



USER MANUAL

# VIA AMOS-3006

Ultra-compact fanless system for  
embedded transportation applications  
in demanding environments



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## Regulatory Compliance

### FCC-A Radio Frequency Interference Statement

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 commercial environment. 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. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his personal expense.

### 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.

### Notice 2

Shielded interface cables and A.C. power cord, if any, must be used in order to comply with the emission limits.

### Notice 3

The product described in this document is designed for general use, VIA Technologies assumes no responsibility for the conflicts or damages arising from incompatibility of the product. Check compatibility issue with your local sales representatives before placing an order.



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With FCC Standards  
FOR HOME OR OFFICE USE



## Battery Recycling and Disposal

- Only use the appropriate battery specified for this product.
- Do not re-use, recharge, or reheat an old battery.
- Do not attempt to force open the battery.
- Do not discard used batteries with regular trash.
- Discard used batteries according to local regulations.



## Safety Precautions

- Always read the safety instructions carefully.
- Keep this User's Manual for future reference.
- All cautions and warnings on the equipment should be noted.
- Keep this equipment away from humidity.
- Put this equipment on a reliable flat surface before setting it up.
- Check the voltage of the power source and adjust to 110/220V before connecting the equipment to the power inlet.
- Do not place the power cord where people will step on it.
- Always unplug the power cord before inserting any add-on card or module.
- If any of the following situations arise, get the equipment checked by authorized service personnel:
  - The power cord or plug is damaged.
  - Liquid has entered into the equipment.
  - The equipment has been exposed to moisture.
  - The equipment is faulty or you cannot get it work according to User's Manual.
  - The equipment has been dropped and damaged.
  - The equipment has an obvious sign of breakage.
- Do not leave this equipment in extreme temperatures or in a storage temperature above 65°C (149°F). The equipment may be damaged.
- Do not leave this equipment in direct sunlight.
- Never pour any liquid into the opening. Liquid can cause damage or electrical shock.
- Do not place anything over the power cord.
- Do not cover the ventilation holes. The openings on the enclosure protect the equipment from overheating.

## Box Contents

- 1 x VIA AMOS-3006 system
- 1 x 4-pole Phoenix plug connector
- 1 x Screw pack for miniPCIe and mSATA modules
- 2 x Thermal pads for mSATA module and heatsink
- 1 x Screw pack for mounting
- 1 x Rubber feet pack

## Ordering Information

Part Number	Description
AMOS-3006-1Q12A1	1.2GHz VIA Eden® X4 CPU with fanless cooling and HDMI, VGA, 2 USB 3.0, 2 Lockable USB 2.0, 4 COM, 2 CAN, DIO, 2 Gigabit Ethernet, 2 miniPCIe, 9~30V DC-in power

## Optional Accessories

### Wireless Accessories

Part Number	Description
EMIO- 1542-00A1	DAUK-W8812 IEEE 802.11ac/a/b/g/n dual-band USB Wi-Fi module with assembly kit and antenna
EMIO-2531-00A1	VAB-820-W-M IEEE 802.11b/g/n miniPCIe Wi-Fi & Bluetooth module with assembly kit and antenna
EMIO-2550-00A1	3.75G HSPA/UMTS mobile broadband full size miniPCIe module with GPS, SIM card slot, assembly kit and antenna
EMIO-2551-02A0	3.75G HSPA/UMTS mobile broadband full size miniPCIe module (Europe only)
EMIO-2551-03A0	3.75G HSPA/UMTS mobile broadband full size miniPCIe module with GPS (Europe only)
EMIO-2573-00A0	4G LTE mobile broadband full size miniPCIe module with assembly kit and antenna pack (USA only)
EMIO-2573-01A0	4G LTE mobile broadband full size miniPCIe module with assembly kit and antenna pack (Europe only)
EMIO-2573-02A0	4G LTE mobile broadband full size miniPCIe module with assembly kit and antenna pack (Japan only)



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# 1. Product Overview

Speed up your commercial and industrial IoT and edge intelligence installations with the VIA AMOS-3006. This ruggedized, fanless system is designed to offer great performance and a rich I/O feature set in the most demanding embedded in-vehicle applications that involve harshest environments.

In addition to supporting a wide operating temperature range from -20°C to 60°C and a wide voltage input from 9 ~ 30V, the VIA AMOS-3006 also offers rich array of networking, connectivity, and I/O features, including dual Gigabit Ethernet, four COM ports, and two CAN bus ports.

Fully compatible with a wide range of Microsoft® Windows® operating systems, including Windows 10 IoT, as well as the popular Linux distributions.

The VIA AMOS-3006 is powered by high performance 1.2GHz VIA Eden® X4 processor, and its housing is made of a heavy-duty steel body chassis and a robust aluminum alloy top cover that provides high stability which can withstand shock and vibration.

## 1.1 Key Features

### 1.1.1 High-Performance

The VIA AMOS-3006 system is powered by a VIA Eden X4 processor that provides a full range of rich features including superb multi-tasking performance and consistent performance in a host of connected device applications.

### 1.1.2 Fanless and Ruggedized Chassis

The VIA AMOS-3006 delivers fanless operation in a sealed aluminum alloy chassis that also act as a thermal solution. The ruggedized chassis design makes it suitable for installations in a space-critical environments, while also ensuring maximum reliability.

### 1.1.3 Optimized Integration with Multiple I/O Access

With front and back panel I/O access, the VIA AMOS-3006 can be easily configured to support a wide variety of applications with easy integration, and quick setup.

### 1.1.4 Storage Expansion

The VIA AMOS-3006 comes with an mSATA slot that enables to have flexible storage of mSATA flash drive.

### 1.1.5 Networking Support

The VIA AMOS-3006 is equipped with two RJ-45 ports that supports high-speed data Gigabit Ethernet.

### 1.1.6 Support for a Wide Range of Power Sources

The VIA AMOS-3006 supports a wide range of input power from 9~30V DC. The flexibility of power input enables the VIA AMOS-3006 to be deployable in a broad variety of automation environments.

### 1.1.7 Wide Range of Operating Temperatures

The VIA AMOS-3006 carries a qualified thermal performance design which allows a wide range of operating temperature - from -20°C to 60°C, suitable for critical applications.

### 1.1.8 Shock and Vibration Resistant

The VIA AMOS-3006 is shock resistant for maximum reliability.

### 1.1.9 Mounting Solution

The VIA AMOS-3006 supports multiple methods for mounting the chassis securely. It can be mounted to any flat surface, or even to VESA mountable surfaces with the VESA mounting kit.

### 1.1.10 Embedded Operating System Ready

The VIA AMOS-3006 is fully compatible with Microsoft® Windows 10, Windows 8.1, Windows 8, Windows 7, Windows 10 IoT, Windows Embedded Standard 7, and Linux.

## 1.2 Product Specifications

### Processor

- 1.2GHz VIA Eden® X4

### Chipset

- VIA VX11 Media System Processor

### BIOS

- AMI BIOS, 32Mbit Flash memory

### System Memory

- 1 DDR3 1333 SDRAM slot

### Storage

- 1 x mSATA slot

### Graphics

- Integrated C-640 DX11 3D/2D graphics with MPEG-2, WMV9, VC-1 and H.264 video decoding accelerator

### Audio

- VIA VT2021 High Definition Audio Codec

### Display I/O

- 1 x HDMI port
- 1 x VGA port supporting VGA resolutions up to 2048x1536 pixel
- Dual independent VGA + HDMI display at different resolutions, pixel depths, and refresh rates

### USB

- 2 x USB 3.0 ports
- 2 x USB 2.0 ports (lockable USB ports for secure connections)

### LAN

- 2 x Realtek RTL8111G/H PCIe Gigabit Ethernet controllers

### COM

- Fintek F81865

### CAN

- 2 x MCP2518

### Expansion I/O

- 2 x MiniPCIe slots (1 with PCIe + USB 2.0 signal, 1 with USB 2.0 signal only)

**Front Panel I/O**

- 2 x Lockable USB 2.0 ports
- 2 x COM ports for RS-232/422/485
- 2 x COM ports for RS-232
- 1 x Red LED for HDD activity
- 1 x Green LED for power status

**Back Panel I/O**

- 1 x HDMI port
- 1 x VGA port
- 2 x USB 3.0 ports
- 2 x Gigabit Ethernet ports
- 1 x DIO port for 8-bit GPIO
- 2 x CAN bus ports (9-pin D-sub connectors)
- 2 x Audio jacks: Line-out and Mic-in
- 1 x 4-pole Phoenix DC jack

**Power Supply**

- 9 ~ 30V DC-in (typical: 19W)

**Operating System**

- Windows 10/8.1/8/7, Windows 10 IoT, Windows Embedded Standard 7, Linux

**VIA Smart ETK**

- BIOS flash tool, Wake-on LAN, Keyboard power-on, Timer power-on, Power Management, Watchdog timer, GPIO

**Operating Temperature**

- -20°C ~ 60°C with qualified industrial grade mSATA and DRAM

**Operating Humidity**

- 0% ~ 95% (relative humidity; non-condensing)

**Storage Temperature**

- -20°C ~ 65°C

**Vibration Loading During Operation**

- With mSATA Flash Drive: 3Grms, IEC 60068-2-64, random, 5 ~ 500Hz, 1hr/axis

**Shock During Operation**

- With mSATA Flash Drive: 50G, IEC 60068-2-27, half sine, 11ms duration

**Mechanical Construction**

- Aluminum top chassis housing
- Metal chassis housing
- Dual removable front & rear metal face plates

**Mounting**

- Wall/DIN Rail/VESA mountable

**Dimensions**

- 250mm(W) x 54.1mm(H) x 109.8mm(D) (9.8" x 2.1" x 4.3")

**Weight**

- 1.3kg (2.87lbs)

**Compliance**

- CE, FCC, E-Mark

**Note:**

As the operating temperature provided in the specifications is a result of testing performed in a testing chamber, a number of variables can influence this result. Please note that the working temperature may vary depending on the actual situation and environment. It is highly recommended to execute a solid testing program and take all variables into consideration when building the system. Please ensure that the system is stable at the required operating temperature in terms of application.

### 1.3 Layout Diagram

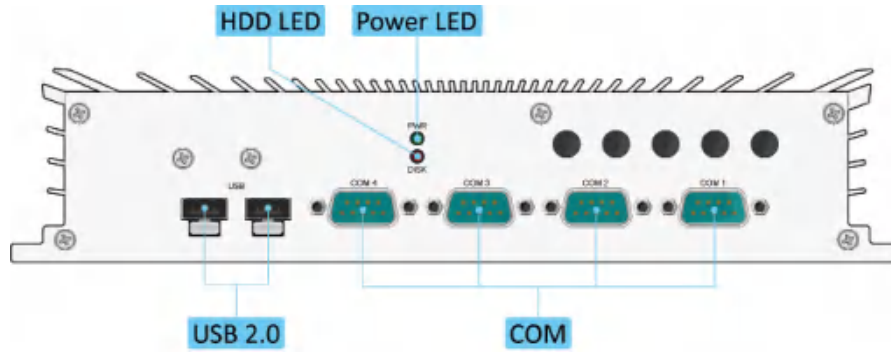


Figure 1: Front panel I/O layout

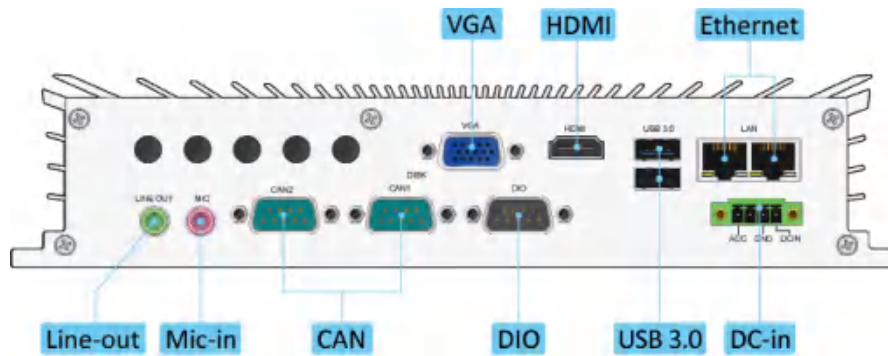


Figure 2: Back panel I/O layout

## 1.4 Product Dimensions

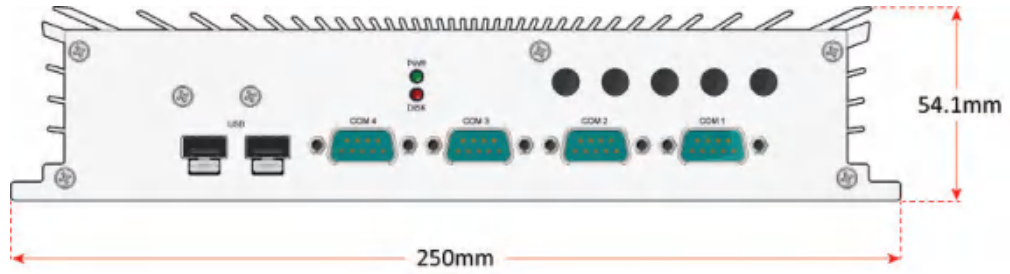


Figure 3: Dimensions of the VIA AMOS-3006 (front view)

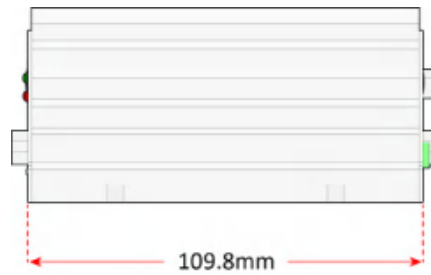


Figure 4: Dimensions of the VIA AMOS-3006 (side view)



## 2. External I/O Pin Descriptions and Functionality

The VIA AMOS-3006 has a wide selection of interfaces, and includes a selection of frequently-used ports as part of the external I/O coastline.

### 2.1 HDMI® Port

The VIA AMOS-3006 is equipped with one HDMI port on the back panel. A HDMI port Type A receptacle connector provides connection to High Definition video and digital audio using a single cable. The pinouts of the HDMI port are shown below.

Pin	Signal	Pin	Signal
1	TX2+	2	GND
3	TX2-	4	TX1+
5	GND	6	TX1-
7	TX0+	8	GND
9	TX0-	10	TXC+
11	GND	12	TXC-
13	NC	14	NC
15	DDCSCL	16	DDCSDA
17	GND	18	+5V
19	Hot Plug Detect		



Figure 5: HDMI port diagram

Table 1: HDMI port pinouts

### 2.2 USB 3.0 Ports

The VIA AMOS-3006 is equipped with two USB 3.0 ports on the back panel. Each USB 3.0 port has a maximum data transfer rate of up to 5Gbps and is backwards compatible with the USB 2.0 specification. The USB ports provides complete Plug and Play and hot swap capabilities for external devices. The pinouts of the USB 3.0 ports are shown below.

USB 3.0 Port 1		USB 3.0 Port 2	
Pin	Signal	Pin	Signal
1	+5V	1	+5V
2	Data1-	2	Data2-
3	Data1+	3	Data2+
4	GND	4	GND
5	RX1-	5	RX2-
6	RX1+	6	RX2+
7	GND	7	GND
8	TX1-	8	TX2-
9	TX1+	9	TX2+

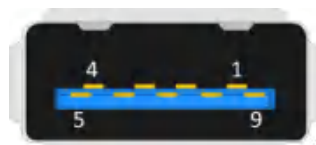


Figure 6: USB 3.0 port diagram

Table 2: USB 3.0 ports pinouts

## 2.3 Lockable USB 2.0 Ports

The VIA AMOS-3006 is equipped with two lockable USB 2.0 ports on the front panel which gives complete Plug and Play and hot swap capability for external devices. The USB 2.0 interface complies with USB UHCI, Rev. 2.0. The pinouts of the USB 2.0 ports are shown below.

USB1 Port		USB2 Port	
Pin	Signal	Pin	Signal
1	VUSB0	1	VUSB0
2	USBDT3-	2	USBDT2-
3	USBDT3+	3	USBDT2+
4	GND	4	GND



Figure 7: Lockable USB 2.0 port diagram

Table 3: Lockable USB 2.0 ports pinouts



**Note:**

To unlock the USB device from the lockable USB 2.0 port, push the tab on the lockable port then pull the USB device. If necessary, use a tip of the screw driver tool or any thin rod to push the tab.

## 2.4 Gigabit Ethernet Ports

The VIA AMOS-3006 comes with two Gigabit Ethernet ports on the back panel which uses an 8 Position and 8 Contact (8P8C) receptacle connector commonly known as RJ-45. Each port is fully compliant with the IEEE 802.3 (10BASE-T), 802.3u (100BASE-TX), and 802.3ab (1000BASE-T) standards. The pinouts of the Gigabit Ethernet port are shown below.

Ethernet Port 1		Ethernet Port 2	
Pin	Signal	Pin	Signal
1	LAN1_TD0+	1	LAN2_TD0+
2	LAN1_TD0-	2	LAN2_TD0-
3	LAN1_TD1+	3	LAN2_TD1+
4	LAN1_TD1-	4	LAN2_TD1-
5	LAN1_TD2+	5	LAN2_TD2+
6	LAN1_TD2-	6	LAN2_TD2-
7	LAN1_TD3+	7	LAN2_TD3+
8	LAN1_TD3-	8	LAN2_TD3-

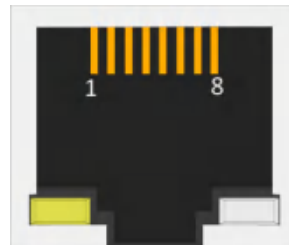


Figure 8: Gigabit Ethernet port diagram

Table 4: Gigabit Ethernet ports pinouts

Each Gigabit Ethernet port (RJ-45) is equipped with two LED indicators on the front side to show its Active/Link status and Speed status.

	Active LED (Left LED on RJ-45 port)	Link LED (Right LED on RJ-45 port)
Link off	LED is off	LED is off
Speed_10Mbit	Orange flash	LED is off
Speed_100Mbit	Orange flash	LED is on in Red color
Speed_1000Mbit	Orange flash	LED is on in Green color

Table 5: Gigabit Ethernet port LED color definition

## 2.5 Audio Jacks

The VIA AMOS-3006 offers High Definition audio through two 3.5mm TRS jacks on the back panel: Line-out and Mic-in. The Line-out jack is used for connecting to external speakers or headphones. The Mic-in jack is used for connecting to a microphone. . The diagram of the audio jacks is shown below.



Figure 9: Audio jacks diagram

## 2.6 LED Indicators

There are two LEDs on the front panel of the VIA AMOS-3006 that indicates the status of the system.

- Power LED (PWR) is green and indicates the status of the system's power.
- HDD LED (DISK) is red and indicates the storage activity.



Figure 10: LED indicators diagram

## 2.7 VGA Port

The VIA AMOS-3006 provides a high resolution VGA interface through DE-15 female connector on the back panel. It supports resolutions up to 2048 x 1536 pixels. The pinouts of the VGA port are shown below.

Pin	Signal	Pin	Signal
1	Red	9	+5V
2	Green	10	GND
3	Blue	11	NC
4	NC	12	DDC_SPD
5	GND	13	HSync
6	GND	14	VSync
7	GND	15	DDC_SCL
8	GND		



Figure 11: VGA port diagram

Table 6: VGA port pinouts

## 2.8 COM Ports

The VIA AMOS-3006 is equipped with four COM ports on the front panel labeled as 'COM 1', 'COM 2', 'COM 3' and 'COM 4'. The COM 1 and COM 2 ports can be configured as RS-232, RS-422, or RS-485 mode. The COM 3 and COM 4 ports' default settings are RS-232 mode. To configure the COM 1 and COM 2 ports, the user needs to setup it in the BIOS. The COM ports pinouts are shown below.

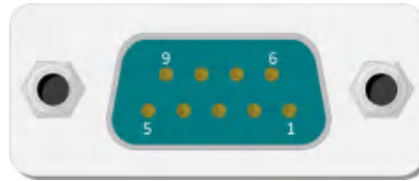


Figure 12: COM port diagram

COM 1		COM 2		COM 3		COM 4	
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	COM_DCD1	1	COM_DCD2	1	COM_DCD3	1	COM_DCD4
2	COM_RXD1	2	COM_RXD1	2	COM_RXD3	2	COM_RXD4
3	COM_TXD1	3	COM_TXD2	3	COM_TXD3	3	COM_TXD4
4	COM_DTR1	4	COM_DIR2	4	COM_DTR3	4	COM_DTR4
5	GND	5	GND	5	GND	5	GND
6	COM_DSR1	6	COM_DSR2	6	COM_DSR3	6	COM_DSR4
7	COM_RTS1	7	COM_RST2	7	COM_RTS3	7	COM_RTS4
8	COM_CTS1	8	COM_CTS2	8	COM_CTS3	8	COM_CTS4
9	COM_R11	9	COM_R12	9	COM_R13	9	COM_R14

Table 7: COM ports pinouts

## 2.9 DIO Port

The VIA AMOS-3006 is equipped with a DIO port located on the back panel. The DIO port offers a Digital I/O communication interface to support 8-bit GPIO. The pinouts of the DIO port are shown below.

Pin	Signal
1	GPIO_50
2	GPIO_52
3	GPIO_54
4	GPIO_56
5	GND
6	GPIO_51
7	GPIO_53
8	GPIO_55
9	GPIO_57

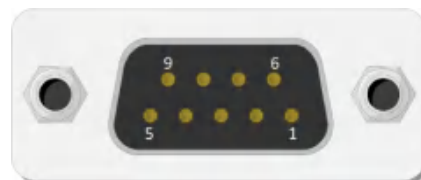


Figure 13: DIO port diagram

Table 8: DIO port pinouts

## 2.10 CAN Bus Ports

The VIA AMOS-3006 is equipped with two CAN bus ports located on the back panel labeled as 'CAN1' and 'CAN2'. Each CAN bus port supports one CAN bus connection. The CAN bus ports supports protocol specification Version 2.0 B. The pinouts of the CAN bus ports are shown below.

CAN 1 Port		CAN 2 Port	
Pin	Signal	Pin	Signal
1	NC	1	NC
2	CAN1_L	2	CAN2_L
3	GND	3	GND
4	NC	4	NC
5	NC	5	NC
6	GND	6	GND
7	CAN1_H	7	CAN2_H
8	NC	8	NC
9	NC	9	NC

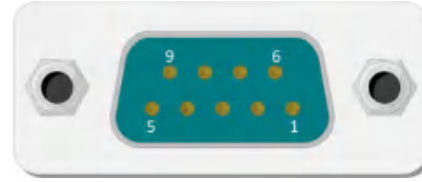


Figure 14: CAN bus port diagram

Table 9: CAN bus ports pinouts

## 2.11 DC-in Jack

The VIA AMOS-3006 integrates a 4-pole Phoenix DC-in jack that carries a 9V ~ 30V DC external power input. The pinouts of the 4-pole Phoenix DC-in jack are shown below.

Pin	Signal
1	DC-IN
2	GND
3	NC
4	ACC



Figure 15: DC-in jack diagram

Table 10: DC-in jack pinouts

### 3. Onboard I/O

This chapter provides information about the onboard connectors on the VIA AMOS-3006.

#### 3.1 MiniPCIe Slots

The VIA AMOS-3006 is equipped with two miniPCIe slots. The location of the miniPCIe slots are shown below.

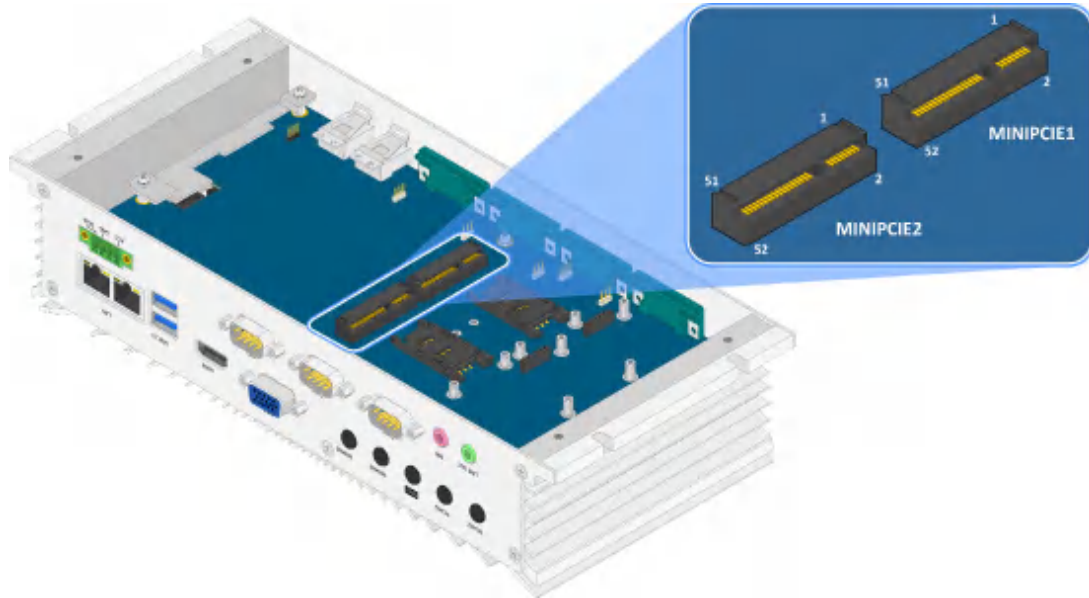


Figure 16: MiniPCIe slots diagram

#### 3.2 mSATA Slot

The VIA AMOS-3006 comes with an mSATA slot which supports mSATA flash drive module to have a flexible storage. The mSATA slot is labeled as 'MSATA'. The location of the mSATA slot is shown below.

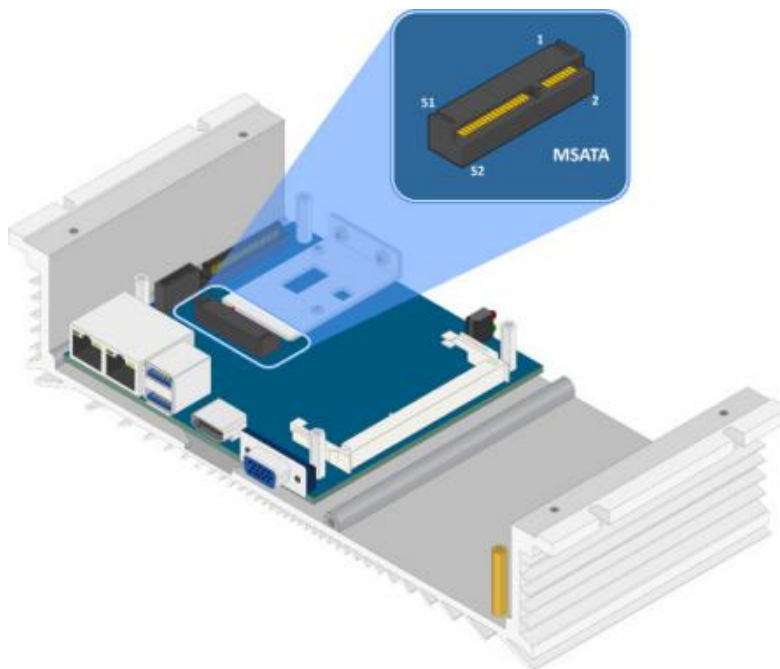


Figure 17: mSATA slot diagram

### 3.3 DDR3 SODIMM Slot

The AMOS-3006 comes with one DDR3 SODIMM slot labeled as 'SODIMM' that supports non-ECC DDR3 1333 SDRAM SODIMM memory module. The DDR3 SODIMM memory slot can accommodate up to 8GB memory size. The location of the DDR3 SODIMM slot is shown below.

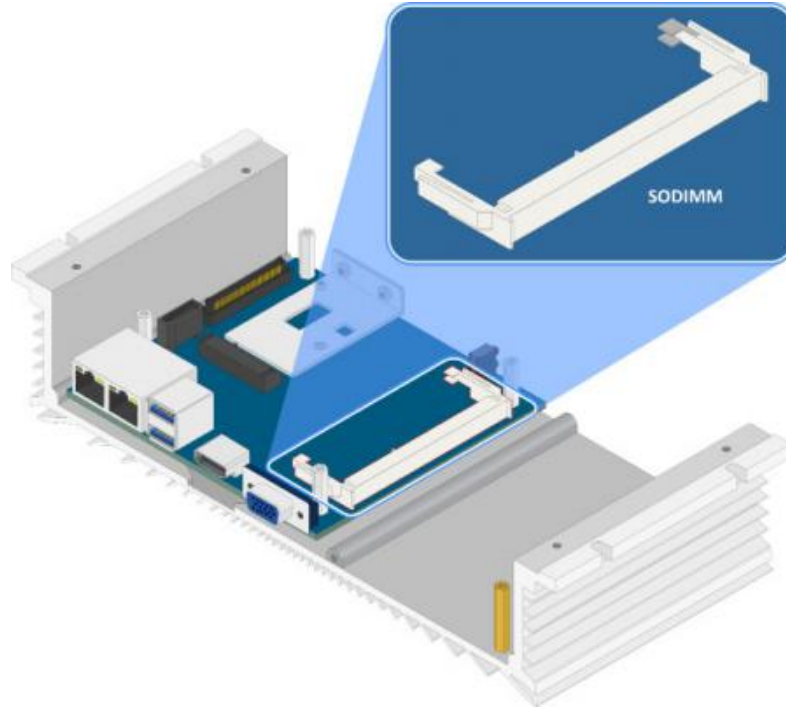


Figure 18: DDR3 SODIMM slot diagram

## 4. Onboard Jumper

### Jumper Description

A jumper consists of a pair of conductive pins used to close in or bypass an electronic circuit to set up or configure a particular feature using a jumper cap. The jumper cap is a small metal clip covered by plastic. It performs like a connecting bridge to short (connect) the pair of pins. The usual colors of the jumper cap are black/red/blue/white/yellow.

### Jumper Setting

There are two settings of the jumper pin: 'Short and Open'. The pins are 'Short' when a jumper cap is placed on the pair of pins. The pins are 'Open' if the jumper cap is removed.

In addition, there are jumpers that have three or more pins, and some pins are arranged in series. In case of a jumper with three pins, place the jumper cap on pin 1 and pin 2 or pin 2 and 3 to Short it.

Some jumpers size are small or mounted on a crowded location on the board that makes it difficult to access. Therefore, using a long-nose plier in installing and removing the jumper cap is very helpful.

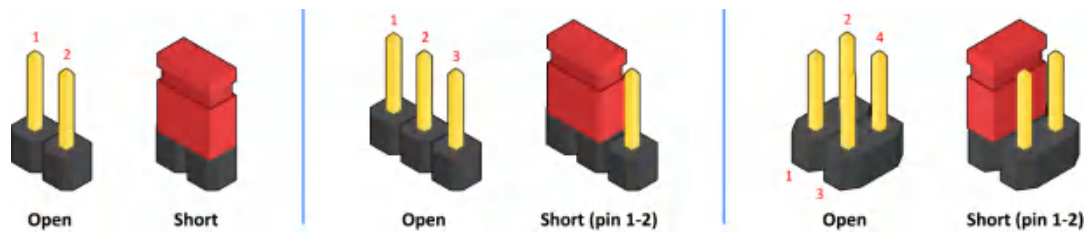


Figure 19: Jumper settings example



**Caution:**

Make sure to install the jumper cap on the correct pins. Installing it on the wrong pins might cause damage and malfunction.



## 4.1 USB 2.0 Power Type Jumper

The USB 2.0 power type jumper labeled as 'VUSB\_SEL1' controls the power type delivered to the lockable USB 2.0 ports on the front panel. The power can be set either on +5VSUS (Standby power) or +5V. The +5VSUS is the default setting. The VUSB\_SEL1 jumper settings are shown below.

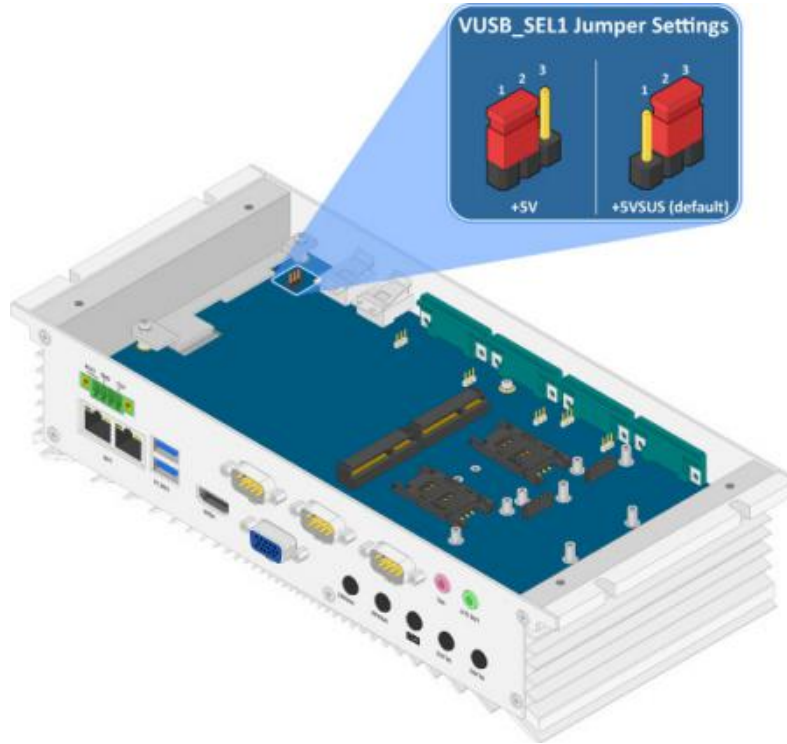


Figure 20: USB 2.0 power type jumper diagram

VUSB_SEL1 Settings	Pin 1	Pin 2	Pin 3
+5V	Short	Short	Open
+5VSUS (default)	Open	Short	Short

Table 11: USB 2.0 power type jumper settings

## 5. Hardware Installation

This chapter provides information about the hardware installation procedures. It is recommended to use a grounded wrist strap before handling computer components. Electrostatic discharge (ESD) can damage some components.

### 5.1 Installing the DDR3 SODIMM Memory

#### Step 1

Remove the six screws of the bottom cover plate, and then gently lift up the bottom plate.

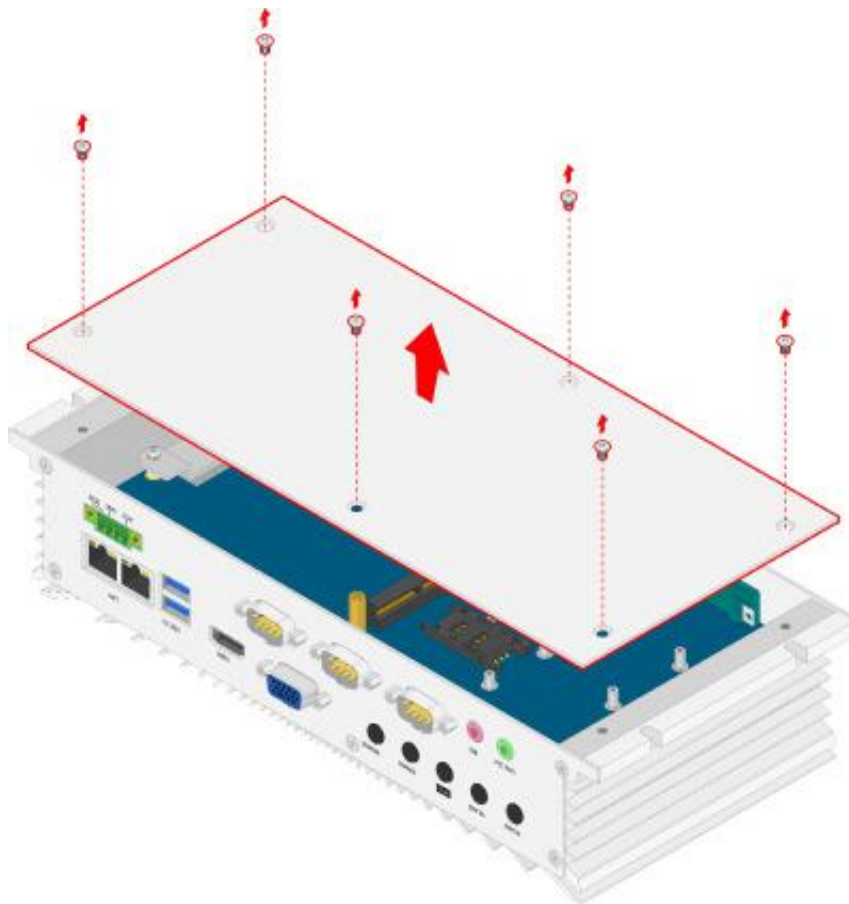


Figure 21: Removing the bottom plate cover

**Step 2**

Remove all screws on the front and back panel plates. Then remove all hex standoff screws of the VGA, DIO, CAN bus and COM ports as shown in the figures below.

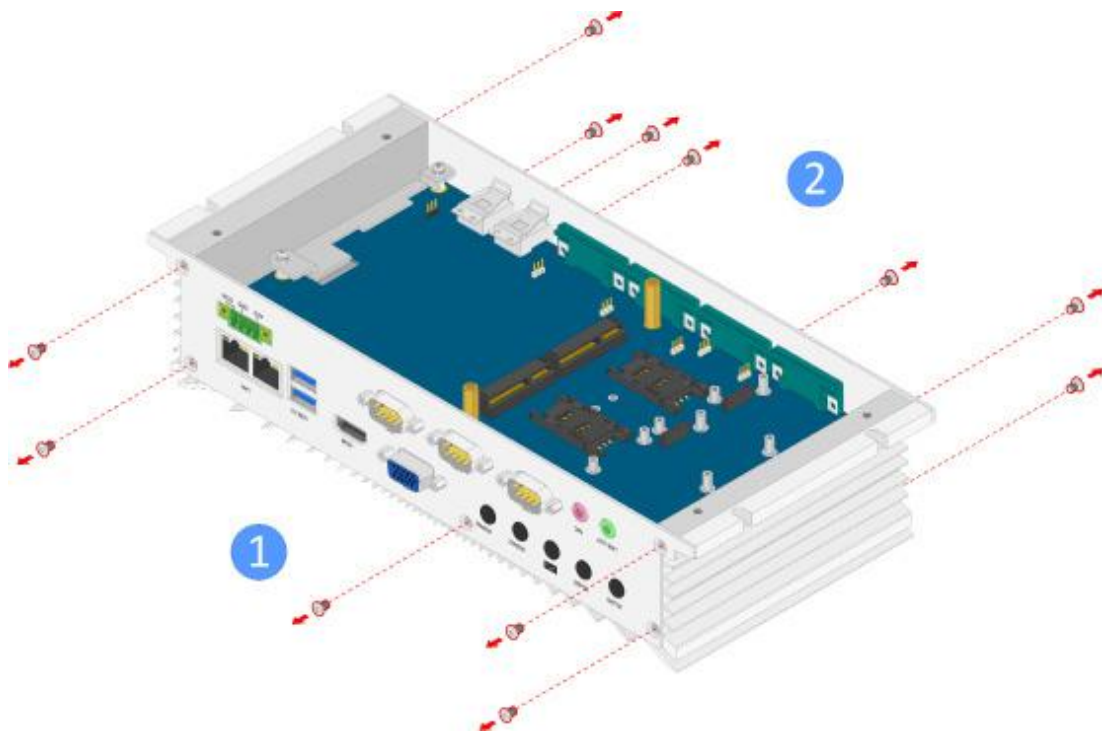


Figure 22: Unscrewing the front and back panel plates

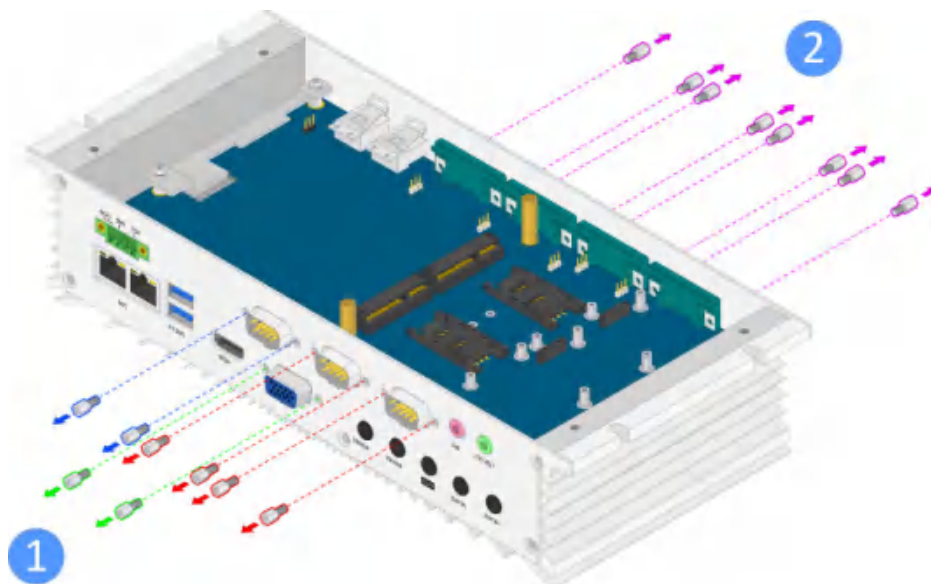


Figure 23: Removing all the hex standoff screws of the VGA, DIO, CAN bus and COM ports

**Step 3**

Gently detach the front and back panel plates from the chassis.

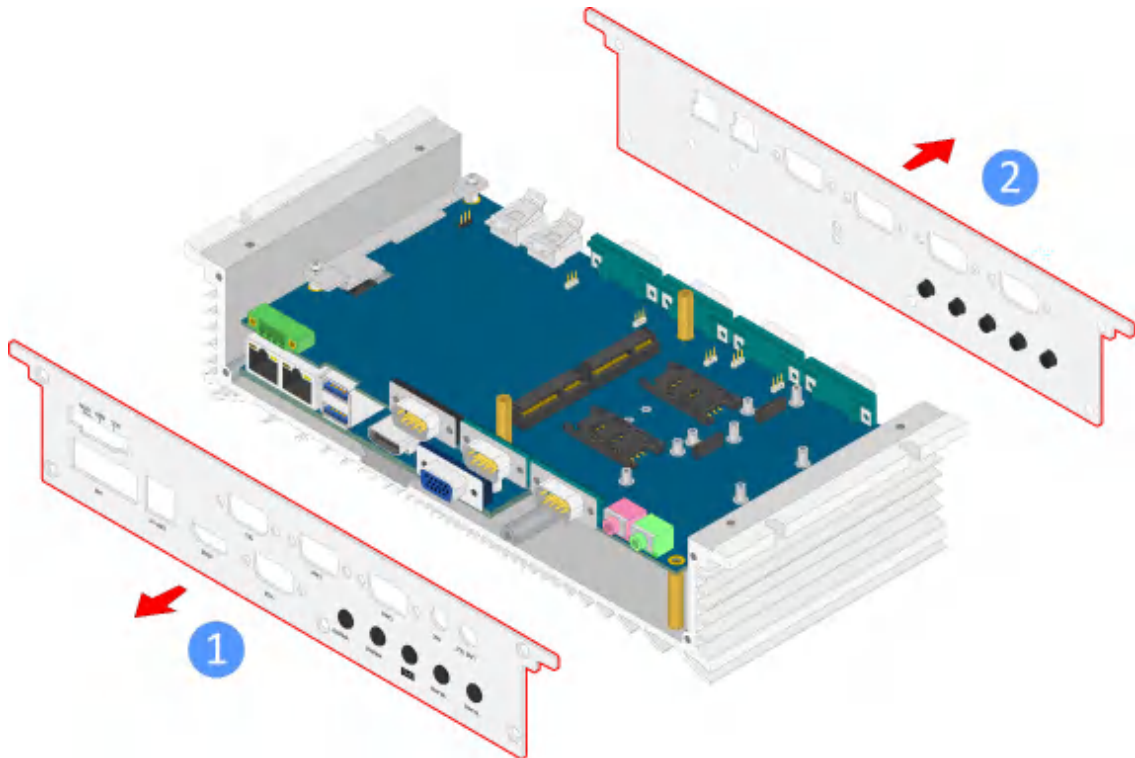


Figure 24: Removing the front and back panel plates

**Step 4**

Remove the four screws and two hex standoff screws on the VIA EMIO-3006 daughterboard.

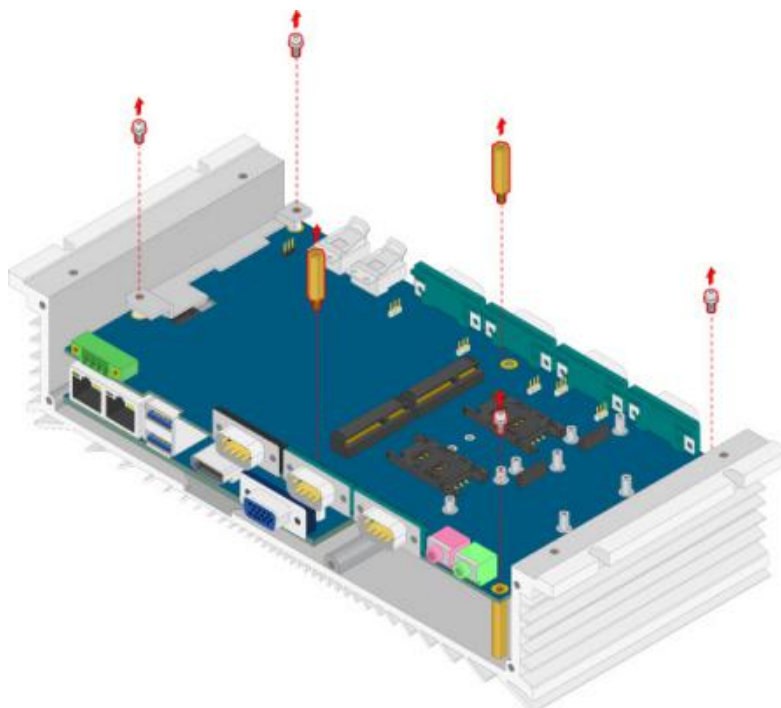


Figure 25: Unscrewing the VIA EMIO-3006 daughterboard

**Step 5**

Remove the anti-vibration bracket, and then remove its two hex standoff screws.

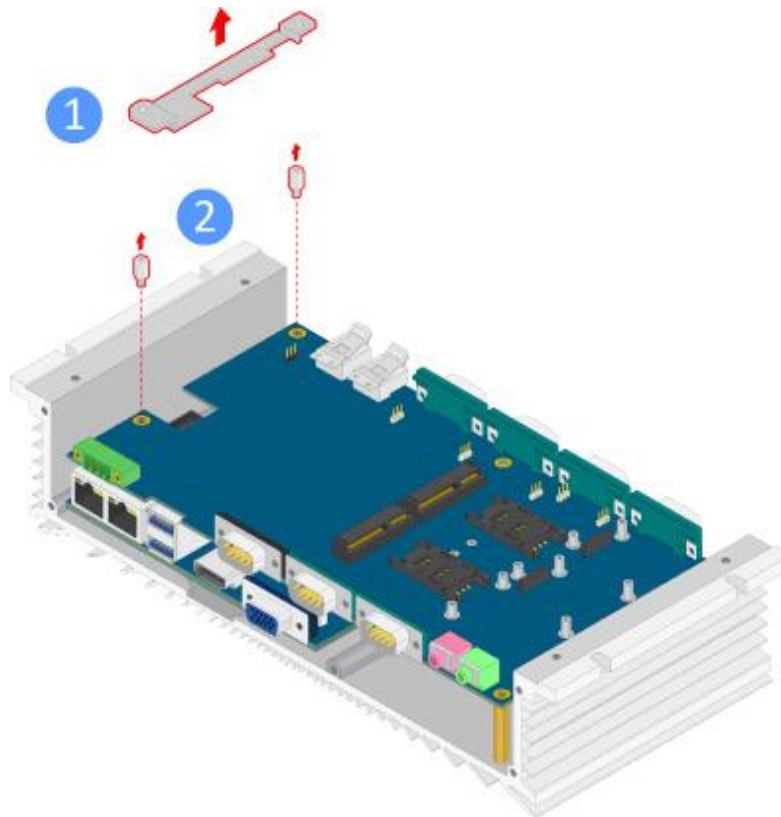


Figure 26: Removing the anti-vibration bracket and two hex standoff screws

**Step 6**

Pull up the VIA EMIO-3006 daughterboard to detach it from the mainboard (VIA EITX-2004).

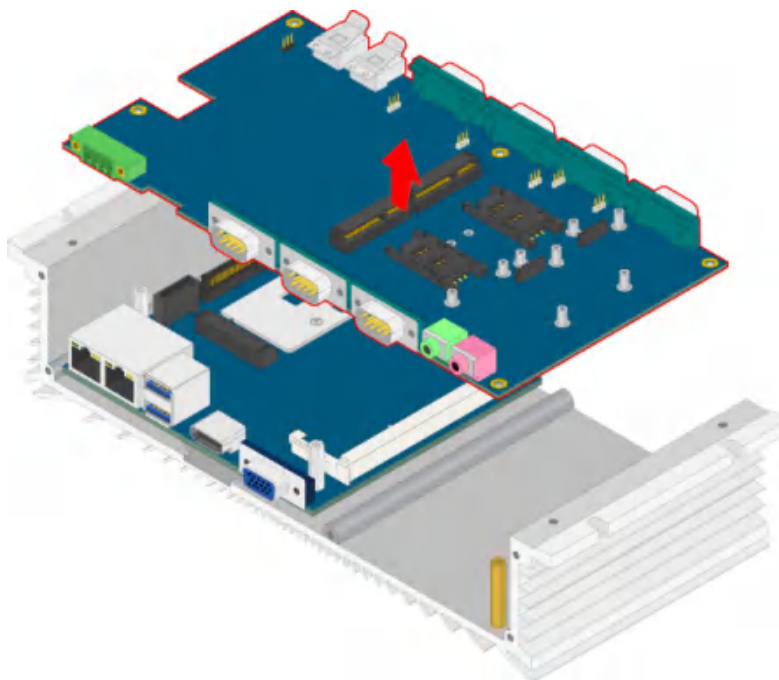


Figure 27: Removing the VIA EMIO-3006 daughterboard

**Step 7**

Align the notch on the DDR3 SODIMM memory module with the counterpart on the DDR3 SODIMM slot. Then insert the DDR3 SODIMM memory module at a 30° angle.

**Step 8**

Push down the DDR3 SODIMM memory module until the locking clips lock the module into place.

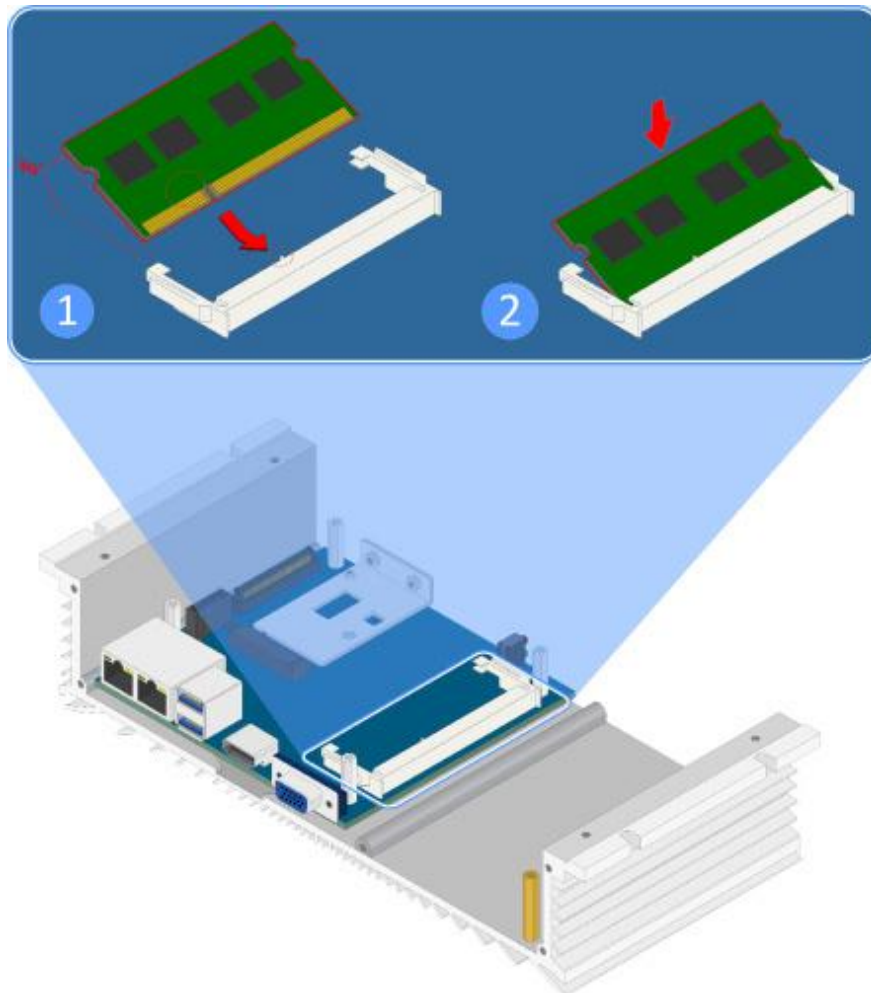


Figure 28: Installing the DDR3 SODIMM memory module

**Step 9**

Reinstall the VIA EMIO-3006 daughterboard, anti-vibration and its hex standoff screws, front and back panel plates, and the bottom plate cover.

## 5.2 Installing the mSATA Flash Drive Module

**Note:**

It is highly suggested to use Transcend's mSATA flash drive module.

**Step 1**

Prepare the mSATA thermal pads provided in the package.

**Step 2**

Peel off the bottom protective (plastic) cover of mSATA thermal pad. Paste the thermal pad onto the controller chip on mSATA module.

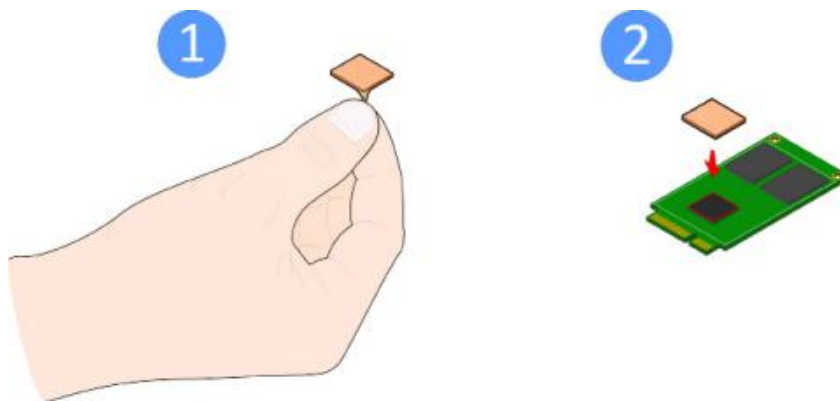


Figure 29: Installing the mSATA thermal pad

**Step 3**

Peel off the remaining protective (plastic) cover of the mSATA thermal pad.

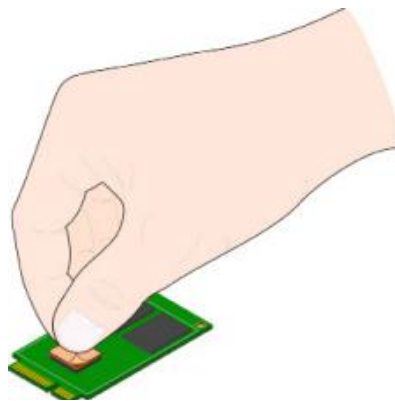


Figure 30: Peeling off the protective plastic cover of mSATA thermal pad

**Step 4**

Flip over the mSATA module. Align the notch on the mSATA module with the counterpart on the mSATA slot. Then insert the module at a 30° angle.

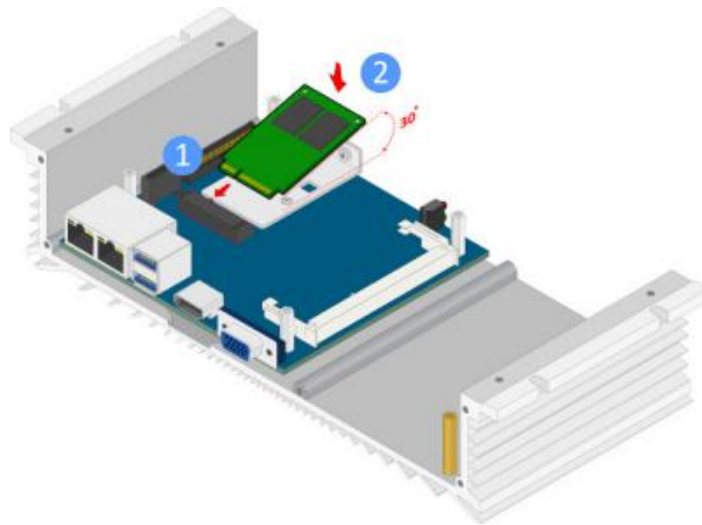


Figure 31: Inserting the mSATA module

**Step 5**

Once the mSATA module has been fully inserted, push down the module until the screw hole is aligned with the standoff hole. Then secure the module with the provided screw.

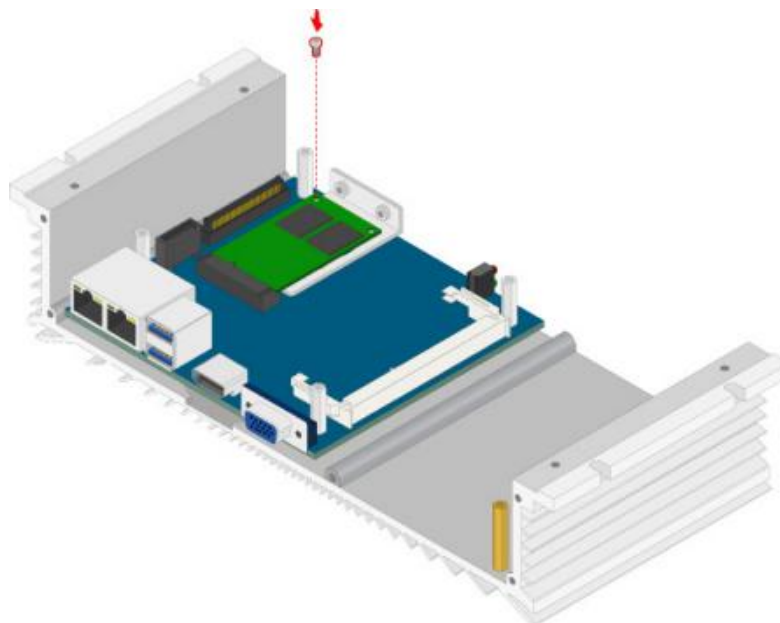


Figure 32: Securing the mSATA module



**Step 6**

Install the thermal pad for the mSATA heatsink as shown in the figure below. Make sure to removed the protective (plastic) cover of the thermal pad.

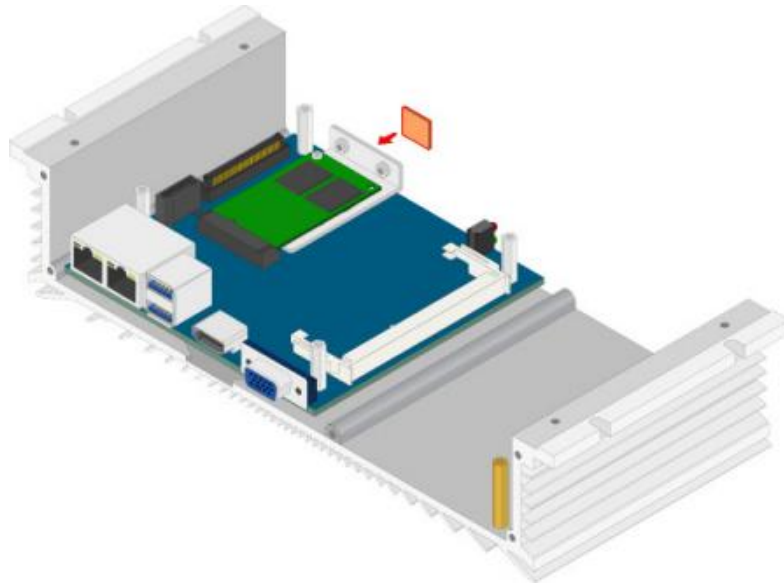


Figure 33: Installing the thermal pad on mSATA heatsink

**Step 7**

Reinstall the VIA EMIO-3006 daughterboard, anti-vibration bracket and its hex standoff screws, front and back panel plates, and the bottom plate cover.

## 5.3 Installing the Rubber Feet

### Step 1

On the bottom side of the VIA AMOS-3006, identify the area where to install the rubber feet.

### Step 2

Attach each rubber foot. Firmly press it down to ensure the rubber foot is properly in place.

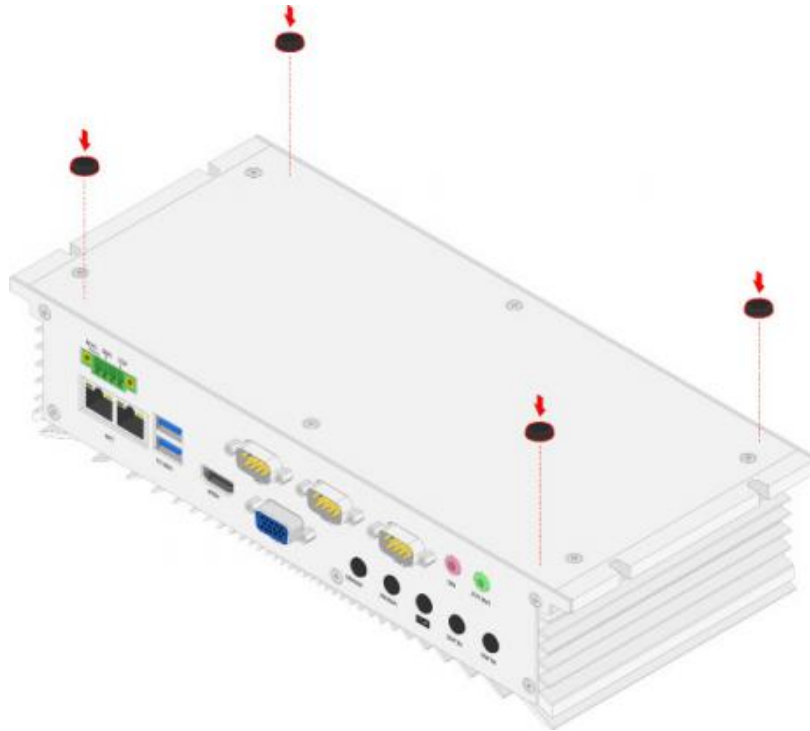


Figure 34: Installing the rubber feet

## 6. BIOS Setup

This chapter gives a detailed explanation of the BIOS setup functions.

### 6.1 Entering the BIOS Setup Utility

Power on the computer and press Delete during the beginning of the boot sequence to enter the BIOS Setup Utility. If the entry point has passed, restart the system and try again.

### 6.2 Control Keys

<b>Up</b>	Move up one row
<b>Down</b>	Move down one row
<b>Left</b>	Move to the left in the navigation bar
<b>Right</b>	Move to the right in the navigation bar
<b>Enter</b>	Access the highlighted item / Select the item
<b>+<sup>1</sup></b>	Increase the numeric value
<b>-<sup>1</sup></b>	Decrease the numeric value
<b>F1</b>	General help <sup>2</sup>
<b>F2</b>	Restore the previous CMOS value
<b>F3</b>	Load optimized defaults
<b>F4</b>	Save all the changes and exit
<b>Esc</b>	Jumps to the Exit screen or returns to the previous screen

**Notes:**

1. Must be pressed using the 10-key pad.
2. The General help contents are only for the Status Page and Option Page setup menus.

### 6.3 Getting Help

The BIOS Setup Utility provides a 'General Help' screen. This screen can be accessed at any time by pressing F1. The help screen displays the keys for using and navigating the BIOS Setup Utility. Press Esc to exit the help screen.

## 6.4 Main Menu

The Main menu screen is the default screen that is shown when the BIOS Setup Utility is launched. This screen can be accessed by traversing the navigation bar to the 'Main' label.

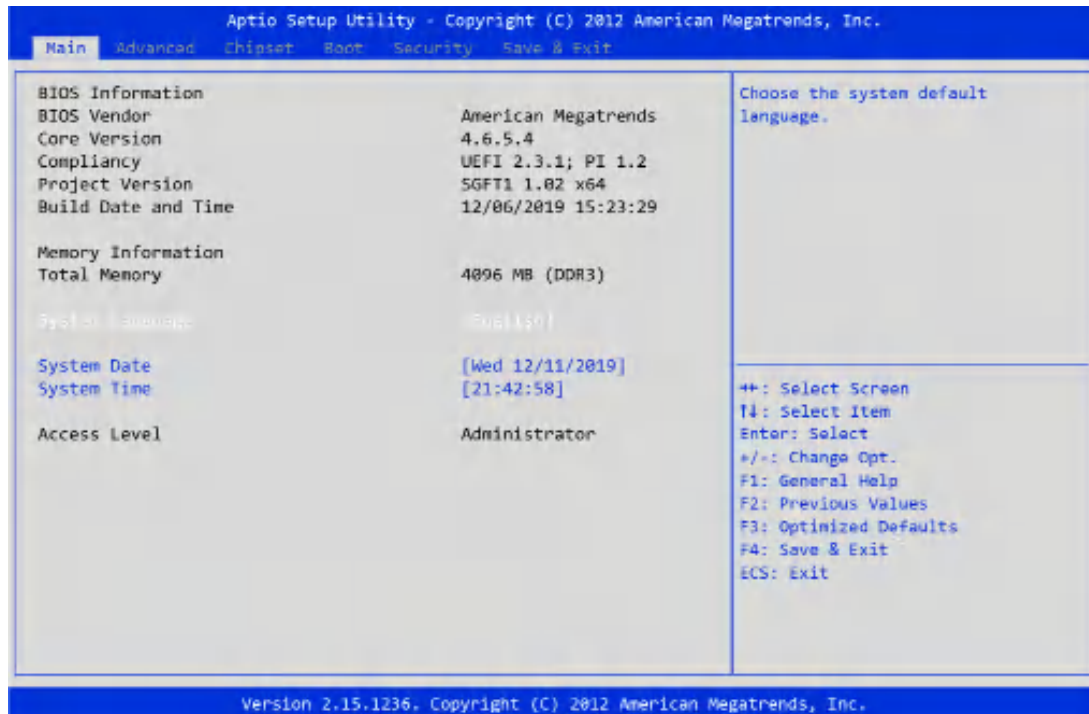


Figure 35: Illustration of the Main Menu screen

### 6.4.1 BIOS Information

The content in this section of the screen shows the information about the BIOS vendor, the Core version, compliancy, the project version and date & time of the project build.

### 6.4.2 Memory Information

This section shows the amount of memory that is installed on the hardware platform.

### 6.4.3 System Language

This option allows the user to configure the language that the user wants to use.

### 6.4.4 System Date

This section shows the current system date. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the month, day, and year segments. The **+** and **-** keys on the number pad can be used to change the values. The weekday name is automatically updated when the date is altered. The date format is [Weekday, Month, Day, Year].

### 6.4.5 System Time

This section shows the current system time. Press **Tab** to traverse right and **Shift+Tab** to traverse left through the hour, minute, and second segments. The **+** and **-** keys on the number pad can be used to change the values. The time format is [Hour : Minute : Second].

## 6.5 Advanced Settings

The Advanced Settings screen shows a list of categories that can provide access to a sub-screen. Sub-screen links can be identified by the preceding right-facing arrowhead.

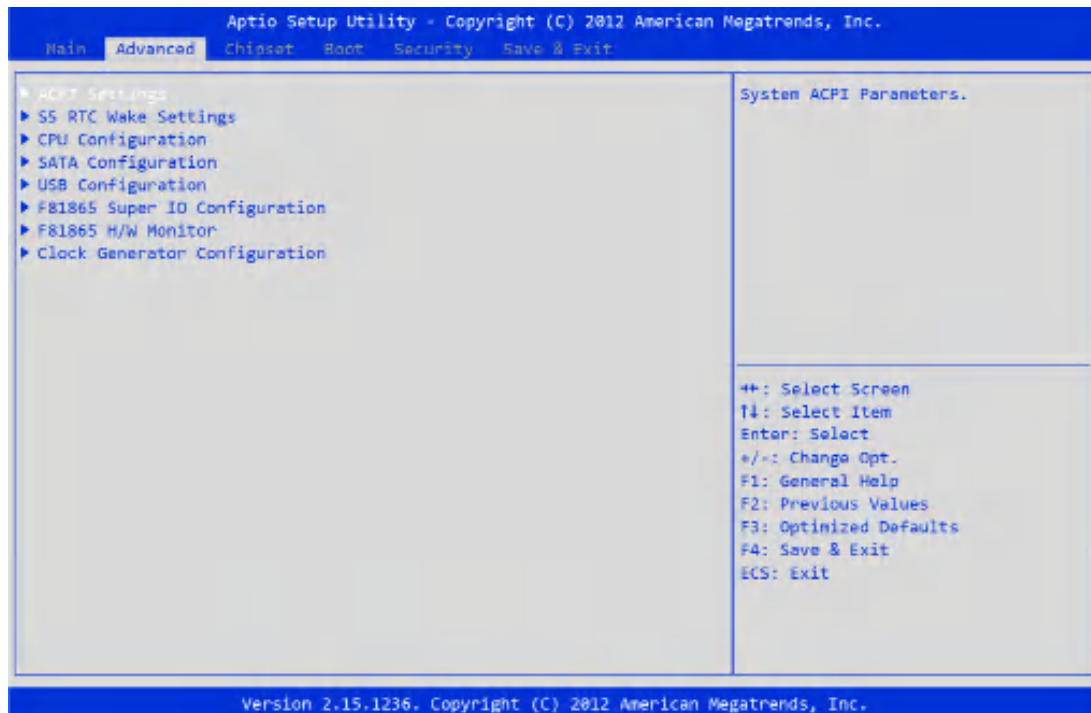


Figure 36: Illustration of the Advanced Settings screen

The Advanced Settings screen contains the following links:

- ACPI Settings
- S5 RTC Wake Settings
- CPU Configuration
- SATA Configuration
- USB Configuration
- F81865 Super IO Configuration
- F81865 H/W Monitor
- Clock Generator Configuration

## 6.5.1 ACPI Settings

ACPI grants the operating system direct control over system power management. The ACPI Configuration screen can be used to set a number of power management related functions.

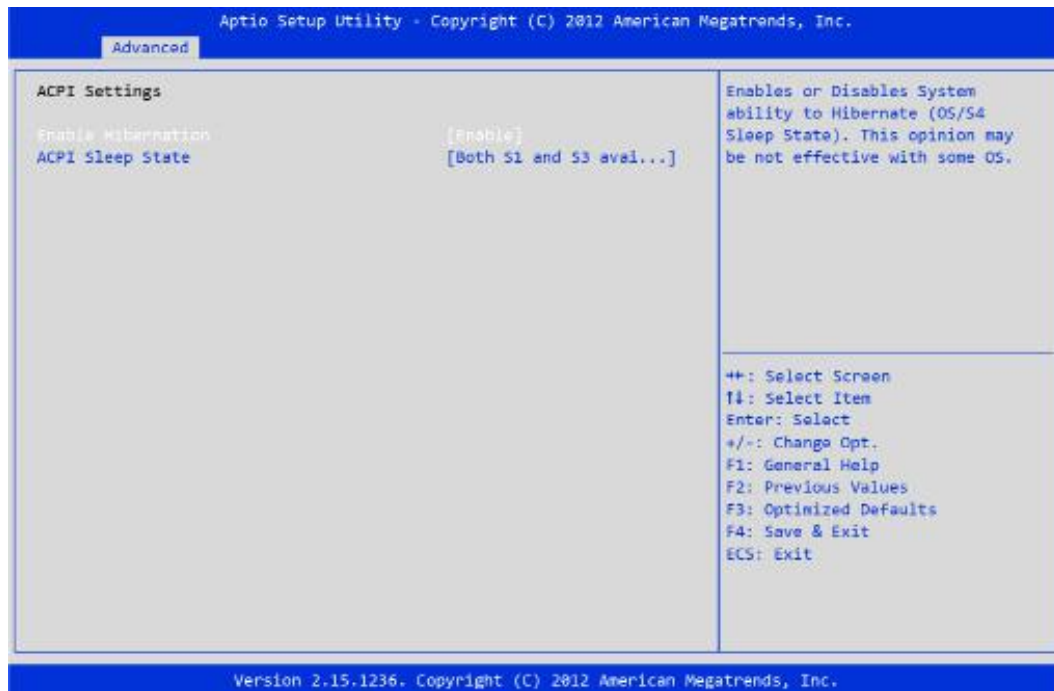


Figure 37: Illustration of the ACPI Settings screen

### 6.5.1.1 Enable Hibernation

Enable or Disable system ability to Hibernate.

### 6.5.1.2 ACPI Sleep State

Select ACPI sleep state the system will enter when the SUSPEND button is pressed. Available options are: Suspend Disabled/S1 only (CPU Stop Clock)/S3 only (Suspend to RAM)/Both S1 and S3 available for OS to choose from.

## 6.5.2 S5 RTC Wake Settings

The S5 RTC Wake Settings screen enables system to wake from S5 using RTC alarm.

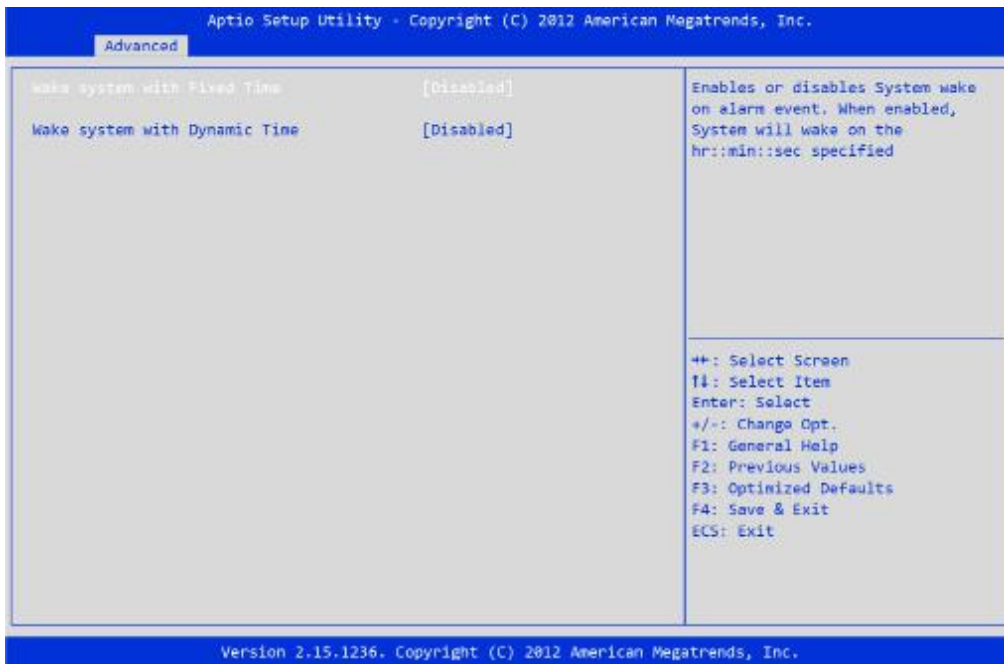


Figure 38: Illustration of the S5 RTC Wake Settings screen

### 6.5.2.1 Wake system with Fixed Time

Enable or Disable system wake on alarm event. When enabled, system will wake on the date/ hr:min:sec specified. '0' means everyday.

### 6.5.2.2 Wake system with Dynamic Time

Enable or Disable system wake on alarm event. When enabled, system will wake on the current time + Increase minutes. Available options are 1 – 5.

### 6.5.3 CPU Configuration

The CPU Configuration screen shows detailed information about the built-in processor.

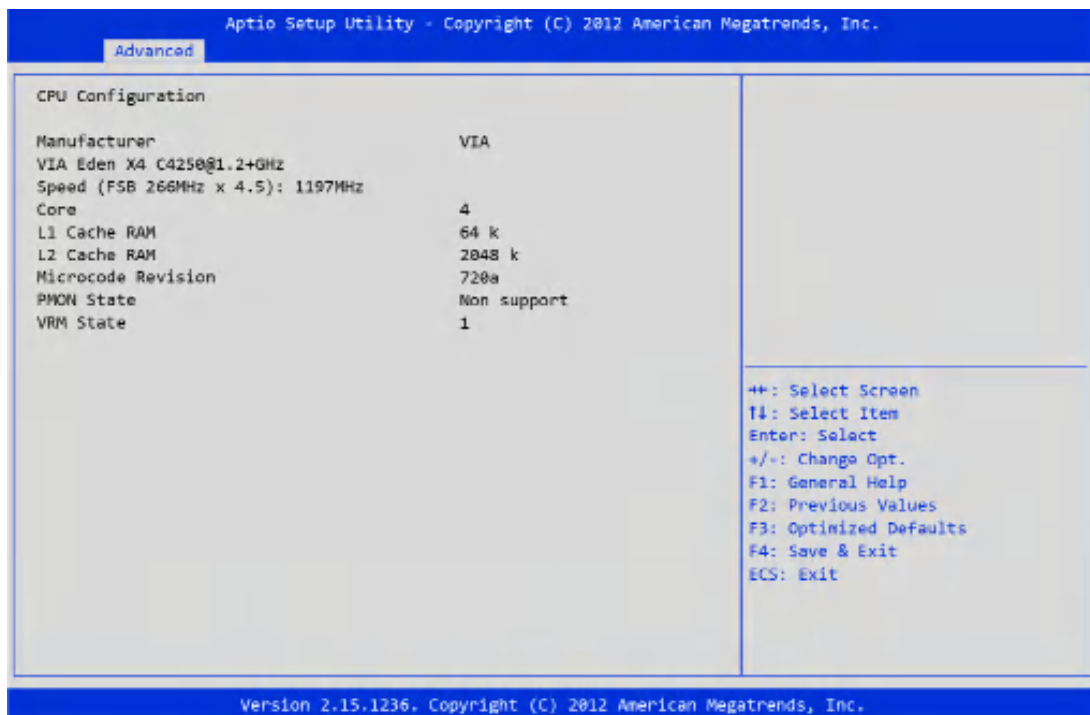


Figure 39: Illustration of the CPU Configuration screen



## 6.5.4 SATA Configuration

The SATA Configuration screen allows the user to view and configure the SATA configuration settings.



Figure 40: Illustration of the SATA Configuration screen

### 6.5.4.1 SATA Mode

This option allows the user to manually configure SATA controller for a particular mode.

**IDE**

Set this value to change the SATA to IDE mode.

**AHCI**

Set this value to change the SATA to AHCI mode.

## 6.5.5 USB Configuration

The USB Configuration screen shows the number of connected USB devices.

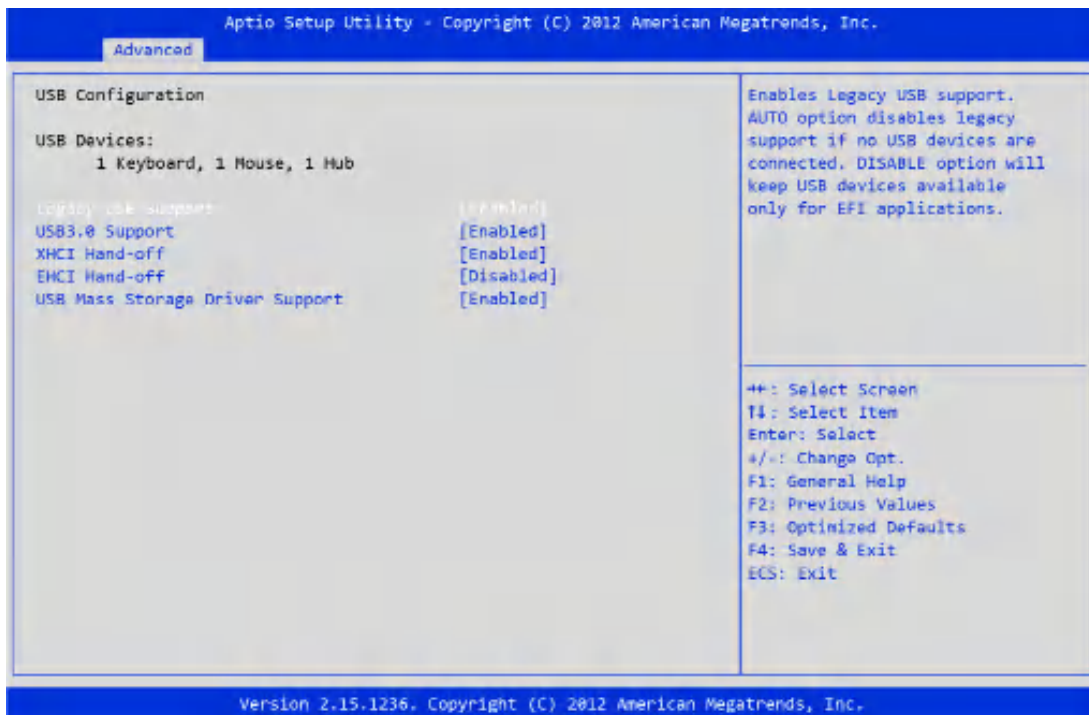


Figure 41: Illustration of the USB Configuration screen

### 6.5.5.1 Legacy USB Support

The Legacy USB Support feature enables environments that do not have native USB support to use USB devices. This feature has three options.

#### Enabled

The Enabled option keeps the Legacy USB Support feature on at all times.

#### Disabled

The Disabled option keeps the Legacy USB Support feature off at all times.

#### Auto

The system automatically disables legacy support if no USB Devices are connected.

### 6.5.5.2 USB 3.0 Support

Enable or Disable USB3.0 (XHCI) Controller support.

### 6.5.5.3 XHCI Hand-off

This is a workaround for Operating Systems without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

#### 6.5.5.4 EHCI Hand-off

This is a workaround feature for Operating Systems without EHCI hand-off support. The EHCI ownership change must be claimed by EHCI Driver.

**Enabled**

This option enables EHCI hand-off support.

**Disabled**

This option disables EHCI hand-off support.

#### 6.5.5.5 USB Mass Storage Driver Support

Enable or Disable USB Mass Storage Driver Support.

## 6.5.6 F81865 Super IO Configuration

The F81865 Super IO Configuration screen allows the user to set system Super IO Chip parameters.

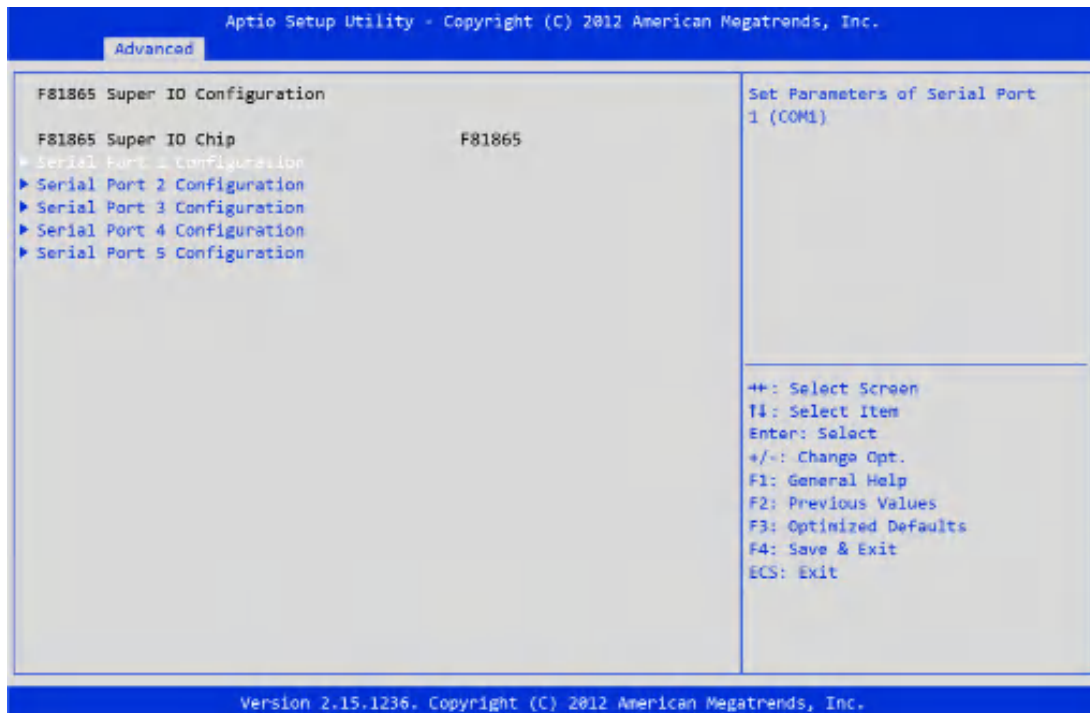


Figure 42: Illustration of the F81865 Configuration screen

### 6.5.6.1 Serial Port 1 Configuration

Set parameters of Serial Port 1 (COM1).

#### 6.5.6.1.1 Serial Port

Enable or Disable Serial Port (COM).

#### 6.5.6.1.2 Uart Transmission Mode

Change the serial port transmission mode. This feature has 3 options: RS232/RS422/RS485.

### 6.5.6.2 Serial Port 2 Configuration

Set parameters of Serial Port 2 (COM2).

#### 6.5.6.2.1 Serial Port

Enable or Disable Serial Port (COM).

#### 6.5.6.2.2 Uart Transmission Mode

Change the serial port transmission mode. This feature has 3 options: RS232/RS422/RS485.

### 6.5.6.3 Serial Port 3 Configuration

Set parameters of Serial Port 3 (COM3).

#### 6.5.6.3.1 Serial Port

Enable or Disable Serial Port (COM).

### 6.5.6.4 Serial Port 4 Configuration

Set parameters of Serial Port 4 (COM4).

#### 6.5.6.4.1 Serial Port

Enable or Disable Serial Port (COM).

### 6.5.6.5 Serial Port 5 Configuration

Set parameters of Serial Port 5 (COM5), which is dedicated to Renesas MCU R5F10268.

#### 6.5.6.5.1 Serial Port

Enable or Disable Serial Port (COM), which is dedicated to Renesas MCU R5F10268.

## 6.5.7 F81865 H/W Monitor

The F81865 screen shows the PC Health Status.

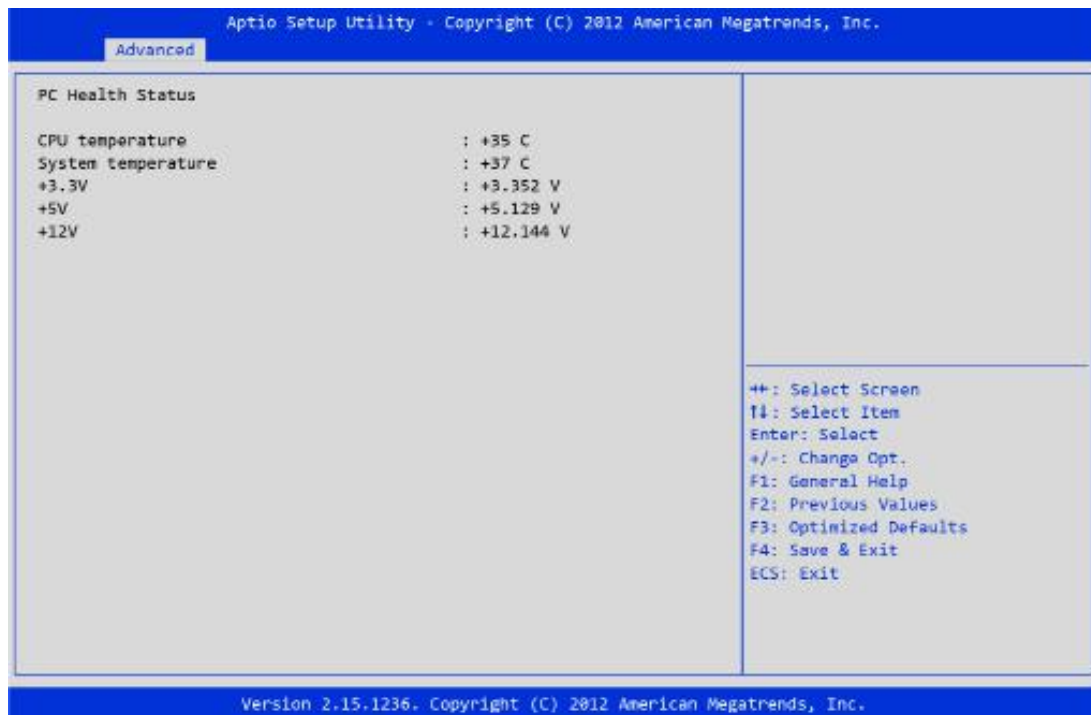


Figure 43: Illustration of the F81865 H/W Monitor screen

## 6.5.8 Clock Generator Configuration

The Clock Generator Configuration screen enables access to the Spread Spectrum Setting feature.



Figure 44: Illustration of the Clock Generator Configuration screen

### 6.5.8.1 CPU Spread Spectrum

The Spread Spectrum Setting feature enables the BIOS to modulate the clock frequencies originating from the mainboard. The settings are in percentages of modulation. Higher percentages result in greater modulation of clock frequencies. This feature has 3 options: Disabled, +0.25% and -0.5%.

### 6.5.8.2 PCIe Spread Spectrum

Select PCIe Spread Spectrum. This feature has 2 options: Disabled and -0.5%.

## 6.6 Chipset Settings

The Chipset Settings screen shows a list of categories that can provide access to a sub-screen. Sub-screen links can be identified by the preceding right-facing arrowhead.



Figure 45: Illustration of the Chipset Settings screen

The Chipset Settings screen contains the following links:

- DRAM Configuration
- Video Configuration
- PMU-ACPI Configuration
- HDAC Configuration
- Others Configuration



## 6.6.1 DRAM Configuration

The DRAM Configuration screen has two features for controlling the system DRAM. All other DRAM features are automated and cannot be accessed.

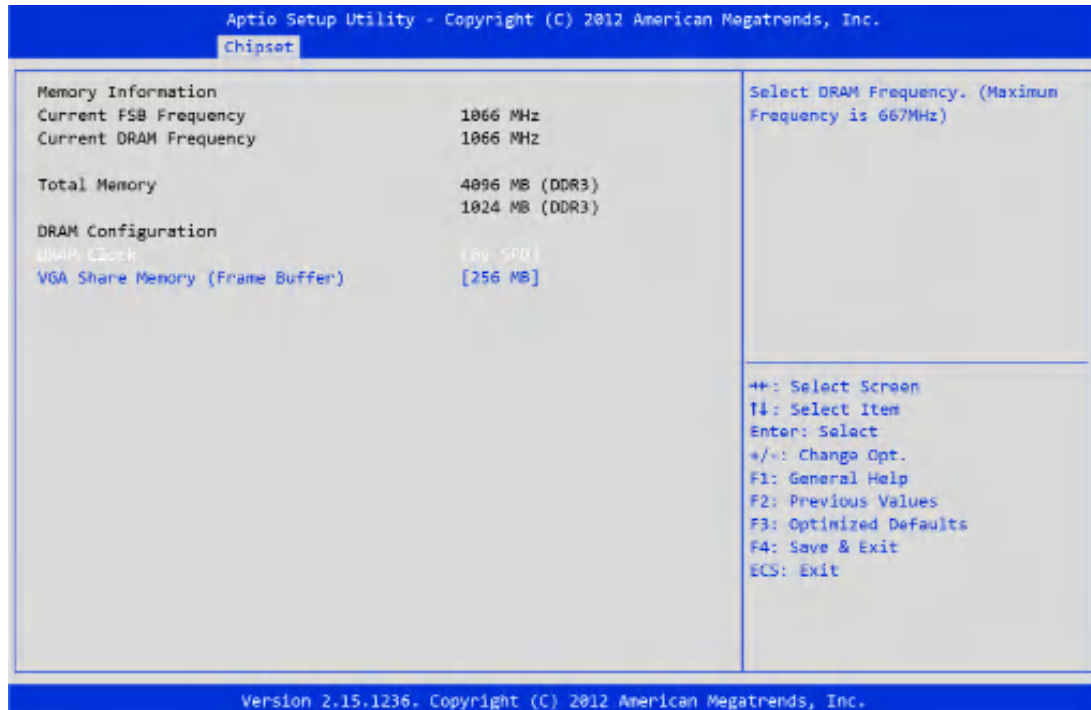


Figure 46: Illustration of the DRAM Configuration screen

### 6.6.1.1 DRAM Clock

The DRAM Clock option enables the user to determine how the BIOS handles the memory clock frequency. The memory clock can either be dynamic or static. This feature has four options.

#### **By SPD**

By SPD option enables the BIOS to select a compatible clock frequency for the installed memory.

#### **400 MHz**

The 400MHz option forces the BIOS to be fixed at 400MHz (DDR3-800) for DDR3 memory modules.

#### **533 MHz**

The 533MHz option forces the BIOS to be fixed at 533MHz (DDR3-1066) for DDR3 memory modules.

#### **667 MHz**

The 667MHz option forces the BIOS to be fixed at 667MHz (for DDR3-1333) for DDR3 memory modules.

### 6.6.1.2 VGA Share Memory (Frame Buffer)

The VGA Share Memory feature enables the user to choose the amount of the system memory to reserve for use by the integrated graphics controller. The selections of memory amount that can be reserved are 256MB and 512MB.

## 6.6.2 Video Configuration

The Video Configuration screen has features for controlling the integrated graphics controller in the VX11 chipset.



Figure 47: Illustration of the Video Configuration screen

### 6.6.2.1 Select Display Device Control

Select VX11 Display Device Control. Available options are: Auto and Manual.

### 6.6.2.2 Select Display Device 1 and 2

The Select Display Device feature enables the user to choose a specific display interface. This feature has two options: CRT and HDMI. If both Select Display Device 1 and Select Display Device 2 are set to the same interface, then any display device connected to the other interface will not function. For example, if both Select Display 1 and 2 are set to CRT, then no data will be sent to the HDMI port.

### 6.6.3 PMU\_ACPI Configuration

The PMU\_ACPI Configuration screen can be used to set a number of power management related functions.

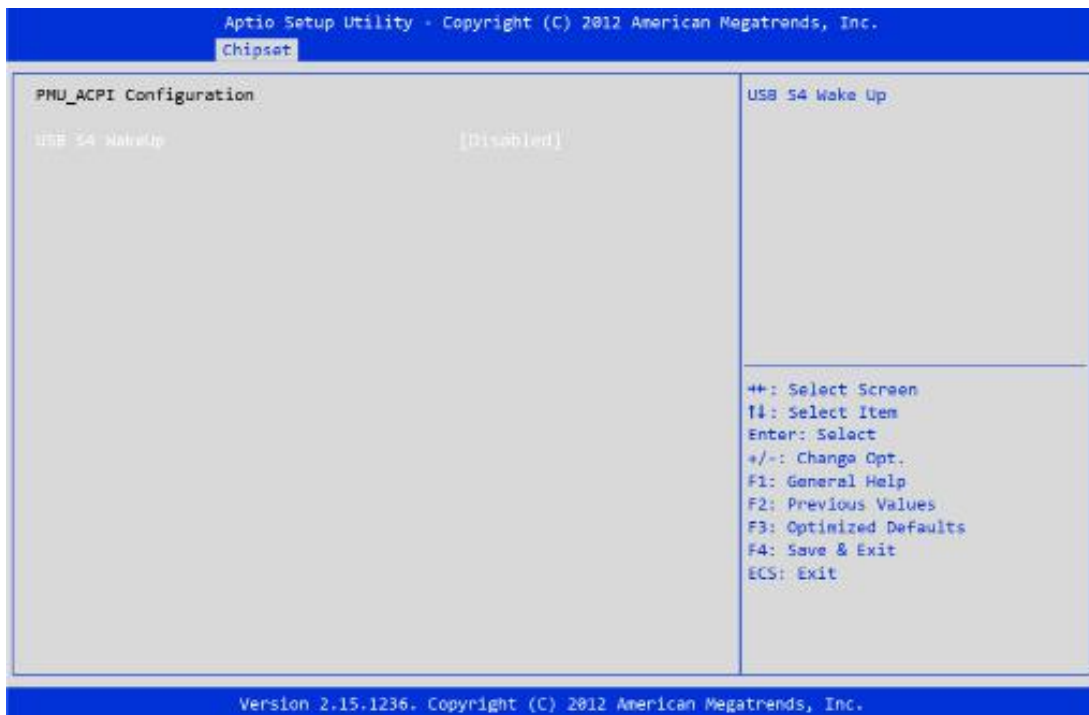


Figure 48: Illustration of the PMU\_ACPI Configuration screen

#### 6.6.3.1 USB S4 WakeUp

The USB S4 WakeUp enables the system to resume through the USB device port from S4 state. There are two options: Enabled and Disabled.

## 6.6.4 HDAC Configuration

HDAC Configuration Parameters.



Figure 49: Illustration of the HDAC Configuration screen

### 6.6.4.1 OnChip HDAC Device

This feature has 2 options: Enable or Disable HDAC Control.

## 6.6.5 Other Configuration

The Others Configuration screen can be used to set Watchdog Timer Configuration.

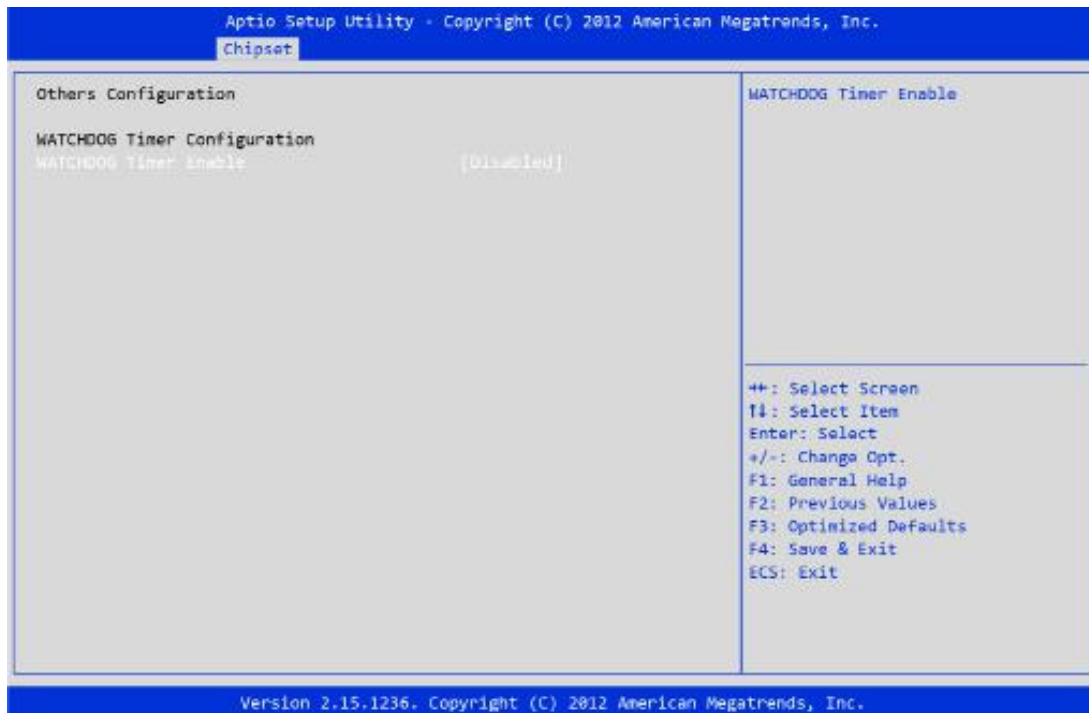


Figure 50: Illustration of the Other Configuration screen

### 6.6.5.1 WATCHDOG Timer Enable

The WATCHDOG Timer Enable feature unlocks three other features that enable the BIOS to monitor the state of the system. This feature has two options: Enabled or Disabled.

### 6.6.5.2 WATCHDOG Timer RUN/STOP

The WATCHDOG Timer RUN/STOP feature controls if the WATCHDOG timer is active or dormant. This feature has two options: Stop and Run.

### 6.6.5.3 WATCHDOG Timer ACTION

The WATCHDOG Timer ACTION feature determines the action the WATCHDOG timer should take if the timer counts down to zero. This feature has two options: Reset and Power off.

### 6.6.5.4 WATCHDOG Timer COUNT

The WATCHDOG Timer COUNT feature determines the length of time the timer should count when the timer is first triggered. This feature has four options: 72, 389, 706, and 1023 seconds.

## 6.7 Boot Settings

The Boot Settings screen has a single link that goes to the Boot Configuration and Boot Option Priorities screens.



Figure 51: Illustration of the Boot Settings screen

### 6.7.1 Boot Configuration

The Boot Settings Configuration screen has several features that can be run during the system boot sequence.

### 6.7.2 Setup Prompt Timeout

Number of seconds to wait for setup activation key. Minimum: 1 second, Maximum: 10 seconds.

### 6.7.3 BootupNumLock State

Select the keyboard NumLock state from On and Off.

### 6.7.4 Display Logo

Enables or Disables to display full screen logo.

### 6.7.5 Boot Option Priorities

The Boot Option Priorities screen lists all bootable devices.

### 6.7.6 Launch PXE OpROM policy

Controls the execution of UEFI and Legacy PXE OpROM.

#### Do not launch

Prevent the option for Legacy Network Device.

#### Legacy only

Allow the option for Legacy Network Device.

## 6.8 Security Settings

The Security Settings screen provides a way to restrict access to the BIOS or even the entire system.

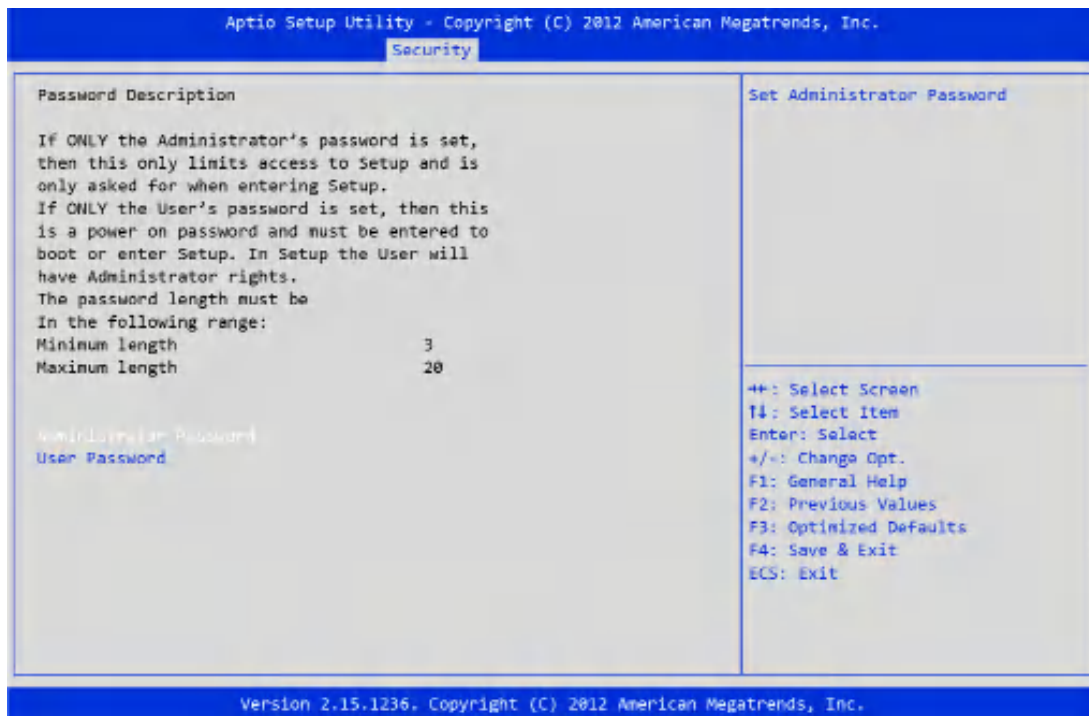


Figure 52: Illustration of the Security Settings screen

### 6.8.1 Administrator Password

This option is for setting the administrator password for accessing the BIOS setup utility. When the password has been set, a password prompt will displayed whenever the BIOS setup utility is launched.

### 6.8.2 User Password

This option is for setting the user password for accessing the BIOS setup utility or to boot up the operating system.

## 6.9 Save & Exit

The Save & Exit Configuration screen has the following features:

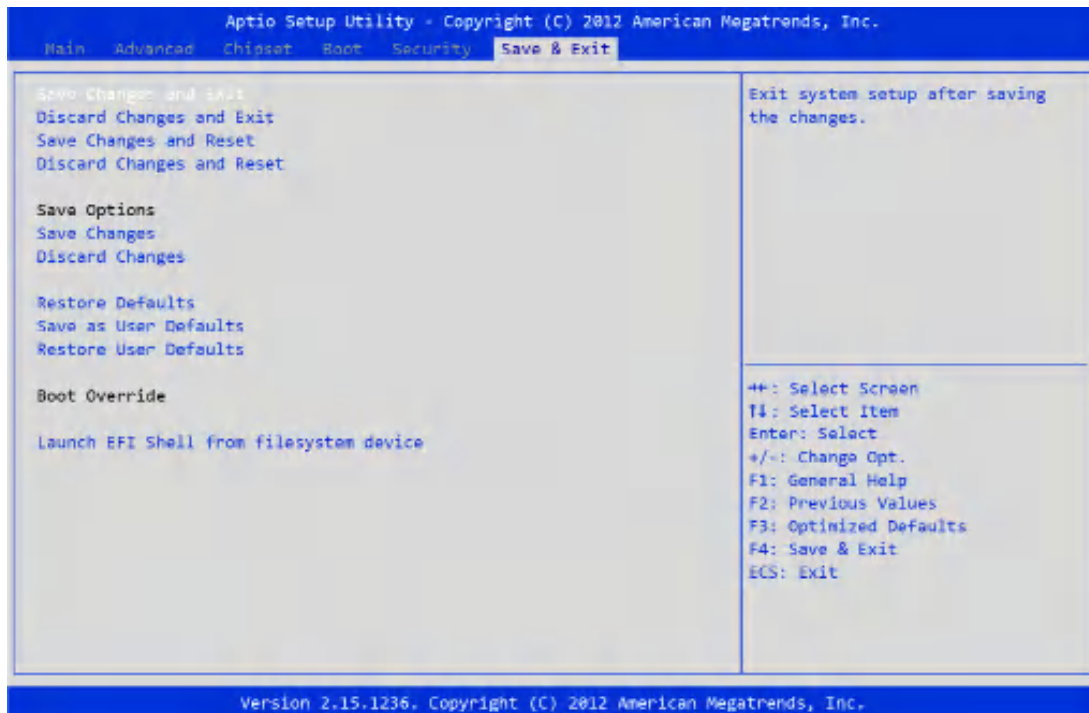


Figure 53: Illustration of the Save & Exit Settings screen

### 6.9.1 Save Changes and Exit

Save all changes to the BIOS and exit the BIOS Setup Utility. The 'F4' hotkey can also be used to trigger this command.

### 6.9.2 Discard Changes and Exit

Exit the BIOS Setup Utility without saving any changes. The 'Esc' hotkey can also be used to trigger this command.

### 6.9.3 Save Changes and Reset

Save all changes to the BIOS and reboot the system. The new system configuration parameters will take effect.

### 6.9.4 Discard Changes and Reset

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched.

#### Save Options

### 6.9.5 Save Changes

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

### 6.9.6 Discard Changes

This command reverts all changes to the settings that were in place when the BIOS Setup Utility was launched.



### 6.9.7 Restore Default

Restore/Load Default values for all the setup options.

### 6.9.8 Save as User Defaults

Save the changes done so far as User Defaults.

### 6.9.9 Restore User Defaults

Restore the User Defaults to all the setup options.

#### **Boot Override**

### 6.9.10 Launch EFI Shell from filesystem device

Attempts to Launch the EFI Shell application (Shellx64.efi) from one of the available filesystem devices.

## 7. Software and Technical Support

### 7.1 Microsoft Windows and Linux Support

The VIA AMOS-3006 features a complete software evaluation image featuring Microsoft Windows 10/8.1/8/7, Windows 10 IoT, Windows Embedded Standard 7, and Linux operating systems.

### 7.2 VIA Smart ETK

The VIA AMOS-3006 features a complete software evaluation image featuring VIA Smart ETK.

### 7.3 Technical Support and Assistance

- For utilities downloads, latest documentation and new information about the VIA AMOS-3006, please visit our website at <https://www.viatech.com/en/systems/amos/amos-3006>
- For technical support and additional assistance, always contact your local sales representative or system distributor, or go to <https://www.viatech.com/en/support/technical-support/> for technical support.
- For OEM clients and system integrators developing a product for long term production, other code and resources may also be made available. Please visit our website at <https://www.viatech.com/en/about/contact/> to submit a request.



### Taiwan Headquarters

1F, 531 Zhong-zheng Road,  
Xindian Dist., New Taipei City 231  
Taiwan

Tel: 886-2-2218-5452  
Fax: 886-2-2218-9860  
Email: [embedded@via.com.tw](mailto:embedded@via.com.tw)



### USA

940 Mission Court  
Fremont, CA 94539,  
USA

Tel: 1-510-687-4688  
Fax: 1-510-687-4654  
Email: [embedded@viatech.com](mailto:embedded@viatech.com)



### Japan

3-15-7 Ebisu MT Bldg. 6F,  
Higashi, Shibuya-ku  
Tokyo 150-0011  
Japan

Tel: 81-3-5466-1637  
Fax: 81-3-5466-1638  
Email: [embedded@viatech.co.jp](mailto:embedded@viatech.co.jp)



### China

Tsinghua Science Park Bldg. 7  
No. 1 Zongguancun East Road,  
Haidian Dist., Beijing, 100084  
China

Tel: 86-10-59852288  
Fax: 86-10-59852299  
Email: [embedded@viatech.com.cn](mailto:embedded@viatech.com.cn)



### Europe

Email: [embedded@via-tech.eu](mailto:embedded@via-tech.eu)