NF835A Series

User's Manual

NO.: G03-NF835A-F

Revision: 1.0

Release date: January 21, 2021

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.

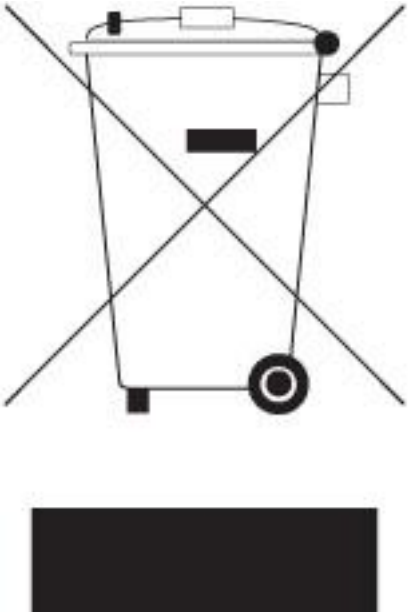


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Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.

- 0 to 60 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)

- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.

- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.

- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

USER'S NOTICE

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Manual Revision Information

Reversion	Revision History	Date
1.0	First Edition	January 21, 2021

Item Checklist

☑ Motherboard
☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Whiskey Lake-U series processor, TDP 15 W, never denies high performance
- Support 2* DDR4 2400MHz SO-DIMM, maximum capacity up to 32GB
- Onboard 2 * RJ-45 gigabit Ethernet LAN port
- Support 1 * DP,1* HDMI, 1*EDP, 1*LVDS (*EDP and LVDS are selectable)
- Support 3 independent displays
- Onboard 1 * M.2 M-key slot, type-2242/2260/2280,PCIe x4(NVMe) and SATA interface are selectable
- Onboard 1 *M.2 E-key slot,type-2230,support Wi-Fi / Bluetooth with Intel CNVi interface
- Support 1 * SATAIII device
- Support 4* USB 3.1 Gen.2 + 2* USB 3.1 Gen.2 (Type-C & Vertical type) + 3* USB 2.0
- Support 6* COM (***COM1** supports RS232/422/485)
- Support CPU Smart FAN
- Compliance with ErP standard
- Support Watchdog function
- Solution for Digital Signage / Industrial PCs / Factory Automation / IoT Solution

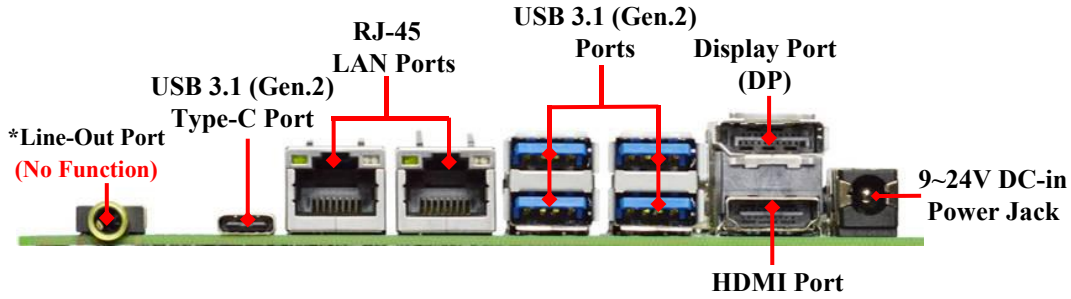
1-2 Specification

Spec	Description
Design	● 3.5”SBC; 8-Layers; PCB size: 14.8x 10.2 cm
Embedded CPU	● Integrated with Intel® Whiskey Lake-U series CPU (TDP 15W) ** **Note:** CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.*
Memory Slot	● 2*DDR4 SO-DIMM slot support 2* DDR4 2400MHz non-ECC SO-DIMM up to 32GB ● Support dual channel function ** **Note:** Memory clock supporting range is decided by specific CPU of the model. For more memory compatibility information please consults your local dealer.*
Expansion Slot	● 1* M.2 M-key slot, type-2242/2260/2280, PCIe x4(NVMe) and SATA interface are selectable (***M2M***) ● M.2 E-key slot,type-2230, support Wi-Fi / Bluetooth with Intel CNVi interface (***M2E***)
Storage	● 1* SATAIII 6Gb/s port
LAN Chip	● Integrated with 1*Intel i211AT & 1*Intel i219LM Gigabit LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
BIOS	● AMI Flash ROM
Rear I/O	● 1* 9~24V DC-in power Jack ● 1* display port (DP) ● 1* HDMI port ● 4* USB 3.1 (Gen.2) port ● 1* USB 3.1 (Gen.2) Type-C port ● 2* RJ-45 LAN port ● 1* Audio Line Out port(**No Function**)
Internal I/O	● 1* 2-pin internal 9~24V DC-in power connector ● 1* Internal vertical USB 3.1 (Gen.2) port connector ● 1* SATA Power-out connector ● 1* CPU FAN header

	● 1* Front panel header ● 1* 9-pin USB 2.0 header (Expansible to 2* USB 2.0 ports) ● 1* 4-pin USB 2.0 header (Expansible to 1* USB 2.0 port) ● 6* Serial port header (**COM1~COM6**;**COM1** supports RS232/422/485) ● 1* Front panel audio header(**No Function**) ● 1* 3W amplifier header(**No Function**) ● 1* GPIO header ● 1* EDP header (selection with LVDS) ● 1* LVDS header(selection with eDP) ● 1* LVDS inverter header ● 1* I2C_CON header ● 1*PS/2 keyboard & mouse header ● 1* LAN LED activity LED header+1* Wi-Fi/BT activity LED header

1-3 Layout Diagram

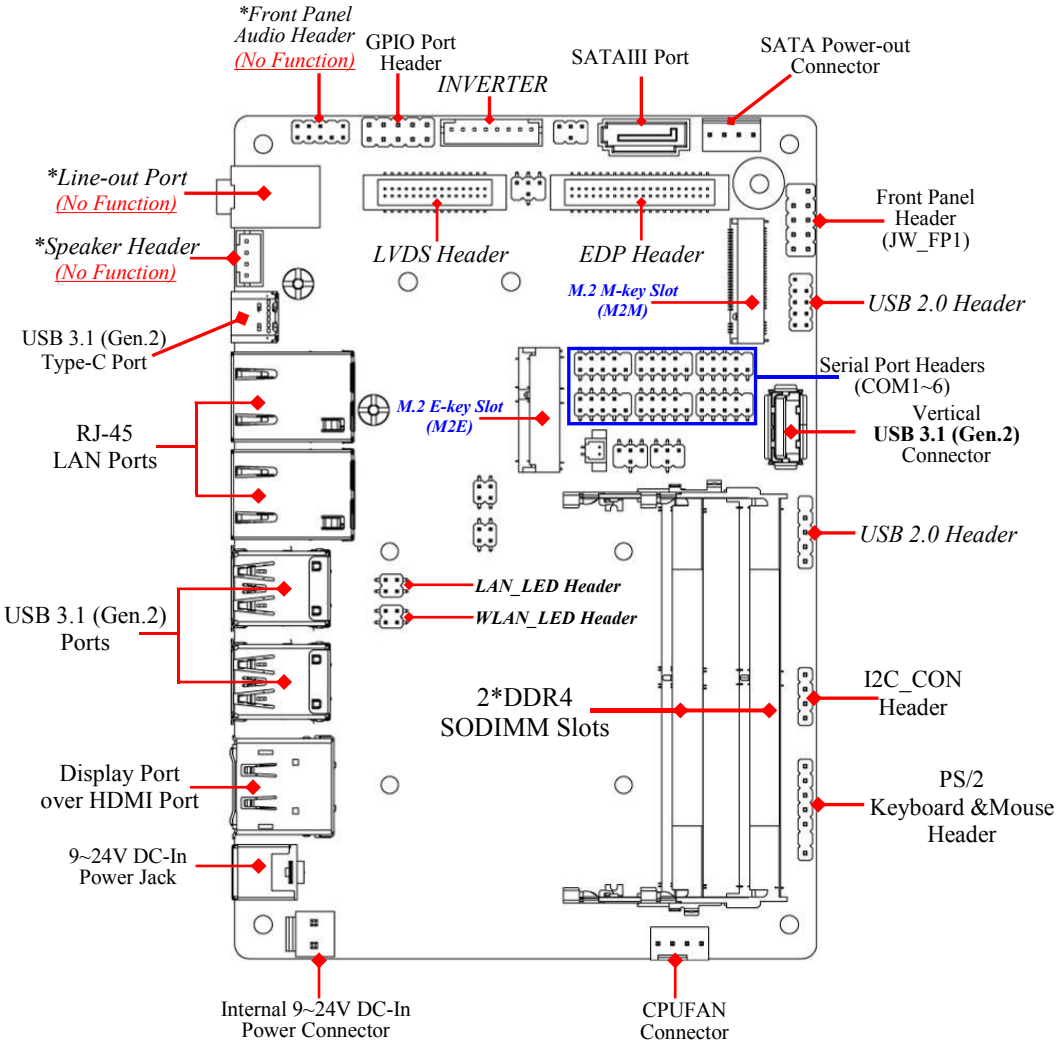
Rear IO Diagram:



Warning!!

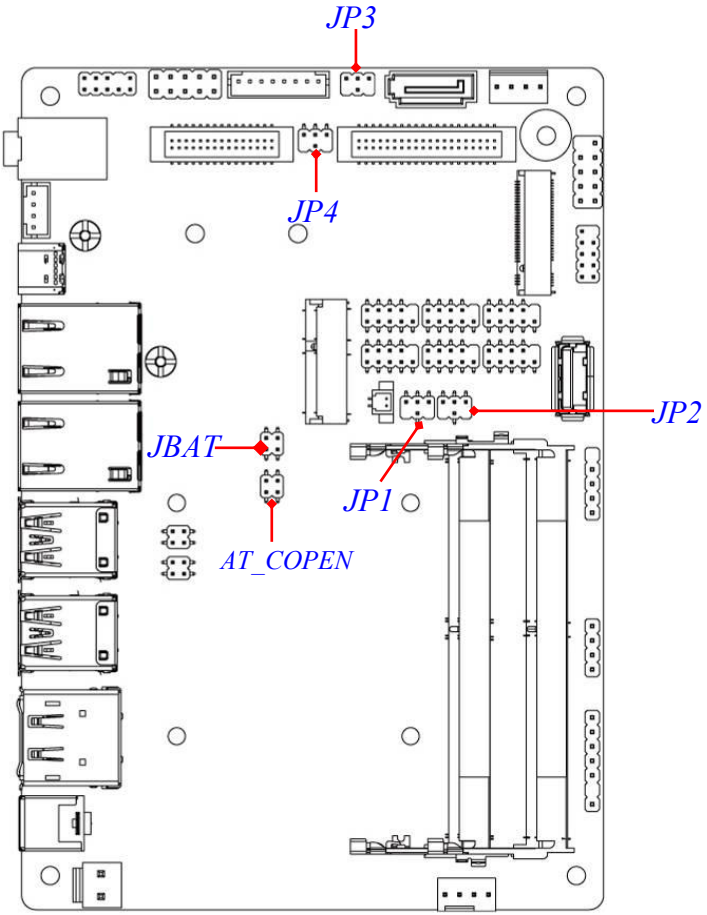
The board has a 9~24V DC-in power connector **(DC_IN)** in I/O back panel and an internal 9~24V power connector **(DC2P).** User can only connect one type of compatible power supply to one of them to power the system.

Diagram-Front Side:



*Note: **Line-Out port, front panel audio header** and **speaker header** are functionless for lack of audio codec.*

Jumper Positions:



Jumpers

Jumper	Name	Description
JP1	*COM1 Header Pin-9 Function Select*	4-Pin Block
JP2	*COM2 Header Pin-9 Function Select*	4-Pin Block
JP3	LCD_ BACKLIGHT VCC Select	4-Pin Block
JP4	LCD Panel VCC Select	4-Pin Block
JBAT	***Pin (1-2):*** Clear CMOS ***Pin (3-4):*** Flash Override	4-Pin Block
AT_COPEN	***Pin (1-2):*** AT Mode Select ***Pin (3-4):*** Case Open Display Select	4-Pin Block

Connectors

Connector	Name
DC_IN	9~24V DC–in Power Jack
DP_HDMI	**Top:** Display Port (DP) Connector **Bottom:** HDMI Port Connector
USB31/USB32	USB 3.1 (Gen.2) Port Connector X4
LAN1/LAN2	RJ-45 LAN Port Connector X2
USBC	USB 3.1 (Gen.2) Type-C Port Connector
LINE_OUT	*Audio Line Out Connector****(No Function)***
FP_USB3	Internal Vertical USB 3.1 (Gen.2) Port Connector
DC2P	Internal 2-Pin 9~24V DC-in Power Connector
SATA	SATAIII Port Connector
SATAPWR	SATA Power out Connector
CPUFAN	CPUFAN Connector

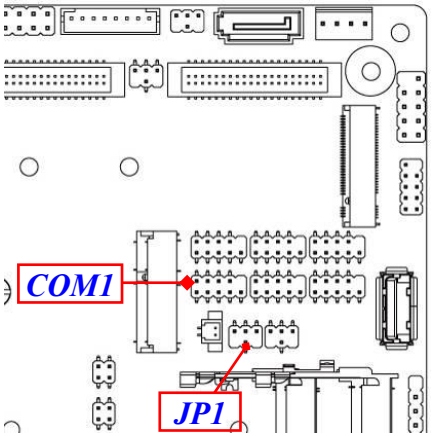
Headers

Header	Name	Description
JW_FP	Front Panel Header(PWR LED/ HDD LED/Power Button /Reset)	9-pin Block
FP_USB22	USB 2.0 Header	9-pin Block
FP_USB21	USB 2.0 Header	4-pin Block
GPIO	GPIO Port Header	10-pin Block
COM1~COM6	Serial Port Header	9-pin Block
EDP	EDP Port Header	40-pin Block
LVDS	LVDS Port Header	30-pin Block
INVERTER	LVDS Inverter	8-pin Block
I2C_CON	I2C_CON Header	4-pin Block
PS2KBMS	PS/2 Keyboard & Mouse Header	6-pin Block
LAN_LED	LAN Activity LED Header	4-pin Block
WLAN_LED	Wi-Fi & BT Activity LED Header	4-pin Block

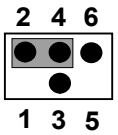
Chapter 2
Hardware Installation

2-1 Jumper Settings

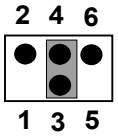
JP1 (4-pin): COM1 Header Pin-9 Function Select



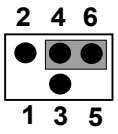
JP1→COM1 Header



2-4 Closed:
RI=RS232;

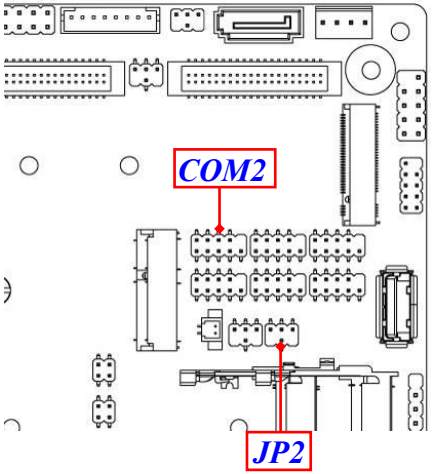


3-4 Closed:
RI= +5V;

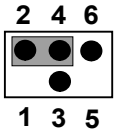


4-6 Closed:
RI= +12V.

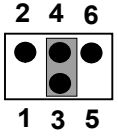
JP2 (4-pin): COM2 Header Pin-9 Function Select



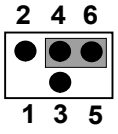
JP2→COM2 Header



2-4 Closed:
RI=RS232;

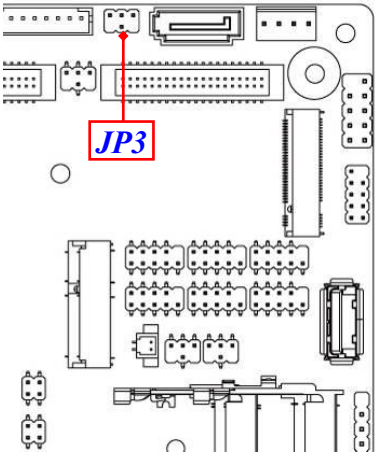


3-4 Closed:
RI= +5V;

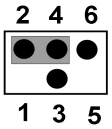


4-6 Closed:
RI= +12V.

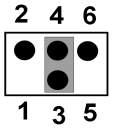
JP3 (4-pin): LVDS/EDP LCD_BACKLIGHT Voltage Select



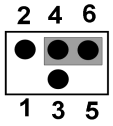
JP3→LCD_BACKLIGHT VCC Select



2-4 Closed:
VCC= +5V;

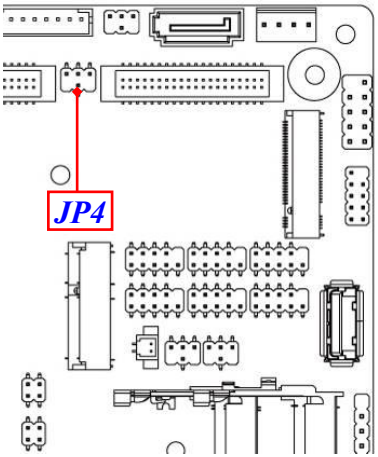


3-4 Closed:
VCC= +12V;

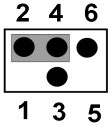


4-6 Closed:
VCC= DCIN.

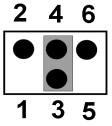
JP4 (4-pin): LVDS/EDP LCD Panel VCC Select



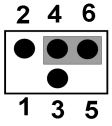
JP4→LCD Panel VCC Select



2-4 Closed:
VCC= 3.3V;

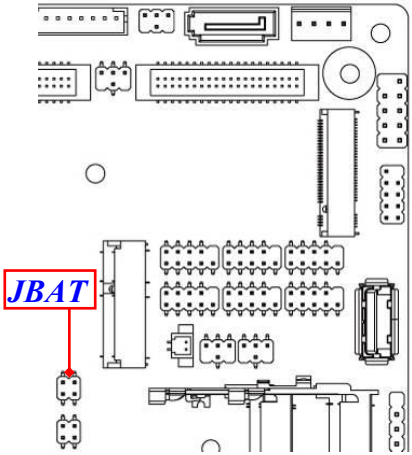


3-4 Closed:
VCC= +5V;

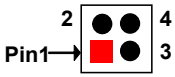


4-6 Closed:
VCC= +12V.

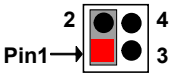
Pin (1-2) of JBAT (4-pin): Clear CMOS Settings



Pin 1&2 of JBAT→Clear CMOS

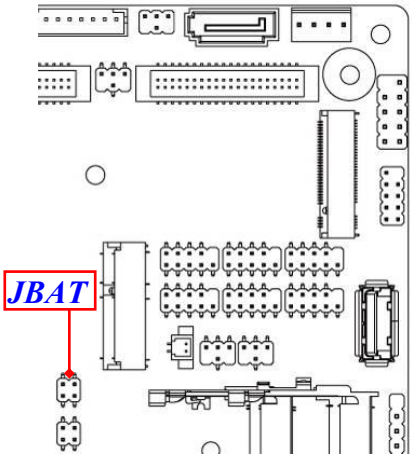


1-2 Open: Normal(Default);

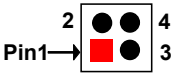


1-2 Closed: Clear CMOS(One Touch).

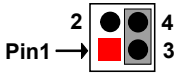
Pin (3-4) of JBAT (4-pin): ME Flash Override Select



Pin 3&4 of JBAT→ME Flash Override

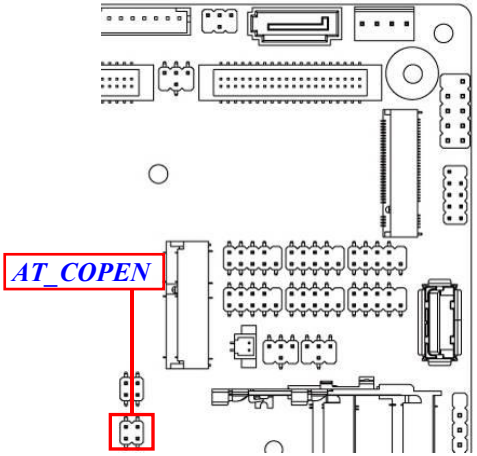


3-4 Open: Normal(Default);

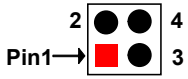


3-4 Closed: ME Flash Override.

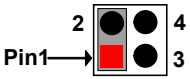
Pin (1-2) of AT_COPEN (4-pin): **ATX Mode/AT Mode Select**



Pin 1&2 of AT_COPEN
→ ATX/AT Mode Select



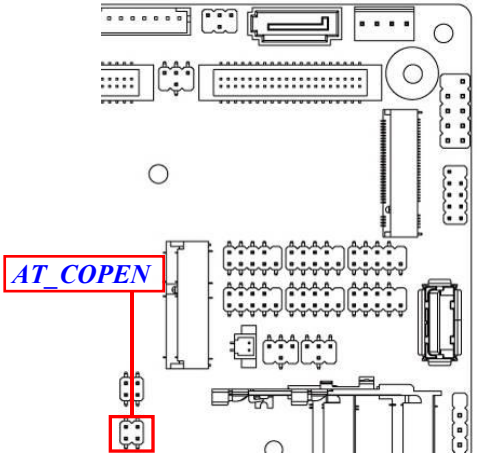
1-2 Open: ATX Mode Selected(Default);



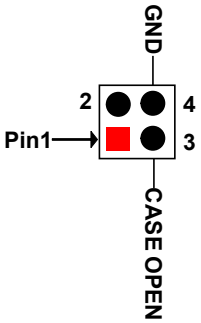
1-2 Closed: AT Mode Selected.

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

Pin (3-4) of AT_COPEN (4-pin): Case Open Message Display Function Select



Pin 3&4 of AT_COPEN
→ Case Open Detection



Pin (3-4) Closed: *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.*

2-2 Connectors and Headers

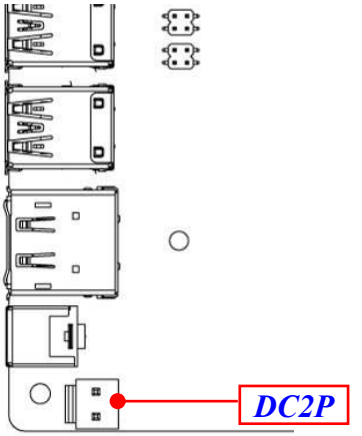
2-2-1 Connectors

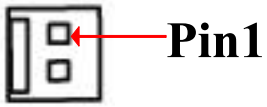
(1) Rear I/O Connectors

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

Icon	*Name*	*Function*
	**9~24V DC-in Power Jack**	For user to connect compatible power adapter to provide power supply for the system.
	**Top: Display Port** **Bottom: HDMI Port**	**Display port:** to the system to corresponding display device with compatible DP cable. **HDMI port:** to connect display device that support HDMI specification.
	**USB 3.1 (Gen.2) Port**	To connect USB keyboard, mouse or other devices compatible with USB 3.1 (Gen.2) specification. Ports support up to 10Gbps data transfer rate.
	**USB 3.1 (Gen.2) Type-C Port**	To connect USB keyboard, mouse or other devices compatible with USB 3.1 (Gen.2) specification with Type-C cable. Ports support up to 10Gbps data transfer rate.
	**RJ-45 LAN Port**	This connector is standard RJ-45 LAN jack for Network connection.
	**Line-Out Connector (No Function)**	Audio Line-out port connector (No function for lack of audio Codec)

(2) DC2P(2-pin) : Internal 9~24V DC-in Power Connector



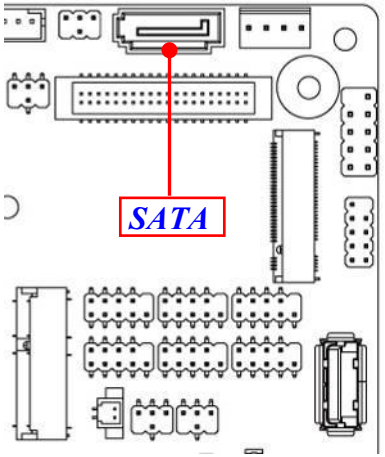


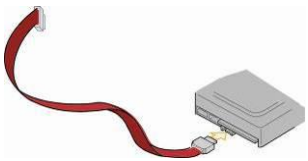
Pin No.	Definition
1	+9V~24VC DC-In
2	GND

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

(3) SATA(7-pin): SATAIII Port connector

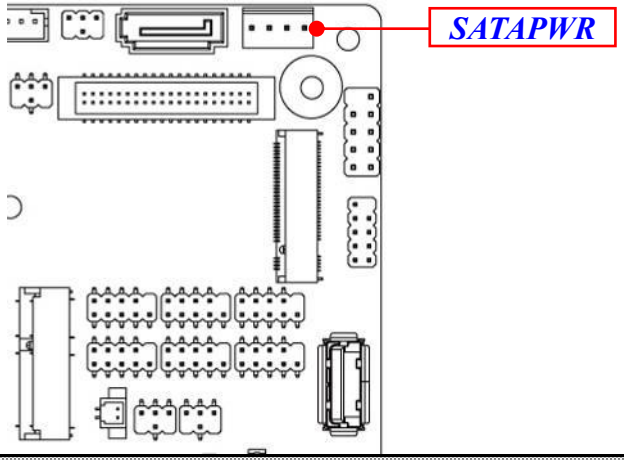
This is a high-speed SATAIII port that supports 6GB/s transfer rate.

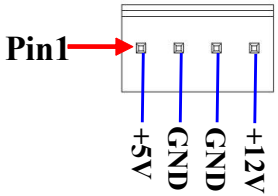




Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

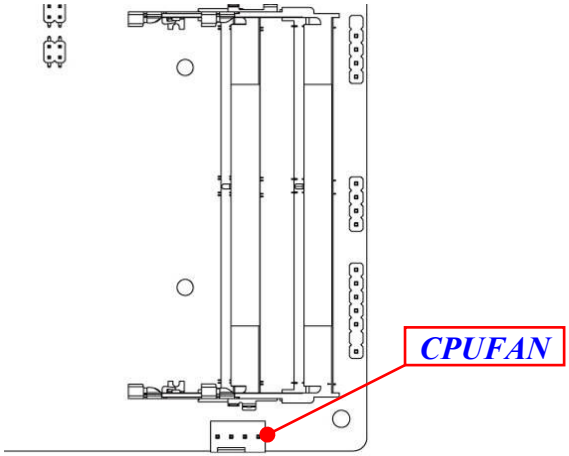
(4) SATAPWR (4-pin): SATA HDD Power-Out Connector

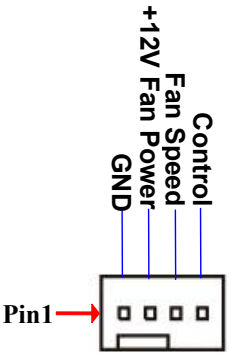




Warning: *Make sure that Pin-1 of compatible SATA Power out connector is inserted into corresponding Pin-1 of* ***SATAPWR*** *connector to avoid possible damage to the board and hard disk driver!*

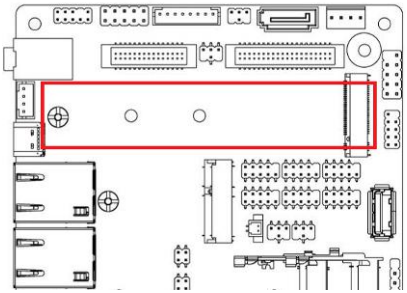
(5) CPUFAN (4-pin): CPU FAN Connector





(6) M2M: M.2 M-key Slot

M2M M.2 M-Key slot supports compatible type 2242/2260/2280 SATA module.

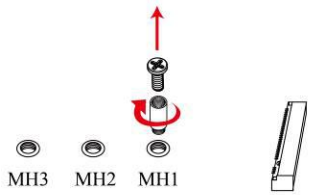


M2M Slot:

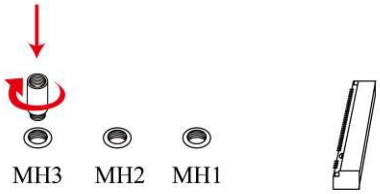


M.2 Module Installation Guide

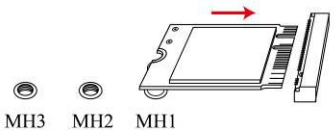
Nut Location	MH1	MH2	MH3
Card Length	**4.2 cm**	**6 cm**	**8 cm**
Module Type	Type- 2242	Type- 2260	Type- 2280



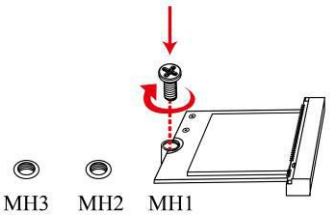
a) Remove the screw post and nut fixed at location **MH1** by default (Skip step 2 & 3 and go straight to Step 4 if you are going to use the default nut).



b) Lock the screw post into the location corresponding to the length of the module.



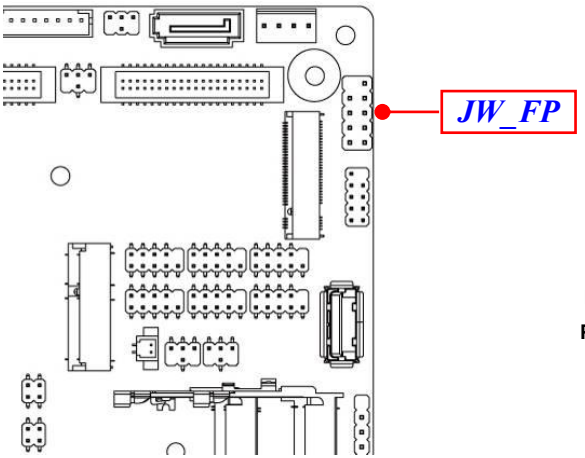
c) Align and insert corresponding M.2 module, as the photo shows.

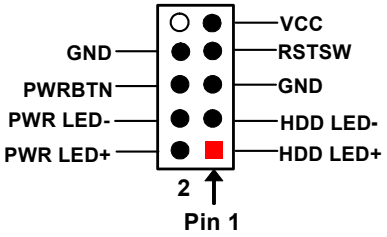


d) Tighten up the screw to secure the module into the M.2 connector. Make sure not overtighten the screw to avoid possible damage to the module.

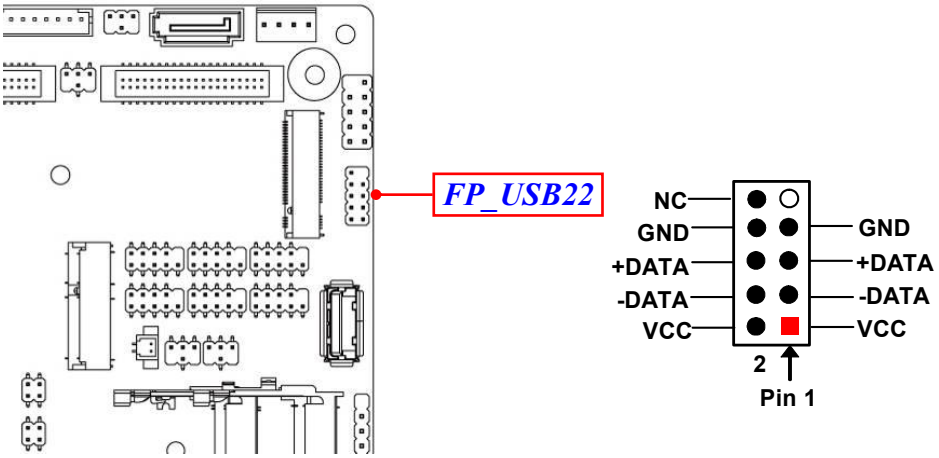
2-2-2 Headers

JW_FP (9-pin): Front Panel Header

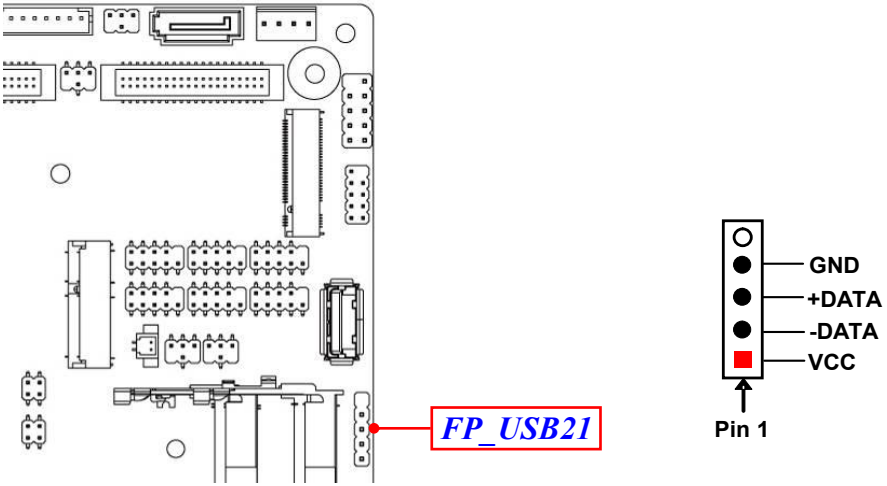




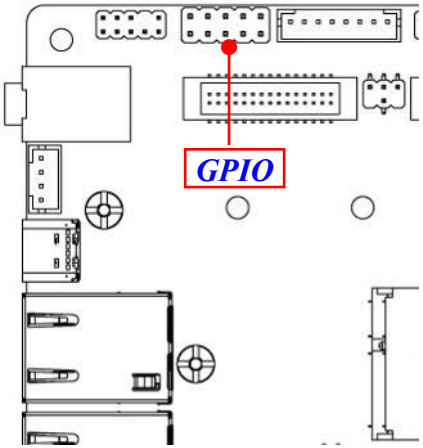
FP_USB22 (9-pin): USB 2.0 Port Header

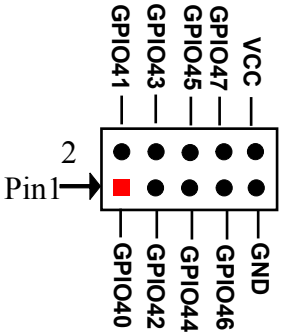


FP_USB21 (4-pin): USB2.0 Header

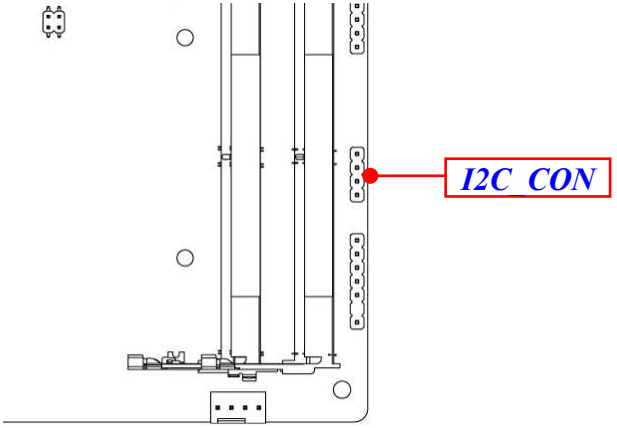


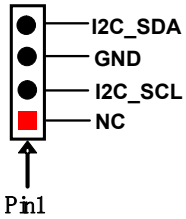
GPIO (10-pin): GPIO Header





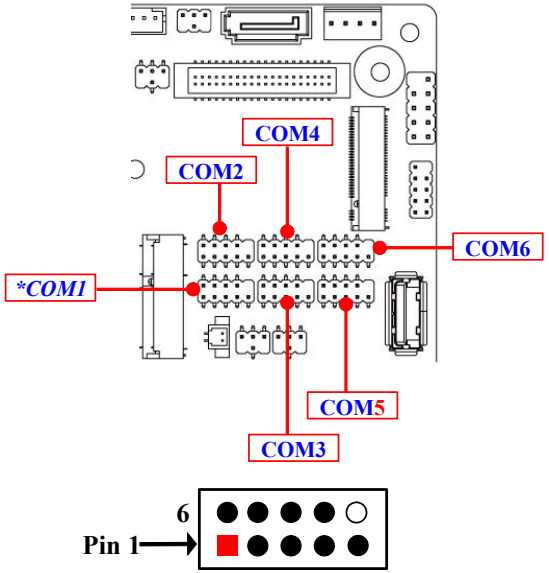
I2C_CON (4-pin): I2C Header





COM1/2/3/4/5/6(9-pin): Serial Port Headers

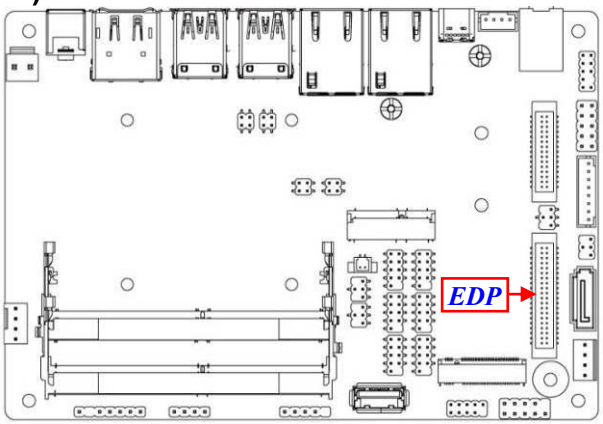
COM1: RS232/422/485 Serial Port Header.
COM2/3/4/5/6: RS232 Serial Port Header.

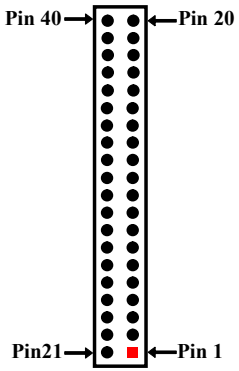


Pin NO.	RS232	*RS422 (optional)	*RS485 (optional)
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC

***Note: COM1 header can function as RS232/422/485 port header.** In normal settings COM1 functions as RS232 header. With compatible COM cable COM1 can function as RS422 or RS 485 header. User also needs to go to BIOS to set '**Transmission Mode Select**' for COM1 (refer to Page-32) at first, before using specialized cable to connect different pins of this port.*

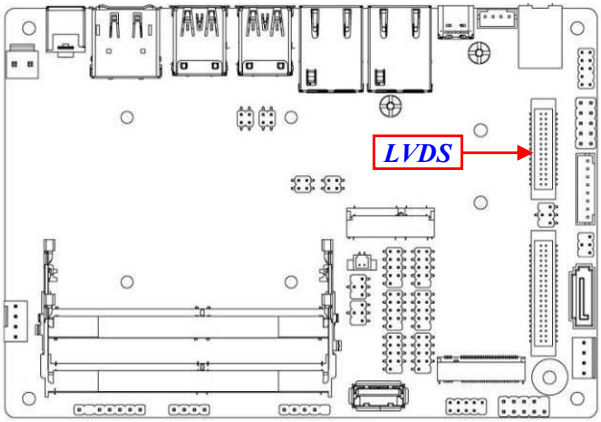
EDP (40-pin): 4-lane eDP Header

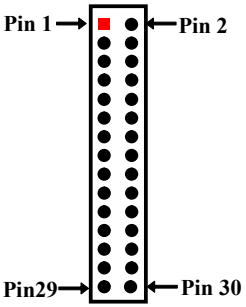




Pin Define	Pin NO.	Pin NO.	Pin Define
NC	Pin 40	Pin 20	LCD_VCC
BL_PWR	Pin 39	Pin 19	LCD_VCC
BL_PWR	Pin 38	Pin 18	LCD_VCC
BL_PWR	Pin 37	Pin 17	GND
BL_PWR	Pin 36	Pin 16	AUX_CH_N
NC	Pin 35	Pin 15	AUX_CH_P
NC	Pin 34	Pin 14	GND
BL_PWM_DIM	Pin 33	Pin 13	Lane0_P
BL_ENABLE	Pin 32	Pin 12	Lane0_N
GND	Pin 31	Pin 11	GND
GND	Pin 30	Pin 10	Lane1_P
GND	Pin 29	Pin 9	Lane1_N
GND	Pin 28	Pin 8	GND
HPD	Pin 27	Pin 7	Lane2_P
GND	Pin 26	Pin 6	Lane2_N
GND	Pin 25	Pin 5	GND
GND	Pin 24	Pin 4	Lane3_P
GND	Pin 23	Pin 3	Lane3_N
NC	Pin 22	Pin 2	GND
NC	Pin 21	Pin 1	NC

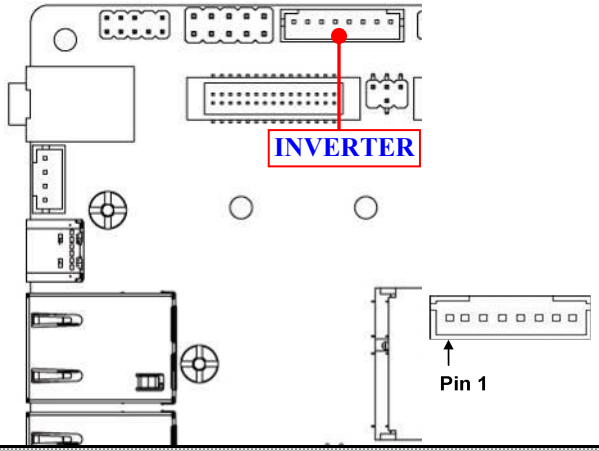
LVDS (30-pin): 24-bit Dual Channel LVDS Header





Pin Define	Pin NO.	Pin NO.	Pin Define
LVDSB_DATAN3	Pin 1	Pin 2	LVDSB_DATAP3
LVDS_CLKBN	Pin 3	Pin 4	LVDS_CLKBP
LVDSB_DATAN2	Pin 5	Pin 6	LVDSB_DATAP2
LVDSB_DATAN1	Pin 7	Pin 8	LVDSB_DATAP1
LVDSB_DATAN0	Pin 9	Pin 10	LVDSB_DATAP0
NC/DDC_DATA	Pin 11	Pin 12	NC/DDC_CLK
GND	Pin 13	Pin 14	GND
GND	Pin 15	Pin 16	GND
LVDSA_DATAP3	Pin 17	Pin 18	LVDSA_DATAN3
LVDS_CLKAP	Pin 19	Pin 20	LVDS_CLKAN
LVDSA_DATAP2	Pin 21	Pin 22	LVDSA_DATAN2
LVDSA_DATAP1	Pin 23	Pin 24	LVDSA_DATAN1
LVDSA_DATAP0	Pin 25	Pin 26	LVDSA_DATAN0
LCD VCC	Pin 27	Pin 28	LCD VCC
LCD VCC	Pin 29	Pin 30	LCD VCC

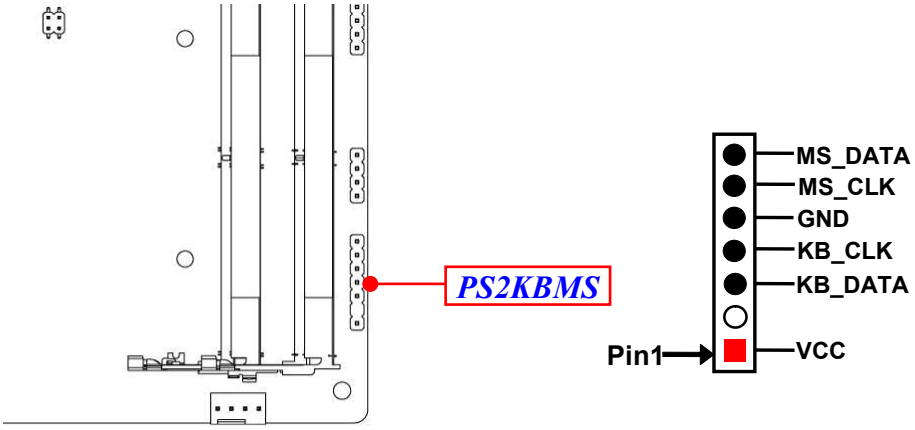
INVERTER (8-pin): LVDS Inverter Connector



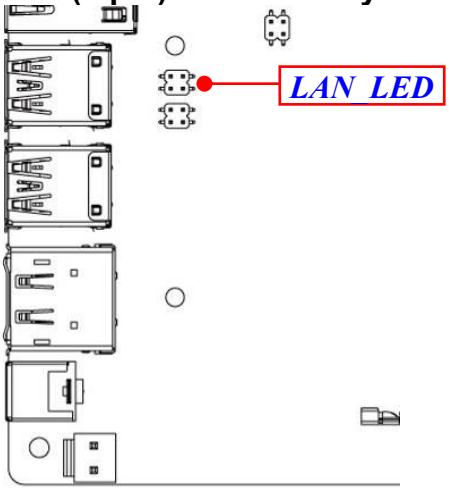
Pin No.	Definition
1	Backlight Enable
2	Backlight PWM
3	PVCC
4	PVCC
5	GND
6	GND
7	Backlight Up SW
8	Backlight Down SW

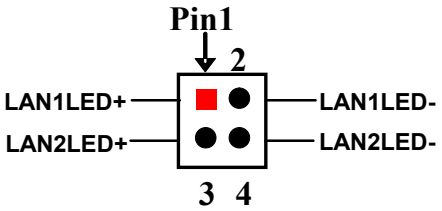
Warning! *Find* ***Pin-1*** *location of the inverter and make sure that the installation direction is correct! Otherwise serious harm will occur to the board/display panel!!*

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

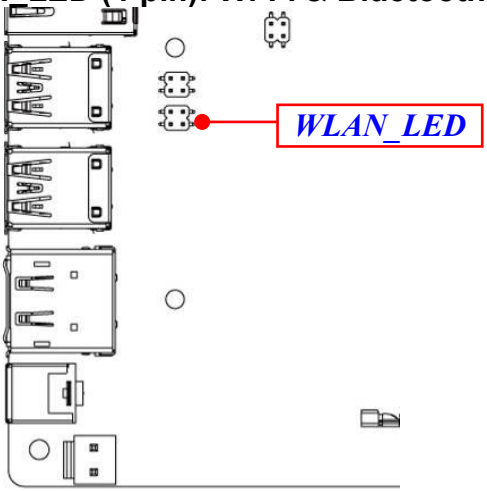


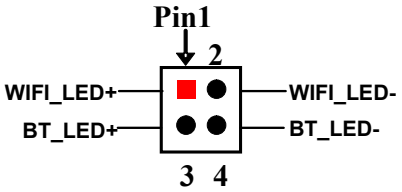
LAN_LED (4-pin): LAN Activity LED Header





WLAN_LED (4-pin): Wi-Fi & Bluetooth Activity LED Header





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.

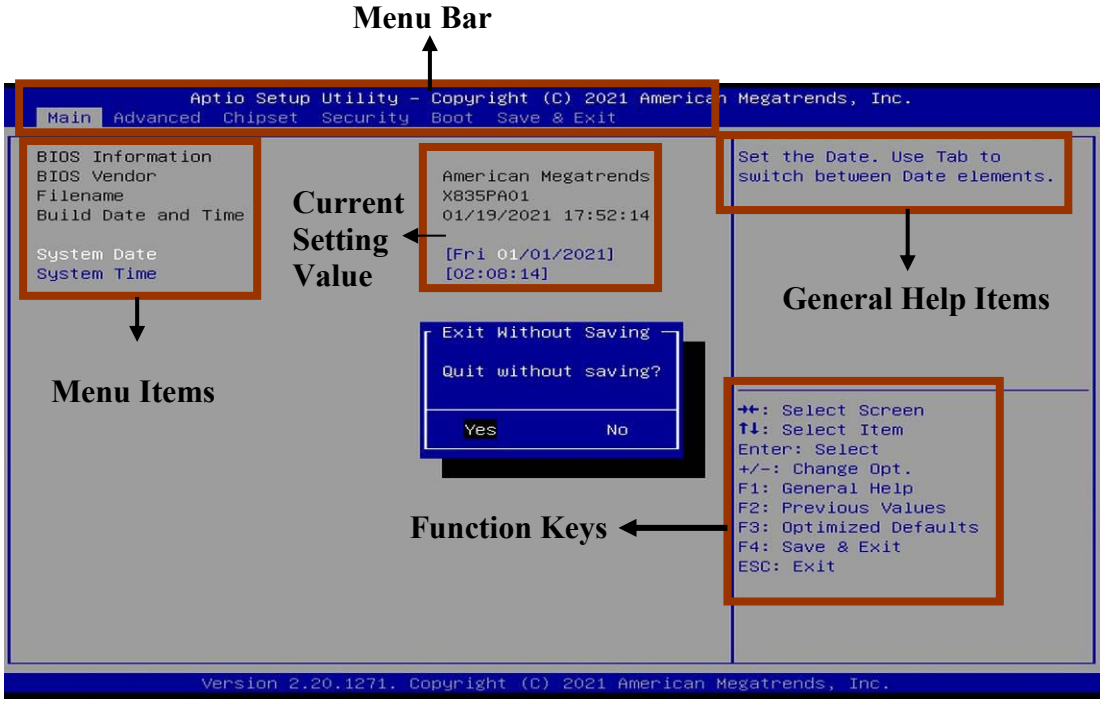
3-1 Entering Setup

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

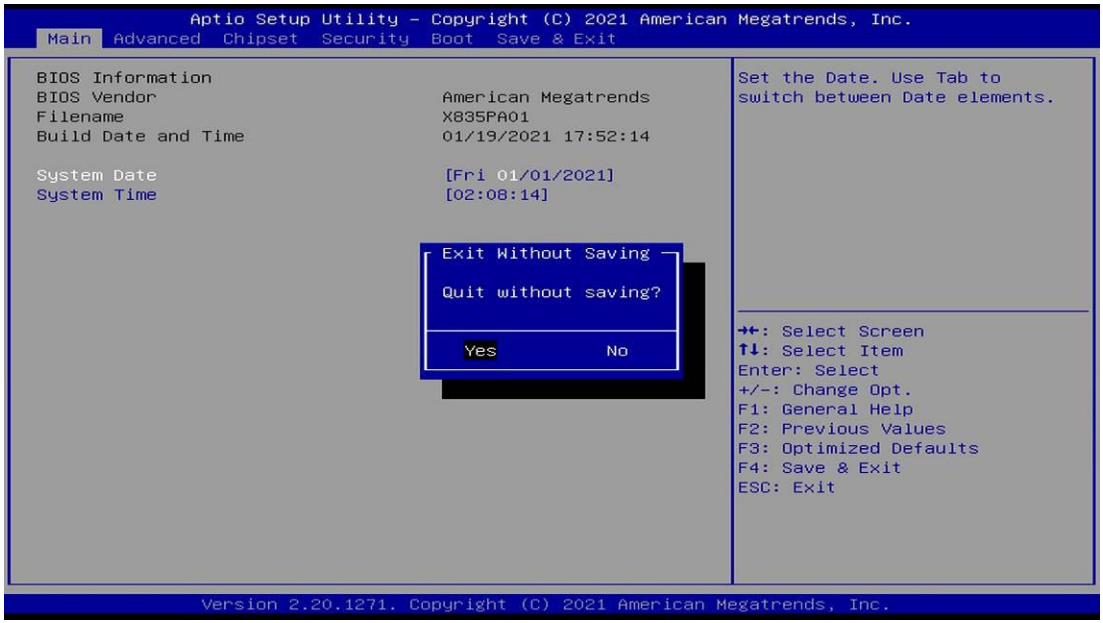
There are six menu bars on top of BIOS screen:

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.



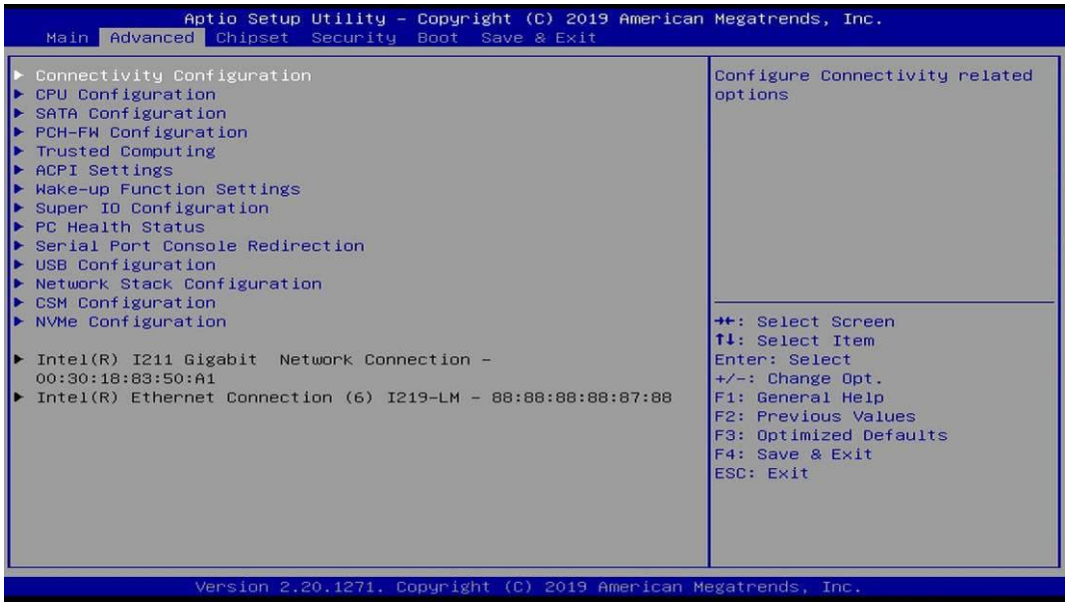
System Date

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 view current Connectivity related options:

  CNVi Configuration

  CNVi Mode

  This option configures connectivity options.

  The optional settings are: [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

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: [Enabled]; [Disabled].
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. This item allows CPU to go to C states when it's not 100% utilized.
The optional settings: [Disabled]; [Enabled].

Turbo Mode
Use this item to enable or disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).
The optional settings: [Disabled]; [Enabled].

- **SATA Configuration**

Press [Enter] to make settings for the following sub-items:
SATA Configuration
SATA Controller(s)
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], the following items shall appear:
SATA Mode Selection
The default setting is: [AHCI].
The optional settings are: [AHCI]; [RAID].

SATA

Port

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

Use this item to enable or disable each SATA port.

Hot Plug

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

M.2

Port

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

Use this item to enable or disable device connected to M.2 SATA slot.

- **PCH-FW Configuration**

  Press [Enter] to view ME information and make settings in the following sub-items:

  - **Firmware Update Configuration**

  Press [Enter] to make settings for '**ME FW Image RE-Flash**'.

  ME FW Image Re-Flash

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

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

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

- **Trusted Computing**

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

  Security Device Support

  Use this item to enable or disable BIOS support for security device. TCG EFI protocol and INT1A interface will not be available.

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

  Pending Operation

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

The optional settings: [None]; [TPM Clear].
**Note: Your computer will reboot to change State or 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-item:
ACPI Settings

ACPI Sleep State
Use this item to select the highest ACPI sleep state the system will enter when the suspend button is pressed.
The optional settings are: [Suspend Disabled]; [S3 (Suspend to RAM)].

- **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], system will wake on the hour/min/sec specified.
Wake-up System with Dynamic Time
Use this item to enable or disable system wake on alarm event.
System will wake on the current time + Increase minute(s).
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will wake on the current time + increased minute(s).
PS2 KB/MS Wake-up
The optional settings: [Disabled]; [Enabled].
Use this item to enable or disable PS2 KB/MS wake-up from S3/S4/S5.
** **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 wakeup.

** **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 power shutdown.

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

Internal USB Port S5 Power

Use this item to enable or disable USB power after power shutdown.

** **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

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

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

- **Serial Port 1 Configuration**

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

Serial Port

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

Change Settings

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

Transmission Mode Select

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

Mode Speed Select

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

- **Serial Port 2 Configuration/ Serial Port 3 Configuration/Serial Port 4 Configuration/ Serial Port 5 Configuration/ Serial Port 6 Configuration**

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

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.**

WatchDog Reset Timer

Use this item to enable or disable WDT reset function.

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

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

WatchDog Reset Timer Value

User can 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 11***, **Pin (1-2) of AT_COPEN** 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.

When set as [Enabled], system will detect if COPEN has been short or not (refer to Page 11); if **Pin (3-4) of AT_COPEN** is short, system will show Case Open Message during POST.

- **PC Health Status**

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

- **SmartFAN Configuration**

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

Super IO Configuration

CPUFAN Smart Mode

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

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

CPUFAN Full-Speed Temperature

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

CPUFAN Full-Speed Duty

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

CPUFAN Idle-Speed Temperature

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

CPUFAN Idle-Speed Duty

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

Shutdown Temperature Configuration

Use this item to select system shutdown temperature.

The optional settings are: [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], 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:

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 are: [COM1]; [COM1(Pci Bus0, Dev0, Func0) (Disabled)].

Resolution

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

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

Redirect After POST

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

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

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

Console Redirection

The optional settings: [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

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

Terminal Type

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

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

[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is **[VT100+]** and then **[VT100]**.

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 are: [Enabled]; [Disabled]; [Auto].

[Enabled]: To enable legacy USB support.

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

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

XHCI Hand-off

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

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

USB Mass Storage Driver Support

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

PS2 KB/MS Enable

Use this item to enable or disable PS/2 keyboard/mouse function.

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

USB Hardware Delays and Time-outs:

USB Transfer Time-out

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

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

Device Reset Time-out

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

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

Device Power-up Delay

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

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

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

taken from hub descriptor.
Select [Manual] you can set value for the following sub-item: '**Device Power-up Delay in Seconds'.**
Device Power-up Delay in Seconds
The delay range is from [1] to [40] seconds, in one second increments.

- **Network Stack Configuration**

Press [Enter] to go to '**Network Stack**' screen to make further settings.
Network Stack
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], the following sub-items shall appear:
Ipv4 PXE Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv4 PXE Boot Support. When set as [Disabled], Ipv4 PXE boot option will not be created.
Ipv6 PXE Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv6 PXE Boot Support. When set as [Disabled], Ipv6 PXE boot option will not be created.
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.
The optional settings range is from [1] to [50].

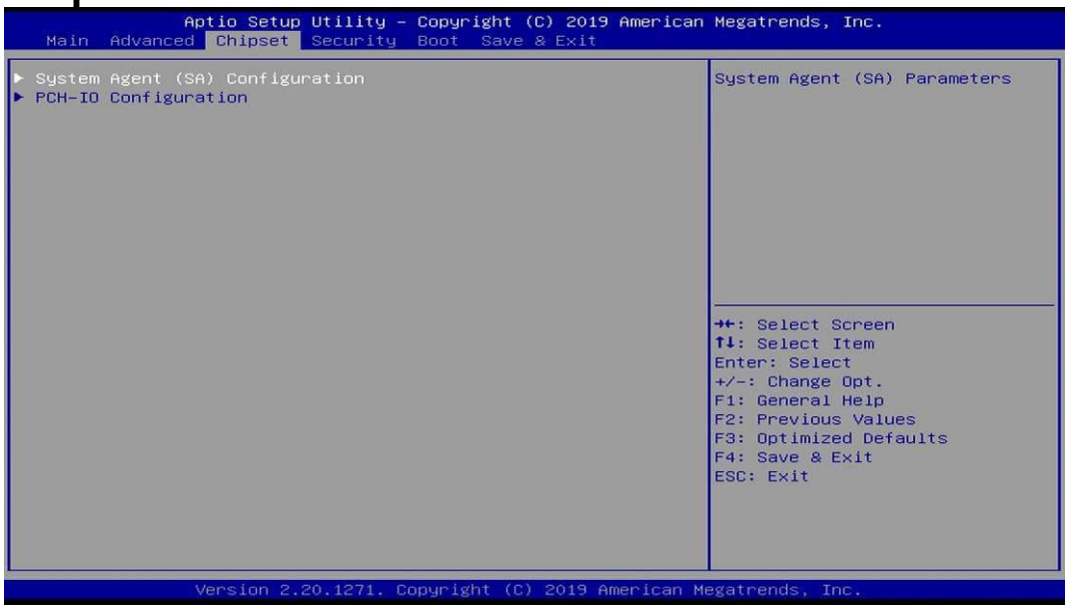
- **CSM Configuration**

Press [Enter] to make settings for the following sub-items:
CSM Support
Use this item to enable or disable CSM Support
The optional settings are: [Disabled]; [Enabled].
Option ROM execution

Network
This option controls the execution of Network OpROM.
The optional settings are: [Do not launch]; [Legacy].
Storage
This option controls the execution of UEFI and Legacy Storage OpROM.
The optional settings are: [Do not launch]; [UEFI]; [Legacy].
Other PCI devices
This item determines OpROM execution policy is for devices other than Network, storage or video.
The optional settings are: [Do not launch]; [UEFI]; [Legacy].

- **NVMe Configuration**
  Press [Enter] to check NVMe controller and driver information.
- **Intel(R) I211 Gigabit Network Connection -XX:XX:XX:XX:XX:XX/ Intel(R) Ethernet Connection (6) I219-LM -XX:XX:XX:XX:XX:XX**
  This item gives Intel gigabit ethernet controller basic driver information.

3-8 Chipset Menu



- **System Agent (SA) Configuration**

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

  VT-d

  The optional settings are: [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 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 are: [VBIOS Default]; [HDMI]; [DP]; [eDP/LVDS].

***Note:** In the case that the '**Primary IGFX Boot Display'** is select as [DP], [HDMI], or [eDP/LVDS], 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 are: [Disabled]; [DP]; [HDMI].

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 are: [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 are: [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 are: [128M]; [256M]; [MAX].

Active LFP

Use this item to select the Active LFP configuration.

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

***Note:** when '**Active LFP'** is set as [**LVDS**], user can make further settings in '**Panel Type**' and '**LVDS FW Write Protect**'.*

Backlight Control

Use this item to select Back Light Control settings.

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

Panel Type

Use this item to manually select LCD panel type.

The optional setting are: [800x 480 18bit Single]; [800x 600 18bit Single]; [800x 600 24bit Single]; [1024 x 600 18bit Single]; [1024 x 768 18bit Single]; [1024 x 768

24bit Single]; [1280 x 768 24bit Single]; [1280 x 800 18bit Single]; [1280 x 800 24bit Single]; [1366 x 768 18bit Single]; [1366 x 768 24bit Single]; [1440 x 900 18bit Dual]; [1440 x 900 24bit Dual]; [1280 x 1024 24bit Dual]; [1680 x 1050 24bit Dual]; [1920 x 1080 24bit Dual].

Note: This function is supported when 'Active LFP**' is set as **[LVDS]**.*

LVDS FW Write Protect

Use this item to enable or disable support LVDS FW update/Protect.

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

Note: This function is supported when 'Active LFP**' is set as **[LVDS]**.*

- **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 are: [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 are: [Disabled]; [Enabled].

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

Onboard Lan2 Controller

Use this item to enable or disable corresponding onboard NIC device or controller.

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

M2E Slot

Use this item to enable or disable M2E slot PCI Express root port function.

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

When set as [Enabled], user can make further settings in 'Speed**':*

Speed

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

M2M Slot

Use this item to enable or disable M2M slot PCI Express root port function.

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

When set as [Enabled], user can make further settings in 'Speed**':*

Speed

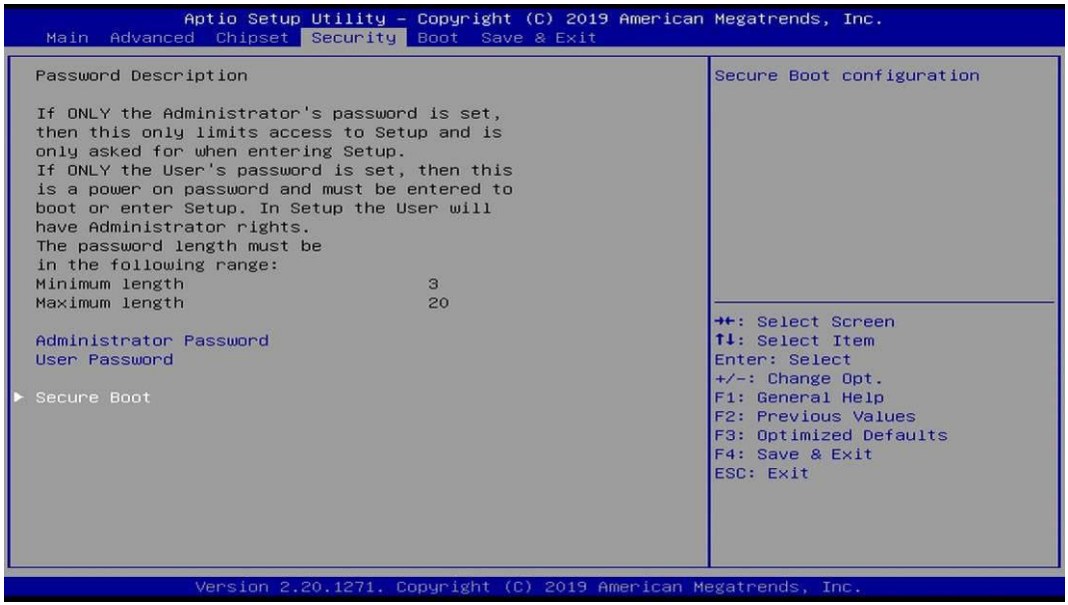
The optional settings are: [Auto]; [Gen1]; [Gen2].

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 Off]; [Always On]; [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:

  Secure Boot

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

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

  Secure Boot Mode

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

  Set 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**], user can make further settings in the following items that show up:*

  - **Restore Factory Keys**

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

  - **Reset To Setup Mode**

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

- **Key Management**

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

Factory Key Provision

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

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

- **Restore Factory Keys**

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

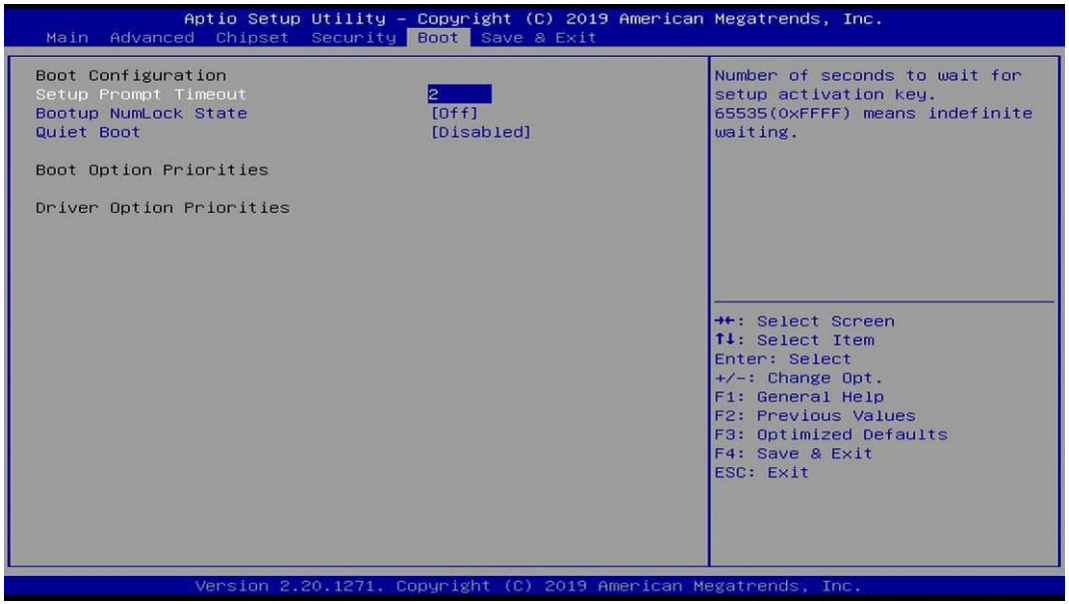
- **Platform Key (PK)/Key Exchange Keys/Authorized Signature/Forbidden Signature/ Authorized TimeStamps/OS Recovery Signatures**

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)
   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.

Bootup Numlock State

Use this item to select keyboard numlock state.
The optional settings are: [On]; [Off].

Quiet Boot

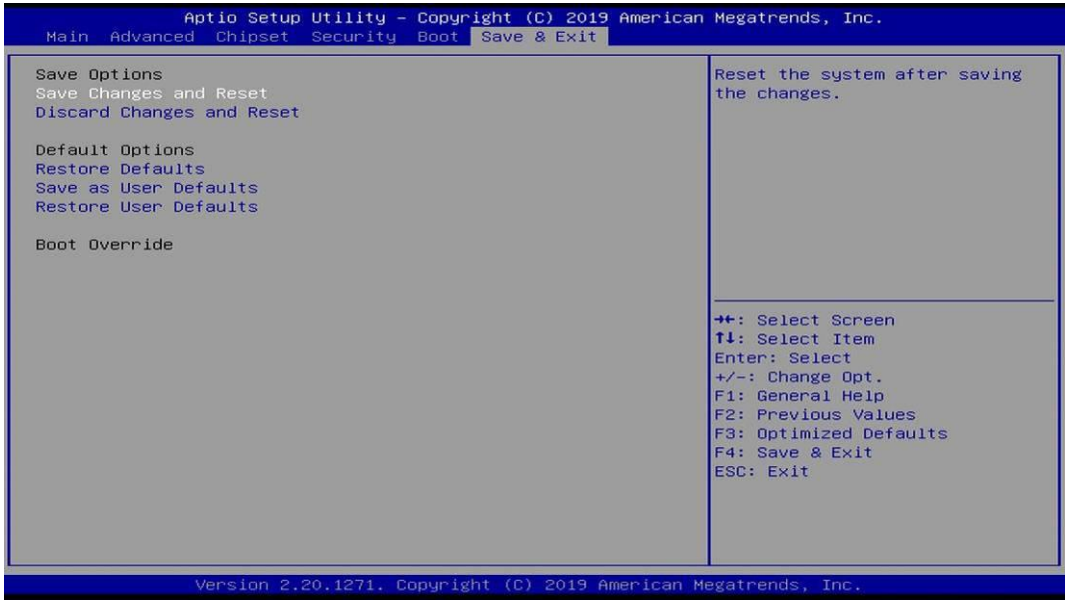
The optional settings are: [Disabled]; [Enabled].

Boot Option Priorities

Boot Option #1/ Boot Option #2…

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

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

UEFI: Built-in EFI Shell

Press this item and a dialogue box shall appear to ask if user wish to save configuration and reset.