NF631R Series

User's Manual

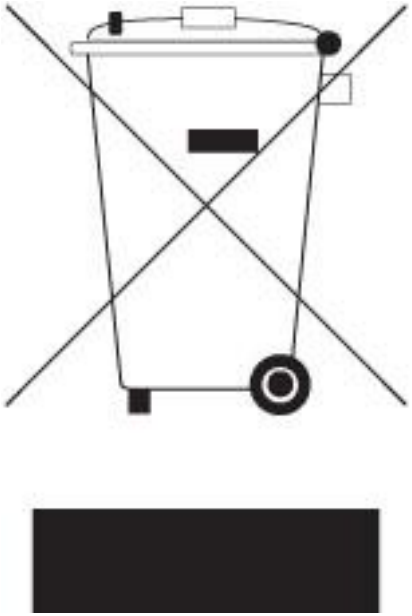
P/N: G03-NF631R-F

Revision: 3.0

Release date: December 12, 2022

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

Manual Revision Information

Reversion	Revision History	Date
3.0	Third Edition	December 12, 2022

Item Checklist

- ☑ Motherboard
- ☑ Cable(s)

Chapter 1: Introduction

1-1 Product Features

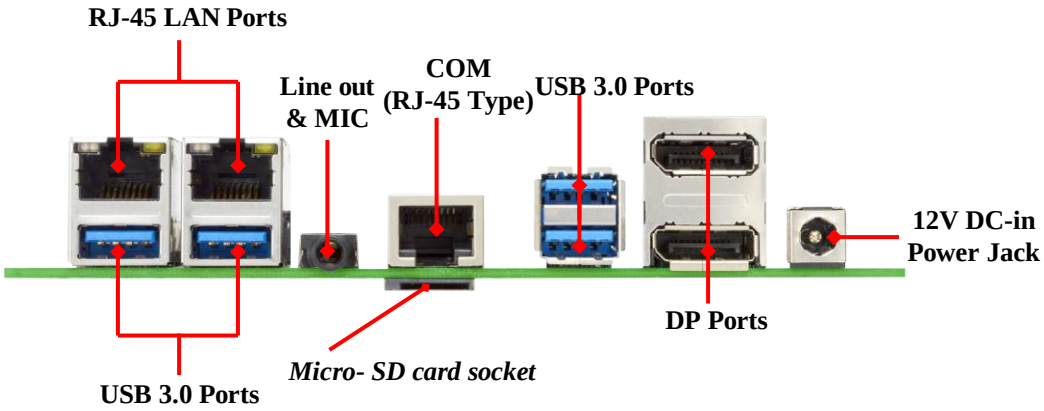
- Onboard Intel® Apollo Lake Series Processor, with low power consumption and high performance
- Support 1* DDR3L SO-DIMM, up to 8GB memory
- Support 2* DP and 1* eDP display ports, max 4K resolution
- Support independent triple display
- Support 1* SATAIII (6Gb) device and 1 * M.2 (M-key 2242) device
- Support RJ-45 gigabit Ethernet LAN port
- Support 4* USB 3.0 data transport demand
- Support Watchdog function

1-2 Specification

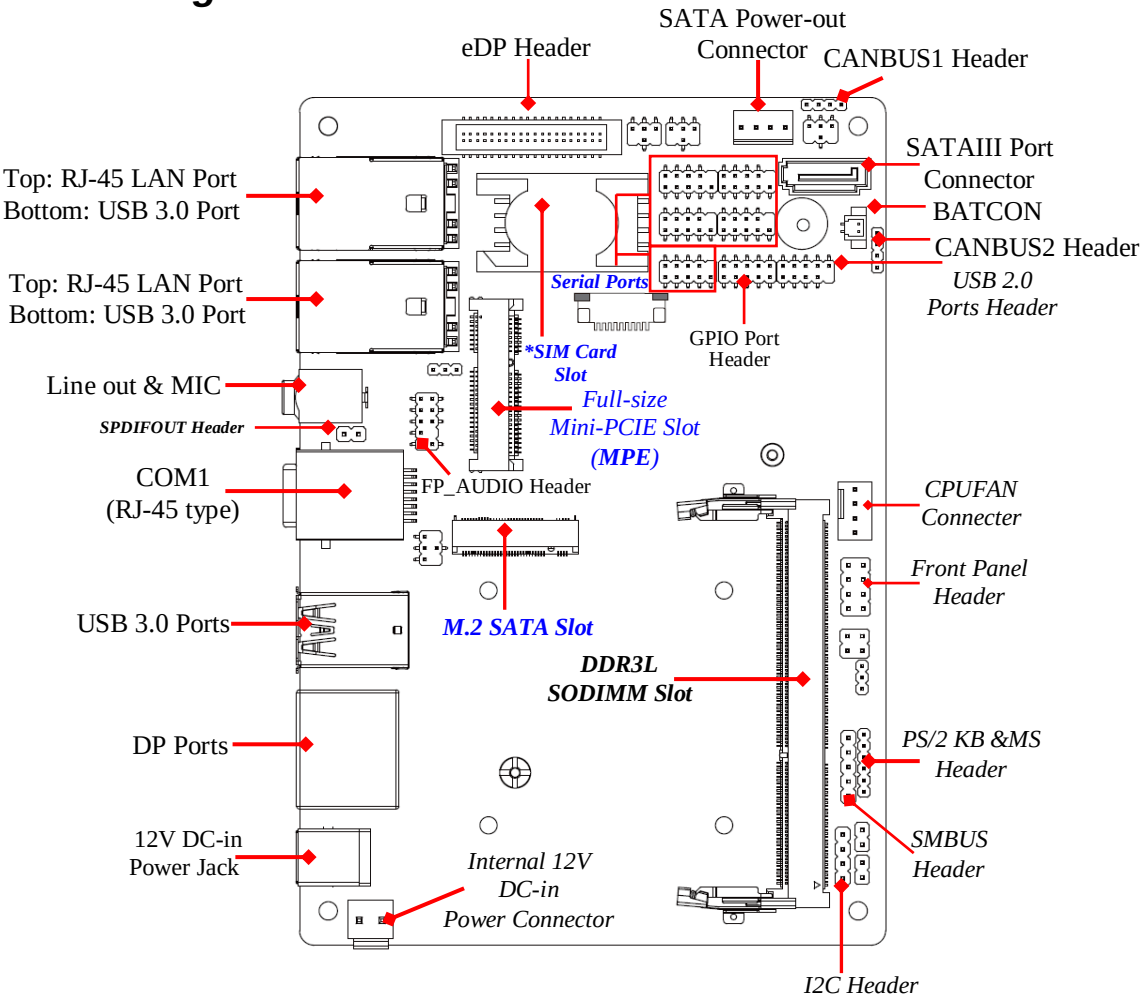
Spec	Description
CPU	● Intel® Apollo Lake series CPU
Memory	● 1* DDR3L 1600MHz SO-DIMM up to 8GB DRAM
Expansion Slot	● 1* full-size Mini-PCIE slot
Storage	● 1* SATA III (6Gb/s) Connector ● 1* M.2 slot (M key 2242) ● 1* Micro-SD socket (Backside)
LAN Chip	● 2* Realtek RTL8119I GbE LAN Chip
Audio Chip	● Realtek ALC888S Audio Codec Chip
BIOS	● 128Mbit AMI BIOS
Rear I/O	● 1* DC 12V power-in connector ● 4* USB 3.0 ports ● 1* COM port (RJ-45 type) ● 1* audio combo port (Line-out / MIC) ● 2* RJ-45 LAN ports ● 2* DP ports
Internal I/O	● 1* Internal 12V power DC -in connector ● 1* SATA Power and 1 * SATA III connector ● 1* eDP header ● 1* Front panel audio header & 1* SPDIF-out header ● 1* 9-pin USB 2.0 header ● 5* Serial port header (COM2 support RS232/RS422/RS485) ● 1* GPIO header ● 1* Front panel header ● 1* SIM card socket ● 1* PS/2 KB&MS header & 1* SMBUS header ● 1* I2C header ● 2* CANBUS header

1-3 Layout Diagram

Rear IO Panel Diagram:

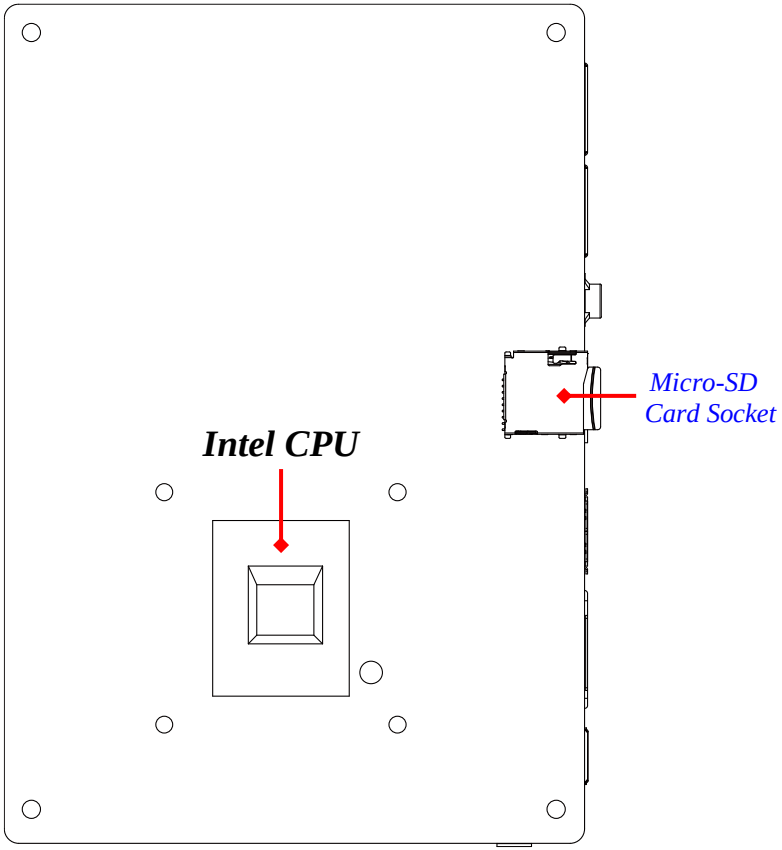


Internal Diagram-Front Side:



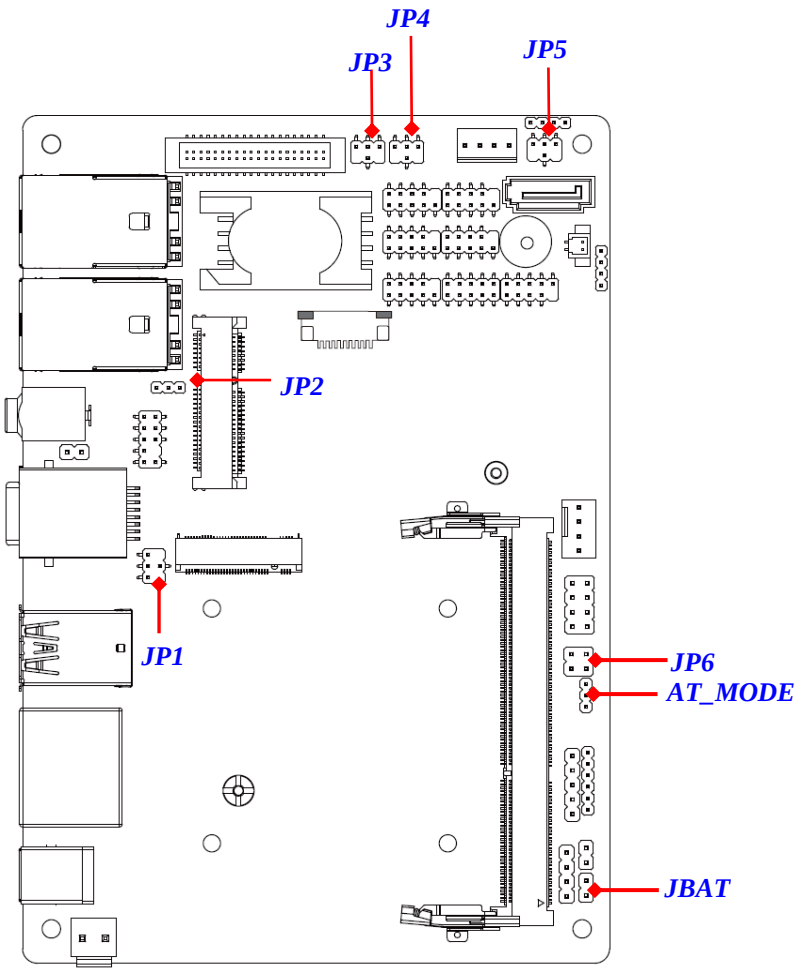
***Note:** **SIM card socket** only works **when** compatible SIM card installed & 3G LAN card installed in full-size Mini-PCIE **(MPE)** slot.*

Internal Diagram-Back Side:



***Note:** CPU is the most important part of the board and very fragile to any possible harm. Make sure that there is no damage to the CPU during any installation procedures!*

Motherboard Jumper Positions:



Jumper

Jumper	Name	Description
JP1	COM1 Port Pin9 Function	4-Pin Block (2.0 pitch)
JP2	MPE Slot Power	3-Pin Block (2.0 pitch)
JP3	eDP LCD Power	4-Pin Block (2.0 pitch)
JP4	eDP Inverter Power	4-Pin Block (2.0 pitch)
JP5	COM2 Pin9 Function	4-Pin Block (2.0 pitch)
JP6	Case Open and TXE Function Select	4-Pin Block (2.54 pitch)
AT_MODE	ATX/AT Mode Select	3-Pin Block (2.0 pitch)
JBAT	CMOS Clear Setting	2-Pin Block (2.54 pitch)

Connectors

Connector	Name
DCIN1	12V DC–in System Power Jack
DP1	DP Port Connector x2
USB1	USB 3.0 Port Connector x2
RJ45_COM1	COM Port Connector RJ-45 Type
AUDIO	Audio Line Out & MIC Connector
UL1	***Top:*** RJ-45 LAN Port Connector ***Bottom:*** USB 3.0 Port Connector
UL2	***Top:*** RJ-45 LAN Port Connector ***Bottom:*** USB 3.0 Port Connector
DCIN3	Internal 12V DC–in Power Connector
SATA	SATAIII Port Connector
PWROUT	SATA Power out Connector
CPUFAN	CPU Fan Connector

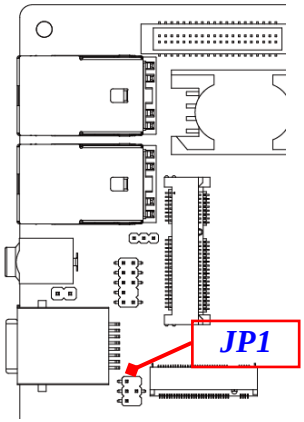
Headers

Header	Name	Description
eDP	eDP Header	40-pin Block (1.25 pitch)
FP_AUDIO	Front Panel Header(PWR LED/ HD LED/Power Button /Reset)	9-pin Block (2.0 pitch)
SPDIFOUT	HDMI S/PDIF-out Header	2-pin Block (2.0 pitch)
USB2	USB 2.0 Port Header	9-pin Block (2.0 pitch)
COM2/3/4/5/6	Serial Port Header	9-pin Block (2.0 pitch)
GPIO	GPIO Port Header	10-pin Block (2.0 pitch)
FP	Front Panel Header	8-pin Block (2.54 pitch)
PS2KBMS	PS/2 Keyboard & Mouse Header	6-pin Block (2.0 pitch)
SMBUS	SMBUS Header	5-pin Block (2.54 pitch)
I2C	I2C Header	4-pin Block (2.54 pitch)
CANBUS1/2	CANBUS Function Pin Header	4-pin Block (2.0 pitch)

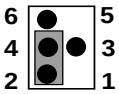
Chapter 2:
Hardware Installation

2-1 Jumper Settings

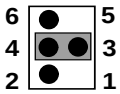
JP1 (4-pin): RJ45_COM1 Port Pin9 Function Select (2.0 pitch)



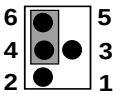
JP1→RJ45_COM1 Port Pin-9



2-4 Closed: RI=NC;

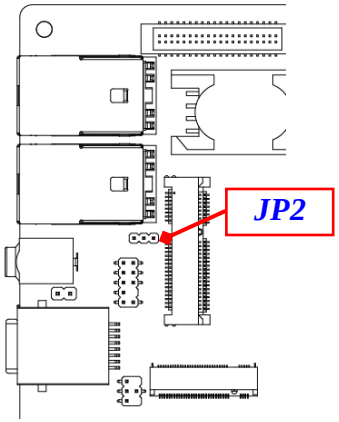


3-4 Closed: RI= 5V;

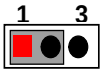


4-6 Closed: RI= 12V.

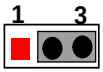
JP2 (3-pin): MPE Slot Power Select (2.0 pitch)



JP2→MPE Slot Power

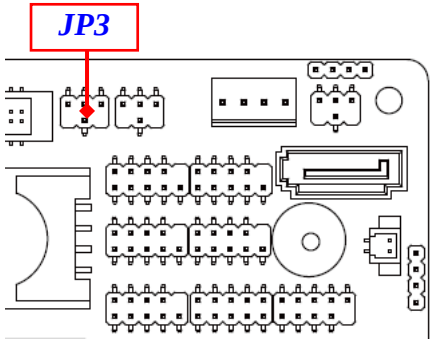


1-2 Close: 3.3V Selected(Default);

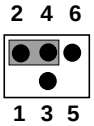


2-3 Close: 3.3VSB Selected.

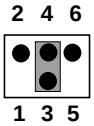
JP3 (4-pin): eDP LCD Power Select (2.0 pitch)



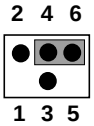
JP3→eDP LCD VCC



2-4 Closed: eDP LCD VCC= 3.3V (default);

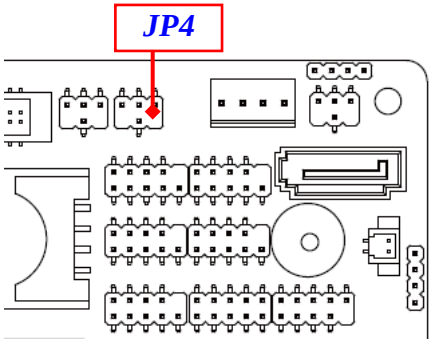


3-4 Closed: eDP LCD VCC= 5V;

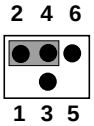


4-6 Closed: eDP LCD VCC= 12V.

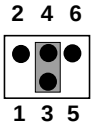
JP4 (4-pin): eDP Inverter Power Select (2.0 pitch)



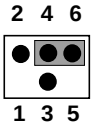
JP4→eDP Inverter VCC



2-4 Closed: eDP Inverter VCC= 5V (default);

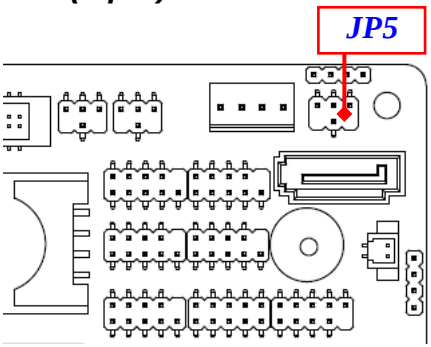


3-4 Closed: eDP Inverter VCC= 12V;

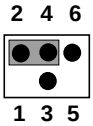


4-6 Closed: eDP Inverter VCC= adapter power.

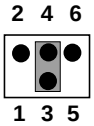
JP5 (4-pin): COM2 Pin9 Function Select (2.0 pitch)



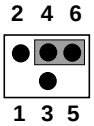
JP5→ COM2 Pin9 Select



2-4 Closed: RI = RS232 (default);

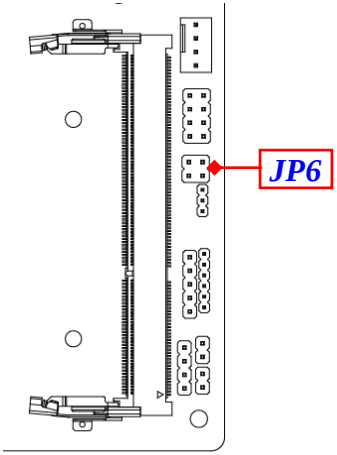


3-4 Closed: RI = 5V;



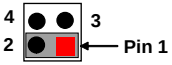
4-6 Closed: RI = 12V.

JP6 (4-pin): Case Open and TXE/ME Select (2.54 pitch)



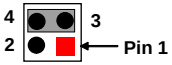
JP6→ Case Open and TXE/ME Select

Pin (1&2) Chassis Intrusion



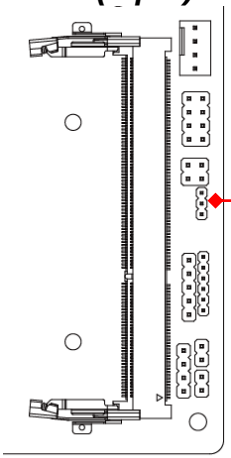
1-2 Open: Normal(Default);
1-2 Closed : Case Open Function Selected (one touch)

Pin (3&4) TXE/ME



3-4 Open: Normal(Default)
3-4 Closed: Disable ME

AT_MODE (3-pin): AT/ATX Mode Function Select (2.0 pitch)



AT_MODE →AT/ATX Mode Select

3
1

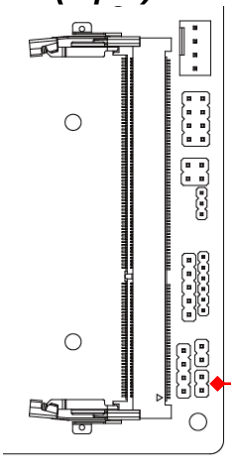
1-2 Closed:
ATX Mode Selected;

3
1

2-3 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.*

JBAT (2-pin): CMOS Clear Setting (2.54 pitch)



JBAT→ CMOS Clear Setting

1

1-2 Open: Normal;

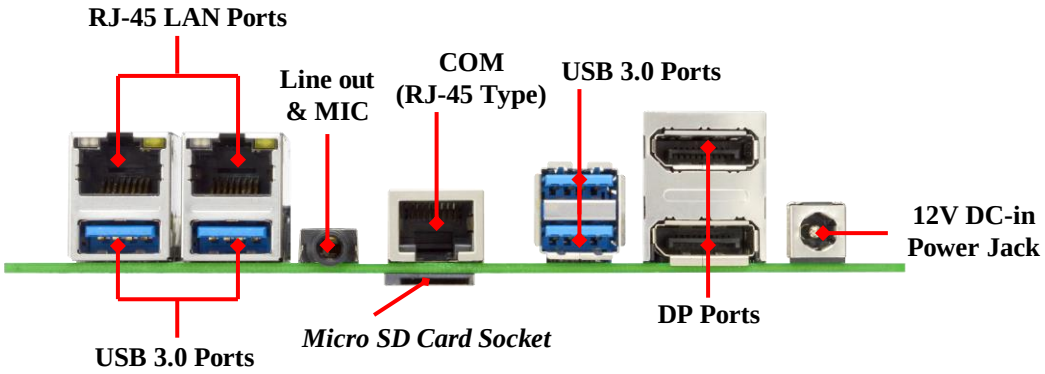
1

1-2 Closed: Clear CMOS.

2-2 Connectors and Headers

2-2-1 Connectors

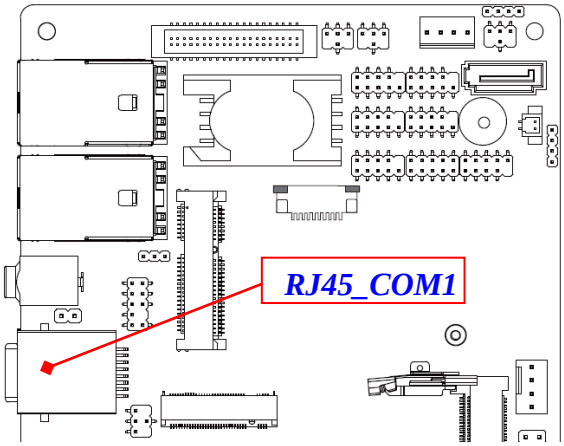
(1) Rear Panel Connectors

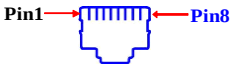


Icon	Name	Function
	**RJ-45 LAN Port**	This connector is standard RJ-45 LAN jack for Network connection.
	**USB 3.0 Port**	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.0 ports supports up to 5Gbps data transfer rate.
	**Line-Out/MIC Combo Connector**	This connector can functions as audio Line-Out jack and MIC jack with compatible cables & devices.
	**RJ45 COM Port**	This connector is a RJ-45 COM port for console function.

	**DisplayPort**	To the system to corresponding display device with compatible DP cable.
	**Power Connector**	12V DC–in system power connector For user to connect compatible power adapter to provide power supply for the system.

(2) RJ45_COM1(8-pin block):RJ-45 COM Port Connector for Console



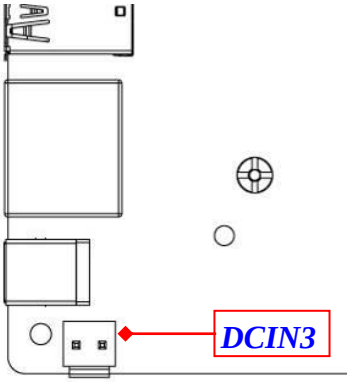


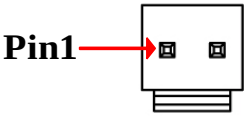
RJ45_COM1

Pin No.	Definition
1	RTS
2	DTR
3	TXD
4	GND
5	GND/VCC/+12V
6	RXD
7	DSR
8	CTS

Note: *Please set* ***Pin (2-4)*** *of Jumper* ***JP1*** *as closed, when apply Console cable to RJ45-COM1 port (refer to page-9).*

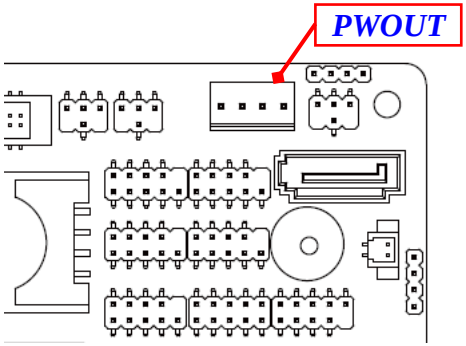
(3) DCIN3 (2-pin block):Internal 12V DC-in Power Connector

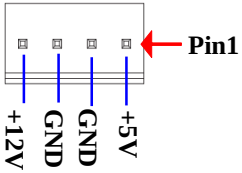




Pin No.	Definition
1	+12V DC_IN
2	GND

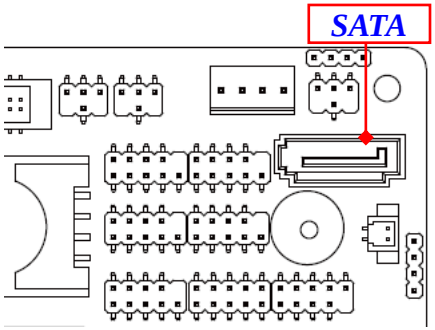
(4) PWROUT (4-pin): SATA Power Connector



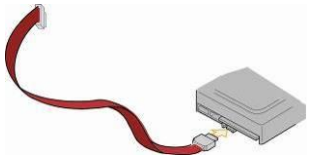


(5) SATA (7-pin Block): SATAIII Port connector

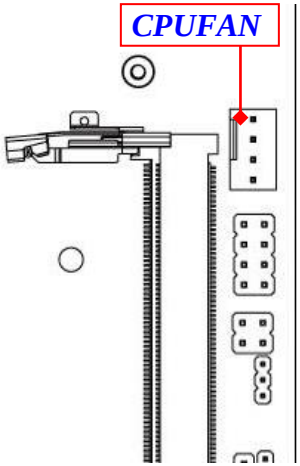
The board comes with a SATAIII port that supports 6GB/s transfer rate.

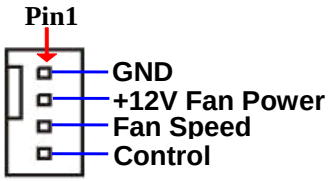


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

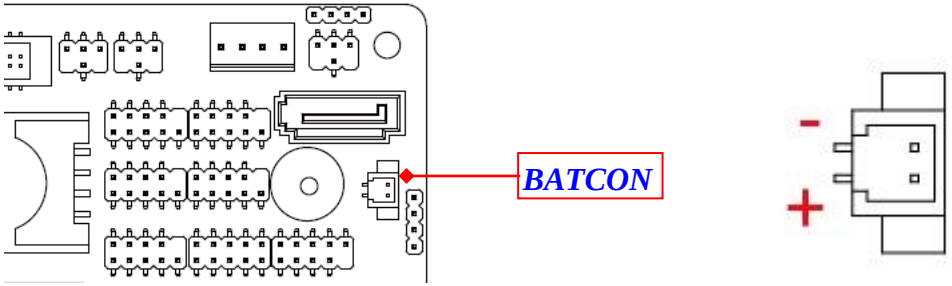


(6) CPUFAN (4-pin): CPU FAN Connector



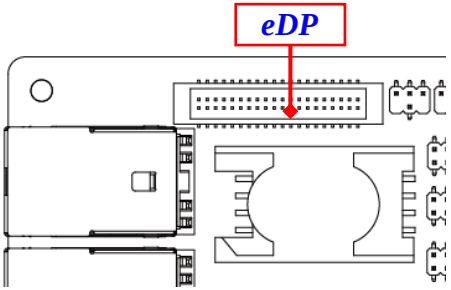


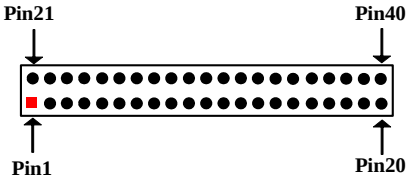
(7) BATCON (2-pin): Battery Connector



2-2-2 Headers

(1) eDP (40-pin): eDP Header (1.25 pitch)

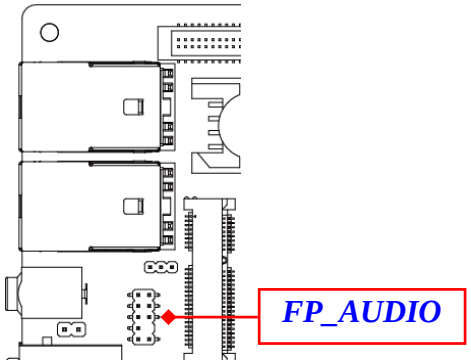


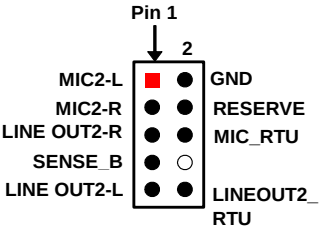


Pin NO.	Pin Define	Pin NO.	Pin Define
Pin 1	NC	Pin 21	NC
Pin 2	GND	Pin 22	NC
Pin 3	Lane3_N	Pin 23	GND
Pin 4	Lane3_P	Pin 24	GND
Pin 5	GND	Pin 25	GND
Pin 6	Lane2_N	Pin 26	GND
Pin 7	Lane2_P	Pin 27	HPD
Pin 8	GND	Pin 28	GND
Pin 9	Lane1_N	Pin 29	GND
Pin 10	Lane1_P	Pin 30	GND
Pin 11	GND	Pin 31	GND
Pin 12	Lane0_N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

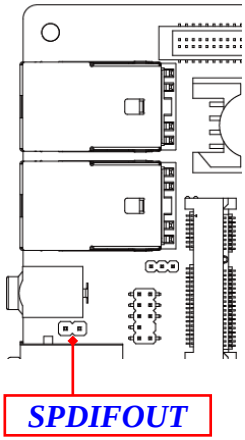
(2) FP_AUDIO (9-pin): Line-Out, MIC-In Header (2.0 pitch)

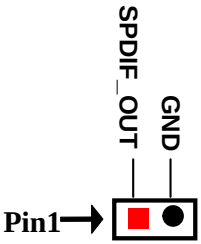
This header connects to Front Panel Line-out, MIC-In connector with cable.



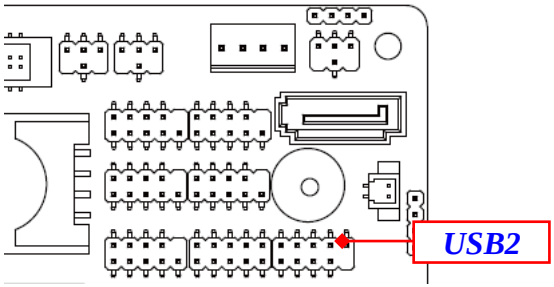


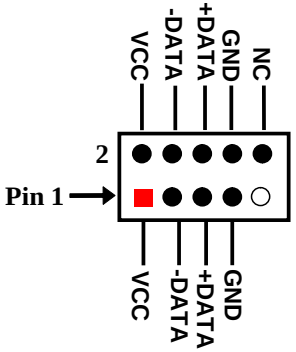
(3) SPDIFOUT (2-pin): HDMI SPDIF Out Header (2.0 pitch)



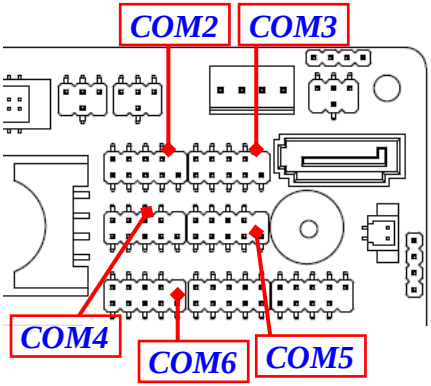


(4) USB2 (9-pin): USB 2.0 Port Pin Header (2.0 pitch)

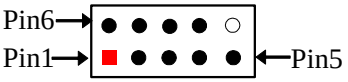




(5) COM2/3/4/5/6 (9-pin): Serial Port Headers (2.0 pitch)

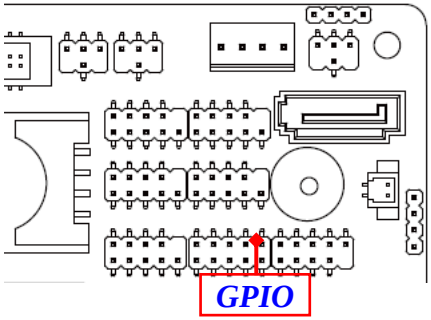


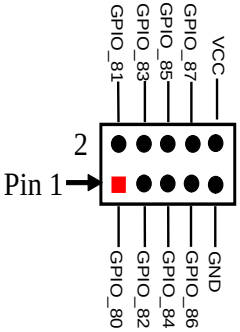
Pin NO.	RS232	*RS422	*RS485
Pin 1	DCD	TX-	DATA-
Pin 2	RXD	TX+	DATA+
Pin 3	TXD	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GNG	GND	GND
Pin 6	DSR	NC	NC
Pin 7	RTS	NC	NC
Pin 8	CTS	NC	NC
Pin 9	RI	NC	NC



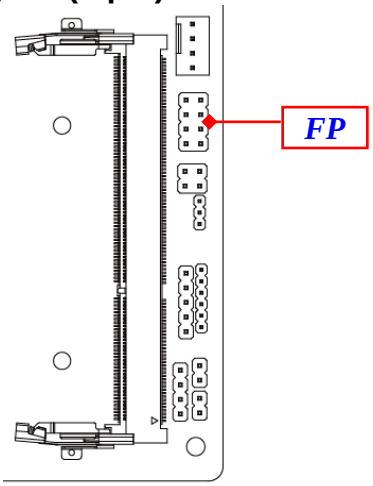
***Notice:** RS422, RS485 function is supported by COM2 header only, with compatible COM cable for RS422 or RS 485 function. User also needs to go to BIOS to set 'Transmission Mode Select' for COM2.*

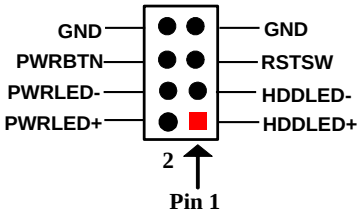
(6) GPIO (10-pin): GPIO Header (2.0 pitch)



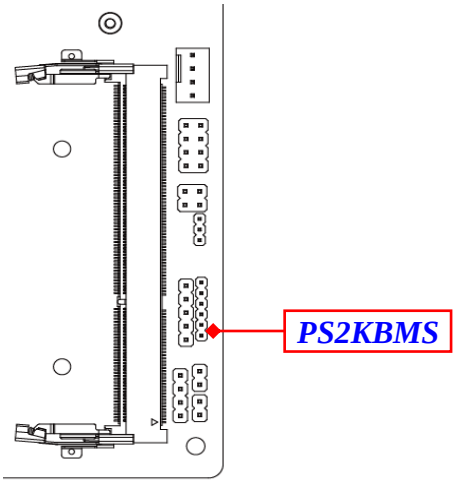


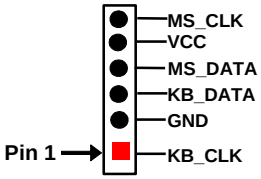
(7) FP (8-pin): Front Panel Header (2.54 pitch)



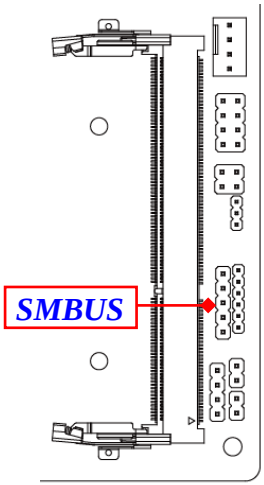


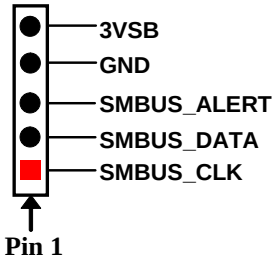
(8) PS2KBMS (6-pin): PS/2 Keyboard & Mouse Header (2.0 pitch)



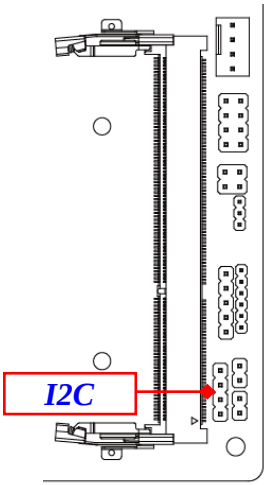


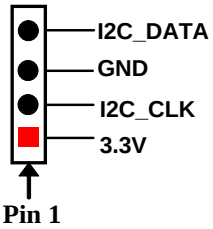
(9) SMBUS (5-pin): SMBUS Header (2.54 pitch)



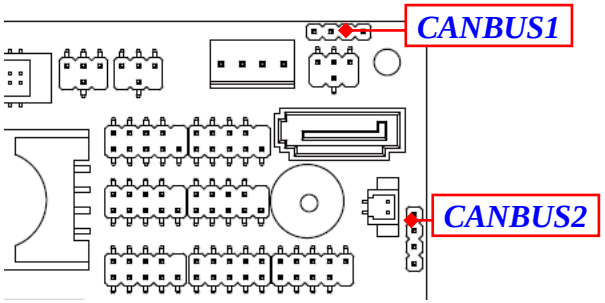


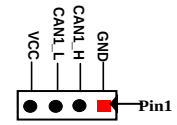
(10) I2C(4-pin): I2C Header (2.54 pitch)





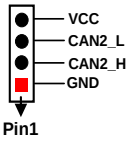
(11) CANBUS1/ CANBUS2 Function Pin Header (2.0 pitch)





CANBUS1

CANBUS2



**Note:* *CAN BUS Driver is required, please donwload Windows / Linux Driver and sample code form Jetway website.*

Chapter 3:
BIOS SETTING

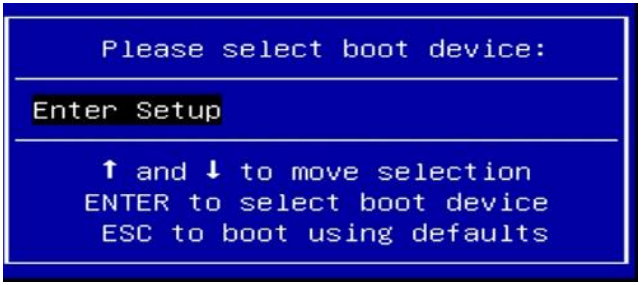
Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download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

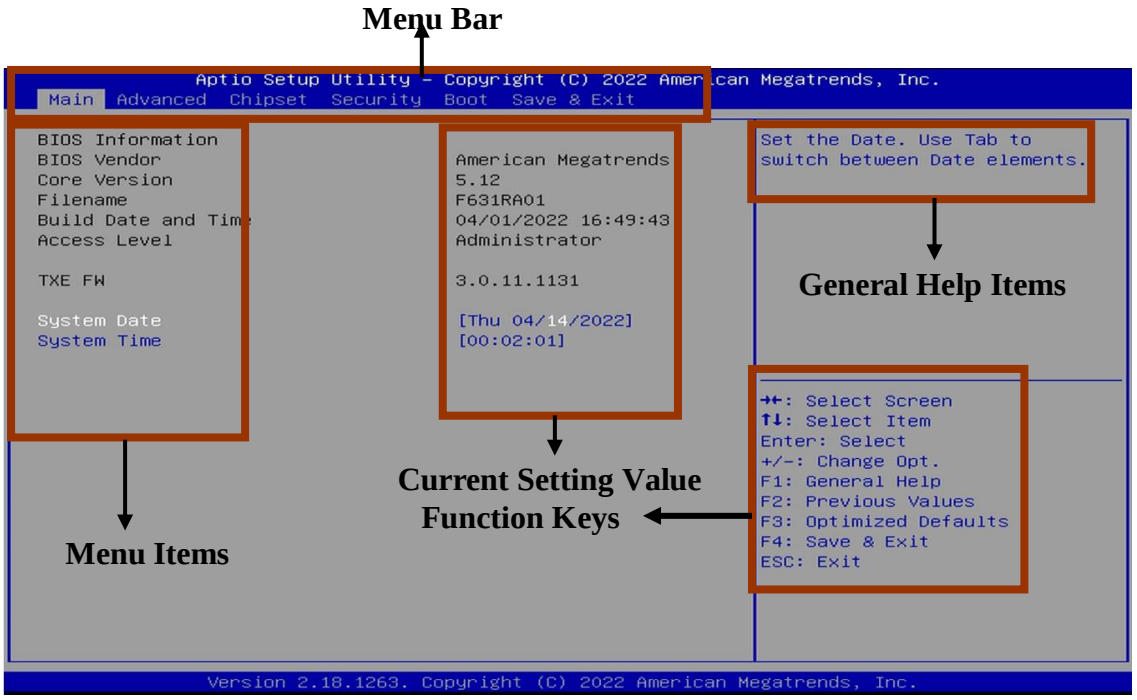
Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously 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



3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



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.
- **[F7]:** User can press this key to enter Boot Menu when system start up.

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

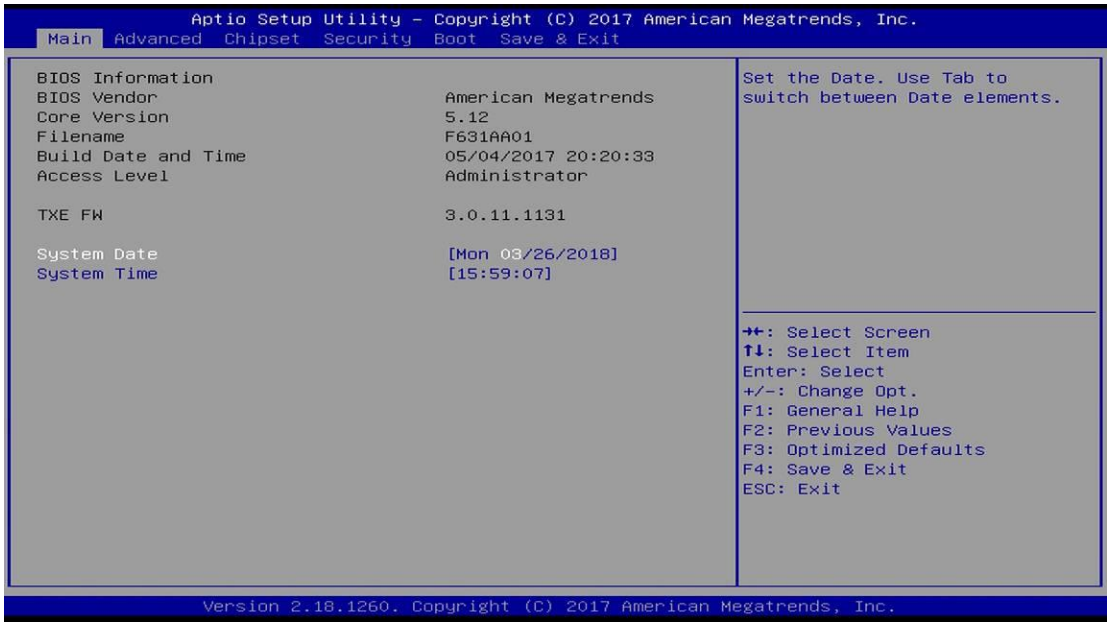
There are six menu bars on top of BIOS screen:

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.



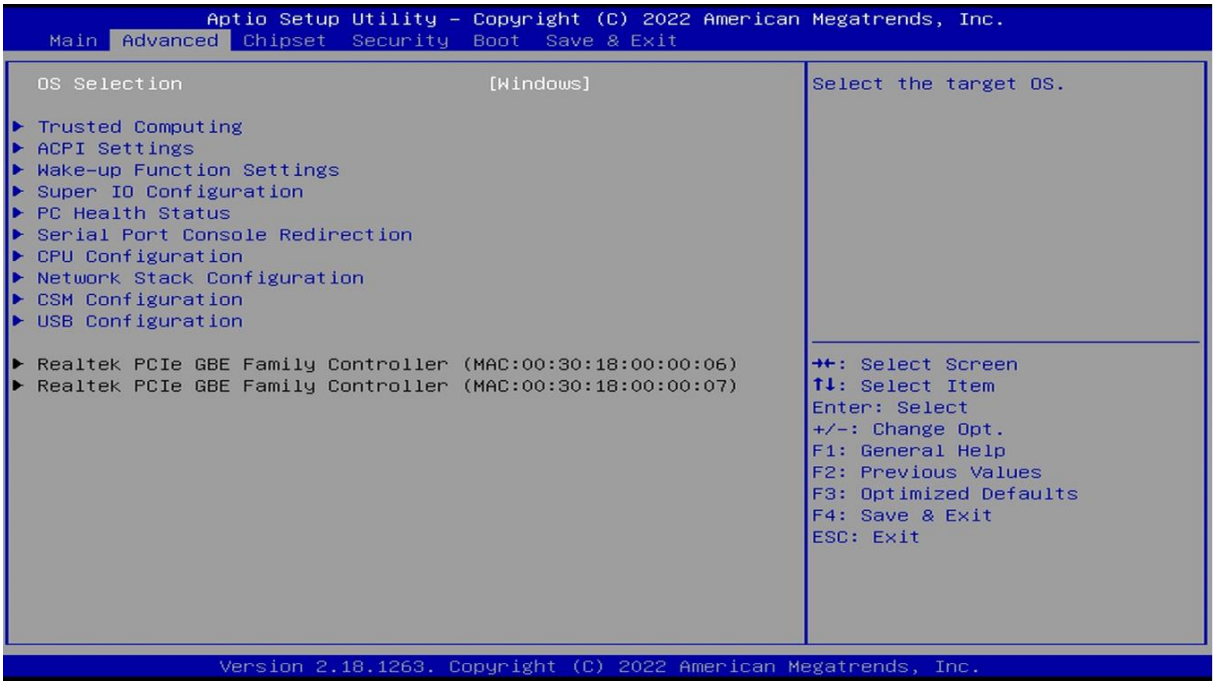
System Date

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



OS Selection

The optional settings: [Windows]; [Intel Linux]; [MSDOS].

**** Note:*** *User need to go to this item to select the OS mode before installing corresponding OS driver, otherwise problems will occur when installing the driver.*

- **Trusted Computing**

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

  Configuration

  Security Device Support

  Use this item to select the enable or disable BIOS support security devices. O.S.

will not show security device. TCG EFI protocol and INT1A interface will not be available.

The optional setting are: [Enabled]; [Disabled]

No Security Device Found

- **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-item:
Wake-up System With Fixed Time

Use this item to enable or disable system wake on alarm event. When enabled system will wake on the hr: min: sec specified
The optional settings are: [Enabled]; [Disabled].
When set as [**Enabled**], the following sub-items shall appear:
Wake-up Hour
Use this item to select 0-23 for example enter 3 for 3am and 15 for 3pm.
Wake-up Minute
Use this item to select 0-59
Wake-up Second
Use this item to select 0-59
When set as [Disabled], the following sub-items shall appear:
Wake-up System With Dynamic Time

Use this item to enable or disable system wake on alarm event. When enabled,

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

The optional settings are: [Enabled]; [Disabled].
When set as [**Enabled**], the following sub-items shall appear:
Wake-up Minute Increase
Use this item to select 1-60

PS2 KB/MS Wake-up
Use this item to enable or disable PS2 KB/MS Wake-up from (S3/S4/S5) Support Only disable ERP function
The optional settings are: [Enabled]; [Disabled].
USB S3/S4 Wake-up
Use this item to enable or disable USB S3/S4 Wake-up support only disable ERP function.
The optional settings are: [Enabled]; [Disabled].
USB S5 Power
Use this item to USB power after system shutdown support only disable ERP function.
The optional settings are: [Enabled]; [Disabled].

- **Super I/O Configuration**

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

ERP Support
Use this item to Energy-Related Products function disable ERP to active all wake-up functions
The optional settings are: [Disabled]; [Auto]
This item should be set as [**Disabled**] if you wish to have all active wake-up functions.

- **Serial Port 1 Configuration**

Use this item to set parameters of serial port (COM)
Press [Enter] to make settings for the following items:

Serial Port

Use this item to [Enabled] or [Disabled] serial port (COM).
When set as [**Enabled**], the following sub-items shall appear:

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.
The optional settings are: [IO= 3F8h; IRQ=4]; [IO=3F8h; IRQ=3,4,5,7,10,11]; [IO=2F8h; IRQ=3,4,5,7,10,11]; [IO=3E8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11].

Serial Port FIFO Mode

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

- **Serial Port 2 Configuration**

Use this item to set parameters of serial port (COM)
Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).
The optional settings are: [Enabled]; [Disabled].
When set as [**Enabled**], the following sub-items shall appear

Change Settings

Use this item to select an optimal setting for super IO device.
The optional settings are: [IO= 2F8h; IRQ=3; [IO=3F8h; IRQ=3,4,5,7,10,11]; [IO=2F8h; IRQ=3,4,5,7,10,11]; [IO=3E8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11].

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 FIFO Mode

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

- **Serial Port 3 Configuration**

Use this item to set parameters of serial port (COM)

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

Serial Port

Use this item to [Enabled] or [Disabled] serial port (COM).

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

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.

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

Serial Port FIFO Mode

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

- **Serial Port 4 Configuration**

Use this item to set parameters of serial port (COM)

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

Serial Port

Use this item to [Enabled] or [Disabled] serial port (COM).

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

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.

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

Serial Port FIFO Mode

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

- **Serial Port 5 Configuration**

Use this item to set parameters of serial port (COM)

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

Serial Port

Use this item to [Enabled] or [Disabled] serial port (COM).

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

Device Settings

Change Settings

Use this item to select an optimal setting for super IO device.

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

Serial Port FIFO Mode

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

- **Serial Port 6 Configuration**

Use this item to set parameters of serial port (COM)

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

Serial Port

Use this item to [Enabled] or [Disabled] serial port (COM).

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

Device Settings

Change Settings
Use this item to select an optimal setting for super IO device.
The optional settings are: [IO= 2E0h; IRQ=11]; [IO=3F8h; IRQ=3,4,5,7,10,11]; [IO=2F8h; IRQ=3,4,5,7,10,11]; [IO=3E8h; IRQ=3,4,5,7,10,11]; [IO=2E8h; IRQ=3,4,5,7,10,11]; [IO=3E0h; IRQ=3,4,5,7,10,11]; [IO=2E0h; IRQ=3,4,5,7,10,11].

Serial Port FIFO Mode
The optional settings are: [16-Byte FIFO]; [32-Byte FIFO]; [64-Byte FIFO]; [128-Byte FIFO].

WatchDog Reset Timer
Use this item to [Enabled] or [Disabled] WatchDog Timer Control.

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.].

WatchDog Wake-up Timer in ERP
This item support WDT wake-up while ERP function is set as [Enabled].
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], the following sub-items shall appear:

WatchDog Timer Value in ERP
User can select a value in the range of [10] to [4095] seconds when '**WatchDog Timer Unit in ERP**' set as [Sec]; or in the range of [1] to [4095] minutes when '**WatchDog Timer Unit in ERP**' set as [Min].

WatchDog Timer Unit in ERP
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 (AT-MODE setting Pin 1&2 of for ATX Mode & Pin 2&3 of AT Mode Select).

Case Open Detect
Use this item to detect case has already open or not, show message in POST.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will detect if COPEN has been short or not (refer to Page 11); if Pin 1&2 of JP6 is short, system will show Case Open Message during POST.
PS2 KB/MS Connect
Use this item to setting PS2 Connect primary devices.
The optional setting are [Keyboard First] or [Mouse First]

- **PC Health Status**
  Press [Enter] to make settings for the following sub-items:

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

  CPUFAN Type
  The optional settings are: [3-Pin]; [4-Pin].

  CPUFAN Smart Mode
  The optional settings are: [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 this pre-set temperature.
  CPUFAN Full-Speed Duty
  Use this item to set CPUFAN full-speed duty. Fan will run at full speed when above this pre-set duty.
  CPUFAN Idle-Speed Temperature

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

CPUFAN Idle-Speed Duty

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

- **Serial Port Console Redirection**

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

COM1

Console Redirection

Use this item to enable or disable COM1 Console Redirection.

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

*When set as [Enabled], user can make further settings in the '**Console Redirection Settings**' screen:*

- **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

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

Terminal Type

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

[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.

Bits per second

Use this item to selects serial port transmission speed. must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings are: [9600]; [19200]; [38400]; [57600]; [115200].

Data Bits

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

Parity

Use this item to a parity bit can be sent with the data bits to detect some transmission errors

[Even]: parity bit is 0 if the num of 1 is in the data bits is even.

[Odd]: parity bit is 0 if num of 1 is 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.

The optional settings are: [None]; [Even]; [Odd];[Mark]; [Space].

Stop Bits

Use this item to 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 are: [1]; [2].

Flow Control

Use this item to flow control can prevent data loss from buffer overflow .When sending data. If the receiving buffers are full, a 'stop' slgnal 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 are: [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 are: [Disabled]; [Enabled].

Recorder Mode

Use this item to with this mode enabled only text will be sent. This is to capture terminal data.

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

Resolution 100x31

Use this item to enables or disables extended terminal resolution.
The optional settings are: [Disabled]; [Enabled].

Legacy OS Redirection Resolution

Use this item to on legacy OS, the number of rows and columns supported redirection.
The optional settings are: [80x24]; [80x25].

Putty Keypad

Use this item to select functionkey and keypad on putty.
The optional settings are: [VT100]; [Intel LINUX]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Redirection After BIOS POST

When Bootloader is selected then legacy console redirection is disabled before booting to legacy OS. When always enable is selected then legacy console redirection is enabled for legacy OS. Default setting for this option is set to always enable
The optional settings are: [Always Enable]; [BootLoader].

Legacy Console Redirection

- **Legacy Console Redirection Settings**

Press [Enter] to make settings in '**Legacy Serial Redirection Port'**.

Legacy Serial Redirection Port

Use this item to select a COM port to display redirection of Legacy OS and Legacy OPROM messages.
The optional settings: [COM1].

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

Console Redirection

The optional settings: [Disabled]; [Enabled].
*When set as [Enabled], user can make further settings in '**Console Redirection Settings**' screen:*

- **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

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

Out-of-Band Mgmt Port

The optional settings are: [COM1].

Terminal Type

Use this item to VT-UTF8 is the preferred terminal type for out-of band management. The next best choice is VT100+ and then VT100. See above, in console redirection settings page for more help with terminal Type/Emulation.

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

Bits per second

Use this item to selects serial port transmission speed. the speed must be matched on the other side. Long or noisy lines may require lower speeds.

The optional settings are: [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 are: [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.*

- **CPU Configuration**

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

  Intel Virtualization Technology

  When enabled, a VMM can utilize the additional hardware capabilities provided by vanderpool technology.

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

  VT-d

  Use this item to enable/disable CPU VT-d

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

  EIST

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

  Use this item to enable or disable Intel SpeedStep.

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

  Turbo Mode

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

  C States

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

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

  Enhanced C state

  Use this item to enable or disable CPU Enhanced C state.

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

  Max Core C-State

  This item controls Max C-state that the processor will support.

  The optional settings: [Fused value]; [C10]; [C9]; [C8]; [C7]; [C6]; [C1]; [Unlimited]

- **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 optional will not be created.
Ipv4 HTTP Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv4 HTTP Boot Support. When set as [Disabled], Ipv4 HTTP boot optional 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 optional will not be created.
Ipv6 HTTP Support
The optional settings are: [Disabled]; [Enabled].
Use this item to enable Ipv6 HTTP Boot Support. When set as [Disabled], Ipv6 HTTP boot optional will not be created.
PXE boot wait time
Use this item to set wait time to press [ESC] key to abort the PXE boot.
Media detect count
Use this item to set the number of times which media will be checked.

- **CSM Configuration**

Use this item to enable/disable, option ROM execution settings, etc
Press [Enter] to make settings for the following sub-items:
Compatibly Support Module Configuration
Boot Option Filter
This item controls Legacy/UEFI ROMs priority.
The optional settings are: [UEFI and Legacy]; [Legacy Only]; [UEFI Only].
Network
This item controls the execution of UEFI and legacy PXE OpROM.
The optional settings are: [Do not launch]; [UEFI]; [Legacy].

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

- **USB Configuration**

Press [Enter] to make settings for the following sub-items:
USB Configuration
Legacy USB Support
Use this item to enables legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option wil keep USB devices available only for EFI applications.
The optional settings are: [Enabled]; [Disabled]; [Auto].
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].
USB hardware delay 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. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.

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

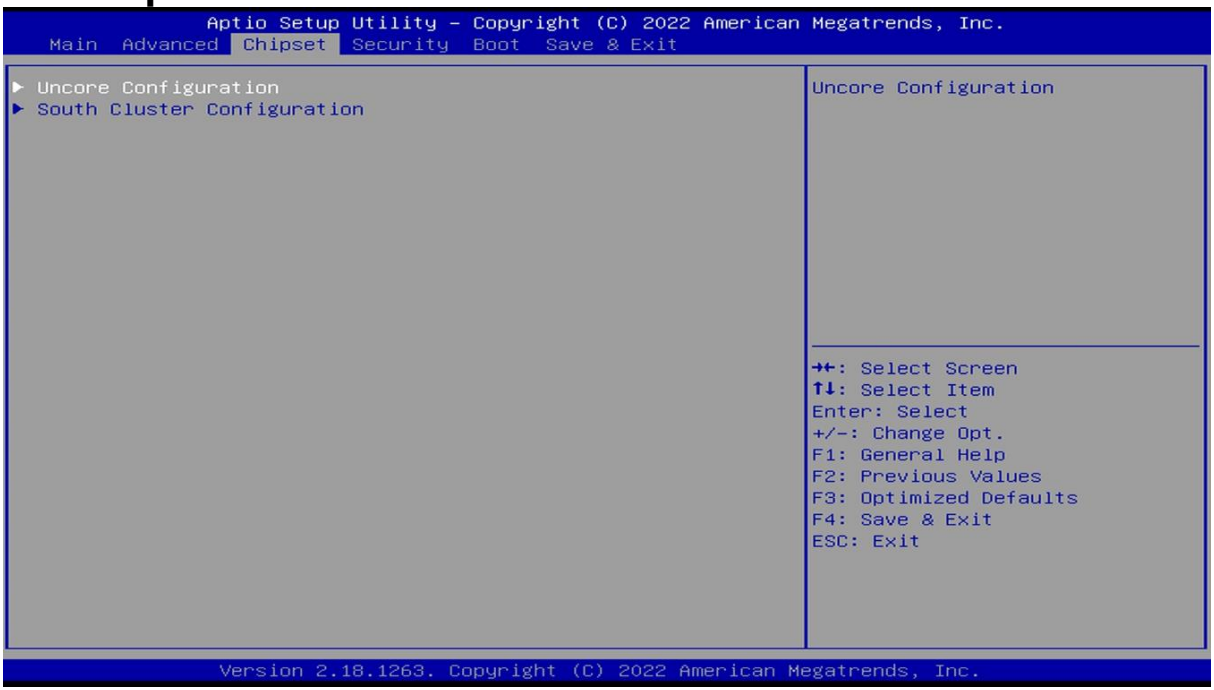
Select [Manual] you can set value for the following sub-item: '**Device Power-up Delay in Seconds'.**

Device Power-up Delay in Seconds

The delay range is from [1] to [40] seconds, in one second increments.

- **Realtek PCIe GBE Family Controller (MAC:XX:XX:XX:XX:XX:XX)**
  Use this item to get MAC address information.
- **Realtek PCIe GBE Family Controller (MAC:XX:XX:XX:XX:XX:XX)**
  Use this item to get MAC address information.

3-8 Chipset Menu



- **Uncore Configuration**

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

  GOP Configuration

  GTT Size

  The optional settings: [2MB]; [4MB]; [8MB].

  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: [64M]; [96M]; [128M]; [160M]; [192M]; [224M]; [256M]; [288M]; [320M]; [352M]; [384M]; [416M]; [448M]; [480M]; [512M].

DVMT Total Gfx Mem

Use this item to select DVMT 5.0 total graphics memory size used by the internal graphics device.

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

Brightness Level

Use this item to set LVDS brightness Level.

The optional settings: [20]; [40]; [60]; [80]; [100]; [120]; [140]; [160]; [180]; [200]; [220]; [240]; [255].

Memory Information

Total Memory

South Cluster Configuration

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

- **SATA Configuration**

  Press <Enter> to select the SATA Device configuration setup options.

  SATA Controller(s)

  Use this item to enables or disables the chipset SATA controller.

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

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

  SATA

  Not Preset

  Port

  Use this item to enables or disables SATA Port

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

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

  Hot Plug

  If enabled, SATA port will be reported as Hot Plug capable.

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

  Device Type

  Identify the SATA port is connected to solid state drive or hard disk drive

  The optional settings: [HDD]; [SSD].

  M.2

Not Present

Port

Use this item to enables or disables SATA Port

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

- **USB Configuration**

XHCI Mode

Once disabled XHCI controller would be function disabled, none of the USB devices are detectable and usable during boot and in OS.

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

SD Card Support

Use this item to enables/disable SCC SD Card Support

The optional settings: [Enabled]; [Disabled]

HD-Audio Support

Use this item to enables/disable HD-Audio Support

The optional settings: [Enabled]; [Disabled]

Onboard Lan1 Controller

Control the PCI Express Root Port

[Enable]: Enable PCIe root port

[Disabled]: Disable PCIE root port

The optional settings: [Enabled]; [Disabled]

Onboard Lan2 Controller

Control the PCI Express Root Port

[Enable]: Enable PCIe root port

[Disabled]: Disable PCIE root port

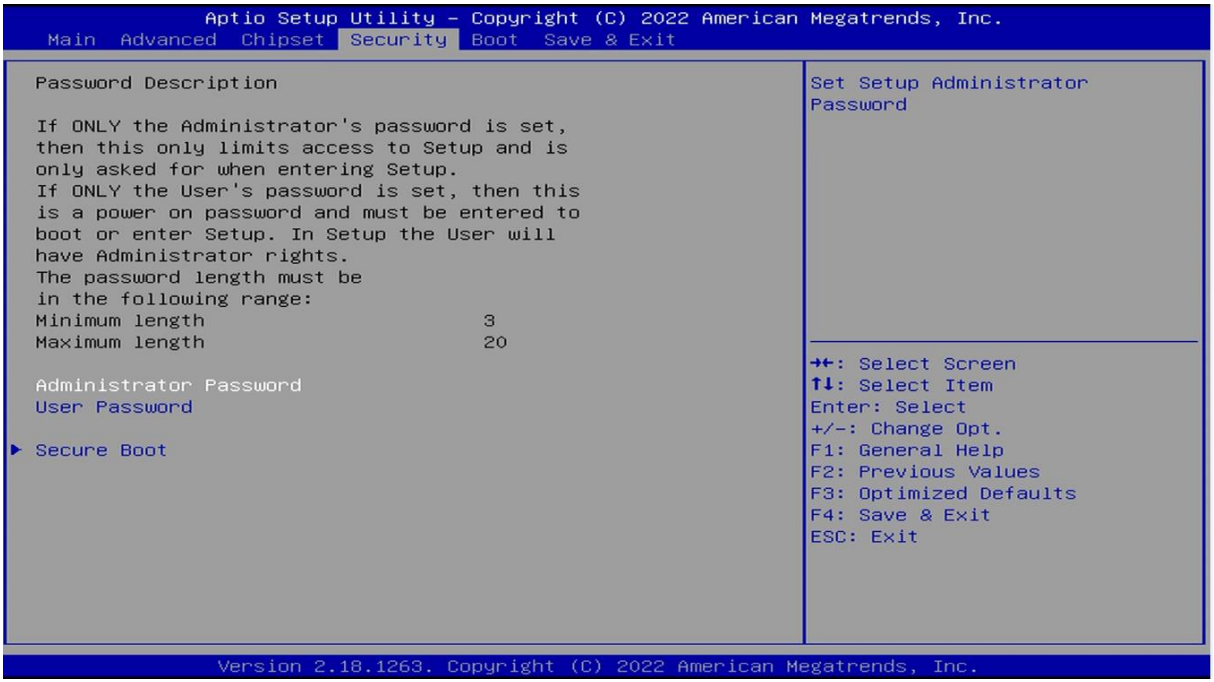
The optional settings: [Enabled]; [Disabled]

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

new administrator password.

- **Secure Boot**
  Press [Enter] to make settings for the following sub-items:
  Secure Boot Control
  The optional settings are: [Disabled]; [Enabled].
  Secure Boot can be enabled if 1. System running in user mode with enrolled Platform Key (PK); 2. CSM function is disabled.
  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.
  **When set as [Custom], user can make further settings in 'Key Management'.*

  - **Key Management**

    Use this item to enables experienced users to modify secure Boot variables.
    Press [Enter] to make settings for the following items:

    Provision Factory Defakt Keys
    The optional settings: [Disabled]; [Enabled].

    - **Enroll all Factory Default Keys**

      This item forces system to User Mode-install all Factory Default keys.
      The optional settings: [Yes]; [No]. Press [Yes] to install default keys.

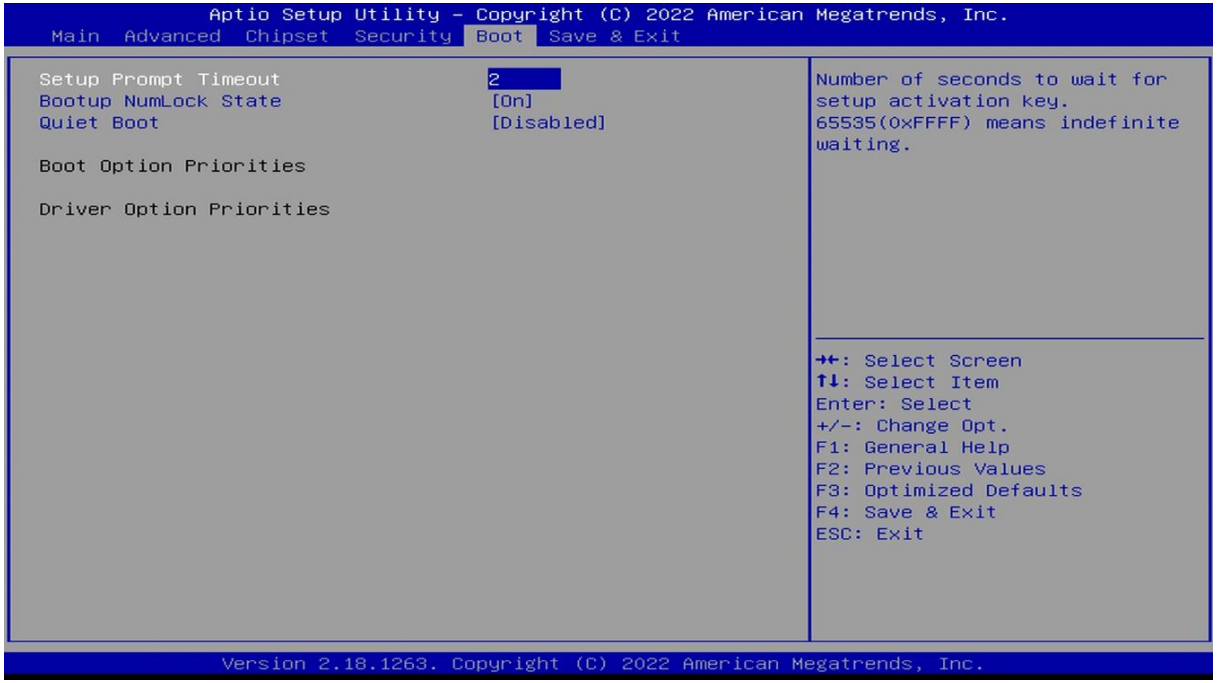
    - **Save all Secure Boot Variables**
      This item will save NRRAM content of all Secure Boot variables to the files (WFI_SIGNATURE_LIST data format) in root folder on a target file system device.
      Press [Enter] to save secure boot variables.

  - **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_SHA256 (bin)
2. Authenticated UEFI Variable

****** Key: Vendor, Custom, Mixed, Test(*) modified from Setup menu

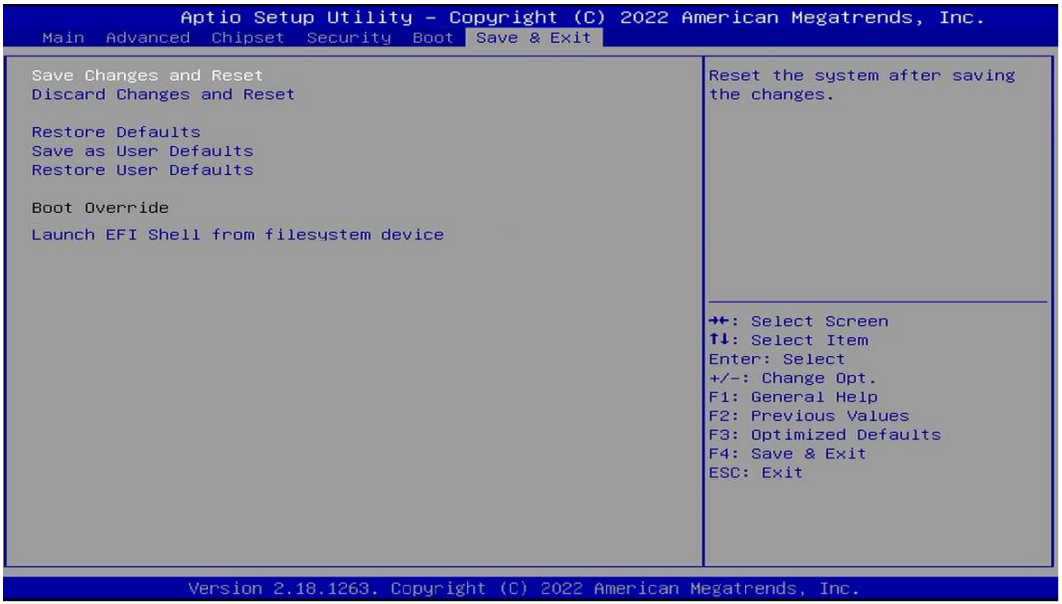
3-10 Boot Menu



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

Driver Option Priorities

3-11 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 defaults to all the setup options.
Boot Override

Launch EFI Shell from filesystem device
This item is used for attempts to launch EFI shell application from one of the available file system devices.