AXIOMTEK

Q7M310/311

Intel® Celeron® N4200/N3350
Intel® Atom™ E3950/E3940/E3930
Qseven Module

User's Manual

Disclaimers

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CAUTION

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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ESD Precautions

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove modules or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the module or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling modules and components.

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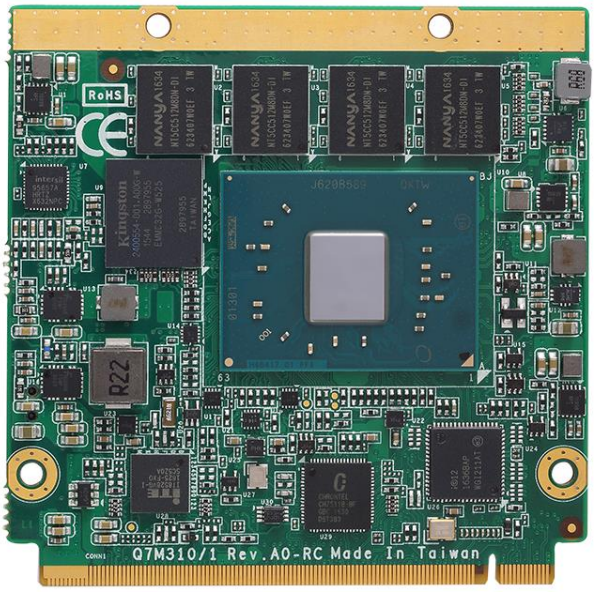
Chapter 1
Introduction



The Q7M311 is a new Qseven Module supporting Intel® Celeron® quad/dual core N4200/N3350 processor. Meanwhile, Q7M310 supports Intel® Atom™ x5 and x7 E3950/E3940/E3930 processor. Both of them deliver outstanding system performance and support excellent multiple I/Os, one DDI, one LVDS, one Gigabit Ethernet, HD Audio interface, two SATA-600, three USB 3.0 and four USB 2.0 ports. For extension purpose, Q7M310/311 provides maximum up to 4 lanes of PCI-Express.

1.1 Features

- Q7M311: Intel® Celeron® N4200/N3350 processor
- Q7M310: Intel® Atom™ E3950/E3940/E3930 processor
- DDR3L onboard memory for up to 8GB memory capacity (the default is 4GB)
- Support max. up to 4 lanes of PCI-Express
- 2 SATA-600
- 3 USB 3.0 and 4 USB 2.0 ports
- Optional eMMC storage upto 64GB (BOM Optional)
- Form factor: Qseven Specification v2.1

1.2 Specifications

- **CPU**
  - Q7M311
    - Intel® Celeron® quad core N4200 1.10GHz.
    - Intel® Celeron® dual core N3350 1.10GHz.
  - Q7M310
    - Intel® Atom™ x7-E3950 1.6GHz.
    - Intel® Atom™ x5-E3940 1.6GHz.
    - Intel® Atom™ x5-E3930 1.3GHz.

- **BIOS**
  - American Megatrends Inc. BIOS.
  - 64Mbit SPI Flash, DMI, Plug and Play.
  - PXE Ethernet Boot ROM, customized default saving features, LPC-free supported, uses SPI type Flash memory.

- **System Memory**
  - DDR3L 1866MHz onboard memory for up to 8GB capacity (the default is 4GB).

- **Expansion Interface**
  - Four PCI-Express x1 (Three PCIe x1 if onboard LAN is supported).
  - Three USB ports comply with USB Spec. Rev. 3.0.
  - Four USB ports comply with USB Spec. Rev. 2.0.

- **SATA Interface**
  - Two SATA-600 supported.

- **On board Storage**
  - 16GB , 32B , 64GB eMMC supported (Not default , only BOM optional)

- **Graphics**
  - Integrated in processor HD graphics Gen 9.
  - 18/24-bit dual channel LVDS interface.
  - One DDI interface supports DVI/HDMI/DisplayPort.

- **Ethernet**
  - One 1000/100/10Mbps Base-T provided by Intel® I210IT with integrated boot ROM.

- **Audio**
  - Intel® High Definition Audio interface.

- **Form Factor**
  - Compact module 70mm x 70mm.

1.3 Utilities Supported

- Chipset driver
- Graphics driver
- Ethernet utility and driver
- Trusted execution engine
- Sideband fabric device
- USB 3.0 driver

Note

All specifications and images are subject to change without notice.

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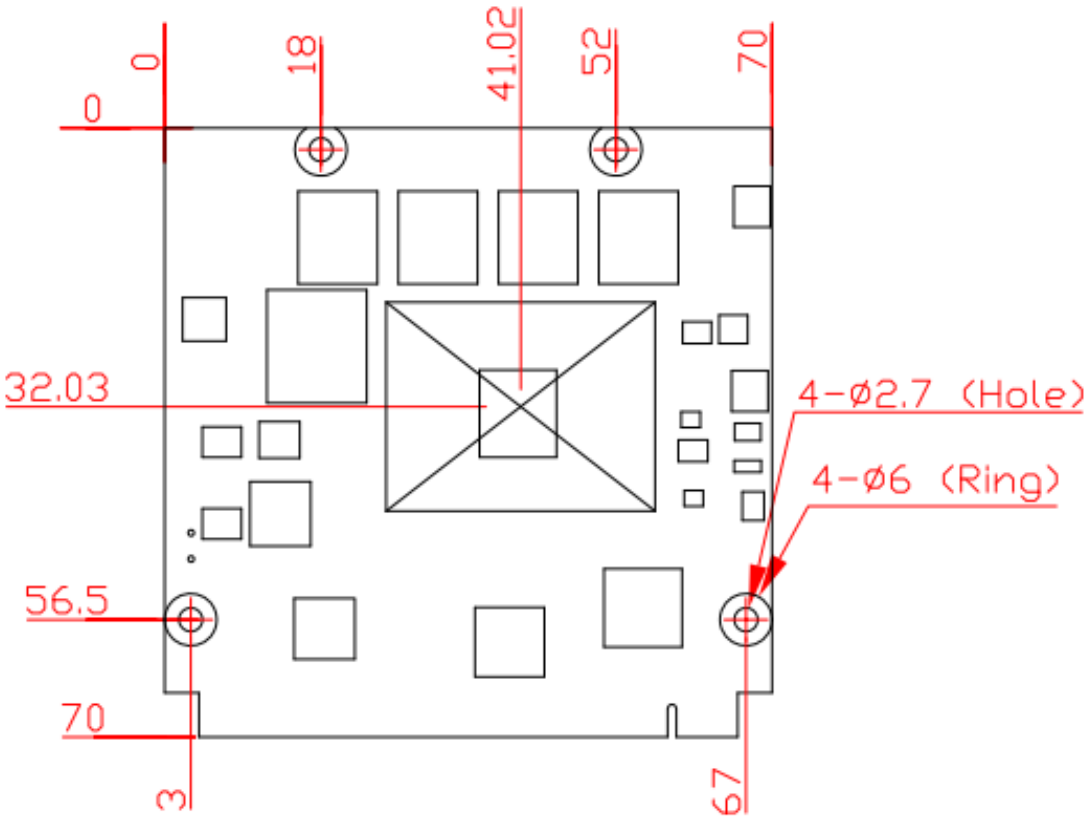
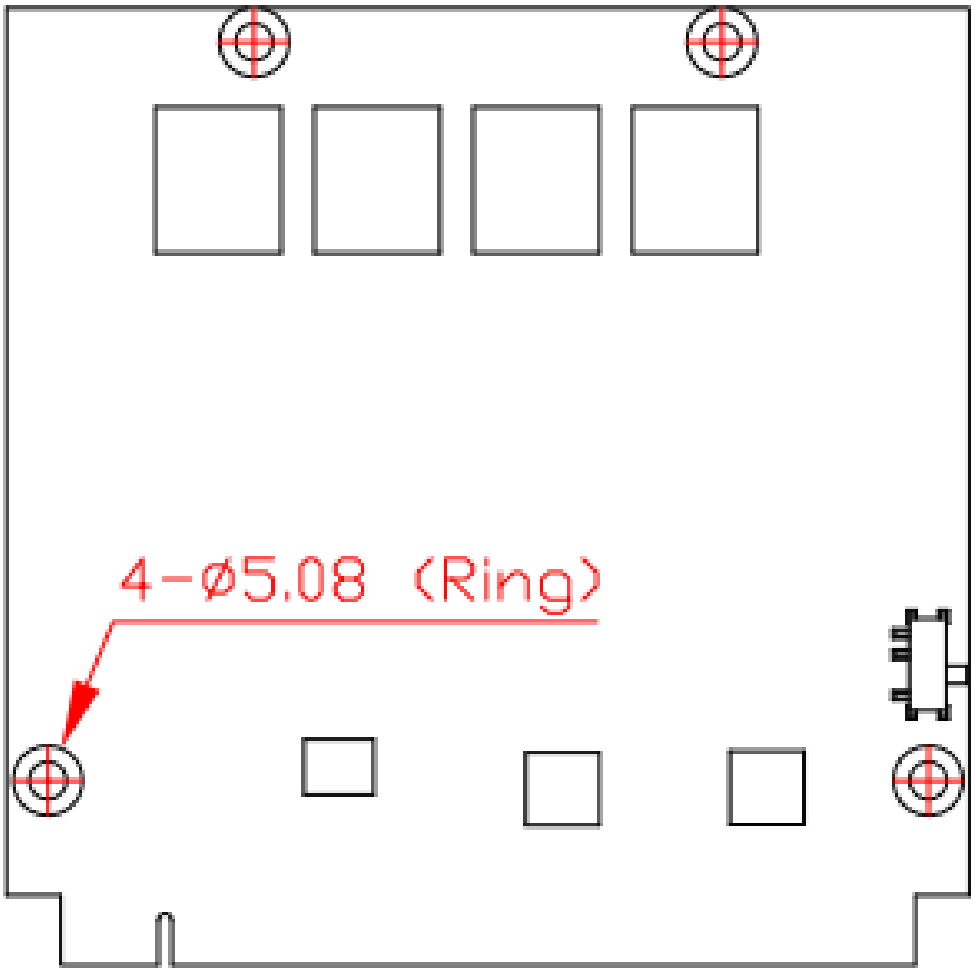
Chapter 2
Module and Pin Assignments

2.1 Module Dimensions and Fixing Holes

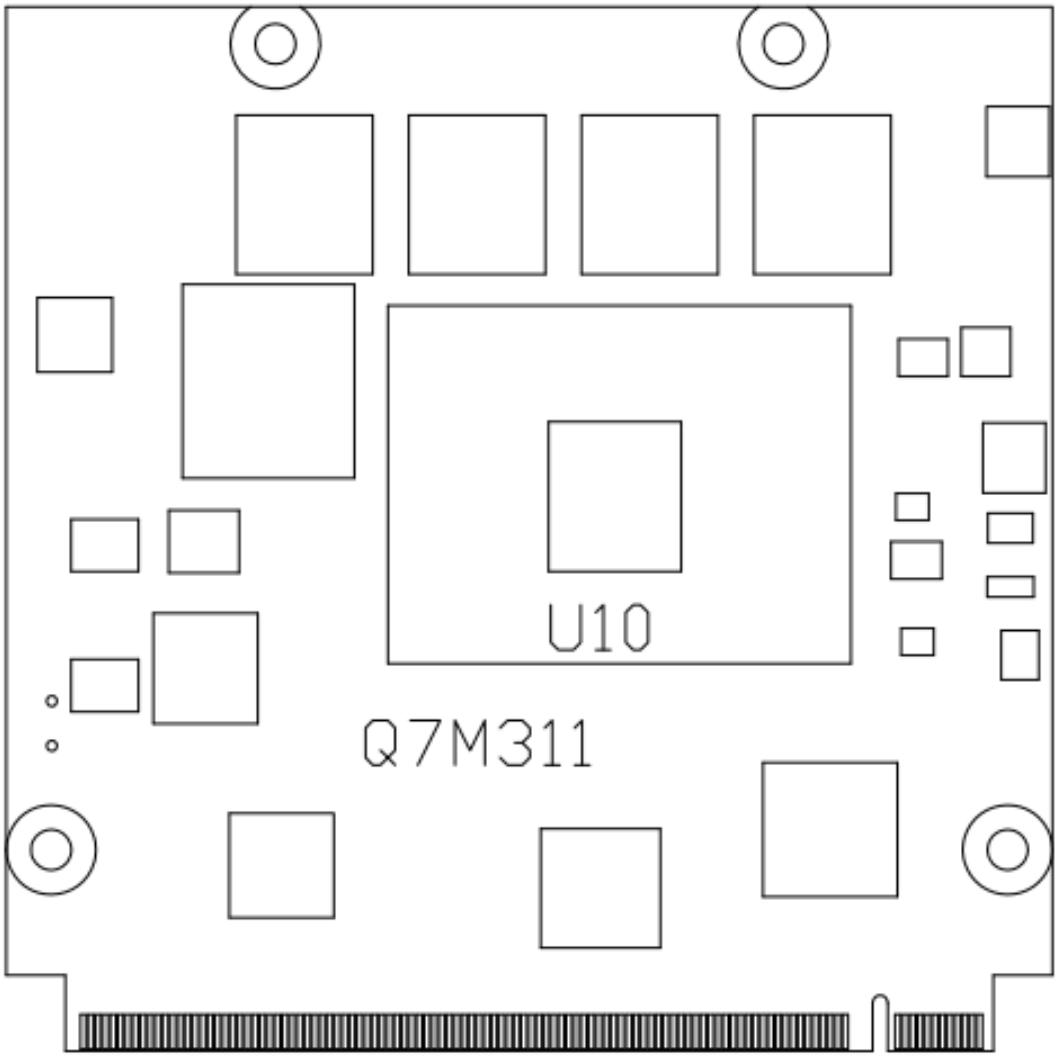


Top View

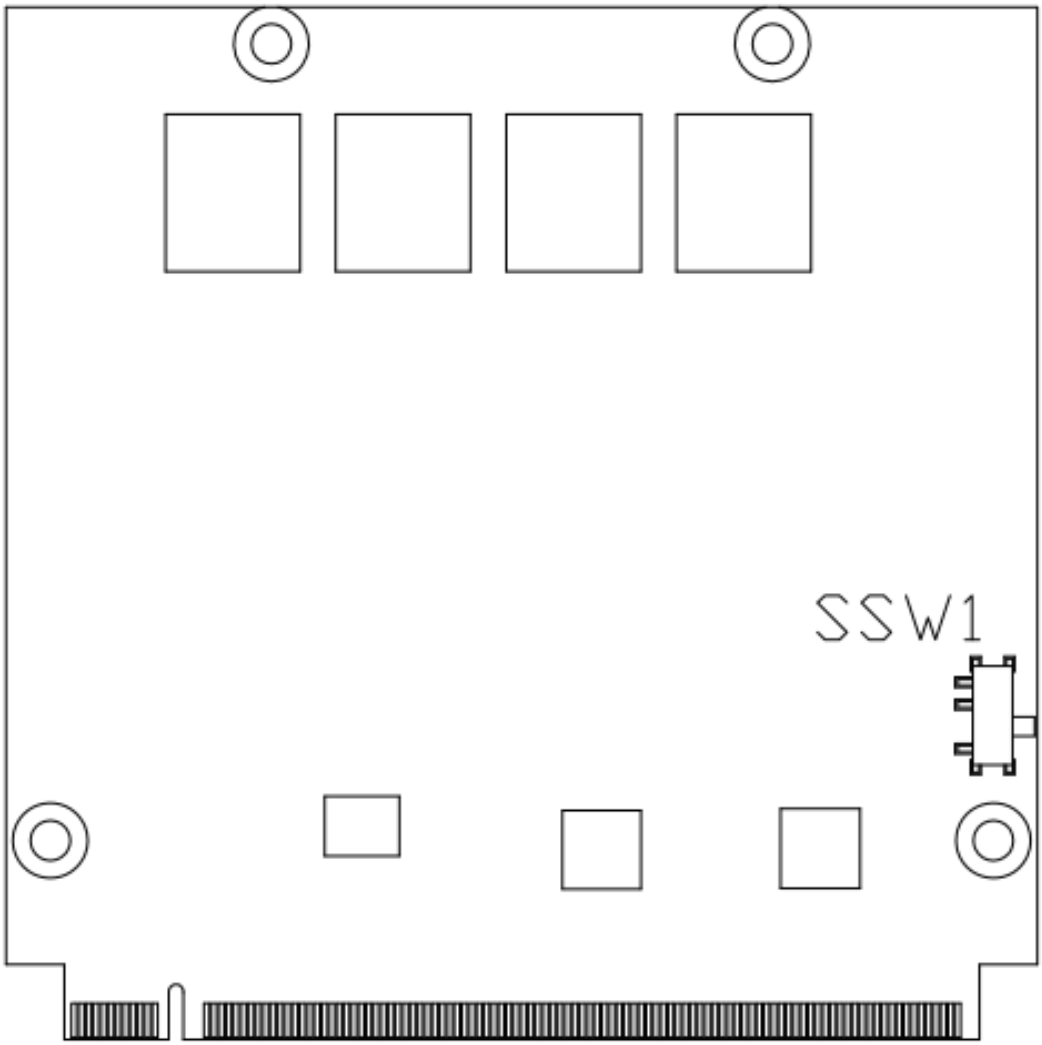


Bottom View

2.2 Module Layout



Top View



Bottom View

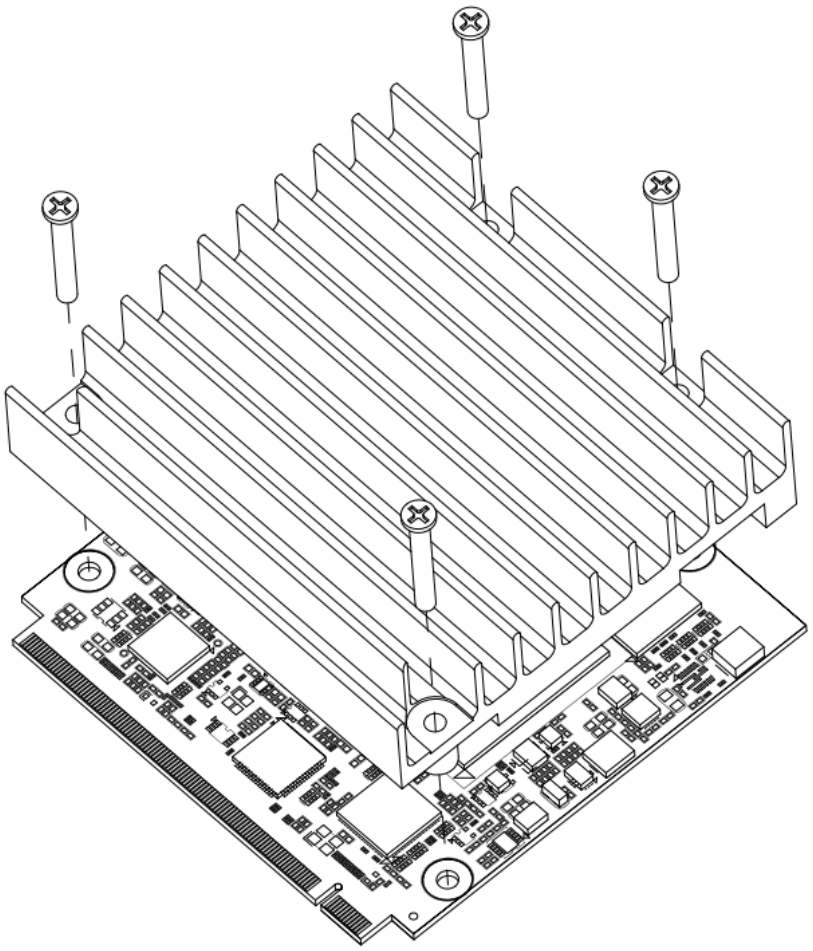
2.3 Installing Thermal Solution

For thermal dissipation, a thermal solution enables the Q7M310/311's components to dissipate heat efficiently. All heat generating components are thermally conducted to the heatsink in order to avoid hot spots. Figure below illustrates how to install the thermal solution on Q7M310/311.

1. There is a protective plastic covering on the thermal pads. This must be removed before the heatsink can be mounted.

2. Each heatsink is designed for a specific Q7M module. The thermal pads on the heatsink are designed to make contact with the necessary components on the Q7M module. When mounting the heatsink you must make sure that the thermal pads on the heatsink make complete contact (no space between thermal pad and component) with the corresponding components on the Q7M module. This is especially critical for Q7M modules that have higher CPU speeds (for example 1.46GHz or more) to ensure that the heatsink acts as a proper thermal interface for cooling solutions.

3. This CPU module has four assembly holes for installing heatsink plate. Use the four screws to secure the heatsink plate to the Q7M310/311. Be careful not to over-tighten the screws.



2.4 Switch Settings

Properly configure switch settings on the Q7M310/311 to meet your application purpose. Below you can find a summary table of all switches and onboard default settings.

Note

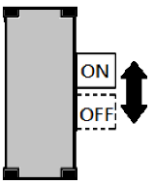
Once the default switch setting needs to be changed, please do it under power-off condition.

Switch	Description	Setting
SSW1	Auto Power On Default: Enable	ON (Up)

2.4.1 Auto Power On (SSW1)

If SSW1 is set to ON (up) position, the system will be automatically power on without pressing soft power button. If set to OFF (down) position, it is necessary to manually press soft power button to power on the system.

Function	Setting
Enable auto power on (Default)	ON (up)
Disable auto power on	OFF (down)



Chapter 3
Hardware Description

3.1 Microprocessor

The Q7M310/311 supports Intel® Celeron® N4200/N3350 and Atom™ E3950/E3940/E3930 processors which enable your system to operate under Windows® 10 and Linux environments. The system performance depends on the microprocessor. You must install the heatsink or cooler carefully and properly to prevent damage.

3.2 BIOS

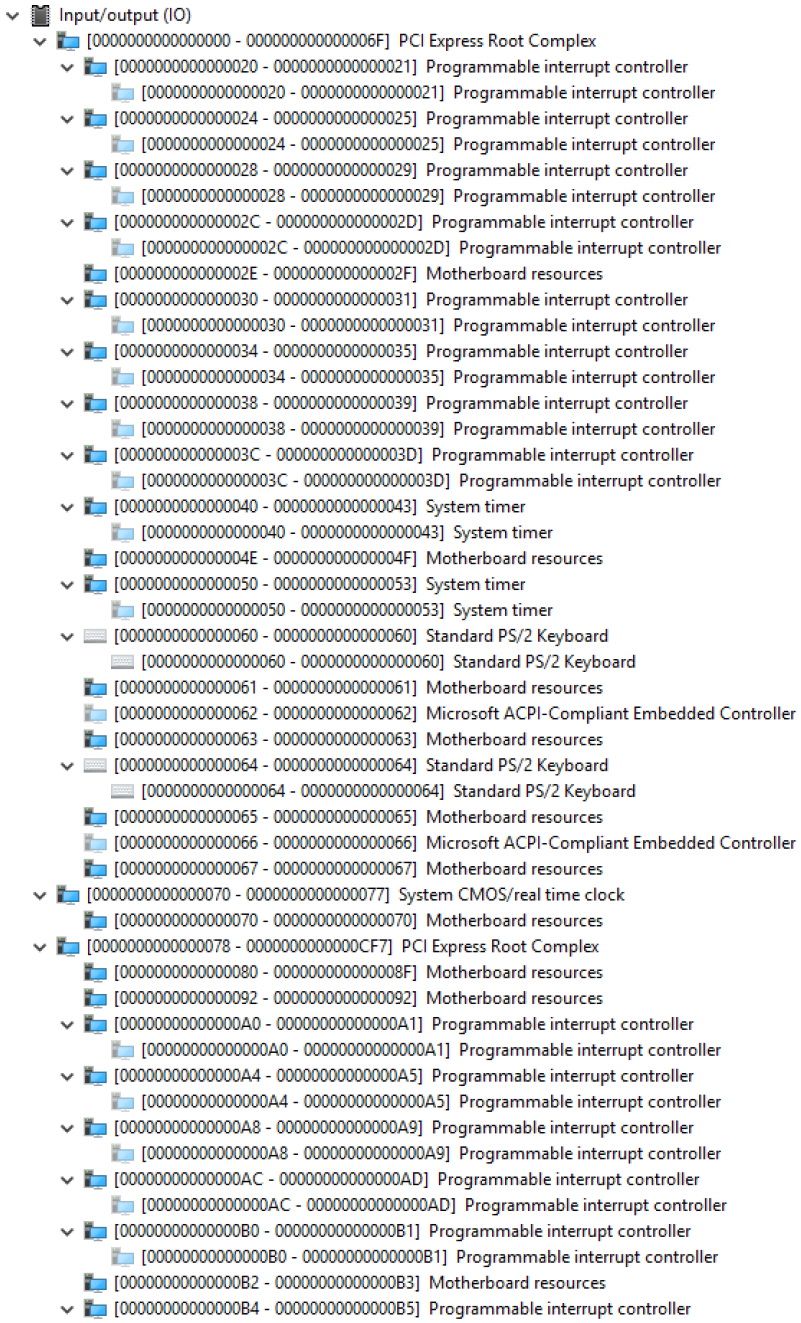
The Q7M310/311 uses AMI Plug and Play BIOS with a single 64Mbit SPI Flash.

3.3 System Memory

The Q7M310/311 supports DDR3L memory for maximum capacity up to 8GB (the default is 4GB).

3.4 I/O Port Address Map

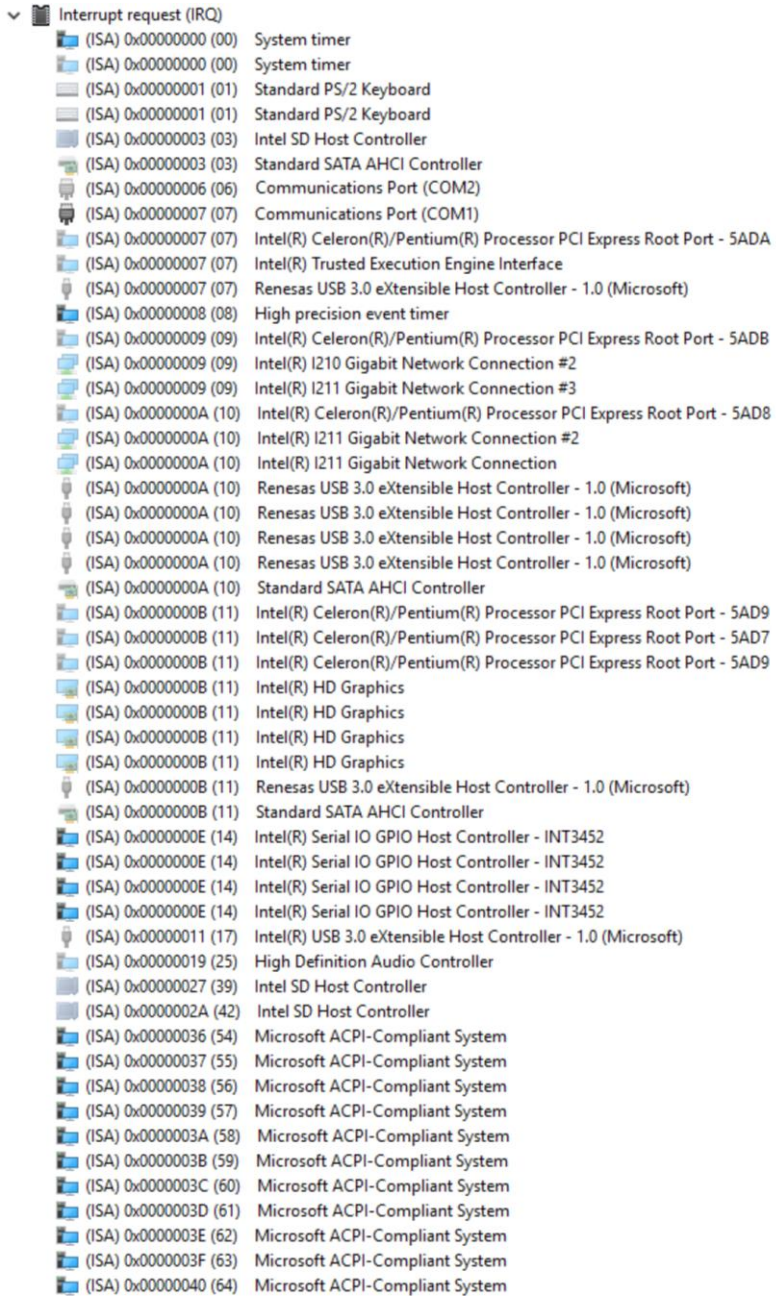
The I/O port addresses are as follows:

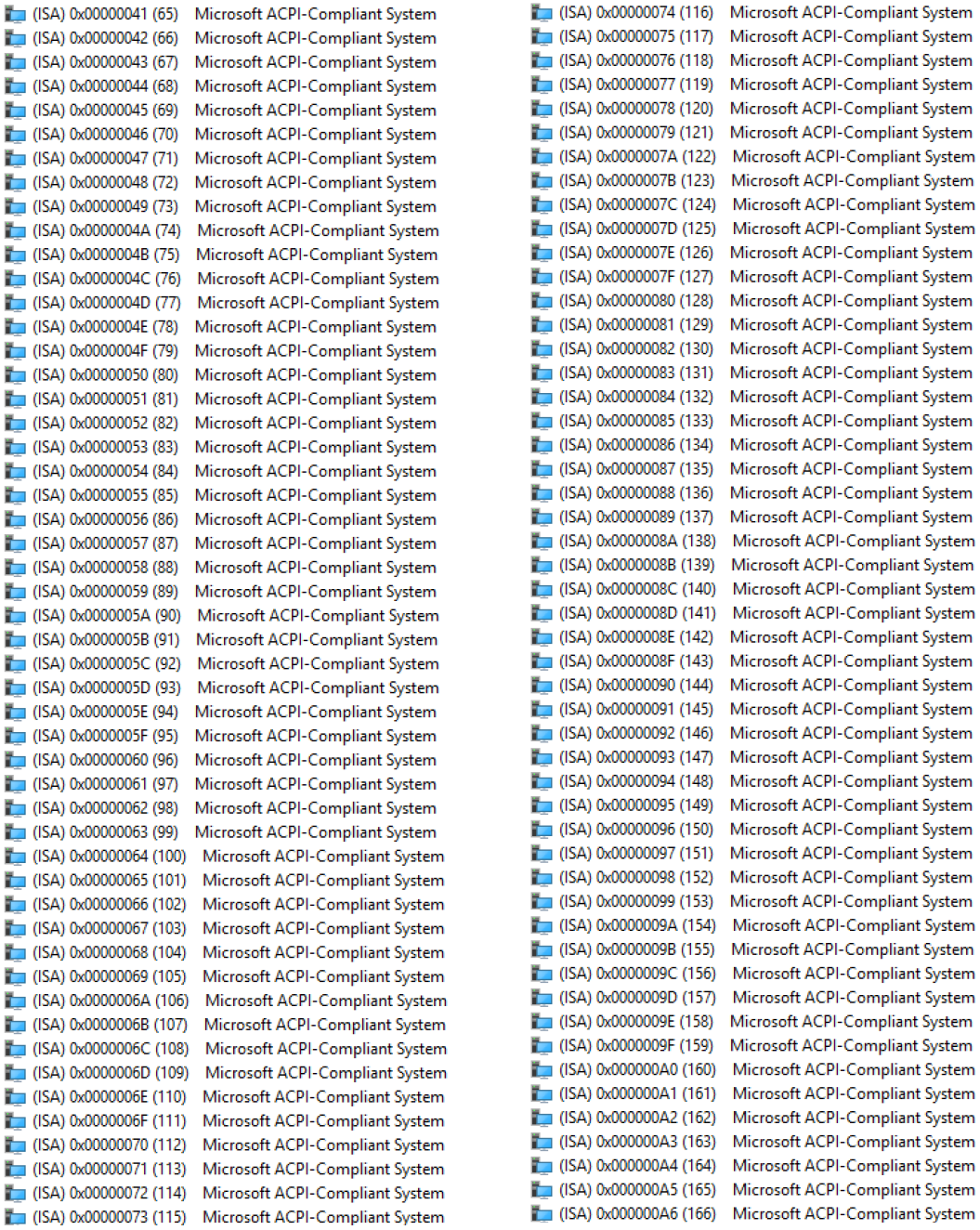


- [00000000000000B8 - 00000000000000B9] Programmable interrupt controller
  - [00000000000000B8 - 00000000000000B9] Programmable interrupt controller
- [00000000000000BC - 00000000000000BD] Programmable interrupt controller
  - [00000000000000BC - 00000000000000BD] Programmable interrupt controller
  - [0000000000000248 - 000000000000024F] Communications Port (COM1)
  - [0000000000000258 - 000000000000025F] Communications Port (COM2)
  - [0000000000000400 - 000000000000047F] Motherboard resources
- [00000000000004D0 - 00000000000004D1] Programmable interrupt controller
  - [00000000000004D0 - 00000000000004D1] Programmable interrupt controller
  - [0000000000000500 - 00000000000005FE] Motherboard resources
  - [0000000000000600 - 000000000000061F] Motherboard resources
  - [0000000000000680 - 000000000000069F] Motherboard resources
- [0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
  - [000000000000164E - 000000000000164F] Motherboard resources
  - [000000000000D000 - 000000000000D01F] Standard SATA AHCI Controller
  - [000000000000D020 - 000000000000D023] Standard SATA AHCI Controller
  - [000000000000D030 - 000000000000D037] Standard SATA AHCI Controller
  - [000000000000D040 - 000000000000D043] Standard SATA AHCI Controller
  - [000000000000D050 - 000000000000D057] Standard SATA AHCI Controller
  - [000000000000E000 - 000000000000EFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD6
    - [000000000000E000 - 000000000000EFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD6
      - [000000000000E000 - 000000000000EFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADB
        - [000000000000E000 - 000000000000EFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9
          - [000000000000E000 - 000000000000E01F] Intel(R) I211 Gigabit Network Connection #3
            - [000000000000E000 - 000000000000E01F] Intel(R) I210 Gigabit Network Connection #2
              - [000000000000E000 - 000000000000E01F] Intel(R) I211 Gigabit Network Connection #2
                - [000000000000E000 - 000000000000E01F] Intel(R) I211 Gigabit Network Connection
                  - [000000000000E000 - 000000000000E01F] Standard SATA AHCI Controller
          - [000000000000E020 - 000000000000E023] Standard SATA AHCI Controller
          - [000000000000E030 - 000000000000E037] Standard SATA AHCI Controller
          - [000000000000E040 - 000000000000E043] Standard SATA AHCI Controller
          - [000000000000E050 - 000000000000E057] Standard SATA AHCI Controller
  - [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics
    - [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics
      - [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics
        - [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics
          - [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics
            - [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics
  - [000000000000F040 - 000000000000F05F] Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
    - [000000000000F040 - 000000000000F05F] Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4
  - [000000000000F060 - 000000000000F07F] Standard SATA AHCI Controller
    - [000000000000F060 - 000000000000F07F] Standard SATA AHCI Controller
  - [000000000000F080 - 000000000000F083] Standard SATA AHCI Controller
    - [000000000000F080 - 000000000000F083] Standard SATA AHCI Controller
  - [000000000000F090 - 000000000000F097] Standard SATA AHCI Controller
    - [000000000000F090 - 000000000000F097] Standard SATA AHCI Controller

3.5 Interrupt Controller (IRQ) Map

The interrupt controller (IRQ) mapping list is shown as follows:

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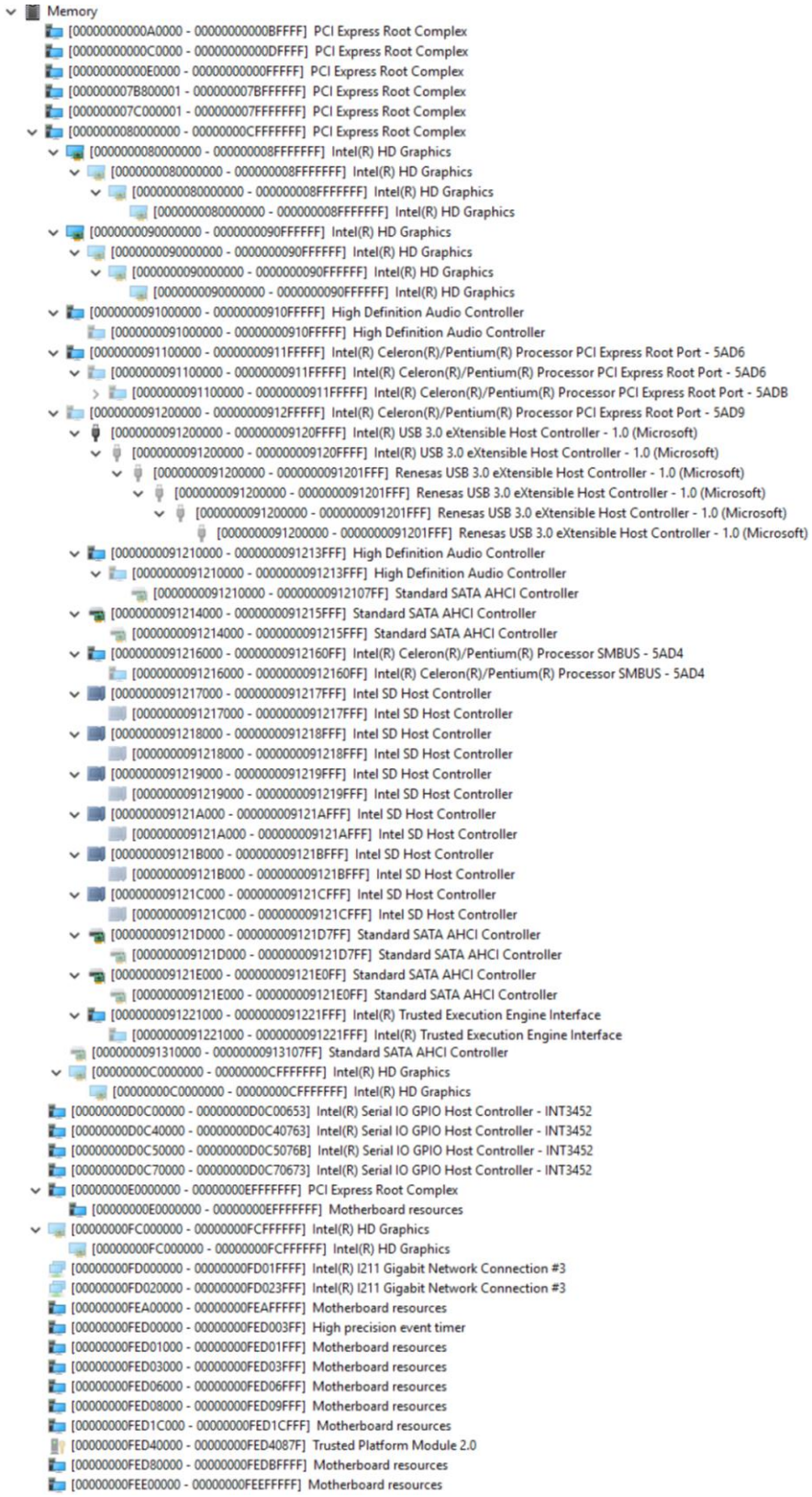
(ISA) 0x000001FF (511) Microsoft ACPI-Compliant System
(PCI) 0x00000003 (03) Intel SD Host Controller
(PCI) 0x00000019 (25) High Definition Audio Controller
(PCI) 0x00000027 (39) Intel SD Host Controller
(PCI) 0x0000002A (42) Intel SD Host Controller
(PCI) 0x00000400 (1024) Intel SD Host Controller
(PCI) 0xFFFFFFF0 (-16) Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
(PCI) 0xFFFFFFF7 (-9) Intel(R) Trusted Execution Engine Interface
(PCI) 0xFFFFFFF8 (-8) Intel(R) HD Graphics
(PCI) 0xFFFFFFF9 (-7) Standard SATA AHCI Controller
(PCI) 0xFFFFFFFA (-6) Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD6
(PCI) 0xFFFFFFFB (-5) Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADB
(PCI) 0xFFFFFFFC (-4) Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADA
(PCI) 0xFFFFFFFD (-3) Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9
(PCI) 0xFFFFFFFE (-2) Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8

3.6 Memory Map

The memory mapping list is shown as follows:



Chapter 4
AMI BIOS Setup 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 chip to save the setup information whenever the power is turned off. This chapter provides users with detailed description about 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 <Del> 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.

It is strongly recommended that you should avoid changing the chipset's defaults. Both AMI and your system manufacturer have carefully set up these defaults that provide the best performance and reliability.

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.

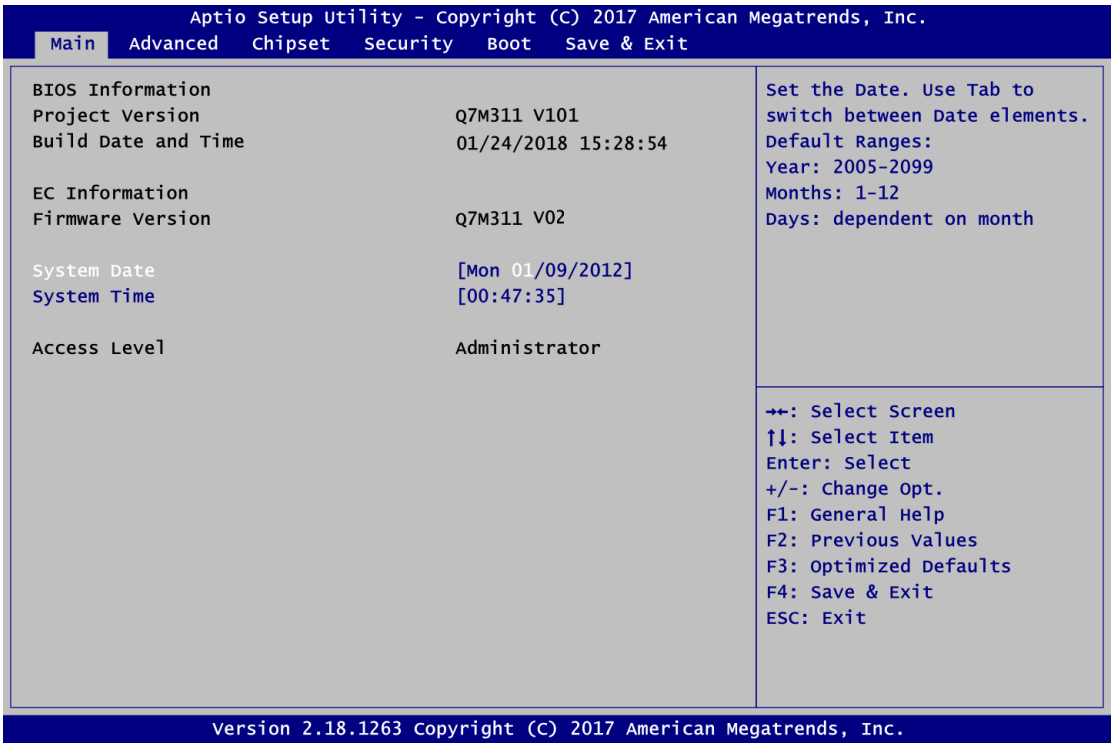
Note

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.



BIOS and EC Information
Display BIOS and EC firmware information.

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.

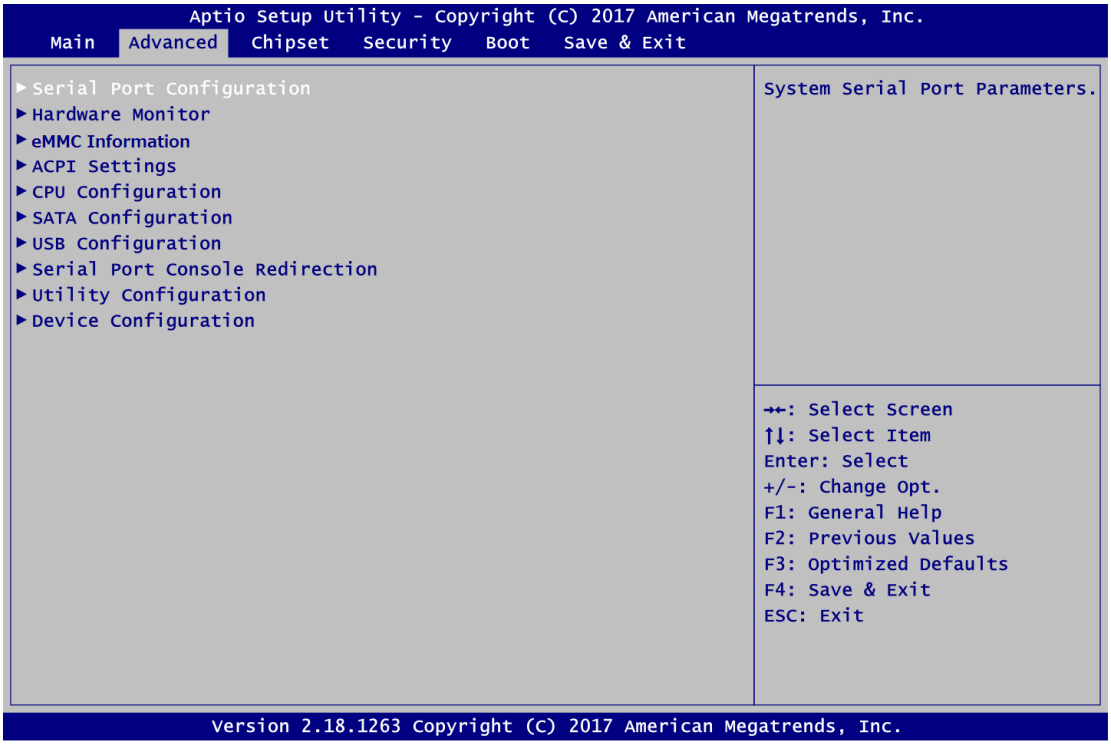
Access Level
Display the access level of current user.

4.4 Advanced Menu

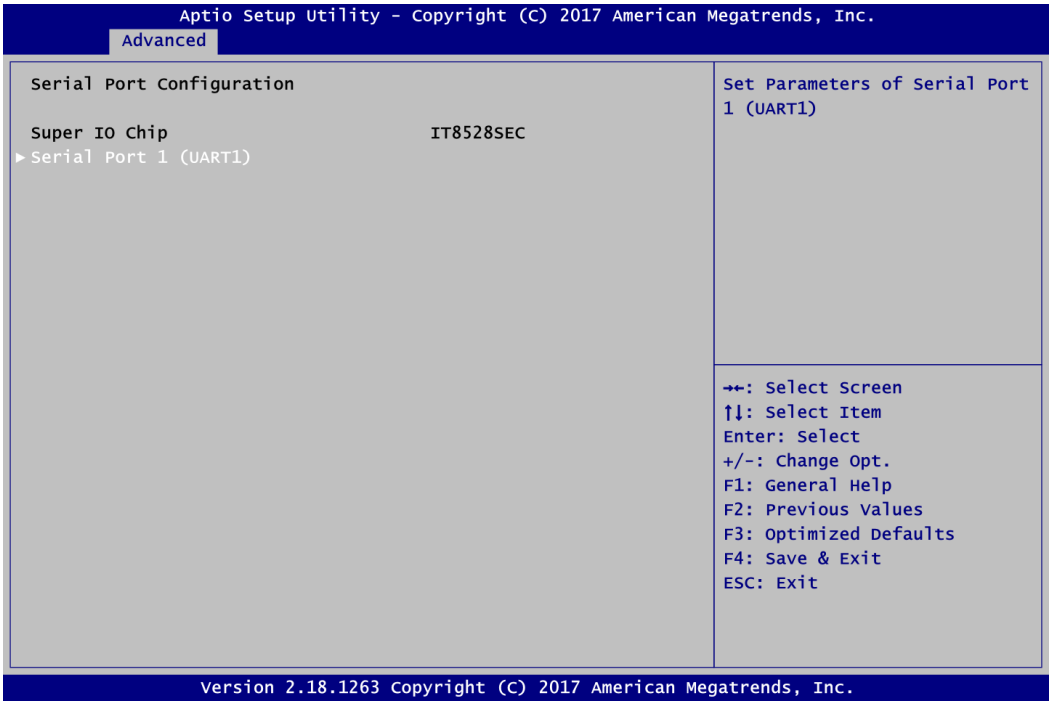
The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- ▶ Serial Port Configuration
- ▶ Hardware Monitor
- ▶ eMMC Information
- ▶ ACPI Settings
- ▶ CPU Configuration
- ▶ SATA Configuration
- ▶ USB Configuration
- ▶ Serial Port Console Redirection
- ▶ Utility Configuration
- ▶ Device Configuration

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

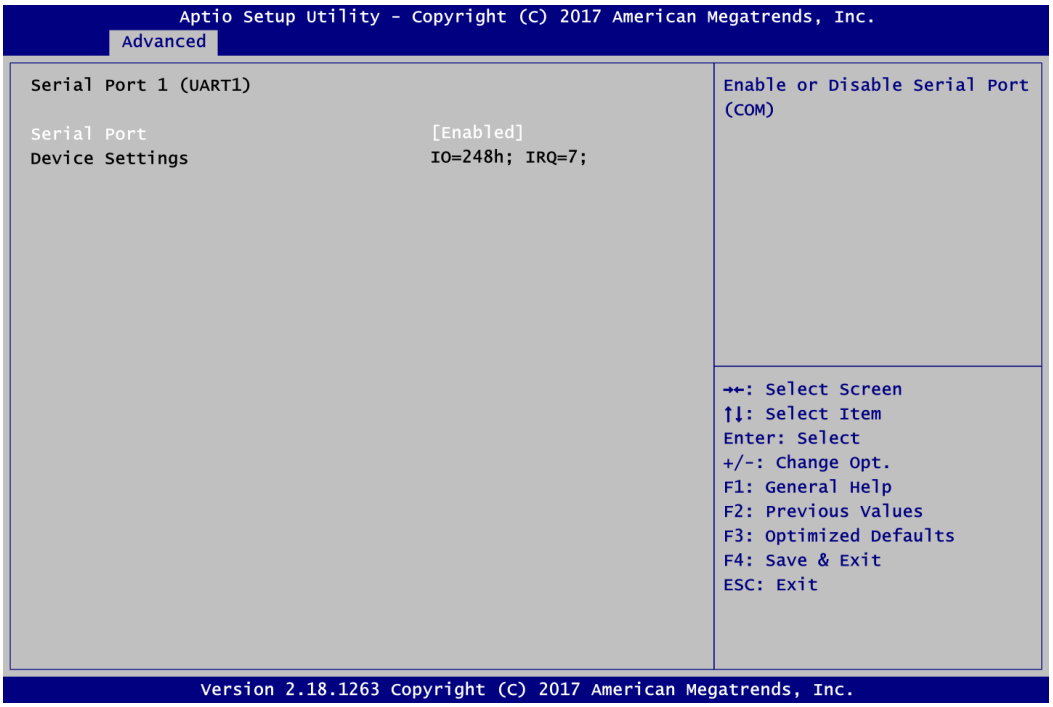


- **Serial Port Configuration**
  You can use this screen to select options for Serial Port Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen. For items marked with "▶", please press <Enter> for more options.



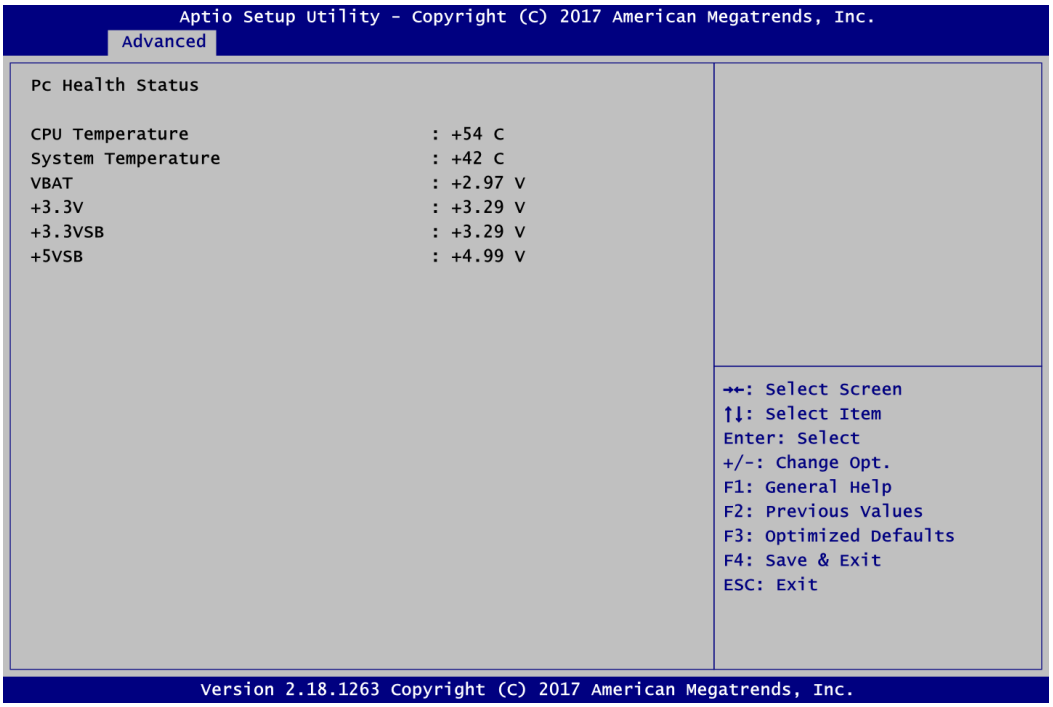
Serial Port Configuration
Set parameters related to serial ports.

- **Serial Port 1 Configuration**



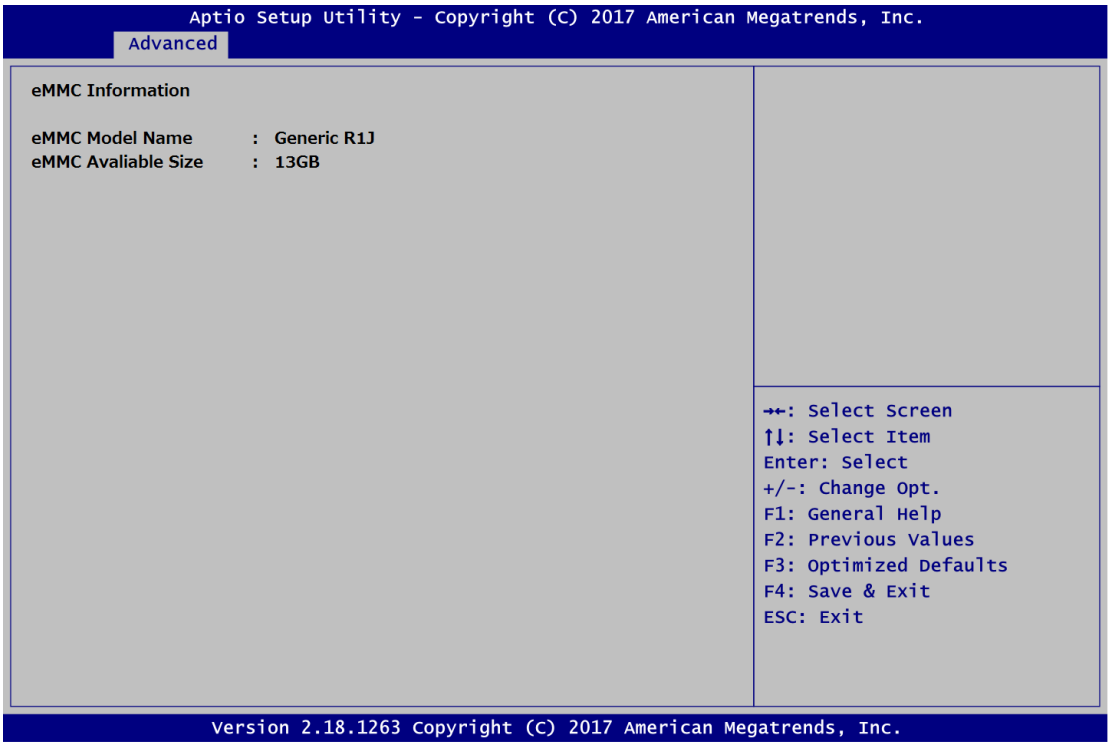
Serial Port 1 (UART1)
Enable or disable serial port 1. The optimal setting for base I/O address is 248h and for interrupt request address is IRQ7.

- **Hardware Monitor**
  This screen is for hardware health status monitoring.

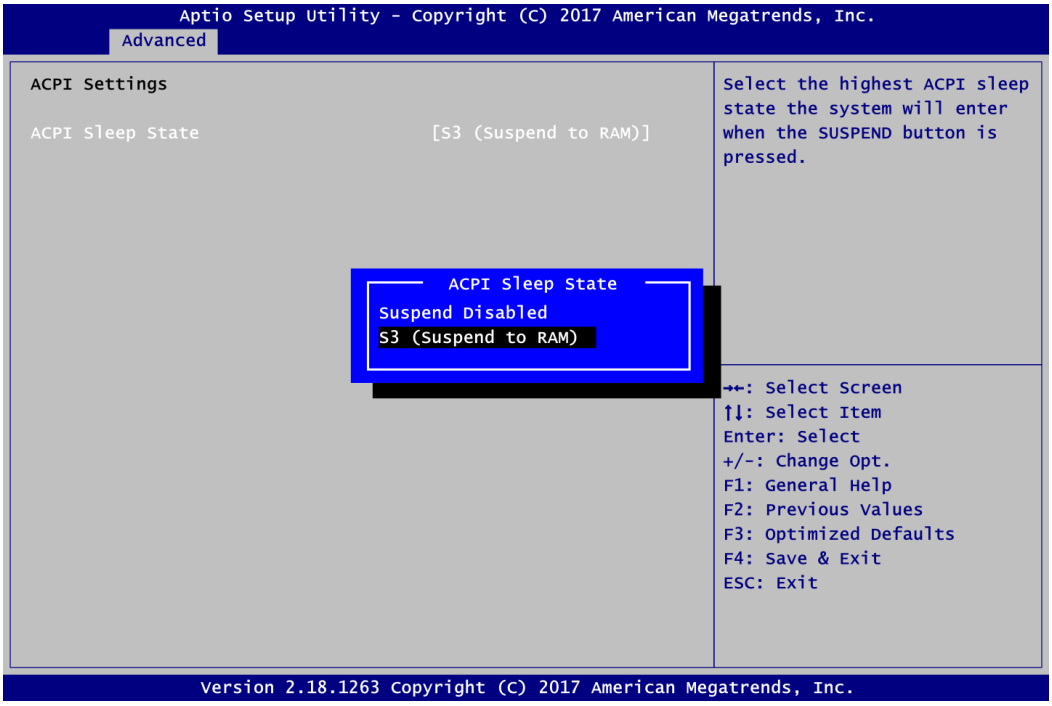


This screen displays the temperature of system and CPU and system voltages (VBAT, +3.3V, +3.3VSB and +5VSB).

- **eMMC Information(option)**
  This screen is for show the eMMC information.

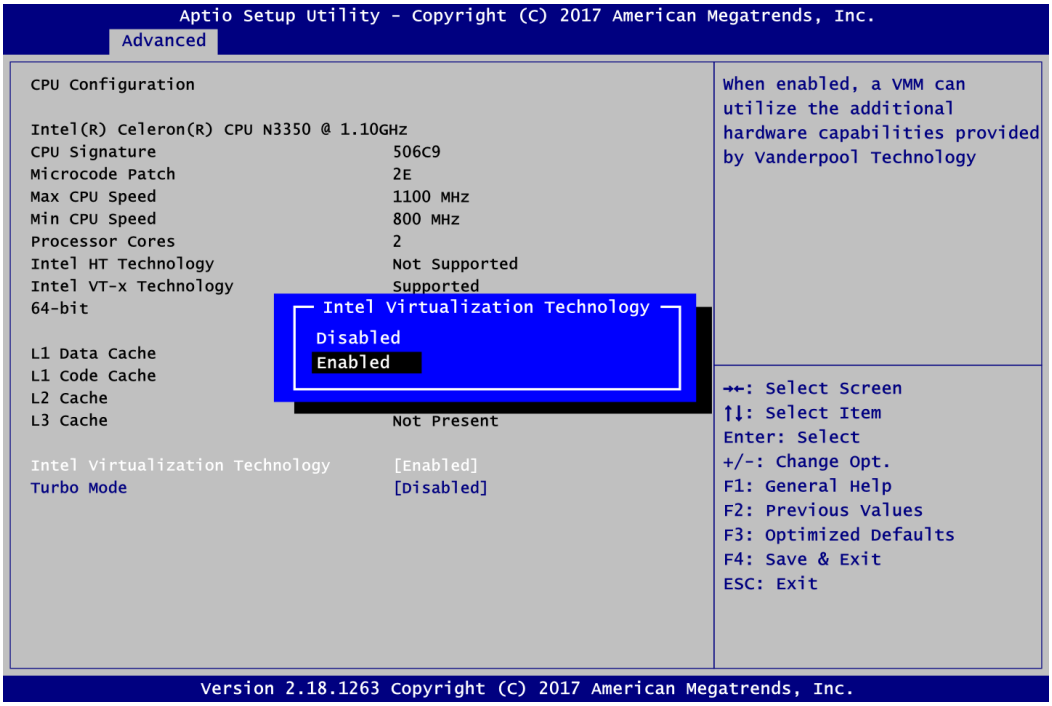


- **ACPI Settings**
  You can use this screen to select options for the ACPI configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.

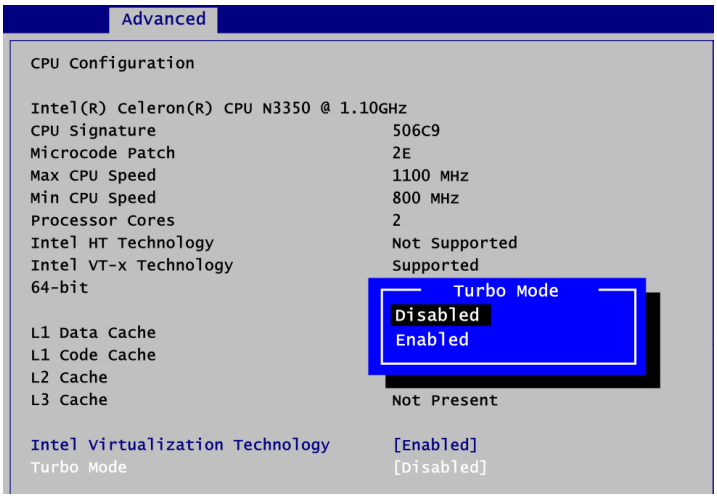


ACPI Sleep State
Select the ACPI (Advanced Configuration and Power Interface) sleep state. Configuration options are Suspend Disabled and S3 (Suspend to RAM). The S3 (Suspend to RAM) option selects ACPI sleep state the system will enter when suspend button is pressed.

- **CPU Configuration**
  This screen shows the CPU Configuration, and you can change the value of the selected option.

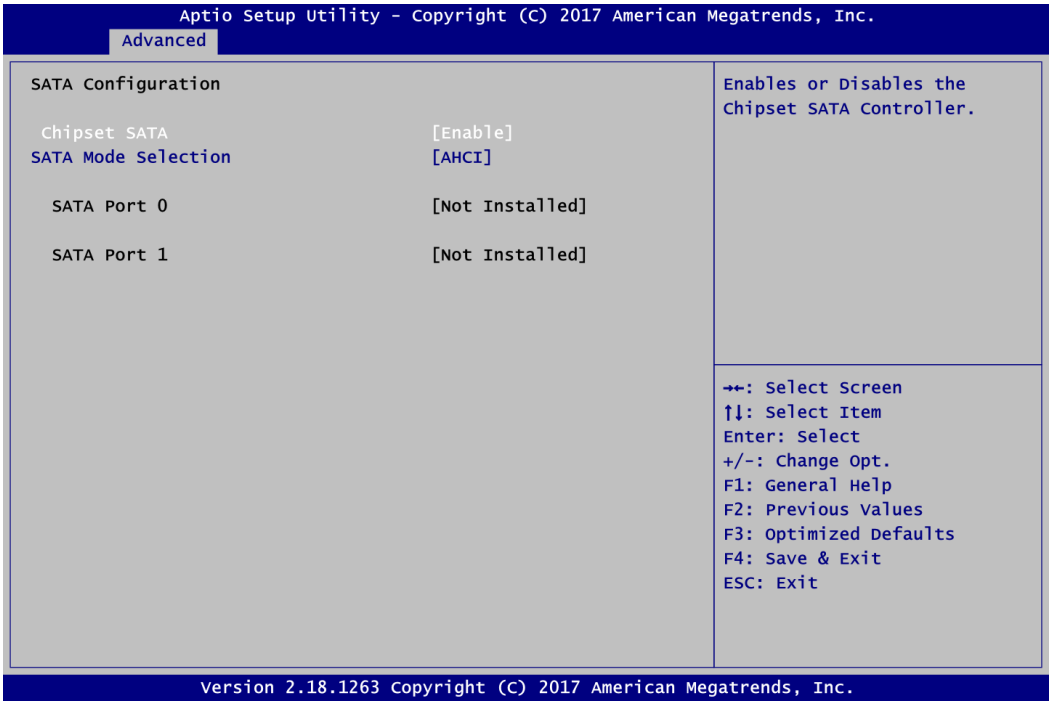


Intel Virtualization Technology
Enable or disable Intel Virtualization Technology. When enabled, a VMM can utilize the additional hardware capabilities. It allows a platform to run multiple operating systems and applications independently, hence enabling a computer system to work as several virtual systems.

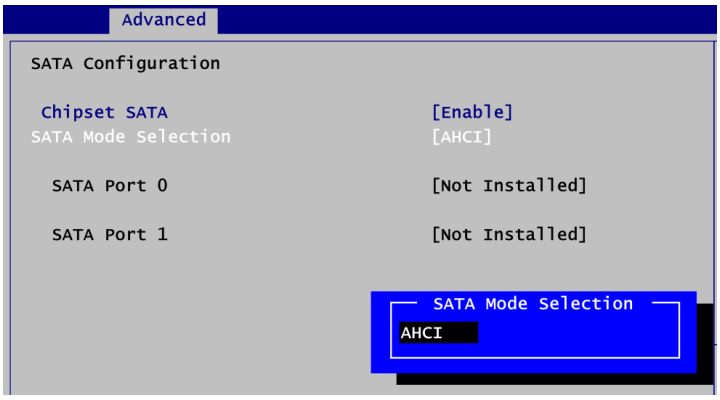


Turbo Mode
Enable or disable turbo mode. The default setting is Disabled.

- **SATA Configuration**
  In the SATA 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.

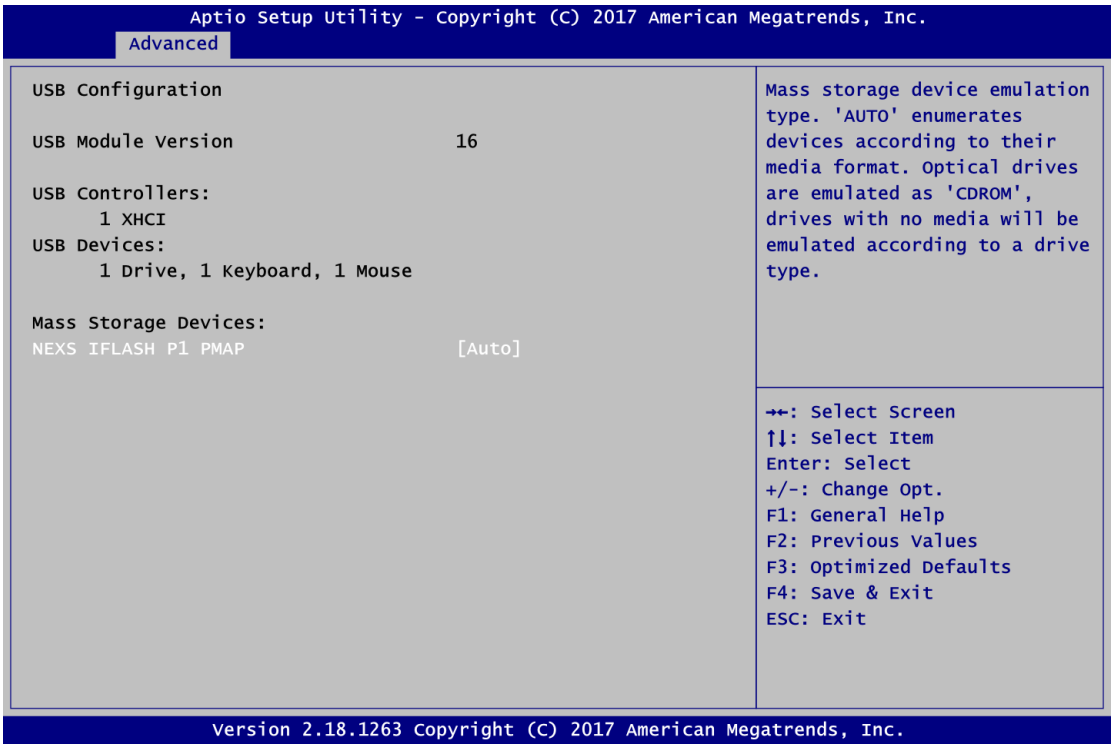


Chipset SATA
Enable or disable SATA controller.



SATA Mode Selection
The SATA operating mode is AHCI.

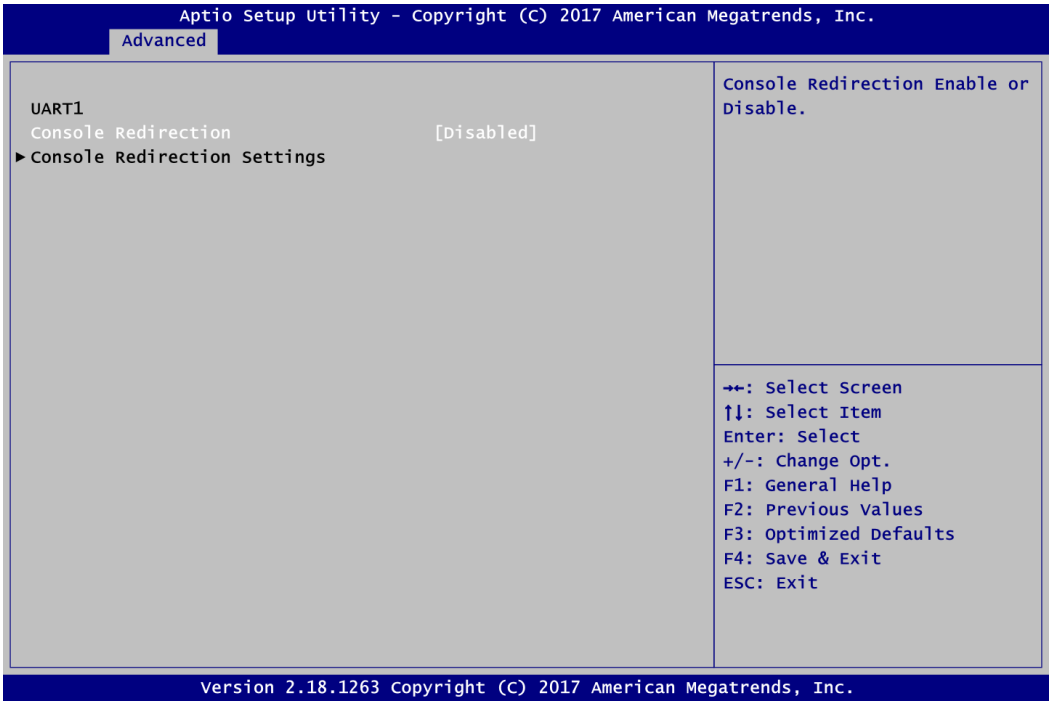
- **USB Configuration**



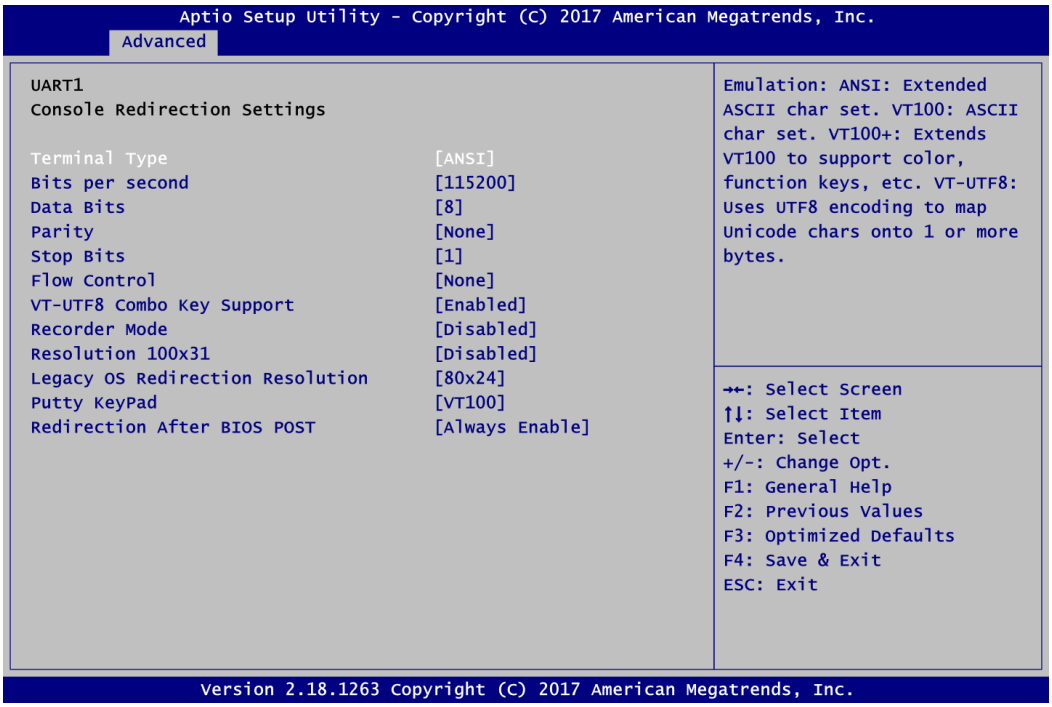
USB Devices
Display all detected USB devices.

Mass Storage Devices
Mass storage device emulation type. Auto option enumerates devices according to their media format. Optical drives are emulated as CDROM, drives with no media will be emulated according to a drive type.

- **Serial Port Console Redirection**
  You can use this screen to select options for Serial Port Console Redirection, 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.



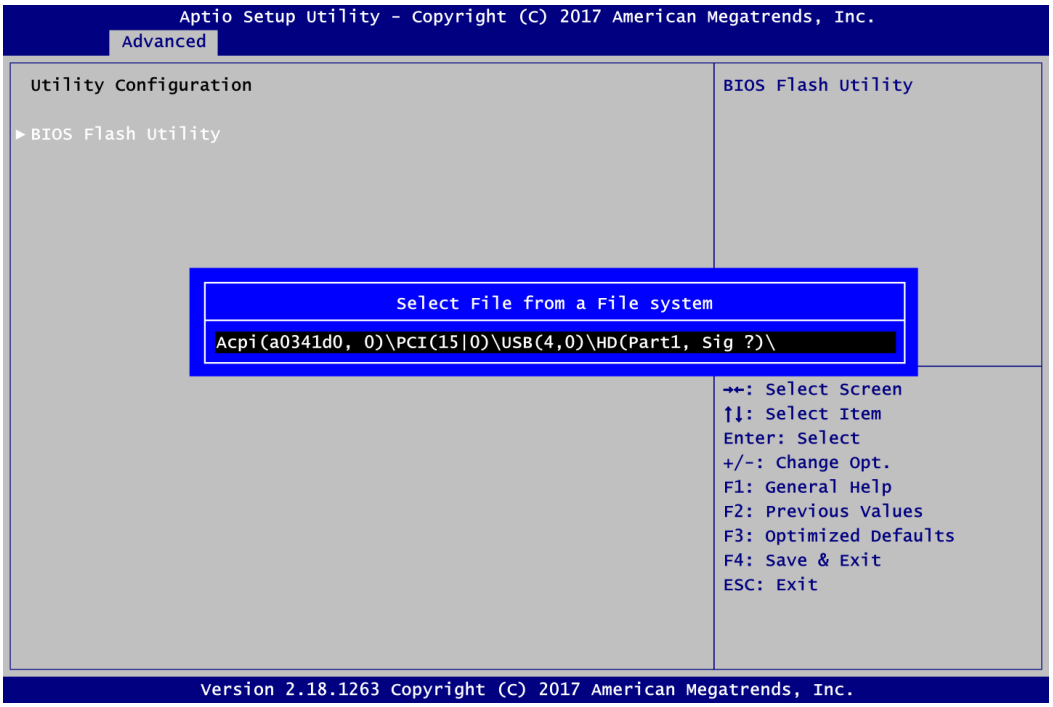
UART1 Console Redirection
Enable or disable UART1 console redirection settings.



UART1 Console Redirection Settings

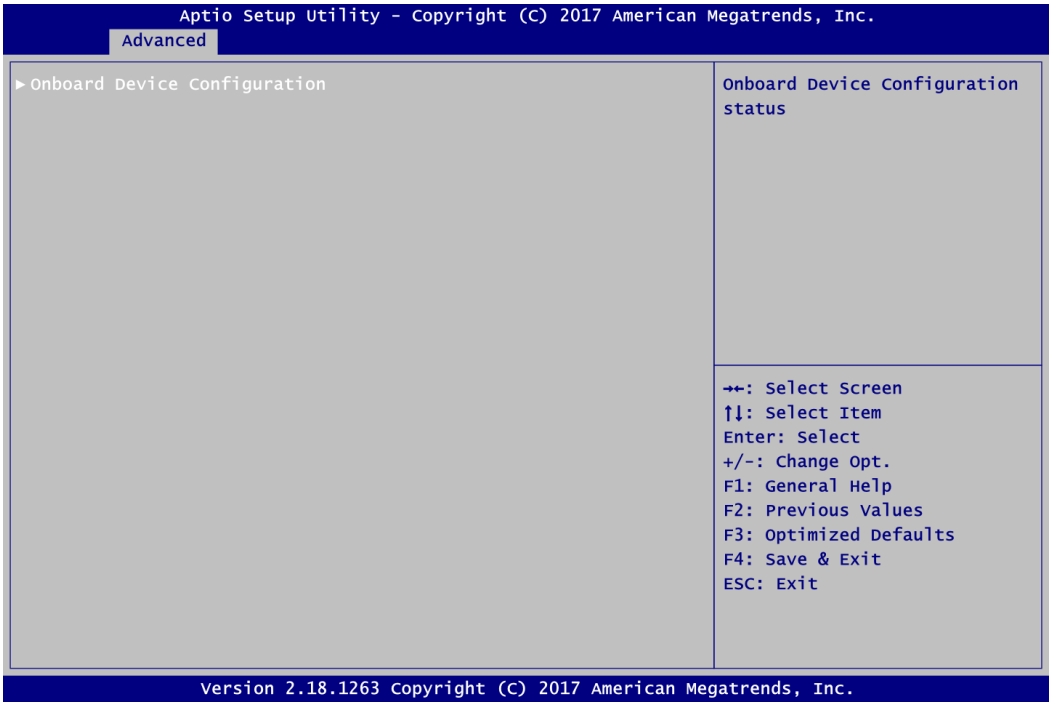
When enabled, the settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

- **Utility Configuration**



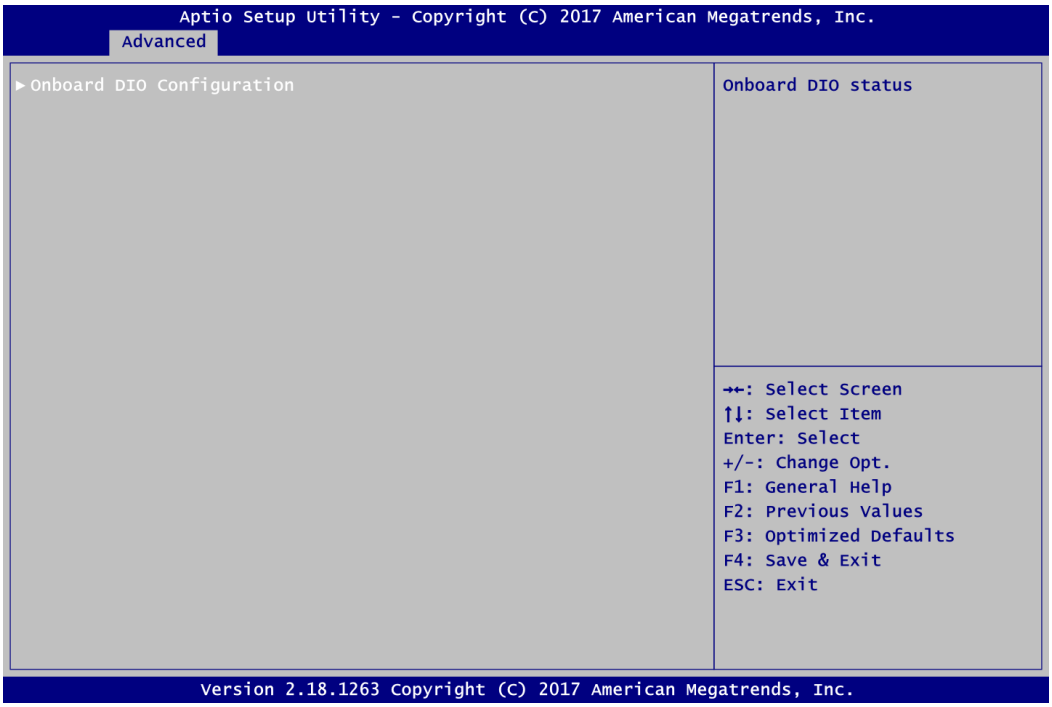
BIOS Flash Utility
BIOS flash utility configuration. For more detailed information, please refer to Appendix A.

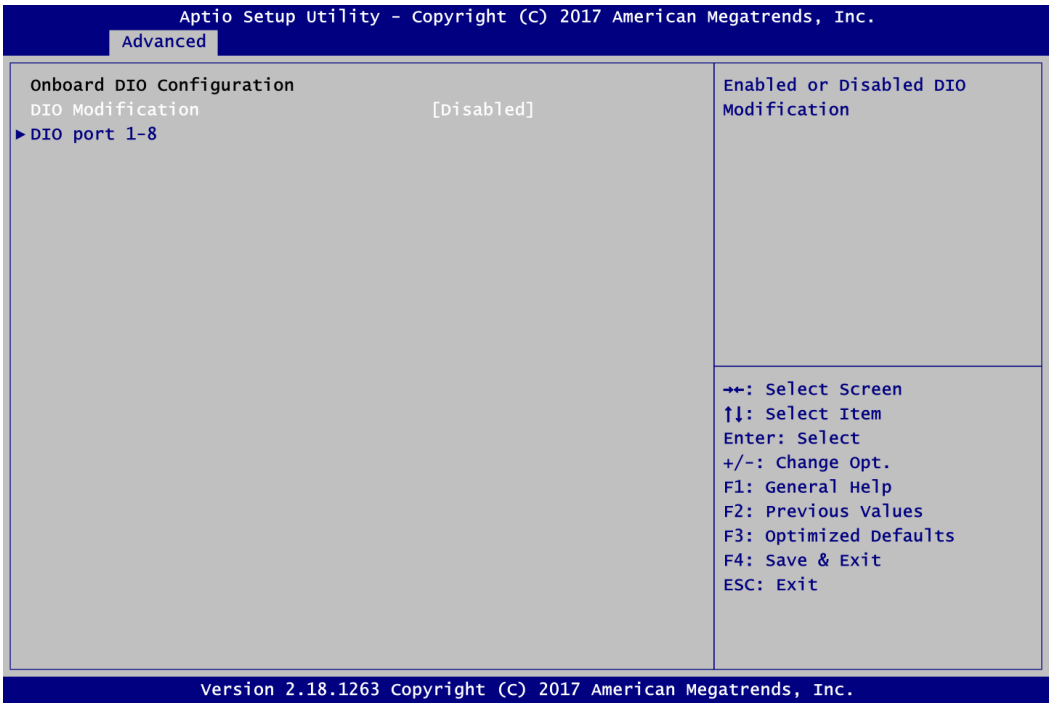
- **Device Configuration**
  A description of selected item appears on the right side of the screen. For items marked with "►", please press <Enter> for more options.



Onboard Device Configuration
Use this option to configure onboard device (e.g., Digital I/O setting).

- **Onboard DIO Configuration**
  You can use this screen to select options for Digital I/O (DIO) Configuration.

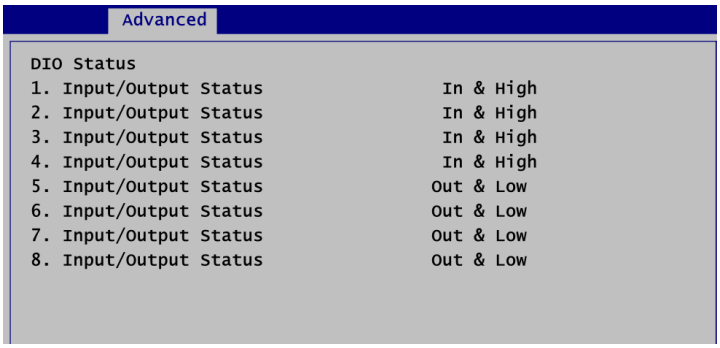




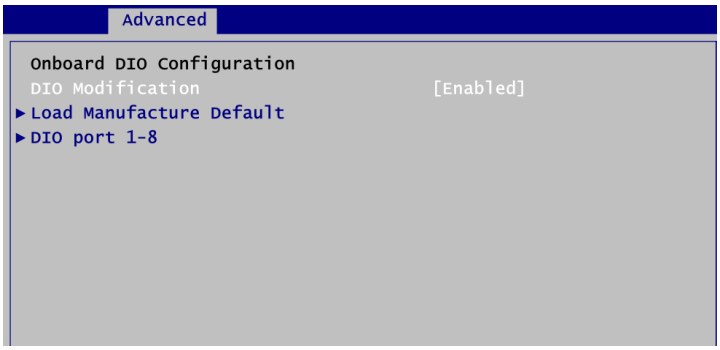
DIO Modification
Enable or disable digital I/O modification. The default is Disabled.

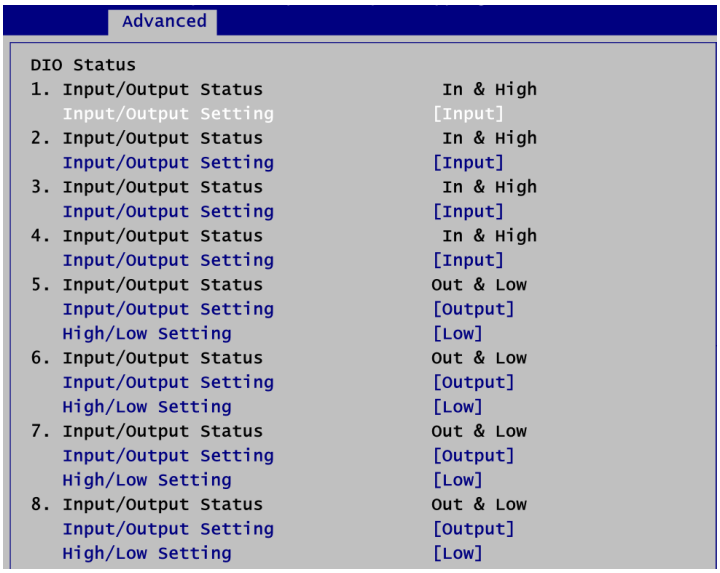
DIO port 1-8
Select this option to open DIO status sub screen.

If DIO Modification is disabled, you are not allowed to change inputs/outputs setting. The DIO status sub screen is as follows:



After enabling, you can load manufacture default and access to the DIO status sub screen to change inputs/outputs setting, see images below.



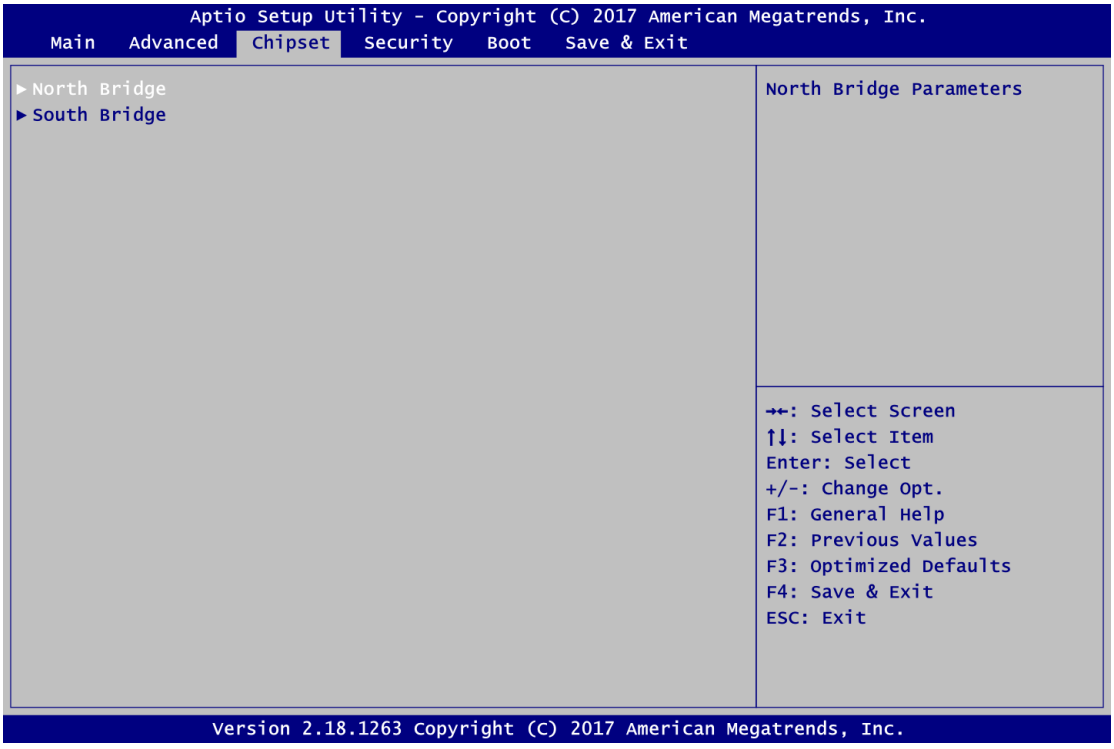


4.5 Chipset Menu

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:

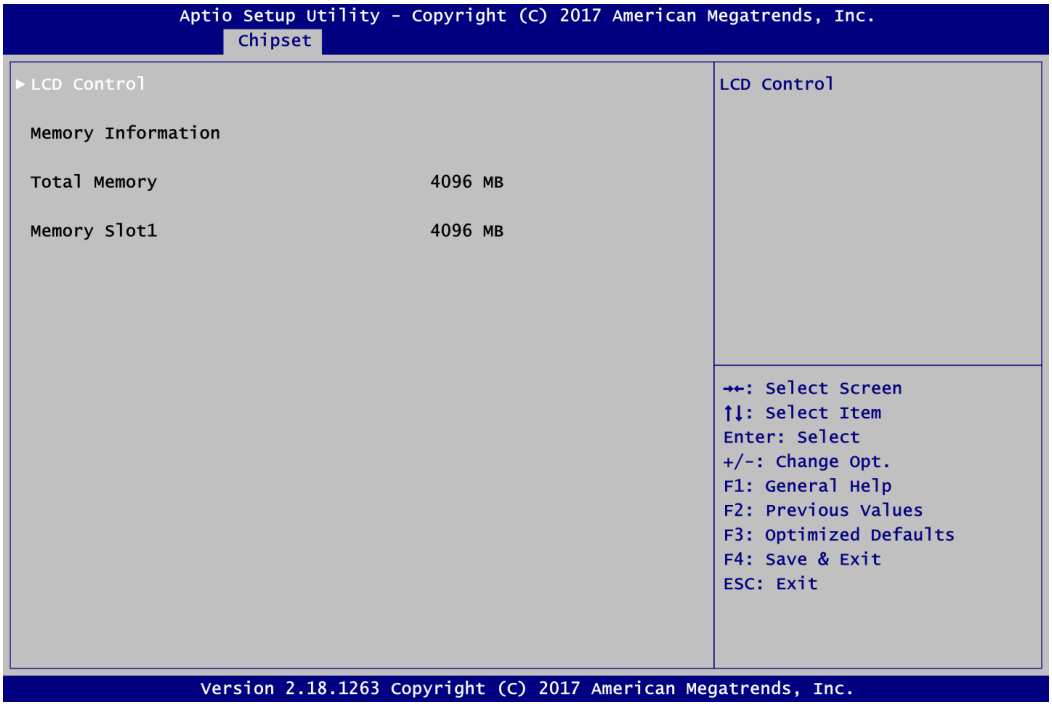
- ► North Bridge
- ► South Bridge

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



North Bridge

This screen shows system memory information and allows users to configure parameters of North Bridge chipset.

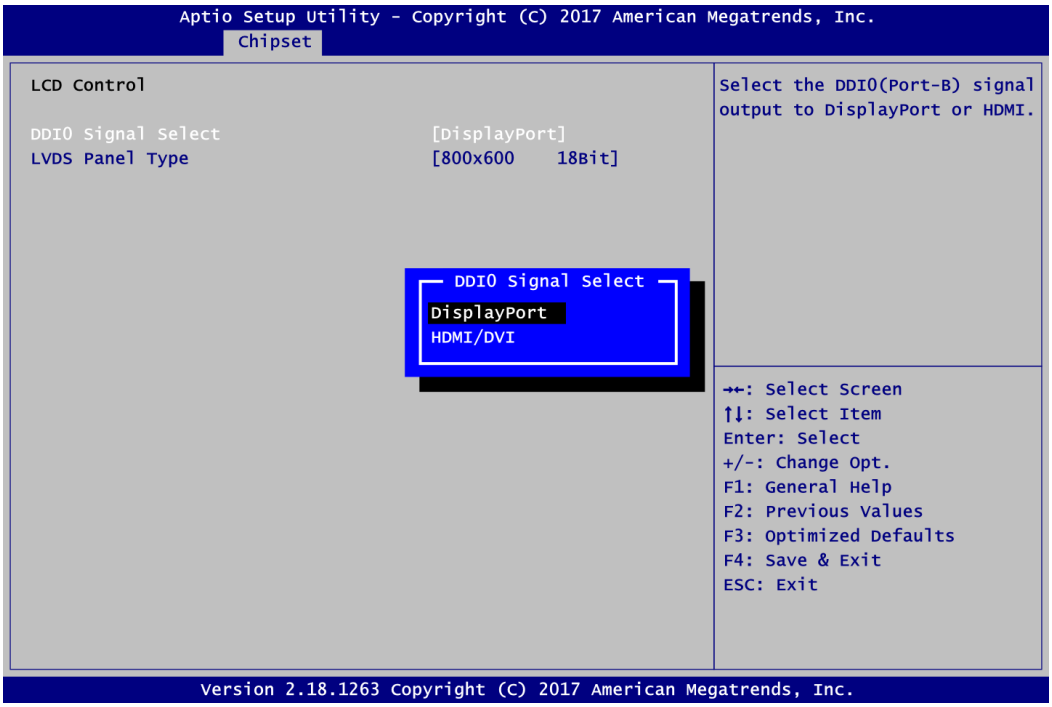


LCD Control

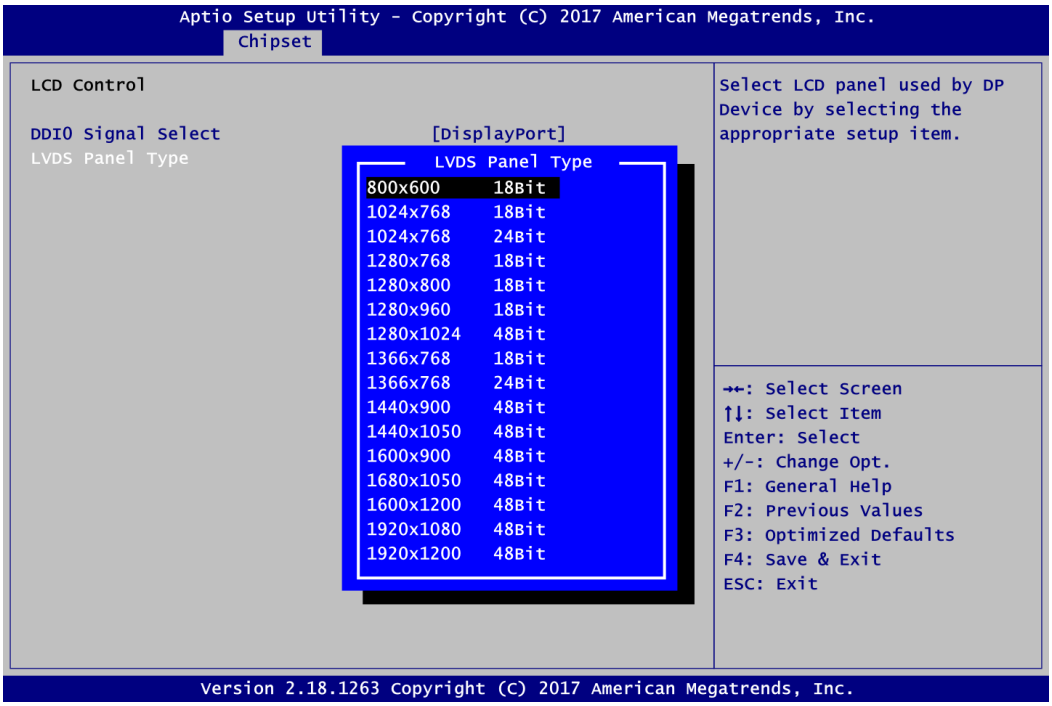
This item allows you to select LCD panel control options. Please press <Enter> to go to the sub menus.

Memory Information

Display system memory information.

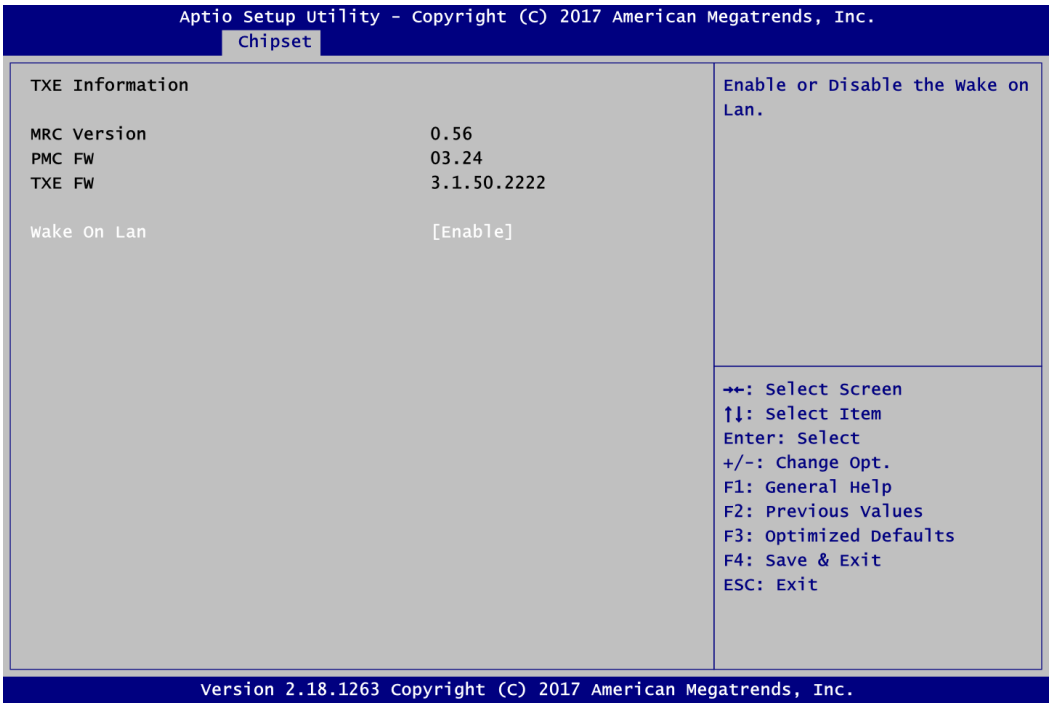


DDI0 Signal Select
Select the DDI0 signal output to DisplayPort or HDMI/DVI.



LVDS Panel Type
Select LVDS panel resolution for the display device by selecting the appropriate setup item.

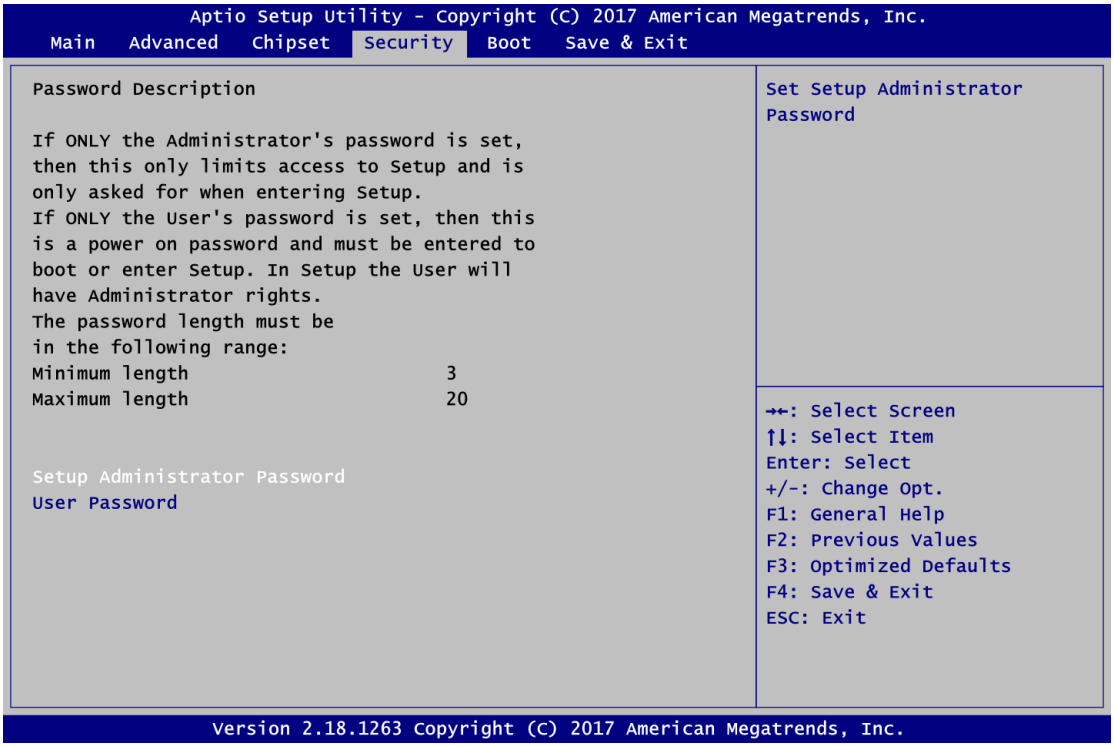
- **South Bridge**
  This screen allows users to configure parameters of South Bridge chipset.



Wake on LAN
Enable or disable integrated LAN to wake the system.

4.6 Security Menu

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

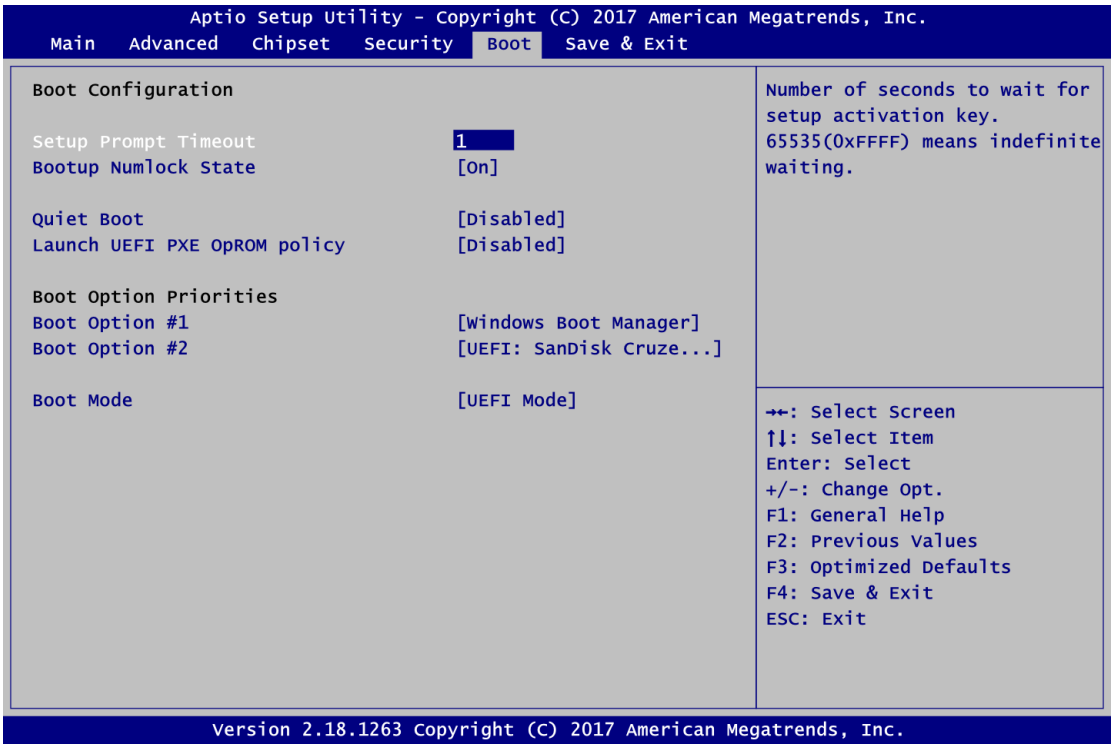


- **Setup Administrator Password**
  Set setup administrator password.

- **User Password**
  Set user password.

4.7 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.

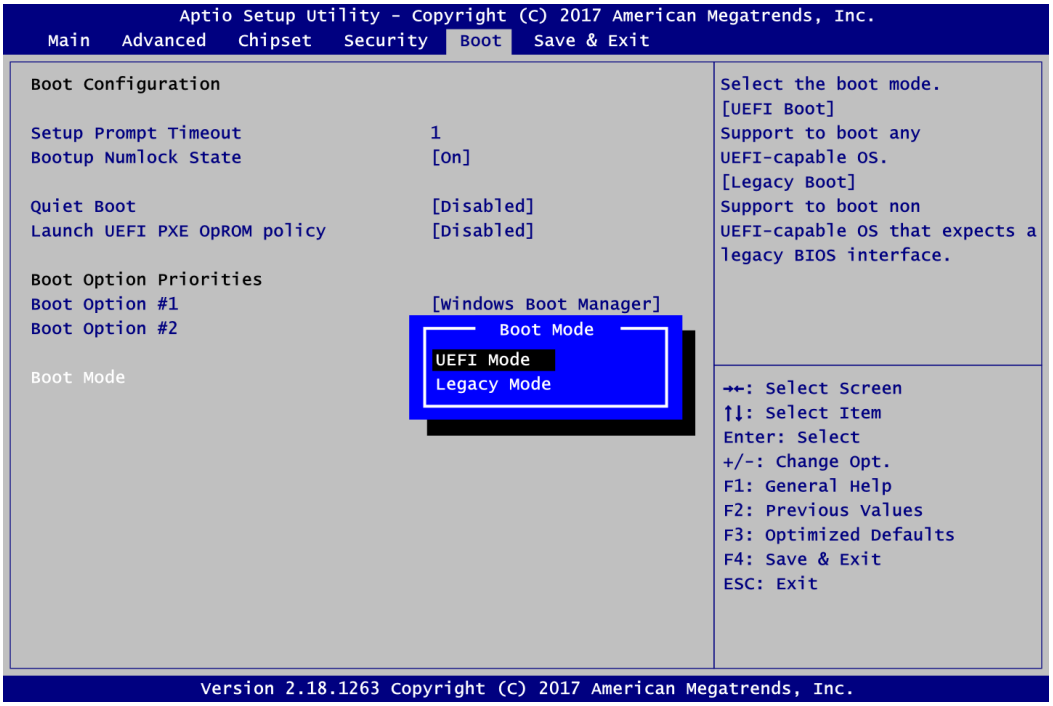
- **Bootup NumLock State**
  Use this item to select the power-on state for the keyboard NumLock.

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

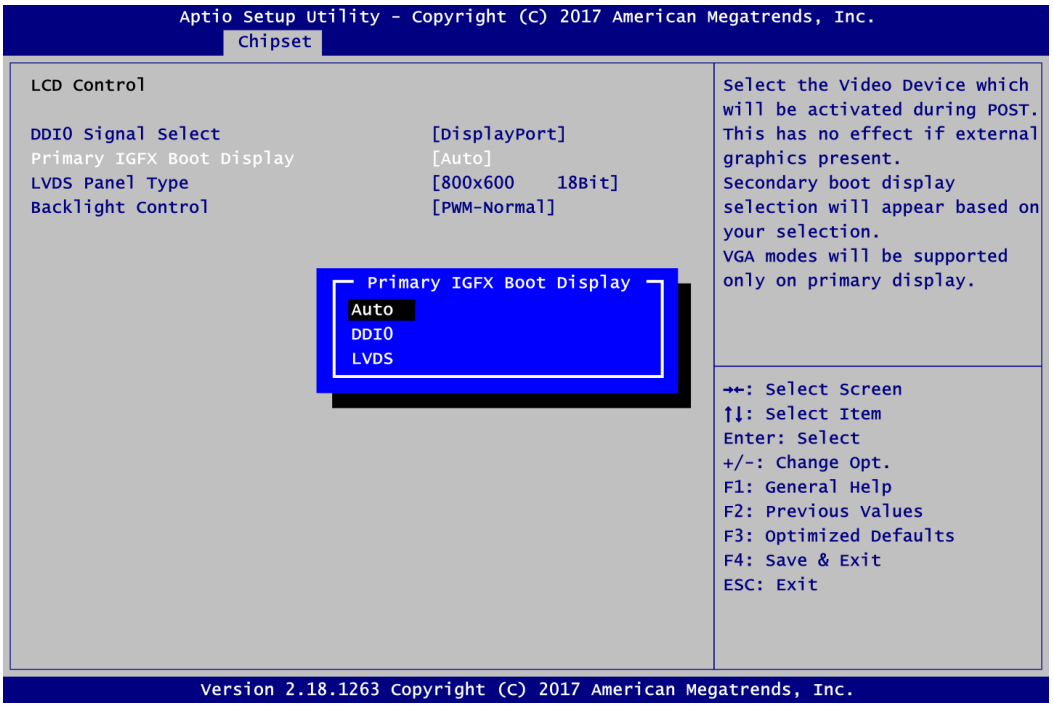
- **Launch UEFI PXE OpROM policy**
  Control the execution of UEFI PXE OpROM.

- **Boot Option Priorities [Boot Option #1, …]**
  These are settings for boot priority. Specify the boot device priority sequence from the available devices.

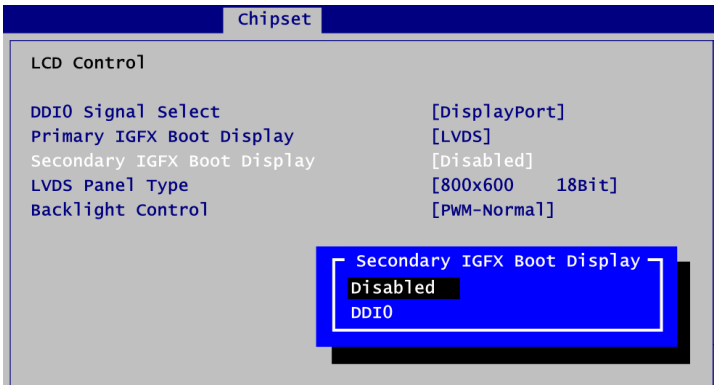
- **Boot Mode**
  Use this item for boot mode settings.
  - UEFI Boot: Select support to boot any UEFI-capable OS.
  - Legacy Boot: Select support to boot non UEFI-capable OS that expects a legacy BIOS interface.



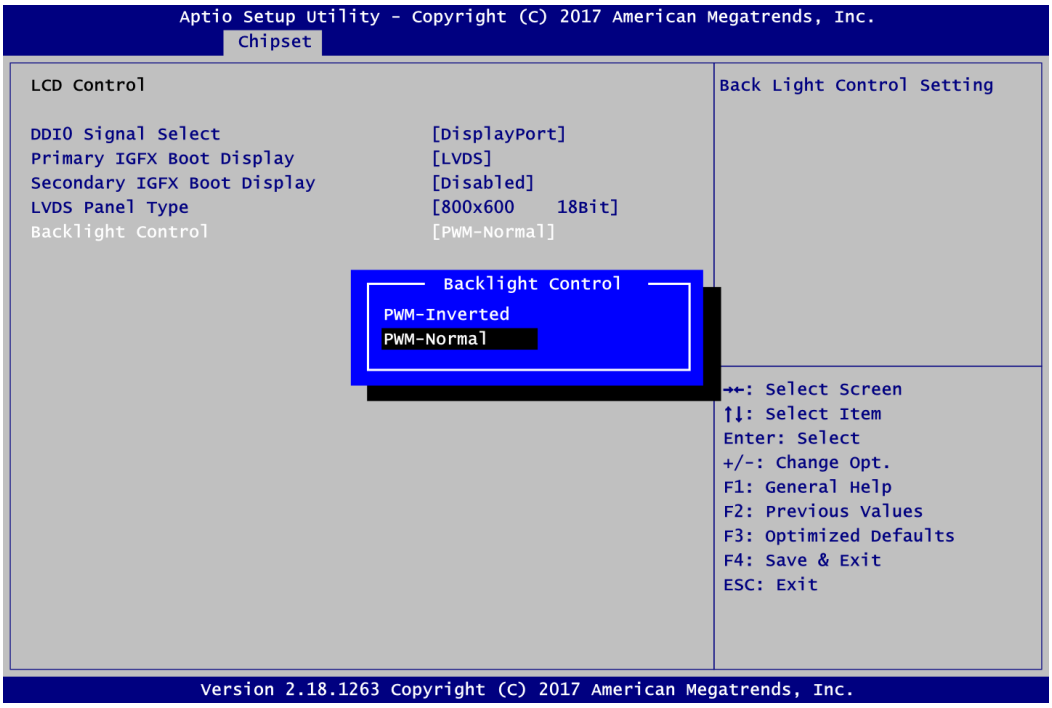
Note that the Primary IGFX Boot Display option appears only if Legacy Mode is selected, see image below.



Primary IGFX Boot Display
Select the video device which will be activated during POST (Power-On Self Test). The secondary boot display item appears based on your Primary IGFX Boot Display selection, see images below.



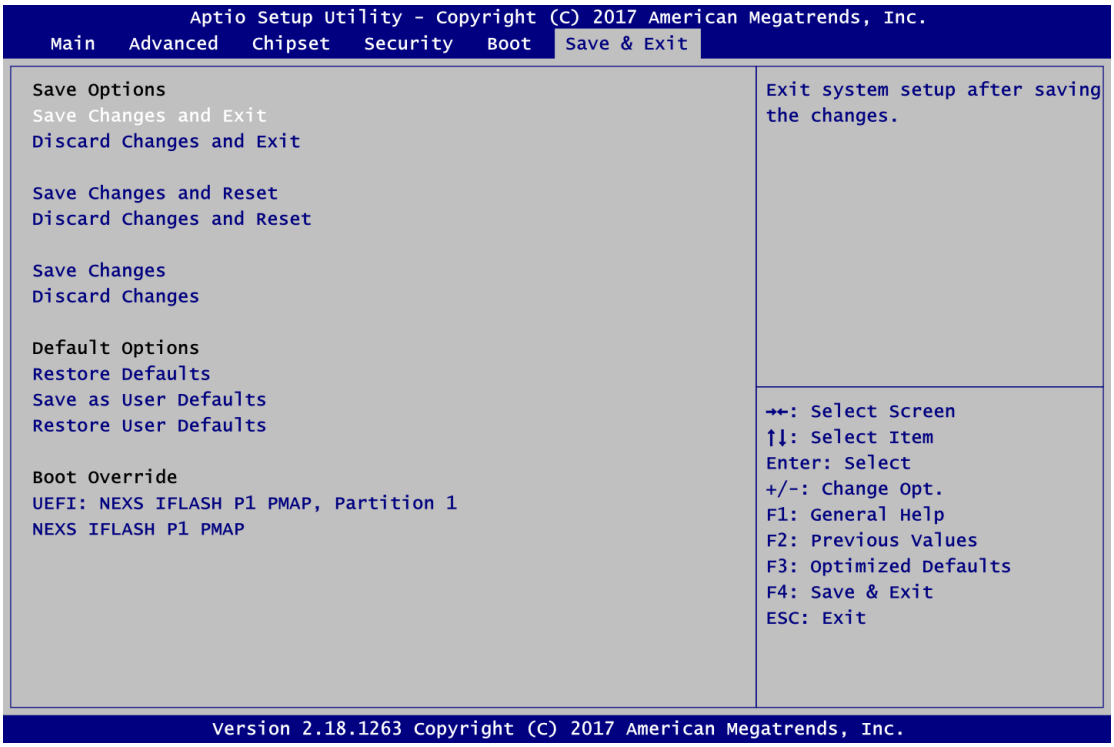
Secondary IGFX Boot Display
Select secondary boot display device.



Backlight Control
Use this item to select backlight control mode.

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 continue to boot to operating system. 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 continue to boot to operating system. 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>.

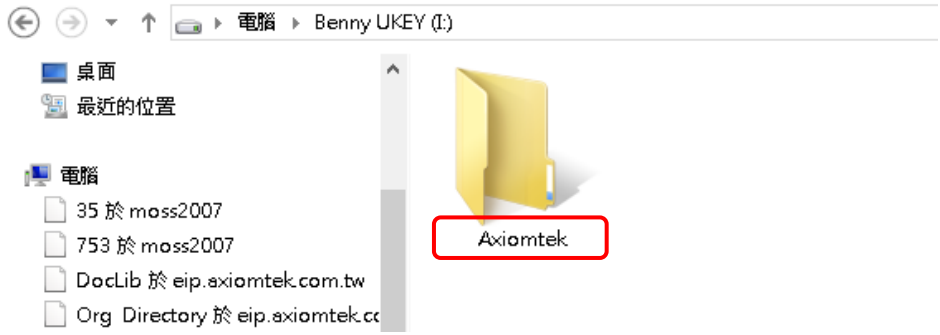
- **Restore User Defaults**
  It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

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

Appendix A
BIOS Flash Utility

The BIOS Flash utility is a new helpful function in BIOS setup program. With this function you can easily update system BIOS without having to enter operating system. In this appendix you may learn how to do it in just a few steps. Please read and follow the instructions below carefully.

1. In your USB flash drive, create a new folder and name it “Axiomtek”, see figure below.

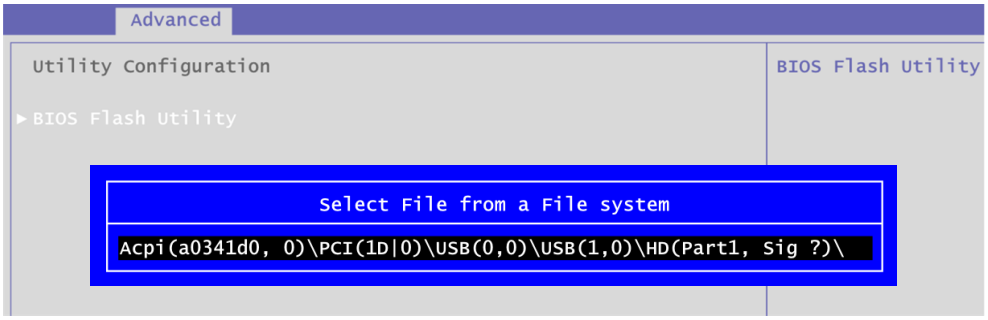


2. Copy BIOS ROM file (e.g. Q7M310X.005) to “Axiomtek” folder.

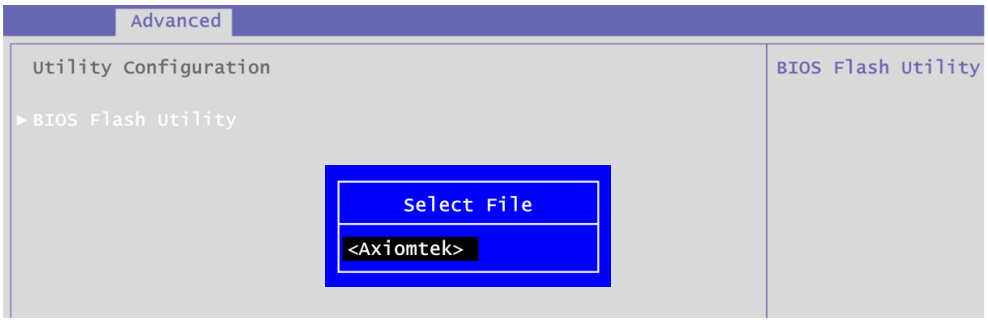
3. Insert the USB flash drive to your system.

4. Enter BIOS setup menu and go to Advanced\Utility Configuration. Select BIOS Flash Utility and press <Enter>.

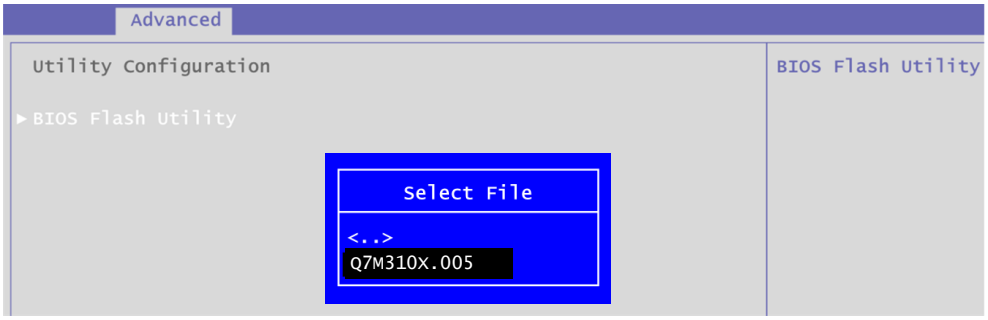
5. BIOS automatically detect all USB drive(s) attached to the system. In this example only one USB drive is attached to the system. That's why, you can see only one device is displayed in figure below.



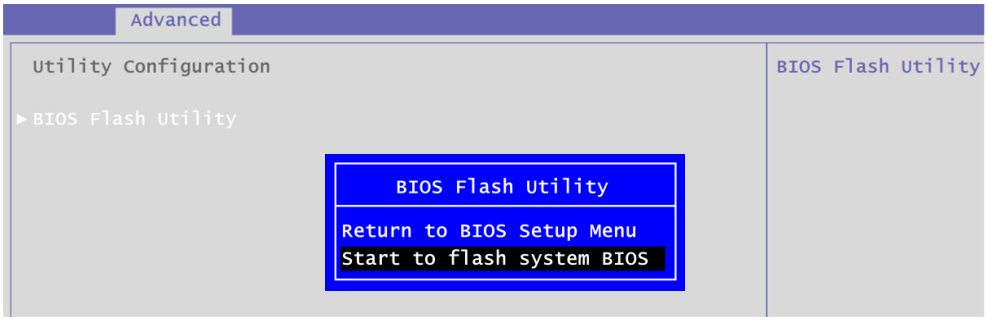
6. Select the USB drive containing BIOS ROM file you want to update using the <↑> or <↓> key. Then press <Enter> to get into "Axiomtek" folder.



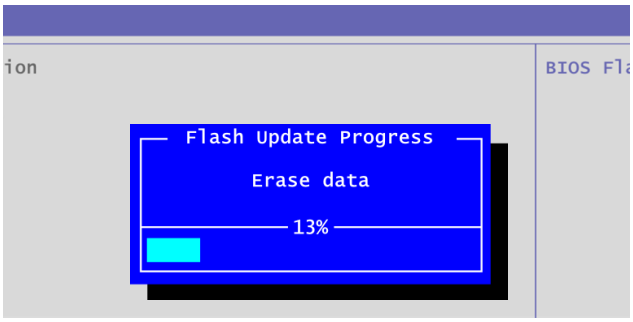
7. Now you can see the BIOS ROM file on the screen, press <Enter> to select.

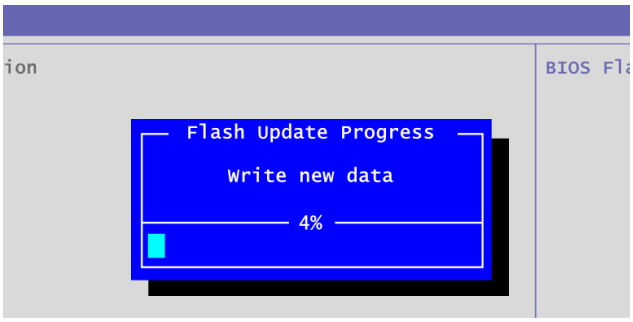


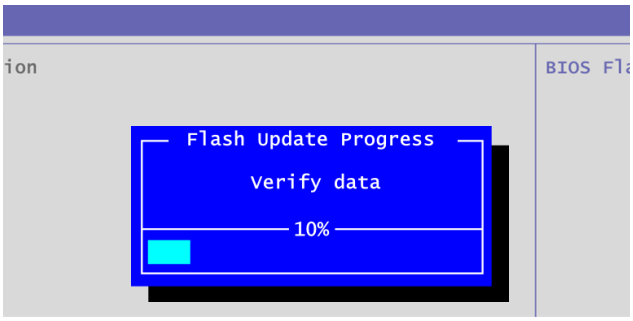
8. Select Start to flash system BIOS option to begin updating procedure.



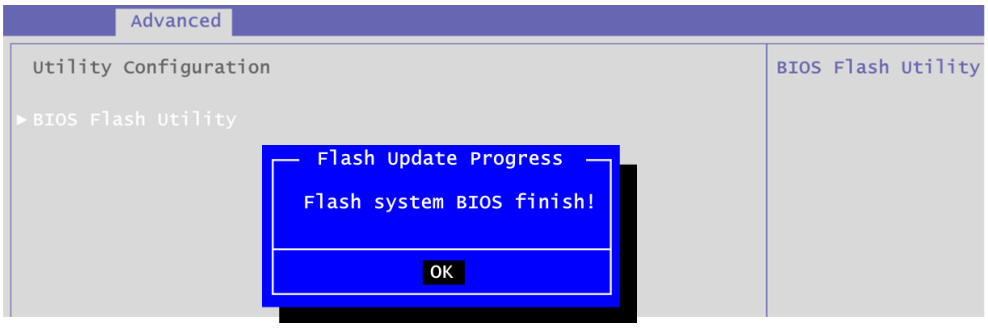
9. Please wait while BIOS completes the entire flash update process: erase data, write new data and verify data.







10. When you see the following figure, press <Enter> to finish the update process. After that the system will shut down and restart immediately.



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Appendix B
Watchdog Timer and GPIO

B.1 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.

Assembly sample code :

```
mov     dx,fa10         ; 5 seconds (Maximum is 65535 seconds; fill in
                        ; 0xFA10 and 0xFA11 register, ex: 0xFA11=0x01,
                        ; 0xFA10=0x68 means 360 seconds)
mov     al,05
out     dx,al

mov     dx,fa12         ; Enable WDT
mov     al,01
out     dx,al
```

B.2 About GPIO

The onboard GPIO or digital I/O has 8 bits (DIO0~7). Each bit can be set to function as input or output by software programming. In default, all pins are pulled high with +3.3V level (according to main power). The BIOS default settings are 4 inputs and 4 outputs where all of these pins are set to 1.

Assembly sample code :

```
mov     dx,fa18         ; Set DIO 0-7 to Output
mov     al,00
out     dx,al

mov     dx,fa19         ; Set DIO 4-7 to High
mov     al,f0
out     dx,al

mov     dx,fa18         ; Set DIO 0-7 to Input
mov     al,ff
out     dx,al

mov     dx,fa19         ; Get DIO 0-7 status
in      al,dx

mov     dx,fa18         ; Set DIO 0-4 to Input, 5-7 to Output
mov     al,1f           ; al = 1F => 00011111
out     dx,al

mov     dx,fa19         ; Set DIO 6 to High
mov     al,40           ; al = 40 => 01000000
out     dx,al

in      al,dx           ; Get DIO 0-7 status
```