

***Technical Manual***  
***of***  
***Intel Gemini Lake Series CPU***  
***Based***  
***3.5'' SBC***

***NO.: G03-NF931-F***

***Revision: 3.0***

***Release date: June 19, 2020***

**Trademark:**

- \* Specifications and Information contained in this documentation are furnished for information use only, and are subject to change at any time without notice, and should not be construed as a commitment by manufacturer.

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## Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.



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## Environmental Safety Instruction

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- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.
- 0 to 60 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)
- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.
- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.
- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

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## Manual Revision Information

Reversion	Revision History	Date
3.0	Third Edition	June 19, 2020

## Item Checklist

☒ Motherboard

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# Chapter 1

## Introduction of the Motherboard

### 1-1 Feature of Motherboard

- Intel® Gemini Lake series SoC Processor, with low power consumption never denies high performance
- Support 2 \* DDR4 SO-DIMM 2400MHz, up to 8GB
- 2\* HDMI & 1\* eDP with support for Triple Display
- Onboard 1\* full-size Mini-PCIE slot & SIM card slot
- Onboard 1 \* M.2 M-key slot (type-2242/2280, PCIe x2/SATA interface Support NVMe) & 1 \* M.2 E-key slot (type-2230, PCIe x1/USB2.0/CNVi interface)
- Support 1 \* SATAIII device
- Support 1\* Intel GbE LAN I211-AT onboard
- Support 1 \* RS232 COM port
- 2 \* External USB 3.0 & 2 \* External USB 2.0 & 2 \* Internal USB 2.0
- Support 12V DC-IN
- Compliance with ErP standard
- Support Watchdog function
- Solution for Digital Signage, IOT Solution

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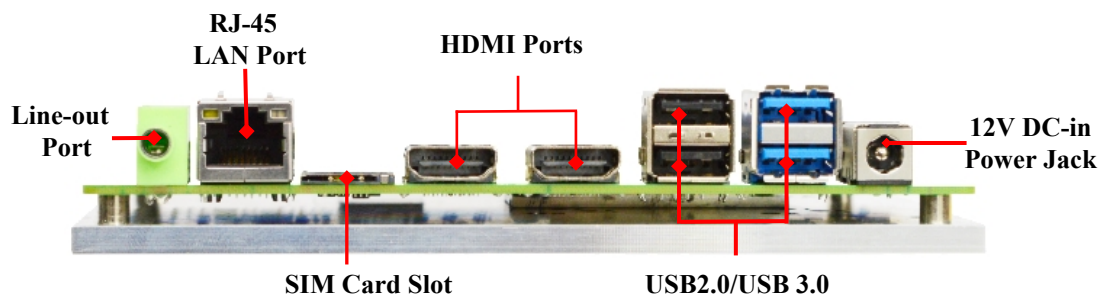
## 1-2 Specification

Spec	Description
Design	<ul style="list-style-type: none"><li>● 3.5'' SBC; PCB size: 14.8x 10.2 cm</li></ul>
Embedded CPU	<ul style="list-style-type: none"><li>● Intel® Gemini Lake <b>*SoC</b> CPU</li></ul> <i>*CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.</i>
Memory Slot	<ul style="list-style-type: none"><li>● Support 2* DDR4 SO-DIMM 2400MHz up to 8GB</li></ul>
Expansion Slot	<ul style="list-style-type: none"><li>● 1* full-size Mini-PCle slot(<b>MPE</b>)</li><li>● 1* SIM card slot (<b>SIMCARD</b>)</li><li>● 1* M.2 PCIe slot (<b>M2E</b>: E-key, PCIe x1/USB2.0/CNVi interface, 2230)</li></ul>
Storage	<ul style="list-style-type: none"><li>● 1* SATAIII 6Gb/s port (<b>SATA1</b>)</li><li>● 1* M.2 SATA slot (<b>M2M</b>:M-key, SATA/PCIe x2 interface Support NVMe, 2242/2280)</li></ul>
LAN Chip	<ul style="list-style-type: none"><li>● Integrated with Intel I211-AT PCIe Gigabit LAN chip</li><li>● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate</li></ul>
Audio Chip	<ul style="list-style-type: none"><li>● Realtek ALC662VD 6-channel Audio Codec integrated</li><li>● Audio driver and utility included</li></ul>
BIOS	<ul style="list-style-type: none"><li>● AMI Flash ROM</li></ul>
Rear I/O	<ul style="list-style-type: none"><li>● 1* 12V DC-in power Jack</li><li>● 2* USB 3.0 port</li><li>● 2* USB 2.0 port</li><li>● 2* HDMI port</li><li>● 1* SIM card expansion header</li><li>● 1* RJ-45 LAN port</li><li>● 1* Audio Line-out port</li></ul>

<b>Internal I/O</b>	<ul style="list-style-type: none"> <li>● 1* 2-pin internal 12V DC-in power connector</li> <li>● 1* SATA Power-out connector</li> <li>● 1* CPU FAN connector</li> <li>● 1* 4-pin 3W SPK connector</li> <li>● 1* Front panel header</li> <li>● 1* SMBUS header</li> <li>● 1* Front panel audio header</li> <li>● 1* 9-pin USB 2.0 header (Expansible to 2* USB 2.0 ports)</li> <li>● 1* Serial port header (<b>COM1</b>)</li> <li>● 1* GPIO header</li> <li>● 1* EDP header</li> </ul>
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## 1-3 Layout Diagram

*Rear IO Diagram:*

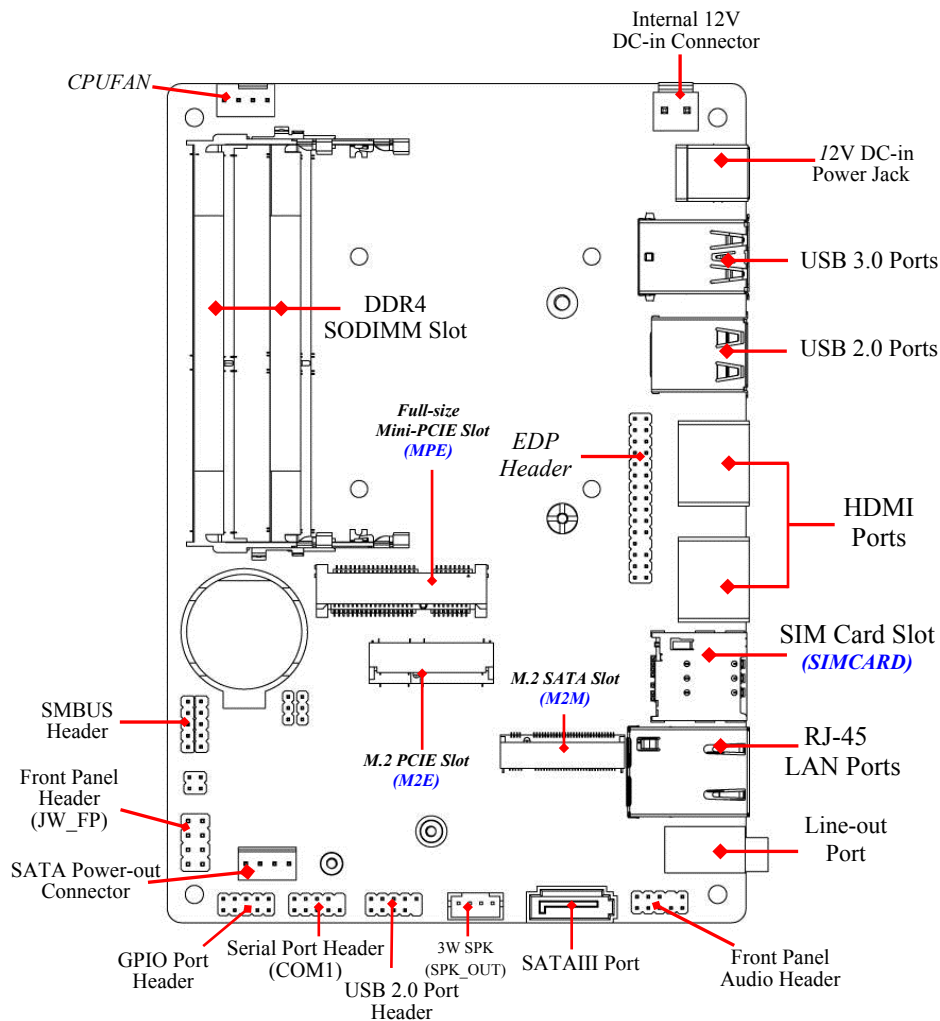


### Warning!!

The board has a 12V DC-in power connector (**DCIN1**) in I/O back panel and an internal 12V power connector (**DCIN**). User can only connect one type of compatible power supply to one of them to power the system.

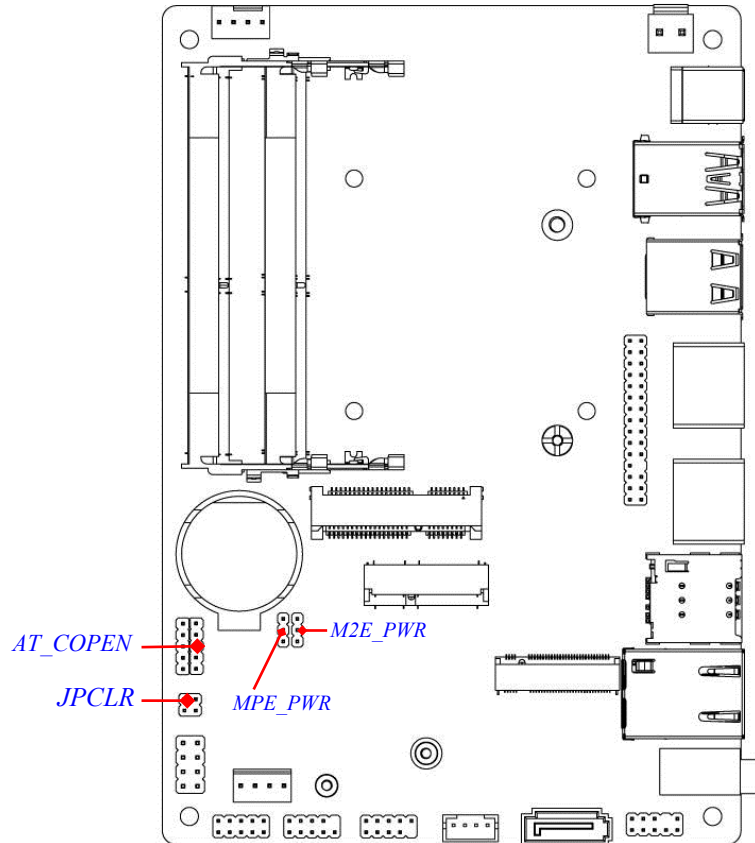


## Internal Diagram-Front Side:



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### *Jumper Position:*



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## ***Jumper***

<b>Jumper</b>	<b>Name</b>	<b>Description</b>
JPCLR	<b><i>Pin (1-2):</i></b> Clear CMOS <b><i>Pin (3-4):</i></b> TXE Override	4-Pin Block (2.0 mm pitch)
AT_COPEN	AT Mode/ATX Mode/ Case Open Select	5-Pin Block (2.0 mm pitch)
MPE_PWR	MPE Slot Voltage Select	3-Pin Block (2.0 mm pitch)
M2E_PWR	M2.E Slot Voltage Select	3-Pin Block (2.0 mm pitch)

## ***Connectors***

<b>Connector</b>	<b>Name</b>
DCIN1	12V DC-in Power Jack
USB1	USB 2.0 Port Connector X2
USB2	USB 3.0 Port Connector X2
HDMI1/HDMI2	HDMI Port Connector X2
SIMCARD	Micro SIM card Slot
LAN1	RJ-45 LAN Port Connector
AUDIO	Audio Line Out Connector
SPK_OUT	4-pin 3W SPK connector
DCIN2	Internal 2-Pin 12V DC-in Power Connector
SATA1	SATAIII Port Connector
SATAPWR1	SATA Power out Connector
CPUFAN	CPUFAN Connector

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## ***Headers***

<b>Header</b>	<b>Name</b>	<b>Description</b>
JW_FP1	Front Panel Header(PWR LED/ HDD LED/Power Button /Reset)	8-pin Block (2.54 mm pitch)
SMBUS	SMBUS Header	5-pin Block (2.0 mm pitch)
FP_AUDIO	Front Panel Audio Header	9-pin Block (2.0 mm pitch)
FP_USB1	USB 2.0 Header	9-pin Block (2.0 mm pitch)
COM1	Serial Port Header	9-pin Block (2.0 mm pitch)
GPIO_CON	GPIO Port Header	10-pin Block (2.0 mm pitch)
EDP1	EDP Header	29-pin Block (2.0 mm pitch)

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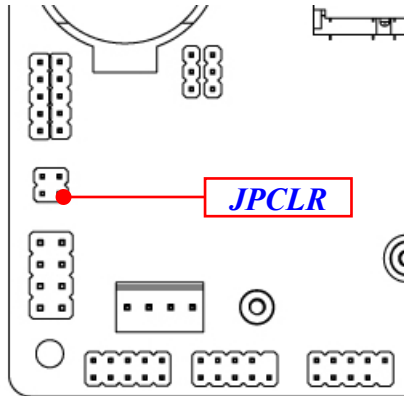
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## Chapter 2

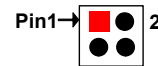
### Hardware Installation

#### 2-1 Jumper Setting

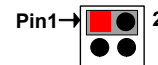
**Pin (1-2) of JPCLR (4-pin): Clear CMOS RAM Setting** (2.0 mm pitch)



**Pin (1-2) of J1 → Clear CMOS RAM Settings**

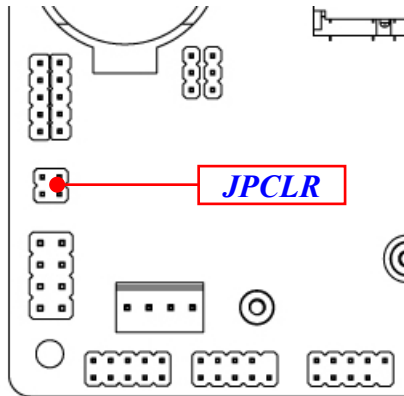


1-2 Open: Normal(Default)

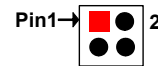


1-2 Closed: RTC Reset

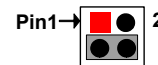
**Pin (3-4) of JPCLR (4-pin): TXE Override Select** (2.0 mm pitch)



**Pin (3-4) of J1 → TXE Override Select**



3-4 Open: Normal(Default)



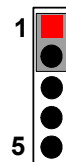
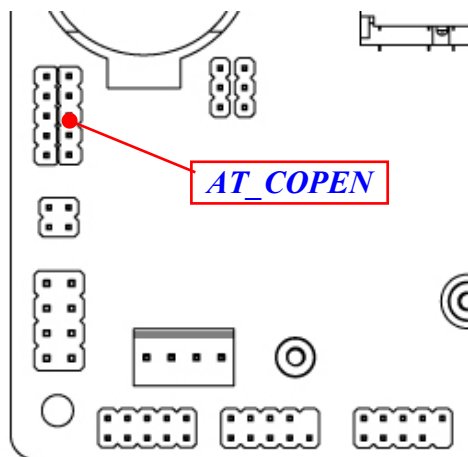
3-4 Closed: TXE Flash Override

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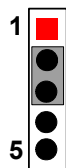
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## AT\_COPEN (5-pin): AT Mode /ATX Mode/Case Open Select

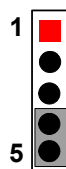
### JAT\_ATX→ATX/AT Mode Select



1-2 Closed: ATX Mode Selected



2-3 Closed: AT Mode Selected



4-5 Open: Normal

4-5 Closed: Case Open

**\*ATX Mode Selected:** Press power button to power on after power input ready;

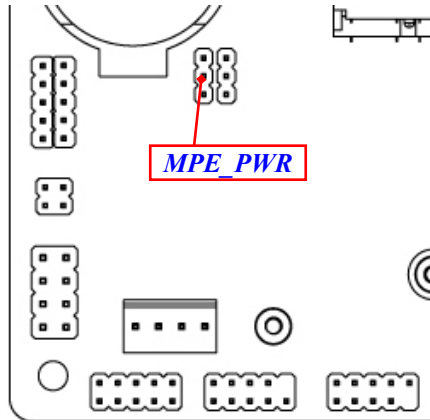
**AT Mode Selected:** Directly power on as power input ready.

**Pin 4-5 Short:** When Case open function pin short to GND, the Case open function was detected. When Used, needs to enter BIOS and enable 'Case Open Detect' function. In this case if your case is removed, next time when you restart your computer, a message will be displayed on screen to inform you of this.

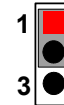
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### ***MPE\_PWR(3-pin): MPE (Mini-PCle) Slot Voltage Select***



***MPE\_PWR → MPE Slot Voltage Select***

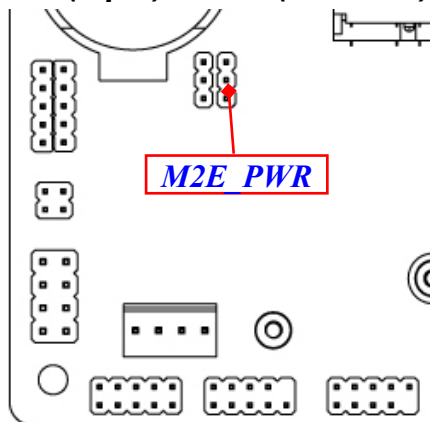


**1-2 Closed: Voltage= 3VSB**

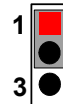


**2-3 Closed: Voltage= VCC3**

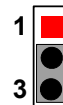
### ***M2E\_PWR(3-pin): M2. E (M.2 PCIe) Slot Voltage Select***



***M2E\_PWR → M2.E Slot Voltage Select***



**1-2 Closed: Voltage= 3VSB**



**2-3 Closed: Voltage= VCC3**

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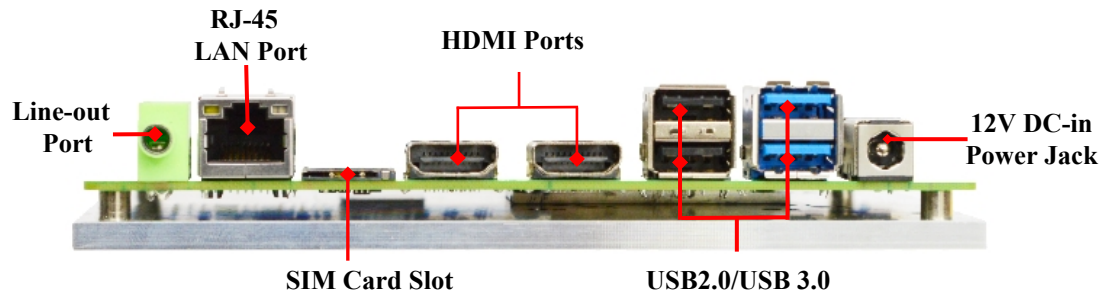
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## 2-2 Connectors and Headers

### 2-2-1 Connectors



#### (1) Rear I/O Connectors

*Rear IO Diagram:*

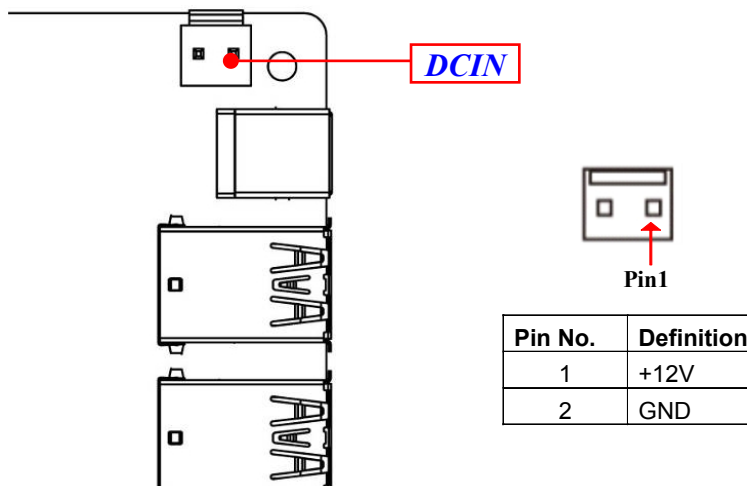


<i><b>Icon</b></i>	<i><b>Name</b></i>	<i><b>Function</b></i>
	<b>12V DC-in Power Jack</b>	For user to connect compatible power adapter to provide power supply for the system.
	<b>USB 3.0 Port</b>	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.0 ports supports up to 5Gbps data transfer rate.
	<b>USB 2.0 Port</b>	To connect USB keyboard, mouse or other devices compatible with USB specification.
	<b>HDMI Port</b>	To connect display device that support HDMI specification.
	<b>Micro SIM Card Slot</b>	Support micro SIM card for 3G/4G Function.



	<b>RJ-45 LAN Port</b>	This connector is standard RJ-45 LAN jack for Network connection.
	<b>Line-out Connector</b>	For user to connect external speaker, earphones, etc to transfer system audio output.

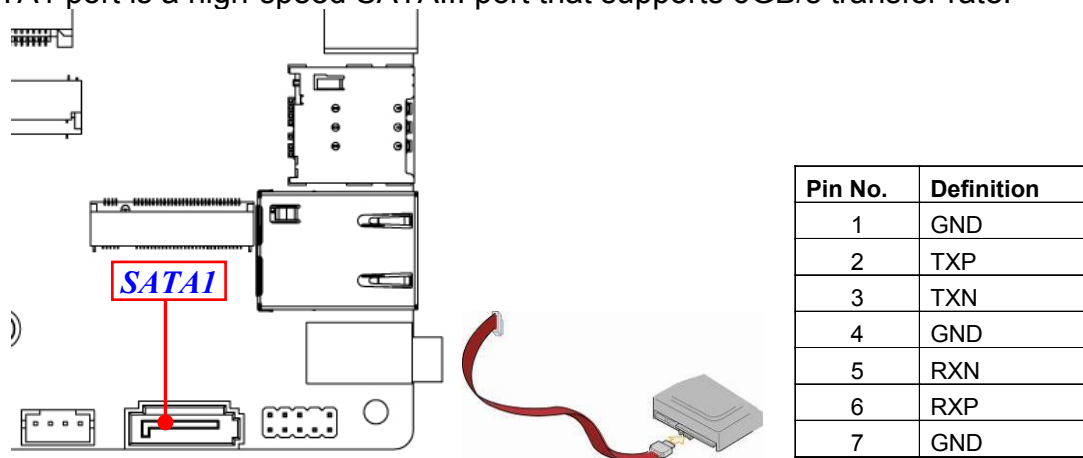
**(2) DCIN2 (2-pin) : Internal 12V DC-in Power Connector**



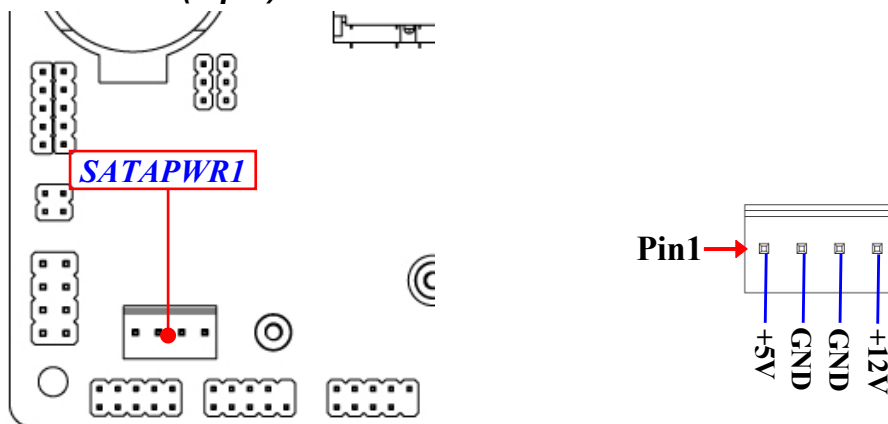
**Warning:** Find Pin-1 position before connecting power cable to this 2-pin power connector. **WRONG INSTALLATION DIRECTION WILL DAMAGE THE BOARD!!**

### (3) SATA1(7-pin): SATAIII Port connector

SATA1 port is a high-speed SATAIII port that supports 6GB/s transfer rate.



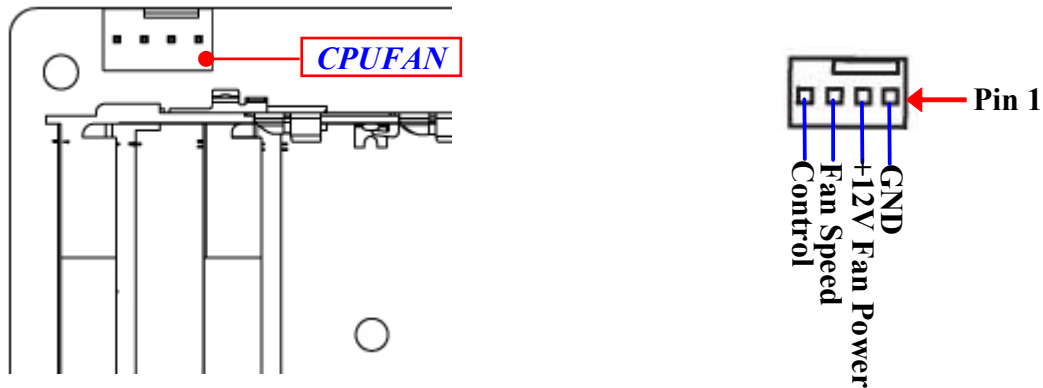
### (4) SATAPWR1 (4-pin): SATA HDD Power-out Connector



**Warning:** Make sure that Pin-1 of compatible SATA Power connector is inserted into corresponding Pin-1 of **SATAPWR1** connector to avoid possible damage to the board and hard disk driver!

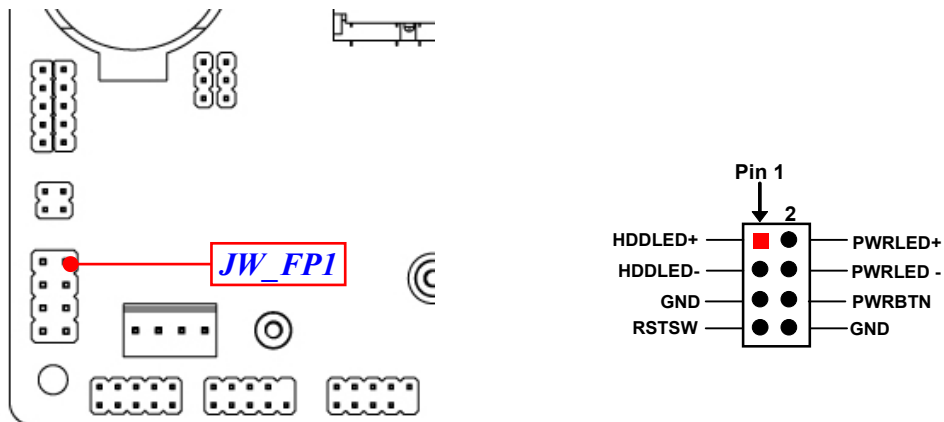
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### (5) CPUFAN (4-pin): CPU FAN Connector



## 2-2-2 Headers

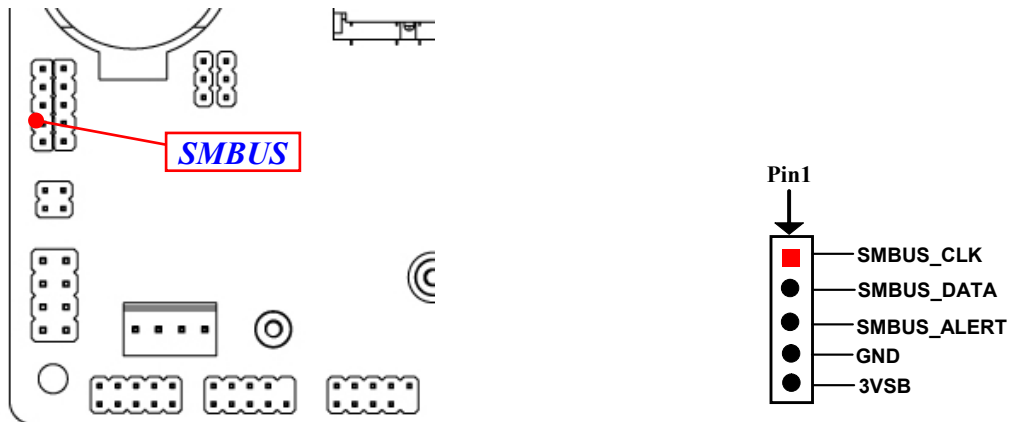
### JW\_FP1 (8-pin): Front Panel Header (2.54 mm pitch)



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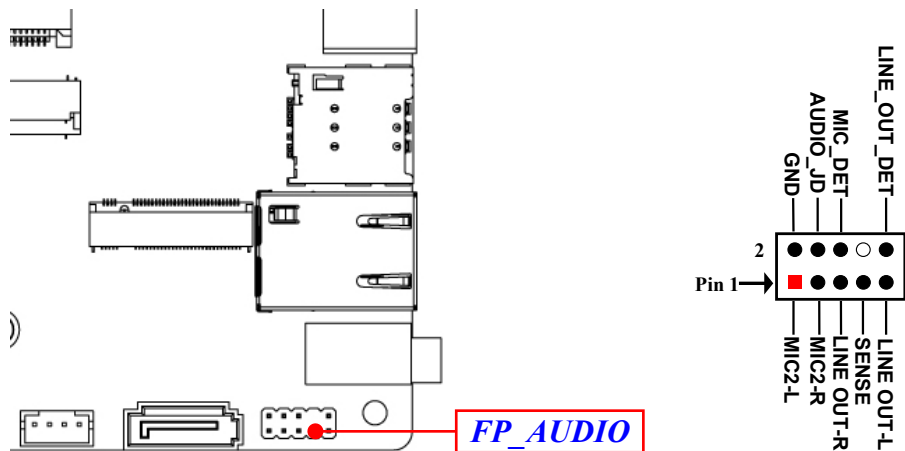
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### SMBUS (5-pin): SMBUS Header (2.0 mm pitch)



### FP\_AUDIO (9-pin): Line-Out, MIC-In Header (2.0 mm pitch)

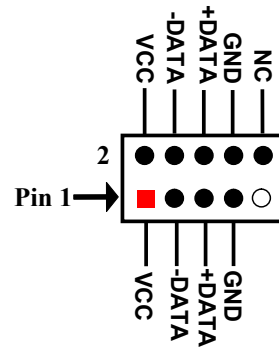
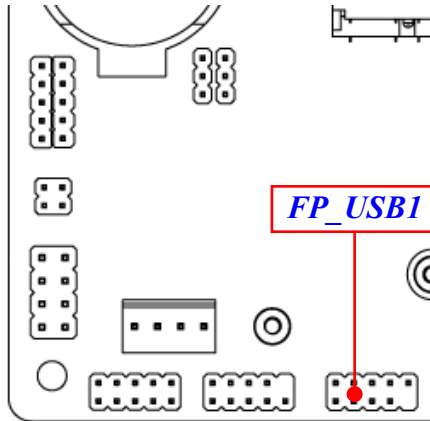
This header connects to Front Panel Line-out, MIC-In connector with cable.



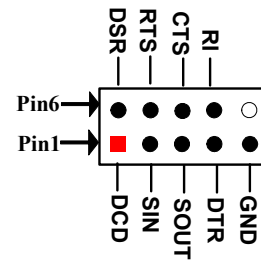
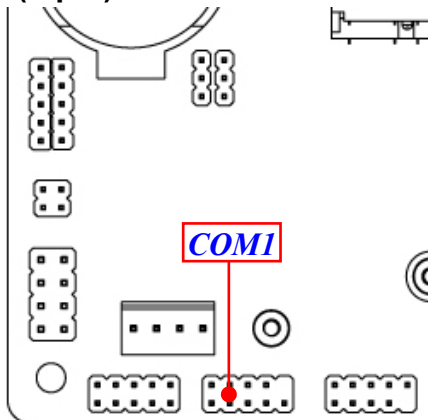
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**FP\_USB1 (9-pin): USB 2.0 Port Header (2.0 mm pitch)**

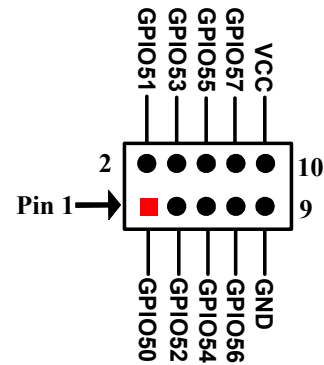
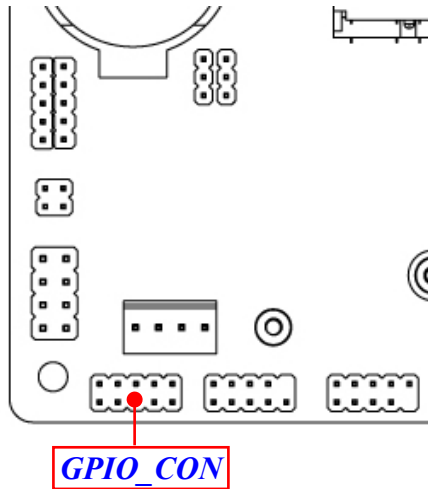


**COM1 (9-pin): RS232 Serial Port Header**

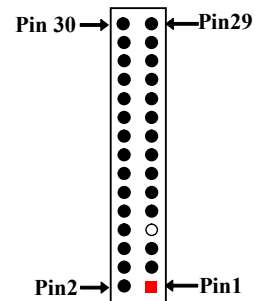
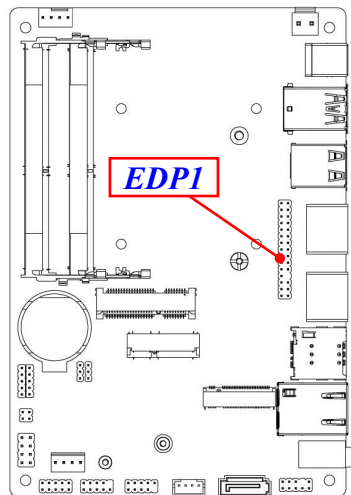


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## GPIO\_CON (10-pin): GPIO Port Header



## EDP1 (29-pin): eDP Port Header



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Pin NO.	Pin Define	Pin NO.	Pin Define
Pin 30	EDP_LANE-0	Pin 29	EDP_LANE+0
Pin 28	EDP_LANE-1	Pin 27	EDP_LANE+1
Pin 26	GND	Pin 25	GND
Pin 24	EDP_LANE-2	Pin 23	EDP_LANE+2
Pin 22	EDP_LANE-3	Pin 21	EDP_LANE+3
Pin 20	GND	Pin 19	GND
Pin 18	EDP_AUXN_C	Pin 17	EDP_HPD
Pin 16	EDP_AUXP_C	Pin 15	L_BKLT_EN
Pin 14	GND	Pin 13	GND
Pin 12	L_BKLT_PWM	Pin 11	EDP_VDD
Pin 10	NC	Pin 9	EDP_VDD
Pin 8	NC	Pin 7	N/A
Pin 6	GND	Pin 5	GND
Pin 4	GND	Pin 3	BKLT_PW
Pin 2	BKLT_PW	Pin 1	BKLT_PW

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## Chapter 3

# Introducing BIOS

**Notice!** The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version from our official website.

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

### 3-1 Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys. If you do not press the keys at the correct time and the



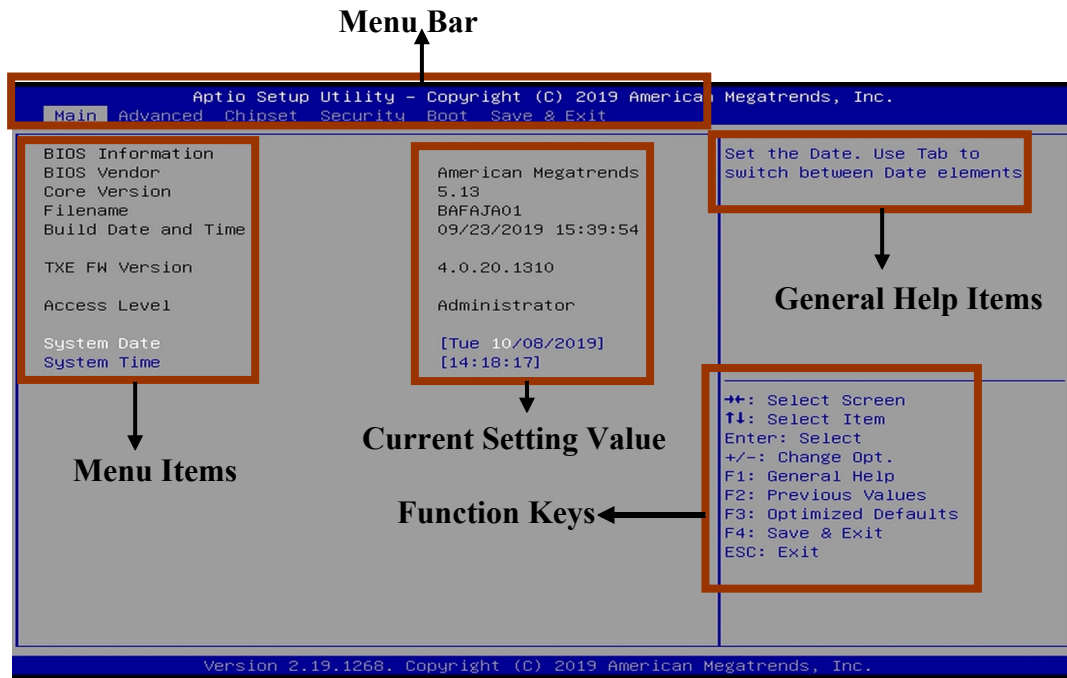
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system does not boot, an error message will be displayed and you will again be asked to

Press <Del> to enter Setup; press <F7> to enter pop-up Boot menu.

## 3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



## 3-3 Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press←→ (left, right) to select screen;

- 
- 
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
  - Press <Enter> to select.
  - Press <+>/<-> keys when you want to modify the BIOS parameters for the active option.
  - [F1]: General help.
  - [F2]: Previous value.
  - [F3]: Optimized defaults.
  - [F4]: Save & Exit.
  - Press <Esc> to quit the BIOS Setup.

## 3-4 Getting Help

### Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

### Status Page Setup Menu/Option Page Setup Menu

Press [F1] to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <Esc>.

## 3-5 Menu Bars

**There are six menu bars on top of BIOS screen:**

<b>Main</b>	To change system basic configuration
<b>Advanced</b>	To change system advanced configuration
<b>Chipset</b>	To change chipset configuration
<b>Security</b>	Password settings
<b>Boot</b>	To change boot settings
<b>Save &amp; Exit</b>	Save setting, loading and exit options.

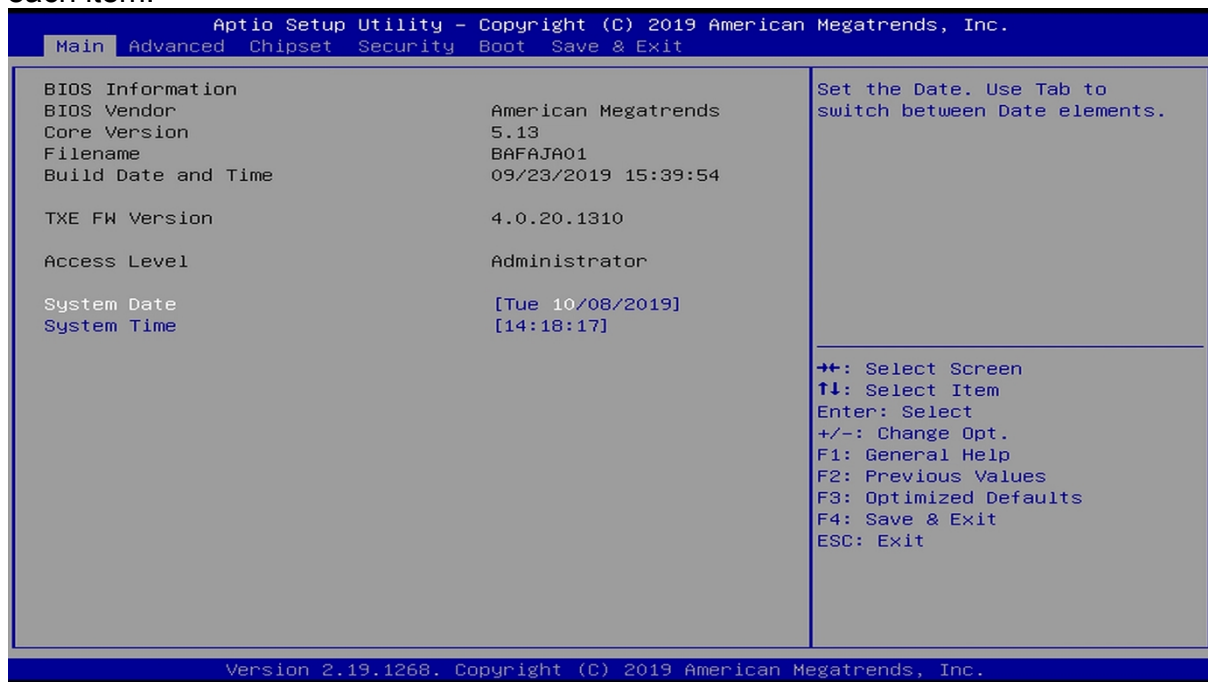
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User can press the right or left arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

## 3-6 Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.



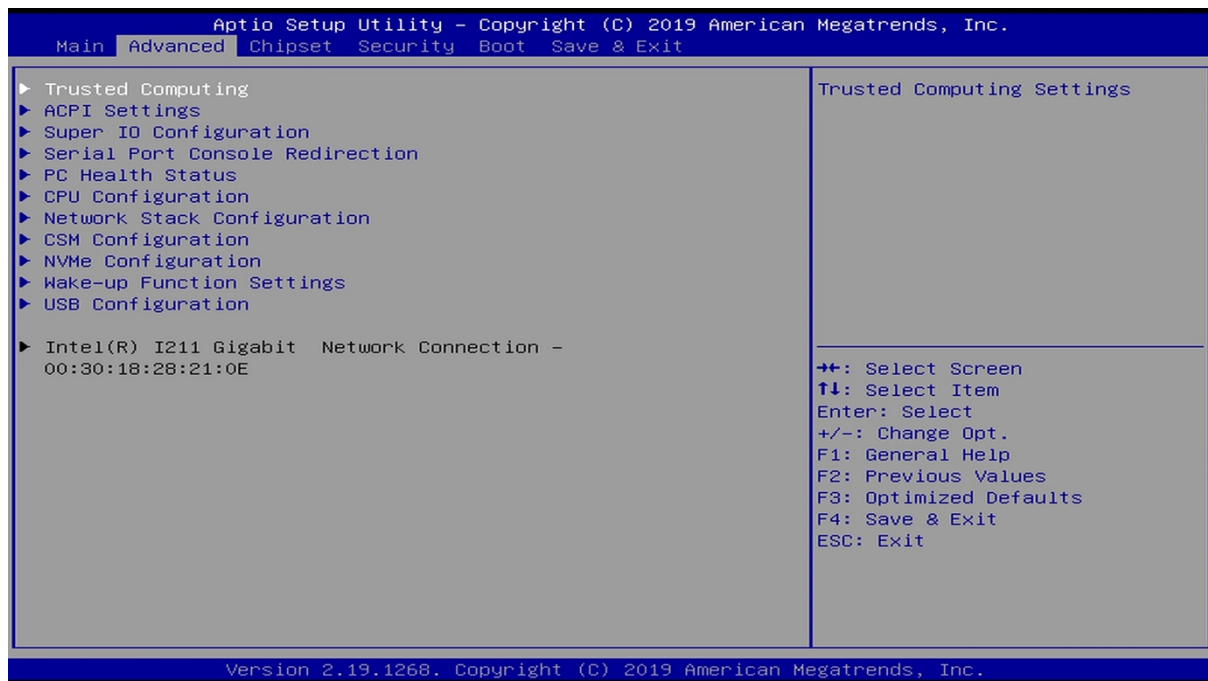
### System Date

Set the date. Please use [Tab] to switch between date elements.

### System Time

Set the time. Please use [Tab] to switch between time elements.

## 3-7 Advanced Menu



### ▶ **Trusted Computing**

Press [Enter] to enable or disable '**Security Device Support**'.

#### **TPM20 Device Found**

### **Security Device Support**

Use this item to enable or disable BIOS support for security device. O.S will not show Security Device. TCG EFI protocol and INT1A interface will not be available. The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following items shall appear:

#### **SHA-1 PCR Bank**

Use this item to enable or disable SHA-1 PCR Bank.

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The optional settings are: [Disabled]; [Enabled].

### **SHA256 PCR Bank**

Use this item to enable or disable SHA256 PCR Bank.

The optional settings are: [Disabled]; [Enabled]

## ▶ **ACPI Settings**

Press [Enter] to make settings for the following sub-item:

### **ACPI Settings**

#### **ACPI Sleep State**

Use this item to select the highest ACPI sleep state the system will enter when the suspend button is pressed.

The optional settings are: [Suspend Disabled]; [S3 (Suspend to RAM)].

## ▶ **Super I/O Configuration**

Press [Enter] to make settings for the following sub-items:

### **Super IO Configuration**

#### ▶ **Serial Port 1 Configuration**

Press [Enter] to make settings for the following items:

#### **Serial Port**

Use this item to enable or disable serial port (COM).

The optional settings are: [Disabled]; [Enabled]

When set as [Enabled], the following items shall appear:

### **Device Settings**

#### **Change Settings**

Use this item to select an optimal settings for Super IO device. **Changing setting may conflict with system resources.**

The optional settings are: [Auto]; [IO=3F8h; IRQ=4;]; [IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;]; [IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12;]; [IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;]; [IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12;].

#### **ERP Support**

Use this item to select Energy-Related Products function. This item should be set

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as [Disabled] if you wish to have all active wake-up functions.

The optional settings are: [Disabled]; [Enabled].

### **Case Open Detect**

Use this item to detect if case have ever been opened. Show message in POST.

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], system will detect if COPEN has been short or not (refer to **Page 9**); if COPEN is short, system will show Case Open Message during POST.

### **WatchDog Reset Timer**

Use this item to enable or disable WatchDog Timer Control.

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

#### **WatchDog Reset Timer Value**

User can set a value in the range of [10] ~ [255] seconds, or [1] ~ [255] minutes.

#### **WatchDog Reset Timer Unit**

The optional settings are: [Sec.]; [Min.].

#### **WatchDog Wake-up Timer**

This item support WDT wake-up while ERP function is set as [Enabled].

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

#### **WatchDog Wake-up Timer Value**

The setting range is [10] ~ [4095] seconds, or [1] ~ [4095] minutes.

#### **WatchDog Wake-up Timer Unit**

The optional settings are: [Sec.]; [Min.].

### **ATX Power Emulate AT Power**

This item displays current Emulate AT Power Status, motherboard power On/Off control by power supply. User needs to select 'AT or ATX Mode' on MB at first (refer to **Page 9** of ATX Mode & AT Mode Select).

### **▶ Serial Port Console Redirection**

#### **COM1**

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## Console Redirection

The optional settings are: [Disabled]; [Enabled]. When set as [Enabled], the following sub-items shall appear for setting:

### ► Console Redirection Settings

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.

Press [Enter] to make settings for the following items:

#### **Terminal Type**

The optional settings are: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].

#### **Bits per second**

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings are: [9600]; [19200]; [38400]; [57600]; [115200].

#### **Data Bits**

The optional settings are: [7]; [8].

#### **Parity**

A parity bit can be sent with the data bits to detect some transmission errors.

The optional settings are: [None]; [Even]; [Odd]; [Mark]; [Space].

**[Even]**: parity bit is 0 if the num of 1's in the data bits is even.

**[Odd]**: parity bit is 0 if num of 1's in the data bits is odd.

**[Mark]**: parity bit is always 1.

**[Space]**: Parity bit is always 0.

**[Mark]** and **[Space]**: parity do not allow for error detection.

#### **Stop Bits**

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

The optional settings are: [1]; [2].

#### **Flow Control**

Flow control can prevent data loss from buffer overflow. When sending data, if

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the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “start” signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

The optional settings are: [None]; [Hardware RTS/CTS].

### **VT-UTF8 Combo Key Support**

Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

The optional settings are: [Disabled]; [Enabled].

### **Recorder Mode**

With this mode enable only text will be sent. This is to capture Terminal data.

The optional settings are: [Disabled]; [Enabled].

### **Resolution 100x31**

Use this item to enable or disable extended terminal resolution.

The optional settings are: [Disabled]; [Enabled].

### **Putty KeyPad**

Use this item to select FunctionKey and KeyPad on Putty.

The optional settings: [VT100]; [Intel Linux]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

## **Legacy Console Redirection**

### **► Legacy Console Redirection Settings**

Press [Enter] to make settings for the following item:

### **Legacy Console Redirection Settings**

#### **Legacy Serial Redirection Port**

For user to select a COM port to display redirection of legacy OS and Legacy OPRM messages.

The optional settings is: [COM1].

#### **Legacy OS Redirection Resolution**

This item is for user to select the number of Rows and Columns supported redirection.

The optional settings are: [80x24]; [80x25].

### **Redirect After BIOS POST**



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The optional settings are: [Always Enable]; [Bootloader].

When [**Bootloader**] is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When [**Always Enabled**] is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to [**Always Enabled**].

**Serial Port for Out-of-Band Management/  
Windows Emergency Management Services (EMS)**

**Console Redirection**

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear for setting:

► **Console Redirection Settings**

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.

Press [Enter] to make settings for the following items:

**Out-of-Band Mgmt Port**

The optional settings: [COM1].

**Terminal Type**

The optional settings are: [VT100]; [VT100+]; [VT-UTF8]; [ANSI].

**Bits per second**

Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings are: [9600]; [19200]; [57600]; [115200].

**Flow Control**

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “start” signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

The optional settings are: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

**Data Bits**

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The default setting is: [8].

*\*This item may or may not show up, depending on different configuration.*

### **Parity**

The default setting is: [None].

*\*This item may or may not show up, depending on different configuration.*

### **Stop Bits**

The default setting is: [1].

*\*This item may or may not show up, depending on different configuration.*

## ► **PC Health Status**

Press [Enter] to view current hardware health status, set shutdown temperature, or make further settings in '**SmartFAN Configuration**'.

When set as [Enabled], the following sub-items shall appear:

### **CPUFAN Smart Mode**

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

### **CPUFAN Full-Speed Temperature**

Use this item to set CPUFAN full speed temperature. Fan will run at full speed when above the preset temperature.

### **CPUFAN Full-Speed Duty**

Use this item to set CPUFAN full speed duty. Fan will run at full speed when above the pre-set duty.

### **CPUFAN Idle-Speed Temperature**

Use this item to set CPUFAN idle speed temperature. Fan will run at idle speed when below the pre-set temperature.

### **CPUFAN Idle-Speed Duty**

Use this item to set CPUFAN idle speed duty. Fan will run at idle speed when below the pre-set duty.

## ► **CPU Configuration**

Press [Enter] to view current CPU configuration and make settings for the following sub-items:

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## **VT-d**

Use this item to enable or disable CPU VT-d.

The optional settings are: [Disabled]; [Enabled].

## **EIST**

Use this item to enable or disable Intel SpeedStep.

The optional settings are: [Disabled]; [Enabled].

## **Turbo Mode**

Use this item to enable or disable Turbo Mode.

The optional settings are: [Disabled]; [Enabled].

## **C-States**

Use this item to enable or disable C state to OS.

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following item shall appear for setting:

### **Enhanced C-states**

Use this item to enable or disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

The optional settings are: [Disabled]; [Enabled].

### **Max Package C State**

This item controls the Max Package C state that the processor will support.

The optional settings are: [S0ix default]; [PC1]; [C0].

### **Max Core C State**

This item controls the Max Core C state that cores will support.

The optional settings are: [Fused Value]; [Core C10]; [Core C9]; [Core C8]; [Core C7]; [Core C6]; [Core C1]; [Unlimited].

## ► **Network Stack Configuration**

Press [Enter] to go to '**Network Stack**' screen to make further settings.

### **Network Stack**

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following sub-items shall appear:

### **Ipv4 PXE Support**

The optional settings are: [Disabled]; [Enabled].

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Use this item to enable Ipv4 PXE boot support. When set as [Disabled], IPV4 PXE boot optional will not be created.

**Ipv6 PXE Support**

The optional settings are: [Disabled]; [Enabled].

Use this item to enable Ipv6 PXE boot support. When set as [Disabled], IPV6 PXE boot optional will not be created.

**PXE Boot Wait Time**

Use this item to set wait time to press [ESC] key to abort the PXE boot.

**Media Detect Count**

Use this item to set media detect count.

▶ **CSM Configuration**

Press [Enter] to make settings for the following sub-items:

**Compatibility Support Module Configuration**

**Boot Option Filter**

This item controls Legacy/UEFI ROMs priority.

The optional settings are: [UEFI and Legacy]; [Legacy only]; [UEFI only].

**Network**

This item controls the execution of UEFI and legacy PXE OpROM.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

**Storage**

This item controls the execution of UEFI and Legacy Storage OpROM.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

**Other PCI Devices**

This item determines OpROM execution policy for devices other than Network, storage or video.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

▶ **NVMe Configuration**

When NVMe SSD is plugged in M.2 PCIe/SATA slot, the NVMe controller and Drive information will appear.

▶ **Wake-up Function Settings**

Press [Enter] to make settings for the following sub-items:

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### **Wake-up System with Fixed Time**

Use this item to enable or disable system wake-up by RTC alarm.

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], system will wake on the Hour/Minute/Second specified.

### **Wake-up System with Dynamic Time**

Use this item to enable or disable system wake-up by RTC alarm.

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], system will wake on the current time + increased minute(s). The settings range is from [1] ~ [60] minute(s).

### **R\_USB Power Gating S4-S5 / F\_USB Power Gating S4-S5**

Use this item to enable or disable USB Wake-up function.

The optional settings: [Enabled]; [Disabled].

*\*This item is only supported when 'ERP Support' is set as [Disabled]. Please disable ERP before activating this function in S4.*

### ► **USB Configuration**

Press [Enter] to make settings for the following sub-items:

#### **USB Configuration**

##### **Legacy USB Support**

The optional settings are: [Enabled]; [Disabled]; [Auto].

**[Enabled]:** To enable legacy USB support.

**[Disabled]:** To keep USB devices available only for EFI specification,

**[Auto]:** To disable legacy support if no USB devices are connected.

##### **XHCI Hand-off**

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

The optional settings are: [Enabled]; [Disabled].

##### **USB Mass Storage Driver Support**

The optional settings are: [Disabled]; [Enabled].

#### **USB Hardware Delays and Time-outs:**

##### **USB Transfer Time-out**

Use this item to set the time-out value for control, bulk, and interrupt transfers.

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The optional settings are: [1 sec]; [5 sec]; [10 sec]; [20 sec].

**Device Reset Time-out**

Use this item to set USB mass storage device start unit command time-out.

The optional settings are: [10 sec]; [20 sec]; [30 sec]; [40 sec].

**Device Power-up Delay**

Use this item to set maximum time the device will take before it properly reports itself to the host controller.

The optional settings: [Auto]; [Manual].

'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

Select [Manual] you can set value for the following sub-item: '**Device Power-up Delay in Seconds**'.

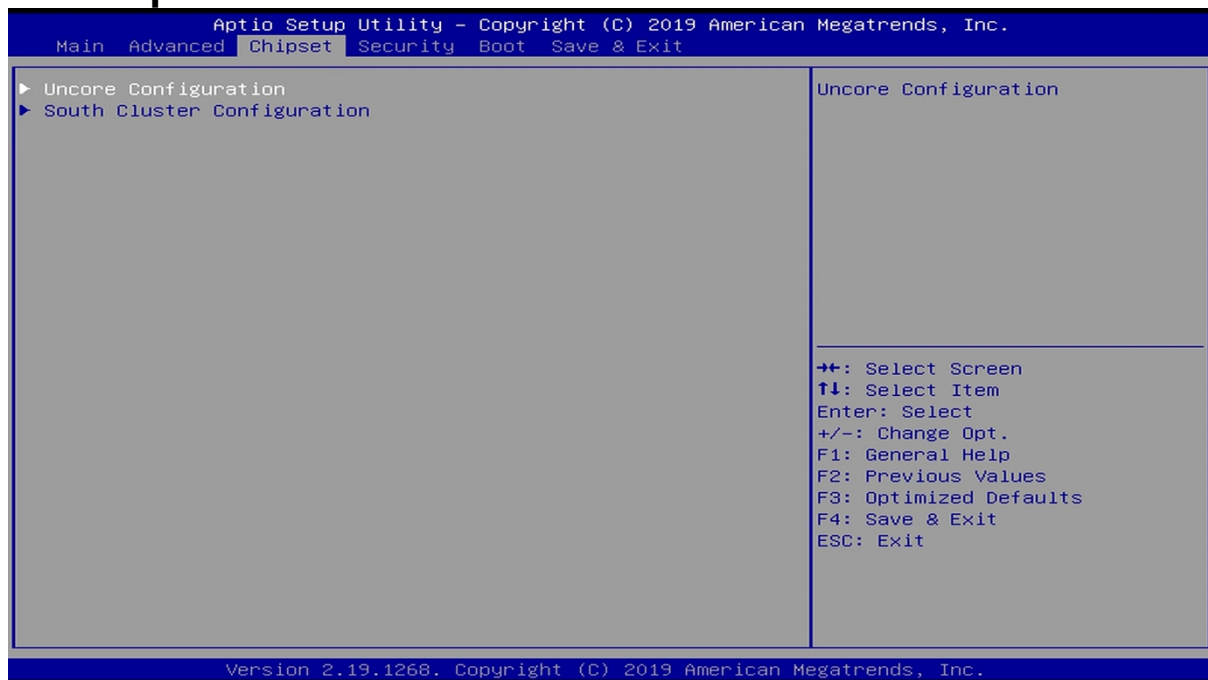
**Device Power-up Delay in Seconds**

The delay range is from [1] to [40] seconds, in one second increments.

- ▶ **Intel(R) I211 Gigabit Network Connection- XX:XX:XX:XX:XX:XX**

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## 3-8 Chipset Menu



### ► Uncore Configuration

Press [Enter] to make settings for the following sub-items:

#### **GTT Size**

Use this item to select the GTT Size.

The optional settings are: [2MB]; [4MB]; [8MB].

#### **DVMT Pre-Allocated**

Use this item to select DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.

The optional settings are: [64M]; [96M]; [128M]; [160M]; [192M]; [224M]; [256M]; [288M]; [320M]; [352M]; [384M]; [416M]; [448M]; [480M]; [512M].

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### **DVMT Total Gfx Mem**

Use this item to select DVMT 5.0 total graphics memory size used by the internal graphics device.

The optional settings are: [128M]; [256M]; [MAX].

### **Primary IGFX Boot Display**

Use this item to select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on selection. VGA modes will be supported only on primary display.

The optional settings are: [Auto]; [eDP]; [HDMI1]; [HDMI2].

### **Secondary IGFX Boot Display**

Use this item to select Secondary Display Device

The optional settings are: [Disabled]; [HDMI1]; [HDMI2].

### **Active LFP**

The optional settings are: [Disabled]; [eDP].

When set as [eDP], the following items shall appear:

### **GMCH BLC Control**

Use this item to control Back Light Control Setting.

The optional settings are: [PWM-Inverted]; [PWM-Normal].

## ▶ **South Cluster Configuration**

Press [Enter] to further setting South Cluster Configuration.

## ▶ **PCI Express Configuration**

Press [Enter] to further setting.

### **Peer Memory Write Enable**

The optional settings are: [Disabled]; [Enabled].

### **Compliance Mode**

The optional settings are: [Disabled]; [Enabled].

## ▶ **SATA Configuration**

Press [Enter] to make settings for the following sub-items:

### **SATA Controller**

The optional settings are: [Enabled]; [Disabled].

When set as [Enabled], the following items shall appear for setting:



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### **SATA Mode Selection**

Use this item to determine how SATA controller operate.

The default setting is: [AHCI].

### **SATA Port**

Use this item to enable or disable SATA Port.

The optional settings are: [Disabled]; [Enabled].

### **M.2**

### **M.2**

Use this item to enable or disable M.2 SATA port.

The optional settings are: [Disabled]; [Enabled].

### **HD-Audio Support**

The optional settings are: [Disabled]; [Enabled].

### **SCC eMMC Support (D28:F0)**

Use this item to enable or disable SCC eMMC support.

The optional settings are: [Disabled]; [Enabled].

When set as [Enabled], the following items shall appear for setting:

### **eMMC Max Speed**

Use this item to select the eMMC Max Speed allowed.

The optional settings are: [HS400]; [HS200]; [DDR50]

### **CNVi Mode**

Use this item to select CNVi Mode.

The optional settings are: [Disabled]; [Auto].

### **System State after power Failure**

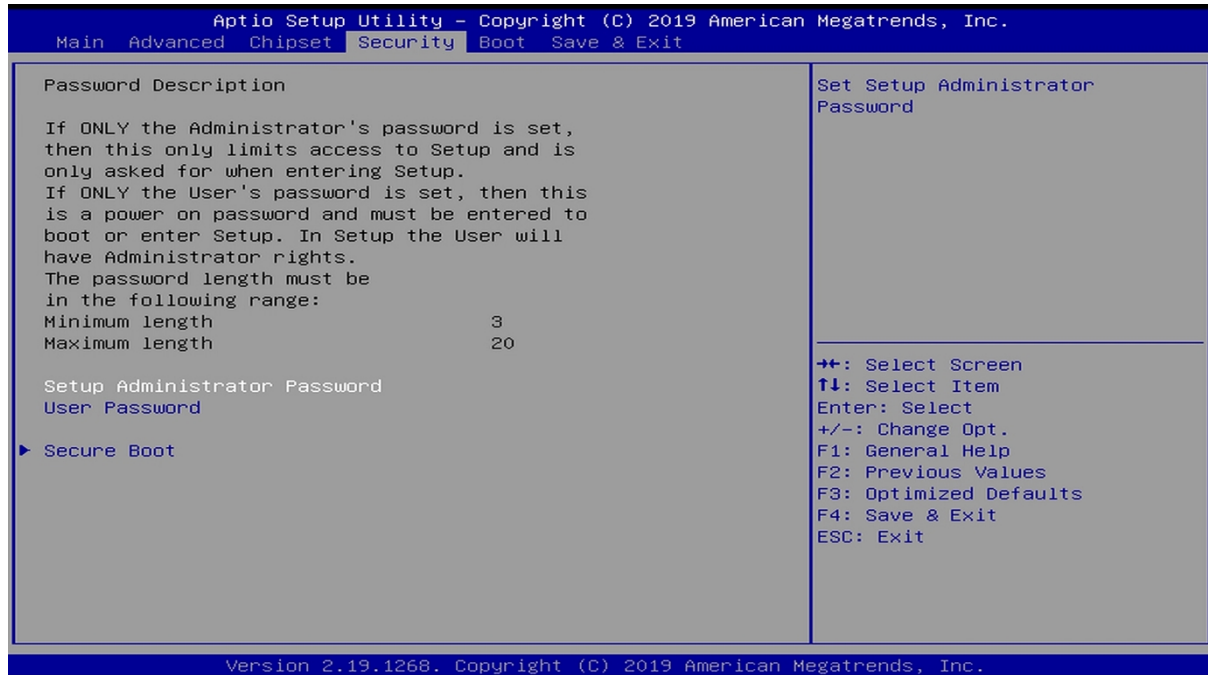
Use this item to specify what state to go to when power re-applied after a power failure.

The optional settings are: [Always On]; [Always Off]; [Former State].

***\*Note:** [Always On] and [Former State] options are affected by ERP function. Please disable ERP to support [Always On] and [Former State].*

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## 3-9 Security Menu



Security menu allow users to change administrator password and user password settings.

### Setup Administrator Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

### User Password

If there is no password present on system, please press [Enter] to create new user password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new user

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password.

▶ **Secure Boot**

Press [Enter] to make customized secure settings:

**Secure Boot**

The optional settings are: [Disabled]; [Enabled].

Secure Boot feature is active if Secure Boot is enabled, Platform Key (PK) is enrolled and the system is in User mode. The mode change requires platform reset.

**Secure Boot Mode**

The optional settings are: [Standard]; [Custom].

Set Secure Boot Mode to Standard mode or Custom mode. This change is effective after save. After reset, this mode will return to Standard mode.

In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

*\*When set as **[Custom]**, user can make further settings in the following items that show up:*

▶ **Restore Factory Keys**

Use this item to force system to User Mode, to install factory default Secure Boot key databases.

▶ **Reset To Setup Mode**

Use this item to delete all Secure Boot Key databases from NVRAM.

▶ **Key Management**

This item enables experienced users to modify Secure Boot variables, which includes the following items:

**Factory Key Provision**

This item is for user to install factory default secure boot keys after the platform reset and while the system is in Setup mode.

The optional settings are: [Disabled]; [Enabled].

▶ **Restore Factory Keys**

Use this item to force system into User Mode. Install factory default Secure Boot

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Key databases.

▶ **Reset to Setup Mode**

Use this item to delete all Secure Boot key databases from NVRAM.

▶ **Export Secure Boot variables**

Use this item to copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

▶ **Enroll Efi Image**

This item allows the image to run in Secure Boot Mode.

Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

**Device Guard Ready**

▶ **Remove 'UEFI CA' from DB**

Device Guard ready system must not list 'Microsoft EFI CA' Certificate in Authorized Signature database (db).

▶ **Restore DB defaults**

Use this item to restore DB variable to factory defaults.

**Secure Boot Variable/Size/Keys/Key Source**

▶ **Platform Key (PK)/Key Exchange Keys/Authorized Signature/Forbidden Signature/ Authorized TimeStamps/OsRecovery Signatures**

Use this item to enroll Factory Defaults or load the keys from a file with:

1. Public Key Certificate in:

- a) EFI\_SIGNATURE\_LIST
- b) EFI\_CERT\_X509 (DER)
- c) EFI\_CERT\_RSA2048 (bin)
- d) EFI\_CERT\_SHAXXX

2. Authenticated UEFI Variable

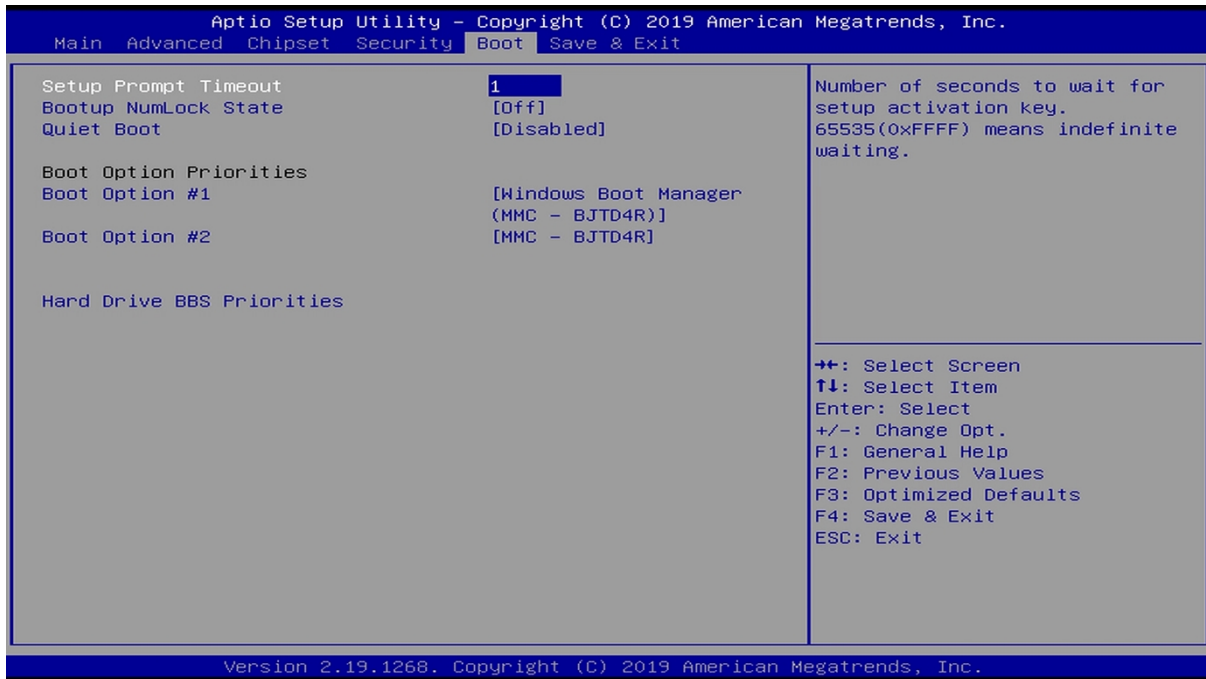
3. EFI PE/COFF Image (SHA256)

Key Source: Factory, External, Mixed.

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## 3-10 Boot Menu



### **Boot Configuration**

#### **Setup Prompt Timeout**

Use this item to set number of seconds to wait for setup activation key.

#### **Bootup Numlock State**

Use this item to select keyboard numlock state.

The optional settings are: [On]; [Off].

#### **Quiet Boot**

The optional settings are: [Disabled]; [Enabled].

### **Boot Option Priorities**

#### **Boot Option #1/ Boot Option #2**

Use this item to decide system boot order from available options.

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The optional settings are: [Windows Boot Manager (MMC - BJTD4R)]; [MMC - BJTD4R]; [Disabled].

### Hard Driver BBS Priorities

Use this item to set the order of available legacy devices in this group.  
Press [Enter] to make settings for the following sub-items:

#### Boot Option#1

The optional settings are: [MMC - BJTD4R]; [Disabled].

## 3-11 Save & Exit Menu



### Save Options

#### Save Changes and Reset

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This item allows user to reset the system after saving the changes.

**Discard Changes and Reset**

This item allows user to reset the system without saving any changes.

**Default Options**

**Restore Defaults**

Use this item to restore /load default values for all the setup options.

**Save as User Defaults**

Use this item to save the changes done so far as user defaults.

**Restore User Defaults**

Use this item to restore the user defaults to all the setup options.

**Boot Override**

**Windows Boot Manager (MMC – BJTD4R)**

Use this item to save configuration and reset.

**MMC – BJTD4R**

Use this item to save configuration and reset.