

***TECHNICAL MANUAL***

***of***

***Intel H410 Express Chipset***

***Based Mini-ITX M/B***

**NO. G03-MI08-F**

**Revision: 3.0**

**Release date: August 2, 2024**

**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 40 centigrade is the suitable temperature. (The temperature comes from the request of the chassis and thermal solution)
- 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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## USER'S NOTICE

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## Manual Revision Information

Reversion	Revision History	Date
3.0	Third Edition	August 2, 2024

## Item Checklist

- ☒ Motherboard
- ☒ Cable(s)
- ☒ I/O Back panel shield

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# Chapter 1

## Introduction of the Motherboard

### 1-1 Feature of Motherboard

- Intel® H410 express chipset
- Support 10<sup>th</sup> LGA1200 Socket Intel® Core™ i7 processors / Intel® Core™ i5 processors / Intel® Core™ i3 processors / Intel® Pentium™ processors / Intel® Celeron™ processors (TDP ≤65 W).
- Support 2\* DDR4 2666/2400MHz SO-DIMM up to 64GB and dual channel function
- Integrated with 1\* Intel i210AT Gigabit Ethernet LAN chip, 1\*Intel i219V Gigabit Ethernet LAN chip
- Integrated with Realtek ALC888-VD2 6-channel HD Audio Codec
- Support USB 3.2 data transport demand
- Support 2 \* SATAIII (6Gb/s) Devices
- Support 1\* Display port & 1\* HDMI port
- Support 1\* PCIE 2.0 x16 slot
- Support 1\* M.2 M-key type 2242/2280 (SATA/PClex2) support NVMe
- Support 1\* M.2 E-key 2230 (PClex1/USB 2.0), 1\* M.2 B-key 3042/3052 (USB3.0/PClex1) W/SIM card slot
- Support Smart FAN function
- Supports ACPI S3 Function
- Compliance with ErP Standard
- Support Watchdog Timer Technology

## 1-2 Specification

Spec	Description
Design	<ul style="list-style-type: none"> <li>● Mini-ITX form factor 6 layers; PCB size: 17.0x17.0cm</li> </ul>
Chipset	<ul style="list-style-type: none"> <li>● Intel H410 Express Chipset</li> </ul>
CPU Socket	<ul style="list-style-type: none"> <li>● Support Intel® LGA 1200 Socket Core™ i7 processors, Intel® Core™ i5 processors, Intel® Core™ i3 processors, Intel® Pentium™ processors, Intel® Celeron™ processors</li> </ul> <p><i>* <b>Note:</b> for detailed CPU support information please visit our website</i></p>
Memory Slot	<ul style="list-style-type: none"> <li>● 2*DDR4 SO-DIMM slot</li> <li>● Support DDR4 2666/2400 MHz SO-DIMM up to 64GB</li> <li>● Support dual channel non-ECC function</li> </ul> <p><i>* <b>Note:</b>Memory frequency range also depends on CPU support</i></p>
Expansion Slot	<ul style="list-style-type: none"> <li>● 1* PCIE x 16 slot</li> <li>● 1* M.2 E-key 2230(PClex1/USB 2.0)</li> <li>● 1* M.2 B-key 3042/3052 (USB 3.0/PClex1) W/SIM card slot</li> </ul>
Storage	<ul style="list-style-type: none"> <li>● 2* SATA III 6G/s connector</li> <li>● 1* M.2 M-key 2242/2280 (SATA/PClex2) support NVMe</li> </ul> <p><i>*<b>Note:</b>M2M slot maximum current limit is 2A while using 3.3V.</i></p>
Gigabit LAN Chip	<ul style="list-style-type: none"> <li>● Integrated with 1* Intel i210AT Gigabit Ethernet LAN chip, 1*Intel i219V Gigabit Ethernet 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 ALC888-VD2 6-channel HD Audio Codec integrated</li> <li>● Audio driver and utility included</li> </ul>
BIOS	<ul style="list-style-type: none"> <li>● AMI 128Mb Flash ROM</li> </ul>
Multi I/O	<p><b>Rear Panel I/O:</b></p> <ul style="list-style-type: none"> <li>● 4* Serial port connector(<b>COM1_COM2/COM3_COM4</b>, COM1 supports RS232/422/485 function )</li> <li>● 1* Display port</li> </ul>

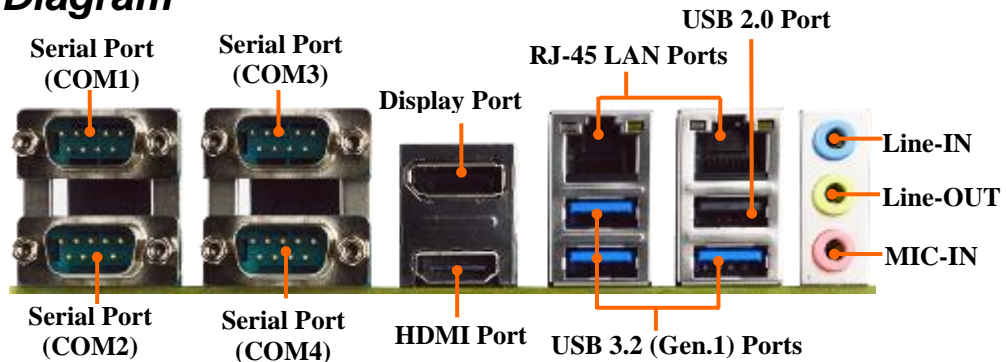
- 1\* HDMI port
- 3\* USB 3.2 (Gen.1) port, 1\*USB 2.0 Port
- 2\* RJ-45 LAN port
- 1\*3-jack audio connector (Line-in, Line-out, MIC)

**Internal I/O Connectors& Headers:**

- 1\*24-pin main power connector
- 1\*4-pin 12V power connector
- 1\*CPUFAN connector & 2\* SYSFAN connector
- 1\*Front panel audio header
- 1\*Front panel header
- 2\*9-Pin USB 2.0/1.1 header for 4\* USB 2.0/1.1 ports
- 1\*PS2 Keyboard & Mouse header
- 1\*SMBUS header
- 1\*GPIO header
- 2\*Serial port header (**COM5/6** support RS232)
- 1\*EDP connector

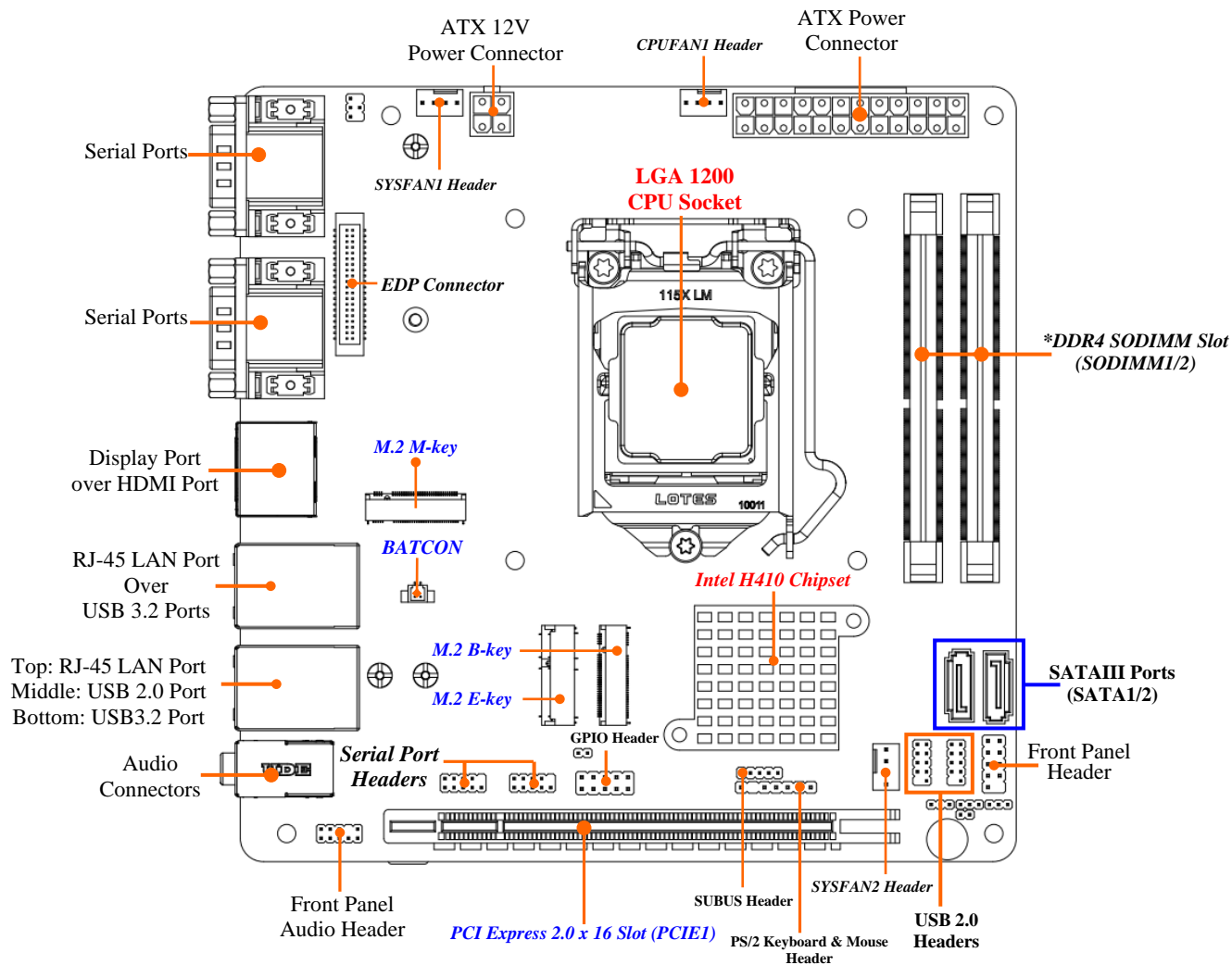
## 1-3 Layout Diagram

### Rear IO Diagram



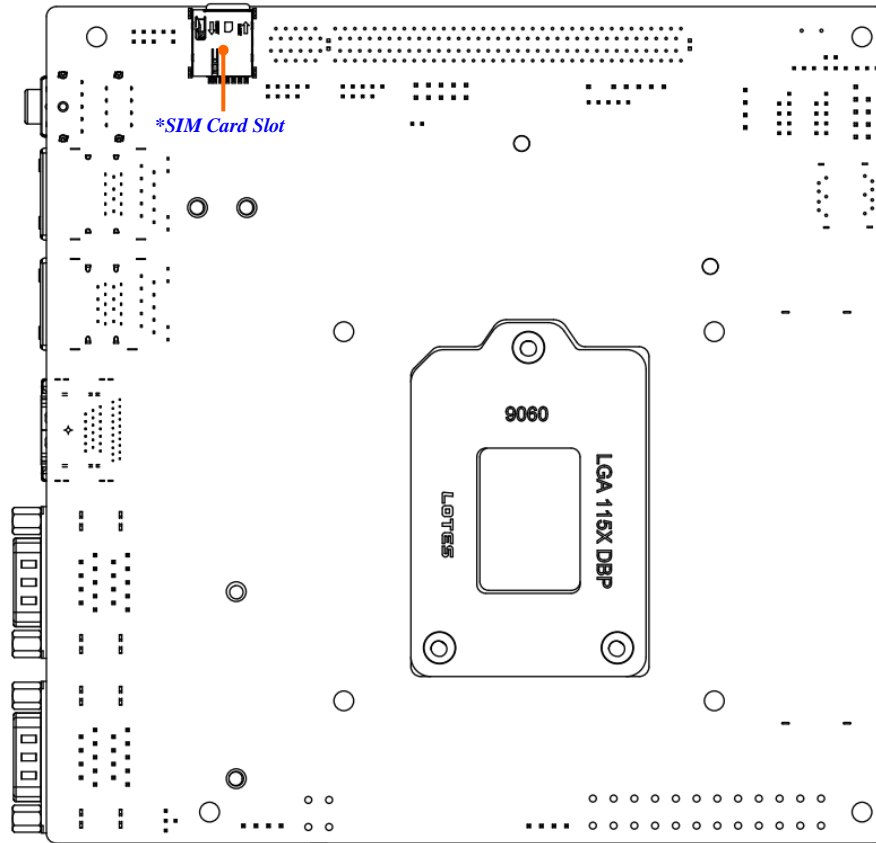


# Motherboard Internal Diagram-Front



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## Motherboard Internal Diagram-Back



**Note:** *SIM card slot* only work **when** compatible SIM card installed & 3G LAN card installed in **MPE1** Mini-PCIE slot.

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## ***Jumper***

<b>Jumper</b>	<b>Name</b>	<b>Description</b>
JP12	COM1 Port Pin9 Function Select	4-pin Block
JP13	GPIO/80 Port Mode Select	3-pin Block
JBAT	Clear CMOS RAM Settings	3-pin Block
JAT_ATX	AT Mode Select	3-pin Block
JP2	ME_Features Select	2-pin Block
COPEN	Case Open Display Select	2-pin Block

## ***Connectors***

<b>Connector</b>	<b>Name</b>
ATXPWR	24-Pin ATX Main Power Connector
ATX12V	4-Pin 12V Power Connector
COM1_COM2/COM3_COM4	Serial Port COM Connector X4
DP_HDMI1	<b>Top:</b> Display Port Connector <b>Bottom:</b> HDMI Port Connector
UL1	<b>Top:</b> RJ-45 LAN Connector X1 <b>Middle &amp; Bottom:</b> USB 3.2 Port Connector X2
UL2	<b>Top:</b> RJ-45 LAN Connector X1 <b>Middle:</b> USB 2.0 Port Connector X1 <b>Bottom:</b> USB 3.2 Port Connector X1
AUDIO	<b>Top:</b> Line-in Connector <b>Middle:</b> Line-out Connector <b>Bottom:</b> MIC Connector
SATA2/3	SATAIII Connector
EDP	EDP Connector
CPUFAN1, SYSFAN1/2	FAN Connector X3

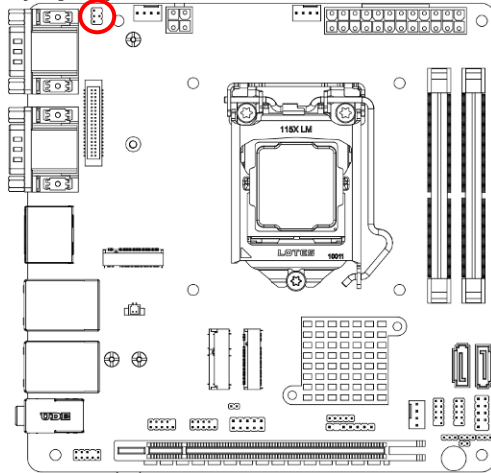
## Headers

Header	Name	Description
FP	Front Panel Header	9-pin Block
FP_USB1/2	USB Header X2	9-pin Block
FP_AUDIO	Front Panel Audio Header	9-pin Block
PS2KBMS1	PS2 Keyboard & Mouse Header	6-pin Block
SMBUS	SMBUS Header	5-pin Block
GPIO	GPIO Header	10-pin Block
COM5/6	Serial Port Header	9-pin Block

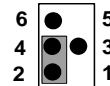
# Chapter 2 Hardware Installation

## 2-1 Jumper Setting

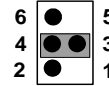
**JP12 (4-pin): COM1 Port Pin9 Function Select** (2.0 pitch)



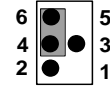
**JP12→COM1 Port Pin-9**



**2-4 Closed:**  
Pin9=RING;



**3-4 Closed:**  
Pin9=5V;

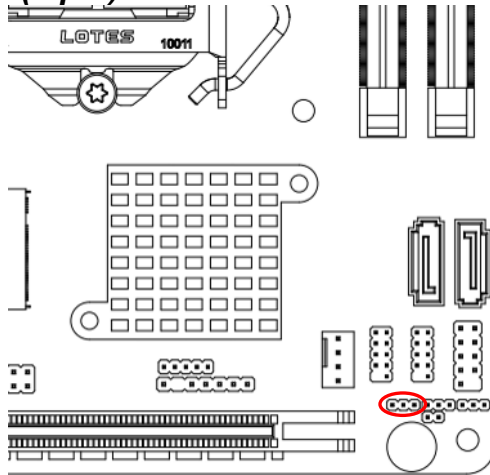


**4-6 Closed:**  
Pin9=12V.

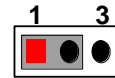
**\*Note:**Maximum current limit is **500mA** while using 5V or 12V.

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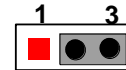
**JP13 (3-pin): GPIO/80 PORT MODE Select** (2.0 pitch)



**JP13→GPIO/80 Port Select**

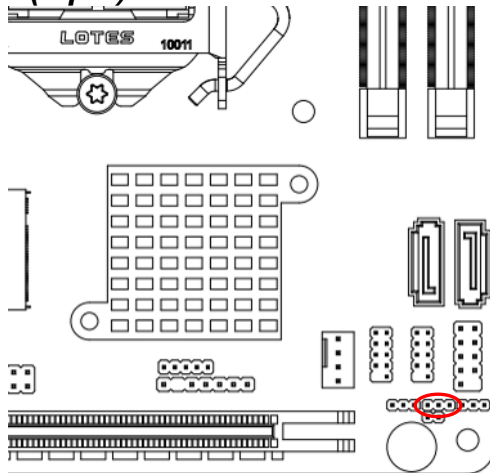


**1-2 Closed: GPIO Mode selected;**

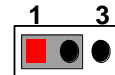


**2-3 Closed: 80 Port Mode Selected.**

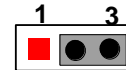
**JBAT (3-pin): Clear CMOS RAM Settings** (2.0 pitch)



**JBAT→Clear CMOS**



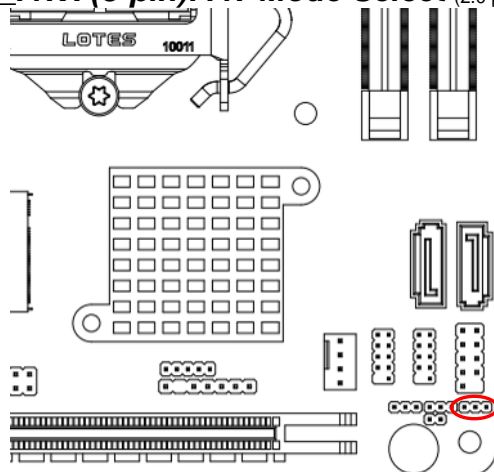
**1-2 Closed: Normal (Default);**



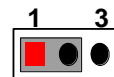
**2-3 Closed: Clear CMOS settings.**

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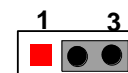
### **JAT\_ATX (3-pin): AT Mode Select** (2.0 pitch)



#### **JAT\_ATX→AT Mode Select**



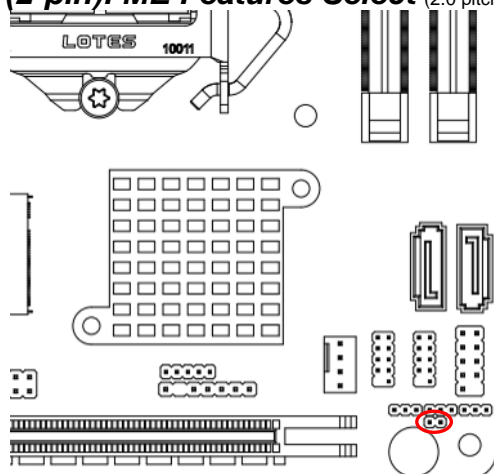
**1-2 Closed: ATX Mode;**



**2-3 Closed: AT Mode.**

**\*ATX Mode Selected:** Press power button to power on after power input ready;  
**AT Mode Selected:** Directly power on as power input ready.

### **JP2 (2-pin): ME Features Select** (2.0 pitch)



#### **JP2→ME Features Select**



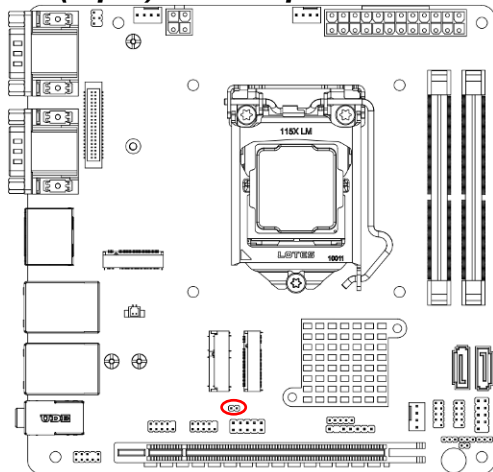
**1-2 Open: Enable ME Features;**



**1-2 Closed: Disable ME Features.**

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## **COPEN (2-pin): Case Open Detection** (2.0 pitch)



**COPEN → Case Open Detection**



**1-2 Open: Normal;**

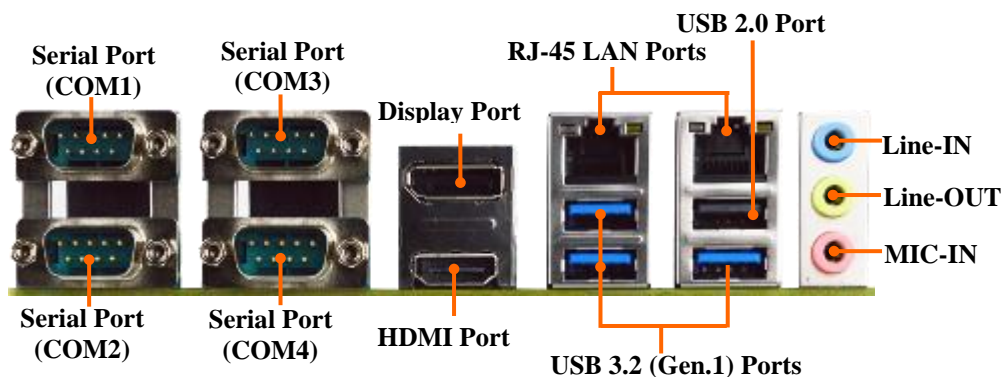


**1-2 Closed: Case Open Function Selected.**








## **2-2 Connectors and Headers**

### **2-2-1 Connectors**

#### **(1) Rear Panel Connectors**



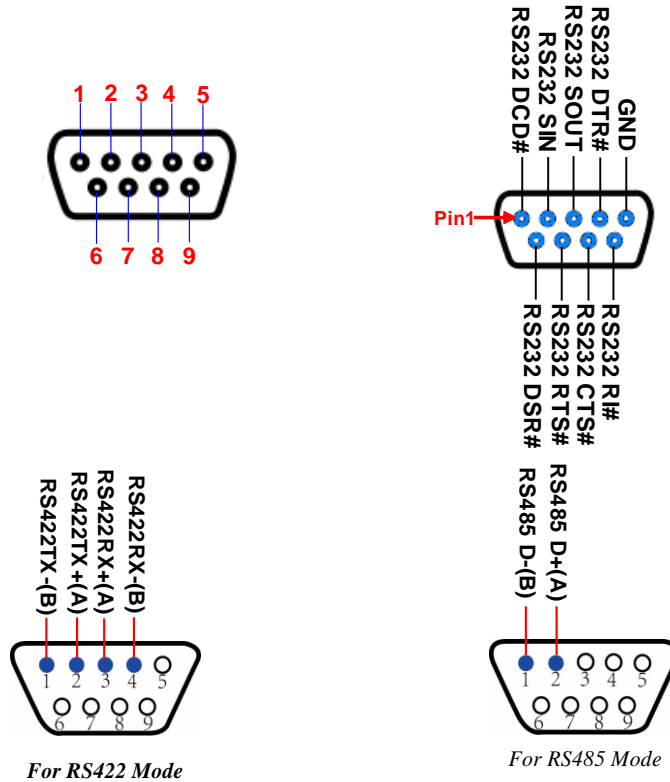


<b><i>Icon</i></b>	<b><i>Name</i></b>	<b><i>Function</i></b>
	<b>Serial Port</b>	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface. <b>*Note:</b> COM1 supports RS232/422/485 function.
	<b>Display Port</b>	To the system to corresponding display device with compatible display port cable.
	<b>HDMI Port</b>	To connect display device that support HDMI specification.
	<b>RJ-45 LAN Port</b>	This connector is standard RJ-45 LAN jack for Network connection.
	<b>USB 3.2 Port</b>	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.2 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>Audio Connectors</b>	<b>BLUE:</b> Line-in Connector <b>GREEN:</b> Line-out Connector <b>PINK :</b> MIC Connector

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## (2) COM1 (9-pin Block): RS232/422/485 Port

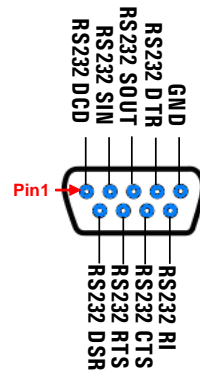
COM1 port can function as RS232/422/485 port. In normal settings COM1 functions as RS232 port. With compatible COM cable COM1 can function as RS422 or RS 485 port. User also needs to go to BIOS to set '**Transmission Mode Select**' for COM1 at first, before using specialized cable to connect different pins of this port.



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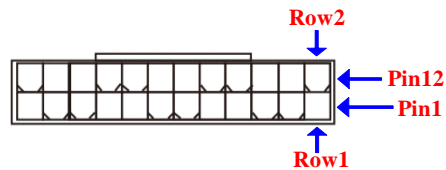
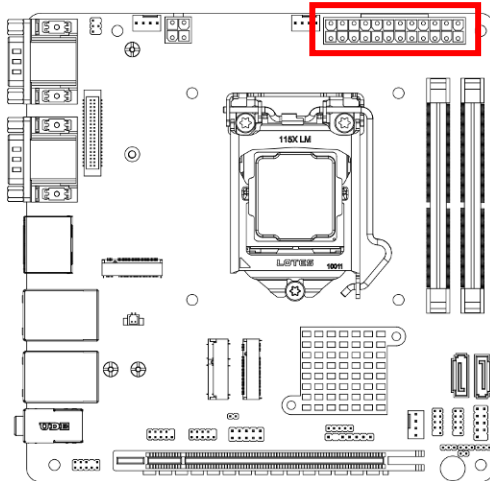
### (3) COM2/3/4 (9-pin Block): RS232 Port

COM2/COM3 port can function as RS232 port.



*RS232 Mode*

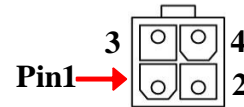
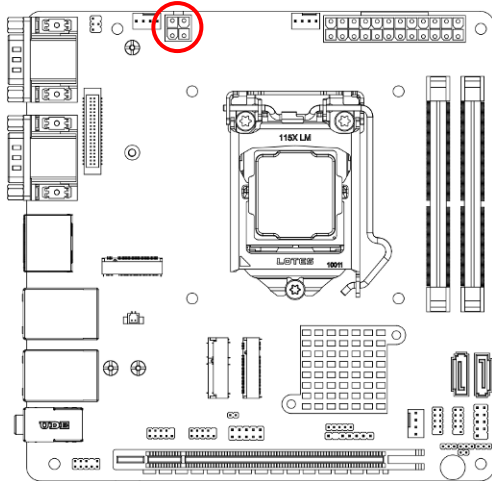
### (4) ATXPWR (24-pin block): Power Connector



PIN	ROW2	ROW1
1	+3.3V	+3.3V
2	-12V	+3.3V
3	GND	GND
4	Soft Power on	+5V
5	GND	GND
6	GND	+5V
7	GND	GND
8	-5V	Power OK
9	+5V	+5V Stand by
10	+5V	+12V
11	+5V	+12V
12	GND	+3.3V

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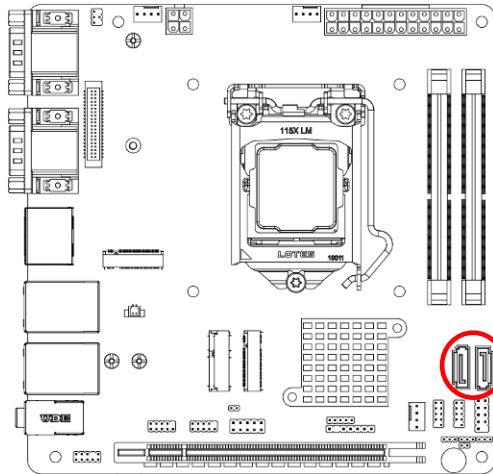
### (5) ATX12V (4-pin block): ATX12V Type Power Connector



Pin No.	Definition
1	GND
2	GND
3	+12V
4	+12V

### (6) SATA1/SATA2 (7-pin): SATA III Port connector

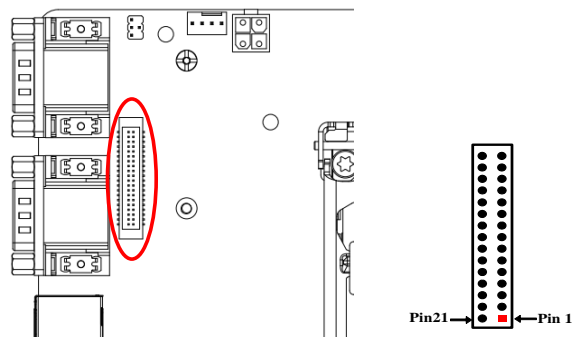
SATA1&SATA2 are high-speed SATAIII port that supports 6 GB/s transfer rate.



Pin No.	Defnition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



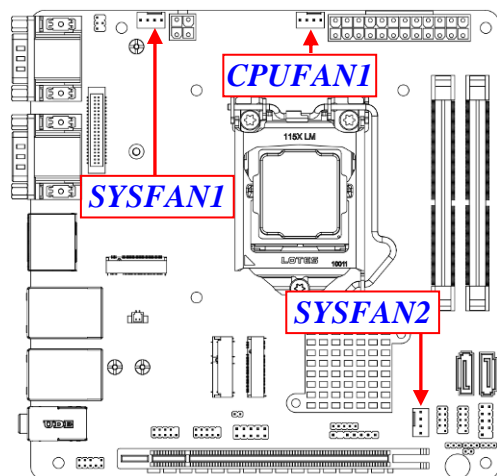
## (7) EDP(40-pin): EDP Connector (1.25 pitch)



Pin No.	Pin Define	Pin No.	Pin Define
Pin 40	NC	Pin 20	LCD_VCC
Pin 39	LCD_BKLT_PWR	Pin 19	LCD_VCC
Pin 38	LCD_BKLT_PWR	Pin 18	LCD_VCC
Pin 37	LCD_BKLT_PWR	Pin 17	GND
Pin 36	LCD_BKLT_PWR	Pin 16	EDP_AUXN
Pin 35	NC	Pin 15	EDP_AUXP
Pin 34	Option	Pin 14	GND
Pin 33	LCD_BKLT_PWM	Pin 13	EDP_DATA0P
Pin 32	LCD_BKLT_EN	Pin 12	EDP_DATA0N
Pin 31	GND	Pin 11	GND
Pin 30	GND	Pin 10	EDP_DATA1P
Pin 29	GND	Pin 9	EDP_DATA1N
Pin 28	GND	Pin 8	GND
Pin 27	EDP_HPD	Pin 7	EDP_DATA2P
Pin 26	GND	Pin 6	EDP_DATA2N
Pin 25	GND	Pin 5	GND
Pin 24	GND	Pin 4	EDP_DATA3P
Pin 23	GND	Pin 3	EDP_DATA3N
Pin 22	NC	Pin 2	GND
Pin 21	NC	Pin 1	NC

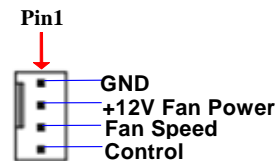
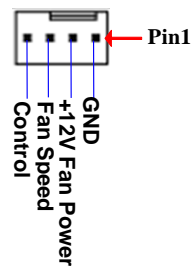
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## (8) CPUFAN1/SYSFAN1/SYSFAN2 (4-pin): Fan Connector



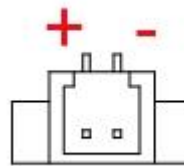
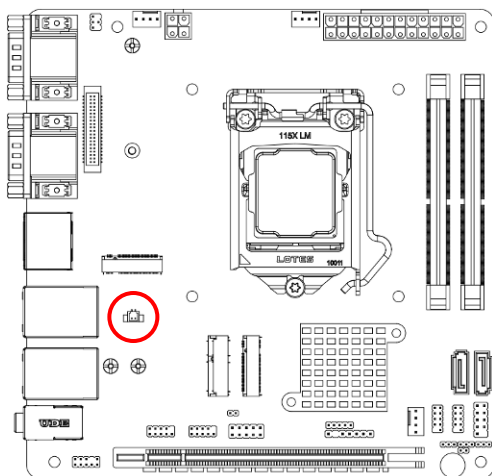
*CPUFAN1/SYSFAN1*

*SYSFAN2*



**\*Note:** Maximum current limit is **1.5A** while using 12V working voltage.

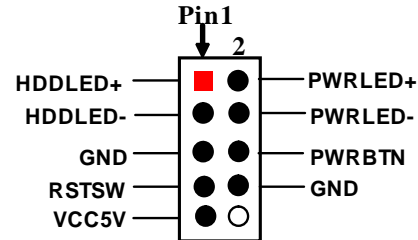
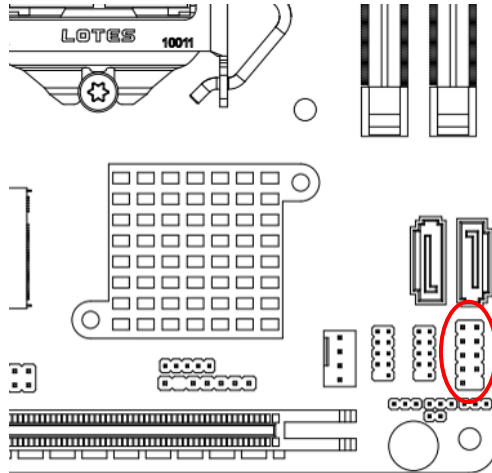
## (9) BATCON (2-pin): Battery Connector



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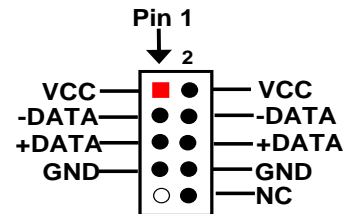
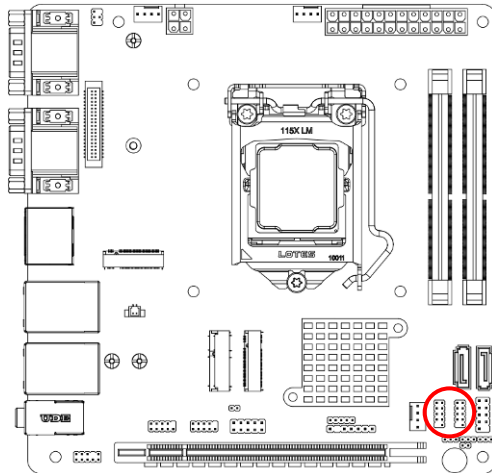
## 2-2-2 Headers

### (1) FP (9-pin): Front Panel Header (2.54 pitch)



**\*Note:** Maximum current limit is **1A** while using 5V working voltage.

### (2) FP\_USB1/FP\_USB2 (9-pin): USB 2.0 Port Headers (2.0 pitch)

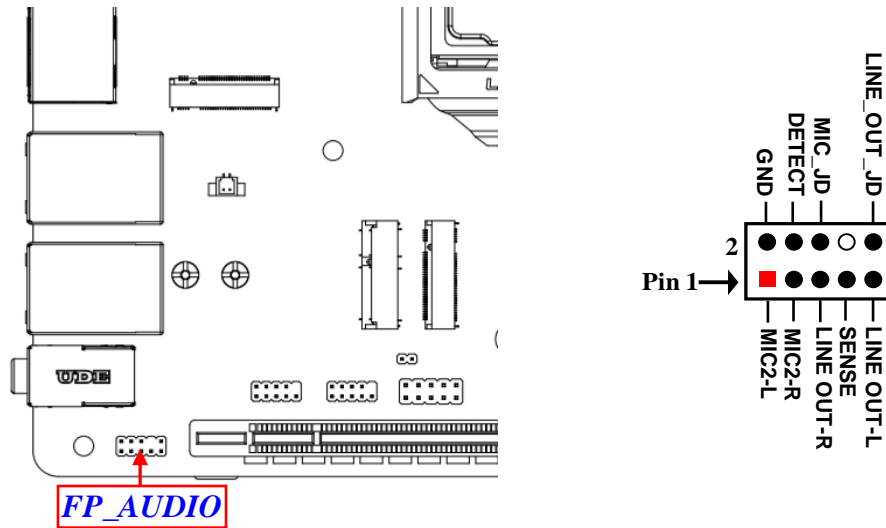


**\*Note:** Maximum current limit is **1.5A** while using 5V working voltage.

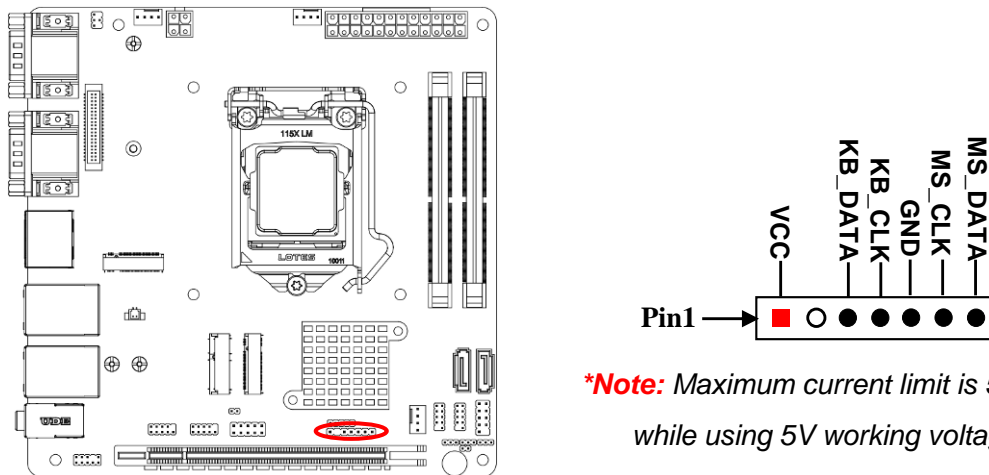
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### (3) FP\_AUDIO (9-pin): Line-Out, MIC-In Header (2.0 pitch)

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



### (4) S2KBMS1 (6-pin): PS/2 Keyboard & Mouse Header (2.54 pitch)

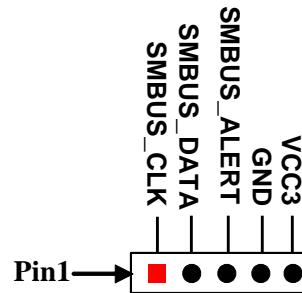
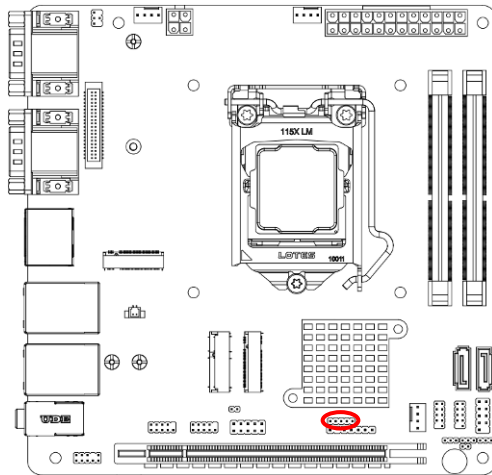


**\*Note:** Maximum current limit is 500mA while using 5V working voltage.



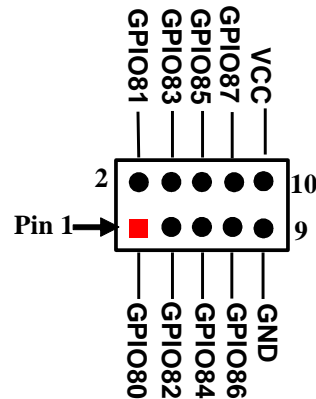
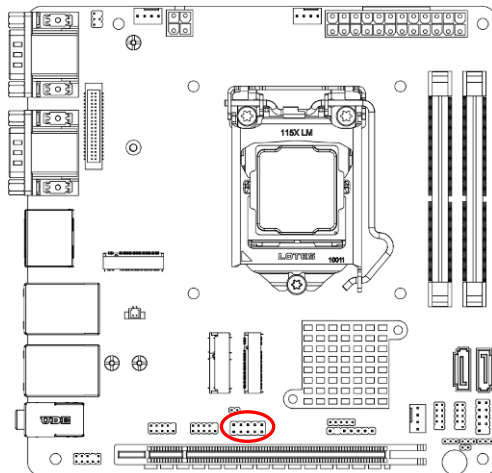
---

**(5) SMBUS (5-Pin): SMBUS Header** (2.0 pitch)



**\*Note:** Maximum current limit is **1A** while using 3.3V working voltage.

**(6) GPIO(10-pin): GPIO Header** (2.54 pitch)

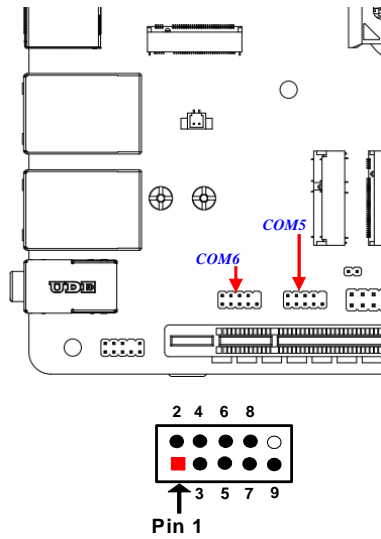


**\*Note:** Maximum current limit is **1A** while using 5V working voltage.

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## (7) COM5/COM6 (9-pin): RS232(/422/485) Serial Port Header (2.0 pitch)



Pin NO.	2	4	6	8	
Pin Define	DSR	RTS	CTS	RI	
Pin NO.	1	3	5	7	9
Pin Define	DCD	RXD	TXD	DTR	GND

---

# Chapter 3

## Introducing BIOS

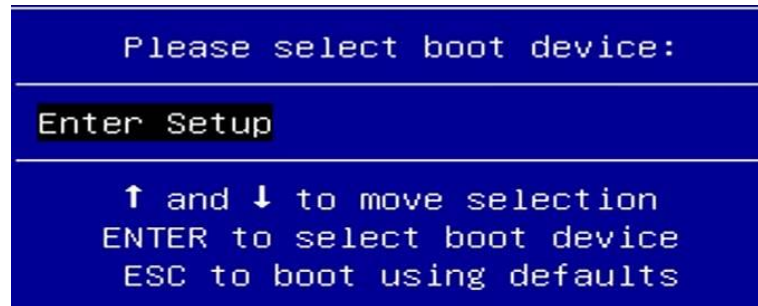
**Notice!** The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form 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 system does not boot, an error message will be displayed and you will again be asked to

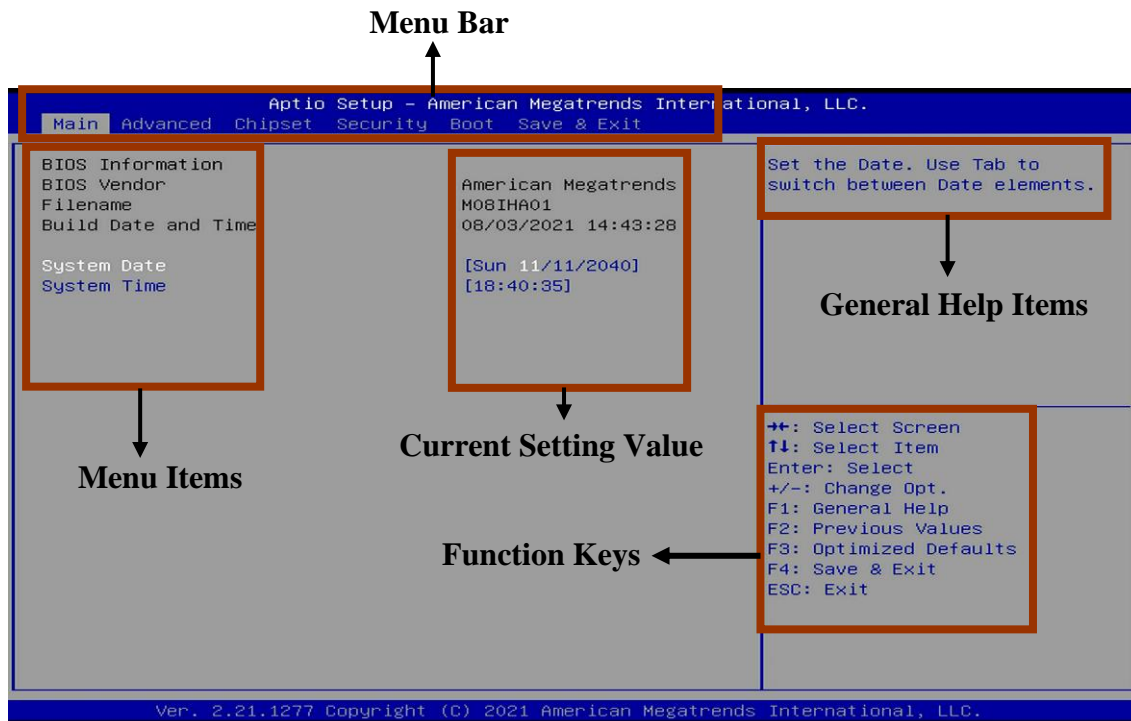
Press    **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.



BIOS Boot Menu Screen (boot device options please refer to actual configuration)

### 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 values.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to exit from 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

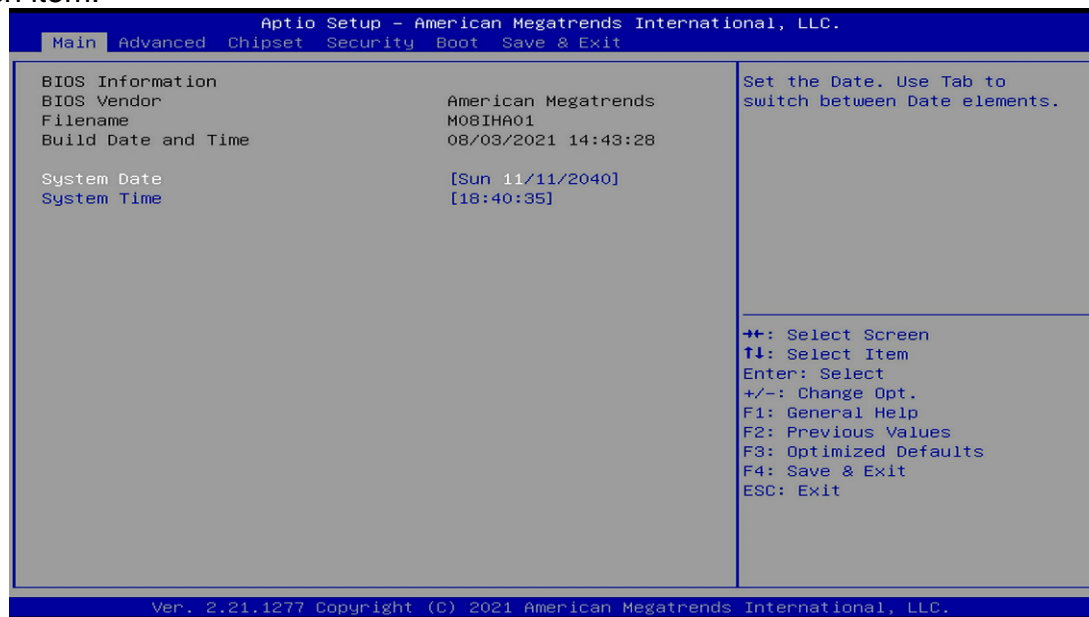
There are six menu bars on top of BIOS screen:

<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.

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.



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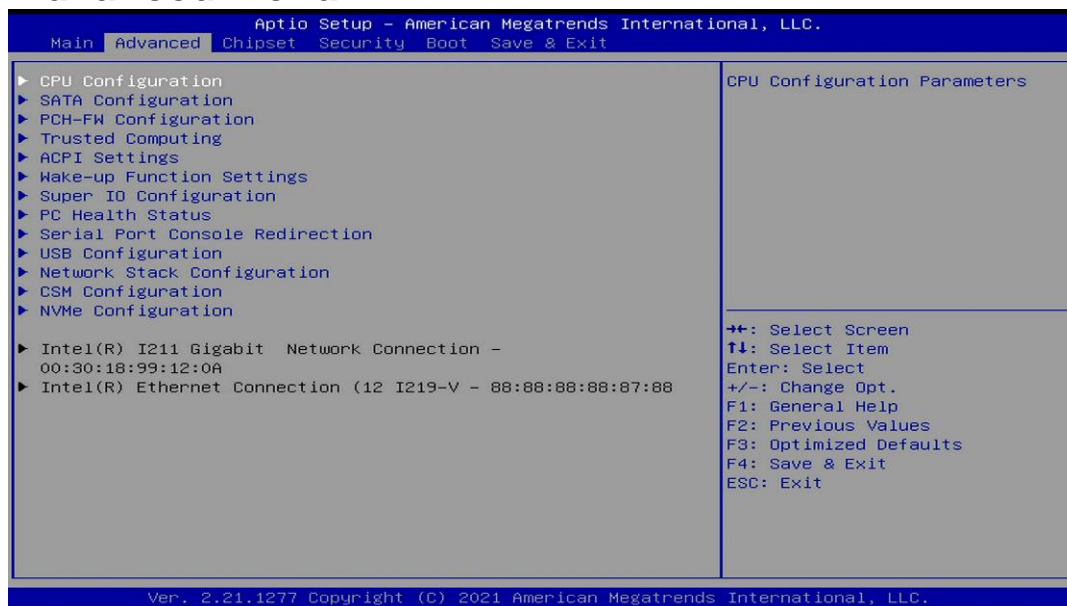
## System Date

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



### ▶ CPU Configuration

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

#### Hyper-Threading

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

When set as [Disabled] only one thread per enabled core is enabled.

#### Intel (VMX) Virtualization Technology

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

When set as **[Enabled]**, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

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### **Intel(R) SpeedStep(tm)**

This item allows more than two frequency ranges to be supported.

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

### **C states**

Use this item to enable or disable CPU Power Management.

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

When set as **[Enabled]**, it allows CPU to go to C states when it's not 100% utilized.

### **Turbo Mode**

Use this item to enable or disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).

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

## ► **SATA Configuration**

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

### **SATA Configuration**

#### **SATA Controller(s)**

Use this item to enable or disable SATA Device.

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

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

#### **SATA Mode Selection**

The default setting is: [AHCI].

### **M.2**

#### **Port**

Use this item to enable or disable SATA Port.

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

### **SATA2/SATA3**

#### **Port**

Use this item to enable or disable SATA Port.

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

#### **Hot Plug**

Use this item to designate this port as Hot Pluggable.

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



---

▶ **PCH-FW Configuration**

Press [Enter] to configure Management Engine Technology Parameters and make settings in the following sub-item:

**ME Firmware Version**

**ME Firmware Mode**

**TPM Device Selection**

Use this item to select TPM device.

The optional settings: [dTPM]; [PTT].

**[PTT]:** Enable PTT in SkuMgr.

**[dTPM]:** Disable PTT in SkuMgr.

*\* **Warning!** PTT/dTPM will be disabled and all data saved on it will be lost.*

▶ **Firmware Update Configuration**

Press [Enter] to make settings for '**Me FW Image Re-Flash**'.

**Me FW Image Re-Flash**

Use this item to enable or disable Me FW Image Re-Flash function.

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

*\* **Note:** In the case that user needs to update Me firmware, user should set '**Me FW Image Re-Flash**' as **[Enabled]**, save the settings and exit. The system will turn off and reboot after 4 seconds. If the user goes to BIOS screen again will find this item is set again as **[Disabled]**, but user can still re-flash to update firmware next time.*

▶ **Trusted Computing**

Press [Enter] to view current status information, or make further settings in the following sub-items:

**TPM 2.0 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: [Disabled]; [Enabled].

When set as **[Enabled]**, user can make further settings in the following items:

---

---

### **Pending operation**

Use this item to schedule an Operation for the Security Device.

**\*Note:** *Your Computer will reboot during restart in order to change State of Security Device.*

The optional settings: [None]; [TPM Clear].

### **TPM 2.0 UEFI Spec Version**

Use this item to select the TCG2 Spec Version Support.

The optional settings: [TCG\_1\_2]; [TCG\_2].

**[TCG\_1\_2]:** the Compatible mode for Win8/Win10.

**[TCG\_2]:** support new TCG2 protocol and event format for Win10 or later.

### ▶ **ACPI Settings**

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

#### **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: [Suspend Disabled]; [S3 (Suspend to RAM)].

### ▶ **Wake-up Function Settings**

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

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

Use this item to enable or disable System wake on alarm event.

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

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

#### **Wake-up Hour**

Use this item to select 0-23. For example enter 3 for 3am and 15 for 3pm.

#### **Wake-up Minute**

Use this item to select 0-59.

#### **Wake-up Second**

Use this item to select 0-59.

---

### Wake-up System with Dynamic Time

Use this item to enable or disable System wake on alarm event.

System will wake on the current time + Increase minute(s).

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

When set as **[Enabled]**, system will wake on the current time + increased minute(s).

### PS2 KB/MS Wake-up

Use this item to enable or disable PS2 KB/MS Wake-up from (S3/S4/S5).

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

***\*Note:** This function is supported when 'ERP Support' is set as [Disabled].*

### USB S5 Power

Use this item to enable or disable USB Power after System Shutdown.

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

***\*Note:** This function is supported when 'ERP Support' is set as [Disabled].*

## ► Super IO Configuration

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

### Super IO Configuration

#### ERP Support

Use this item to select Energy-Related Products function. This item should be set as [Disabled] if you wish to have all active wake-up functions.

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

## ► Serial Port 1 Configuration

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

### Serial Port 1 Configuration

#### Serial Port

Use this item to enable or disable Serial Port (COM).

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

When set as **[Enabled]**, user can make further settings in the following items:

---

## **Device Settings**

### **Change Settings**

Use this item to select an optimal setting for Super IO Device.

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

### **Transmission Mode Select**

The optional settings: [RS422]; [RS232]; [RS485].

### **Mode Speed Select**

Use this item to select RS232/RS422/RS485 Speed.

The optional settings: [RS232/RS422/RS485=250Kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].

### **► Serial Port 2 Configuration**

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

### **Serial Port 2 Configuration**

### **Serial Port**

Use this item to enable or disable Serial Port (COM).

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

When set as **[Enabled]**, user can make further settings in the following items:

## **Device Settings**

### **Change Settings**

Use this item to select an optimal setting for Super IO Device.

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

---

► **Serial Port 3 Configuration**

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

**Serial Port 3 Configuration**

**Serial Port**

Use this item to enable or disable Serial Port (COM).

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

When set as **[Enabled]**, user can make further settings in the following items:

**Device Settings**

**Change Settings**

Use this item to select an optimal setting for Super IO Device.

The optional settings: [IO=3E8h; IRQ=10;]; [IO=3F8h; IRQ=3,4,5,7,10,11;];

[IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h;

IRQ=3,4,5,7,10,11;]; [IO=3E0h; IRQ=3,4,5,7,10,11;]; [IO=2E0h;

IRQ=3,4,5,7,10,11;].

► **Serial Port 4 Configuration**

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

**Serial Port 4 Configuration**

**Serial Port**

Use this item to enable or disable Serial Port (COM).

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

When set as **[Enabled]**, user can make further settings in the following items:

**Device Settings**

**Change Settings**

Use this item to select an optimal setting for Super IO Device.

The optional settings: [IO=2E8h; IRQ=10;]; [IO=3F8h; IRQ=3,4,5,7,10,11;];

[IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h;

IRQ=3,4,5,7,10,11;]; [IO=3E0h; IRQ=3,4,5,7,10,11;]; [IO=2E0h;

IRQ=3,4,5,7,10,11;].

---

► **Serial Port 5 Configuration**

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

**Serial Port 5 Configuration**

**Serial Port**

Use this item to enable or disable Serial Port (COM).

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

When set as **[Enabled]**, user can make further settings in the following items:

**Device Settings**

**Change Settings**

Use this item to select an optimal setting for Super IO Device.

The optional settings: [IO=3E0h; IRQ=11;]; [IO=3F8h; IRQ=3,4,5,7,10,11;]; [IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h; IRQ=3,4,5,7,10,11;]; [IO=3E0h; IRQ=3,4,5,7,10,11;]; [IO=2E0h; IRQ=3,4,5,7,10,11;].

► **Serial Port 6 Configuration**

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

**Serial Port 6 Configuration**

**Serial Port**

Use this item to enable or disable Serial Port (COM).

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

When set as **[Enabled]**, user can make further settings in the following items:

**Device Settings**

**Change Settings**

Use this item to select an optimal setting for Super IO Device.

The optional settings: [IO=2E0h; IRQ=11;]; [IO=3F8h; IRQ=3,4,5,7,10,11;]; [IO=2F8h; IRQ=3,4,5,7,10,11;]; [IO=3E8h; IRQ=3,4,5,7,10,11;]; [IO=2E8h; IRQ=3,4,5,7,10,11;]; [IO=3E0h; IRQ=3,4,5,7,10,11;]; [IO=2E0h; IRQ=3,4,5,7,10,11;].

---

### **WatchDog Reset Timer**

Use this item to enable or disable WDT reset function.

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

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

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

User can select a value in the range of [4] to [255] seconds when 'WatchDog Reset Timer Unit' set as [Sec]; or in the range of [4] to [255] minutes when 'WatchDog Reset Timer Unit' set as [Min].

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

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

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

This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select 'AT or ATX Mode' on MB jumper at first (*refer to JAT\_ATX jumper setting for ATX Mode & AT Mode Select*).

### **Case Open Detect**

Use this item to detect Case has already open or not. Show message in POST.

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

When set as **[Enabled]**, system will detect if COPEN has been short or not (*refer to **COPEN** jumper setting for Case Open Detection*); if Pin 1&2 of **COPEN** are short, system will show Case Open Message during POST.

### ► **PC Health Status**

Press [Enter] to view current hardware health status, make further settings in 'SmartFAN Configuration'.

#### ► **SmartFAN Configuration**

Press [Enter] to make settings for 'SmartFan Configuration':

#### **SmartFAN Configuration**

##### **CPUFAN1 / SYSFAN1 / SYSFAN2 Smart Mode**

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

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

---

---

### **CPUFAN1 / SYSFAN1 / SYSFAN2 Full-Speed Temperature**

Use this item to set CPUFAN/SYSFAN1/SYSFAN2 full speed temperature. Fan will run at full speed when above this pre-set temperature.

### **CPUFAN1 / SYSFAN1 / SYSFAN2 Full-Speed Duty**

Use this item to set CPUFAN/SYSFAN1/SYSFAN2 full-speed duty. Fan will run at full speed when above this pre-set duty.

### **CPUFAN1 / SYSFAN1 / SYSFAN2 Idle-Speed Temperature**

Use this item to set CPUFAN/SYSFAN1/SYSFAN2 idle speed temperature. Fan will run at idle speed when below this pre-set temperature.

### **CPUFAN1 / SYSFAN1 / SYSFAN2 Idle-Speed Duty**

Use this item to set CPUFAN/SYSFAN1/SYSFAN2 idle speed duty. Fan will run at idle speed when below this pre-set duty.

## ▶ **Serial Port Console Redirection**

### **COM1**

#### **Console Redirection**

Use this item to enable or disable COM1 Console Redirection.

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

When set as **[Enabled]**, user can make further settings in the following items:

#### ▶ **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 sub-items.

### **COM1**

#### **Console Redirection Settings**

##### **Terminal Type**

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

**[ANSI]**: Extended ASCII char set;

**[VT100]**: ASCII char set;

**[VT100+]**: Extends VT100 to support color, function keys, etc.;

**[VT-UTF8]**: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.



---

### **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: [9600]; [19200]; [38400]; [57600]; [115200].

### **Data Bits**

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

### **Parity**

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

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

### **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: [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: [Disabled]; [Enabled].

### **Recorder Mode**

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

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

---

### **Resolution 100x31**

Use this item to enable or disable extended terminal resolution.

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

### **Putty KeyPad**

Use this item to select FunctionKey and KeyPad on Putty.

The optional settings: [VT100]; [LINUX]; [XTERM6]; [SCO]; [ESCN]; [VT400].

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

#### **Console Redirection**

Use this item to enable or disable Console Redirection.

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

When set as **[Enabled]**, user can make further settings in the following items:

#### **Console Redirection Settings**

#### **Out-of-Band Mgmt Port**

#### **Terminal Type EMS**

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

**[VT-UTF8]** is the preferred terminal type for out-of-band management. The next best choice is **[VT100+]** and then **[VT100]**. See above, in Console Redirection Settings page, for more help with Terminal Type/Emulation.

#### **Bits per second EMS**

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: [9600]; [19200]; [57600]; [115200].

#### **Flow Control EMS**

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: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

#### **Data Bits EMS**

The default setting is: [8].

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

---

---

### **Parity EMS**

The default setting is: [None].

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

### **Stop Bits EMS**

The default setting is: [1].

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

## ► **USB Configuration**

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

### **USB Configuration**

#### **Legacy USB Support**

Use this item to enable or disable Legacy USB support.

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

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

Use this item to enable or disable USB mass storage driver support.

The optional settings: [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.

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

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

Select **[Manual]** you can set value for the following sub-item: '**Device power-up delay in seconds**', the delay range in from 1 to 40 seconds, in one second increments.

### ► **Network Stack Configuration**

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

#### **Network Stack**

Use this item to enable or disable UEFI Network Stack.

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

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

#### **IPv4 PXE Support**

Use this item to enable IPv4 PXE boot support. When set as [Disabled], IPv4 boot support will not be available.

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

#### **Ipv6 PXE Support**

Use this item to enable IPv6 PXE boot support. When set as [Disabled], IPv6 boot support will not be available.

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

#### **PXE boot wait time**

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

Use either [+] / [-] or numeric keys to set the value.

#### **Media detect count**

Use this item to set number of times presence of media will be checked.

Use either [+] / [-] or numeric keys to set the value.

### ► **CSM Configuration**

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

#### **Compatibility Support Module Configuration**

#### **CSM Support**

---

---

Use this item to enable or disable CSM Support

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

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

**Option ROM execution**

**Network**

Use this item to control the execution of Network OpROM.

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

**Storage**

Use this item to control the execution of UEFI and Legacy Storage OpROM.

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

**Other PCI devices**

Use this item to determine OpROM execution policy for devices other than Network, Storage, or Video.

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

▶ **NVMe Configuration**

Press [Enter] to view current NVMe Configuration.

*\*Note: options only when NVMe device is available.*

▶ **Intel(R) I210 Gigabit Network Connection - XX:XX:XX:XX:XX:XX**

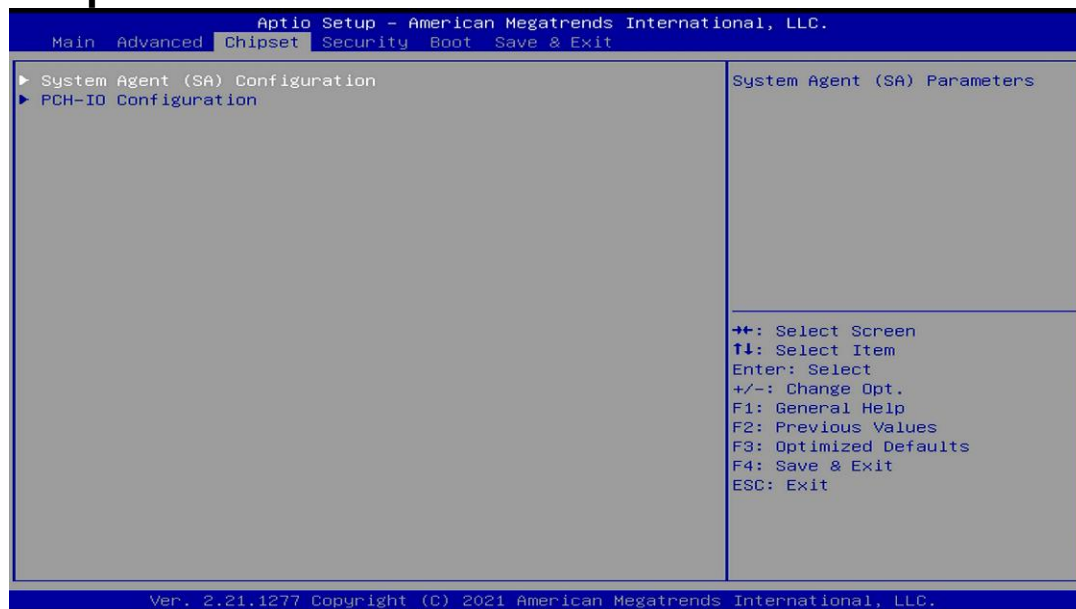
This item shows current network brief information.

▶ **Intel(R) Ethernet Connection (12 I219-V - XX:XX:XX:XX:XX:XX**

This item shows current network brief information.

---

## 3-8 Chipset Menu



### ▶ System Agent (SA) Configuration

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

#### **System Agent (SA) Configuration**

##### **VT-d**

### ▶ Memory Configuration

Press [Enter] to view brief information for the Memory Configuration Parameters.

### ▶ Graphics Configuration

Press [Enter] to make further settings for Graphics Configuration.

#### **Graphics Configuration**

### Internal Graphics

Use this item to keep IGFX enabled based on the setup options.

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

---

---

### **Aperture Size**

Use this item to select the Aperture Size.

**\*Note:** *Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.*

The optional settings: [128MB]; [256MB]; [512MB]; [1024MB]; [2048MB].

### **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: [32M]; [64M].

### **DVMT Total Gfx Mem**

Use this item to select DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device.

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

### **PEG Port Configuration**

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

#### **PEG Port configuration**

#### **PCIe Slot**

##### **Enable Root Port**

Use this item to enable or disable the Root Port.

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

##### **Max Link Speed**

Use this item to configure PEG 0:1:0 Max Speed.

The optional settings: [Auto]; [Gen1]; [Gen2]; [Gen3].

##### **Max Link Width**

Use this item to force PEG link to retrain to X1/2/4/8.

The optional settings: [Auto]; [Force X1]; [Force X2]; [Force X4]; [Force X8].

### **Detect Non-Compliance Device**

Use this item to detect Non-Compliance PCI Express Device in PEG.

The optional settings: [Disabled]; [Enabled]

---

► **PCH-IO Configuration**

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

**PCH-IO Configuration**

**HD Audio**

Use this item to control Detection of the HD-Audio device.

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

**[Disabled]**: HDA will be unconditionally disabled.

**[Enabled]**: HAD will be unconditionally enabled.

**Onboard Lan1 Controller**

Use this item to enable or disable onboard NIC.

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

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

**Wake on LAN Enable**

Use this item to enable or disable integrated LAN to wake the system.

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

**Onboard Lan2 Controller**

Use this item to control the PCI Express Root Port.

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

**System State After Power Failure**

Use this item to specify what state to go to when power is re-applied after a power failure (G3 state).

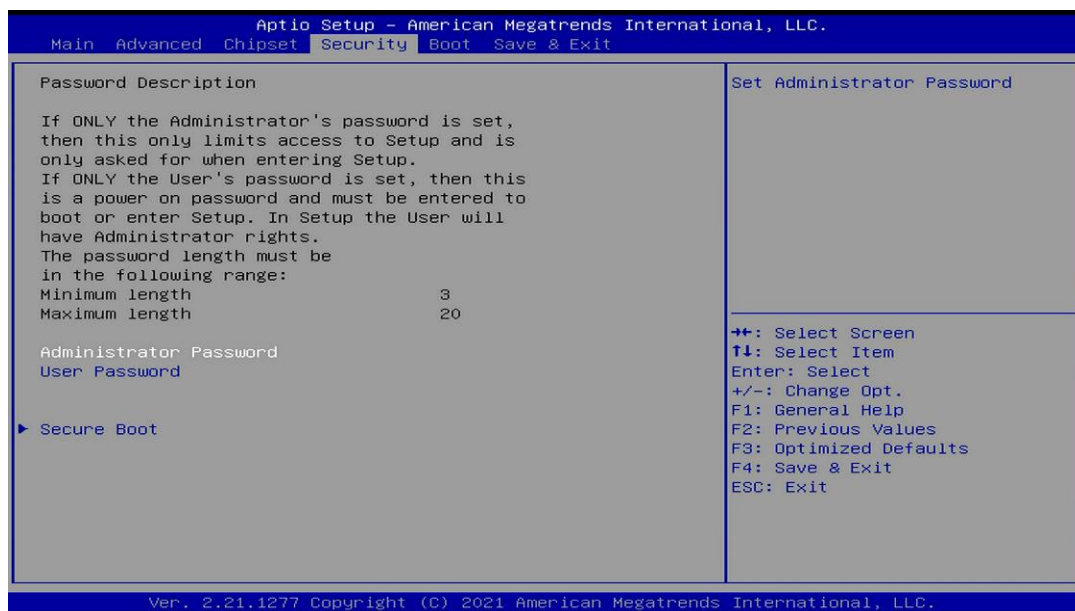
The optional settings: [Always On]; [Always Off]; [Former State].

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



---

## 3-9 Security Menu



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

### 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 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.

---

▶ **Secure Boot**

Press [Enter] to make customized secure settings:

**System Mode**

**Secure Boot**

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.

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

**Secure Boot Mode**

Set UEFI 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.

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

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**

▶ **Key Management**

This item enables expert users to modify Secure Boot Policy variables without full authentication, which includes the following items:

**Vendor Keys**

**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: [Disabled]; [Enabled].

---

- ▶ **Restore Factory Keys**

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

- ▶ **Reset To Setup Mode**
- ▶ **Export Secure Boot variables**
- ▶ **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**
- ▶ **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 Signatures/Forbidden Signatures/ Authorized TimeStamps/OsRecovery Signatures**

Use this item to enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate:
    - 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.

---

## 3-10 Boot Menu



### **Boot Configuration**

#### **Setup Prompt Timeout**

Use this item to set number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

#### **Bootup NumLock State**

Use this item to select keyboard NumLock state.

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

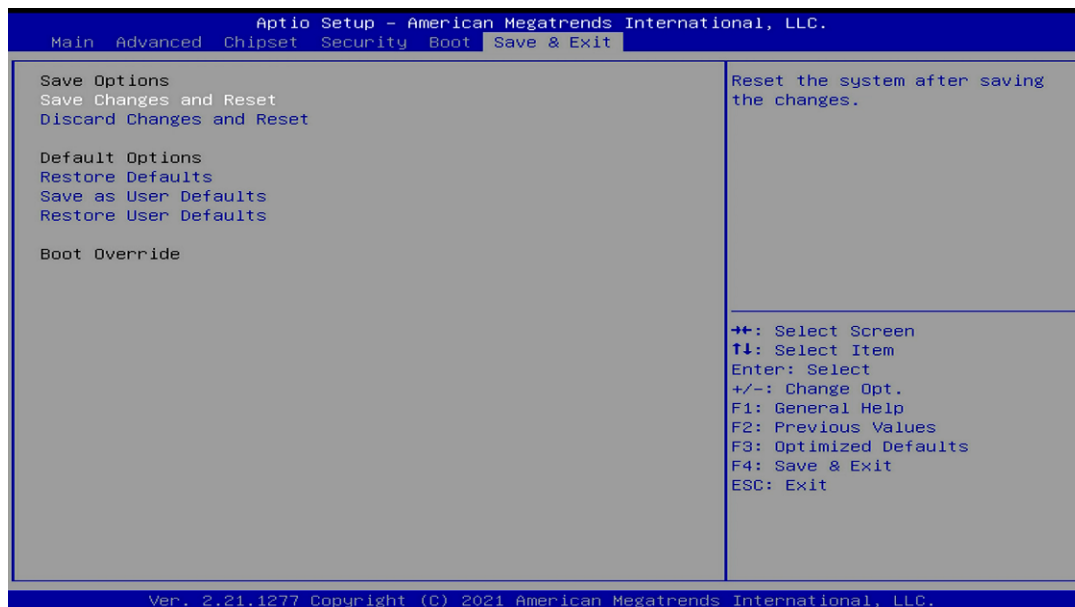
#### **Quiet Boot**

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

### **Boot Option Priorities**

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## 3-11 Save & Exit Menu



### **Save Options**

#### **Save Changes and Reset**

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**