Technical Manual

Of

Intel Braswell Series CPU

Based SBC

NO.G03-NU591R-F

Revision: 2.0

Release date: December 8, 2022

Trademark:

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

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

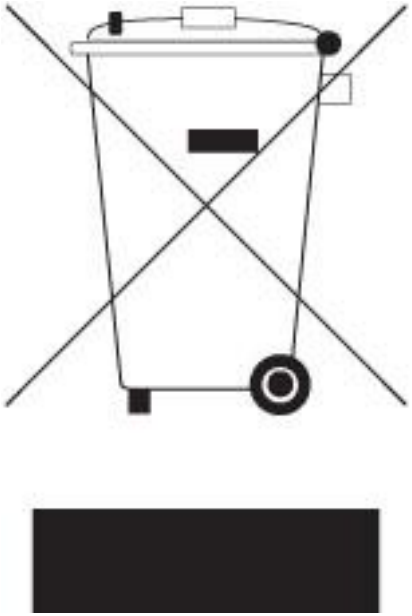


TABLE OF CONTENT

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
2.0	Second Edition	December 08, 2022

Item Checklist

- ☑ Motherboard
- ☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Braswell series SoC Processor, with low power consumption never denies high performance
- Support 1* DDR3L 1600 MHz SO-DIMM, up to 8GB
- Onboard 2 * RJ-45 gigabit Ethernet LAN port
- Onboard 1* full-size Mini-PCIE/MSATA shared slot
- Onboard 1* half-size Mini-PCIE slot
- Onboard 1* SIM card slot
- Support 1* SATAIII device
- 2* HDMI ports & 1* Display port, supports Triple Independent Display
- Support USB 3.0 data transport demand
- Support CPU Smart FAN
- Compliance with ErP standard
- Support Watchdog function

1-2 Specification

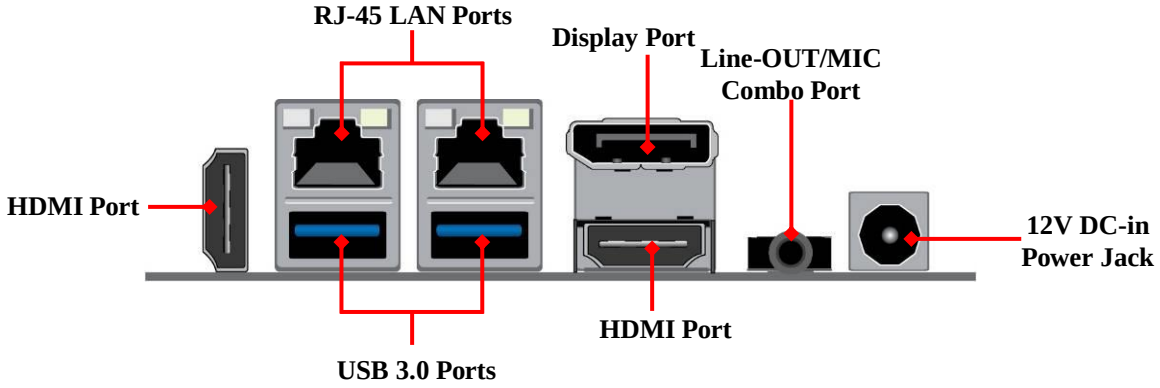
Spec	Description
Design	● NUC form factor; PCB size: 10.1 cm x 10.1 cm
Embedded CPU	● Intel® Braswell ***SoC*** CPU **CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.*
Memory Slot	● 1 * DDR3L SODIMM Slot for un-buffered ***DDR3L 1600 MHz*** SDRAM, expandable to 8GB **Memory frequency range also depend on CPU support*
Expansion Slot	● 1* Full-size Mini-PCIE/MSATA shared slot **(MMPE)** ● 1* Half-size Mini-PCIE slot **(MPE)** ● 1* SIM card slot
Storage	● 1* SATAIII 6Gb/s port ● 1* Full-size Mini-PCIE/MSATA shared slot **(MMPE)**
LAN Chip	● Integrated with 2* Realtek RTL8119I Gigabit LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000Mbps Ethernet data transfer rate
Audio Chip	● Realtek HD audio chip
BIOS	● AMI 64MB Flash ROM
Rear Panel I/O	● 2* RJ-45 LAN port ● 2* USB 3.0 port ● 2* HDMI port ● 1* Display Port ● 1* Audio Line-Out & MIC combo jack ● 1* 12V DC-in system power Jack
Front Panel I/O	● 2* USB 3.0 port ● 1* Serial port (**COM1 supports RS232/422/485** function)
Internal I/O	● 1* SATA Power connector ● 1* FP_CON connector (on the backside) ● 1* CPU FAN header (on the backside/**optional)**

	• 1* 9-Pin USB 2.0/1.1 header for 2* USB 2.0/1.1 ports • 1* LAN LED activity header • 1* GPIO header • 1* SMBUS header

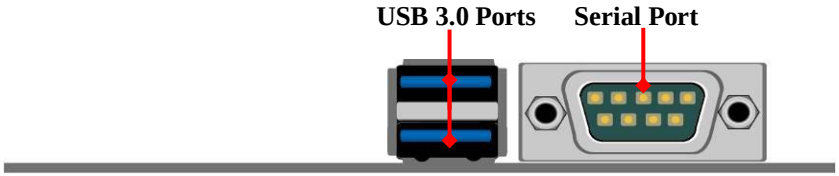
** **Note: 1.** Many PCs now include XHCI USB controllers which allow for the support of USB 3.0 and higher USB speeds. This inclusion of XHCI controllers has lessened the need for EHCI USB controllers within platforms. However, legacy operating systems (OS) may not natively recognize XHCI controllers. You might need to pre-install XHCI driver while desiring to install a non-xHCI OS (ex.Windows* 7) on Intel platforms which do not include EHCI controllers. Please contact your representative for more details. **2.** Braswell SOC will support memory speed at 1600 MHz and 1066 MHz only. If 1333 MHz DIMM is installed, it will run at 1066 MHz. It is not validated while installing 1066MHz DIMM with this SOC.*

1-3 Layout Diagram

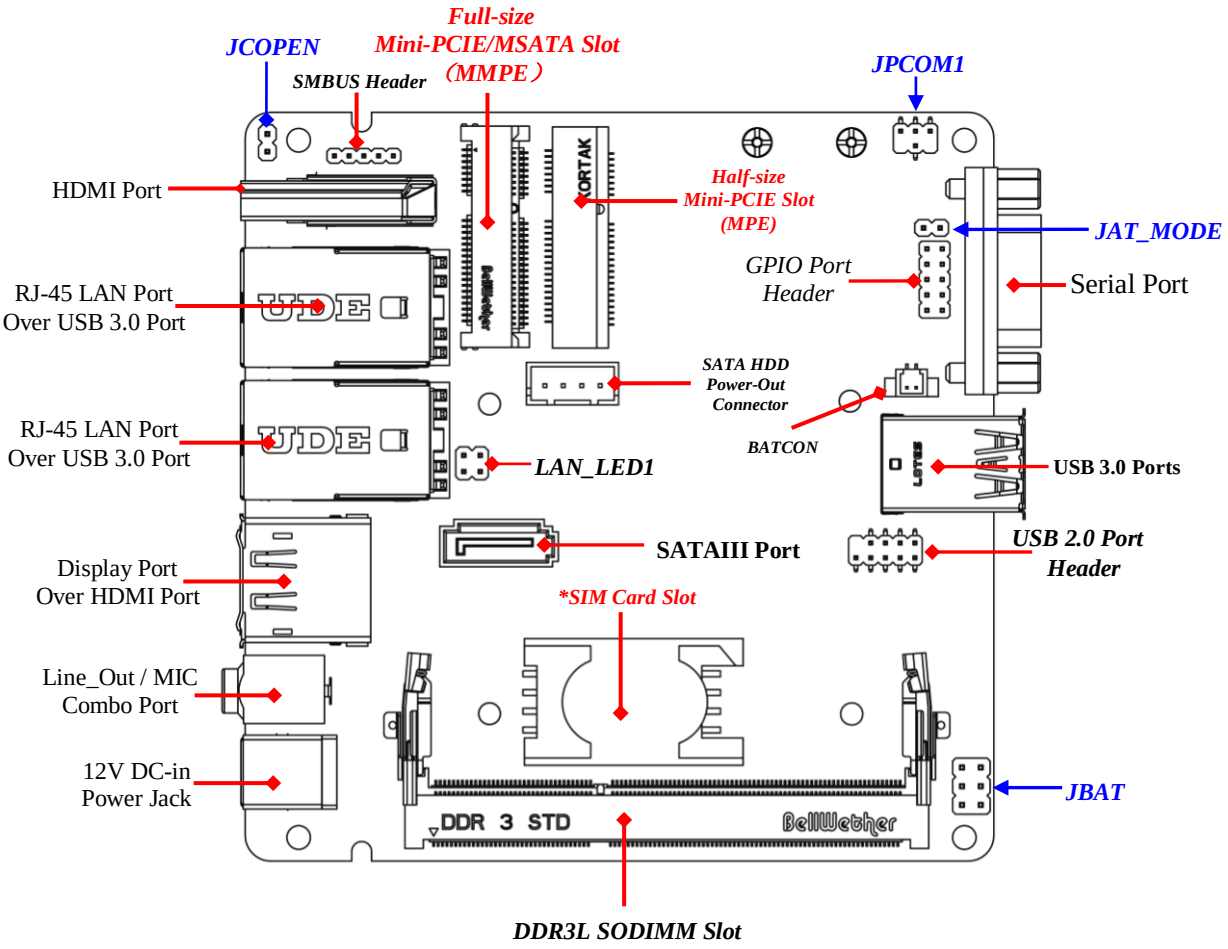
Rear IO Panel Diagram:



Front IO Panel Diagram:

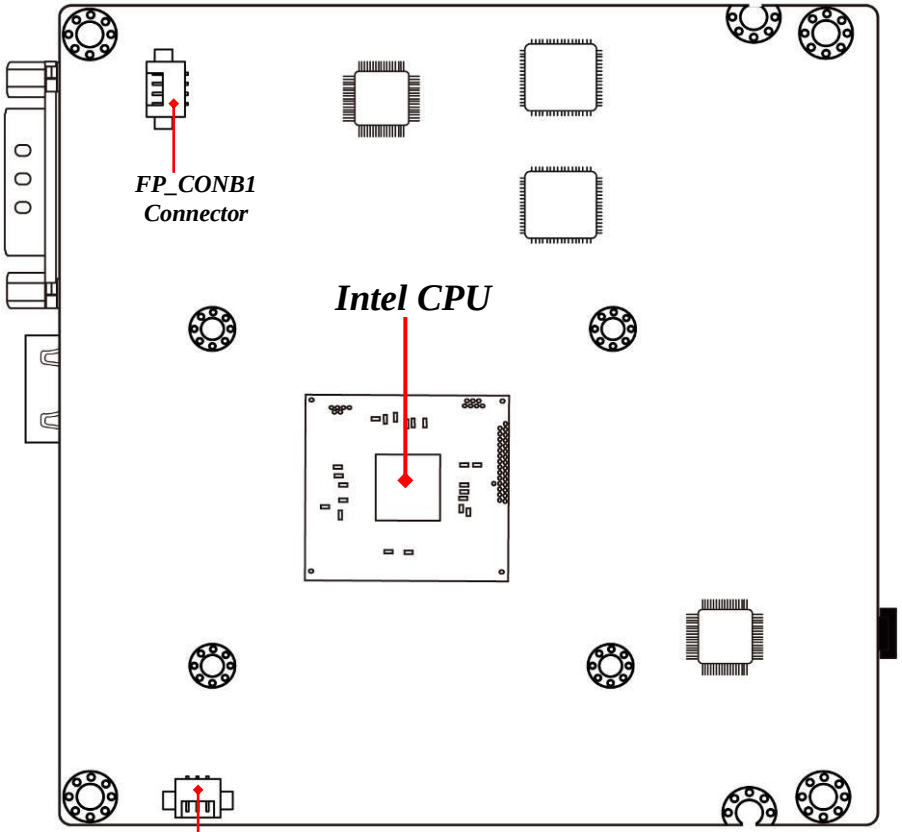


Internal Diagram-Front Side:



***Note: 1.** SODIMM module should be **1.35V DDRIII** SODIMM and **not exceeding 8GB total capacity**.*
***2. SIM card slot** only work **when** compatible SIM card installed & 3G LAN card installed in full-size Mini-PCIE **(MMPE)** slot.*

Internal Diagram-Back Side:



***Note: CPUFANB1** connector is optional for specific model. Please refer to the product you purchased for actual specifications.*

Connectors

Connector	Name
HDMI2	HDMI Connector
UL1/UL2	***Top***: RJ-45 LAN Port Connector ***Bottom:*** USB 3.0 Port Connector
HDMI-DP	***Top***: Display Port Connector ***Bottom:*** HDMI Connector
AUDIO1	Line-Out/MIC Combo Connector
DCIN1	12V DC–in System Power Jack
USB1	USB 3.0 Port Connector x2
SATA	SATAIII Port Connector
PWOUT1	SATA Power out Connector
FP_CONB1 (backside)	Front Panel Connector
**CPUFANB1(backside, optional)*	CPUFAN Connector

Headers

Header	Name	Description	Pitch
FP_USB1	USB 2.0 Port Header	9-pin Block	2.0mm
LAN_LED1	LAN Activity LED Header	4-pin Block	2.0mm
GPIO_CON1	GPIO Header	10-pin Block	2.0mm
SMBUS	SMBUS Header	5-pin Block	2.0mm

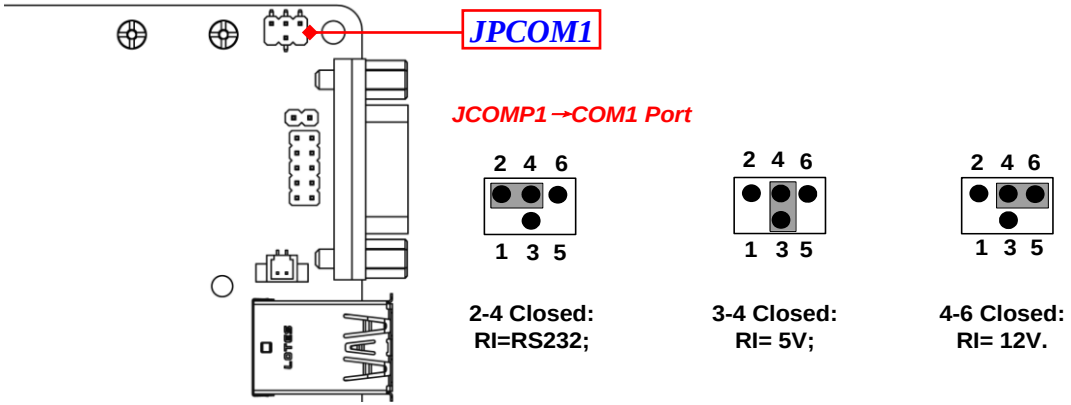
Jumper

Jumper	Name	Description	Pitch
JPCOM1	COM1 Port Pin9 Function Select	4-Pin Block	2.0mm
JCOPEN	Case Open Message Display Function Select	2-Pin Block	2.54.mm
JAT_MODE	ATX Mode & AT Mode Select	2-Pin Block	2.54.mm
JBAT	***Pin (1-2):*** Clear Me Function Setting ***Pin (3-4):*** Clear CMOS RAM Setting ***Pin (5-6):*** Flash Descriptor Security Override	6-Pin Block	2.54.mm

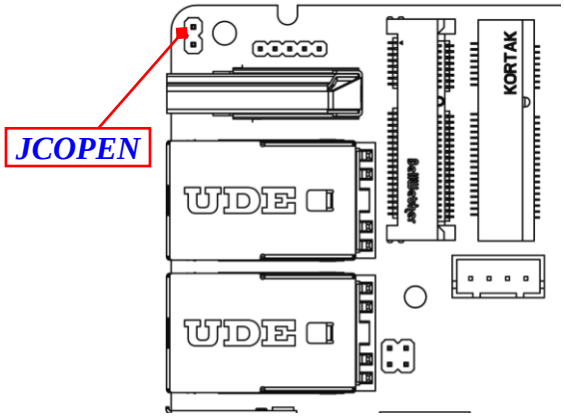
Chapter 2
Hardware Installation

2-1 Jumper Setting

JPCOM1 (4-pin): COM1 Port Pin9 Function Select ***(Pitch:2.0mm)***



JCOPEN (2-pin): Case Open Message Display Function Select (Pitch:2.54mm)



JCOPEN

1

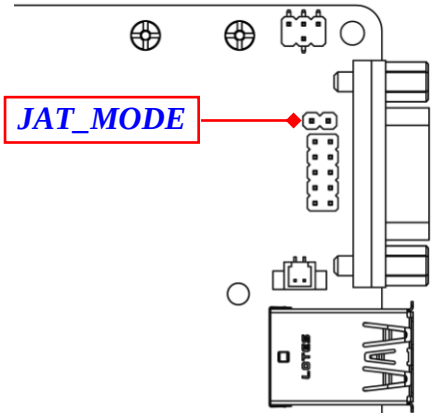
1-2 Open: Normal(Defualt);

1

1-2 Short: Case Open Function Selected (One Touch).

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

JAT_MODE (2-pin): ATX Mode &AT Mode Select (Pitch:2.54mm)



JAT_MODE

1

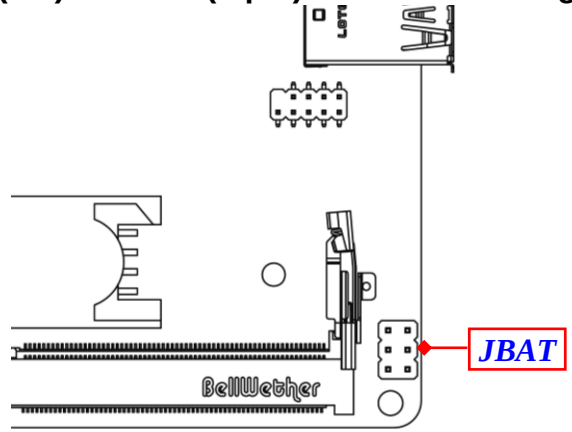
1-2 Open: ATX Mode Selected;

1

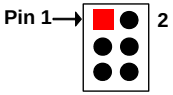
1-2 Closed：AT Mode Selected.

ATX Mode Selected: *Press power button to power on after power input ready;*
***AT Mode Selected:** Directly power on as power input ready.*
User needs to restart the system for the settings to take effect.

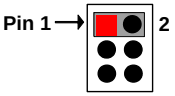
Pin (1-2) of JBAT (6-pin): Clear ME Setting *(Pitch:2.54mm)*



Pin (1-2) of JBAT→ Clear ME

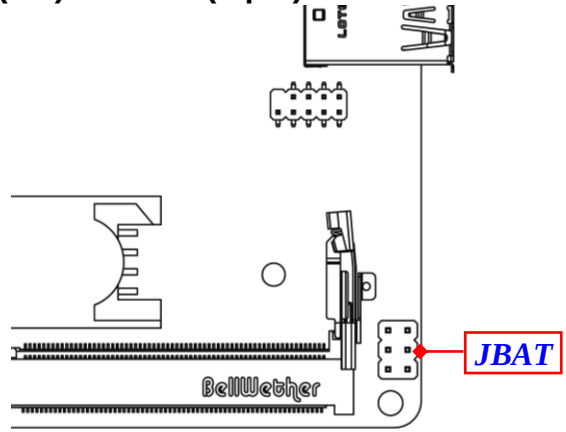


1-2 Open: Normal (Default);

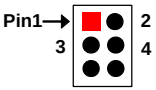


1-2 Closed: Clear ME(One Touch).

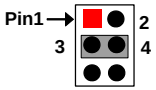
Pin (3-4) of JBAT (6-pin): Clear CMOS RAM Setting *(Pitch:2.54mm)*



Pin (3-4) of JBAT→Clear CMOS

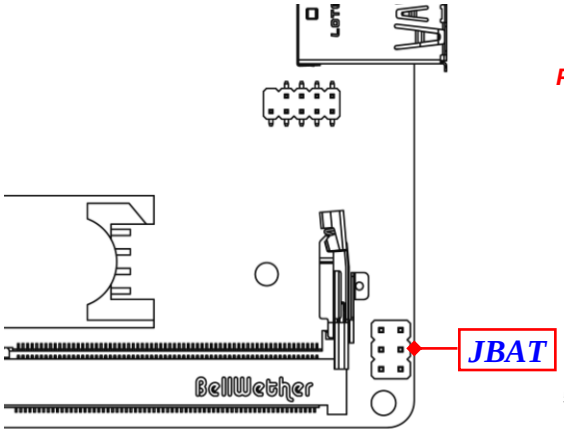


3-4 Open: Normal(Default);

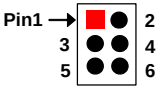


3-4 Closed: Clear CMOS(One Touch).

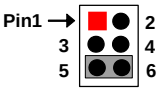
Pin (5-6) of JBAT (6-pin): Flash Descriptor Security Override *(Pitch:2.54mm)*



Pin (5-6) of JBAT→ Flash Override



5-6 Open: Enable Security Measures in the Flash Descriptor(Default);

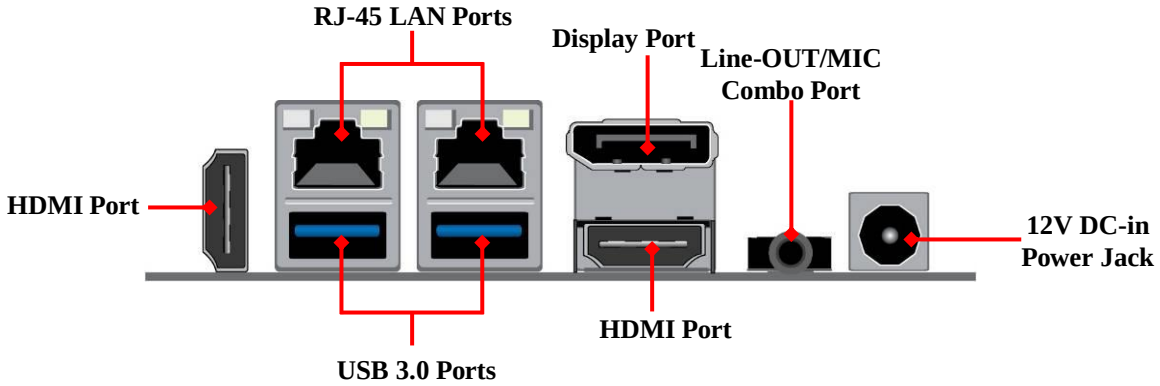


5-6 Closed: Disable Security Measures in the Flash Descriptor(Override).

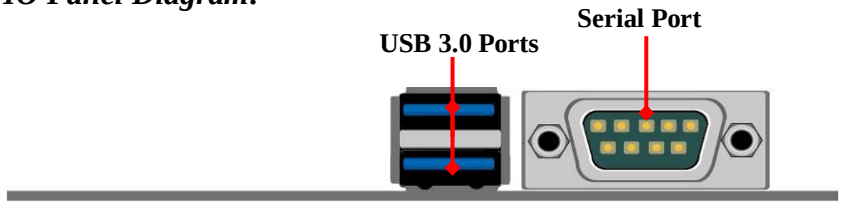
2-2 Connectors and Headers

2-2-1 Connectors

Rear IO Panel Diagram:



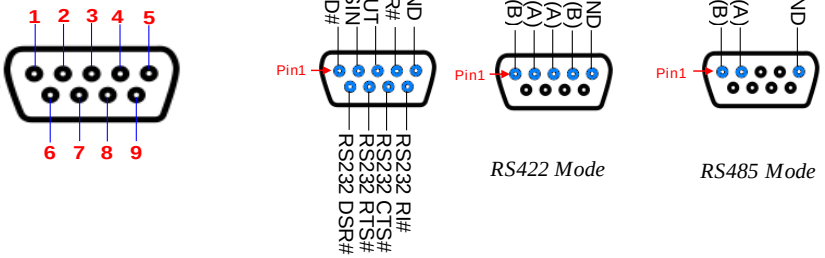
Front IO Panel Diagram:



Icon	Name	Function
	**Power Connector**	12V DC–in system power connector For user to connect compatible power adapter to provide power supply for the system.
	**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.
	**HDMI Port**	To connect display device that support HDMI specification.
	**Display Port**	To the system to corresponding display device with compatible display port cable.
	**Line-Out/MIC Combo Connector**	This connector can functions as audio Line-Out jack and MIC jack with compatible cables & devices.
	**COM1:** ***RS232/422/485*** ***Serial Port***	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.

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

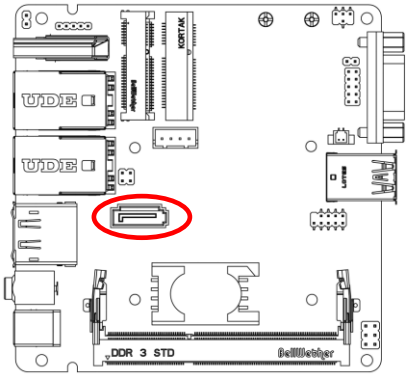
COM1 port can function as RS232/422/485 port. In normal settings COM1 functions as RS232 port. With compatible COM cable they can function as RS422 or RS 485 port.User also needs to go to BIOS to set **'*Transmission Mode Select*'** for COM1 (refer to **Page-23**) at first, before using specialized cable to connect different pins of this port. The pin assignment for RS-232/ 422/ 485 is listed as follows:



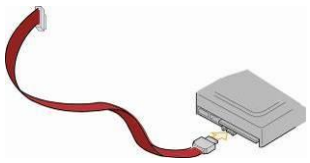
RS232 Mode *RS422 Mode* *RS485 Mode*

SATA (7-pin Block): SATAIII Port connector

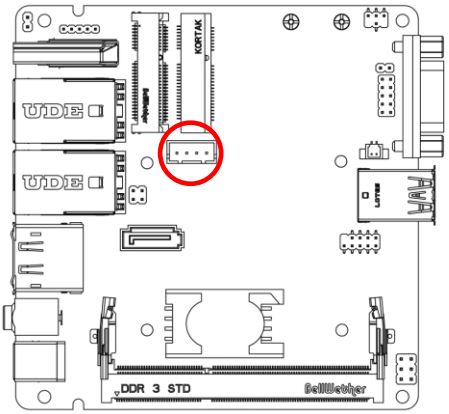
The board comes with a SATAIII port that supports 6GB/s transfer rate.

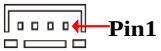


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND



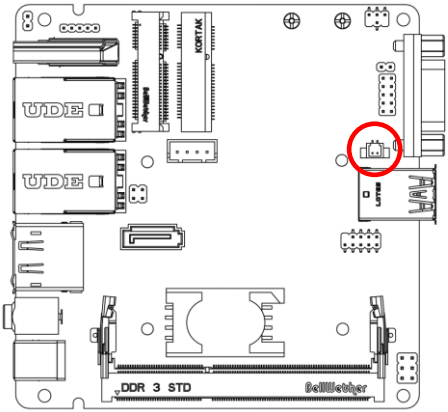
PWOUT1 (4-pin): SATA HDD Power-Out Connector

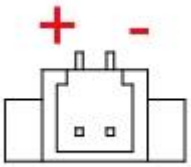




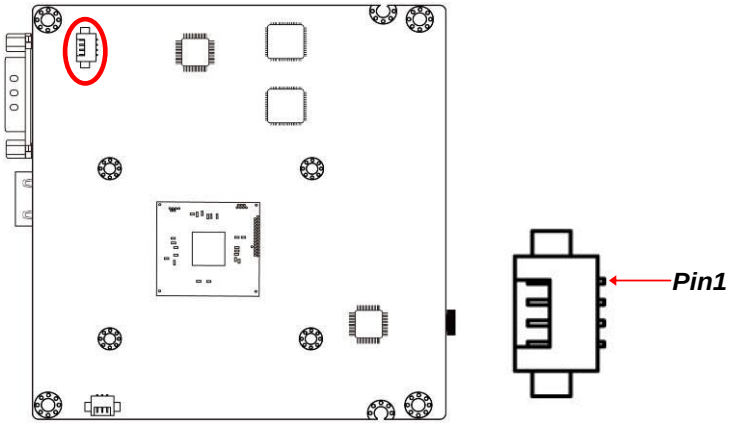
Pin No.	Definition
1	+5V
2	GND
3	GND
4	+12V

BATCON (2-pin): Battery Connector



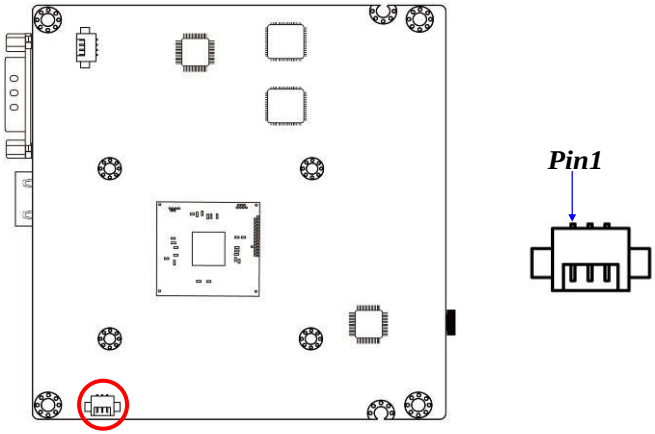


FP_CONB1 (4-pin): Front Panel Connector



Pin No.	Definition
1	Power_SW
2	GND
3	PWRLED -
4	PWRLED+

CPUFANB1 (3-pin): CPUFAN Connector

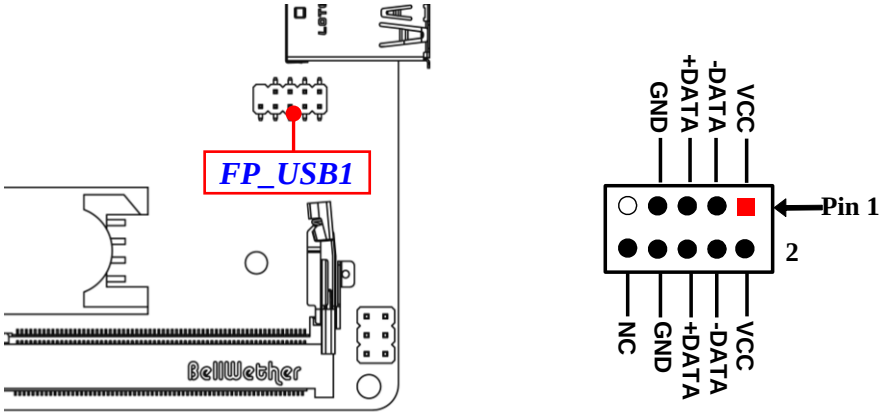


Pin No.	Definition
1	VCC
2	GND
3	Fan Detect

***Note: CPUFANB1** connector is optional for specific model. Please refer to the product you purchased for actual specifications.*

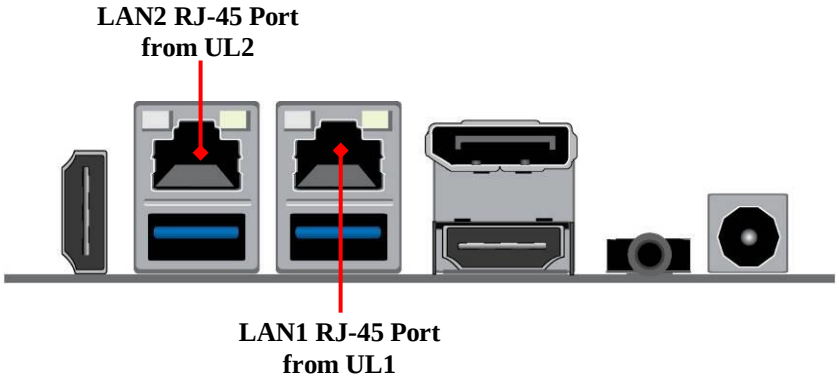
2-2-2 Headers

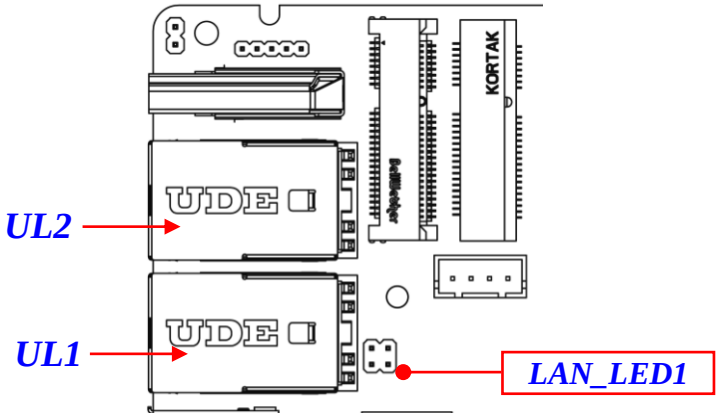
FP_USB1 (9-pin): USB 2.0 Port Header *(Pitch:2.0mm)*

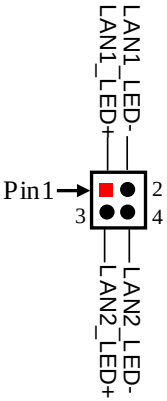


LAN_LED1 (4-pin): LAN Activity LED Header *(Pitch:2.0mm)*

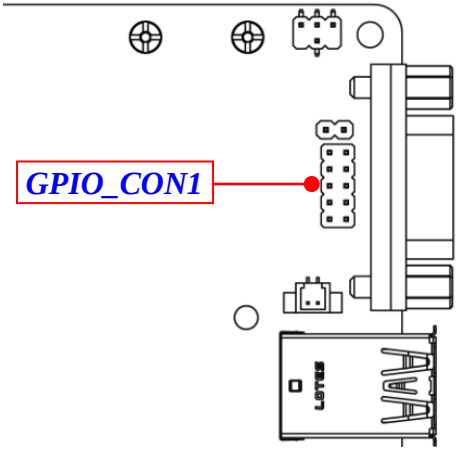
Pin(1-2): For UL1 RJ-45 LED; Pin (3-4): For UL2 RJ-45 LED

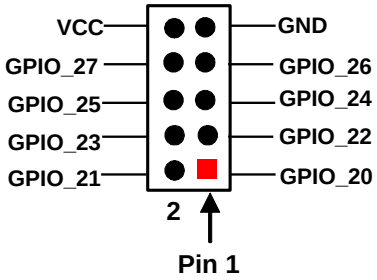




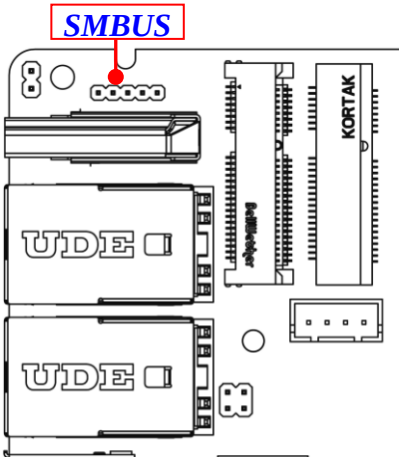


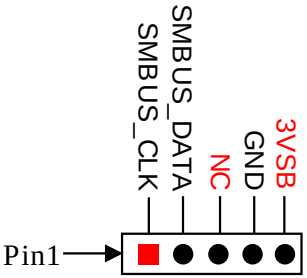
GPIO_CON1 (10-pin): GPIO Header ***(Pitch:2.0mm)***





SMBUS (5-Pin): SM BUS Header ***(Pitch:2.0mm)***





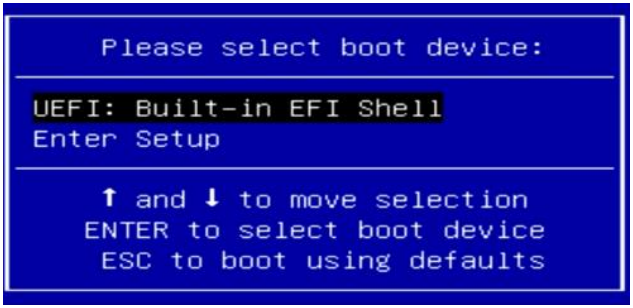
Chapter 3
Introducing BIOS

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

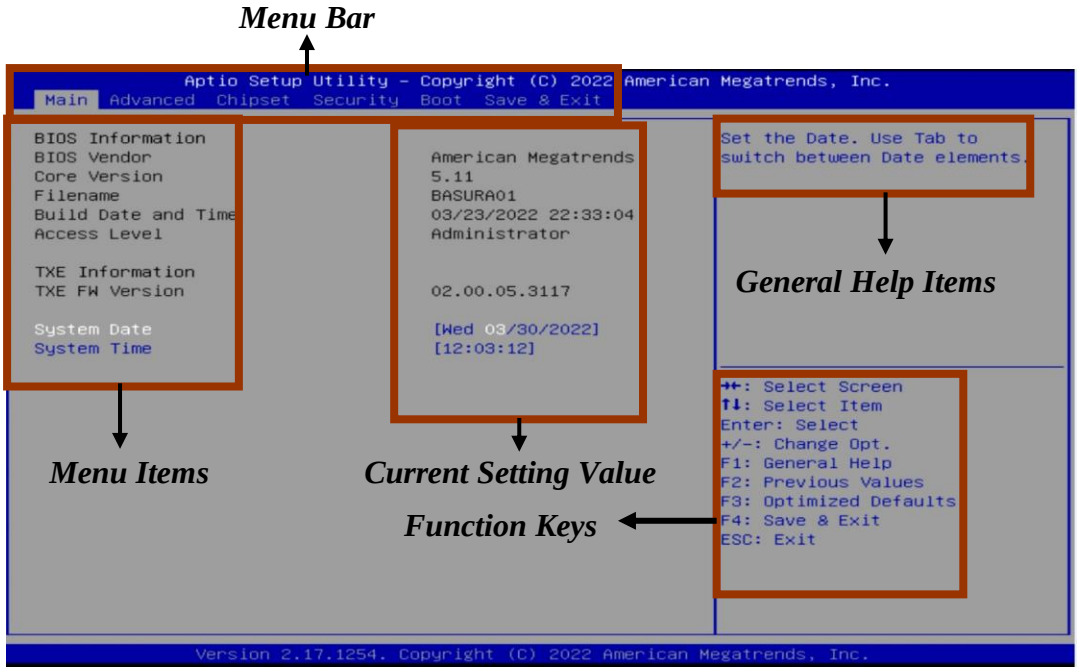
Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously 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.
- **[F7]:** To enter pop-up boot menu to select boot device.
- 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

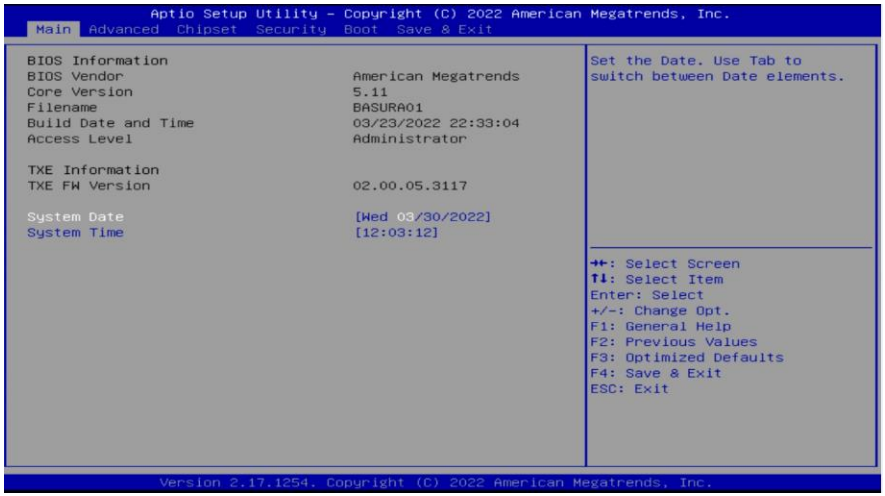
There are six menu bars on top of BIOS screen:

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.

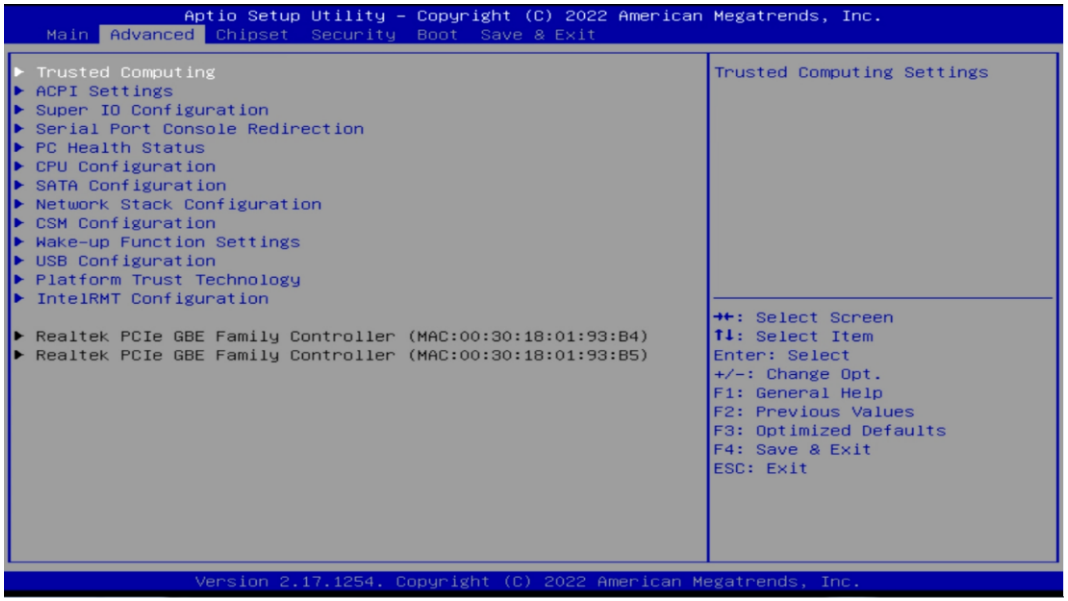
3-6 Main Menu

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



- **Trusted Computing**
  Press [Enter] to enable or disable Security Device Support.
  TPM20 Device Found

  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].

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

Active PCR Banks

Available PCR Banks

SHA-1 PCR Bank

Use this item to enable or disable SHA-1 PCR Bank

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

SHA256 PCR Bank

Use this item to enable or disable SHA256 PCR Bank

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 during restart in order to change state of security Device*

TPM2.0 UEFI Spec Version

Use this item to select the TCG2 Spec Version Support

1.0: The compatible mode for Win8/Win10

1.x: For TCG2 newer spec for Win10

The optional settings: [1.0]; [1.x].

- **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)].

- **Super I/O Configuration**

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

Super IO Configuration

  - **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).
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 [Auto]; [IO= 3F8h; IRQ=4]; [IO= 2F8h; IRQ=3]; [IO= 3E8h; IRQ=4]; [IO= 2E8h; IRQ=3]
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].

ERP Support

Use this item to Energy-Related Products function
The optional settings: [Disabled]; [Enabled].
This item should be set as **[Disabled]** if you wish to have all active wake-up functions.
Case Open Detect
This item controls detect case open function.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will detect if COPEN has been short or not (*refer to **JCOPEN** jumper setting for Case Open Detection*); if Pin 1&2 of ***JCOPEN*** are short, system will show Case Open Message during POST.

WatchDog Reset Timer
Use this item to enable or disable WatchDog Timer reset function. When set as [Enabled], the following sub-items shall appear:
WatchDog Reset Timer Value
User can set a value in the range of [10] to [255].
WatchDog Reset Timer Unit
The optional settings are: [Sec.]; [Min.].
WatchDog Wake-up Timer
This item support WDT wake-up while ERP function is set as [Enabled].
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], the following sub-items shall appear:

WatchDog Wake-up Timer Value
The setting range is [10] ~ [4095] seconds, or [1] ~ [4095] minutes.

WatchDog Wake-up Timer Unit
The optional settings are: [Sec.]; [Min.].

ATX Power Emulate AT Power
This item displays current Emulate AT Power Status, motherboard power On/Off control by power supply. User needs to select 'AT or ATX Mode' on MB jumper at first (refer to ***Page 9***, **Pin (1&2) of JAT_MODE** for ATX Mode & AT Mode Select).

- **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].

[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 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]; [38400]; [57600]; [115200].

Data Bits

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

Parity

A parity bit can be sent with the date bits to detect some transmission errors.

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

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

[Odd]: Parity bit is 0 if num of 1 in the data bits is odd

[Mark]: parity bit is always 1

[Space]: Parity bit is always 0. Allow for error detection

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’ 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].

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 date.
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]; [LINUX]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Redirection After BIOS POST

Use this item to the settings specify if BootLoader is selected then Legacy console redirection is disabled before booting to Legacy OS, Default value is always enable which means Legaacy console Redirection is enabled for Legacy OS.
The optional settings are: [Always Enable]; [BootLoader].

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':

- **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 default setting is: [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

Use this item to flow control can prevent date 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.*

- **PC Health Status**

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

PC Health Status

- **SmartFAN Configuration**

Press [Enter] to make settings for SmartFAN 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].

- **CPU Configuration**

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

Limit CPUID Maximum
The optional settings: [Disabled]; [Enabled].
This item should be set as [Disabled] for Windows XP.

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

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

CPU C State Report
Use this item to enable or disable CPU C state report to OS.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], the following item shall appear:

Max CPU C State
This item controls Max C state that the processor will support.
The optional settings: [C7]; [C6]; [C1].

- **SATA Configuration**

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

SATA Configuration

SATA Controller
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], the following items shall appear:

SATA Mode Selection
Use this item to determines how SATA controller operate.

The default setting is: [AHCI].

SATA Interface Speed

Use this item to selsct SATA Interface speed CHV A1 always with Gen1 Speed.
The optional settings are: [Gen1]; [Gen2]; [Gen3].

SATA Port1

Not Present

Port

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

mSATA

Not Present

Port

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

- **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 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], Ipv4 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 number of times presence of media will be checked.
The optional settings range from [1] to [50].

- **CSM Configuration**

Use this item to Enable/Disable, Option ROM execution settings, etc.
Press [Enter] to make settings for the following sub-items:
Compatibility 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 only]; [Legacy].
Storage
This item controls the execution of UEFI and Legacy Storage OpROM.
The optional settings are: [Do not launch]; [UEFI only]; [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 only]; [Legacy].

- **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-up by RTC alarm.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will wake on the hour/min/sec specified.

Wake-up Hour
Use this item to 0-23. For example, 3 for 3am and 15 for 3pm.
Wake-up Minute
Use this item to 0-59
Wake-up Second

Use this item to 0-59

Wake-up System with Dynamic Time

Use this item to enable or disable system wake-up by RTC alarm.

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

When set as [Enabled], system will wake on the current time + increased minute(s).The settings range is from [1] ~ [60] minute(s).

Wake-up Time Increase

Use this item to 1 to 60 minute(s)

- **USB Configuration**

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

USB Configuration

USB Devices

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].

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.

- **Platform Trust Technology**

Press [Enter] to make settings for the following sub-item:
TPM Configuration
fTPM
The optional settings are: [Enabled]; [Disabled].

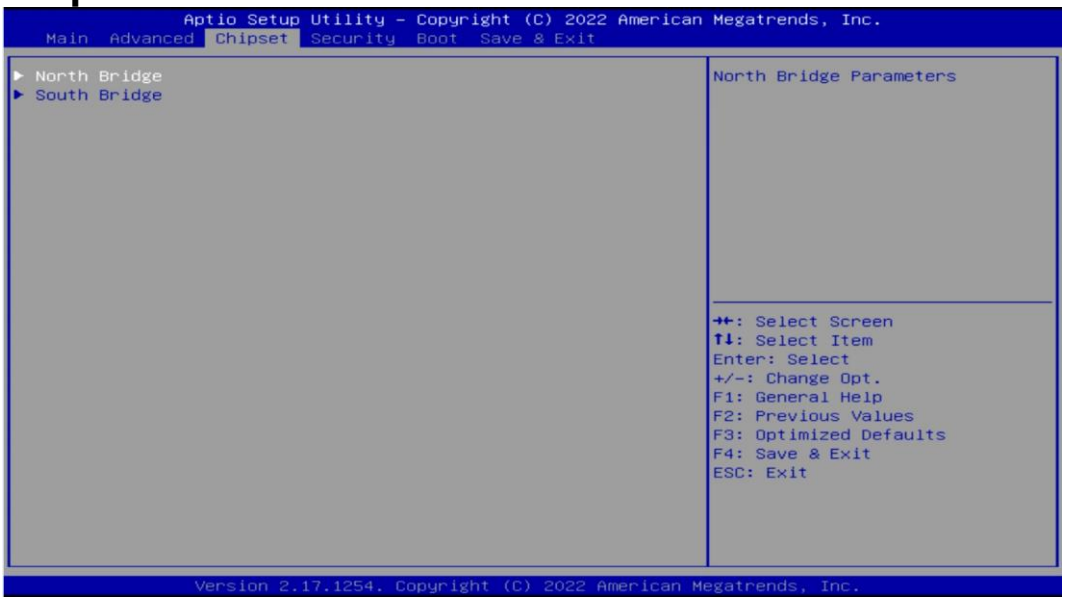
- **IntelRMT Configuration**

User Select Intel RMT(Ready Mode Techology) Support
Press [Enter] to make settings for the following sub-item:
IntelRMT Configuration
Intel RMT Support
Use this item to Intel RMT (Ready Mode Technology) SSDT table will be loaded if enabled.
The optional settings are: [Enabled]; [Disabled].
*When set as **[Enabled]**, user can make further settings in the following item:*
HW Notification
Use this item to Hardware notification enabling status.
The optional settings are: [Disabled]; [Enabled].

- ***Realtek PCIe GBE Family Controller (Mac: XX:XX:XX:XX:XX:XX)***
- ***Realtek PCIe GBE Family Controller (Mac: XX:XX:XX:XX:XX:XX)***

These items give working gigabit ethernet controller basic driver information.

3-8 Chipset Menu



- **North Bridge**

  Press [Enter] to view memory configurations or make settings for the following sub-items:

  PAVC

  Use this item to enable or disable protected audio video control.

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

  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]; [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].

Aperture Size

Use this item to select the Aperture size

The optional settings are: [128MB]; [256MB]; [512MB].

GTT Size

Use this item to select the GTT size

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

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. Secondary boot display selection will appear based on your selection . VGA modes will be supported only on primary display.

The optional settings are: [Auto]; [HDMI1]; [HDMI2]; [Display Port]

Secondary IGFX Boot Display

Use this item to select secondary display device

The optional settings are: [Disabled]; [HDMI1]; [HDMI2]; [Display Port]

Memory Information

Total Memory

Memory Sloto

Max TOLUO

Use this item to Maximum value of TOLUD

The optional settings are: [2GB]; [2.25GB]; [2.5GB]; [2.75GB]; [3GB]

- **South Bridge**

Press [Enter] to further setting USB device configuration.

Mini PCIE

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

Mini PCIE Speed

The optional settings are: [Auto]; [Gen 2]; [Gen 1].

Mini PCIE1 Speed

The optional settings are: [Auto]; [Gen 2]; [Gen 1].

Onboard PCIE LAN1

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

Onboard PCIE LAN2

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

Audio Controller

Use this item to control detection of the Azalia device.
The optional settings are: [Disabled]; [Enabled].
[Disabled]: Azalia will be unconditionally disabled;
[Enabled]: Azalia will be unconditionally enabled.
Press [Enter] to make settings for the following sub-items

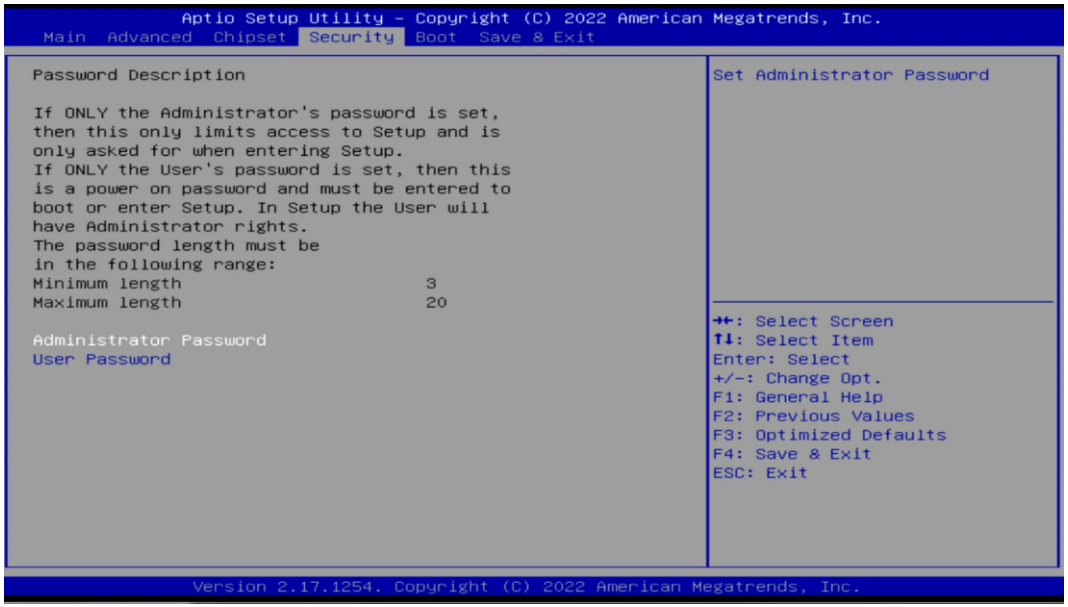
Azalia HDMI Codec

Use this item to enable or disable internal HDMI codec for Azalia.
The optional settings are: [Disabled]; [Enabled].

System State after Power Failure

Use this item to select the system state when AC power is re-applied after a power loss.
The optional settings are: [Always Off]; [Always On]; [Former State].
** The option [Always On] and [Former State] are affected by ERP function. Please disable ERP to support [Always On] and [Former State] function.*

3-9 Security Menu



Security menu allow users to change administrator password and user password settings.

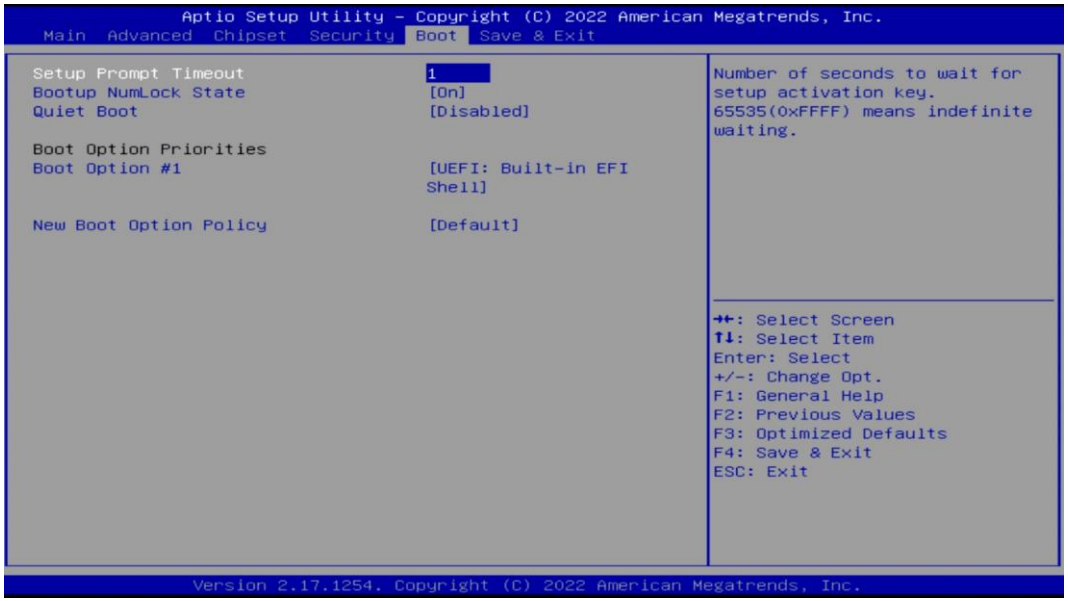
Administrator Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

User Password

If there is no password present on system, please press [Enter] to create new 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.

3-10 Boot Menu



Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key.65535(0xFFFF) means indefinite waiting.

Bootup Numlock State

Use this item to select keyboard numlock state.

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

Quiet Boot

Use this item to Enables or disables Quiet Boot option

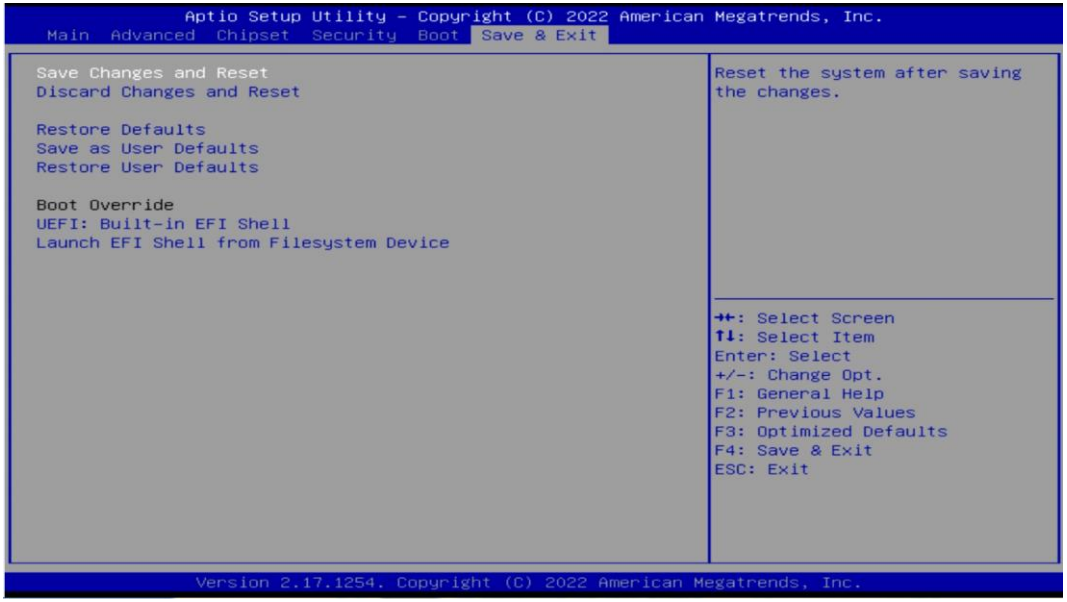
The optional settings are: [Disabled]; [Enabled].

Boot Option Priorities

Boot Option #1
Use this item to sets the system boot order
The optional settings are: [UEFI: Built-in EFI Shell]; [Disabled].

New Boot Option Policy
This item controls the placement of newly detected UEFI boot options.
The optional settings are: [Default]; [Place First]; [Place Last].

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 the user defaults to all the setup options.
Boot Override

Boot Override
UEFI: Built-in EFI Shell
Press this item to select the device as boot disk after save configuration and reset.

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