MZ02 Series

User's Manual

NO. G03-MZ02-F

Revision: 2.0

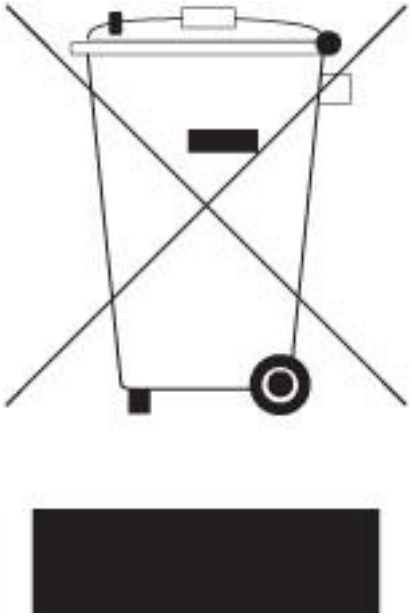
Release date: December 13, 2022

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.



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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
2.0	Second Edition	December 13, 2022

Item Checklist

- ☑ Motherboard
- ☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Tiger Lake-U series SoC BGA Processor, with low power consumption never denies high performance
- Support 2* DDR4 3200 MHz Dual CH SO-DIMM, up to 64GB
- Integrated with 1* Intel® i219LM GbE & 1* Intel® i225V 2.5GbE
- Onboard 1* M.2 M-key slot,type-2242/2280, SATA/PCIe 4.0 x4 interface, supports NVMe
- Onboard 1* M.2 E-key slot,type-2230 PCIex1/USB2.0 interface supports Wi-Fi with Intel CNVi technology
- Onboard 1* M.2 B-key slot,type-3042/3052 (USB3.1/USB2.0/PCIe x1)
- Support 1* SATA-HDD hard disk driver device (6Gb/s)
- Support 2* USB3.2 (Gen.2), 4* USB2.0 data transport demand
- Support 1* HDMI 2.0b & 2* DP 1.4b (1 from Type-C USB 3.2 Gen.2 port) to support up to three independent 4K HDR displays.
- Support CPU Over-Temperature protection
- Support CPU Smart FAN
- Compliance with ErP standard
- Support Watchdog function

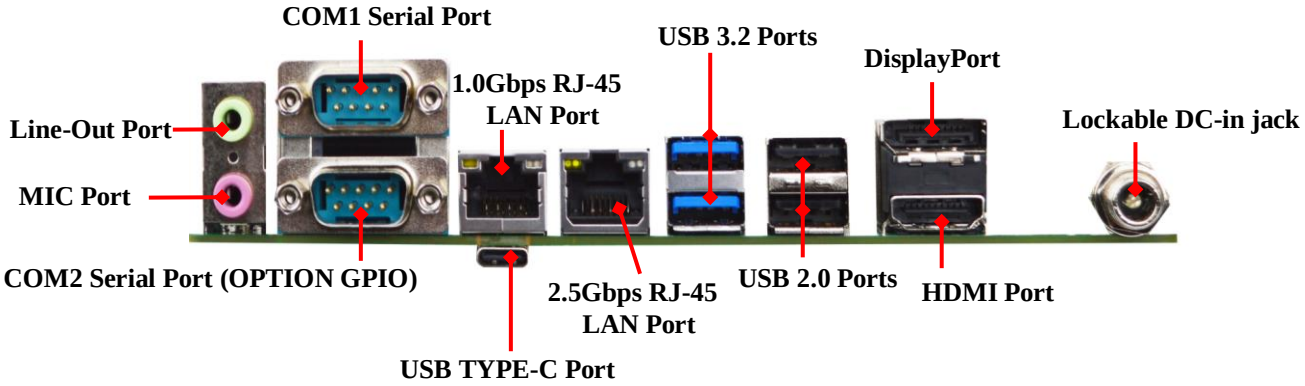
1-2 Specification

Spec	Description
Design	● 10 layers; PCB size: 11 x 16.7 cm
Embedded CPU	● Intel® Tiger Lake-U series SoC BGA CPU *CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.
Memory Slot	● 2* DDR4 3200 MHz Dual CH SO-DIMM, up to 64GB ● Dual-channel function supported
Expansion Slot	● 2* PCIe x1 slot by sideway ● 1* M.2 M-key 2242/2280, SATA/PCIe 4.0 x4 interface, support NVMe (M2M1) ● 1* M.2 B-Key 3042/3052 (USB3.1/USB2.0/PCIe x1 interface) (M2B1) ● SIM card slot (along with M.2 B-key) ● 1* M.2 E-key 2230, USB2.0/PCIex1 interface support CNVi (M2E1) *Note: M2M1 & M2E1 slot maximum current limit is 2A while using 3.3V
LAN Chip	● Integrated with Intel i225V 2.5Gigabit PCI-E LAN chip & Intel i219LM Gigabit PHY LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000/2500 Mbps Ethernet & 10/100/1000 Mbps Ethernet data transfer rate
Audio Chip	● HD audio: Realtek codec ● Audio driver and utility included
Storage	● 1* 7+5 pin HDD Connector for 2.5” SATA HDD
BIOS	● AMI EFI 128Mb SMT Flash ROM
Multi I/O	***Rear Panel I/O:*** ● 1* 12V-24V Lockable DC-in power Jack ● 1* DisplayPort ● 1* HDMI port ● 1* USB3.2(Gen.2) Type-C port support DP1.4 display output (**on the backside**) ● 2* USB 3.2(Gen.2) ports ● 2* USB 2.0 ports ● 2* RJ-45 LAN ports ● 2* COM RS232 serial ports (COM1/COM2; COM2 OPTION GPIO) ● 1* Audio Line Out port ● 1* Audio MIC port

	Internal I/O Connectors& Headers: ● 1* 2-pin internal 12V-24V DC-in power connector ● 1* CPUFAN Wafer ● 1* Front panel header ● 1* 9-pin USB 2.0 header(Expansible to 2* USB 2.0 ports) ● 1* GPIO_CON header ● 1* FP_AUDIO header ● 1* SMBUS header ● 2* LAN Activity LED Headers ● 1* PD_JTAG1 Header (For lab test only)

1-3 Layout Diagram

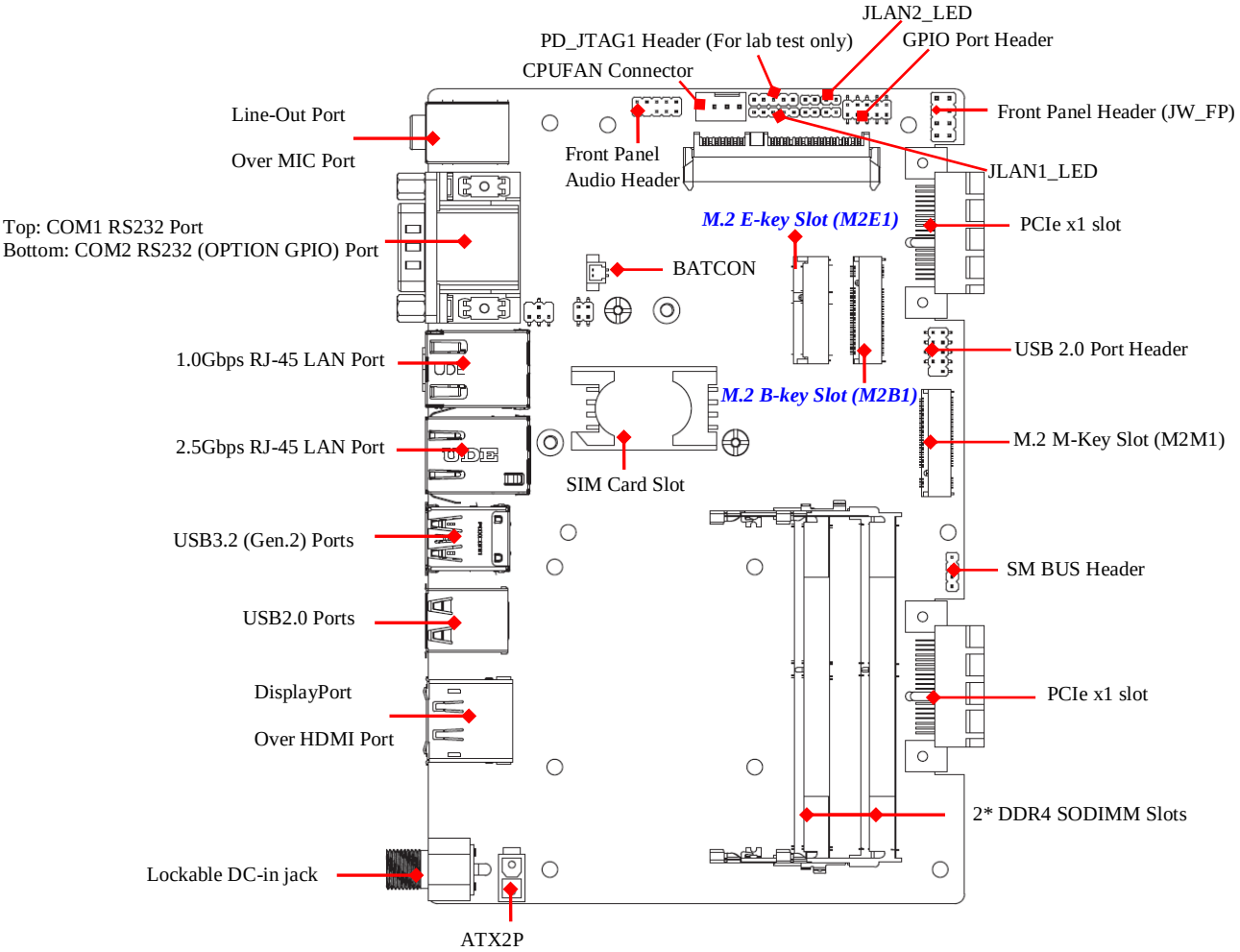
Rear IO Panel Diagram:



Warning!!

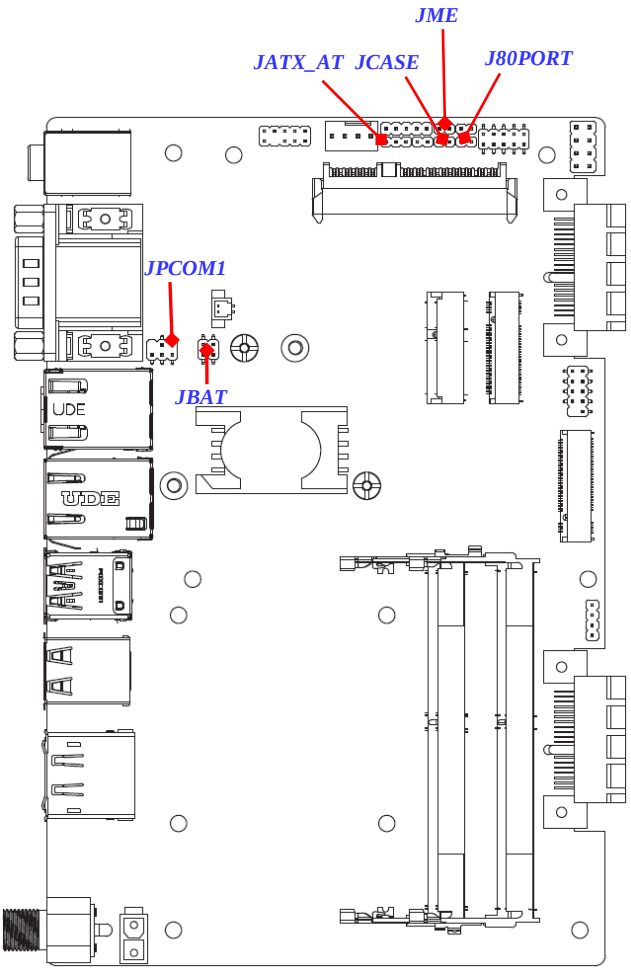
The board has a 12V~24V DC-in power connector (DCIN1) in I/O back panel and an internal ATX2P power connector. User can only connect one type of compatible power supply to one of them to power the system.

Motherboard Internal Diagram-Front Side

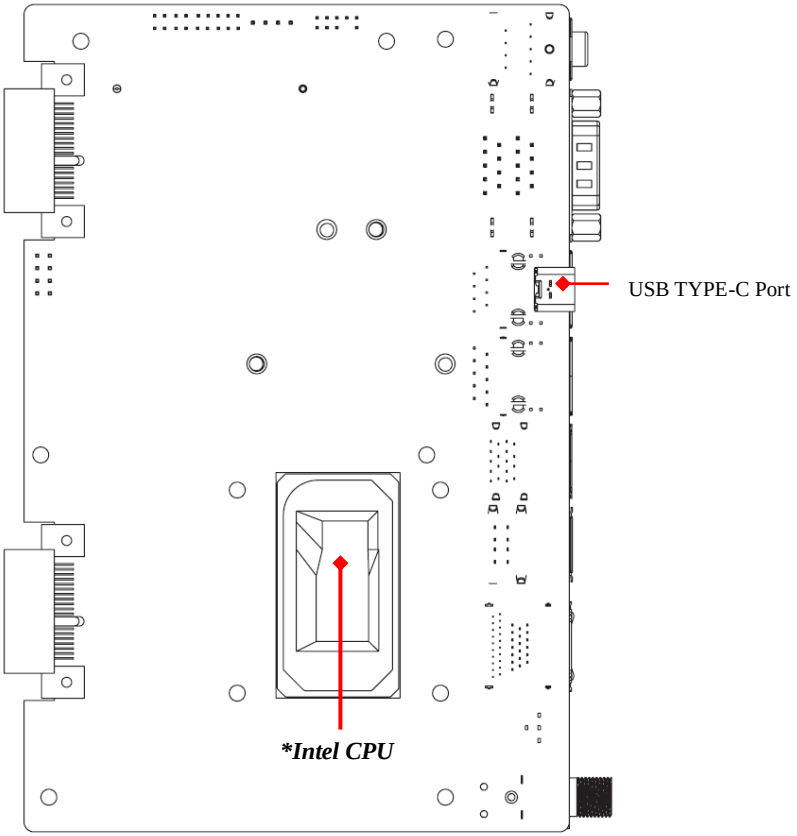


***Note*: SIM card slot (along with M.2 B-key)**

Motherboard Jumper Position



Motherboard 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!*

Jumper

Jumper	Name	Description
JPCOM1	COM1 Port Pin9 Function Select	4- pin Block (2.0 pitch)
JME	ME Flash Override Select	2- pin Block (2.0 pitch)
JATX_AT	ATX Mode/AT Mode Select	3- pin Block (2.0 pitch)
JCASE	For Case Open	2- pin Block (2.0 pitch)
J80PORT	GPIO_CON 80 Port/GPIO Function Select	2- pin Block (2.0 pitch)
JBAT	Pin (1-2): Clear CMOS Pin (3-4): Clear ME_REG	4- pin Block (2.0 pitch)

Connectors

Connector	Name
DCIN1	12V~24V Lockable DC-in power Jack Connector
DP_HDMI	Top: DisplayPort Connector Bottom: HDMI Port Connector
USB1	USB 3.2 Port Connector x 2
USB2	USB 2.0 Port Connector x 2
LAN1/LAN2	LAN1: 1.0Gbps RJ-45 LAN Port LAN2: 2.5Gbps RJ-45 LAN Port
COM1/COM2-GPIO	2* COM RS232 serial port (COM1/COM2; COM2 OPTION GPIO)
AUDIO	Top: Audio Line Out Connector Bottom: Audio MIC Connector
USBC1	1* USB3.2(Gen.2) Type-C port support DP1.4 display output
ATX2P	Internal 2-Pin12V~24V DC-in power Connector

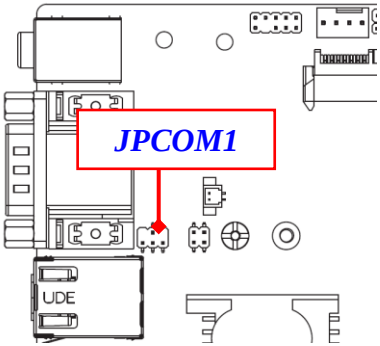
Headers & Wafers

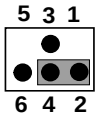
Header	Name	Description
JLAN1_LED	LAN1 Activity LED Header	2-pin Block (2.0 pitch)
JLAN2_LED	LAN2 Activity LED Header	2-pin Block (2.0 pitch)
GPIO_CON	GPIO Header	10-pin Block (2.0 pitch)
FP_USB2	USB 2.0 Header	9-pin Block (2.0 pitch)
SMBUS	SM BUS Header	4-pin Block (2.0 pitch)
CPUFAN	CPUFAN Wafer	4-pin Block (2.54 pitch)
JW_FP	Front Panel Header	8-pin Block (2.0 pitch)
FP_AUDIO	Front Panel Audio Header	9-pin Block (2.0 pitch)
PD_JTAG1	For lab test only	5-pin Block (2.54 pitch)

Chapter 2
Hardware Installation

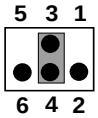
2-1 Jumper Setting

JPCOM1 (4-pin): COM1 Port Pin9 Function Select PITCH=2.0

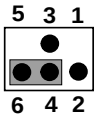




2-4 Closed:
RI=RS232

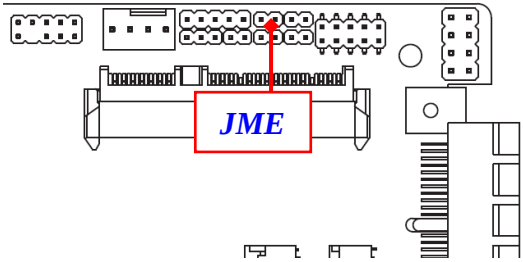


3-4 Closed:
RI=+5V;

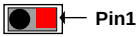


4-6 Closed:
RI=+12V.

JME (2-pin): ME Flash Override Select PITCH=2.0

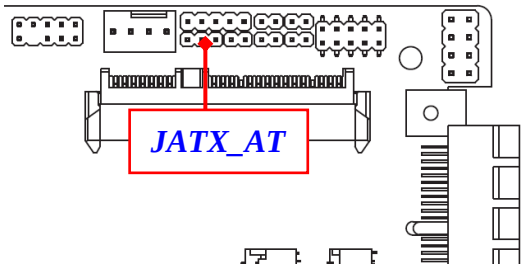


1-2 Open: Normal (Default);



1-2 Closed: ME Flash Override

JATX_AT (3-pin): ATX Mode/AT Mode Select PITCH=2.0

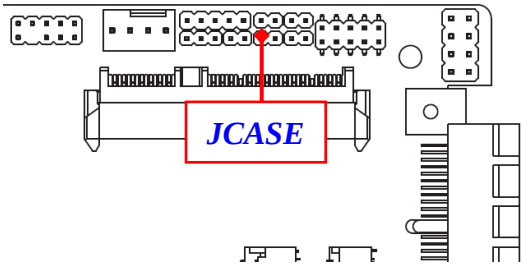


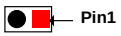
1-2 Closed:ATX Mode Selected

2-3 Closed:AT Mode Selected

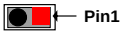
ATX Mode Selected: Press power button to power on after power input ready;
AT Mode Selected: Directly power on as power input ready.

JCASE (2-pin): For CASE OPEN PITCH=2.0





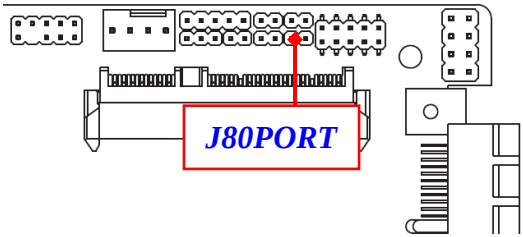
1-2 Open: Normal (Default);

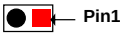


1-2 Closed: Touch Case OPEN.

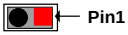
Pin 1-2 Short: *When Case open function pin short to GND, the Case open function was detected. When Used, needs to enter BIOS and enable 'Case Open Detect' function. In this case if your case is removed, next time when you restart your computer, a message will be displayed on screen to inform you of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

J80PORT (2-pin): GPIO_CON 80 Port/GPIO Function Select PITCH=2.0



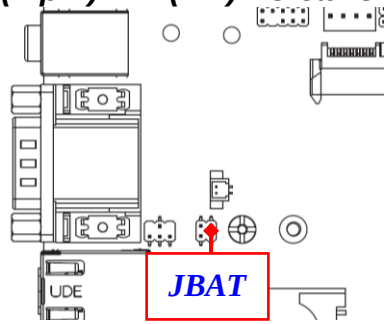


1-2 Open: GPIO_CON=80 Port;

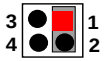


1-2 Closed: GPIO_CON=GPIO Port(Default).

JBAT (4-pin) PIN (1-2) : Clear CMOS PITCH=2.0

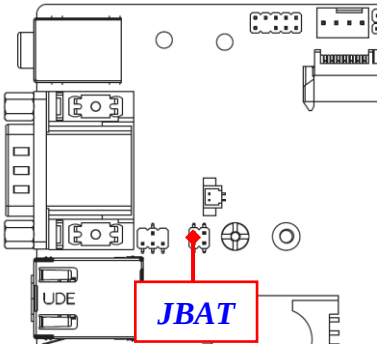


1-2 Open: Normal(Default);



1-2 Closed:Clear CMOS (One Touch)

JBAT (4-pin) PIN (3-4) : Clear ME_REG PITCH=2.0



3-4 Open: Normal(Default);

3-4 Closed:Clear ME Register

2-2 Connectors and Headers

2-2-1 Connectors

(1) Rear I/O Connectors

Refer to Page-3: Rear IO Panel Diagram.

Icon	*Name*	*Function*
	**12V~24V DC-in Power Connector**	For user to connect compatible power adapter to provide power supply for the system.
	**DisplayPort**	To the system to corresponding display device with compatible DP cable.
	**HDMI Port**	To connect display device that support HDMI specification.
	**USB 2.0 Port**	To connect USB keyboard, mouse or other devices compatible with USB specification
	**USB 3.2 Port**	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.2 ports supports up to 10Gbps data transfer rate.
	**RJ-45 LAN Port**	This connector is standard RJ-45 LAN jack for Network connection.
	**Type-C USB/DP Port**	Type-C USB3.2(Gen.2) support DP1.4 Display output & power
	**Serial Port**	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface. ***Note: COM1** (**Top**) RS232 Serial Port* ***COM2** (**Bottom**). RS232 (OPTION GPIO) Port*

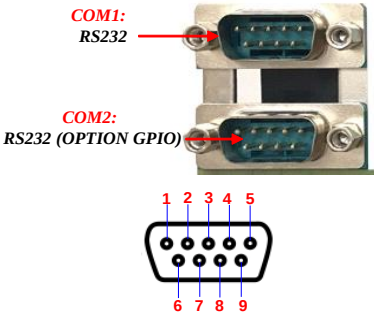
	**Audio Connectors**	**GREEN:** Line-out Connector **PINK :** MIC Connector

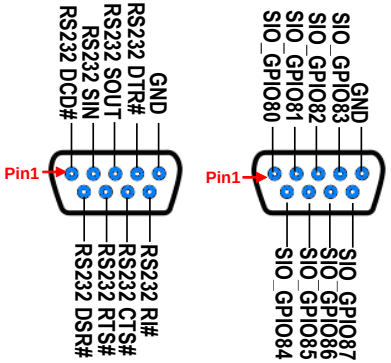
(2) COM1/COM2-GPIO (9-pin Block): Serial Port

COM1/COM2*: RS232 Serial Port;*

COM2-GPIO: *OPTION GPIO Port.* ***(BOM OPTION)***

The pin assignment for RS232/ OPTION GPIO is listed as follows:

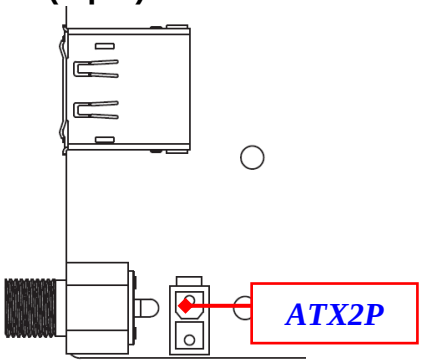


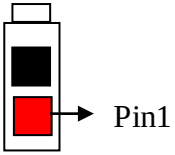


COM2 OPTION GPIO (BOM OPTION)

COM1/COM2 RS232 Mode

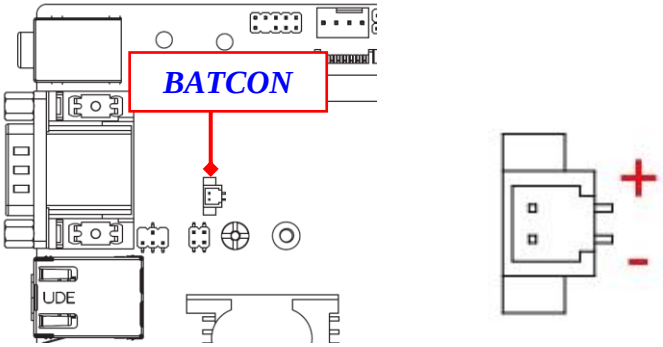
(3) ATX2P(2-pin): Internal 2-Pin12V~24V DC-in power Connector





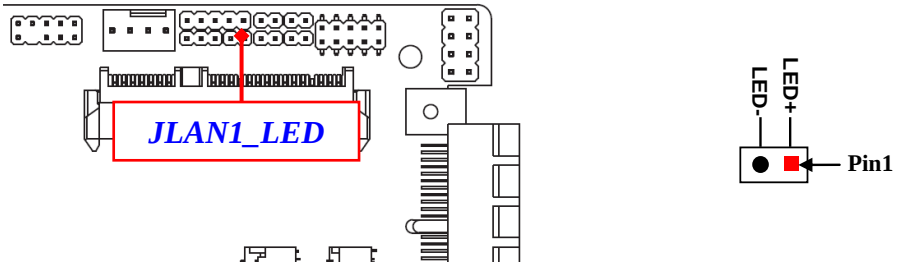
Pin No.	Definition
1	+12V~24VC DC-In
2	GND

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

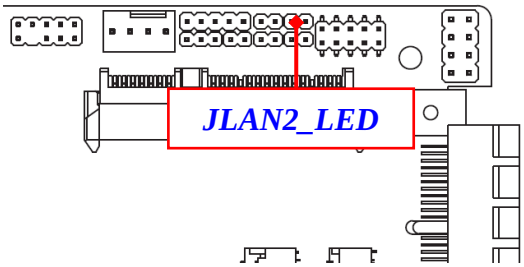


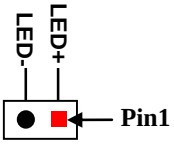
2-2-2 Headers & Wafers

(1) JLAN1_LED(2-pin): LAN1 Activity LED Header PITCH=2.0

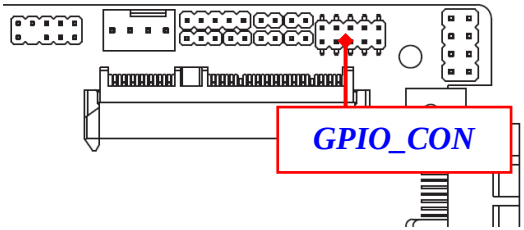


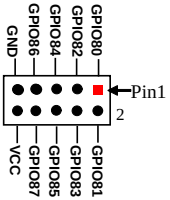
(2) JLAN2_LED(2-pin): LAN2 Activity LED Header PITCH=2.0





(3) GPIO_CON (10-pin): GPIO 8bit Header PITCH=2.0

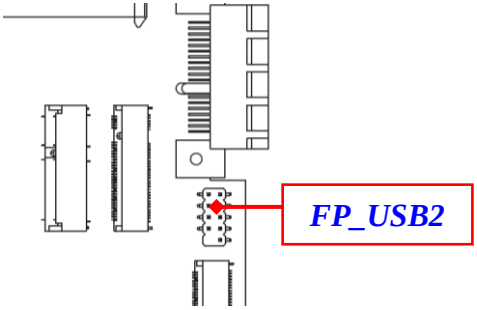


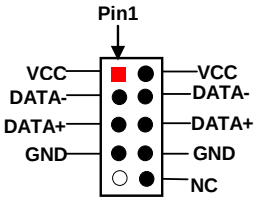


J80PORT Closed: Normal 8-bit GPIO;
J80PORT Open: For 80Port Function.

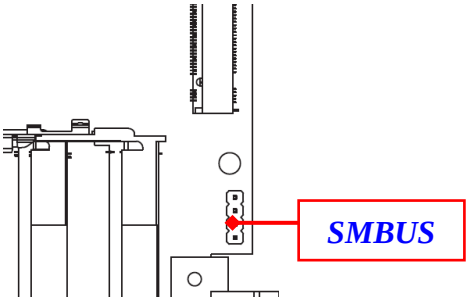
Note: Please refer to **Pege-11 J80PORT jumper setting for GPIO_CON header **GPIO Port** or **80 Port** function select.*

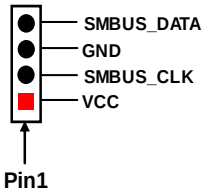
(4) FP_USB2 (9-pin): USB 2.0 Port Header PITCH=2.0



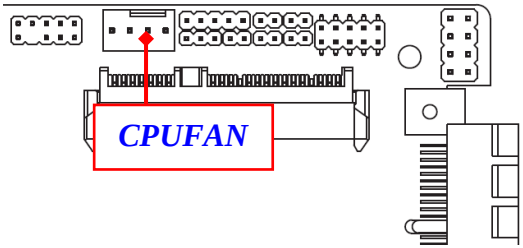


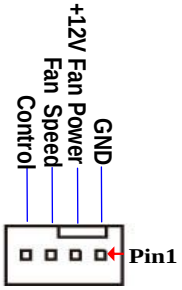
(5) SMBUS (4-Pin): SM BUS Header PITCH=2.0



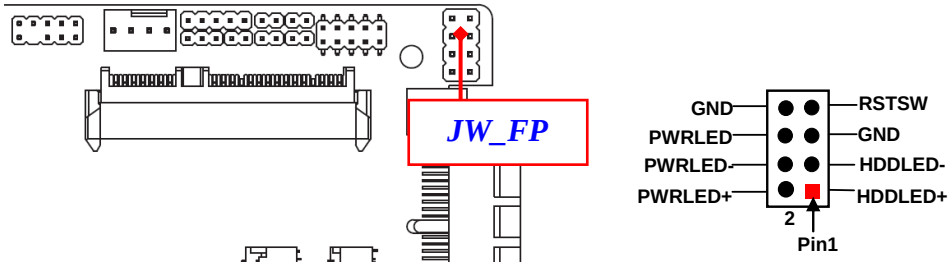


(6) CPUFAN (4-pin): CPU FAN Wafer PITCH=2.54

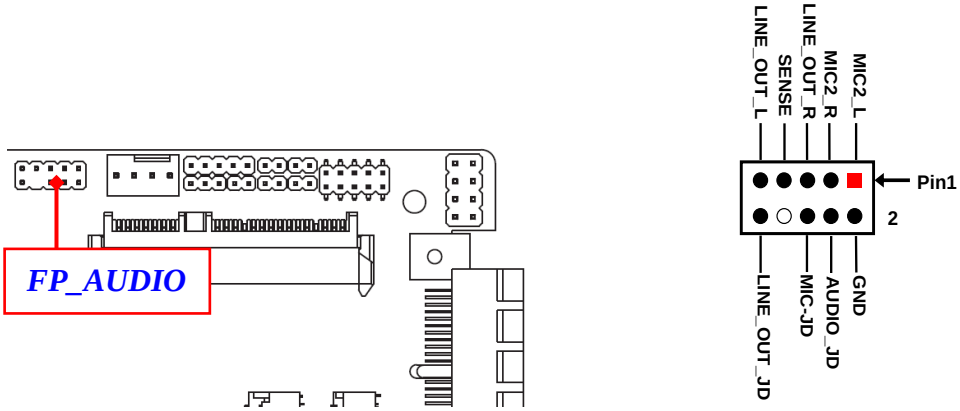




(7) JW_FP (8-pin) : Front Panel Header PITCH=2.0



(8) FP_AUDIO (9-pin): Front Panel Audio Header PITCH=2.0



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.

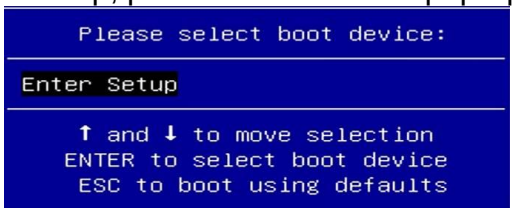
3-1 Entering Setup

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

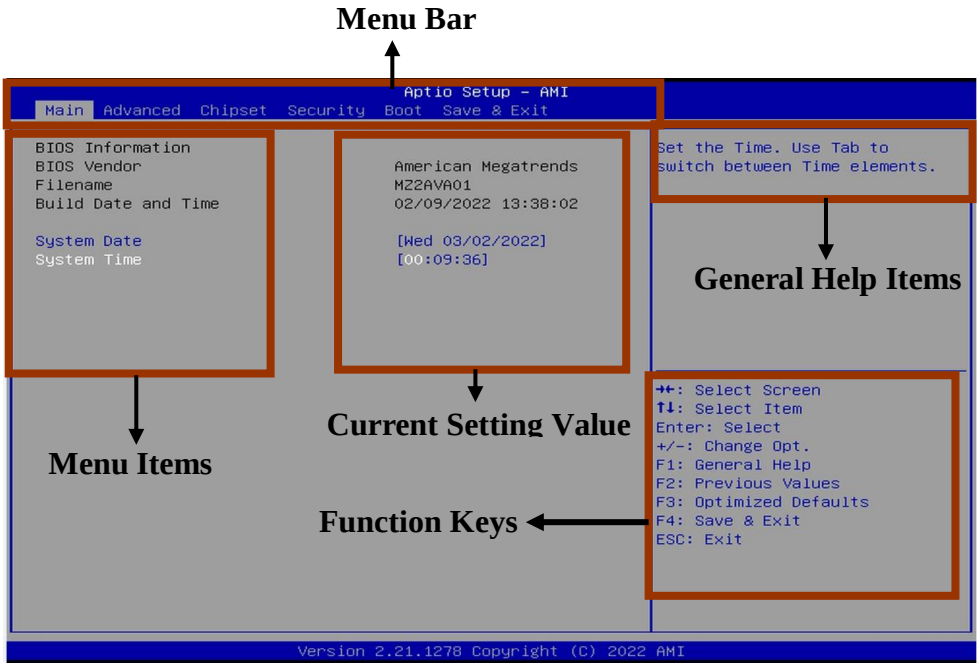
Press **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.



BIOS Boot Menu Screen (boot device options please refer to actual configuration)

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 values.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to exit from BIOS Setup.

3-4 Getting Help

Main Menu

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

Status Page Setup Menu/Option Page Setup Menu

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

3-5 Menu Bars

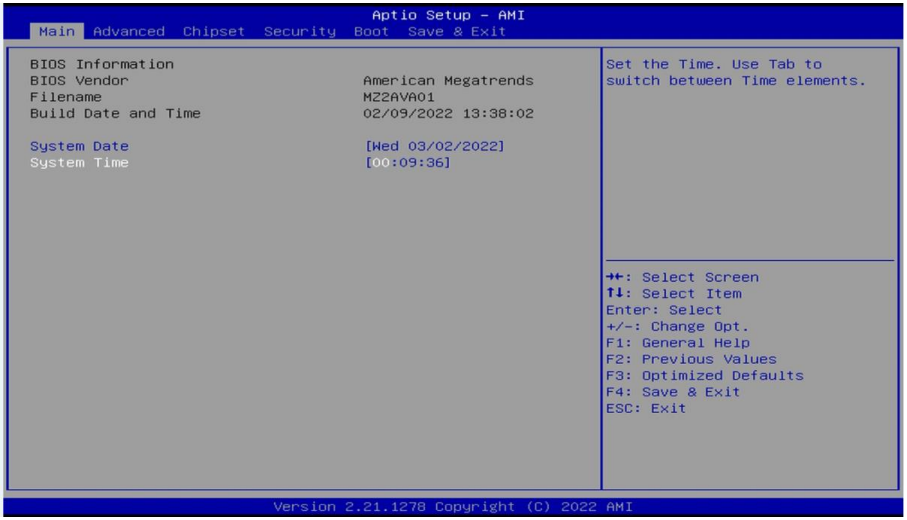
There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
Save & Exit	Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

3-6 Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.



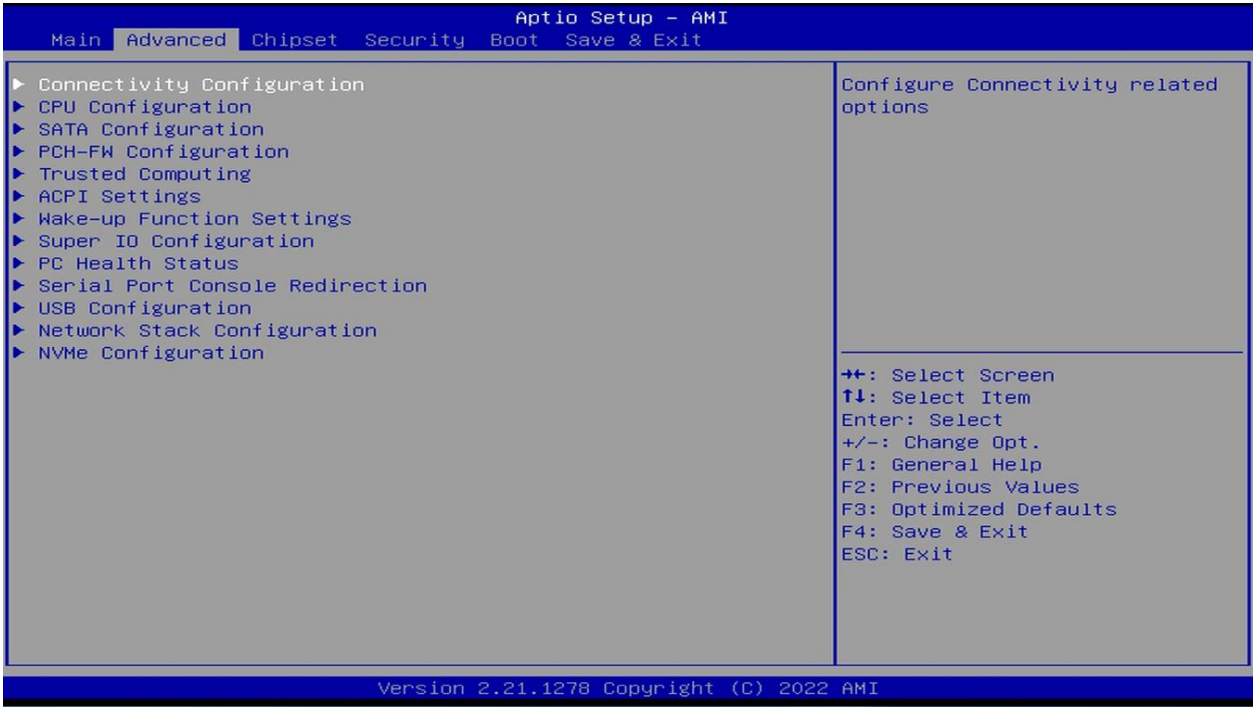
System Date

Set the date. Please use [Tab] to switch between date elements.

System Time

Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu



- **Connectivity Configuration**

  Use this item to configure Connectivity related options.

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

  CNVi present

CNVi Configuration

CNVi Mode

This option configures Connectivity.

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

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

[Disabled Integrated] disables Integrated Solution.

- **CPU Configuration**

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

Hyper-Threading

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

Intel (VMX) Virtualization Technology

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

When set as **[Enabled]**, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Intel(R) SpeedStep(tm)

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

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

Turbo Mode

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

This Processor Turbo Mode (requires EMTTM enabled too).AUTO means enabled

C states

Use this item to enable or disable CPU Power Management. When set as [Enabled], it allows CPU to go to C states when it's not 100% utilized.

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

Hardware Prefetcher

Use this item to turn on/off the MLC streamer prefetcher.

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

Adjacent Cache Line Prefetch
Use this item to turn on/off prefetching of adjacent cache lines.
The optional settings: [Disabled]; [Enabled].

- **SATA Configuration**
  Press [Enter] to make settings for the following sub-items:
  SATA Configuration
  SATA Controller(s)
  Use this item to enable or disable SATA Device.
  The optional settings: [Enabled]; [Disabled].
  When set as **[Enabled]**, the following items shall appear:
  M.2
  Port
  Use this item to enable or disable SATA Port.
  The optional settings: [Disabled]; [Enabled].
  SATA
  Port
  Use this item to enable or disable SATA Port.
  The optional settings: [Disabled]; [Enabled].
- **PCH-FW Configuration**
  Press [Enter] to view Management Engine Technology Parameters and make settings in the following sub-item:
  ME Firmware Version
  ME Firmware Mode
  TPM Device Selection
  Use this item to select TPM Device.
  The optional settings: [dTPM]; [PTT].
  [PTT]: Enable PTT in SkuMgr; **[dTPM]**: Disable PTT in SkuMgr.
  Warning! *PTT/dTPM will be disabled and all data saved on it will be lost.*
- **Firmware Update Configuration**
  Press [Enter] to make settings for '**Me FW Image Re-Flash**'.
  Me FW Image Re-Flash

Use this item to enable or disable Me FW Image Re-Flash function.
The optional settings: [Disabled]; [Enabled].

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

- **Trusted Computing**

  Press [Enter] to view current status information, or make further settings in the following sub-items:

  Configuration

  Security Device Support

  Use this item to enable or disable BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
  The optional settings: [Disabled]; [Enabled].
  When set as **[Enabled]**, user can make further settings in the following items:

- **ACPI Settings**

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

  ACPI Settings

  ACPI Sleep State

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

- **Wake-up Function Settings**

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

  Wake-up System With Fixed Time

  Use this item to enable or disable System wake on alarm event.
  The optional settings: [Disabled]; [Enabled].
  When set as **[Enabled]**, the following items shall appear:

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

Wake-up System with Dynamic Time
Use this item to enable or disable System wake on alarm event.
System will wake on the current time + Increase minute(s).
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, system will wake on the current time + increased minute(s).
Wake-up Minute Increase
Use this item to select 1-60
USB S3/S4 Wake-up
Use this item to enable or disable USB S3/S4 wake-up.
The optional settings: [Disabled]; [Enabled].
**Note: This function is supported when 'ERP Support' is set as [Disabled].*
USB S5 Power
Use this item to enable or disable USB Power after System Shutdown.
The optional settings: [Disabled]; [Enabled].
**Note: This function is supported when 'ERP Support' is set as [Disabled].*

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

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

► **Serial Port 1 Configuration**

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

Serial Port 1 Configuration

Serial Port

Use this item to enable or disable Serial Port (COM).

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

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

Device Settings

Change Settings

Use this item to select an optimal setting for Super IO Device.

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

► **Serial Port 2 Configuration**

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

Serial Port 2 Configuration

Serial Port

Use this item to enable or disable Serial Port (COM).

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

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

Device Settings

Change Settings

Use this item to select an optimal setting for Super IO Device.

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

WatchDog Reset Timer

Use this item to enable or disable WDT reset function.

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

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

WatchDog Reset Timer Value

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

WatchDog Reset Timer Unit

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

ATX Power Emulate AT Power

This item support Emulate AT power function, MB power On/Off control by power supply. Use needs to select 'AT or ATX Mode' on MB jumper at first (refer to JATX_AT jumper setting Pin 1&2 of for ATX Mode & Pin 2&3 of AT Mode Select).

Case Open Detect

Use this item to detect case have ever been opened, show message in POST.

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

When set as [Enabled], system will detect if COPEN has been short or not (*refer to **JCASE** jumper setting for Case Open Detection*); if Pin 1&2 of ***JCASE*** are short, system will show Case Open Message during POST.

- **PC Health Status**

  Press [Enter] to view current hardware health status, make further settings in '**SmartFAN Configuration**' and set value in '**Shutdown Temperature**'.

SmartFAN Configuration

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

SmartFAN Configuration

CPUFAN 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 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**

COM1
Console Redirection
Use this item to enable or disable COM1 Console Redirection.
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, user can make further settings in the following items:

- **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.
Press [Enter] to make settings for the following sub-items.
COM1
Console Redirection Settings
Terminal Type
The optional settings: [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 select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.

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

Data Bits

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

Parity

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

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

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

[Odd]: parity bit is 0 if num of 1's in the data bits is odd;

[Mark]: parity bit is always 1;

[Space]: parity bit is always 0;

[Mark] and **[Space]**: parity do not allow for error detection.

Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

The optional settings: [1]; [2].

Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

The optional settings: [None]; [Hardware RTS/CTS].

VT-UTF8 Combo Key Support

Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.

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

Recorder Mode

With this mode enable only text will be sent. This is to capture Terminal data.

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

Resolution 100x31

Use this item to enable or disable extended terminal resolution.

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

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

The optional settings: [VT100]; [LINUX]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

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

Console Redirection EMS

Use this item to enable or disable Console Redirection.

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

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

- **Console Redirection Settings**

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

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

Out-of-Band Mgmt Port

Terminal Type EMS

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

[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is [VT100+] and them [VT100]. See above, in Console Redirection Settings page, for more help with Terminal Type/Emulation.

Bits per second EMS

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

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

Flow Control EMS

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “start” signal can be sent to re-start the flow. Hardware

flow control uses two wires to send start/stop signals.
The optional settings: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

Data Bits EMS

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

Parity EMS

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

Stop Bits EMS

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

- **USB Configuration**

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

  USB Configuration

  XHCI Hand-off

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

  USB Mass Storage Driver Support

  Use this item to enable or disable USB mass storage driver support.
  The optional settings: [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: [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: [10 sec]; [20 sec]; [30 sec]; [40 sec].

  Device power-up delay

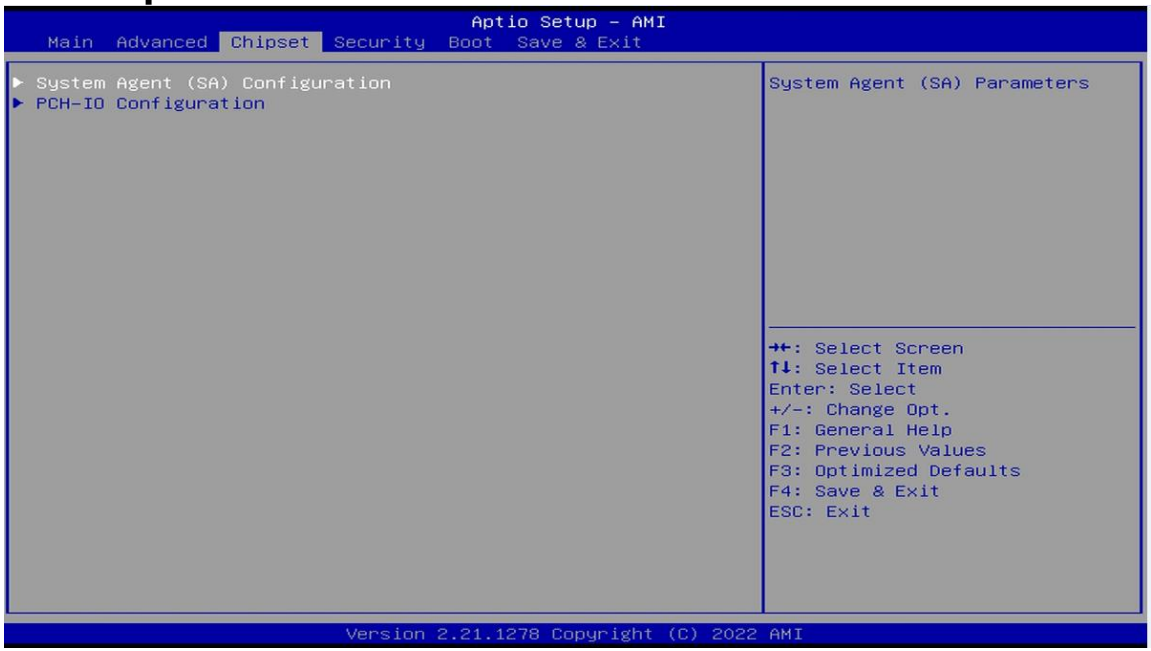
Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.
The optional settings: [Auto]; [Manual].
Select **[Manual]** you can set value for the following sub-item: '**Device power-up delay in seconds**', the delay range in from 1 to 40 seconds, in one second increments.

- **Network Stack Configuration**
  Press [Enter] to go to '**Network Stack**' screen to make further settings.

Network Stack
Use this item to enable or disable UEFI Network Stack.
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following sub-items shall appear:
IPv4 PXE Support
Use this item to enable IPv4 PXE boot support. When set as [Disabled], IPv4 boot support will not be available.
The optional settings: [Disabled]; [Enabled].
IPv6 PXE Support
Use this item to enable IPv6 PXE boot support. When set as [Disabled], IPv6 boot support will not be available.
The optional settings: [Disabled]; [Enabled].
PXE boot wait time
Use this item to set wait time to press [ESC] key to abort the PXE boot.
Use either [+] / [-] or numeric keys to set the value.
Media detect count
Use this item to set number of times presence of media will be checked.
Use either [+] / [-] or numeric keys to set the value.

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

3-8 Chipset Menu



- **System Agent (SA) Configuration**
  Press [Enter] to make settings for the following sub-items:
  System Agent (SA) Configuration
  VT-d
- **Memory Configuration**
  Press [Enter] to view brief information for the working memory module.
- **Graphics Configuration**
  Press [Enter] to make further settings for Graphics Configuration.
  Graphics Configuration
  Aperture Size
  Use this item to select the Aperture Size.
  The optional settings: [128M]; [256M]; [512M]; [1024M].

***Note:** Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.*

DVMT Pre-Allocated

Use this item to select DVMT5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

The optional settings: [0M]; [32M]; [64M]; [96M]; [128M]; [160M].

DVMT Total Gfx Mem

Use this item to select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

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

► **VMD setup menu**

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

VMD Configuration

Enable VMD controller

Use this item to enable or disable to VMD controller.

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

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

Map this Root Port under VMD

Use this item to map/unmap this root port to VMD.

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

Root Port BDF details

► **PCH-IO Configuration**

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

PCH-IO Configuration

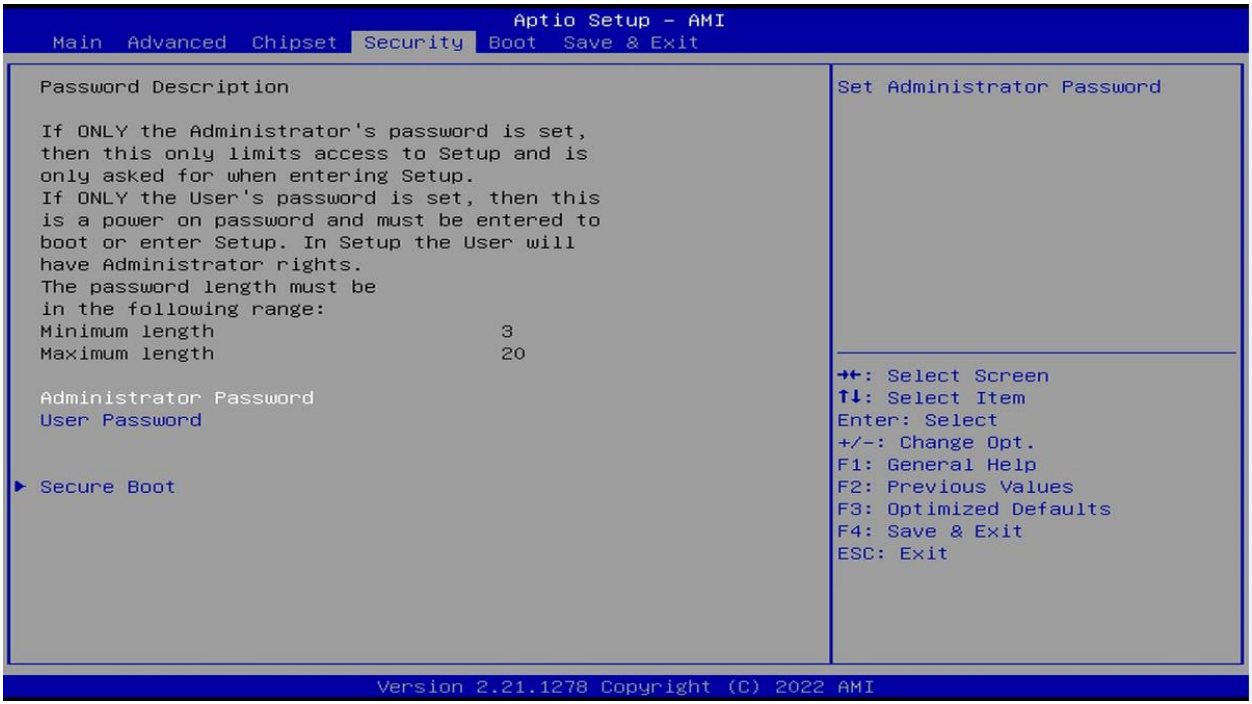
USB Controller

Use this item to enable or disable USB Physical Connector (physical port). Once **[Disabled]**any USB devices plug into the connector will not be detected by BIOS or OS.

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

HD Audio
Use this item to control Detection of the HD-Audio device.
The optional settings: [Disabled]; [Enabled].
[**Disabled**]: HDA will be unconditionally disabled.
[**Enabled**]: HDA will be unconditionally enabled.
System State After Power Failure
Use this item to specify what state to go to when power is re-applied after a power failure (G3 state).
The optional settings: [Always On]; [Always Off]; [Former State].
Note:* The option [Always On] and [Former State] are affected by 'ERP Support**' function. Please disable ERP to support [Always On] and [Former State] function.*
Onboard Lan1 Controller
Use this item to control the PCI Express Root Port.
The optional settings: [Disabled]; [Enabled].
When set as **[Enabled]**, the following sub-items shall appear:
Wake on LAN Enable
Use this item to enable or disable integrated LAN to wake the system.
The optional settings: [Enabled]; [Disabled].
Onboard Lan2 Controller
Use this item to enable or disable onboard NIC.
The optional settings: [Enabled]; [Disabled].

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 customized secure settings:

System Mode

Secure Boot

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

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

Secure Boot Mode

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

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

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

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

- **Restore Factory Keys**

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

- ***Reset To Setup Mode***
- **Key Management**

This item enables expert users to modify Secure Boot Policy variables without full authentication, which includes the following items:

Vendor Keys

Factory Key Provision

This item is for user to install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

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

- **Restore Factory Keys**

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

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

This item allows the image to run in Secure Boot mode.
Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

Device Guard Ready

- ***Remove 'UEFI CA' from DB***
- **Restore DB defaults**

Use this item to restore DB variable to factory defaults.

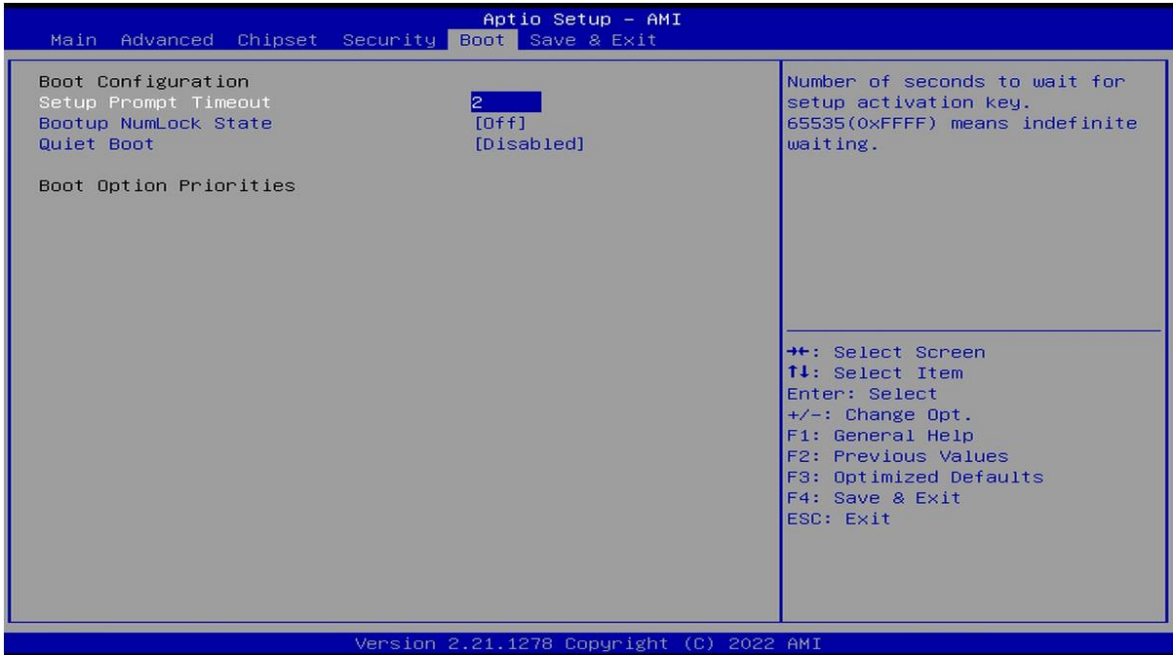
Secure Boot variable/Size/Keys/Key Source

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

Use this item to enroll Factory Defaults or load certificates from a file:
1. Public Key Certificate:
  a) EFI_SIGNATURE_LIST
  b) EFI_ CERT_X509 (DER)
  c) EFI_ CERT_RSA2048 (bin)
  d) EFI_ CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/COFF Image (SHA256)

Key Source: Factory, External, Mixed.

3-10 Boot Menu



Boot Configuration

Setup Prompt Timeout

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

Bootup NumLock State

Use this item to select keyboard NumLock state.

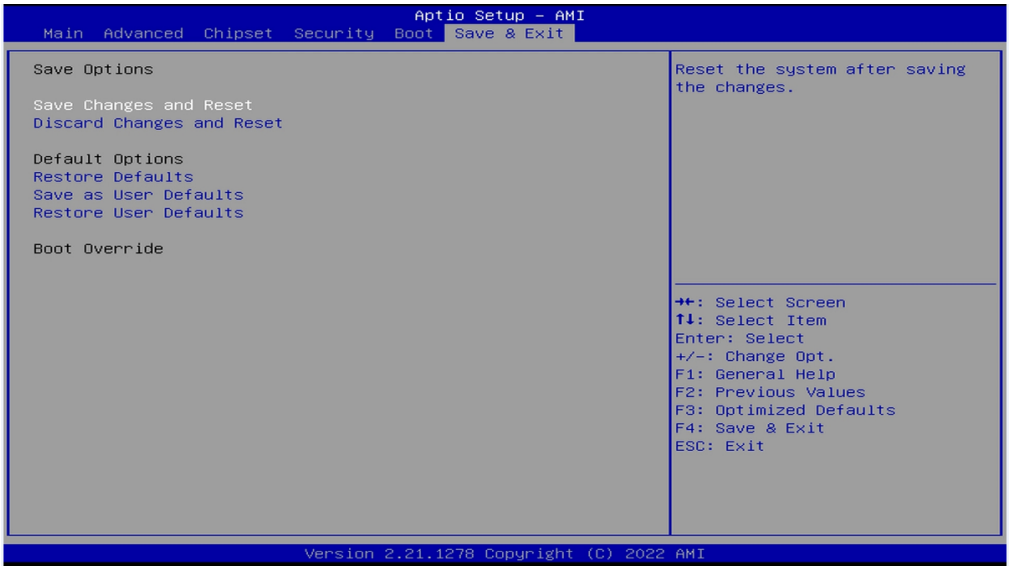
The optional settings: [On]; [Off].

Quiet Boot

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

Boot Option Priorities

3-11 Save & Exit Menu



Save Options

Save Changes and Reset

This item allows user to reset the system after saving the changes.

Discard Changes and Reset

This item allows user to reset the system without saving any changes.

Default Options

Restore Defaults

Use this item to restore /load default values for all the setup options.

Save as User Defaults

Use this item to save the changes done so far as user defaults.

Restore User Defaults

Use this item to restore the user defaults to all the setup options.

Boot Override