# *TECHNICAL MANUAL*

# *Of*

# *Intel H310 Express Chipset*

# *Based Mini-ITX M/B*

**NO. G03-MI98-F**

**Revision: 3.0**

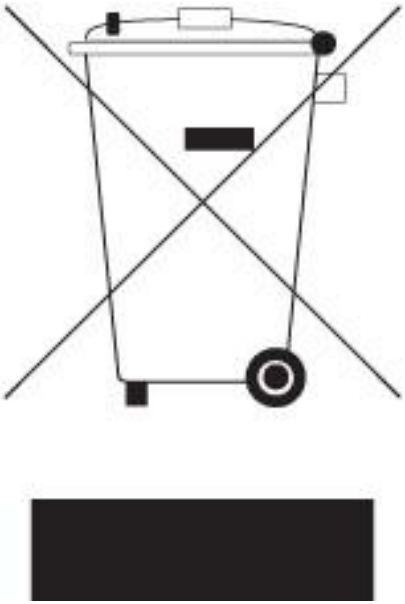
**Release date: December 15, 2020**

**Trademark:**

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

## 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



## Manual Revision Information

| Reversion | Revision History | Date |
|---|---|---|
| 3.0 | Third Edition | December 15, 2020 |

## Item Checklist

☑ Motherboard

☑ Cable(s)

# Chapter 1
# Introduction of the Motherboard

## 1-1 Feature of Motherboard

- IntelH310 express chipset
- LGA 1151 CPU socket supports Intel® 8th & 9th Generation Core i9/i7/i5/i3/Pentium/Celeron series processor (TDP:95W)
- Support 2* DDR4 2666MHz SO-DIMM up to 64GB and dual channel function
- Intel® HD Graphics integration supports 1*HDMI,1*Display Port & 1*EDP
- 2* SATA III (6Gb/s) & M.2 M-key (type-2242/2280,NVMe) slot
- 1* PCI-E x16 slot, 1*M.2 E key (type-2230) slot supports CNVi
- 2*RJ-45 LAN, 2*RS232 (**COM1** Support RS232/422/485), 4* External USB3.1, 4*Internal USB2.0
- Support ATX Power
- Support TPM 2.0 (**MI98-02 series**)
- Support Smart FAN function
- Supports ACPI S3 Function
- Compliance with ErP Standard
- Support Watchdog Timer Technology

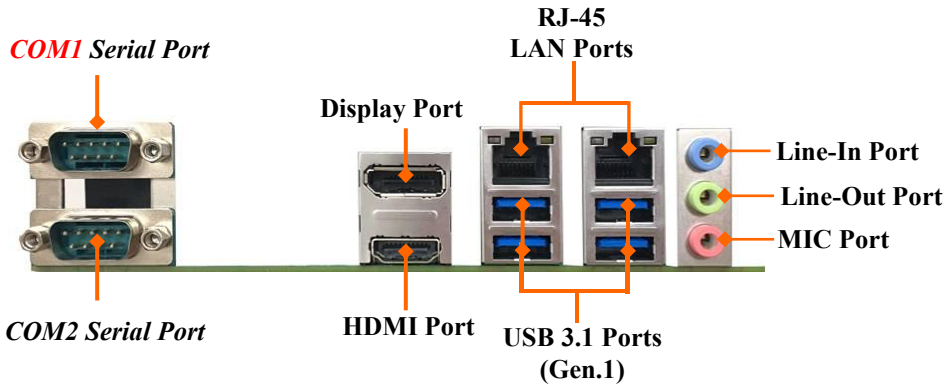
## 1-2 Specification

| Spec | Description |
|---|---|
| **Design** | ● Mini-ITX form factor; PCB size: 17.0x17.0cm |
| **Chipset** | ● Intel H310 Express Chipset |
| **CPU Socket** | ● Intel® LGA 1151 Socket for Intel® 8th & 9th Generation Core i9/i7/i5/i3/Pentium/Celeron processors (TDP: 95W)<br>**Note*: for detailed CPU support information please visit our website* |
| **Memory Slot** | ● 2*DDR4 SO-DIMM slot<br>● Support DDR4 2666MHz SDRAM<br>● Maximum capacity: up to 64GB<br>● *Memory frequency range also depends on CPU support* |
| **Expansion Slot** | ● 1* PCIe x16 slot *(**PCIE16**)*<br>● 1* M.2 E Key slot *(**M2E,** type-2230, USB2.0 & PCIe x1 interface supports CNVi)* |
| **Storage** | ● 2* SATAIII 6G/s port **(*SATA1/2*)**<br>● 1* M.2 M-key slot *(**M2M,** type-2242/2280, SATA with PCIe x4 interface for NVMe)* |
| **LAN Chip** | ● Integrated with 1* Intel i219-V & 1* Realtek 8111H Gigabit PCI-E LAN chip<br>● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate |
| **Audio Chip** | ● Realtek ALC662-VC HD Audio Codec integrated<br>● Audio driver and utility included |
| **BIOS** | ● AMI Flash ROM |
| **Multi I/O** | ***Rear Panel I/O:***<br>● 2* Serial Port (**COM1_COM2**, **COM1** supports RS232/422/485)<br>● 1* DP Port<br>● 1* HDMI Port<br>● 2* RJ-45 LAN port<br>● *4* USB 3.1 (Gen.1) port*<br>● 1* Audio Jack**(Line-In + Line-Out +MIC)** |

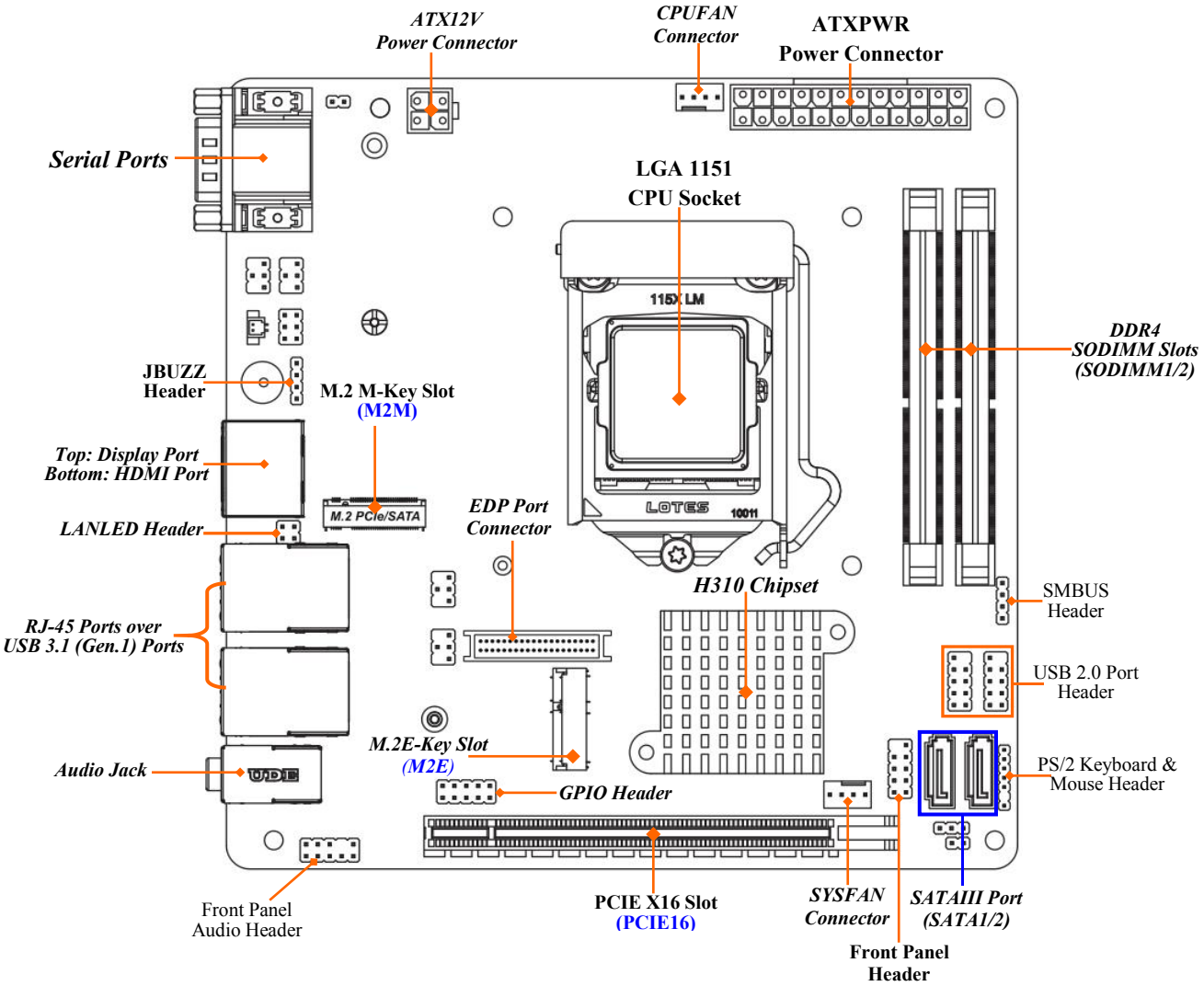
| | |
|---|---|
| | ***Internal I/O Connectors & Headers:***<br>● 1 *24-pin ATX main power connector<br>● 1 *4-pin ATX12V power connector<br>● 1* CPUFAN connector &1* SYSFAN connector<br>● 1* EDP connector<br>● 1* Front panel header<br>● 2* 9-Pin USB 2.0 header for 4* USB 2.0 ports<br>● 1* PS/2 keyboard & mouse header<br>● 1* SMBUS header<br>● 1*Front panel audio header<br>● 1*GPIO header<br>● 1* LAN_LED header<br>● 1* JBUZZ header |

## 1-3 Layout Diagram

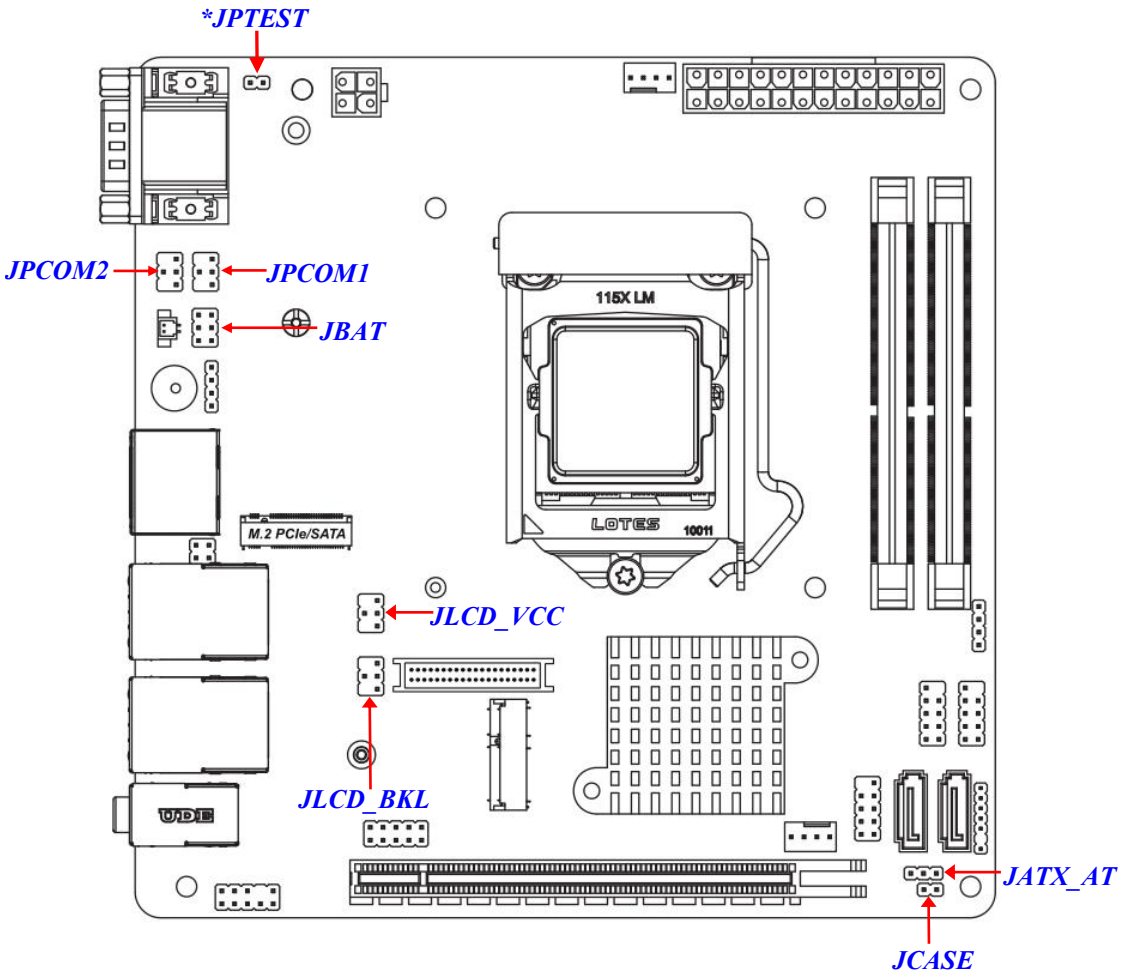
### *Rear IO Diagram*



# *Motherboard Internal Diagram:*



## *Motherboard Jumper Position:*




*Note: **JPTEST** is for manufacture usage only.*

## *Connectors*

| P/N | Name |
|---|---|
| **ATXPWR** | 24-Pin ATX Main Power Connector |
| **ATX12V** | 4-Pin 12V Power Connector |
| **COM1_COM2** | **Top:** RS232/422/485 Serial Port(**COM1**)<br>**Bottom:** RS232 Serial Port (**COM2**) |
| **HDMI-DP** | **Top:** Display Port<br>**Bottom:** HDMI Port |
| **USB1-LAN1** | **Top:** RJ-45 LAN Connector (**PHY LAN I219V**)<br>**Middle & Bottom:** USB 3.1 (Gen.1) Port Connector x2 |
| **USB2-LAN2** | **Top:** RJ-45 LAN Connector (**RTL8111H**)<br>**Middle & Bottom:** USB 3.1 (Gen.1) Port Connector x2 |
| **AUDIO** | **Top:** Line-in Connector<br>**Middle:** Line-out Connector<br>**Bottom:** MIC Connector |
| **SATA1/2** | SATAIII Connector X2 |
| **CPUFAN** | CPUFAN Connector |
| **SYSFAN** | System Fan Connector |
| **EDP** | EDP Port Connector |

## *Headers*

| P/N | Name | Description |
|---|---|---|
| JW_FP | Front Panel Header<br>(PWR LED/ HD LED/Power Button /Reset) | 9-pin Block |
| FP_USB1/2 | USB 2.0 Port Headers | 9-pin Block |
| PS2KBMS | PS/2 Keyboard & Mouse Header | 6-pin Block |
| SMBUS | SMBUS Header | 4-pin Block |
| FP_AUDIO | Front Panel Audio Header | 9-pin Block |
| JGPIO_CN | GPIO Port Header | 10-pin Block |
| JBUZZ | Buzzer Header | 4-pin Block |
| JLAN_LED | LAN Activity LED Header | 4-pin Block |

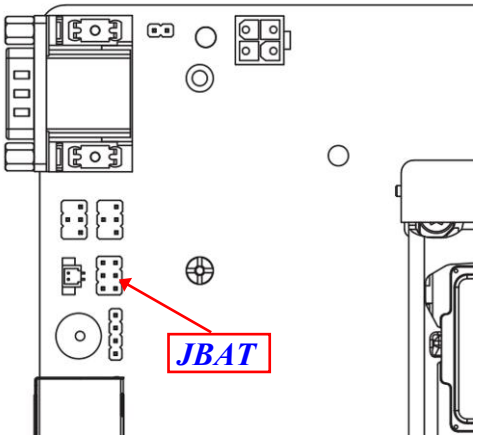
## *Jumper*

| P/N | Name | Description |
|---|---|---|
| JBAT | ***Pin (1-2):*** Clear CMOS RAM Settings<br>***Pin (3-4):*** Flash Descriptor Override<br>***Pin (5-6):*** PWROK Override | 6-pin Block |
| JPCOM1 | COM1 Port Pin-9 | 4-pin Block |
| JPCOM2 | COM2 Port Pin-9 | 4-pin Block |
| JATX_AT | ATX/AT Mode Select | 3-pin Block |
| JCASE | Case Open Display Select | 2-pin Block |
| JLCD_VCC | LCD Panel VCC Select | 4-pin Block |
| JLCD_BKL | LCD Backlight Select | 4-pin Block |

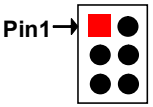
# Chapter 2
# Hardware Installation

## 2-1 Jumper Setting

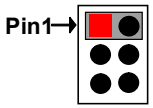
***Pin 1&2 of JBAT (6-pin): Clear CMOS RAM Setting***




***Pin 1&2 of JBAT→Clear CMOS***

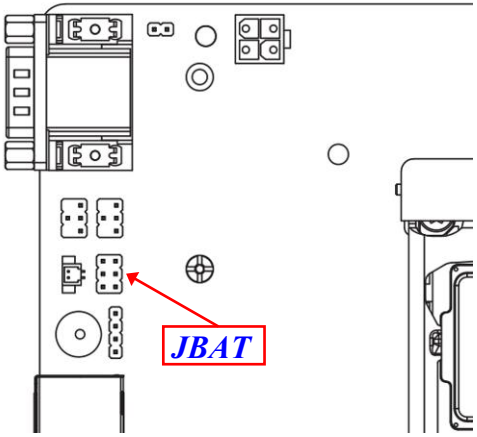



**1-2 Open: Normal(Default);**

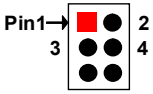



**1-2 Closed: Clear CMOS(One Touch).**

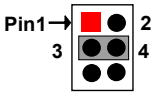
### *Pin 3&4 of JBAT (6-pin): Flash Descriptor Override Select*




***Pin 3&4 of JBAT→***
***Flash Descriptor Override***

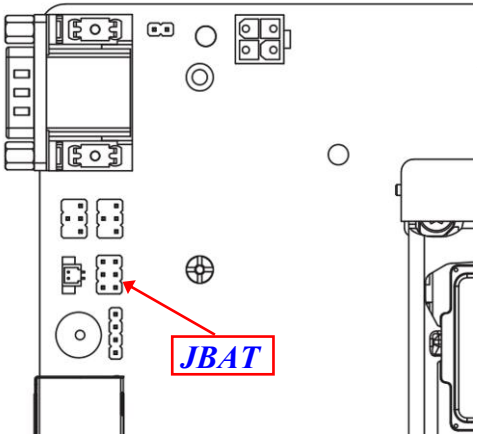



**3-4 Open: Normal(Default);**

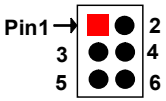



**3-4 Closed: Disable Flash Descriptor Security (Override).**

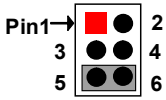
### *Pin 5&6 of JBAT (6-pin): PWROK Override Select*




***Pin 5&6 of JBAT→PWROK Override***



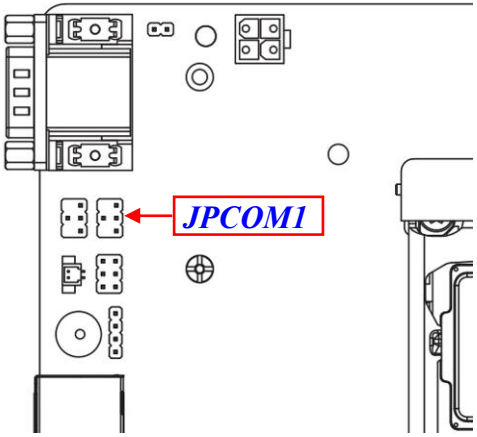

**5-6 Open: Normal(Default);**



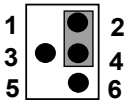

**5-6 Closed: PWROK Override.**

** **Note**: **PWROK override** is for manufacturing test only.*

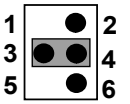
## *JPCOM1 (4-pin): COM1 Port Pin9 Function Select*



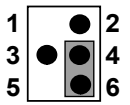

*JPCOM1→COM1 Port Pin-9*




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

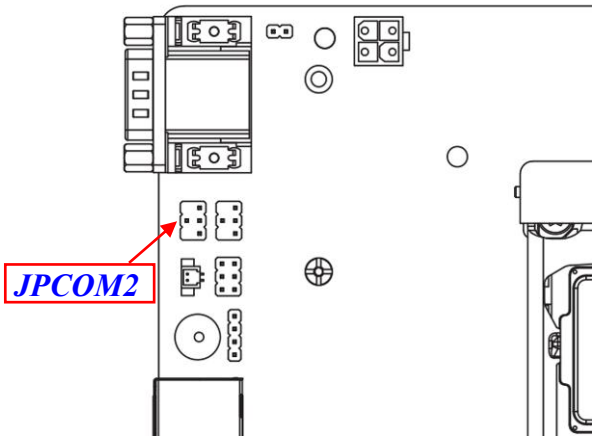



**3-4 Closed:**
**Pin9=+5V;**

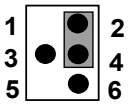



**4-6 Closed:**
**Pin9=+12V.**

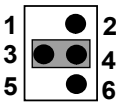
## *JPCOM2 (4-pin): COM2 Port Pin9 Function Select*



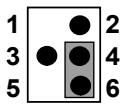

*JPCOM2→COM2 Port Pin-9*




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

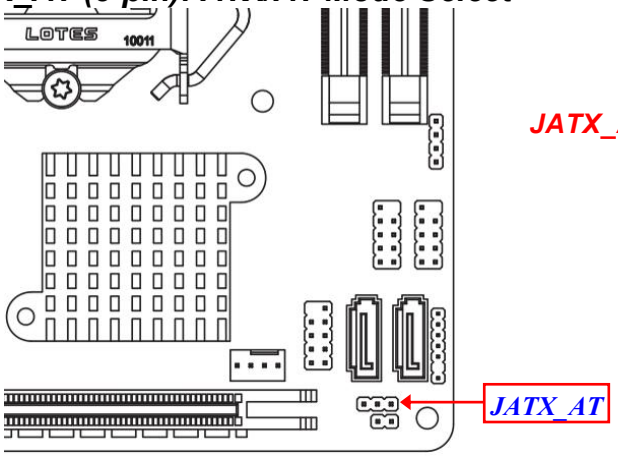



**3-4 Closed:**
**Pin9=+5V;**

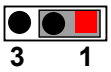



**4-6 Closed:**
**Pin9=+12V.**

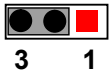
***JATX_AT (3-pin): ATX/AT Mode Select***




***JATX_AT→ATX/AT Mode Select***



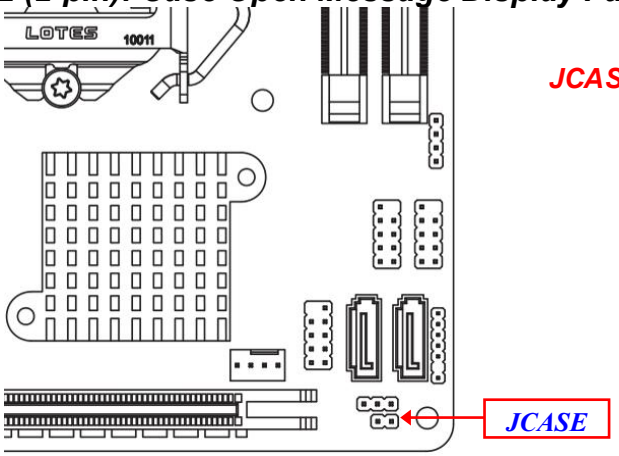

**1-2 Closed: ATX Mode;**



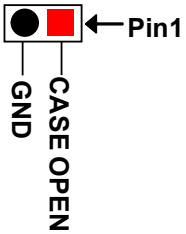

**2-3 Closed: AT Mode.**

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

***JCASE (2-pin): Case Open Message Display Function Select***

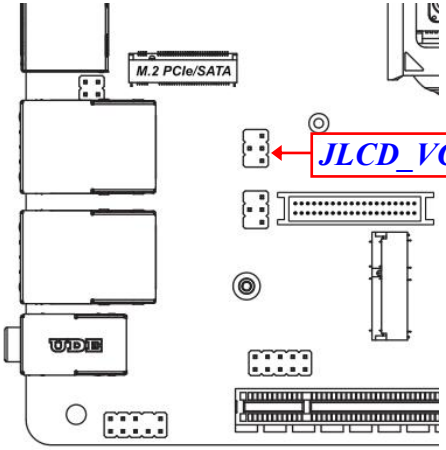



***JCASE→ Case Open Detection***

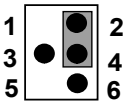



**Pin (1&2) short**: *When Case open function pin short to GND, the Case open function was detected. When used, needs to enter BIOS and enable '**Case Open Detect**' function. In this case if your case is removed, next time when you restart your computer, a message will be displayed on screen to inform you of this.*

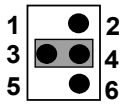
## *JLCD_VCC(4-pin): LCD Panel VCC Select*



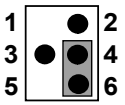

*JLCD_VCC→LCD Panel VCC*




**2-4 Closed:**
**LCD VCC=3.3V;**

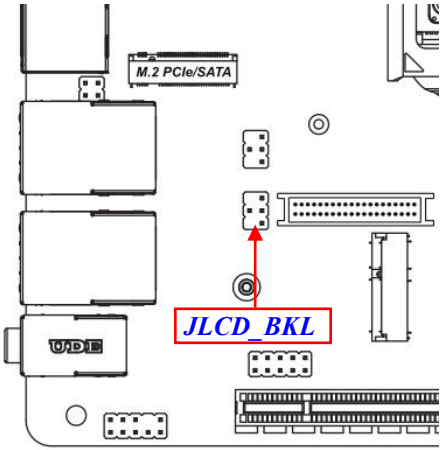



**3-4 Closed:**
**LCD VCC =5V;**

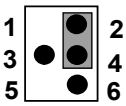



**4-6 Closed:**
**LCD VCC =12V.**

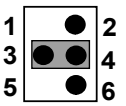
## *JLCD_BKL(4-pin): LCD Panel Backlight Select*



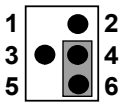

*JLCD_BKL→LCD Backlight VCC Select*




**2-4 Closed:**
**BKLT VCC=3.3V;**




**3-4 Closed:**
**BKLT VCC =5V;**




**4-6 Closed:**
**BKLT VCC=12V.**

# 2-2 Connectors and Headers

## 2-2-1 Connectors

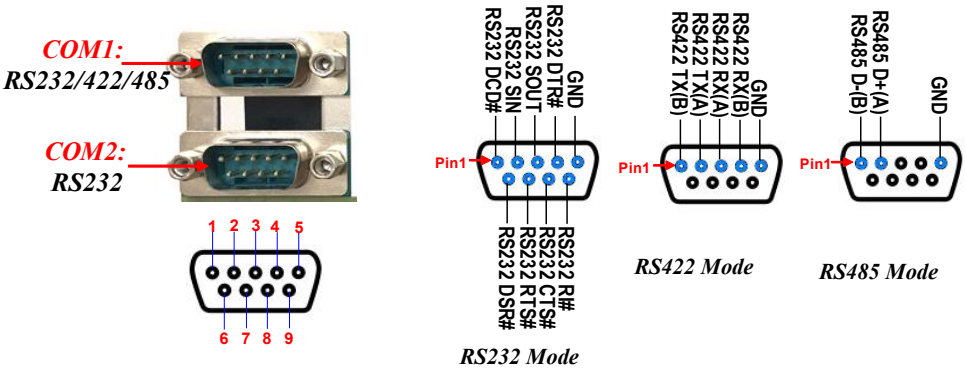
### (1) Rear Panel Connectors

***Refer to Page-3 Rear IO Diagram.***

| *Icon* | *Name* | *Function* |
|---|---|---|
|  | **Serial Port** | Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.<br>***Note: COM1** (**Top**) 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 3.1(Gen.1)Port** | To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.1 (Gen.1) ports supports up to 5Gbps data transfer rate. |
|  | **Audio Connectors** | **BLUE:** Line-in Connector<br>**GREEN:**Line-out Connector<br>**PINK :** MIC Connector |

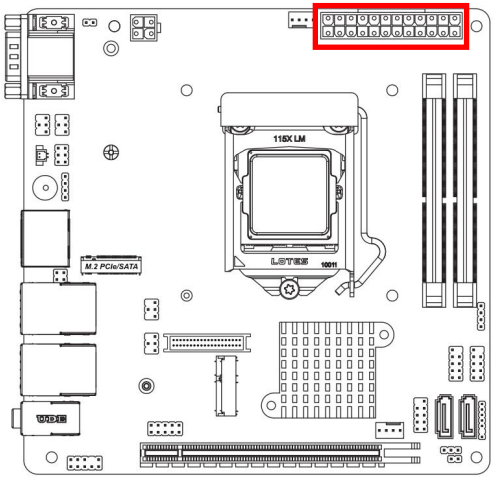
## (2) COM1_COM2(9-pin Block): Serial Port

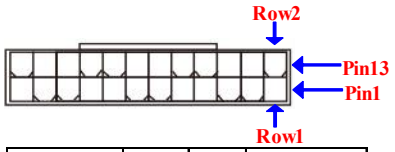
***COM1**: RS232/422/485 Serial Port; **COM2:** RS232 Serial Port.*
The pin assignment for RS-232/ 422/ 485 is listed as follows:




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.

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

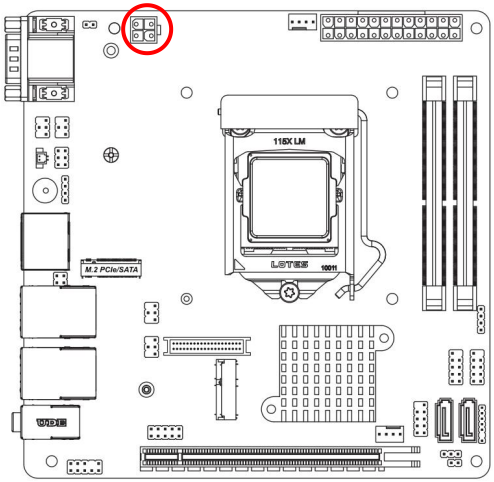


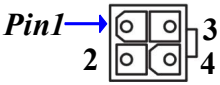



| ROW1 | PIN | PIN | ROW2 |
|---|---|---|---|
| +3.3V | 1 | 13 | +3.3V |
| +3.3V | 2 | 14 | -12V |
| GND | 3 | 15 | GND |
| +5V | 4 | 16 | Soft Power on |
| GND | 5 | 17 | GND |
| +5V | 6 | 18 | GND |
| GND | 7 | 19 | GND |
| Power OK | 8 | 20 | -5V |
| +5V Stand by | 9 | 21 | +5V |
| +12V | 10 | 22 | +5V |
| +12V | 11 | 23 | +5V |
| +3.3V | 12 | 24 | GND |

**24-pin Main Power Connector**

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

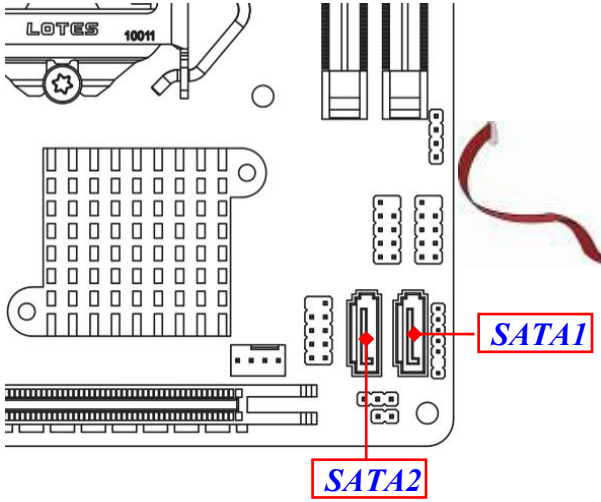





| Pin No. | Definition |
|---|---|
| 1 | GND |
| 2 | GND |
| 3 | +12V |
| 4 | +12V |

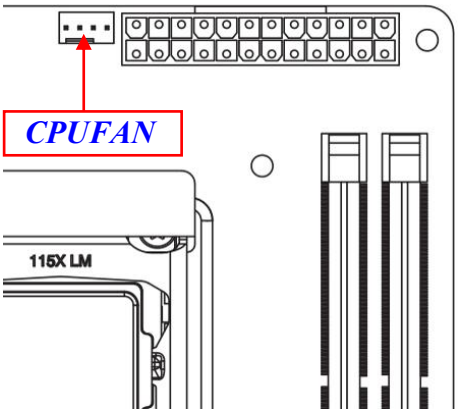
### (5) SATA1/SATA2(7-pin): SATA III Port connector

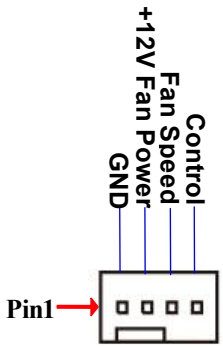
SATA1 & SATA2 are high-speed SATAIII port that supports 6 GB/s transfer rate.



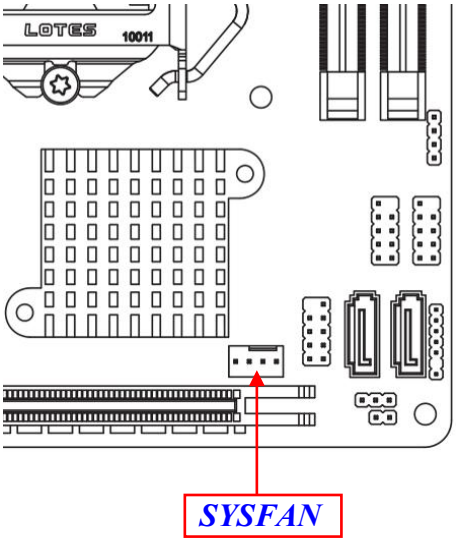

| Pin No. | Definition |
|---|---|
| 1 | GND |
| 2 | TXP |
| 3 | TXN |
| 4 | GND |
| 5 | RXN |
| 6 | RXP |
| 7 | GND |

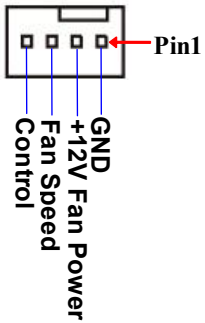
## (6) CPUFAN (4-pin): CPU Fan Connector



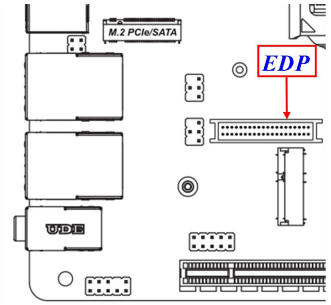



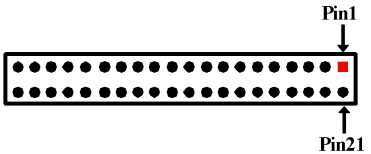

## (7) SYSFAN (4-pin):System Fan Connector



## (8) EDP(40-pin): EDP Connector

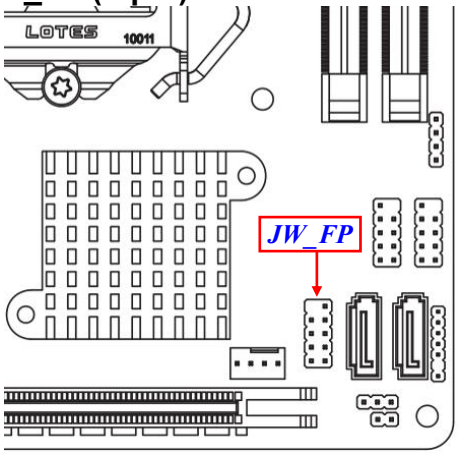


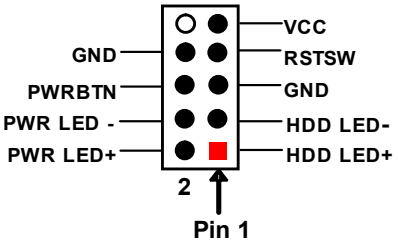




| Pin No. | Pin Define | Pin No. | Pin Define |
|---|---|---|---|
| **Pin 1** | NC | **Pin 21** | NC |
| **Pin 2** | GND | **Pin 22** | NC |
| **Pin 3** | EDP_DATA3N | **Pin 23** | GND |
| **Pin 4** | EDP_DATA3P | **Pin 24** | GND |
| **Pin 5** | GND | **Pin 25** | GND |
| **Pin 6** | EDP_DATA2N | **Pin 26** | GND |
| **Pin 7** | EDP_DATA2P | **Pin 27** | EDP_HPD |
| **Pin 8** | GND | **Pin 28** | GND |
| **Pin 9** | E DP_DATA1N | **Pin 29** | GND |
| **Pin 10** | EDP_DATA1P | **Pin 30** | GND |
| **Pin 11** | GND | **Pin 31** | GND |
| **Pin 12** | EDP_DATA0N | **Pin 32** | LCD_BKLT_EN |
| **Pin 13** | EDP_DATA0P | **Pin 33** | LCD_BKLT_CTL |
| **Pin 14** | GND | **Pin 34** | NC |
| **Pin 15** | EDP_AUXP | **Pin 35** | NC |
| **Pin 16** | EDP_AUXN | **Pin 36** | LCD_BKLT_PWR VCC |
| **Pin 17** | GND | **Pin 37** | LCD_BKLT_PWR VCC |
| **Pin 18** | LCD_VCC | **Pin 38** | LCD_BKLT_PWR VCC |
| **Pin 19** | LCD_VCC | **Pin 39** | LCD_BKLT_PWR VCC |
| **Pin 20** | LCD_VCC | **Pin 40** | NC |

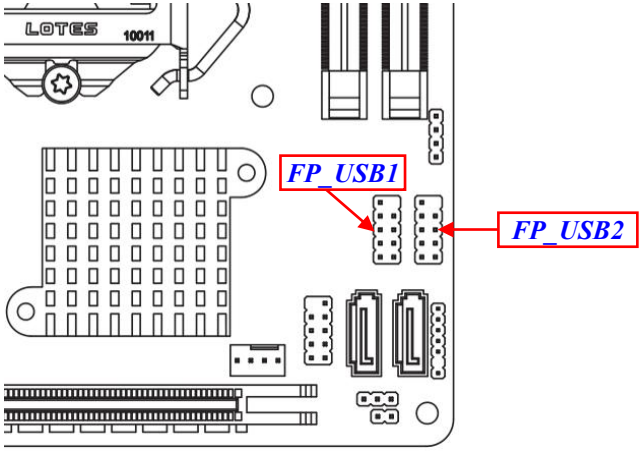
## 2-2-2 Headers

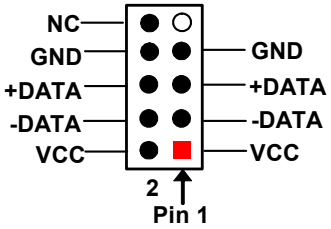
### (1) JW_FP (9-pin): Front Panel Header



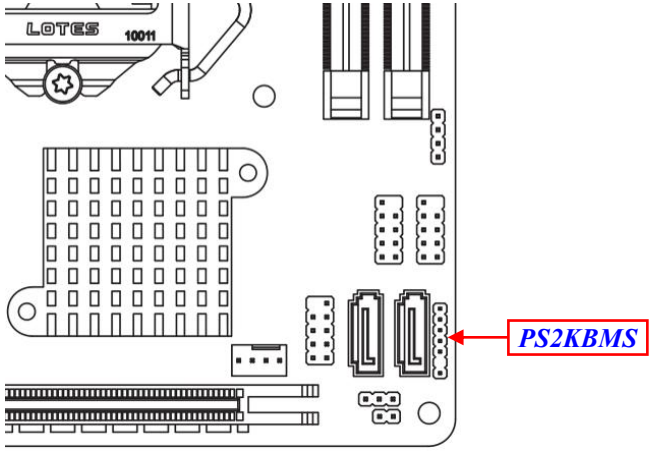



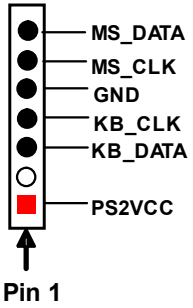

### (2) FP_USB1/FP_USB2 (9-pin): USB 2.0 Port Header



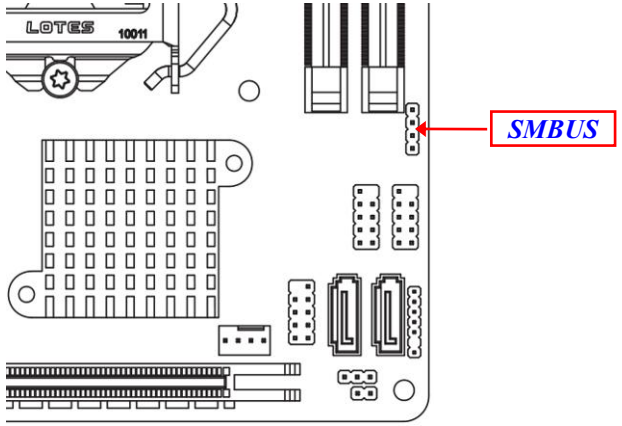



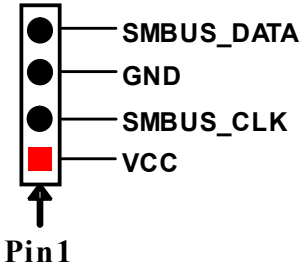
### (3) PS2KBMS (6-pin): PS/2 Keyboard & Mouse Header



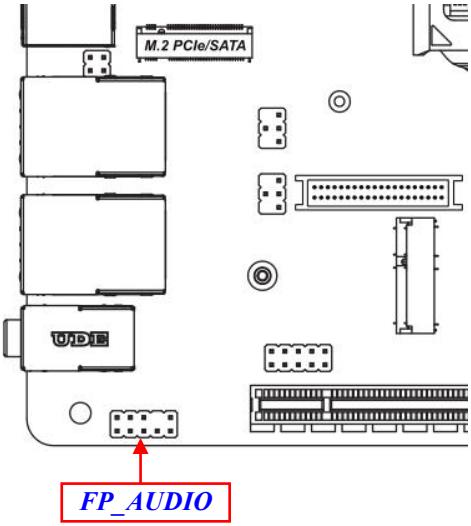

### (4) SMBUS(4-pin): SMBUS Header

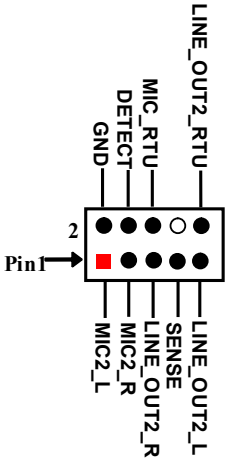


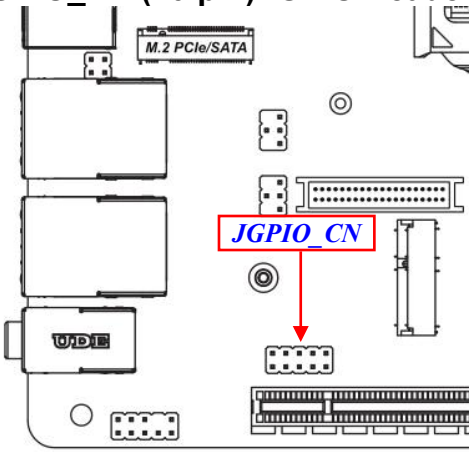
### (5) FP_AUDIO (9-pin): Line-Out, MIC-In Header

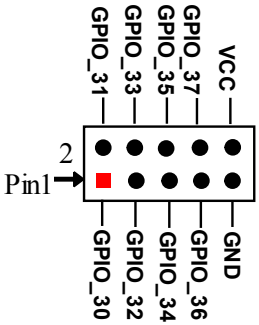
This header connects to Front Panel Line-out, MIC-In connector with cable.



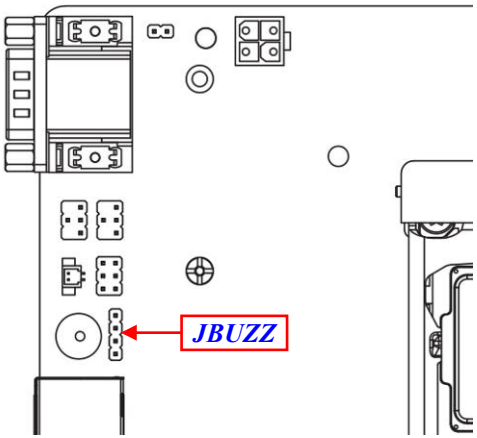



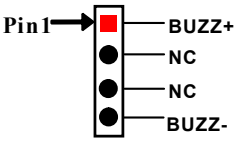

### (6) JGPIO_CN (10-pin): GPIO Header



## (7) JBUZZ(4-pin): Buzzer Header

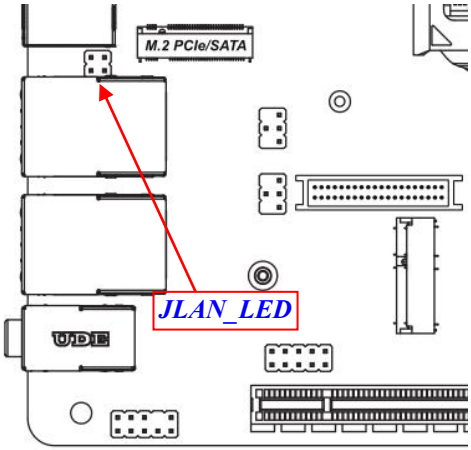


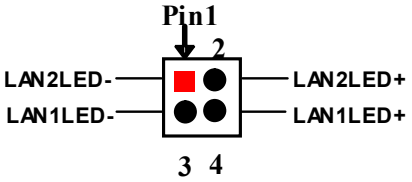




## (8) JLAN_LED (6-pin): LED Header

*Pin(1-2): For PCIe LAN (LAN2).*

*Pin(3-4): For PHY LAN (LAN1).*



# 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.

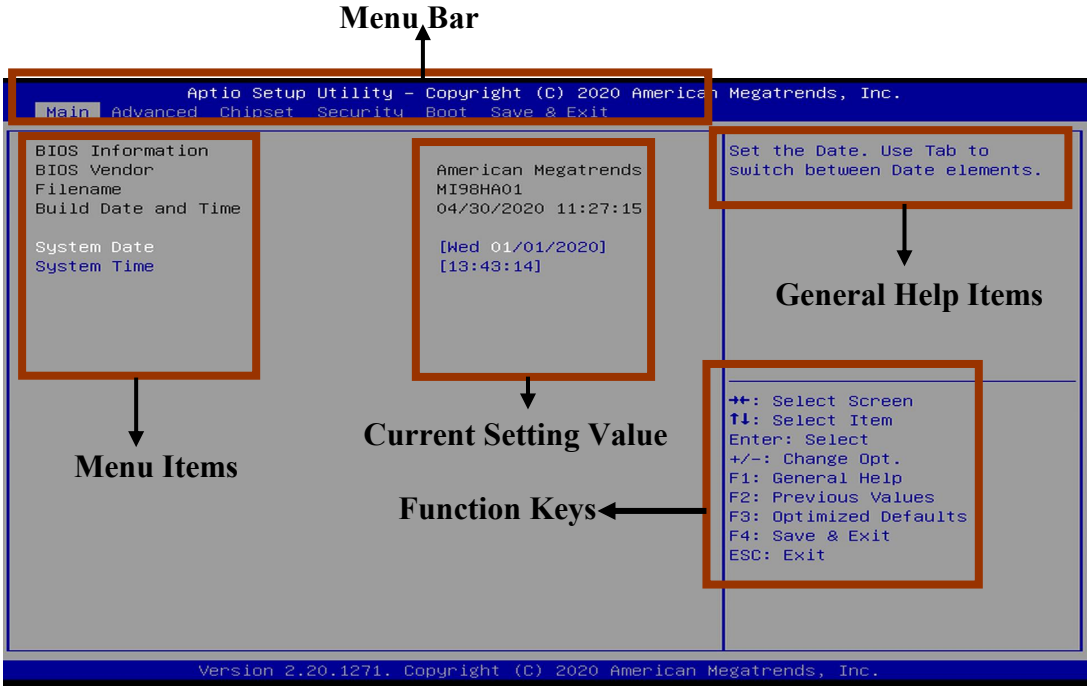
## 3-1 Entering Setup

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.

## 3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:




## 3-3 Function Keys

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

- Press←→ (left, right) to select screen;
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press **<Enter>** to select.
- Press **<+>/<–>** keys when you want to modify the BIOS parameters for the active option.

- **[F1]:** General help.
- **[F2]:** Previous value.
- **[F3]:** Optimized defaults.
- **[F4]:** Save & Exit.
- Press **<Esc>** to quit the BIOS Setup.

## 3-4 Getting Help

### Main Menu

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

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

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

## 3-5 Menu Bars

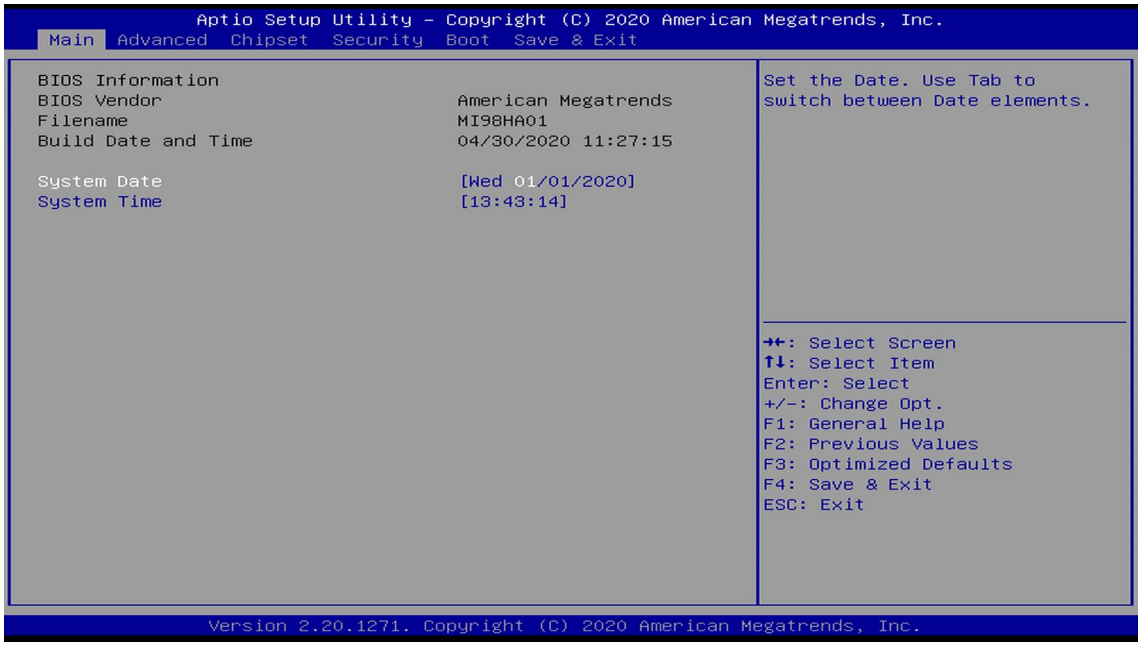
### There are six menu bars on top of BIOS screen:

| | |
|---|---|
| **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.



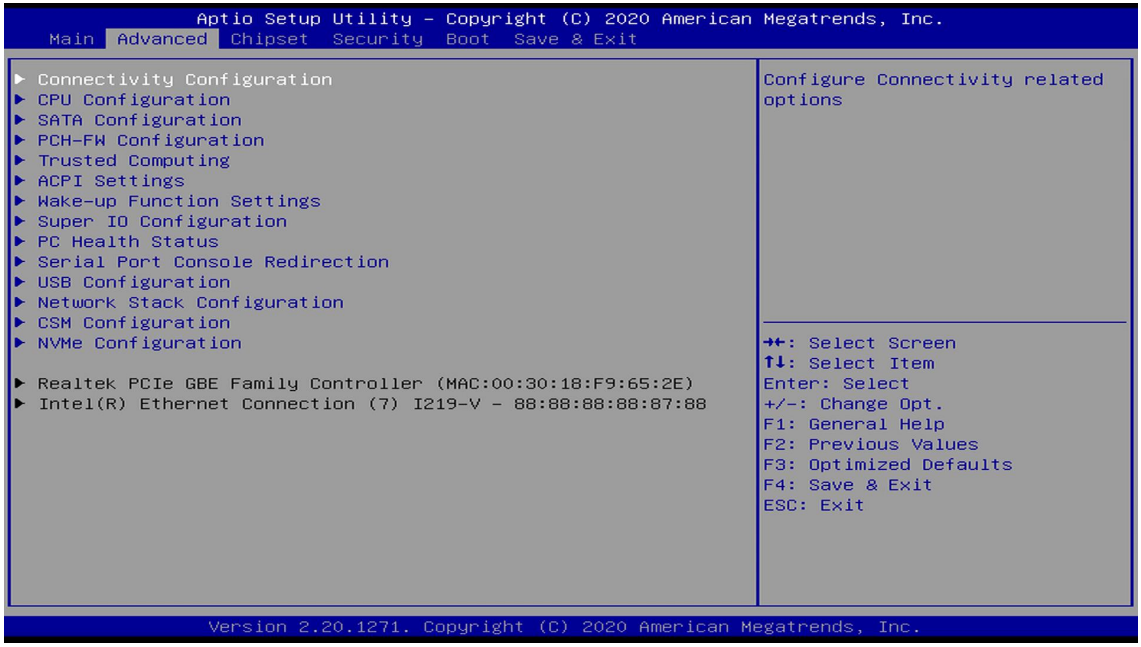

**System Date**

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




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

  ***CNVi present***

  ***CNVi Confituration***

  **CNVi Mode**

  This option configures Connectivity.

  The optional settings: [Disable Integrated]; [Auto Detection].

  **[Auto Detection]** means that if Discrete Solution is discovered it will be enabled by default. Otherwise Integrated Solution (CNVi) will be enabled; **[Disable Integrated]** disables Integrated Solution.

- **CPU Configuration**
  Press [Enter] to view current CPU configuration and make settings for the following

sub-items:

**Hyper-Threading**

Use this item to enable or disable Hyper-Threading Technology.

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

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

**[Enabled]:** for Windows and Linux (OS optimized for Hyper-Threading Technology).

**[Disabled]:** for other OS (OS optimized not for Hyper-Threading Technology).

**Note: 'Hyper-Threading' item may or may not show up, depending on different CPU.*

**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 is not 100% utilized.

**Turbo Mode**

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

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

**Note: This item might not be available depending on configuration.*

- **SATA Configuration**

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

***SATA Configuration***

**SATA Controller(s)**

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

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

**SATA Mode Selection**

Use this item to determine how SATA controller(s) operate. This PCH SKU doesn't support RST feature.
The default setting is: [AHCI].

***M.2***

**Port**

Use this item to enable or disable SATA Port.
The optional settings: [Disabled]; [Enabled].

***SATA1***

**Port**

Use this item to enable or disable SATA Port.
The optional settings: [Disabled]; [Enabled].

**Hot Plug**

Designates this port as Hot Pluggable.
The optional settings: [Disabled]; [Enabled].

***SATA2***

**Port**

Use this item to enable or disable SATA Port.
The optional settings: [Disabled]; [Enabled].

**Hot Plug**

Designates this port as Hot Pluggable.
The optional settings: [Disabled]; [Enabled].

- **PCH-FW Configuration**

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

  ***ME Firmware Version***

  ***ME Firmware Mode***

- **Firmware Update Configuration**

  Use this item to configure Management Engine Technology Parameters.
  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].

** 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 enable or disable '**Security Device Support**'.

***TPM20 Device Found***

**Security Device Support**

****Note**: '**Security Device Support'** item is only available for motherboards with **TPM** function 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].

****Note**: 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.

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

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

**TPM2.0 UEFI Spec Version**

Use this item to select the TCG2 Spec Version Support.

The optional settings: [TCG_1_2]; [TCG_2].

- **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).

**Wake-up Minute Increase**

Use this item to select 1-60.

**PS2 KB/MS Wake-up**

Use this item to enable or disable PS2 KB/MS Wake-up from (S3/S4/S5). This function is only supported when ERP function is disabled.

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

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

**USB S3/S4 Wake-up**

Use this item to enable or disable USB S3/S4 wake-up. This function is only supported when ERP function is disabled.

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 I/O Configuration**

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

***Super IO Configuration***

**ERP Support**

This item is Energy-Related Products function.

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

*Note: This item should be set as [Disabled] if you wish to have all active wake-up functions.*

- **Serial Port 1 Configuration**

Use this item to make setting for Parameters of Serial Port 1 (COMA).

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

**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:

**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 FIFO Mode**

The optional settings: [16-Byte FIFO]; [32-Byte FIFO]; [64-Byte FIFO]; [128-Byte FIFO].

- **Serial Port 2 Configuration**

Use this item to make setting for Parameters of Serial Port 2 (COMB).

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

**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:

**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 FIFO Mode**

The optional settings: [16-Byte FIFO]; [32-Byte FIFO]; [64-Byte FIFO]; [128-Byte FIFO].

**WatchDog Timer**

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

Use this item to enable or disable WDT function. When set as [Enabled], the following sub-items shall appear:

**WatchDog Timer Value**

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

**WatchDog Timer Unit**

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

**WatchDog Wake-up Timer in ERP**

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

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

**WatchDog Timer Value in ERP**

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

**WatchDog Timer Unit in ERP**

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 JATX_AT 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 JCASE jumper for case open detection);* if COPEN is 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**' and set value in '**Shutdown Temperature**'.

  - **SmartFAN Configuration**
    Press [Enter] to make settings for SmartFan Configuration:
    ***SmartFAN Configuration***

    **CPUFAN / SYSFAN Smart Mode**
    The optional settings: [Disabled]; [Enabled].
    When set as [Enabled], the following sub-items shall appear:
    **CPUFAN / SYSFAN Full-Speed Temperature**
    Use this item to set CPUFAN/SYSFAN full speed temperature. Fan will run at full speed when above this pre-set temperature.
    **CPUFAN / SYSFAN Full-Speed Duty**
    Use this item to set CPUFAN/SYSFAN full-speed duty. Fan will run at full speed when above this pre-set duty.
    **CPUFAN / SYSFAN Idle-Speed Temperature**
    Use this item to set CPUFAN /SYSFAN idle speed temperature. Fan will run at idle speed when below this pre-set temperature.
    **CPUFAN / SYSFAN Idle-Speed Duty**
    Use this item to set CPUFAN/SYSFAN idle speed duty. Fan will run at idle speed when below this pre-set duty.

**Shutdown Temperature**

Use this item to select system shutdown temperature.

The optional settings: [Disabled]; [70°C/158°F]; [75°C/167°F]; [80°C/176°F]; [85°C/185°F]; [90°C/194°F].

- **Serial Port Console Redirection**

***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 items:

**Terminal Type**

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

Emulation: **[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].

***Legacy Console Redirection***

- **Legacy Console Redirection Settings**

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

***Legacy Console Redirection Settings***

**Redirection COM Port**

For user to select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.

The optional settings: [COM1]; [COM1(Pci Bus0, Dev0, Func0) (Disabled)].

**Resolution**

On Legacy OS, this item is for user to select the Number of Rows and Columns supported redirection.

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

**Redirect After POST**

The optional settings: [Always Enable]; [BootLoader].

When [**Bootloader**] is selected, then Legacy Console Redirection is disabled before booting to legacy OS.

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

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

**Console Redirection**

The optional settings: [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 items:

**Out-of-Band Mgmt Port**

Microsoft Windows Emergency Management Services (EMS) allow for remote management of a Windows Server OS through a serial port.

The optional settings: [COM1]; [COM1(Pci Bus0, Dev0,Func0) (Disabled)].

**Terminal Type**

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**

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**

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***

The default setting is: [8].
**This item may or may not show up, depending on different configuration.*

***Parity***

The default setting is: [None].
**This item may or may not show up, depending on different configuration.*

***Stop Bits***

The default setting is: [1].
**This item may or may not show up, depending on different configuration.*

- **USB Configuration**

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

***USB Configuration***

**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**

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

***USB hardware delays and time-outs:***

**USB transfer time-out**

Use this item to make setting for 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 make setting for 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].

When 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 option will not be created.

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

**Ipv6 PXE Support**

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

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 the 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:

  **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**

  This option controls the execution of Network OpROM.

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

  **Storage**

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

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

  **Other PCI devices**

  This item determines OpROM execution policy for devices other than Network, Storage or Video.

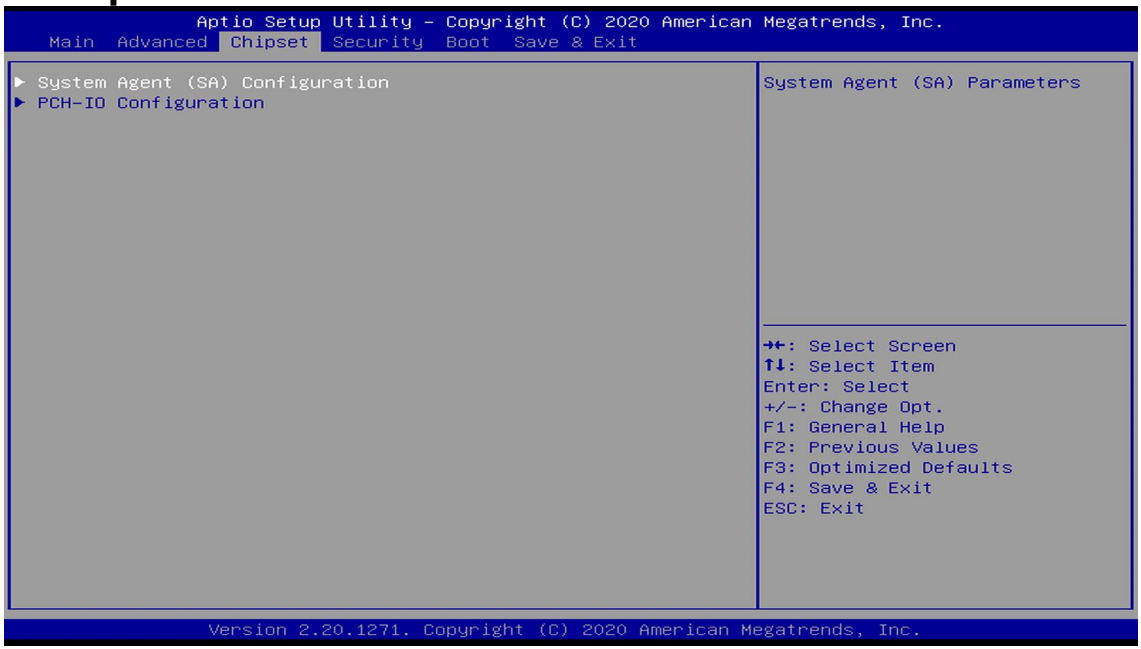
  The optional settings: [Do not launch]; [UEFI]; [Legacy].

- **NVMe Configuration**

  Press [Enter] to check NVMe controller and driver information.

- ***Realtek PCIe GBE Family Controller (MAC: XX:XX:XX:XX:XX:XX)***
- ***Intel(R) Ethernet Connection (7) I219-V - XX:XX:XX:XX:XX:XX***

# 3-8 Chipset Menu




- **System Agent (SA) Configuration**

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

  **VT-d**

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

  - **Memory Configuration**

  Press [Enter] to view brief information for the working memory module.

  - **Graphics Configuration**

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

  ***Graphics Configuration***

  **Primary Display**

  Use this item to select which Graphics device should be Primary Display.
  The optional settings: [Auto]; [IGFX]; [PEG].

  **Primary IGFX Boot Display**

Use this item to select the Video Device which will be activated during POST. This has no effect if external graphics present.
The optional settings: [VBIOS Default]; [HDMI]; [DP]; [eDP].

**Note: In the case that the 'Primary IGFX Boot Display' is select as [HDMI]; [DP]; [eDP], user can make further settings in 'Secondary IGFX Boot Display':*

**Secondary IGFX Boot Display**
Use this item to select the secondary Display device.
The optional settings: [Disabled]; [HDMI]; [DP].

**Internal Graphics**
Use this item to keep IGFX enabled based on the setup options.
The optional settings are: [Auto]; [Disabled]; [Enabled].

**Aperture Size**
Use this item to select the Aperture Size. 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].

**Backlight Control**
Use this item to select Back Light Control settings.
The optional settings: [PWM Inverted]; [PWM Normal].

► **PEG Port Configuration**
Press [Enter] to make further settings for PEG Port Options.

***PCIEx16 Slot***

**Enable 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:

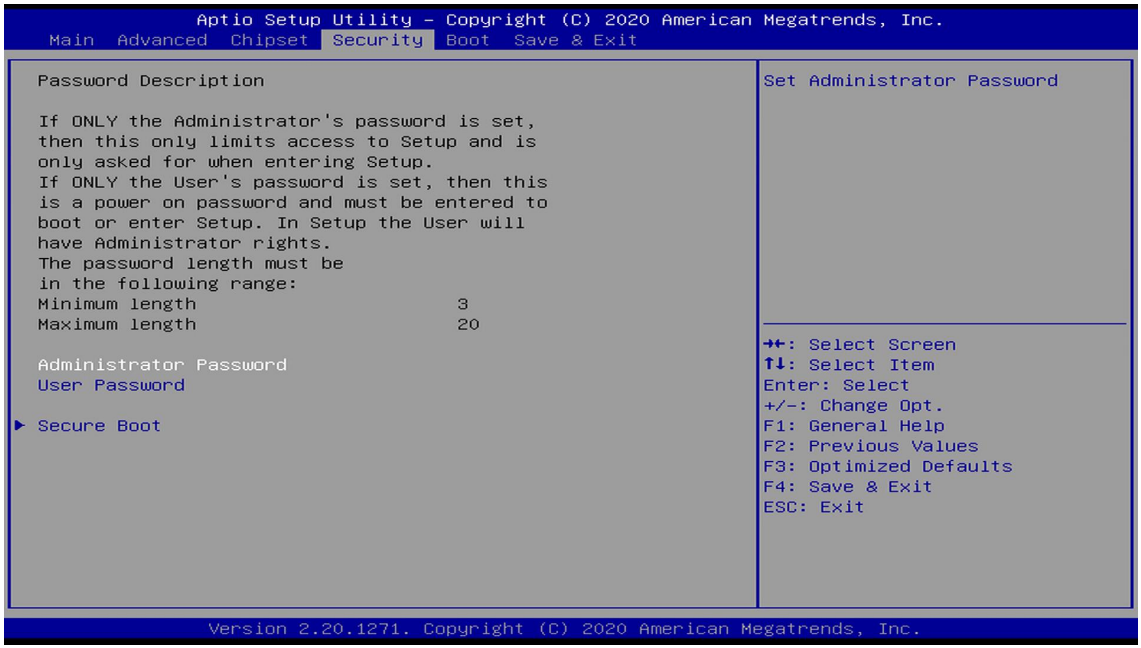
***PCH-IO Configuration***

**HD Audio**
This item controls 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 corresponding onboard NIC device or controller.
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 enable or disable the PCI Express Root Port.
The optional settings: [Disabled]; [Enabled].
**M2M Slot**
Use this item to enable or disable PCI Express Root Port.
The optional settings: [Disabled]; [Enabled].
**M2E Slot**

Use this item to enable or disable 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 re-applied after a power failure (G3 state).
The optional settings are: [Always On]; [Always Off]; [Former State].

## 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 user password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new user password.

- **Secure Boot**

  Press [Enter] to make customized secure settings:

  ***System Mode***

  **Secure Boot**

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

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

  **Secure Boot Mode**

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

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

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

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

  - **Restore Factory Keys**

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

  - ***Restore To Setup Mode***

  - **Key Management**

  This item enables expert users to modify Secure Boot Policy variables without full authentication.

  Press [Enter] to make customized secure settings:

***Vendor Keys***

**Factory Key Provision**

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

- ***Restore To Setup Mode***
- ***Export Secure Boot variables***
- **Enroll Efi Image**

  This item allow 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/Key#/Key Source***

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

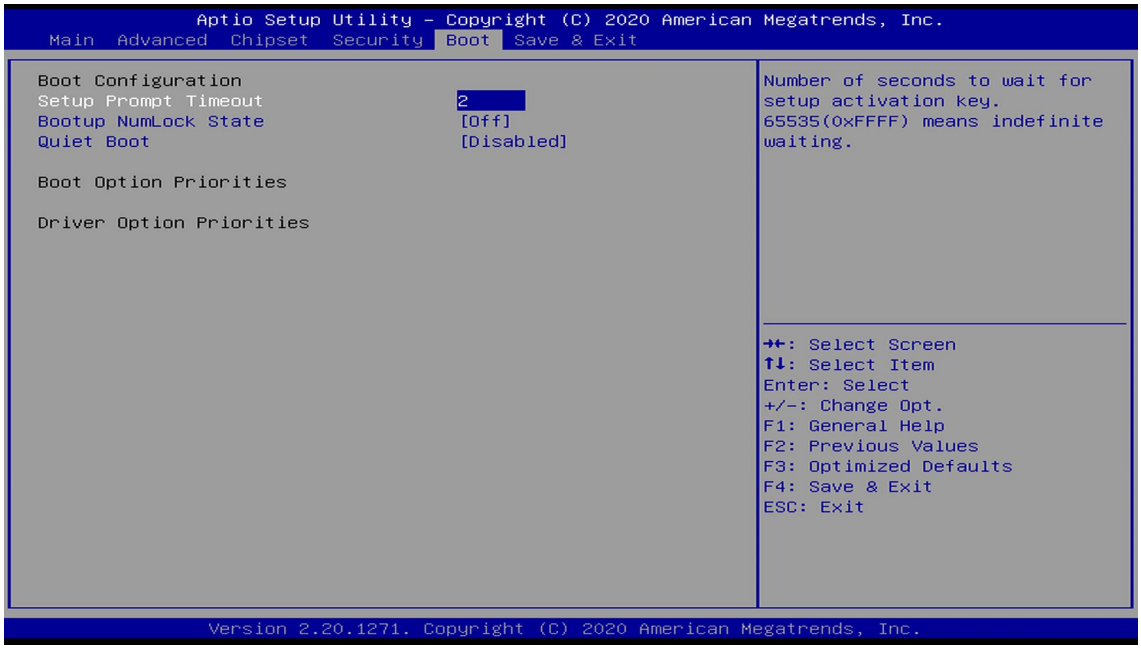
  Use this item to enroll Factory Defaults or load certificates from a file:

  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(0xFFF) means indefinite waiting.

**Bootup NumLock State**

Use this item to select the keyboard NumLock state.

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

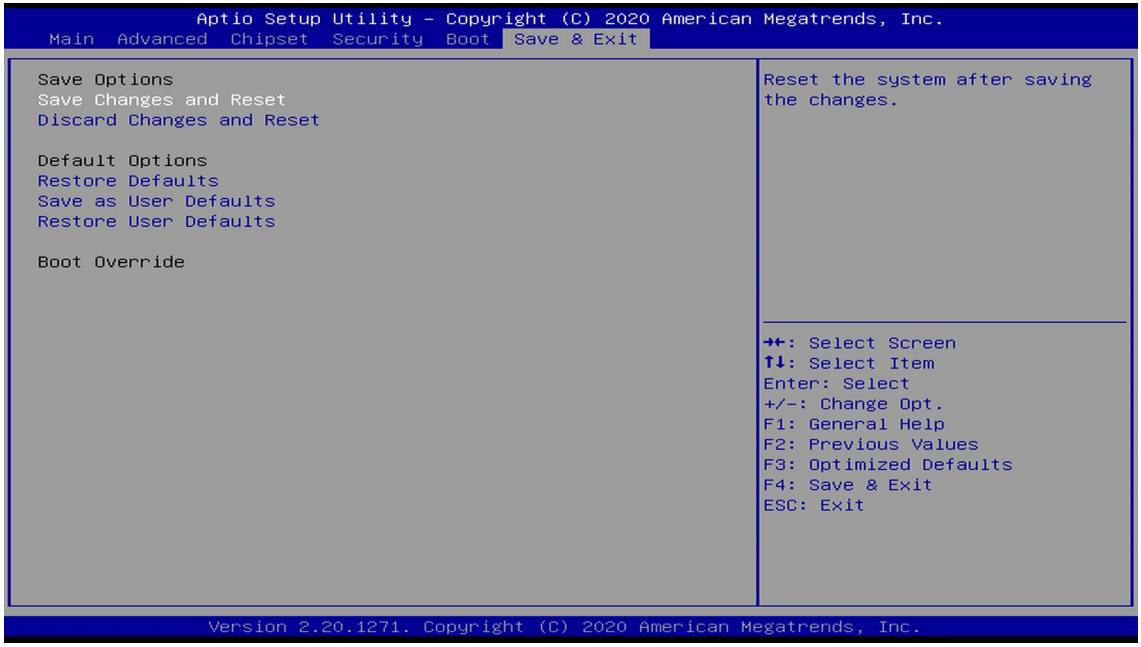
**Quiet Boot**

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

***Boot Option Priorities***

***Driver 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***