Technical Manual

Of

Intel Elkhart Lake Series CPU

Based IPC M/B

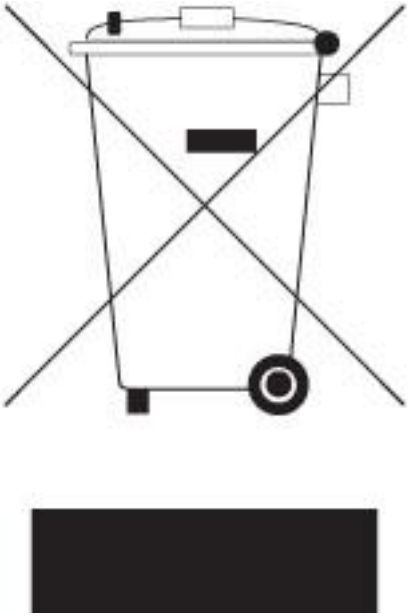
NO. G03-MF13-F

Revision: 4.0

Release date: December 11, 2023

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
4.0	Foutrh Edition	December 11, 2023

Item Checklist

- ☑ Motherboard
- ☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Elkhart Lake Series Processor, with low power consumption never denies high performance
- Support 1* DDR4 3200MHz SO-DIMM, maximum capacity up to 32GB
- Support 2* RS232/RS422/RS485 COM Ports
- Onboard 1* M.2 M-key (2242/2280, SATA/PCIe Gen.3x2 interface) support NVMe
- Onboard 1* M.2 E-key (2230, USB2.0/PCIe Gen.3x1 interface)
- Onboard 1* M.2 B-key (3042/3052, USB3.1 interface)
- Support 1* SATAIII (6Gb/s) Device & 1* SIM card slot
- Support 1* External USB 3.1(Gen.2), 1* External USB 2.0, 2* Internal USB 2.0
- Support 4* i225V 2.5GbE RJ-45 LAN ports
- Onboard optional 32GB / 64GB eMMC (by order)
- Onboard Lockable 12V DC-in PWR jack
- Support CPU Over-Temperature protection
- Support CPU Over-Current/Under Voltage protection
- Support CPU Smart FAN
- Compliance with ErP standard
- Support Watchdog function
- Onboard TPM (by order)

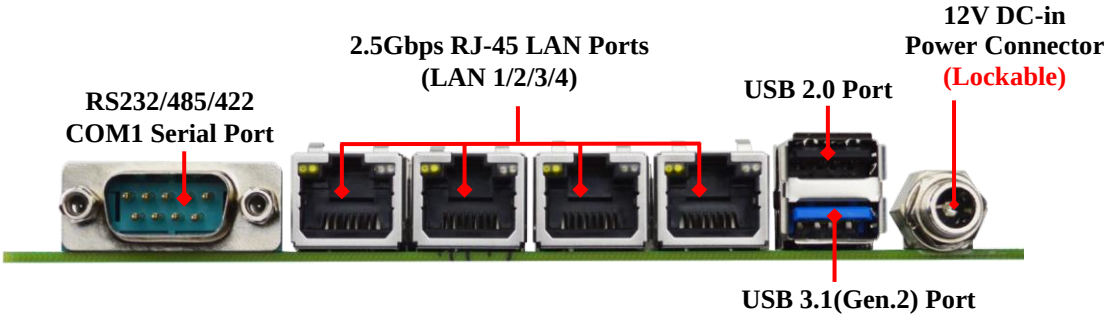
1-2 Specification

Spec	Description
Design	● 3.5” SBC Form Factor; PCB size: 148mm * 102mm
Embedded CPU	● Integrated with Intel® Elkhart Lake series CPU **CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.*
Memory	● 1* DDR4 SO-DIMM slot Support 1* DDR4 3200MHz SO-DIMM up to 32GB * ***Note:*** *Memory clock supporting range is decided by specific CPU of the model. For more memory compatibility information please consults your local dealer.*
Expansion Slot	● 1* M.2 E-key (2230, USB2.0/PCIe Gen.3x1 interface) **(M2E1)** ● 1* M.2 B-key (3042/3052, USB3.1 interface; co-function with **SIMCARD1**) **(M2B1)** ● **SIMCARD1:** 1* SIM card slot **(**co-function with **M2B1** slot**)**
LAN Chip	● Integrated with 4* Intel i225-V PCI-E 2.5Gigabit LAN chip ● Support Fast Ethernet LAN function of providing 10/100/1000/2500Mbps Ethernet data transfer rate ** **Note: 2500Mbps** high-speed transmission rate is **only** supported over **CAT 5e UTP cable**.*
Storage	● 1* SATAIII 6Gb/s port ● 1* M.2 M-key (2242/2280, SATA/PCIe Gen.3x2 interface) support NVMe **(M2M)** ● Onboard optional 32GB / 64GB eMMC (***by order***) ● ****Note:*** *Onboard eMMC capacity depends on the actual model purchased as technical specifications may update, without prior notice*
BIOS	● AMI Flash ROM
Rear I/O	● 1* Lockable 12V DC-in power Jack ● 1* USB 3.1(Gen.2) port ● 1* USB 2.0 port ● 4* 2.5Gbps RJ-45 LAN ports ● 1* RS232/RS422/RS485 COM Port (**COM1**)

Internal I/O	● 1* 2-Pin internal 12V DC-in power connector ● 1* SATA Power-out connector ● 1* CPUFAN connector ● 1* Front panel header ● 1* LAN_LED header ● 1* 9-pin USB 2.0 header (Expansible to 2* USB 2.0 ports) ● 1* RS232/422/485 serial port header (**FP_COM2**) ● 1* PS/2 keyboard & mouse header ● 1* SMBUS header ● 1* GPIO header ● 1* HDMI header

1-3 Layout Diagram

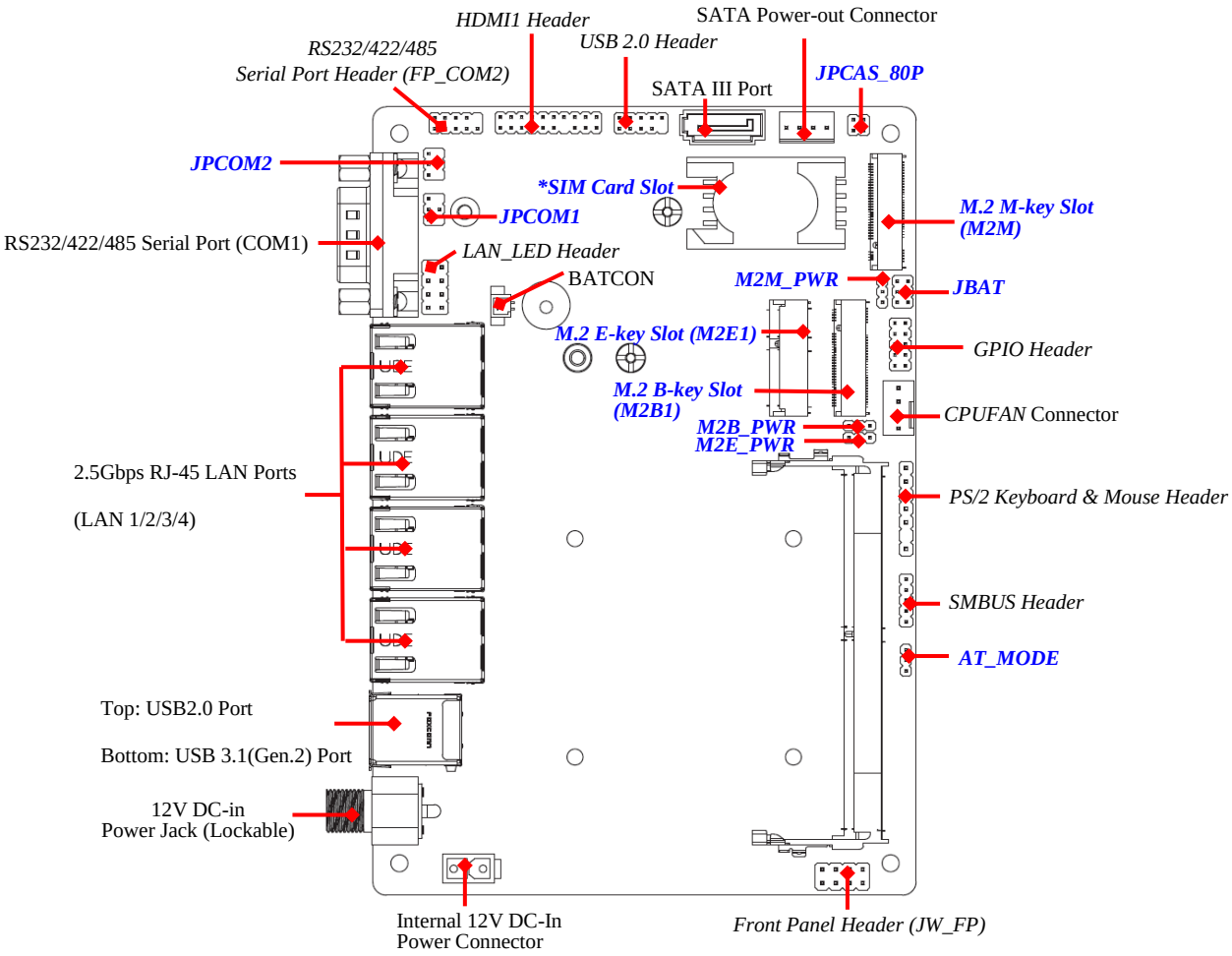
Rear IO Panel Diagram:



Warning!!

The board has a 12V DC-in power connector (DCIN) in I/O back panel and an internal ATX12V (ATXPWR) 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:** **M2B1** slot co-functions with SIM card; please install compatible 3G/4G/5G LTE card into SIM card holder as well for full function.*

Connectors

Connector	Name
DCIN1	Lockable 12V DC-in power Jack
USB31	***Top:*** USB 2.0 Port Connector ***Bottom:*** USB 3.1(Gen.2) Port Connector
LAN1/2/3/4	2.5Gbps RJ-45 LAN Port Connector x 4
COM1	RS232/485/422 Serial Port Connector
ATXPWR	Internal 12V DC–in Power Connector
SATA1	SATAIII Connector
SATAPWR	SATA Power-out Connector
CPUFAN	CPUFAN Connector

Headers

Header	Name	Description	Pitch
JW_FP	Front Panel Header(PWR LED/ HDD LED/Power Button /Reset)	8-pin Block	2.54mm
SMBUS	SMBUS Header	5-pin Block	2.0mm
PS2KBMS	PS/2 Keyboard & Mouse Header	6-pin Block	2.54mm
GPIO	GPIO Port Header	10-pin Block	2.0mm
FP_USB21	USB 2.0 Header	9-pin Block	2.0mm
HDMI1	HDMI Port Header	19-pin Block	2.0mm
FP_COM2	RS232/485/422 Serial Port Header	9-pin Block	2.0mm
LAN_LED	LAN Activity LED Header	8-pin Block	2.54mm

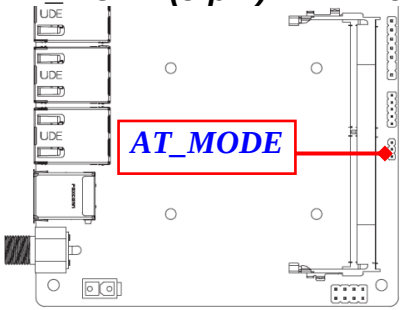
Jumpers

Jumper	Name	Description	Pitch
AT_MODE	ATX Mode/AT Mode Select	3-Pin Block	2.0mm
JBAT	***Pin (1&2):*** Clear RTC ***Pin(3&4):*** Clear CMOS ***Pin(5&6):*** ME Disable	6-Pin Block	2.0mm
JPCAS_80P	***Pin (1&2):*** SHORT_CASE OPEN ***Pin(3&4):*** SHORT_80 PORT	4-Pin Block	2.0mm
JPCOM1	COM1 Pin9 Function Select	4-Pin Block	2.0mm
JPCOM2	FP_COM2 Pin9 Function Select	4-Pin Block	2.0mm
M2B_PWR	M.2 B-key Power Select	3-Pin Block	2.0mm
M2E_PWR	M.2 E-key Power Select	3-Pin Block	2.0mm
M2M_PWR	M.2 M-key Power Select	3-Pin Block	2.0mm

Chapter 2
Hardware Installation

2-1 Jumper Setting

AT_MODE (3-pin): ATX Mode/AT Mode Select ***Pitch=2.0mm***

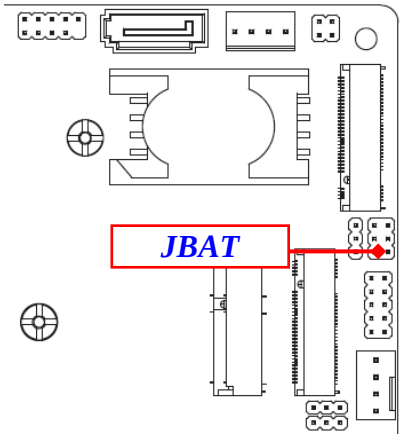


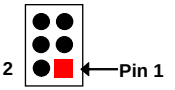
1-2 Closed：ATX Mode Selected;

2-3 Closed：AT Mode Selected.

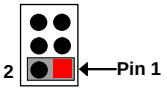
***ATX Mode Selected**: Press power button to power on after power input ready;*
***AT Mode Selected:** Directly power on as power input ready.*

Pin (1-2) of JBAT (6-pin): Clear RTC *Pitch=2.0mm*



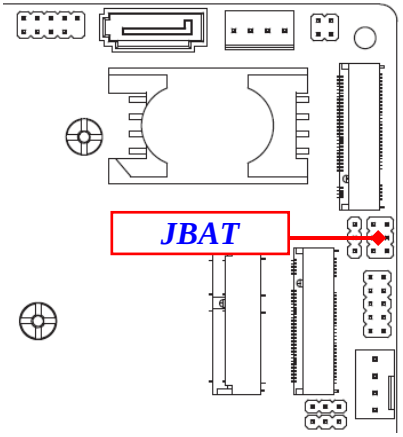


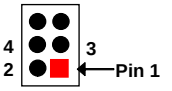
1-2 Open: Normal(Default);



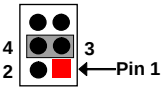
1-2 Closed: Clear RTC.

Pin (3-4) of JBAT (6-pin): Clear CMOS *Pitch=2.0mm*



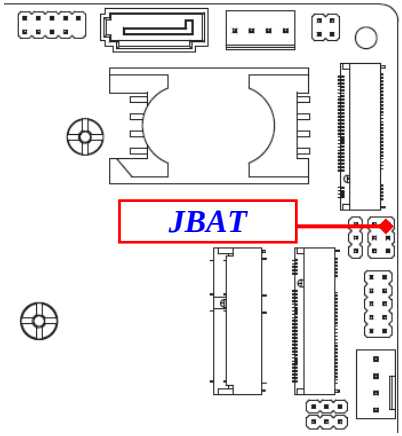


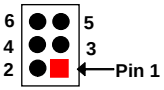
3-4 Open: Normal(Default);



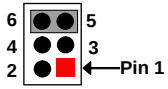
3-4 Closed: Clear CMOS.

Pin (5-6) of JBAT (6-pin): ME Disable *Pitch=2.0mm*



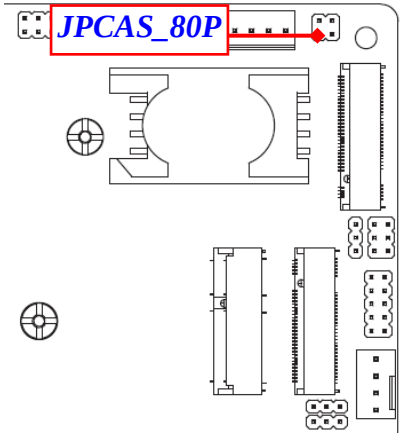


5-6 Open: Normal(Default);



5-6 Closed: ME Disable.

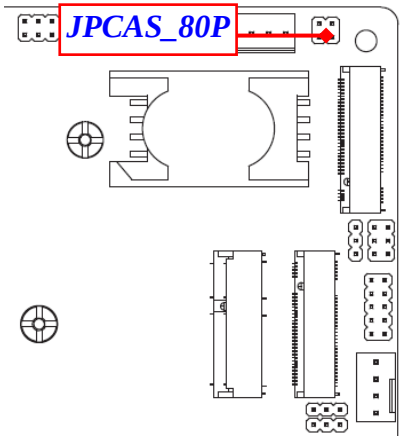
Pin (1-2) of JPCAS_80P (4-pin): SHORT_CASE OPEN *Pitch=2.0mm*



1-2 Open: Normal(Default);

1-2 SHORT:CASE OPEN

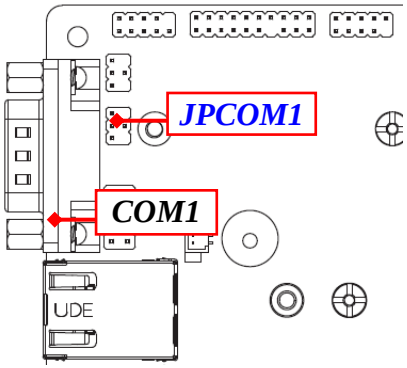
PIN (3-4) of JPCAS_80P (4-pin): SHORT_80 PORT *Pitch=2.0mm*

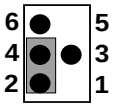


3-4 Open: Normal(Default);

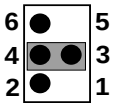
3-4 SHORT:80 PORT

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

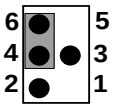




2-4 Closed:
RI=RS232

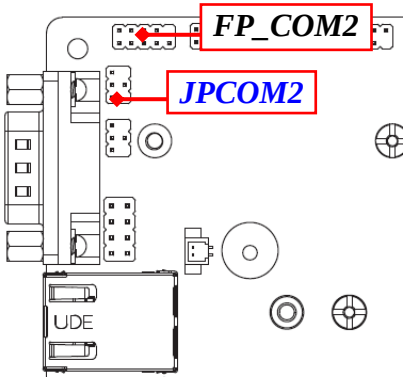


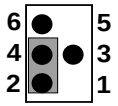
3-4 Closed:
RI=5V



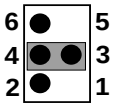
4-6 Closed:
RI=12V

JPCOM2 (4-pin) :FP_COM2 Pin9 Function Select *Pitch=2.0mm*

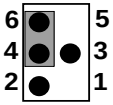




2-4 Closed:
RI=RS232

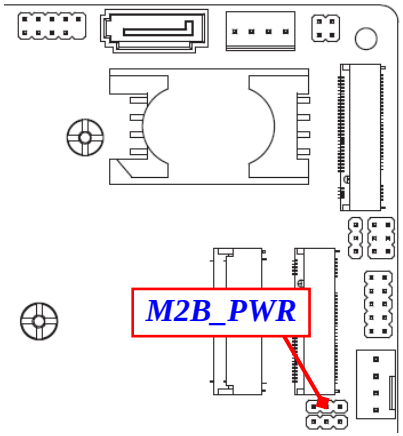


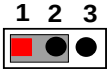
3-4 Closed:
RI=5V



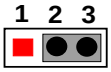
4-6 Closed:
RI=12V

M2B_PWR (3-pin): M.2 B-key Power Select *Pitch=2.0mm*



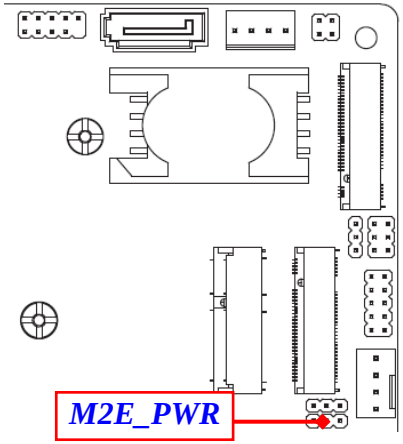


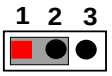
1-2 Closed:
VCC= VCC3



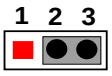
2-3 Closed:
VCC= 3VSB

M2E_PWR (3-pin): M.2 E-key Power Select *Pitch=2.0mm*



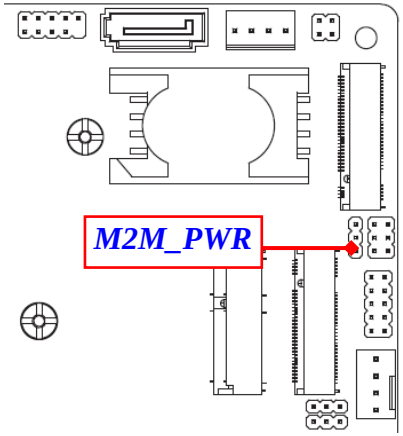


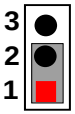
1-2 Closed:
VCC= VCC3



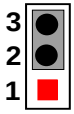
2-3 Closed:
VCC= 3VSB

M2M_PWR (3-pin): M.2 M-key Power Select *Pitch=2.0mm*





1-2 Closed:
VCC= VCC3

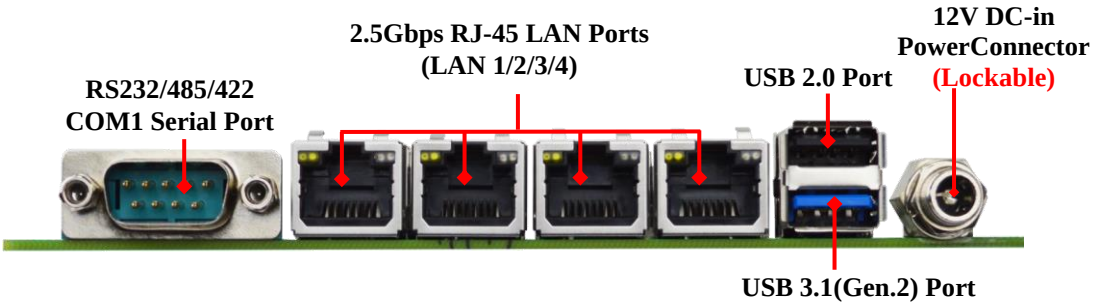


2-3 Closed:
VCC= 3VSB

2-2 Connectors and Headers

2-2-1 Connectors

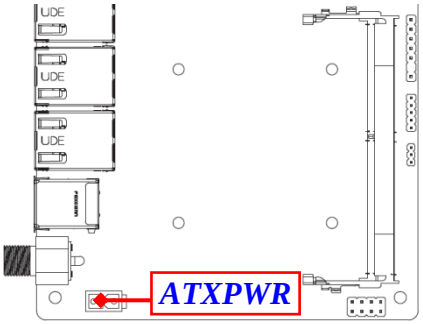
(1) Rear I/O Connectors

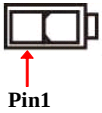


Icon	*Name*	*Function*
	**12V DC-in Power Connector (Lockable)**	For user to connect compatible power adapter to provide power supply for the system.
	**USB 2.0 Port**	To connect USB keyboard, mouse or other devices compatible with USB specification.
	**USB 3.1(Gen.2) Port**	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.1(Gen.2) ports supports up to 10Gbps data transfer rate.
	**2.5Gbps RJ-45 LAN Port**	This connector is standard 2.5Gbps RJ-45 LAN jack for Network connection. ***(*Note: 2.5Gbps** is **only** supported with **CAT 5e UTP cable).***

	**RS232/485/422 Serial Port**	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.

(2) ATXPWR (2-pin Block): Internal 12V DC-in Power Connector

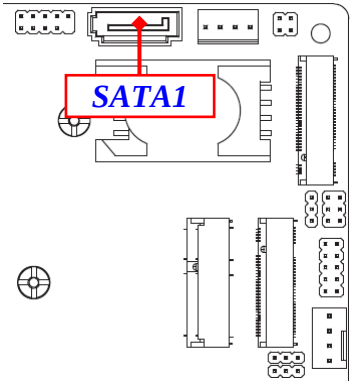




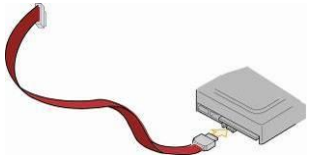
Pin.	Definition
1	GND
2	+12V DC_IN

(3) SATA1 (7-pin): STATIII Port Connector

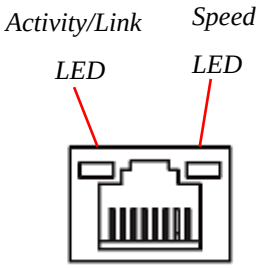
SATA1 is a high-speed SATAIII port that supports 6Gb/s transfer rate.



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



(4) *For 2.5Gbps RJ-45 LAN port:*



Activity/Link LED

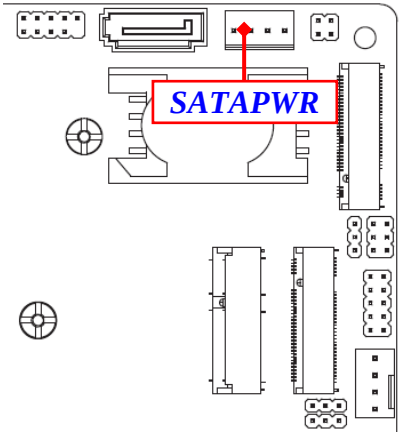
Status	Description
Off	No Link
Blinking	Data Activity
On	Link

Speed LED

Status	Description
Off	10Mbps connection
Orange	1000Mbps connection
Green	2.5Gbps connection

* ***Note:*** ***2.5Gbps*** *high-speed transmission rate is* ***only*** *supported over* ***CAT 5e UTP cable***

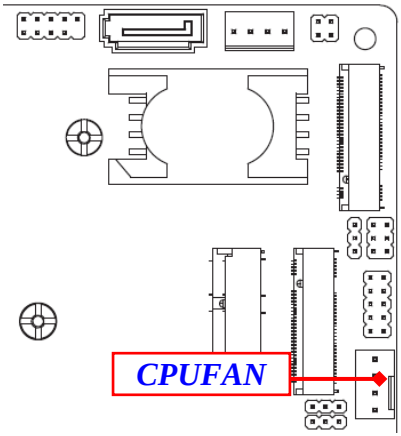
(5) SATAPWR (4-pin): SATA HDD Power-Out Connector

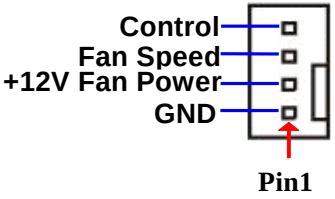


Pin No.	Definition
1	+5V
2	GND
3	GND
4	+12V

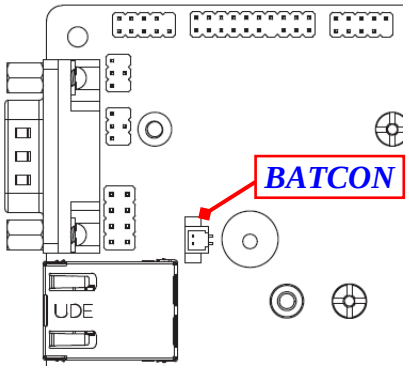
Warning: *Make sure that Pin-1 of compatible SATA Power connector is inserted into corresponding Pin-1 of SATAPWR to avoid possible damage to the board and hard disk driver!*

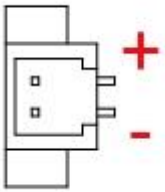
(6) CPUFAN (4-pin): CPU FAN Connector





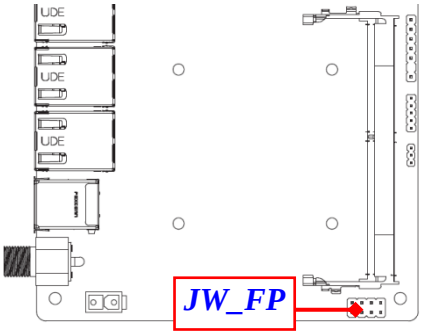
(7) BATCON (2-pin): Battery Connector

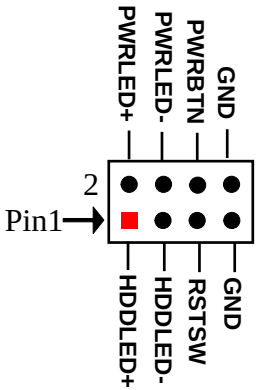




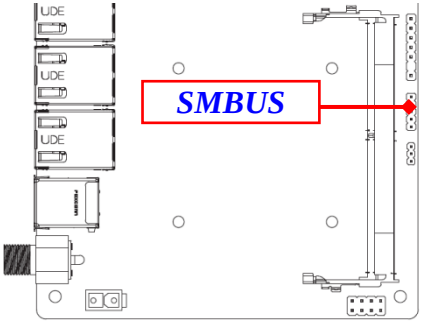
2-2-2 Headers

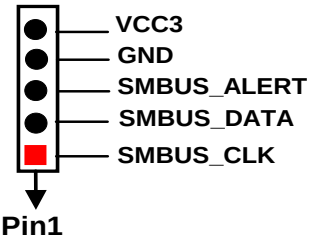
(1) JW_FP (8-pin): Front Panel Header *Pitch=2.54mm*



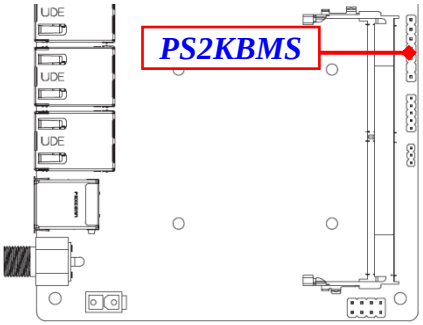


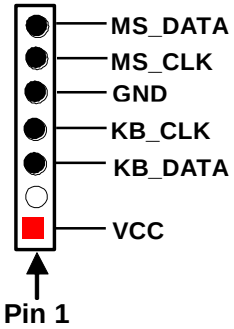
(2) SMBUS (5-pin): SM BUS Header *Pitch=2.0mm*



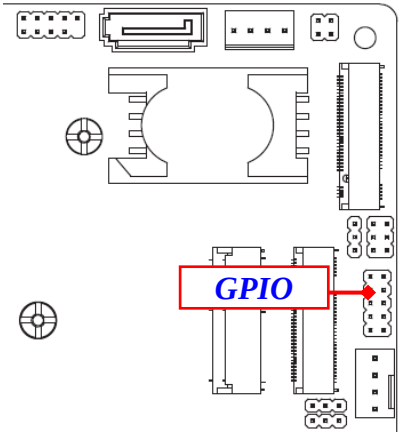


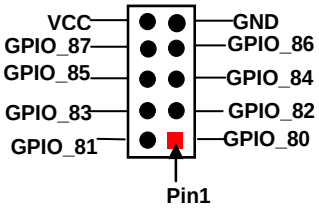
(3) PS2KBMS (6-pin): PS/2 Keyboard & Mouse Header *Pitch=2.54mm*



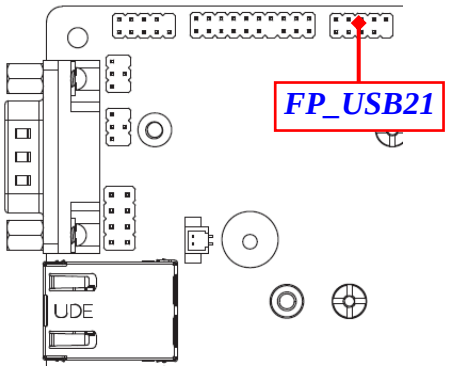


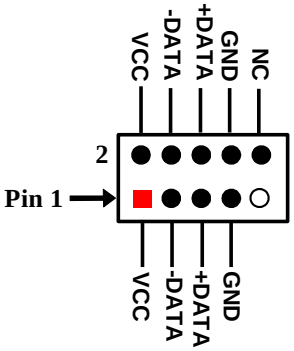
(4) GPIO (10-pin): GPIO Header *Pitch=2.0mm*



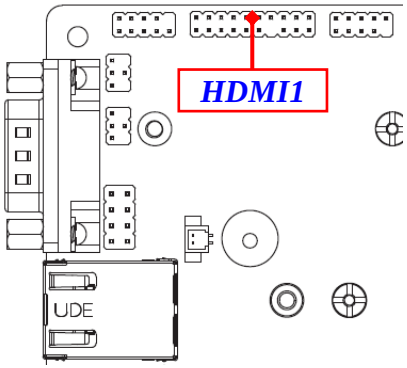


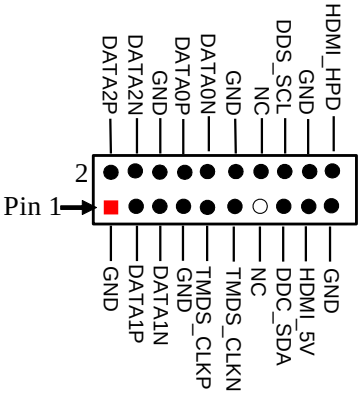
(5) FP_USB21 (9-pin): USB 2.0 Port Header *Pitch=2.0mm*





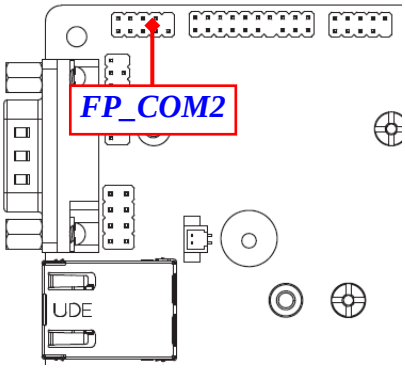
(6) HDMI1 (19-pin): HDMI Port Header *Pitch=2.0mm*

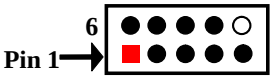




(7) FP_COM2 (9-pin): Serial Port Header (support RS232/422/485)

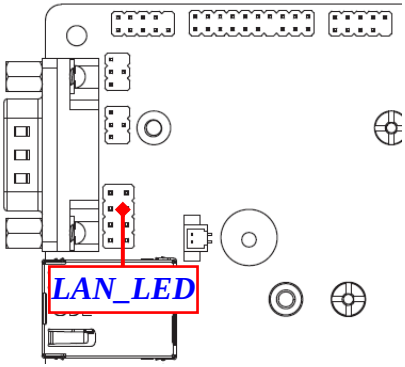
Pitch=2.0mm

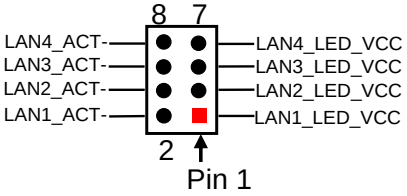




Pin NO.	RS232	*RS422	*RS485
Pin 1	DCD	TX-	DATA-
Pin 2	**SIN**	TX+	DATA+
Pin 3	**SO-**	RX+	NC
Pin 4	DTR	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR-	NC	NC
Pin 7	RTS-	NC	NC
Pin 8	CTS-	NC	NC
Pin 9	RI-	NC	NC

(8) LAN_LED (8-pin): LAN Activity LED Header *Pitch=2.54mm*





2-2-3 Maximum Voltage & Current Limit

Below is a list of maximum voltage & Current Limit specification for motherboard interface (including but not limited to slots, connectors, wafers and headers) for setup reference:

Location	Function	Working Voltage	Current Support
USB31	USB2.0/USB3.1(Gen.2)	5V	1.5A
SATAPWR	SATA 4Pin Power	5V	1A
CPUFAN	CPU FAN	5V	0.5A
SMBUS	SMBUS	5V	0.3A
GPIO	GPIO Port	5V	1.5A
JW_FP	Front Panel	5V	1A
PS2KBMS	PS/2 Keyboard & Mouse	5V	0.5A
FP_USB21	USB2.0 x2	5V	1.5A
LAN_LED	LAN Activity LED	3.3V	0.3A
JPCOM1	COM1 Function Select	5V or 12V	0.5A
JPCOM2	FP_COM2 Function Select	5V or 12V	0.5A
M2E_PWR	M.2 E-key Power	3.3V	2A
M2M_PWR	M.2 M-key Power	3.3V	2A
M2B_PWR	M.2 B-key Power	3.3V	2A

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.

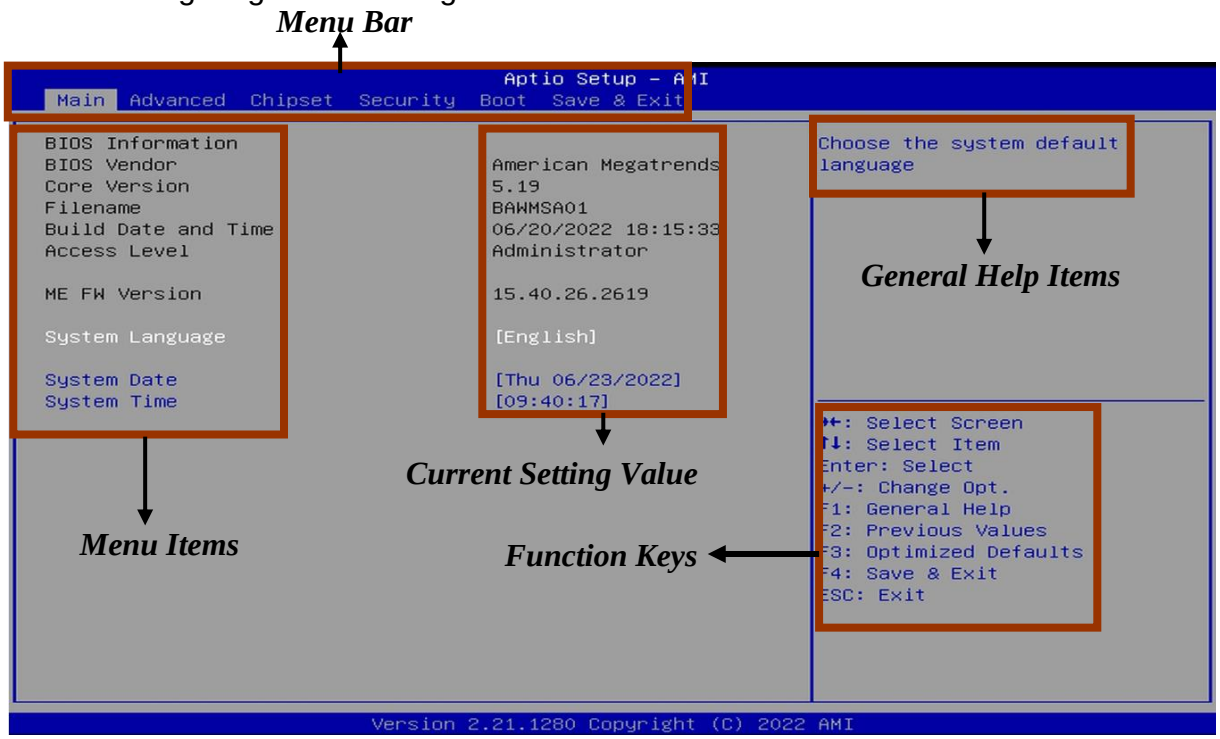
3-1 Entering Setup

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

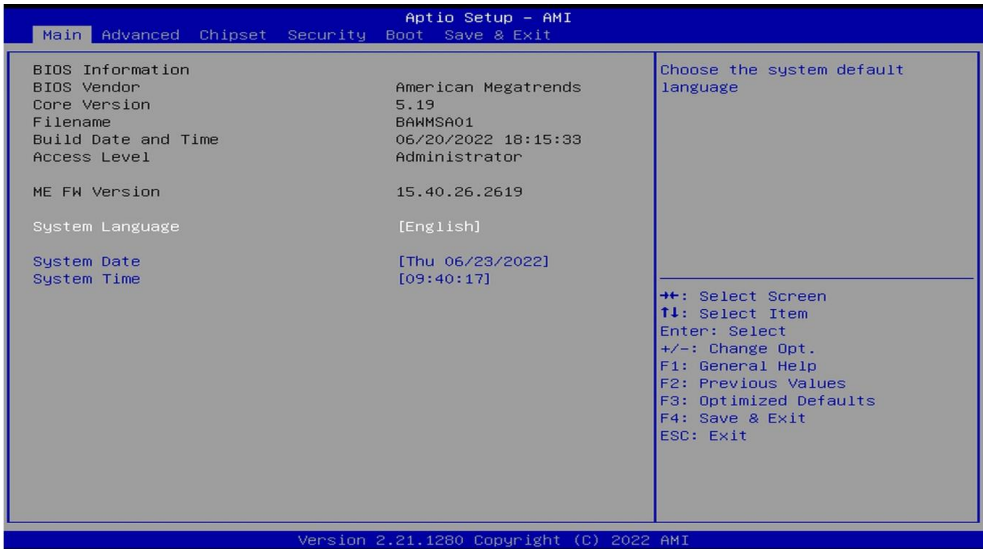
There are six menu bars on top of BIOS screen:

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.

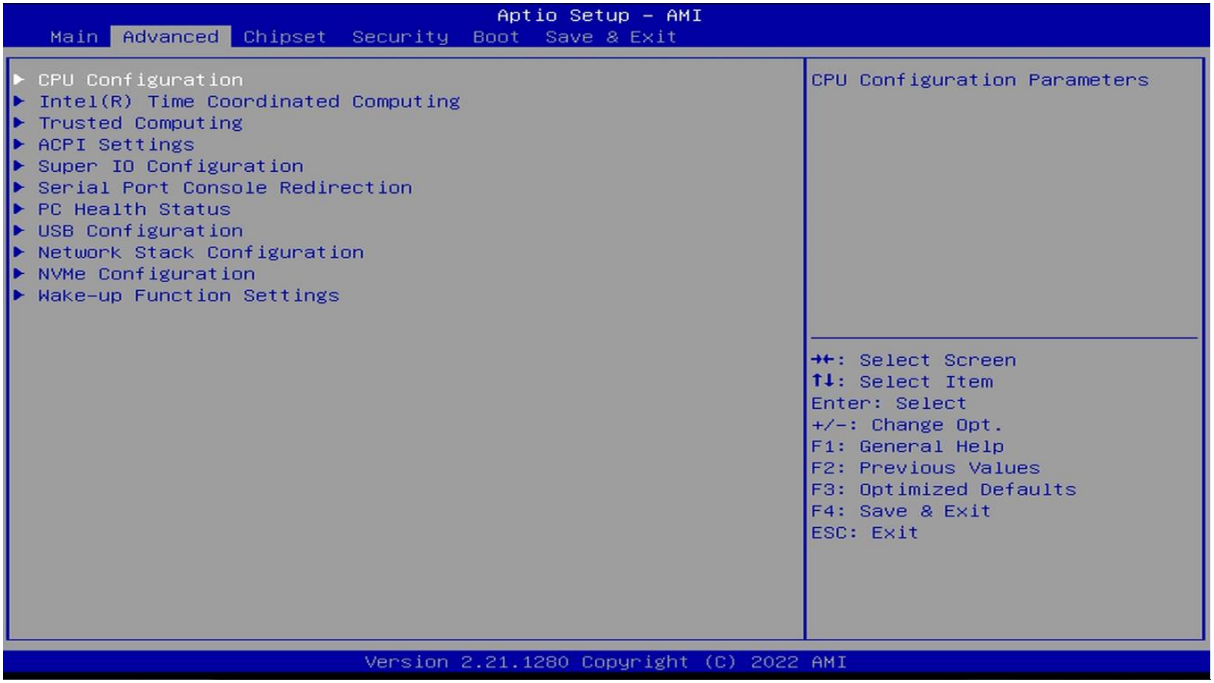


System Date

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

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

3-7 Advanced Menu



- **CPU Configuration**

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

  Boot Performance Mode

  Use this item to select the performance state that the BIOS will set starting from reset vector.

  The optional settings: [Max Battery]; [Max Non-Turbo Performance]; [Turbo Performance].

Intel(R) SpeedStep(tm)

Use this item to allows more than two frequency ranges to be supported.
The optional settings: [Disabled]; [Enabled].

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

Turbo Mode

Use this item to enable or disable processor Turbo Mode (requires EMTTM enabled too) AUTO means enabled.

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

C states

Use this item to enable or disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

The optional settings: [Disabled]; [Enabled]

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

Enhanced C-states

Use this item to enable or disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

The optional settings: [Disabled]; [Enabled]

Package C State Limit

Use this item to maximum Package C State Limit Setting. CPU Default: Leaves to Factory default value. Auto: Initializes to deepest available package C State

The optional settings: [C0/C1]; [C2]; [C3]; [C6]; [C7]; [C7S]; [C8]; [C9]; [C10]; [CPU Default]; [Auto]

Power Limit 1 Override

Use this item to enable or disable Power Limit 1 override, If this option is disabled, BIOS WILL program the default values for power Limit 1 and Power Limit 1 Time Window.

The optional settings: [Disabled]; [Enabled]

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

Power Limit 1

Use this item to power Limit 1 in Milli watts. BIOS will round to the nearest 1/8W when programming. 0=no custom override. 12.50W, enter 12500. Overclocking SKU: Value must be between Max and Min Power Limits (specified by PACKAGE_POWER_SKU_MSR). Other SKUs:This value must be between Min Power Limit and TDP Limit. If value is 0, BIOS will program TDP value

Power Limit 1 Time Window

Use this item to power Limit 1 Time Window value in seconds. The value may vary from 0 to 128. 0=default value (28 sec for Mobile and 8 sec for desktop). Defines time Window which TDP value should be maintained.

The optional settings: [0]; [1]; [2]; [3] ; [4] ; [5] ; [6] ; [7] ; [8] ; [10] ; [12] ; [14] ; [16] ; [20] ; [24] ; [28] ; [32] ; [40] ; [48] ; [56] ; [64] ; [80] ; [96] ; [112] ; [128]

Power Limit 2 Override

Use this item to enabled/disable power Limit 2 override. If this option is disabled, BIOS will program the default values for Power Limit 2.

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

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

Power Limit 2

Use this item to power Limit 2 vallue in Milli watts. BIOS will round to the nearest 1/8W when programming. If the value is 0, BIOS will program this value as 1.25*TDP. For 12.50W, enter 12500. Processor applies control policies such that the package power does not exceed this limit.

- **Intel(R) Time Coordinated Computing**

  Use this item to Intek(R) Time Coordinated Computing (Intel(R) TCC) options

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

  Intel(R) TCC Mode

Use this item to enable or disable Intel(R) TCC mode. when enabled, this will modify system settings to improve real-time performance. The full list of settings and their current state are displayed below when Intel(R) TCC mode is enabled

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

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

Intel(R) TCC Authentication

Use this item to enabled/disable authentication of Intel(R) TCC configuration data.

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

When set **Intel(R) TCC Mode** as [Disabled], user can make further settings in the following items:

IO Fabric Low Latency

Use this item to enabled or disable IO Fabric Low Latency. This will turn off some power management in the PCH IO fabrics. This option provides the most aggressive IO Fabric performance setting. S3 state is NOT supported

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

GT CLOS

Use this item to enabled or disable Graphics Technology(GT) Class of Service. Enable will reduce Gfx LLC allocation to minimize impact of Gfx workload on LLC.

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

- **Trusted Computing**

  Press [Enter] to view current status information, or make settings in '**Security Device Support**'.

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], the following item 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].
SHA384 PCR Bank
Use this item to enable or disable SHA384 PCR Bank.
The optional settings: [Disabled]; [Enabled].
SM3_256 PCR Bank
Use this item to enable or disable SM3_256 PCR Bank.
The optional settings: [Disabled]; [Enabled].
Pending Operation
Use this item to schedule an operation for the security device
NOTE: Your computer will reboot during restart in order to change state of security device
The optional settings: [None]; [TPM Clear].

- **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: [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/ Serial Port 2 Configuration**

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

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. Changing setting may conflict with system resources.

The optional settings: [Auto]; [IO=3F8h; IRQ=4]; [IO=2F8h; IRQ=3]; [IO=3E8h; IRQ=4]; [IO=2E8h; IRQ=3].

Transmission Mode Select

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

Mode Speed Select

Use this item to RS232/RS422/RS485 Speed Select

The optional settings: [RS232/RS422/RS485=250Kbps]; [RS232=1Mbos, RS422/RS485=10Mbps]

ERP Support

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

Use this item to detect case has already open or not, show message in POST.

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

When set as [Enabled], system will detect if COPEN has been short or not (*refer to* ***JPCAS_80P*** *jumper setting for Case Open Detection*); if Pin 1&2 of ***JPCAS_80P*** are short, system will show Case Open Message during POST

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 [10] to [255] seconds when '**WatchDog Reset Timer Unit**' set as [Sec]; or in the range of [1] to [255] minutes when '**WatchDog Reset Timer Unit**' set as [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: [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 AT_MODE jumper setting Pin 1&2 of for ATX Mode & Pin 2&3 of AT Mode Select).

- **Serial Port Console Redirection**
  Press [Enter] to make settings for the following sub-items:

COM1

Console Redirection
The optional settings: [Disabled]; [Enabled]. When set as [Enabled], the following sub-items shall appear:

- **Console Redirection Settings**
  The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.
  Press [Enter] to make settings for the following items:

Terminal Type

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

Emulation: [ANSI]: Extended ASCII char set; [VT100]: ASCII char set; [VT100+]: Extends VT100 to support color, function keys, etc.; [VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.

Bits per second

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

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

Data Bits

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

Parity

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

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

[Even]: parity bit is 0 if the num of 1's in the data bits is even; [Odd]: parity bit is 0 if num of 1's in the data bits is odd; [Mark]: parity bit is always 1; [Space]: Parity bit is always 0; [Mark] and [Space] Parity do not allow for error detection.

Stop Bits

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

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

Flow Control

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

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

VT-UTF8 Combo Key Support

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

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

Recorder Mode

With this mode enable only text will be sent. This is to capture Terminal data.
The optional settings: [Disabled]; [Enabled].

Resolution 100x31

Use this item to enable or disable extended terminal resolution.
The optional settings: [Disabled]; [Enabled].

Legacy OS Redirection Resolution

On Legacy OS, the Number of Rows and Columns supported redirection.
The optional settings: [80x24]; [80x25].

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

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.
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

Terminal Type

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

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

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

Flow Control

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

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

Data Bits

The default setting is: [8].

**This item may or may not show up, depending on different configuration.*

Parity

The default setting is: [None].

**This item may or may not show up, depending on different configuration.*

Stop Bits

The default setting is: [1].

**This item may or may not show up, depending on different configuration.*

- **PC Health Status**

Press [Enter] to view current hardware health status, set shutdown temperature, or make further settings in ‘**Smart Fan Configuration**’.

- **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.

- **USB Configuration**

Press [Enter] to make settings for the following sub-item:
XHCI Hand-off
This is a workaround for 0Ses 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/disable USB Mass storage driver support
The optional settings: [Enabled]; [Disabled].
USB Transfer Time-out
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 USB mass storage device start unit command time-out
The optional settings: [10 sec]; [20 sec]; [30 sec]; [40 sec].
Device Power-up Delay
Maximum time the device will take before it properly report 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]
When set as [Manual], the following sub-items shall appear:
Device Power-up Delay in Seconds
Use this item to delay range is 1..40 seconds in one second increments

- **Network Stack Configuration**

Press [Enter] to go to '**Network Stack**' screen to make further settings.
Network Stack
The optional settings: [Enabled]; [Disabled].
When set as [Enabled], the following sub-items shall appear:
Ipv4 PXE Support
The optional settings: [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: [Disabled]; [Enabled].
Use this item to enable Ipv6 PXE Boot Support. When set as [Disabled], Ipv6 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 number of time the presence of media will be checked. Use either +/- or numberic keys to set the value

- **NVMe Configuration**

Press [Enter] to make settings for the following sub-items:
**Note: options only when NVME device is available.*

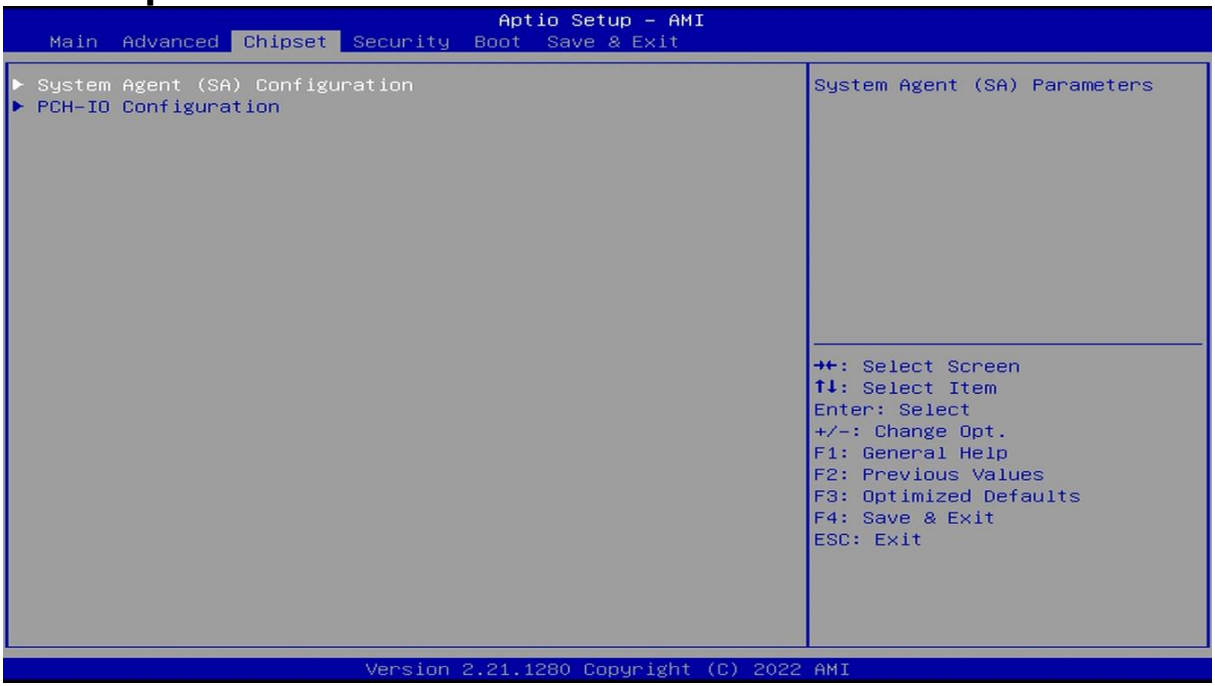
- **Wake-up Function Settings**

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)
PS2 KB/MS Wake-Up from S3-S5
Use this item to PS2 KB/MS Wake-up is affected by ERP function in S4-S5. Please disabled ERP before activating this function in S4-S5.
The optional settings: [Disabled]; [Enabled].
USB Power Gating S4-S5
Use this item to USB Wake-up is affected by ERP function in S4. Please disable ERP before activating this function in S4.
The optional settings: [Disabled]; [Enabled].
PCIe Wake-up from S3-S5
The optional settings: [Disabled]; [Enabled]

3-8 Chipset Menu



- **System Agent(SA) Configuration**

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

  GTT Size

  Use this item to select the GTT Size.

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

  DVMT Pre-Allocated

  Use this item to select DVMT 5.0 pre-allocated (fixed) graphics memory size used by the internal graphics device.

  The optional settings: [0M]; [4M]; [8M]; [12M]; [16M]; [20M]; [24M]; [28M]; [32M]; [36M]; [40M]; [44M]; [48M]; [52M]; [56M] ; [60M] ; [64M] ; [96M] ; [128M] ; [160M]

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: [128M]; [256M]; [MAX].
Total Memory

- **PCH-IO Configuration**
  Press [Enter] to make further settings in south bridge parameters.
- **PCI Express Configuration**
  Press [Enter] to make further settings in south bridge parameters.

Peer Memory Write Enable
The optional settings: [Enabled]; [Disabled].

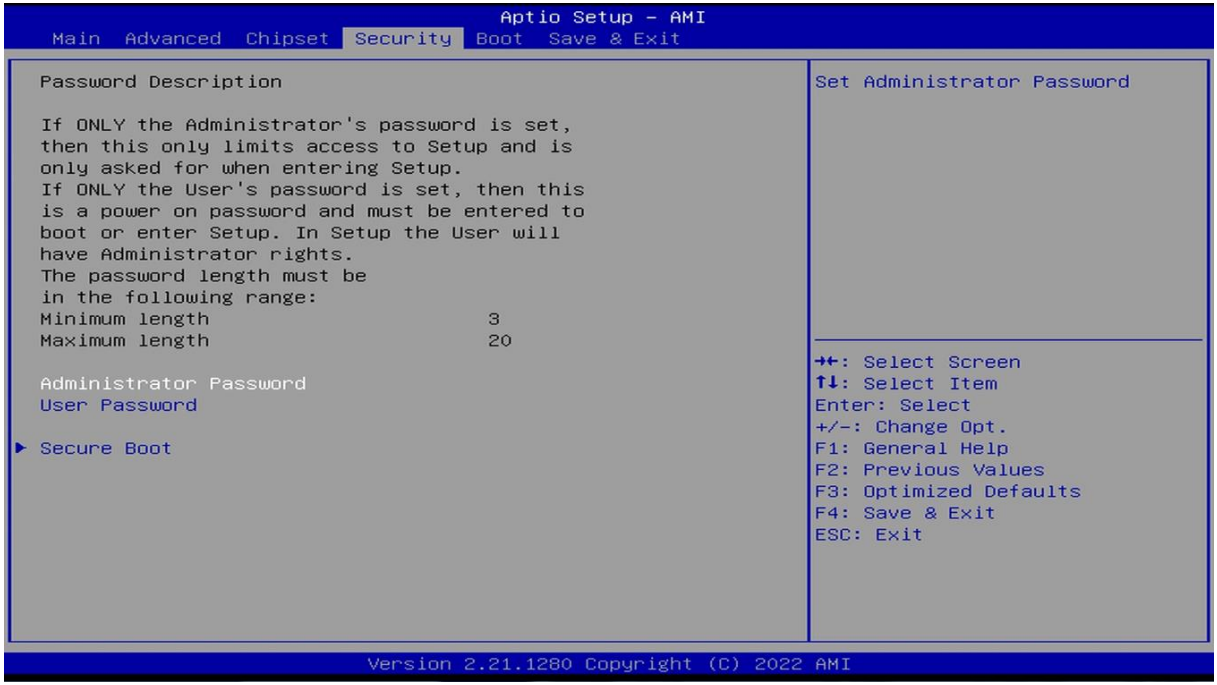
- **SATA Configuration**
  Press [Enter] to make settings for the following sub-items:

SATA Controller
Use this item to enable/disable SATA Device
When set as [Enabled], the following sub-items shall appear:
SATA Mode Selection
Use this item to determines how SATA controller(s) operate.
The optional settings: [AHCI]
SATA Port
SATA Port
The optional settings: [Enabled]; [Disabled].
Hot Plug
Use this item to designates this port as Hot Pluggable
The optional settings: [Enabled]; [Disabled].
M.2
M.2
The optional settings: [Enabled]; [Disabled].
HD-Audio Support
The optional settings: [Enabled]; [Disabled].

SCS eMMC Support
The optional settings: [Enabled]; [Disabled].
System State after Power Failure
Use this item to specify what state to go to when power is re-applied after a power failure
The optional settings: [Always On]; [Always Onff]; [Former State]

PinCntrl Driver GPIO Scheme
Use this item to enable/disable PinCntrl Driver GPIO Scheme
The optional settings: [Enabled]; [Disabled]

3-9 Security Menu



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

Administrator Password

Press [Enter] to create new administrator password. Press again to confirm the new administrator password.

User Password

Press [Enter] to create new user password. Press again to confirm the new user 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**

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

  - **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**

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

- **Export Secure Boot variables**

Use this item to copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

- **Enroll Efi Image**

This item allows the image to run in Secure Boot mode.

Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

Device Guard Ready

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

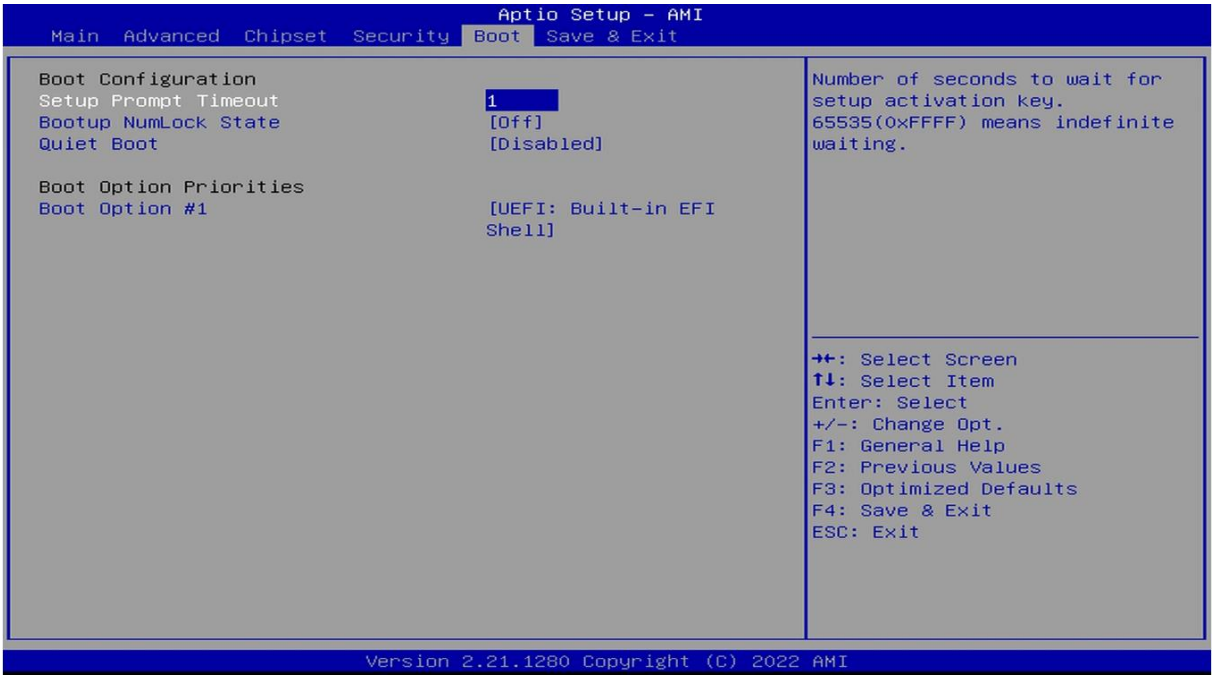
Use this item to enroll Factory Defaults or load certificates from a file:

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.

Bootup Numlock State

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

Quiet Boot

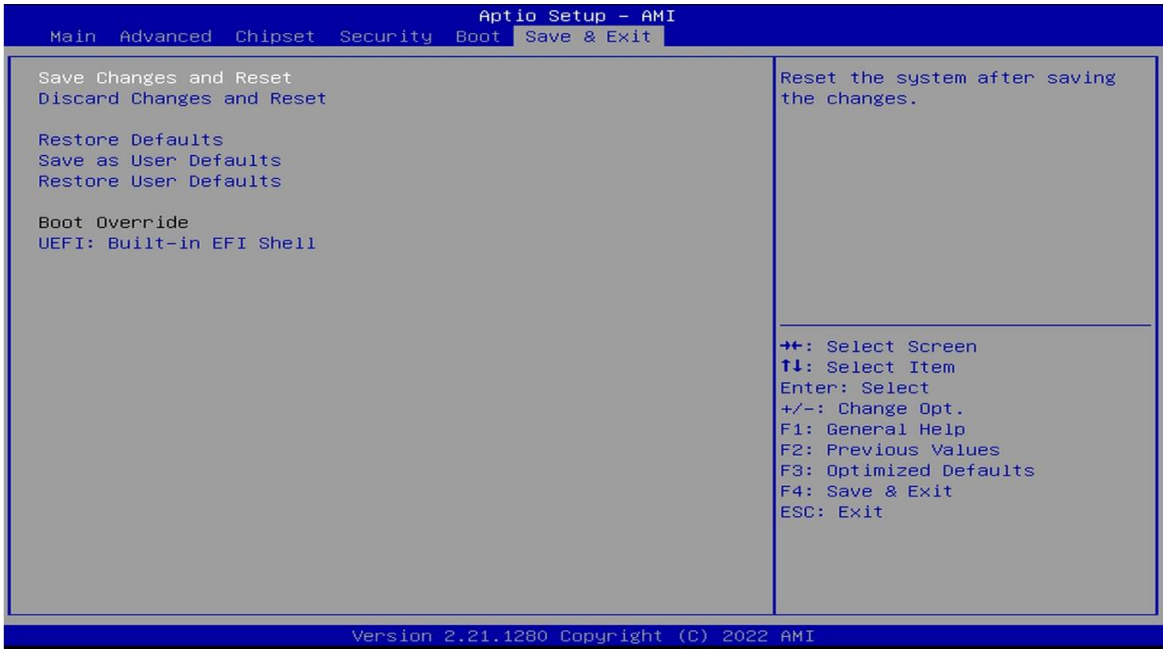
The optional settings: [Disabled]; [Enabled].

Boot Option Priorities

Boot Option #1

Use this item to decide system boot order from available options.
The optional settings: [UEFI: Bulit-in EFI Shell]; [Disabled].

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.