

# User Manual

## ZKBio610P

Date: July 2020

Doc Version: 1.0

English

Thank you for choosing our product. Please read the instructions carefully before operation. Follow these instructions to ensure that the product is functioning properly. The images shown in this manual are for illustrative purposes only.



For further details, please visit our Company's website  
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If there is any issue related to the product, please contact us.

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## About the Company

ZKTeco is one of the world's largest manufacturers of RFID and Biometric (Fingerprint, Facial, Finger-vein) readers. Product offerings include Access Control readers and panels, Near & Far-range Facial Recognition Cameras, Elevator/floor access controllers, Turnstiles, License Plate Recognition (LPR) gate controllers and Consumer products including battery-operated fingerprint and face-reader Door Locks. Our security solutions are multi-lingual and localized in over 18 different languages. At the ZKTeco state-of-the-art 700,000 square foot ISO9001-certified manufacturing facility, we control manufacturing, product design, component assembly, and logistics/shipping, all under one roof.

The founders of ZKTeco have been determined for independent research and development of biometric verification procedures and the productization of biometric verification SDK, which was initially widely applied in PC security and identity authentication fields. With the continuous enhancement of the development and plenty of market applications, the team has gradually constructed an identity authentication ecosystem and smart security ecosystem, which are based on biometric verification techniques. With years of experience in the industrialization of biometric verifications, ZKTeco was officially established in 2007 and now has been one of the globally leading enterprises in the biometric verification industry owning various patents and being selected as the National High-tech Enterprise for 6 consecutive years. Its products are protected by intellectual property rights.

## About the Manual

This manual introduces the operations of ZKBio610P product.

All figures displayed are for illustration purposes only. Figures in this manual may not be exactly consistent with the actual products.

## Document Conventions

Conventions used in this manual are listed below:

### GUI Conventions

For Software	
Convention	Description
<b>Bold font</b>	Used to identify software interface names e.g. <b>OK, Confirm, Cancel</b>
>	Multi-level menus are separated by these brackets. For example, File > Create > Folder.
For Device	
Convention	Description
<>	Button or key names for devices. For example, press <OK>
[ ]	Window names, menu items, data table, and field names are inside square brackets. For example, pop up the [New User] window
/	Multi-level menus are separated by forwarding slashes. For example, [File/Create/Folder].

### Symbols

Convention	Description
	This implies about the notice or pays attention to, in the manual
	The general information which helps in performing the operations faster
	The information which is significant
	Care taken to avoid danger or mistakes
	The statement or event that warns of something or that serves as a cautionary example.

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## 1 Overview

This document describes the functionalities of ZKBio610P. It is a new generation Point-of-Sales device which facilitates hassle-free transactions. It is the most stable and reliable POS terminal incorporated with an efficient Intel processor. It has a modular design with aluminium alloy material. It supports dual-hinge stand, table stand, and standard VESA mount and thus enabling user-friendly transactions.

## 2 Packing List

### 2.1 Standard Accessories

a. 	b. 	a) ZKBio610P b) Power Adapters c) Power cords d) CD
c. 	d. 	

## 2.2 Optional Accessories

a. 	b. 	c. 
d. 	e. 	f. 
g. 	<ul style="list-style-type: none"><li>a. Single MSR</li><li>b. VFD</li><li>c. 2<sup>nd</sup> Display</li><li>d. 1D or 2D Attached Type Barcode Scanner</li><li>e. 1D or 2D Handheld Type Barcode Scanner</li><li>f. Thermal Printer</li><li>g. Cash Drawer</li></ul>	

## 3 System View

### 3.1 Rear View





★ Please make sure the 12V DC is plugged-in the right direction before plugging in DC

### 3.2 Side View



### 3.3 Specifications

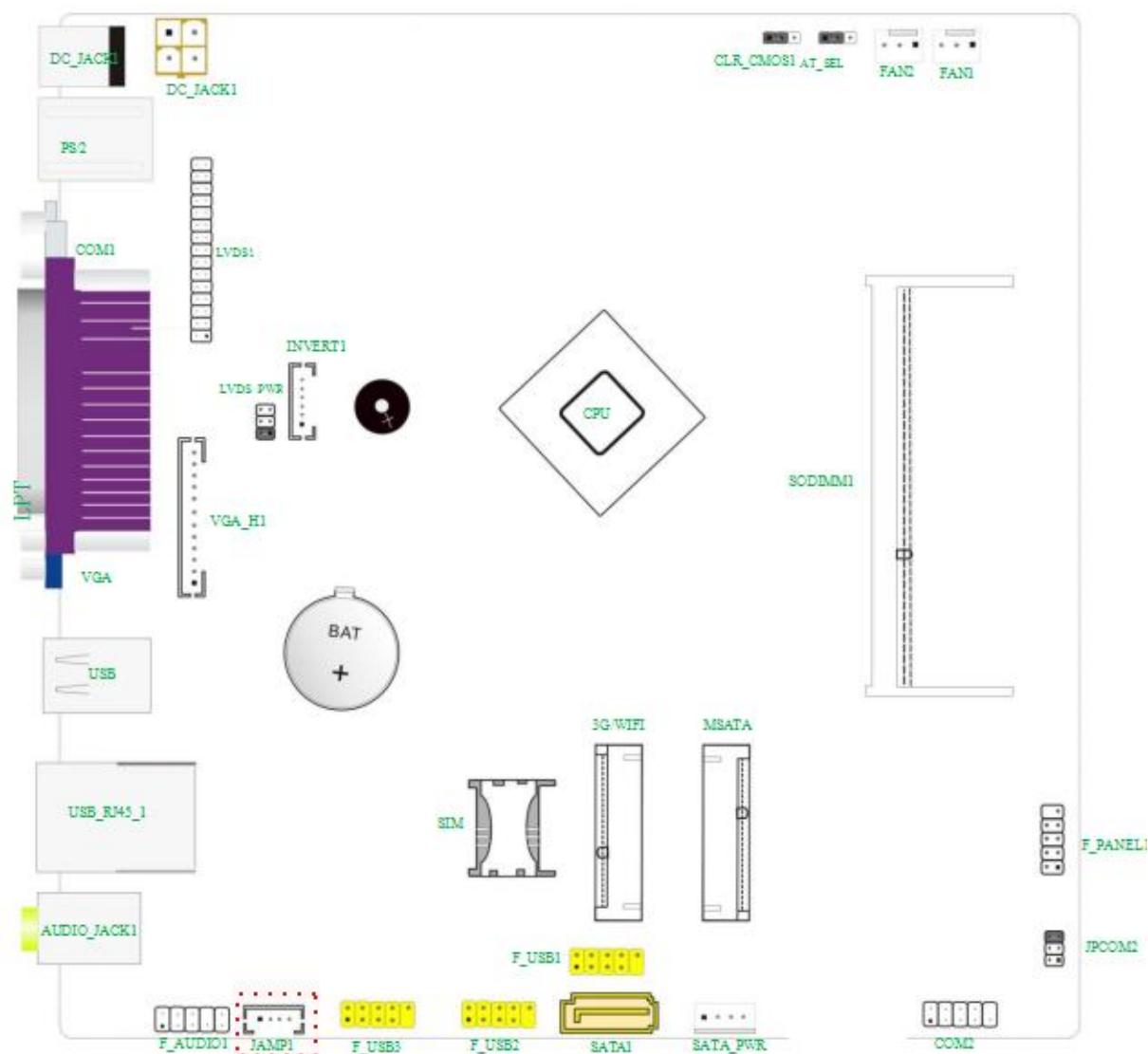
Display & Touch	LCD Display Size	15" TFT LCD
	Max. Resolution	1024x768
	Brightness	250 cd/m <sup>2</sup>
	Supported Colours	16.2M/ 262K colours
	Backlight	LED
	Touch Type	Standard Projected Capacitive
Main Board	Processor	Intel® Celeron J1900 QC 2.0GHz
	System Memory	One SO-DIMM socket supports DDR3L 1333 up to 8GB
Storage	HDD	MINI SSD x 1
I/O	USB	X 5 (USB 2.0)
		X 1 (USB 3.0)
	Powered COM	X 1
	LPT	X 1
	Audio Port	x 1 Line-out x1 mic in
Network	LAN	X 1 (RJ45 10/100/1000 Base-T)

Environment	Temperature	Operation	32° to 104° F (0° to 40° C)
		Storage	-4° to 140° F (-20° to 60° C)
	Relative Humidity	20% to 80% non-condensing	
Power Supply		12V 5A Power Adapter	
OS Support		POS Ready 7 / Win 8.1 Industry / Win 10 IoT Enterprise	
Dimensions		460(W) x490(H) x 315(D) mm(ZK1510) 358(W) x368(H) x 222(D) mm(ZK1515)	
Printer		ZKP8008	
Compliance	Certifications		CE / FCC

**Note:** Intel® Celeron J1900 CPU does not support POS Ready 2009.

## 3.4 Internal Layout

## M/B PCBA



## 4 Pin Definition

In this section, the pin configurations have been described. The definition for each of the pins are also described in the tables.

### 4.1 CPU

This Mainboard uses Intel® Bay Trail J1900 Quad core 2.0GHz CPU. Its frequency can be increased to 2.4GHz.

### 4.2 Fan Pin

The Fan Pin supports the connection of System fan and CPU fan for refrigeration, fan power cord and the connector may be different for each manufacturer.

**FAN1: CPU Fan pin**

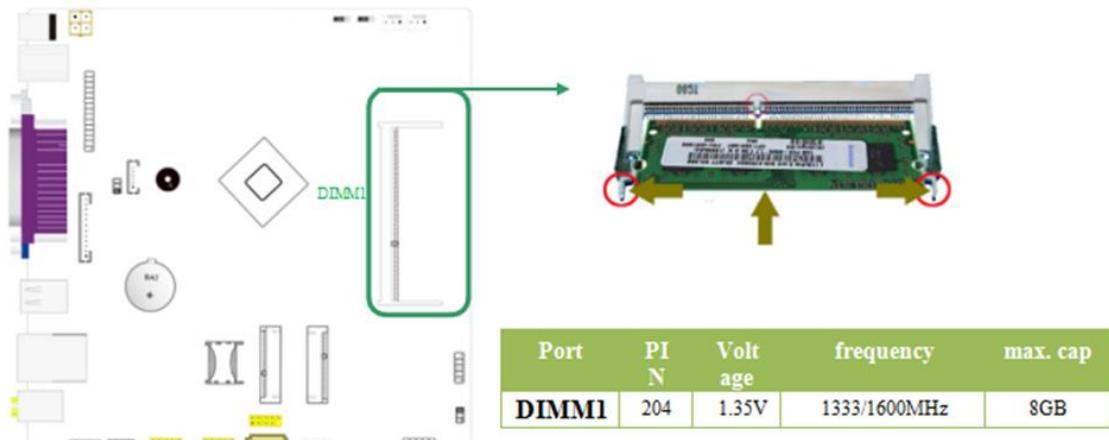
**FAN2: System fan pin**



Pin	Definition
1	GND
2	+12V
3	Fan speed detection

### 4.3 RAM

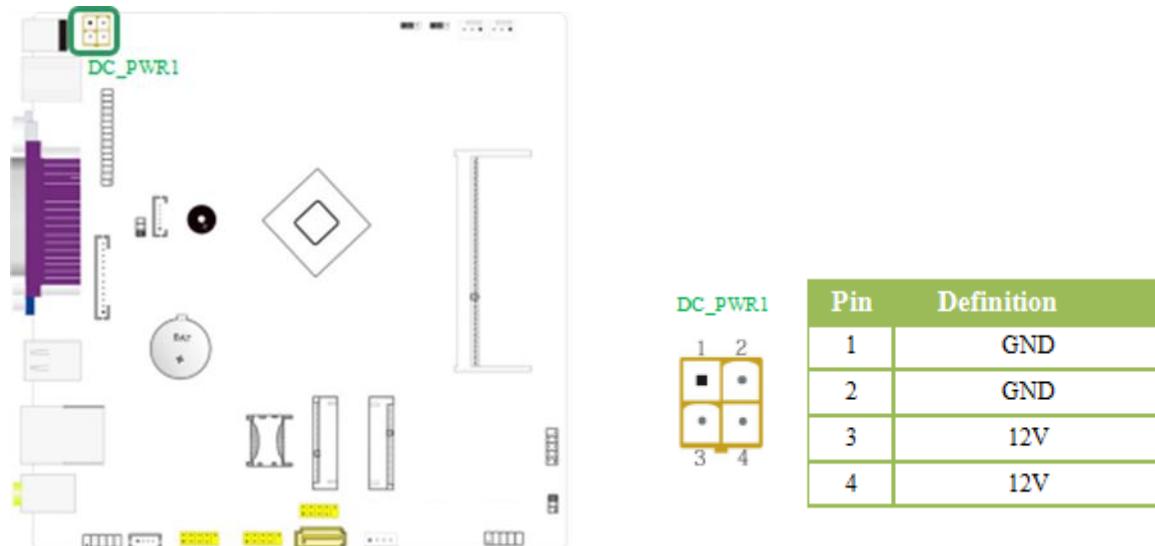
**DIMM1: RAM Port (SO-DIMM)**



### **Memory Unit Assembly and Disassembly**

1. To install the memory unit, please use the thumb and index finger to gently hold the memory unit at both the ends. Align the memory pin and slot on the positioning hole, insert at 30 degree oblique angle and gently press down until you hear the locking sound.
2. To remove the memory unit, place your two fingers at both the ends of the slot , then pop up the memory unit.

## **4.4 Power Supply (motherboard provides the DC power supply)**



DC 12V DC input / output interface (4Pin)

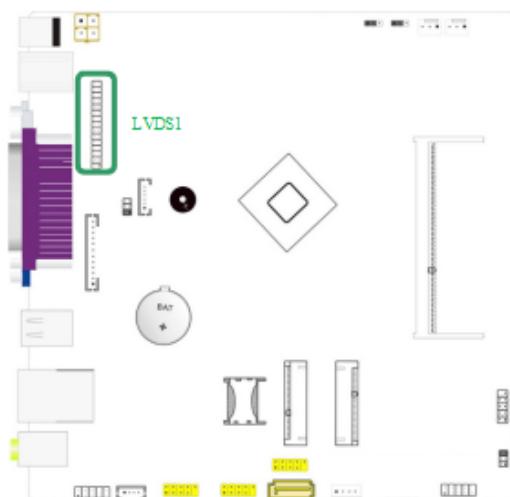
DC\_PWR1 and backplane IO DC jack cannot be connected simultaneously

## 4.5 Onboard Slot / Connector / Pin / Jumper

### 4.5.1 Definition of Display port pins: LVDS, INVERT, LVDS\_PWR, VGA\_H1

#### LVDS1: LVDS Connector

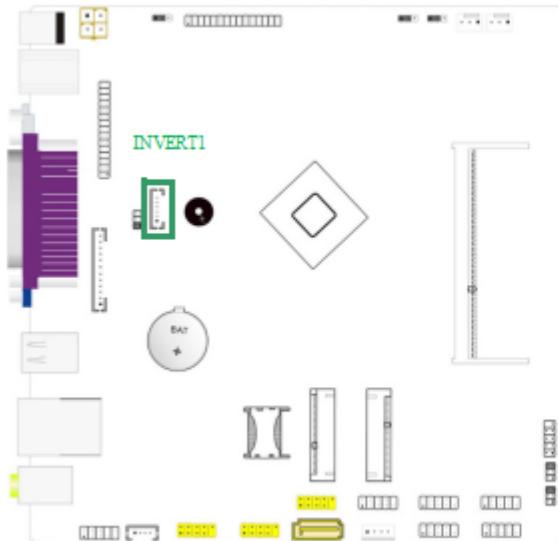
The Motherboard provides DuPont encapsulated LVDS(Low Voltage Differential Signalling) connector, supports dual-channel 24bit LVDS display port output, and can be connected to a single 6 bit, dual 6 bit, single 8 bit ,dual 8-bit LVDS LCD.



LVDS1	PIN		Definiti		PIN		Definiti	
	30	29	1	VCC	2	VCC	4	GND
			3	VCC	4	GND		
			5	GND	6	GND		
			7	AD00-	8	AD00+		
			9	AD01-	10	AD01+		
			11	AD02-	12	AD02+		
			13	GND	14	GND		
			15	ACLK-	16	ACLK+		
			17	AD03-	18	AD03+		
			19	BDO0-	20	BDO0+		
			21	BDO1-	22	BDO1+		
			23	BDO2-	24	BDO2+		
			25	GND	26	GND		
			27	BCLK-	28	BCLK+		
			29	BDO3-	30	BDO3+		

#### INVERT1: LVDS Backlight connector

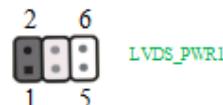
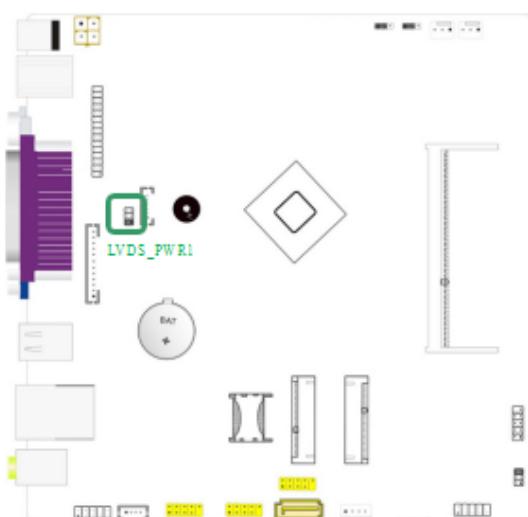
The Motherboard provides a 6 pin INVERT for driving the LVDS LCD backlight panel.



Pin	Definition
1	+12V
2	+12V
3	ENABLE
4	PWM
5	GND
6	GND

### LVDS\_PWR1: LVDS LCD logic circuit voltage select jumper

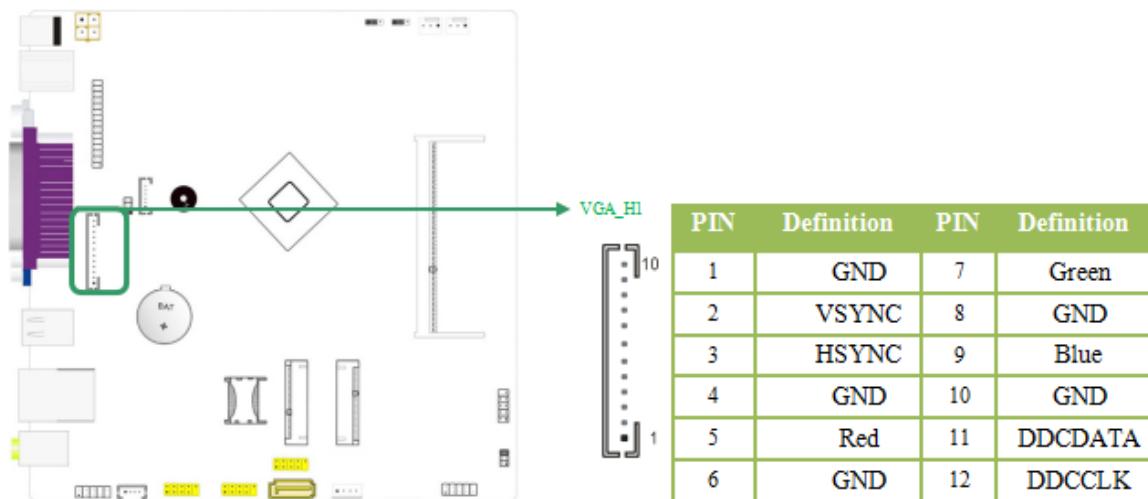
The Jumper Cap is used to select the voltage of the LVDS LCD logic circuit.



Pin	Definition
1-2	LVDS 3.3V
3-4	LVDS 5V
5-6	LVDS 12V

### VGA\_H1: VGA Internal pin

The Pin and VGA(Video Graphics Array) of I/O port is the same display channel and only supports the dual-VGA synchronous display.



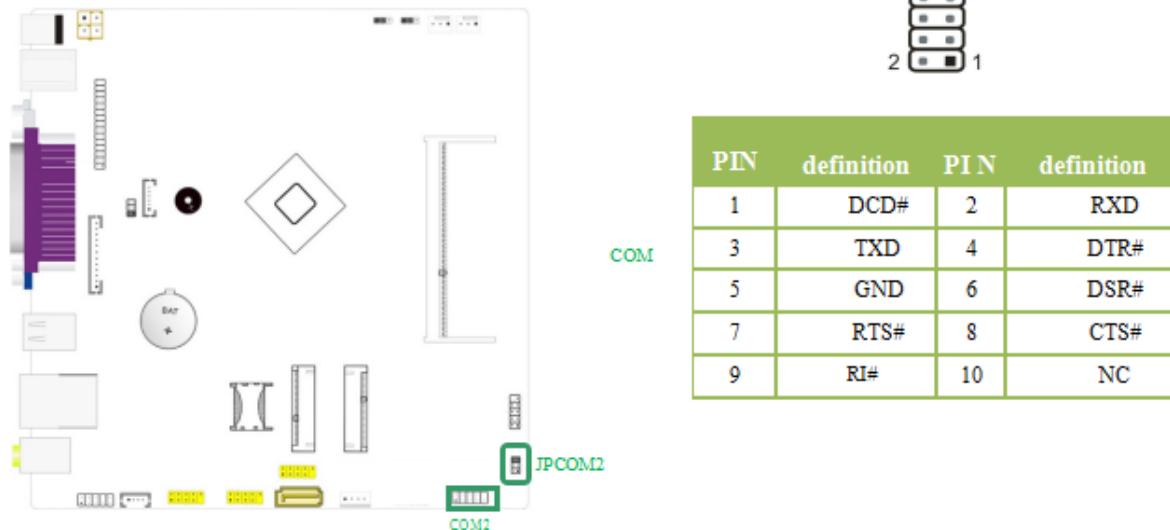
### Dual display settings

The board provides a standard VGA interface (VGA built a pin), a dual-channel 24bit LVDS interface, various combinations of dual-screen display and dual display functions are given below:

Combination mode	Double display function
VGA1 +LVDS	Supports synchronous/asynchronous dual display
VGA_H1+ LVDS	Supports synchronous/asynchronous dual display

### 4.5.2 Definition of Common Function Port Pin

#### COM2 RS-232



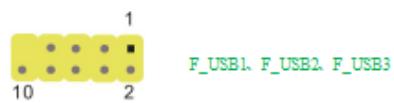
#### 5V/12V power supply (COM2)



Pin	definition
1-2	RI
3-4	+5V
5-6	+12V

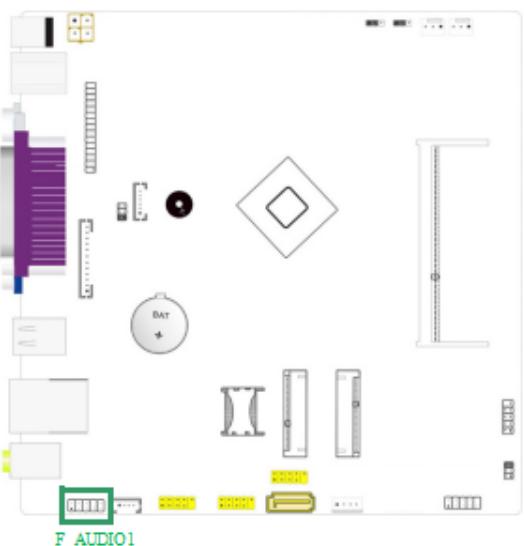
The above COM does not support RI wake up.

#### F\_USB1, F\_USB2 , F\_USB3 (2.0) Extension Pin



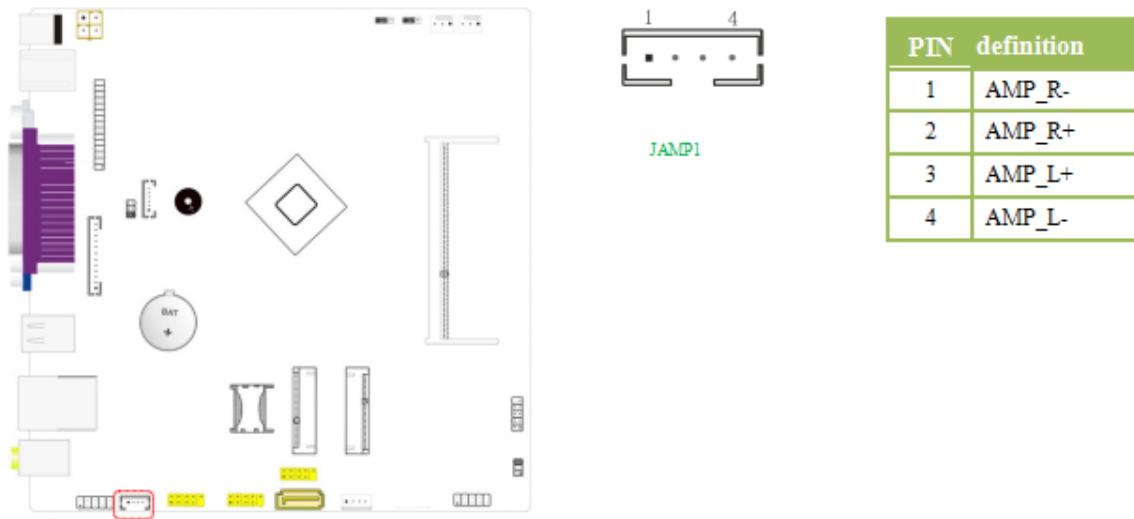
PIN	definition	PIN	definition
1	+5V	2	+5V
3	USB1_Data-	4	USB2_Data-
5	USB1_Data+	6	USB2_Data+
7	GND	8	GND
9		10	GND_CHASSIS

The audio extension cable can be extended to audio input and output ports.



PIN	definition	PIN	definition
1	MIC-L	2	GND
3	MIC-R	4	PRESENCE
5	LINEOUT-R	6	MIC SENSE
7	SENSE_SEND	8	
9	LINEOUT-L	10	LINEOUT SENSE

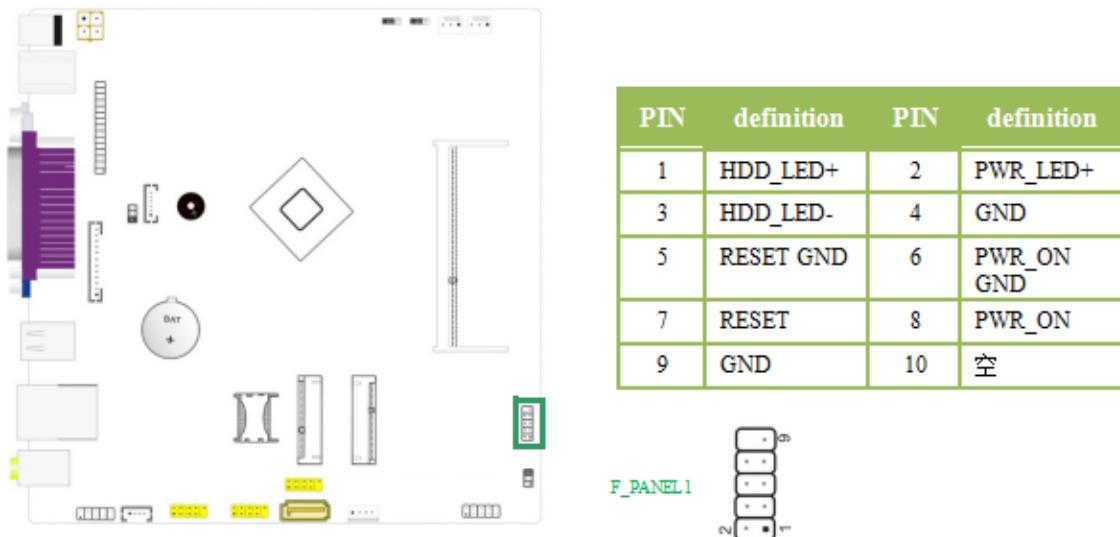
### JAMP1 Digital audio output connector (optional)



### 4.5.3 Other Pin Definitions: F\_PANEL1, CLR\_CMOS, AT\_SEL

#### F\_PANEL1: Front panel pin

The 10-Pin function includes power-on, reset, hard disk indicator, power indicator, allowing the user to connect the system's front panel switch.



#### CLR\_CMOS1: Wipe the CMOS, setup jumper

It allows the user to shorten the Pin2-3 of the jumper to restore the BIOS initial security settings. Follow the instructions carefully to avoid damaging the Motherboard.



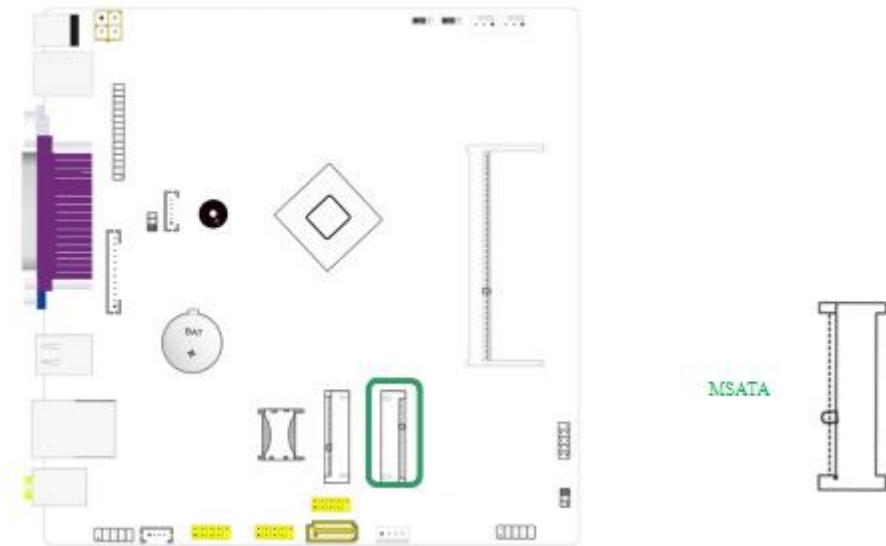
Clear the COMS data:

- ① Disconnect the power supply
- ② Set the jumper to "Pin 2-3 closed"
- ③ Wait for 5 seconds
- ④ Then set the jumper to "Pin 1-2 closed"
- ⑤ Power on to reset the password or clear the CMOS data

#### 4.5.4 Slots and connectors: MSATA1, SATA, 3G/WIFI, SATA\_PWR

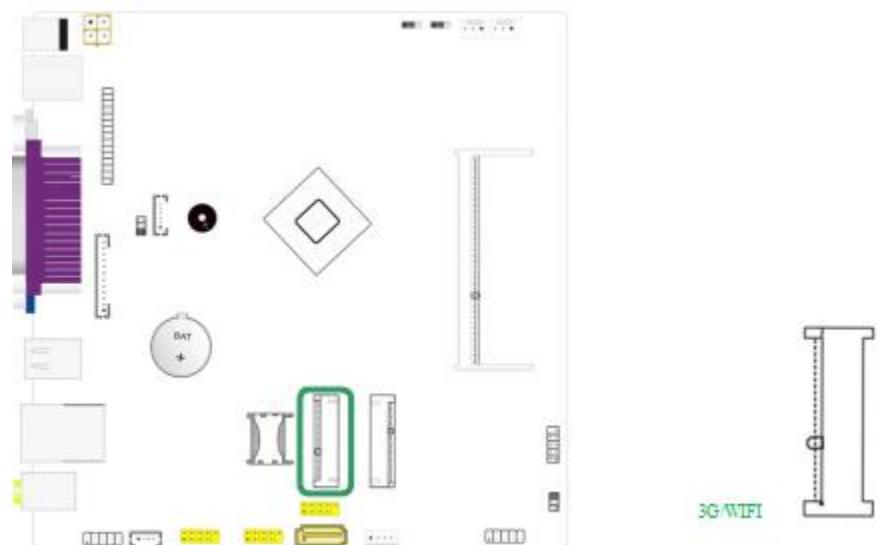
##### MSATA: mSATA Slot

The slot supports the mSATA SSD installation.



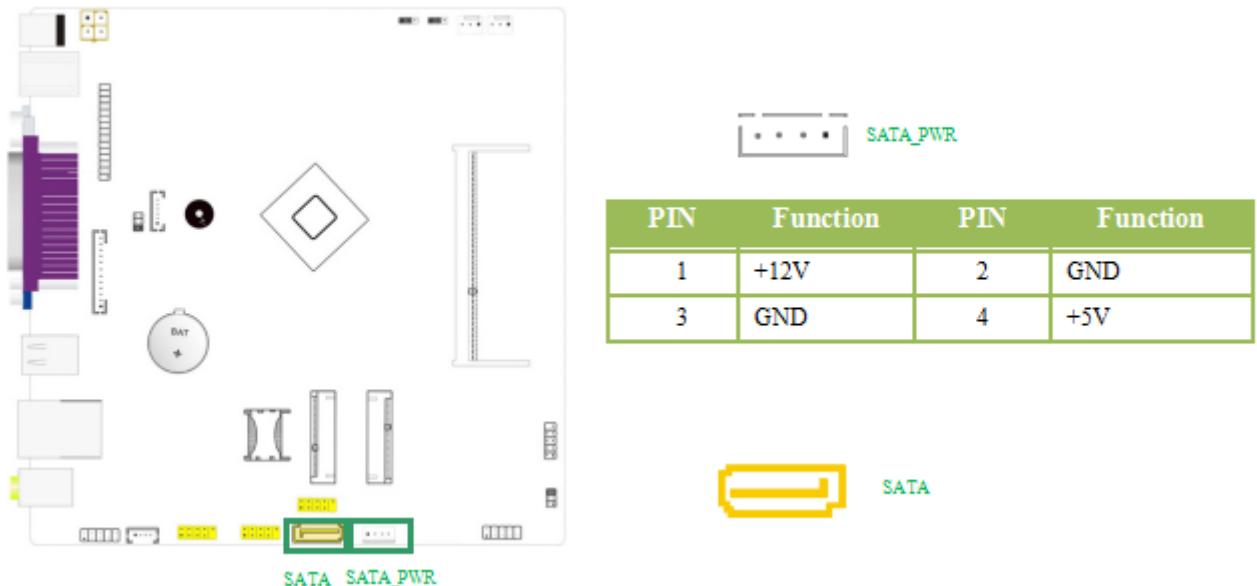
While installing the SSD, please be careful while using the tightening screw.

### 3G/WI-FI



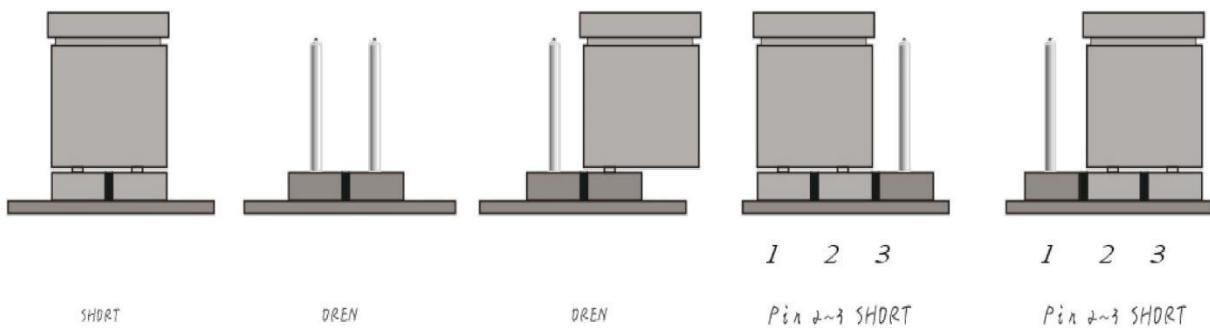
### SATA1: 1×SATA 2.0 Interface

**SATA\_PWR1,SATA2.0 (yellow) supports 3GB/s transfer rate.**



## Set Jumper

The following figure shows the jumper set up procedure. When the jumper cap is placed on the pin, the jumper will be "Closed", indicating that the two pins are connected; otherwise, "Open".



## 5 BIOS Settings

### Introduction

The purpose of this section is to introduce the functions of the Motherboard AMI BIOS setup menu. The BIOS program allows the user to modify and save the basic system configuration. The BIOS setup options and modified data are stored in the CMOS RAM and the CMOS RAM power supply is provided by a lithium battery on the Motherboard. To ensure that the modified value saved in CMOS RAM is not lost, make sure that the power is cut off.

Under normal circumstances, the factory default BIOS is an optimized value, and no modification is required. However, if any other problem causes BIOS data loss, it is required to re-set the BIOS.

In case you do not understand the BIOS options and settings, please do not arbitrarily modify them. In case any problem occurs, it can be because of the error in BIOS value; to resolve it please restore the BIOS factory settings.

This manual provides the basic instructions that allows the user to refer and optimize the BIOS function settings, but there are still some BIOS projects that are not described. Please keep the default settings without having to fully understand their functions.

## BIOS Setting

The following contents of this manual will instruct you to set the basic functions of the BIOS program.

When the computer is started, the BIOS enters the POST program. The self-test program is a series of diagnostic programs that are fixed in the BIOS. When the self-test program is executed, if any error occurs, it will display the following information:

### Press Delete to BIOS

If you want to enter the BIOS setup program, press <Delete>. If this message disappears before you respond, you can turn off or press the Reset button or Restart your system. You can also press <**Ctrl + Alt + Delete**> to restart the system.

In the BIOS setup, you will see a description of the options in the upper right corner, which is a brief description of the selected items. The detailed description of Function keys will be in the lower right corner; you can use these keys to change the settings.

### BIOS Function keys

BIOS Function keys	Description
→←	Select screen
↑↓	Select item
ENTER	Select the item and enter the submenu
+/-	Changes the value, add or subtract values
F1	Displays the help content
F2	Previous setting values
F3	Optimized Default value
F4	Save changes and Exit
ESC	Exit

### BIOS Upgrade

- 1) Please download from the official website or get the latest BIOS file and refresh the tool from the supplier.
- 2) Let the system run in UEFI Shell mode; the AMI BIOS refresh tool is provided by us is FPT64.efi.
- 3) Run the application to back up the BIOS file. The instruction is FPT64.efi / D bakup.BIN.
- 4) Update the BIOS. The instruction is FPT64.efi / F NEWBIOS.BIN.

5) Restart the system, press "Delete" to set the BIOS, press "F3" to select "Load Optimized default" and press "F4" to save the changes and exit.

The default BIOS settings are suitable for most of the situations, ensuring optimal motherboard performance. If the system becomes unstable when you change the settings, load the default settings to ensure system compatibility and stability.

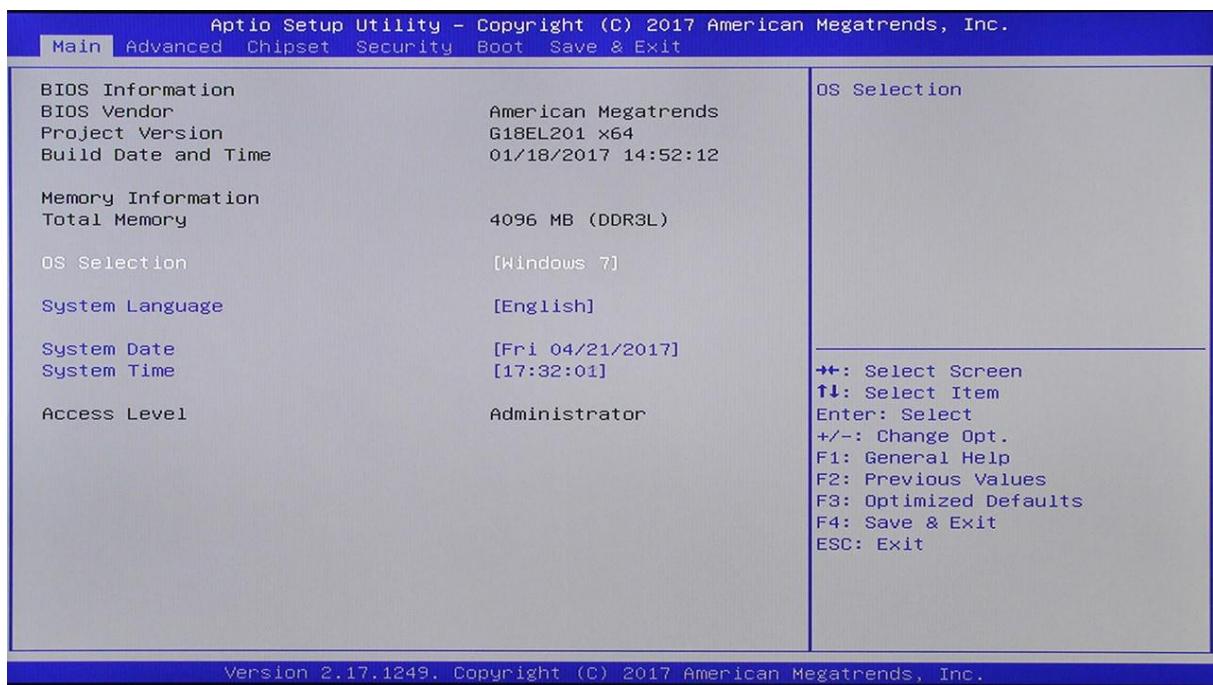
For a system performance, the Motherboard's BIOS firmware will be constantly updated.

The BIOS information described here is just for your reference, and the actual BIOS information and its settings may differ slightly from the manual.

**The contents of this manual are subject to change without notice.**

## 5.1 MAIN MENU

Once you have entered the AMI BIOS setup menu, the main menu appears on the screen and displays an overview of the basic system information. Select the menu you want to change, press the "↑ ↓ ← →" buttons to move the navigation bar to the menu you want to change and press the <Enter> button. When you move the navigation bar to each menu, the top right of the screen will display the Help information to help you better understand the functionality of this menu. When a menu is selected, the submenu of the item is displayed and the user can adjust the corresponding configuration parameters.



### BIOS Information

Displays BIOS system information, including BIOS version, creation date, etc.

### OS Selection

Displays the OS selection such as Windows 7, Windows 8.X, etc.

### System Date

Allows to set the current date of the system; the display format is "Week \* Month / Day / Year".

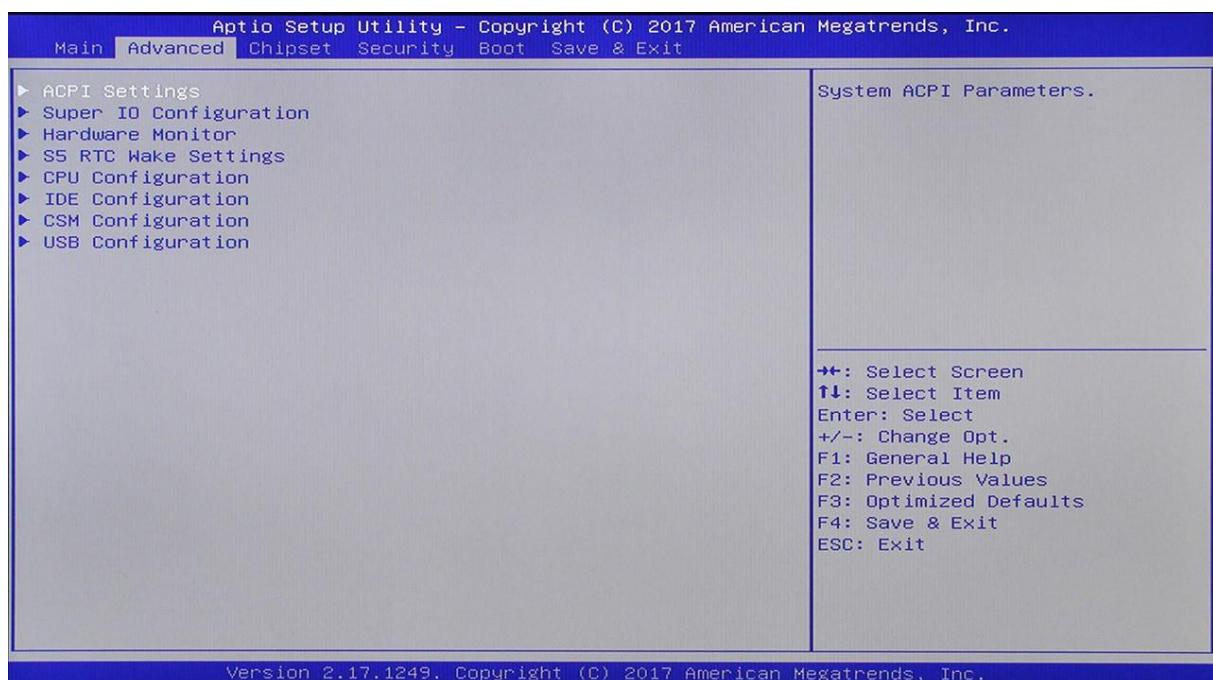
### System Time

Allows to set the current time of the system; the display format is "Hours: Minutes: Seconds".

## 5.2 ADVANCED MENU

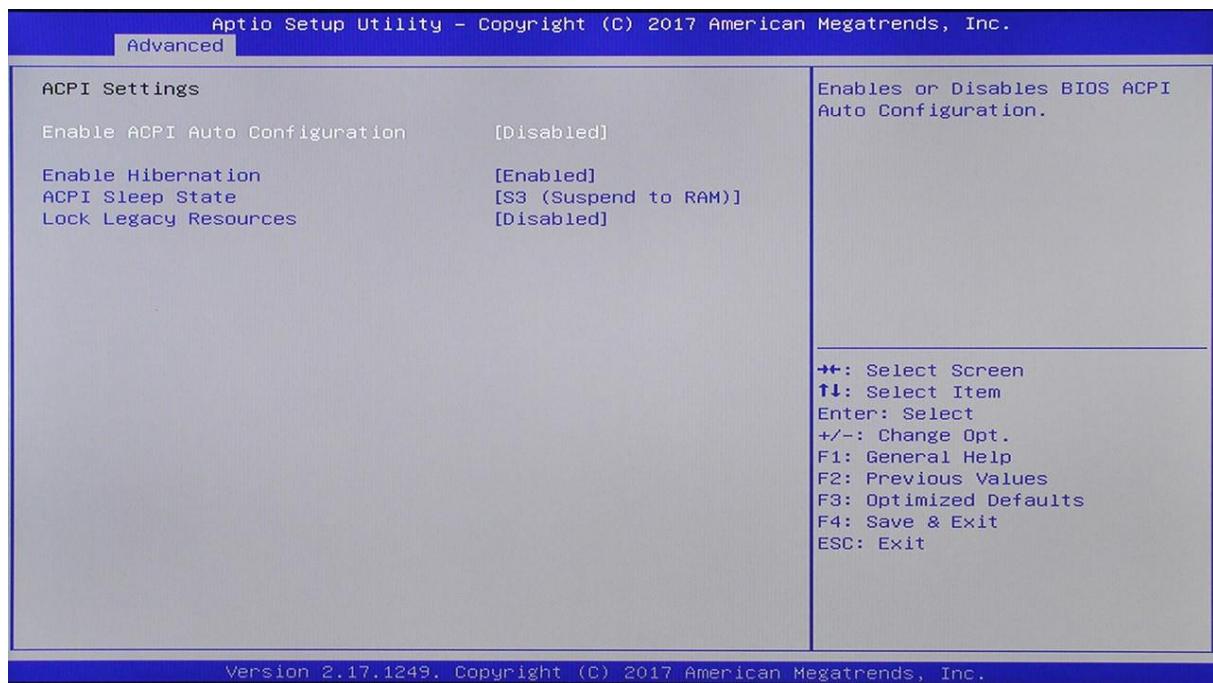
The Advanced menu allows you to set up the CPU, Super I / O, Power settings management, and other system devices.

 **If the value in this menu is set incorrectly, it may cause system failure.**



### ACPI Settings

This menu provides the power management information setting (Due to different models of motherboards, some options are different, please choose according to the actual menu).



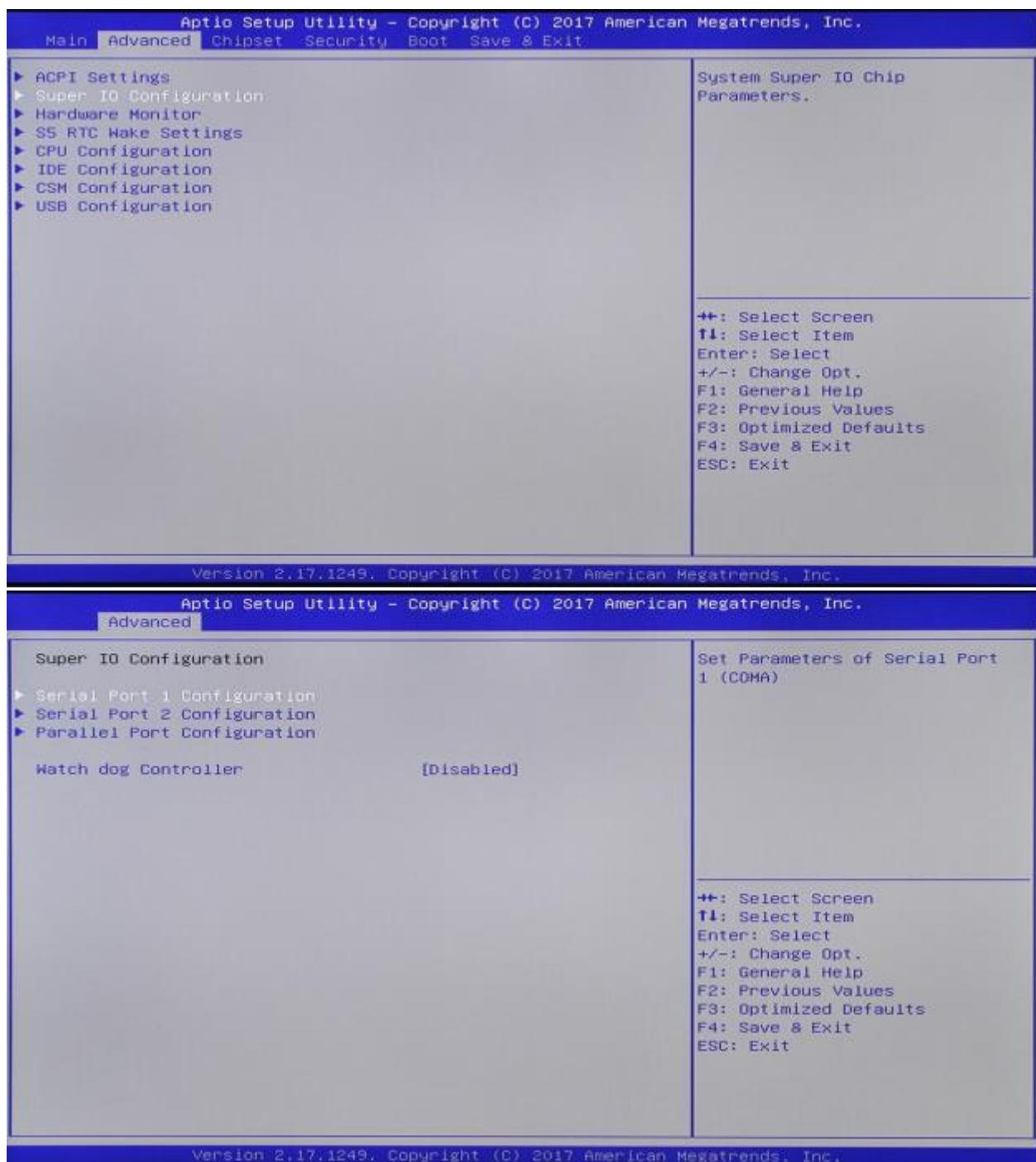
## Enable Hibernation

Allows to set the Enable or Disabled system hibernation, the default is "Enabled".

## ACPI Sleep State

Allows to set the ACPI sleep state, the option is: "Suspend Disabled".

## IT8786E Super IO Configuration



## Watchdog Controller

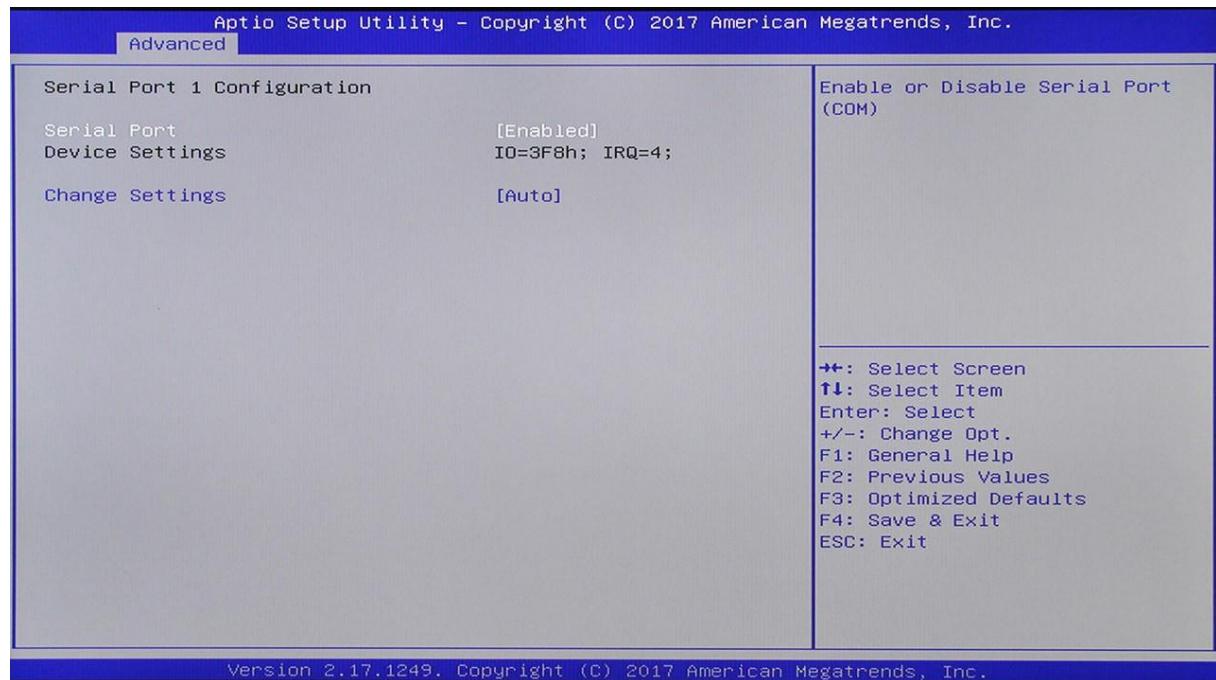
The options of Watchdog Controller are: Disabled (default), Second, Minute.

## Restore AC Power Loss By IO

The options are Power Off (default), Power On, Last State.

## Serial Port Configuration

Select an address and the corresponding interrupt value to the serial port, enter the settings interface and it will be displayed as shown below:



### Serial PortX

Select the serial port, and the available options are [Enabled] and [Disabled].

### Device Settings

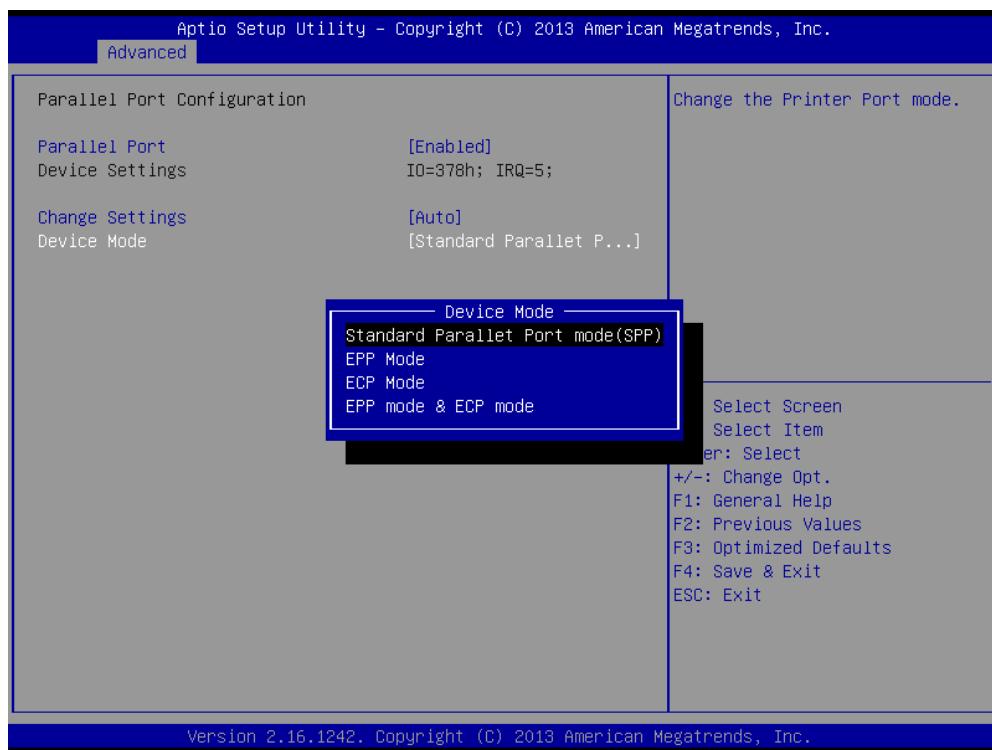
Set the serial port interrupt value, the interrupt settings are [IO=3F8h; IRQ=4].

### Change Settings

The menu has six options, the default value is [Auto].

### Parallel Port Configuration

Select an address and the corresponding interrupt to the serial port, open the settings interface and it will be displayed as shown below:



## Parallel Port

Set the parallel port to on or off, the available options are [Enabled] and [Disabled].

## Device Settings

Set the parallel port interrupt [IO=378h; IRQ=6].

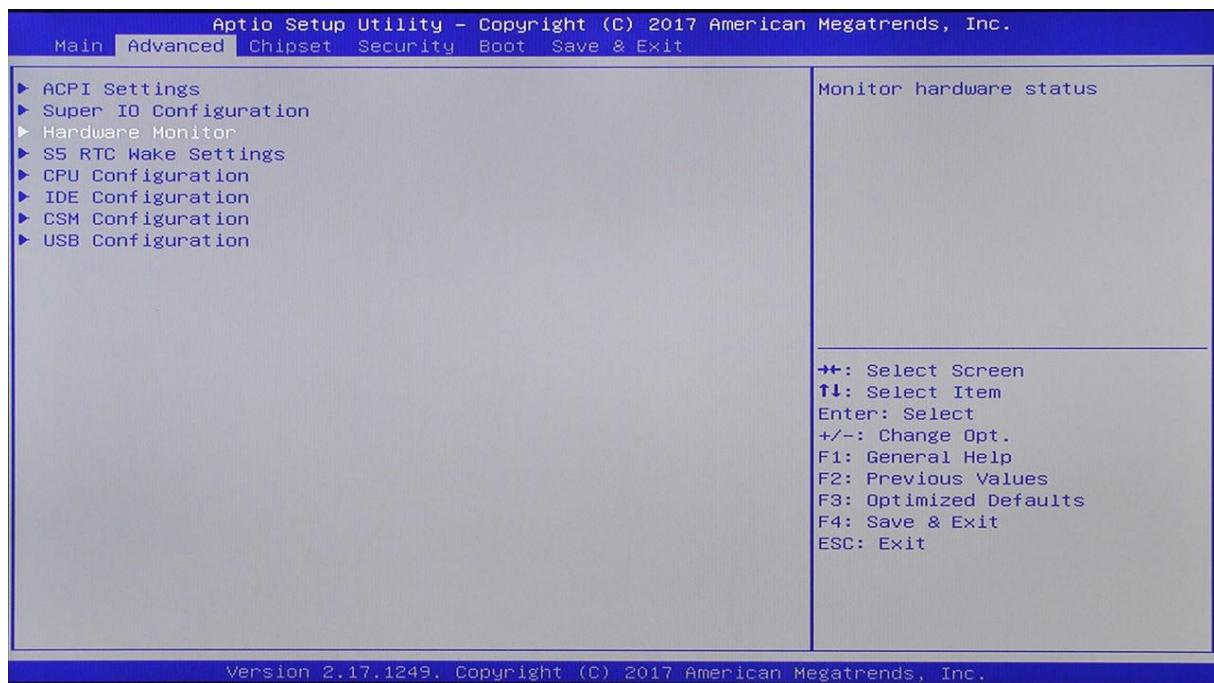
## Change Settings

The settings have five options, the default value is [Auto].

## Device Mode

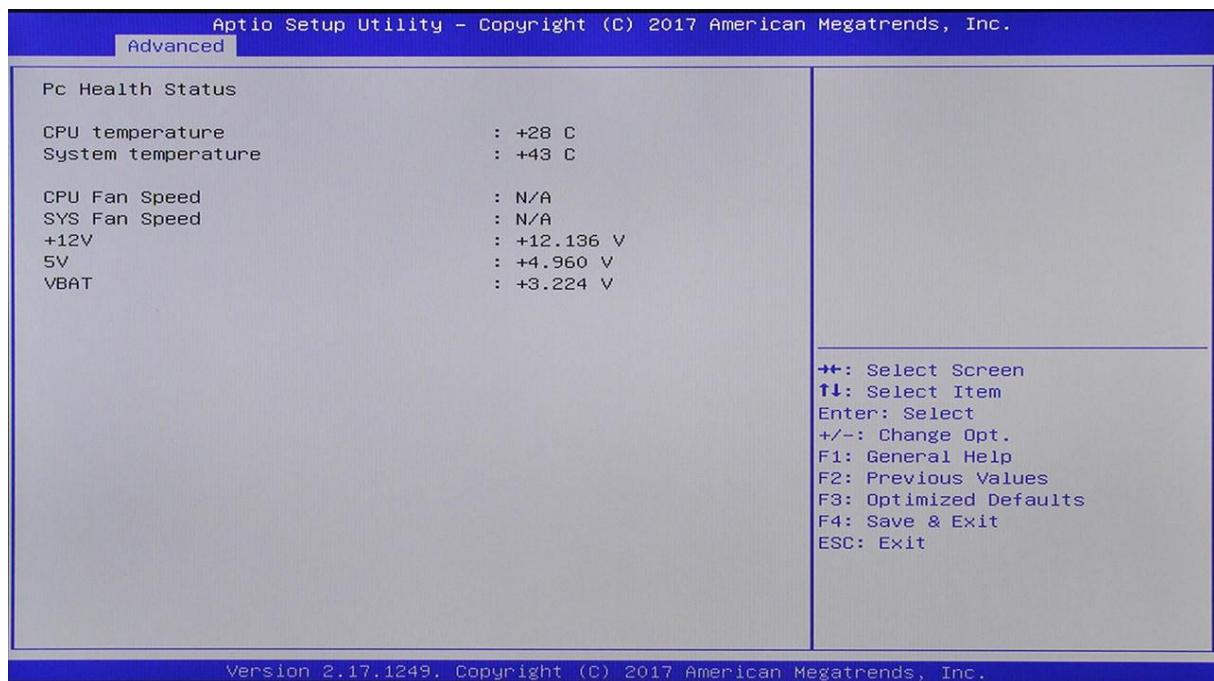
The device modes are EPP Mode, ECP Mode, EPP mode and ECP Mode.

## Hardware Monitor



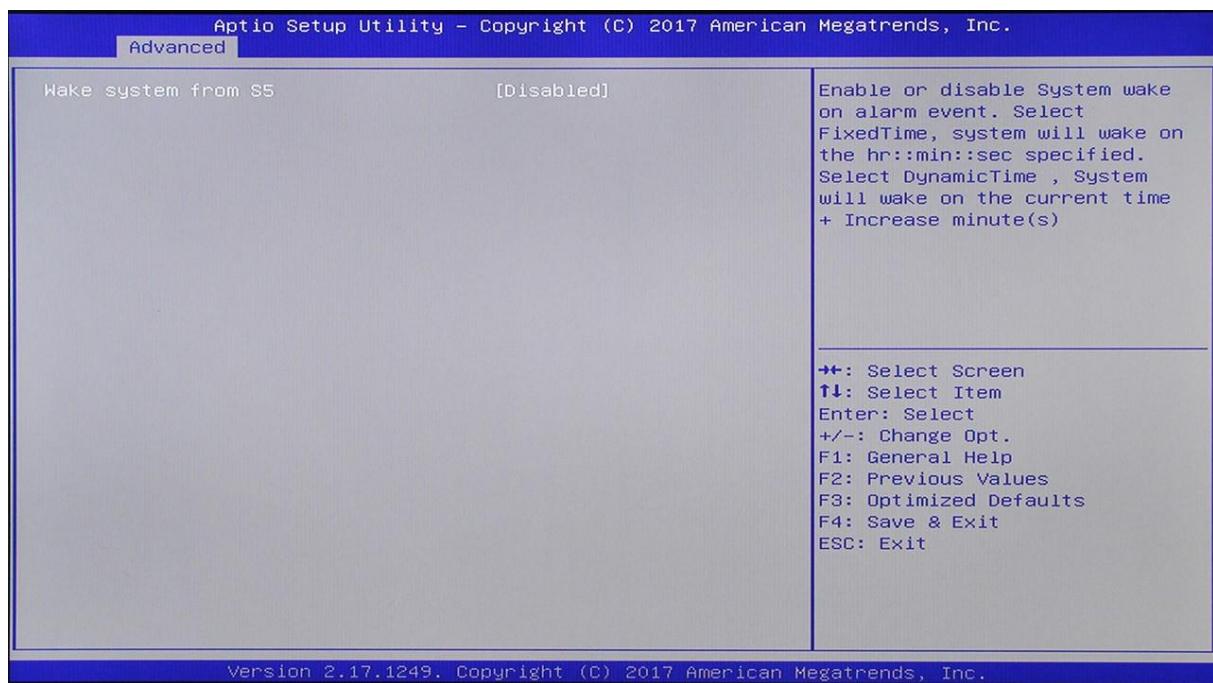
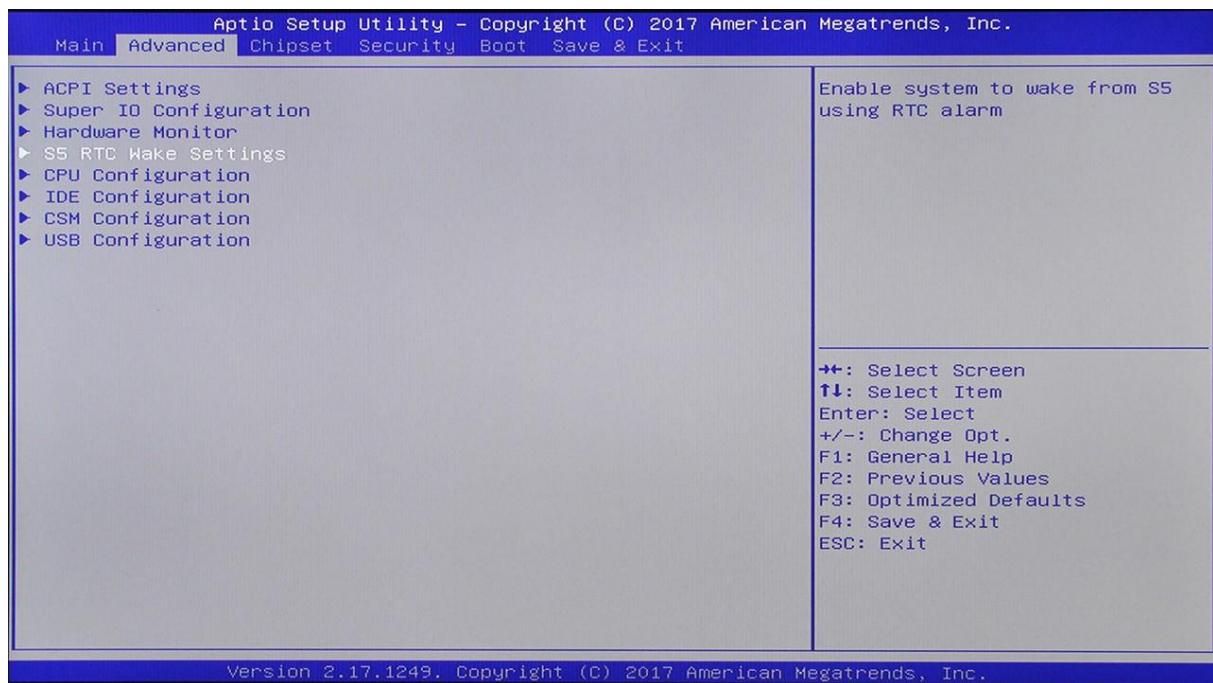
## PC Health Status

The interface displays information about the health status of the PC hardware, including CPU temperature, System temperature, CPU fan speed, System fan speed, Voltage, etc.



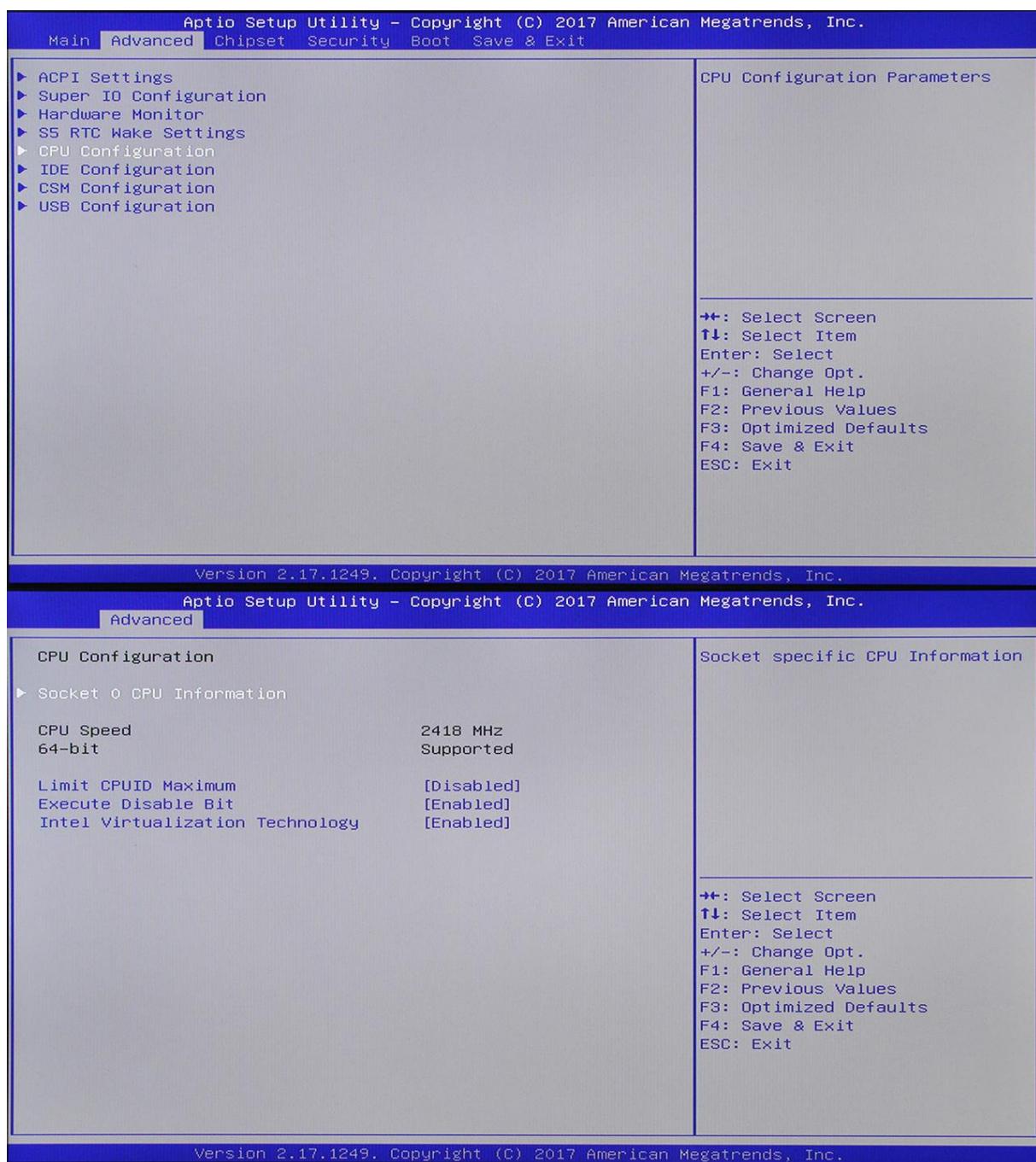
## Advanced S5 RTC Wake Settings

Here you can set the timer switch, and the setting options are: Disabled (default), Enabled. When set to Enabled, you need to set the fixed boot time, format: Day (D): Hour (H): minute (M): Second (S)



## CPU Information

This displays the information that the BIOS automatically detects.



## Socket 0 CPU Information

Displays the detailed CPU information.

### Active Processor Cores [ALL]

Activates the number of processor cores with options ALL, and 1.

### Limit CPUID Maximum [Disabled]

Please set this option to [Enabled] when you want to use an operating system that does not support the extended CPUID function.

### Execute Disable Bit [Enabled]

This option is used to enable or disable the “No-Execution Page Protection technology”. When set to [Enabled], the XD function is always forced to 0. The setting options are: [Disabled] and [Enabled].

### Hardware Prefetcher [Enabled]

This option allows you to use or not use the hardware prefetcher function. The setting options are: [Disabled] and [Enabled].

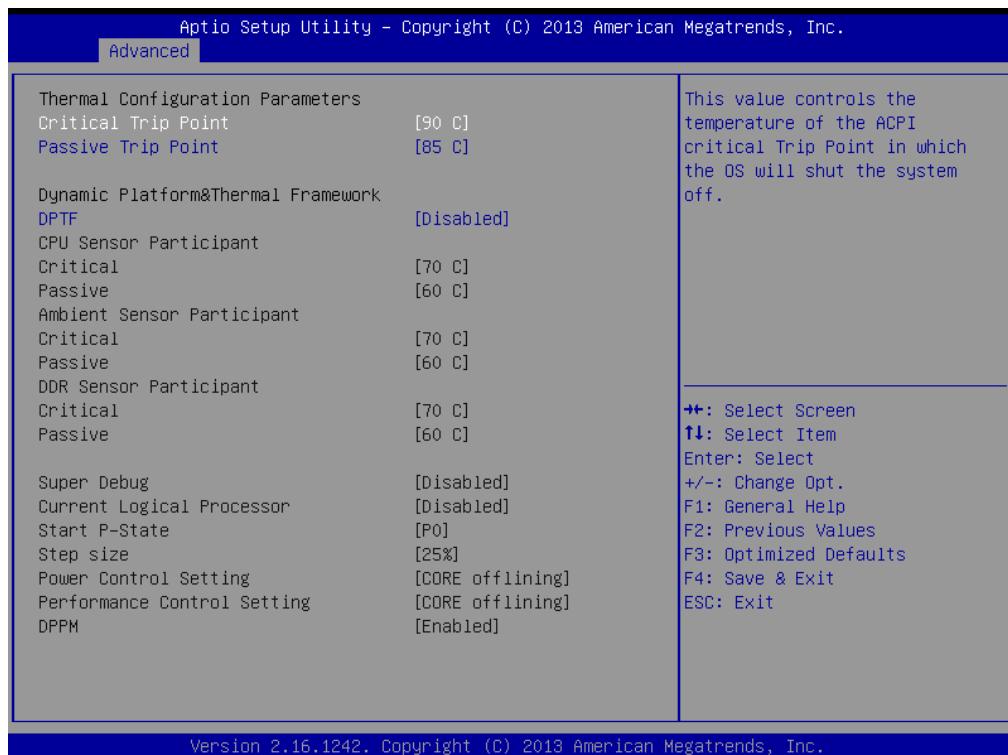
### Adjacent Cache Line Prefetch [Enabled]

This option allows you to use or not use the prefetcher adjacent cache data mode. When set to [Disabled], only one 64-bit line is pre-read from the 128-bit segment (contains the requested data). When set to [Enabled], both lines will be prefetched, regardless of whether they have the requested data. The setting options are: [Disabled] and [Enabled].

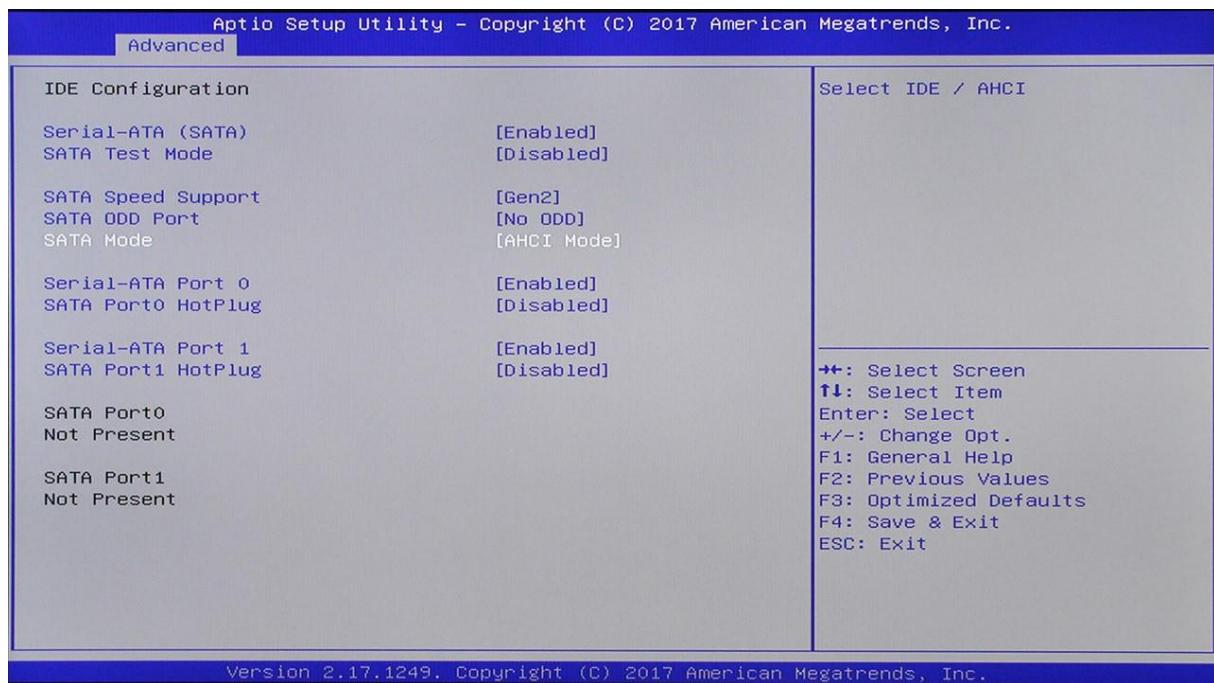
### Intel Virtualization Technology [Disabled]

The Intel Virtualization Technology setting options are [Disabled] and [Enabled].

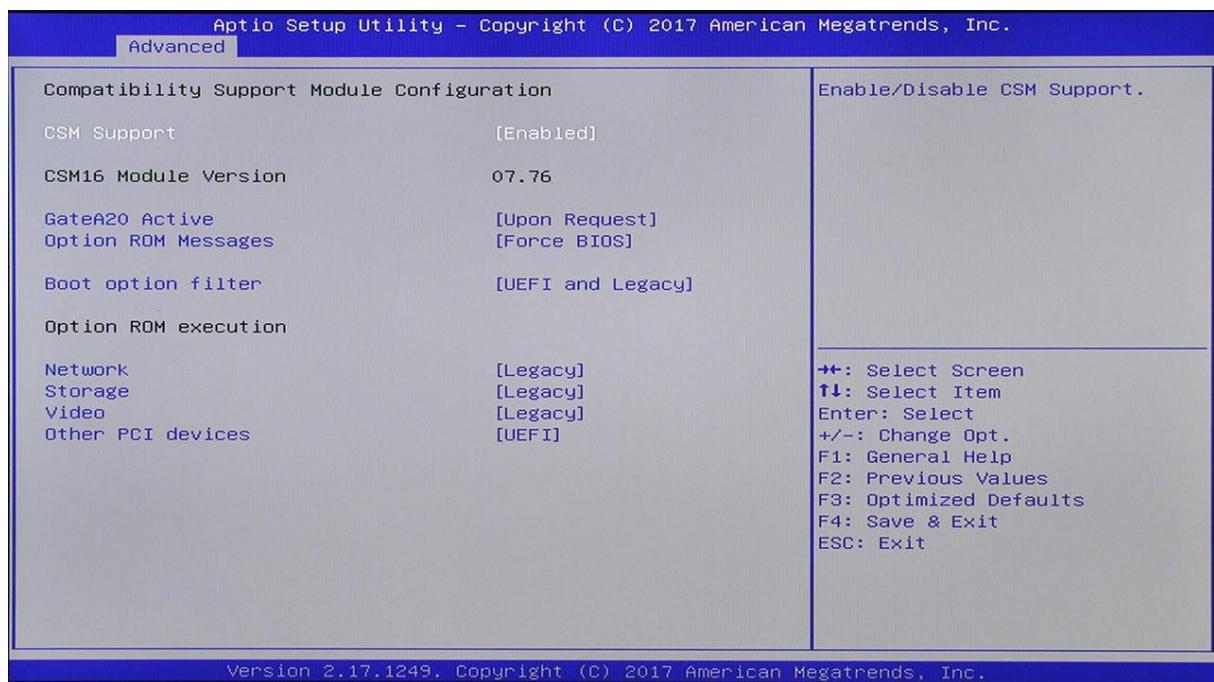
## Thermal Configuration



## IDE Configuration

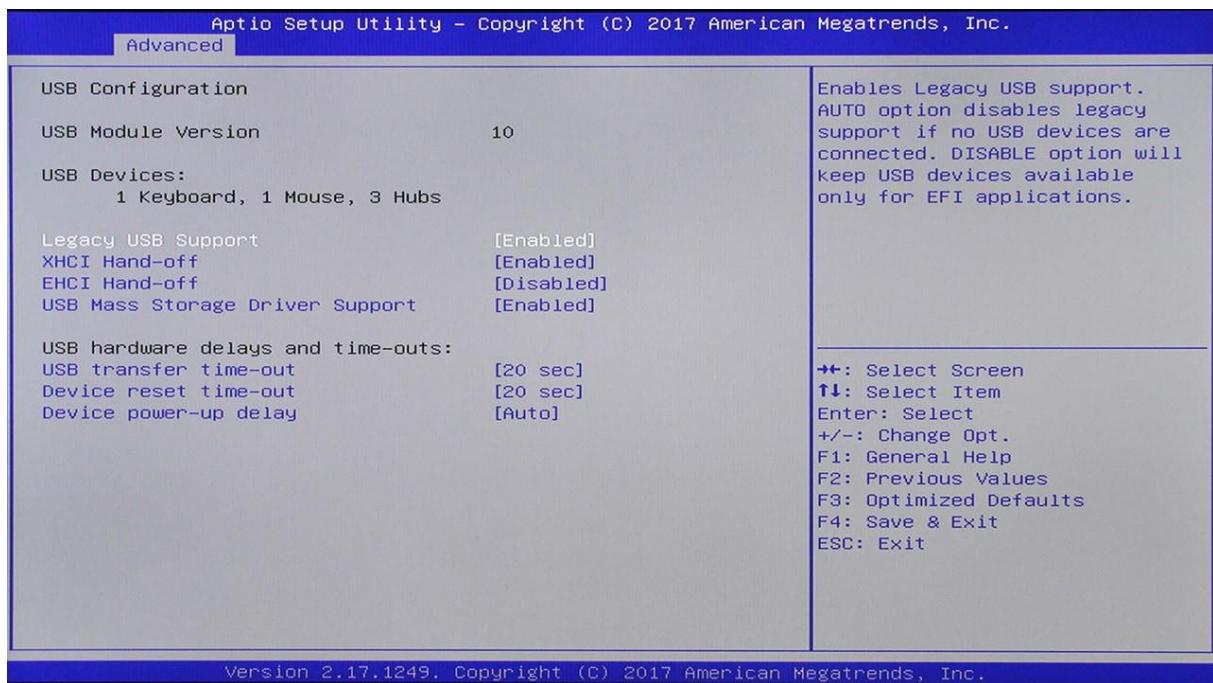


## CSM Configuration



## USB Configuration

The auto-detected values or devices are displayed in the USB Devices project. If no device is connected, it displays "None".



### **Legacy USB Support [Enabled]**

This menu is used to enable or disable the USB device. When set to the default value [Auto], the system can automatically detect whether a USB device exists or not, if yes, then it starts the USB controller; otherwise, it will not start. However, if you set this item to [Disabled], the USB controller in the system is turned off regardless of the presence or absence of the USB device. The setting options are: [Disabled], [Enabled] and

[Auto]

### **XHCI HAND-OFF [Enabled]**

This menu and EHCI HAND-OFF, are used to select whether EFI releases control of the USB controller before the OS loads the USB driver. If you select Enabled, EFI closes XHCI (USB2.0) when entering the OS.

### **EHCI Hand-off [Disabled]**

This menu is used to start an operating system that does not support the EHCI hand-off function. The setting options are [Disabled] and [Enabled]. If you select Enabled, EFI closes EHCI (USB2.0) when entering the OS.

### **USB Mass Storage Driver Support [Enabled]**

The USB Mass Storage Driver setting options are [Disabled] and [Enabled].

### **USB Transfer time-out [20sec]**

This menu sets the maximum time for a data transfer on the USB2.0. If the transmission is not completed within this time, the error is given to the EFI. This setting only works on EFI and does not affect the USB drive on the OS.

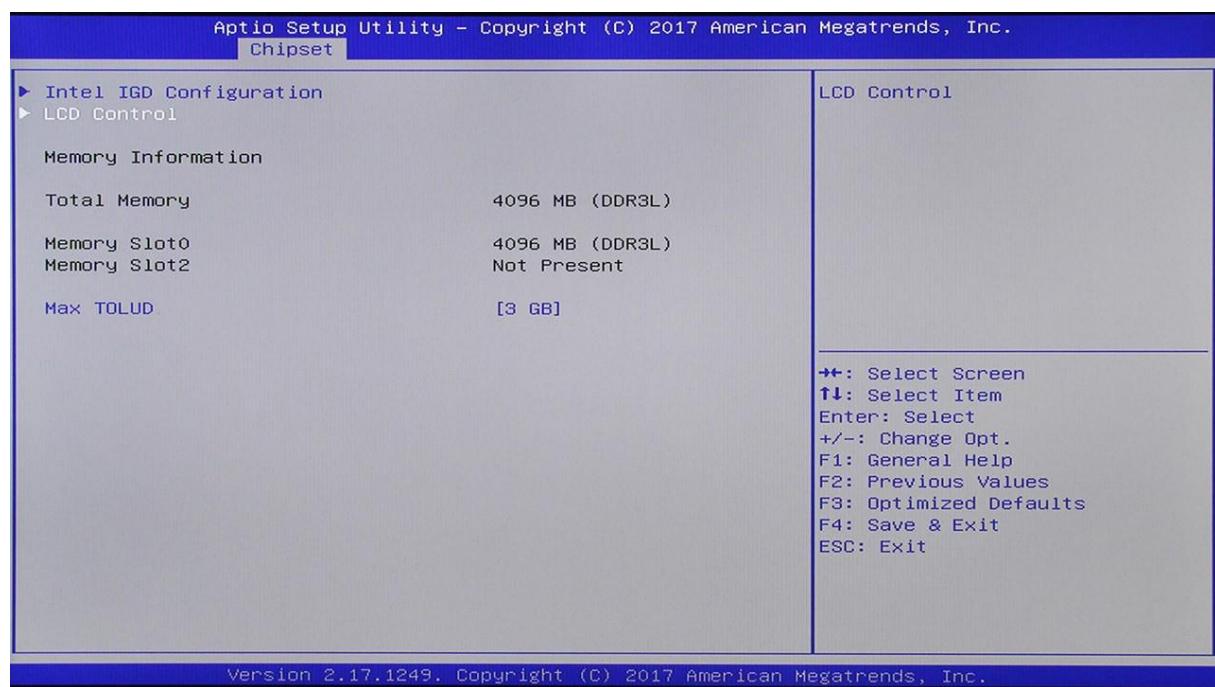
### Device reset time-out [20sec]

This menu sets the maximum time required for the storage device reset on the USB2.0. During the time, EFI checks whether the storage device can accept the instructions. If the timeout occurs, the storage device is considered to be faulty.

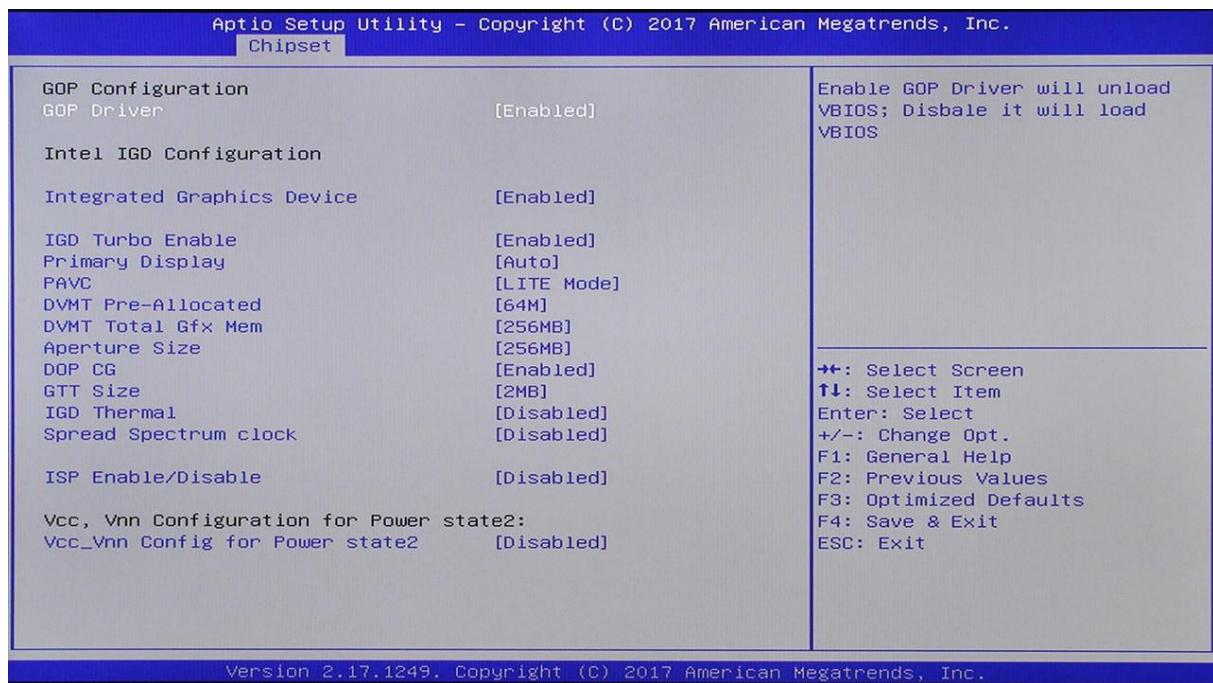
## 5.3 Chipset MENU



### North Bridge



## Intel ICD Configuration



### GOP Driver

The GOP Driver options are Enabled (default) and Disabled.

### Integrated Graphics Device

The Integrated Graphics Device options are Enabled (default) and Disabled.

### Primary Display

The Primary Display options are Auto, IGD (default), PCI, SG.

### PAVC

The PAVC setting options are [SERPENT Mode] and [LITE Mode].

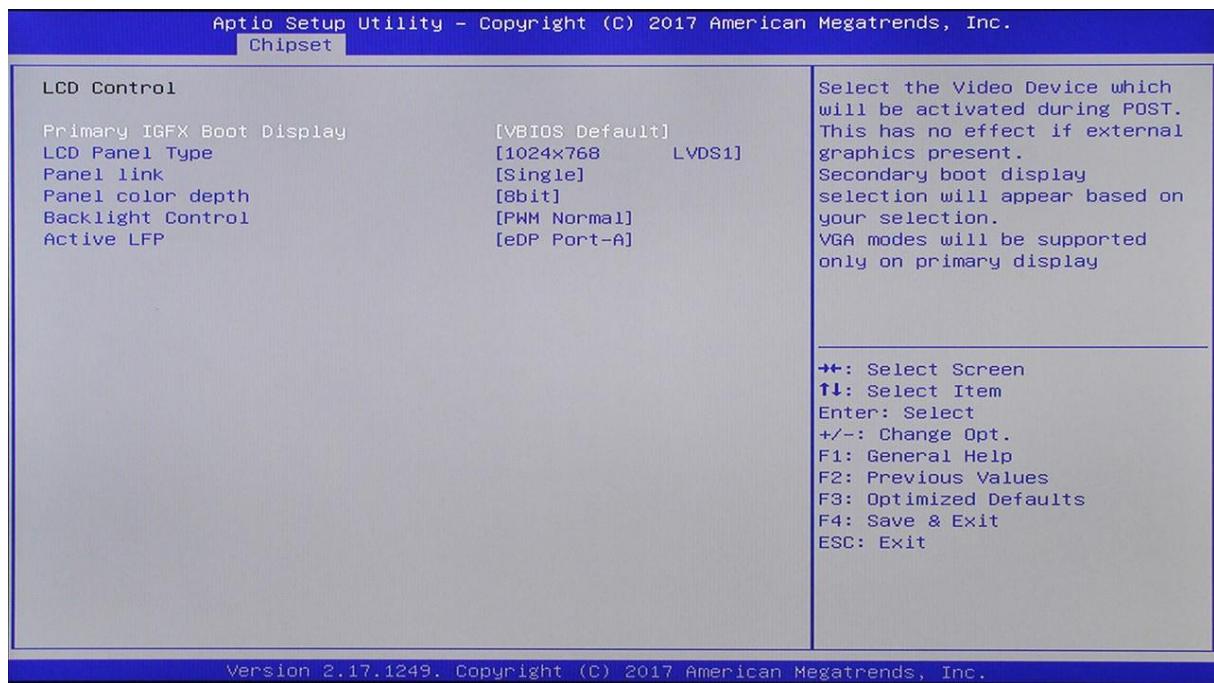
### DVMT Pre-Allocate

Set the DVMT Pre-Allocate value, the default value is 64MB.

### DVMT Total Gfx Mem

Set the DVMT Total Gfx Mem value, the default value is 256MB.

## LCD Control



### Primary IGFX Boot Display

The Primary Display setting options are Auto (default), VGA&VGA\_H1, VGA\_H2, LVDS.

### LCD Panel Type

#### Panel link

Set the resolution of LVDS, the default is Single 8 1024X768

#### Panel color depth

Set the resolution of LVDS, the default is Single 8 1024X768

#### Panel link

Set the resolution of LVDS, the default is Single 8 1024X768

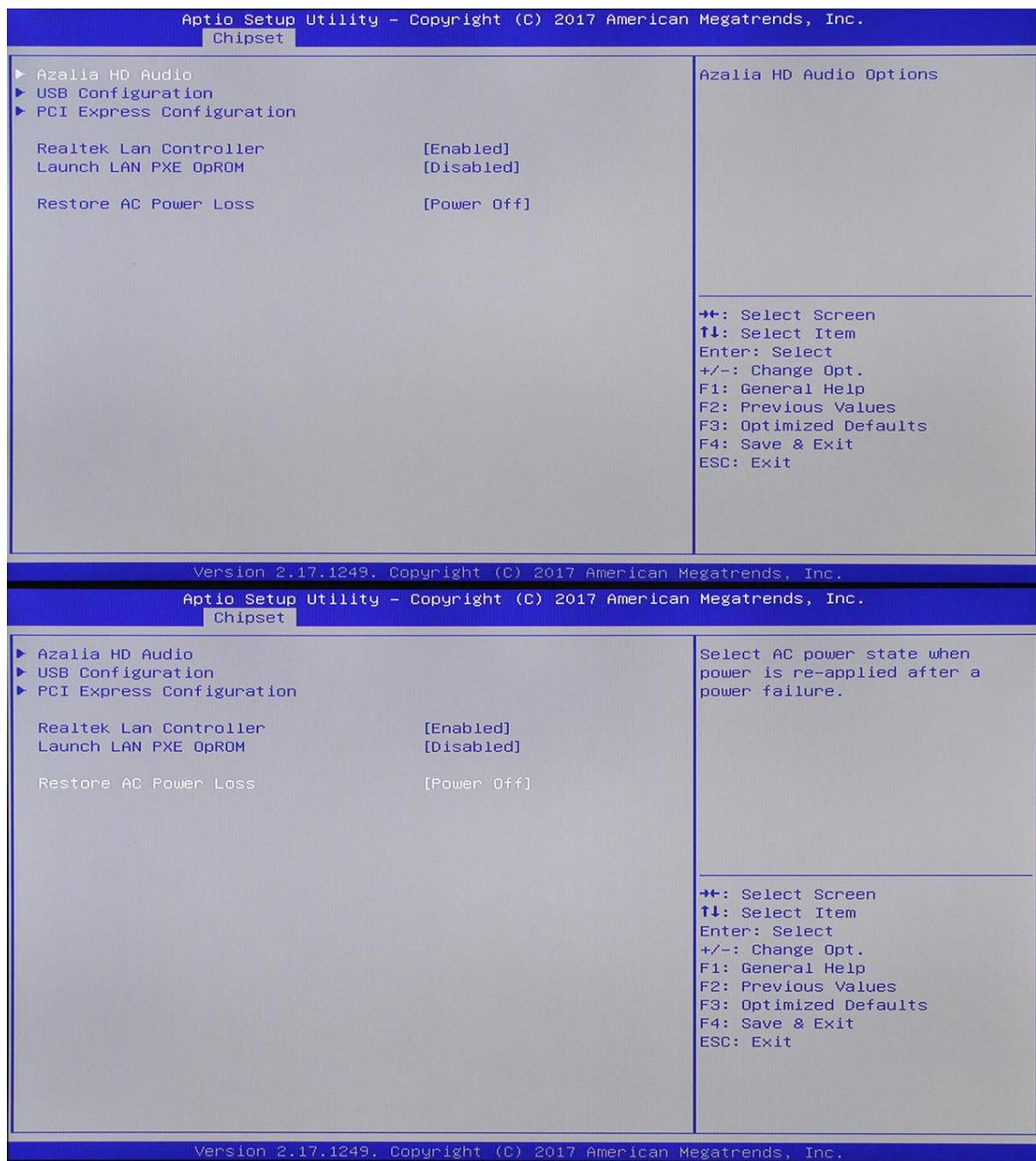
#### Back light control

Set the resolution of LVDS, the default is Single 8 1024X768

#### Active LFP

Set the resolution of LVDS, the default is Single 8 1024X768

## South Bridge



## Azalia HD Audio

### Azalia HDMI codec Port [Enabled]

Here you can turn On/Off the HDMI Port audio output.

### USB Configuration

You can set the USB port to On/Off.

### PCI Express Configuration

### LAN Controller [Enabled]

This menu is used to turn On or Off the LAN controller, the default is On.

### LAN PXE OpROM Boot [Do not launch]

This menu is used to turn On or Off the LAN PXE OpROM Boot, and the setting options are [Do not launch] [UEFI only].

### [Legacy only]

#### Restore AC Power Loss [Power Off]

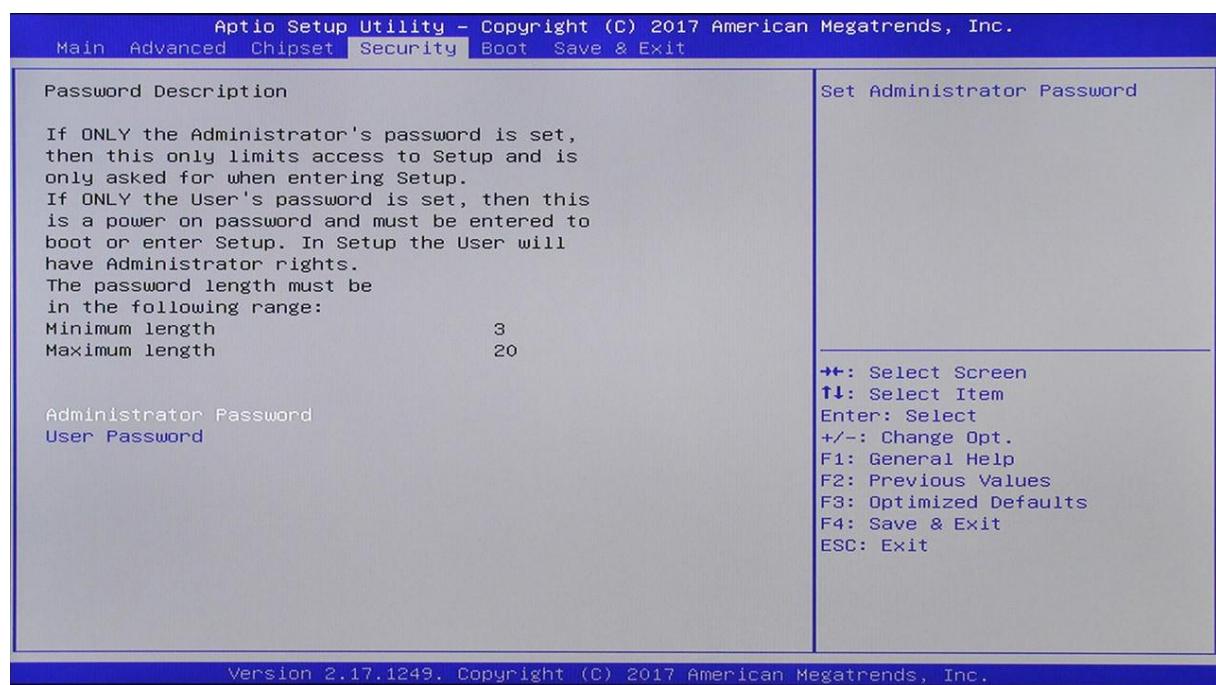
The Restore AC Power Loss options are [Power Off], [Power On], and [Last State].

When set to [Power Off], plug the power and press the power switch to boot.

When set to [Power On], plug the power, regardless of whether the power switch is pressed or not, the host will boot up directly.

When set to [Last State], plug the power, it will be restored to the previous state before the system is powered off, if the system works on when the power off, it will automatically boot, if it shut down before the state, it will be still on the shutdown status.

## 5.4 Security MENU



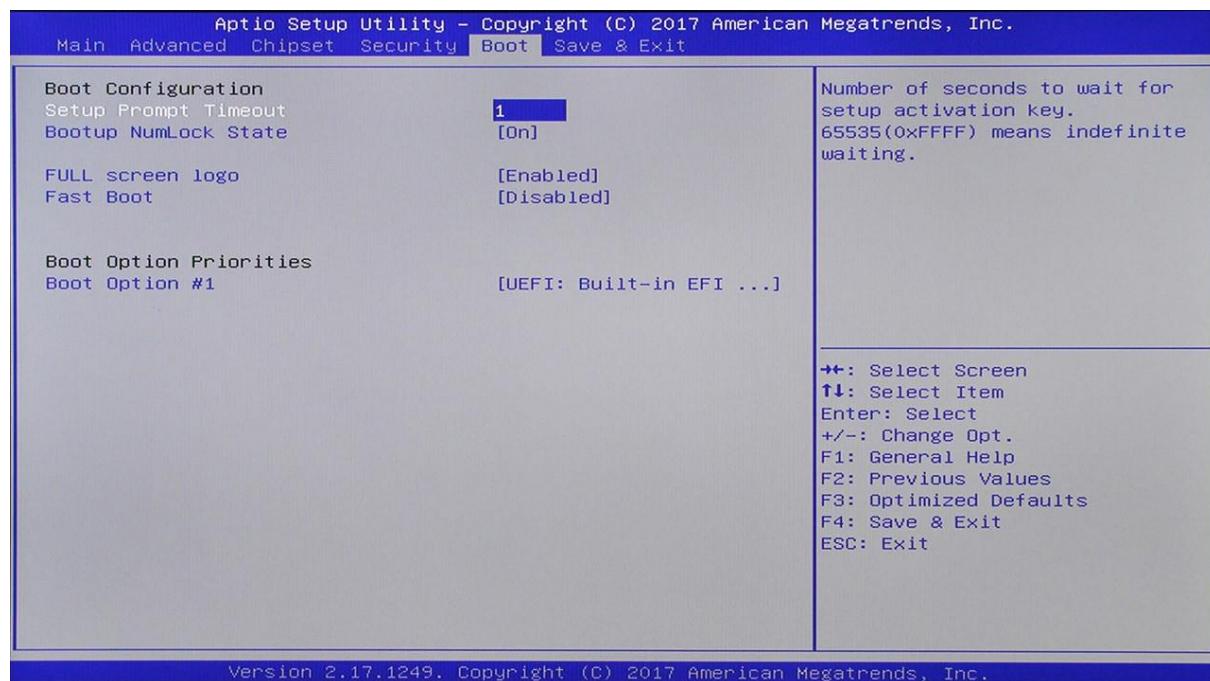
### Administrator Password

This option is used to set the BIOS system Administrator password, which is required to enter the BIOS settings. In this menu, press the <Enter> key, and a password input box will pop-up. Type the password, and confirm it.

## User Password

This menu is used to set the BIOS user password. In this menu, press the <Enter> key, and a password input box will pop-up. Then type the password, and confirm it.

## 5.5 BOOT MENU



### Setup Prompt Timeout [1]

Set the display time of the prompt, and the unit is number of seconds.

### Bootup NumLock State [On]

Set the numeric keypad to on, and the setting options are [On] and [Off].

### Full-Screen Logo [Disabled]

Set the full-screen LOGO display on / off, and the settings options are [Enabled] and [Disabled].

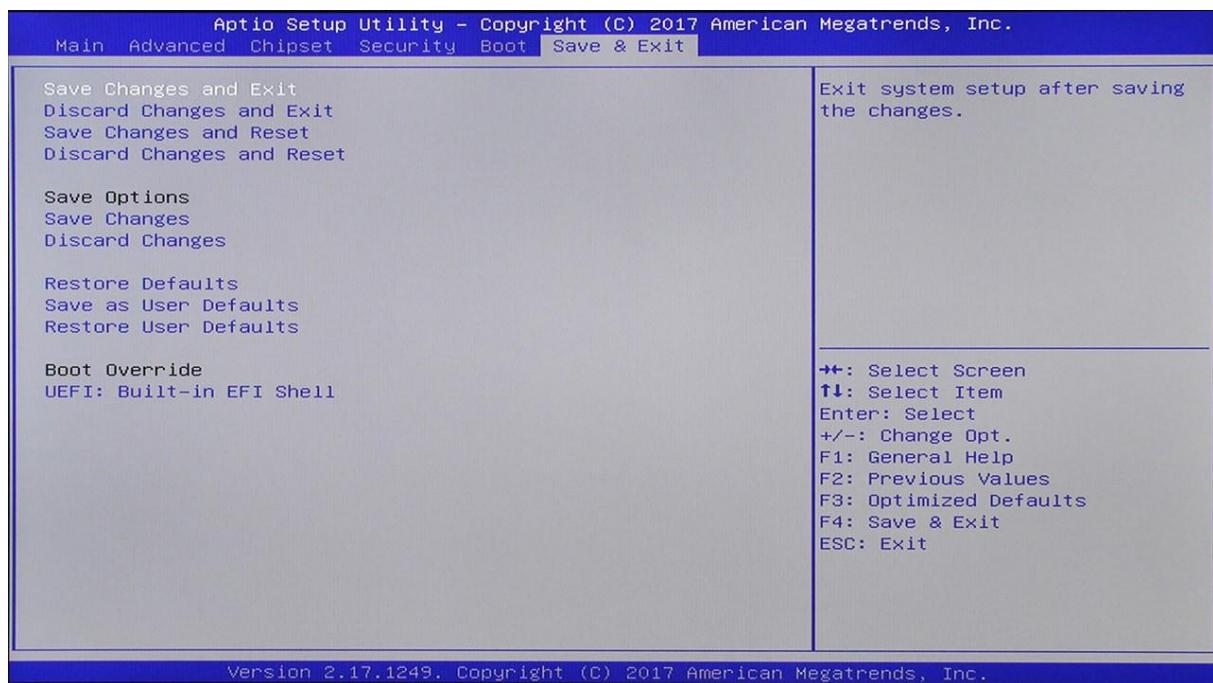
### Fast Boot [Disabled]

Set the Fast Boot function, the fast boot is the minimum initialization device that can start, and the setting options are [Enabled] and [Disabled].

### Boot Option Priorities

Set the priority of the startup options.

## 5.6 Save & Exit MENU



The available options are

- **Save Changes and Exit**
- **Discard Changes and Exit**
- **Launch EFI Shell from “filesystem” device**

## 6 LCD Surface Cleaning

### 1. How to clean the LCD surface properly?

- ❖ Do not spray any liquids on the LCD screen directly, and do not use paper towels, this can cause scratches on the LCD screen.
- ❖ Always apply the liquid to the cloth first and not directly on the parts you are cleaning to avoid dripping the solution directly into your computer or laptop.
- ❖ Stroke the cloth across the display in one direction, moving from the top of the display to the bottom.

### 2. What are some of the basic supplies needed to clean the LCD screen?

- ❖ A soft cotton cloth. When cleaning the LCD screen it is important to use a soft cotton cloth, rather than an old rag. Materials such as paper towels could cause scratches and damage the LCD screen.
- ❖ A solution of water and isopropyl alcohol. This solution can be used along with the soft cotton cloth.
- ❖ Computer wipes. Only use these if they specifically state on the package that they are designed for LCD laptop screens. Computer wipes can come in handy for fast clean-ups or when you want to avoid mixing up a cleaning solution yourself.

### 3. What type of cleaners can be used?

- ❖ Water
- ❖ Vinegar (mixed with water)
- ❖ Isopropyl Alcohol

**NOTE:** The following cleaners are not recommended:

- ❖ Acetone
- ❖ Ethyl alcohol
- ❖ Ethyl acid
- ❖ Ammonia
- ❖ Methyl chloride

## **CE Notice**

This device complies with the requirements of the CE directive.

## **FCC Notice**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Shielded interface cables must be used in order to comply with emission limits.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

## **WEEE Notice**

This appliance is labelled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.



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