TECHNICAL MANUAL

of

Intel H410 Express Chipset

Based Mini-ITX M/B

NO. G03-MI08-F

Revision: 2.0

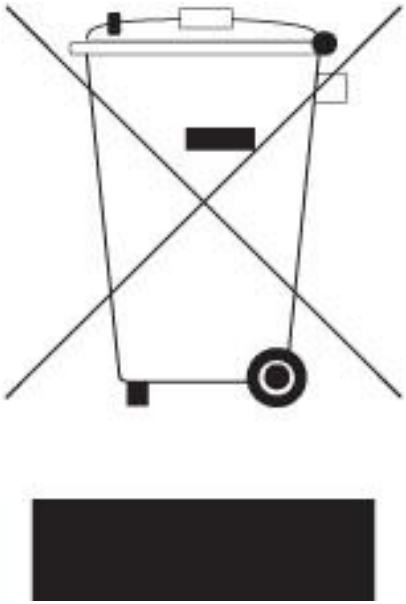
Release date: December 13, 2022

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.**

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

- 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.

USER'S NOTICE

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Manual Revision Information

Reversion	Revision History	Date
2.0	Second Edition	December 13, 2022

Item Checklist

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

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Intel® H410 express chipset
- Support 10th 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 i211AT 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/PCIex2) support NVMe
- Support 1* M.2 E-key 2230 (PCIex1/USB 2.0), 1* M.2 B-key 3042/3052 (USB3.0/ PCIex1) W/SIM card slot
- Support Smart FAN function
- Supports ACPI S3 Function
- Compliance with ErP Standard
- Support Watchdog Timer Technology

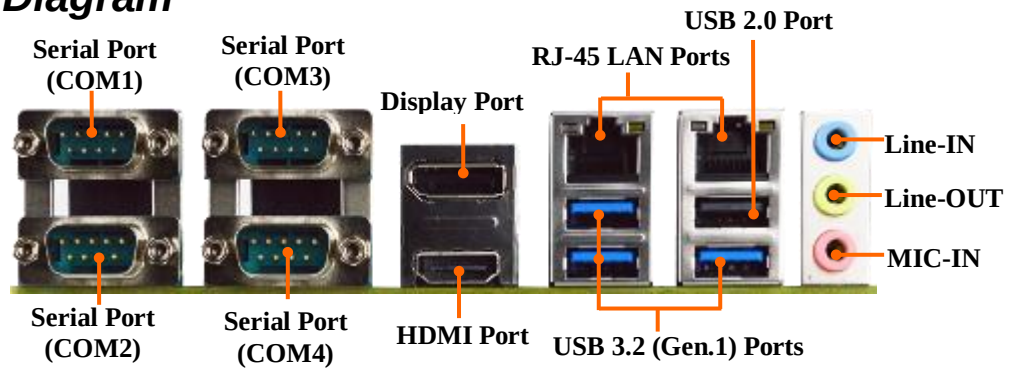
1-2 Specification

Spec	Description
Design	● Mini-ITX form factor 6 layers; PCB size: 17.0x17.0cm
Chipset	● Intel H410 Express Chipset
CPU Socket	● Support Intel® LGA 1200 Socket Core™ i7 processors, Intel® Core™ i5 processors, Intel® Core™ i3 processors, Intel® Pentium™ processors, Intel® Celeron™ processors * ***Note:*** *for detailed CPU support information please visit our website*
Memory Slot	● 2*DDR4 SO-DIMM slot ● Support DDR4 2666/2400 MHz SO-DIMM up to 64GB ● Support dual channel non-ECC function * ***Note:****Memory frequency range also depends on CPU support*
Expansion Slot	● 1* PCIE x 16 slot ● 1* M.2 E-key 2230(PCIex1/USB 2.0) ● 1* M.2 B-key 3042/3052 (USB 3.0/PCIex1) W/SIM card slot
Storage	● 2* SATA III 6G/s connector ● 1* M.2 M-key 2242/2280 (SATA/PCIex2) support NVMe ***Note:M2M** slot maximum current limit is 2A while using 3.3V.*
Gigabit LAN Chip	● Integrated with 1* Intel i211AT Gigabit Ethernet LAN chip, 1*Intel i219V Gigabit Ethernet LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Audio Chip	● Realtek ALC888-VD2 6-channel HD Audio Codec integrated ● Audio driver and utility included
BIOS	● AMI 128Mb Flash ROM
Multi I/O	***Rear Panel I/O:*** ● 4* Serial port connector(***COM1_COM2/COM3_COM4****, COM1 supports RS232/422/485 function)* ● 1* Display port

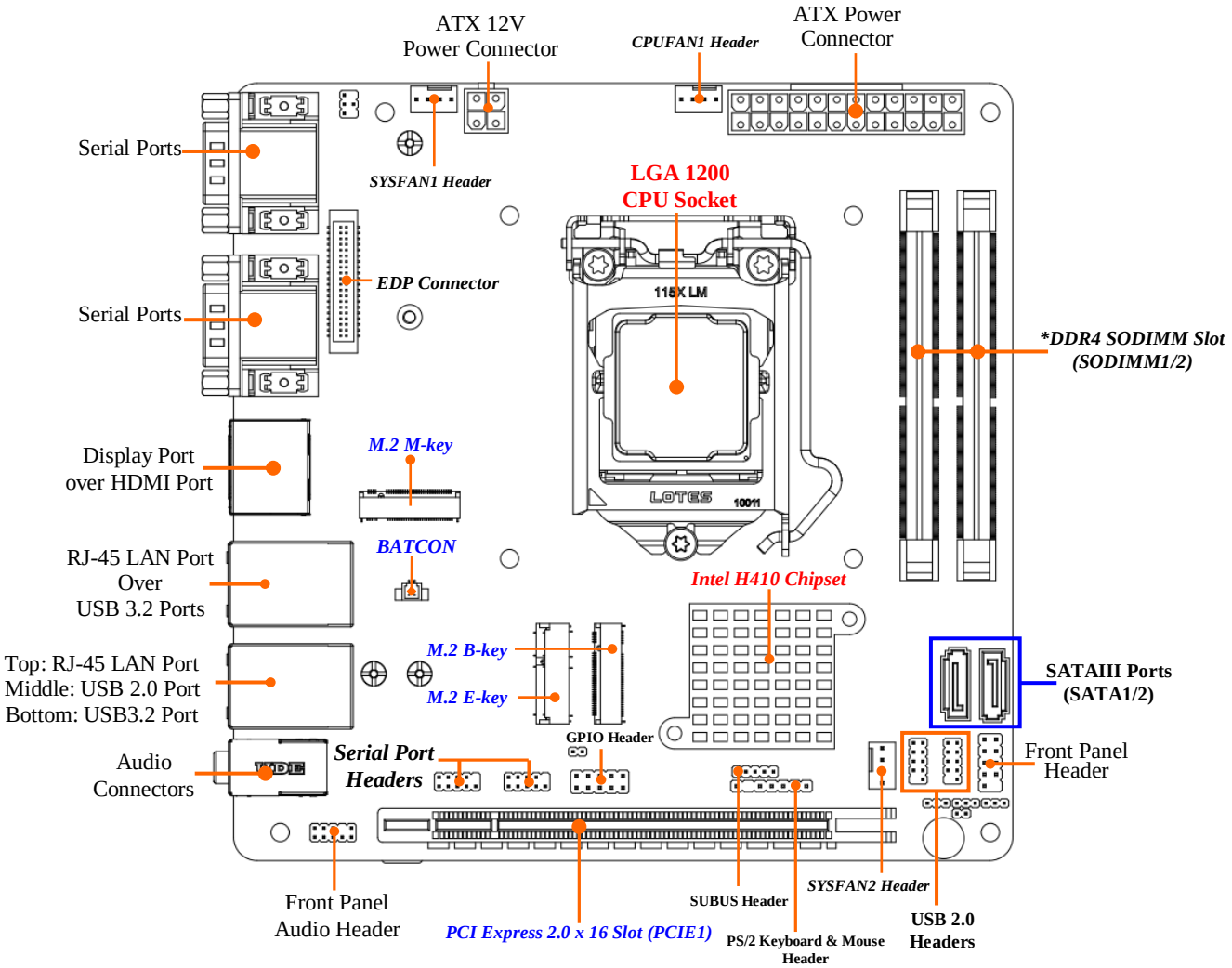
	● 1* HDMI port ● 3* USB 3.2 (Gen.1) port, 1*USB 2.0 Port ● 2* RJ-45 LAN port ● 1*3-jack audio connector (Line-in, Line-out, MIC) ***Internal I/O Connectors& Headers:*** ● 1*24-pin main power connector ● 1*4-pin 12V power connector ● 1*CPUFAN connector & 2* SYSFAN connector ● 1*Front panel audio header ● 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

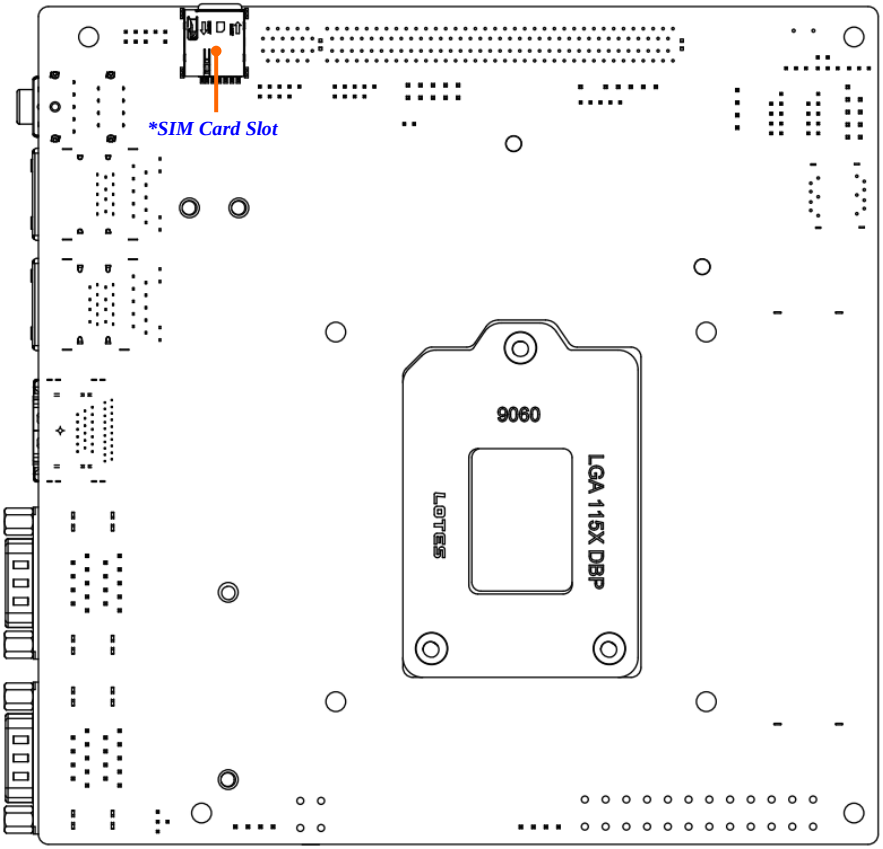
Rear IO Diagram



Motherboard Internal Diagram-Front

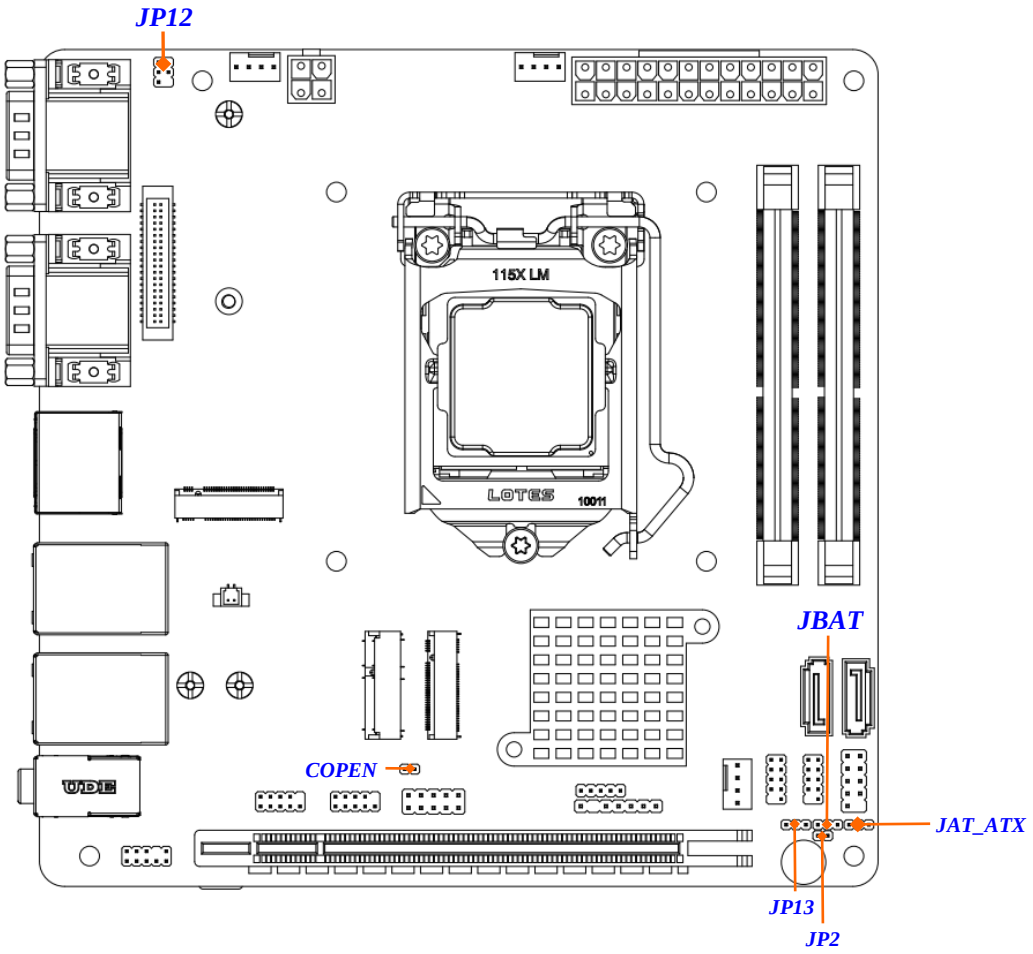


Motherboard Internal Diagram-Back



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

Motherboard Jumper Position



Jumper

Jumper	Name	Description
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

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

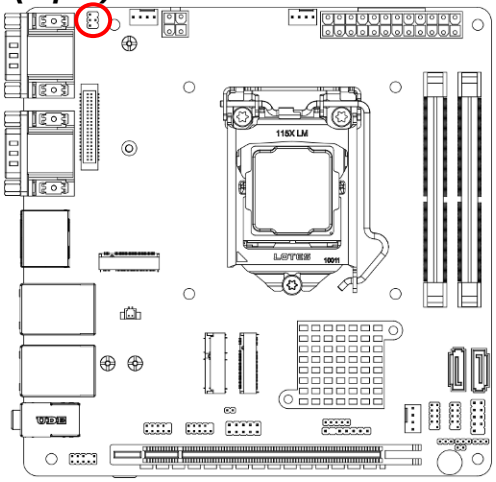
Headers

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

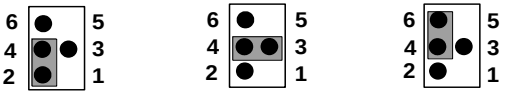
Chapter 2
Hardware Installation

2-1 Jumper Setting

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



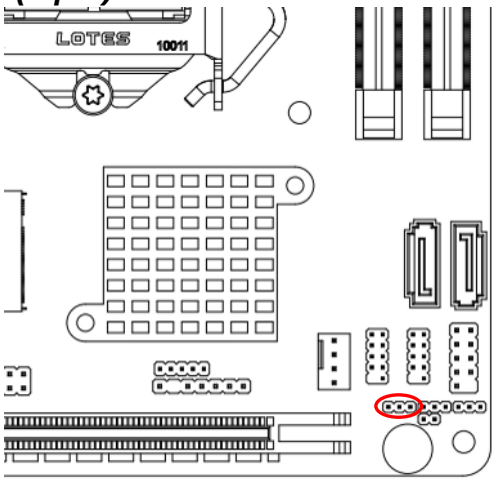
JP12→COM1 Port Pin-9



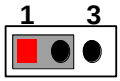
2-4 Closed: Pin9=RING; **3-4 Closed: Pin9=5V;** **4-6 Closed: Pin9=12V.**

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

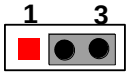
JP13 (3-pin): GPIO/80 PORT MODE Select (2.0 pitch)



JP13→GPIO/80 Port Select

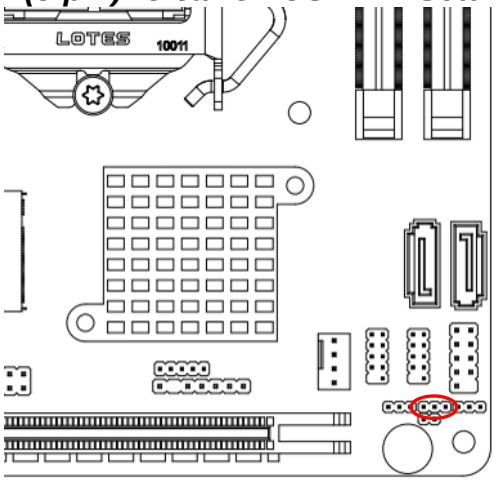


1-2 Closed: GPIO Mode selected;

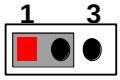


2-3 Closed: 80 Port Mode Selected.

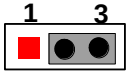
JBAT (3-pin): Clear CMOS RAM Settings (2.0 pitch)



JBAT→Clear CMOS

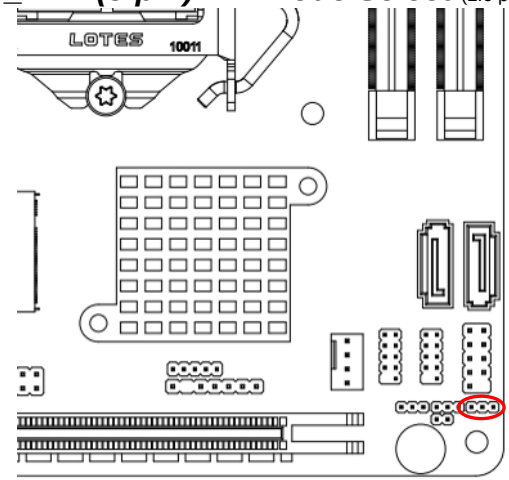


1-2 Closed: Normal (Default);

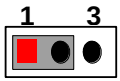


2-3 Closed: Clear CMOS settings.

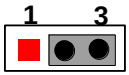
JAT_ATX (3-pin): AT Mode Select (2.0 pitch)



JAT_ATX→AT Mode Select



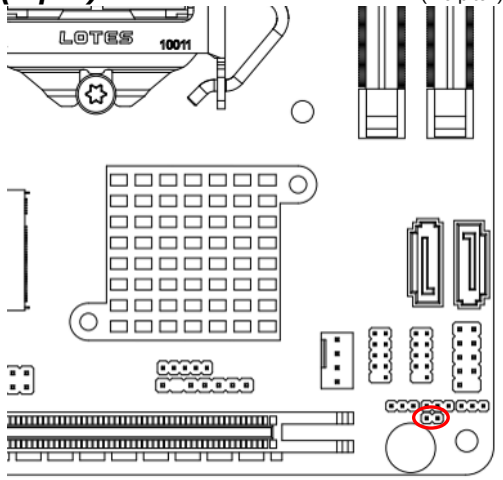
1-2 Closed: ATX Mode;



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)

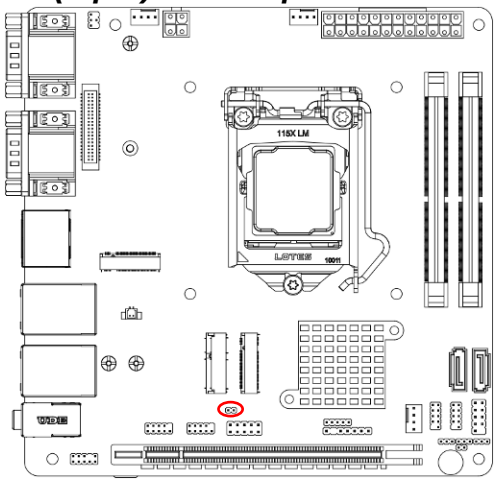


JP2→ME Features Select

1-2 Open: Enable ME Features;

1-2 Closed: Disable ME Features.

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



COPEN →*Case Open Detection*

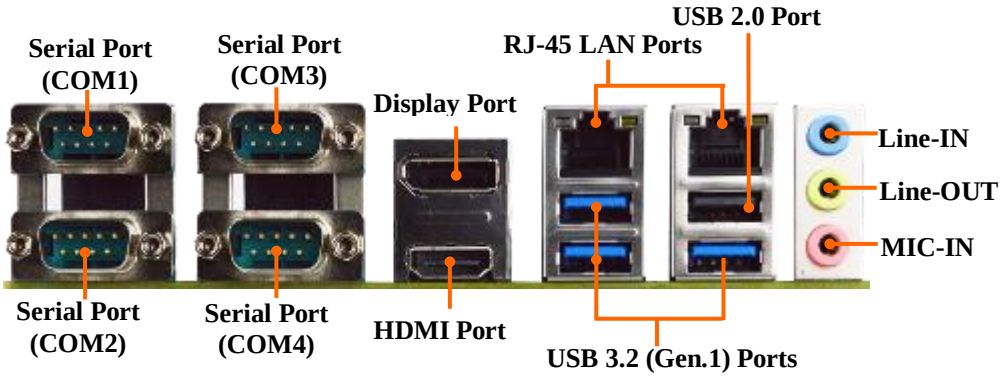
1-2 Open: Normal;

1-2 Closed: Case Open Function Selected.

2-2 Connectors and Headers

2-2-1 Connectors

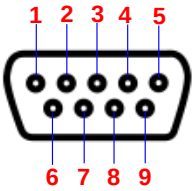
(1) Rear Panel Connectors

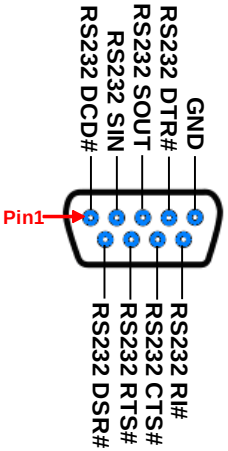


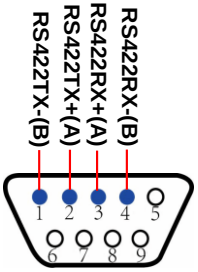
Icon	*Name*	*Function*
	Serial Port	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface. ***Note:** COM1 supports RS232/422/485 function.*
	Display Port	To the system to corresponding display device with compatible display port cable.
	HDMI Port	To connect display device that support HDMI specification.
	RJ-45 LAN Port	This connector is standard RJ-45 LAN jack for Network connection.
	USB 3.2 Port	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.2 ports supports up to 5Gbps data transfer rate.
	USB 2.0 Port	To connect USB keyboard, mouse or other devices compatible with USB specification.
	Audio Connectors	**BLUE:** Line-in Connector **GREEN:**Line-out Connector **PINK :** MIC Connector

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

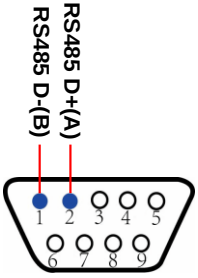
COM1 port can function as RS232/422/485 port. In normal settings COM1 functions as RS232 port. With compatible COM cable COM1 can function as RS422 or RS 485 port. User also needs to go to BIOS to set **'Transmission Mode Select'** for COM1 at first, before using specialized cable to connect different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







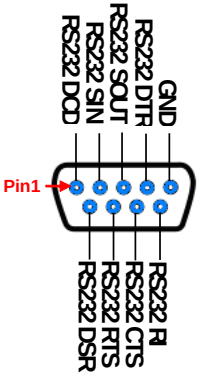
For RS422 Mode



For RS485 Mode

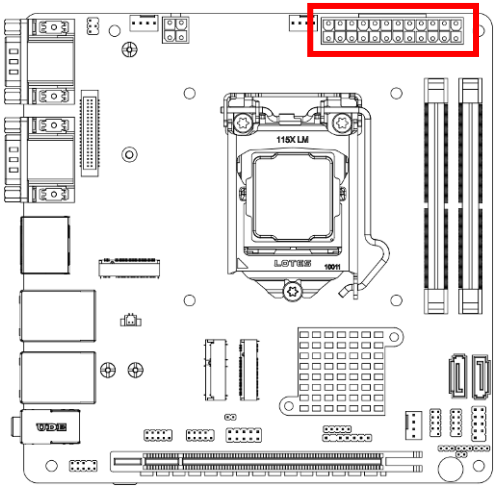
(3) COM2/3/4 (9-pin Block): RS232 Port

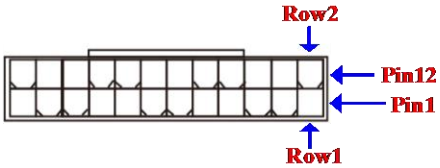
COM2/COM3 port can function as RS232 port.



RS232 Mode

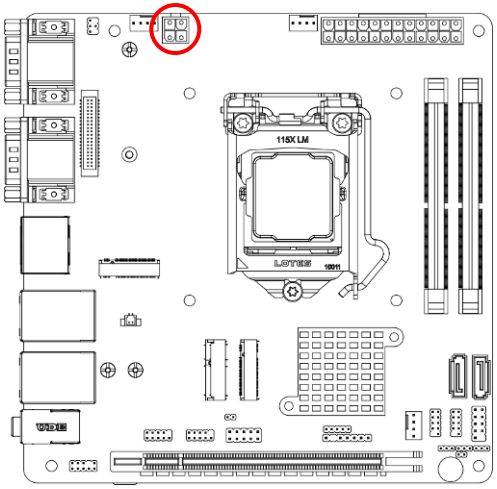
(4) ATXPWR (24-pin block): Power Connector

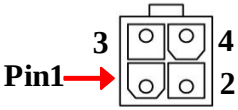




PIN	ROW2	ROW1
1	+3.3V	+3.3V
2	-12V	+3.3V
3	GND	GND
4	Soft Power on	+5V
5	GND	GND
6	GND	+5V
7	GND	GND
8	-5V	Power OK
9	+5V	+5V Stand by
10	+5V	+12V
11	+5V	+12V
12	GND	+3.3V

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

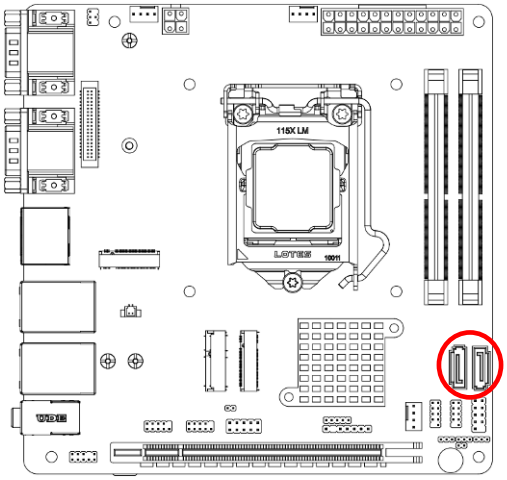




Pin No.	Definition
1	GND
2	GND
3	+12V
4	+12V

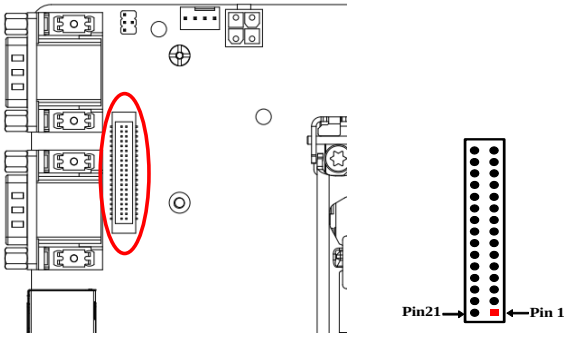
(6) SATA1/SATA2 (7-pin): SATA III Port connector

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



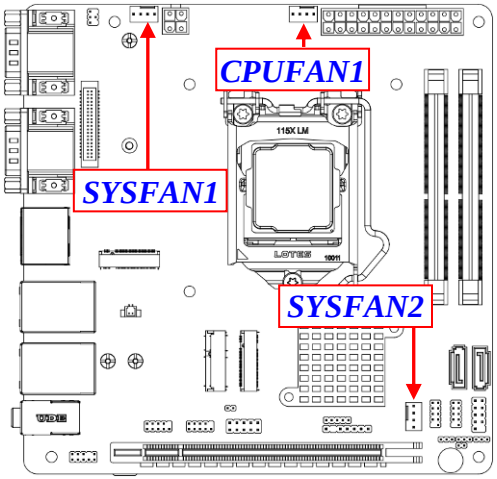
Pin No.	Defnition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

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

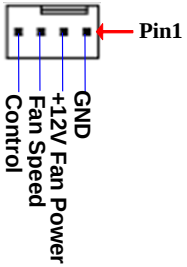


Pin No.	Pin Define	Pin No.	Pin Define
Pin 40	NC	**Pin 20**	LCD_VCC
Pin 39	LCD_BKLT_PWR	**Pin 19**	LCD_VCC
Pin 38	LCD_BKLT_PWR	**Pin 18**	LCD_VCC
Pin 37	LCD_BKLT_PWR	**Pin 17**	GND
Pin 36	LCD_BKLT_PWR	**Pin 16**	EDP_AUXN
Pin 35	NC	**Pin 15**	EDP_AUXP
Pin 34	Option	**Pin 14**	GND
Pin 33	LCD_BKLT_PWM	**Pin 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**	E DP_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

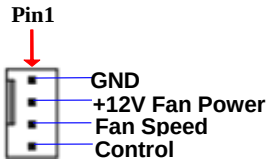
(8) CPUFAN1/SYSFAN1/SYSFAN2 (4-pin): Fan Connector



CPUFAN1/SYSFAN1

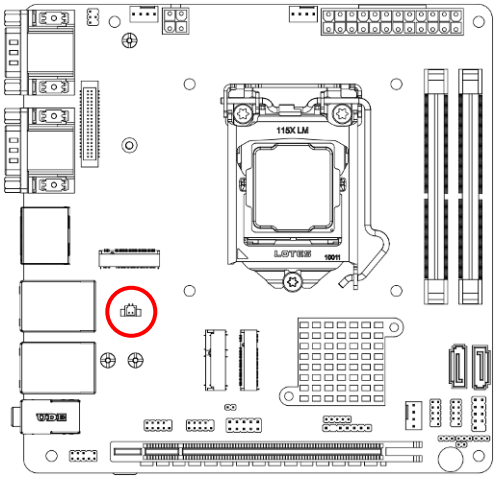


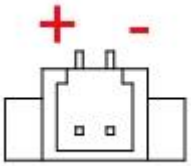
SYSFAN2



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

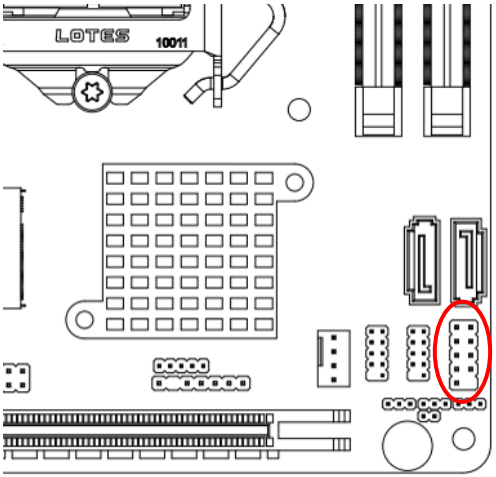
(9) BATCON (2-pin): Battery Connector

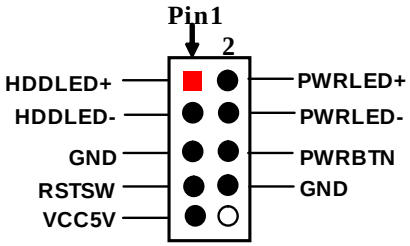




2-2-2 Headers

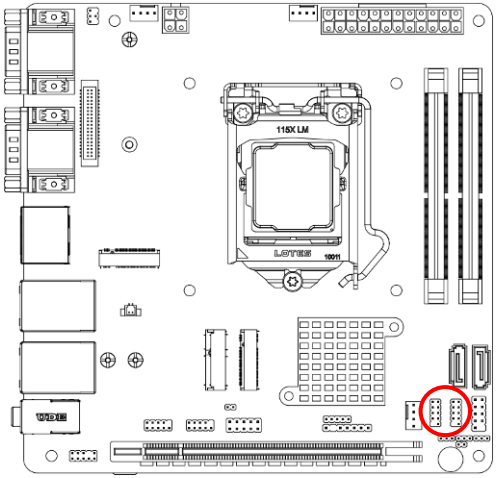
(1) FP (9-pin): Front Panel Header (2.54 pitch)

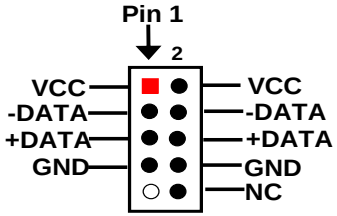




***Note:** Maximum current limit is **1A** while using 5V working voltage.*

(2) FP_USB1/FP_USB2 (9-pin): USB 2.0 Port Headers (2.0 pitch)

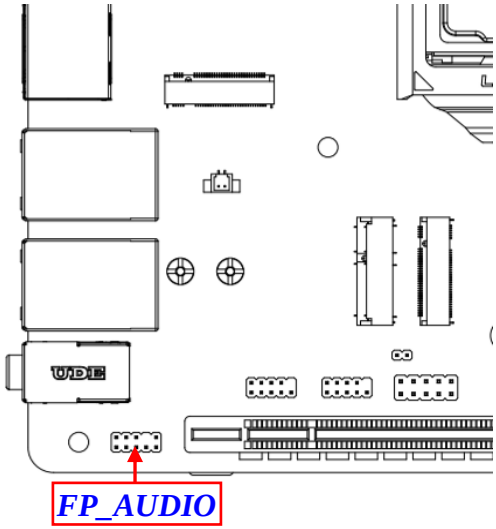


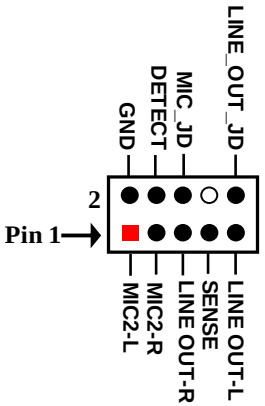


***Note:** Maximum current limit is **1.5A** while using 5V working voltage.*

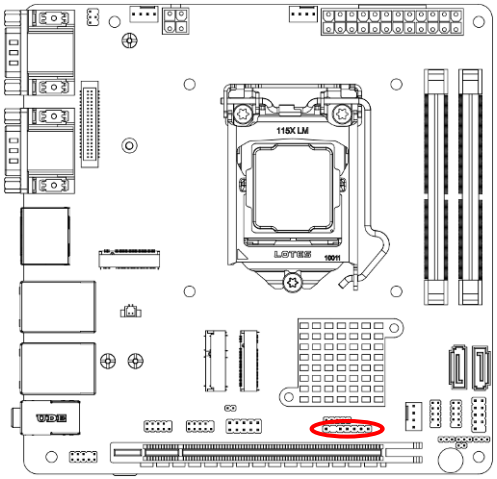
(3) FP_AUDIO (9-pin): Line-Out, MIC-In Header (2.0 pitch)

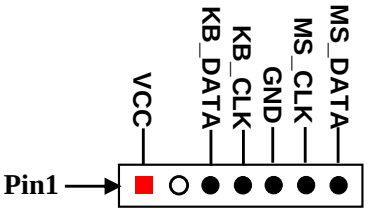
This header connects to Front Panel Line-out, MIC-In connector with cable.





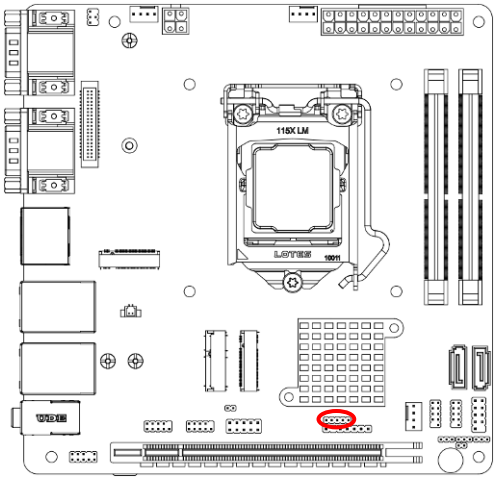
(4) S2KBMS1 (6-pin): PS/2 Keyboard & Mouse Header (2.54 pitch)

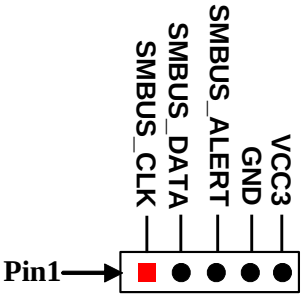




***Note:** Maximum current limit is **500mA** while using 5V working voltage.*

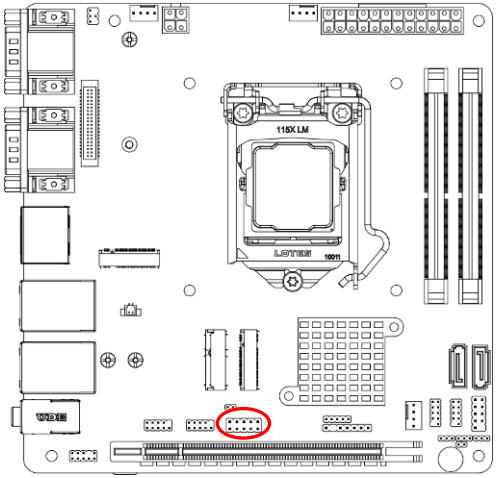
(5) SMBUS (5-Pin): SMBUS Header (2.0 pitch)

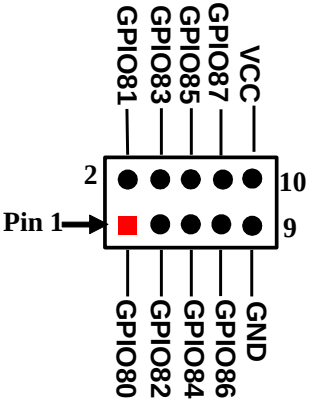




***Note:** Maximum current limit is **1A** while using 3.3V working voltage.*

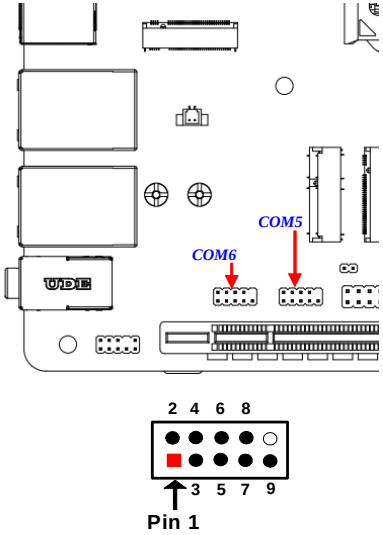
(6) GPIO(10-pin): GPIO Header (2.54 pitch)





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

(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

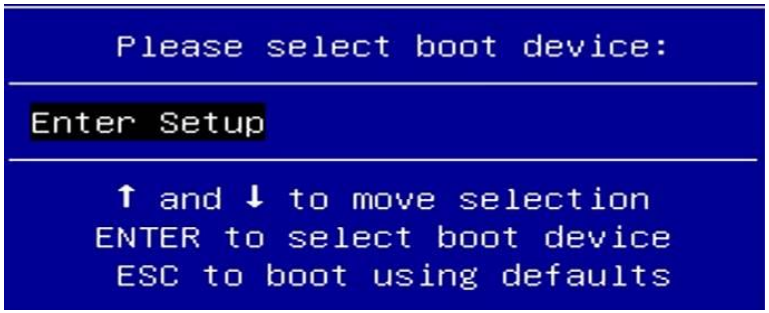
Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download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

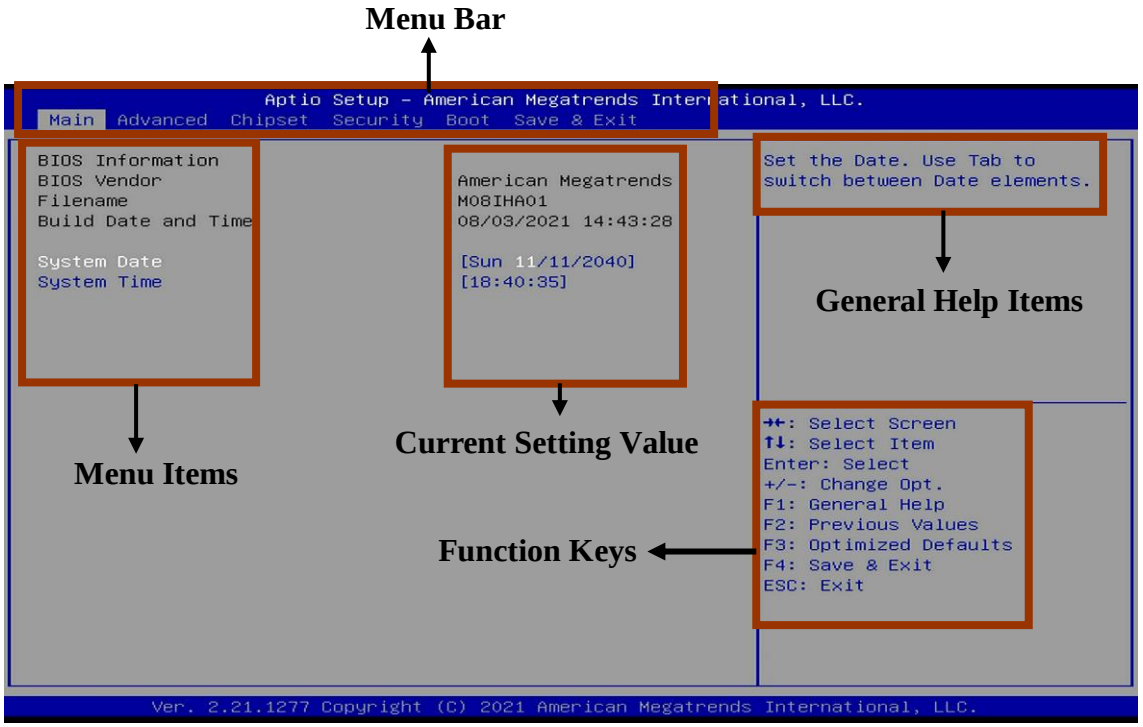
Press **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.



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

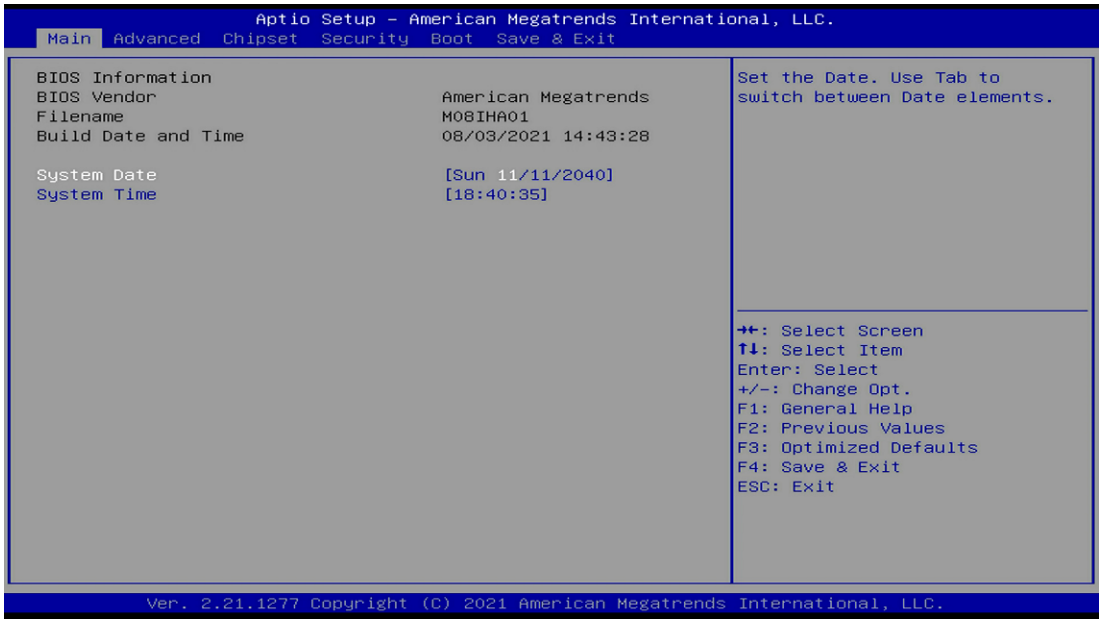
There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
Save & Exit	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.

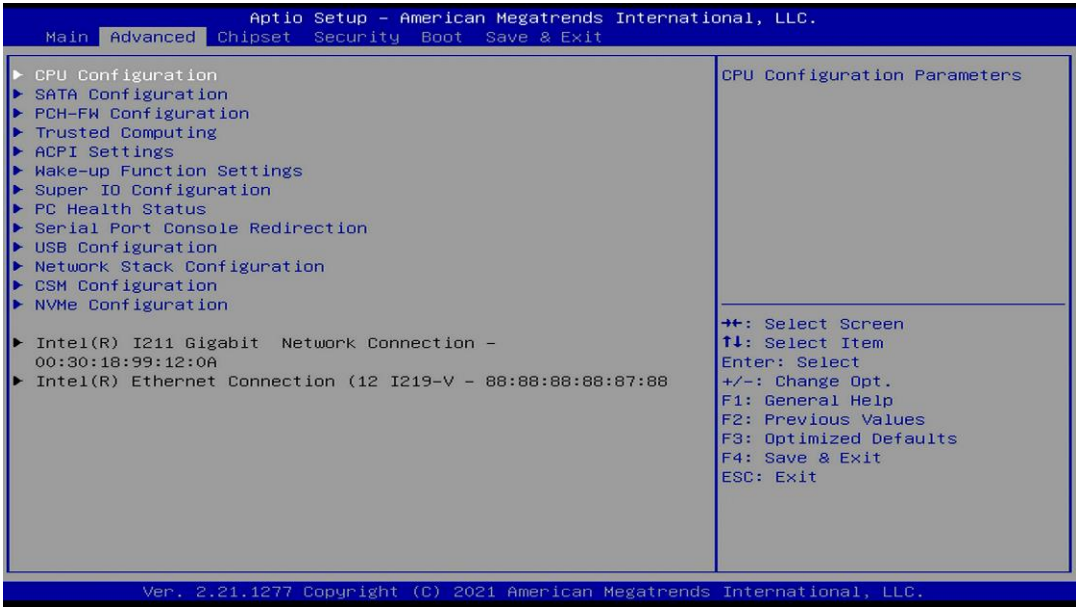
3-6 Main Menu

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.



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.

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]; [XTERMR6]; [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

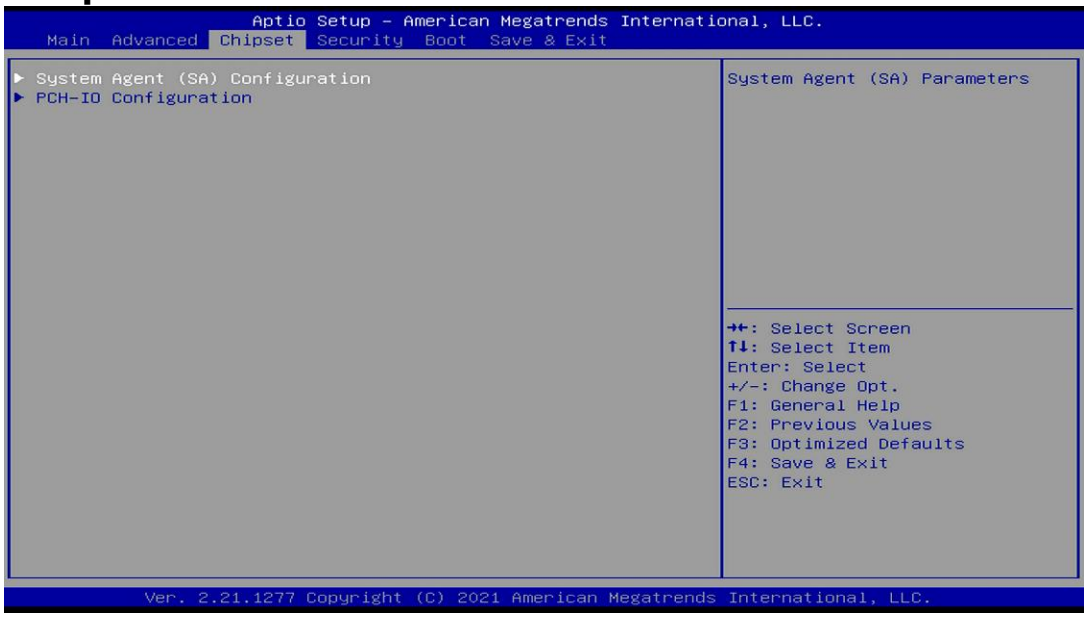
Use this item to enable or disable CSM Support
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following sub-items shall appear:

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) I211 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].

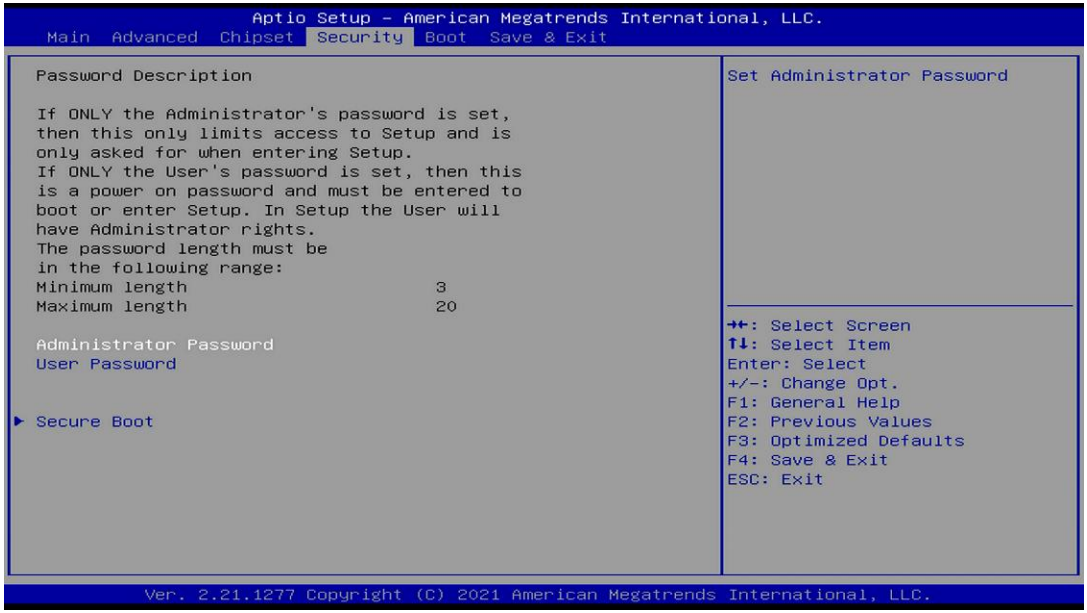
System State After Power Failure

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.

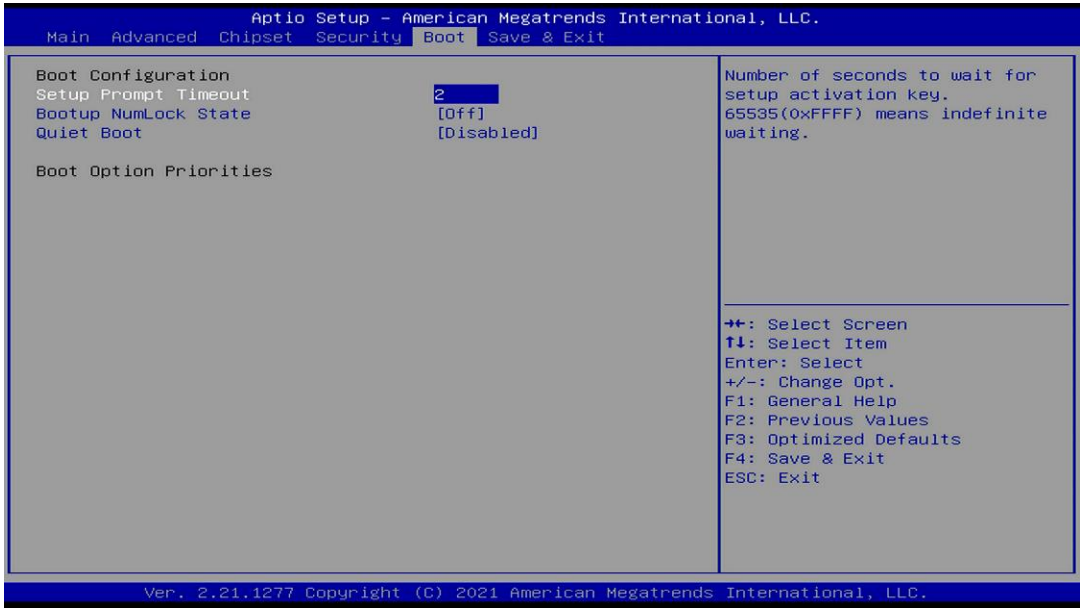
Secure Boot variable/Size/Keys/Key Source

- **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.

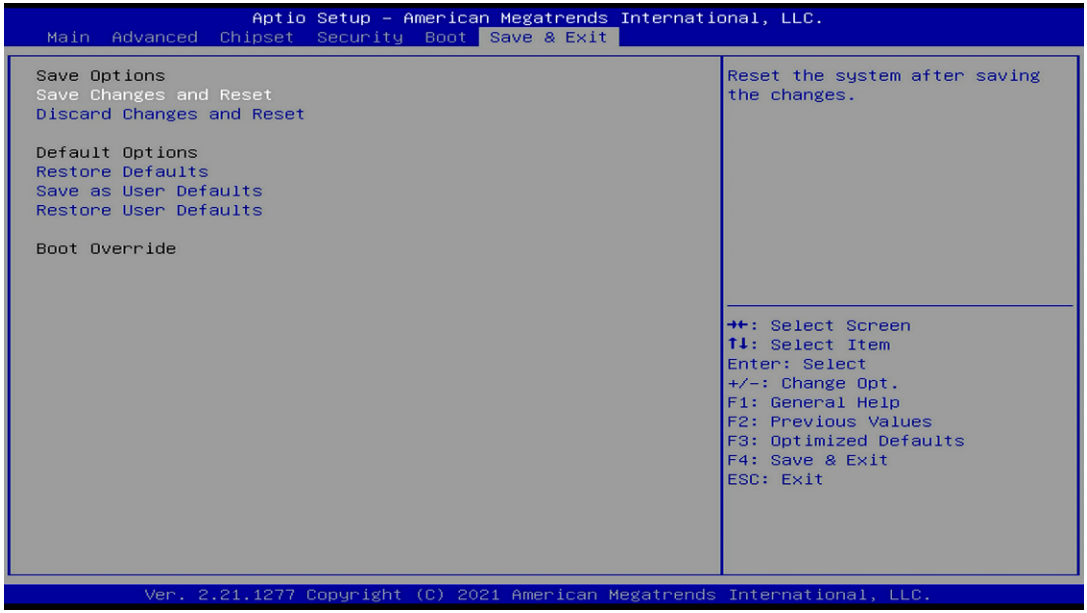
The optional settings: [On]; [Off].

Quiet Boot

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

Boot Option Priorities

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