# AXIOMTEK

# OPS700-520 Series

**Intel Open Pluggable Specification Plus Box**

**User's Manual**

RoHS

# Disclaimers

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# 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 mean 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 OPS700-520 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 OPS700-520 Series before any installation. Be sure both the system and external devices turned OFF already. Make sure the OPS700-520 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 OPS700-520 Series, make sure to install it securely.

6. Do not leave this equipment in an uncontrolled environment where the storage temperature is below 0℃ or above 45℃. 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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# Table of Contents

# CHAPTER 1
# INTRODUCTION



This chapter contains general information and detailed specifications of the OPS700-520 Series. Chapter 1 includes the following sections:

- **General Description**

- **Specification**

- **Michanical Assembly**

- **Package List**

## 1.1    General Description

Intel Open Pluggable Specification Plus (OPS+) Compliance

OPS700-520 Series is based on the 8th generation Intel® Core™ processor on board with Intel® Q370 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 functionally of the module in all compatible display panel system.

OPS700-520 Series meets Intel Open Pluggable Specification Plus 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

OPS700-520 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.

OPS700-520 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**

  ■ 8$^{th}$ Gen. Intel$^{®}$ Core™ i7/i5/i3/Celeron Processors, LGA1151, 35W TDP

● **System Chipset**

  ■ Intel® Q370 PCH

● **BIOS**

  ■ American Megatrends Inc. UEFI (Unified Extensible Firmware Interface).

● **System Memory**

  ■ Two 260-pin DDR4 2400MHz SO-DIMM, maximun up to 32GB

### 1.2.2    I/O System

● **Front I/O**

  ■ One HDMI1.4b supports for FullHD (Up to 1920 x 1080) without audio and 4K (Up to 4096 x 2160@24Hz) resolution. (Default: FullHD without audio)

*NOTE:* **The default resolution is FullHD without audio. The 4K resolution with audio can be enabled when the DisplayPort via HRS connector is disabled, and the HRS connector cannot be connected to the flat-panel display as well; otherwise, the HDMI would be disabled directly. The resolution mode can be selected in BIOS. For more details, please refer to Graphics Configuration in section 4.5 Chipset Menu.**

  ■ Two  USB ports  3.1 Gen2

  ■ Two  USB ports  2.0

  ■ One  RS-232(COM2)

  ■ One  Power On/Off button

  ■ One  Reset button

  ■ Two  LED Indicaters (Power & 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)

*NOTE:* **For more details, please refer to section 3.1.1 JAE TX25A Connector (CN1)**

- One 60Pin HRS FX18
  - ➢ 1 x DP 1.2 (Up to 4096 x 2304@60Hz)
  - ➢ 1 x PCI-Express 3.0 x4
  - ➢ DC output 5V@3A max, 3.3V@3A max

  *NOTE:* **For more details, please refer to section 3.1.2 HRS FX18 Connector (CN2).**
- One 12/19V DC-Jack connector for optional adpter 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 SATA SSD
- **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℃ to 45℃ (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 OPS700-520 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.
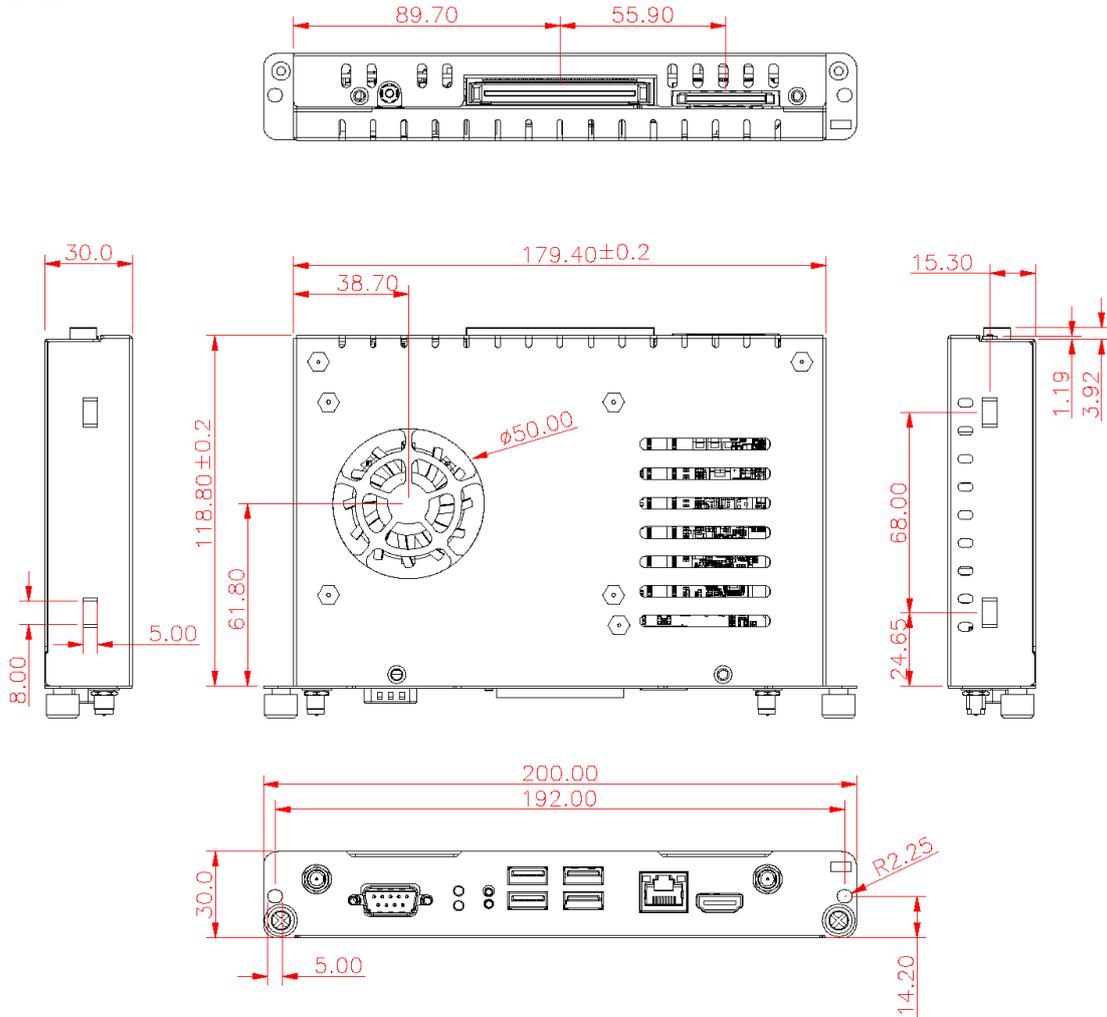


※While plugging the OPS+ module, please make sure the heat sink side of OPS+ module toward the outside. Axiomtek will be out of reasonability if there is any damage occurred due to it.

### 1.3.2   I/O outlet

The following figures show you the locations of the OPS700-520 SeriesI/O outlets.
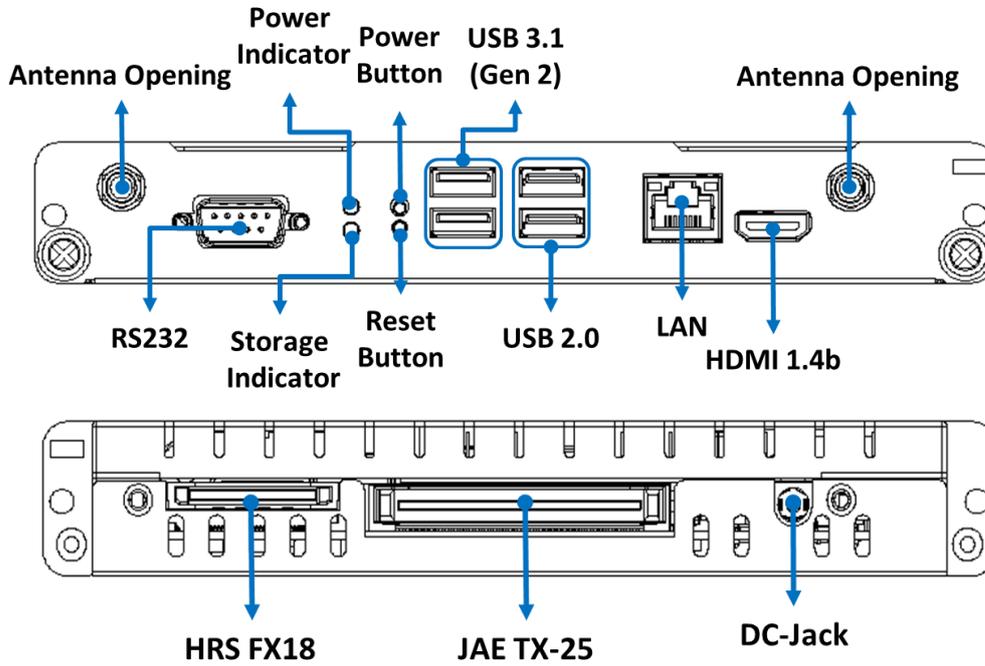


### 1.3.3   Mechanical Specifications

**OPS700-520 Series is docked in the reference display panel**

The OPS700-520 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.*
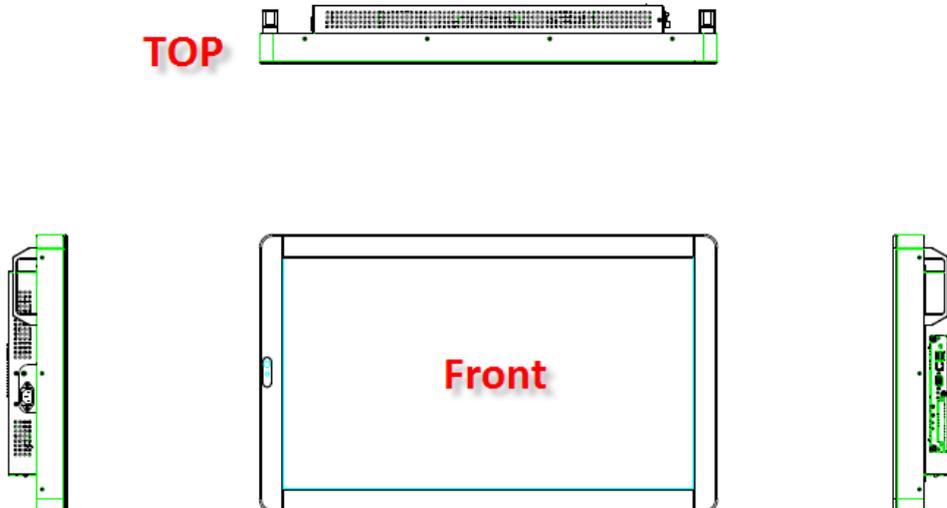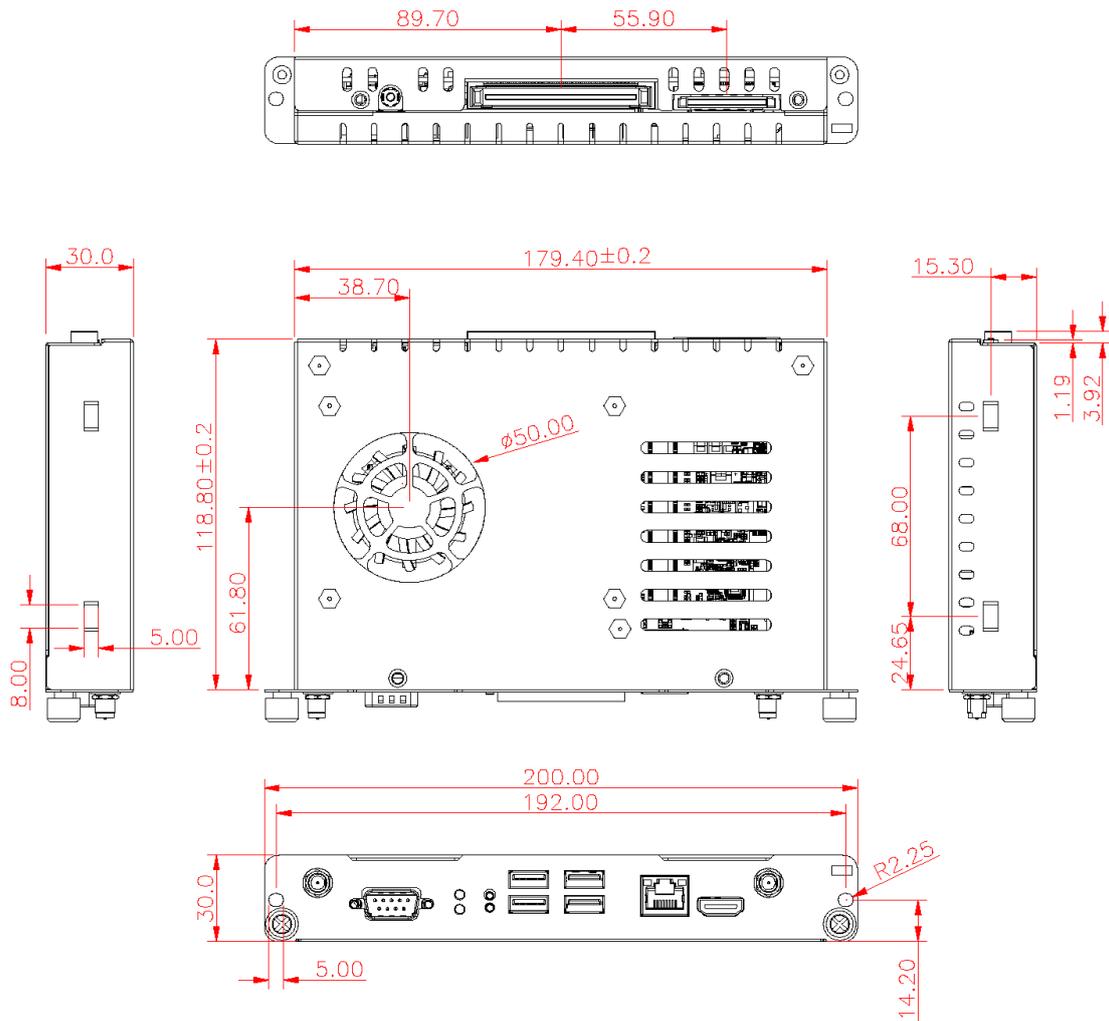
**Exploded View of the Pluggable Module**
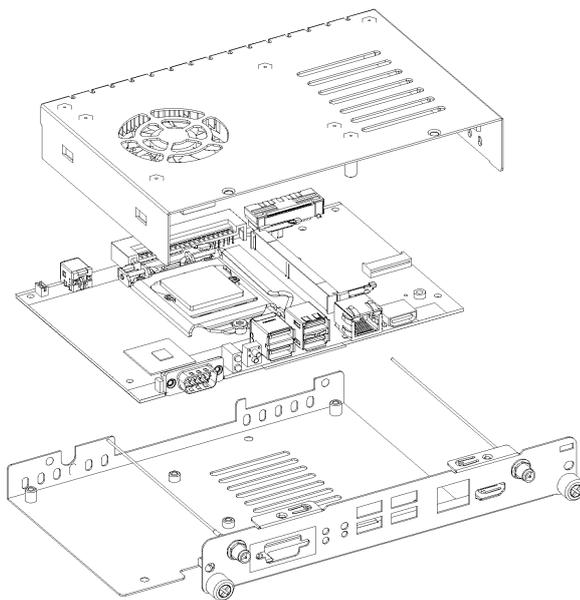
**The Guide Rail Mechanism for the OPS700-520 Series Module**

You can use the rails alongside of OPS700-520 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.

Please refer to the following drawing for the location of Lock Hole on the pluggable module.
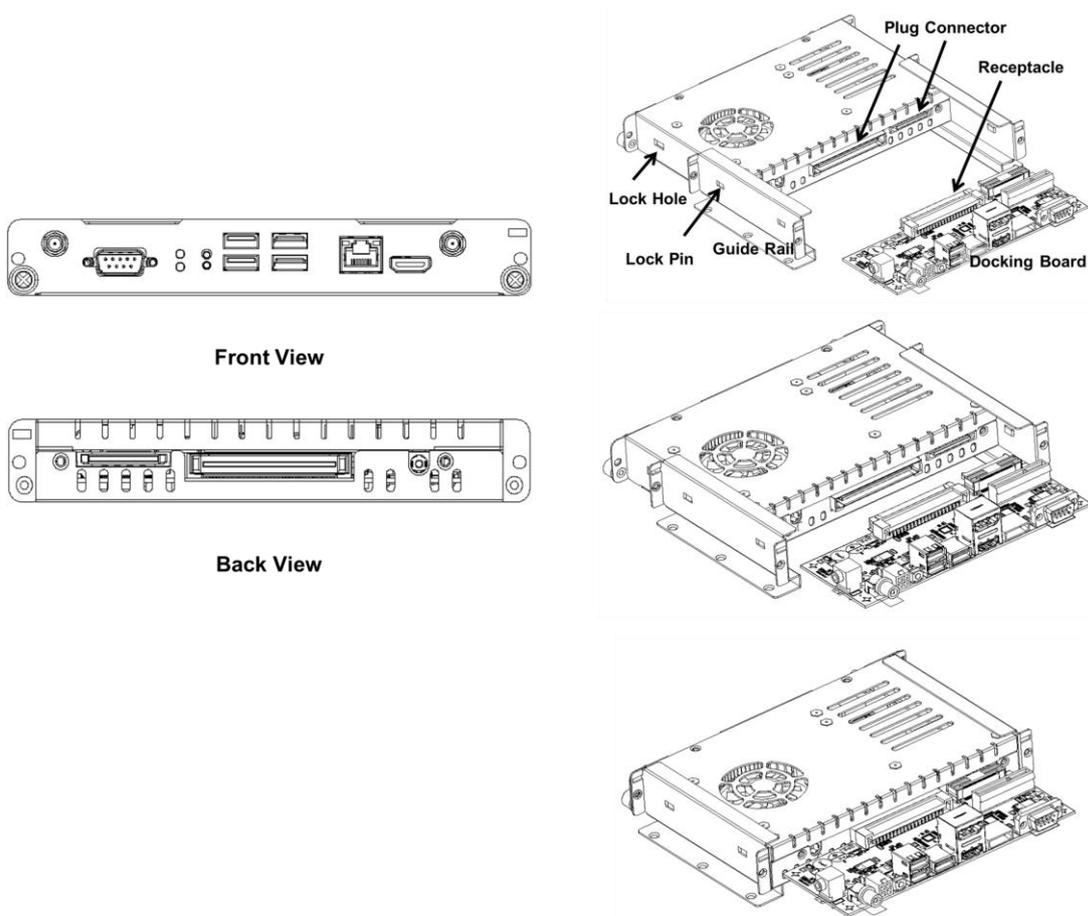


*The drawing is base on Intel Open Pluggable Specification Plus (OPS+).

**Dimensions of the Guide Rail**
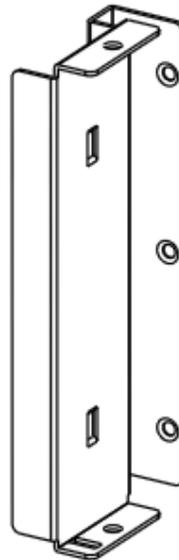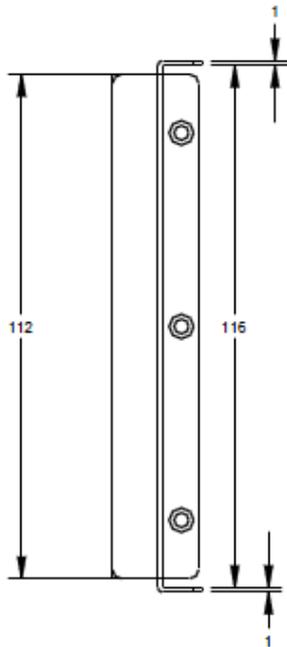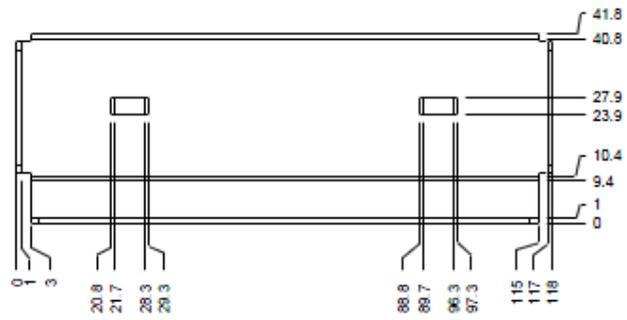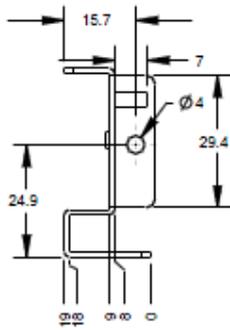
**Location of JAE TX25A & HRS FX18 Plug Connector**

Please refer to the following drawing for location of the JAE TX25A and HRS FX18 plug connector. Pin 1 of the connector is 114.77 mm from the edge of the module and 106.89 mm from the inner side of the front panel. The center of the FX18-60S connector is 55.9 mm from the center of the JAE connector, and 1.27 mm from the outer side of the rear panel. For mating tolerance of the plug/receptacle connector, refer to the JAE and HRS specification.
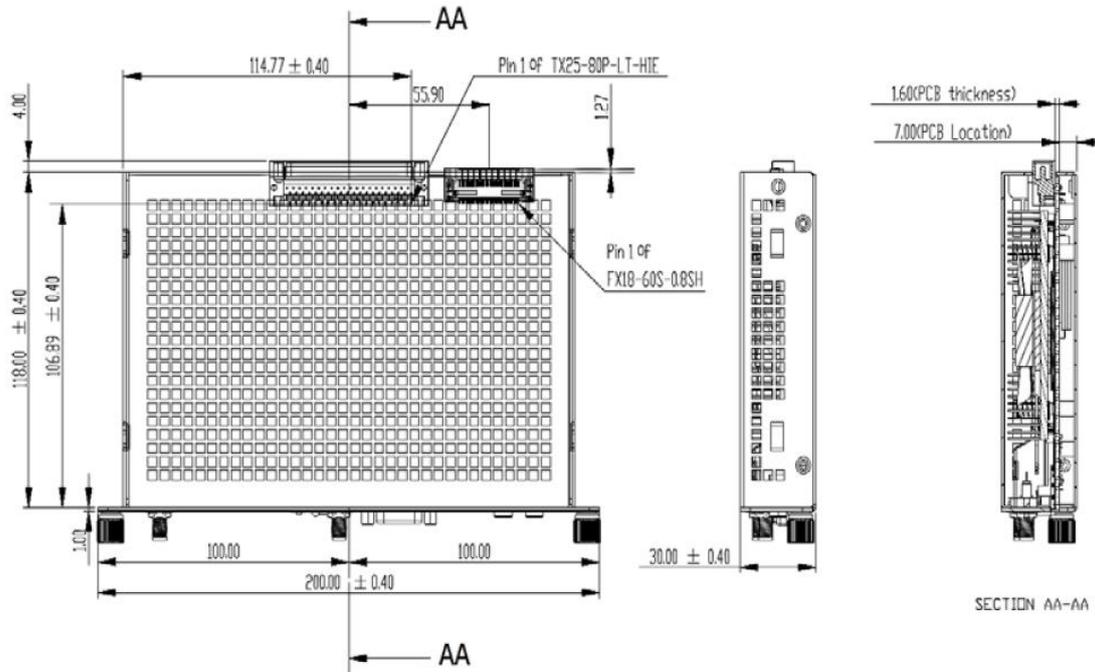


**Vent Holes at the Pluggable Module Back Panel**

On the OPS700-520 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.
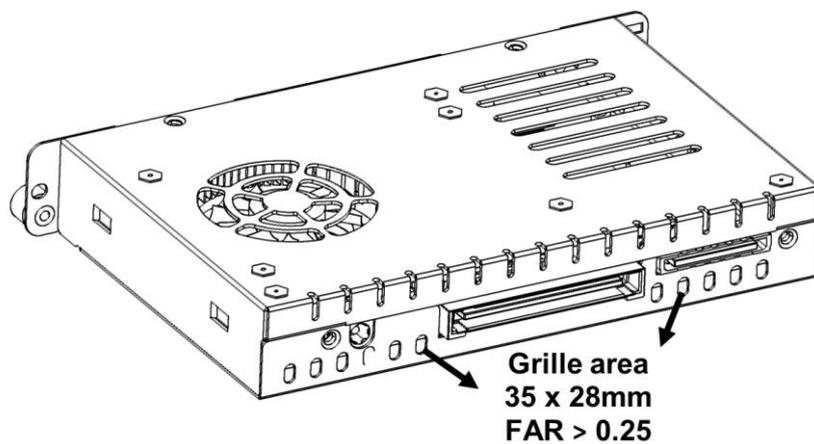
### 1.3.4    Reference Design

Display Panel Rear View − Internal
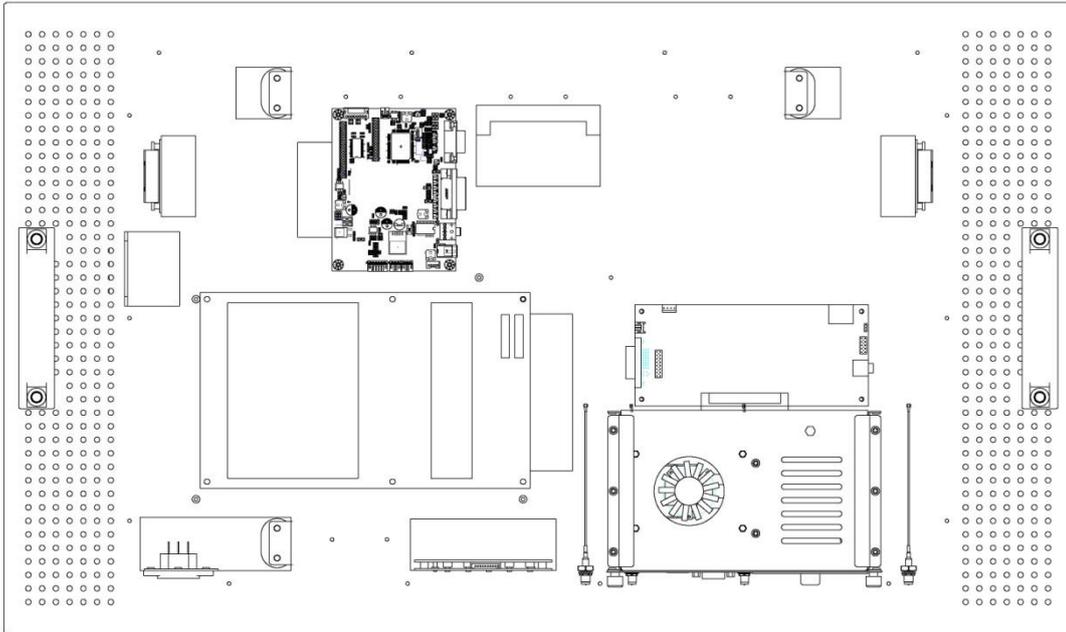


The digital signage OPS700-520 Series prototype is based on a **32"** display panel with the functional blocks illustrated. It is mainly a 3-board partitioning design consisting of the pluggable module, docking board and the panel control board.

## 1.4    Package List

When you receive the OPS700-520 Series, the bundled package should contain the following items:

● **OPS700-520 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.

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<div align="right">

# CHAPTER 2
# HARDWARE INSTALLATION

</div>

The OPS700-520 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 OPS700-520 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-DIMM2)

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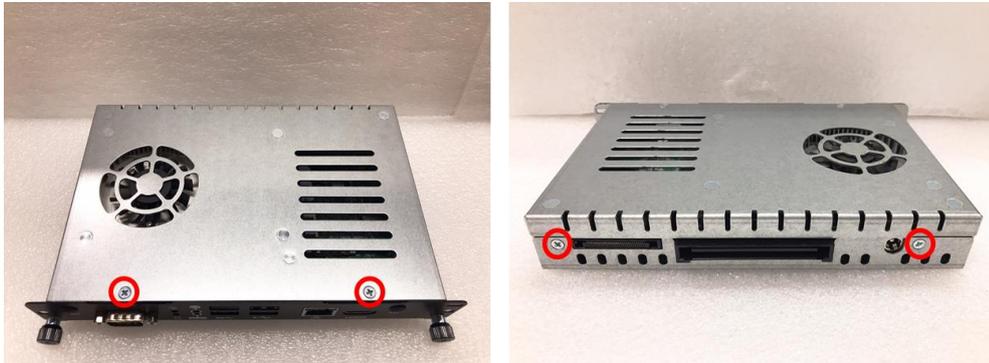


**Step 2** To open the upper case, please hold the system with your middle fingers at the Lock Hole, and put your thumbs at the edge of the front panel, then use your thumbs press enough force at the edge of the front panel (① red arrow in the second figure below), meanwhile; lift up the upper case with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



**Lock Hole**

**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 OPS700-520 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.**
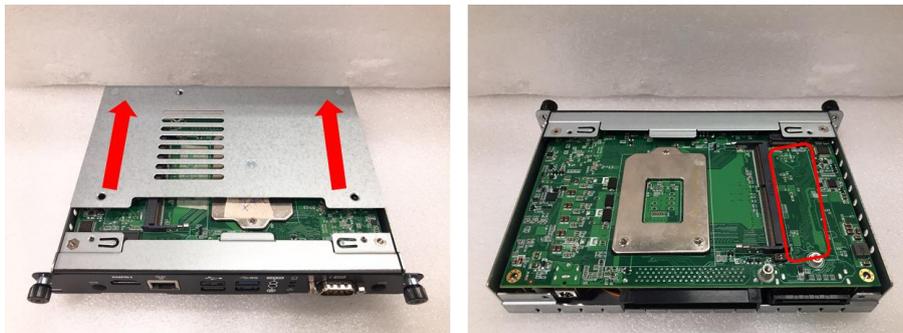


**Step 3   Holding the M.2 2280 Key M SSD card at a 30 degree angle up from horizontal, slowly insert the golden fingers into the M.2 2280 Key M slot until it is fully inserted in. And secure the M.2 2280 Key M SSD card to the carrier by tightening up the one M3*4L pan head screw to the marked position.**



**Step 4   Then apply the M.2 thermal pad on the M.2 2280 Key M SSD card.**
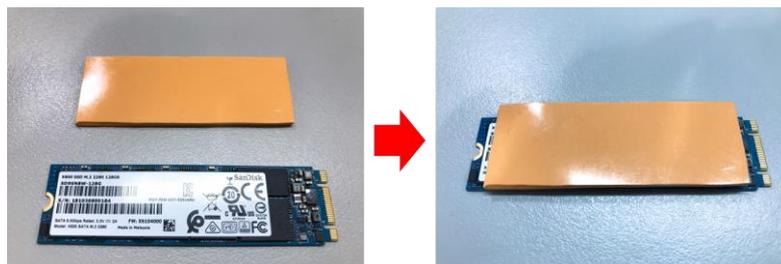
### 2.1.4   Wireless Module (M.2 Key E Card)

The OPS700-520 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.**
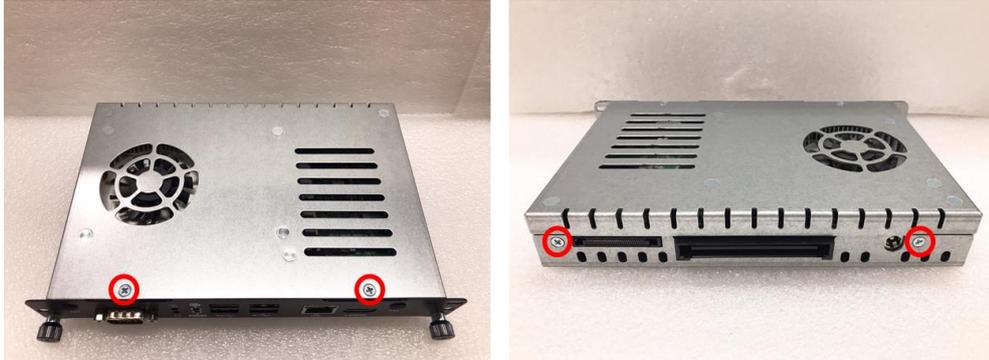
**Step 2**   **To open the upper case, please hold the system with your middle fingers at the Lock Hole, and put your thumbs at the edge of the front panel, then use your thumbs press enough force at the edge of the front panel (① red arrow in the second figure below), meanwhile; lift up the upper case with your middle fingers (② blue arrow in the second figure below).**
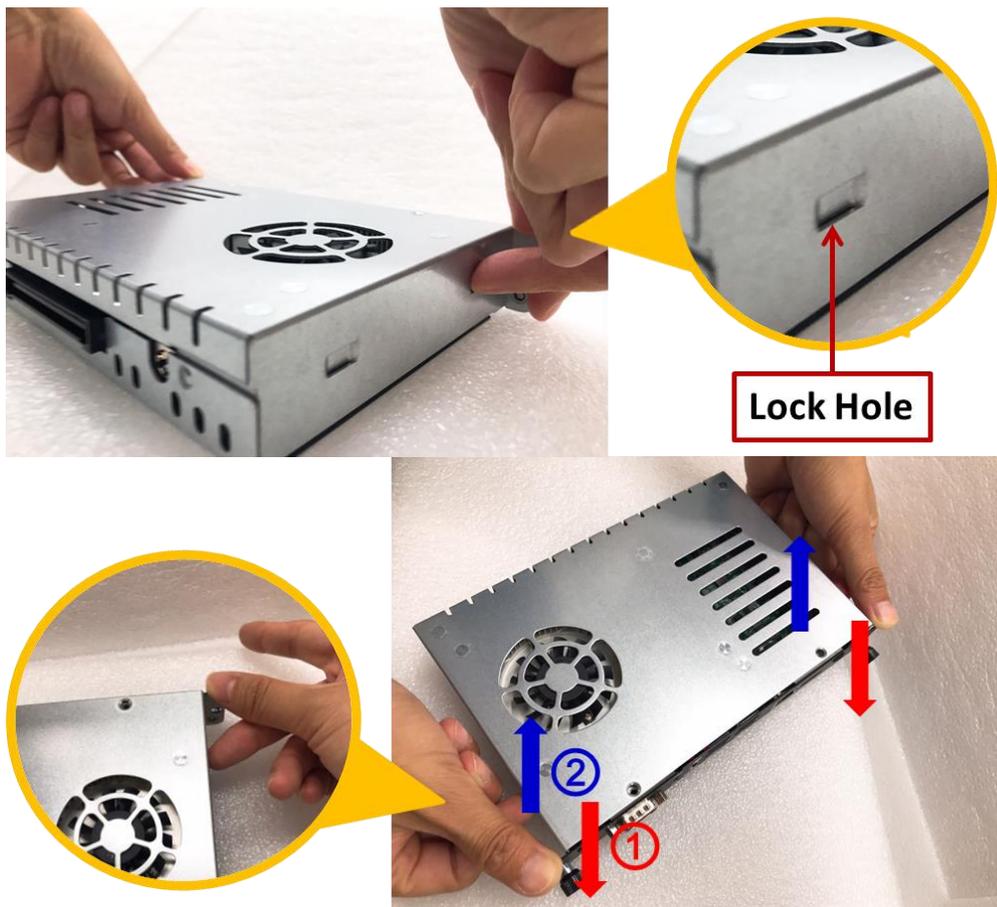
**Step 3** **Locate the M.2 2230 Key E slot on the board. And holding the M.2 2230 Key E card at a 30-degree angle up from horizontal, slowly insert the golden fingers into the M.2 2230 Key E slot until it is fully inserted in.**



**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    Pluggble Module Method

*NOTE:   Please contact Axiomtek for the available option display*



**Step 1    Pluggable the box into display**

**Caution: When plugging OPS700-520 Series module into an OPS+/OPS display, please disconnect the HDMI cable from the HDMI connector at the front I/O first, and make sure the module's heat sink is facing outside of the display. Axiomtek is not responsible for any damage caused by the wrong installation.**

**Step 2    Fasten the screws as illustrated.**
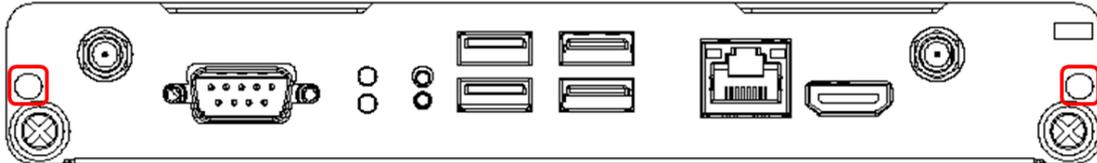
# CHAPTER 3
# CONNECTORS

This chapter provides users with detailed description how connectors connect this board with other parts of the system. Loose or improper connection might cause problems. Make sure all connectors are properly connected.

## 3.1    Connectors

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 |
| HRS FX18 Connector | CN2 | 3.1.2 |
| CPU FAN Connector | CN3 | 3.1.3 |
| M.2 2230 Key E Wi-Fi & Bluetooth | CN4 | 3.1.4 |
| USB2.0 Port | CN5 | 3.1.5 |
| USB3.1 Port (Gen2) | CN6 | 3.1.6 |
| Power & Reset Button | CN7 | 3.1.7 |
| HDMI Connector | CN9 | 3.1.8 |
| Battery 2 PIN | BAT1 | 3.1.9 |
| M.2 2280 Key M SSD | SCN1 | 3.1.10 |
| COM Port | COM2 | 3.1.11 |
| RJ45 (i219LM) | LAN1 | 3.1.12 |
| DC Power Jack | PWR1 | 3.1.13 |
| AT/ATX Mode | SW1 | 3.1.14 |
| CMOS Clear | | |

## Board Layout
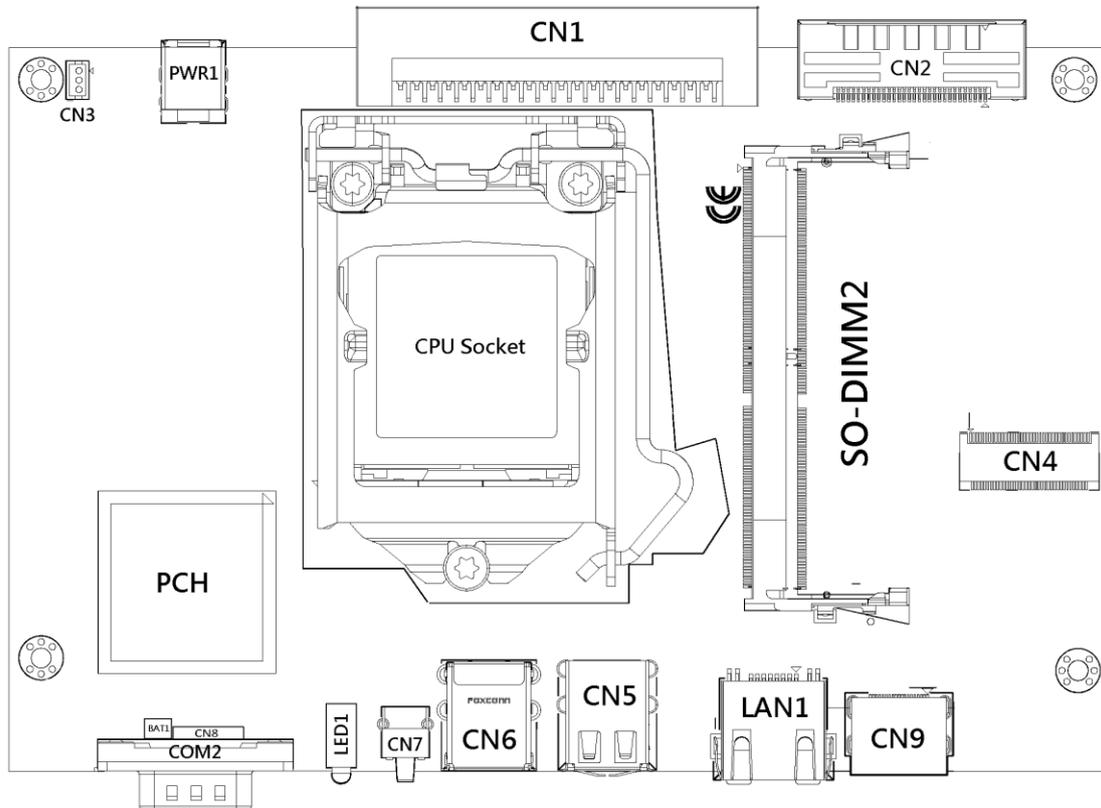


**Top side**
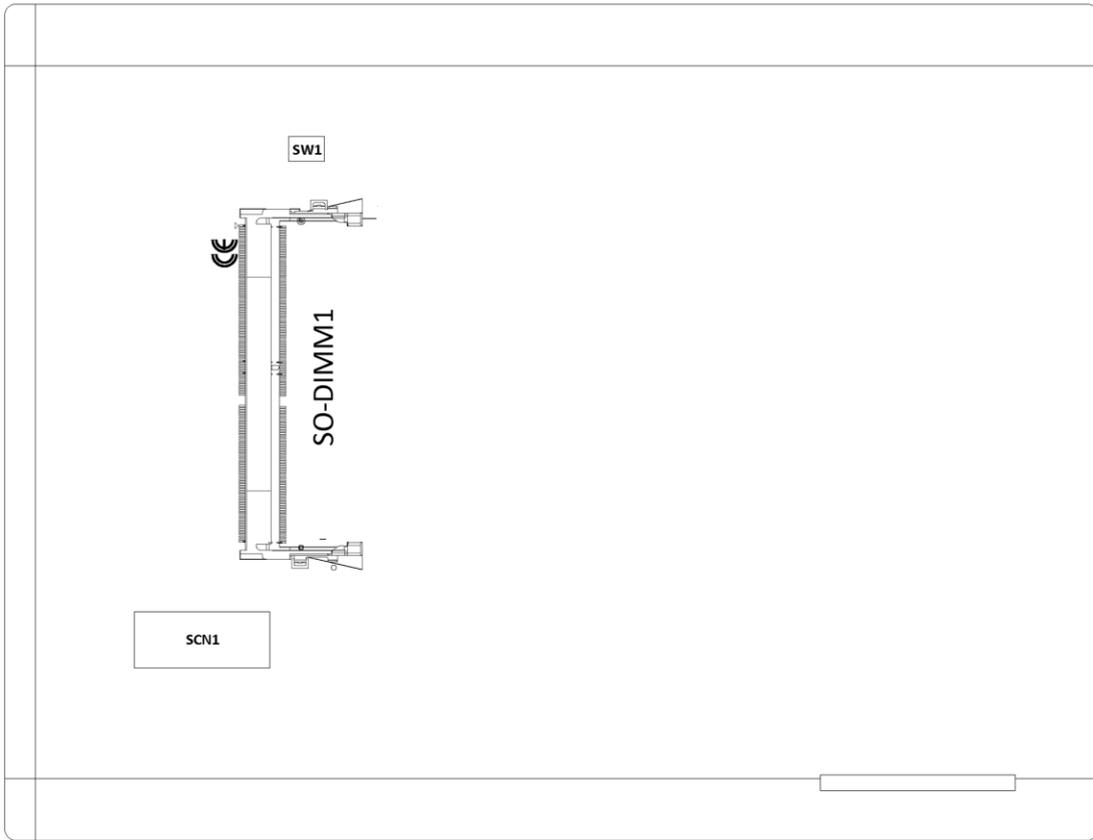
**Bottom side**

### 3.1.1    JAE TX25A Connector (CN1)

OPS700-520 supports HDMI/DP, UART (Tx/Rx), 1x USB3.0, 2x USB2.0, Audio-out from JAE TX-25A 80-pin angle connector which plugs JAE TX-24A to a monitor.

| 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_DATA | 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 |
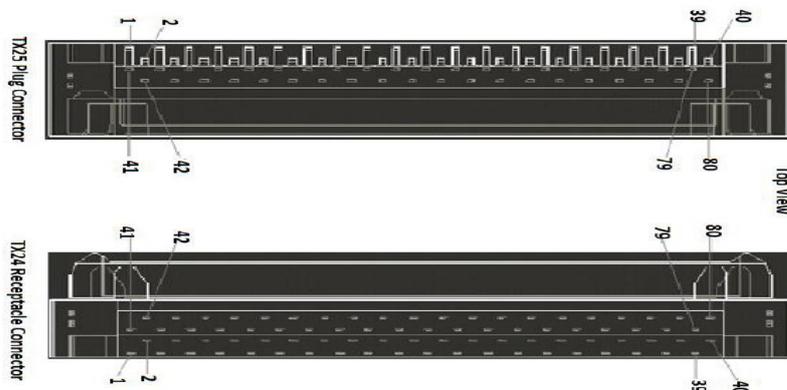
### 3.1.2 HRS FX18 Connector (CN2)

OPS700-520 supports 1 HRS FX18 Connector, please see the following table for the pin assignments:

| Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|-----|--------|-----|--------|
| 1 | PCIE-RXN0 | 2 | PCIE-RXP0 | 3 | GND | 4 | GND |
| 5 | PCIE-RXN1 | 6 | PCIE-RXP1 | 7 | GND | 8 | GND |
| 9 | PCIE-RXN2 | 10 | PCIE-RXP2 | 11 | GND | 12 | GND |
| 13 | PCIE-RXN3 | 14 | PCIE-RXP3 | 15 | GND | 16 | GND |
| 17 | PCIE_CLK_N | 18 | PCIE_CLK_P | 19 | GND | 20 | SM_CLK |
| 21 | SM_DATA1 | 22 | GND | 23 | DDP1_AUXN | 24 | DDP1_AUXP |
| 25 | GND | 26 | DDP1_1N | 27 | DDP1_1P | 28 | GND |
| 29 | DDP1_0N | 30 | DDP1_0P | 31 | PCIE_WAKE | 32 | GND |
| 33 | PCIE-TXN0 | 34 | PCIE-TXP0 | 35 | GND | 36 | GND |
| 37 | PCIE-TXN1 | 38 | PCIE-TXP1 | 39 | GND | 40 | GND |
| 41 | PCIE-TXN2 | 42 | PCIE-TXP2 | 43 | GND | 44 | GND |
| 45 | PCIE-TXN3 | 46 | PCIE-TXP3 | 47 | GND | 48 | NC |
| 49 | NC | 50 | NC | 51 | SLEEP_S3 | 52 | PCIe_RST |
| 53 | GPO | 54 | GND | 55 | DDP1_3N | 56 | DDP1_3P |
| 57 | GND | 58 | DDP1_2N | 59 | DDP1_2P | 60 | DDP1_HPD |
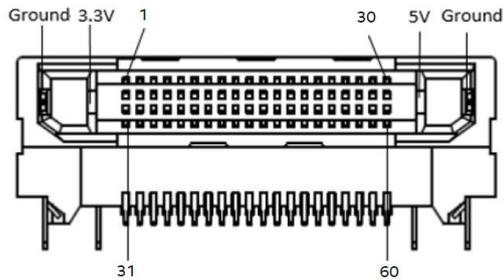


### 3.1.3 CPU FAN Connector (CN3)

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 |
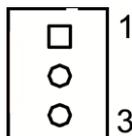
### 3.1.4　M.2 2230 Key E Wi-Fi & Bluetooth (CN4)

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 | CLINK RESET# | 39 | GND | 40 | CLINK DATA |
| 41 | PERp0 | 42 | CLINK CLK | 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 | | |
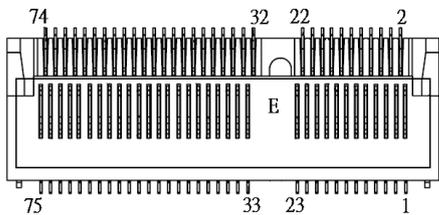


✎**Note:** Please be informed that pin 38, pin 40, and pin 42 are based on Intel C-Link pin assignment to define.

✎**Note:** C-Link is the signal for Intel vPro wireless solution.

### 3.1.5　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 | Pin | Signal |
|---|---|---|---|
| 1 | USB_POWER | 5 | USB_POWER |
| 2 | USB D0- | 6 | USB D1- |
| 3 | USB D0+ | 7 | USB D1+ |
| 4 | GND | 8 | GND |
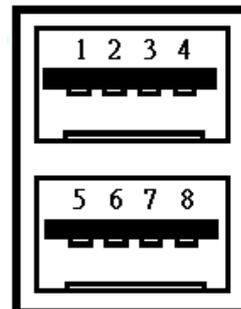
### 3.1.6 USB 3.1 Port (Gen2) (CN6)

The Universal Serial Bus connectors are compliant with USB 3.1 Gen2 (10Gb/s), and ideally for installing USB peripherals such as keyboard, mouse, scanner, etc.

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1 | USB3_POWER | 10 | USB3_POWER |
| 2 | USB D0- | 11 | USB D1- |
| 3 | USB D0+ | 12 | USB D1+ |
| 4 | GND | 13 | GND |
| 5 | USB3_SSRX0- | 14 | USB3_SSRX1- |
| 6 | USB3_SSRX0+ | 15 | USB3_SSRX1+ |
| *7* | *GND* | *16* | *GND* |
| 8 | USB3_ SSTX0- | 17 | USB3_ SSTX1- |
| 9 | USB3_ SSTX0+ | 18 | USB3_ SSTX1+ |
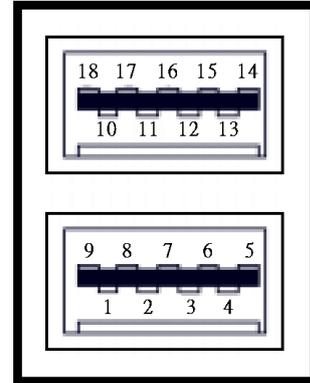
### 3.1.7 Power & Reset Button (CN7)

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 |
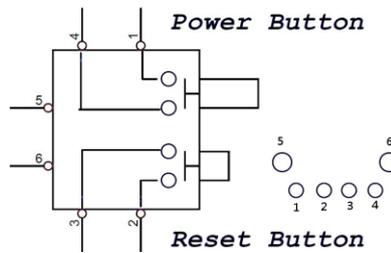
### 3.1.8   HDMI Connector (CN9)

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 | | |
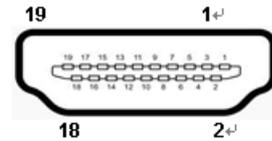
### 3.1.9   Battery 2 PIN (BAT1)

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

| Pin | Signal |
|---|---|
| 1 | +VBAT |
| 2 | GND |
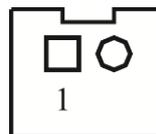
### 3.1.10 M.2 2280 Key M SSD (SCN1)

The OPS700-520 comes with one M.2 2280 Key M SATA SSD for storage.

| Pin | Signal | Pin | Signal | Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|-----|--------|-----|--------|
| 1 | GND | 2 | +3.3V | 3 | GND | 4 | +3.3V |
| 5 | NC | 6 | NC | 7 | NC | 8 | NC |
| 9 | GND | 10 | LED_1# | 11 | NC | 12 | +3.3V |
| 13 | NC | 14 | +3.3V | 15 | GND | 16 | +3.3V |
| 17 | NC | 18 | +3.3V | 19 | NC | 20 | NC |
| 21 | GND | 22 | NC | 23 | NC | 24 | NC |
| 25 | NC | 26 | NC | 27 | GND | 28 | NC |
| 29 | NC | 30 | NC | 31 | NC | 32 | NC |
| 33 | GND | 34 | NC | 35 | NC | 36 | NC |
| 37 | NC | 38 | NC | 39 | GND | 40 | NC |
| 41 | SATA-B+ | 42 | NC | 43 | SATA-B- | 44 | NC |
| 45 | GND | 46 | NC | 47 | SATA-A- | 48 | NC |
| 49 | SATA-A+ | 50 | NC | 51 | GND | 52 | NC |
| 53 | NC | 54 | NC | 55 | NC | 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 | | |
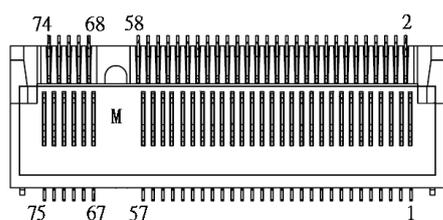
### 3.1.11  COM Port (COM2)

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 |
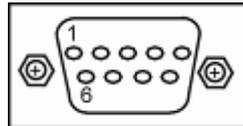
### 3.1.12  RJ45 (i219LM) (LAN1)

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 |
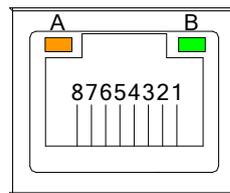
### 3.1.13 DC Power Jack (PWR1)

PWR1 is a ⌀2.5mm 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 |

### 3.1.14 SW1 Setting (SW1)

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.

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# CHAPTER 4
# AMI BIOS SETUP UTILITY

This chapter provides users with detailed description how to set up basic system configuration through the Aptio Setup Utility.

## 4.1　Starting

To enter the setup screens, follow the steps below:

➢ **Turn on the computer and press the <Del> key immediately.**

➢ **After you press the <Del> 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.

ThesKey Es 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**

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
  Main  Advanced  Chipset  Security  Boot  Save & Exit

  BIOS Information                                      Set the Date. Use Tab to
  Project Version              87520 V2.00              switch between Date elements.
  Build Date and Time          10/03/2018 10:12:09      Default Ranges:
                                                        Year: 2005-2099
  System Date                  [Thu 10/04/2018]         Months: 1-12
  System Time                  [10:49:55]               Days: dependent on month

  Access Level                 Administrator

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

          Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

➢ **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 thKey Eboard. 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**
- ➢ **AMT Configuration**
- ➢ **CSM Configutation**

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

```
          Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
      Main  Advanced  Chipset  Security  Boot  Save & Exit

                                                         System Super IO Chip
                                                         Parameters.
 ▶ F81803 Super IO Configuration
 ▶ Hardware Monitor
 ▶ ACPI Settings
 ▶ Trusted Computing
 ▶ CPU Configuration
 ▶ SATA And RST Configuration
 ▶ PCH-FW Configuration
 ▶ AMT Configuration
 ▶ CSM Configuration



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




          Version 2.20.1271. Copyright (C) 2019 American Megatrends, Inc.
```

● **F81803 Super IO Configuration**

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

```
             Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
      Advanced

   F81803 Super IO Configuration                              Set Parameters of Serial Port
                                                              1 (COMA)
   Super IO Chip                      F81803
 ▶ Serial Port 1 Configuration
 ▶ Serial Port 2 Configuration



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




             Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

➢ **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.

```
        Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
          Advanced

  ACPI Settings                                         Select the highest ACPI sleep
                                                        state the system will enter
  ACPI Sleep State              [S3 (Suspend to RAM)]   when the SUSPEND button is
                                                        pressed.



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



        Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```
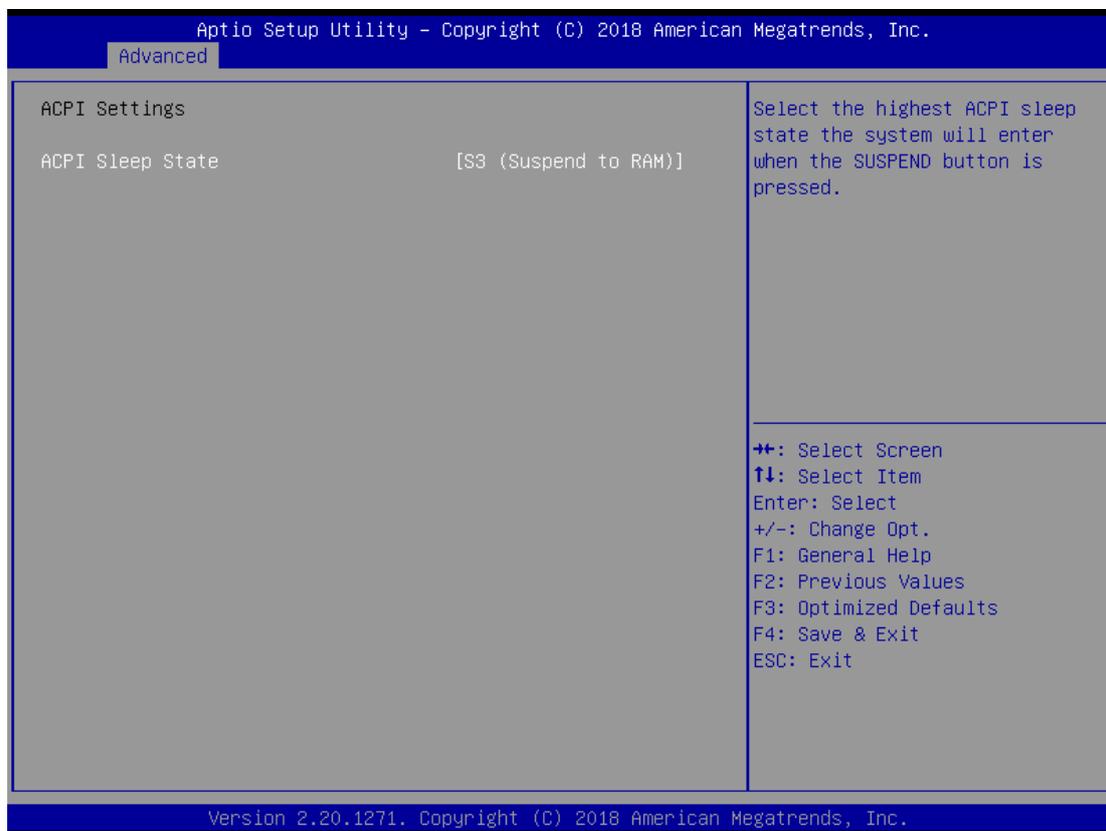
➢ **ACPI Sleep State**

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.

```
           Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
   Advanced

     Firmware Version:          71.4               Enables or Disables BIOS
     Vendor:                    STM                support for security device.
                                                   O.S. will not show Security
     Security Device Support    [Enable]           Device. TCG EFI protocol and
                                                   INT1A interface will not be
                                                   available.


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




           Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

➢ **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.

```
           Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Advanced

  CPU Configuration                                              Enabled for Windows XP and
                                                                 Linux (OS optimized for
  Type                        Intel(R) Core(TM)                  Hyper-Threading Technology)
                              i7-8700T CPU @ 2.40GHz             and Disabled for other OS (OS
  ID                          0x906EA                            not optimized for
  Speed                       2400 MHz                           Hyper-Threading Technology).
  L1 Data Cache               32 KB x 6
  L1 Instruction Cache        32 KB x 6
  L2 Cache                    256 KB x 6
  L3 Cache                    12 MB
  L4 Cache                    N/A
  VMX                         Supported
  SMX/TXT                     Supported                          ─────────────────────────
                                                                 ↔: Select Screen
  Hyper-Threading             [Disabled]                         ↑↓: Select Item
  Intel (VMX) Virtualization  [Enabled]                          Enter: Select
  Technology                                                     +/-: Change Opt.
                                                                 F1: General Help
                                                                 F2: Previous Values
                                                                 F3: Optimized Defaults
                                                                 F4: Save & Exit
                                                                 ESC: Exit



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```

➢ **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 (VMX) 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.

```
          Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
        Advanced

    SATA And RST Configuration                              Enable/Disable SATA Device.

    SATA Controller(s)              [Enabled]

    Serial ATA Port 0               LITEON CV1-8B1 (128.0GB)




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




          Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```
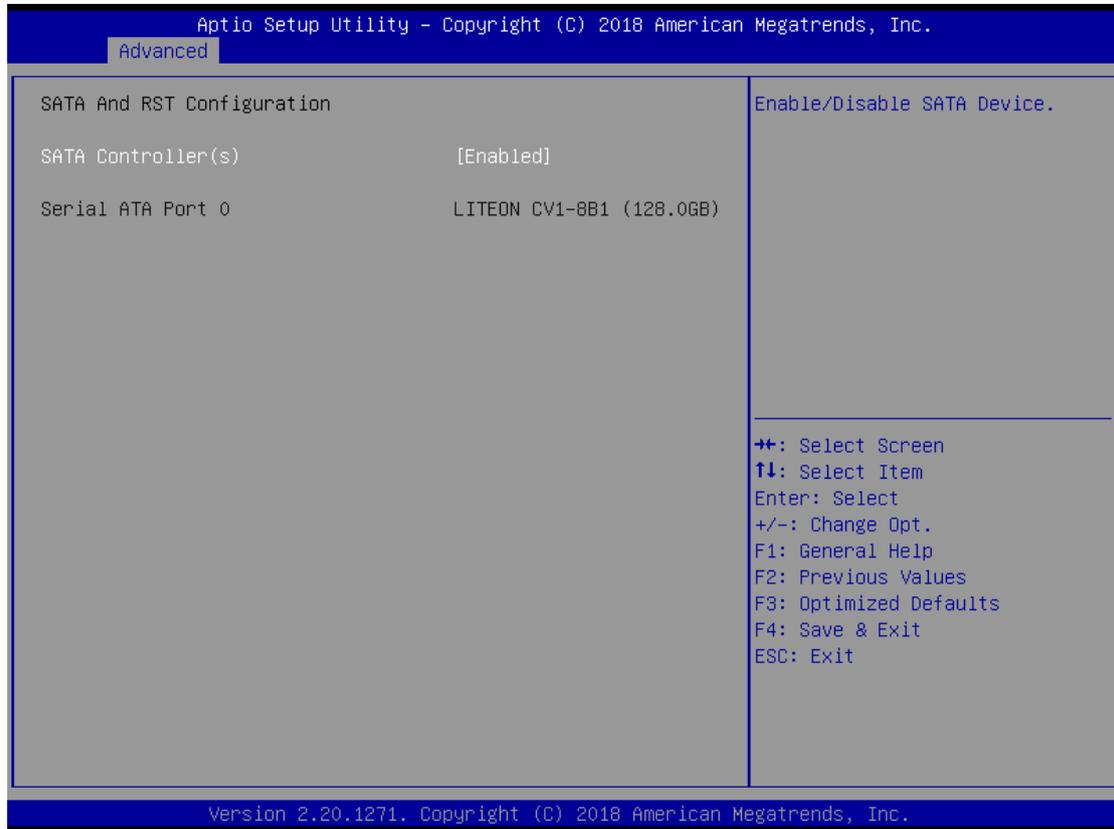
➢ **Serial-ATA Controller(S)**

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.

```
            Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
   Advanced

  ME Firmware Version                12.0.0.1068
  ME Firmware Mode                   Normal Mode
  ME Firmware SKU                    Corporate SKU




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




            Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```
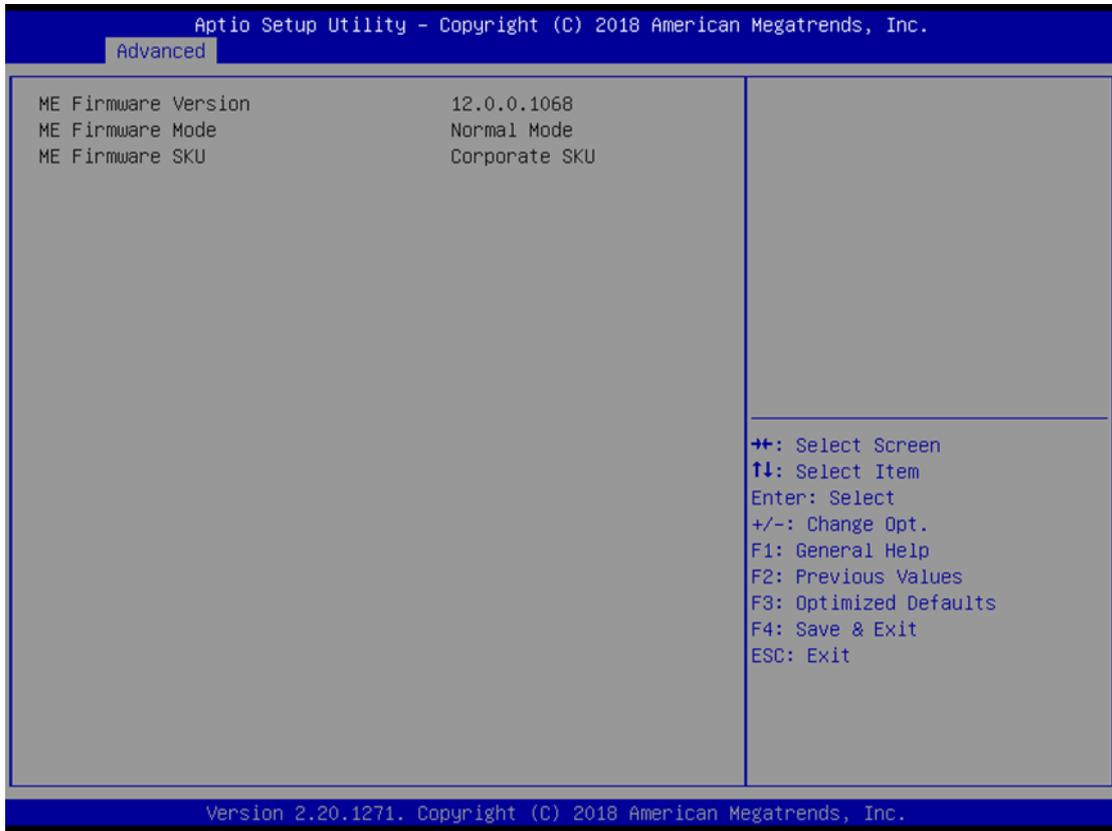
● **AMT Configuration**

This section is used to configure Intel® Active Management Technology (AMT) options.

```
        Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     Advanced

  AMT BIOS Features                   [Enabled]




                                                      ↔: Select Screen
                                                      ↑↓: Select Item
                                                      Enter: Select
                                                      +/-: Change Opt.
                                                      F1: General Help
                                                      F2: Previous Values
                                                      F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit




          Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```
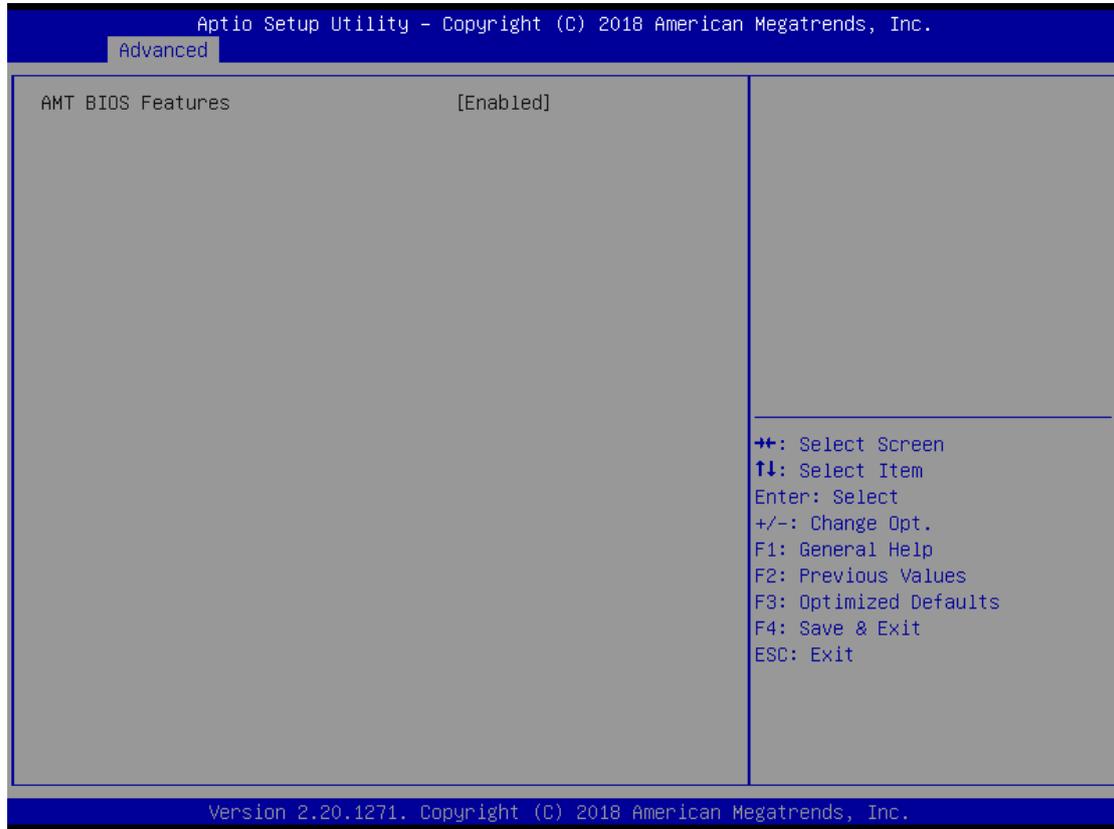
➢ **AMT BIOS Features**

Enables or disables Intel® Active Management Technology.

● **CSM Configuration**

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

```
              Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
         Advanced

Compatibility Support Module Configuration                    This option controls
                                                              Legacy/UEFI ROMs priority
CSM16 Module Version                07.82

Boot option filter                  [UEFI and Legacy]

Option ROM execution

Launch PXE OpROM policy             [Do not launch]
Video                               [Legacy]


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




              Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

➢ **Boot option filiter**

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.

● **Hardware Monitor**

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

```
           Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
   Advanced

   Hardware Monitor                                        Enable or Disable Smart Fan
                                                           Enable
   Smart Fan Function           [Enabled]                   - Fan speed would change by
                                                           temp
   CPU temperature              : +46 ℃                   Disable
   System temperature           : +37 ℃                    - Fan would keep full speed
   Fan Speed                    : 4373 RPM
   +3.3V                        : +3.280 V
   +5V                          : +5.111 V
   +3.3VSB                      : +3.136 V
   +5VSB                        : +5.112 V
   VBAT                         : +3.152 V

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




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```

➢ **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**

```
         Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

 ▶ System Agent (SA) Configuration               System Agent (SA) Parameters
 ▶ PCH-IO Configuration




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




         Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

● **System Agent (SA) Configuration**

To adjust graphics and memory detail configurations.

```
                Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
           Chipset

    System Agent (SA) Configuration                        Graphics Configuration

    SA PCIe Code Version                7.0.46.80

  ▶ Graphics Configuration
  ▶ Memory Configuration




                                                           ↔: Select Screen
                                                           ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit



                Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

➤ **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.

```
         Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
           Chipset

  IGFX VBIOS Version              1009                    Enable:
                                                          -Front panel HDMI support 4K
  Front panel HDMI 4K support     [Disabled]              resolution with audio,but DP
                                                          1.2 via HRS connector will be
                                                          disabled.
                                                          Disable:(Default)
                                                          -Front panel HDMI support FHD
                                                          resolution without audio,but
                                                          DP 1.2 via HRS connector will
                                                          be enabled.


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




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```

➢ **Front panel HDMI 4K support**

Enable or Disable the front panel HDMI supports for 4K resolution.

**Enable:**

The front panel HDMI will support 4K resolution, but the DisplayPort via HRS connector will be disabled. Also, the HRS connector cannot be connected to flat-panel display, otherwise the HDMI would be disabled directly.

**Disable (Default):**

Both of the front panel HDMI and DisplayPort via HRS Connector will be enabled, but the front panel HDMI will support FHD resolution only and without audio.

● **Memory Information**

This screen shows the system memory information.

```
           Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
              Chipset


   Memory RC Version             0.7.1.65
   Total Memory                   8192 MB
   DIMM#1                        Populated & Enabled
      Size                       8192 MB (DDR4)
   DIMM#2                        Not Populated / Disabled




                                                       ↔: Select Screen
                                                       ↑↓: Select Item
                                                       Enter: Select
                                                       +/-: Change Opt.
                                                       F1: General Help
                                                       F2: Previous Values
                                                       F3: Optimized Defaults
                                                       F4: Save & Exit
                                                       ESC: Exit




           Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```

● **PCH−IO Configuration**

This screen allows users to set PCH parameters.

```
           Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
            Chipset

 PCH-IO Configuration                                          Enable/Disable onboard NIC.

 Name                             CNL PCH-H
 PCH SKU                          Q370
 Stepping                         B0

 PCH LAN Controller               [Enabled]
   Wake on LAN Enable             [Enabled]



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




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```

➢ **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**

```
         Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  Chipset  Security   Boot  Save & Exit

    Boot Configuration                                          Sets the system boot order
    Setup Prompt Timeout               1
    Bootup NumLock State               [On]

    Quiet Boot                         [Disabled]

    Boot Option Priorities
    Boot Option #1                     [Windows Boot Manager
                                       (SAMSUNG
                                       MZVLW128HEGR-00000)]
    Boot Option #2                     [UEFI: SanDisk,
                                       Partition 1]
    Boot Option #3                     [SAMSUNG
                                       MZVLW128HEGR-00000]          ↔: Select Screen
    Boot Option #4                     [SanDisk]                    ↑↓: Select Item
                                                                  Enter: Select
    Hard Drive BBS Priorities                                     +/-: Change Opt.
    USB Device BBS Priorities                                     F1: General Help
                                                                  F2: Previous Values
                                                                  F3: Optimized Defaults
                                                                  F4: Save & Exit
                                                                  ESC: Exit




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```
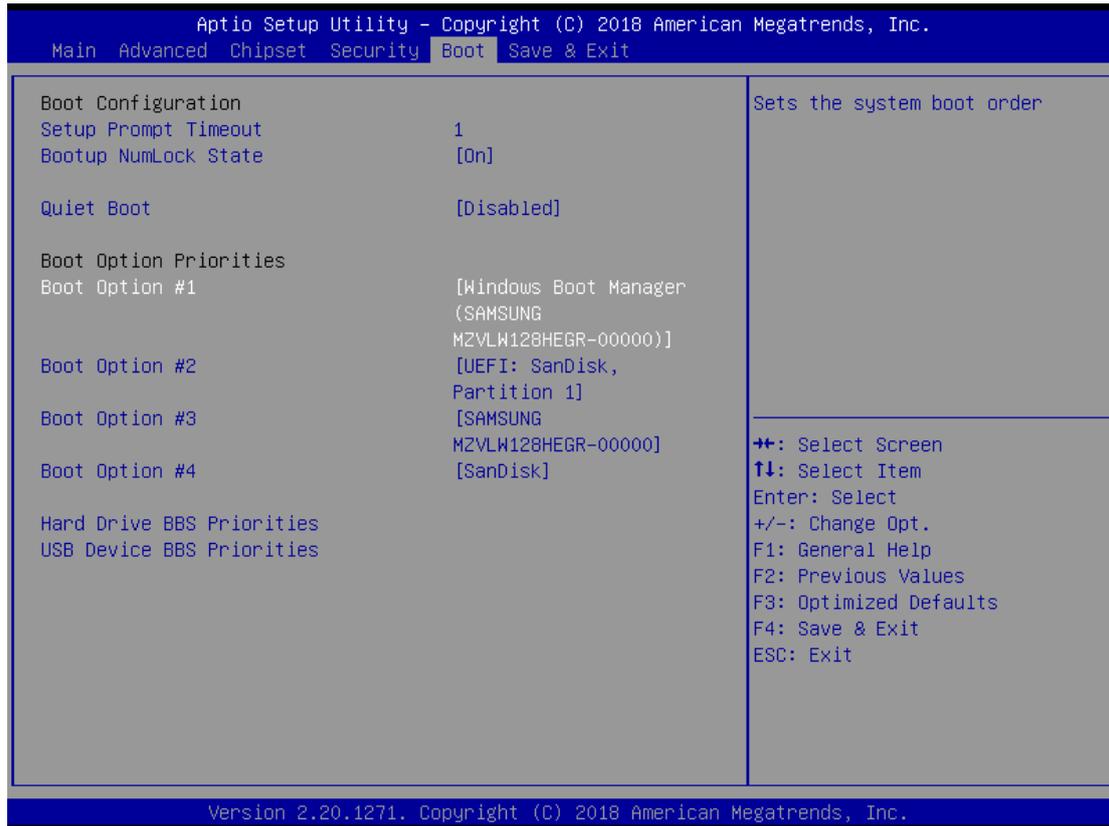
➢ **Setup Prompt Timeout**

   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.

```
        Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
    Main  Advanced  Chipset  Security  Boot  Save & Exit

   Password Description                              Set Administrator Password

   If ONLY the Administrator's password is set,
   then this only limits access to Setup and is
   only asked for when entering Setup.
   If ONLY the User's password is set, then this
   is a power on password and must be entered to
   boot or enter Setup. In Setup the User will
   have Administrator rights.
   The password length must be
   in the following range:
   Minimum length                    3
   Maximum length                    20
                                                    →←: Select Screen
                                                    ↑↓: Select Item
   Administrator Password                           Enter: Select
   User Password                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit




        Version 2.20.1271. Copyright (C) 2018 American Megatrends, Inc.
```
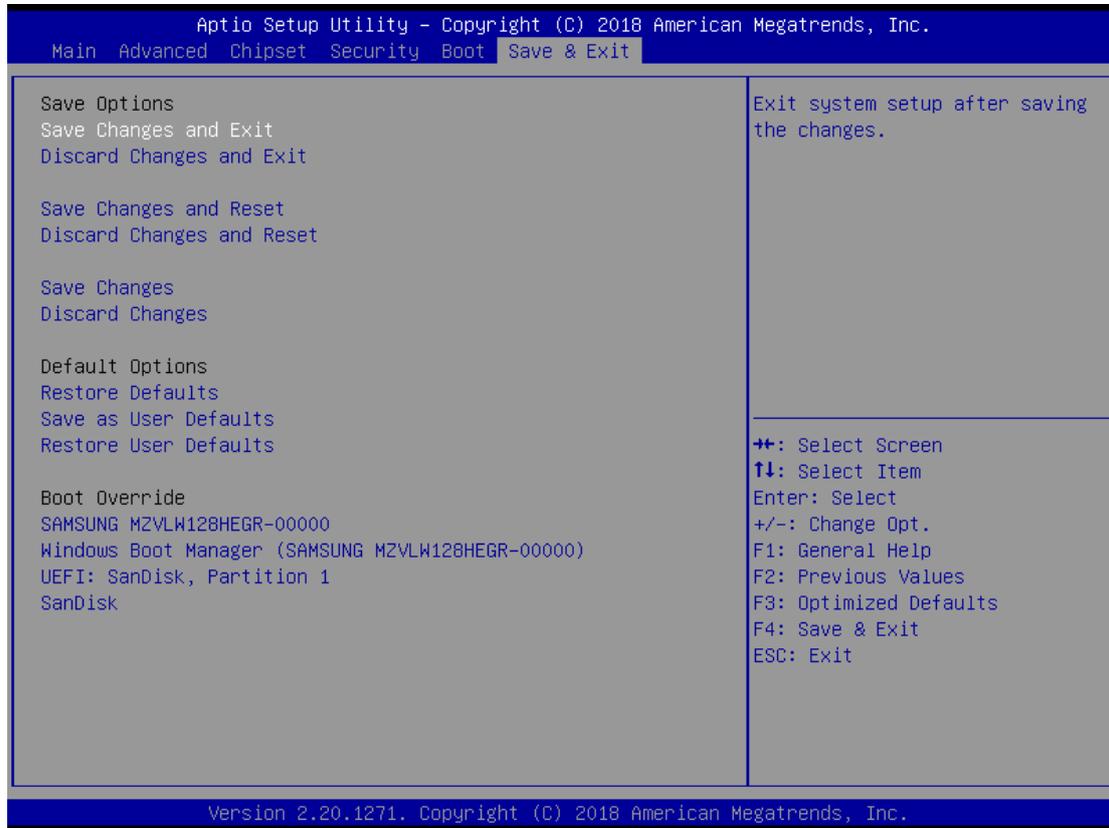
➢ **Administrator Password**

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.

```
            Aptio Setup Utility – Copyright (C) 2018 American Megatrends, Inc.
     Main  Advanced  Chipset  Security  Boot  Save & Exit

   Save Options                                       Exit system setup after saving
   Save Changes and Exit                              the changes.
   Discard Changes and Exit

   Save Changes and Reset
   Discard Changes and Reset

   Save Changes
   Discard Changes

   Default Options
   Restore Defaults
   Save as User Defaults
   Restore User Defaults                              →←: Select Screen
                                                      ↑↓: Select Item
   Boot Override                                      Enter: Select
   SAMSUNG MZVLW128HEGR-00000                         +/–: Change Opt.
   Windows Boot Manager (SAMSUNG MZVLW128HEGR-00000)  F1: General Help
   UEFI: SanDisk, Partition 1                         F2: Previous Values
   SanDisk                                            F3: Optimized Defaults
                                                      F4: Save & Exit
                                                      ESC: Exit


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```

➢ **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 configurationSelect 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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