



User's Manual

AMD V2000 4x4 Board BP-FP6

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These specifications are subject to change without notice.

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Federal Communications Commission (FCC) Statement


This device has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with instructions contained in this manual, may cause harmful interference to radio and television communications. However, there is no guarantee that interference will not occur in a particular installation.

If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the product into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

 Note1: Connecting this device to peripheral devices that do not comply with Class B requirements, or using an unshielded peripheral data cable, could also result in harmful interference to radio or television reception.

 Note2: The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this product.

 Note3: To ensure that the use of this product does not contribute to interference, it is necessary to use shielded I/O cables.

CE: Radiation of EN 55022 & Immunity of EN 55024

Waste Electrical and Electronic Equipment (WEEE) Statement

To protect the global environment, this product must be sent to separate collection facilities for recovery and recycling.



DISPOSAL

Do not dispose of this product as unsorted municipal waste. Collect such waste separately for special treatment.



Manufacturer

Sapphire Technology Limited

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Chapter 1 Introduction

1-1 Mainboard Specifications

APU

- AMD® V2000 series APU for FP6 package with Zen 2 core

Graphics

- AMD® Radeon Vega graphics series
- Supports two independent displays with HDMI ports

Port	Supported resolution
HDMI 2.1	4096x2160@60Hz

System Memory

- Two 260-pin DDR4 SDRAM SO-DIMM (ECC/Non ECC) sockets
- Supports 1.2V DDR4-2133/2400/2666/2933/3200 DIMMs with dual channel architecture
 - * The memory speed will be depend on CPU specification
- Supports 4GB, 8GB, 16GB and 32GB DDR4 SO-DIMMs up to maximum 64GB

Expansion Slots

- One M.2 Slot E-key with 2230 type with PCIe x1 and USB2.0 for Wifi/BT
- One M.2 Slot M-key with 2242/2280 storage type with PCIe x4 for SSD

USB Ports

- Two USB 2.0 ports supported with a 10 pin header and one USB 2.0 supported with a 4 pin header, supporting transfer speed up to 480Mbps
- Two USB3.1 ports at rear panel and two USB3.1 ports at front panel, supporting transfer speed up to 10Gbps
- Supports wake-up from S3 and S4 modes

SATA Port

- One SATA3 port with 6Gb/s data transfer rate

-
- Supports AHCI (Advanced Host Controller Interface)

Onboard LAN

- One Gigabit Ethernet from Realtek® RTL8111H Gigabit controller

Onboard TPM

- Supports TPM2.0 from Infineon SLB9670

Onboard Audio

- Supports 2-channel High-Definition audio from Realtek ALC256 codec

I/O

- Onboard Fintek F81803U LPC bus I/O controller
- Supports Hardware Monitor for fan speed monitoring, CPU and system temperature

Back Panel I/O Ports

- 1 x RJ45 LAN port
- 2 x HDMI ports
- 2 x USB3.1 ports
- 1 x DC-in 12V~19V Jack, dimension: 5.5x2.5mm

Front Panel I/O Ports

- 2 x USB3.1 ports
- 1 x 4-conductor 3.5mm Audio jack with Left/Right Audio out and MIC in

Internal I/O Connectors

- 1 x 4-pin 12V ATX Power connector
- 1 x SATA3 connector
- 1 x SATA power header, 1.25mm pitch
- 1 x Front Panel header, 2.00mm pitch
- 1 x COM header, 2.00mm pitch
- 1 x USB2.0 10-pin header, 2.54mm pitch (It can be used to connect to 2 USB 2.0 devices)
- 1 x USB2.0 4-pin header, 2.54mm pitch

-
- 1 x Case Open header, 2.54mm pitch
 - 1 x GPIO header, 2.54mm pitch
 - 1 x SPI header, 1.27mm pitch
 - 1 x 4-pin APU Fan header, 1.25mm pitch
 - Battery header, 1.25mm pitch

Onboard Jumper

- Auto Power ON selection jumper, 2.54mm pitch
- Clear CMOS jumper, 2.54mm pitch

BIOS

- 128Mb SPI Flash with AMI based BIOS
- Supports ACPI (Advanced Configuration and Power Interface)
- Onboard jumper to clear the CMOS data

Dimensions

- Size: 104.89mm × 109.6mm

Operating systems

- Supports Windows 10 (64bit), Ubuntu 20.04.1 (64-bit)

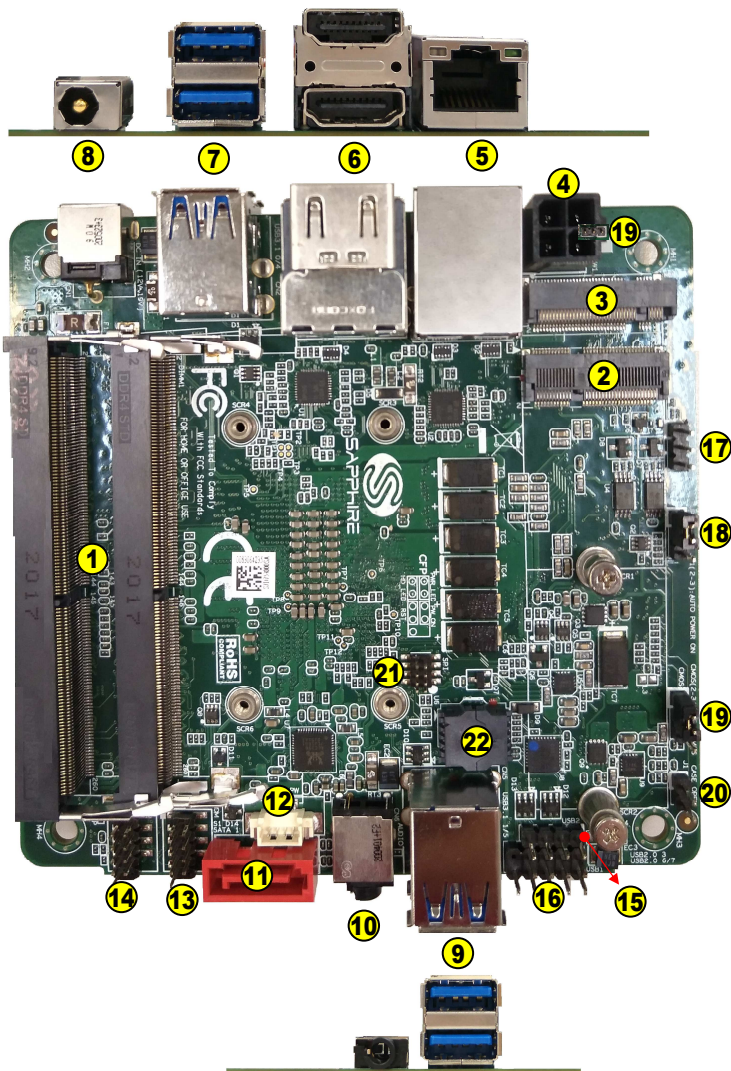
Environmental

- Power Requirement: Power adapter of 12V~19V DC OUT, >65W, 5.5/2.5mm power jack, input voltage tolerance +/- 10%
- Operating Temperature: 0°C~50°C (32°F~122°F)
- Storage Temperature: -20°C~80°C (-4°F~176°F)
- Relative Humidity: 10%~90%

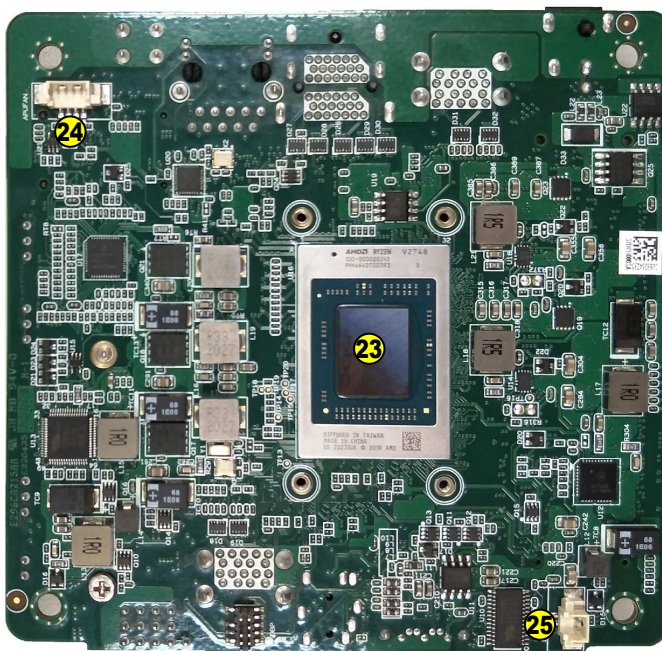
1-2 Mainboard Layout

The following figure shows the location of components on the mainboard. See page 5 for component description.

Front view of mainboard:



Back view of mainboard:



Note:

Picture is for reference only, actual board may be slightly different.

Item	Component description	Item	Component description
1	DDR4 SO-DIMM *2	14	Front Panel Header, 2.00mm pitch
2	M.2 E-Key slot for Wifi/BT card	15	USB2.0 Header, 4-pin 2.54mm pitch
3	M.2 M-key for SSD device	16	USB2.0 Header, 10-pin 2.54mm pitch (It can be used to connect to 2 USB 2.0 devices)
4	4-pin 12V ATX power connector	17	GPIO Header, 2.54mm pitch
5	1GbE RJ45 LAN Port	18	Auto Power ON Jumper, 2.54mm pitch
6	HDMI Port *2	19	Clear CMOS Jumper, 2.54mm pitch
7	USB3.1 Port *2	20	Case Open Header, 2.54mm pitch
8	DC-in 12V ~ 19V Jack ^(Note)	21	SPI Header, 1.27mm pitch
9	USB3.1 Port *2	22	BIOS
10	Audio Jack (Line-out/Mic) (See next page for phone jack plug definition)	23	AMD FP6 APU
11	SATA3 connector	24	APU Fan Header, 1.25mm pitch
12	SATA Power Header, 1.25mm pitch	25	Battery Header, 1.25mm pitch
13	COM1 Header, 2.00mm pitch		

Note:

There are two ways to source power to the board: DC jack or 4-pin ATX power connector. Two different physical ports that can only be used one at a time.
e.g. When DC-in 12V ~ 19V jack is being used, the 4-pin power connector (PW1) shouldn't be connected to any power source.

Warning:

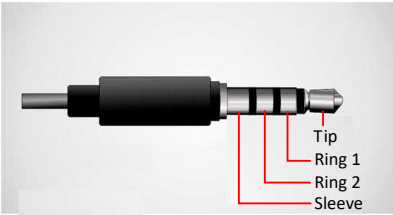
One of the power inputs may be damaged when connecting both DC jack and ATX power at the same time.

Phone jack plug definition

TRRS (Tip Ring Ring Sleeve) Standards:

Standard	Tip	Ring 1	Ring 2	Sleeve
OMTP	Left Audio	Right Audio	Microphone	Ground
CTIA / AHJ	Left Audio	Right Audio	Ground	Microphone

Ring 2 and Sleeve below is auto detectable by BP6.
That is, either type of TRRS can be used.

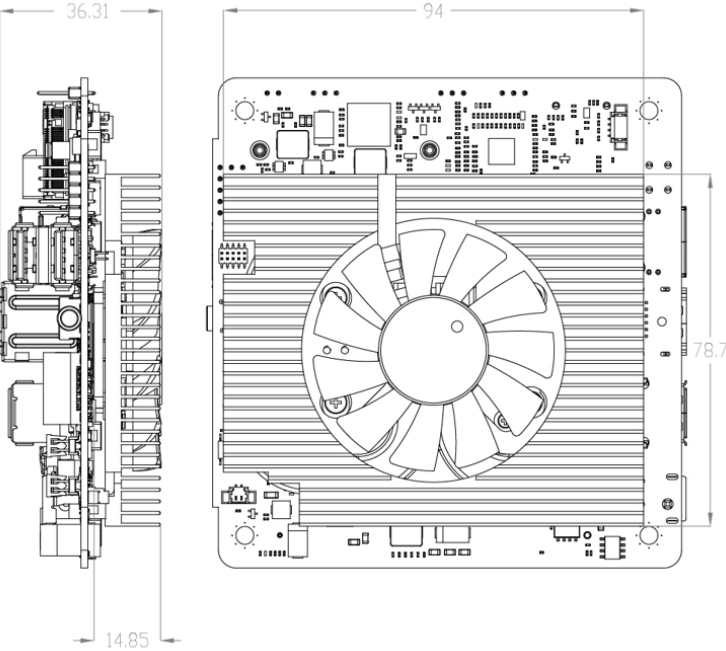


PCB size: 104.89 x 109.6mm

PCB size: 104.89 x 109.6mm



Cooler size: 94 x 78.7 x 14.85 mm



Chapter 2 Installation

2-1 Installing System Memory

This mainboard has two 260-pin SO-DIMM (ECC/Non ECC) sockets for DDR4 memory.

- Supports 4GB, 8GB, 16GB and 32GB DDR4 SO-DIMMs up to maximum 64GB.
- Supports 1.2v DDR4-2133/2400/2666/2933/3200 DIMMs with dual channel architecture.

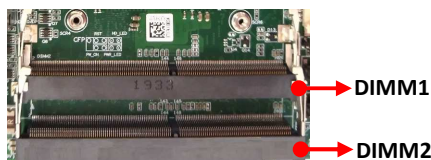
* The memory speed will be depend on CPU specification.

Make sure that you install memory modules of the same type and density in different channel DIMM slots for Dual-Channel mode.

Memory Configuration

To use 1 DIMM: Install the first DIMM in the top socket (DIMM slot 2)

To use 2 DIMMs: Install into DIMM slot 1 and DIMM slot 2.



Memory Installation

DDR4 and DDR3 memory modules are physically different. Please only install DDR4 DIMMs on this mainboard. To make sure you have the correct DIMM, check that all the notches line up with the DDR4 DIMM slot.

To install the DIMM, follow these steps:

1. Align the notch in the DIMM with the key in the socket.
2. Insert the DIMM firmly into the slot at a 30-45 degree angle, and until it clicks into place.

To remove DIMM from a socket, gently spread the socket's retention arms to disengage them from the DIMM.

Note: To avoid damaging the DIMM, do not touch its contact edge.

2-2 Installing Expansion Cards

The mainboard provides

One M.2 Slot E-key with 2230 type with PCIe x1 and USB2.0 for Wifi/BT

One M.2 Slot M-key with 2242/2280 storage type with PCIe x4 for SSD



- M2:
M.2 M-key for M.2 SSD device
- M1+:
M.2 E-key for wifi/bluetooth card

Note:
Recommended torque for the M.2
hold down screws: 1 ~ 1.5lbf.

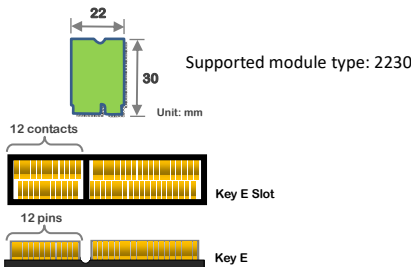
M.2 E-Key Slot

To install the M.2 wifi/bluetooth card (type 2230) only:

1. Remove screw&standoff and align the notch on the M.2 2230 edge connector with the tab in the slot.
2. Plug the M.2 2230 firmly into the slot at a 20-degree angle, and until it clicks into place.
3. Fasten M.2 2230 onto the nut with screw&standoff.



Note:
The mainboard in the picture is not
actual mainboard, just for reference.



M.2 M-Key Slot

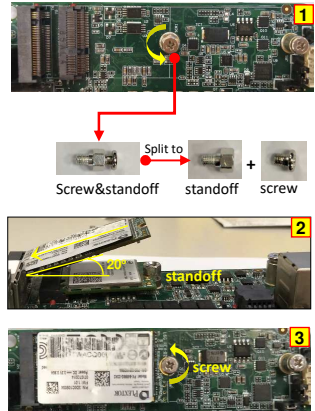
To install the M.2 SSD device (type 2242/2280):

Please note: for different modules type, need to use corresponding standoff or screw to fasten them.

If have a M.2 wifi/bluetooth card (2230), need to install the M.2 2230 first.

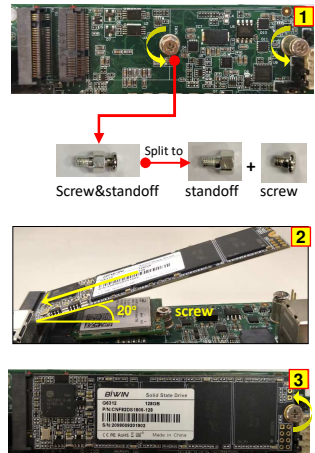
♦ Use M.2 2230 + M.2 2242:

1. Remove screw&standoff.
2. Use standoff to fasten M.2 2230 first.
Align the notch on the M.2 2242 edge connector with the tab in the slot.
Plug the M.2 2242 firmly into the slot at a 20-degree angle, and until it clicks into place.
3. Fasten M.2 2242 onto the standoff with screw.



♦ Use M.2 2230 + M.2 2280:

1. Remove all screws and standoff.
2. Use screw to fasten M.2 2230 first.
Align the notch on the M.2 2280 edge connector with the tab in the slot.
Plug the M.2 2280 firmly into the slot at a 20-degree angle, and until it clicks into place.
3. Fasten M.2 2280 onto the nut with screw.
4. Please keep the remaining standoff for use when needed.



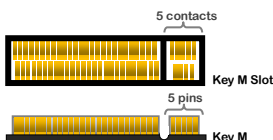
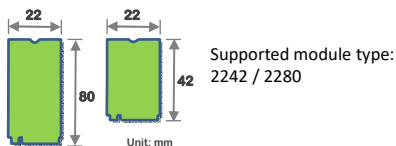
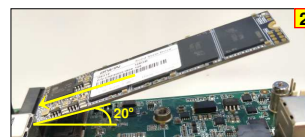
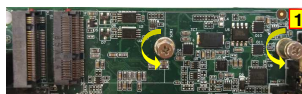
♦ Use M.2 2242 only:

1. Remove screw and leave the standoff on nut.
2. Align the notch on the M.2 2242 edge connector with the tab in the slot. Plug the M.2 2242 firmly into the slot at a 20-degree angle, and until it clicks into place.
3. Fasten M.2 2242 onto the standoff with screw.



♦ Use M.2 2280 only:

1. Remove all screws and standoff.
2. Align the notch on the M.2 2280 edge connector with the tab in the slot. Plug the M.2 2280 firmly into the slot at a 20-degree angle, and until it clicks into place.
3. Fasten M.2 2280 onto the nut with screw.
4. Please keep the remaining screw&standoff for use when needed.



Note:

The mainboard in the picture is not actual mainboard, just for reference.

Removing Device Caution

- Remove the M.2 wifi/bluetooth card or M.2 SSD device at a 20-degree angle.
- Please DO NOT pull up the M.2 wifi/bluetooth card or M.2 SSD device to avoid damage to the M.2 slot.



2-3 Connecting Cables and Jumper Settings

This section takes you through all the necessary connections on the mainboard.

Front Panel Header

The front panel header (CFP, 2.00mm pitch) on this motherboard is used to connect the front panel switches and LEDs.

▶ **PWR_LED**

Attach the front panel power LED cable to these two pins of the connector.

The Power LED indicates the system's status.

System Status	Power LED indicates
S0	The LED is on
S5	The LED is off
S3	The LED will blink
S4	The LED is off

▶ **PW_ON**

Attach the power button cable from the case to these two pins. Pressing the power button on the front panel turns the system on and off rather than using the onboard button.

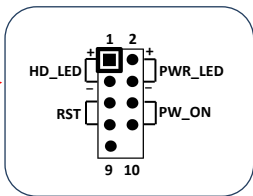
▶ **HD_LED**

Attach the hard disk drive indicator LED cable to these two pins. The HDD indicator LED indicates the activity status of the hard disks.

Note: The HDD indicator LED supports SATA HDD only.

▶ **RESET**

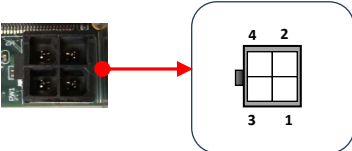
Attach the Reset switch cable from the front panel of the case to these two pins. The system restarts when the RESET switch is pressed.



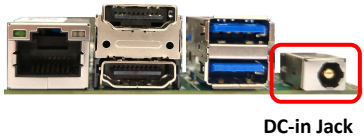
Header	Pin	Signal
HD_LED	1	HD_PWR
	3	HD Active
PWRLED	2	PWR LED+
	4	PWR LED-
RESET	5	Ground
	7	RST BTN
PWRSW	6	PWR BTN
	8	Ground
No Connect	9	+5V
Empty	10	Empty

4-pin 12V ATX Power Connector

The PW1 power connector is used to provide power to the system. Align the power plug to the connector and press firmly until seated.



Pin	Definition
1	GND
2	GND
3	12V
4	12V



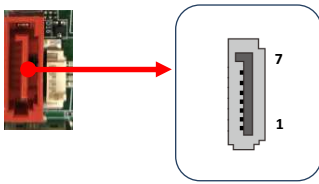
DC-in Jack

Note:
There are two ways to source power to the board: DC jack or 4-pin ATX power connector. Two different physical ports that can only be used one at a time.
e.g. When DC-in 12V ~ 19V jack is being used, the 4-pin power connector (PW1) shouldn't be connected to any power source.

Warning:
One of the power inputs may be damaged when connecting both DC jack and ATX power at the same time.

SATA3 Connector

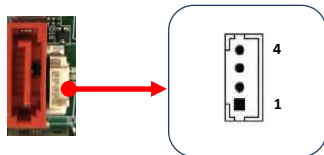
The S1 is SATA3 Connector and works at speeds of up to 6G/s. Each cable can be used to connect one SATA drive to the mainboard.



Pin	Definition
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

SATA Power Header

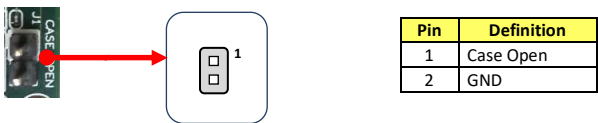
The SATA Power header (1.25mm pitch) is used to provide 5V power to SATA3 connector.



Pin	Definition
1	GND
2	GND
3	+5V
4	+5V

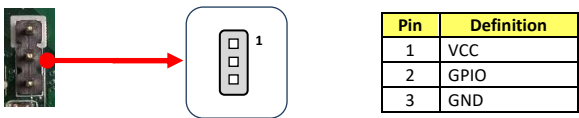
Case Open Header

This header (2.54mm pitch) is used to for a chassis open detect. When set, the warning message will appear during POST when the case is opened.



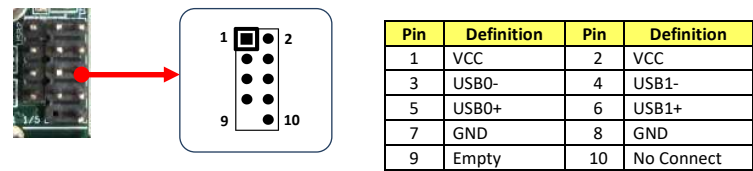
GPIO Header

There is a GPIO (General-purpose input/output) header (2.54mm pitch) on the motherboard. It can connect a variety of simple one- or two-wire devices.



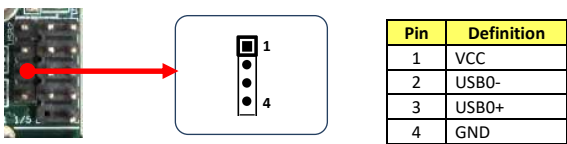
USB2.0 Header (10-pin)

This mainboard contains one 10-pin onboard header connectors (2.54mm pitch) that can be used to connect to two (2) external USB 2.0 devices.



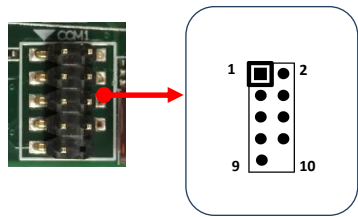
USB2.0 Header (4-pin)

This mainboard contains one 4-pin onboard header (2.54mm pitch) that can be used to connect to one (1) external USB 2.0 device.



COM Header

The Serial port header (COM1, 2.00mm pitch) can provide one serial port via an optional COM port cable.

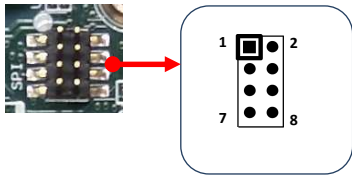


Pin	Definition	Pin	Definition
1	DCD	2	RXD
3	TXD	4	DTR
5	GND	6	DSR
7	RTS	8	CTS
9	RI#	10	Empty

Note:
The pin definition of header and standard DB9 male pin out is different.

SPI Header

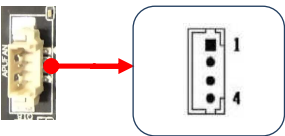
The SPI header (1.27mm pitch) is for SPI signal interface.



Pin	Definition	Pin	Definition
1	CS	2	VDD
3	SO	4	SOLD
5	WP	6	CLK
7	VSS	8	SI

Fan Header

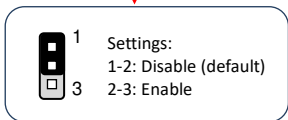
There is a fan header (1.25mm pitch) on the motherboard. It can connect CPU Fan or Memory Module Fan for cooling. This fan can be speed detected/controlled and displayed in the Hardware Monitor section of the CMOS Setup. The fan is automatically turned off after the system enters S3, S4 or S5 mode.



Pin	Definition
1	Sense
2	GND
3	Control
4	+5V

Auto Power ON Jumper

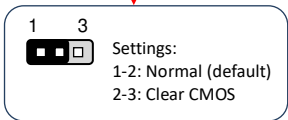
You can use JP1 (2.54mm pitch) to select to enable or disable the auto power on function.



Pin	Settings
1-2	Disable. Press power button manually to power on after power input is connected to power source (Default)
2-3	Enable. Automatically power on when power input is connected to power source

Clear CMOS Jumper

This mainboard contains a jumper (CMOS1, 2.54mm pitch) that can clear CMOS data. If the CMOS data becomes corrupted or you forgot the supervisor or user password, clear the CMOS data to reconfigure the system back to the default values stored in the ROM BIOS.



To clear CMOS data, please follow the steps below.

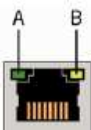
1. Turn off the system.
2. Change the jumper from “1-2” to “2-3” position for a few seconds.
3. Replace the jumper back to the “1-2” position.
4. Turn on the system and hold down the key to enter BIOS Setup.

Note:

When use clear CMOS function, the DC jack and the 4-pin power connector shouldn't be connected to any power source.

Note for LAN Port

Two LEDs are built into the RJ-45 LAN connector. These LEDs indicate the status of the LAN.



LED	LED Color	LED state	Indicates
A	Green	Off	LAN link is not established
		On	LAN link is established
		Blinking	LAN activity is occurring
B	N/A	Off	10 Mb/s data rate
	Green	On	100 Mb/s data rate
	Yellow	On	1000 Mb/s data rate

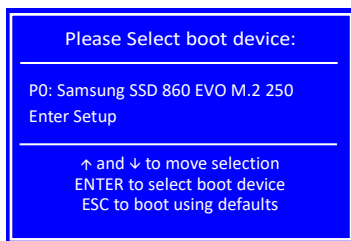
Chapter 3 Configuring the BIOS

This chapter provides information on the BIOS Setup program and allows you to configure the system for optimum use.

3-1 Select Boot Device

Select Boot Device Menu allows you to set the first boot device without entering BIOS Setup.

During Power On Self Test (POST), you can press the <**F7**> key to enter select boot device menu. The system will directly boot from the device configured in Boot Menu.





3-2 Enter BIOS Setup

The BIOS is the communication bridge between hardware and software. Correctly setting the BIOS parameters is critical to maintain optimal system performance.

Use the following procedure to change BIOS settings.

1. Power on the computer.
2. Press the <**Del**> or <**F2**> key to enter BIOS Setup during BIOS Power On Self Test (POST).

 Note1: It is strongly recommended that you do not change the default BIOS settings. Changing some settings could damage your computer.

 Note2: The BIOS options in this manual are for reference only. 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 from our official website.

Control Keys

Please check the following table for the function description of each Control key.

Control Key(s)	Function Description
← / →	Moves cursor left or right to select screens
↑ / ↓	Moves cursor up or down to select items
<Enter>	To bring up the selected item
+ / -	To change option for the selected items
<F1>	To display the General Help Screen
<F2>	To load previous values for all the settings
<F3>/<F9>	To load optimized default values for all the settings
<F4>/<F10>	To save changes and exit the setup utility
<ESC>	To jump to the Exit Screen or exit the current screen

3-3 Main Menu

When entering the Aptio Setup Utility, the main menu screen appears. This main menu includes the system overview and displays the basic system configuration, such as BIOS information, memory size and system date/time.

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.			
Main	Advanced	Chipset	Security Boot Save & Exit
BIOS Information		Set the Date. Use Tab to switch between Date elements.	
BIOS Vendor	American Megatrends		Default Ranges:
Core Version	5.16		Year: 1998-9999
Compliance	UEFI 2.7; PI 1.6		Months: 1-12
Project Version	V013 (I917H013.ROM) x64		Days: Dependent on month
Build Date and Time	03/05/2021 12:47:54		Range of Year may vary.
Access Level	Administrator		
Memory Information		→←: Select Screen	
Total Memory	16384 MB (DDR4-2133)		↑↓: Select Item
System Date	[Mon 03/08/2021]		Enter: Select
System Time	[15:01:03]		+/-: Change Opt.
			F1: General Help
			F2: Previous Values
			F3/F9: Optimized Defaults
			F4/F10: Save & Exit
			ESC: Exit
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BIOS Information

This field displays the current BIOS version, build date and ID information etc..

Memory Information

Displays current system memory size.

System Date

Allows you to set the system date. The format is <Day> <Month> <Date> <Year>.

[Day] Weekday from Sun. to Sat., this is automatically displayed by BIOS.

[Month] The month from 1 to 12.

[Date] The date from 1 to 31 can be keyed by numeric function keys.

[Year] The year can be adjusted by users.

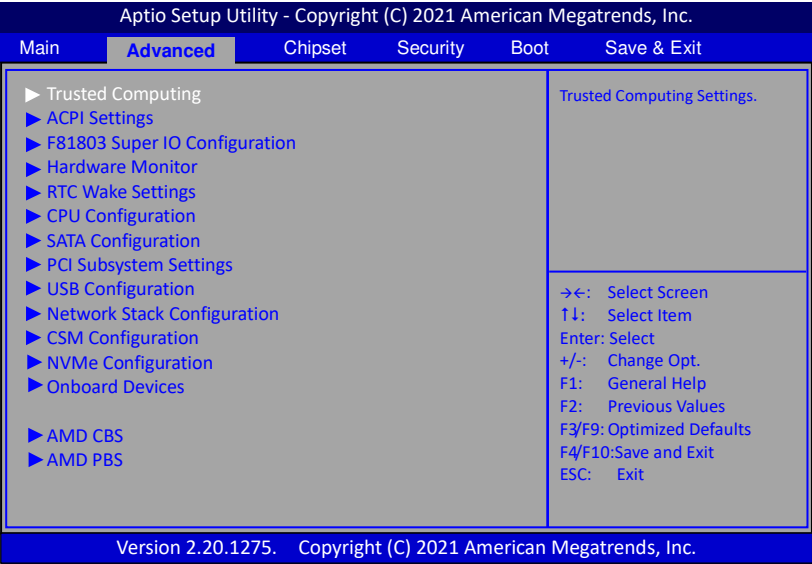
System Time

Allows you to set the system time. The time format is

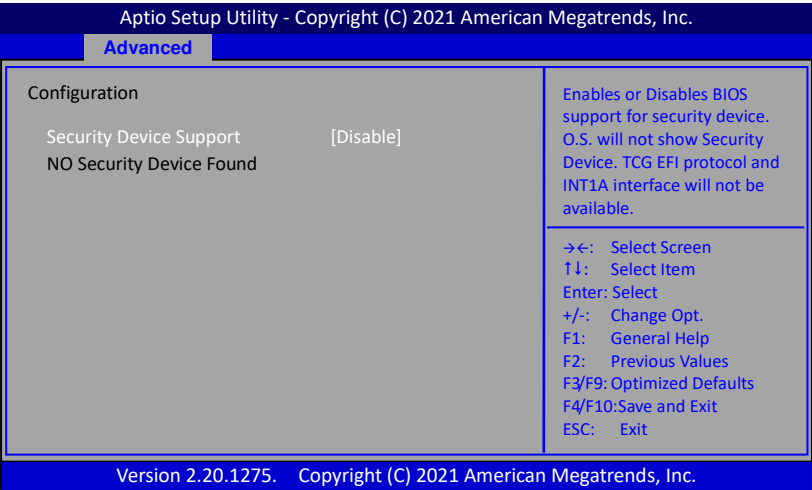
<hour>:<minute>:<second>.

3-4 Advanced Menu

The Advanced menu items allow you to change the settings for the CPU, USB and other system devices. Press <Enter> to display the configuration options.



► Trusted Computing



Security Device Support

Enables or disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. When enabled, the related items will appear.

Options: Enabled, Disabled.

SHA-1 PCR Bank

Enable or disable SHA-1 PCR Bank.

Options: Enabled, Disabled.

SHA256 PCR Bank

Enable or disable SHA256 PCR Bank.

Options: Enabled, Disabled.

Pending operation

Schedule an Operation for the Security Device.

NOTE: Your Computer will reboot during restart in order to change State of Security Device.

Options: None, TPM Clear.

Platform Hierarchy

Enables or disable Platform Hierarchy.

Options: Enabled, Disabled.

Storage Hierarchy

Enables or disable Storage Hierarchy.

Options: Enabled, Disabled.

Endorsement Hierarchy

Enables or disable Endorsement Hierarchy.

Options: Enabled, Disabled.

TPM2.0 UEFI Spec Version

Select the TCG2 Spec Version Support.

TCG_1_2: The Compatible mode for Win8/Win10.

TCG_2: Support new TCG2 protocol and event format for Win10 or later.

Options: TCG_1_2, TCG_2.

Physical Presence Spec Version

Select to Tell O.S. to support PPI Spec version 1.2 or 1.3. Note some HCK tests might not support 1.3.

Options: 1.2, 1.3.

► **ACPI Settings**

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Advanced

ACPI Settings

Enable Hibernation

[Enabled]

ACPI Sleep State

[S3 (Suspend to RAM)]

APU ACPI Shutdown Temperature

[Disabled]

EuP Function

[Disabled]

Enables or Disables System ability to Hibernates (OS/S4 Sleep State). This option may not be effective with some operating systems.

→<: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3/F9: Optimized Defaults
F4/F10: Save and Exit
ESC: Exit

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Enable Hibernation

This item allows you to enable system ability to Hibernates (OS/S4 Sleep State). This option may be not effective with some OS.
Options: Enabled, Disabled.

ACPI Sleep State

Allow you to select the power saving modes for ACPI function.
Options: Suspend Disabled, S3 (Suspend to RAM).

APU ACPI Shutdown Temperature

If the APU temperature is higher than ACPI shutdown temperature, the system will shut down. When set to "Enabled" option. The following items will appear.

Shutdown Temperature

Allows you set a value of temperature for system shutdown.
The default is 80.

EuP Function

Enables the EuP (Energy Using Products) function, allows BIOS to switch off some power at S5 state to get system ready for the EuP requirement to reduce power consumption.
Options: Enabled, Disabled.

► F81803 Super IO Configuration

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.	
Advanced	
F81803 Super IO Configuration	Set Parameters of Serial Port 1 (COMA)
Super IO Chip F81803	
► Serial Port 1 Configuration	
	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3/F9: Optimized Defaults F4/F10: Save and Exit ESC: Exit
Version 2.20.1275. Copyright (C) 2021 American Megatrends, Inc.	

Serial Port 1 Configuration

Serial Port

Enables the Serial Port 1 support.

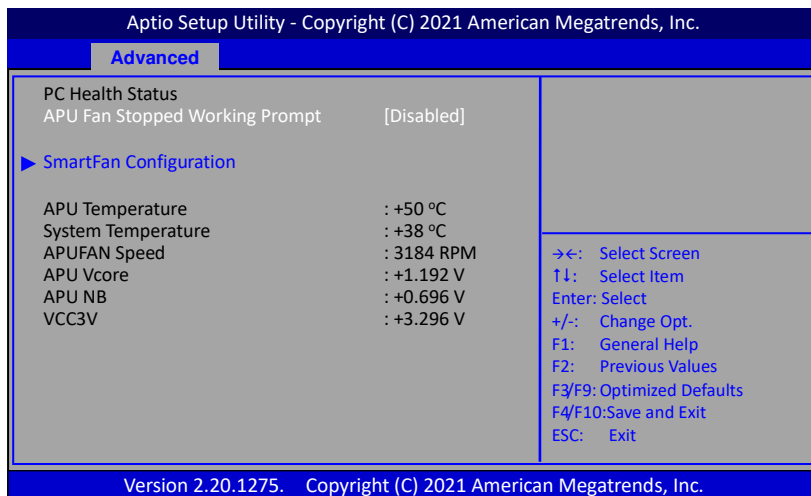
Options: Enabled, Disabled.

Change Settings

Select an optimal setting for super I/O device.

Options: Auto, IO=3F8H; IRQ=4; IO=3F8h; IRQ=3,4,5,6,7,9,10,11,12;
IO=2F8h; IRQ=3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ=3,4,5,6,7,9,10,11,12;
IO=2E8h; IRQ=3,4,5,6,7,9,10,11,12.

► Hardware Monitor



APU Fan Stopped Working Prompt

When the cooler is damaged or the APU fan connector is not connected even other factors affecting fan operation, the APU Fan will be stopped working. Meanwhile the system will automatically restart and appear prompt message (Shown below) during POST.

You can make a selection to enter the system.



► **Smart Fan Configuration**

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.		
Advanced		
SmartFan Configuration		Fan Mode Setting
APUFan Mode Setting	[SmartFan]	
Highest Fan Speed In Percentage	100	
1st Temperature Threshold (°C)	80	
2nd Fan Speed In Percentage	80	
2nd Temperature Threshold (°C)	70	
3rd Fan Speed In Percentage	70	
3rd Temperature Threshold (°C)	60	
4th Fan Speed In Percentage	60	
4th Temperature Threshold (°C)	50	
Lowest Fan Speed In Percentage	40	
		→←: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3/F9: Optimized Defaults
		F4/F10: Save and Exit
		ESC: Exit
Version 2.20.1275. Copyright (C) 2021 American Megatrends, Inc.		

APUFan Mode Setting

This item controls the speed of the various fans on the motherboard.

SmartFan: When you want the speed of the fans automatically controlled based on temperature.

Manual By DutyCycle: To set the fan speed to a constant rate, the speed from 0% to 100%.

Manual By RPM: This item sets the fan speed at a fixed.

APU / System Temperature

Displays the current APU / System Temperature.

APUFAN Speed

Displays the current APU Fan Speeds.

APU Vcore / APU NB / VCC3V

The current voltages are automatically detected and displayed by the system.

► **RTC Wake Settings**

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Advanced

Wake system at specific Time	[Disabled]	Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified.
Wake System duration after shutdown	[Disabled]	

→←: Select Screen

↑↓: Select Item

Enter: Select

+/-: Change Opt.

F1: General Help

F2: Previous Values

F3/F9: Optimized Defaults

F4/F10: Save and Exit

ESC: Exit

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Wake system at specific Time

Enable or disable system wakeup on alarm event. When enabled, the related items will appear.

Options: Enabled, Disabled.

Wake up days of the week

This item allows you to select days of the week to wake up the system.

Options: Every day, Selective.

Wake up hour / Wake up minute

This item allows you to set the system to wake up at the hr:min specified.

Wake System duration after shutdown

When enabled, system will wake up at current time + Increment in minutes(s) after shutdown. When enabled, the related items will appear.

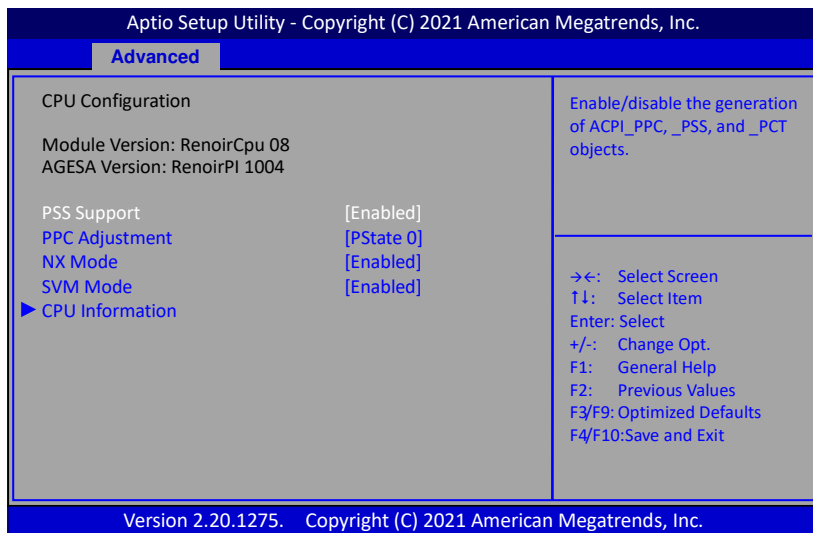
Options: Enabled, Disabled.

Duration (minute)

This item allows you to set duration time to wake system.

Options: 1 ~ 30.

► CPU Configuration



PSS Support

It's a power save function for the CPU. You can enable it, or disable it for added stability for overclocking.

Options: Enabled, Disabled.

PPC Adjustment

Allows you to adjust _PPC object.

Options: PState 0, PState 1, PState 2.

NX Mode

Enable or disable No-execute page protection function.

Options: Enabled, Disabled.

SVM Mode

Enables the CPU SVM (Secure Virtual Machine) function.

Options: Enabled, Disabled.

► **CPU Information**

Displays current processor information.

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Advanced

Socket0: AMD Ryzen Embedded V2718 with Radeon Graphics
8 Core(s) Running @ 1728 MHZ 1218 mV
Processor Family: 17h
Processor Model: 60h-6Fh
CPUID: 00860F01
Current Speed:1700 MHZ
Min Speed:1400 MHZ
Microcode Patch Level: 8600103

----- Cache Per Core -----
L1 Instruction Cache: 32 KB/8-way
L1 Data Cache: 32 KB/8-way
L2 Cache: 512 KB/8-way
Total L3 Cache per Socket: 8 MB/16-way

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► **SATA Configuration**

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.

Advanced

SATA Configuration

SATA Controller 0:
Port0 (S1 SATA)SAMSUNG SSD 885 (256.0GB)

SATA Controller 1:
Port0 (M.2 M-Key)SAMSUNG MZNLN1 (128.0GB)

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3/F9: Optimized Defaults
F4/F10: Save and Exit
ESC: Exit

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Port0 (S1 SATA) / Port0 (M.2 M-Key)

This field shows SATA ports connection state.

► **PCI Subsystem Settings**

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Advanced

AMI PCI Driver Version: A5.01.19

PCI Settings Common for all Devices:

SR-IOV Support [Disabled]

Change Settings of the Following PCI Devices:

WARNING: Changing PCI Device(s) settings may have unwanted side effects! System may HANG! PROCEED WITH CAUTION.

If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3/F9: Optimized Defaults
F4/F10: Save and Exit

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SR-IOV Support

If system has SR-IOV capable PCIe devices, this option enables or disables Single Root IO Virtualization support.

Options: Enabled, Disabled.

► **USB Configuration**

Aptio Setup Utility - Copyright (C) 2021 American Megatrends, Inc.		
Advanced		
USB Configuration		Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLED option will keep USB devices available only for EFI applications.
USB Module Version	25	
USB controllers:	2 XHCIs	
USB Devices:	1 Keyboard, 1 Mouse	
Legacy USB Support	[Enabled]	
XHCI Hand-off	[Enabled]	→←: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3/F9: Optimized Defaults F4/F10: Save and Exit ESC: Exit
USB Mass Storage Driver Support	[Enabled]	
USB Hardware delays and time-outs:		
USB transfer time-out	[5 sec]	
Device reset time-out	[10 sec]	
Device power-up delay	[Auto]	

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Legacy USB Support

Allows you to select legacy support for USB devices.

Enabled: Enables Legacy USB support.

Disabled: Keep USB devices available only for EFI application.

Auto: Disables 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.

Options: Enabled, Disabled.

USB Mass Storage Driver Support

Allows you to enable or disable USB Mass Storage Driver support.

Options: Enabled, Disabled.

USB transfer time-out

The time-out value for control, bulk, and interrupt transfers.

Options: 1 sec, 5 sec, 10 sec, 20 sec.

Device reset time-out

Sets USB mass storage devices start unit command time-out.

Options: 10 sec, 20 sec, 30 sec, 40 sec.

Device power-up delay

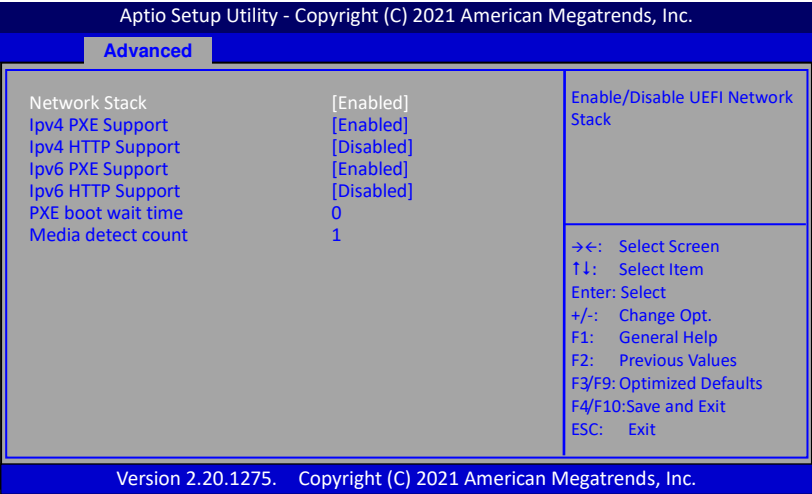
Maximum time the device will take before it properly reports itself to the Host

controller. 'Auto' uses default values: for a Root port it is 100ms, for a Hub port the delay is taken from Hub descriptor.
Options: Auto, Manual.

Device power-up delay in seconds

This item is used to set a wait time in seconds for device power-up delay.
Options: 1 ~ 40.

► **Network Stack Configuration**



Network Stack

This item is used for network boot in UEFI mode.
Options: Enabled, Disabled.

Ipv4 PXE Support

This item is used to enable or disable the Ipv4 PXE boot support. If disabled, Ipv4 PXE boot option will not be available.
Options: Enabled, Disabled.

Ipv4 HTTP Support

This item is used to enable or disable the Ipv4 HTTP boot support. If disabled, Ipv4 HTTP boot option will not be available.
Options: Enabled, Disabled.

Ipv6 PXE Support

This item is used to enable or disable the Ipv6 PXE boot support. If disabled

Ipv6 PXE boot option will not be available.
Options: Enabled, Disabled.

Ipv6 HTTP Support

This item is used to enable or disable the Ipv6 HTTP boot support. If disabled, Ipv6 HTTP boot option will not be available.
Options: Enabled, Disabled.

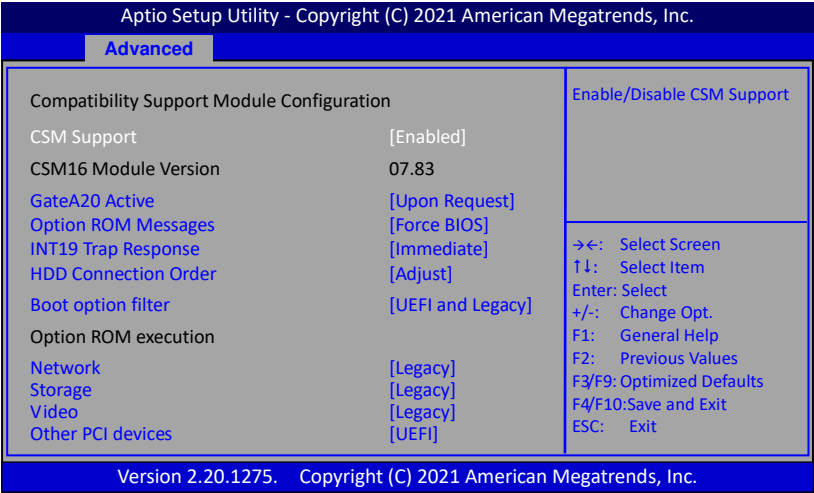
PXE boot wait time

This item is used to set a wait time in seconds for PXE boot. Press ESC key to abort the PXE boot.
Options: 0~5 sec.

Media detect count

Number of times presence of media will be checked.

► **CSM Configuration**



CSM Support

This item allows enable or disable the CSM (Compatibility Support Module) configuration.
Options: Enabled, Disabled.

GateA20 Active

This feature determines how Gate A20 is used to address memory above 1MB.

Upon Request: GA20 can be disabled using BIOS services.
Always: Do not allow disabling GA20.

Option ROM Message

Sets display mode for Option ROM.

Force BIOS: To force to a BIOS-compatible output. This will show the option ROM messages.

Keep Current: To keep the current video mode. This will suppress option ROM messages. Option ROMs requiring interactive inputs may not work properly in this mode.

INT19 Trap Response

This item allows BIOS reaction on INT19 trapping by option ROM.

Immediate: Execute the trap right away.

Postponed: Execute the trap during legacy boot.

HDD Connection Order

Some OS require HDD handles to adjusted, i.e. OS is installed on drive 80h.

Options: Adjust, Keep.

Boot option filter

This option controls what devices system can boot to UEFI or Legacy.

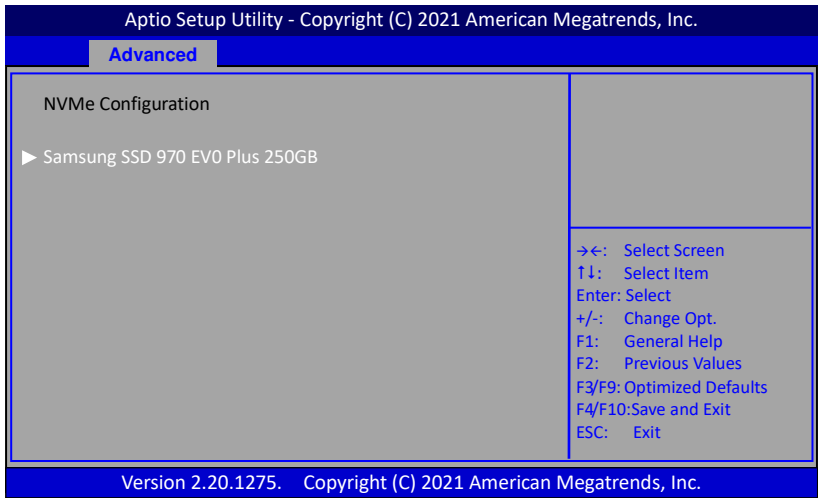
Options: UEFI and Legacy, Legacy only, UEFI only.

Option ROM execution

This field controls the execution policy for Network, Storage, Video and other PCI devices.

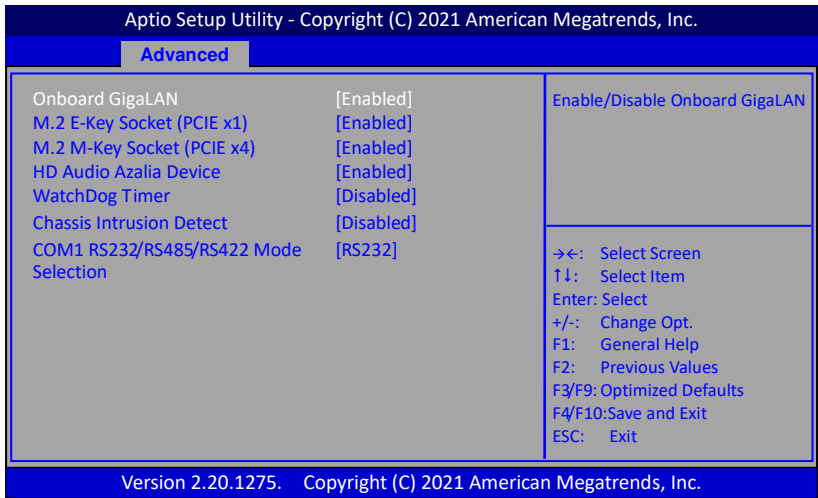
Options: Do not launch, Legacy, UEFI.

► **NVMe Configuration**



This field is displayed the NVMe controller and Drive information.

► **Onboard Devices**



Onboard GigaLAN

Allows you to enable or disable the onboard LAN controller.

Options: Enabled, Disabled.

M.2 E-Key Socket (PCIe x1)

Allows you to enable or disable the M.2 E-Key Socket.

Options: Disabled, Enabled.

M.2 M-Key Socket (PCIe x4)

Allows you to enable or disable the M.2 M-Key Socket.

Options: Disabled, Enabled.

HD Audio Azalia Device

Allows you to enable or disable the onboard High Definition Audio controller.

Options: Disabled, Enabled.

WatchDog Timer

Allow you to enable WatchDog timer expires during OS boot. When set to "Enabled" option. The following items will appear.

Time of watchdog timer (second)

Allows you set a period of seconds for watchdog timer.

Options: 5 ~ 255 second.

Chassis Intrusion Detect

The chassis intrusion detection alerts you whenever your computer chassis was opened. If the case cover is opened, the system will automatically restart and appear prompt message (Shown below) during POST.

You can press <F6> key to pass this warning then enter the system.

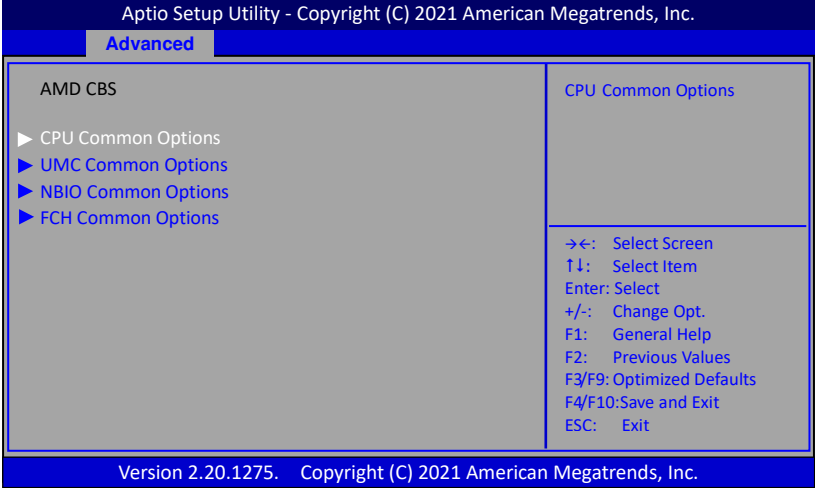


COM1 RS232/RS485/RS422 Mode Selection

Select the RS232/RS485/RS422 Mode for COM1 port.

Options: RS232, RS422, RS485 DE#/RE, RS485 DE/RE#.

► **AMD CBS**



► **CPU Common Options**

Core Performance Boost

Allows you set the Core Performance Boost.

Options: Disabled, Auto.

Global C-state Control

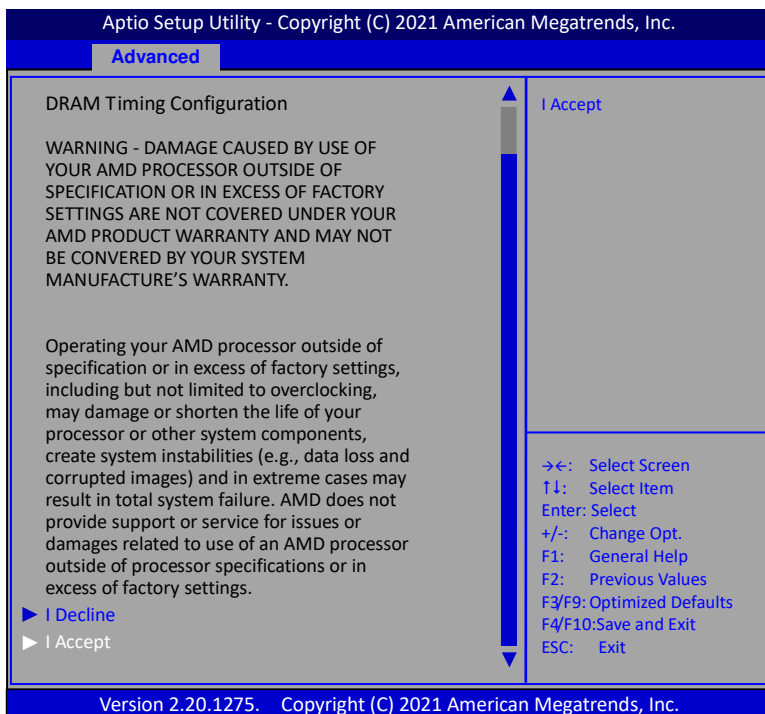
Allows you to control the IO based C-state generation and DF C-states.

Options: Disabled, Enabled, Auto.

▶ UMC Common Options

DDR4 Common Options

DRAM Timing Configuration



Select "I Accept" item to enter the overclock function.

Overclock

When set to "Enabled", allow you to individually set overclock parameters.

Options: Auto, Enabled.

Memory Clock Speed

Recommend to select and follow below items option only.

1200MHz → 2400MHz

1600MHz → 3200MHz

Note:

Please attention DRAM timing configuration "WARNING" description. If there is no boot after setting, please to do CMOS clear.

Common RAS

ECC Configuration

DRAM ECC Symbol Size

Use this option to select the DRAM ECC Symbol Size.

Options: x4, x8, Auto.

DRAM ECC Enable

Use this option to enable/disable DRAM ECC. Auto will set ECC to enable.

Options: Enabled, Disabled, Auto.

DRAM UECC Retry

Use this option to enable/disable DRAM UECC Retry.

Options: Enabled, Disabled

▶ NBIO Common Options

IOMMU

This item allows you to enable or disable the IOMMU (Input/Output Memory Management Unit).

Options: Disabled, Enabled, Auto.

PSPP Policy

This item allows you to select PCIe speed power policy.

Options: Disabled, Performance, Balanced, Power Saving, Auto.

GFX Configuration

iGPU Configuration

Allows you to select the UMA mode.

Options: Auto, iGPU Disabled, UMA_SPECIFIED, UMA_AUTO, UMA_GAME_OPTIMIZED,.

UMA Frame buffer Size

This item will only appear when "iGPU Configuration" item is set to "UMA_SPECIFIED" option. It controls the amount of system memory that is allocated to the integrated graphics processor.

Options: Auto, 64M, 80M, 96M, 128M, 256M, 384M, 512M, 768M, 1G, 2G, 3G, 4G, 8G, 16G.

Display Resolution

This item will only appear when "iGPU Configuration" item is set to "UMA_AUTO" option. It allows you select the

display resolution.

Options: 1920x1080 and below, 2560x1600, 3840x2160,
Auto.

UMA Version

Allows you to select the UMA version.

Options: Legacy, Non-Legacy, Hybrid Secure, Auto.

Audio Configuration

DP/HDMI Audio

Allows you to enable or disable the Integrated HD Audio Controller.

Options: Disabled, Enabled, Auto

SMU Common Options

System Configuration

This item allows you to select the System Configuration.

Options:

10W POR Configuration – 1

15W POR Configuration – 2

25W POR Configuration – 3

Auto.

*Warning: Select System Configuration may cause the system to hang,
as some System Configuration may not be supported by your OPN.*

▶ FCH Common Options

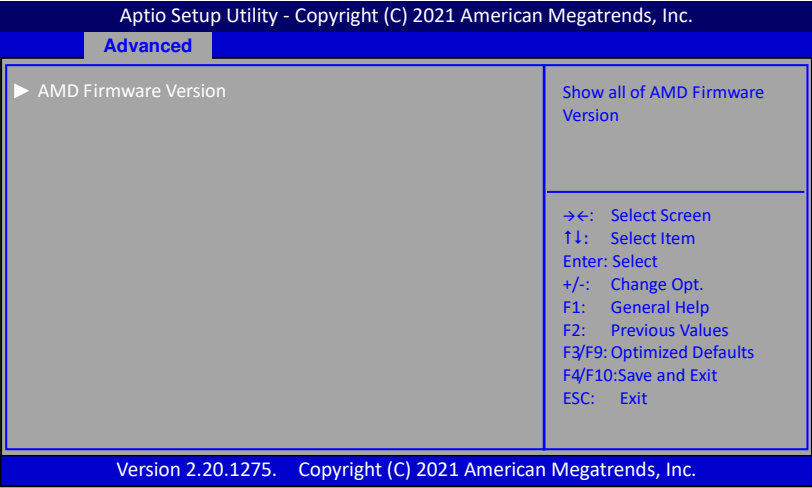
AC Power Loss Options

Ac Loss Control

Enables your computer to automatically restart or return to its last operating status after power returns from a power failure.

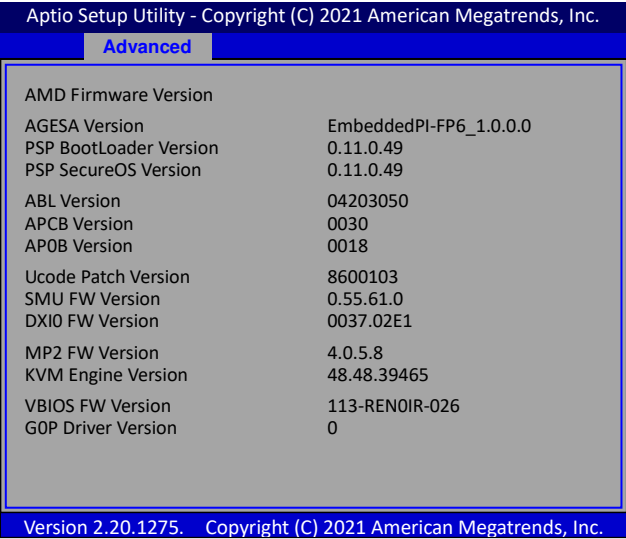
Options: Always Off, Always On, Previous.

► **AMD PBS**



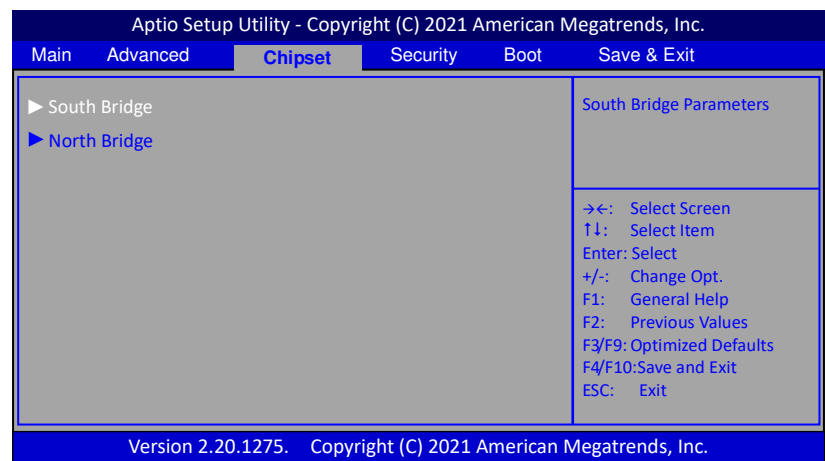
► **AMD Firmware Version**

Show all of AMD Firmware Version.

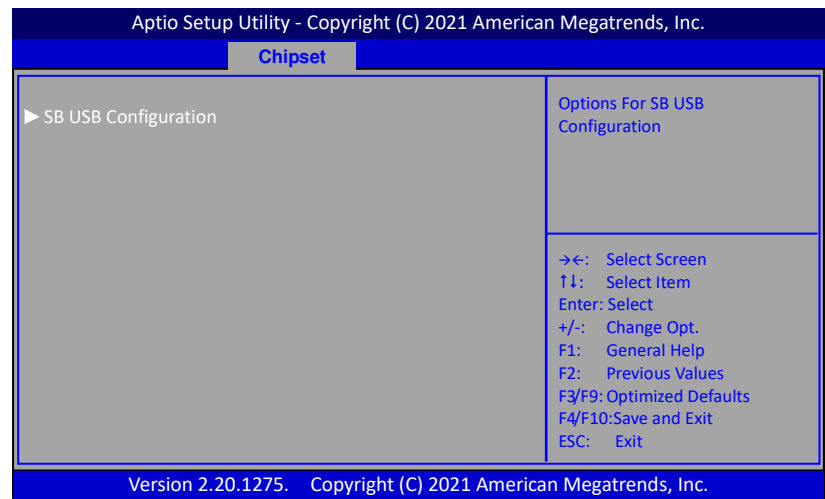


3-5 Chipset Menu

The chipset menu items allow you to change the advanced chipset settings.
Press <Enter> to display the sub-menu.



▶ South Bridge



▶ SB USB Configuration

**USB Port (CN5 USB3.1 Down) / USB Port (M1 – M.2 E Key) /
USB Port (USB2 – USB2.0 Header) / USB Port (CN5 USB3.1 Up) /**

USB Port (USB1 – USB2.0 Header1) / USB Port (USB1 – USB2.0 Header2)

Allows you to enable or disable USB ports.

Options: Enabled, Disabled.

► **North Bridge**

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Chipset

North Bridge Configuration

Memory Information

Total Memory: 16384 MB (DDR4)

► Memory Information

View Information related to Socket 0

→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3/F9: Optimized Defaults
F4/F10: Save and Exit
ESC: Exit

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► **Memory Information**

Displays the memory related information.

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Chipset

Memory Information

Starting Address: 0 KB
Ending Address: 16777215 KB

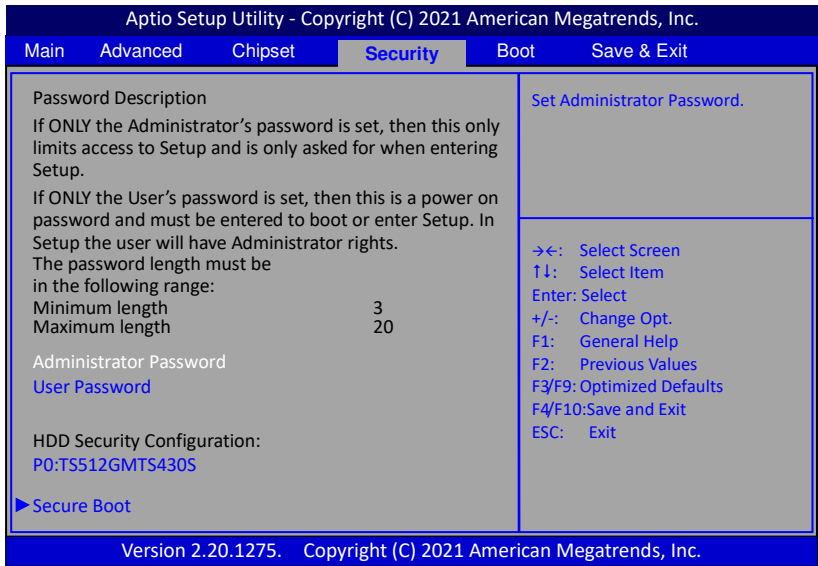
ChannelA:
Dimm0: size=8192 MB
Current speed=2133 MTs
Max speed=2133 MTs

ChannelB:
Dimm0: size=8192 MB
Current speed=2133 MTs
Max speed=2133 MTs

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3-6 Security Menu

The Security menu allows you to change the system security settings.



Administrator Password

This function is used to set, change or delete the Administrator password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return. The password must be 3 to 20 characters long.

User Password

This function is used to set, change or delete the User password. If there is already a password installed, the system asks for this first. To clear a password, simply enter nothing and acknowledge by pressing Return. To set a password, enter it twice and acknowledge by pressing Return. The password must be 3 to 20 characters long.

HDD Security Configuration

The HDD Security Configuration for selected drive.

*** Advisable to Power Cycle System after Setting Hard Disk Passwords ***.
Discard of Save changes option in setup does not have any impact on HDD when password is set or removed. If the 'Set HDD User Password' option is hidden, do power cycle to enable the option again.

To set a password, enter it twice and acknowledge by pressing Return. The password must be 1 to 12 characters long.

Clear HDD password, please follow these steps:

1. Select Set User Password, and enter original HDD Password.



2. To Clear Password, please input "Enter".



3. To complete clearing old password, please select "Yes" when the following message shows up.

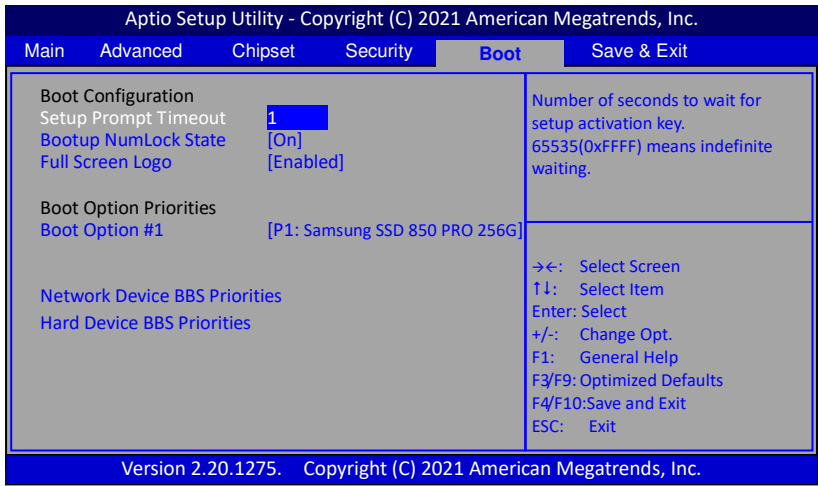


Secure Boot

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.

3-7 Boot Menu

The Boot menu is used to configure the boot settings and the boot priority.



Setup Prompt Timeout

This is used to set an additional time the POST should wait for the operator to press the key to enter setup. The time is entered in seconds.

Bootup NumLock State

Selects the state of the keyboard’s Numlock function after POST.

Options: On, Off.

Full Screen Logo

This item allows you to enable or disable the full screen logo display feature.

Options: Enabled, Disabled.

Boot Option Priorities

These items specify the boot device priority sequence of the available devices.

The number of device items that appears on the screen depends on the number of devices installed in the system.

Network Device BBS Priorities

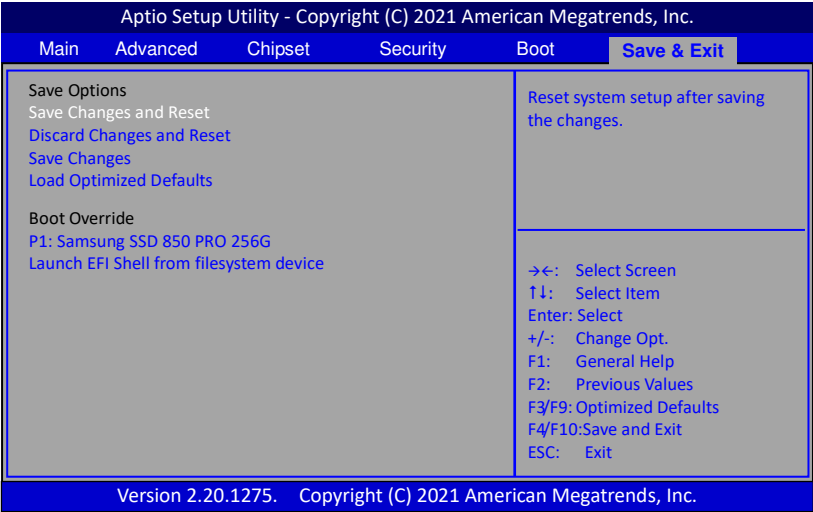
Allows you to configure the boot order for a specific Network device class.

Hard Drive BBS Priorities

Allows you to configure the boot order for a specific Hard Drive device class.

3-8 Save & Exit Menu

The Save & Exit menu allows you to load the optimal default values for BIOS, and save or discard your changes to the BIOS items.



Save Options

Allows you to save the options you made.

Save Changes and Reset

This resets system after saving the changes.

Discard Changes and Reset

This resets system without saving the changes.

Save Changes

Allows you to save the changes you made.

Load Optimized Defaults

The Load default values are the factory settings of this motherboard.

Boot Override

This group of functions includes a list, each of them corresponding to one device within the boot order. Select a drive to immediately boot that device regardless of the current boot order.

Launch EFI Shell from filesystem device

Attempts to launch EFI Shell application (Shellx64.efi) form one of the available filesystem devices.

Chapter 4 Driver Installation

After the operating system has been installed, you need to install drivers for this mainboard.


The support DVD that came with the motherboard contains necessary drivers and useful utilities that enhance the motherboard features.

4-1 Driver Install

Insert the bundled driver DVD into your optical drive and the main menu will be displayed on your PC screen. Click each item button and select the item you want to install.



<Main Page>

 **Note:** If Autorun function is not enabled in your computer, browse the contents of the support DVD to locate the file autorun.exe, and click this file to run the DVD.