



AXIOMTEK

OPS500-520-H Series

Intel Open Pluggable Specification Box

User's Manual



Disclaimers

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October 2018, Version A1

Printed in Taiwan

Safety Approvals

- ◆ CE Marking
- ◆ FCC Class A

◆ FCC Compliance

This equipment has been tested in compliance with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are meant to provide reasonable protection against harmful interference in a residential installation. If not installed and used in accordance with proper instructions, this equipment might generate or radiate radio frequency energy and cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment 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 methods:

- A. Increase the separation between the equipment and receiver.
- B. Connect the equipment to another outlet of a circuit that does not connect with the receiver.
- C. Consult the dealer or an experienced radio/TV technician for help.

Shielded interface cables must be used in order to comply with the emission limits.

Safety Precautions

Before getting started, please read the following important safety precautions.

1. The OPS500-520-H Series does not come equipped with an operating system. An operating system must be loaded first before installing any software into the computer.
2. Be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and place all electronic components in any static-shielded devices. Most electronic components are sensitive to static electrical charge.
3. Disconnect the power cord from the OPS500-520-H Series before any installation. Be sure both the system and external devices turned OFF already. Make sure the OPS500-520-H Series set to ground properly.
4. The brightness of the flat panel display will be getting weaker as frequently used. However, the operating period varies depending on the application environment.
5. The flat panel display is not susceptible to shock or vibration. When assembling the OPS500-520-H Series, make sure to install it securely.
6. Do not leave this equipment in an uncontrolled environment where the storage temperature is below 0°C or above 45°C. It may damage the equipment.
7. External equipment intended for connection to signal input/out or other connectors shall comply with relevant UL/IEC standard.
8. Do not open the back cover of the system. If opening the cover for maintenance is necessary, only allow technicians to implement it. Integrated circuits on computer boards are sensitive to static electricity. To avoid damaging chips from electrostatic discharge, observe the following precautions:
9. Before handling a board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. This will help to discharge any static electricity on your body.
10. Please wear a wrist-grounding strap if you handling boards and electronic components.

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CHAPTER 1

INTRODUCTION

This chapter contains general information and detailed specifications of the OPS500-520-H Series. Chapter 1 includes the following sections:

- **General Description**
- **Specification**
- **Mechanical Assembly**
- **Package List**

1.1 General Description

Intel Open Pluggable Specification (OPS) Compliance

OPS500-520-H Series is based on the 8th generation Intel® Core™ processor on board with Intel® H310 Express Chipset platform and it also future products. The Pluggable Module is dedicated to provide an interchangeable solution to the digital signage media players with compatible connector. This document provides the module form factor, connector specification, reference thermal solution, and boundary conditions in order to ensure the functionality of the module in all compatible display panel system.

OPS500-520-H Series meets Intel Open Pluggable Specification for design and development, simplifying system upgrade maintenance for manufacturers and developers that supports Intel® 8th Generation Core i series family, which stand for high flexible and user-friendly digital signage applications.

Easy maintenance

OPS500-520-H Series offers a best solution for digital signage market. Compliant with Intel OPS architecture, digital signage players are capable of deploying interchangeable systems faster and easing upgrading/maintenance, while lowering costs for development and implementation. Additionally, having the ability to simply slot-in and out the unique pluggable engine box makes daily hassle easier and faster for users.

OPS500-520-H Series has pluggable engine box design; you can change storage, DRAM and update configurations more easily

1.2 System Specifications

1.2.1 Main CPU Board

- **CPU**
 - 8th Gen. Intel® Core™ i7/i5/i3/Celeron Processors, LGA1151, 35W TDP
- **System Chipset**
 - Intel® H310 PCH
- **BIOS**
 - American Megatrends Inc. UEFI (Unified Extensible Firmware Interface).
- **System Memory**
 - Two 260-pin DDR4 2400MHz SO-DIMM, maximum up to 32GB

1.2.2 I/O System

- **Front I/O**
 - One HDMI1.4b (Up to 4096 x 2160@30Hz)
 - Two USB ports 3.1 Gen1
 - Two USB ports 2.0
 - One RS-232(COM2)
 - One Power On/Off button
 - One Reset button
 - Two LED Indicators (PWR & Storage Active LED)
- **Rear I/O**
 - One 80Pin JAE TX25A
 - 1 x HDMI 2.0 (Up to 4096 x 2160@60Hz)
 - 1 x DP 1.2 (Up to 4096 x 2304@60Hz)
 - 1 x USB 3.0
 - 2 x USB 2.0
 - 1 x UART (TX/RX)
 - 1 x Audio out L/R
 - DC input +12V~+19V
 - Control signals (PWR_STATUS, PS_ON#, PB_DET, SYS_FAN)
 - One 12/19V DC-Jack connector for optional adapter usage
- **Ethernet**
 - 10/100/1000Mbps Ethernet (with Intel® I219-LM)
- **Expansion**
 - One M.2 2230 Key E (USB+PCIe signal supported)

- **Storage**
 - One M.2 Key M 2280 for NVMe(PCIe x4 Gen3) / SATA SSD (BIOS selectable)
- **Antenna opening**
 - Two Antenna openings in the front I/O side
- **Net Weight**
 - 0.9kg(1.99 lb) without cooler
- **Dimension (Main Body Size)**
 - 200 mm x 119 mm(D) x 30 mm(H)
- **Operation Temperature**
 - 0°C to 45°C (with airflow 1.2 m/s)
- **Power Input**
 - 12V~19VDC



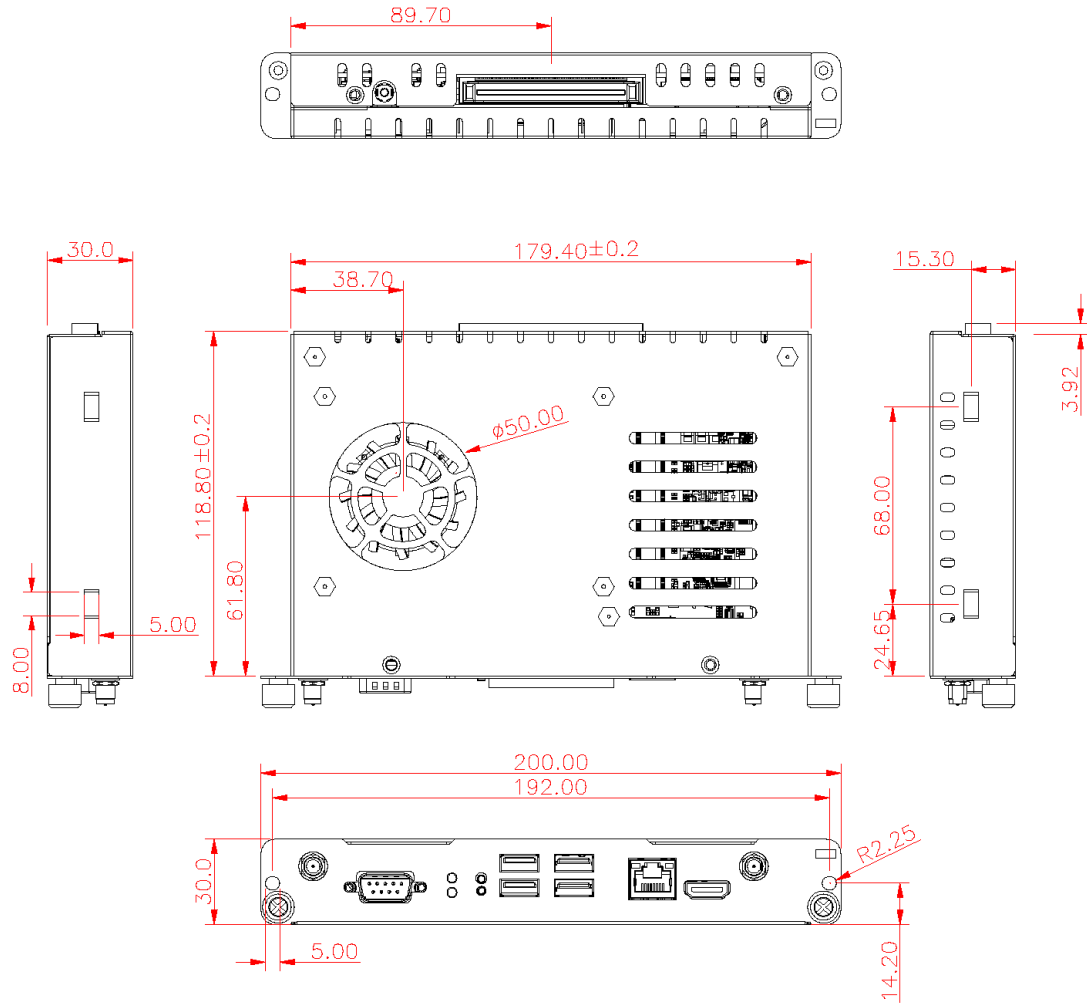
NOTE: All specifications and images are subject to change without notice.

1.3 Mechanical Assembly

1.3.1 Dimensions

This diagram shows you dimensions and outlines of the OPS500-520-H Series

The overall dimension of the module including the mounting frame is 200mm x 119mm x 30mm, and it shows the location of the screw holes of front panel as well as the security lock.

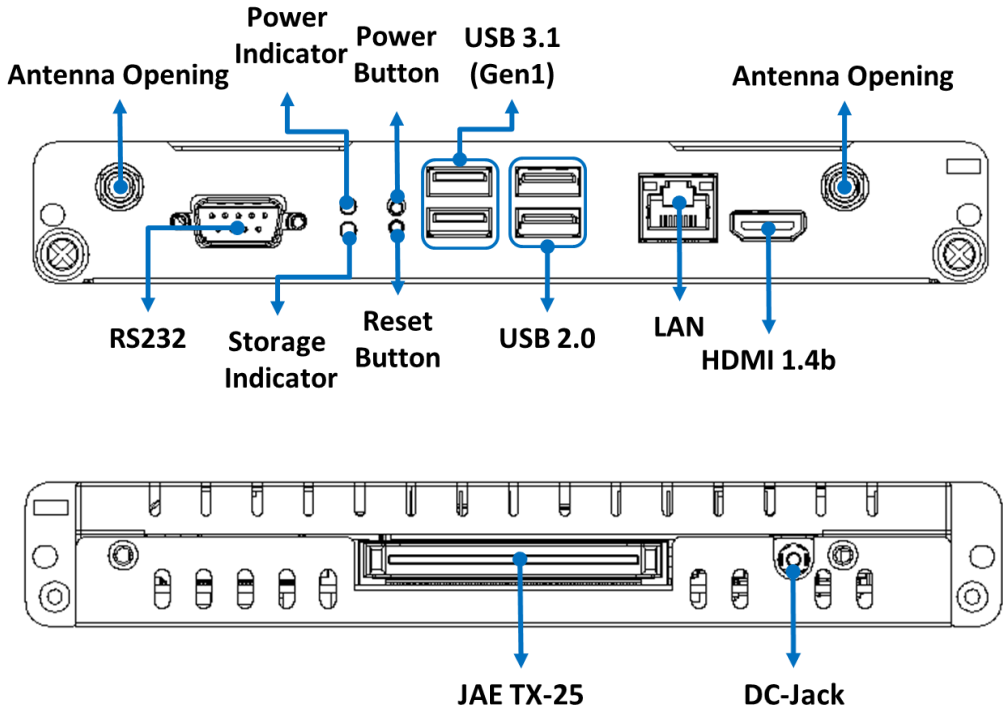


※While plugging the OPS module, please make sure the heat sink side of OPS module toward the outside. Axiomtek will be out of reasonability if there is any damage occurred due to it.



1.3.2 I/O outlet

The following figures show you the locations of the OPS500-520-H Series I/O outlets.

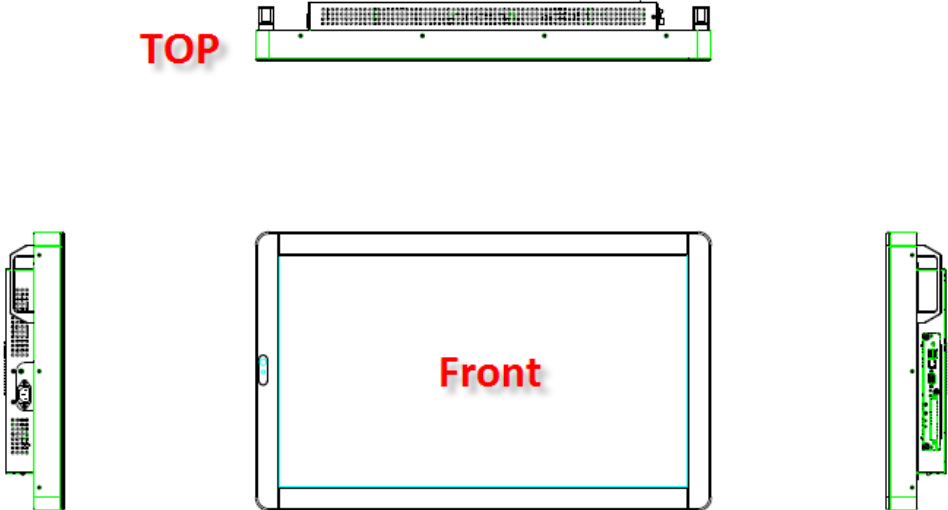


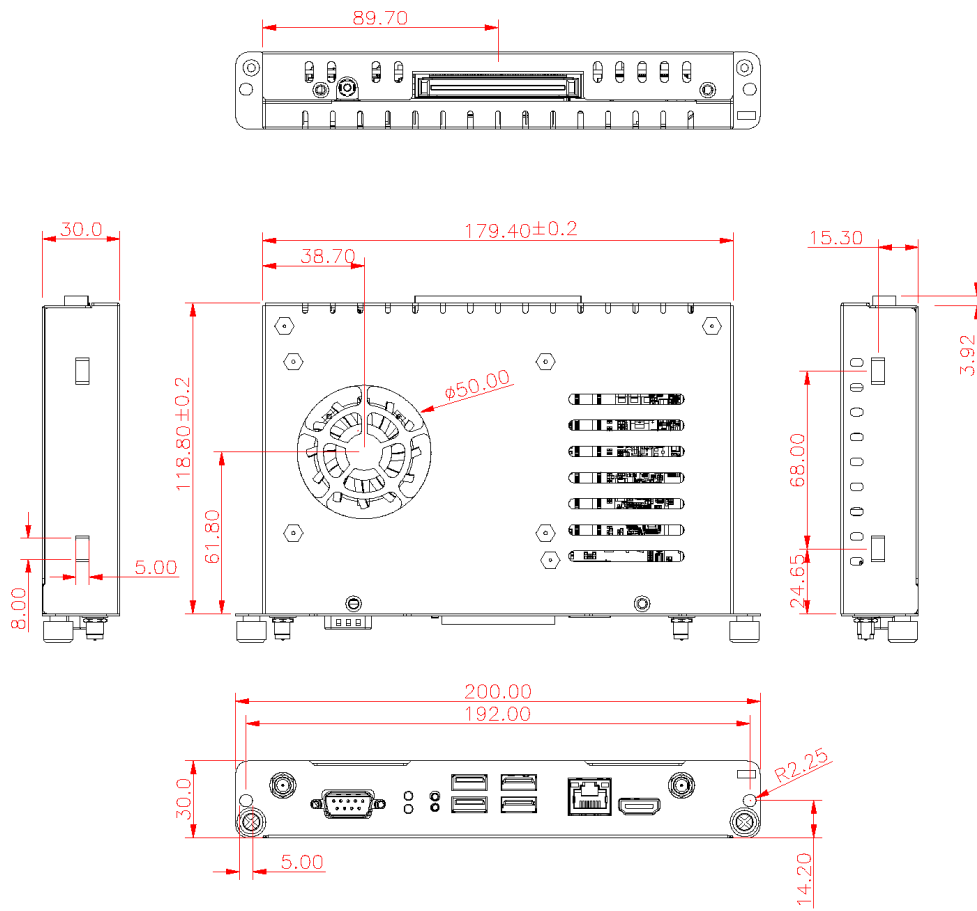
1.3.3 Mechanical Specifications

OPS500-520-H Series is docked in the reference display panel

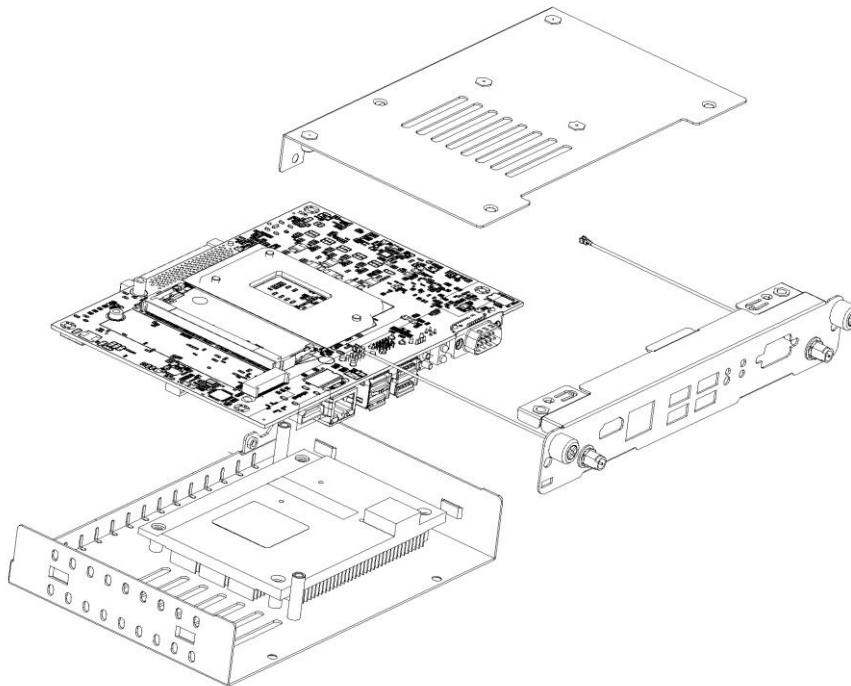
The OPS500-520-H Pluggable Module docked at a display panel system. In this reference design, the module is docked and undocked in the vertical direction.

 **NOTE:** Please contact Axiomtek for available option display panel.



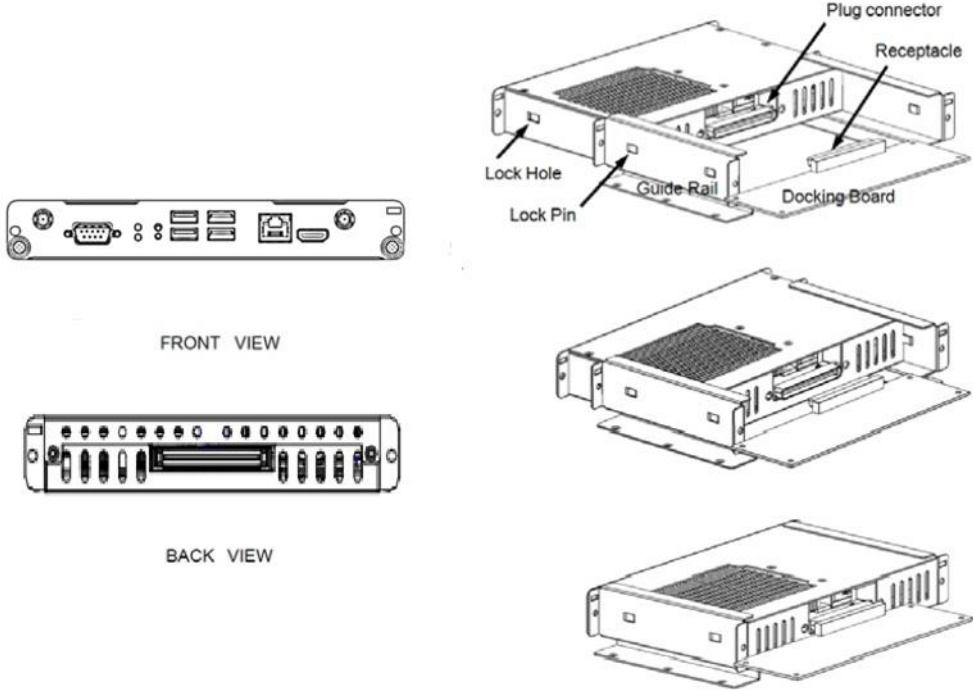


Exploded View of the Pluggable Module

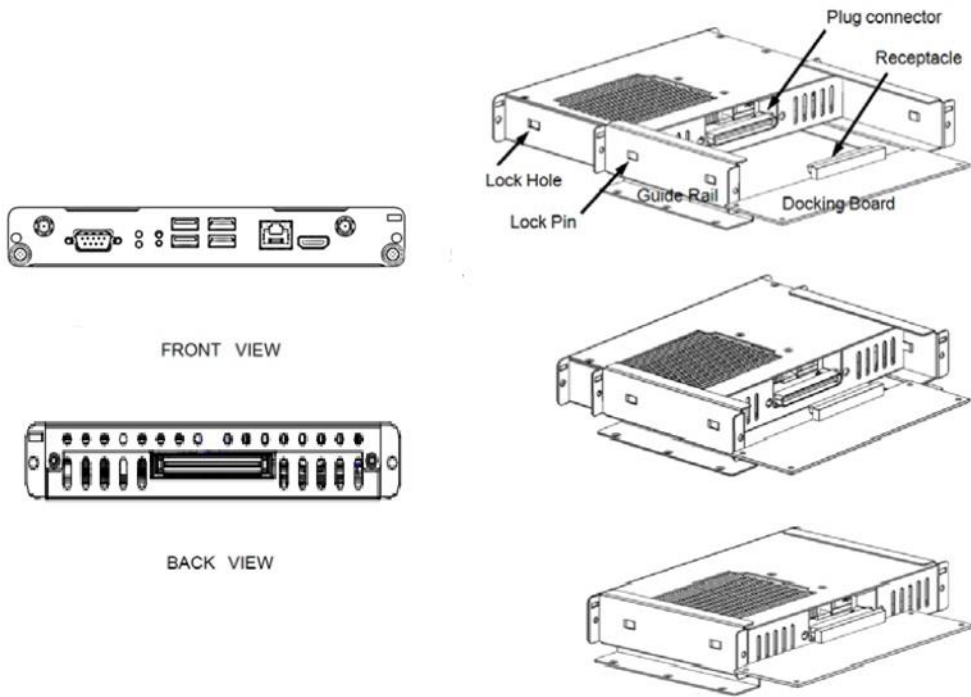


The Guide Rail Mechanism for the OPS500-520-H Series Module

You can use the rails alongside of OPS500-520-H Series Module to dock and undock the plug connector at the back of the module to connect with docking board. There are two lock pins on each side of the rail, and they serve as the locking mechanism to attach the lock holes on the series module.

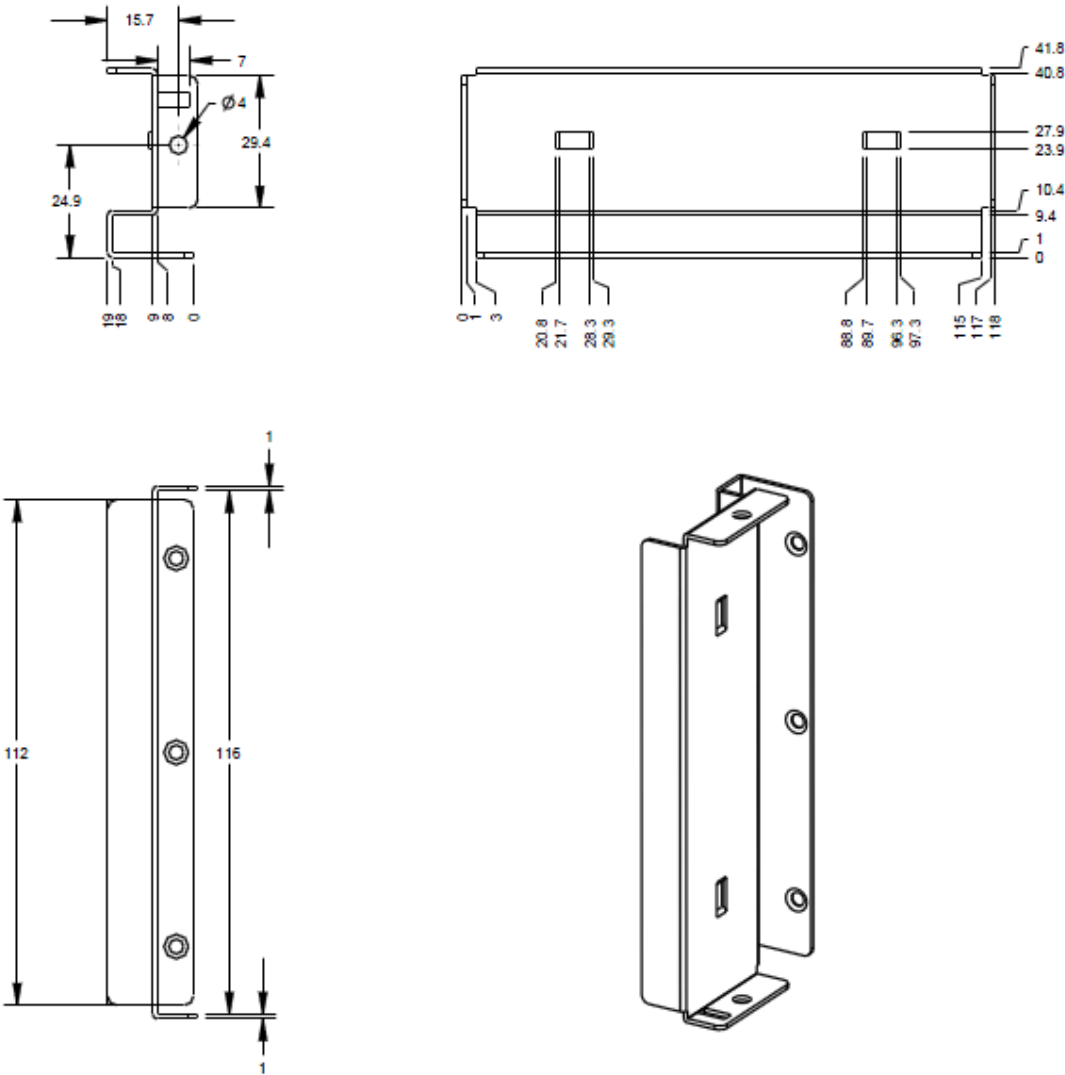


Location of Lock Hole on the Pluggable Module



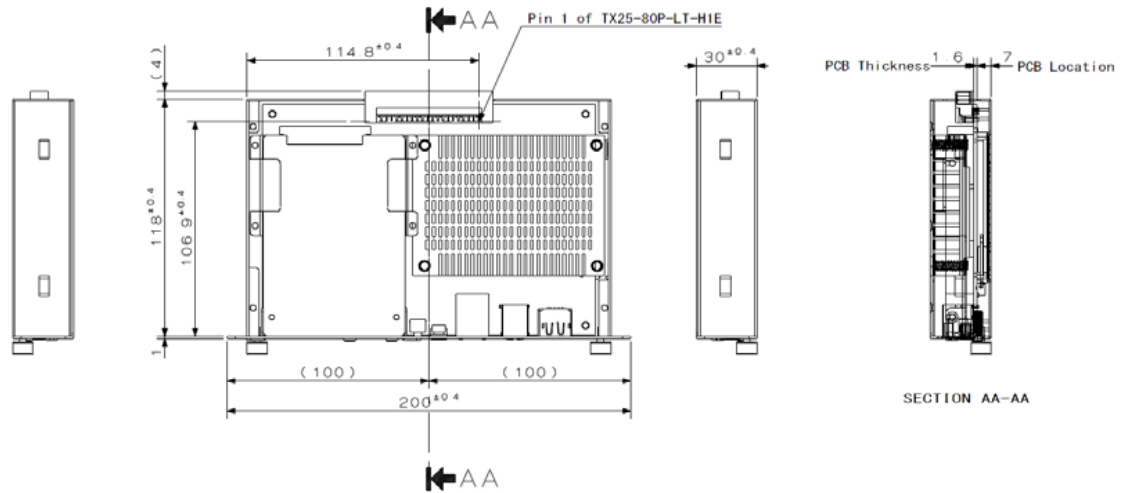
*The drawing is base on Intel Open Pluggable Specification

Dimensions of the Guide Rail



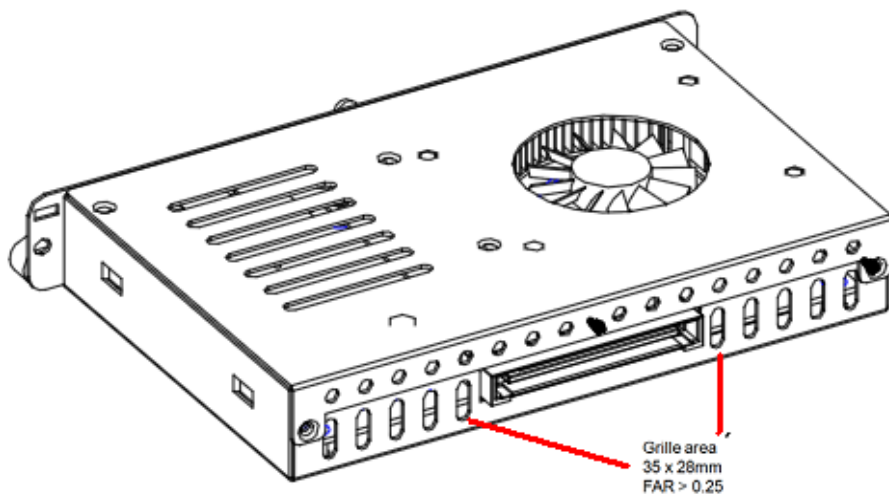
Location of JAE TX25A Plug Connector

Please refer to the following drawing for location of the JAE TX25A plug connector. Pin 1 of the connector is located at 114.8 mm from the edge of the module, and 106.9 mm from the inner side of the front panel. For mating tolerance of TX25A plug connector and TX24A receptacle connector, please refer to the JAE improved connector specification



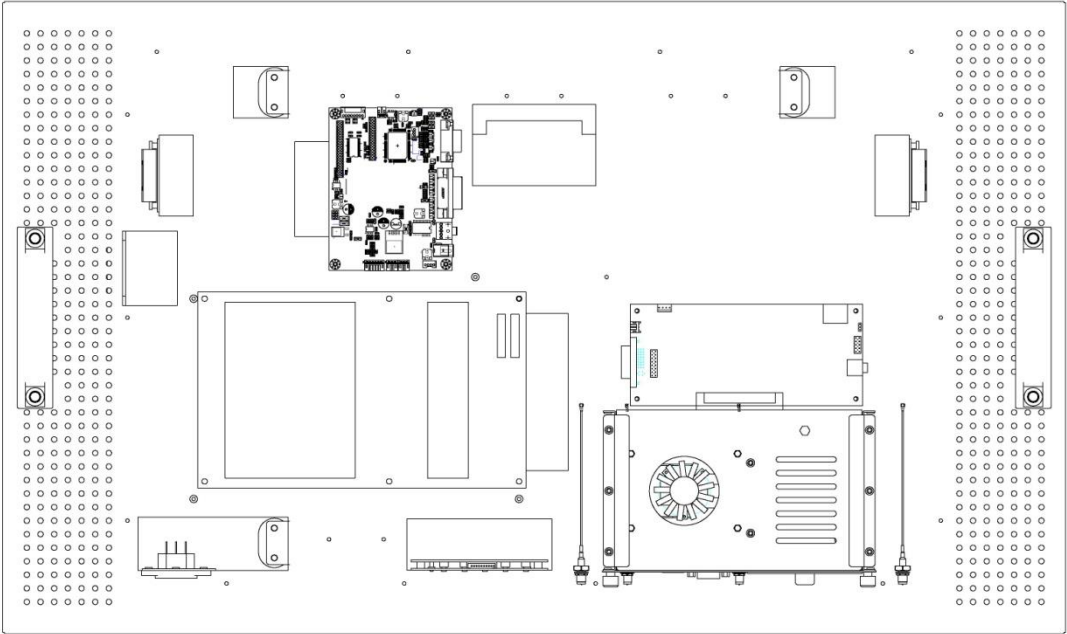
Vent Holes at the Pluggable Module Back Panel

On the OPS500-520-H Series module, it is recommended by Intel that some vent holes be opened at the back so that hot air can escape more easily from the module that the FAR in on both sides of the module back panel should be greater than 0.25.



1.3.4 Reference Design

Display Panel Rear View – Internal



The digital signage OPS500-520-H Series prototype is based on a **32"** display panel with the functional blocks illustrated. It is mainly a 3-board partitioning design consisting of the pluggable module, docking board and the panel control board.

1.4 Package List

When you receive the OPS500-520-H Series, the bundled package should contain the following items:

- **OPS500-520-H x 1**
- **Quick Manual x 1**
- **Driver CD x 1**
- **Thermal Grease (Syringe 1G) x 1**
- **M.2 Thermal Pad x 1**
- **M3*4L screw x 2**
- **M4*6L screw x 2**

If you cannot find the package or any items are missing, please contact Axiomtek distributors immediately.

CHAPTER 2 HARDWARE INSTALLATION

The OPS500-520-H Series is convenient for your various hardware configurations, such as Storage, Memory Module.

The chapter 2 will show you how to install the hardware. It includes:

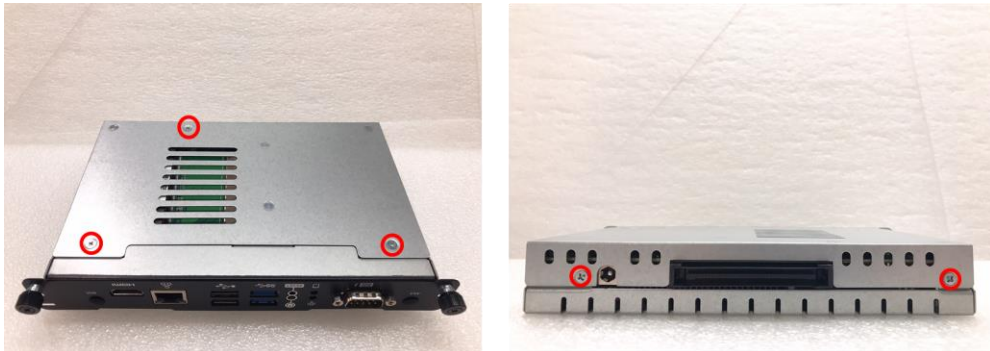
- ◆ **DRAM, SSD, Wireless module Installation**
- ◆ **Pluggable Module Method**

2.1 DRAM, Storage, Wireless module Installations

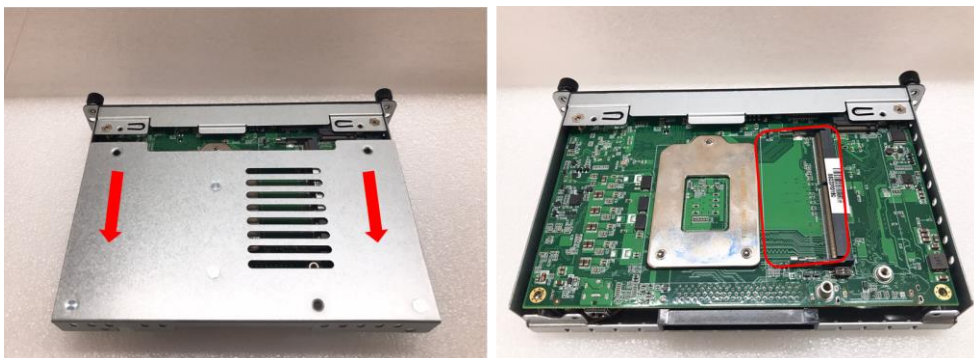
The OPS500-520-H Series model offers a convenient drive bay module for users to DDR4 SO-DIMM DRAM, M.2 2280 Key M SSD Storage and wireless modules. Please follow the steps as below:

2.1.1 DDR4 SO-DIMM DRAM Installation (SO-DIMM1)

Step 1 Turn the system upside down to locate screws at the chassis as red marked and loosen five screws.



Step 2 Slide the bottom chassis out of the module, and locate the SO-DIMM socket on the board.

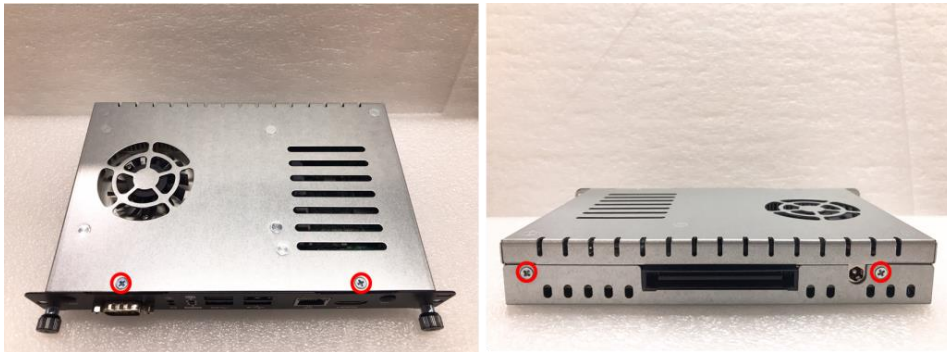


Step 3 Place the memory module into the socket and press it firmly. The socket latches are levered upwards and clipped on to the edges of the SO-DIMM.

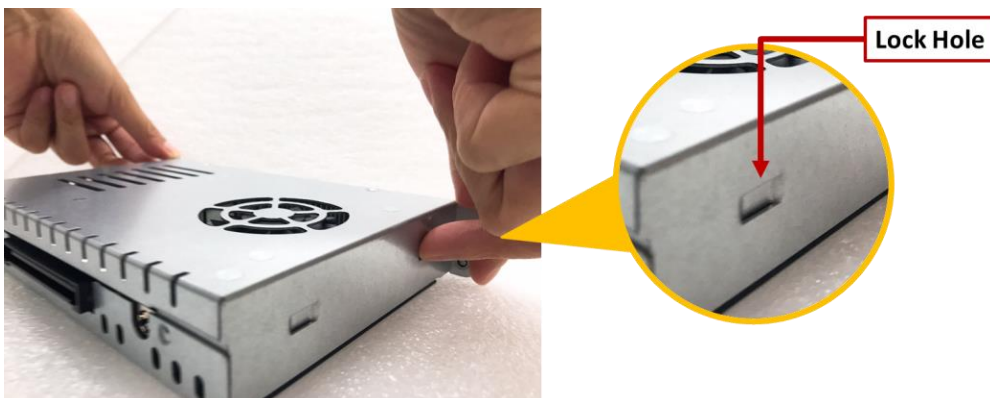


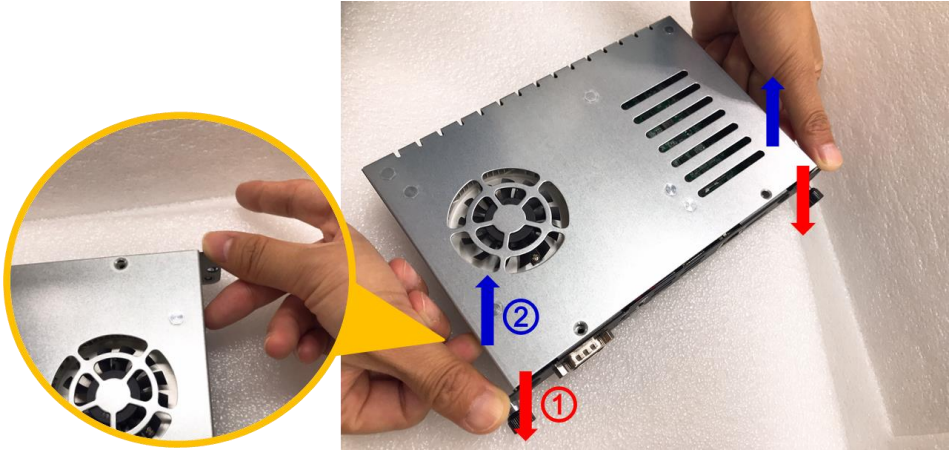
2.1.2 DDR4 SO-DIMM DRAM Installation (SO-DIMM 2)

Step 1 Locate screws at the chassis as red marked and loosen four screws.

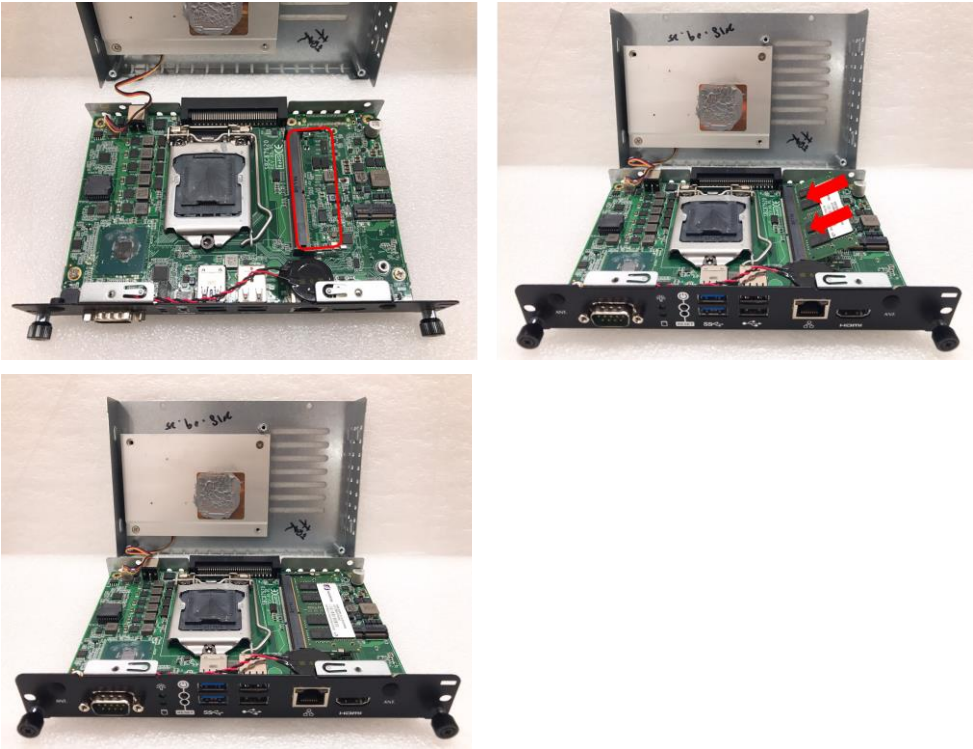


Step 2 To open the upper case, please hold the system with your middle fingers at the Lock Hole, and put your thumbs at the edge of the front panel, then use your thumbs press enough force at the edge of the front panel (①red arrow in the second figure below), meanwhile; lift up the upper case with your middle fingers (②blue arrow in the second figure below).





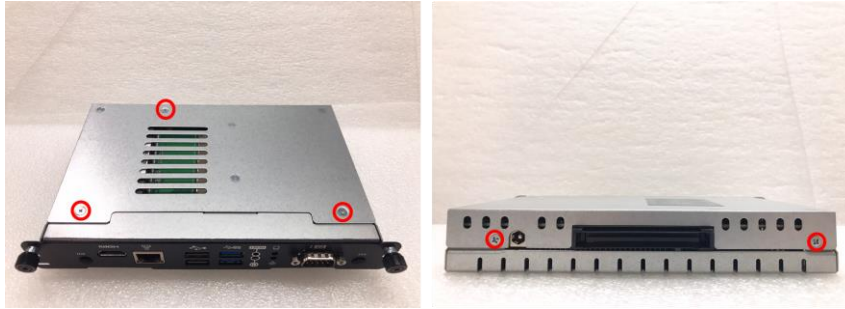
Step 3 Place the memory module into the socket and press it firmly. The socket latches are levered upwards and clipped on to the edges of the SO-DIMM.



2.1.3 M.2 SSD Installation

The OPS500-520-H Series provides one M.2 Key M 2280 socket to install M.2 SSD. Please refer to the following instructions and illustration.

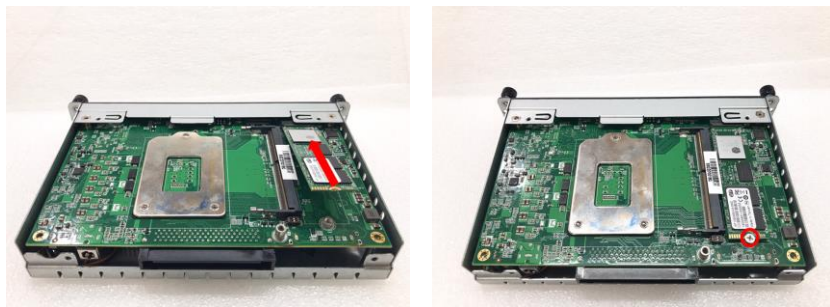
Step 1 Turn the system upside down to locate screws at the chassis as red marked and loosen five screws.



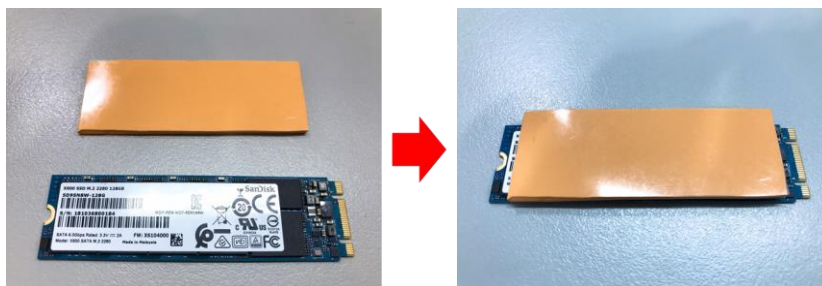
Step 2 Slide the bottom chassis out of the module, and locate the M.2 2280 Key M slot on the board.



Step 3 Holding the M.2 2280 Key M SSD card at a 30 degree angle up from horizontal, slowly insert the golden fingers into the M.2 2280 Key M slot until it is fully inserted in. And secure the M.2 2280 Key M SSD card to the carrier by tightening up the one M3*4L pan head screw to the marked position.



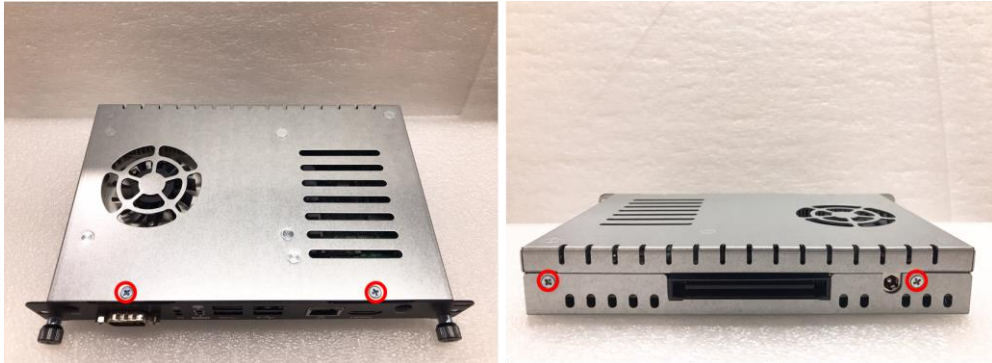
Step 4 Then apply the M.2 thermal pad on the M.2 2280 Key M SSD card.



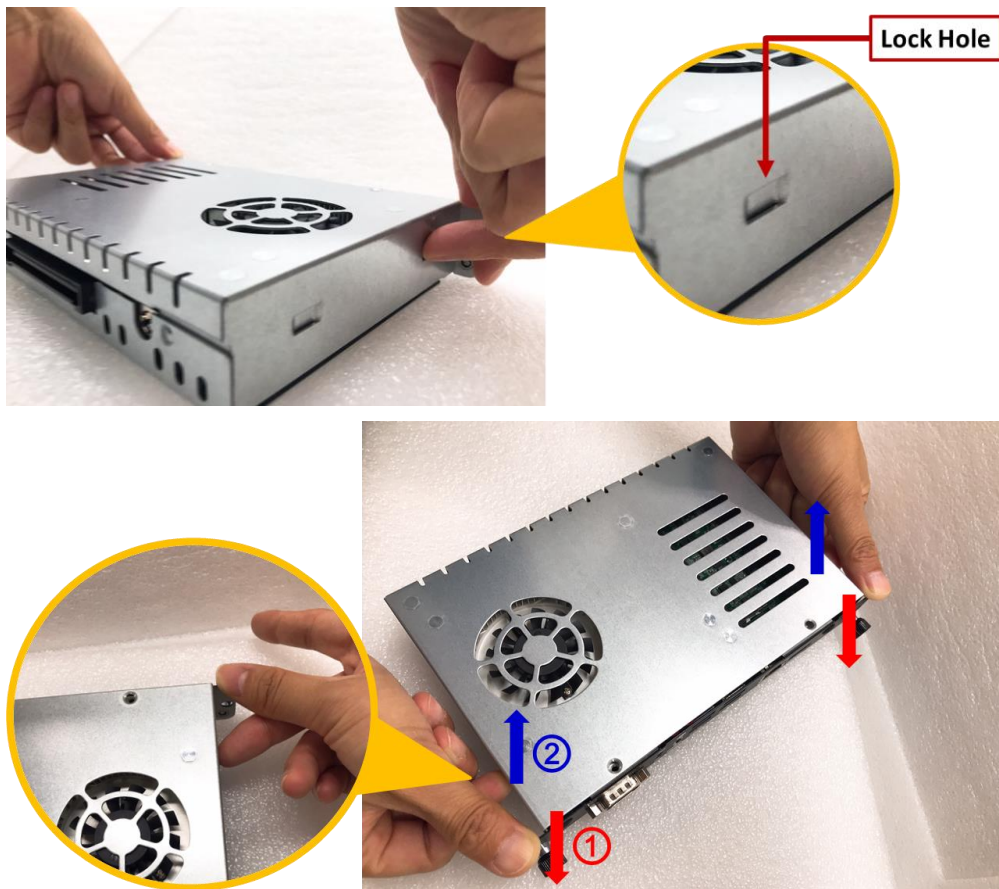
2.1.4 Wireless Module (M.2 Key E Card)

The OPS500-520-H Series provides one M.2 Key E Socket for user to install M.2 Key E Card, please refer to the following instructions and illustration.

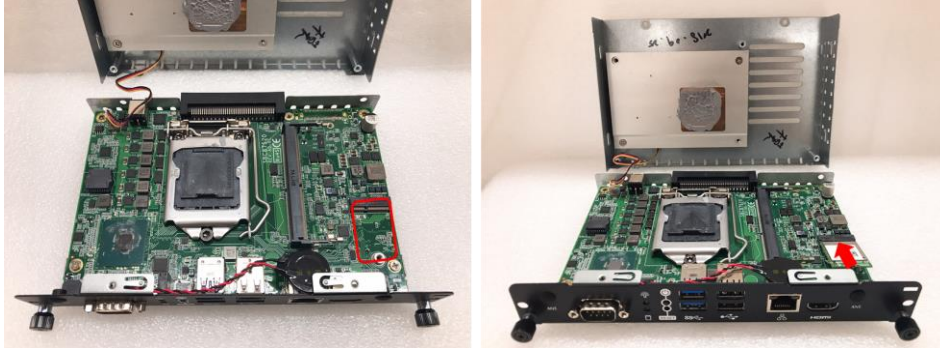
Step 1 Locate screws at the chassis as red marked and loosen four screws.



Step 2 To open the upper case, please hold the system with your middle fingers at the Lock Hole, and put your thumbs at the edge of the front panel, then use your thumbs press enough force at the edge of the front panel (①red arrow in the second figure below), meanwhile; lift up the upper case with your middle fingers (②blue arrow in the second figure below).



Step 3 Locate the M.2 2230 Key E slot on the board. And holding the M.2 2230 Key E card at a 30 degree angle up from horizontal, slowly insert the golden fingers into the M.2 2230 Key E slot until it is fully inserted in.



Step 4 Then secure the M.2 2230 Key E Wi-Fi Module to the carrier by tightening up the one M3*4L pan head screw to the marked position.



2.2 Pluggable Module Method



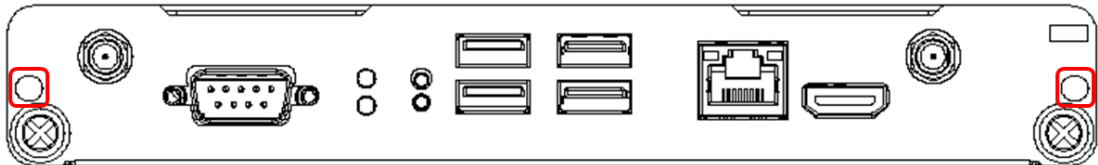
NOTE: Please contact Axiomtek for the available option display



Step 1 Pluggable the box into display

Caution: When plugging OPS500-520-H Series module into an OPS display, make sure the module's heat sink is facing outside of the display. Axiomtek is not responsible for any damage caused by wrong installation.

Step 2 Fasten the screws as illustrated.



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CHAPTER 3 CONNECTORS

This chapter provides users with detailed description how to set up basic system configuration through the AMIBIOS8 BIOS setup utility.

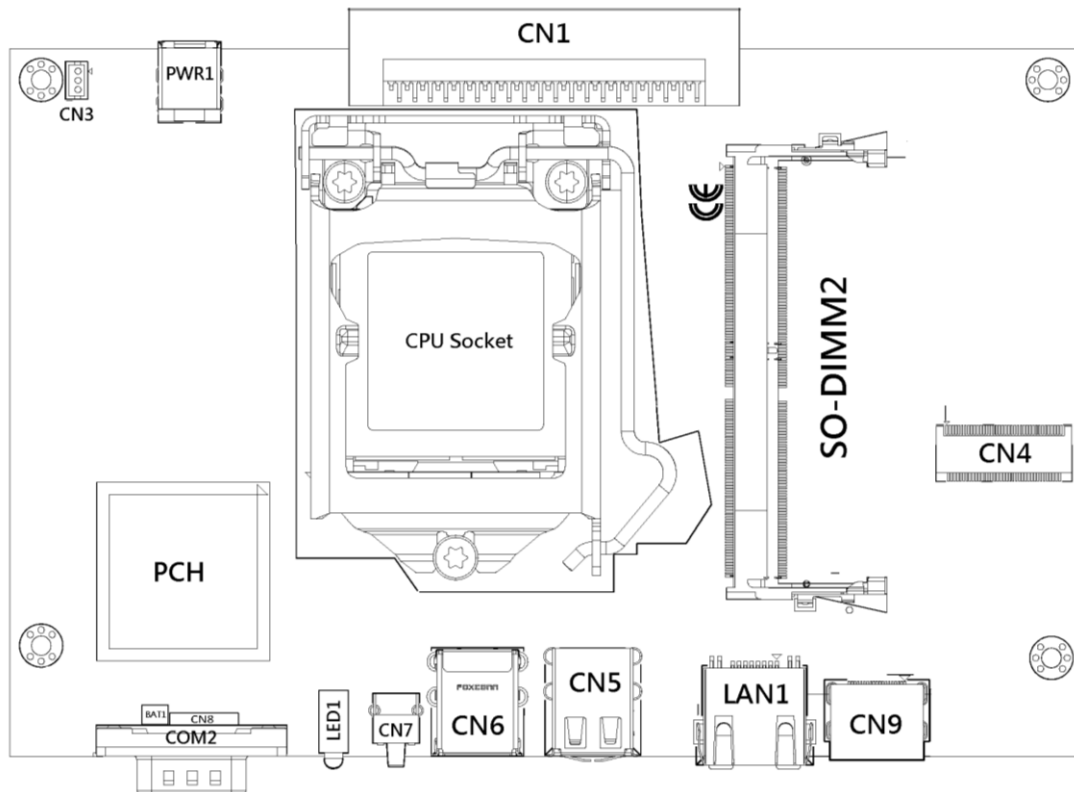
3.1 Connectors

Connectors connect this board with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly connected.

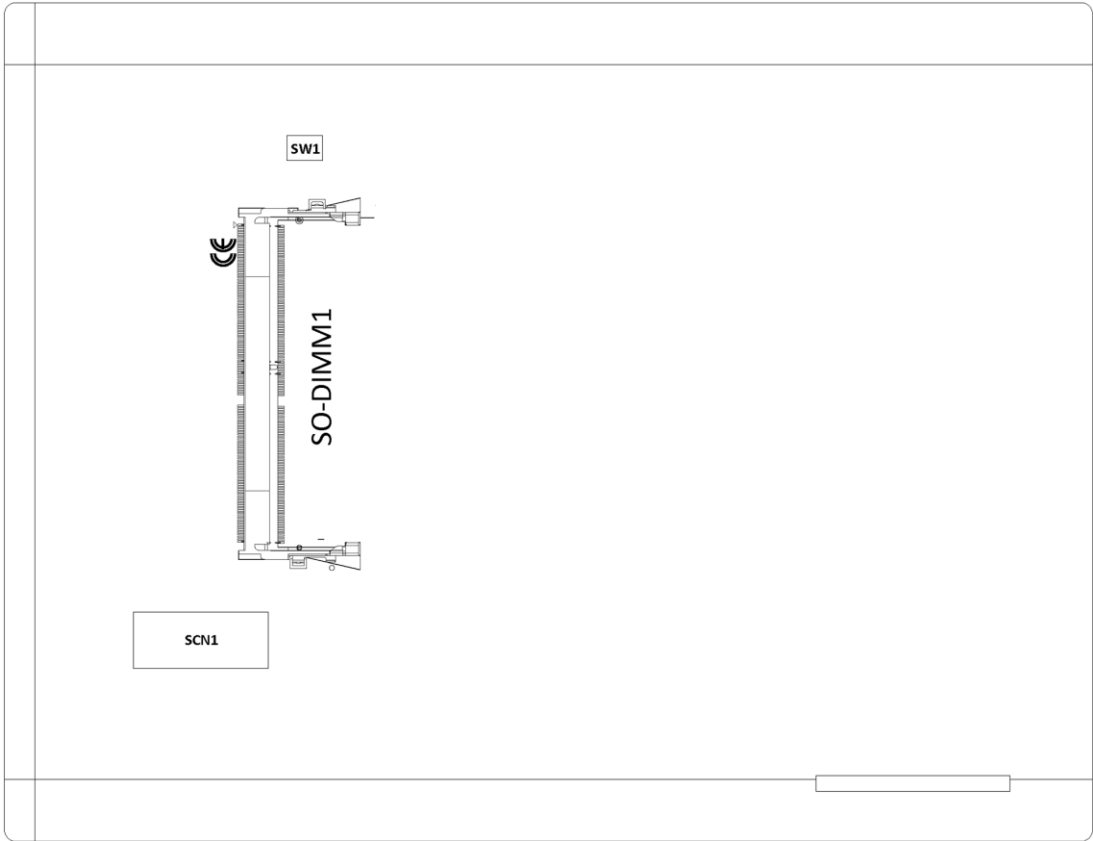
Here is a summary table shows you all connectors on the board.

External Connectors / Buttons	PCB Location	Section
JAE TX25A Connector	CN1	3.1.1
CPU FAN Connector	CN3	3.1.2
M.2 2230 Key E Wi-Fi & Bluetooth	CN4	3.1.3
USB2.0 Port	CN5	3.1.4
USB3.1 Port (Gen1)	CN6	3.1.5
Power & Reset Button	CN7	3.1.6
HDMI Connector	CN9	3.1.7
Battery 2 PIN	BAT1	3.1.8
M.2 2280 Key M NVMe SSD	SCN1	3.1.9
COM Port	COM2	3.1.10
RJ45 (i219LM)	LAN1	3.1.11
DC Power Jack	PWR1	3.1.12
AT/ATX Mode	SW1	3.1.13
CMOS Clear		

Board Layout



Top side

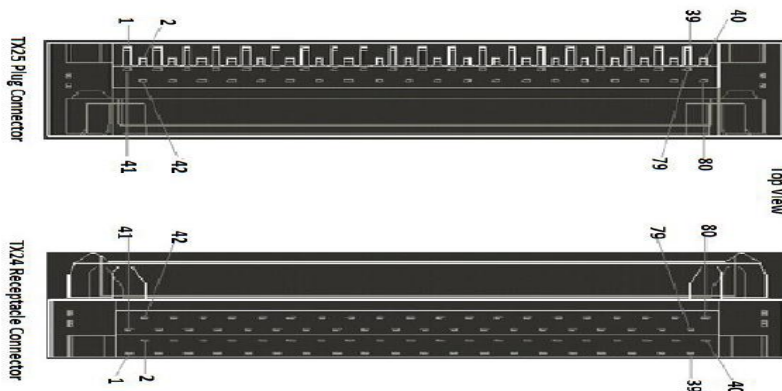


Bottom side

3.1.1 JAE TX25A Connector (CN1)

Connector JAE TX25A CN1 is for JAE improved interface supported.

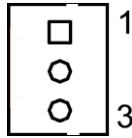
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	DDP_3N	2	DDP_3P	3	GND	4	DDP_2N
5	DDP_2P	6	GND	7	DDP_1N	8	DDP_1P
9	GND	10	DDP_0N	11	DDP_0P	12	GND
13	DDP_AUXN	14	DDP_AUXP	15	DDP_HPD	16	GND
17	TMDS_CLK-	18	TMDS_CLK+	19	GND	20	TMDS0-
21	TMDS0+	22	GND	23	TMDS1-	24	TMDS1+
25	GND	26	TMDS2-	27	TMDS2+	28	GND
29	DVI_DDC_DAT A	30	DVI_DDC_CLK	31	DVI_HPD	32	GND
33	+12V~+19V	34	+12V~+19V	35	+12V~+19V	36	+12V~+19V
37	+12V~+19V	38	+12V~+19V	39	+12V~+19V	40	+12V~+19V
41	RSVD	42	RSVD	43	RSVD	44	RSVD
45	RSVD	46	RSVD	47	RSVD	48	RSVD
49	SLP_S3	50	SYS_FAN	51	UART_RXD	52	UART_TXD
53	GND	54	StdA_SSRX-	55	StdA_SSRX+	56	GND
57	StdA_SSTX-	58	StdA_SSTX+	59	GND	60	USB_PN2
61	USB_PP2	62	GND	63	USB_PN1	64	USB_PP1
65	GND	66	USB_PN0	67	USB_PP0	68	GND
69	AZ_LINEOUT_ L	70	AZ_LINEOUT_ R	71	NC	72	PB_DET
73	PS_ON#	74	PWR_STATUS	75	GND	76	GND
77	GND	78	GND	79	GND	80	GND



3.1.2 CPU FAN Connector (CN3)

CN3 provides power input and FAN control signal, and you can connect CPU FAN through this connector.

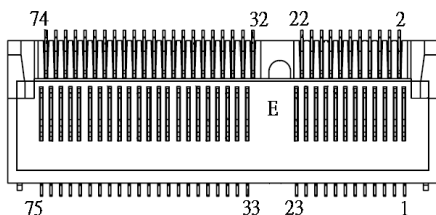
Pin	Signal
1	GND
2	FAN CTRL
3	FAN DET



3.1.3 M.2 2230 Key E Wi-Fi & Bluetooth (CN4)

CN4 for PCI-Express and USB signals interface supported Socket 1 , Key E , type 2230.

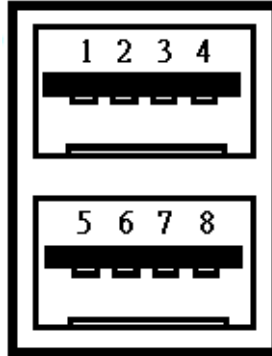
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	+3.3V	3	USB_D+	4	+3.3V
5	USB_D-	6	NC	7	GND	8	NC
9	NC	10	NC	11	NC	12	NC
13	NC	14	NC	15	NC	16	NC
17	NC	18	GND	19	NC	20	NC
21	NC	22	NC	23	NC	24	CONNECTOR KEY E
25	CONNECTOR KEY E	26	CONNECTOR KEY E	27	CONNECTOR KEY E	28	CONNECTOR KEY E
29	CONNECTOR KEY E	30	CONNECTOR KEY E	31	CONNECTOR KEY E	32	NC
33	GND	34	NC	35	PETp0	36	NC
37	PETn0	38	NC	39	GND	40	NC
41	PERp0	42	NC	43	PERn0	44	NC
45	GND	46	NC	47	REFCLKp0	48	NC
49	REFCLKn0	50	SUSCLK	51	GND	52	PERST0#
53	CLKREQ0#	54	W_DISABLE2#	55	PEWAKE0#	56	W_DISABLE1#
57	GND	58	I2C_DATA	59	NC	60	I2C_CLK
61	NC	62	ALERT#	63	GND	64	NC
65	NC	66	NC	67	NC	68	NC
69	GND	70	NC	71	NC	72	+3.3V
73	NC	74	+3.3V	75	GND		



3.1.4 USB 2.0 Port (CN5)

The Universal Serial Bus connectors are compliant with USB 2.0 (480Mbps), and ideally for installing USB peripherals such as keyboard, mouse, scanner, etc.

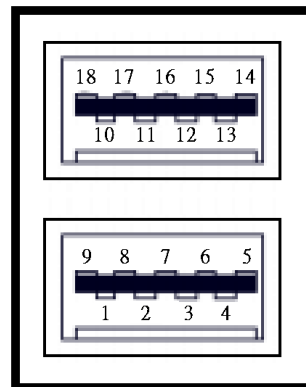
Pin	Signal
1	USB_POWER
2	USB D0-
3	USB D0+
4	GND
5	USB_POWER
6	USB D1-
7	USB D1+
8	GND



3.1.5 USB 3.1 Port (Gen1) (CN6)

The Universal Serial Bus connectors are compliant with USB 3.1 Gen1 (5Gb/s), and ideally for installing USB peripherals such as keyboard, mouse, scanner, etc.

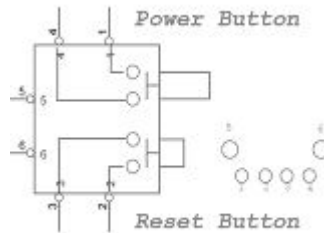
Pin	Signal
1	USB3_POWER
2	USB D0-
3	USB D0+
4	GND
5	USB3_SSRX0-
6	USB3_SSRX0+
7	GND
8	USB3_SSTX0-
9	USB3_SSTX0+
10	USB3_POWER
11	USB D1-
12	USB D1+
13	GND
14	USB3_SSRX1-
15	USB3_SSRX1+
16	GND
17	USB3_SSTX1-
18	USB3_SSTX1+



3.1.6 Power & Reset Button (CN7)

The CN7 comes with one power button and one reset button. The reset button is for rebooting your computer instead of turning OFF the power switch. It is a better way to reboot your system for a longer life of the system's power supply.

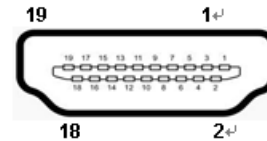
Pin	Signal
1	GND
2	GND
3	RST_BTN
4	PWR_BTN
5	GND
6	GND



3.1.7 HDMI Connector (CN9)

The HDMI (High-Definition Multimedia Interface) is a compact digital interface which is capable of transmitting high-definition video and high-resolution audio over a single cable.

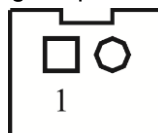
Pin	Signal	Pin	Signal
1	HDMI OUT_DATA2+	2	GND
3	HDMI OUT_DATA2-	4	HDMI OUT_DATA1+
5	GND	6	HDMI OUT_DATA1-
7	HDMI OUT_DATA0+	8	GND
9	HDMI OUT_DATA0-	10	HDMI OUT Clock+
11	GND	12	HDMI OUT Clock-
13	N.C.	14	N.C.
15	HDMI OUT_SCL	16	HDMI OUT_SDA
17	GND	18	+5V
19	HDMI_HTPLG		



3.1.8 Battery 2 PIN (BAT1)

The two pin power connector is supplying the power for battery.

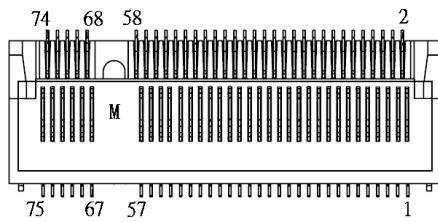
Pin	Signal
1	+VBAT
2	GND



3.1.9 M.2 2280 Key M NVMe SSD (SCN1)

The OPS500-520-H comes with one M.2 2280 Key M NVMe Express SSD for storage. SCN1 supports PCIe or mSATA interface which can be set in BIOS.

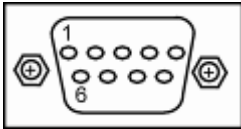
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	+3.3V	3	GND	4	+3.3V
5	PERn3	6	NC	7	PERp3	8	NC
9	GND	10	LED_1#	11	PETn3	12	+3.3V
13	PETp3	14	+3.3V	15	GND	16	+3.3V
17	PERn2	18	+3.3V	19	PERp2	20	NC
21	GND	22	NC	23	PETn2	24	NC
25	PETp2	26	NC	27	GND	28	NC
29	PERn1	30	NC	31	PERp1	32	NC
33	GND	34	NC	35	PETn1	36	NC
37	PETp1	38	NC	39	GND	40	NC
41	PERn0/SATA-B+	42	NC	43	PERp0/SATA-B-	44	NC
45	GND	46	NC	47	PETn0/SATA-A-	48	NC
49	PETp0/SATA-A+	50	PERST#	51	GND	52	CLKREQ#
53	REFCLKn	54	PEWAKE#	55	REFCLKp	56	NC
57	GND	58	NC	59	CONNECTOR Key M	60	CONNECTOR Key M
61	CONNECTOR Key M	62	CONNECTOR Key M	63	CONNECTOR Key M	64	CONNECTOR Key M
65	CONNECTOR Key M	66	CONNECTOR Key M	67	NC	68	NC
69	NC	70	+3.3V	71	GND	72	+3.3V
73	GND	74	+3.3V	75	GND		



3.1.10 COM Port (COM2)

The COM Port connector (COM2) is a standard DB-9 connector. The pin assignment of RS-232 is listed on the following table

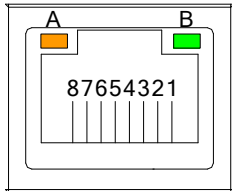
Pin	Signal
1	DCD, Data carrier detect
2	RXD, Receive data
3	TXD, Transmit data
4	DTR, Data terminal ready
5	GND, ground
6	DSR, Data set ready
7	RTS, Request to send
8	CTS, Clear to send
9	RI, Ring indicator



3.1.11 RJ45 (i219LM) (LAN1)

The RJ-45 connector LAN1 is for Ethernet. To connect the board to 100-Base-T or 1000-Base-T hub, just plug one end of the cable into LAN1 and connect the other end (phone jack) to a 100-Base-T hub or 1000-Base-T hub.

Pin	Signal
1	Tx+ (Data transmission positive)
2	Tx- (Data transmission negative)
3	Rx+ (Data reception positive)
4	RJ-1(For 1000 base T-Only)
5	RJ-1(For 1000 base T-Only)
6	Rx- (Data reception negative)
7	RJ-1(For 1000 base T-Only)
8	RJ-1(For 1000 base T-Only)
A	Active LED
B	Speed LED



3.1.12 DC Power Jack (PWR1)

PWR1 is a ø2.5mm DC Power Jack. Loose connection may cause system instability and make sure all components/devices are been installed properly before connecting.

Pin	Signal
1	+12V or +19V
2	GND



3.1.13 SW1 Setting

ATX/AT Mode and CMOS Clear can be set through SW1.

Pin	Description	ON	OFF (Default)
1	AT / ATX Mode	AT	ATX
2	CMOS Clear	Clear CMOS	Normal



Power LED

The Power LED lights up when the system is powered ON

Storage Activity LED

This connection is linked to hard drive activity LED on the control panel. LED flashes when Storage is being accessed.

CHAPTER 4 AMI BIOS SETUP UTILITY

This chapter provides users with detailed description how to set up basic system configuration through the AMIBIOS8 BIOS setup utility.

4.1 Starting

To enter the setup screens, follow the steps below:

- **Turn on the computer and press the key immediately.**
- **After you press the key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as the Chipset and Power menus.**

4.2 Navigation Keys

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.

These keys include <F1>, <F2>, <Enter>, <ESC>, <Arrow> keys, and so on.



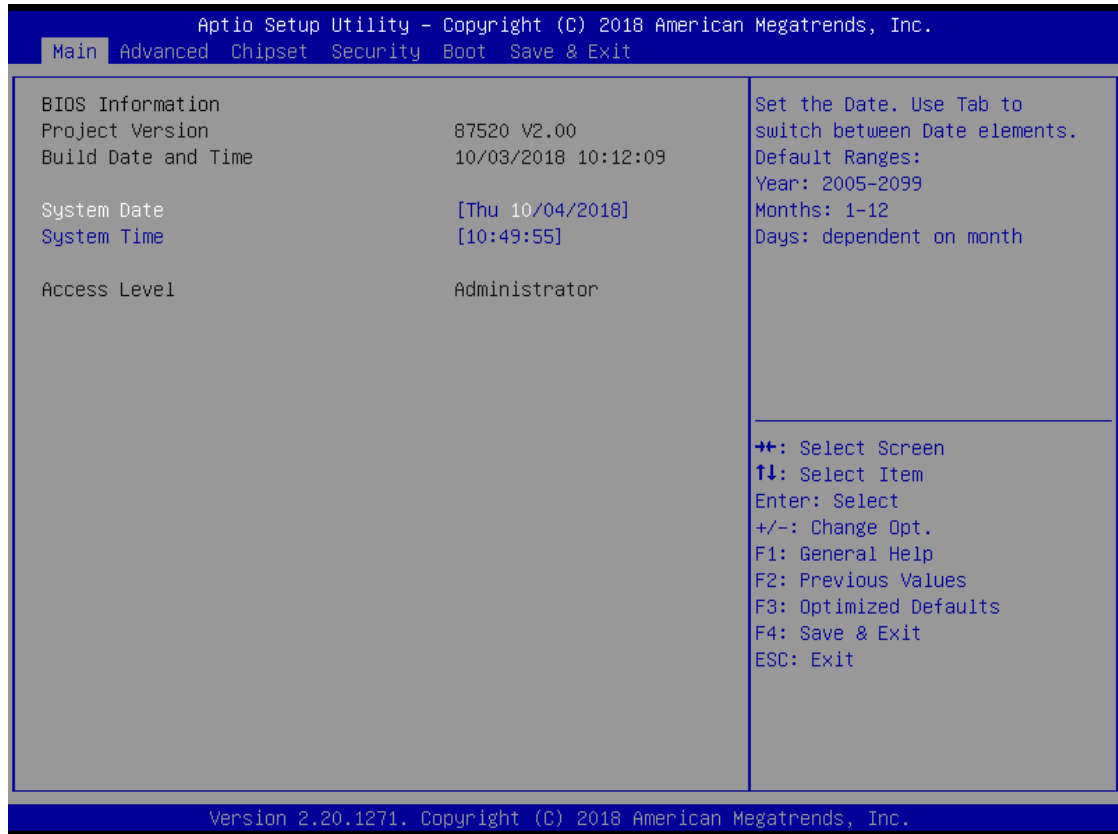
NOTE: *Some of navigation keys differ from one screen to another.*

Hot Key	Description
← →Left/Right	The Left <Arrow> keys allow you to select a setup screen.
↑↓ Up/Down	The Up and Down <Arrow> keys allow you to select a setup screen or sub-screen.
+– Plus/Minus	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item.
Tab	The <Tab> key allows you to select setup fields.
F1	The <F1> key allows you to display the General Help screen.
F2	The <F2> key allows you to Load Previous Values.
F3	The <F3> key allows you to Load Optimized Defaults.
F4	The <F4> key allows you to save any changes you have made and exit Setup. Press the <F4> key to save your changes.
Esc	The <Esc> key allows you to discard any changes you have made and exit the Setup. Press the <Esc> key to exit the setup without saving your changes.
Enter	The <Enter> key allows you to display or change the setup option listed for a particular setup item. The <Enter> key can also allow you to display the setup sub- screens.

4.3 Main Menu

When you first enter the Setup Utility, you will enter the Main setup screen. You can always return to the Main setup screen by selecting the Main tab. There are two Main Setup options. They are described in this section. The Main BIOS Setup screen is shown below.

- **BIOS Information**



- **System Date/Time**

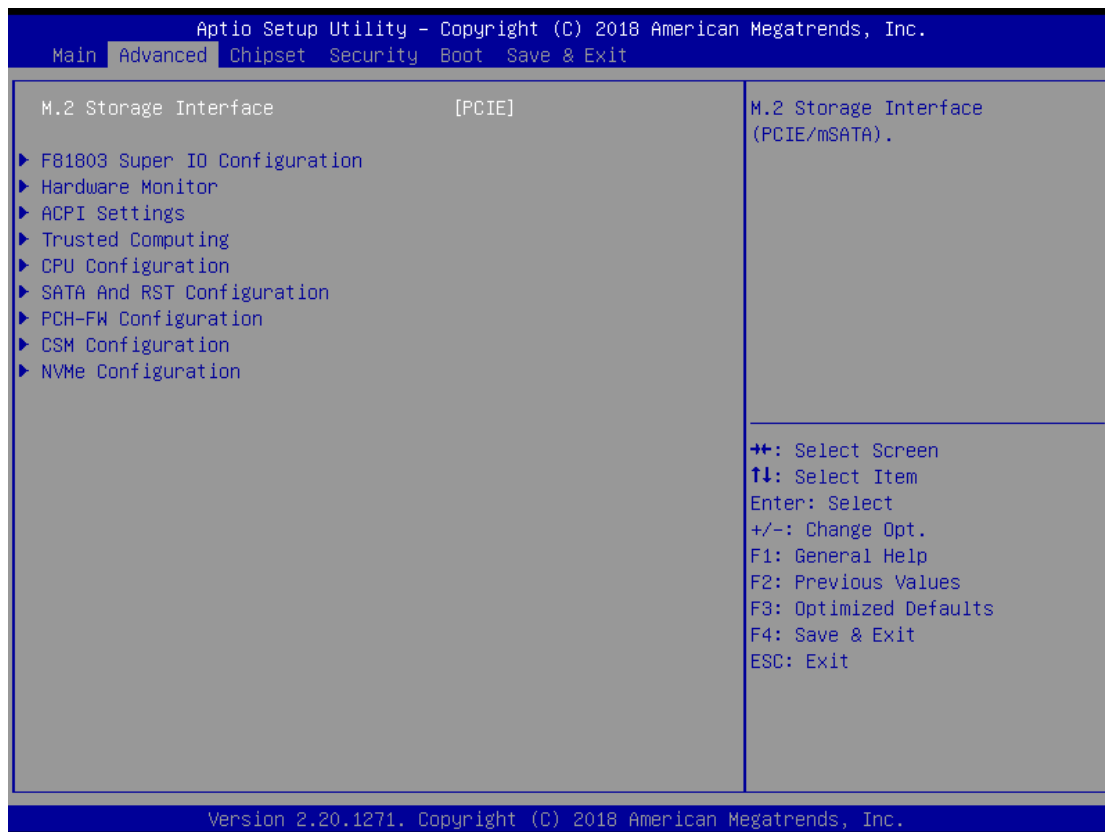
Use this option to change the system date and time. Highlight System Date or System Time using the <Arrow> keys. Enter new values through the Keyboard. Press the <Tab> key or the <Enter> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

4.4 Advanced Menu

The Advanced menu also allows users to set configuration of the CPU and other system devices. You can select any of the items in the left frame of the screen to go to the sub menus:

- **F81803 Super IO Configuration**
- **Hardware Monitor**
- **ACPI Settings**
- **Trusted Computing**
- **CPU Configuration**
- **SATA And RST Configuration**
- **PCH-FW Configuration**
- **CSM Configuration**
- **NVMe Configuration**

For items marked with “▶”, please press <Enter> for more options.

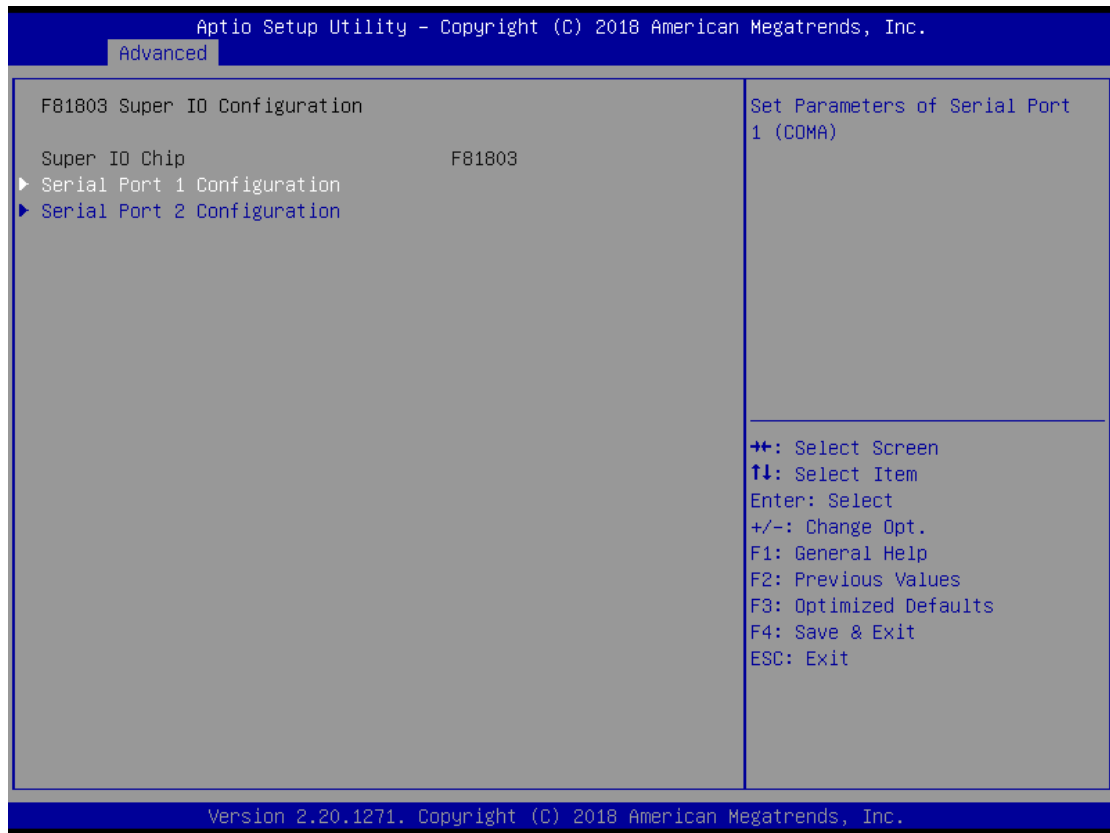


- **M.2 Storage Interface**

Use this option to change the M.2 Storage Interface, either PCIe or SATA.

- **F81803 Super IO Configuration**

Set parameters of Serial Port 1(COM1)/Serial Port 2(COM2)



- **Serial Port**
Enable or Disable serial port.
- **Device Settings**
Display the serial port resource.

- **ACPI Settings**

You can use this screen to select options for the ACPI Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



- **ACPI Sleep State**

Allow you to select the Advanced Configuration and Power Interface (ACPI) state to be used for system suspend. Here are the options for your selection, S3 (Suspend to RAM)

- **Trusted Computing**

This screen provides function for specifying the TPM(Trusted Platform Module) settings.



- **Security Device Support**

Use this item to enable or disable TPM(Trusted Platform Module) function.

● **CPU Configuration**

This screen shows the CPU Configuration, and you can change the value of the selected option.



➤ **Hyper Threading**

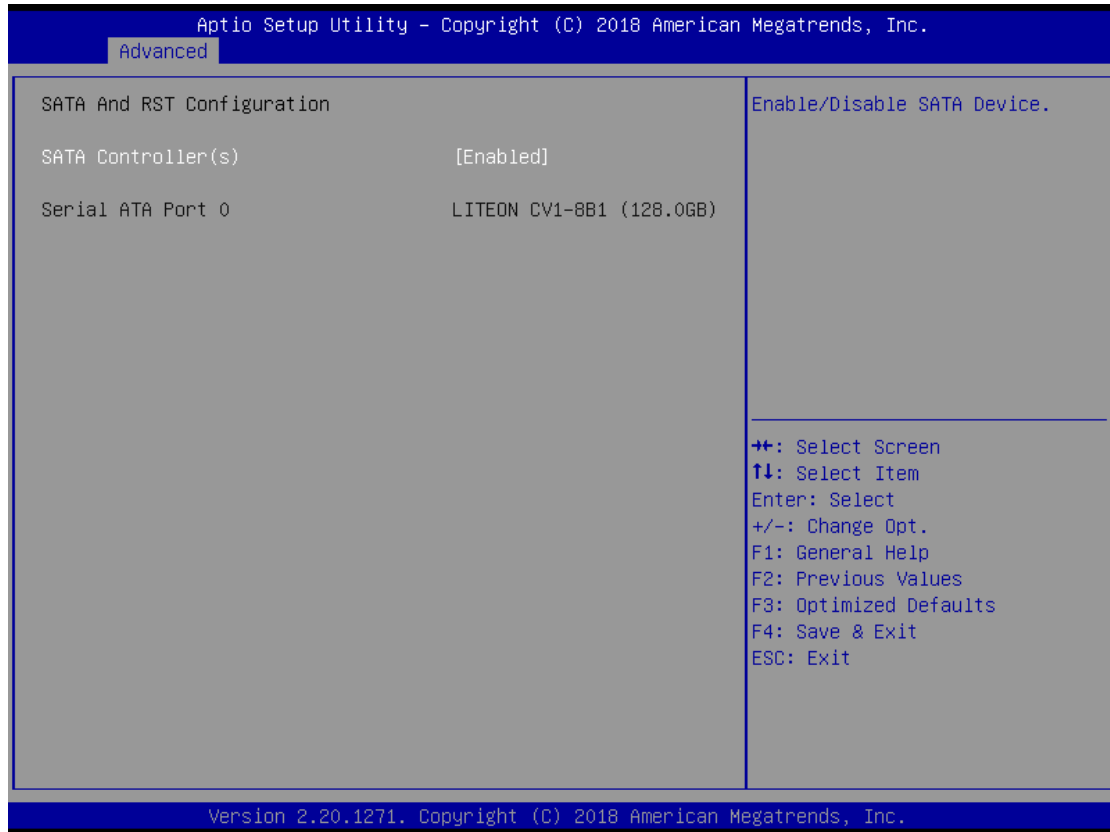
To select Hyper-threading function which is Intel's proprietary simultaneous multithreading (SMT) implementation used to improve parallelization of computations (doing multiple tasks at once) performed on x86 microprocessors.

➤ **Intel Virtualization Technology**

Allows a hardware platform to run multiple operating systems separately and simultaneously, enabling one system to virtually function as several systems.

- **SATA And RST Configuration**

You can use this screen to select options for the SATA And RST Configuration, and change the value of the selected option. A description of the selected item appears on the right side of the screen.



- **Serial-ATA Controller(S)**

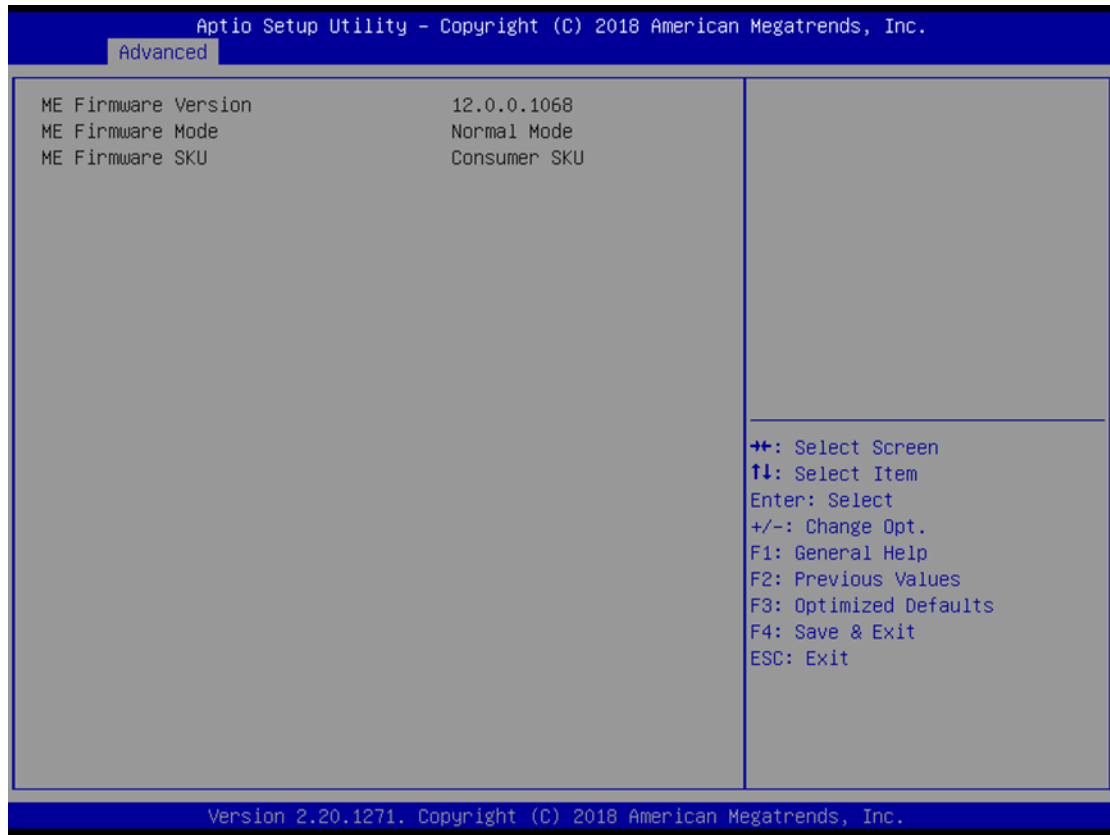
Use this item to enable or disable the integrated SATA controllers. (Default: Enabled)

- **Serial ATA Port 0**

Display the information of SATA Device.

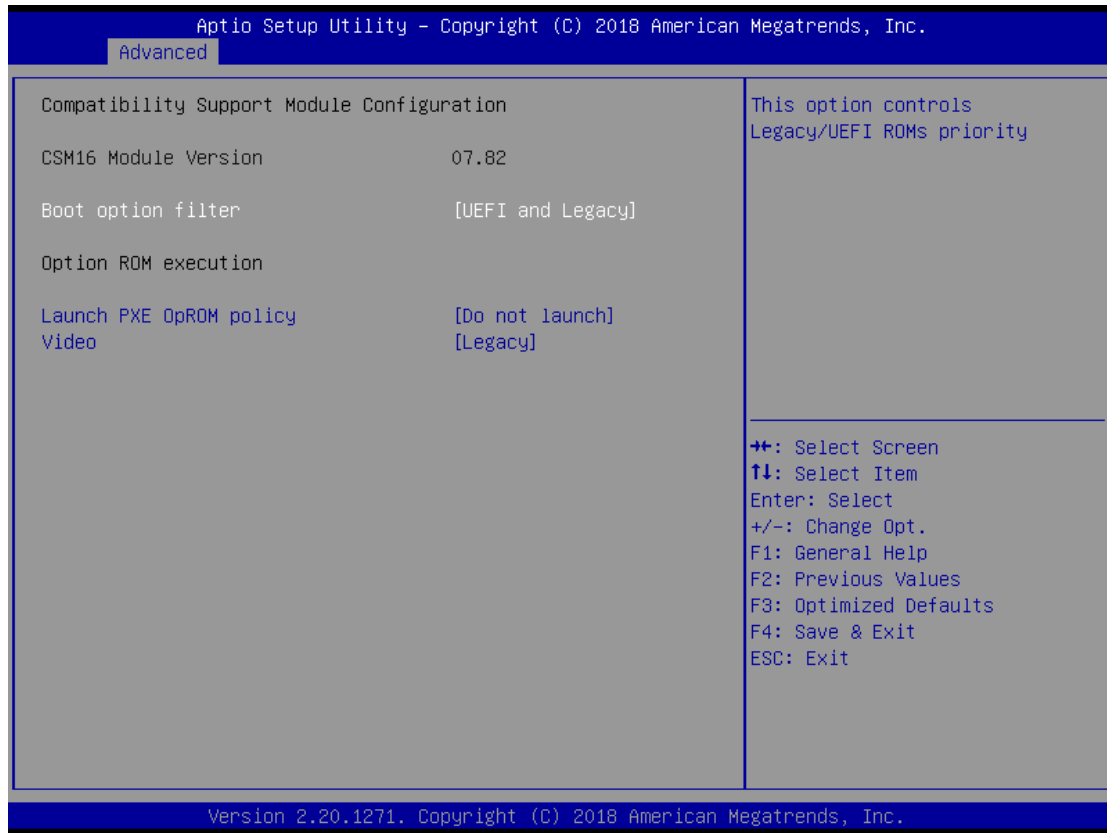
- **PCH-FW Configuration**

You can use this screen to confirm ME Firmware version.



- **CSM Configuration**

Configure settings associated with the CSM (Compatibility Support Module), such as Option ROM execution.



- **Boot option filter**

This option controls Legacy/UEFI ROMs priority.

- **Launch PXE OpROM policy**

Specifies which PXE Option ROM will be started. For PXE boot there is available the normal (Legacy) PXE boot as well as a UEFI PXE boot.

- **Video**

Controls the execution of UEFI and Legacy Video OpROM.

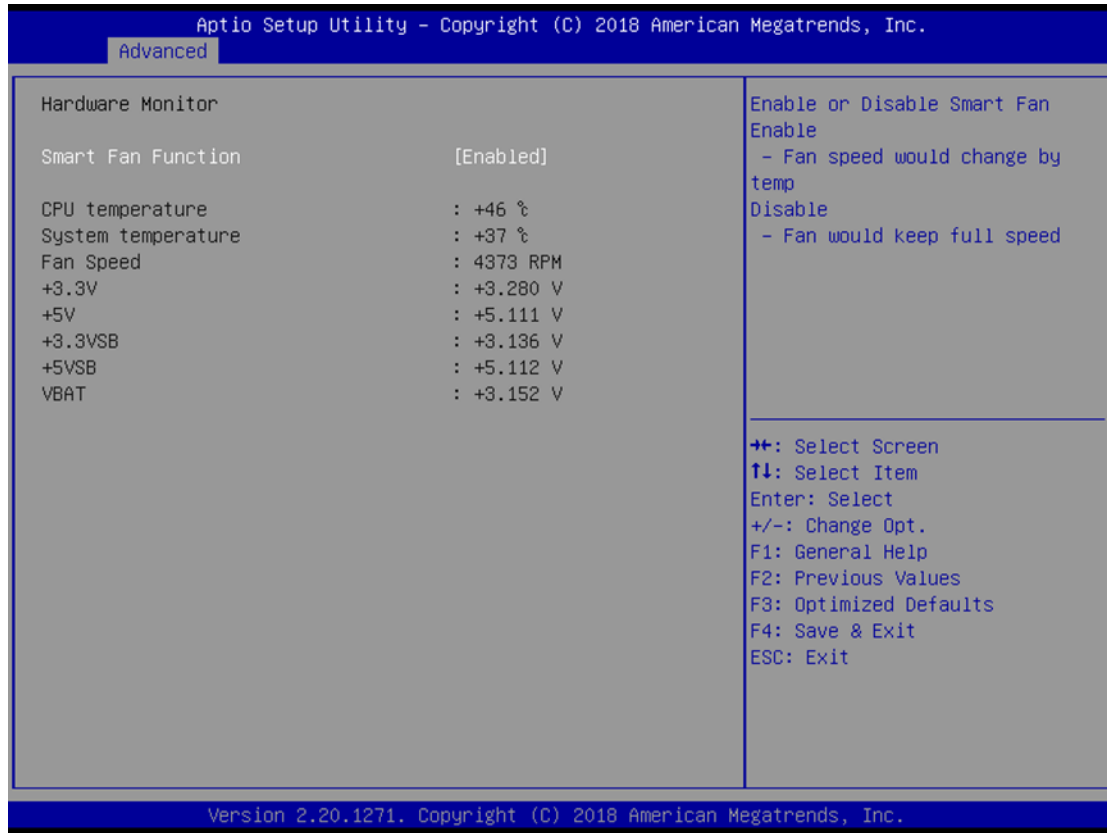
- **NVMe Configuration**

This page shows NVMe device that is installed in the system. The system will detect automatically.



- **Hardware Monitor**

This screen shows the Hardware Configuration, and enable or disable smart fan.



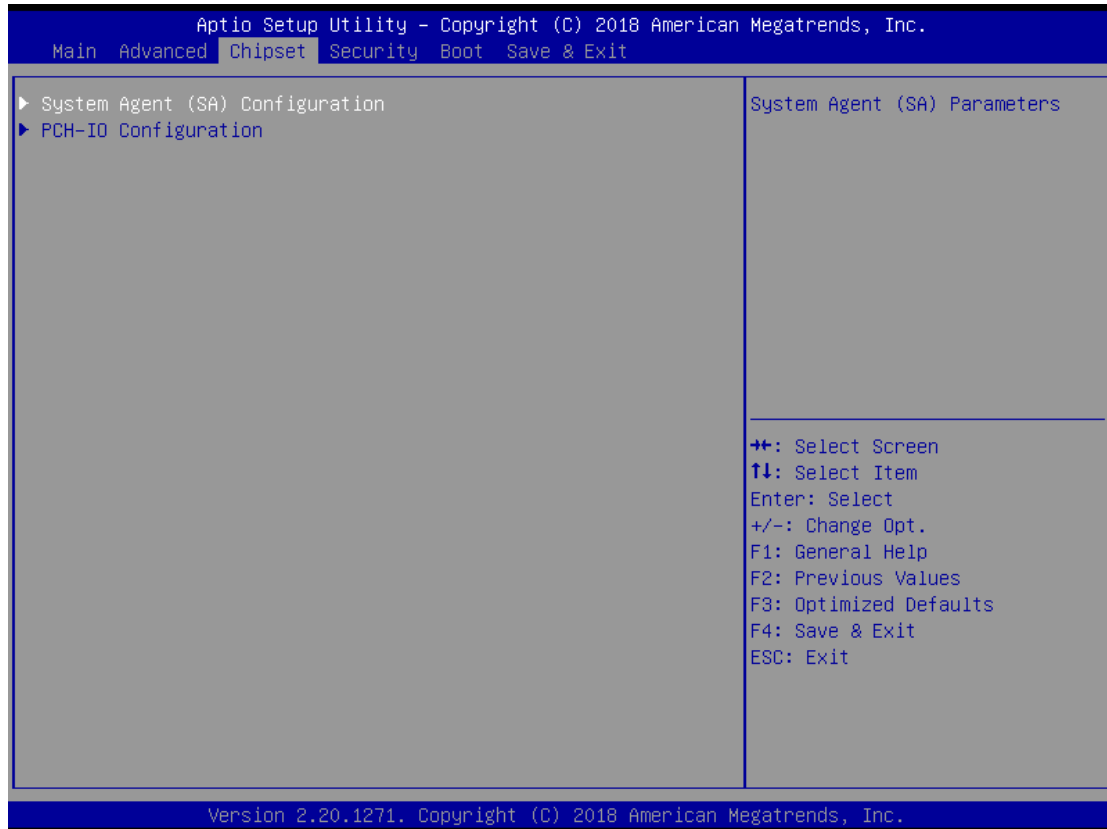
- **Smart Fan Function**

Enable or Disable Smart Fan.

4.5 Chipset Menu

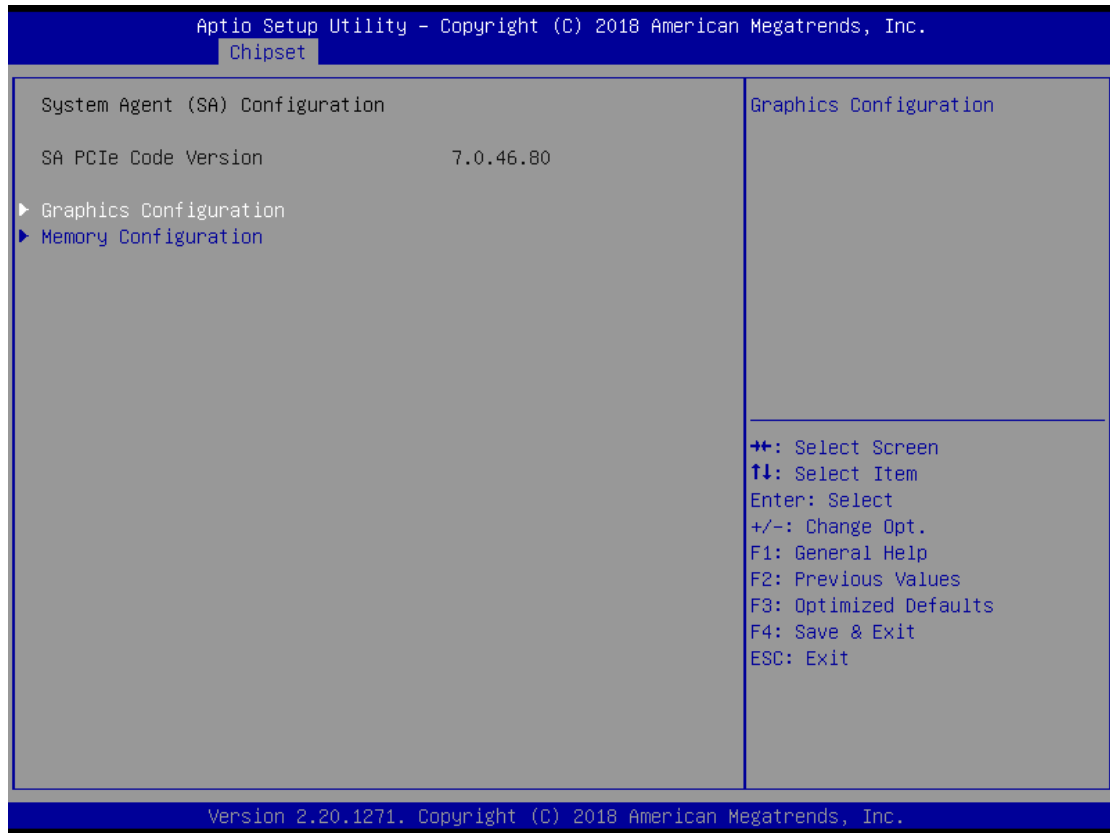
The Chipset menu allows users to change the advanced chipset settings. You can select any of the items in the left frame of the screen to go to the sub menus:

- **System Agent (SA) Configuration**
- **PCH-IO Configuration**



- **System Agent (SA) Configuration**

To adjust graphics and memory detail configurations.



- **Graphics Configuration**

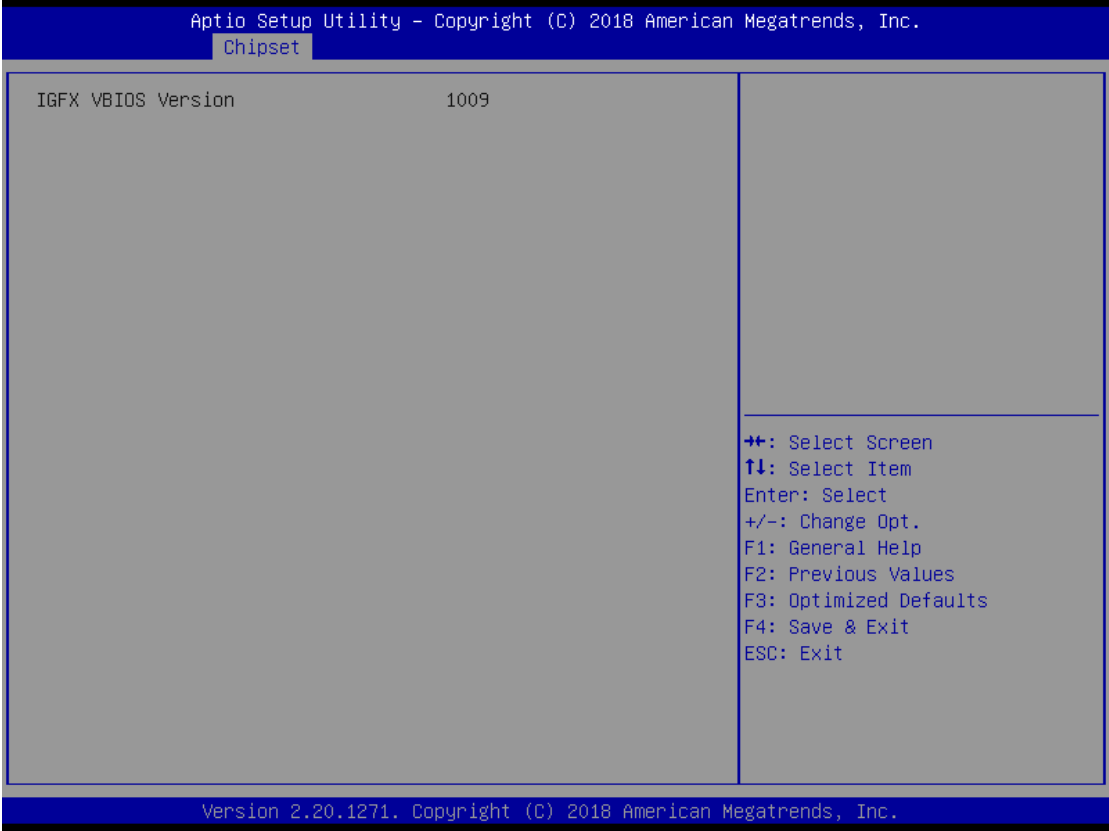
Graphics configuration parameters.

- **Memory Configuration**

Memory configuration parameters.

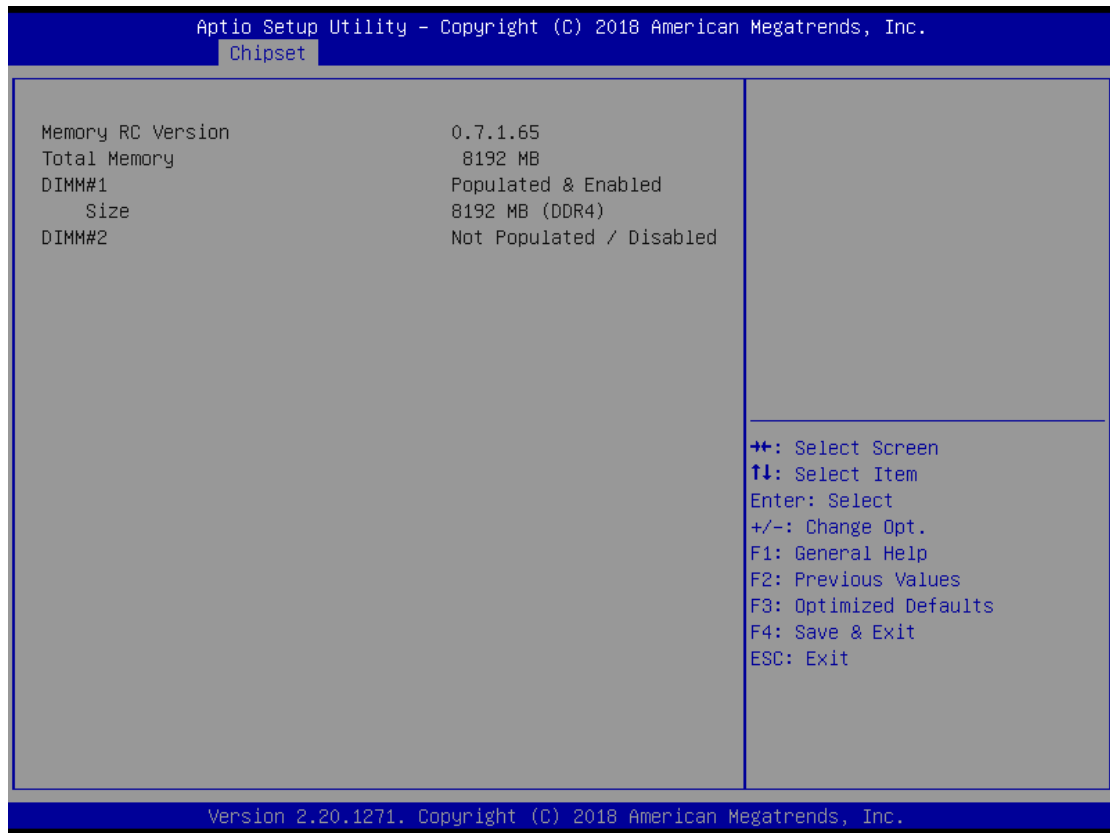
• **Graphics Configuration**

This option allows the user to view the Graphics Configuration parameters, such as Intel Internal Graphics (IGFX) Video BIOS Version.



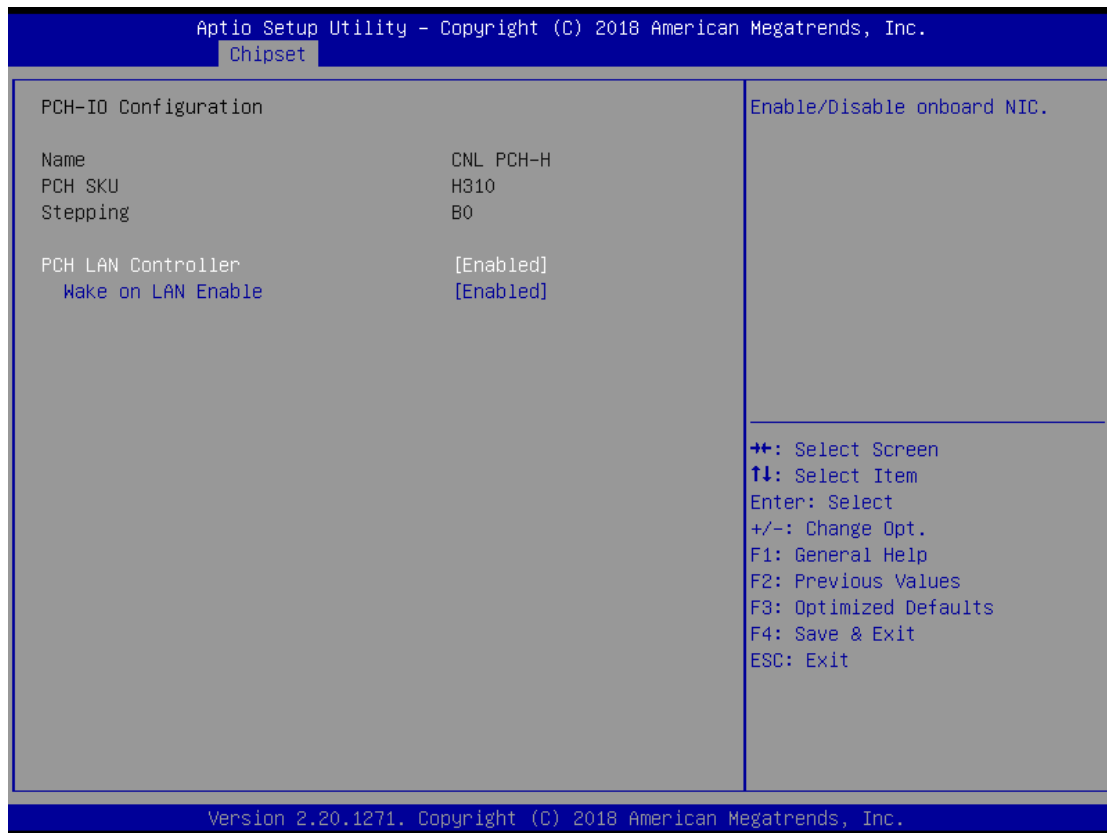
- **Memory Information**

This screen shows the system memory information.



- **PCH-IO Configuration**

This screen allows users to set PCH parameters.



- **PCH LAN Controller**

Enable or disable PCH LAN controller.

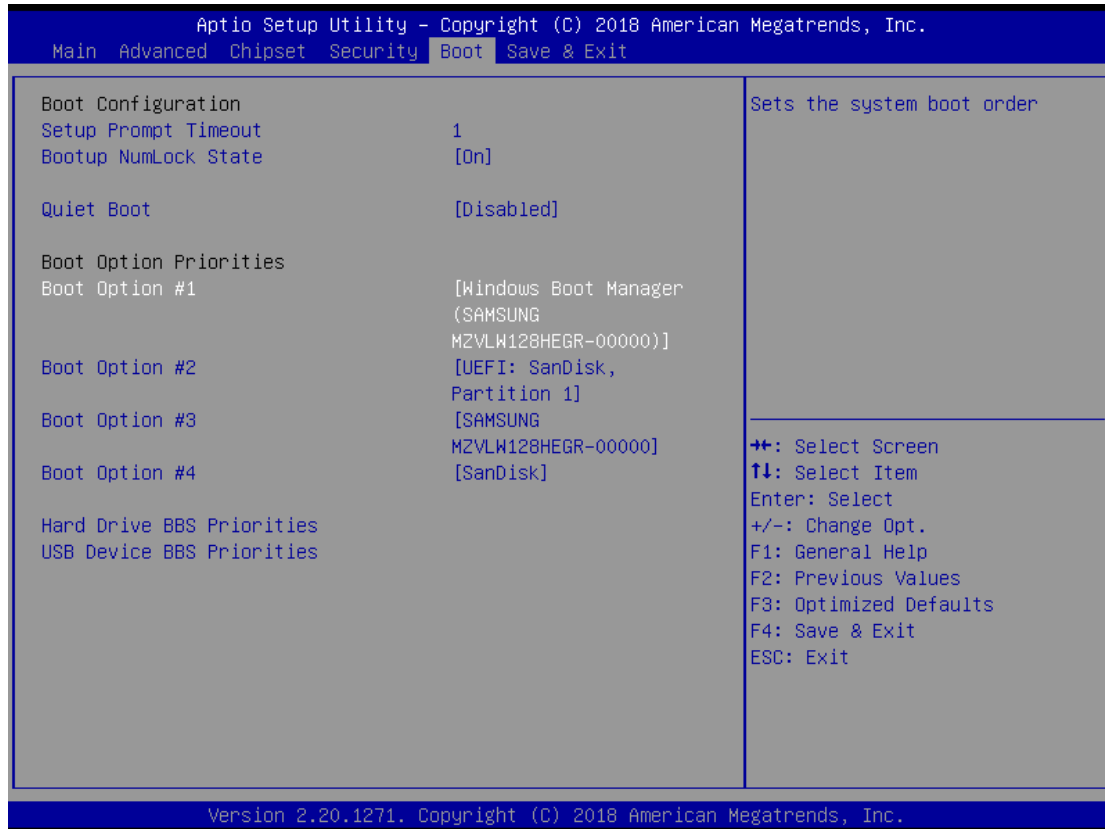
- **Wake on LAN**

Enable or disable Wake on LAN functionality.

4.6 Boot Menu

The Boot menu allows users to change boot options of the system. You can select any of the items in the left frame of the screen to go to the sub menus:

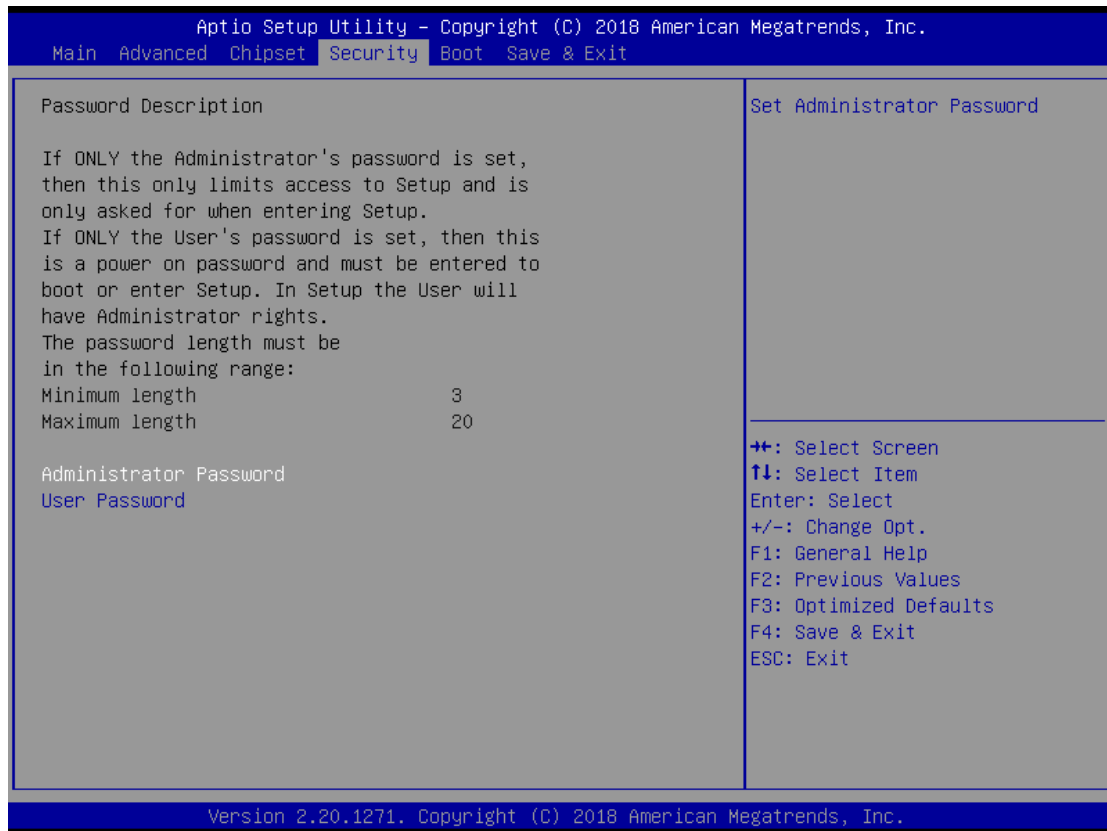
- **Setup Prompt Timeout**
- **Boot up NumLock State**
- **Quiet Boot**
- **Boot Option Priorities**



- **Setup Prompt Timeout**
Set the number of seconds to wait for Setup activation key.
- **Boot up NumLock State**
Use this item to select the power-on state for the Mum Lock. The default setting is on.
- **Quiet Boot**
Use this item to enable or disable the Quite Boot state. The default setting is disable.
- **Boot Option Priorities**
Sets the system boot order

4.7 Security Menu

The Security menu allows users to change the security settings for the system.



➤ Administrator Password

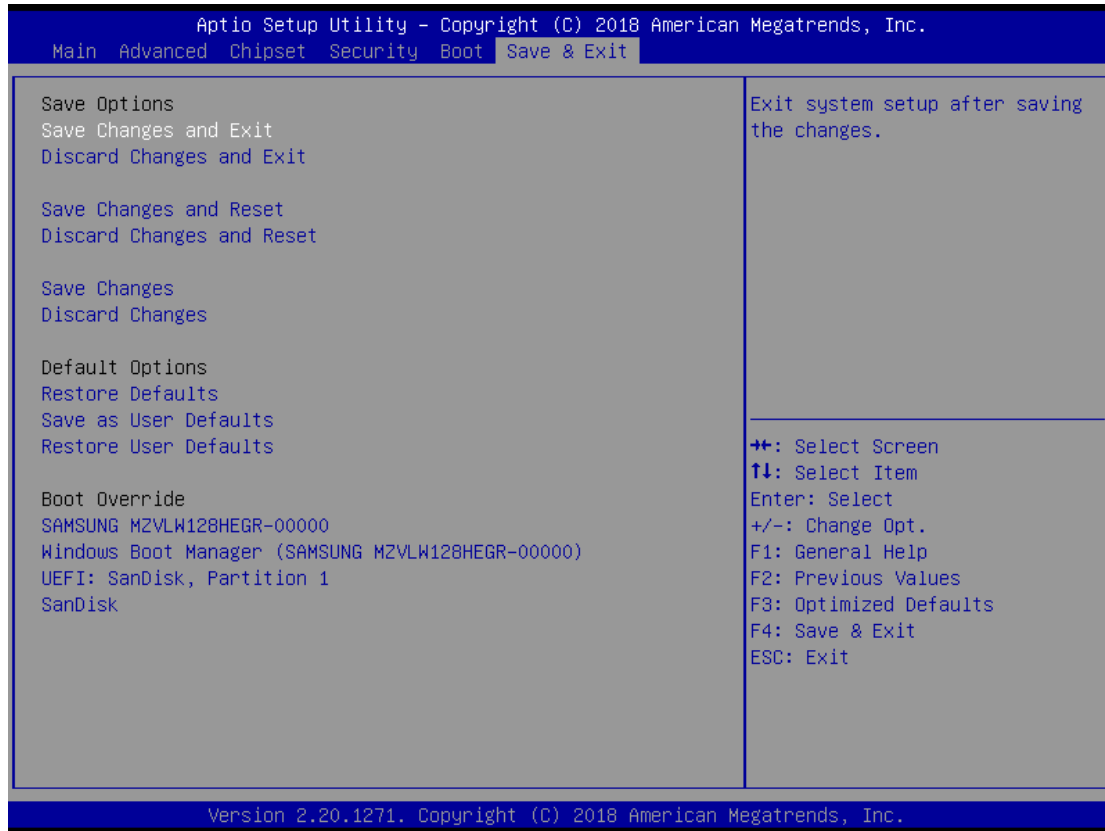
This item indicates whether an administrator password has been set. If the Administrator password is set, BIOS will ask and wait for administrator password entered.

➤ User Password

This item indicates whether a user password has been set. If the password is set, BIOS will ask and wait for User password entered

4.8 Save & Exit Menu

The Save & Exit menu allows users to load your system configuration with optimal or failsafe default values.



➤ Save Changes and Exit

When you have completed the system configuration changes, select Save Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to save changes and exit BIOS Setup.

➤ Discard Changes and Exit

This option provide quit Setup without making any permanent changes to the system configuration. Select Discard Changes and Exit from the Save & Exit menu and press <Enter>. Select Yes to discard changes and exit BIOS Setup.

➤ Save Changes and Reset

When you have completed the system configuration changes, select this option to leave Setup and reboot the computer so the new system configuration parameters can take effect. Select Save Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to save changes and reset.

➤ **Discard Changes and Reset**

Select this option to quit Setup without making any permanent changes to the system configuration and reboot the computer. Select Discard Changes and Reset from the Save & Exit menu and press <Enter>. Select Yes to discard changes and reset.

➤ **Save Changes**

When you have completed the system configuration changes, select this option to save changes. Select Save Changes from the Save & Exit menu and press <Enter>. Select Yes to save changes.

➤ **Discard Changes**

Select this option to quit Setup without making any permanent changes to the system configuration. Select Discard Changes from the Save & Exit menu and press <Enter>. Select Yes to discard changes.

➤ **Restore Defaults**

It automatically sets all Setup options to a complete set of default settings when you select this option. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications. In particular, do not use the Optimal Setup options if your computer is experiencing system configuration problems. Select Restore Defaults from the save & Exit menu and press <Enter>.

➤ **Save as User Defaults**

Select this option to save system configuration changes done so far as User Defaults. Select Save as User Defaults from the Save & Exit menu and press <Enter>.

➤ **Restore User Defaults**

It automatically sets all Setup options to a complete set of User Defaults when you select this option. Select Restore User Defaults from the Save & Exit menu and press <Enter>.

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APPENDIX A WATCHDOG TIMER

Watchdog Timer Setting

After the system stops working for a while, it can be auto-reset by the Watchdog Timer. The integrated Watchdog Timer can be set up in the system reset mode by program.

Using the Watchdog Function Start

1. Enable configuration (Following is example to enable configuration by using debug)

-O 2E 87

-O 2E 87

2. Select Logic device:

-O 2E 07

-O 2F 07

3. WDT Device Enable

-O 2E 2B

-O 2F 00

-O 2E 30

-O 2F 01

4. Activate WDT:

-O 2E F0

-O 2F 80

5. Set base timer:

-O 2E F6

-O 2F 0A → Set Reset Time (Ex. A: 10 Sec)

6. Set timer unit

-O 2E F5

-O 2F 71 (1: Sec ; 9: Minute)

7. Disable WDT

-O 2E 30

-O 2F 00

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