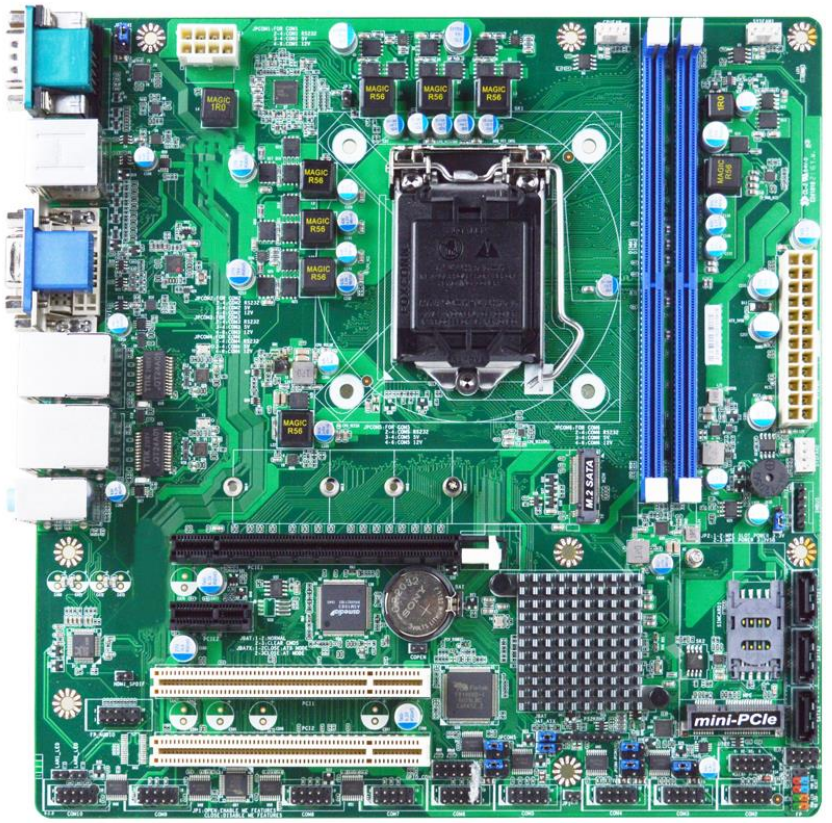
PMAT-03069

Portwell India

PMAT-03069 (Micro-ATX Size motherboard)

Version 1.0

Published date:



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1. Introduction

PMAT-03069 is based on Intel® H310 chipset which supports Core i3/i5/i7 8th and 9th gen processor. PMAT-03069 adopts Two DDR4 sockets and supports up to 64GB Memory.

Desktop solution is still popular in the market of DVR and Factory Automation which can fulfill most of these applications; therefore, with high performance and high-end specifications, PMAT-03069 is generation Coffee lake chip architecture on Micro-ATX product line.

2. Specifications

CPU	Intel® socket 1151 for 8th Gen Intel® Core™ i7/ i5/ i3,8th generation Coffee Lake series processor up to 65W TDP
Chipset	Intel® H310 Chipset
Memory	2 x DDR4 U-DIMM max.64GB, DDR4 up to 2666 MHz SDRAM
Graphics	By CPU
Expansion slots	1 – PCIe x16 slot 1 – PCIe x 1 slot 2 – PCI Slot 1 – Full-size Mini-PCIE slot
Storage	3 – SATA Gen 3.0, up to 6.0 Gb/s ports (SATA1/2/3) 1 – M.2 Key-M key slot type-2242/2260/2280/22110 with SATA Interface (M2M)
LAN	Realtek RTL8111H Gigabit PCI-E LAN chip 10/100/1000Mbps
Audio	Realtek ALC662 6-channel Audio Codec integrated
Rear I/O ports	1 x RS232/422/485 COM Port (COM 1) 1 x DP Port (Max. Resolution: 4096x2304@60Hz) 1 x HDMI (Max. Resolution: 4096x2160@30Hz) 1 x DVI-D (Max. Resolution: 1920x1200@60Hz) 1 x VGA (Max. Resolution: 1920x1200@60Hz) 2 x USB 2.0 2 x RJ45 LAN 4 x USB 3.1 (Gen 1) 1 x Line-in, Line-out, MIC
Internal I/O Ports	1 x 24-PIN ATX power connector 1 x 8-pin 12V Power connector 1 x CPU FAN Connector and 2 x SYSFAN Connector 1 x Front Panel Header 1 x Power LED 1 x Speaker Header 1 x Front Panel Audio Header 1 x HDMI-SPDIF Out Header 2 x LAN Status Indicator header **(LAN1_LED/ LAN2_LED)** 1 x PS/2 keyboard & Mouse Header

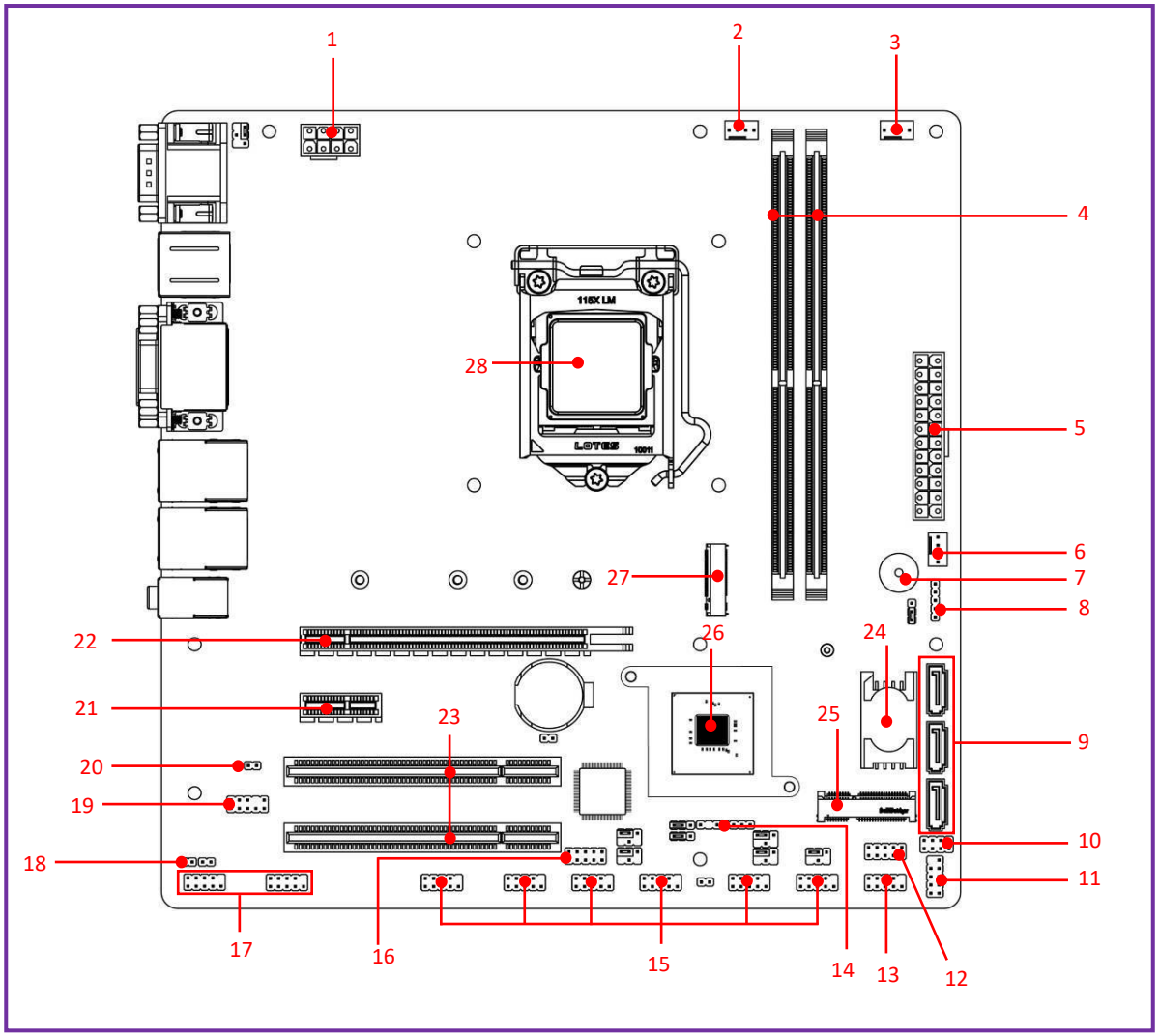
	1 x SMBUS header 1 x 9-Pin front panel USB 2.0 header for 2-expansion USB 2.0 ports 1 x RS232/422/485 COM Port header **(COM 2)** 8 x RS232 COM Port header **(COM 3/4/5/6/7/8/9/10)**
GPIO	1 x GPIO header
BIOS	AMI Flash ROM
Watchdog	From Super I/O to drag RESETCON# 256 segments, 10sec…255min
Power Requirement	24 pin/8 pin ATX PWR Connector AT/ATX Supported
Operating Temp	0°C – 60°C
Non-Operation Temp	-20°C – 85°C
Form Factor	Micro-ATX PCB size: 24.4 x24.4 cm

2.1. Supported Operating Systems [Platform-Coffee Lake(i3-8100T)]

- ✧ Windows 8
- ✧ Windows 10 (64-Bit)
- ✧ Win 10 IoT Enterprise (64-Bit)
- ✧ Fedora-LXDE 29.1.2(2d), Fedora workstation 29.1.2(2d), Fedora Server 29.1.2(2d)
- ✧ Ubuntu Standard / LTS- 1804(2d), Ubuntu Server- 18.04.1(2d)
- ✧ pfSence
- ✧ Android x86 8.1_rc2(2d)

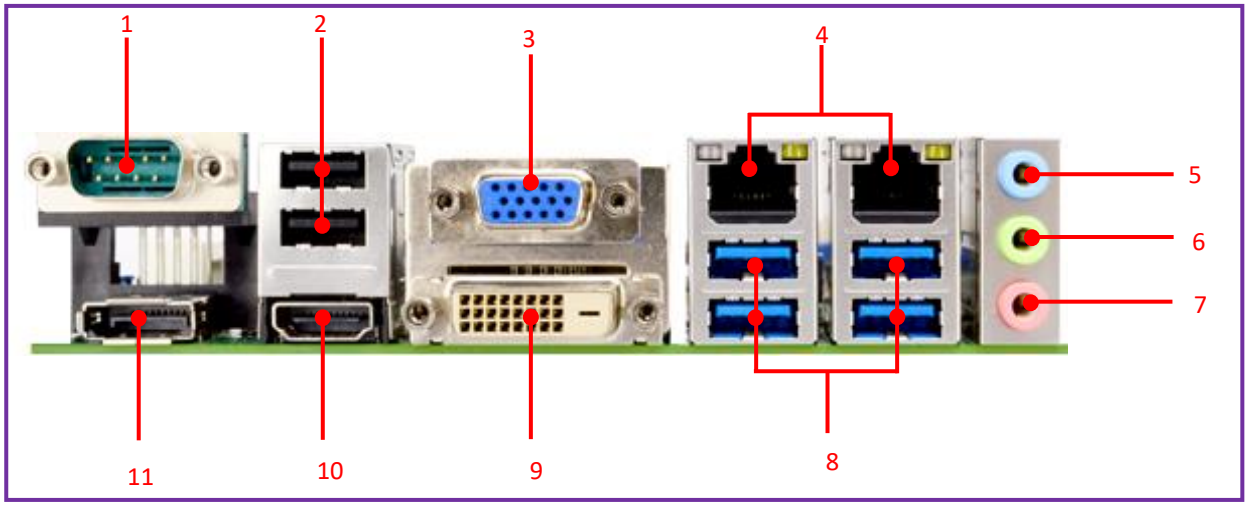
3. Internal I/O & Rear I/O

3.1. Internal I/Os



1	ATX 12V Power connector
2	CPU Fan connector
3	System Fan connector
4	DDR4 DIMM Slot – 2 Nos
5	ATX Power connector
6	System Fan-2 connector
7	Buzzer
8	SMBUS Header
9	SATA III Ports – SATA1/2/3
10	Power LED and Speaker Header
11	Front Panel Header
12	USB 2.0 header
13	Serial port header (COM2)
14	PS2 KBMS Header
15	Serial Port Headers (COM8/7/6/5/4/3)
16	GPIO Header
17	Serial Port Headers (COM10/9)
18	LAN LED Headers
19	Front Panel Audio Header
20	HDMI_SPDIF Header
21	PCI Express x1 Slot (PCIE2)
22	PCI Express x16 Slot (PCIE1)
23	PCI Slots (PCI1/2)
24	*SIM Card Slot - *SIM card slot only works when compatible SIM card installed & LAN expansion card installed in MPE Mini-PCIE slot*
25	Full-size Mini-PCIE Slot (*MPE)
26	Intel Chipset
27	M.2 M-Key Slot (M2M)
28	LGA 1151 CPU Socket

3.2. Rear I/O.



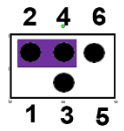
1	RS232/422/485 Serial Port – COM 1
2	USB 2.0 Port
3	VGA Port
4	RJ-45 LAN Port
5	**BLUE**: Line-in Connector
6	**GREEN**: Line-out Connector
7	**PINK**: MIC Connector
8	USB 3.1 (Gen.1) Port
9	DVI-D Port
10	HDMI Port
11	Display Port

4. Jumpers & Headers

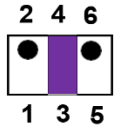
4.1. Jumpers

4.1.1.JPCOM1

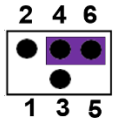
Connector Type	(4-pin): COM1 Port Pin9 Function Select



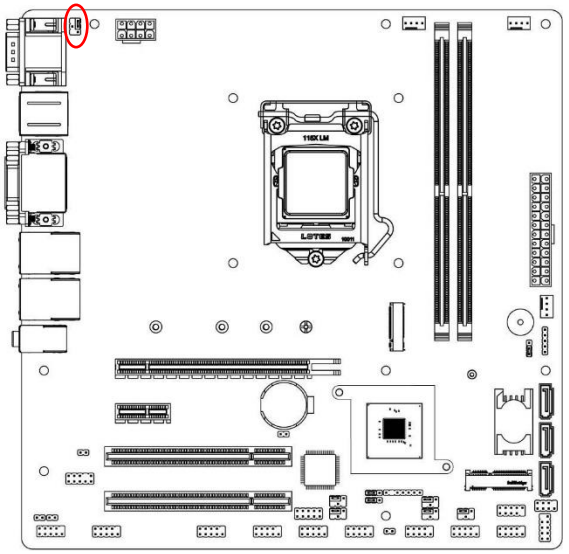
2-4 Closed: RI=RS232;



3-4 Closed: RI= 5V;

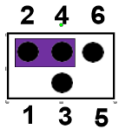


4-6 Closed: RI= 12V.

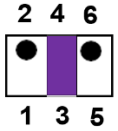


4.1.2.JPCOM2

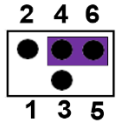
Connector Type	(4-pin): COM2 Port Pin9 Function Select



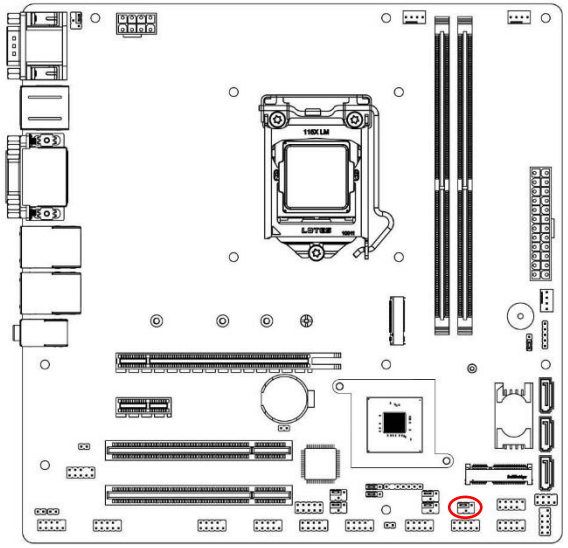
2-4 Closed: RI=RS232;



3-4 Closed: RI= 5V;

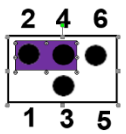


4-6 Closed: RI= 12V.

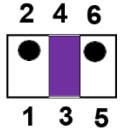


4.1.3.JPCOM3:

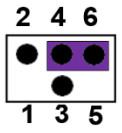
Connector Type	(4-pin): COM3 Port Pin9 Function Select



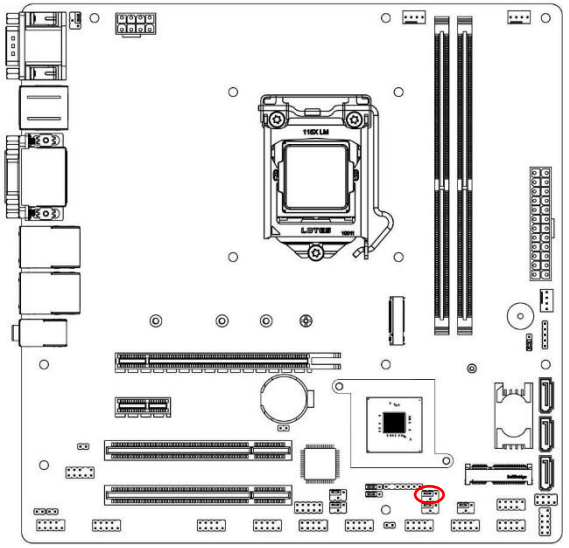
2-4 Closed:
RI=RS232;



3-4 Closed:
RI= 5V;

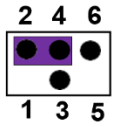


4-6 Closed:
RI= 12V.

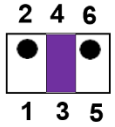


4.1.4. JPCOM4

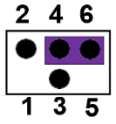
Connector Type	(4-pin): COM4 Port Pin9 Function Select



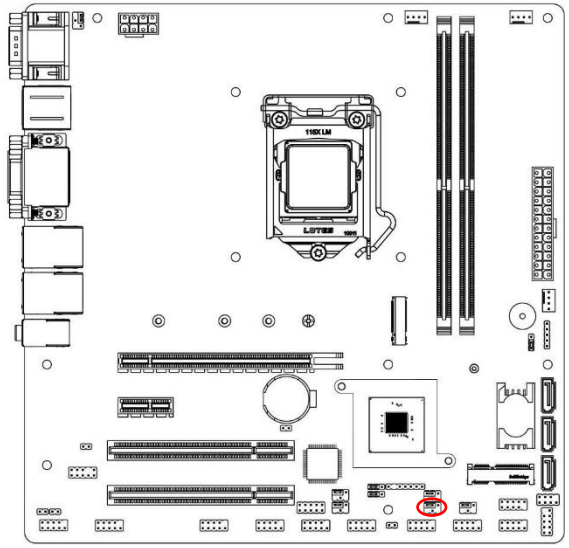
2-4 Closed:
RI=RS232;



3-4 Closed:
RI= 5V;

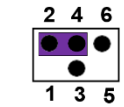


4-6 Closed:
RI= 12V.

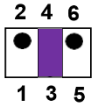


4.1.5.JPCOM5

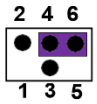
Connector Type	(4-pin): COM4 Port Pin9 Function Select



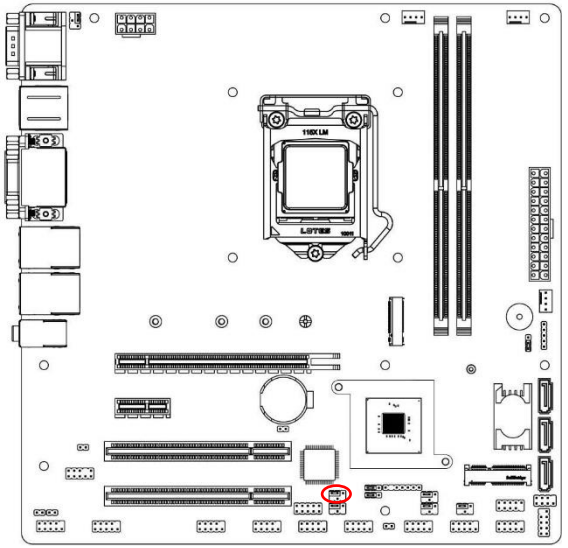
2-4 Closed:
RI=RS232;



3-4 Closed:
RI= 5V;

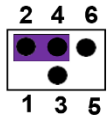


4-6 Closed:
RI= 12V.

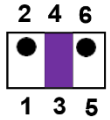


4.1.6.JPCOM6

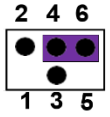
Connector Type	(4-pin): COM4 Port Pin9 Function Select



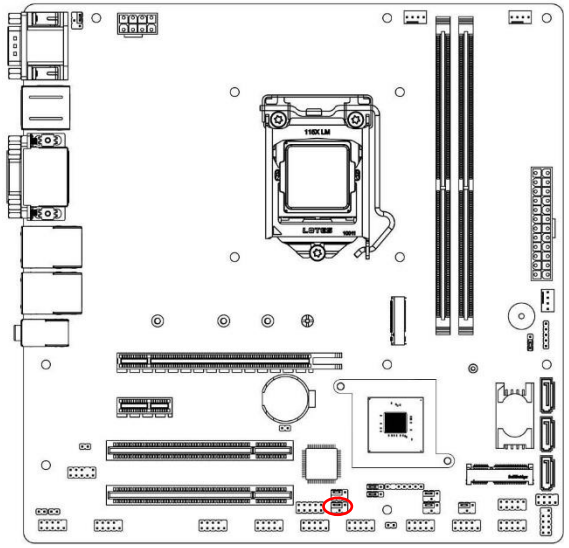
2-4 Closed:
RI=RS232;



3-4 Closed:
RI= 5V;

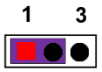


4-6 Closed:
RI= 12V.

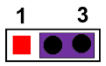


4.1.7.JBAT: Clear CMOS

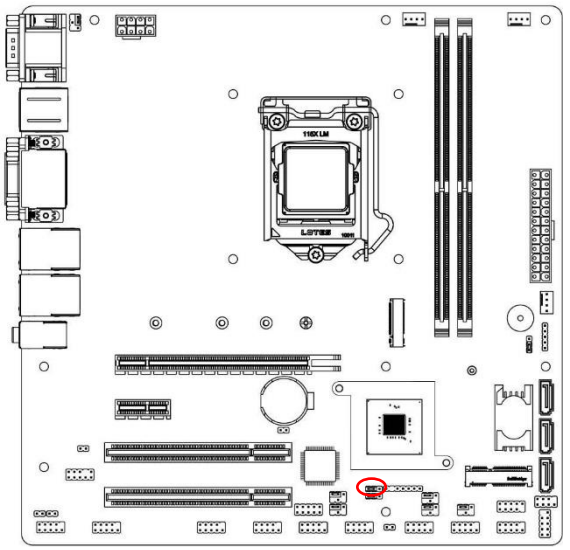
Connector Type	(3-pin): Clear CMOS RAM Settings



1-2 Closed: Normal.



2-3 Closed: Clear CMOS.

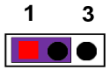


4.1.8.JAT_ATX : AT/ATX mode select

Connector Type	(3-pin): AT Mode /ATX Mode Select

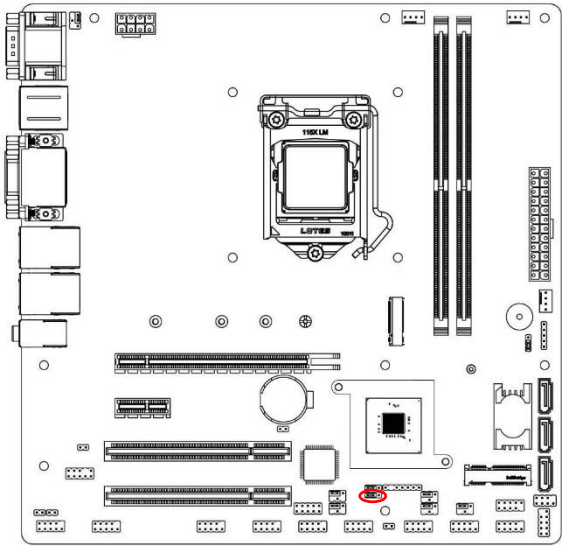
ATX Mode selected: Press power button to power on after power input ready

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



1-2 Closed: ATX Mode selected

2-3 Closed: AT Mode selected

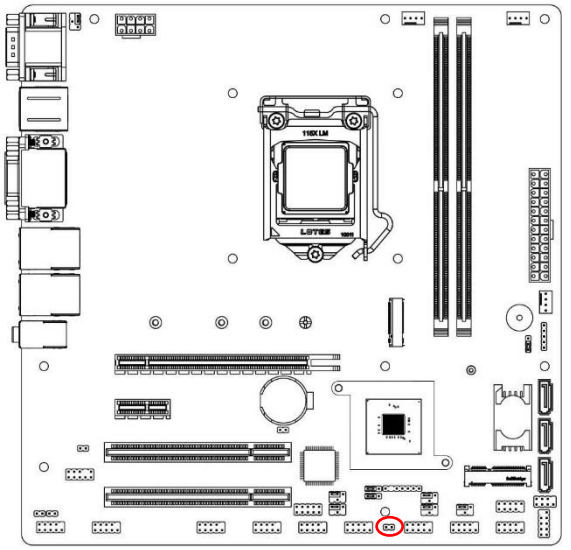


4.1.9.JP1: ME Features Select

Connector Type	(2-pin): ME Features Select

1-2 Open:ME Features Enabled;

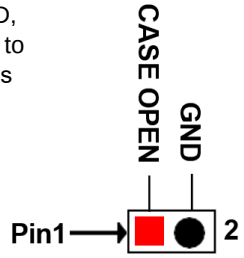
1-2 Closed:ME Features Disabled.

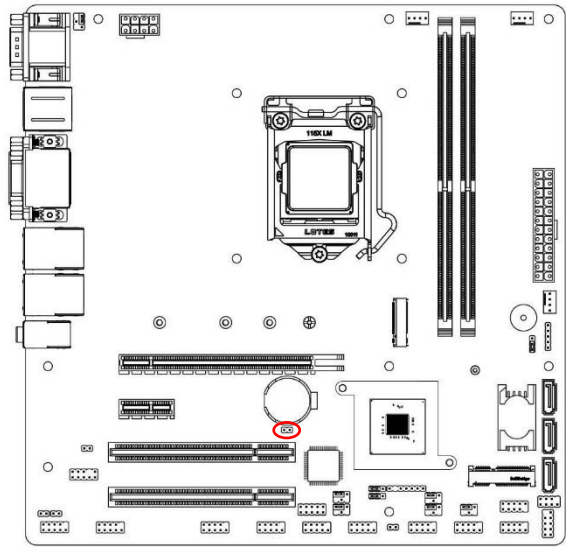


4.1.10. COPEN: Case Open Message Display Function

Connector Type	(2-pin): Case Open Message Display Function

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





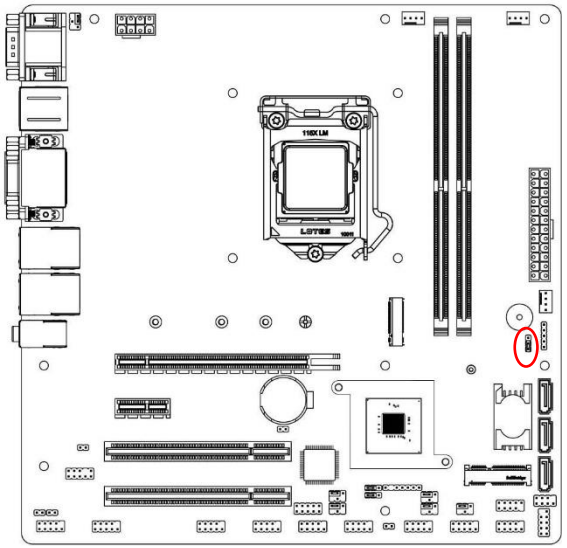
4.1.11. JP2 (3-pin): MPE (Mini PCI-E) Slot VCC 3.3V/3.3VSB Select

Connector Type	(3-pin): MPE (Mini PCI-E) Slot VCC 3.3V/3.3VSB Select

JP2→ Mini-PCIE Slot VCC Select

1-2 Closed: MINI PCI-E Slot VCC= 3.3V;

2-3 Closed: MINI PCI-E Slot VCC = 3.3VSB.



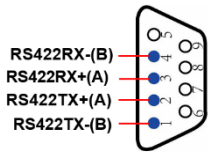
4.2. Headers

4.2.1. COM 1: COM1 (9-pin Block): RS232/422/485 Port

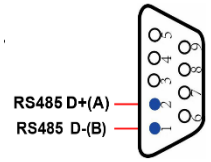
Connector Type	(9-pin Block):RS232/422/485 Port

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.

RS422 Mode



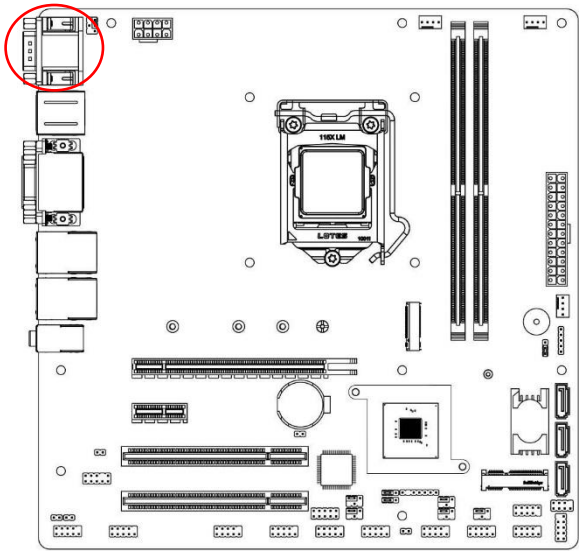
RS485 Mode

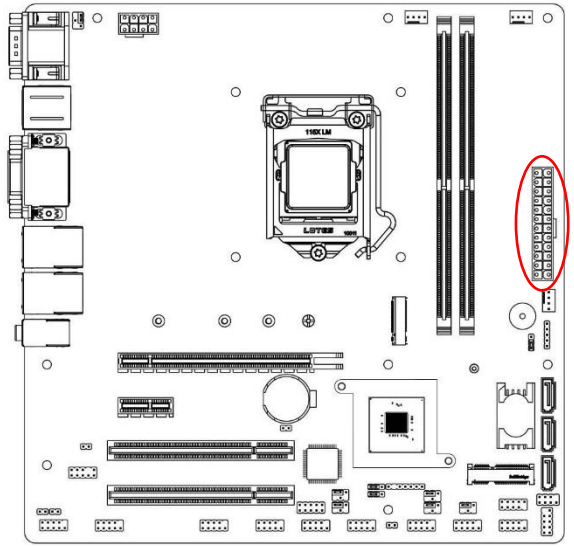


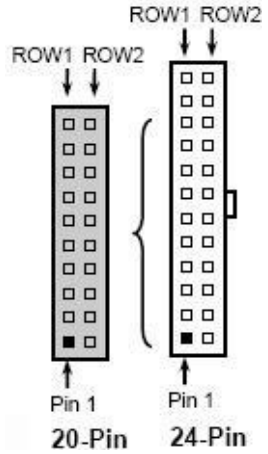
4.2.2. ATX PWR: Main Power Connector

Connector Type	(24-pin block): Main Power Connector

- Recommend using an ATX 12V Specification 2.0-compliant PSU with a minimum of 350W power rating. This type has 24-pin and 4-pin power plugs.
- If you intend to use a PSU with 20-pin + 4-pin power plugs, ensure that the 20-pin power plug provides at least 15A on +12V and the power supply unit has a minimum power rating of 350W. The system may become unstable or may not boot up if the power is inadequate.
- If using a 20-pin power plug, please refer to **Figure1** for power supply connection. Power plug form power supply and power connectors from motherboard both adopt key design to avoid mistake installation. You can insert the power plug into the connector with ease only in the right direction. If the direction is wrong, it is hard to fit in and if you make the connection by force if is possible







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

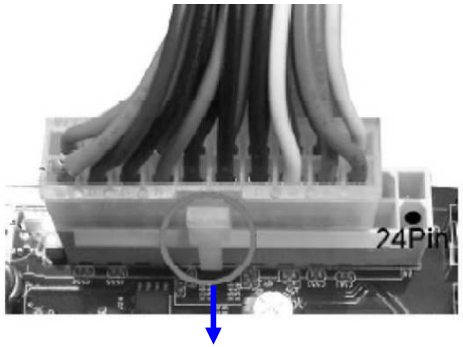


Figure1：20-pin power plug

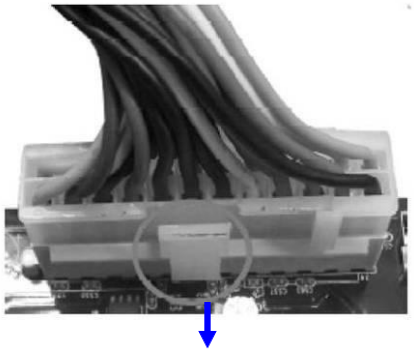
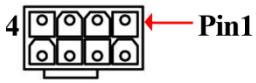


Figure 2：24-pin power plug

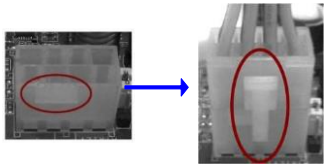
4.2.3.ATX12V (8-pin block): 12V Power Connector

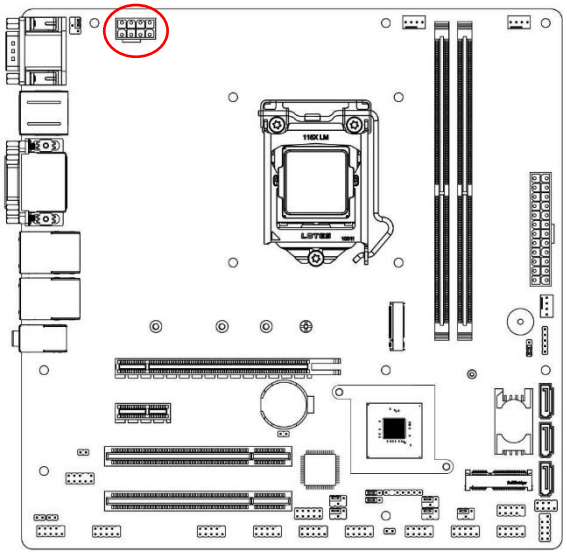
Connector Type	(8-pin block): 12V Power Connector

This is a new defined 8-pin connector that usually comes with ATX Power Supply that supports extra 12V voltage to maintain system power consumption. Without this connector might cause system unstable because the power supply cannot provide sufficient current for system.



Pin No.	Definition	Pin No.	Definition
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V
4	GND	8	+12V



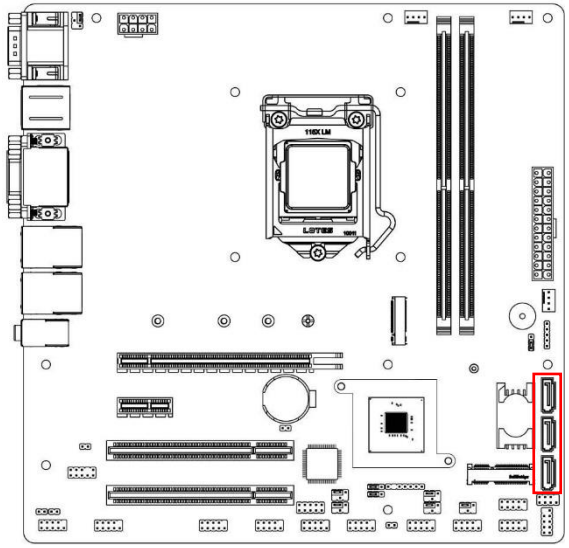


4.2.4. SATA1/2/3 (7-pin): SATA III Port connector

Connector Type	(7-pin): SATAIII Port connector

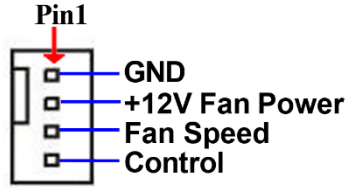
These connectors are high-speed SATAIII ports that support 6 GB/s transfer rate.

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

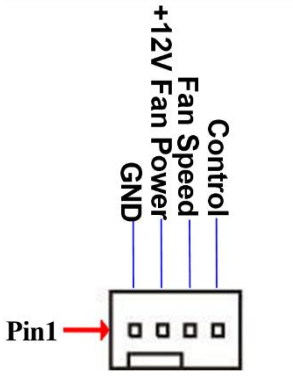


4.2.5. CPUFAN/SYSFAN1/SYSFAN2

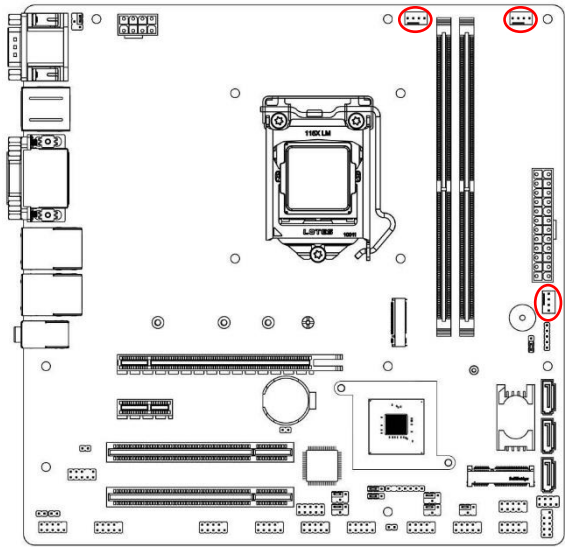
Connector Type	(4-pin): Fan Connectors



SYSFAN2



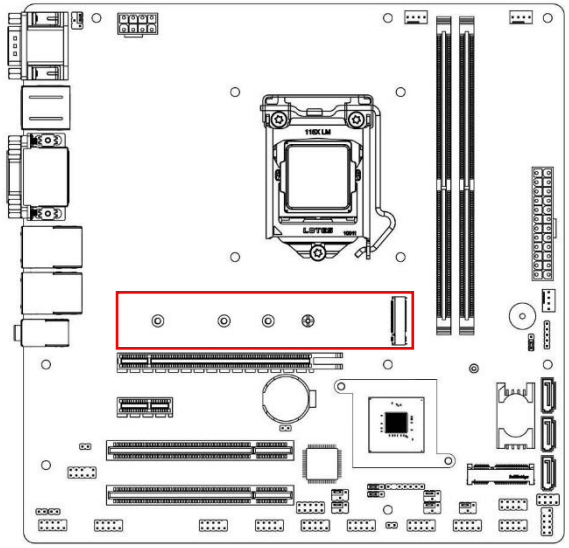
CPUFAN/SYSFAN1



4.2.6. M2M: M.2 M-Key Slot

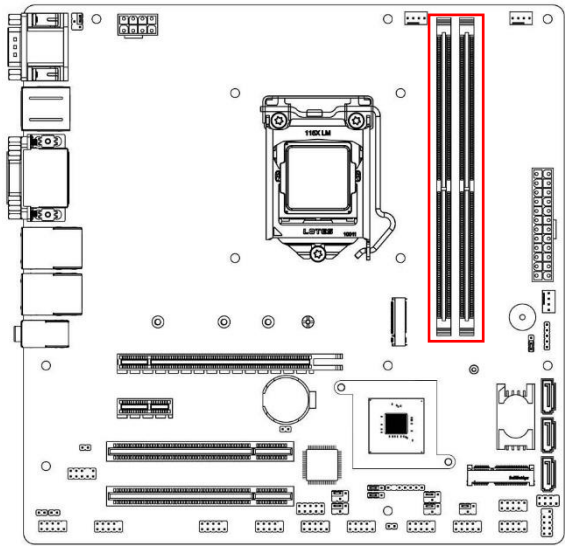
M2M M.2 M-Key slot supports compatible type 2242/2260/2280/22110 SATA module. Deferent type of cards has different length. Find corresponding nut location for further installation.

Nut Location	MH1	MH2	MH3	MH4
Card Length	4.2 cm	6 cm	8 cm	11 cm
Module Type	Type- 2242	Type- 2260	Type- 2280	Type- 22110



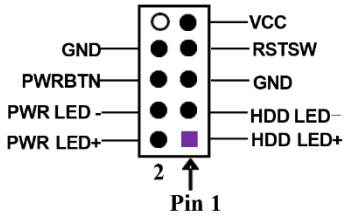
4.2.7. Dual Channel Memory Installation

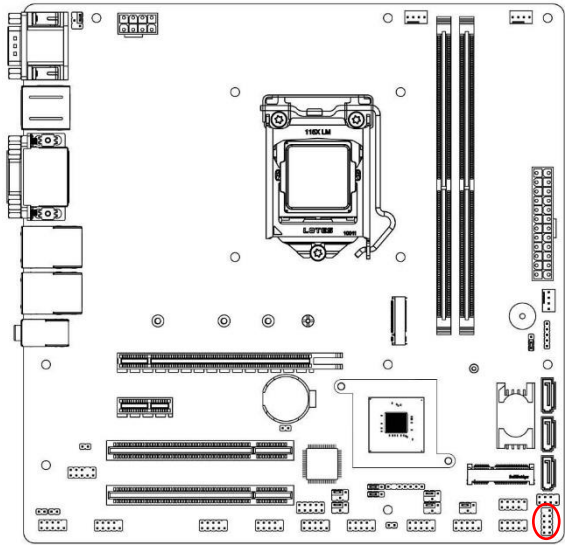
- For dual channel installation, you need to install the same brand, speed, size and type memory module.
- It is unable to activate dual channel feature if you install only one memory module. Slot order can be from left-to-right or right-to-left, and it must be installed in pairs.



4.2.8. FP: Front Panel Header

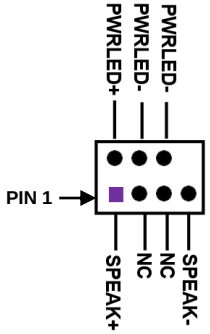
Connector Type	(9-pin): Front Panel Header

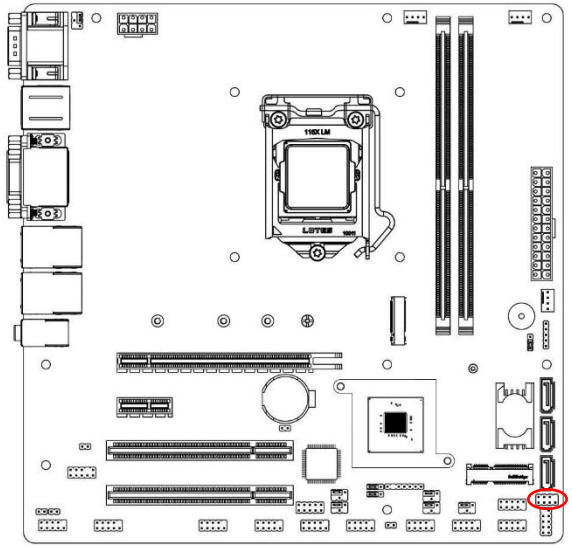




4.2.9.SPK_LED: PWR LED Header & Speaker Header

Connector Type	(7-pin): PWR LED Header & Speaker Header

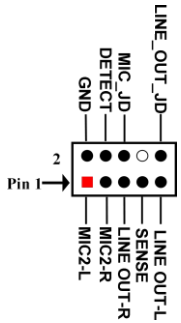


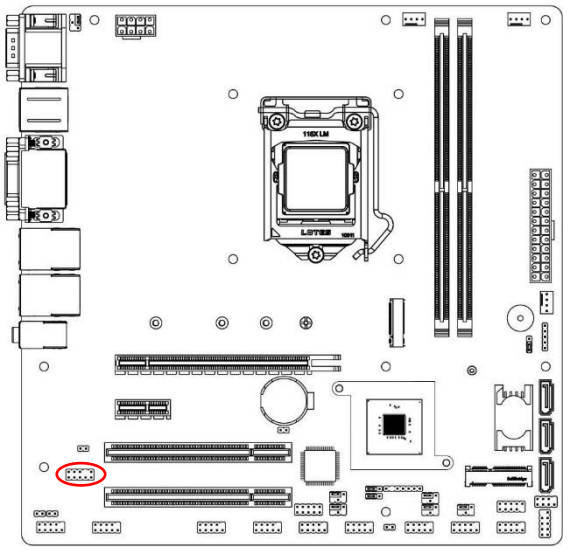


4.2.10. FP_AUDIO: Line-Out, MIC-In Header

Connector Type	(9-pin): Line-Out, MIC-In Header

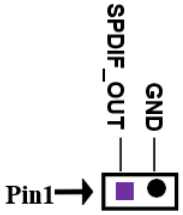
This header is connected to Front Panel Line-out, MIC connector with cable

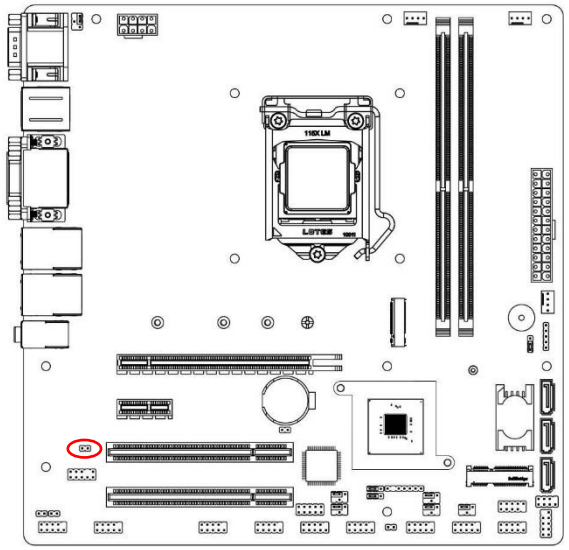




4.2.11. HDMI_SPDIF: HDMI-SPDIF Out header

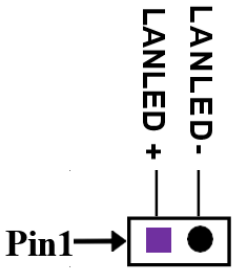
Connector Type	(2-pin): HDMI-SPDIF Out header

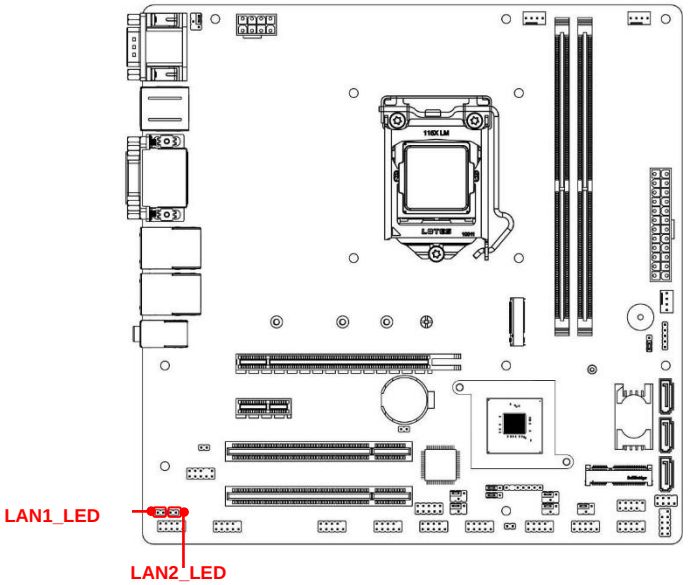




4.2.12. LAN1_LED/ LAN2_LED: LANLED Header

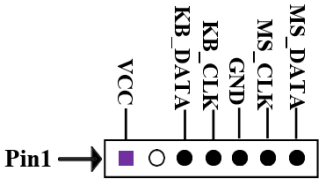
Connector Type	(2-pin): LANLED Header

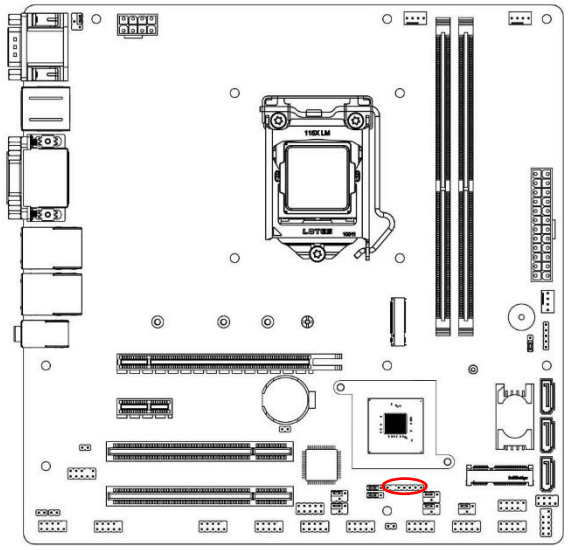




4.2.13. PS2KBMS: PS/2 Keyboard & Mouse Header

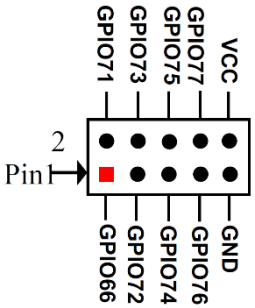
Connector Type	(6-pin): PS/2 Keyboard & Mouse Header

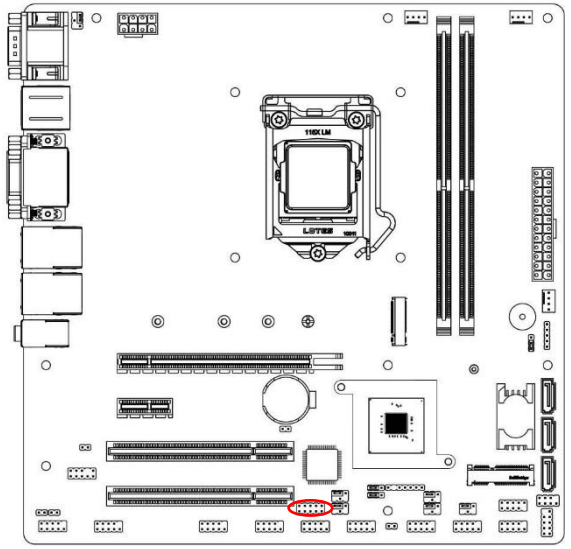




4.2.14. GPIO_CON: GPIO Header

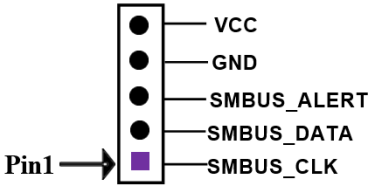
Connector Type	(10-pin): GPIO Header

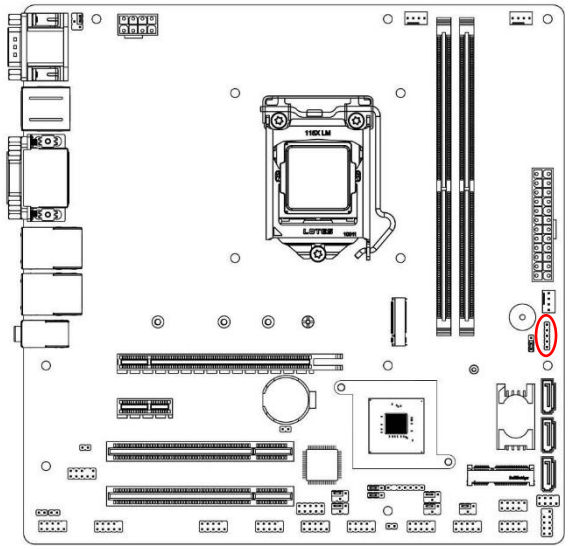




4.2.15. SMBUS: SM BUS Header

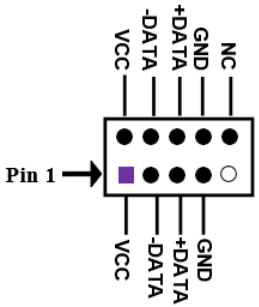
Connector Type	(5-pin): SM BUS Header

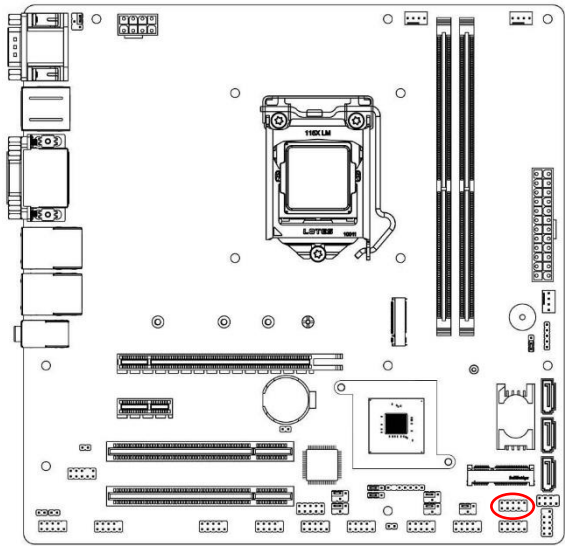




4.2.16. USB2: USB 2.0 Port Header

Connector Type	(9-pin): USB 2.0 Port Header



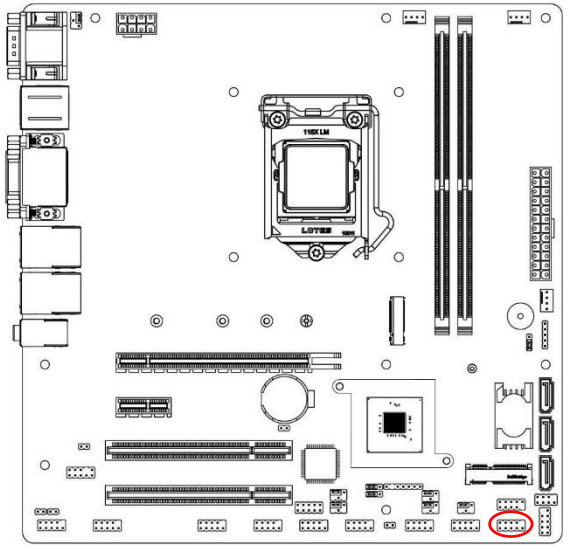


4.2.17. COM2: Serial Port Header

Connector Type	(9-pin): Serial Port Header

COM2 header can function as RS232/422/485 port header. In normal settings COM2 functions as RS232 header. With compatible COM cable COM2 can function as RS422 or RS 485 header. User also needs to go to BIOS to set '**Transmission Mode Select**' for COM2 (**refer to BIOS Section for COM details**) at first, before using specialized cable to connect different pins of this port.

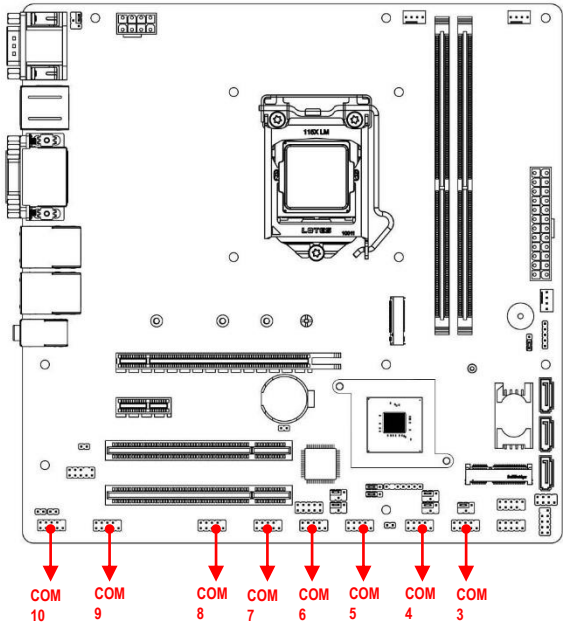
Pin NO.	RS232	*RS422 (optional)	*RS485 (optional)
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC



4.2.18. COM 3/4/5/6/7/8/9/10: Serial Port Header

Connector Type	(9-pin): Serial Port Header

Pin NO.	RS232
Pin 1	DCD
Pin 2	RXD
Pin 3	TXD
Pin 4	DTR
Pin 5	GND
Pin 6	DSR
Pin 7	RTS
Pin 8	CTS
Pin 9	RI



5. BIOS

5.1. BIOS Setup Program

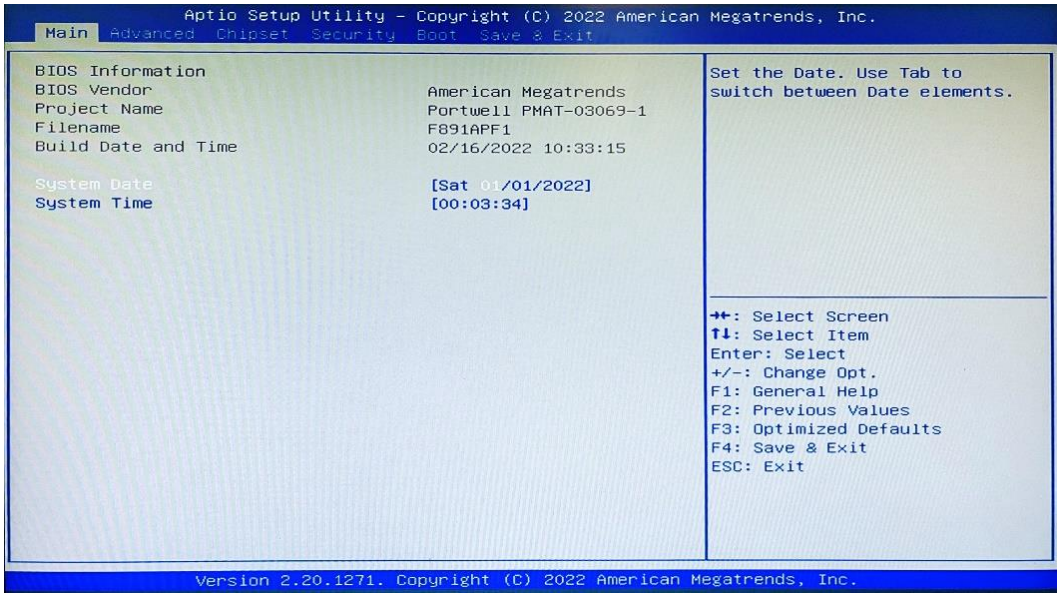
Use the BIOS Setup program to update the BIOS or configure its parameters. The BIOS screens include navigation keys and brief online help to guide you in using the BIOS Setup program

Press <**Delete**> or <**F2**> during the Power-On Self-Test (POST). If you do not press <**Delete**> or <**F2**>, POST continues with its routines.

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

Note: Using the power button, reset button, or the <Ctrl>+<Alt>+<Del> keys to reboot a running operating system can cause damage to your data or system. Always shut down the system properly from the operating system.

5.2. Menu Bar



The menu bar on top of the screen has the following main items

Main	For changing the basic system configuration
Advanced	For changing the advanced system settings
Chipset	To change chipset configuration
Security	For configuring the system security settings
Boot	For changing the system boot configuration.
Exit	For selecting the save options and default options.

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

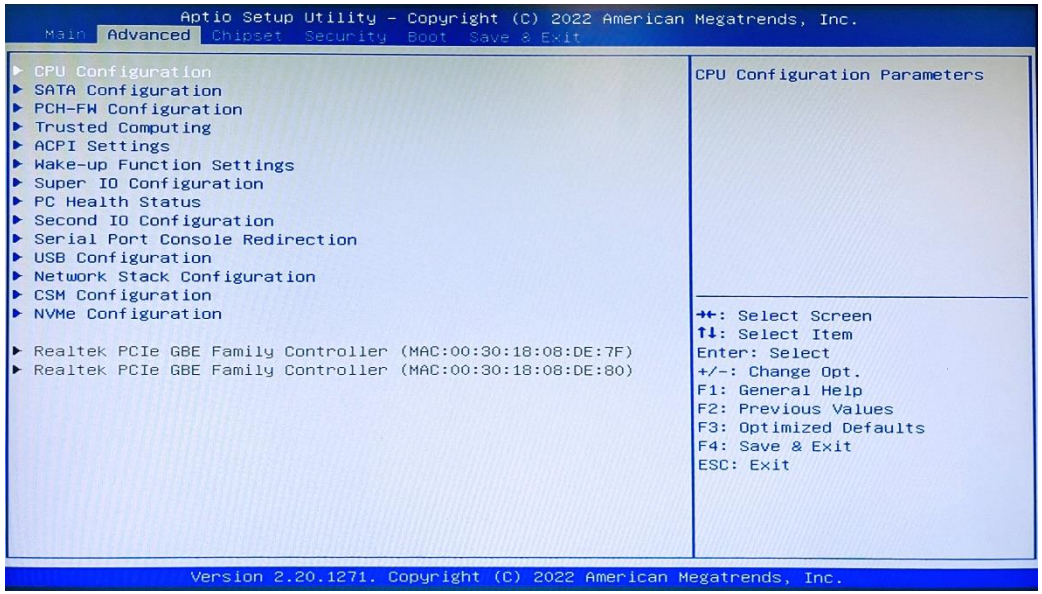
5.3. MAIN Menu

The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.

System Date [Day MM/DD/YYYY] : Allows you to set the system date

System Time [HH:MM:SS] : Allows you to set the system time

5.4. Advanced



The Advanced menu items allow you to change the settings for the CPU and other system devices.

Note: Be cautious when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.

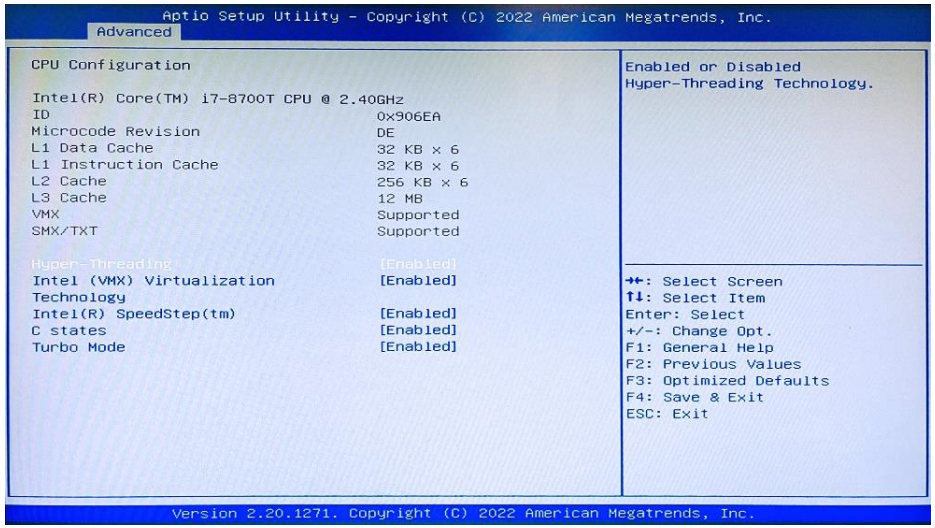
5.4.1. CPU Configuration

The items in this menu show CPU-related information the BIOS automatically detects.
Note: The items shown in the submenu may be different depending on the type of CPU installed
Hyper-Threading: options**: [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: Options: **[Enabled]; [Disabled].**

[Enabled]: a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Intel(R) SpeedStep(tm) : Options : **[Disabled]; [Enabled].**

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

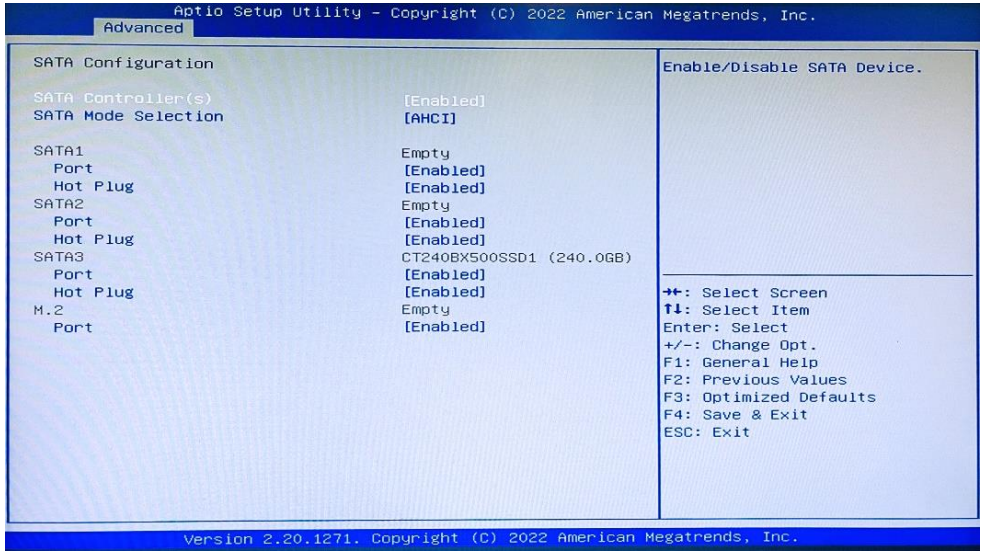
C states: Options**: [Disabled]; [Enabled]. -** Use this item to enable or disable CPU Power Management**.**

[Enabled]: it allows CPU to go to C states when it's not 100% utilized.

Turbo Mode: Use this item to enable or disable Turbo Mode

**This item might not be available depending on configuration*

5.4.2. SATA Configuration



Press [**Enter**] to make settings for the following sub-items
SATA Controller(s): Use this item to enable or disable SATA device. Options: **[Disabled]; [Enabled]**
When **[Enabled]:** the following items shall appear
SATA Mode Selection: Options**: [AHCI]**

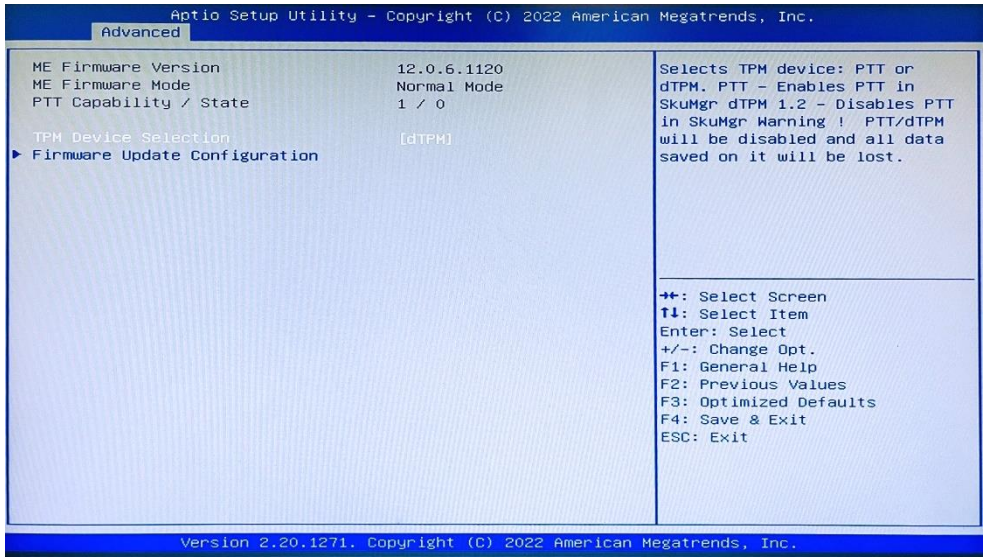
SATA1/SATA2/SATA3:

Port - Use this item to enable or disable SATA port**.** Options: **[Disabled]; [Enabled]**

Hot Plug- Use this item to designate this port as Hot Pluggable. Options: **[Disabled]; [Enabled]**

M.2 : Port: Use this item to enable or disable M.2 SATA port**.** Options: **[Disabled]; [Enabled]**

5.4.3. PCH-HW configuration

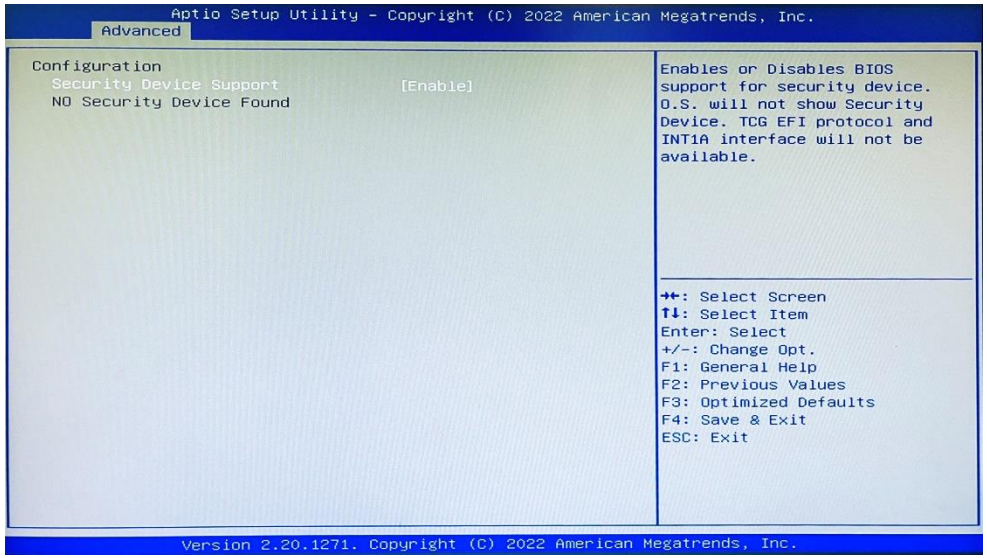


Press [**Enter**] to view Management Engine technology parameters and make settings in the following sub-item:
Firmware Update Configuration: Press [**Enter**] to make settings for '**ME FW Image Re-Flash**'

ME FW Image Re-Flash: Use this item to enable or disable ME FW Image Re-Flash function.
Options: **[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

5.4.4. Trusted Computing



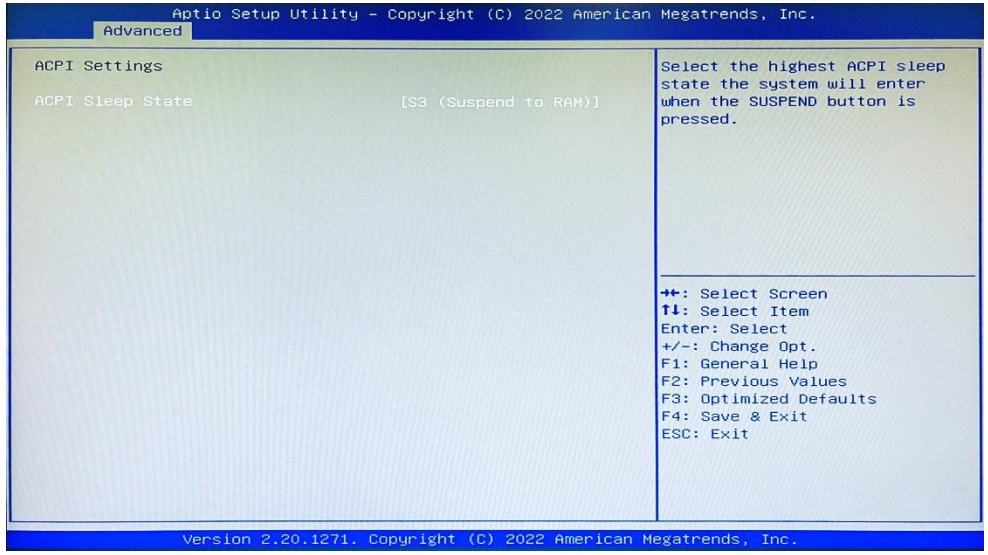
Press [**Enter**] to view current status information & make further settings in the below sub-items.
Security Device Support: Use this item to enable or disable BIOS support for security device. O.S. will not show security device. TGG EFI protocol and INT1A interface will not be available.
Options: **[Disabled]; [Enabled]**

When [**Enabled**], further settings appear.

Pending Operation: Use this item to schedule an operation for the security device. System will reboot during restart to change state of device.
Options: **[None]; [TPM Clear]**.

TPM2.0 UEFI Spec Version: Use this item to select the TCG2 Spec Version Support.
Options: **[TCG_1_2]; [TCG_2].**

5.4.5. ACPI Settings



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

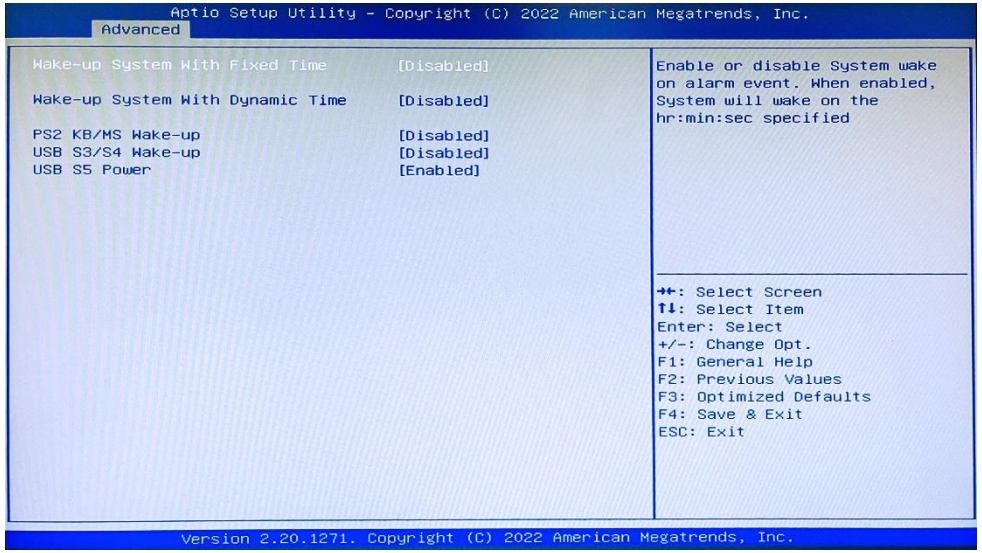
ACPI Sleep State: select the highest ACPI sleep state the system will enter when the suspend button is pressed.

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

5.4.6. Wake-up Function Settings

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

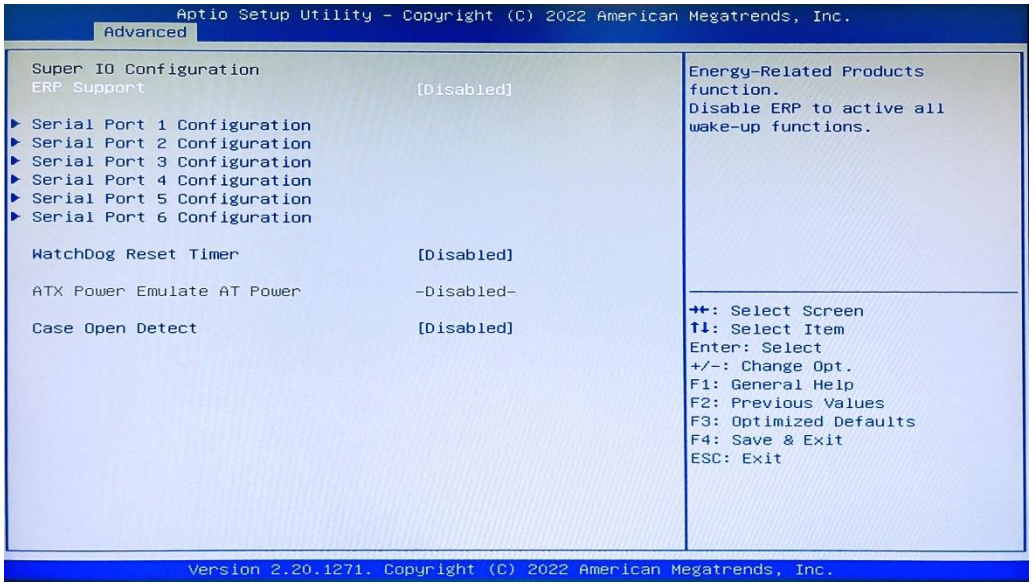
- **Wake-up System with Fixed Time:** Options**: [Disabled]; [Enabled].** When **[Enabled]:** system will wake on the hour/min/sec specified
- **Wake-up System With Dynamic Time:** enable or disable system wake on alarm event. System will wake on the current time + Increase minute(s). Options**: [Disabled]; [Enabled].** When **[Enabled]** system will wake on the current time + increased minute(s).
- **Wake-up Minute Increase:** The settings range is from 1 to 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 supported when 'ERP Support' is set as [**Disabled**] Options**: [Disabled]; [Enabled]**
- **USB S3/S4 Wake-up:** Use this item to enable or disable USB wake-up from S3/S4 state. *This function is supported when 'ERP Support' is set as [**Disabled**]. Options**: [Disabled]; [Enabled]**
- **USB S5 Power:** Use this item to enable or disable USB power after power shutdown. *This function is supported when 'ERP Support' is set as [**Disabled**].



5.4.7. Super IO Configurations

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

ERP Support: Options: [**Disabled**]; [**Auto**].
*This item should be set as [Disabled] to have all active wake-up functions.



Serial Port 1 /Serial Port 2 Configuration:
Serial Port: Options: [**Disable**]; [**Enable**]. When [**Enable**], user can make further settings in the followings.

- **Change Settings:** Use this to select an optimal setting. Changing setting may conflict with system resources.
  - **Transmission Mode Select:** [RS422]; [RS232]; [RS485].
  - **Mode Speed Select:** [RS232/RS422/RS485=250kbps]; [RS232=1Mbps, RS422/RS485=10Mbps].

Serial Port 3 /Serial Port 4/ Serial Port 5/ Serial Port 6/ Configuration:
Serial Port: Options: [**Disable**]; [**Enable**]. When [**Enable**], user can make further settings in the followings.

- **Change Settings:** Use this to select an optimal setting. Changing setting may conflict with system resources.

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

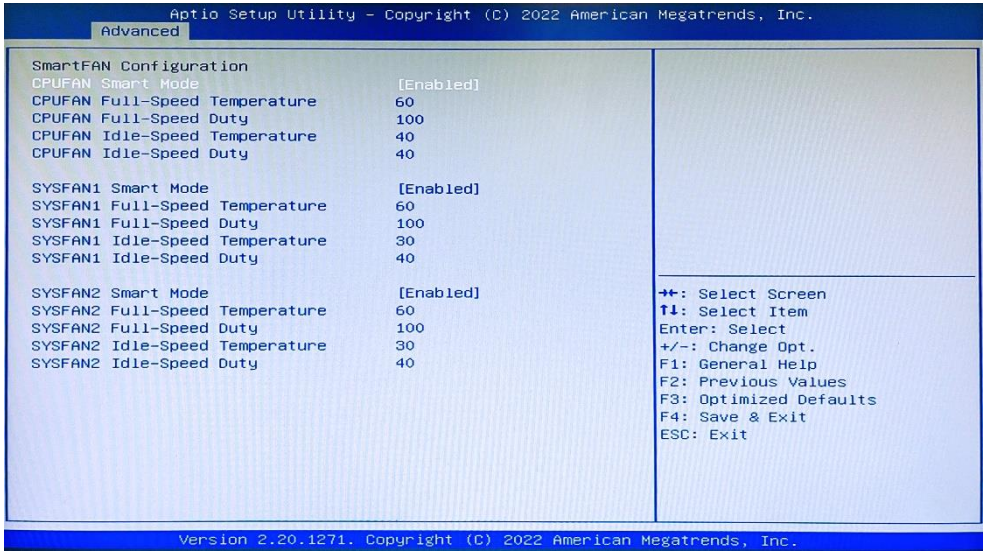
- **WatchDog Reset Timer Value:** User can set a value in the range of [**4**] to [**255**].
- **WatchDog Reset Timer Unit:** The optional settings are: [**Sec**.]; [**Min**.].
- **ATX Power Emulate AT Power:** This item support Emulate AT power function, MB power on/Off control by power supply. Use needs to select 'AT or ATX Mode' on MB jumper at first **(refer to Page-13, JAT_ATX jumper for ATX Mode & AT Mode Select).**

Case Open Detect: Use this item to detect case has already open or not, show message in POST. Options: [**Disable**]; [**Enable**]. When [**Enable**], system will detect if COPEN has been short or not **(refer to Page-14, COPEN jumper for Case Open Detection); if Pin 1&2 of COPEN is short, system will show Case Open Message during POST.**

5.4.8. PC Health Status

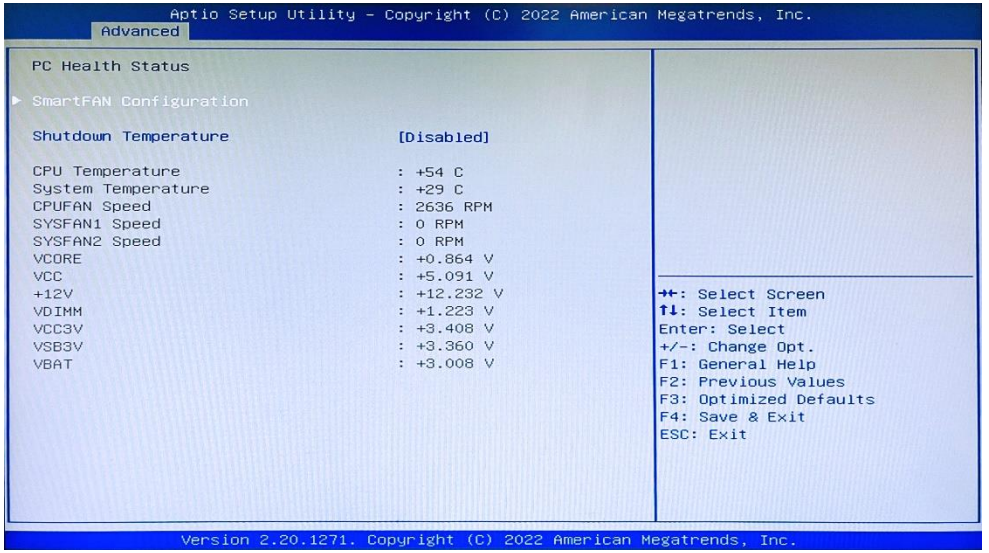
SmartFAN Configuration:

- **CPUFAN / SYSFAN1/ SYSFAN2 Smart Mode:** Options: [**Disable**]; [**Enable**]. When Enable
  - **CPUFAN / 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.
  - **CPUFAN / 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.
  - **CPUFAN / 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.
  - **CPUFAN / 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

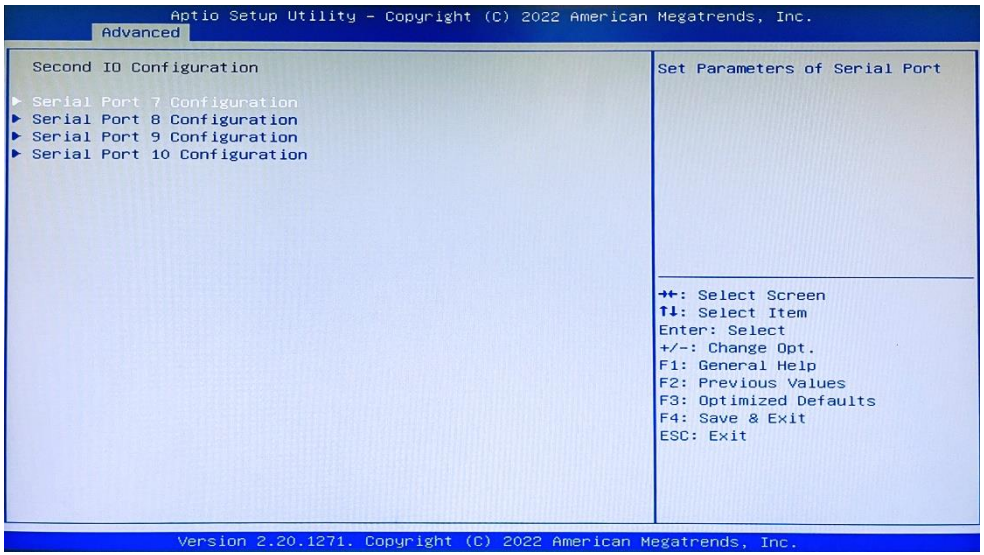


Shutdown Temperature:

Use this item to select system shutdown temperature.
Options: [**Disabled**]; [**70oC/158oF**]; [**75oC/167oF**]; [**80oC/176oF**]; [**85oC/185oF**]; [**90oC/194oF**].



5.4.9. Second IO Configuration.

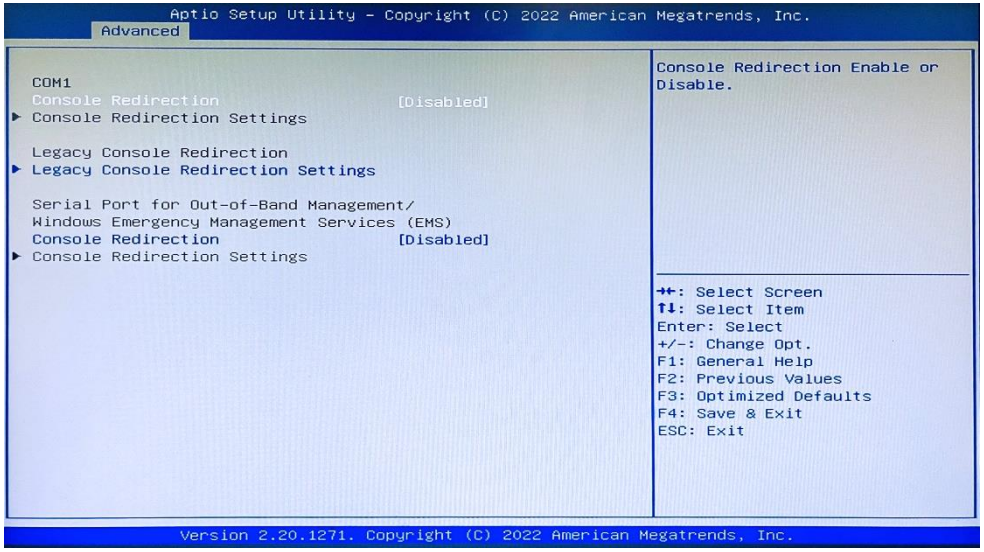


Serial Port 7 /Serial Port 8 /Serial Port 9 /Serial Port 10 Configuration:

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

Change Settings: Use this item to select an optimal setting for super IO device. Changing setting may conflict with system resources.

5.4.10. Serial Port Console Redirection



Console Redirection: Options: [**Disable**]; [**Enable**]. When [**Enable**], following items shall appear.

Console Redirection Settings: The settings specify exchange data between host & user system. Both systems should have the same or compatible settings.

COM1:
Console Redirection Settings: Options: [**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.
Options: [**9600**]; [**19200**]; [**38400**]; [**57600**]; [**115200**].

Data Bits: Options: [**7**]; [**8**].

Parity: A parity bit can be sent with the data bits to detect some transmission errors. Options: [**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. Options: [**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. Options: [**None**]; [**Hardware RTS/CTS**].

VT-UTF8 Combo Key Support: Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals. Options: [**Disabled**]; [**Enabled**].

Recorder Mode: With this mode enable only text will be sent. This is to capture Terminal data. Options: [**Disabled**]; [**Enabled**].

Resolution: 100x31: Use this item to enable or disable extended terminal resolution. Options: [**Disabled**]; [**Enabled**].

Putty KeyPad: Use this item to select Function Key and KeyPad on Putty. Options: [**VT100**]; [**Linux**]; [**XTERMR6**]; [**SCO**]; [**ESCN**]; [**VT400**].

Legacy Console Redirection: Press [Enter] to make settings for the following item;

Legacy Console Redirection Settings:
Legacy Serial Redirection Port: For user to select a COM port to display redirection of legacy OS and Legacy OPROM messages. Options: [**COM1**]; [**COM1(Pci Bus0, Dev0, Func0) (Disabled)**].

Resolution: This item is for user to select the number of Rows and Columns supported redirection. Options: [**80x24**]; [**80x25**].

Redirect After POST: Options: [**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**], the following sub-items shall appear:

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) allows for remote management of a Windows Server OS through a serial port.
Options: [**COM1**]; [**COM1(Pci Bus0, Dev0, Func0) (Disabled)**].

Terminal Type: Options: [**VT100**]; [**VT100+**]; [**VT-UTF8**]; [**ANSI**].
[**VT-UTF8**] is the preferred terminal type for out-of-band management. The next best choice is [**VT100+**] and them [**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.
Options: [**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.
Options: [**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.

5.4.11. USB Configuration

Legacy USB Support: Options: **[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.

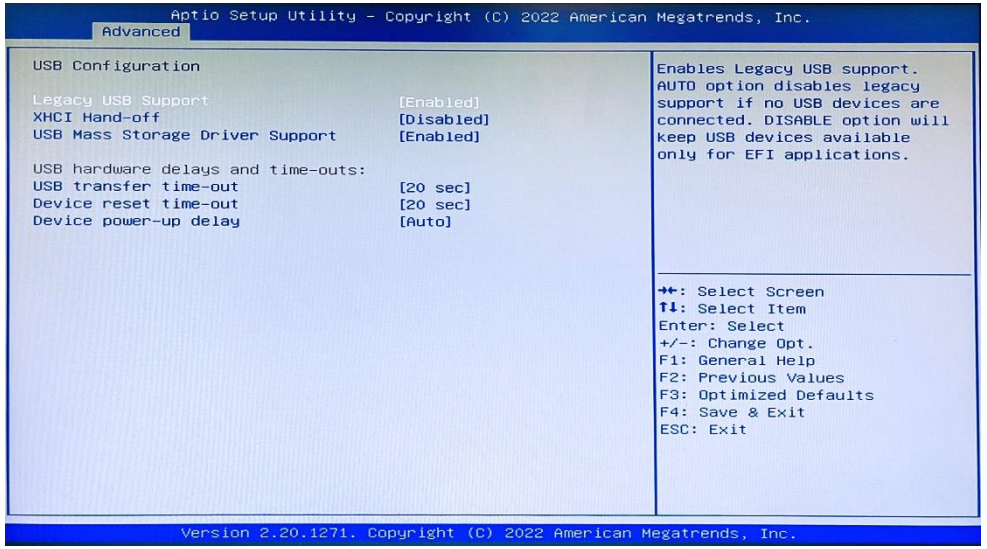
XHCI Hand-off: This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver. Options: **[Enabled]; [Disabled].**

USB Mass Storage Driver Support: Use this item to enable or disable USB mass storage driver support. Options: **[Enabled]; [Disabled].**

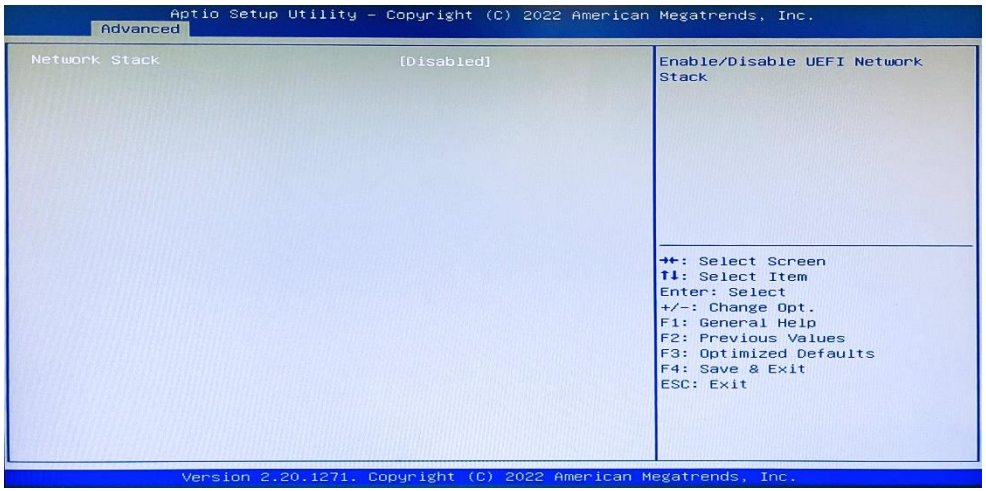
USB Transfer time-out: Use this item to set the time-out value for control, bulk, and interrupt transfers. Options: [**1 sec**]; [**5 sec**]; [**10 sec**]; [**20 sec**].

Device reset time-out: Use this item to set USB mass storage device start unit command time-out. Options: [**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. Options: [**Auto**]; [**Manual**].
Select [**Manual**] you can set value for the sub-item: '**Device Power-up delay in seconds**', the delay range in from 1 to 40 seconds, in one second increments.



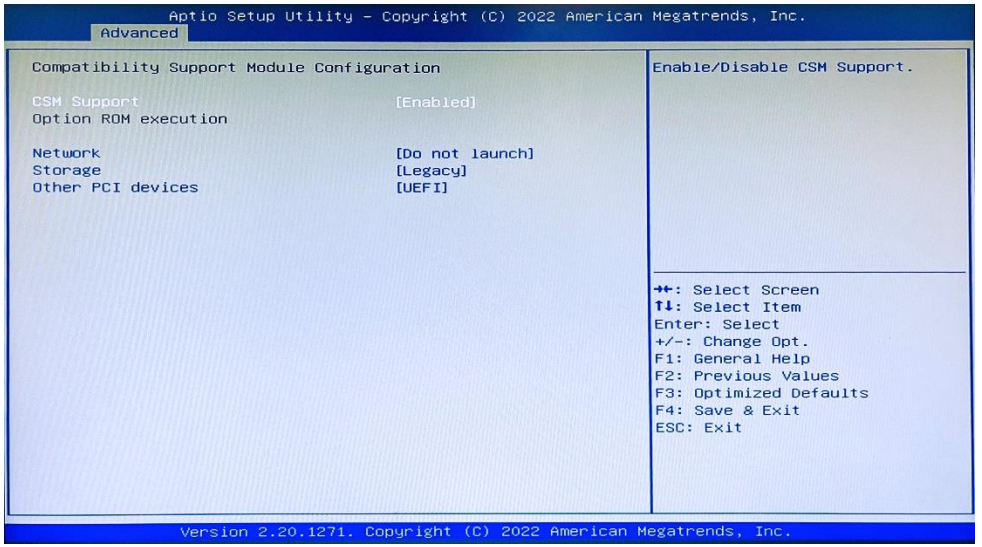
5.4.12. Network Stack Configuration



Network Stack: Use this item to enable or disable UEFI Network Stack.
Options: [**Disabled**]; [**Enabled**]. *When set as [**Enabled**], the following sub-items shall appear:

- **Ipv4 PXE Support:** Options: [**Disabled**]; [**Enabled**]. Use this item to enable IPv4 PXE boot support. When set as [**Disabled**], IPv4 boot support will not be available.
- **Ipv6 PXE Support:** The optional settings are: [**Disabled**]; [**Enabled**]. Use this item to enable IPv6 PXE boot support. When set as [**Disabled**], IPv6 boot support will not be available
- **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.

5.4.13. CSM Configuration



CSM Support: Optional: [**Disabled**]; [**Enabled**].
*When set as [**Enabled**], the following sub-items shall appear:

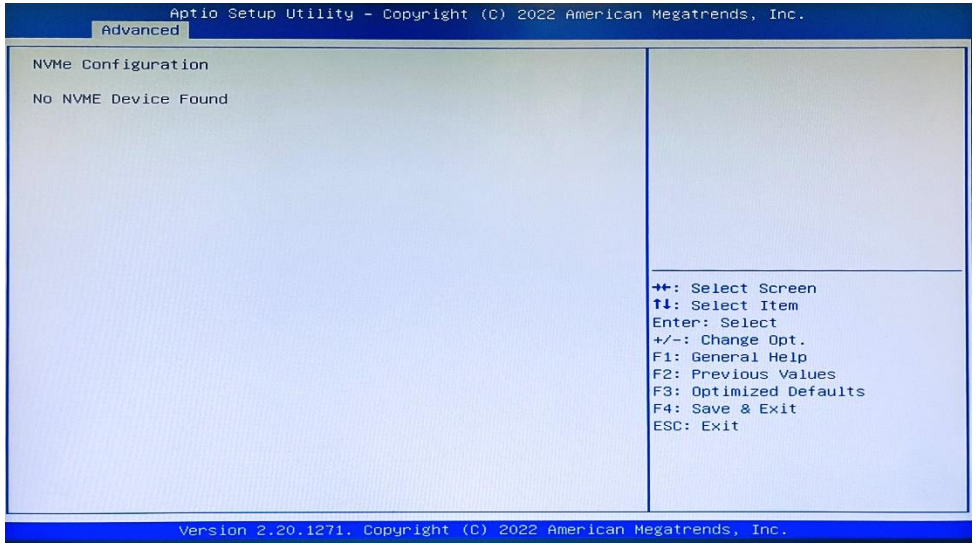
Network: This option controls the execution of network OpROM.
Options: [**Do not launch**]; [**Legacy**].

Storage: This option controls the execution of UEFI and Legacy Storage OpROM.
Options: [**Do not launch**]; [**UEFI**]; [**Legacy**].

Other PCI devices: This item is for system to determine OpROM execution policy for devices other than Network, Storage or Video.
Options: [**Do not launch**]; [**UEFI**]; [**Legacy**].

5.4.14. NVMe Configuration

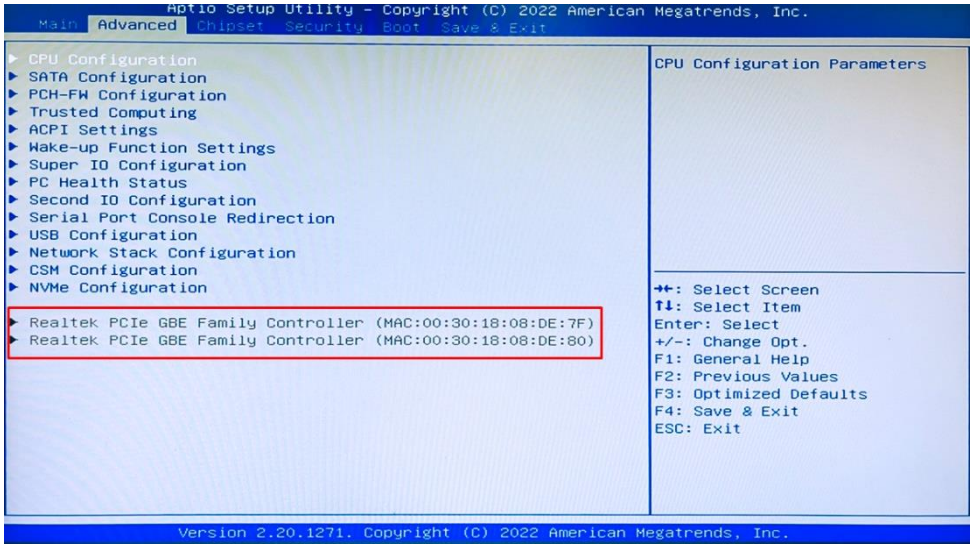
Press [**Enter**] to view current NVMe Configuration.
*Note: options only when NVME device is available



5.4.15. Realtek PCIe GBE Family Controller

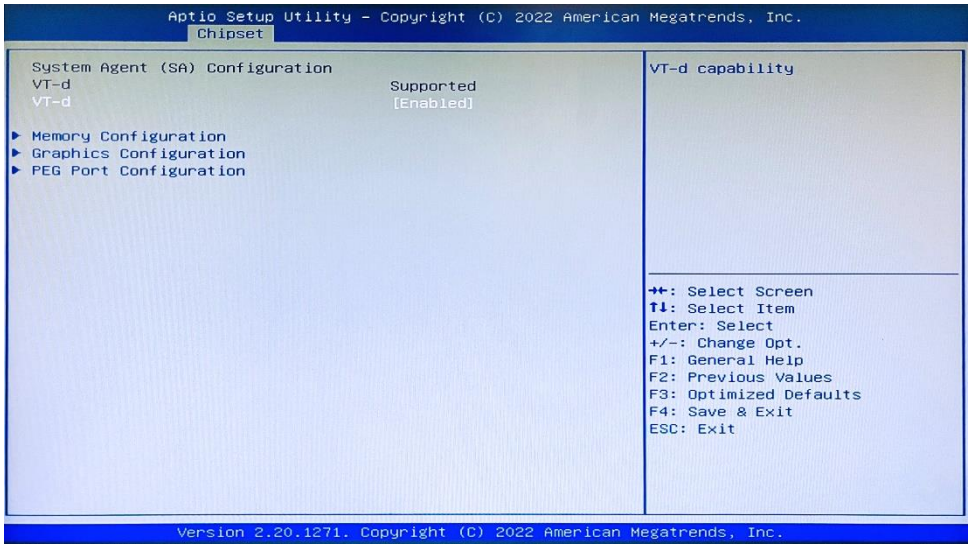
Realtek PCIe GBE Family Controller (MAC:XX:XX:XX:XX:XX:XX)/
Realtek PCIe GBE Family Controller (MAC:XX:XX:XX:XX:XX:XX)

These items show current network brief information.



5.5. Chipset Menu

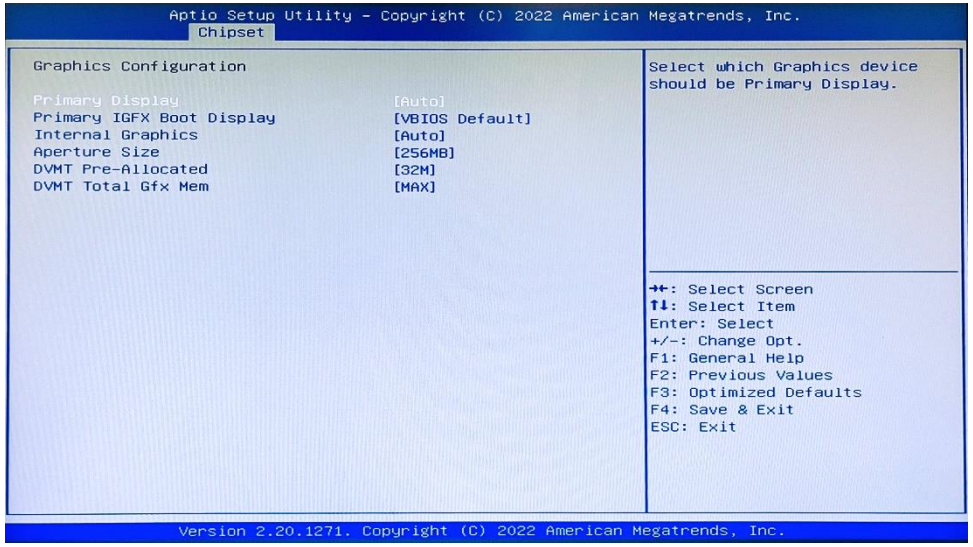
5.5.1. System Agent (SA) Configuration



VT-d: Options: [**Disabled**]; [**Enabled**]
Use this item to enable or disable VT-d capability

Memory Configuration: Press to view brief information for the working memory module

5.5.1.1. Graphics Configuration



Primary Display: Options: **[Auto]; [IGFX]; [PEG]; [PCI].** Use this to select Primary Display

Primary IGFX Boot Display: Options**: [VBIOS Default]; [DP]; [HDMI]; [DVI]; [VGA].**
Use this to select the video device which will be activated during POST. This has no effect if external graphics present.
***Note**: In the case that the '**Primary IGFX Boot Display**' is select as [**DP**], [**HDMI**], [**DVI**] or [**VGA**], user can make further settings in '**Secondary IGFX Boot Display**':*

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

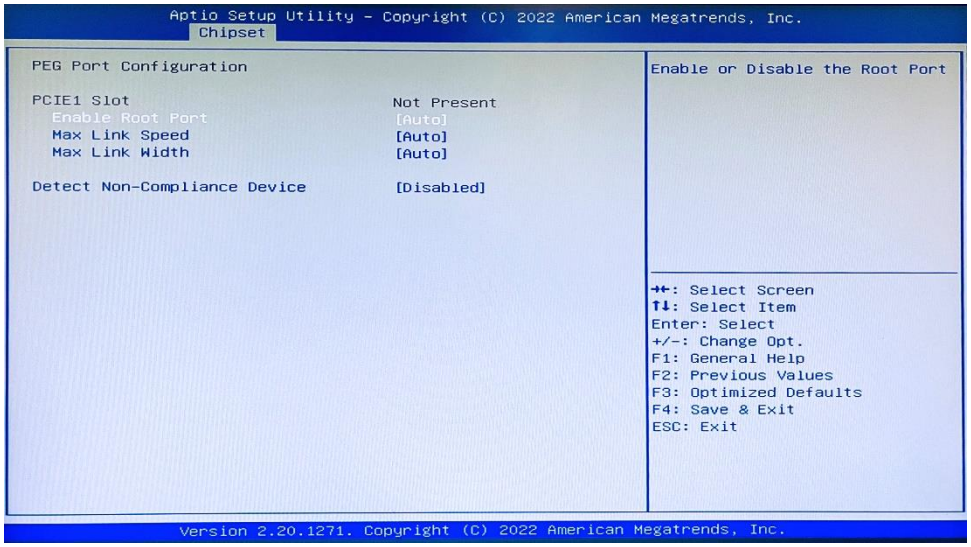
Internal Graphics: Options**: [Auto]; [Disabled]; [Enabled]**
Use this item to keep IGFX enabled based on the setup options.

Aperture Size: Options: [**128MB**]; [**256MB**]; [**512MB**]; [**1024MB**]; [**2048MB**]
Use this 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

DVMT Pre-allocated: Options: [**32M]; [64M**]. Use this item to select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem: Options**: [128M]; [256M]; [MAX].** Use this to select DVMT 5.0 Total Graphic Memory size used by the Internal Graphics Device

5.5.1.2. PEG Port Configuration



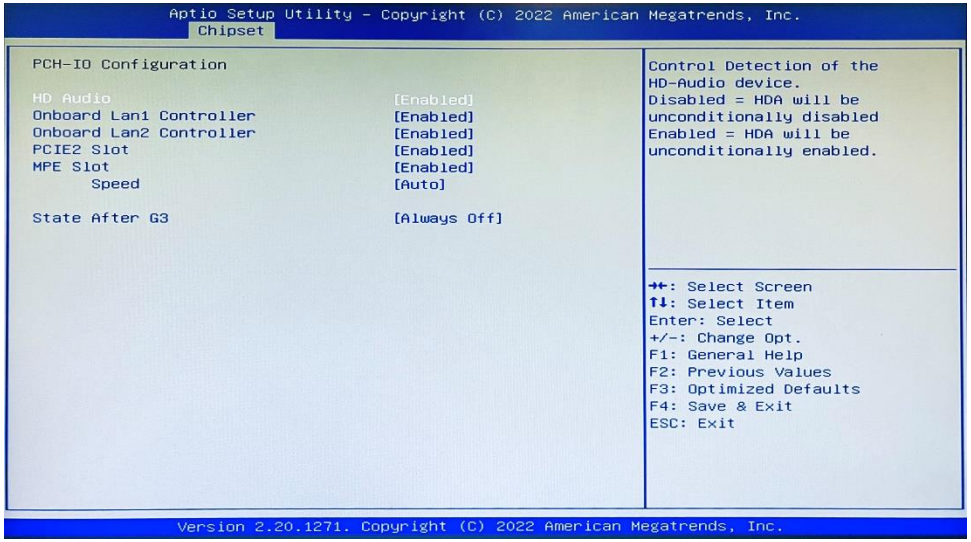
PCIE1 Slot: Options: **[Disabled]; [Enabled]; [Auto].**
Use this item to enable or disable the root port.

Max Link Speed: Options: **[Auto]; [Gen1]; [Gen2]; [Gen3].**
Use this item to select slot max speed

Max Link Width: Options: **[Auto]; [Force X1]; [Force X2]; [Force X4]; [Force X 8].**
This item is for user to force PEG link to restrain to X1/2/4/8.

Detect Non-Compliance Device: Options: **[Disabled]; [Enabled].**
This item is for user to detect Non-Compliance PCI Express Device in PEG.

5.5.2. PCH-IO Configuration



HD Audio: Options: **[Disabled]; [Enabled];**
This item controls detection of the HD-Audio device.

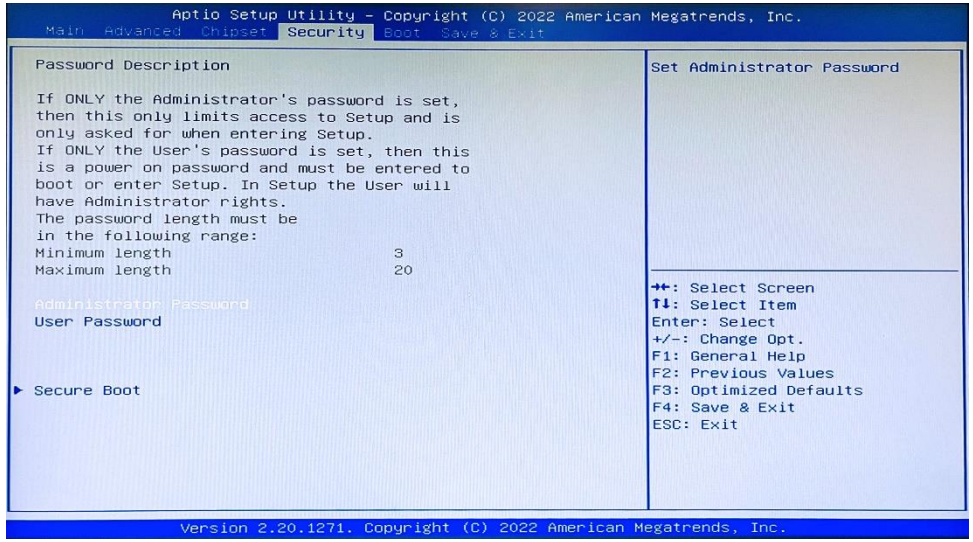
Onboard Lan1 Controller: Options: **[Disabled]; [Enabled];**
Use this item to enable or disable corresponding onboard NIC device or controller

Onboard Lan2 Controller: Options: **[Disabled]; [Enabled];**
Use this item to enable or disable Lan2 onboard NIC device or controller.

PCIE2 Slot: Options: **[Disabled]; [Enabled];**
Use this item to control respective PCI Express Root Port

MPE Slot: Options: **[Disabled]; [Enabled];**
Use this item to enable or disable MPE slot function
Speed: Options: **[Auto], [Gen1], [Gen2];**
System after G3: Options: **[Always On]; [Always Off]; [Former State];**
Use it to specify state of PC when power re-applied after a power failure.

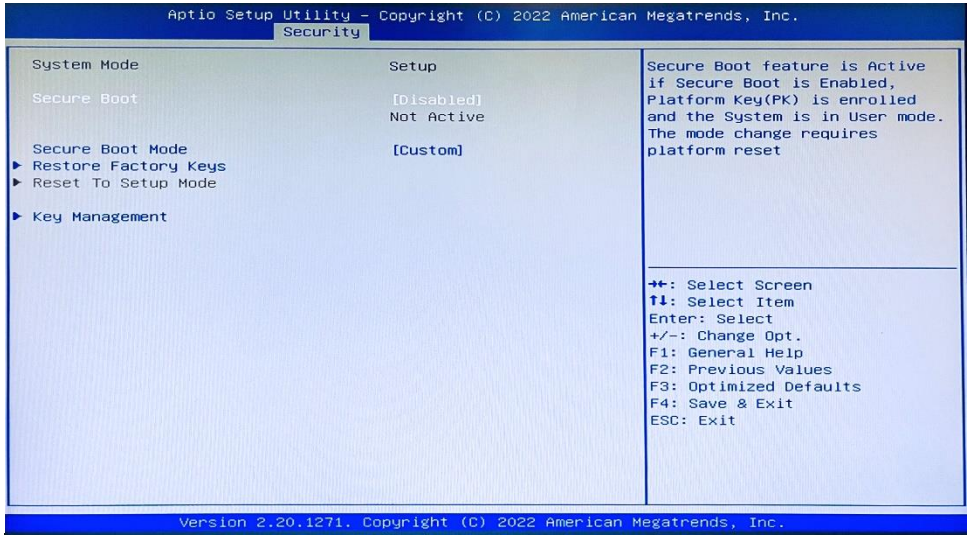
5.6. Security Menu



Administrator Password: If there is no password present on system, press [**Enter**] to create new. If password is present, 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.

5.6.1. Secure Boot



Secure Boot: Options: [**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: Options: [**Standard**], [**Custom**];
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.

*When set as [**Custom**], further settings show up.
Restore Factory Keys: Use this item to force system to User Mode, to install factory default Secure Boot key databases.

Reset To Setup Mode: Use this item to delete all Secure Boot Key databases from NVRAM

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

Factory Key Provision: Options: [**Disabled**], [**Enabled**];
This item is for user to install factory default secure boot keys after the platform reset and while the system is in Setup mode

- **Restore Factory Keys**: Use this item to force system into User Mode. Install factory default Secure Boot Key databases.
- **Reset to Setup Mode:** Use this item to delete all Secure Boot key databases from NVRAM.
- **Export Secure Boot variables:** Use this item to copy NVRAM content of Secure Boot variables to files in a root folder on a file system device
- **Enroll Efi Image:** This item allows the image to run in Secure Boot Mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)

Device Guard Ready

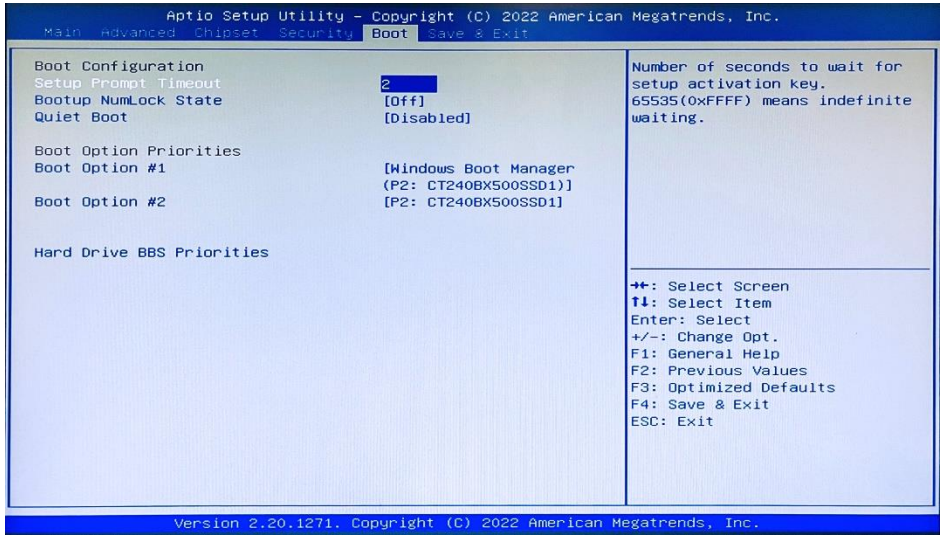
Remove 'UEFI CA' from DB: Device Guard ready system must not list 'Microsoft EFI CA' Certificate in Authorized Signature database (db).
Restore DB defaults: Use this item to restore DB variable to factory defaults

Secure Boot Variable/Size/Keys/Key Source
Platform Key (PK)/Key Exchange Keys/Authorized Signature/Forbidden Signature/ Authorized TimeStamps/OS Recovery Signatures: Use this item to enroll Factory Defaults or load the keys from a file with:

1. Public Key Certificate in:
    a. EFI_SIGNATURE_LIST
    b. EFI_ CERT_X509 (DER encoded)
    c. EFI_ CERT_RSA2048 (bin)
    d. EFI_ CERT_SHAXXX (bin)
2. Authenticated UEFI Variable
3. EFI PE/COFF Image (SHA256)

Key Source: Factory, External, Mixed.

5.7. Boot Menu



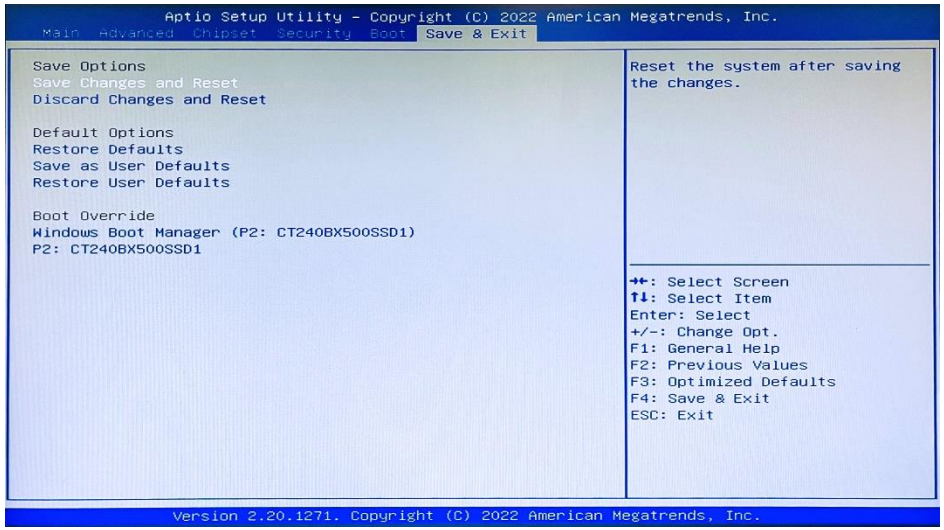
Setup Prompt Timeout: Options: [**Disabled**], [**Enabled**];
Use this item to set number of seconds to wait for setup activation key.

Bootup Numlock State: Options: [**On**], [**Off**];
Use this item to select keyboard numlock state

Quiet Boot: Options: [**Disabled**], [**Enabled**];

Boot Option Priorities:
Boot Option #1/ Boot Option #2… Use this item to decide system boot order from available options.

5.8. Save & Exit Menu



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

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

UEFI: Built-in EFI Shell: Press this item and a dialogue box shall appear to ask if user wish to save configuration and reset