

Table of Contents

| | |
|--|-----------|
| Safety Precautions | iii |
| Classification | iv |
| General Cleaning Tips | iv |
| Scrap Computer Recycling | vi |
| CHAPTER 1 INTRODUCTION | 1 |
| 1.1 General Description | 1 |
| 1.2 System Specifications | 3 |
| 1.2.1 CPU | 3 |
| 1.2.2 BIOS | 3 |
| 1.2.3 System Memory | 3 |
| 1.2.4 Display | 3 |
| 1.2.5 Ethernet Ports | 3 |
| 1.2.6 Storages | 3 |
| 1.2.7 Wireless | 3 |
| 1.2.8 USB | 4 |
| 1.2.9 COM | 4 |
| 1.2.10 Power | 4 |
| 1.2.11 Power Button - | 5 |
| 1.2.12 DIO - | 5 |
| 1.2.13 WatchDog Timer (WDT) | 5 |
| 1.2.14 Restore BIOS Optimal Defaults (JP2) | 5 |
| 1.2.15 System LED | 6 |
| 1.2.16 Operation Temperature | 6 |
| 1.2.17 Storage Temperature | 6 |
| 1.2.18 Humidity | 6 |
| 1.2.19 Weight | 6 |
| 1.2.20 Dimensions | 6 |
| 1.2.21 System I/O Outlets | 6 |
| 1.3 Dimensions | 7 |
| 1.4 I/O Outlets | 9 |
| CHAPTER 2 HARDWARE INSTALLATION | 13 |
| 2.1 Installing the Memory Module | 13 |
| 2.2 Installing the CompactFlash (CF) | 15 |
| 2.3 Installing the Hard Disk Drive | 17 |
| 2.4 Installing Din-rail Mounting | 19 |
| 2.5 Installing Wall Mounting (optional) | 21 |
| CHAPTER 3 AMI UEFI BIOS UTILITY | 23 |
| 3.1 Entering Setup | 23 |
| 3.2 The Main Menu | 24 |
| 3.3 Advanced Features | 25 |
| 3.4 Chipset Feature | 41 |
| 3.5 Security | 43 |
| 3.6 Boot Type | 45 |

| | | |
|--|---------------------------------|-----------|
| 3.7 | Save & Exit | 49 |
| APPENDIX A WATCHDOG TIMER..... | | 53 |
| | About Watchdog Timer | 53 |
| | How to Use Watchdog Timer | 53 |
| APPENDIX B POWER BUTTON SETTING FOR WINDOW SOFTWARE ... | | 55 |

CHAPTER 1 INTRODUCTION

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

1.1 General Description

Din-rail fanless embedded system is suitable for communications control and for protocol converter applications in critical environments. Built for rugged work environments, features an extra low power consumption Intel[®] ATOM[™] E3815 (1.46GHz) or E3827 (1.75GHz) processors supporting industrial temperature range of -20°C to +70°C. Its front accessible I/O cabling is very convenient for wiring and maintenance. offers a VGA output, making it particularly well-suited for communication control, SCADA and industrial automation. Its compact size with Din-rail mounting allows for easy installation into control cabinet. Pre-installed with Linux, Windows[®] 7 embedded and Windows 8 embedded, provides programmers with a friendly environment for developing application software at a lower cost.

is robust industrial-grade hardware design and adopts the advanced cooling system, besides, supporting the CompactFlash[™] and SATA SSD (or HDD), which makes it especially suitable for field control & monitoring system solution for following markets:

Utility Industries (Water; Energy; Chemical Plant; Mining...)

Public Transportation Industries (Traffic/ Highway Control; Train/Bus Control...)

Homeland Security (Weather Monitoring/Alarm System...)

● Checklist

- | | |
|-------------------|----------------------------|
| ✓ System Unit x 1 | ✓ Power terminal block x 1 |
| ✓ Screws | ✓ DVD x 1 (for Driver) |
| ✓ CF Mylar x 1 | ✓ Din-rail Kit x1 |
| ✓ Cable Tie x1 | ✓ SATA+Power HDD cable x1 |



Note: Please contact your local vendors if any damaged or missing items.

- **Features**

- Fanless design
- Wide temperature operation of -20°C - +70°C (-40°C - +70°C for optional)
- 2 10/100/1000 Base-T Ethernets with Magnetic Isolated Protection
- 4 COM Ports support RS-232/422/485
- 1 Wireless (USB and PCIe Interface)
- Support one 2.5" SATA drive bay and one CompactFlash™ (or mSATA)
- Wide range 12–24V DC-in with terminal block
- 1 DI/DO (8-bit programmable, DB9 female connector) (-)
- Din-rail mounting
- Wall mounting (optional)
- Passed UL Certification, CE with FCC testing

- **Embedded O.S. Supported**

- not only supports Windows® 7 and Windows® 8, but also supports embedded OS, such as Windows® 7 embedded, Windows® 8 embedded and Linux package support. For storage device, supports one SATA SSD (or HDD) and one type II CompactFlash™ socket.

1.2 System Specifications

1.2.1 CPU

- Onboard Intel® ATOM™ E3815 (1.46 GHz) processor or E3827 (1.75GHz) processor

1.2.2 BIOS

- AMI (American Megatrends Inc.) UEFI (Unified Extensible Firmware Interface) BIOS.

1.2.3 System Memory

- One DDR3L 204-pin SO-DIMM (1.35V) slot.
- Supports 1333/1600 MHz up to 4GB (E3815), up to 8GB (E3827).

1.2.4 Display

- A slim type 15-pin D-Sub connector as VGA connector.

1.2.5 Ethernet Ports

- LAN Chip : Intel Ethernet Controller I211-AT.
- LAN Chip : Intel Ethernet Controller I210-IT.(-WT)
LAN 1 and LAN 2

The board has dual RJ-45 connectors, support 10/100/1000 Base-T with 1.5KV magnetic isolated protection.

1.2.6 Storages

- 1 x 2.5" SATA drive bay.
- 1 x CompactFlash™ Typell socket (or mSATA).

1.2.7 Wireless

- 1 x Full size Mini Card slot supports module with USB and PCIe Interface.
- 1 x SIM Card Socket.
- 2 x Antenna holes.

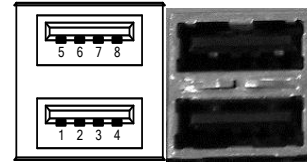


Note: CF and mSATA function can be either one, it can be selected by BIOS menu.
mSATA and wireless use the same slot, and only one of them can be selected.

1.2.8 USB

- 2 x USB2.0
- USB Pin Define :

| Pin | Signal USB Port 0 | Pin | Signal USB Port 1 |
|-----|----------------------|-----|----------------------|
| 1 | VCC | 5 | VCC |
| 2 | D- | 6 | D- |
| 3 | D+ | 7 | D+ |
| 4 | GND | 8 | GND |

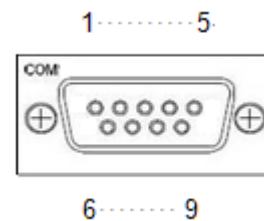


1.2.9 COM

- 4 ports DB9 support RS-232/422/485 which can be selected by BIOS.
- Supports Auto Flow Control in RS485 mode.
- Serial Port Pin Define: (DB9 Male) as below

COM1~4

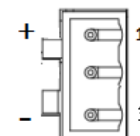
| Pin | RS-232 | RS-422 | RS-485 |
|-----|--------|--------|--------|
| 1 | DCD | TX- | Data- |
| 2 | RXD | TX+ | Data+ |
| 3 | TXD | RX+ | -- |
| 4 | DTR | RX- | -- |
| 5 | GND | GND | GND |
| 6 | DSR | -- | -- |
| 7 | RTS | -- | -- |
| 8 | CTS | -- | -- |
| 9 | RI | -- | -- |



1.2.10 Power

- Wide-range 12 - 24V DC power input with terminal block.
- OVP and Reverse protection.

| Pin | Signal |
|-----|--------|
| 1 | + |
| 2 | NC |
| 3 | - |



1.2.11



- AT auto power on
- Power button setting for software must be set up firstly.

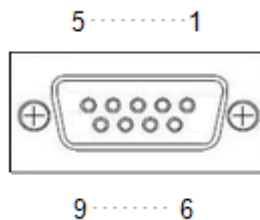


Note: Power button setting for Window software is offered on APPENDIX B for reference.

1.2.12 DIO

- One DB9 female connector supports 8 bits TTL level programmable digital input/output
- The voltage of TTL is 5V
- The programming is as follow:
 - I/O sink current is 8~10mA (Output drive current \pm 50 mA)
 - Input/Output can be programmed

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



1.2.13 WatchDog Timer (WDT)

- 1~255 seconds or minutes; up to 255 levels.

1.2.14 Restore BIOS Optimal Defaults (JP2)

- Put jumper clip to pin 2-3 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 |
| Restore BIOS optimal defaults | 2-3 |



1.2.15 System LED

- There are showed the LED's indicators and functional descriptions.

| LED Name | Description | Color |
|----------|--|--------|
| ACT | Indicate the storage status and it's flashing when storage access. | Green |
| PWR | Indicate the Power status. When the DC input is acceptable, the LED will ON. | Yellow |

1.2.16 Operation Temperature

- -20°C ~ +70°C

1.2.17 Storage Temperature

- -40°C ~ +85°C

1.2.18 Humidity

- 10% ~ 95% (non-condensation)

1.2.19 Weight

- 1 kg

1.2.20 Dimensions

- 48mm(1.88") (W) x110mm(4.33") (D) x155mm(6.1") (H)

1.2.21 System I/O Outlets

- Four 9-pin D-Sub male connectors, COM1~COM4.
- One 15-pin D-Sub female connector for VGA.
- Two 10/100/1000 Base-T RJ-45 with 1.5KV magnetic isolated protection.
- Two USB 2.0 connectors.
- One DC Power Input with terminal block.
- One 9-pin D-Sub Female connectors for DIO. ()
- Two Antenna holes.

CHAPTER 2 HARDWARE INSTALLATION

The is convenient for your various hardware configurations, such as Memory Module and Hard Disk Drive. The chapter 2 will show you how to install the hardware. It includes:

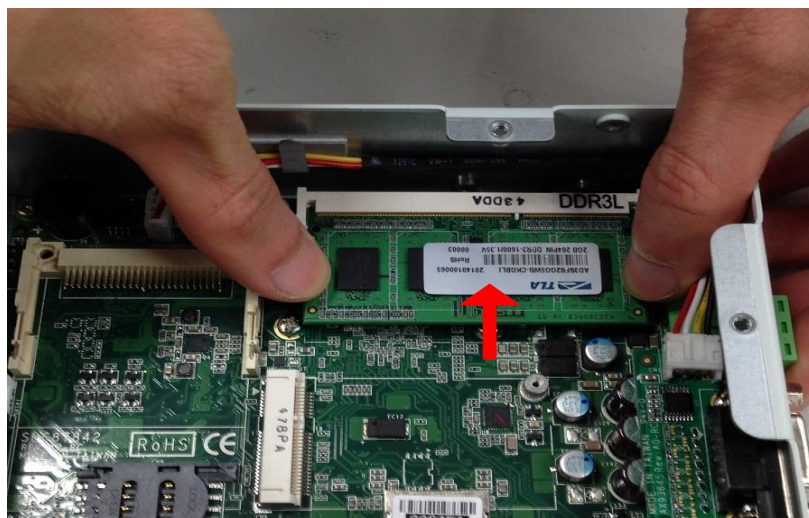
2.1 Installing the Memory Module

Step 1 Turn off the system.

Step 2 Loosen all screws of the cover and remove the cover from the system.



Step 3 Use two fingers to hold the memory module, and insert the gold figure into the slot and push the module down.



Step 4 The memory module is locked by two latches on the sides. We strongly recommend using “LDC737” silicone on the two sides of the memory for good ability of vibration.



Step 5 Put the cover back to the system, and fasten screws tight close the chassis.

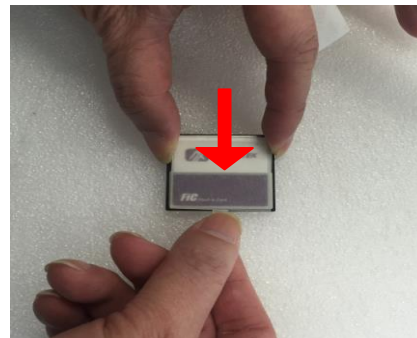
2.2 Installing the CompactFlash (CF)

Step 1 Turn off the system.

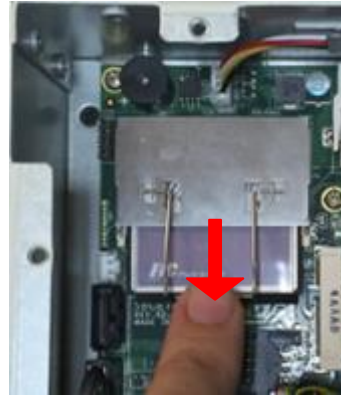
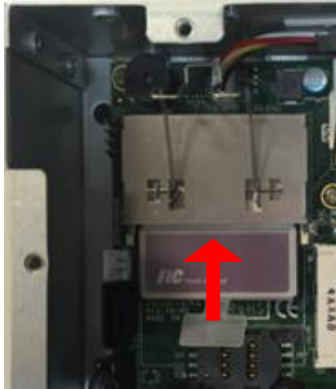
Step 2 Loosen all screws of the cover and remove the cover from the system.




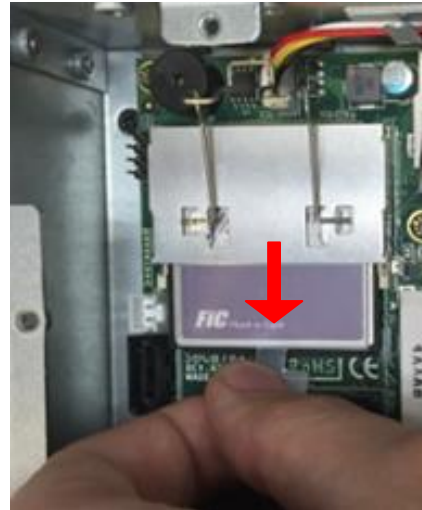
Step 3 Stick CF mylar on CF card.



Step 4 Insert the CF card into the socket tightly and lock the CF card.



 **Note:** *Unlock the CF card from the socket and pull out the CF card when taking out CF card.*



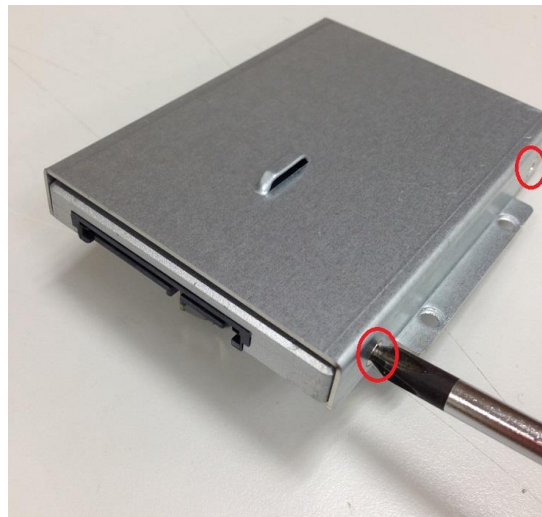
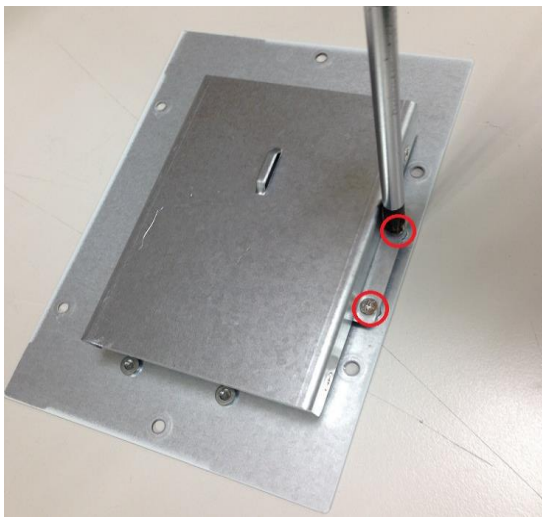
2.3 Installing the Hard Disk Drive

Step 1 Turn off the system.

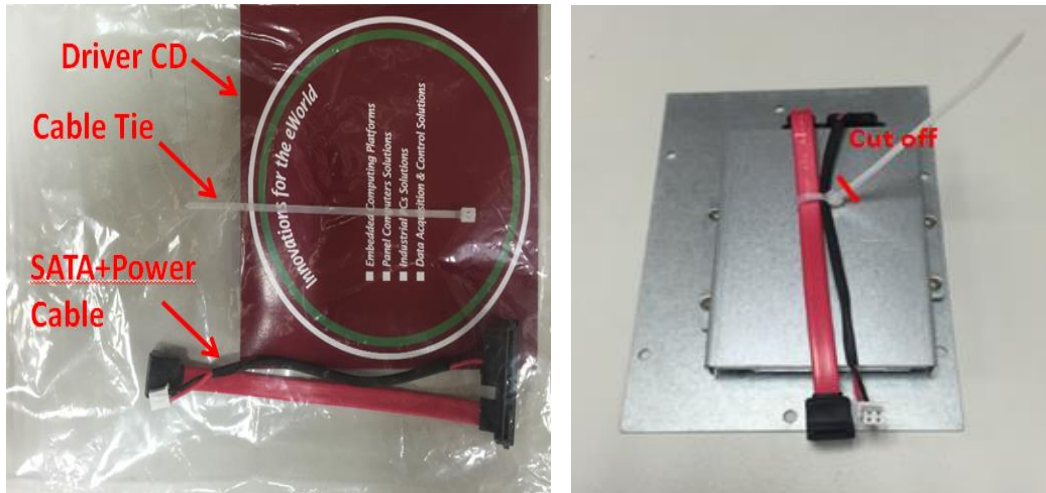
Step 2 Loosen all screws of the cover and remove the cover from the system.



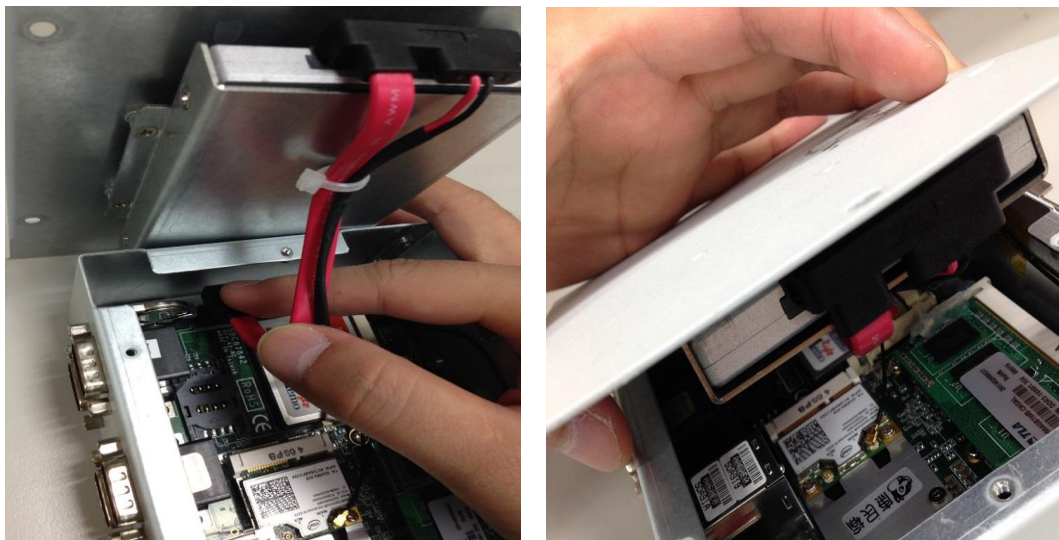
Step 3 Loosen 4pcs screws of the cover, and put the HDD into the HDD bracket and fix the HDD by 4pcs of screws in the accessory bag.



Step 4 Put the HDD bracket on the cover and use 4pcs screws to fix tightly. Takes the HDD SATA+Power HDD cable and Cable Tie out from the accessory bag and connect SATA+Power HDD cable to HDD then use Cable Tie to fix it on the HDD bracket, cut off the lengthy Cable Tie.



Step 5 Connect SATA+Power HDD cable to the board connector, SATA side first then power side second.



Step 6 Put the cover back to the system, and fasten screws tight close the chassis.

2.4 Installing Din-rail Mounting

provides Din-rail Mount for 2 methods that customers can install as below:

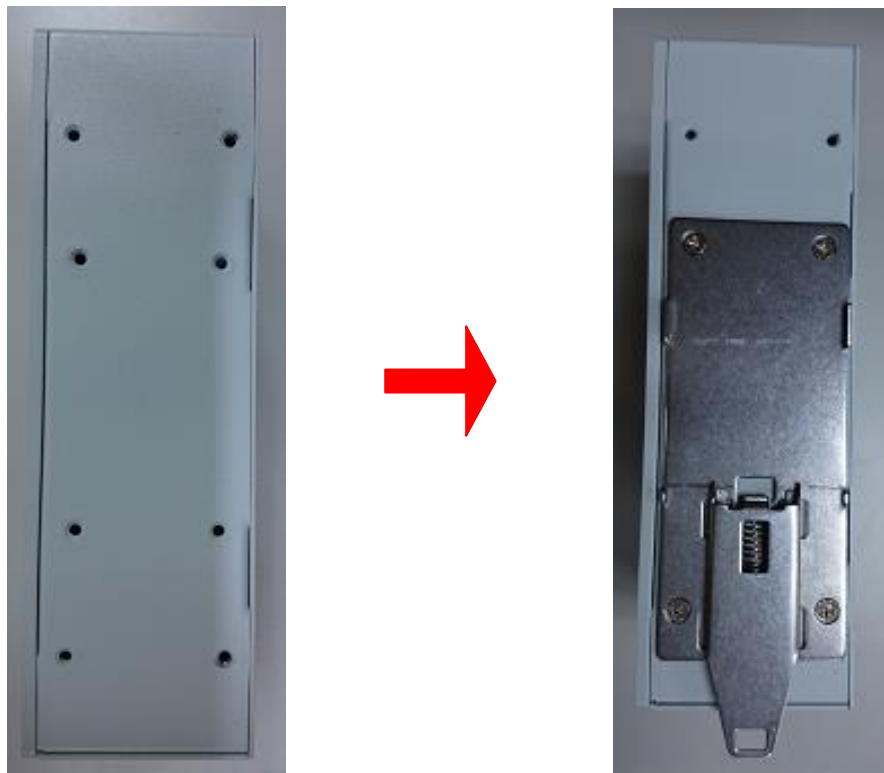
Step 1 Prepare Din-rail Mount assembling components (screws and bracket) ready.



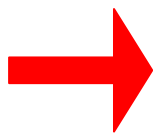
 **Note:** ***Only** 4mm length M3 type screws can be accepted.*

Step 2 Assembly the bracket to the system and fasten screws tight.

Method 1:



Method 2:



2.5 Installing Wall Mounting (optional)

The [redacted] provides Wall Mounting that customers can install as below:

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



Step 2 Assembly the bracket to the system, and fasten screws tight.



CHAPTER 3

AMI UEFI BIOS UTILITY

The AMI UEFI BIOS provides users with a built-in Setup program to modify basic system configuration. All configured parameters are stored in a flash-backed-up to save the Setup information whenever the power is turned off.

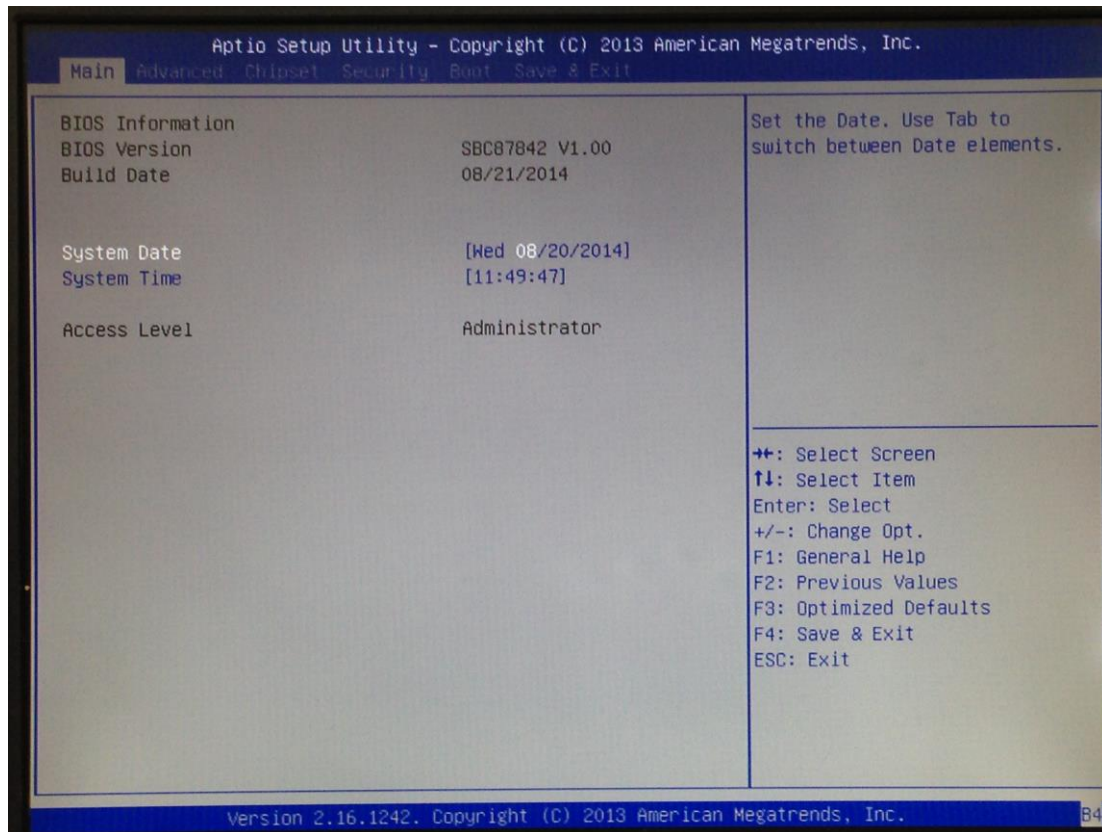
3.1 Entering Setup

To enter the setup screens, follow the steps below:

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

3.2 The Main Menu

Once you enter the AMI BIOS Aptio Setup Utility, the Main Menu appears on the screen. In the Main Menu, there are several Setup functions and a couple of Exit options for your selection. Use Select Screen Keys (or Move Keys) to select the Setup Page you intend to configure then press <Enter> to accept or enter its sub-menu.



System Date

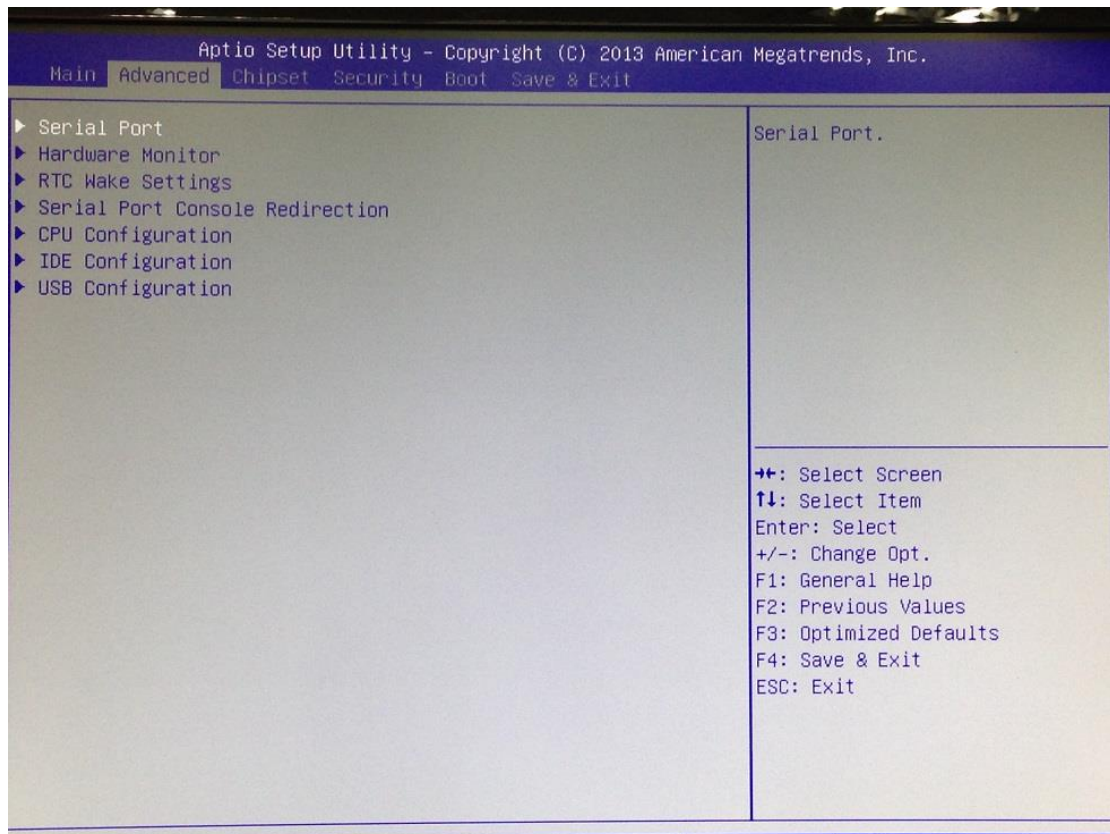
The date format is <day> <month> <date> <year>.

System Time

This item shows current time of your system with the format <hour> <minute> <second>. The time is calculated based on the 24-hour military-time clock. For example, 1 p.m. is 13:00:00.

3.3 Advanced Features

This Advanced section allows users to configure and improve your system, to set up some system features according to your preference. You can select any of the items in the left frame of the screen to go to the sub menus:



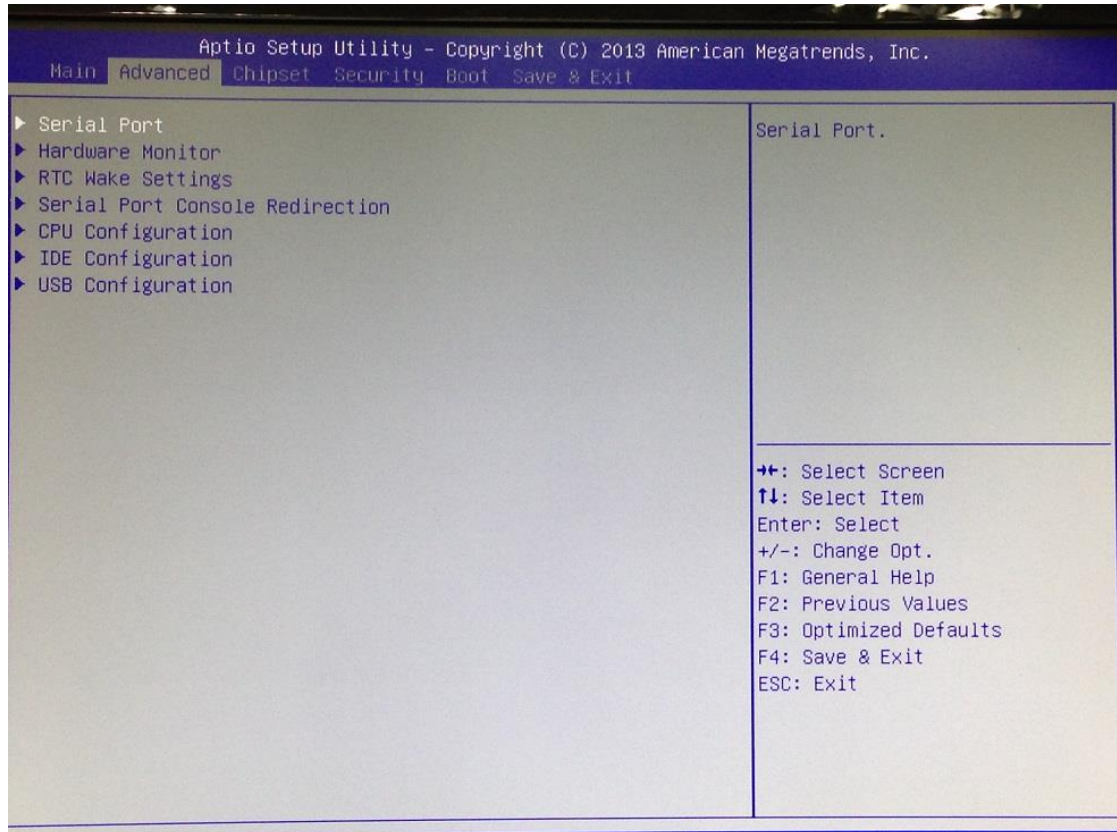
- **Serial Port Configuration**

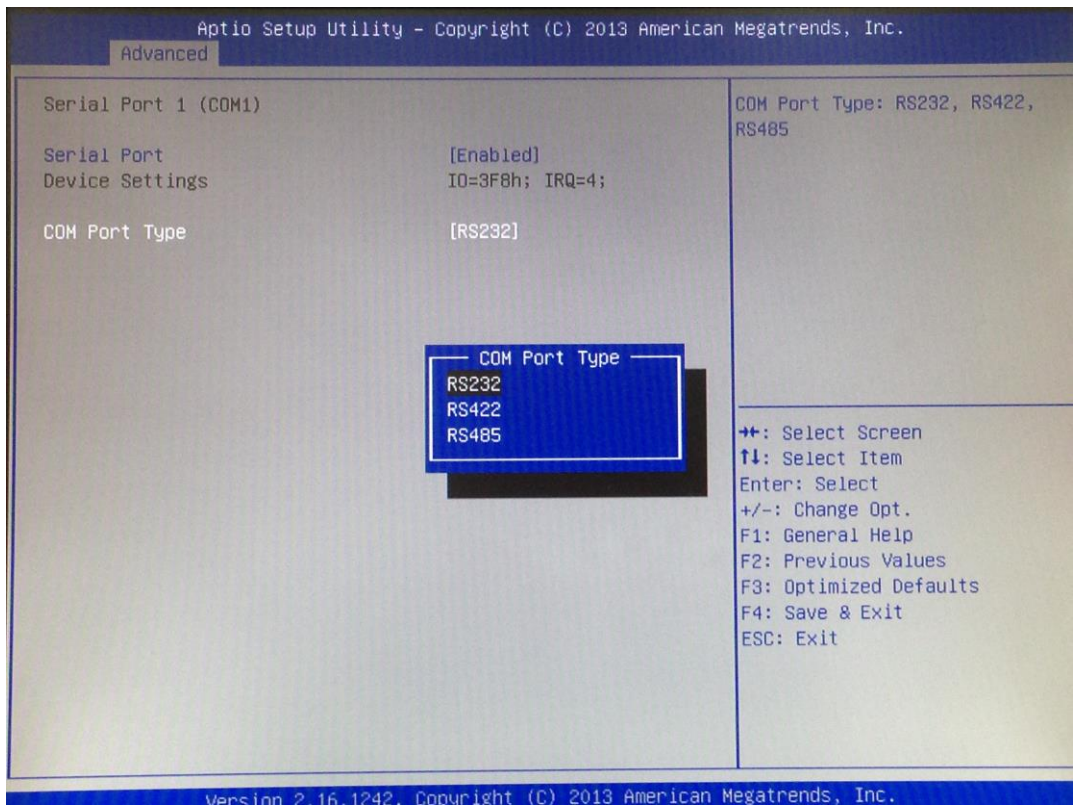
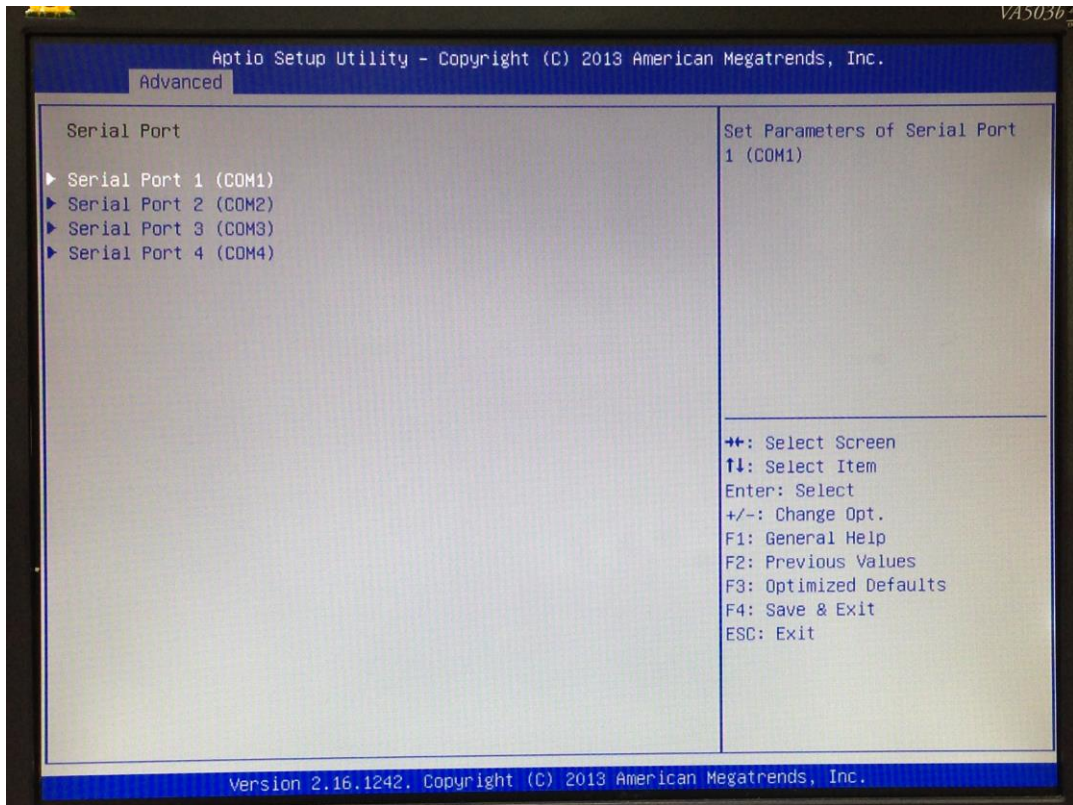
The default setting for all Serial Ports are RS232.

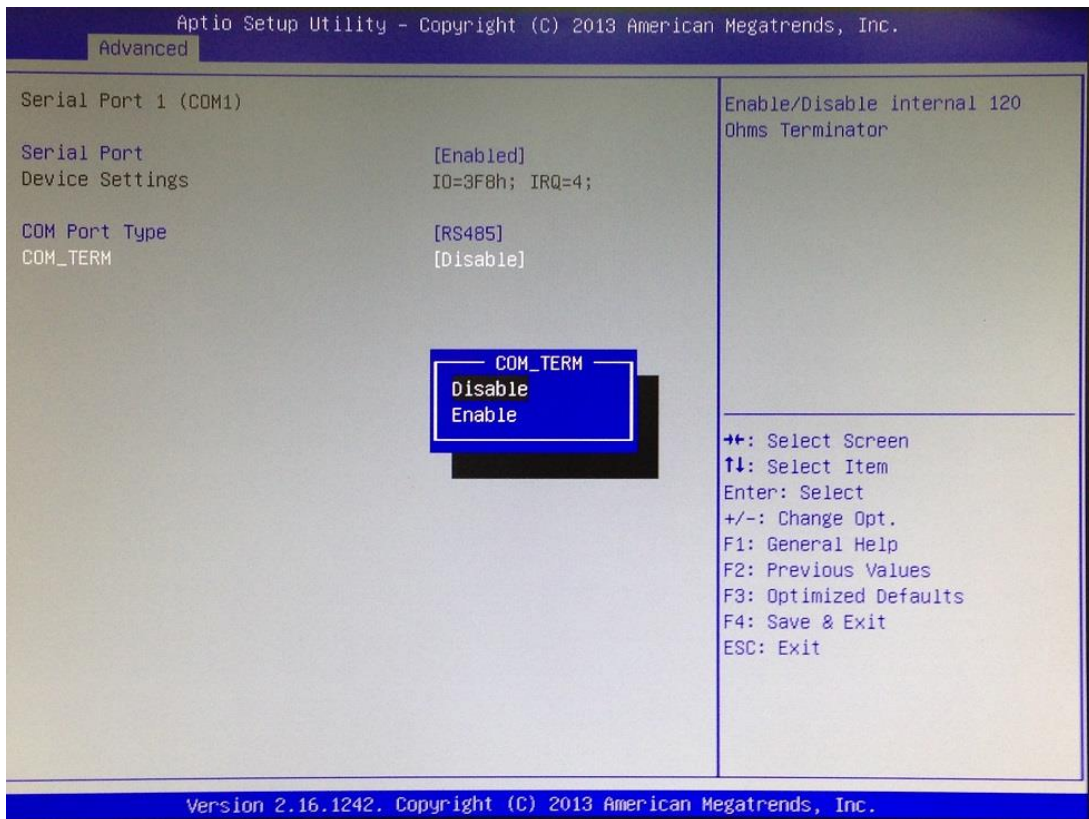
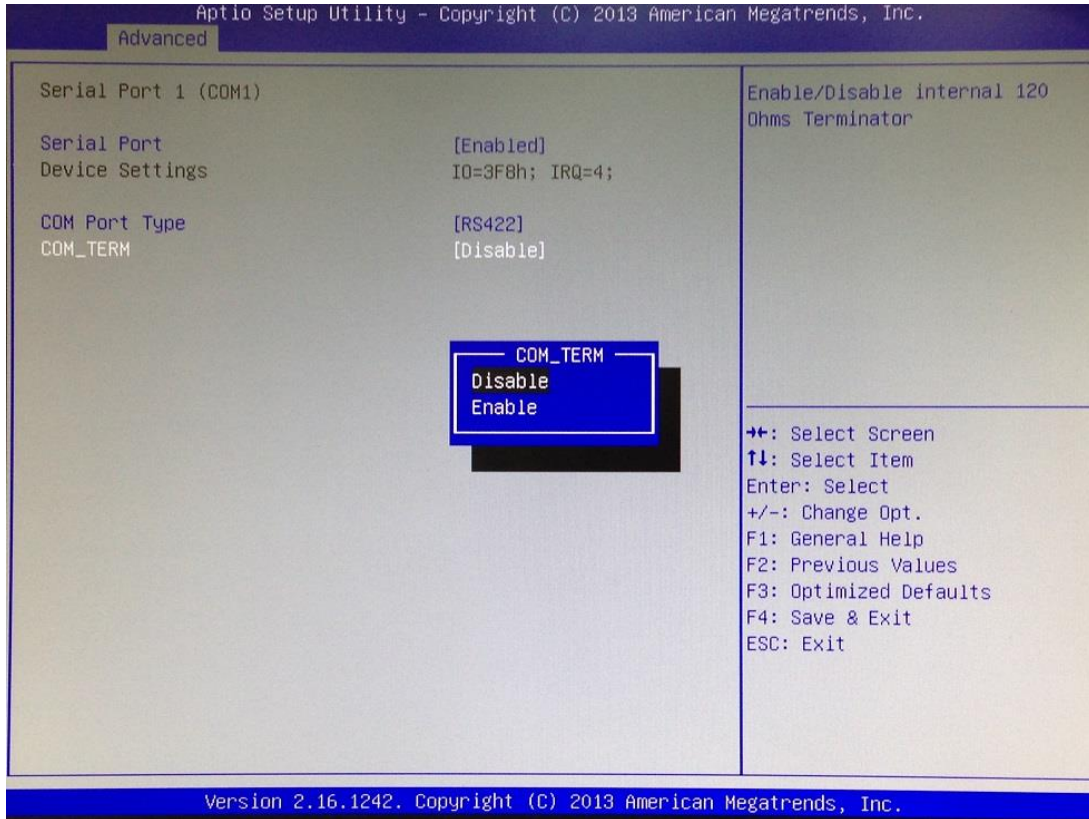
You can change the setting by selecting the value you want in each COM Port Type.

Supports internal 120 ohms terminator in RS422 & RS485 mode.

(Please refer below graphics.)



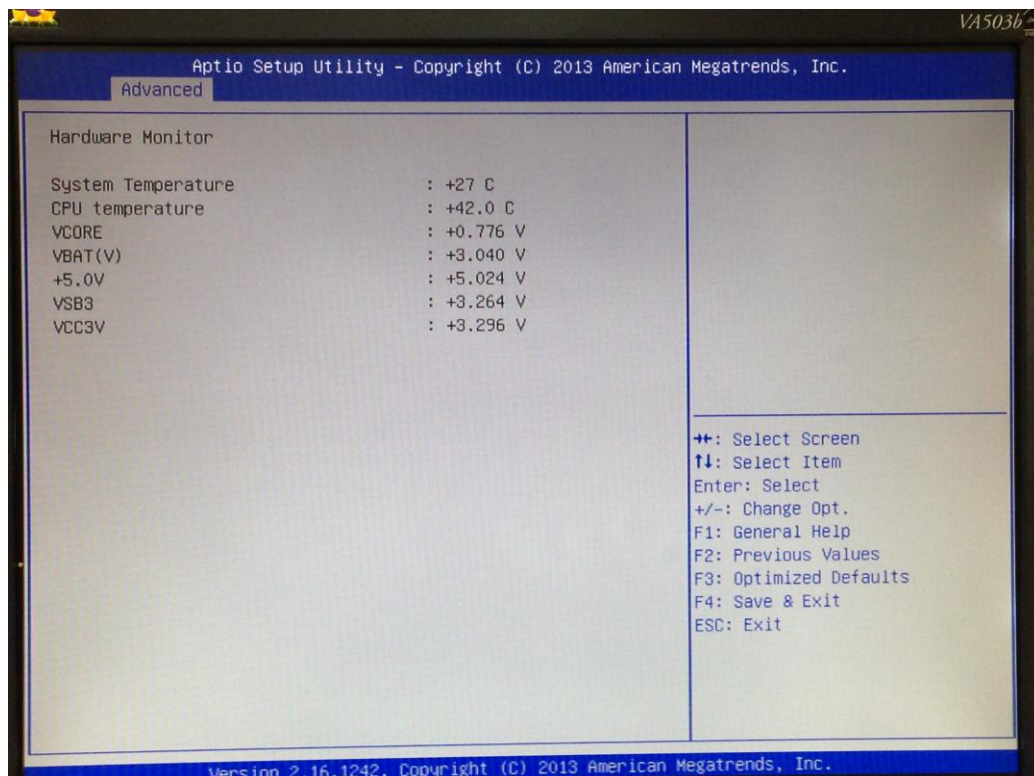
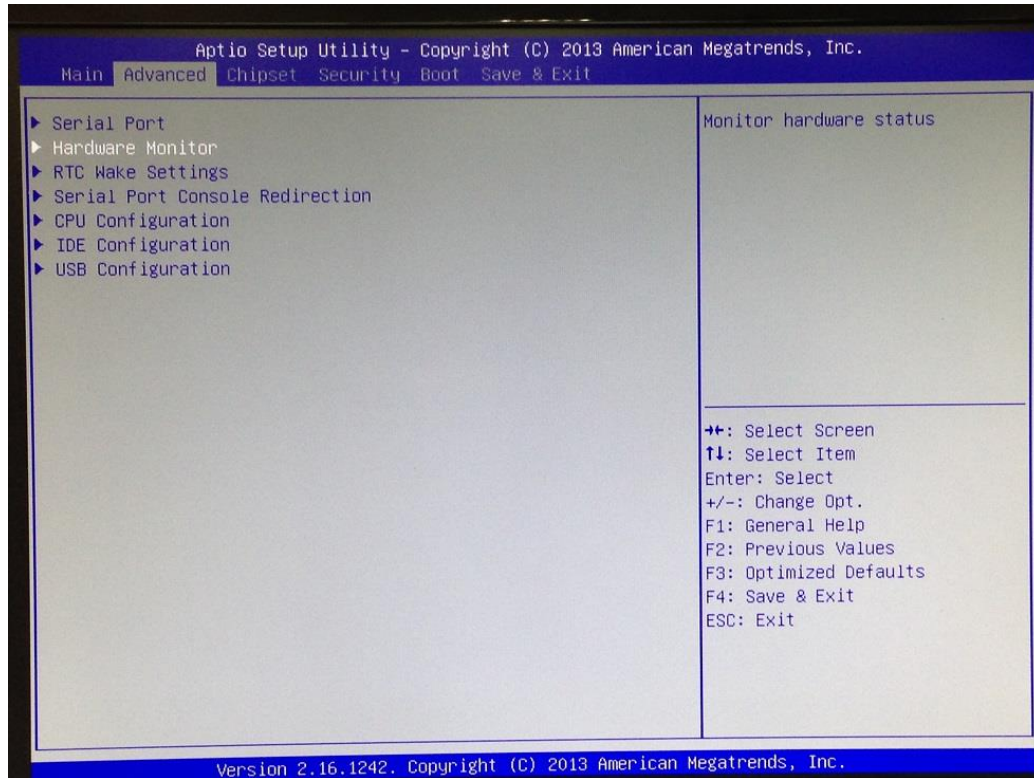




- **H/W Monitor**

Scroll to this item and press <Enter> to view the monitor hardware status.

(Please refer below graphics.)

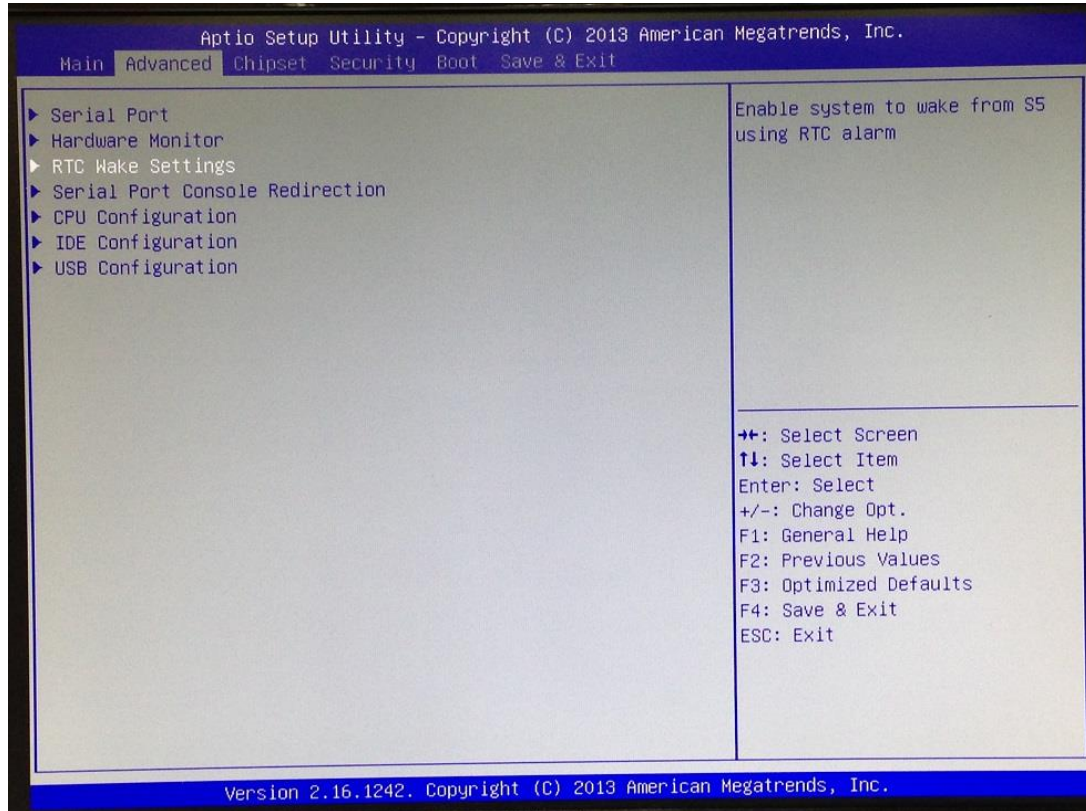


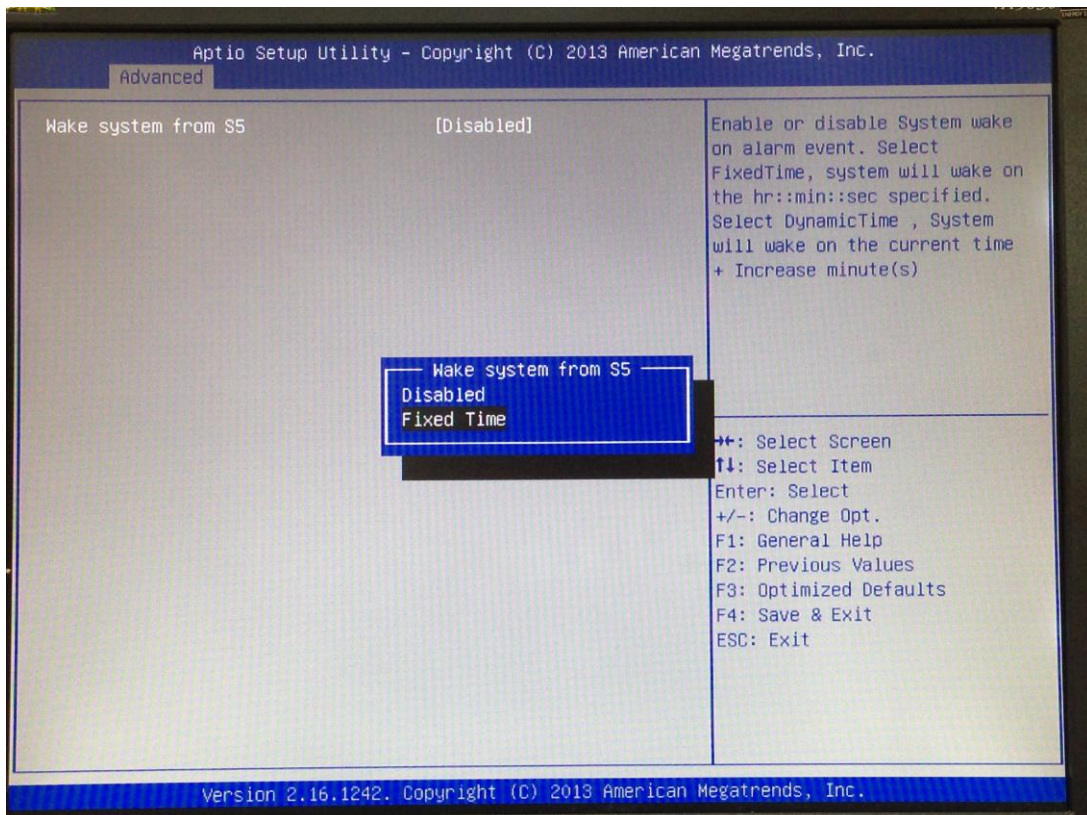
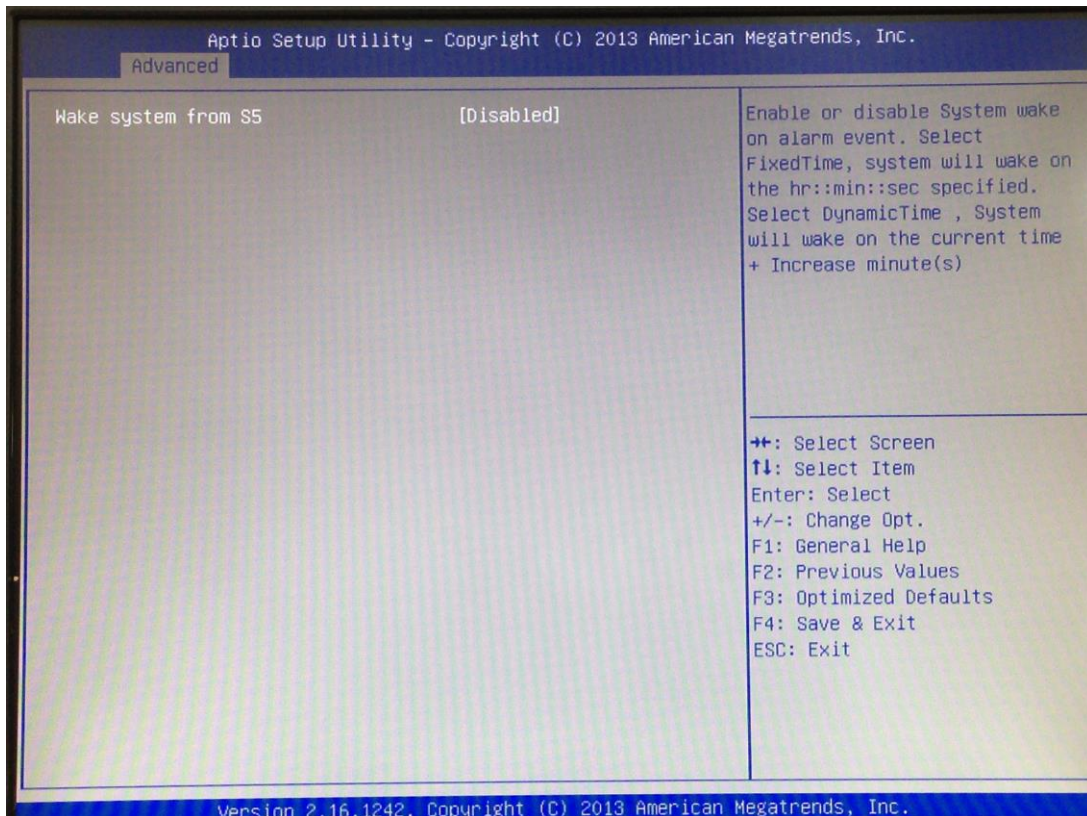
- **RTC Wake Settings**

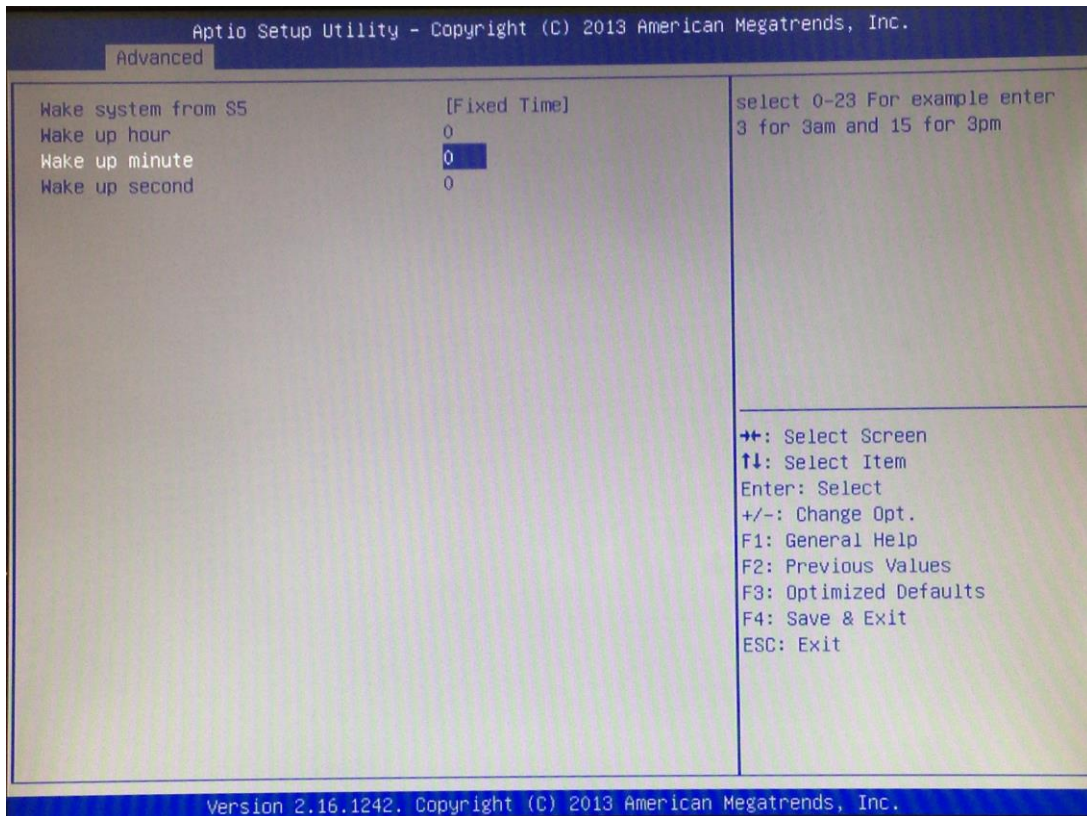
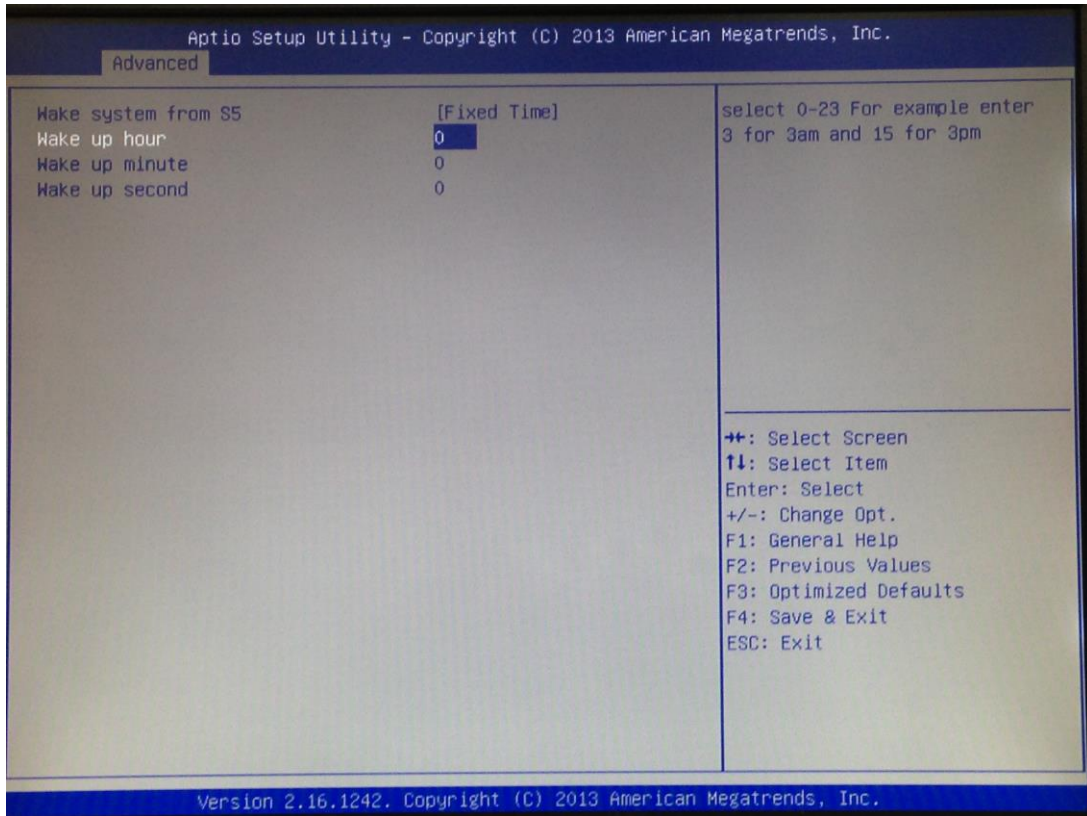
The default setting is “disable”.

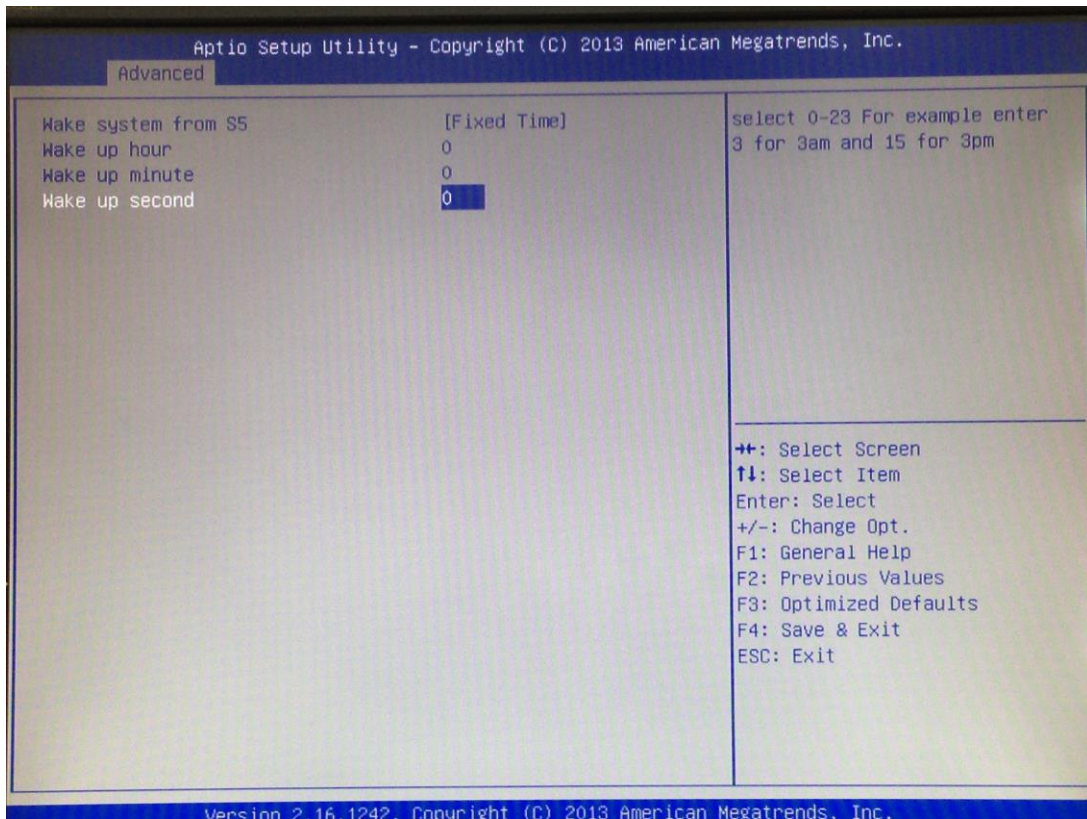
If the setting is changed for “enable”, you can set up the fixed time to boot up automatically.

(Please refer below graphics.)







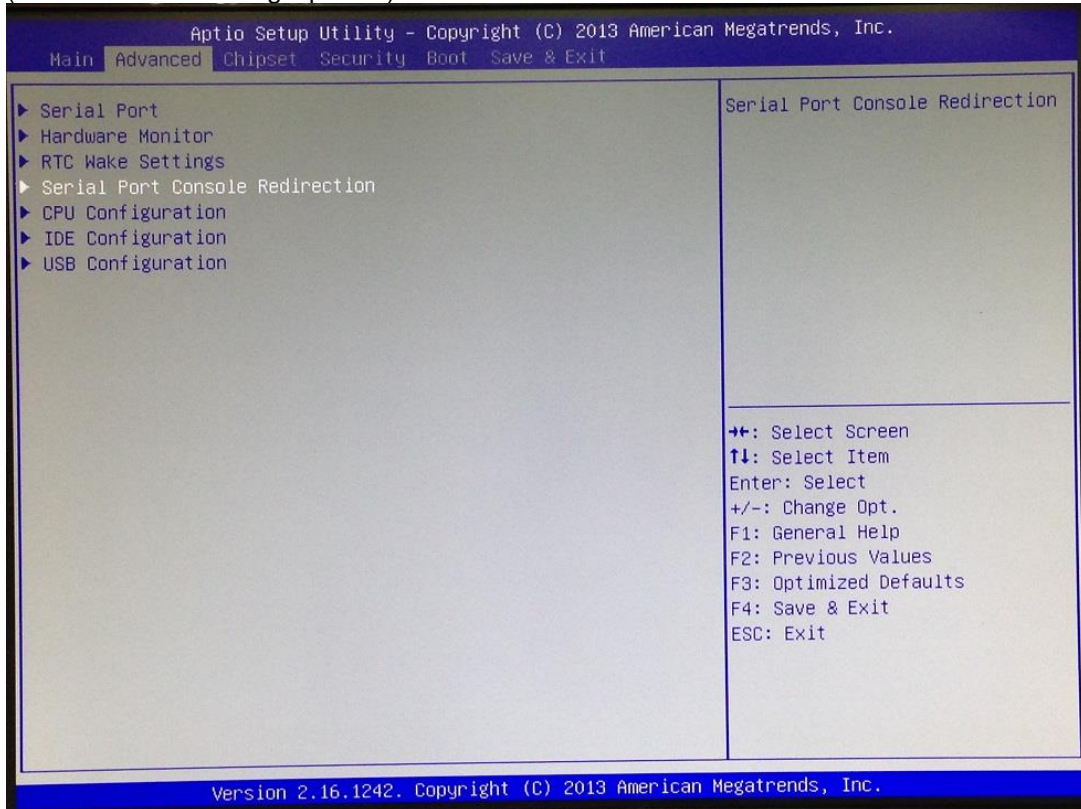


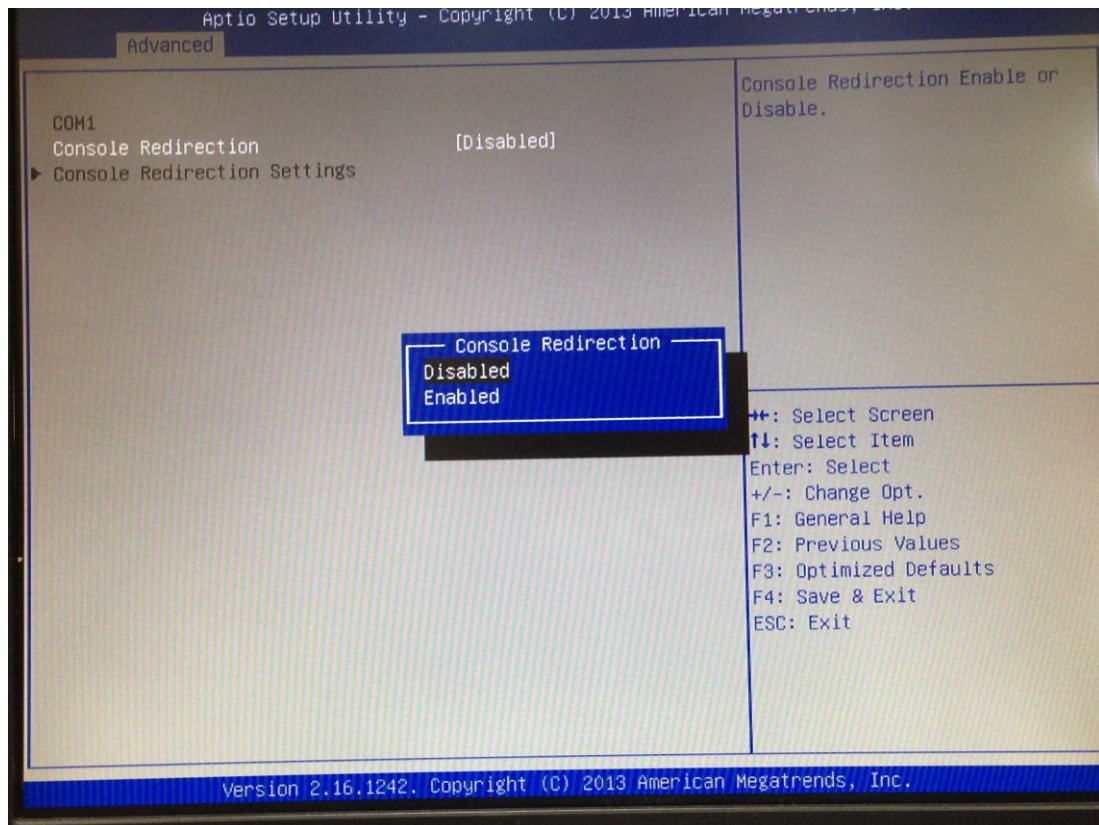
- **Serial Port Console Redirection**

Only COM1 has the console redirection function.

The default setting for the console redirection function is [Disabled]

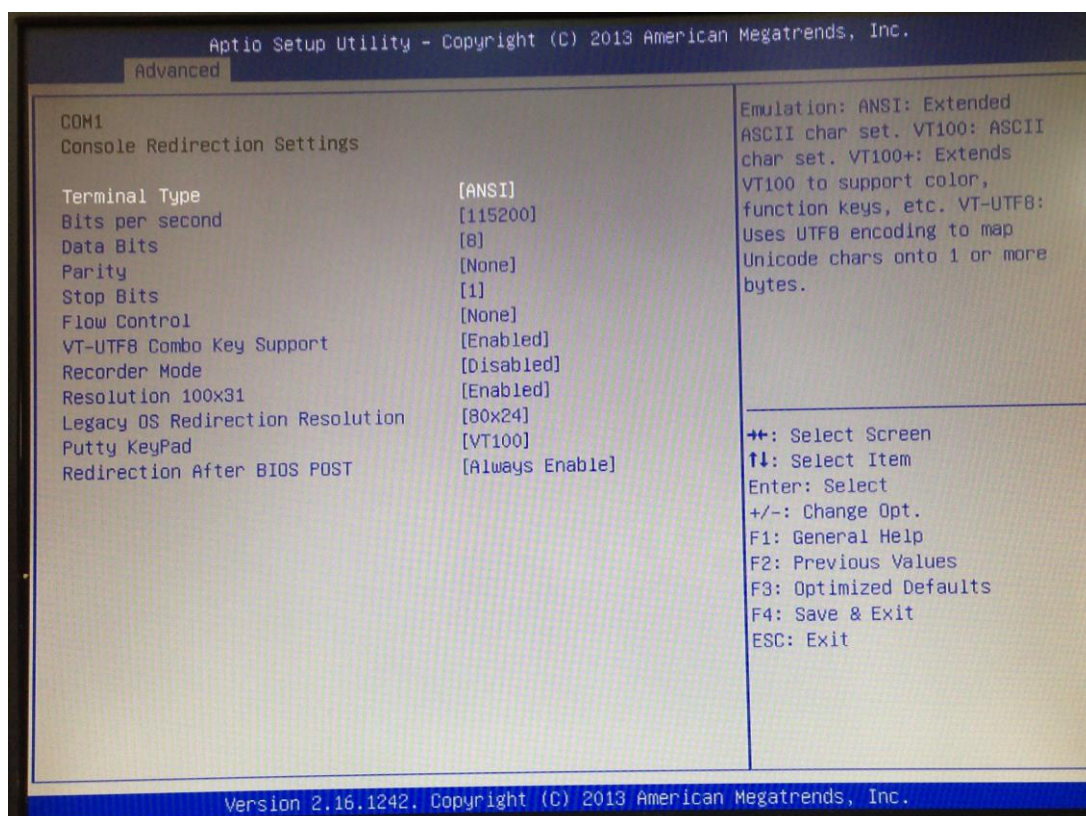
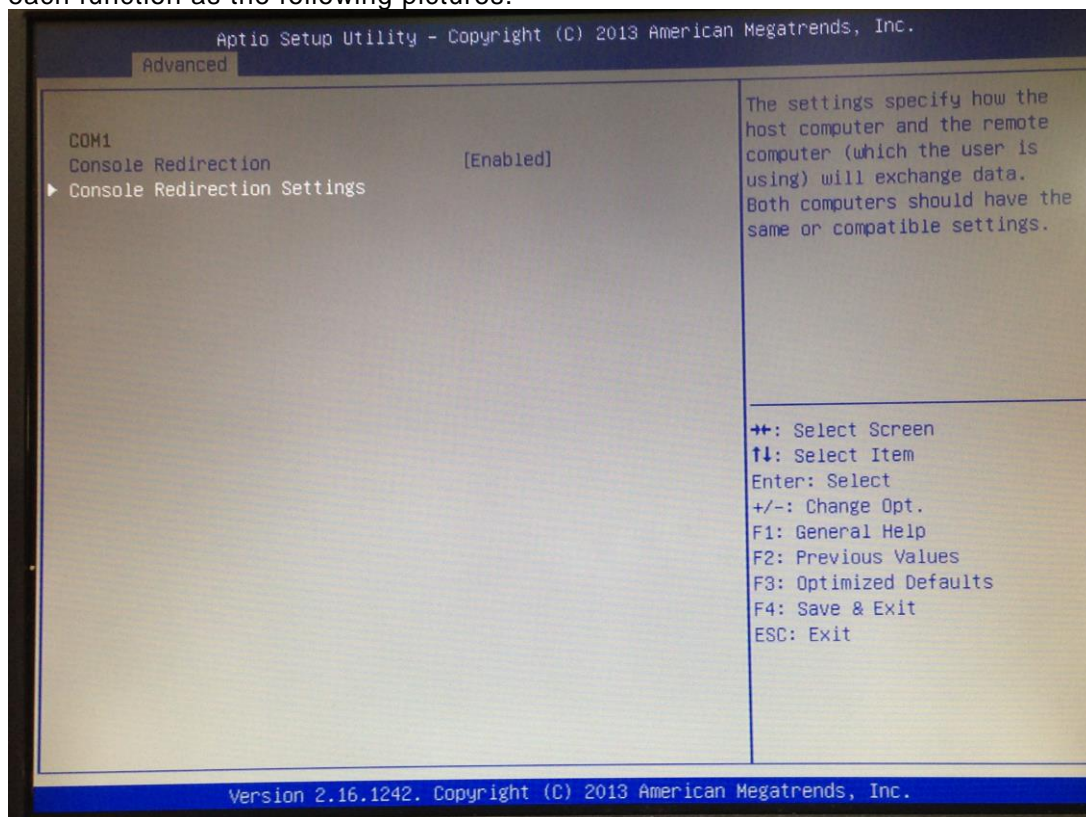
(Please refer below graphics.)





If the setting for the console redirection function is changed for [Enabled], the settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

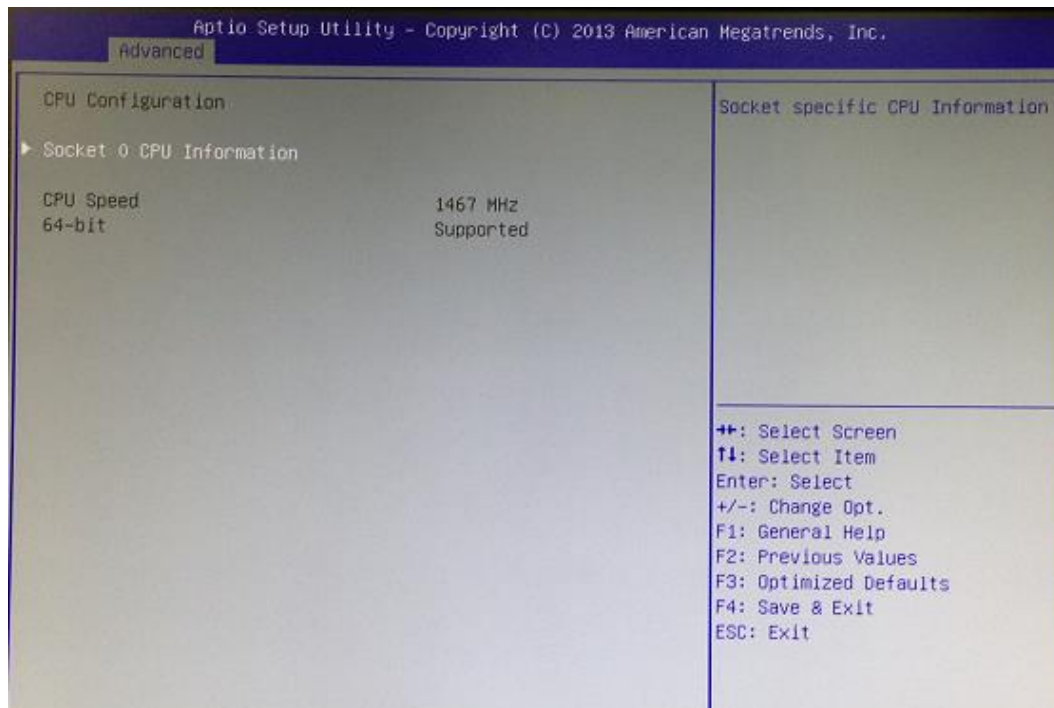
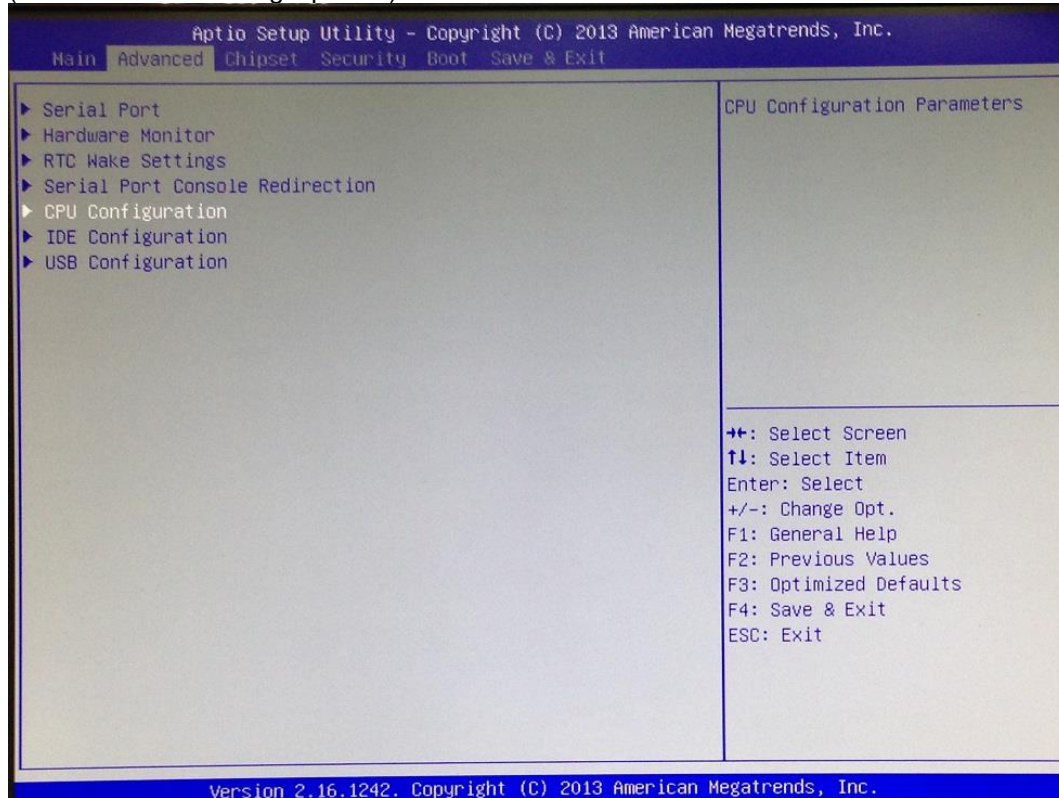
And you can further change the setting by selecting or setting the value you want in each function as the following pictures.

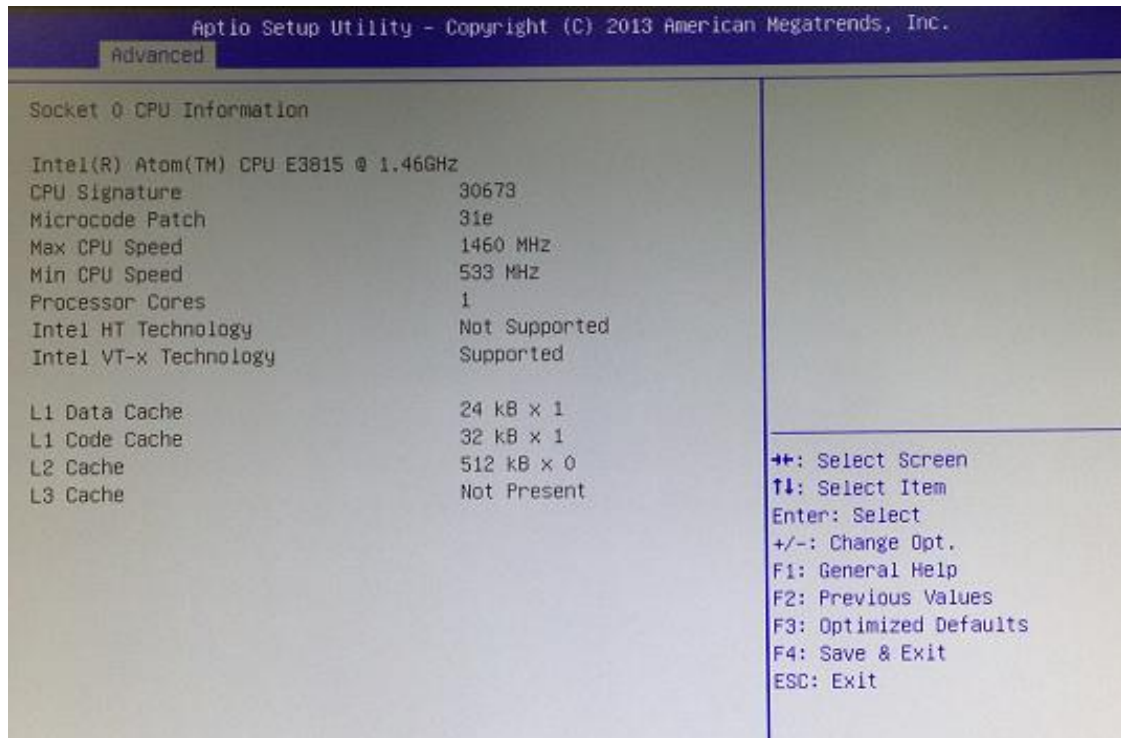


- **CPU Configuration**

Scroll to this item and press <Enter> to view the CPU Configuration informations.

(Please refer below graphics.)

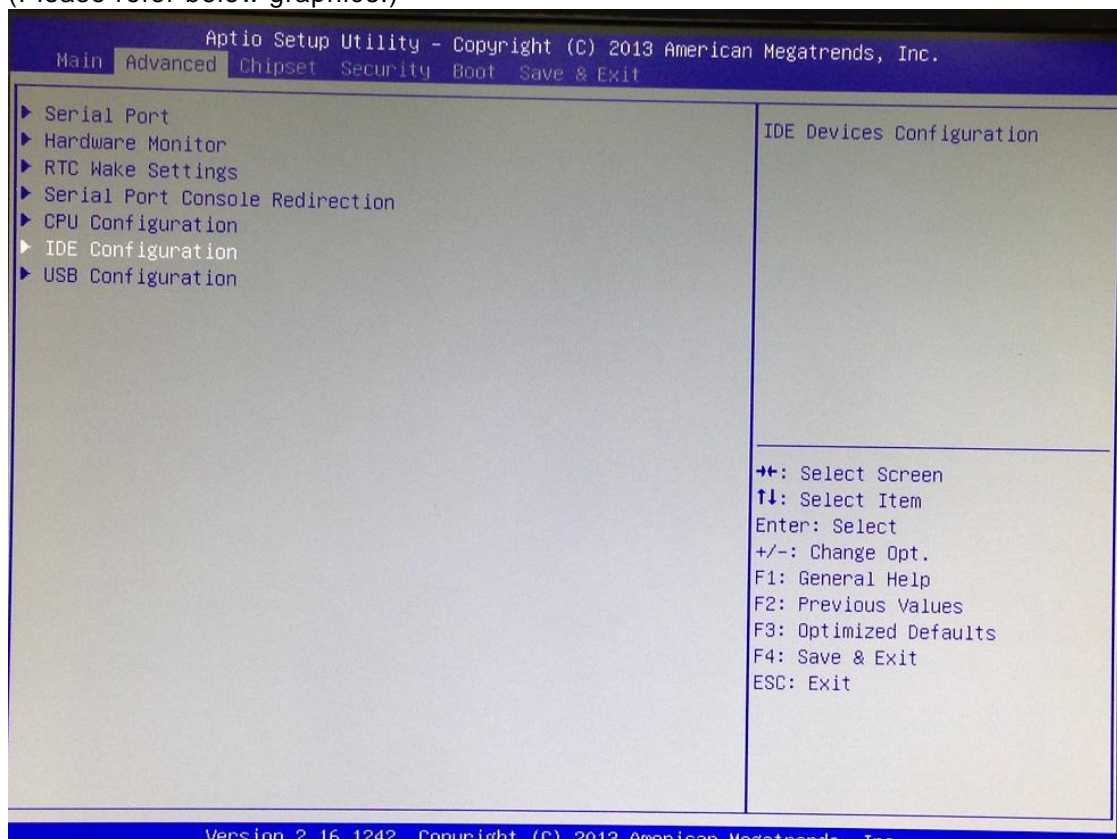


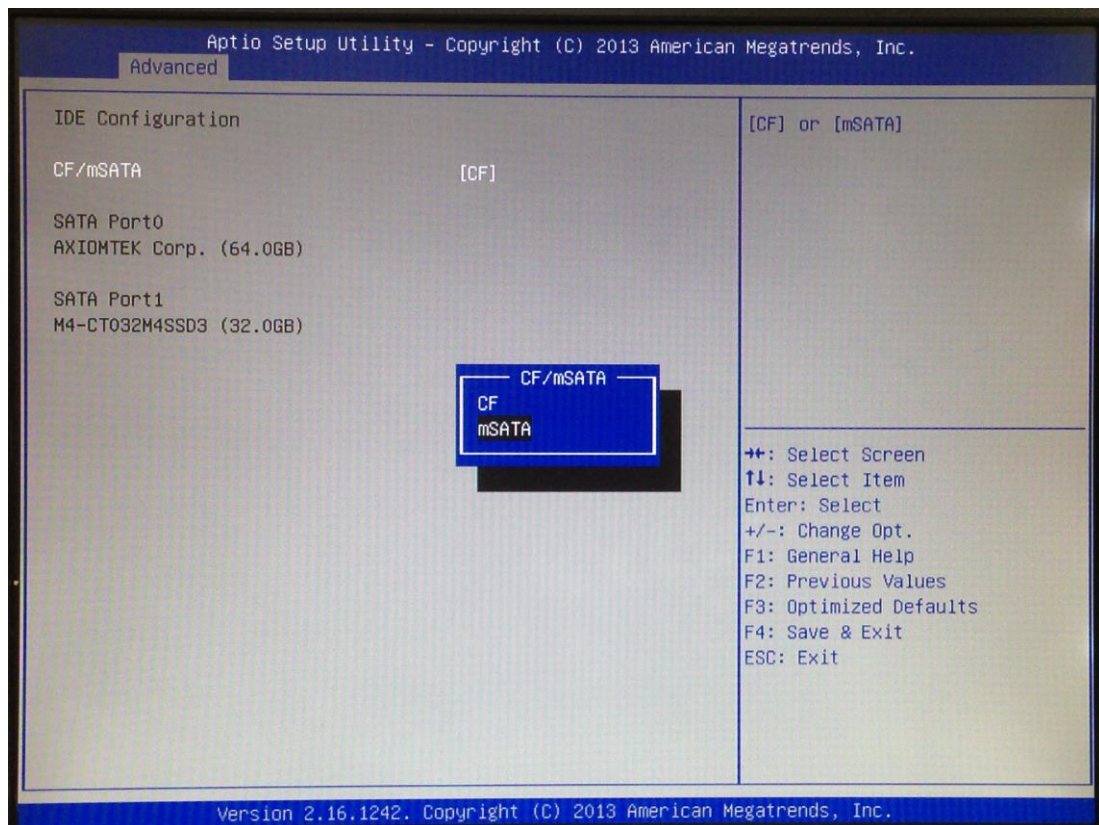


- **IDE Configuration**

Scroll to this item and press <Enter> to view the IDE Configuration informations.

(Please refer below graphics.)



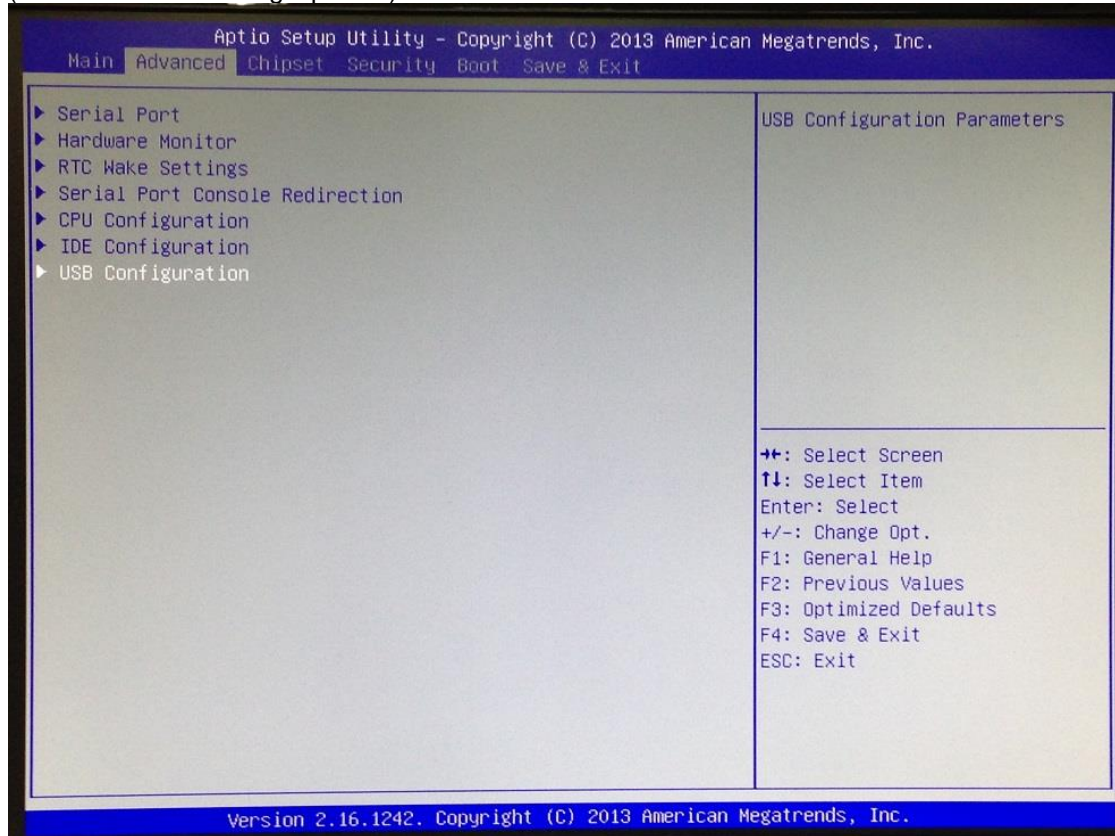


Note: CF and mSATA function can be either one, it can be select by BIOS menu. mSATA and wireless use the same slot, and only one of them can be selected.

- **USB Configuration**

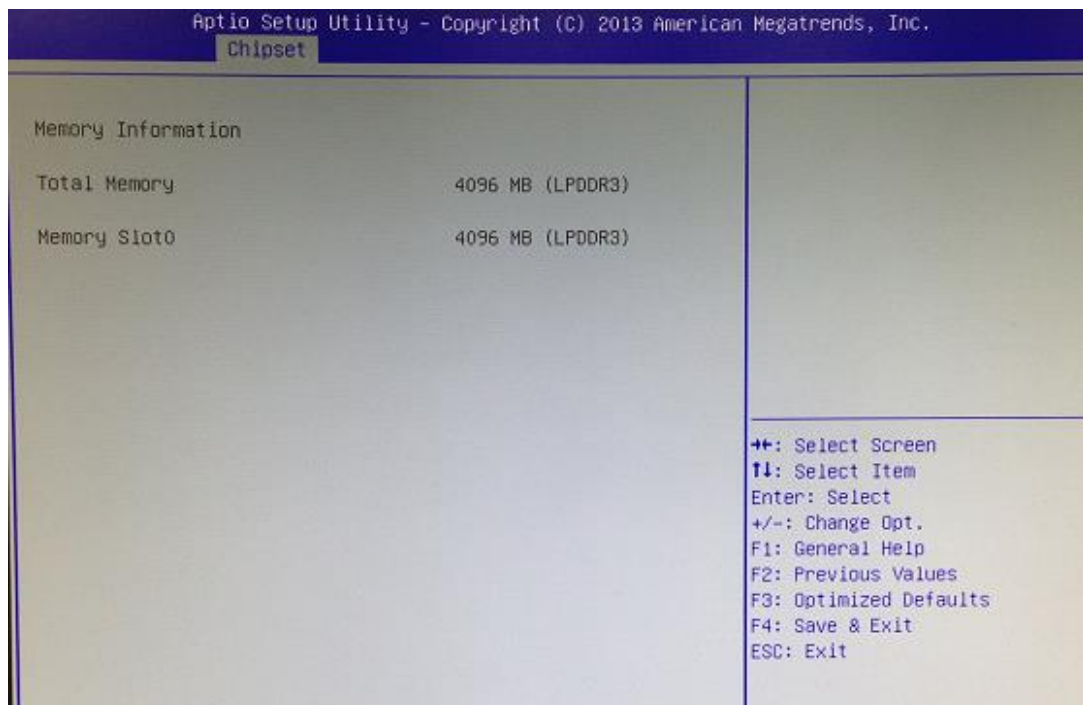
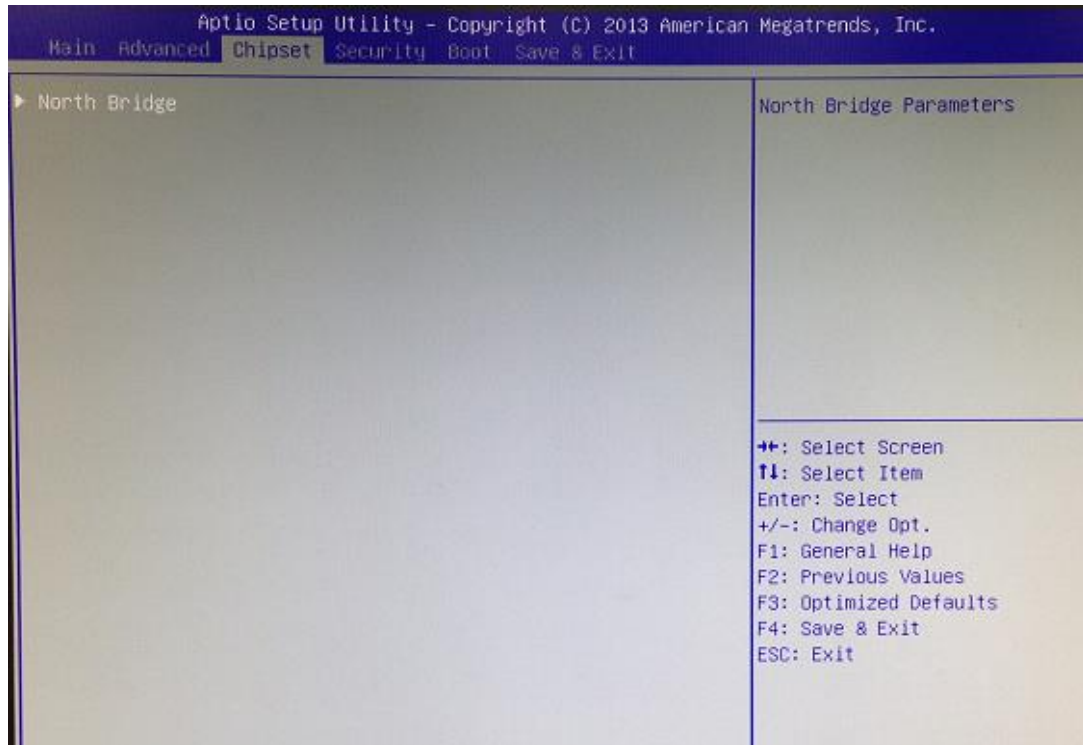
Scroll to this item and press <Enter> to view the USB Configuration informations.

(Please refer below graphics.)



3.4 Chipset Feature

This section contains completely optimized chipset's features in the system



Advanced

USB Configuration

USB Module Version 8.11.01

USB Devices:
 1 Hub

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

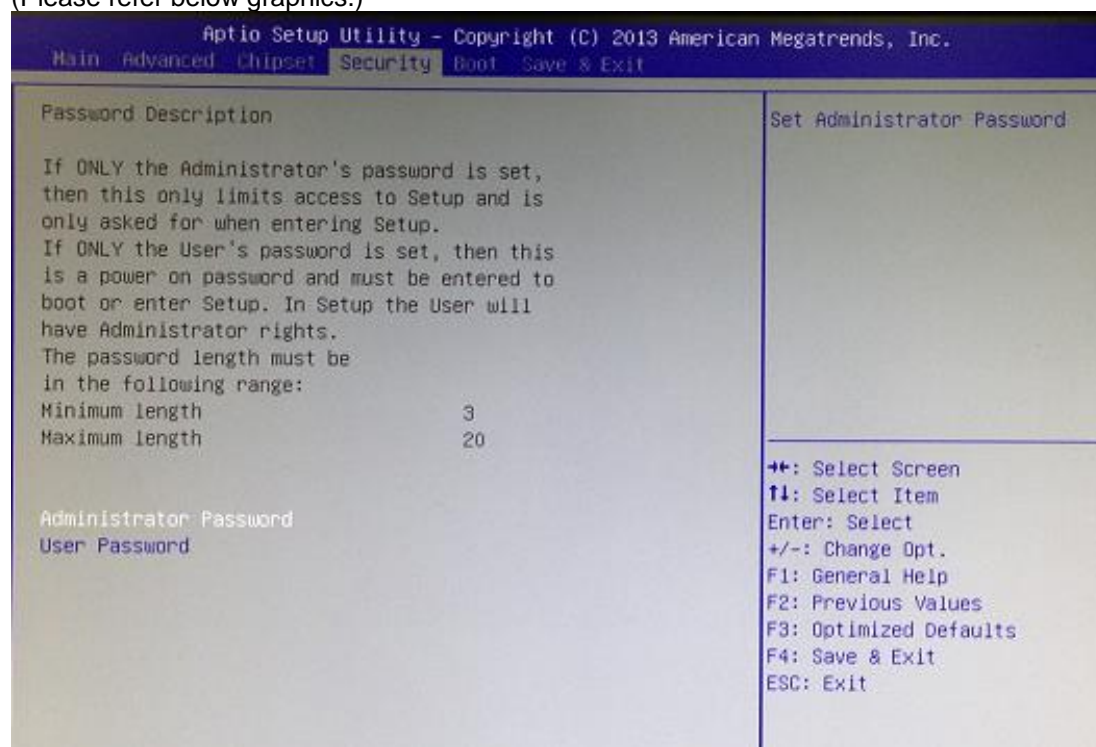
3.5 Security

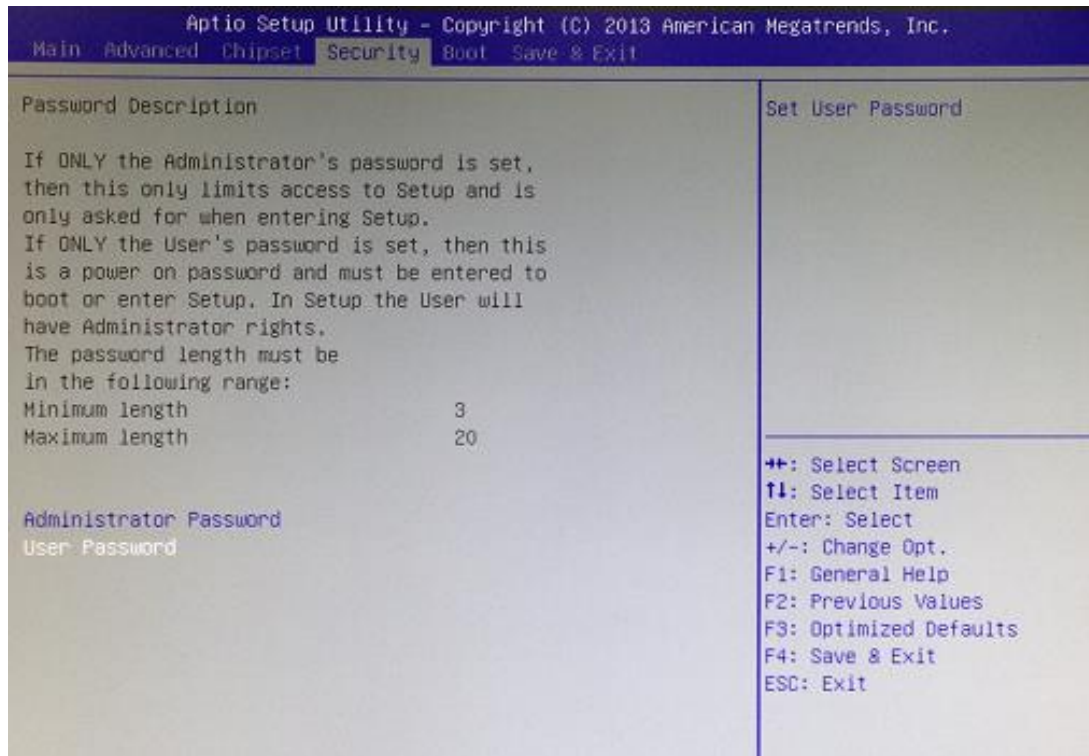
The default setting for Administrator Password is “Not setting passwords”.

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

You can set the password for both Administrator Password and User Password.

(Please refer below graphics.)



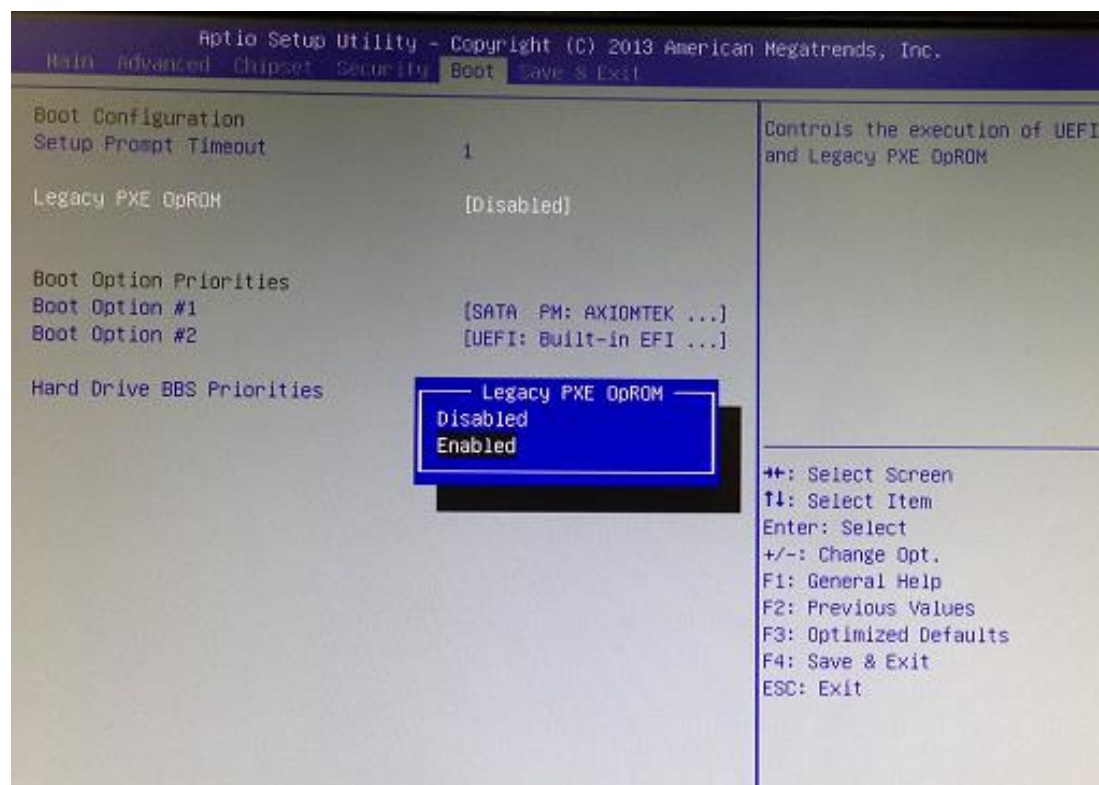
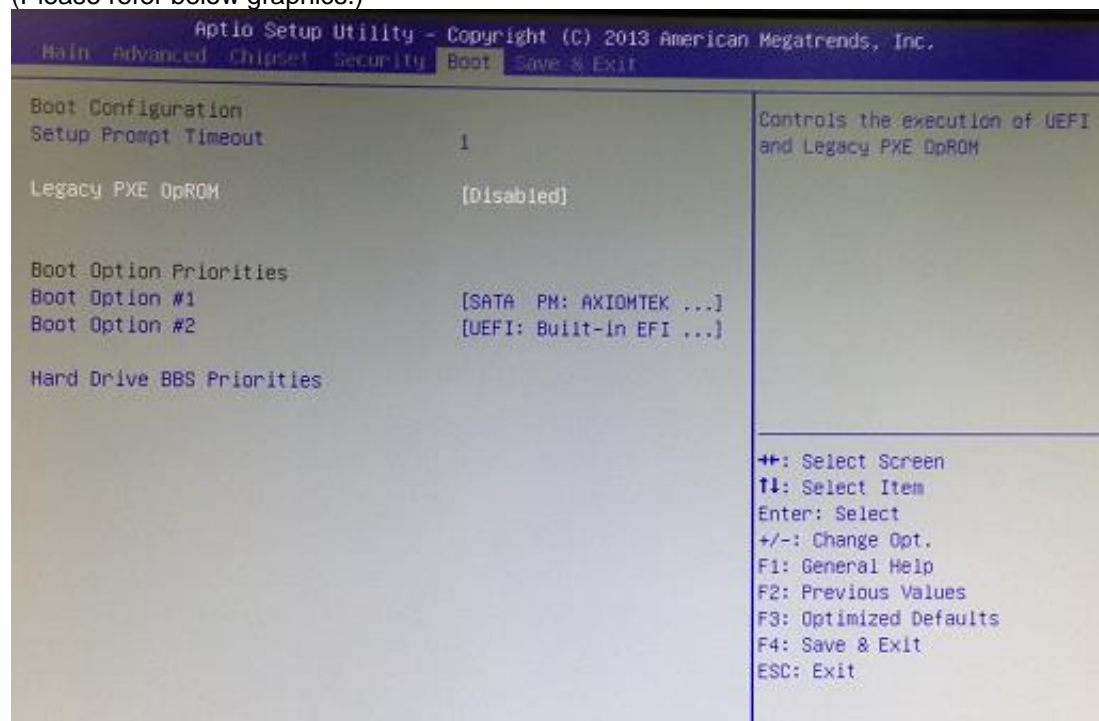


Note: The BIOS default has no password, when user created the password, please remember the password number, if users forget password the RMA is the only solution.

3.6 Boot Type

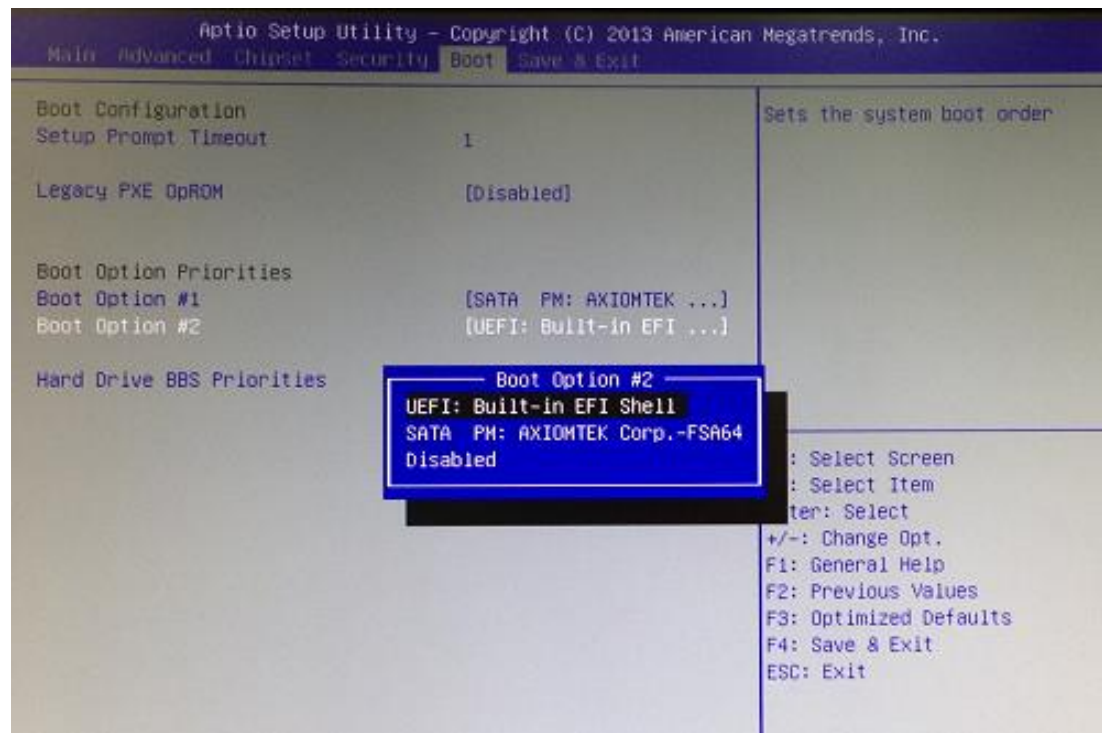
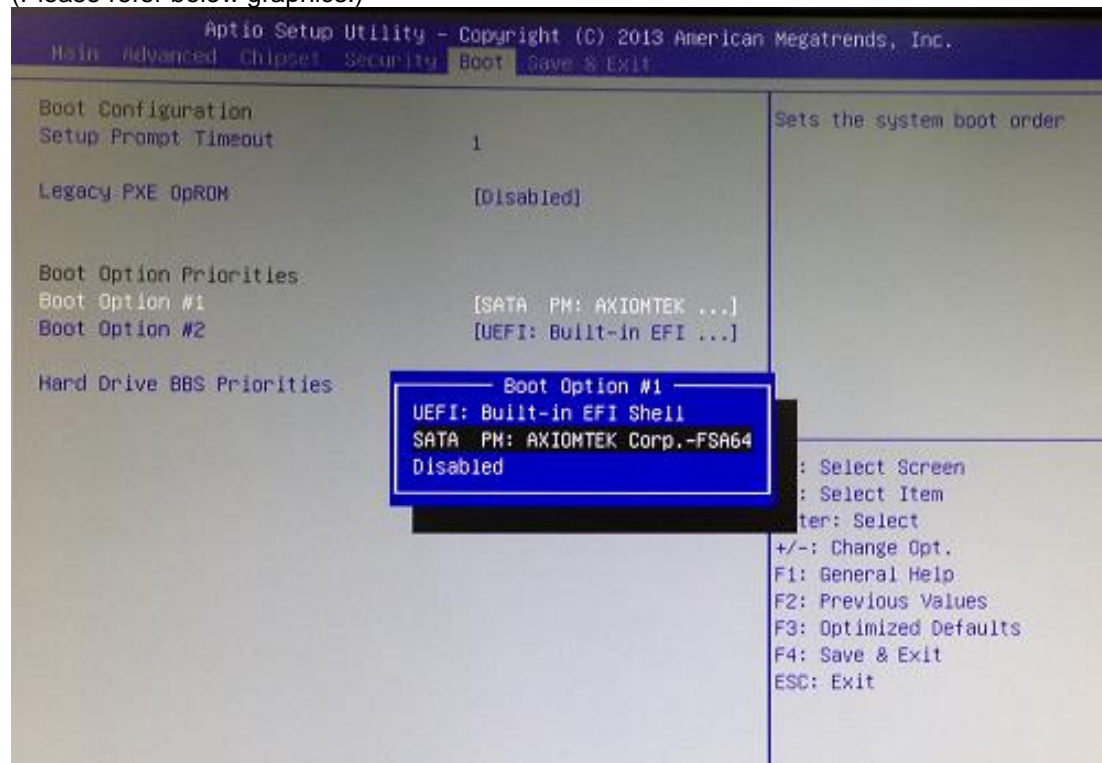
The default setting boot from onboard LAN PxE Rom is [Disabled]

(Please refer below graphics.)

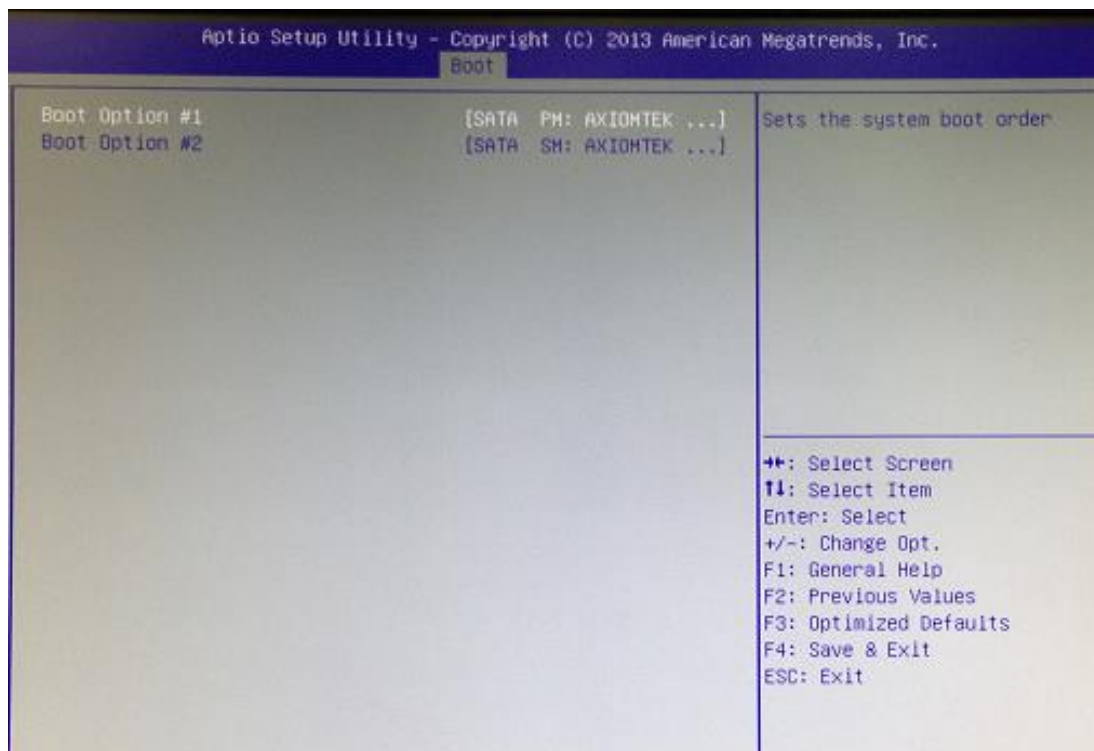
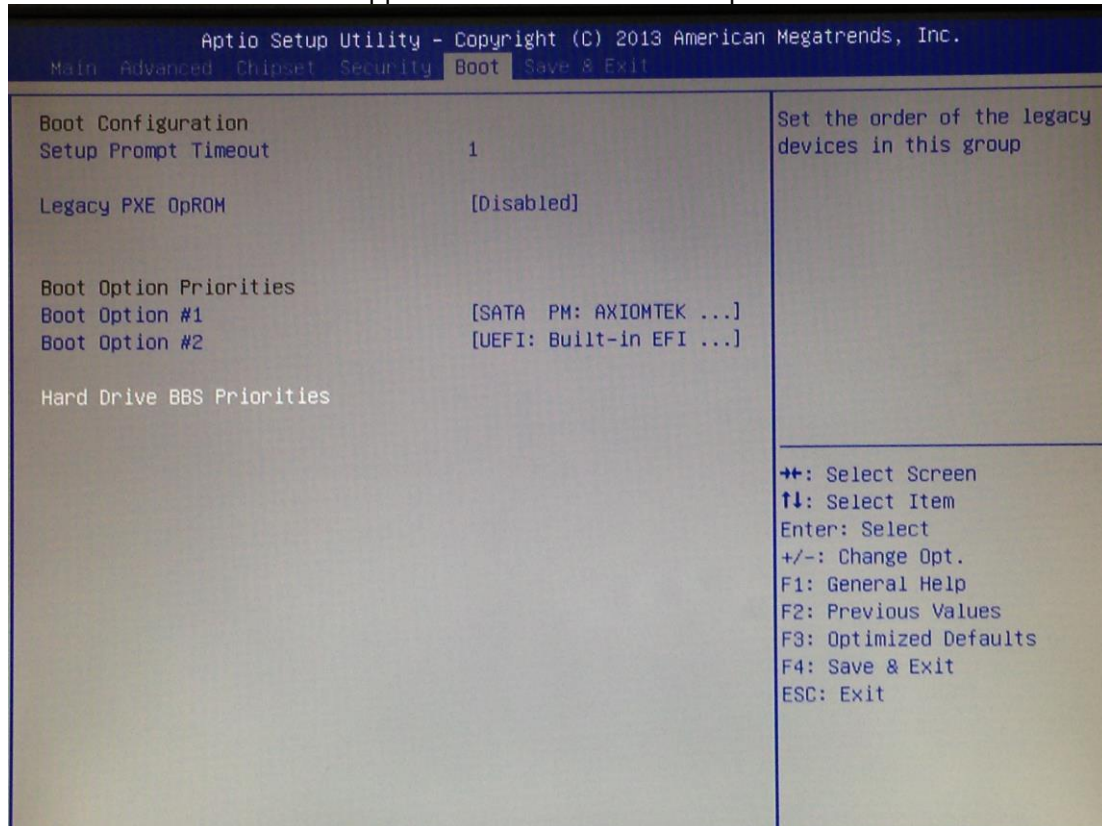


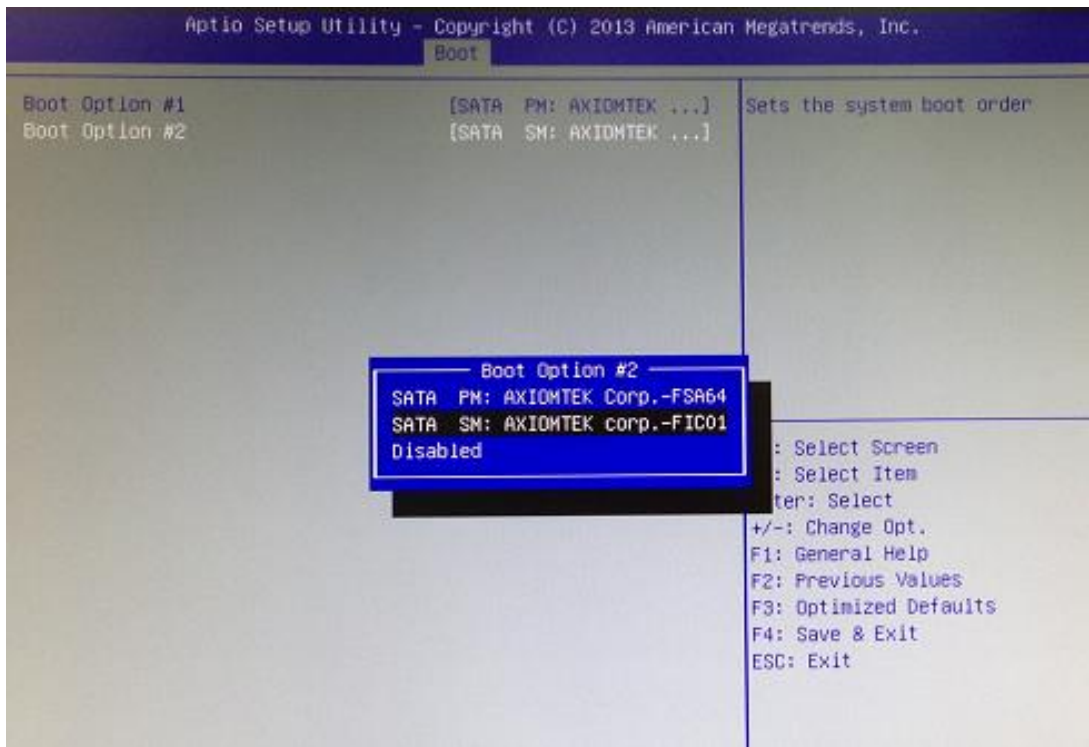
The Boot Option Priorities can select by Boot Option #1, #2...

(Please refer below graphics.)



Hard Drive BBS Priorities supports the hard drive boot option.

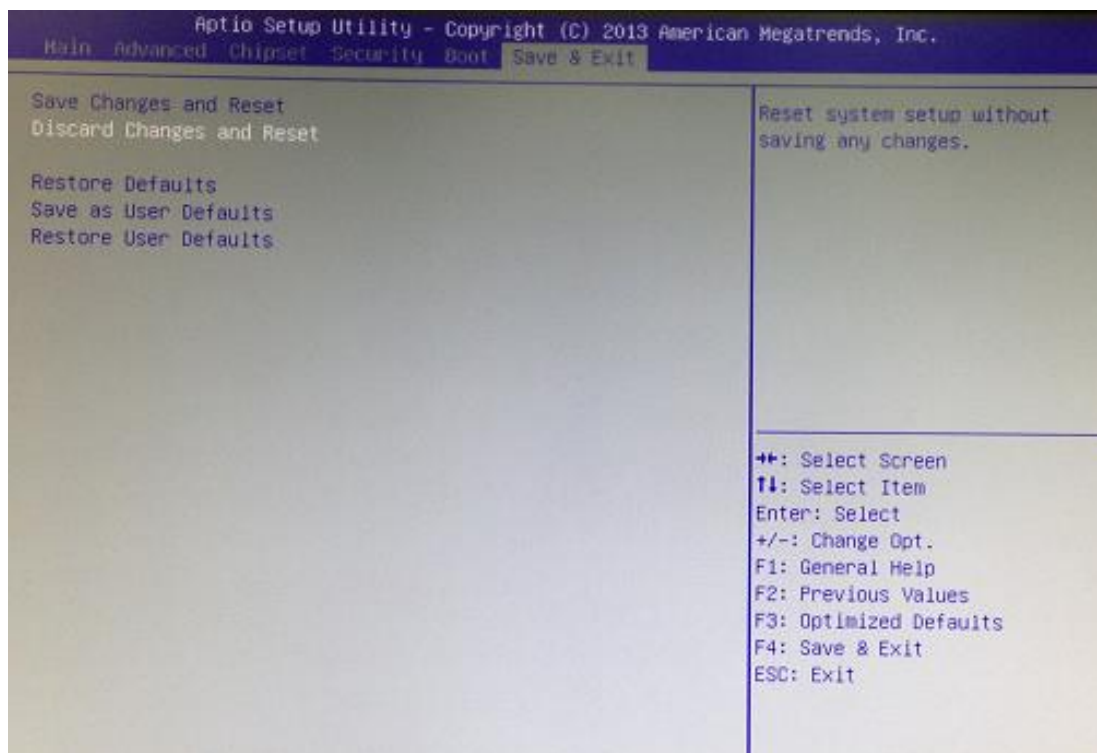
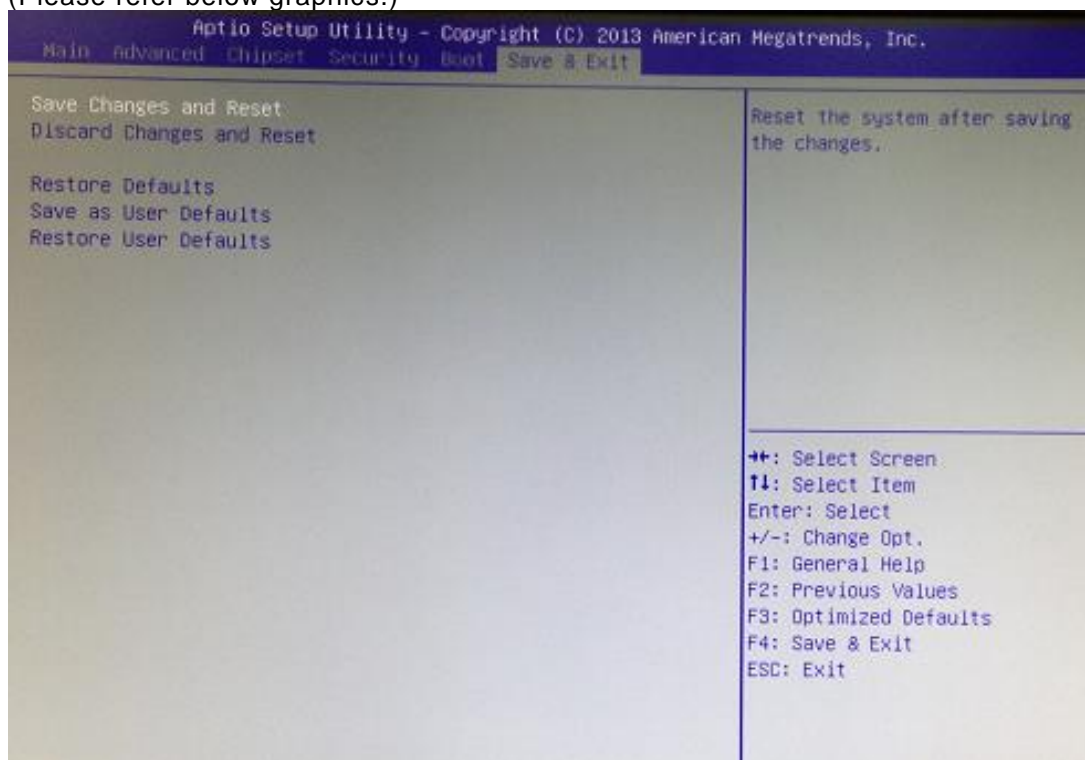


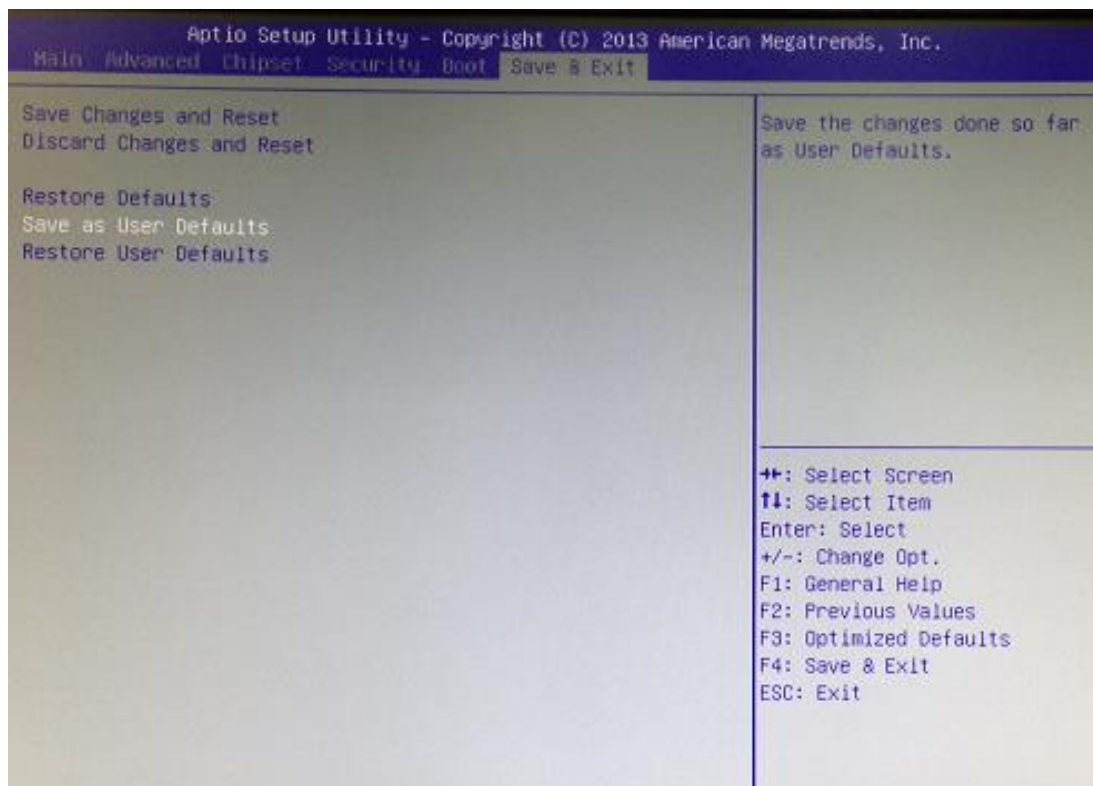
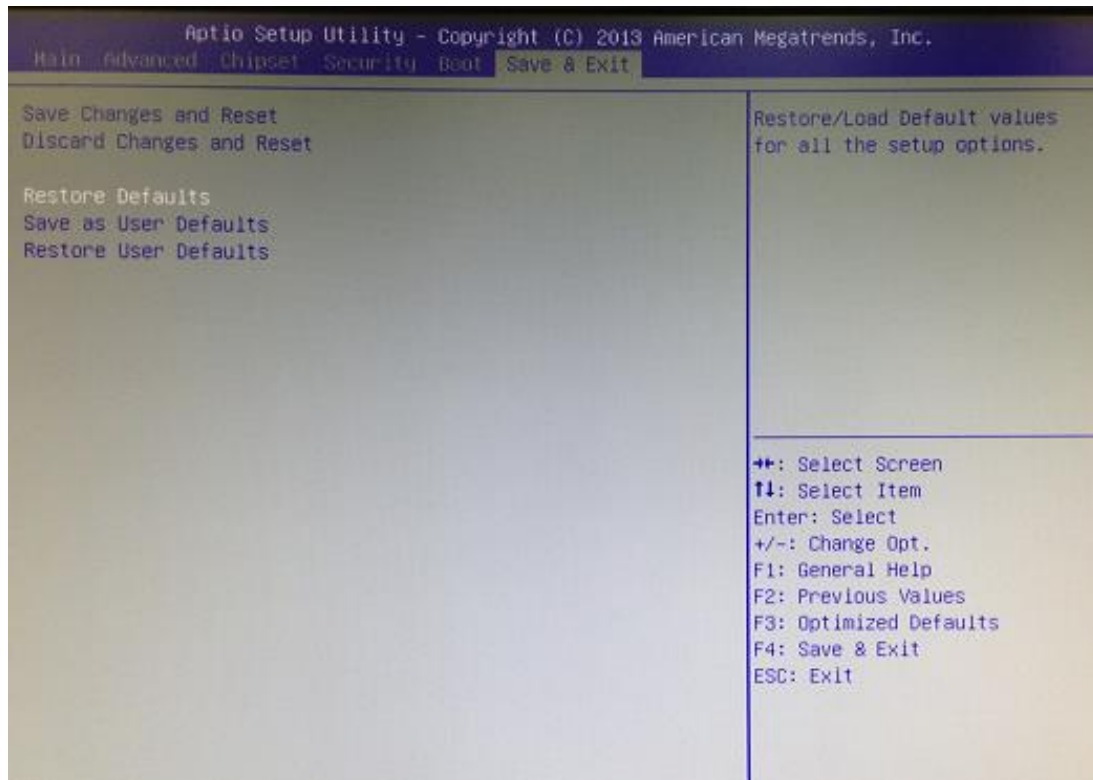


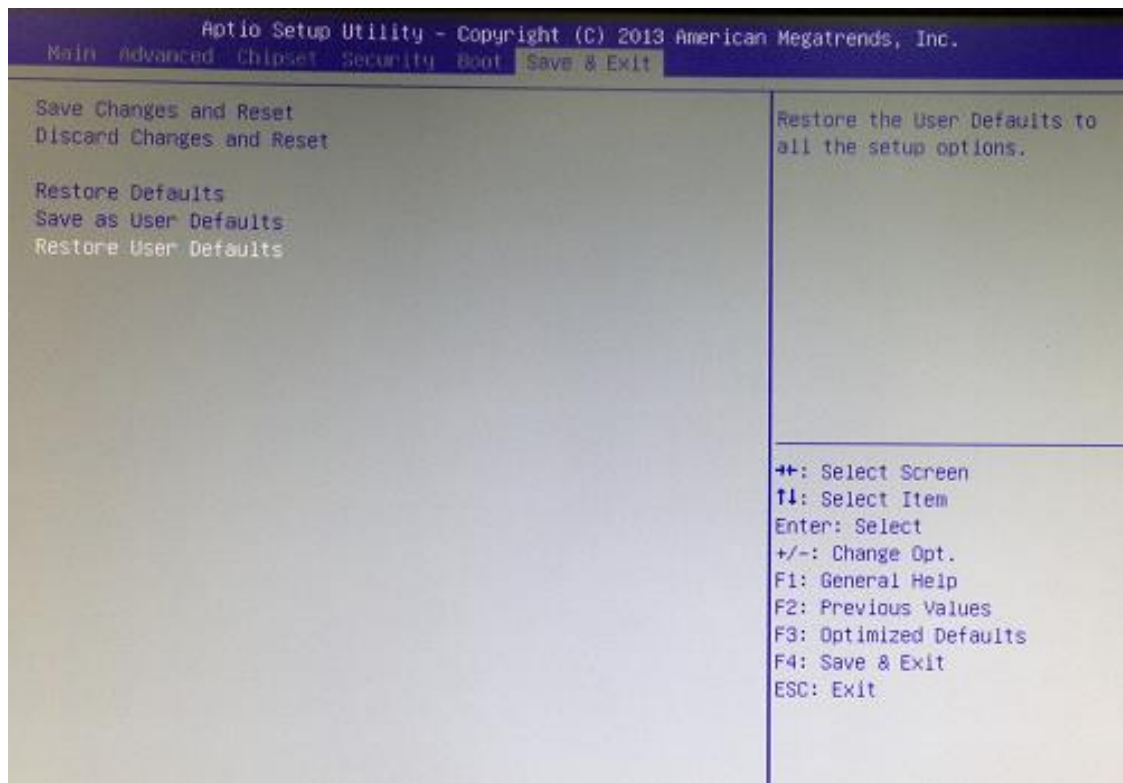
3.7 Save & Exit

This section allows you to determine whether or not to accept your modifications. Type “Y” to quit the setup utility and save all changes. Type “N” to bring you back to the Previous Setup utility.

(Please refer below graphics.)







APPENDIX A WATCHDOG TIMER

About Watchdog Timer

After the system stops working for a while, it can be auto-reset by the watchdog timer. The integrated watchdog timer can be set up in the system reset mode by program.

How to Use Watchdog Timer

The following example enables configuration using debug tool.

Enable WDT

↓

Enable configuration:

O 2E 87 ; Un-lock super I/O

O 2E 87

↓

Select logic device:

O 2E 07

O 2F 08

↓

WDT device enable:

O 2E 30

O 2F 01

↓

Set timer unit:

O 2E F0

O 2F 00 ; (00: Sec; 08:Minute)

↓

Set base timer:

O 2E F1

O 2F 0A ; Set reset time (where 0A (hex) = 10sec)

Disable WDT



Enable configuration:

O 2E 87 ; Un-lock super I/O

O 2E 87



Select logic device:

O 2E 07

O 2F 08



WDT device disable:

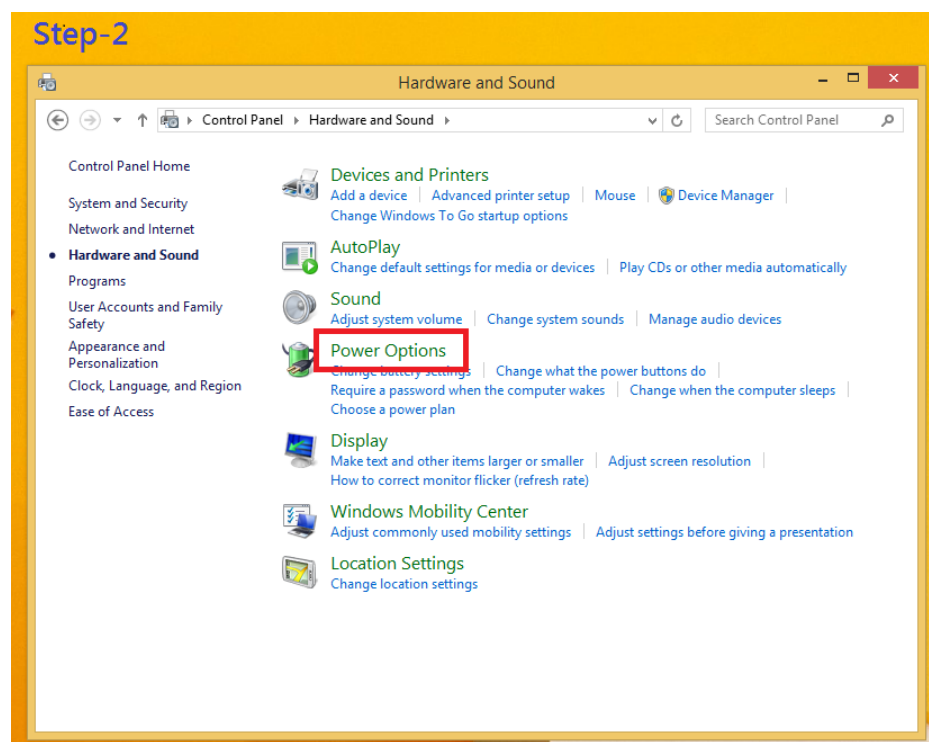
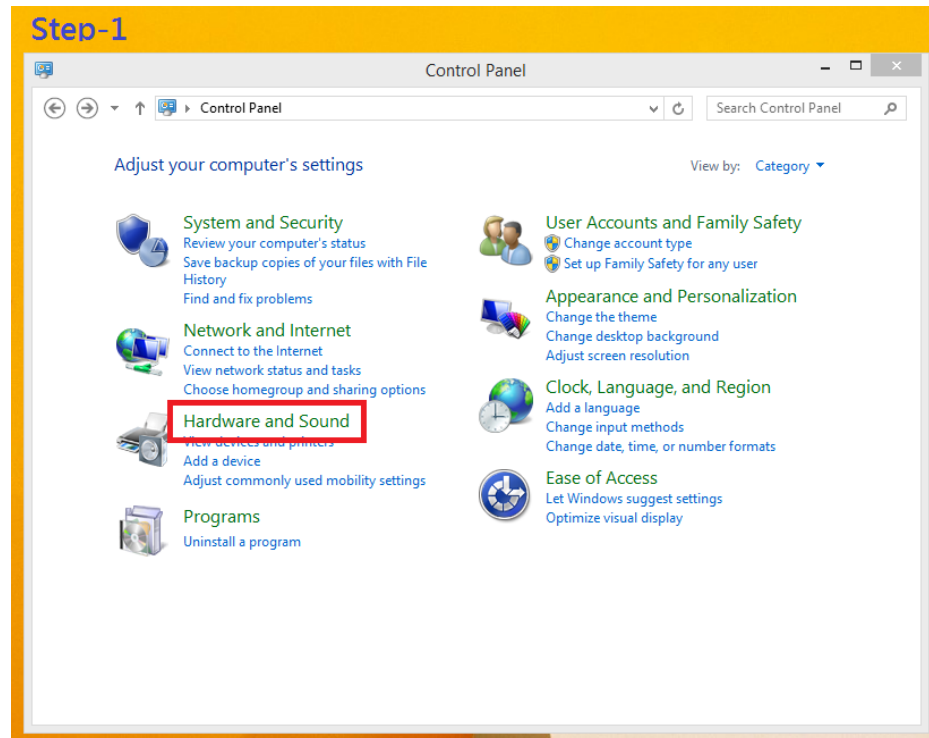
O 2E 30

O 2F 00

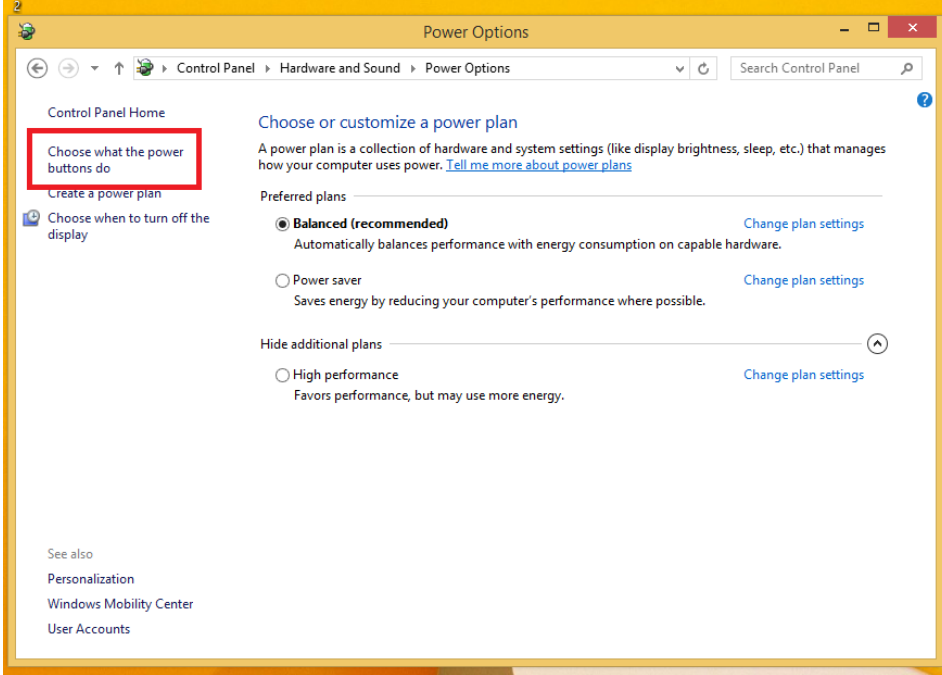
APPENDIX B

POWER BUTTON SETTING FOR WINDOW SOFTWARE

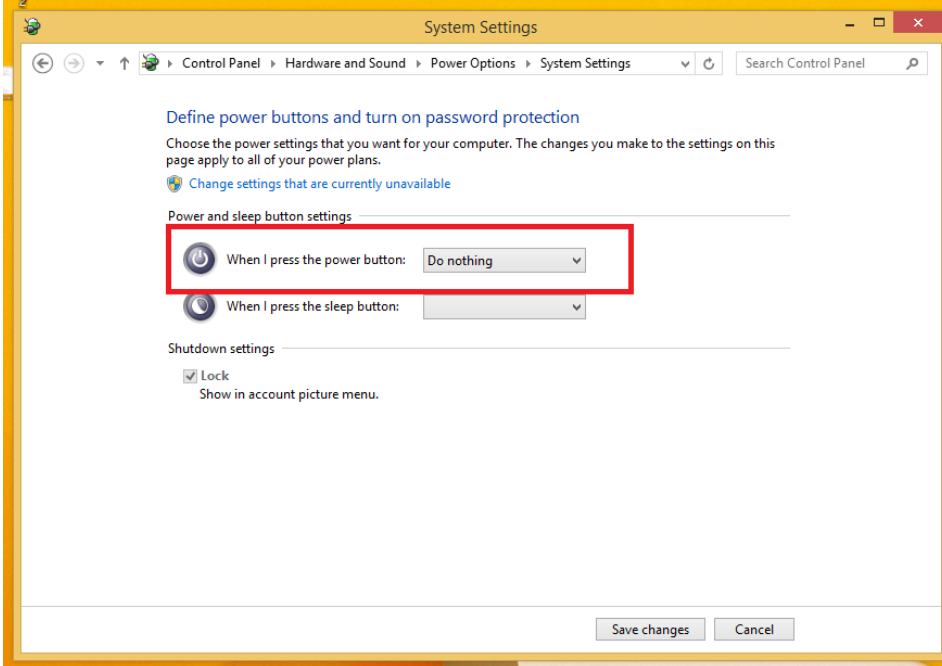
Please make the power button setting from the console of PC, then follow up below pictures to do the setting.



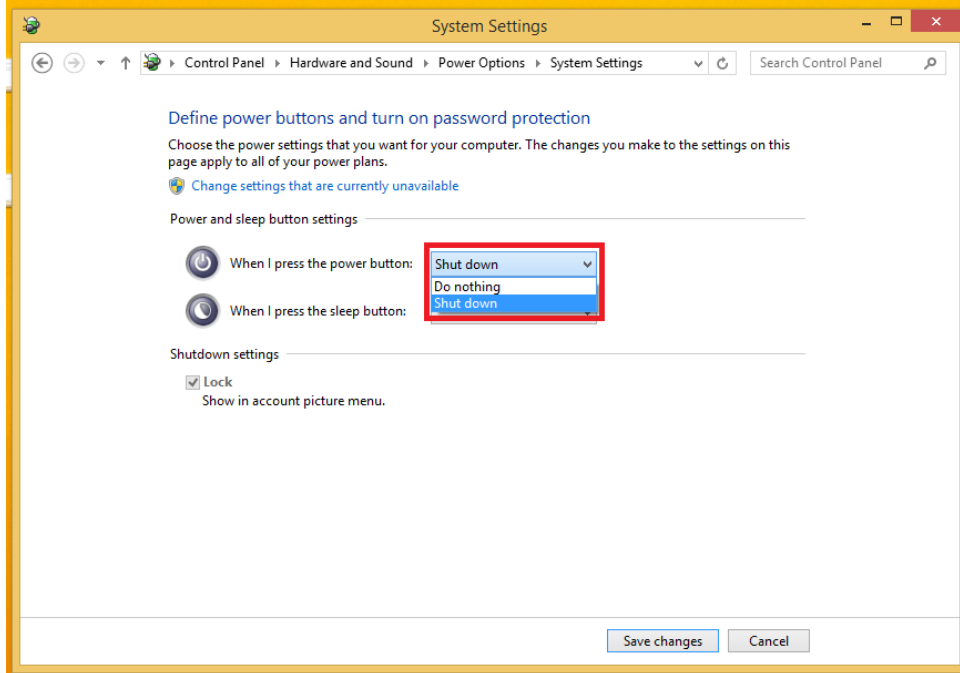
Step-3



Step-4



Step-5



Step-6

