Technical Manual

Of

Intel Apollo Lake Series CPU

Based IPC M/B

NO. G03-NF841V-F

Revision: 2.0

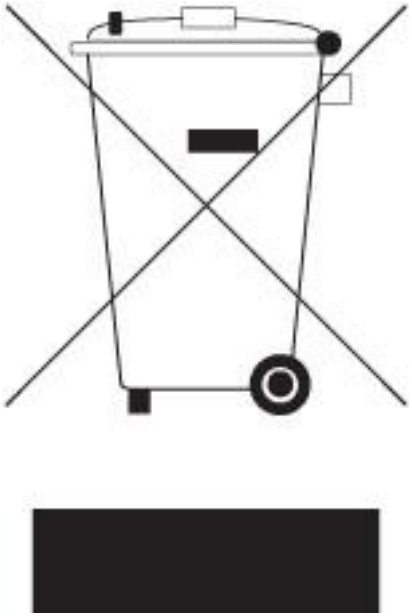
Release date: December 12, 2022

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 12, 2022

Item Checklist

- ☑ Motherboard
- ☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard Intel® Apollo Lake Series Processor, with low power consumption and high performance
- Support 1* DDR3L 1866MHz SO-DIMM with maximum memory capacity up to 8GB
- Integrated with 2* Intel i225V 2.5Gigabit Ethernet LAN chip
- Integrated with Realtek 6-channel HD Audio Codec
- Onboard 2* full-size Mini-PCIE slot & 2* PCIE x1 sideway slot
- Onboard 1* M.2 M-key (type-2280, SATA interface) slot
- Onboard 1* 2.5'' SATAIII hard disk drive connector
- Support USB 3.0 data transport demand
- Support 2* HDMI display output
- Amplifier implement to support 3W Speaker
- Support Smart FAN function
- Supports ACPI S3 Function
- Compliance with ErP Standard
- Support Watchdog Timer Technology

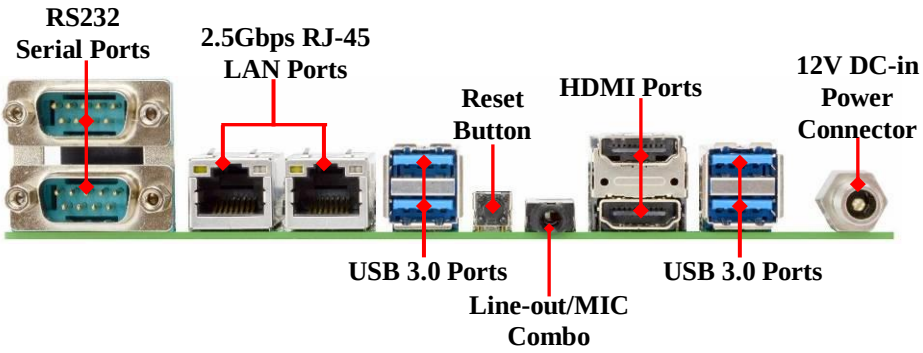
1-2 Specification

Spec	Description
Design	● 6 layers; PCB size: 10 x 16.7 cm
Embedded CPU	● Intel® Apollo Lake series CPU ** for detailed CPU support information please visit our website*
Memory Slot	● 1* DDR3L SODIMM Slot for un-buffered DDR3L 1866 MHz SDRAM, expandable to 8GB in total
Expansion Slot	● 2* Full-size Mini-PCIE slot (**MPE1/ MPE2**) ● 2* PCIE x1 slot by sideway(**PCIE1/PCIE2**)
Storage	● 1* 7+15 pin HDD Connector for 2.5" SATAHDD (**SATA_HDD1**) ● 1* M.2 M-key,type-2280, SATA interface slot (**M2.M**)
LAN Chip	● Integrated with 2* Intel I225V 2.5Gigabit LAN chips ● Support Fast Ethernet LAN function of providing 10/100/1000/2500Mbps Ethernet data transfer rate
Audio Chip	● Realtek ALC662-VD 6-channel Audio Codec integrated ● Audio driver and utility included
BIOS	● AMI Flash ROM
Rear I/O	● 1* 12V DC-in power Jack ● 4* USB 3.0 ports ● 2* HDMI ports ● 1* Audio Line Out & MIC Combo port ● 1* System reset button ● 2* RJ-45 LAN ports ● 2* RS232 serial ports
Internal I/O	● 1* CPUFAN connector ● 1* SYSFAN connector ● 1* Front panel header ● 1* GPIO_CON header

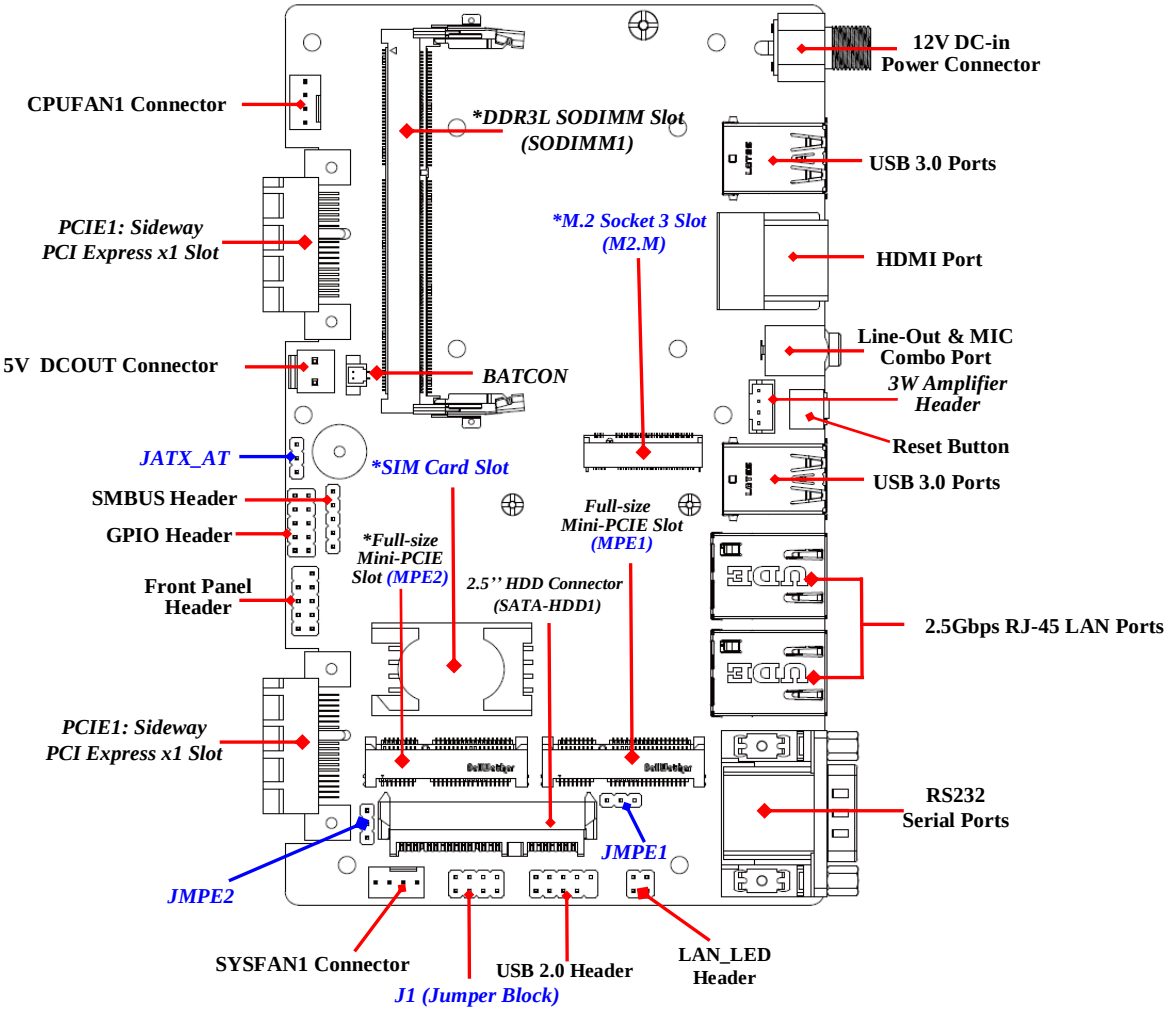
	• 1* SMBUS header • 1* 9-pin USB 2.0 header (Expansible to 2* USB 2.0 port) • 1* SPEAK_CON header • 1* LAN Status LED header

1-3 Layout Diagram

Rear IO Panel Diagram:



Motherboard Internal Diagram-Front Side



Note: 1.*The memory module should be* ***DDR3L 1.35V*** *SODIMM and* ***not exceeding 8GB total capacity****. 2.* ***SIM card slot*** *only work* ***when*** *compatible SIM card installed & 3G LAN card installed in* ***MPE2*** *Mini-PCIE slot.*

Jumper

Jumper	Name	Description	PITCH
JMPE1	MPE1 Slot VCC Select	3-pin Block	2.54mm
JMPE2	MPE2 Slot VCC Select	3-pin Block	2.54mm
JATX_AT	ATX/AT Mode Select	3-pin Block	2.54mm
J1	***Pin (1-2):*** Clear ME Settings ***Pin (3-4):*** Clear CMOS ***Pin (5-6):*** ME Disable ***Pin (7-8):*** Case Open Detection	8-pin Block	2.54mm

Connectors

Connector	Name
DCIN	12V System DC–in Power Jack Connector
HDMI	HDMI Port Connector x 2
AUDIO	Audio Line Out & MIC Combo Connector
USB1/USB2	USB 3.0 Port Connector x 4
LAN1/LAN2	RJ-45 LAN Port Connector x 2
COM1	RS232 Serial Port Connector x 2
SATA-HDD1	7+15 pin HDD Connector for 2.5'' SATA HDD
CPUFAN1	CPU FAN Connector
SYSFAN1	SYS FAN Connector
5V_DCOUT	External power supply

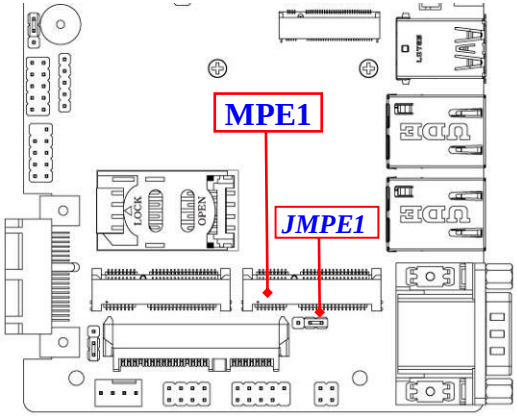
Headers

Header	Name	Description	PITCH
JW_FP	Front Panel Header (PWR LED/ HDD LED/Power Button /Reset)	9-pin Block	2.54mm
GPIO_CON1	GPIO Header	10-pin Block	2.54mm
SMBUS	SMBUS Header	5-pin Block	2.54mm
FP_USB1	USB 2.54 Header	4-pin Block	2.54mm
JLED	LAN Activity Status LED Header	4-pin Block	2.54mm
SPEAK_CON1	Speaker wafer	4-pin Block	2.0mm

Chapter 2
Hardware Installation

2-1 Jumper Setting

JMPE1 (3-pin): MPE1 Slot VCC Select PITCH=2.54mm

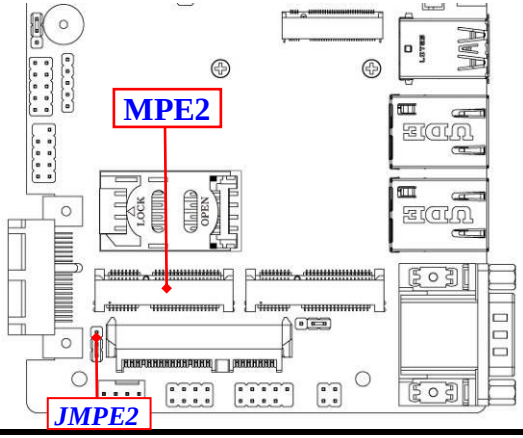


JMPE1→MPE1 Slot Power VCC

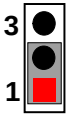
1-2 Closed: MPE1 Slot Power VCC= 3.3V;

2-3 Closed: MPE1 Slot Power VCC= 3.3VSB.

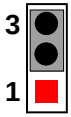
JMPE2 (3-pin): MPE2 Slot VCC Select PITCH=2.54mm



JMPE2→MPE2 Slot Power VCC Select

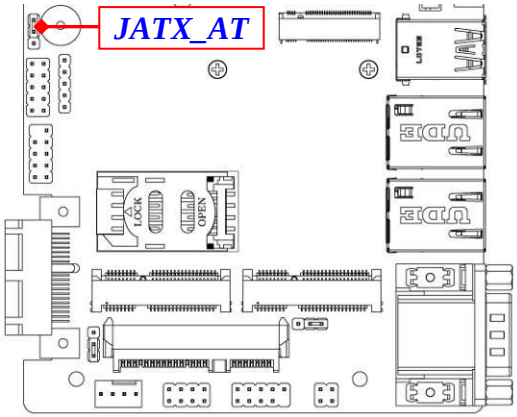


1-2 Closed: MPE2 Slot Power VCC= 3.3V;

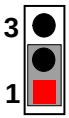


2-3 Closed: MPE2 Slot Power VCC= 3.3VSB.

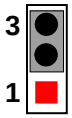
JATX_AT (3-pin): ATX Mode/ AT Mode Select *PITCH=2.54mm*



JATX_AT→ATX/AT Mode Select



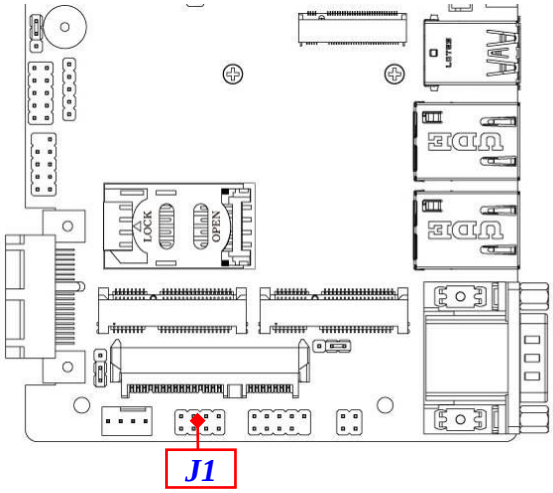
1-2 Closed: ATX Mode Selected;



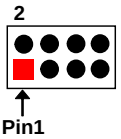
2-3 Closed: AT Mode Selected.

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

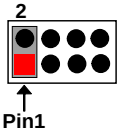
Pin 1&2 of J1 (8-pin): Clear ME Settings (Clear ME RTC) PITCH=2.54mm



Pin 1&2 of J1→Clear ME RTC

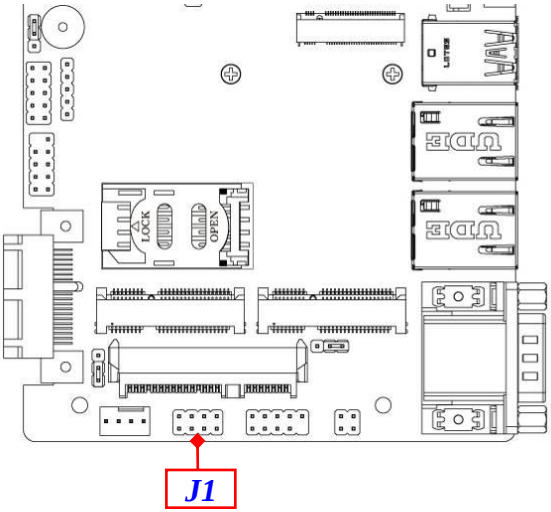


1-2 Open: Normal(Default);

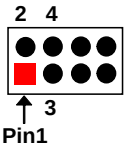


1-2 Closed: Clear ME RTC (One Touch).

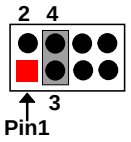
Pin 3&4 of J1 (8-pin): Clear CMOS RAM Settings PITCH=2.54mm



Pin 3&4 of J1→Clear CMOS

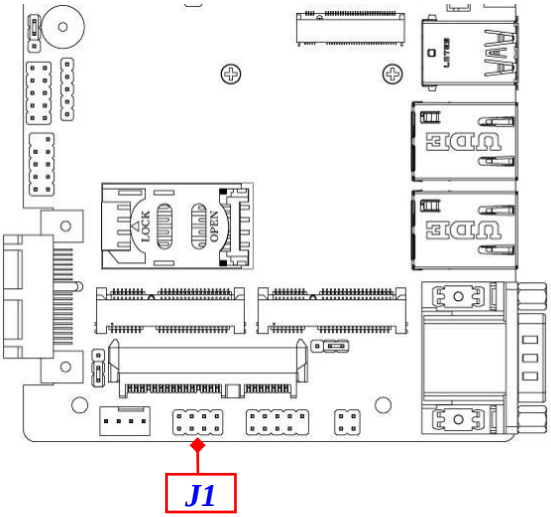


3-4 Open: Normal(Default);

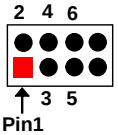


3-4 Closed: Clear CMOS(One Touch).

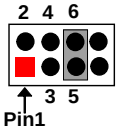
Pin 5&6 of J1 (8-pin): ME Disable (TXE Override Setting) PITCH=2.54mm



Pin 5&6 of J1→ME Disable

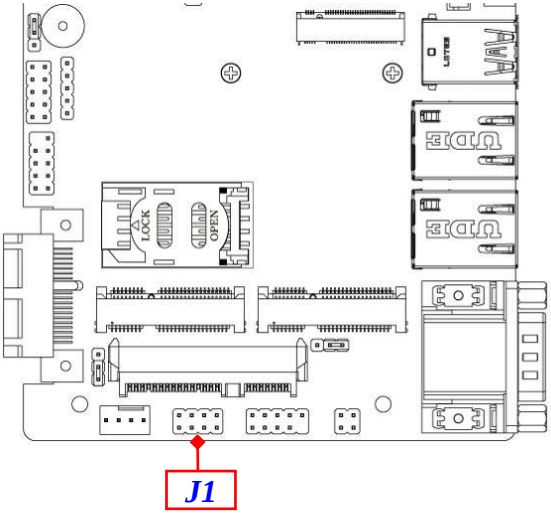


5-6 Open: Enable Security Measures in the Flash Descriptor(Default);

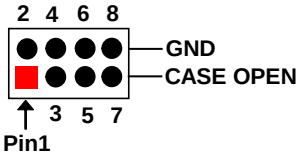


5-6 Closed: Disable Security Measures in the Flash Descriptor(Override).

Pin 7&8 of J1 (8-pin): Case Open Detection PITCH=2.54mm



Pin 7&8 of J1→Case Open Detection



Pin (7&8) 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.*

2-2 Connectors and Headers

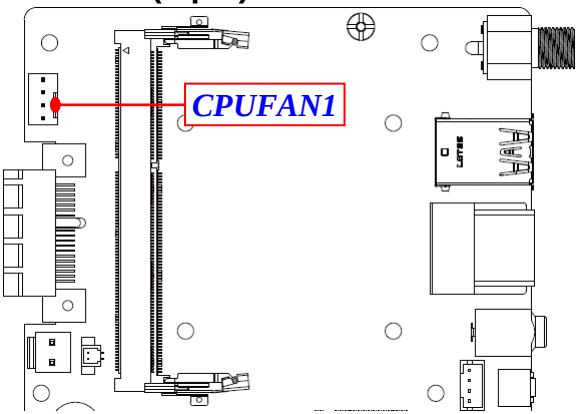
2-2-1 Connectors

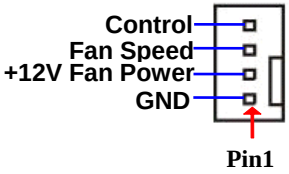
(1) Rear I/O Connectors

Refer to Page-3: Rear IO Panel Diagram.

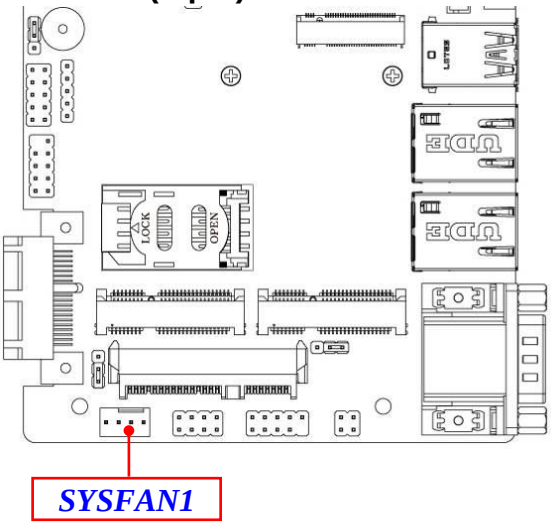
Icon	*Name*	*Function*
	**12V DC-in Power Connector**	For user to connect compatible power adapter to provide power supply for the system.
	**USB 3.0 Ports**	To connect USB keyboard, mouse or other devices compatible with USB specification. USB 3.0 ports supports up to 5Gbps data transfer rate.
	**HDMI Ports**	To connect display device that support HDMI specification.
	**Line-out/MIC Combo Audio Connector**	To function as audio line out or MIC connector.
	**Reset Button**	Press to reset the system.
	**RJ-45 LAN Ports**	This connector is standard RJ-45 LAN jack for Network connection.
	**RS232 Serial Ports**	Mainly for user to connect external MODEM or other devices that supports Serial Communications Interface.

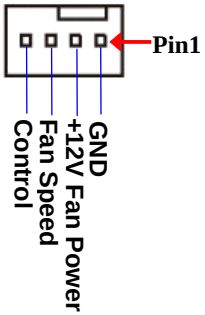
(2) CPUFAN1 (4-pin): CPUFAN Connector



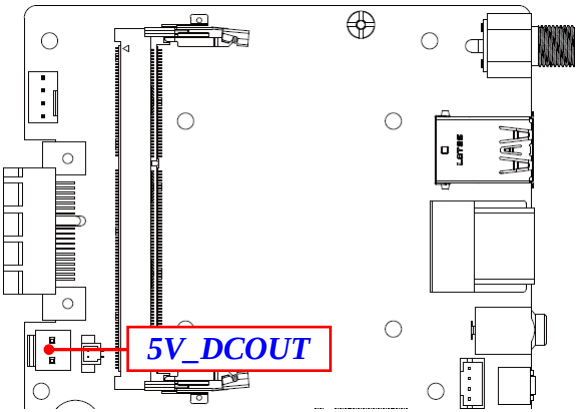


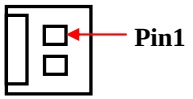
(3) SYSFAN1 (4-pin): SYSFAN Connector





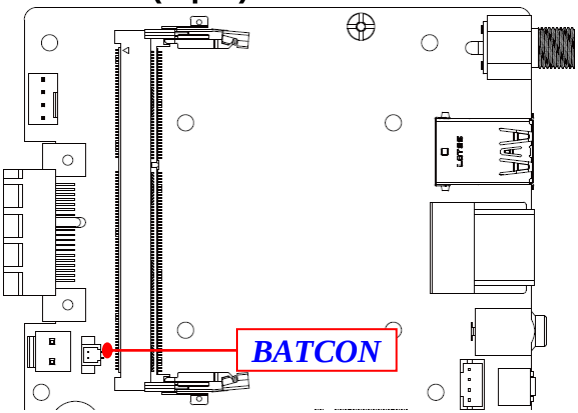
(4) 5V_DCOUT (2-pin): External power supply

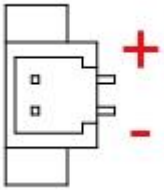




Pin No.	Definition
1	+5V
2	GND

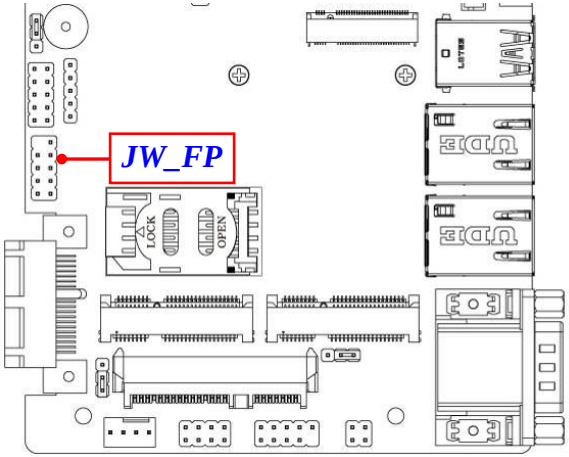
(5) CPUFAN1 (4-pin): CPUFAN Connector

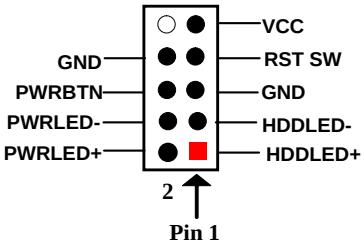




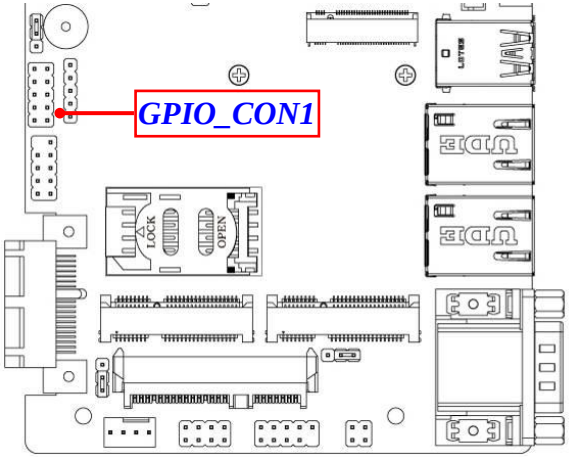
2-2-2 Headers

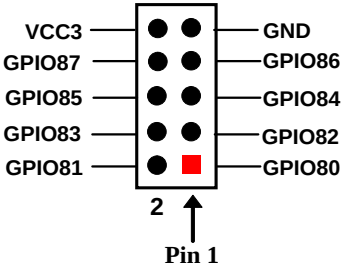
(1) JW_FP (9-pin): Front Panel Header PITCH=2.54mm



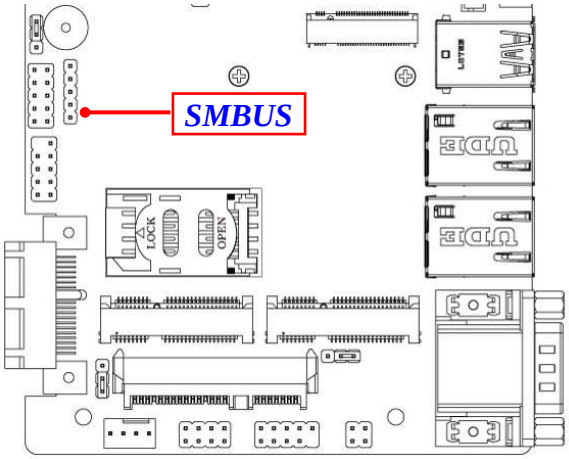


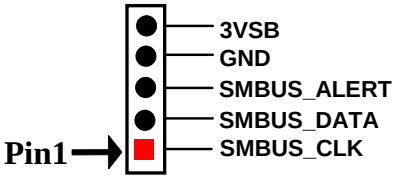
(2) GPIO_CON1 (10-pin): GPIO Header PITCH=2.54mm



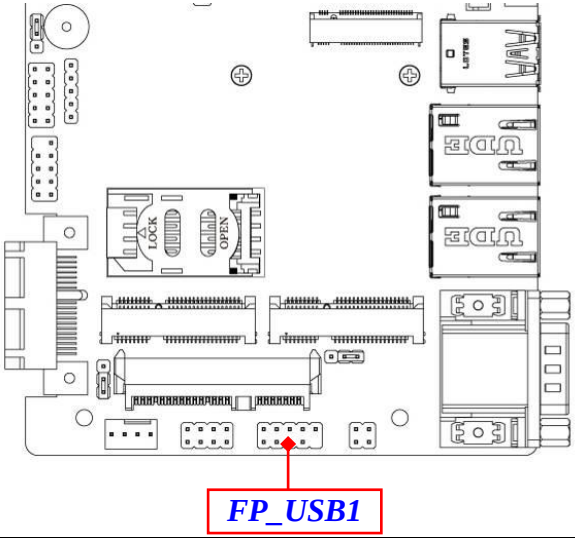


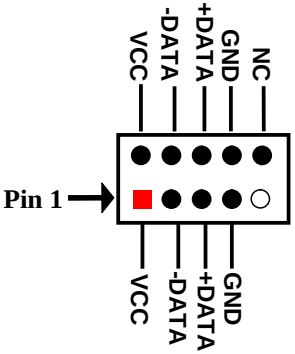
(3) SMBUS (5-Pin): SMBUS Header PITCH=2.54mm



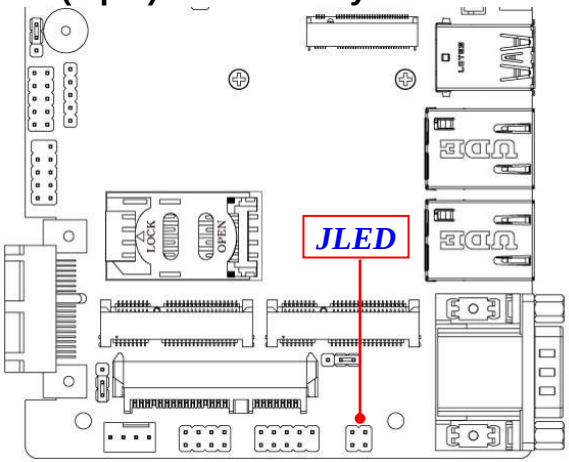


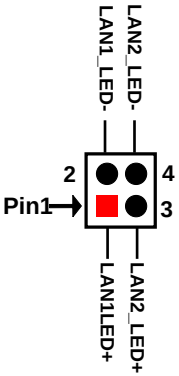
(4) FP_USB1 (9-pin): USB 2.54 Header PITCH=2.54mm



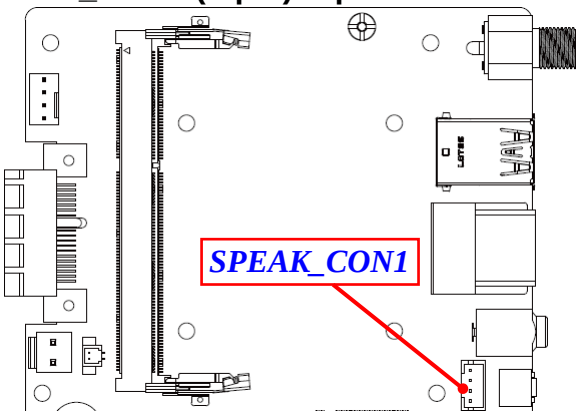


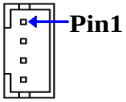
(5) JLED (4-pin): LAN Activity LED Header PITCH=2.54mm





(6) SPEAK_CON1 (4-pin): Speaker Wafer PITCH=2.0mm





Pin No.	Definition
1	L-
2	L+
3	R+
4	R-

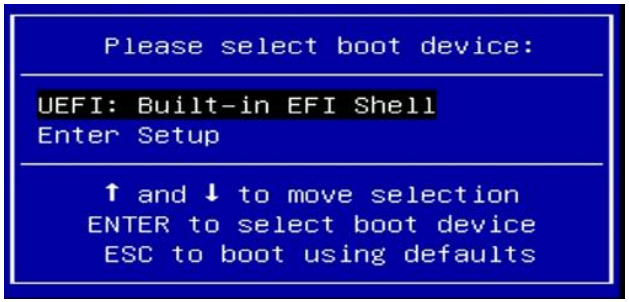
Chapter 3
Introducing BIOS

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

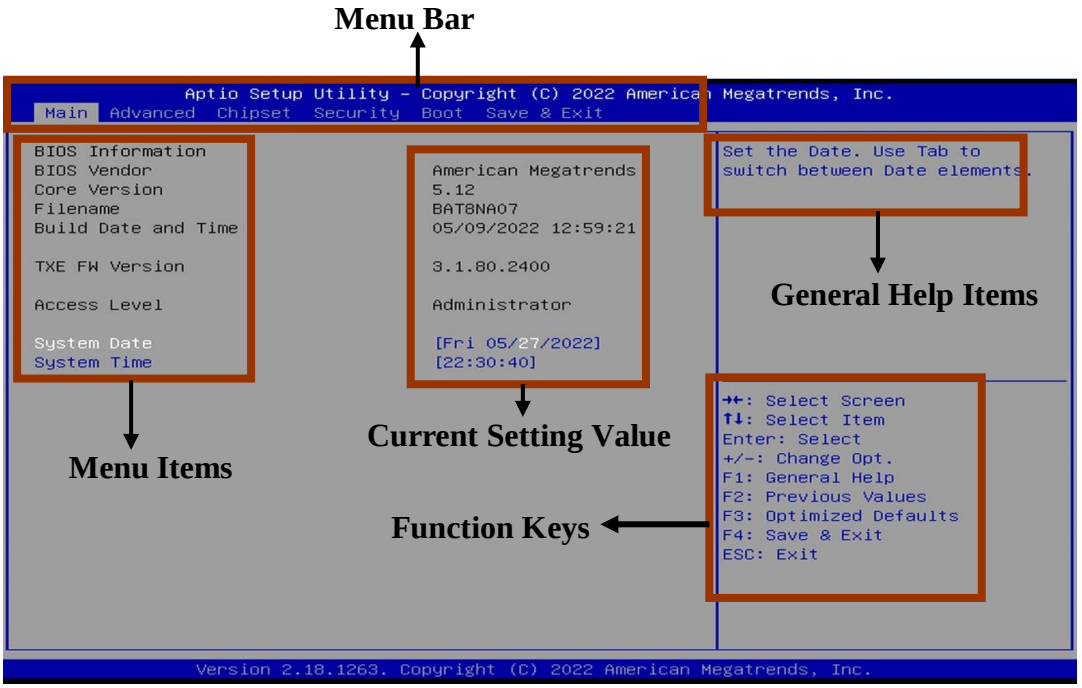
Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the “RESET” button on the system case. You may also restart by simultaneously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

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:



3-3 Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

- Press←→ (left, right) to select screen;
- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press <Enter> to select.
- Press <+>/<–> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous value.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to quit the BIOS Setup.

3-4 Getting Help

Main Menu

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

Status Page Setup Menu/Option Page Setup Menu

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

3-5 Menu Bars

There are six menu bars on top of BIOS screen:

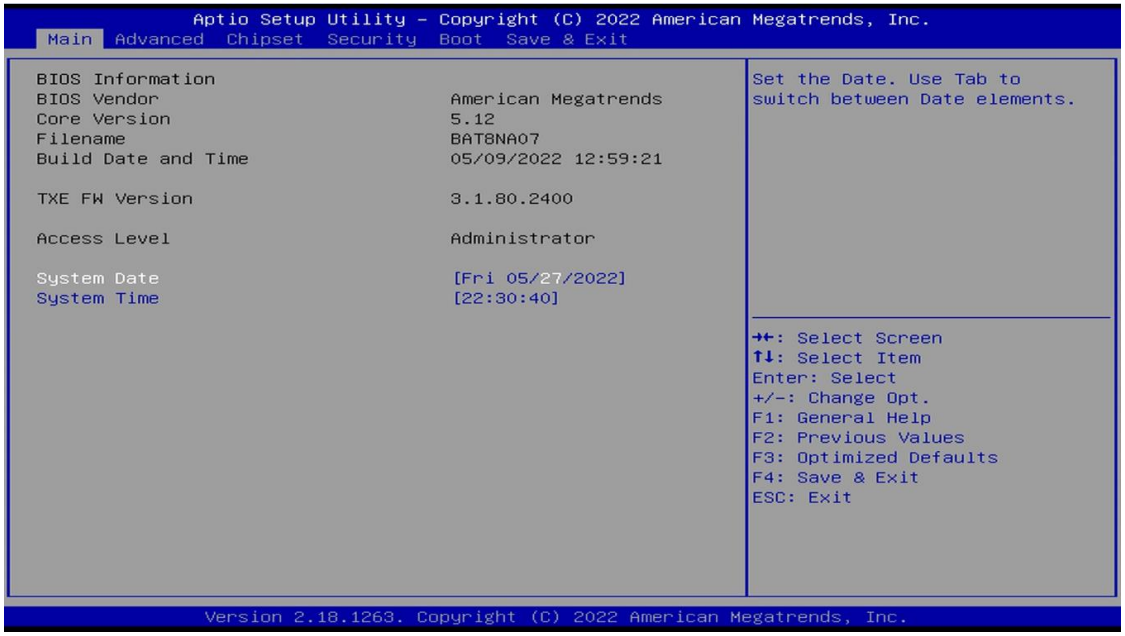
Main	To change system basic configuration

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

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

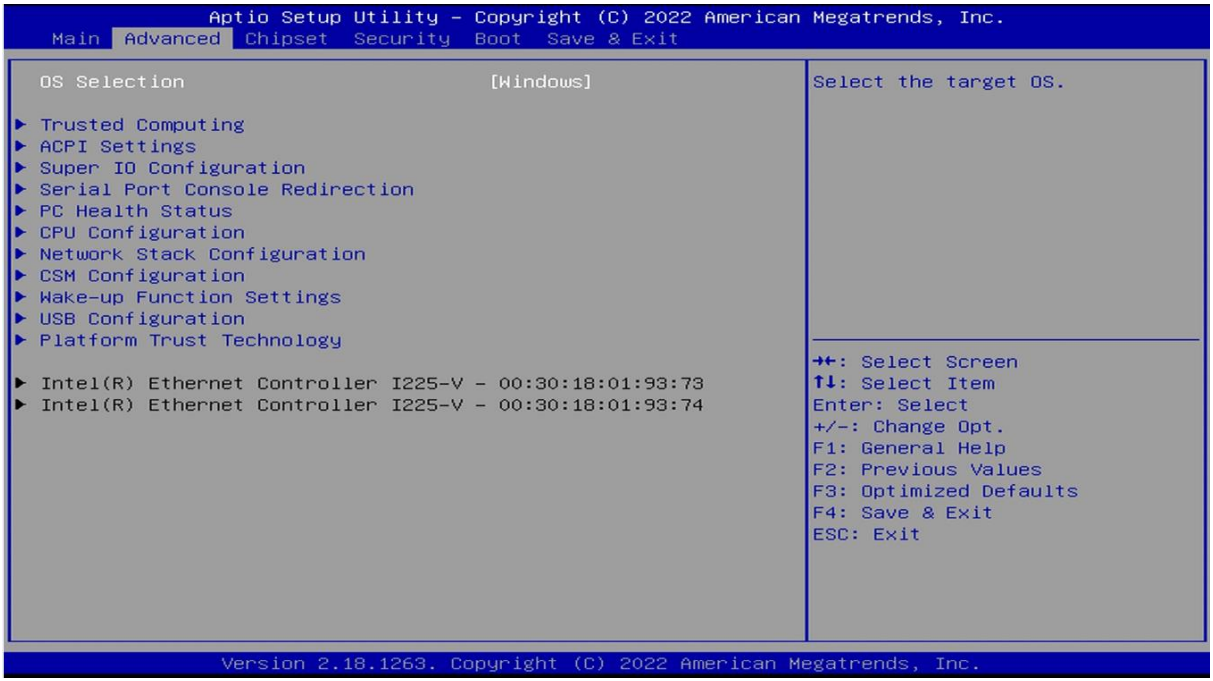
3-6 Main Menu

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



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

3-7 Advanced Menu



OS Selection
The optional settings: [Windows]; [Intel Linux]; [MSDOS].
**** Note:*** *User need to go to this item to select the OS mode before installing corresponding OS driver, otherwise problems will occur when installing the driver.*

► **Trusted Computing**

Press [Enter] to enable or disable '**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].

No Security Device Found

► **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 are: [Suspend Disabled]; [S3 (Suspend to RAM)].

► **Super I/O Configuration**

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

Super IO Configuration

► **Serial Port 1 Configuration/ 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 are: [Disabled]; [Enabled].

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 are: [Auto]; [IO=3F8h; IRQ=4]; ; [IO=2F8h; IRQ=3]; ; [IO=3F8h; IRQ=4]; ; [IO=2F8h; IRQ=3];

ERP Support

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

Case Open Detect

Use this item to detect case has already open or not, show message in POST.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will detect if COPEN has been short or not (refer to Page 9); if **Pin 7&8 of J1** is 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 Reset Timer Unit

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

WatchDog Wake-up Timer

This item support WDT wake-up.
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], the following sub-items shall appear:

WatchDog Wake-up Timer Value

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

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

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

- **Serial Port Console Redirection**

COM1

Console Redirection
Use this item to console redirection enable or disable
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: ASNI: 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 data bits is odd; 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]; [Intel Linux]; [XTERMR6]; [SCO]; [ESCN];

[VT400].

Redirection After BIOS POST

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

Whet Bootloader is selected, then Lagacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console is enabled for legacy OS. Default setting for this option is set to Always Enable.

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

Console Redirection

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

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

- **Console Redirection Settings**

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

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

Out-of-Band Mgmt Port

The optional setting is: [COM1].

Terminal Type

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

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

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

Bits per second

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

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

Flow Control

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

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

Data Bits

The default setting is: [8].

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

Parity

The default setting is: [None].

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

Stop Bits

The default setting is: [1].

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

► **PC Health Status**

Press [Enter] to view current hardware health status, make further settings in ‘**SmartFAN Configuration**’.

► **SmartFAN Configuration**

Press [Enter] to make settings for SmartFan Configuration:

SmartFAN Configuration

CPUFAN/SYSFAN Smart Mode

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

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

CPUFAN/SYSFAN Full-Speed Temperature

Use this item to set CPUFAN/SYSFAN full speed temperature. Fan will run at full speed when above this pre-set temperature.

CPUFAN/SYSFAN Full-Speed Duty

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

CPUFAN/SYSFAN1 Idle-Speed Temperature

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

CPUFAN/SYSFAN Idle-Speed Duty

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

► **CPU Configuration**

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

VT-d

Use this item to enable or disable CPU VT-d.

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

EIST

Use this item to enable or disable Intel SpeedStep.

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

Turbo Mode

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

C-States

Use this item to enable or disable C-State.

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

When set as [Enabled], the following sub-items 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].

Max Package C State

Use this option to controls the max Core C state that cores will support

The optional settings: [PC2]; [PC1] ; [CO]

Max Core C States

Use this option to this option controls the Max Core C State that cores will support

The optional settings are: [Fused value]; [Core C10]; [Core C9]; [Core C8]; [Core C

7]; [Core C6]; [Core C1]; [Unlimited].

- **Network Stack Configuration**

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

Network Stack

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

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

Ipv4 PXE Support

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

Use this item to enable Ipv4 PXE Boot Support. When set as [Disabled], Ipv4 boot optional will not be created.

Ipv6 PXE Support

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

Use this item to enable Ipv6 PXE Boot Support. When set as [Disabled], Ipv6 boot optional will not be created.

PXE Boot Wait Time

Use this item to set wait time to press [ESC] key to abort the PXE boot.

Media Detect Count

Use this item to set number of times presence of media will be checked.

The optional settings range from [1] to [50].

- **CSM Configuration**

Use this item to CSM configuration: Enable/ Disable, Option ROM execution settings, etc

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

Compatibility Support Module Configuraton

Boot option filter

This item controls Legacy/UEFI ROMs priority.

The optional settings are: [UEFI and Legacy]; [Legacy only]; [UEFI only].

Network

This item controls the execution of UEFI and Legacy PXE OpROM.

The optional settings are: [Do not launch]; [UEFI]; [Legacy].

Storage

This item controls the execution of UEFI and Legacy Storage OpROM.
The optional settings are: [Do not launch]; [UEFI]; [Legacy].

Video

This item controls the execution of UEFI and Legacy Video OpROM.
The optional settings are: [UEFI]; [Legacy].

Other PCI devices

This item determines OpROM execution policy for devices other than Network, storage or video.
The optional settings are: [Do not launch]; [UEFI]; [Legacy].

► **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. When this function is enabled, system will wake on the time (hr:: min :: sec) specified
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 Displays and changes the system tume from the Real-Time Clock is displayed in 24-hour format.

Wake-up Second

Use this item to Displays and changes the system time from the Real-Time Clock is displayed in 24-hour format.

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 minutes.
The optional settings: [Disabled]; [Enabled].
When set as [Enabled], system will wake on the current time + increased minute(s).

Wake-up Time Increase

Use this item to 1 to 60 minute(s)

USB Wake-up from S4

Use this item to enable or disable USB wakeup from S4.

******Note****: USB Wake-up is affected by ERP function in S4. Please disable ERP before activating this function in S4.*

- **USB Configuration**

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

USB Configuration

Legacy USB Support

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

[Enabled]: To enable legacy USB support.

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

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

XHCI Hand-off

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

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

USB Mass Storage Driver Support

Use this item to enable or disable USB Mass Storage Driver Support.

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

USB Hardware Delays and Time-outs:

USB Transfer Time-out

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

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

Device Reset Time-out

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

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

Device Power-up Delay

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

The optional settings: [Auto]; [Manual].
'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.
Select [Manual] you can set value for the following sub-item: '**Device Power-up Delay in Seconds'.**

Device Power-up Delay in Seconds

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

► **Platform Trust Technology**

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

TPM Configuration

fTPM

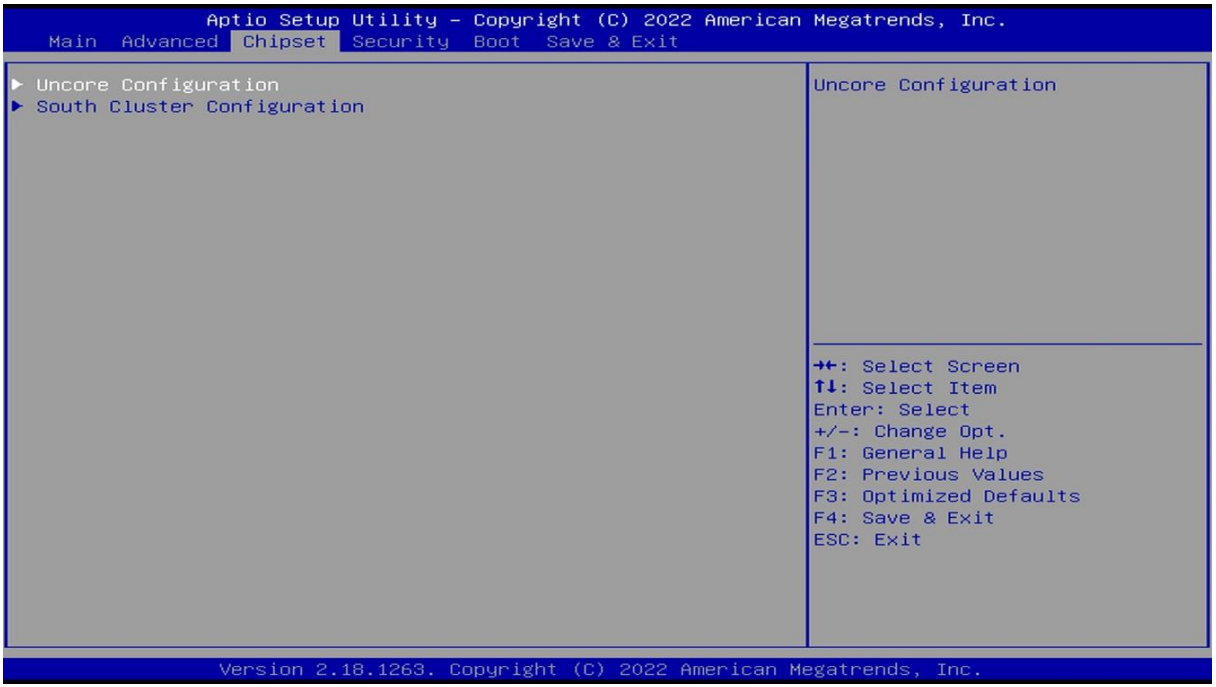
The optional settings are: [Enabled]; [Disabled].

► **Intel(R) Ethernet Controller I225-V-XX:XX:XX:XX:XX:XX**

► **Intel(R) Ethernet Controller I225-V-XX:XX:XX:XX:XX:XX**

These items show current network brief information.

3-8 Chipset Menu



► **Uncore Configuration**

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

GTT Size

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

DVMT Pre-Allocated

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

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

DVMT Total Gfx Memory

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

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

Primary IGFX Boot Display

Use this item to select the video device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection.

The optional settings are: [Auto]; [HDMI1]; [HDMI2].

Secondary IGFX Boot Display

Use this item to select Secondary Display Device.
The optional settings are: [Disabled]; [HDMI1]; [HDMI2].

Memory Configuration

The working memory information will be on display.

► **South Cluster Configuration**

▸ **PCI Express Configuration**

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

PCI Express Configuration

Peer Memory Write Enable

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

Compliance Mode

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

▸ **SATA Configuration**

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

SATA Controller

Use this item to enables or disables the chipset SATA Controller. The chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port).
The optional settings are: [Enabled]; [Disabled].
When set as [Enabled], the following items shall appear:

SATA Mode Selection

Use this item to determine how SATA controller(s) operate.

The default setting is: [AHCI].

SATA Port

SATA Port

Use this item to enable or disable each SATA port.

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

M.2

M.2

Use this item to enable or disable M.2 SATA port.

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

HD-Audio Support

Use this item to enable or disable HD-Audio Support.

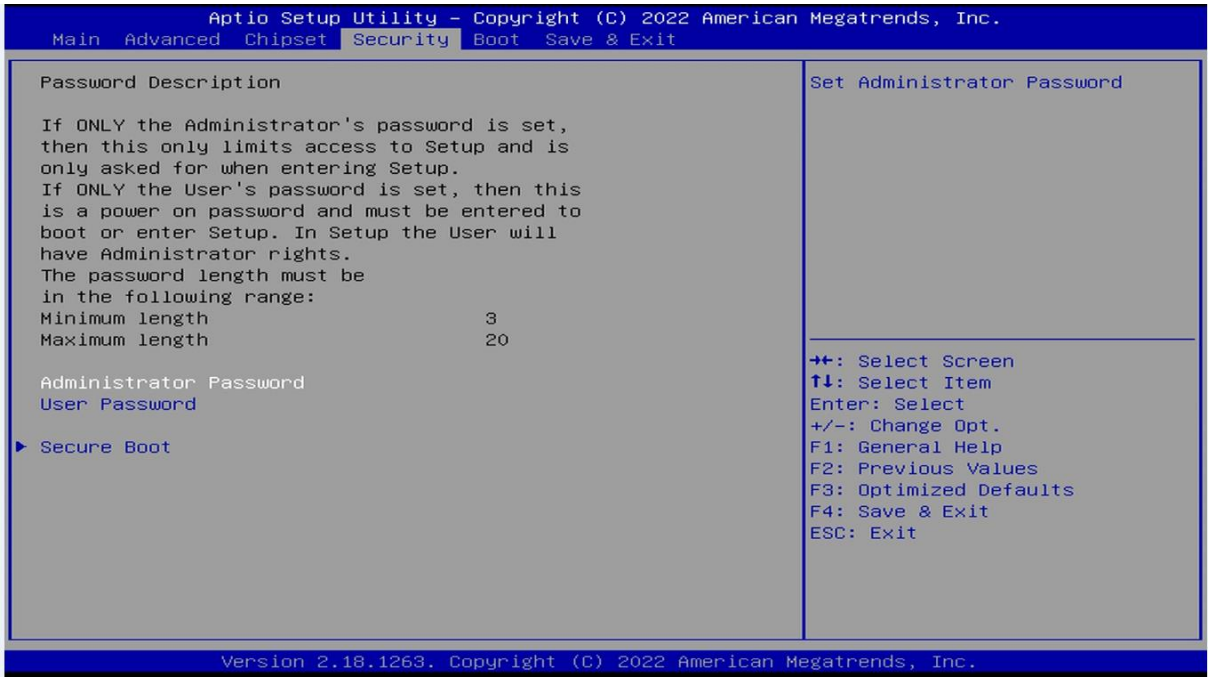
The optional settings are: [Disabled]; [Enabled].

System State after Power Failure

Use this item to specify what state to go to when power re-applied after a power failure.

The optional settings are: [Always On]; [Always Off]; [Former State].

3-9 Security Menu



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

Administrator Password

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

User Password

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

administrator password.

- **Secure Boot**

  Press [Enter] to make customized secure settings:

  Secure Boot Control

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

  Secure Boot can be enabled if 1. System running in user mode with enrolled Platform Key (PK); 2. CSM function is disabled.

  Secure Boot Mode

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

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

  **When set as [Custom], user can make further settings in 'Key Management'.*

  - **Key Management**

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

  Provision Factory Default Keys

  This item is for user to install factory default secure boot keys when system is in Setup Mode.

  - **Enroll All Factory Default Keys**

    This item forces system to User Mode-install all Factory Default keys.

  This item shows up when 'Provision Factory Default Keys**' is set as [Enabled].*

  - **Delete All Factory Default Keys**

    This item forces system to Setup Mode-clear all Secure Boot Variables.

    *This item shows up when '**Provision Factory Default Keys**' is set as [Disabled].

  - **Save all Secure Boot Variables**

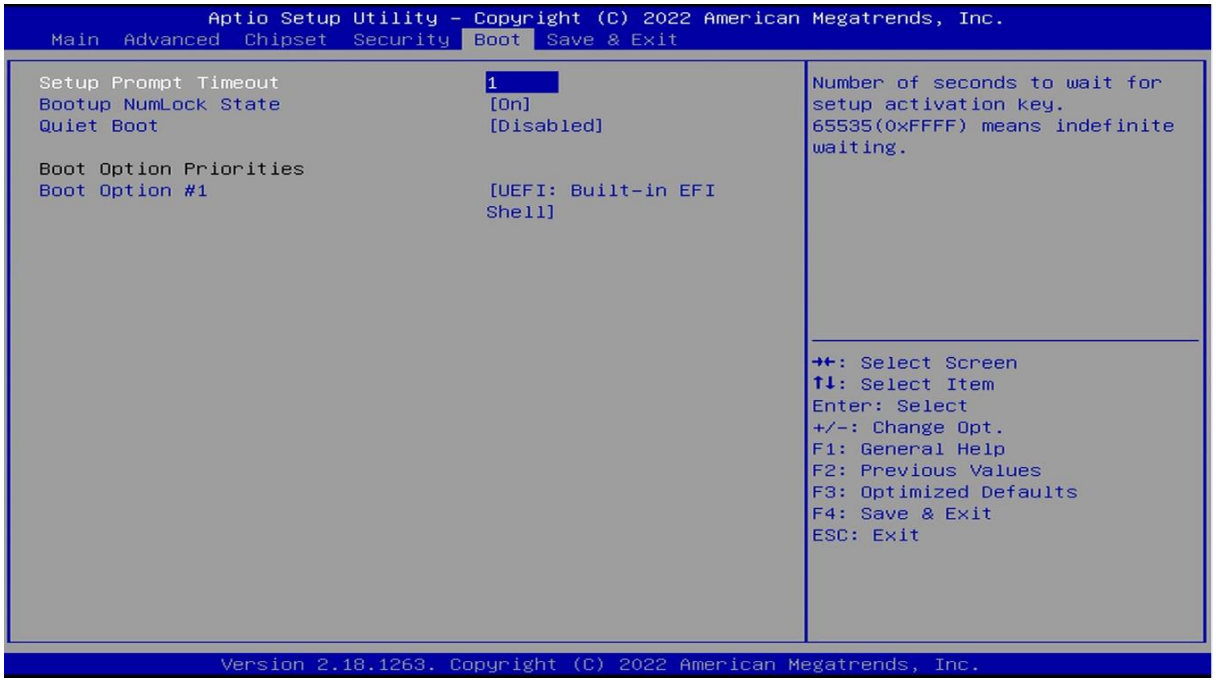
    This item will save NRRAM content of all Secure Boot variables to the files (WFI_SIGNATURE_LIST data format) in root folder on a target file system device.

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

Use this item to enroll Factory Defaults or load the keys from a file with:

1. Public Key Certificate in:
   a) EFI_SIGNATURE_LIST
   b) EFI_ CERT_X509 (DER encoded)
   c) EFI_ CERT_RSA2048 (bin)
   d) EFI_ CERT_SHA256 (bin)
2. Authenticated UEFI Variable

3-10 Boot Menu

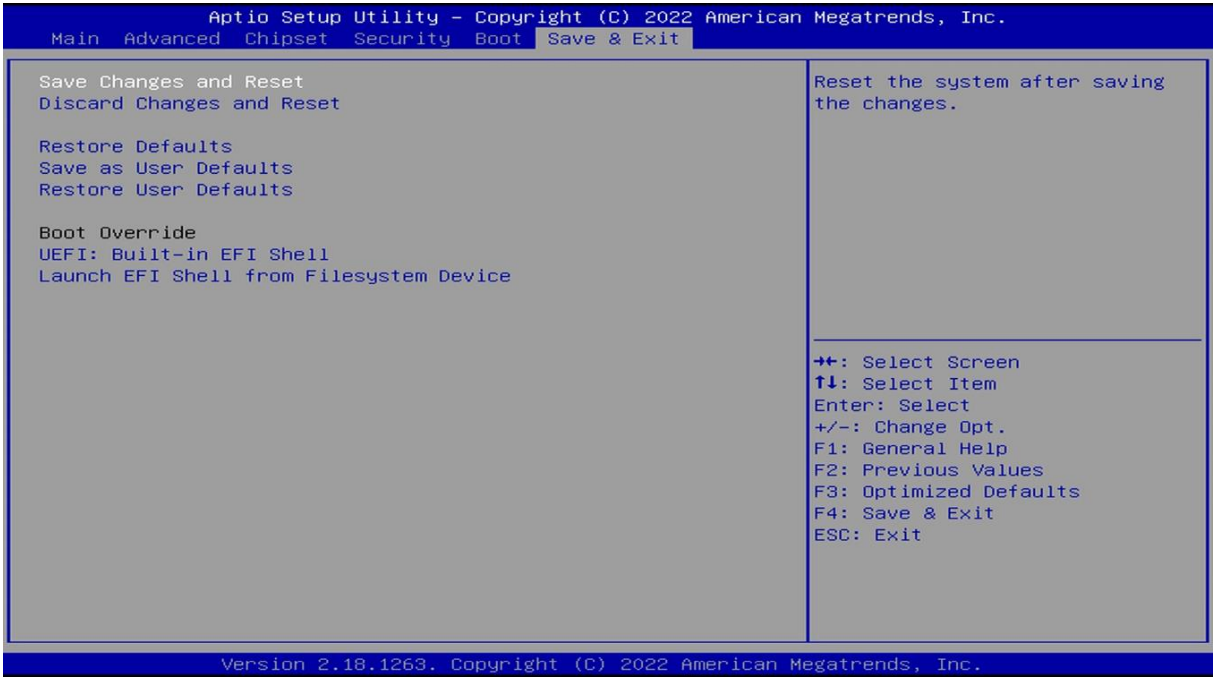


Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key.

Bootup Numlock State
Use this item to select keyboard numlock state.
The optional settings are: [On]; [Off].
Quiet Boot
The optional settings are: [Disabled]; [Enabled].
Boot Option Priorities
Boot Option #1
Use this item to decide system boot order from available options.

3-11 Save & Exit Menu



Save Changes and Reset
This item allows user to reset the system after saving the changes.

Discard Changes and Reset
This item allows user to reset the system without saving any changes.

Restore Defaults
Use this item to restore /load default values for all the setup options.
Save as User Defaults
Use this item to save the changes done so far as user defaults.
Restore User Defaults
Use this item to restore defaults to all the setup options.

Boot Override

UEFI: Built-in EFI Shell

The available options here are dynamically updated and make system boot to any boot option selected.
Lauch EFI Shell from filesystem device
Use this item to launch EFI shell application (shell.efi) from one of the available filesystem device.