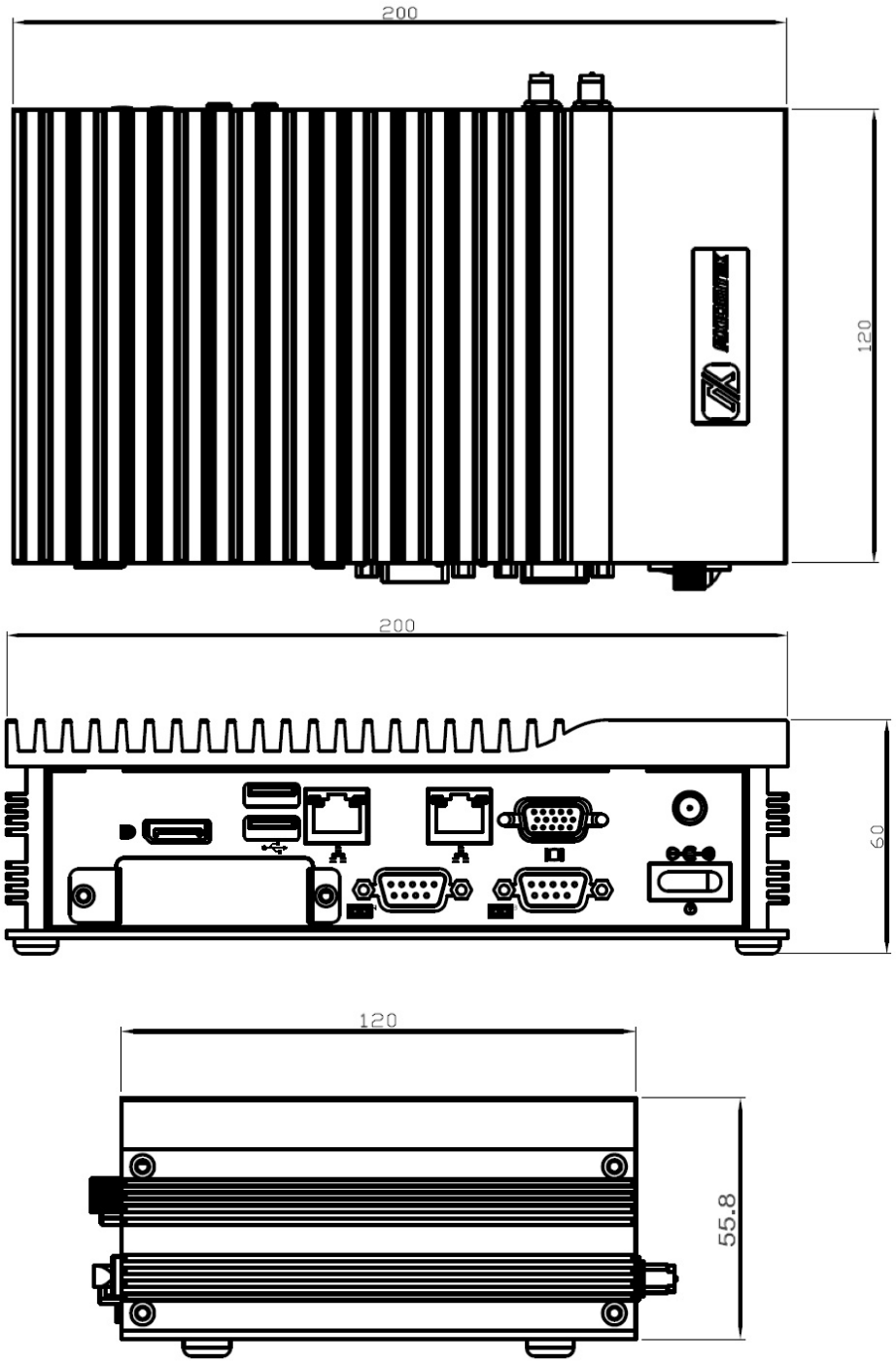
1.3 Dimensions

The following diagrams show you dimensions and outlines of the eBOX623-831-FL.

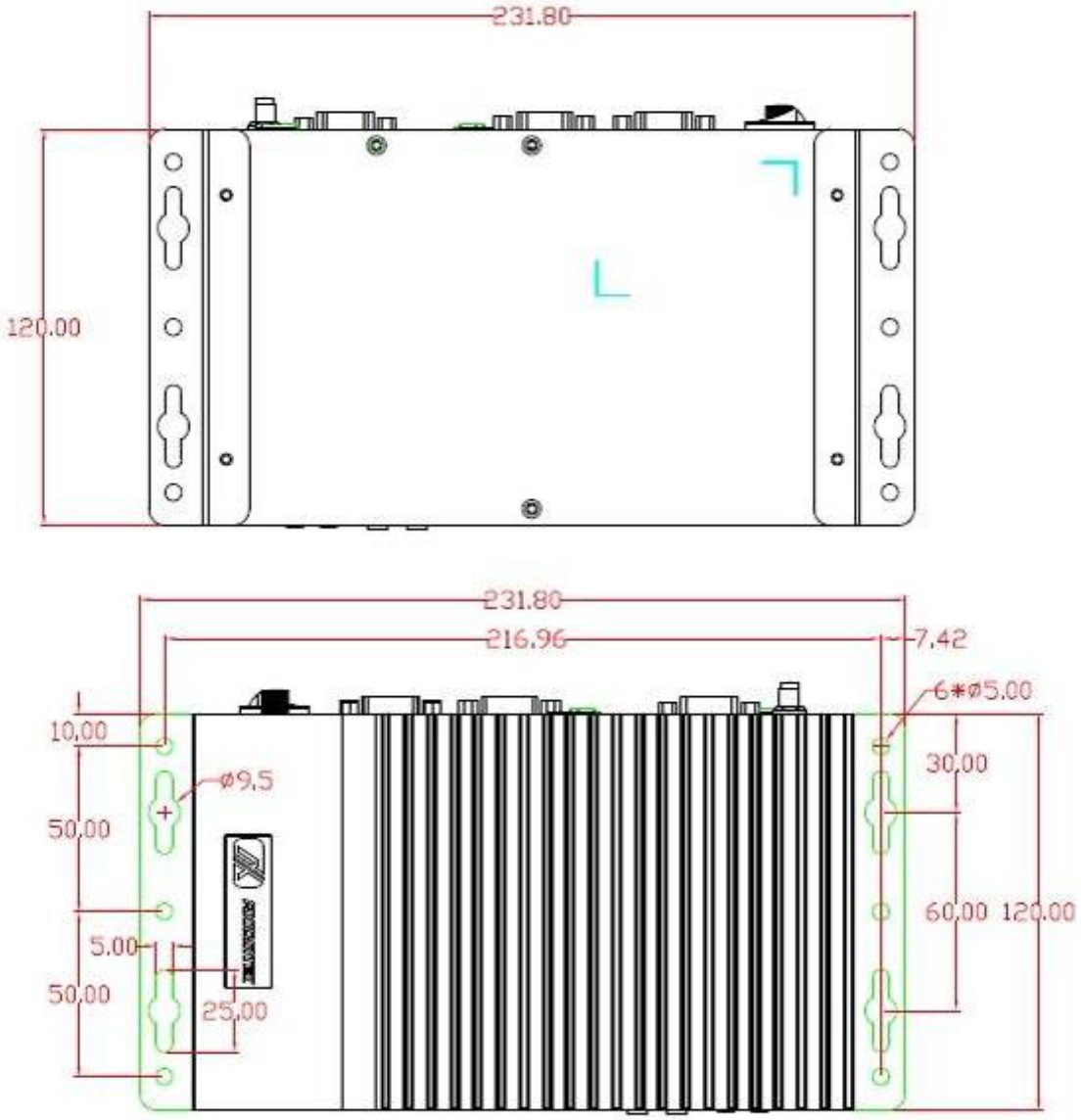
1.3.1 System Dimension



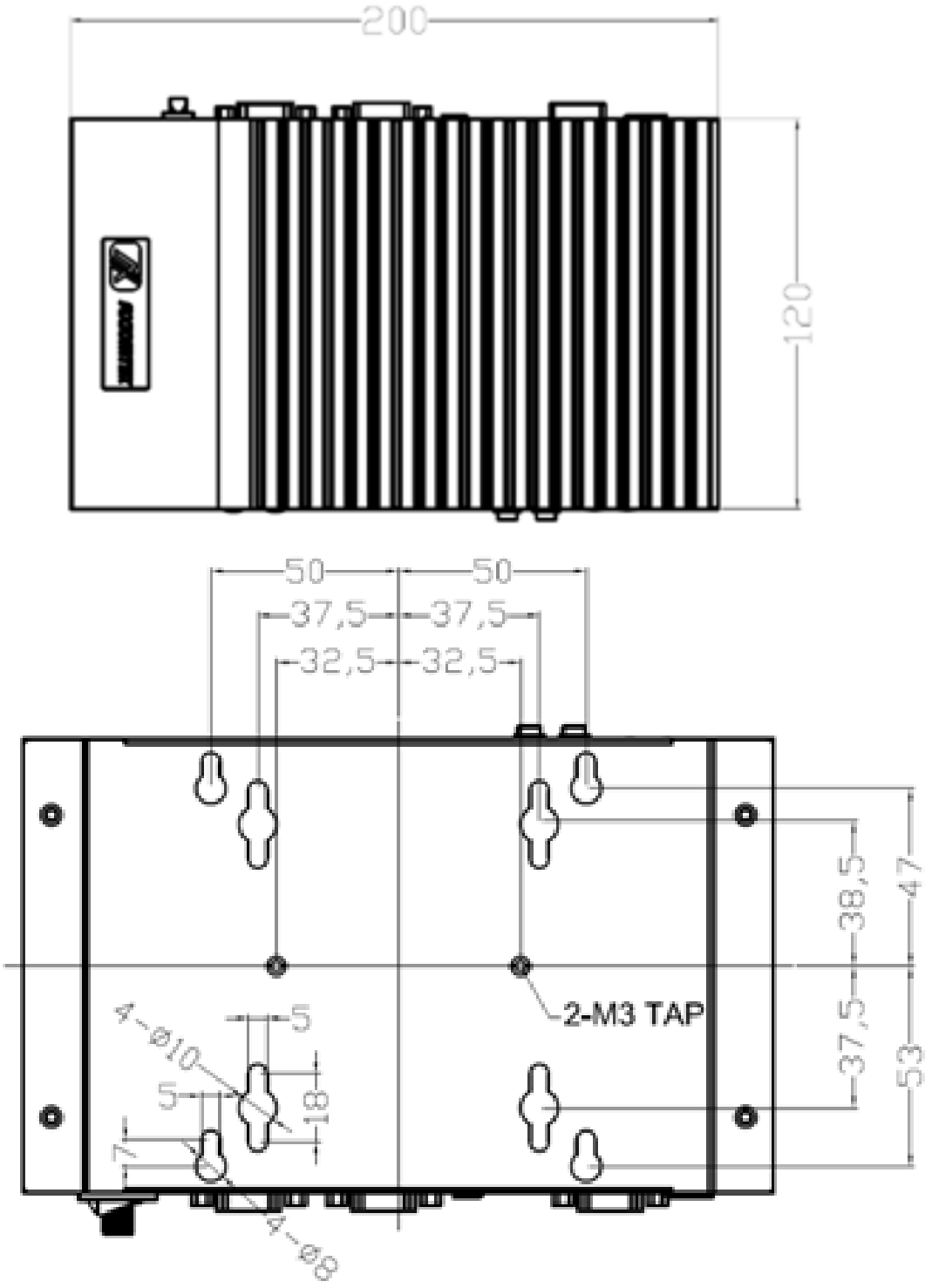



200
120
200
60
120
55.8

1.3.2 Wall mount Bracket Dimension



1.3.3 VESA Mount Bracket Dimension

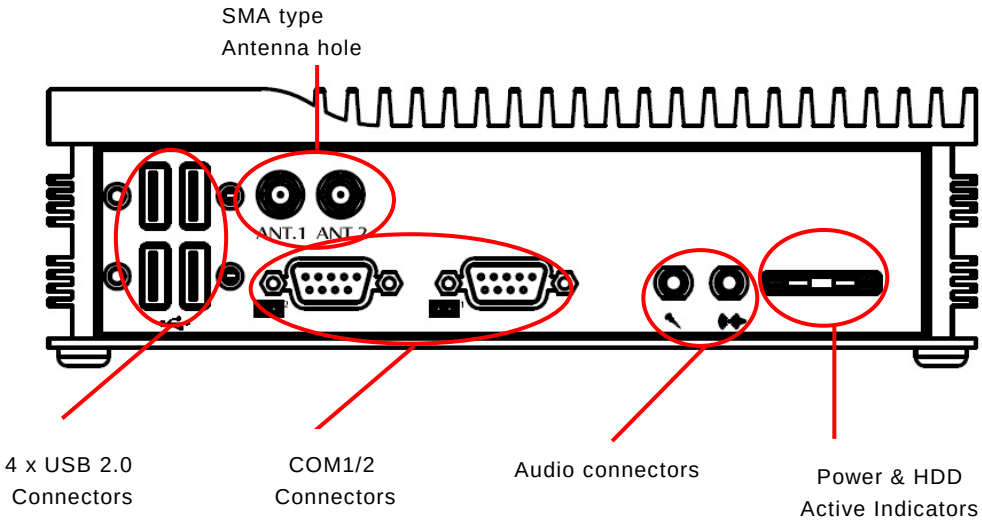


1.4 I/O Outlets

The following figures show you I/O outlets on front view of the eBOX623-831-FL.

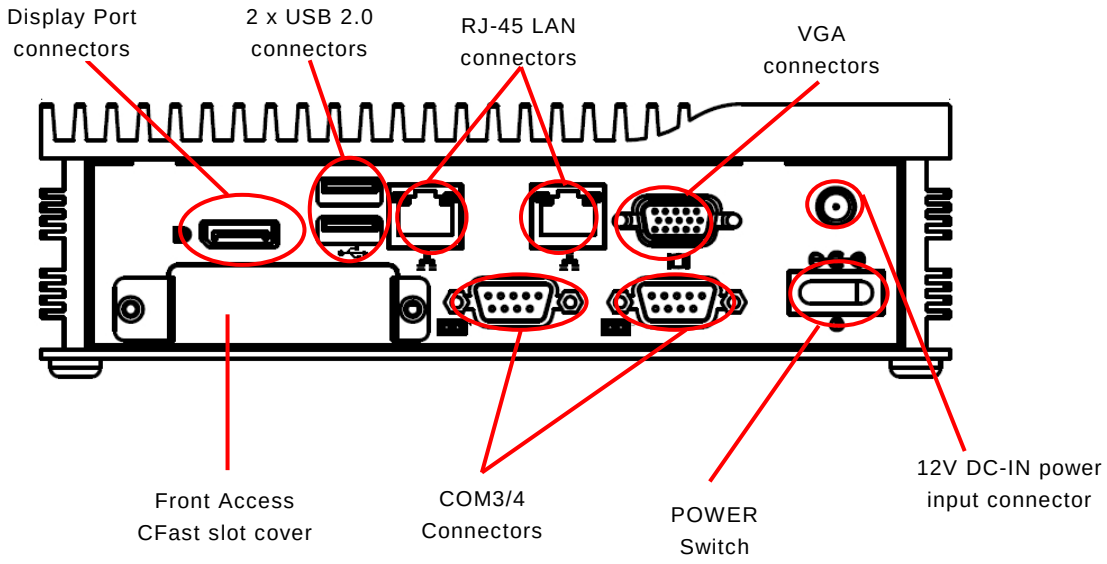
- **Front View**

- **Front View drawing**



- **Rear View**

- **Rear View drawing**



1.5 Packing List

The package bundled with your eBOX623-831-FL should contain the following items:

- **eBOX623-831-FL System Unit x 1**
- **eBOX623-831-FL Quick Manual x 1**
- **CD x 1 (For Driver and User's Manual)**
- **Screws pack x1**
- **Foot pad x4**
- **Thermal Grease x1**
- **CFast™ card Handhold Mylar x1**
- **DRAM Thermal pad x2**
- **60W AC-DC Adapter**
- **Wall-mount Brackets (optional)**
- **VESA-mount Bracket (optional)**
- **Din-rail Bracket (optional)**
- **2.5" SATA Storage (optional)**
- **CFast™ card (optional)**
- **DDR3 SODIMM (optional)**

1.6 Model List

eBOX623-831-FL-D2550-1.86G-US	Fanless embedded system with Intel® ATOM® D2550 1.86GHz dual core processor, US power cord
eBOX623-831-FL-D2550-1.86G-EU	Fanless embedded system with Intel® ATOM® D2550 1.86GHz dual core processor, EU power cord
eBOX623-831-FL-N2600-1.6G-US	Fanless embedded system with Intel® ATOM® N2600 1.6GHz dual core processor, US power cord
eBOX623-831-FL-N2600-1.6G-EU	Fanless embedded system with Intel® ATOM® N2600 1.6GHz dual core processor, EU power cord

If you cannot find this package or any items are missing, please contact Axiomtek distributors immediately.

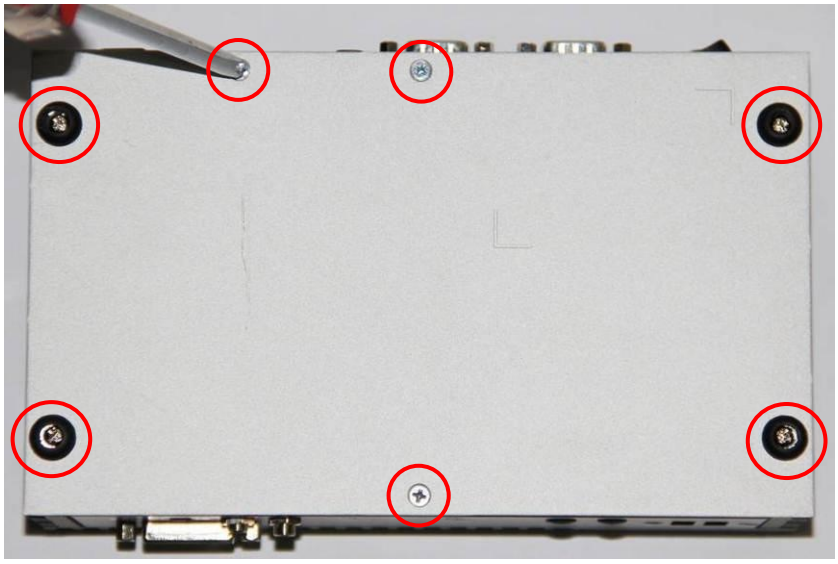
CHAPTER 2
HARDWARE INSTALLATION

The eBOX623-831-FL is convenient for your various hardware configurations, such as Memory Module, HDD (Hard Disk Drive), SSD (Solid State Drive) and CFast™ card. The chapter 2 will show you how to install the hardware.

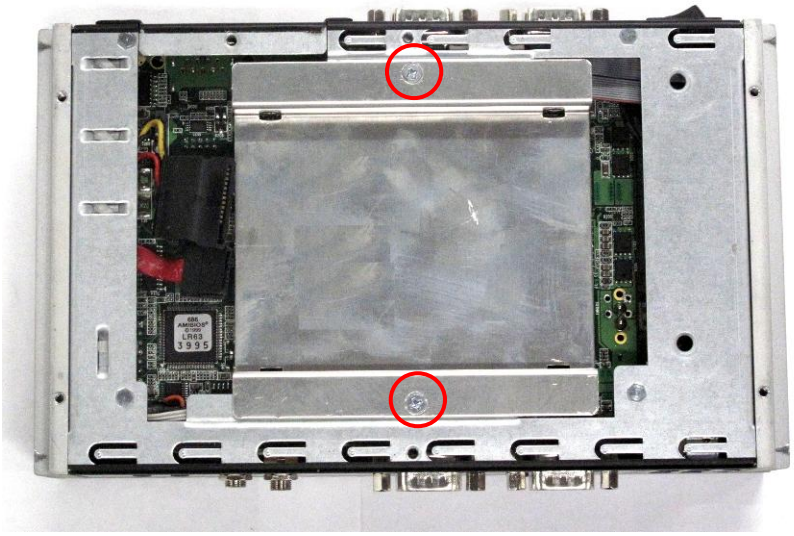
2.1 Installing the Memory Module

Step 1 Turn off the system, and unplug the power cord.

Step 2 Turn the system upside down to locate screws at the bottom, loosen screws.

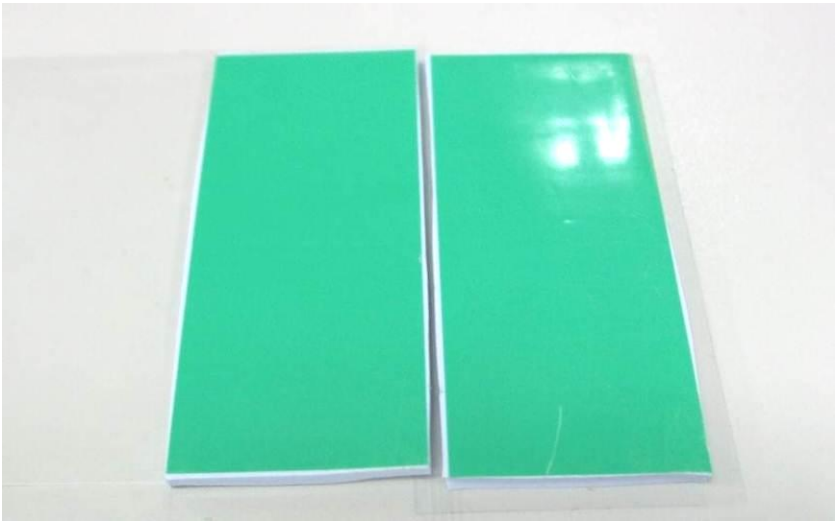


Step 3 Remove the bottom cover and Loosen screws of HDD bracket



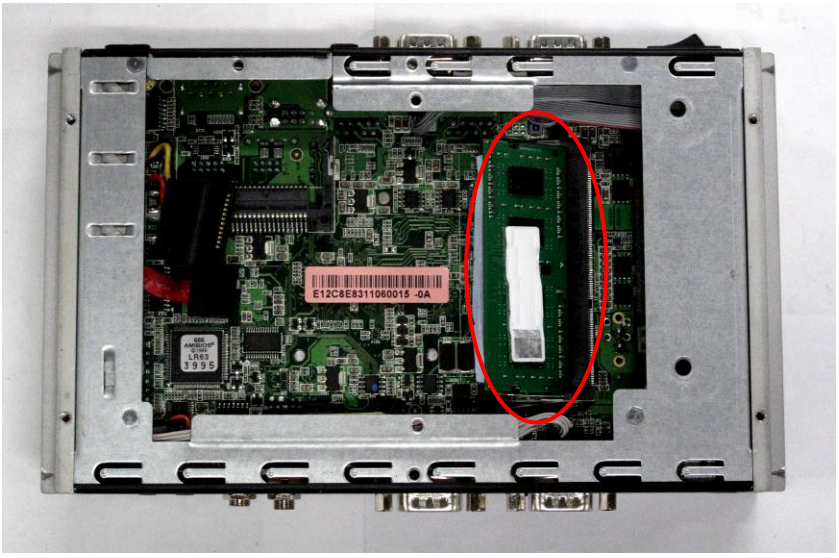
Step 4 Remove the HDD bracket

Step 5 Take out the thermal pad from accessory kit

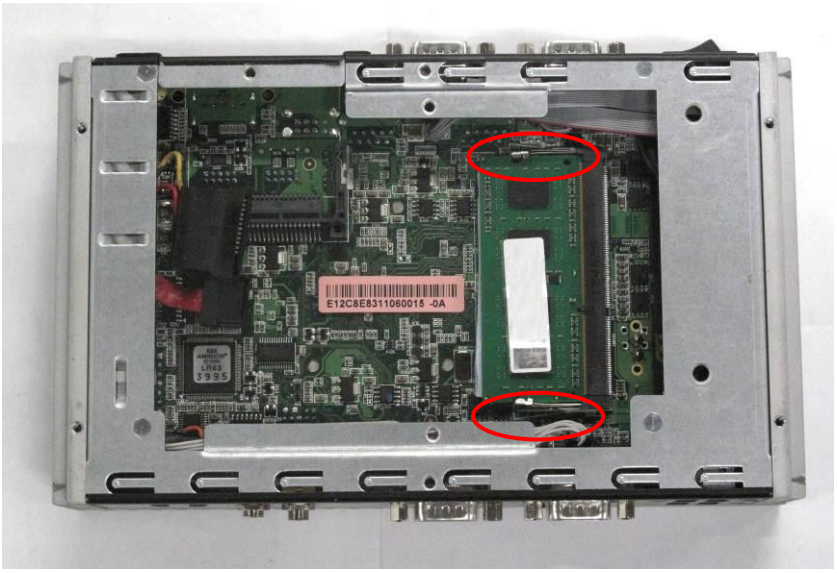


Step 6 Remove the transparent plastic Mylar from thermal pad, and stick the thermal pad onto motherboard.

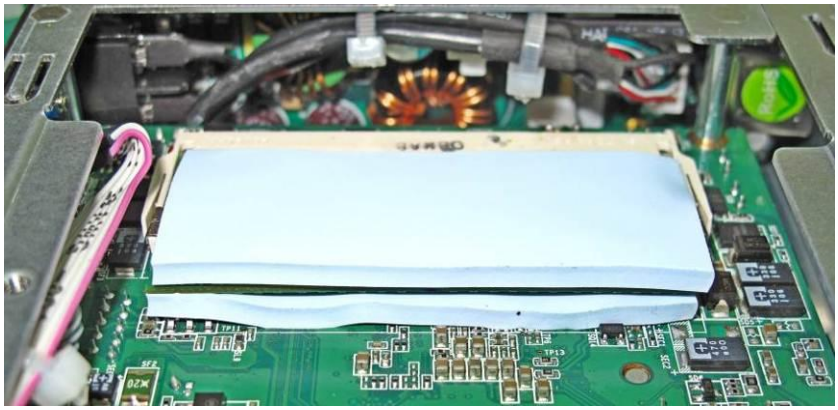
Step 7 Locate the memory module, insert the gold colored contact into the socket.



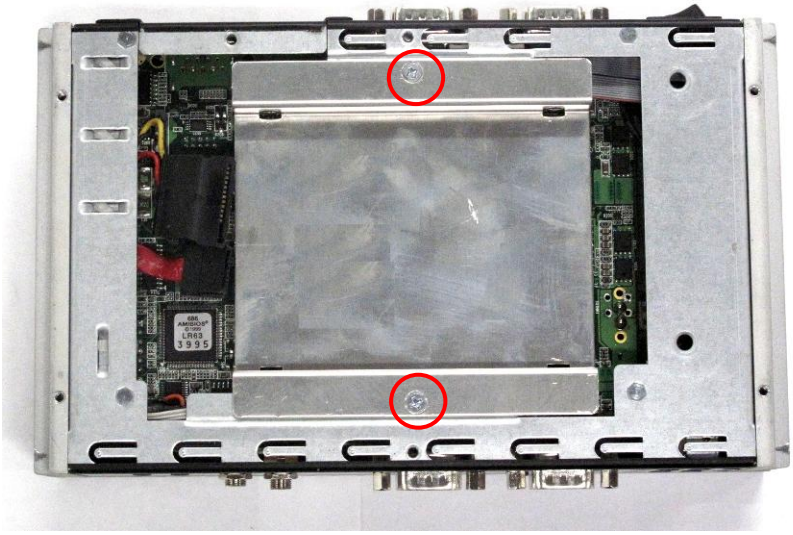
Step 8 Push the module down, until it is firmly seated by locking two latches on the sides.



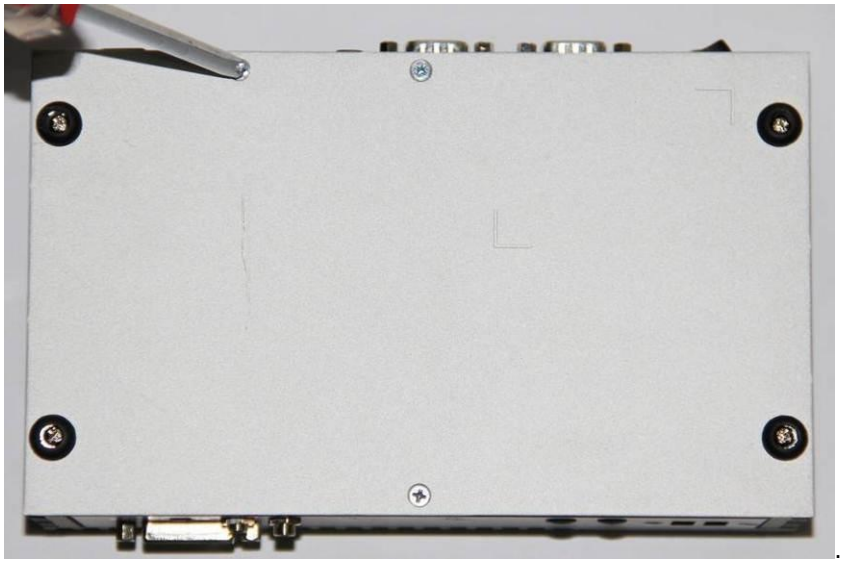
Step 9 Take 2nd thermal pad, remove the transparent plastic mylar and stick it onto memory.



Step 10 Fasten screws of HDD bracket



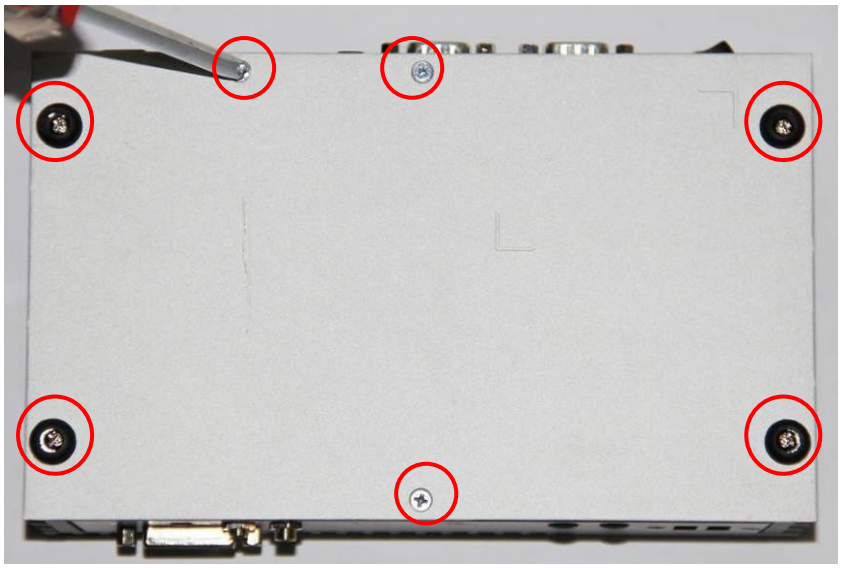
Step 11 Close the cover to the chassis, and fasten all screws.



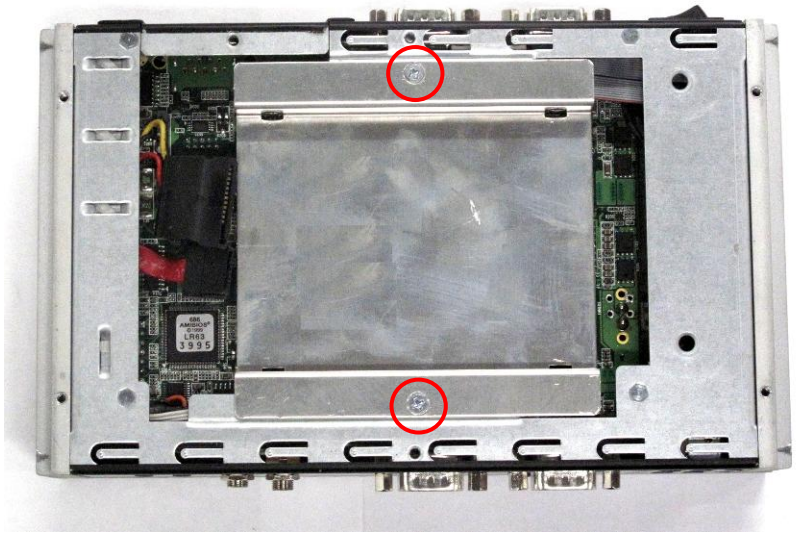
2.2 Installing the SATA HDD

Step 1 Turn off the system, and unplug the power cord.

Step 2 Turn the system upside down to locate screws at the Bottom, loosen screws.

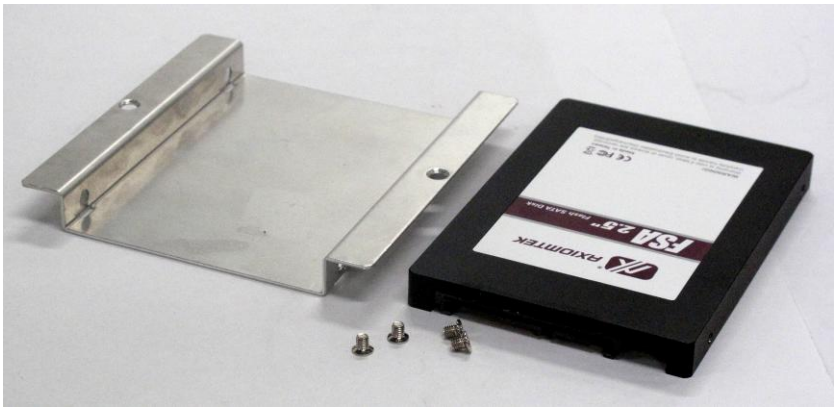


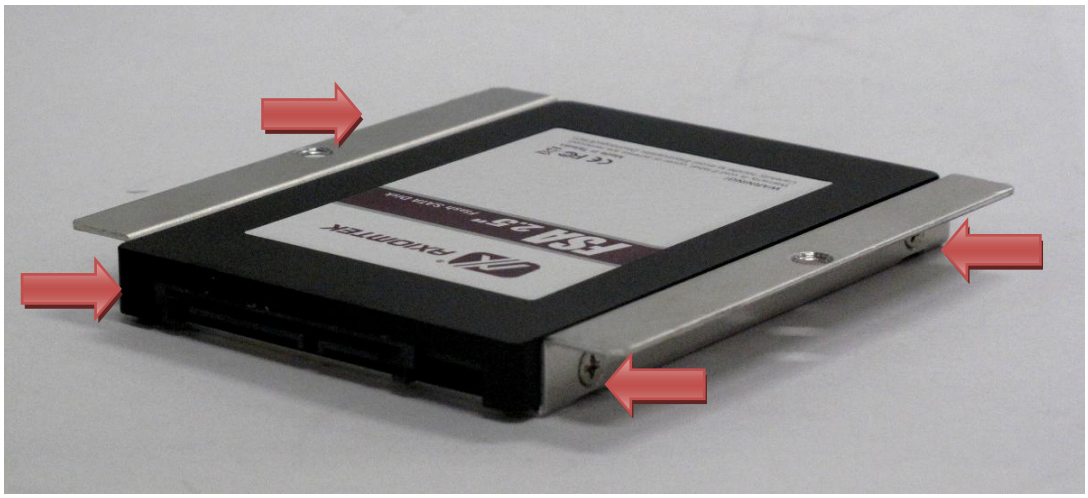
Step 3 Remove the bottom cover and Loosen screws of HDD bracket



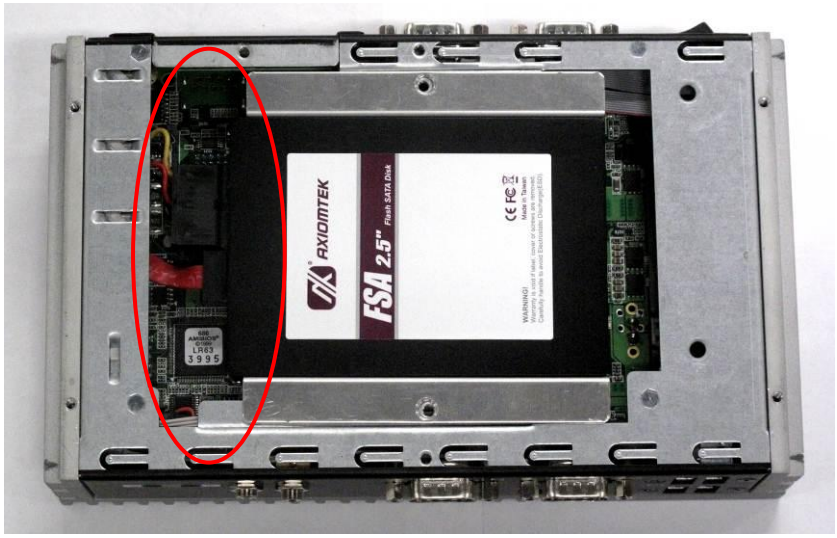
Step 5 Remove the HDD bracket

Step 6 Assembly the HDD bracket together with the SATA HDD

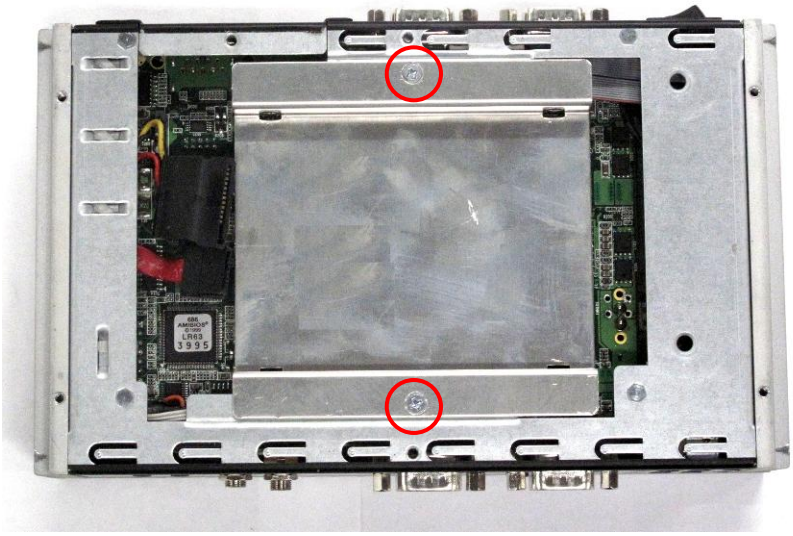




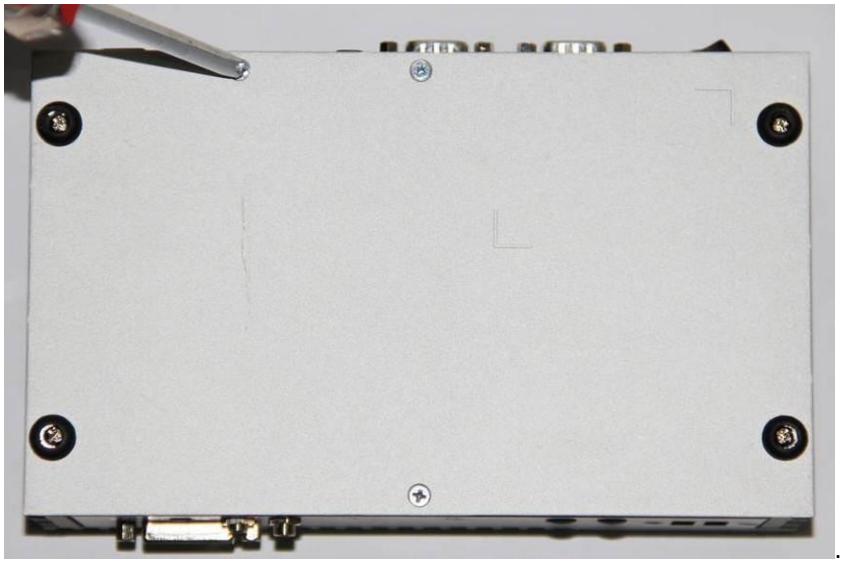
Step 7 Connect SATA cable and power cable to SATA HDD.



Step 8 Fasten screws of HDD bracket



Step 9 Close the cover to the chassis, and fasten all screws.

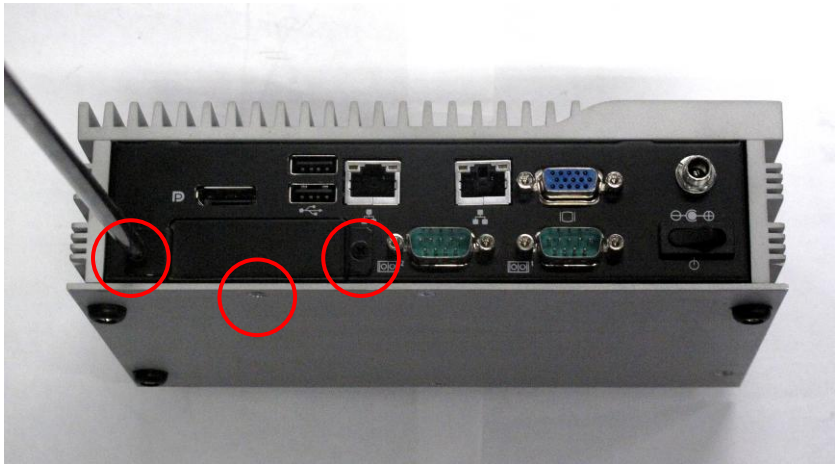


2.3 Installing the CFast™

Step 1 Turn off the system, and unplug the power cord.

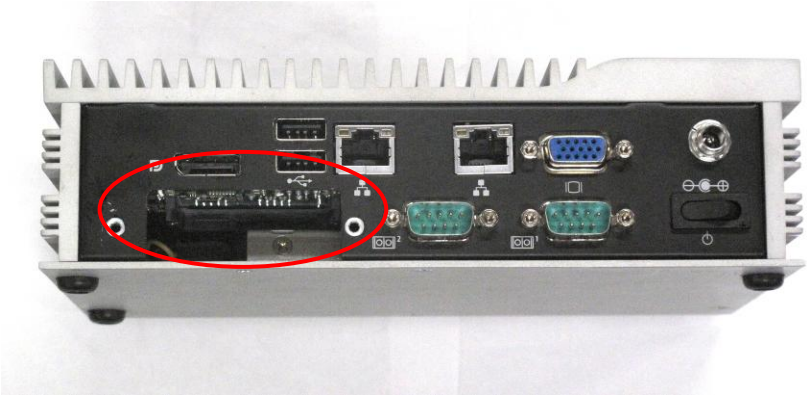
Step 2 Turn the system upside down to locate screws at the Bottom, loosen screws.

Step 3 Loosen screws to remove the CFast cover.



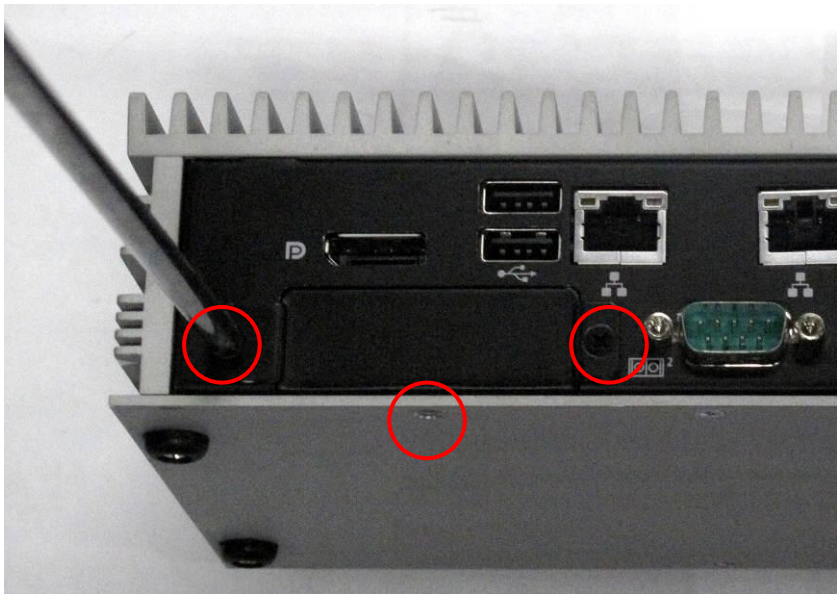
Step 4 Stick the Mylar onto the CFast™ card

Step 5 Slide CFast card into CFast slot with caution.



Step 6 Bend the CFast Mylar with caution.

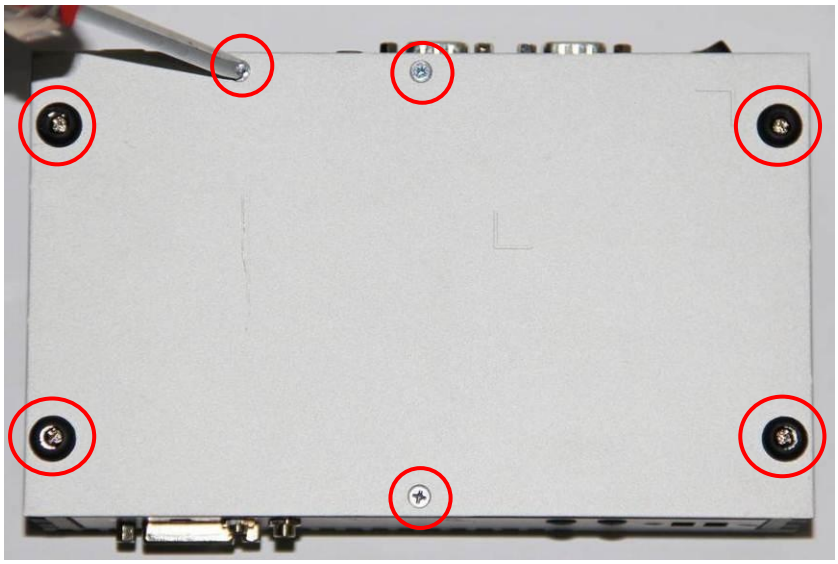
Step 7 Close the cover to the chassis, and fasten all screws.



2.4 Installing the Express Mini Card

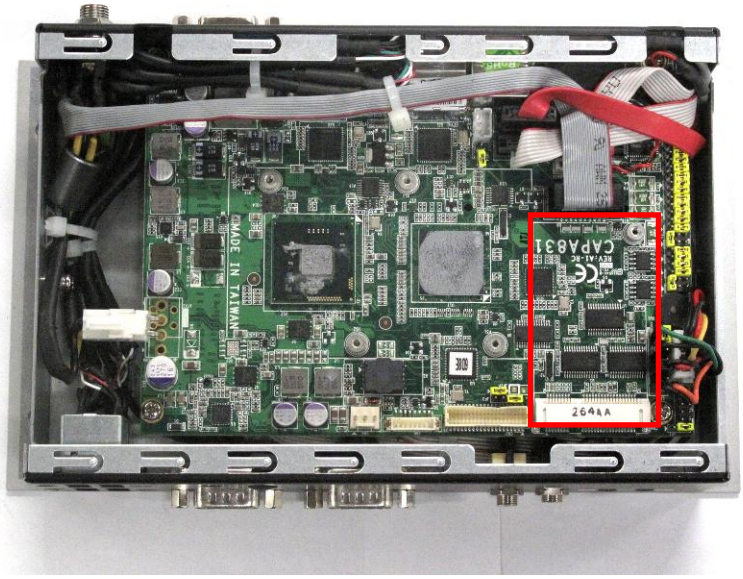
Step 1 Turn off the system, and unplug the power cord.

Step 2 Turn the system upside down to locate screws at the Bottom, loosen screws.

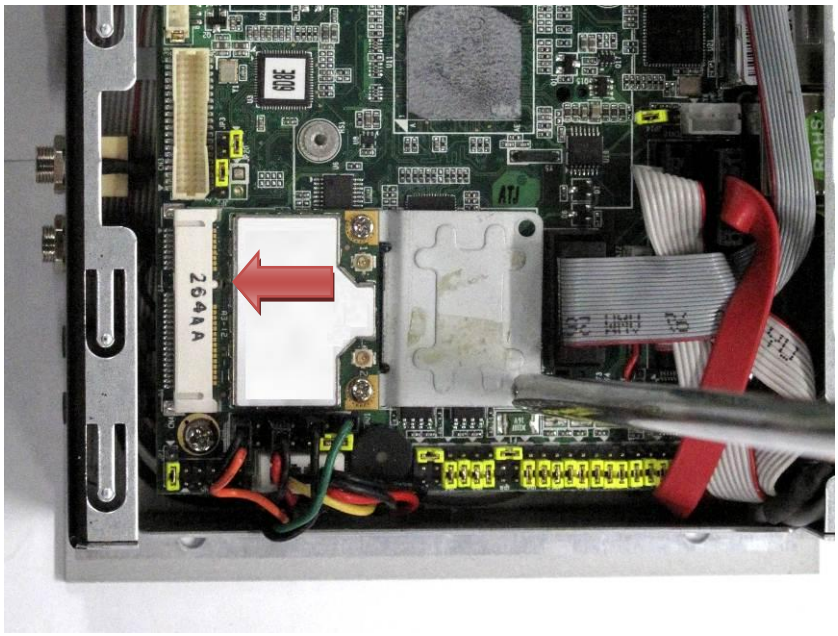


Step 3 Loosen screws at left side and right side. There are Total 8 screws.

Step 4 Remove the top heat sink to locate the Express Mini Card slot.



Step 5 Slide Mini card into Mini Card slot with caution and Fasten screw of Express Mini Card.



Step 6 Assembly the Top Cover back and fasten all screws.

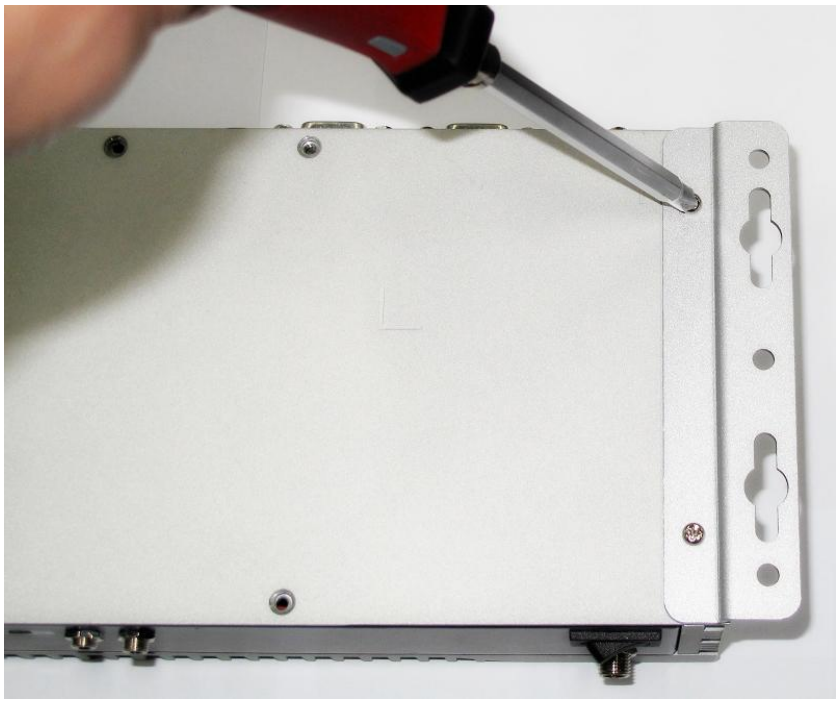
2.5 Installing the Wall Mount (Optional)

The eBOX623-831-FL provides Wall Mount that customers can install as below:

Step 1 Prepare Wall Mount assembling components (screws and Bracket) ready.

Step 2 Loose the screw of four footpads at the bottom of eBOX623-831-FL and remove footpad.

Step 3 Fix the wall mount to the correct location, and fasten all screws.



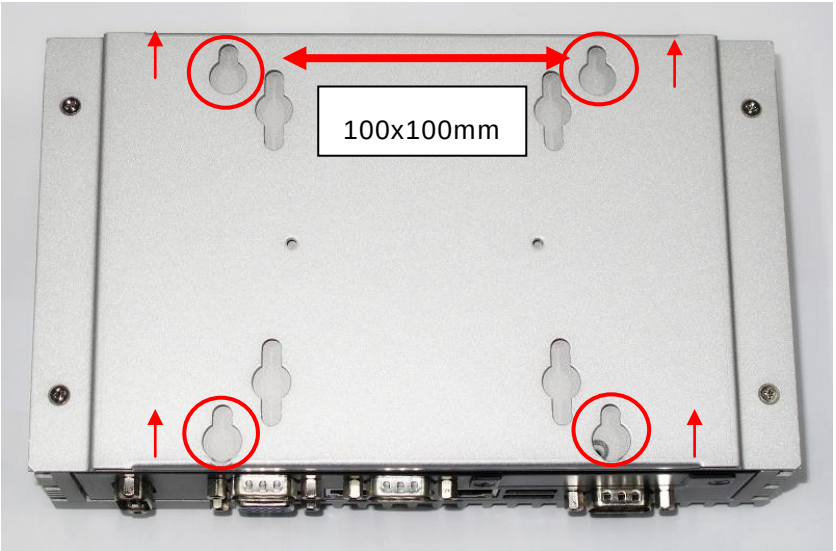
2.6 Installing the VESA Mount (optional)

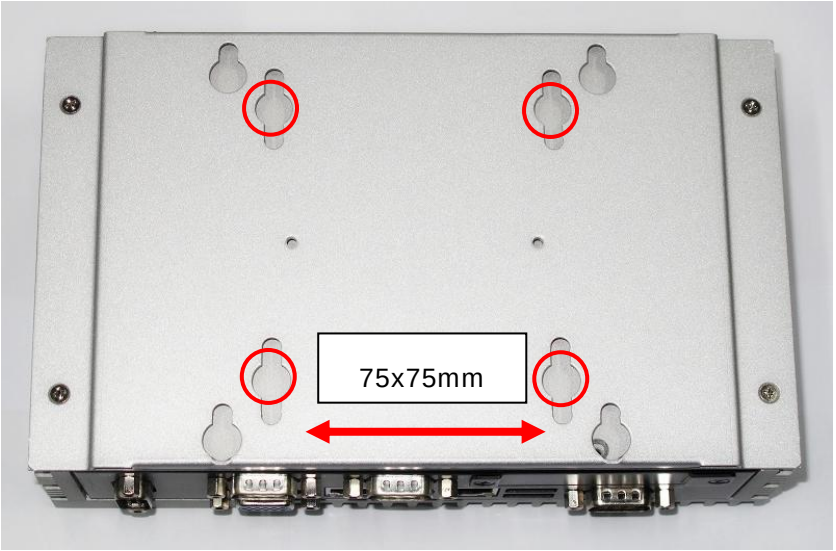
The eBOX623-831-FL provides VESA Mount that customers can install as below:

Step 1 Prepare VESA Mount assembling components (screws and VESA mount bracket) ready.

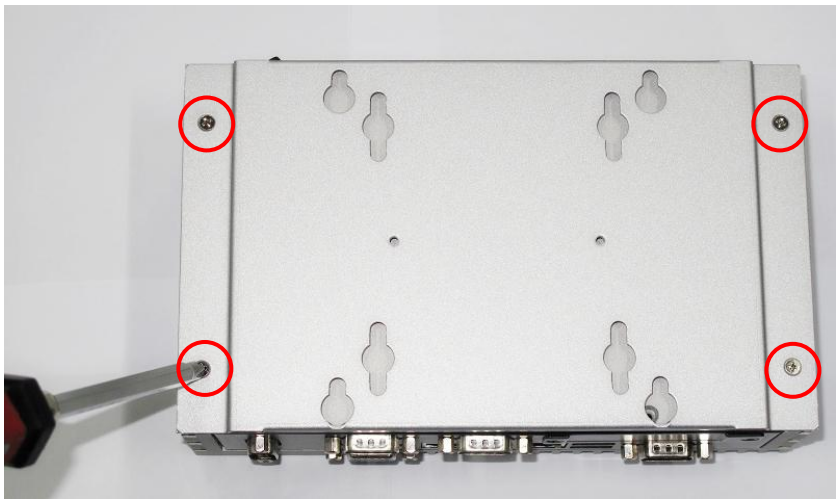
Step 2 Loose the screw of four footpads at the bottom of eBOX623-831-FL, and emove footpad.

Step 3 Decide correct mounting direction.eBOX623-831-FL supports both 100x100mm and 75x75mm VESA mount. The 100x100mm type has special direction.





Step 4 Fix the VESA mount to the correct location, and fasten all screws.



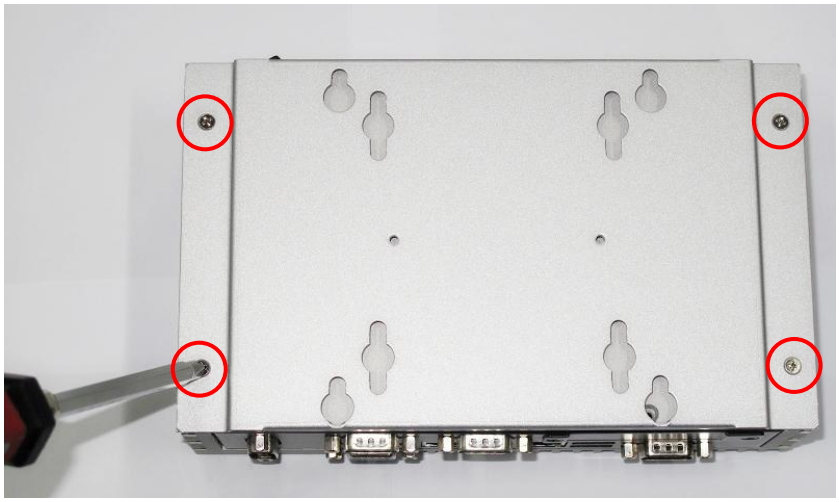
2.7 Installing the Din-Rail Mount (optional)

The eBOX623-831-FL provides Din-Rail Mount that customers can install as below:

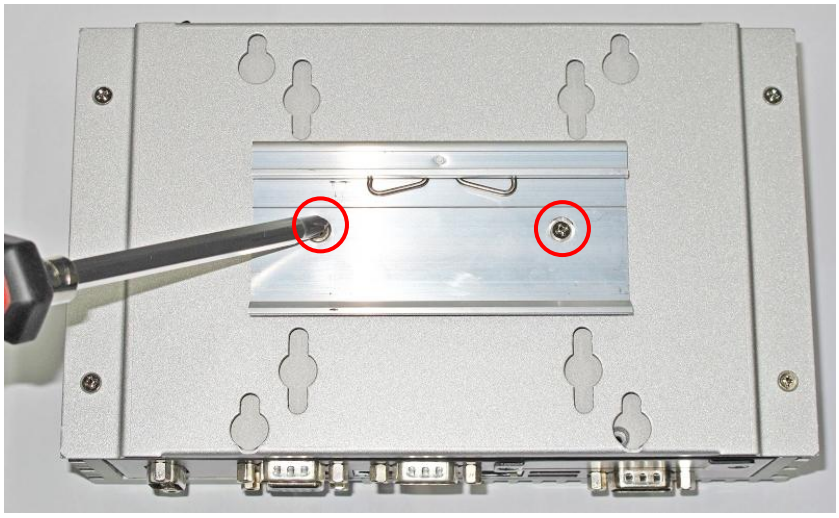
Step 1 Prepare Din-Rail Mount assembling components (screws, Din-rail and VESA mount bracket) ready.

Step 2 Loose the screw of four footpads at the bottom of eBOX623-831-FL and remove footpad.

Step 3 Fix the VESA mount to the correct location, and fasten all screws.



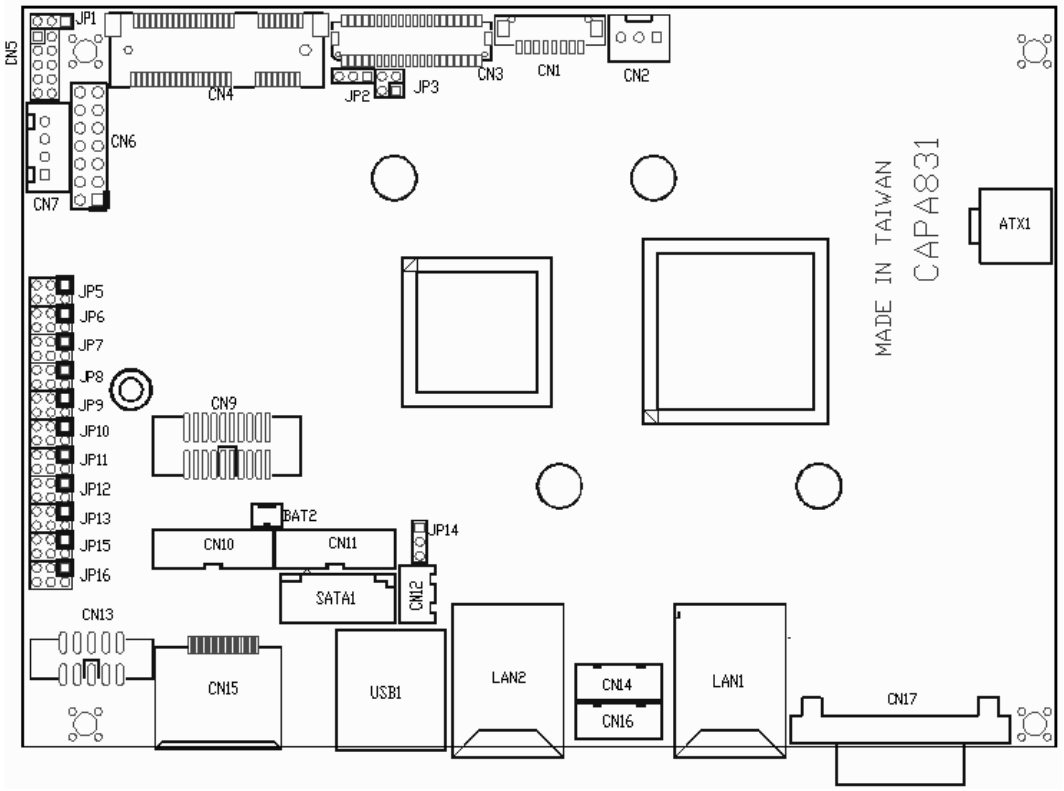
Step 4 Fix the Din-rail mount bracket to the correct location, and fasten all screws.



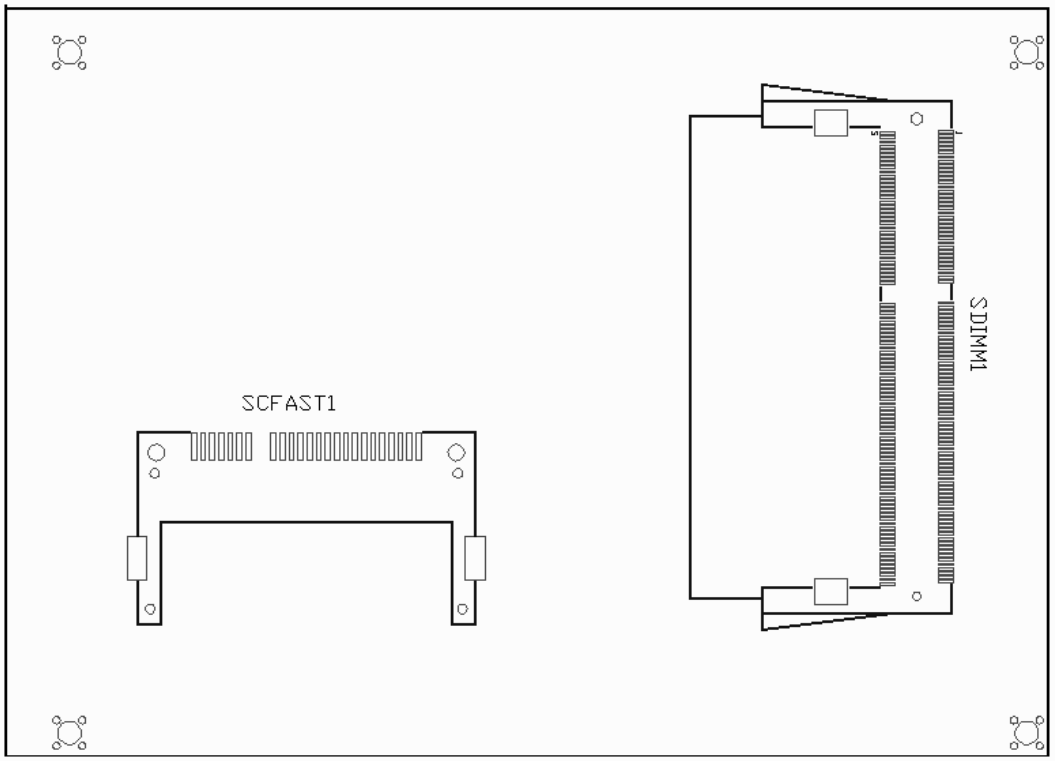
CHAPTER 3
Jumper Setting & Connector

Proper jumper settings configure the **eBOX623-831-FL** to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

3.1 SBC layout



TOP Side

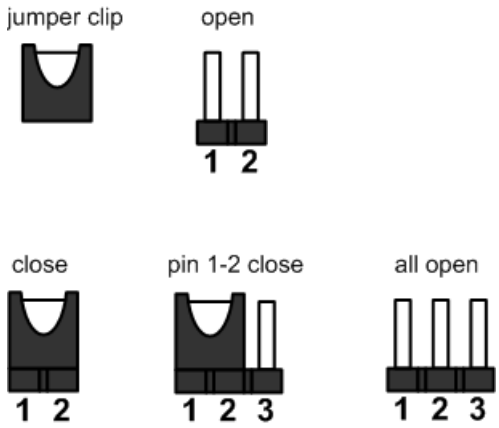


Bottom Side

NOTE: ***We strongly recommended that you should not modify any unmentioned jumper setting without Axiomtek FAE's instruction. Any modification without instruction might cause system to become damage.***

3.2 Jumper Settings

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



Properly configure jumper settings on the eBOX623-831-FL to meet your application purpose. We are herewith listing a summary table of all jumpers and default settings for onboard devices, respectively.

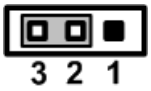
Jumper	Description	Jumper Setting
JP1	Auto Power On Default: Disable	2-3 close
JP5	COM2 RS-232/422/485 Mode Setting Default: RS-232	1-2 close
JP6		3-5, 4-6 close
JP7		3-5, 4-6 close
JP8	COM1 RS-232/422/485 Mode Setting Default: RS-232	1-2 close
JP9		3-5, 4-6 close
JP10		3-5, 4-6 close
JP14	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 close

3.2.1 Auto Power On

If JP1 is enabled for AC power input, the system will be automatically power on without pressing soft power button. If JP1 is disabled for AC power input, it is necessary to manually press soft power button to power on the system.

The function is also used to simulate AT mode when set as Enable.

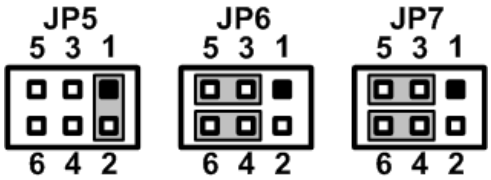
Function	Setting
Disable auto power on (Default)	2-3 close
Enable auto power on	1-2 close



3.2.2 COM2 RS-232/422/485 Mode Setting

Use JP5, JP6, JP7 to set COM2 port to operate as RS-232, RS-422 or RS-485 communication mode.

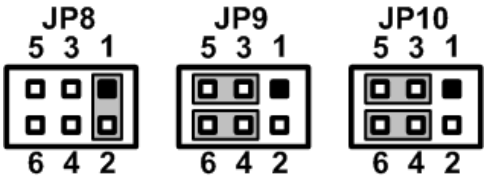
Function	Setting
RS-232 mode (Default)	JP5 1-2 close JP6 3-5, 4-6 close JP7 3-5, 4-6 close
RS-422 mode	JP5 3-4 close JP6 1-3, 2-4 close JP7 1-3, 2-4 close
RS-485 mode	JP5 5-6 close JP6 1-3, 2-4 close JP7 1-3, 2-4 close



3.2.3 COM1 RS-232/422/485 Mode Setting

Use jumpers of JP8, JP9 and JP10 to set COM1 port to operate as RS-232, RS-422 or RS-485 communication mode.

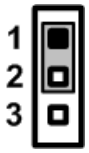
Function	Setting
RS-232 mode (Default)	JP8 1-2 close JP9 3-5, 4-6 close JP10 3-5, 4-6 close
RS-422 mode	JP8 3-4 close JP9 1-3, 2-4 close JP10 1-3, 2-4 close
RS-485 mode	JP8 5-6 close JP9 1-3, 2-4 close JP10 1-3, 2-4 close



3.2.4 Restore BIOS Optimal Defaults

Put jumper clip to pin 2-3 of JP14 for a few seconds then move it back to pin 1-2. Doing this procedure can restore BIOS optimal defaults.

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



3.3 Connectors

Connectors connect the system with other parts/devices. Loose or improper connection might cause problems. Make sure all connectors are properly and firmly connected. Below summary table shows you all connectors on the eBOX623-831-FL.

External Connectors	Section
AC-DC Jack Power In Connector	3.3.1
COM1~COM2 Serial Port Connector	3.3.2
COM3~COM4 Serial Port Connector	3.3.3
VGA Connector	3.3.4
DisplayPort Connector	3.3.5
Ethernet Connector(LAN1,LAN2)	3.3.6
USB Connector	3.3.7
ATX Power On/Off Button	3.3.8
Audio Connector	3.3.9
Internal Connectors	**Section**
Serial ATA (SATA) Connector	3.3.10
SATA Power Connector	3.3.11
CFast™ Socket	3.3.12
DDR3 SO-DIMM Socket	3.3.13
PCI-Express Mini Card Slot	3.3.14

3.3.1 AC-DC Jack Power In Connector

The system supports a DC12V DC-in Jack connector for system power input. Connect it to the power AC-DC 60W Adapter

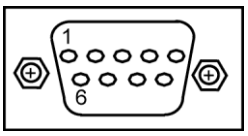
Pin	Signal
1	+12V
2	GND

3.3.2 COM1~COM2 Serial Port Connector

The system has four serial ports. COM1~COM2 are RS-232/422/485 ports. Please refer to Chapter 3.2.2 and 3.2.3 for the setting.

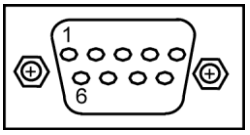
Pin	RS-232	RS-485	RS-422
1	DCD, Data Carrier Detect	TX- / RX-	TX-
2	RXD, Receive Data	TX+ / RX+	TX+
3	TXD, Transmit Data	No use	RX+
4	DTR, Data Terminal Ready	No use	RX-
5	GND, Ground	GND	GND
6	DSR, Data Set Ready	No use	No use
7	RTS, Request To Send	No use	No use
8	CTS, Clear To Send	No use	No use
9	RI, Ring Indicator	No use	No use

COM1



Pin	RS-232	RS-485	RS-422
1	DCD, Data Carrier Detect	TX- / RX-	TX-
2	RXD, Receive Data	TX+ / RX+	TX+
3	TXD, Transmit Data	No use	RX+
4	DTR, Data Terminal Ready	No use	RX-
5	GND, Ground	GND	GND
6	DSR, Data Set Ready	No use	No use
7	RTS, Request To Send	No use	No use
8	CTS, Clear To Send	No use	No use
9	RI, Ring Indicator	No use	No use

COM2

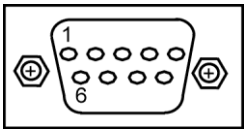


3.3.3 COM3~COM4 Serial Port Connector

The system has four serial ports. COM3~COM4 are RS-232 ports.

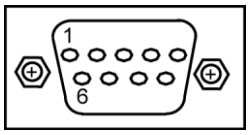
Pin	Description
1	DCD, Data Carrier Detect
2	RXD, Receive Data
3	TXD, Transmit Data
4	DTR, Data Terminal Ready
5	GND, Ground
6	DSR, Data Set Ready
7	RTS, Request To Send
8	CTS, Clear To Send
9	RI, Ring Indicator

COM3



Pin	Description
1	DCD, Data Carrier Detect
2	RXD, Receive Data
3	TXD, Transmit Data
4	DTR, Data Terminal Ready
5	GND, Ground
6	DSR, Data Set Ready
7	RTS, Request To Send
8	CTS, Clear To Send
9	RI, Ring Indicator

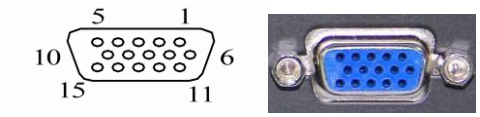
COM4



3.3.4 VGA Connector

The VGA connector is a slim type 15-pin D-Sub connector which is common for the CRT VGA display. The VGA interface configuration can be configured via the software utility.

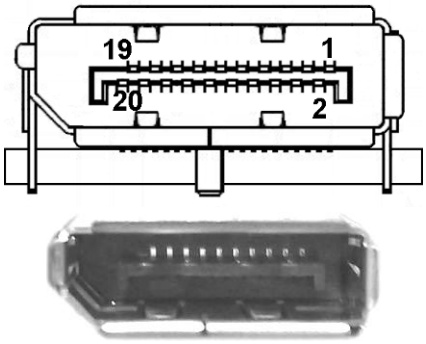
Pin	Signal	Pin	Signal	Pin	Signal
1	Red	2	Green	3	Blue
4	N.C.	5	GND	6	DETECT
7	GND	8	GND	9	VCC
10	GND	11	N.C.	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync	15	DDC CLK



3.3.5 DisplayPort Connector

DisplayPort interface is also called DP port.

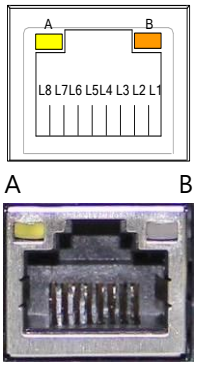
Pin	Signal
1	DPB_LANE0
2	GND
3	DPB_LANE0#
4	DPB_LANE1
5	GND
6	DPB_LANE1#
7	DPB_LANE2
8	GND
9	DPB_LANE2#
10	DPB_LANE3
11	GND
12	DPB_LANE3#
13	Detect Pin
14	GND
15	DPB_AUX
16	GND
17	DPB_AUX#
18	DPB_HPDE
19	GND
20	+3.3V



3.3.6 LAN Connector (LAN1, LAN2)

The RJ-45 connector is for Ethernet. To connect the board to a 1000/100/10 Base-T hub, just plug one end of the cable into connector and connect the other end (phone jack) to a 1000/100/10-Base-T hub

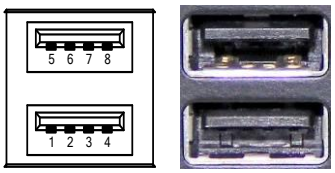
Pin	Signal	Pin	Signal
L1	MDI0+	L5	MDI2-
L2	MDI0-	L6	MDI1-
L3	MDI1+	L7	MDI3+
L4	MDI2+	L8	MDI3-
A	Active LED (Yellow)		
B	100 LAN LED (Green)/ 1000 LAN LED (Orange)		



3.3.7 USB Connector

The Universal Serial Bus connectors are compliant with USB 2.0 (480Mbps), and ideally for installing USB peripherals such as keyboard, mouse, scanner, etc.

Pin	Signal USB Port 0	Pin	Signal USB Port 1
1	USB VCC (+5V level)	5	USB VCC (+5V level)
2	USB #0_D-	6	USB #1_D-
3	USB #0_D+	7	USB #1_D+
4	Ground (GND)	8	Ground (GND)



3.3.8 ATX Power On/OFF Button

The ATX power button is on the I/O side. It can allow users to control eBOX623-831-FL power on/off.

Pin	Signal
1	GND
2	PSIN

3.3.9 Audio Connector

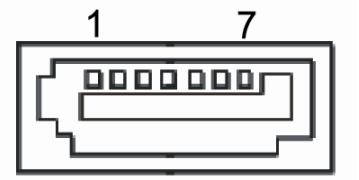
These two audio jacks ideal are for Audio Mic-In and Audio Line-out.

Pin	Signal
1	Microphone In
2	Line Out

3.3.10 SATA Connector

The SATA connector is for high-speed SATA interface ports and they can be connected to hard disk devices.

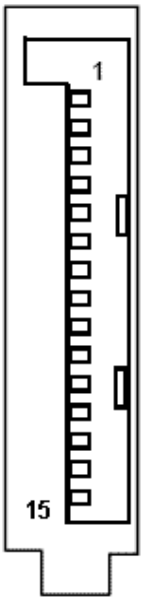
Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND



3.3.11 SATA Power Connector

The SATA connector is for high-speed SATA interface ports and they can be connected to hard disk devices.

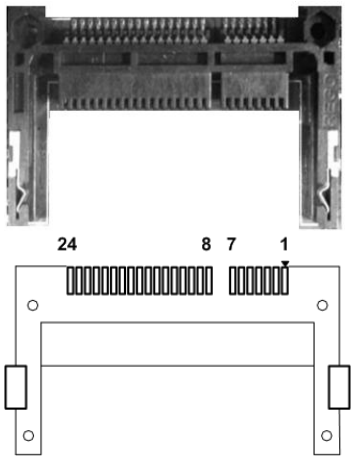
Pin	Signal
1	+3.3VDC
2	+3.3VDC
3	+3.3VDC
4	COM
5	COM
6	COM
7	+5VDC
8	+5VDC
9	+5VDC
10	COM
11	COM
12	COM
13	+12VDC
14	+12VDC
15	+12VDC



3.3.12 CFast™ Socket

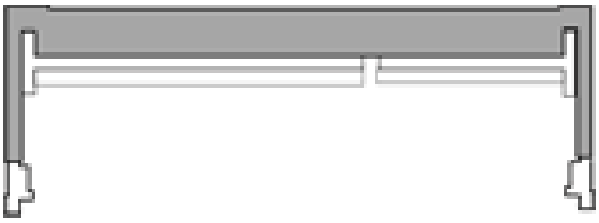
The system is equipped with a CFast™ socket on the bottom side to support a CFast™ card which is based on the Serial ATA bus. The socket is specially designed to avoid incorrect installation of the CFast™ card. When installing or removing the CFast™ card, please make sure the system power is off. The CFast™ card by default identifies itself as C: or D: drive in your PC system.

Pin	Signal	Pin	Signal
1	GND	13	N.C
2	SATA_TX+	14	GND
3	SATA_TX-	15	N.C
4	GND	16	CFAST_LED#
5	SATA_RX-	17	N.C
6	SATA_RX+	18	N.C
7	GND	19	N.C
8	N.C	20	+3.3V Level
9	GND	21	+3.3V Level
10	N.C	22	GND
11	N.C	23	GND
12	N.C	24	N.C



3.3.13 DDR3 SODIMM Socket

eBOX623-831-FL supports one standard DDR3 204-pin 800/1066 MHz SO-DIMM socket.

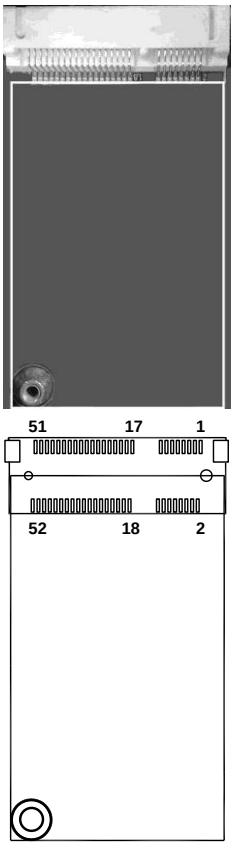


3.3.14 Express Mini Card Slot

PCI Express Mini Card connector supports a PCI Express x1 link and a USB 2.0 link. A PCI Express Mini Card can be applied to either PCI Express or USB 2.0. It complies with PCI-Express Mini Card Spec. V1.2.

The USB 2.0 support will be helpful during the transition to PCI Express, because peripheral vendors will need time to design their chipsets to have the PCI Express function. During the transition, PCI Express Mini Cards can be quickly implemented by using USB 2.0.

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



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CHAPTER 4
AMI BIOS SETUP UTILITY

This chapter provides users with detailed description how to set up basic system configuration through the AMI BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

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

4.2 Navigation Keys

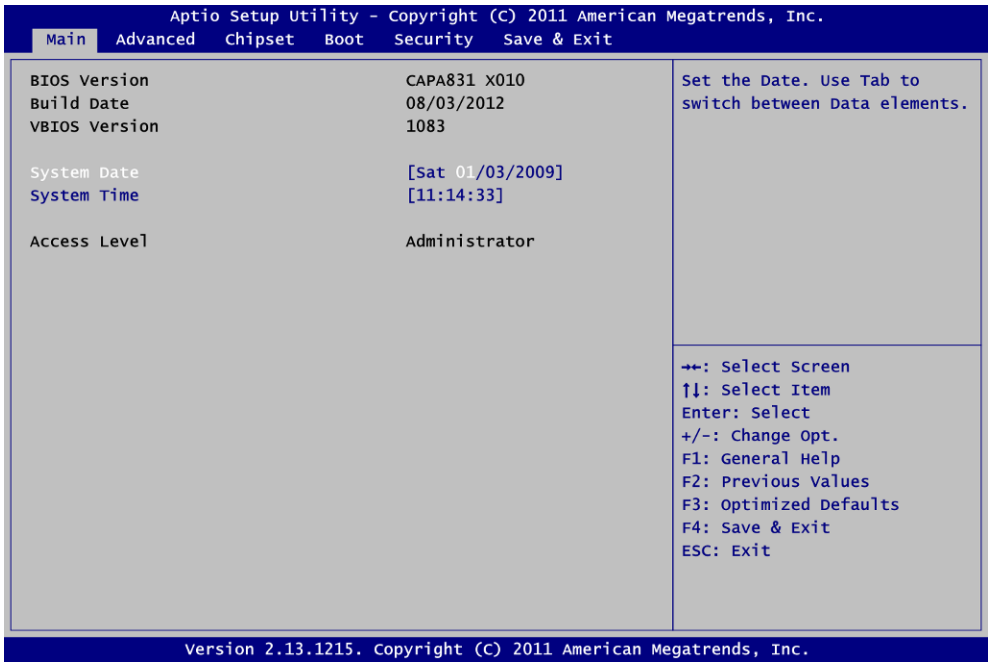
The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.

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

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

4.3 Main Menu

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



- **System Date/Time**

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

4.4 Advanced Menu

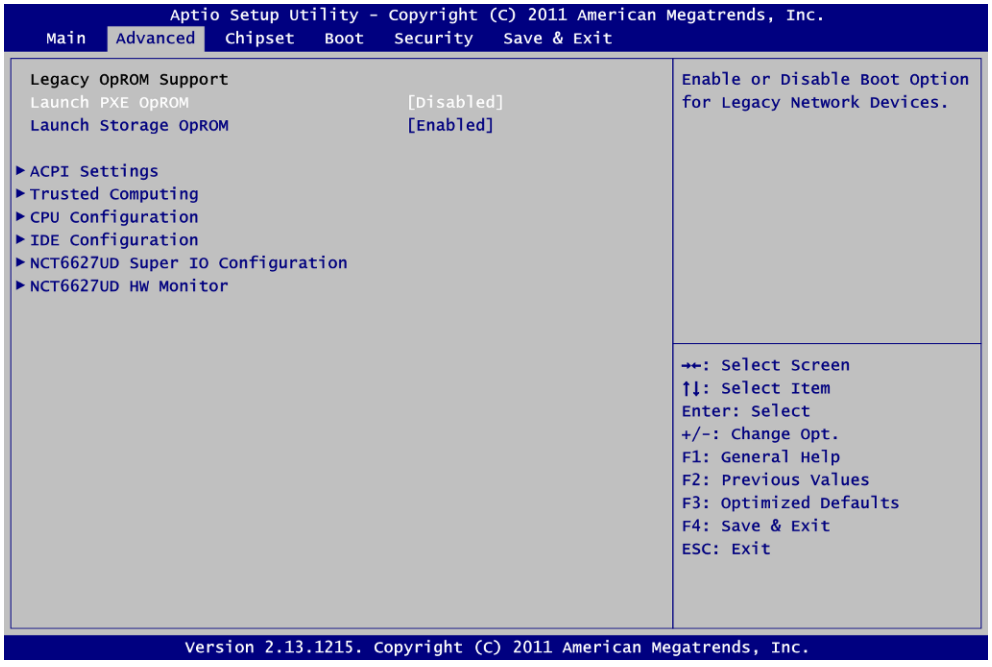
- **Launch PXE OpROM**
  Use this item to enable or disable the boot ROM function of the onboard LAN chip when the system boots up.

- **Launch Storage OpROM**
  Enable or disable boot option for legacy mass storage devices with option ROM.

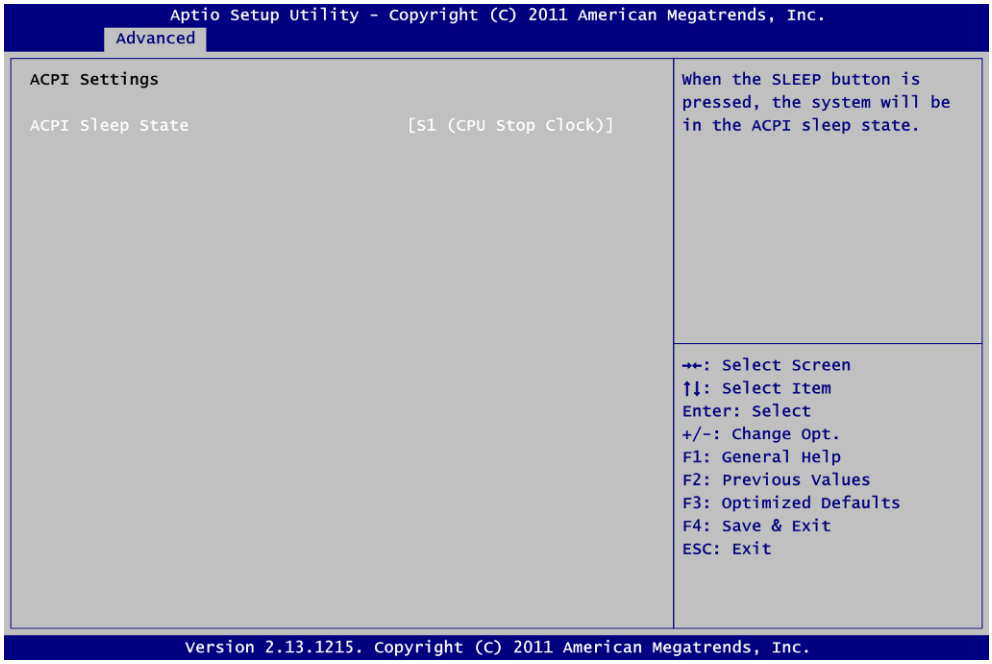
The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- ► ACPI Settings
- ► Trusted Computing
- ► CPU Configuration
- ► IDE Configuration
- ► NCT6627UD Super IO Configuration
- ► NCT6627UD HW Monitor

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



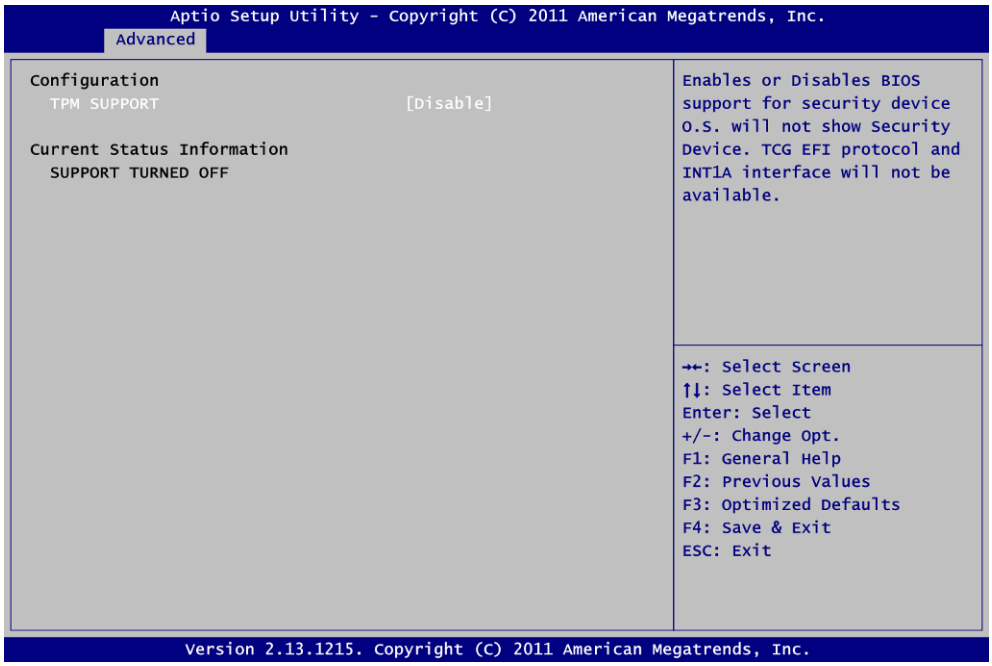
- **ACPI Settings**



➢ ACPI Sleep State

When the sleep button is pressed, the system will be in the ACPI sleep state. The default is S1 (CPU Stop Clock).

- **Trusted Computing**
  This screen provides function for specifying the TPM settings.



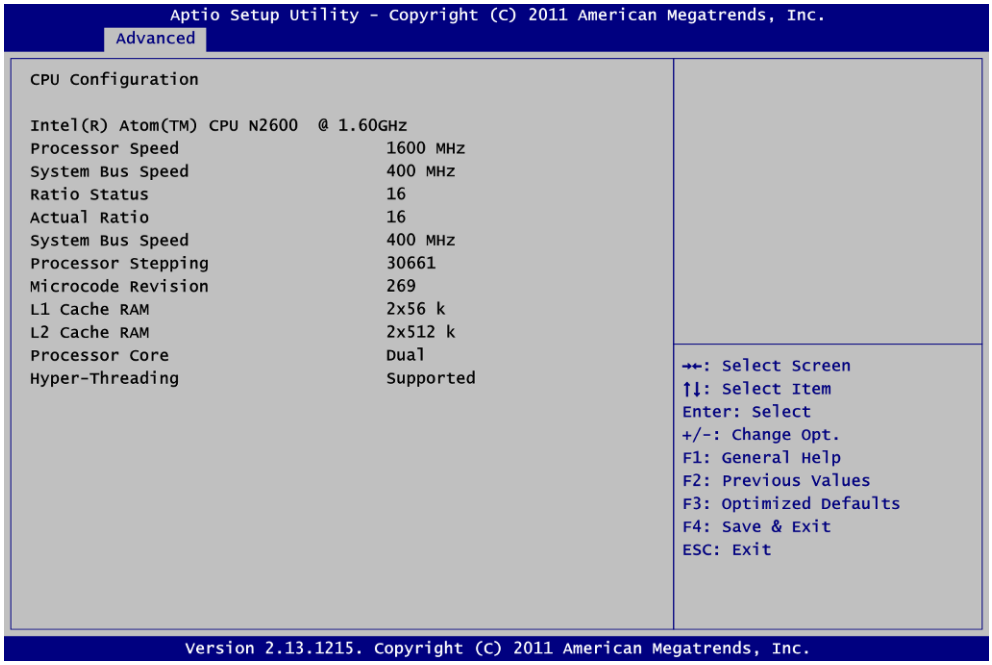
➢ TPM Support

Enable or disable BIOS support for security device. "Disable" is the default.

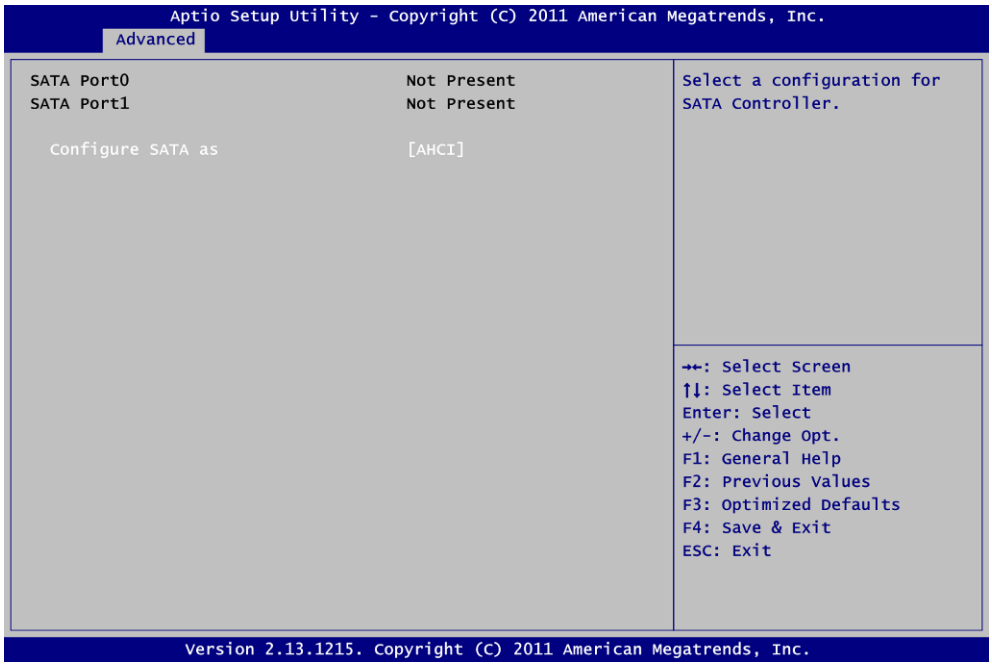
➢ Current Status Information

Display current TPM status information.

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



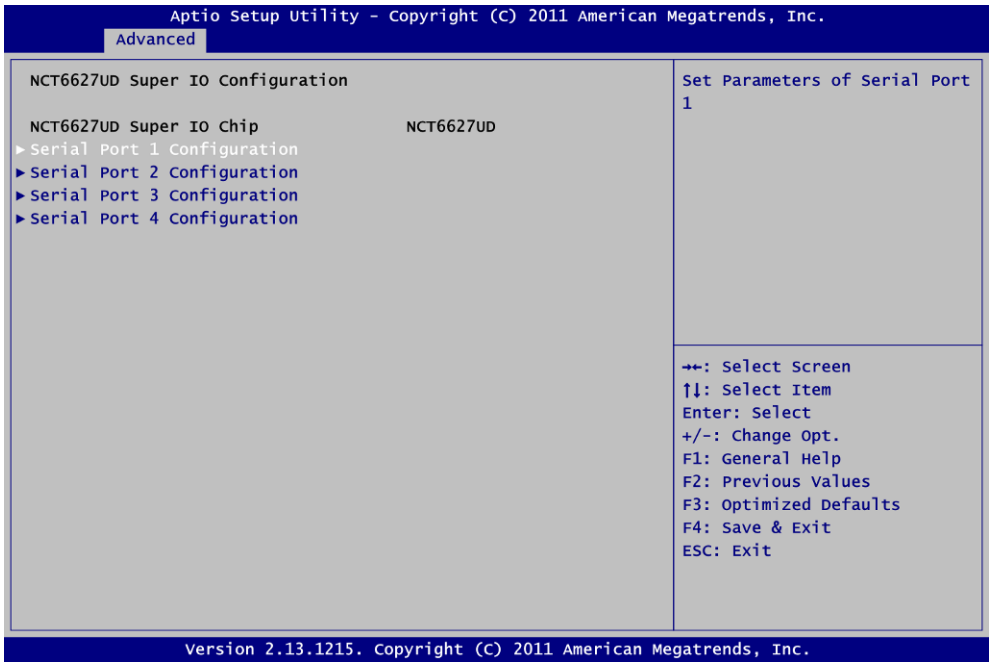
- **IDE Configuration**
  In the IDE Configuration menu, you can see the currently installed hardware in the SATA ports. During system boot up, the BIOS automatically detects the presence of SATA devices.



  - Configure SATA as

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

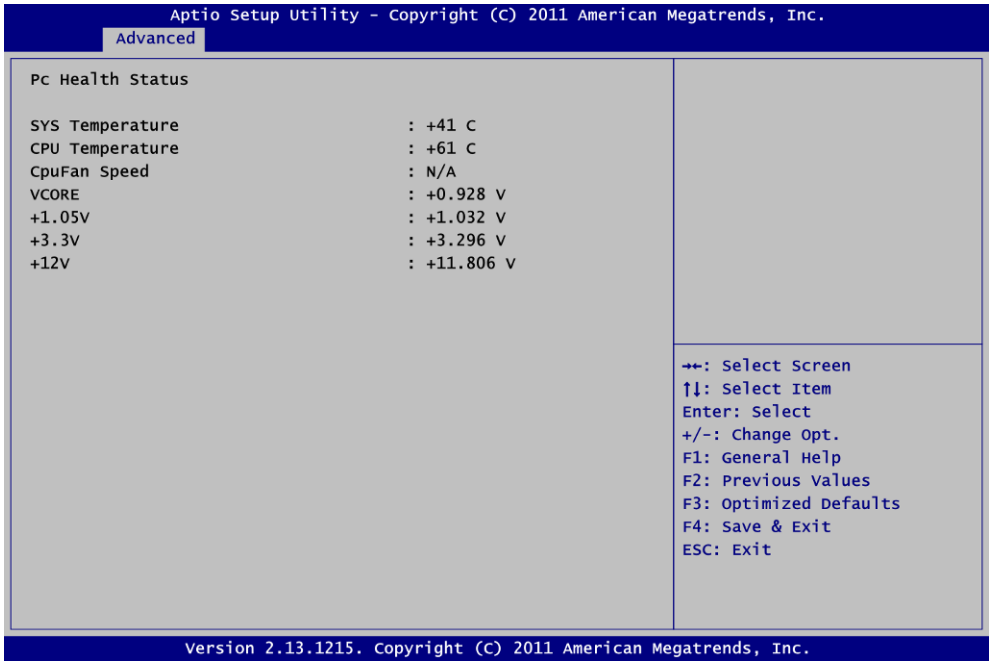
- **NCT6627UD Super IO Configuration**
  You can use this screen to select options for the Super IO Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "►", please press <Enter> for more options.



➢ Serial Port 1~4 Configuration

Use these items to enable or disable the serial port 1~4.

- **NCT6627UD HW Monitor**
  This screen monitors hardware health status.



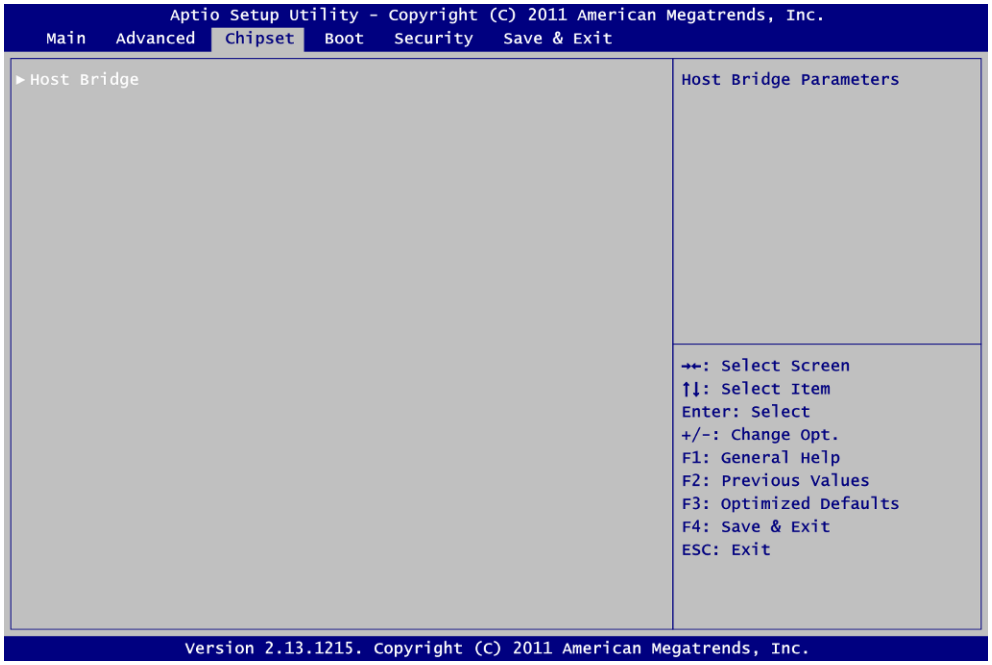
This screen displays the temperature of system and CPU, cooling fan speed in RPM and system voltages (VCORE, +1.05V, +3.3V and +12V).

4.5 Chipset Menu

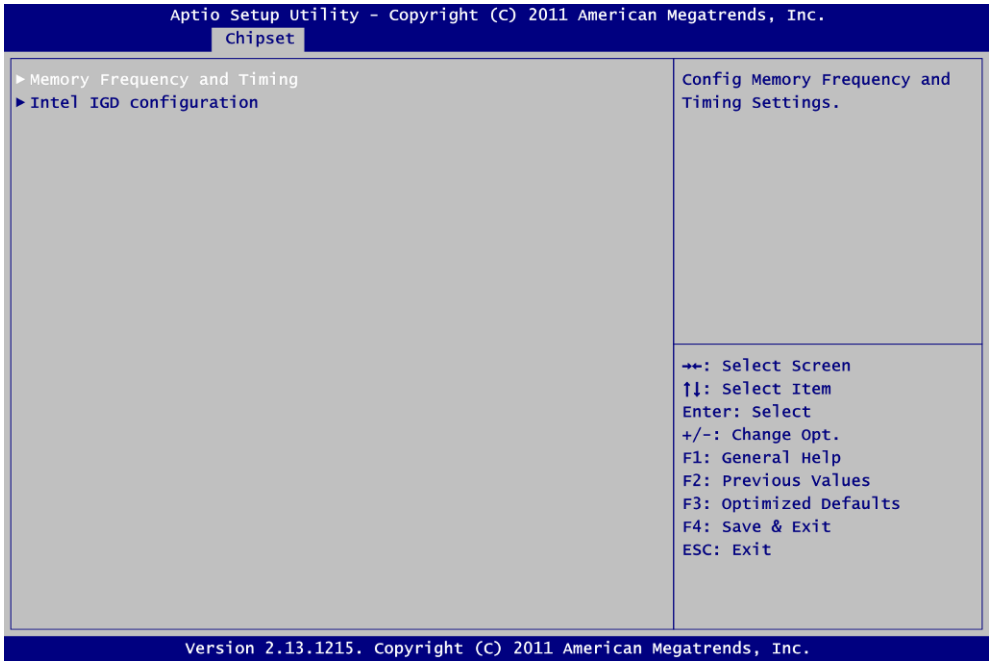
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

► Host Bridge

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



- **Host Bridge**
  This screen allows users to configure parameters of Host Bridge chipset.



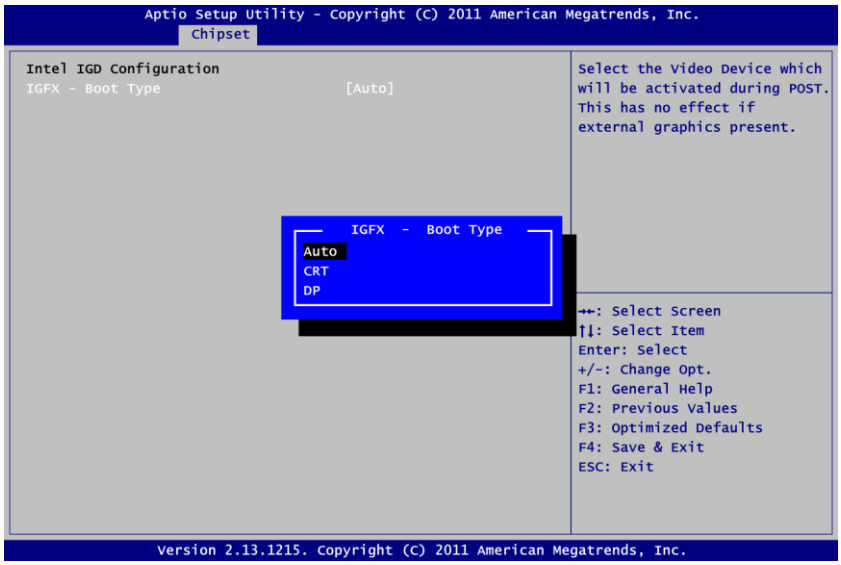
➢ Memory Frequency and Timing

Use this item to refer to the information related to memory frequency.

➢ Intel IGD Configuration

Use this item to configure internal graphics controller.

- **Intel IGD Configuration**
  This screen shows the configure parameters of internal graphics controller.

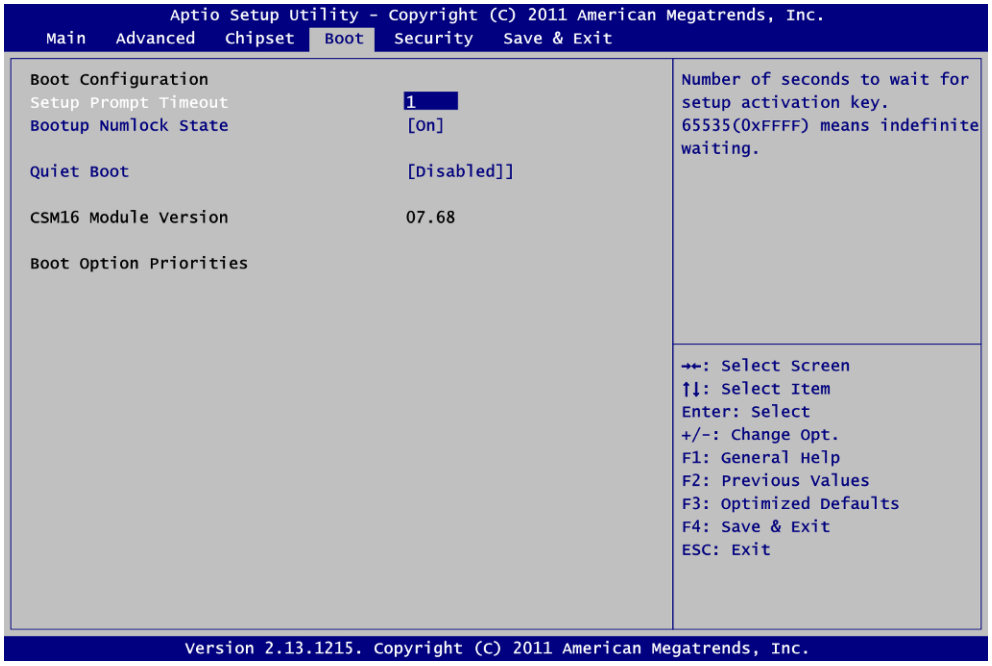


- **IGFX – Boot Type**

  Select the video device which will be activated during POST (Power-On Self Test). This has no effect if external graphics present.

4.6 Boot Menu

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



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

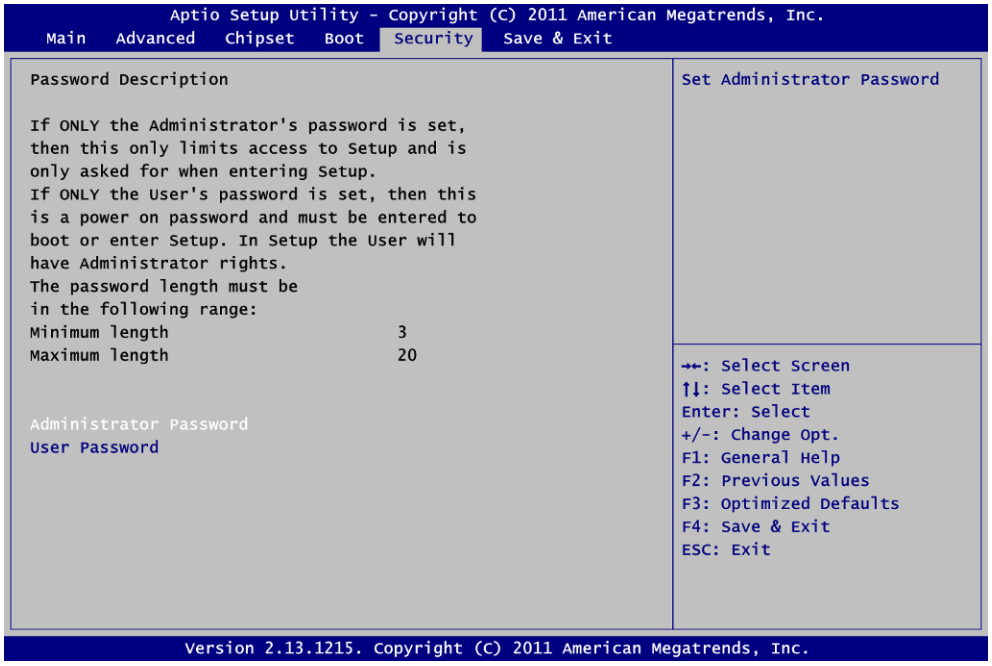
- **Bootup NumLock State**
  Use this item to select the power-on state for the NumLock.

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

- **Boot Option Priorities**
  These are settings for boot priority. Specify the boot device priority sequence from the available devices.

4.7 Security Menu

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

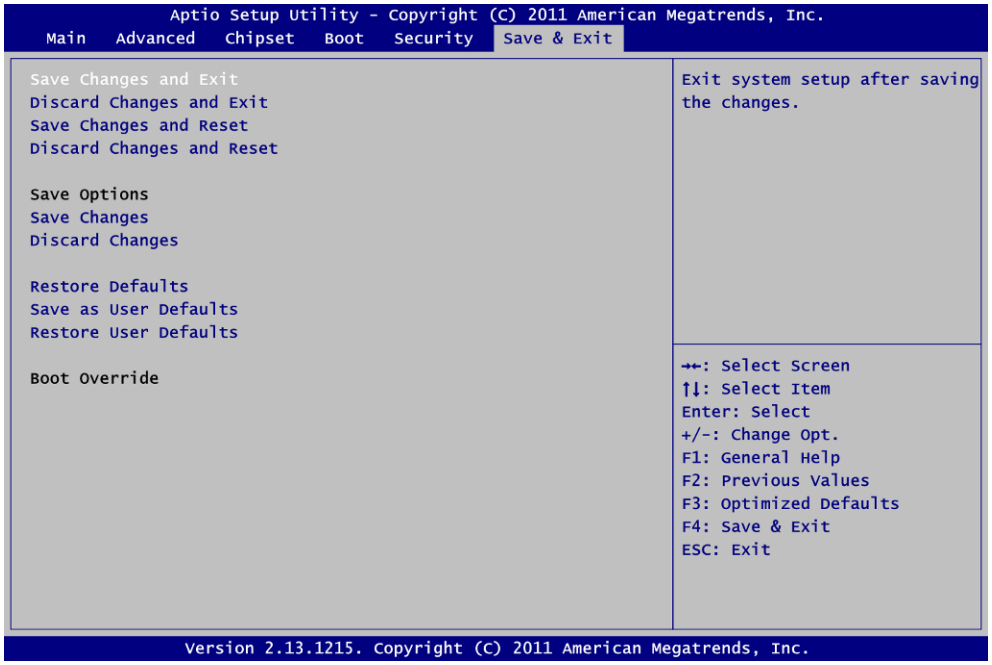


- **Administrator Password**
  This item indicates whether an administrator password has been set (installed or uninstalled).

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

4.8 Save & Exit Menu

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



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

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

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

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

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

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

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

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

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

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

CHAPTER 5
Drivers Installation

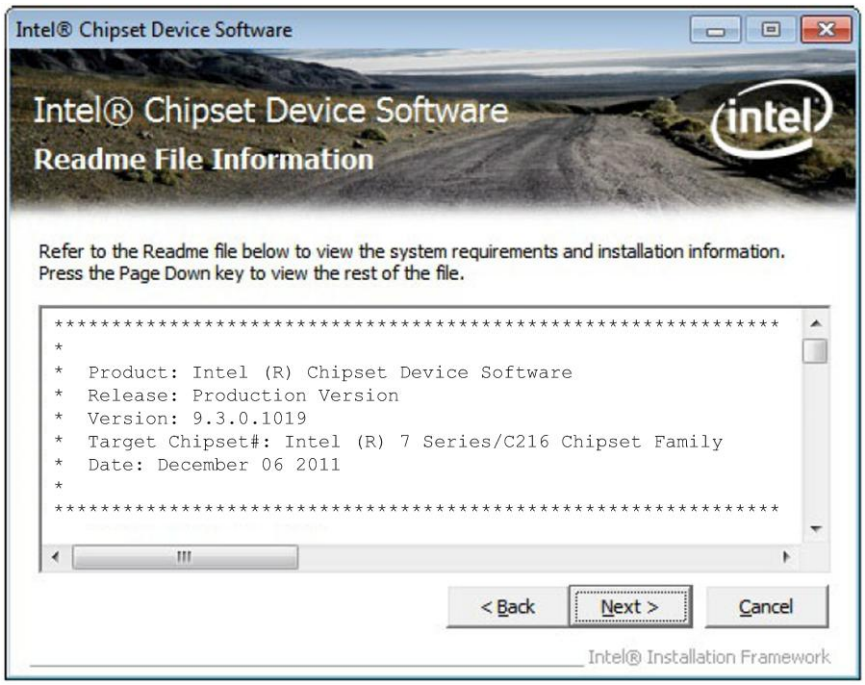
The device drivers are located on the product information CD that comes with the eBOX623-831-FL Series package. The auto-run function of drivers will guide you to install the utilities and device drivers under Windows system. You can follow the onscreen instructions to install these devices:

- Chipset
- Graphics
- Ethernet
- Audio

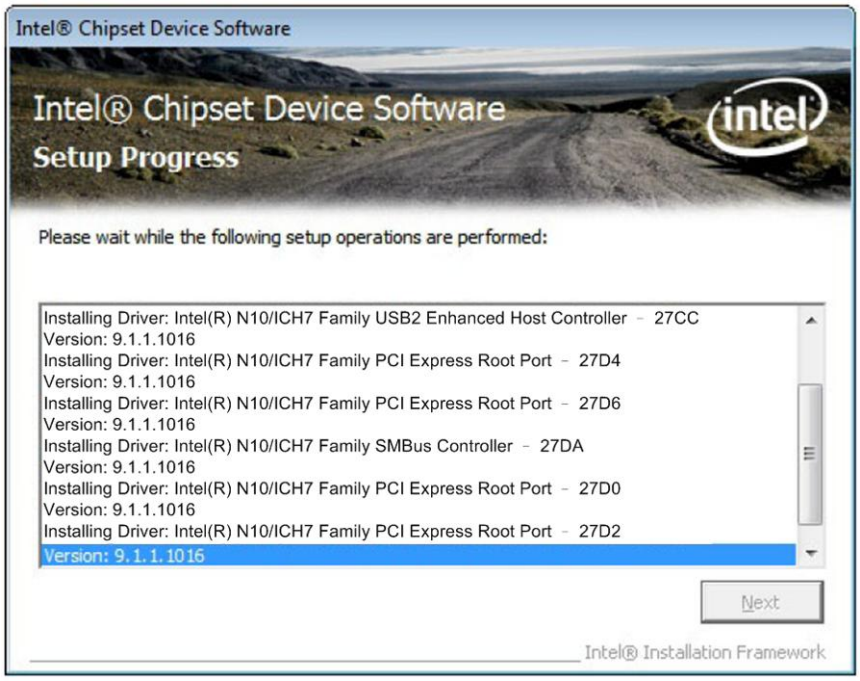
5.1 Installing Chipset Driver

1. Run the infinst_auto1.exe program from the driver directory in product information CD. Click "Next" to next step.

2. A Readme File Information screen appears to show you the system requirements and installation information. Click "Next" to next step.



3. Please wait while setup processes the following operations.



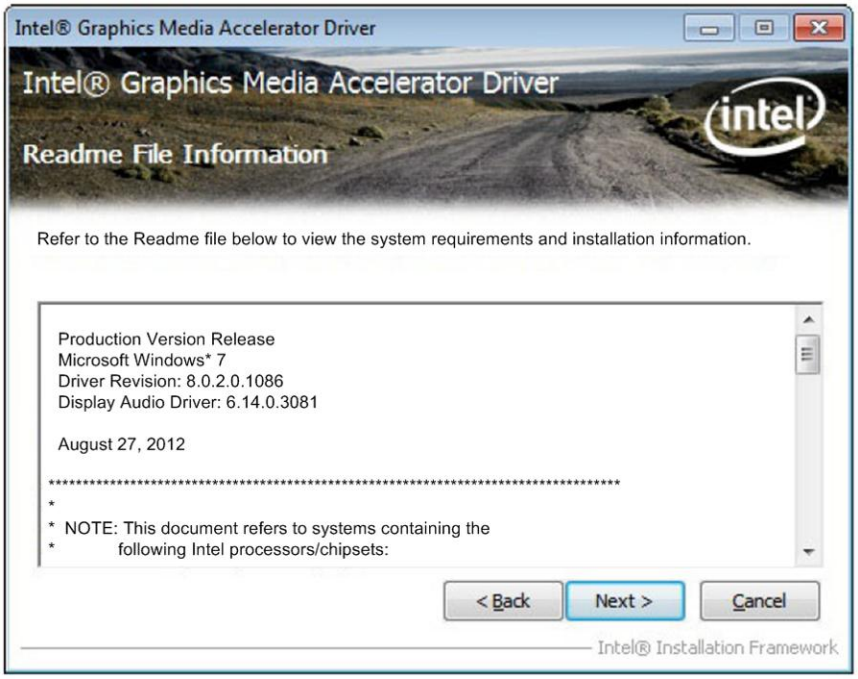
4. You are suggested to select "Yes, I want to restart this computer now". Click "Finish" to complete the setup process and reboot.

5.2 Installing Graphics Media Accelerator Driver

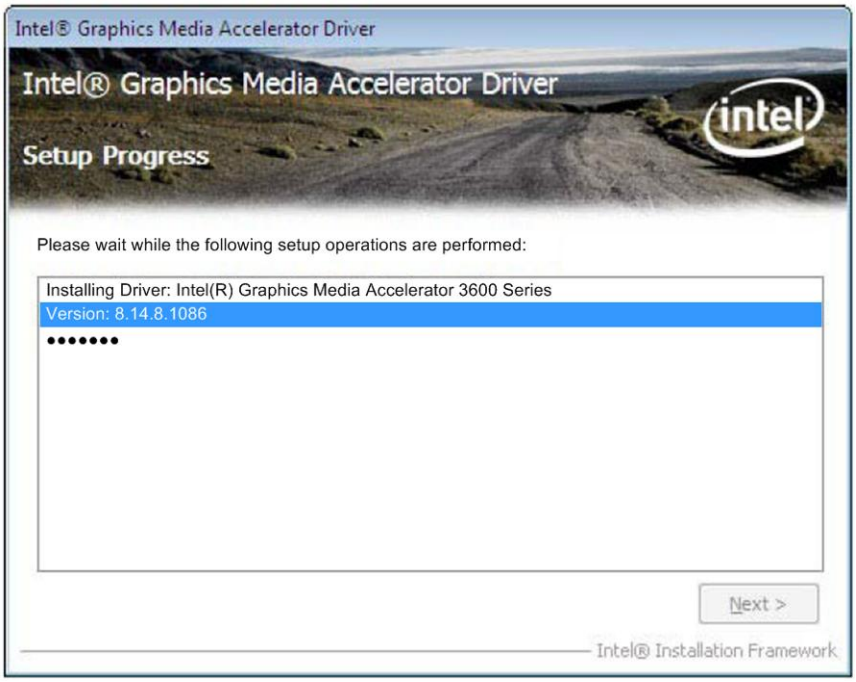
1. Run the setup.exe program from the driver directory in product information CD. Click "Next" to next step.

2. When Intel® License Agreement screen appears, please click "Yes" to next step.

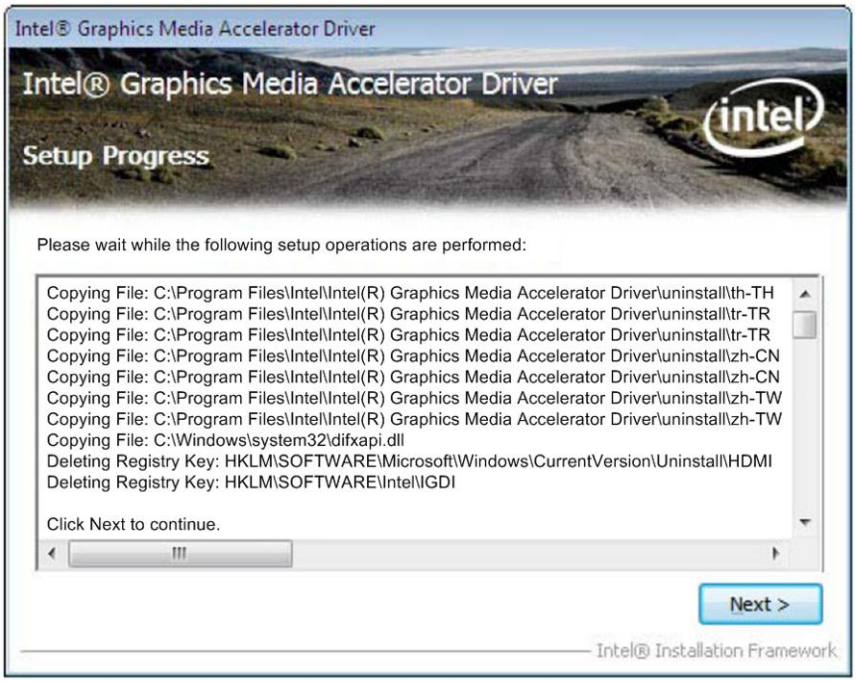
3. A Readme File Information screen appears to show you the system requirements and installation information. Click "Next" to next step.



4. Please wait while setup processes the following operations.



5. When the following screen appears, please click "Next".



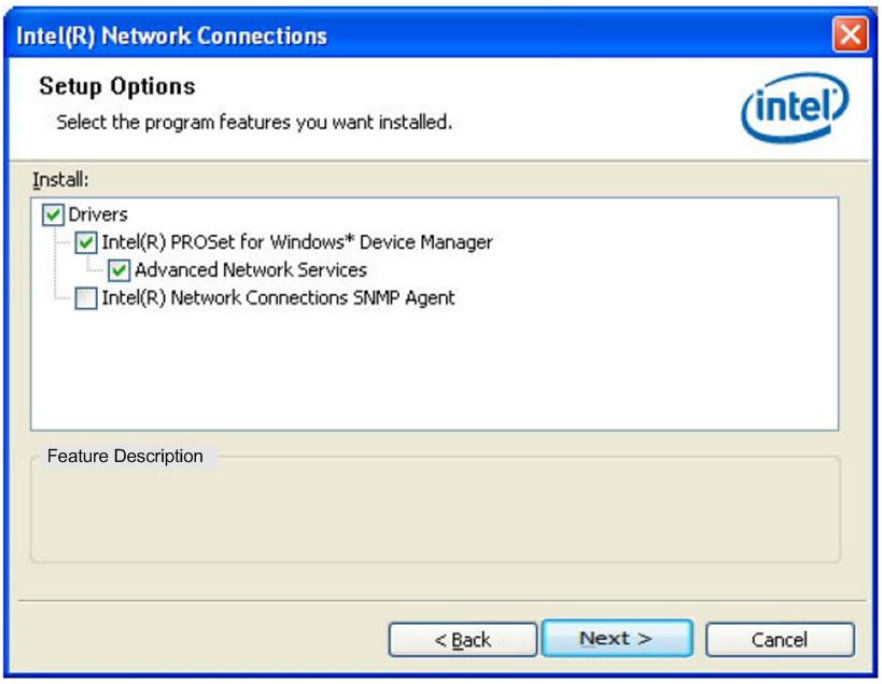
6. You are suggested to select "Yes, I want to restart this computer now". Click "Finish" to complete the setup process and reboot.

***NOTE**: After the computer reboots, the display is in extended mode. Please click hot key <Ctrl+Alt+F1> to switch display back to single mode.*

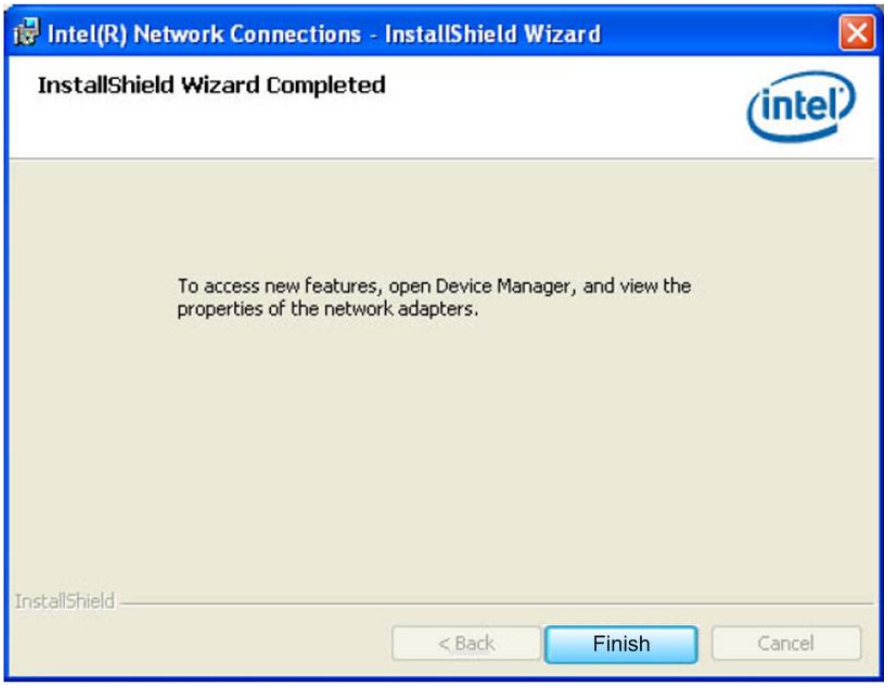
5.3 Installing Ethernet Driver

1. Unzip PROWin32 for ethernet driver from the driver directory in product information CD. Click "Next" to start the installation.

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

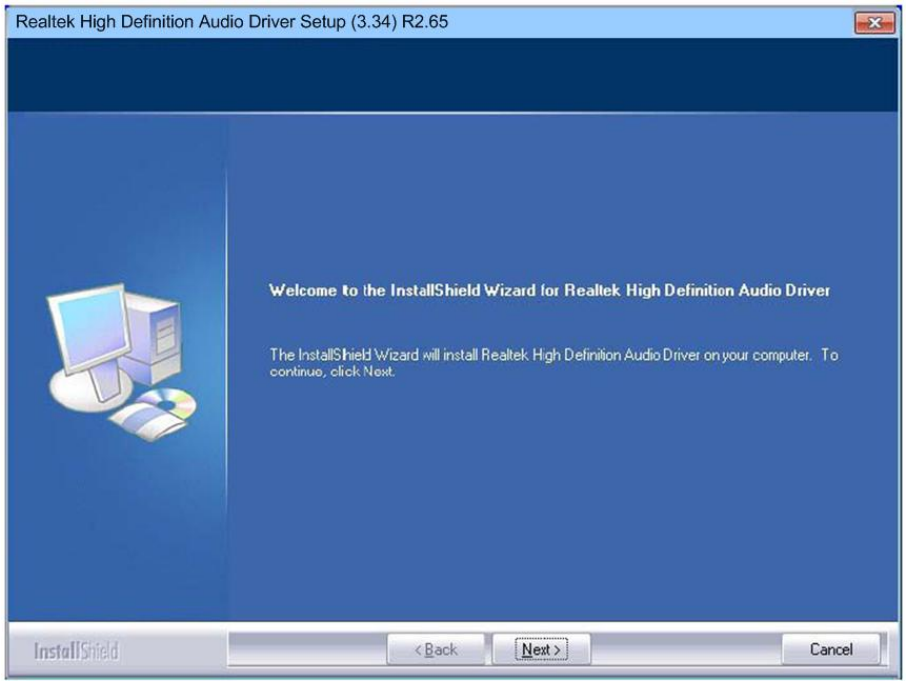


3. Click "Finish" to complete the installation.

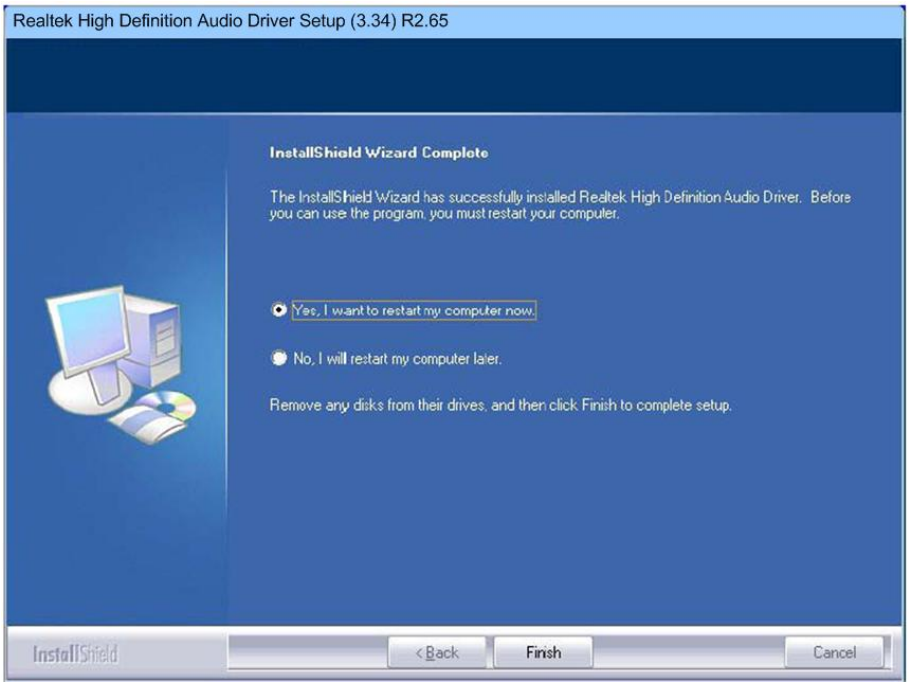


5.4 Installing Audio Driver

1. Run the setup.exe for audio from the driver directory in product information CD. Click "Next" to continue.



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



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Appendix A
Watchdog Timer

About Watchdog Timer

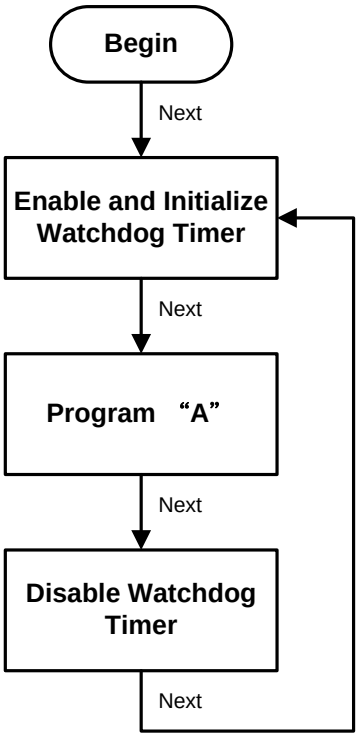
Software stability is major issue in most application. Some embedded systems are not watched by human for 24 hours. It is usually too slow to wait for someone to reboot when computer hangs. The systems need to be able to reset automatically when things go wrong. The watchdog timer gives us solution.

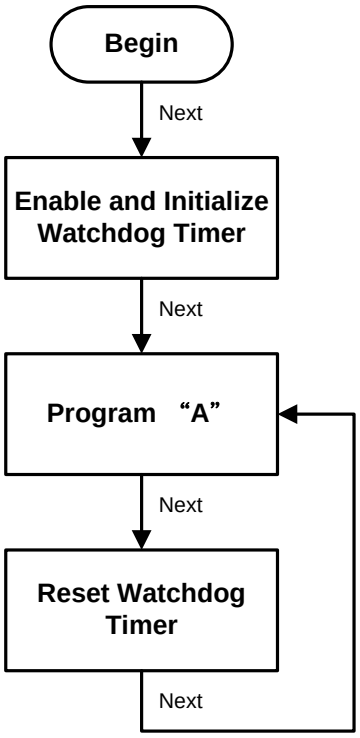
The watchdog timer is a counter that triggers a system reset when it counts down to zero from a preset value. The software starts counter with an initial value and must reset it periodically. If the counter ever reaches zero which means the software has crashed, the system will reboot.

How to Use Watchdog Timer

The I/O port base addresses of watchdog timer are 2E (hex) and 2F (hex). The 2E (hex) and 2F (hex) are address and data port respectively.

Assume that program A is put in a loop that must execute at least once every 10ms. Initialize watchdog timer with a value bigger than 10ms. If the software has no problems; watchdog timer will never expire because software will always restart the counter before it reaches zero.


Begin
Next
Enable and Initialize Watchdog Timer
Next
Program "A"
Next
Disable Watchdog Timer
Next


Begin
Next
Enable and Initialize Watchdog Timer
Next
Program "A"
Next
Reset Watchdog Timer
Next

Sample Program

Assembly sample code :

```
;Enable WDT:
mov    dx,2Eh
mov    al,87          ;Un-lock super I/O
out    dx,al
out    dx,al

;Select Logic device:
mov    dx,2Eh
mov    al,07h
out    dx,al
mov    dx,2Fh
mov    al,08h
out    dx,al

;Activate WDT:
mov    dx,2Eh
mov    al,30h
out    dx,al
mov    dx,2Fh
mov    al,01h
out    dx,al

;Set Second or Minute :
mov    dx,2Eh
mov    al,0F5h
out    dx,al
mov    dx,2Fh
mov    al,Nh          ;N=00h or 08h(see below Note)
out    dx,al

;Set base timer :
mov    dx,2Eh
mov    al,0F6h
```

```
out     dx,al
mov     dx,2Fh
mov     al,Mh           ;M=00h,01h,...FFh (hex),Value=0 to 255
out     dx,al           ;(see below Note)

;Disable WDT:
mov     dx,2Eh
mov     al,30h
out     dx,al
mov     dx,2Fh
mov     al,00h          ;Can be disabled at any time
out     dx,al
```

NOTE:

*If **N**=00h, the time base is set to second.*

***M** = time value*

00: Time-out Disable

01: Time-out occurs after 1 second

02: Time-out occurs after 2 seconds

03: Time-out occurs after 3 seconds

.

.

FFh: Time-out occurs after 255 seconds

*If **N**=08h, the time base is set to minute.*

***M** = time value*

00: Time-out Disable

01: Time-out occurs after 1 minute

02: Time-out occurs after 2 minutes

03: Time-out occurs after 3 minutes

.

.

FFh: Time-out occurs after 255 minutes

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