

# BOXER-6710

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Fanless Embedded Box PC

User's Manual 7<sup>th</sup> Ed

## Copyright Notice

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## Packing List

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Before setting up your product, please make sure the following items have been shipped:

| Item                        | Quantity |
|-----------------------------|----------|
| BOXER-6710                  | 1        |
| 3 Pin DC-In Power Connector | 1        |
| Din Rail Bracket            | 1        |
| Screw Package               | 1        |

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

## About this Document

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This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the product page at [AAEON.com](http://AAEON.com) for the latest version of this document.

## Safety Precautions

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Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. All cables and adapters supplied by AAEON are certified and in accordance with the material safety laws and regulations of the country of sale. Do not use any cables or adapters not supplied by AAEON to prevent system malfunction or fires.
3. Make sure the power source matches the power rating of the device.
4. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
5. Always completely disconnect the power before working on the system's hardware.
6. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
7. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
8. Always disconnect this device from any AC supply before cleaning.
9. While cleaning, use a damp cloth instead of liquid or spray detergents.
10. Make sure the device is installed near a power outlet and is easily accessible.
11. Keep this device away from humidity.
12. Place the device on a solid surface during installation to prevent falls
13. Do not cover the openings on the device to ensure optimal heat dissipation.
14. Watch out for high temperatures when the system is running.
15. Do not touch the heat sink or heat spreader when the system is running
16. Never pour any liquid into the openings. This could cause fire or electric shock.

17. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.
18. If any of the following situations arises, please the contact our service personnel:
  - i. Damaged power cord or plug
  - ii. Liquid intrusion to the device
  - iii. Exposure to moisture
  - iv. Device is not working as expected or in a manner as described in this manual
  - v. The device is dropped or damaged
  - vi. Any obvious signs of damage displayed on the device
19. **DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

## FCC Statement

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### **Warning!**



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

### **Caution:**

*There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.*

### **Attention:**

*Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.*

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON System

QQ4-381 Rev.A2

| 部件名称                                                                                                                                                                                                                                                                                                                                                    | 有毒有害物质或元素 |           |           |                 |               |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------------|---------------|-----------------|
|                                                                                                                                                                                                                                                                                                                                                         | 铅<br>(Pb) | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| 印刷电路板<br>及其电子组件                                                                                                                                                                                                                                                                                                                                         | ×         | ○         | ○         | ○               | ○             | ○               |
| 外部信号<br>连接器及线材                                                                                                                                                                                                                                                                                                                                          | ×         | ○         | ○         | ○               | ○             | ○               |
| 外壳                                                                                                                                                                                                                                                                                                                                                      | ○         | ○         | ○         | ○               | ○             | ○               |
| 中央处理器<br>与内存                                                                                                                                                                                                                                                                                                                                            | ×         | ○         | ○         | ○               | ○             | ○               |
| 硬盘                                                                                                                                                                                                                                                                                                                                                      | ×         | ○         | ○         | ○               | ○             | ○               |
| 液晶模块                                                                                                                                                                                                                                                                                                                                                    | ×         | ○         | ○         | ○               | ○             | ○               |
| 光驱                                                                                                                                                                                                                                                                                                                                                      | ×         | ○         | ○         | ○               | ○             | ○               |
| 触控模块                                                                                                                                                                                                                                                                                                                                                    | ×         | ○         | ○         | ○               | ○             | ○               |
| 电源                                                                                                                                                                                                                                                                                                                                                      | ×         | ○         | ○         | ○               | ○             | ○               |
| 电池                                                                                                                                                                                                                                                                                                                                                      | ×         | ○         | ○         | ○               | ○             | ○               |
| <p>本表格依据 SJ/T 11364 的规定编制。</p> <p>○：表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。</p> <p>×：表示该有害物质的某一均质材料超出了 GB/T 26572 的限量要求，然而该部件仍符合欧盟指令 2011/65/EU 的规范。</p> <p>环保使用期限(EFUP (Environmental Friendly Use Period))：10 年</p> <p>备注：</p> <p>一、此产品所标示之环保使用期限，系指在一般正常使用状况下。</p> <p>二、上述部件物质中央处理器、内存、硬盘、光驱、电源为选购品。</p> <p>三、上述部件物质液晶模块、触控模块仅一体机产品适用。</p> |           |           |           |                 |               |                 |

China RoHS Requirement (EN)

Name and content of hazardous substances in product

AAEON System

QO4-381 Rev.A2

| Part Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Hazardous Substances |           |           |                 |               |                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-----------|-----------|-----------------|---------------|-----------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 铅<br>(Pb)            | 汞<br>(Hg) | 镉<br>(Cd) | 六价铬<br>(Cr(VI)) | 多溴联苯<br>(PBB) | 多溴二苯醚<br>(PBDE) |
| PCB Assemblies                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ×                    | ○         | ○         | ○               | ○             | ○               |
| Connector and Cable                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ×                    | ○         | ○         | ○               | ○             | ○               |
| Chassis                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ○                    | ○         | ○         | ○               | ○             | ○               |
| CPU and Memory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ×                    | ○         | ○         | ○               | ○             | ○               |
| Hard Disk                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ×                    | ○         | ○         | ○               | ○             | ○               |
| LCD Modules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ×                    | ○         | ○         | ○               | ○             | ○               |
| CD-ROM/DVD-ROM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ×                    | ○         | ○         | ○               | ○             | ○               |
| Touch Modules                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | ×                    | ○         | ○         | ○               | ○             | ○               |
| Power                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ×                    | ○         | ○         | ○               | ○             | ○               |
| Battery                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | ×                    | ○         | ○         | ○               | ○             | ○               |
| <p>The table is prepared in accordance with the provisions of SJ/T 11364.</p> <p>○ : Indicates that said hazardous substance contained in all of the homogenous materials for this product is below the limit requirement of GB/T 26572.</p> <p>× : Indicates that said hazardous substance contained in at least one of the homogenous materials used for this part is above the limit requirement of GB/T 26572. But this product still be compliance with 2011/65/EU Directive (allowed with 2011/65/EU Annex III of RoHS exemption with number 6(c),7(a),7(c)-1).</p> <p>EFUP (Environment Friendly Use Period) value: 10 years.</p> <p>Notes:</p> <p>1. This product defined period of use is under normal condition.</p> <p>2. In above part, CPU/Memory/ Hard Disk/CD-ROM/DVD-ROM/ Power are optional.</p> <p>3. In above part, LCD Modules/ Touch Modules are for all-in-one product model.</p> |                      |           |           |                 |               |                 |

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# Chapter 1

---

Product Specifications

## 1.1 Specifications

### System

|                   |                                                                                                                                                                                                                               |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CPU               | Intel® Pentium® Processor N4200<br>Intel® Celeron® Processor N3350                                                                                                                                                            |
| Chipset           | Intel® System on Chip                                                                                                                                                                                                         |
| System Memory     | DDR3L 1866MHz SODIMM x 1 (Max. 8GB, up to 1600MHz)<br><br>(Note: Memory with frequency greater than 1600MHz will automatically fix to 1600MHz)                                                                                |
| Display Interface | VGA x 1<br>HDMI x 1                                                                                                                                                                                                           |
| Storage Device    | HDD/SSD<br>mSATA (Optional)                                                                                                                                                                                                   |
| Ethernet          | Intel® i211-AT x 2                                                                                                                                                                                                            |
| I/O               | VGA x 1<br>HDMI x 1<br>RJ-45 x 2 for GbE LAN<br>USB 3.2 Gen 1 (Type-A) x 4<br>Mic-in x 1<br>Line-out x 1<br>RS-232/422/485 x 3 with automatic flow control<br>Power On/Off Button x 1<br>9~24V 3-Pin DC-in Terminal Block x 1 |
| Expansion         | Full-Size Mini Card x 1 w/ SIM Slot<br>Half-Size Mini Card x 1 (Optional for mSATA)                                                                                                                                           |
| Indicator         | Power LED on Power Button                                                                                                                                                                                                     |

## System

|            |                                                |
|------------|------------------------------------------------|
| OS Support | Windows® 10 IoT 64-bit<br>Linux Ubuntu 16.04.4 |
|------------|------------------------------------------------|

**Note:** To avoid random non-booting issue caused by the incompatibility of Intel® Pentium® Processor N Series with certain unstable 1866MHz memories, memory with frequency greater than 1600MHz will automatically fix to 1600MHz, while memory that runs at a speed lower than 1600MHz will maintain its original speed.

## Mechanical

|              |                                           |
|--------------|-------------------------------------------|
| Mounting     | DIN Rail Mount                            |
| Dimensions   | 1.7" x 6.5" x 4.1" (44mm x 166mm x 106mm) |
| Gross Weight | 3.08 lb. (1.4kg)                          |
| Net Weight   | 1.32 lb. (0.6kg)                          |

## Environmental

|                       |                                                                                                              |
|-----------------------|--------------------------------------------------------------------------------------------------------------|
| Operating Temperature | -20°C ~ 60°C with W.T. SSD/HDD/mSATA (according to IEC68-2-14 with 0.5 m/s airflow; with industrial devices) |
| Storage Temperature   | -49°F ~ 176°F (-45°C ~ 80°C)                                                                                 |
| Storage Humidity      | 95% @ 40°C, non-condensing                                                                                   |
| Anti-Vibration        | 3 Grms/ 5 ~ 500Hz/ operation – mSATA/SSD<br>1 Grms/ 5~ 500Hz/ operation – HDD                                |
| Certification         | CE/FCC Class A                                                                                               |

## Power Supply

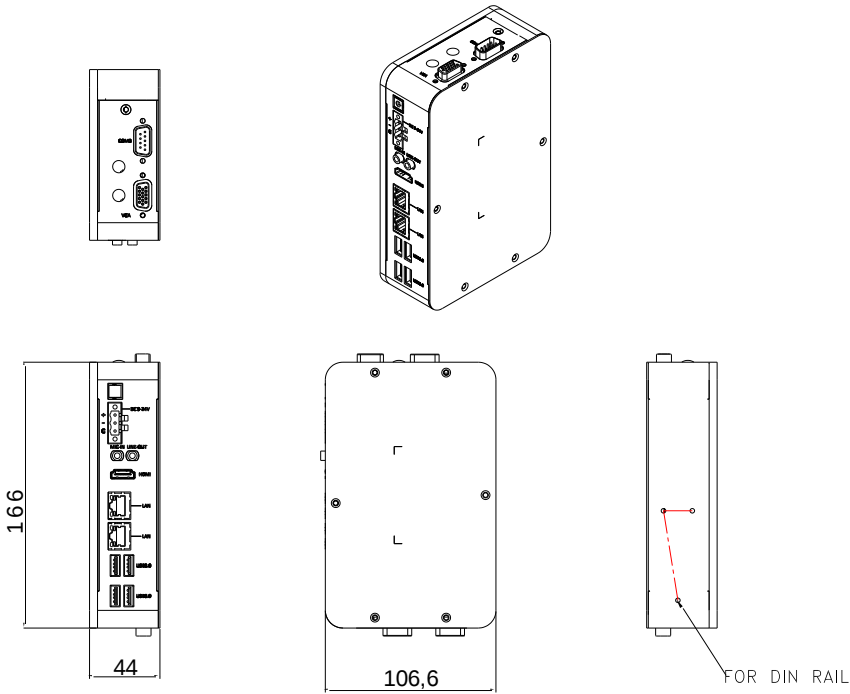
|                   |                                   |
|-------------------|-----------------------------------|
| Power Requirement | 9 ~ 24V with 3-pin Terminal Block |
|-------------------|-----------------------------------|

# Chapter 2

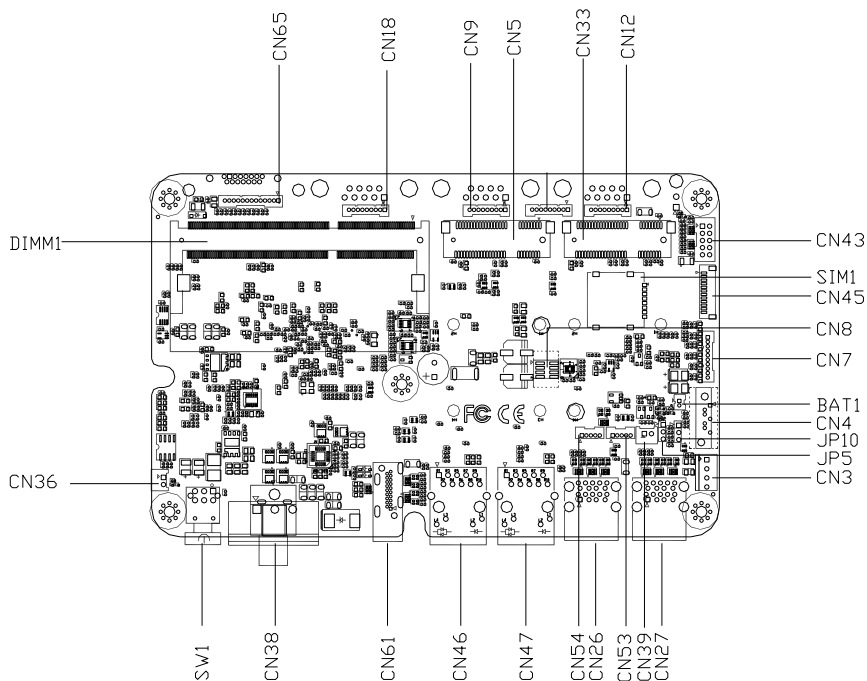
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Hardware Information

## 2.1 Dimensions



## 2.2 Jumpers and Connectors



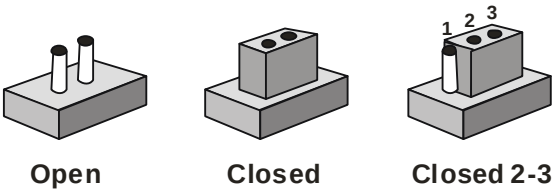
## 2.3 List of Jumpers

Please refer to the table below for all of the system's jumpers that you can configure for your application

| Label | Function           |
|-------|--------------------|
| JP5   | AT/ATX Mode Select |
| JP10  | Clear CMOS         |

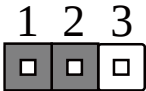
### 2.3.1 Setting Jumpers

You configure your card to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2 or 2 and 3.

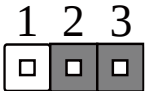


A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any change. Generally, you simply need a standard cable to make most connections.

2.3.2 AT/ATX Mode Select (JP5)



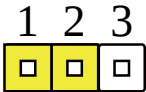
Disable



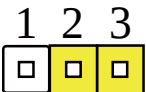
Enable (Default)

| JP5 | Function       |
|-----|----------------|
| 1-2 | ATX (Default)- |
| 2-3 | AT             |

2.3.3 Clear CMOS (JP10)



Normal (Default)



Clear CMOS

| JP10 | Function         |
|------|------------------|
| 1-2  | Normal (Default) |
| 2-3  | Clear CMOS       |

## 2.4 List of Connectors

Please refer to the table below for all of the system's connectors that you can configure for your application

| Label | Function                                      |
|-------|-----------------------------------------------|
| CN65  | CRT Port (Box Connector)                      |
| CN38  | DC-In                                         |
| CN61  | HDMI Connector                                |
| CN8   | SPI ROM Connector                             |
| CN26  | Dual Stack USB (3.0/2.0)                      |
| CN27  | Dual Stack USB (3.0/2.0)                      |
| CN7   | Audio Jack Connector (Box Connector)          |
| CN36  | Remote Button Cable Connector (Box Connector) |
| CN53  | USB 2.0 Connector (Box Connector)             |
| CN54  | USB 2.0 Connector (Box Connector)             |
| CN46  | RJ-45 LAN Connector                           |
| CN47  | RJ-45 LAN Connector                           |
| CN18  | COM Port 1 Box Connector (RS-232/422/485)     |
| CN9   | COM Port 2 Box Connector (RS-232/422/485)     |
| CN12  | COM Port 3 Box Connector (RS-232/422/485)     |
| SW1   | Power Button Connector (Box Connector)        |
| CN43  | DIO Connector                                 |
| CN3   | SATA PWR Connector                            |
| CN4   | SATA Connector                                |
| BAT1  | RTC Battery Connector                         |
| CN45  | Debug Port Connector                          |
| CN33  | Mini Card Connector                           |
| CN5   | Mini Card Connector                           |

| Label | Function             |
|-------|----------------------|
| SIM1  | SIM 1 Card Connector |
| CN39  | SATA LED Connector   |
| DIMM1 | SODIMM Connector     |

## 2.4.1 Mini Card Connector (CN5/CN33)

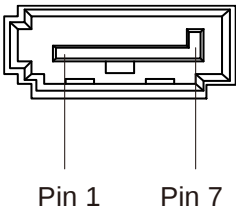
| Pin | Signal        | Pin | Signal     |
|-----|---------------|-----|------------|
| 1   | PCIE_WAKE#    | 2   | +V3.3A     |
| 3   | NC            | 4   | GND        |
| 5   | NC            | 6   | +1.5V      |
| 7   | PCIE_CLK_REQ# | 8   | UIM_PWR    |
| 9   | GND           | 10  | UIM_DATA   |
| 11  | PCIE_REF_CLK- | 12  | UIM_CLK    |
| 13  | PCIE_REF_CLK+ | 14  | UIM_RST    |
| 15  | GND           | 16  | UIM_VPP    |
| 17  | NC            | 18  | GND        |
| 19  | NC            | 20  | W_DISABLE# |
| 21  | GND           | 22  | PCIE_RST#  |
| 23  | PCIE_RX-      | 24  | +V3.3A     |
| 25  | PCIE_RX+      | 26  | GND        |
| 27  | GND           | 28  | +1.5V      |
| 29  | GND           | 30  | SMB_CLK    |
| 31  | PCIE_TX-      | 32  | SMB_DATA   |
| 33  | PCIE_TX+      | 34  | GND        |
| 35  | GND           | 36  | USB_D-     |
| 37  | GND           | 38  | USB_D+     |
| 39  | +V3.3A        | 40  | GND        |
| 41  | +V3.3A        | 42  | NC         |
| 43  | GND           | 44  | NC         |
| 45  | NC            | 46  | NC         |
| 47  | NC            | 48  | +1.5V      |

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 49  | NC     | 50  | GND    |
| 51  | NC     | 52  | +V3.3A |

2.4.2 LPC Port (CN45)

| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1   | LAD0     | I/O         | +3.3V        |
| 2   | LAD1     | I/O         | +3.3V        |
| 3   | LAD2     | I/O         | +3.3V        |
| 4   | LAD3     | I/O         | +3.3V        |
| 5   | +3.3V    | PWR         | +3.3V        |
| 6   | LFRAME#  | IN          |              |
| 7   | LRESET#  | OUT         | +3.3V        |
| 8   | GND      | GND         |              |
| 9   | LCLK     | OUT         |              |
| 10  | I2C CLK  | I/O         | +3.3V        |
| 11  | I2C DATA | I/O         | +3.3V        |
| 12  | SERIRQ   | I/O         | +3.3V        |

2.4.3 SATA Port (CN4)

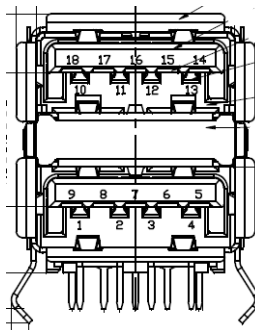


| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1   | GND #    | GND         |              |
| 2   | SATA_TX+ | DIFF        |              |
| 3   | SATA_TX- | DIFF        |              |
| 4   | GND      | GND         |              |
| 5   | SATA_RX- | DIFF        |              |
| 6   | SATA_RX+ | DIFF        |              |
| 7   | GND      | GND         |              |

2.4.4 SATA PWR Port (CN3)

| Pin | Signal | Pin |
|-----|--------|-----|
| 1   | +12V   | 12V |
| 2   | GND    | GND |
| 3   | GND    | GND |
| 4   | +5V    | 5V  |

### 2.4.5 USB 3.0 (CN26/CN27)



| Pin | Signal   | Pin | Signal   |
|-----|----------|-----|----------|
| 1   | VBUS_1   | 2   | VBUS_2   |
| 3   | (A)D-    | 4   | (B)D-    |
| 5   | (A)D+    | 6   | (B)D+    |
| 7   | GND      | 8   | GND      |
| 9   | (A)SSRX- | 10  | (B)SSRX- |
| 11  | (A)SSRX+ | 12  | (B)SSRX+ |
| 13  | GND      | 14  | GND      |
| 15  | (A)SSTX- | 16  | (B)SSTX- |
| 17  | (A)SSTX+ | 18  | (B)SSTX+ |

### 2.4.6 CRT Port (Box Connector) (CN65)

| Pin | Signal   | Pin | Signal  |
|-----|----------|-----|---------|
| 1   | VSYNC    | 2   | HSYNC   |
| 3   | NC       | 4   | DDC_CLK |
| 5   | DDC_DATA | 6   | GND     |

| Pin | Signal  | Pin | Signal |
|-----|---------|-----|--------|
| 7   | Blue    | 8   | GND    |
| 9   | Green   | 10  | GND    |
| 11  | Red     | 12  | GND    |
| 13  | VGA_VCC |     |        |

2.4.7 DC-In (CN38)

| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | PWR_IN | 2   | GND    |
| 3   | NC     |     |        |

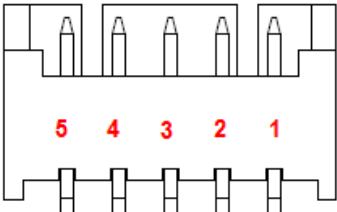
2.4.8 HDMI Port (CN61)

| Pin | Signal       | Pin | Signal       |
|-----|--------------|-----|--------------|
| 1   | HDMI_DATA2_P | 2   | GND          |
| 3   | HDMI_DATA2_N | 4   | HDMI_DATA1_P |
| 5   | GND          | 6   | HDMI_DATA1_N |
| 7   | HDMI_DATA0_P | 8   | GND          |
| 9   | HDMI_DATA0_N | 10  | HDMI_CLK_P   |
| 11  | GND          | 12  | HDMI_CLK_N   |
| 13  | NC           | 14  | NC           |
| 15  | HDMI_SCL     | 16  | HDMI_SDA     |
| 17  | GND          | 18  | HDMI_PWR     |
| 19  | HDMI_HDP     |     |              |

2.4.9 SPI ROM Connector (CN8)

| Pin | Signal       | Pin | Signal      |
|-----|--------------|-----|-------------|
| 1   | SPI_VCC      | 2   | GND         |
| 3   | SPI_CE       | 4   | SPI_CLK     |
| 5   | SPI_DATA_OUT | 6   | SPI_DATA_IN |
| 7   | NC           | 8   | NC          |

2.4.10 USB 2.0 Connector (Box Connector) (CN53/CN54)

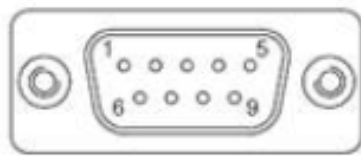


| Pin | Signal | Pin | Signal |
|-----|--------|-----|--------|
| 1   | VBUS   | 2   | USB1-  |
| 3   | USB+   | 4   | GND    |
| 5   | GND    |     |        |

2.4.11 Remote Button Cable Connector (Box Connector) (CN36)

| Pin | Signal  | Pin | Signal |
|-----|---------|-----|--------|
| 1   | PANSWH# | 2   | GND-   |

2.4.12 Physical COM Port (COM 1/COM 2/COM 3)



| Pin | RS-232 | RS-422 | RS-485 |
|-----|--------|--------|--------|
| 1   | DCD    | TX-    | DATA-  |
| 2   | RXD    | RX+    | DATA+  |
| 3   | TXD    | TX+    | NC     |
| 4   | DTR    | RX-    | NC     |
| 5   | GND    | NC     | NC     |
| 6   | DSR    | NC     | NC     |
| 7   | RTS    | NC     | NC     |
| 8   | CTS    | NC     | NC     |
| 9   | RI     | NC     | NC     |

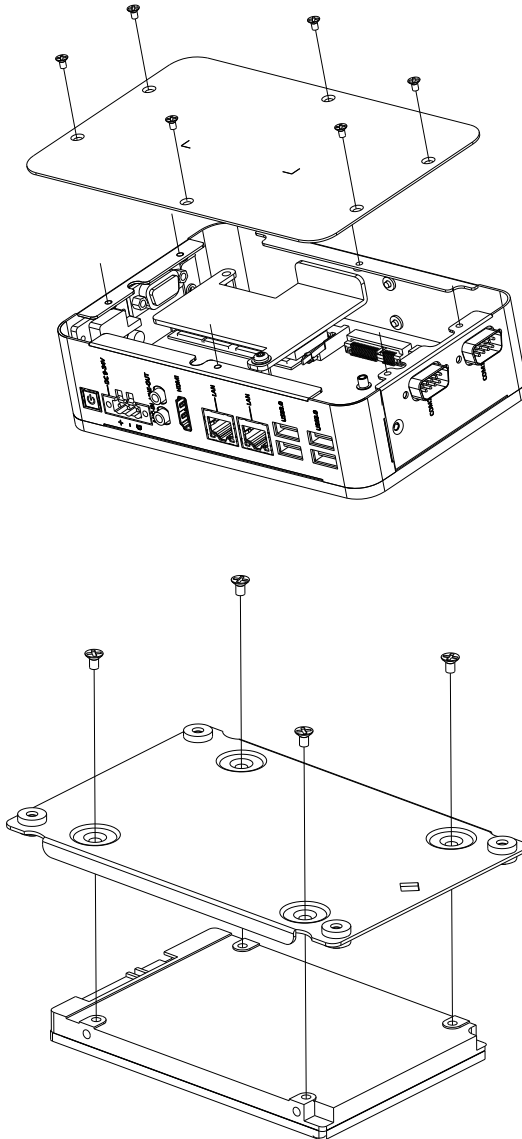
2.4.13 COM Port Box Connector (CN18/CN9/CN12)

| Pin | RS-232 | RS-422 | RS-485 |
|-----|--------|--------|--------|
| 1   | DCD    | TX-    | DATA-  |
| 2   | DSR    | NC     | NC     |
| 3   | RXD    | TX+    | DATA+  |

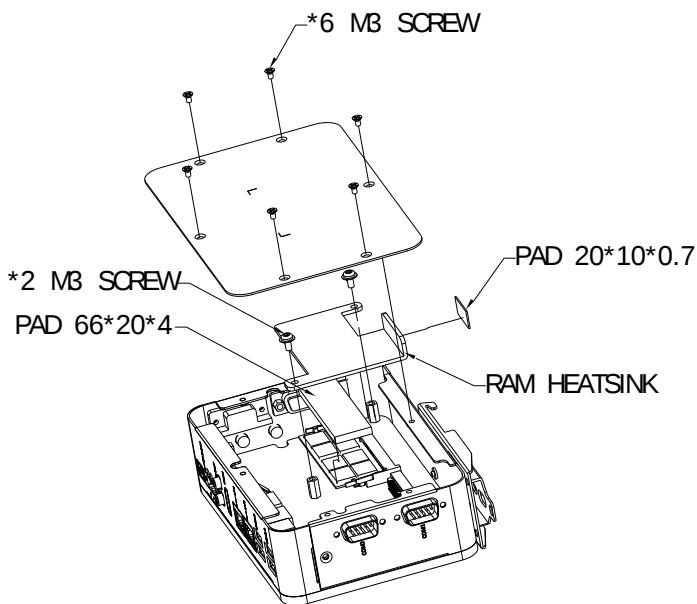
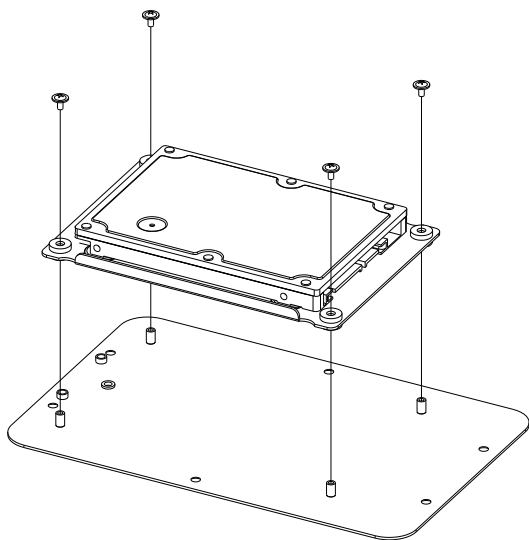
| Pin | RS-232 | RS-422 | RS-485 |
|-----|--------|--------|--------|
| 4   | RTS    | NC     | NC     |
| 5   | TXD    | RX+    | NC     |
| 6   | CTS    | NC     | NC     |
| 7   | DTR    | RX-    | NC     |
| 8   | RI     | NC     | NC     |
| 9   | GND    | NC     | NC     |

## 2.5 HDD & RAM Installation

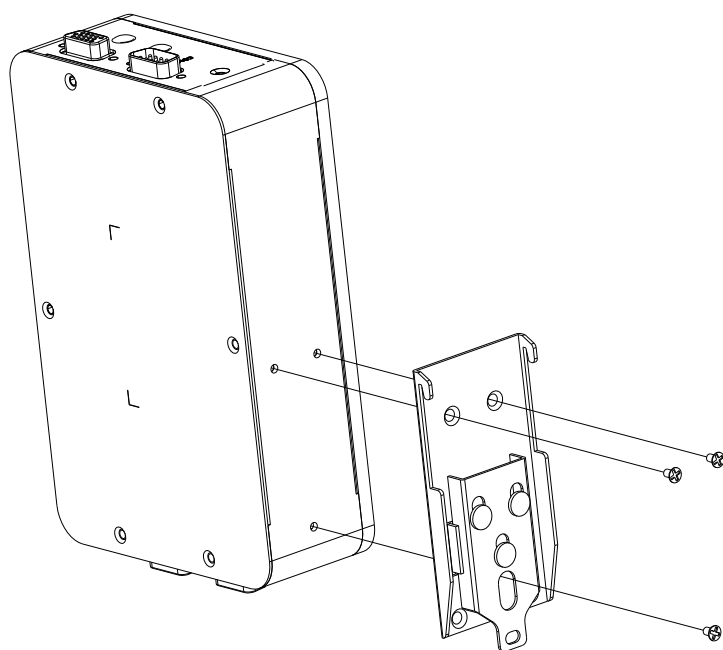
1. Remove the screws as shown below; then remove the chassis cover.



2. Put the thermal pad on between the chassis and the RAM, insert the RAM into the slot diagonally and push down to secure.



# 2.6 Din Rail Installation



# Chapter 3

---

AMI BIOS Setup

### 3.1 System Test and Initialization

---

The system uses certain routines to perform testing and initialization. If an error, fatal or non-fatal, is encountered, a few short beeps or an error message will be outputted. The board can usually continue the boot up sequence with non-fatal errors.

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory. If they do not match, an error message will be outputted, in which case you will need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

- You are starting your system for the first time
- You have changed your system's hardware
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention, which is to be replaced once emptied.

## 3.2 AMI BIOS Setup

---

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press <Del> or <F2> immediately while your computer is powering up.

The function for each interface can be found below.

**Main** – Date and time can be set here. Press <Tab> to switch between date elements

**Advanced** – Enable/ Disable boot option for legacy network devices

**Chipset** – For hosting bridge parameters

**Security** – The setup administrator password can be set here

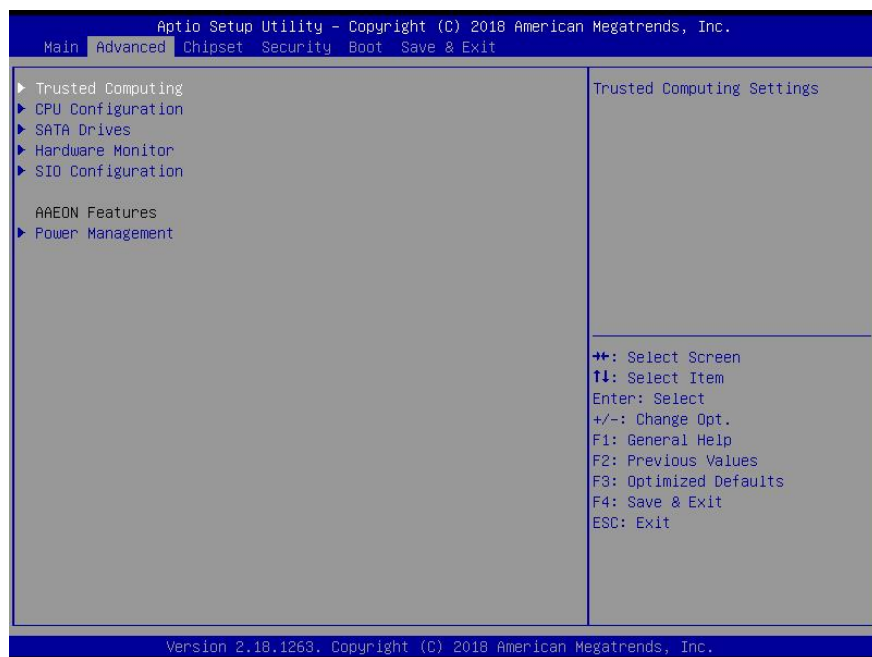
**Boot** – Enable/ Disable quiet Boot Option

**Save & Exit** – Save your changes and exit the program

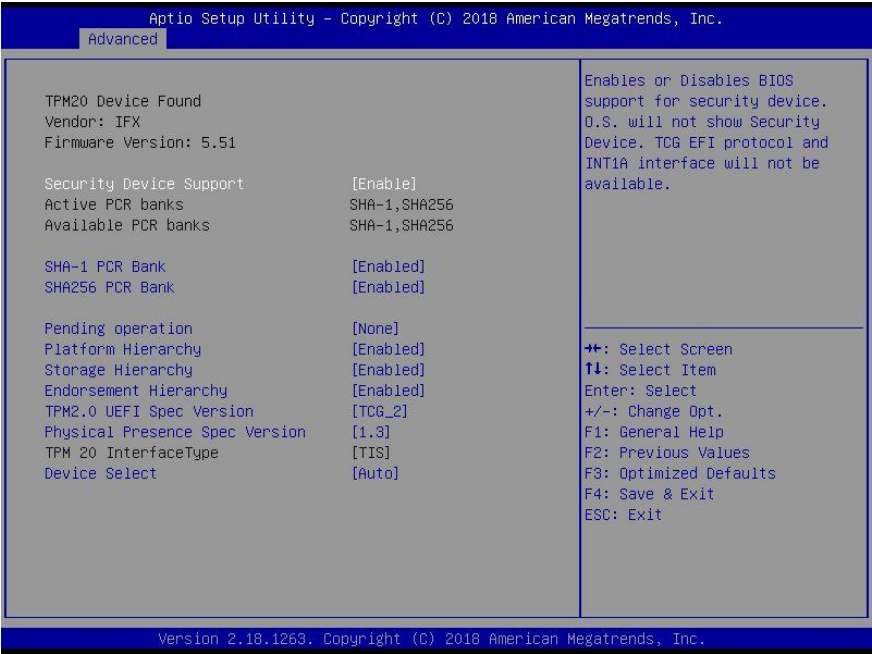
### 3.3 Setup Submenu: Main



### 3.4 Setup Submenu: Advanced



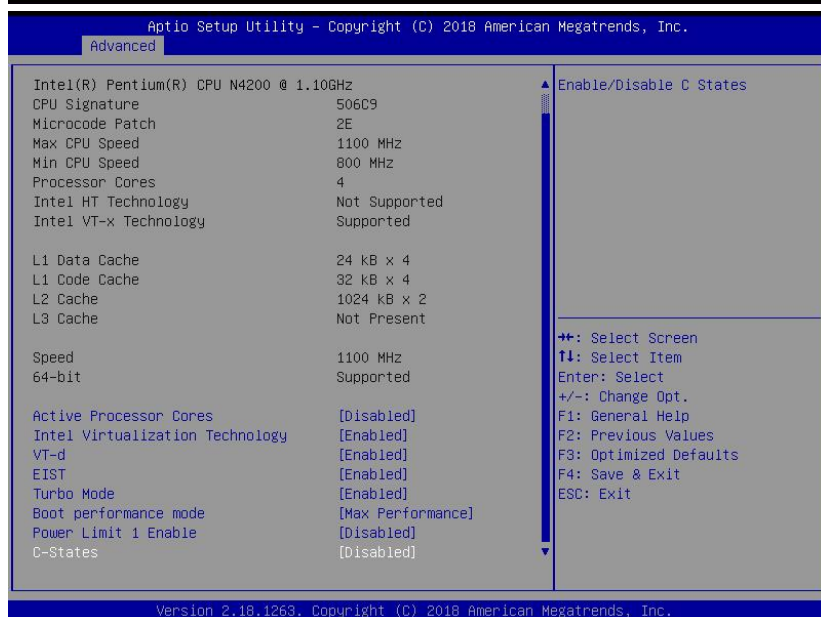
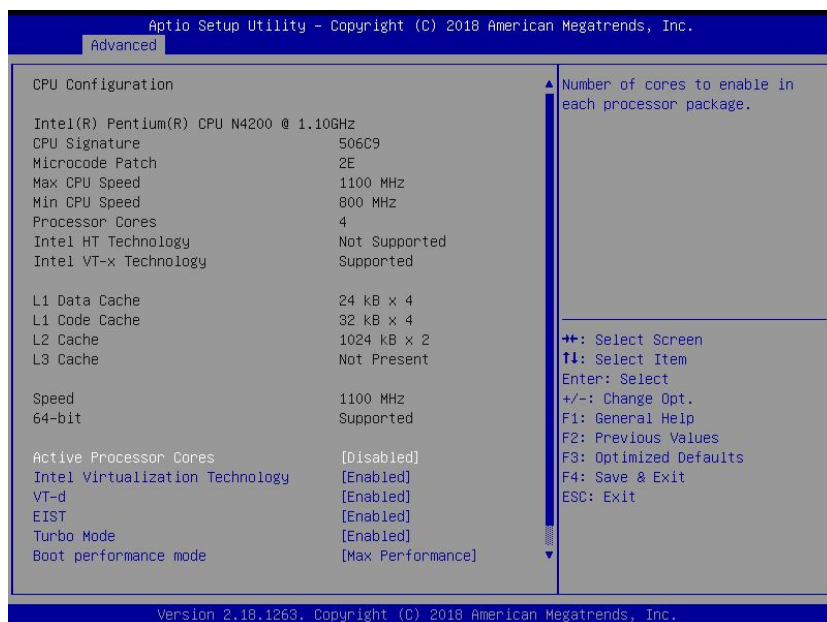
### 3.4.1 Trusted Computing



| Options Summary                                                                                    |           |                                   |
|----------------------------------------------------------------------------------------------------|-----------|-----------------------------------|
| Security Device Support                                                                            | Disabled  | Optimal Default, Failsafe Default |
|                                                                                                    | Enabled   |                                   |
| Enable/Disable Security Device.                                                                    |           |                                   |
| <b>NOTE:</b> Your Computer will reboot during restart in order to change State of the Device.      |           |                                   |
| SHA-1 PCR Bank                                                                                     | Disabled  |                                   |
|                                                                                                    | Enabled   | Optimal Default, Failsafe Default |
| Enable or Disable SHA-1 PCR Bank.                                                                  |           |                                   |
| SHA256 PCR Bank                                                                                    | Disabled  |                                   |
|                                                                                                    | Enabled   | Optimal Default, Failsafe Default |
| Enable or Disable SHA256 PCR Bank.                                                                 |           |                                   |
| Pending Operation                                                                                  | TPM Clear |                                   |
|                                                                                                    | None      | Optimal Default, Failsafe Default |
| Schedule an Operation for the Security Device.                                                     |           |                                   |
| <b>NOTE:</b> Your Computer will reboot during restart in order to change State of Security Device. |           |                                   |

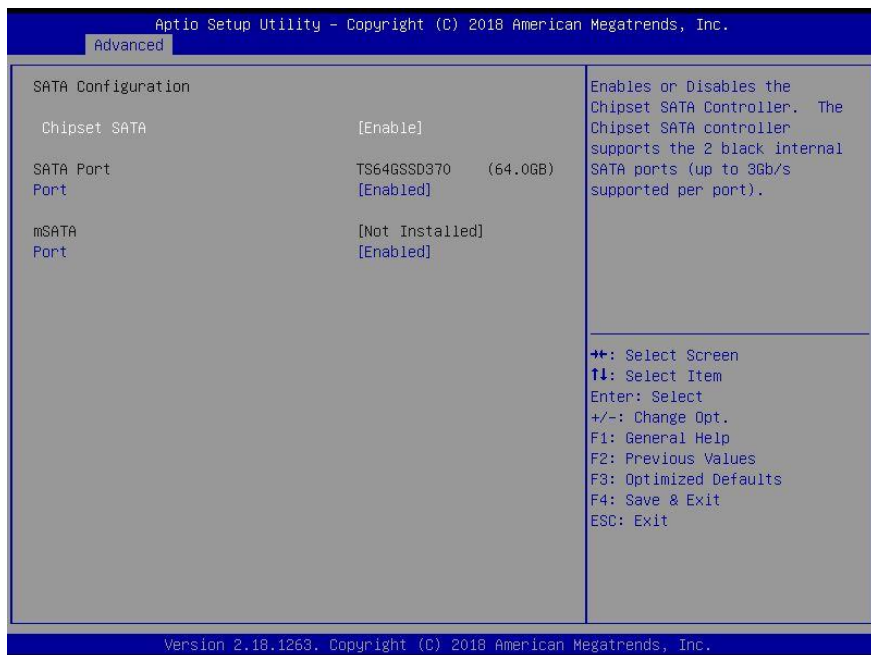
| Options Summary                                                                                                                                                                                                           |          |                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------|
| Platform Hierarchy                                                                                                                                                                                                        | Disabled |                                   |
|                                                                                                                                                                                                                           | Enabled  | Optimal Default, Failsafe Default |
| Enable or Disable Platform Hierarchy.                                                                                                                                                                                     |          |                                   |
| Storage Hierarchy                                                                                                                                                                                                         | Disabled |                                   |
|                                                                                                                                                                                                                           | Enabled  | Optimal Default, Failsafe Default |
| Enable or Disable Storage Hierarchy.                                                                                                                                                                                      |          |                                   |
| Endorsement Hierarchy                                                                                                                                                                                                     | Disabled |                                   |
|                                                                                                                                                                                                                           | Enabled  | Optimal Default, Failsafe Default |
| Enable or Disable Endorsement Hierarchy.                                                                                                                                                                                  |          |                                   |
| TPM2.0 UEFI Spec Version                                                                                                                                                                                                  | TCG_2    | Optimal Default, Failsafe Default |
|                                                                                                                                                                                                                           | TCG_1_2  |                                   |
| Select the TCG2 Spec Version Support.<br>TCG_1_2: The Compatible mode for Win8/Win10.<br>TCG_2: Support new TCG2 protocol and event format for Win10 or later.                                                            |          |                                   |
| Physical presence Spec Version                                                                                                                                                                                            | 1.3      | Optimal Default, Failsafe Default |
|                                                                                                                                                                                                                           | 1.2      |                                   |
| Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.                                                                                                                    |          |                                   |
| TPM 20 InterfaceType                                                                                                                                                                                                      | TIS      | Optimal Default, Failsafe Default |
|                                                                                                                                                                                                                           | CRB      |                                   |
| Select the Communication Interface to TPM 20 Device.                                                                                                                                                                      |          |                                   |
| Device Select                                                                                                                                                                                                             | Auto     | Optimal Default, Failsafe Default |
|                                                                                                                                                                                                                           | TPM 1.2  |                                   |
|                                                                                                                                                                                                                           | TPM 2.0  |                                   |
| TPM 1.2 will restrict support to TPM 1.2 devices.<br>TPM 2.0 will restrict support to TPM 2.0 devices<br>Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated. |          |                                   |

## 3.4.2 CPU Configuration



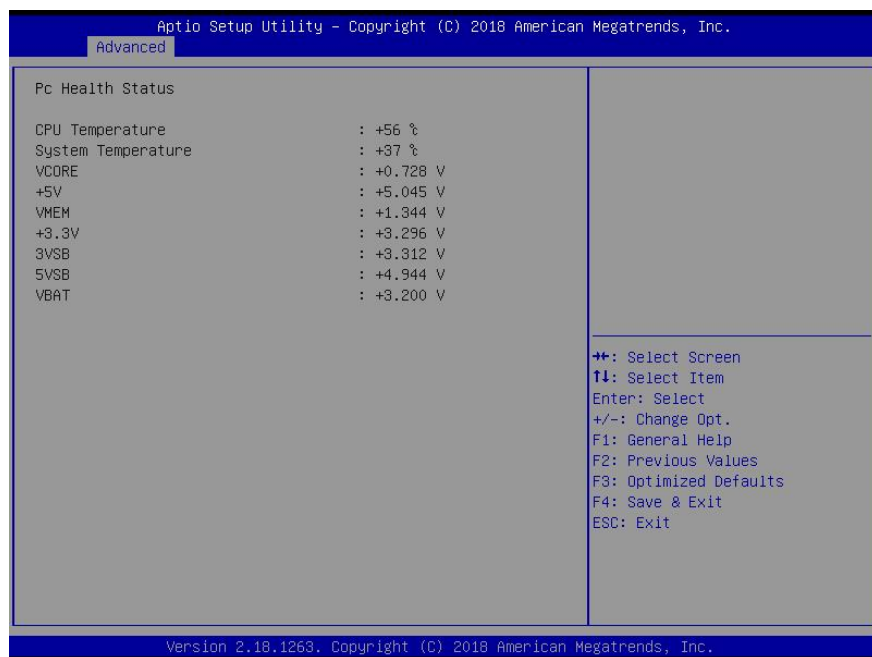
| Options Summary                                                                                         |                 |                                   |
|---------------------------------------------------------------------------------------------------------|-----------------|-----------------------------------|
| Active Processor Cores                                                                                  | Disabled        | Optimal Default, Failsafe Default |
|                                                                                                         | Enabled         |                                   |
| Number of cores to enable in each processor package.                                                    |                 |                                   |
| Intel Virtualization Technology                                                                         | Disabled        |                                   |
|                                                                                                         | Enabled         | Optimal Default, Failsafe Default |
| When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. |                 |                                   |
| VT-d                                                                                                    | Disabled        |                                   |
|                                                                                                         | Enabled         | Optimal Default, Failsafe Default |
| Enable/Disable CPU VT-d.                                                                                |                 |                                   |
| EIST                                                                                                    | Disabled        |                                   |
|                                                                                                         | Enabled         | Optimal Default, Failsafe Default |
| Enable/Disable Intel SpeedStep.                                                                         |                 |                                   |
| Turbo Mode                                                                                              | Disabled        |                                   |
|                                                                                                         | Enabled         | Optimal Default, Failsafe Default |
| Turbo Mode.                                                                                             |                 |                                   |
| Boot performance mode                                                                                   | Max performance | Optimal Default, Failsafe Default |
|                                                                                                         | Max battery     |                                   |
| Select the performance state that the BIOS will set before OS handoff.                                  |                 |                                   |
| Power Limit 1 Enable                                                                                    | Disabled        | Optimal Default, Failsafe Default |
|                                                                                                         | Enabled         |                                   |
| Enable/Disable Power Limit 1.                                                                           |                 |                                   |
| C-States                                                                                                | Disabled        | Optimal Default, Failsafe Default |
|                                                                                                         | Enabled         |                                   |
| Enable/Disable C States.                                                                                |                 |                                   |

### 3.4.3 SATA Drives

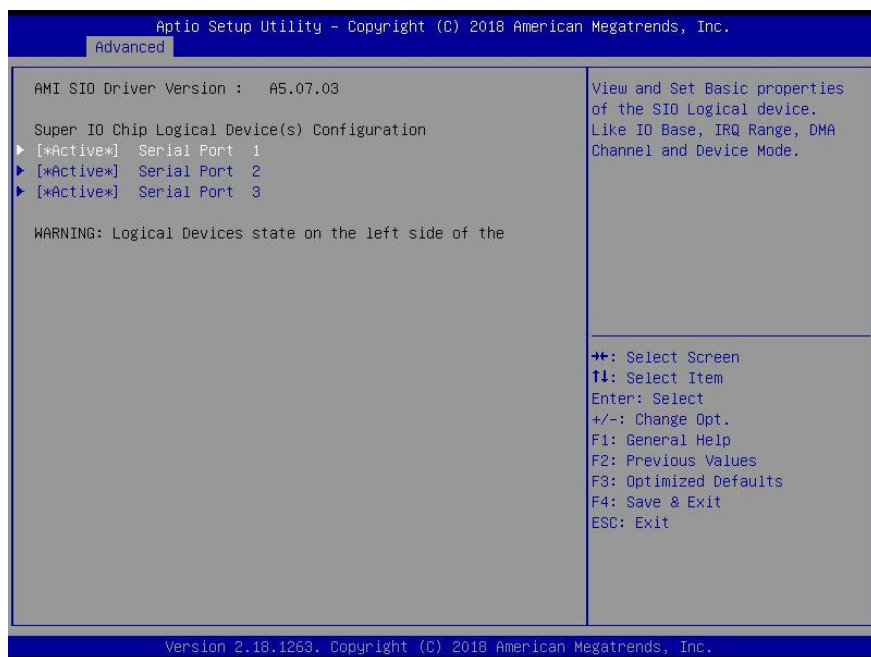


| Options Summary                                                                                                                                       |         |                                   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----------------------------------|
| Chipset SATA                                                                                                                                          | Enable  | Optimal Default, Failsafe Default |
|                                                                                                                                                       | Disable |                                   |
| Enable or Disable the Chipset SATA Controller. The Chipset SATA controller supports the 2 black internal SATA ports (up to 3Gb/s supported per port). |         |                                   |
| Port                                                                                                                                                  | Enable  | Optimal Default, Failsafe Default |
|                                                                                                                                                       | Disable |                                   |
| Enable or Disable SATA Port.                                                                                                                          |         |                                   |
| Port                                                                                                                                                  | Enable  | Optimal Default, Failsafe Default |
|                                                                                                                                                       | Disable |                                   |
| Enable or Disable SATA Port.                                                                                                                          |         |                                   |

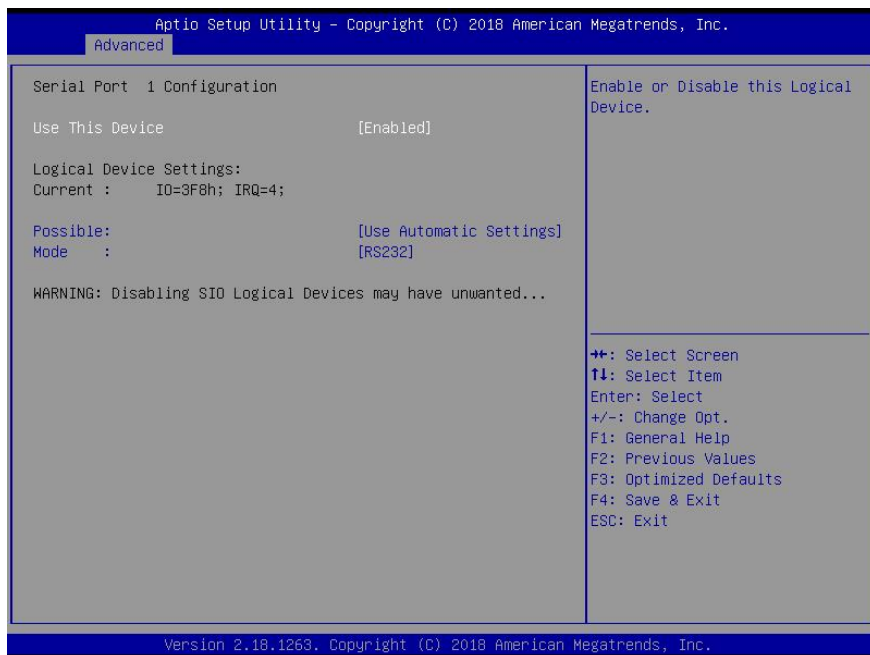
### 3.4.4 Hardware Monitor



### 3.4.5 SIO Configuration

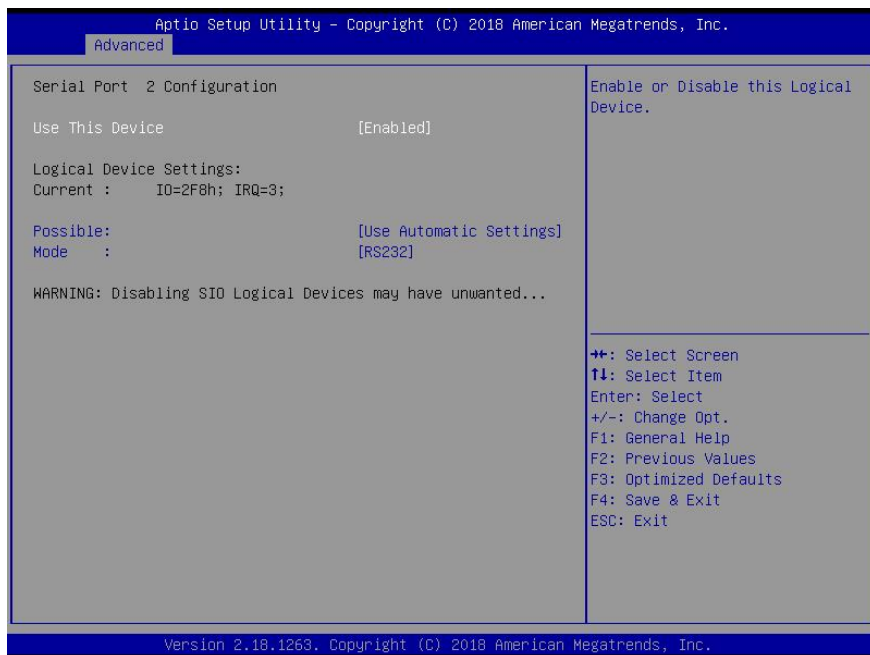


### 3.4.5.1 Serial Port 1 Configuration



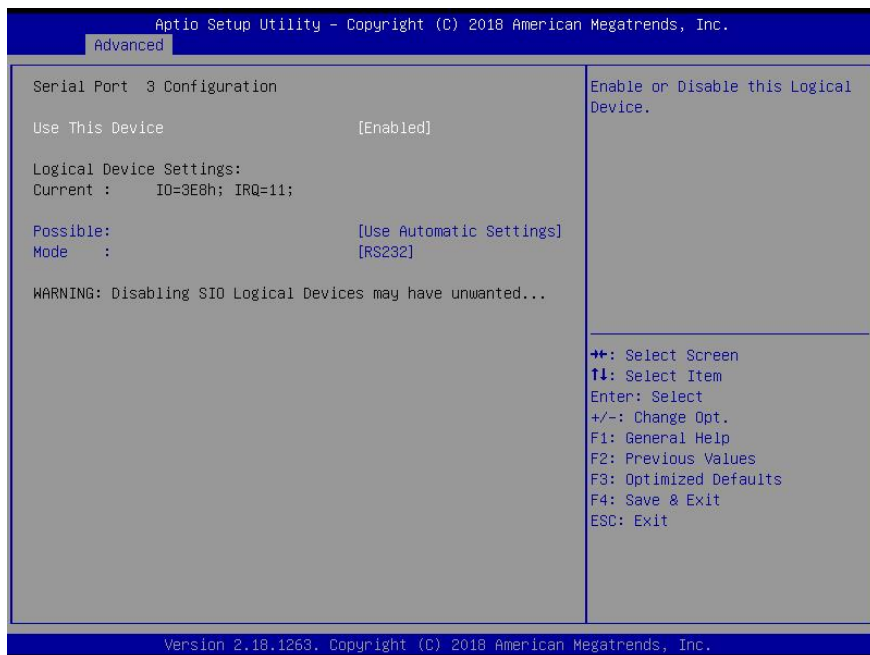
| Options Summary                                                                                                                  |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                                  | Disabled               |                                   |
|                                                                                                                                  | Enabled                | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device.                                                                                           |                        |                                   |
| Possible:                                                                                                                        | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                                  | IO=3F8; IRQ=4;         |                                   |
|                                                                                                                                  | IO=2F8; IRQ=3;         |                                   |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |                        |                                   |
| Mode:                                                                                                                            | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                                  | RS422                  |                                   |
|                                                                                                                                  | RS458                  |                                   |
| UART RS232 RS422 RS485 selection.                                                                                                |                        |                                   |

### 3.4.5.2 Serial Port 2 Configuration



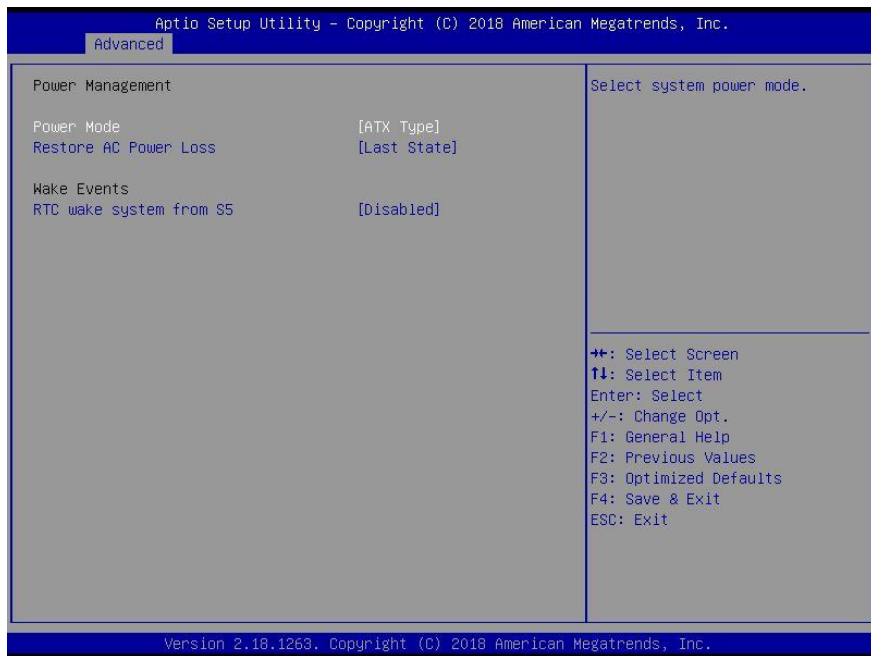
| Options Summary                                                                                                                  |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                                  | Disabled               |                                   |
|                                                                                                                                  | Enabled                | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device.                                                                                           |                        |                                   |
| Possible:                                                                                                                        | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                                  | IO=2F8; IRQ=3;         |                                   |
|                                                                                                                                  | IO=3F8; IRQ=4;         |                                   |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |                        |                                   |
| Mode:                                                                                                                            | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                                  | RS422                  |                                   |
|                                                                                                                                  | RS458                  |                                   |
| UART RS232 RS422 RS485 selection.                                                                                                |                        |                                   |

### 3.4.5.3 Serial Port 3 Configuration



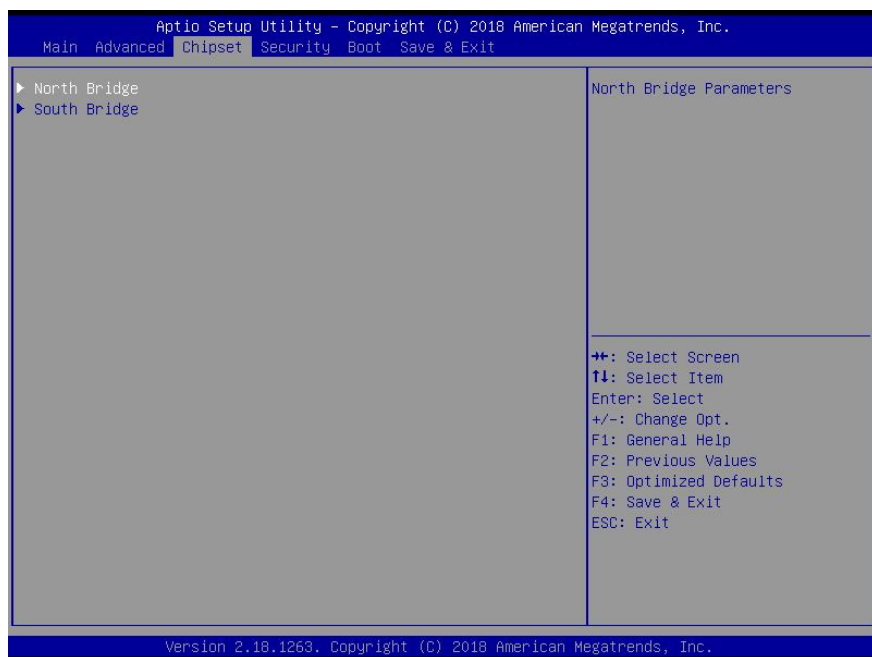
| Options Summary                                                                                                                  |                        |                                   |
|----------------------------------------------------------------------------------------------------------------------------------|------------------------|-----------------------------------|
| Use This Device                                                                                                                  | Disabled               |                                   |
|                                                                                                                                  | Enabled                | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device.                                                                                           |                        |                                   |
| Possible:                                                                                                                        | Use Automatic Settings | Optimal Default, Failsafe Default |
|                                                                                                                                  | IO=3E8; IRQ=11;        |                                   |
|                                                                                                                                  | IO=2E8; IRQ=11;        |                                   |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. |                        |                                   |
| Mode:                                                                                                                            | RS232                  | Optimal Default, Failsafe Default |
|                                                                                                                                  | RS422                  |                                   |
|                                                                                                                                  | RS458                  |                                   |
| UART RS232 RS422 RS485 selection.                                                                                                |                        |                                   |

### 3.4.6 Power Management



| Options Summary                                                                                             |              |                                   |
|-------------------------------------------------------------------------------------------------------------|--------------|-----------------------------------|
| Power Mode                                                                                                  | ATX Type     | Optimal Default, Failsafe Default |
|                                                                                                             | AT Type      |                                   |
| Select system power mode.                                                                                   |              |                                   |
| Restore AC Power Loss                                                                                       | Last State   | Optimal Default, Failsafe Default |
|                                                                                                             | Power On     |                                   |
|                                                                                                             | Power Loss   |                                   |
| RTC wake system from S5                                                                                     | Disabled     | Optimal Default, Failsafe Default |
|                                                                                                             | Fixed Time   |                                   |
|                                                                                                             | Dynamic Time |                                   |
| Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified. |              |                                   |

### 3.5 Setup Submenu: Chipset

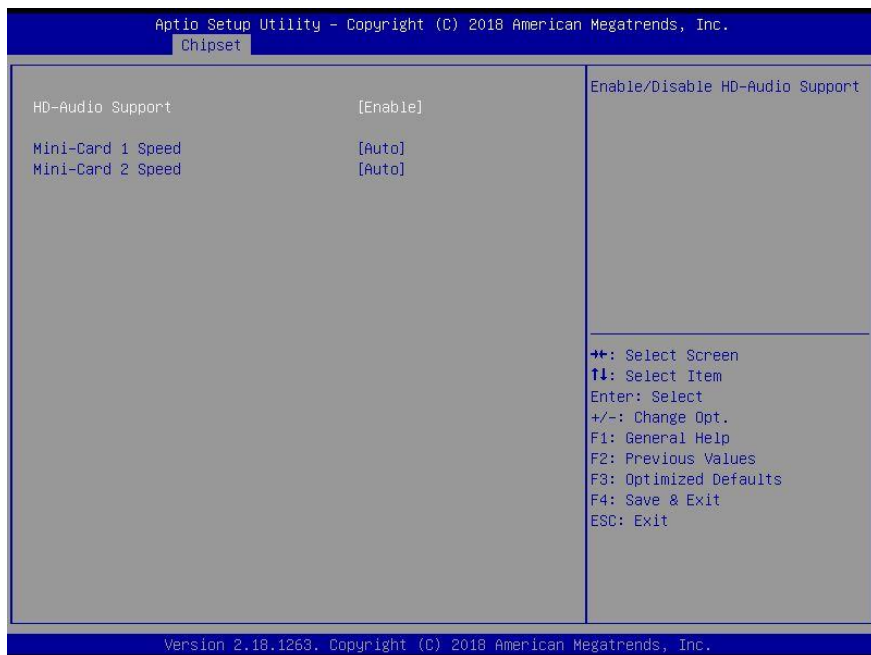


### 3.5.1 North Bridge



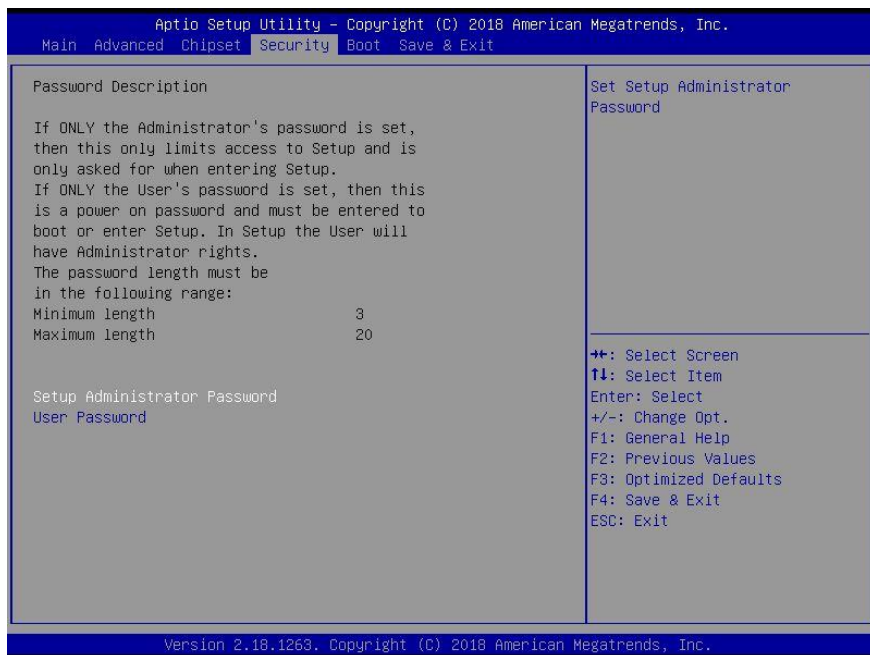
| Options Summary                                                                 |      |                                   |
|---------------------------------------------------------------------------------|------|-----------------------------------|
| DCMT Total Gfx Mem                                                              | 128M |                                   |
|                                                                                 | 256M | Optimal Default, Failsafe Default |
|                                                                                 | MAX  |                                   |
| Select DVMT5.0 Total Graphics Memory size used by the Internal Graphics Device. |      |                                   |

### 3.5.2 South Bridge



| Options Summary                  |         |                                   |
|----------------------------------|---------|-----------------------------------|
| HD-Audio Support                 | Disable |                                   |
|                                  | Enable  | Optimal Default, Failsafe Default |
| Enable/Disable HD-Audio Support. |         |                                   |
| Mini-Card 1 Speed                | Auto    | Optimal Default, Failsafe Default |
|                                  | Gen 1   |                                   |
|                                  | Gen 2   |                                   |
| Configure PCIe Speed.            |         |                                   |
| Mini-Card 2 Speed                | Auto    | Optimal Default, Failsafe Default |
|                                  | Gen 1   |                                   |
|                                  | Gen 2   |                                   |
| Configure PCIe Speed.            |         |                                   |

## 3.6 Setup Submenu: Security



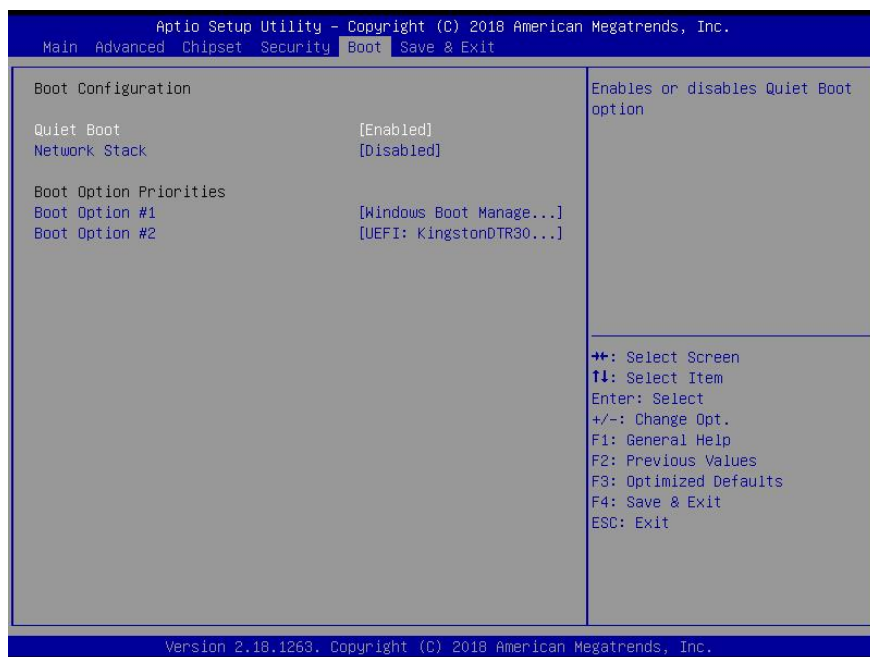
### Change User/Administrator Password

You can set a User Password once an Administrator Password is set. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility. Select the password you wish to set, press Enter to open a dialog box to enter your password (you can enter no more than six letters or numbers). Press Enter to confirm your entry, after which you will be prompted to retype your password for a final confirmation. Press Enter again after you have retyped it correctly.

### Removing the Password

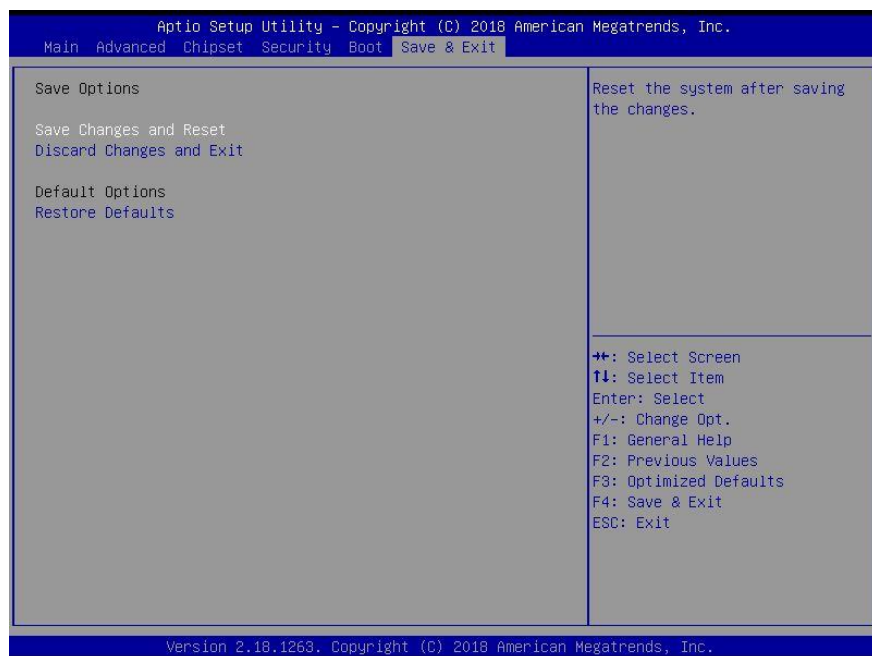
Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

### 3.7 Setup Submenu: Boot



| Options Summary                      |          |                                   |
|--------------------------------------|----------|-----------------------------------|
| Quiet Boot                           | Disabled |                                   |
|                                      | Enabled  | Optimal Default, Failsafe Default |
| Enable or Disable Quiet Boot option. |          |                                   |
| Network Stack                        | Disabled | Optimal Default, Failsafe Default |
|                                      | Enabled  |                                   |
| Enable/Disable UEFI Network Stack.   |          |                                   |

### 3.8 Setup Submenu: Save & Exit



# Chapter 4

---

Drivers Installation

## 4.1 Driver Download and Installation

---

Drivers for the BOXER-6710 can be downloaded from the product page on the AAEON website by following this link:

<https://www.aaeon.com/en/p/fanless-embedded-box-pc-boxer-6710>

Download the driver(s) you need and follow the steps below to install them.

### Step 1 – Install Chipset Drivers

1. Open the **STEP1-Chipset** folder and select your OS
2. Open the **SetupChipset.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 2 – Install Graphics Driver

1. Open the **STEP2-Graphics** folder
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 3 – Install TXE Driver

1. Open the **STEP3-TXE** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Step 4 – Install LAN Drivers

1. Open the **STEP4–LAN** folder and select your OS
2. Open the **tar.gz** or **.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

### Step 5 – Install Audio Drivers

1. Open the **STEP5–Audio** folder and select your OS
2. Open the **.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

### Step 6 – Install Serial IO Drivers

1. Open the **STEP6–Serial IO Driver** folder
2. Open the **SetupSerialIO.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

### Step 7 – Install Serial Port Driver (Optional)

1. Open the **STEP7–Serial Port Driver (Optional)** folder and select your OS
2. Open the **Setup\_x64.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

### Step 8 – Install Linux Peripheral Drivers

1. Open the **Peripheral Driver-Linux** folder
2. Follow the instructions provided in the project user guide to manually install drivers

# Appendix A

---

## Watchdog Timer Programming

## A.1 Watchdog Timer Initial Program

**Table 1: Super I/O Relative Register Table**

|       | Default Value | Note                                           |
|-------|---------------|------------------------------------------------|
| Index | 0x2E(Note1)   | SIO MB PnP Mode Index Register<br>0x2E or 0x4E |
| Data  | 0x2F(Note2)   | SIO MB PnP Mode Data Register<br>0x2F or 0x4F  |

**Table 2: Watchdog Relative Register Table**

|                 | LDN          | Register     | BitNum    | Value     | Note                                                                  |
|-----------------|--------------|--------------|-----------|-----------|-----------------------------------------------------------------------|
| Timer Counter   | 0x07(Note3)  | 0xF6(Note4)  |           | (Note24)  | Time of watchdog timer (0~255)<br>This register is byte access        |
| Counting Unit   | 0x07(Note5)  | 0xF5(Note6)  | 3(Note7)  | 0(Note8)  | Select time unit.<br>0: second<br>1: minute                           |
| Watchdog Enable | 0x07(Note9)  | 0xF5(Note10) | 5(Note11) | 1(Note12) | 0: Disable<br>1: Enable                                               |
| Timeout Status  | 0x07(Note13) | 0xF5(Note14) | 6(Note15) | 1         | 1: Clear timeout status                                               |
| Output Mode     | 0x07(Note16) | 0xF5(Note17) | 4(Note18) | 1(Note19) | Select WDTRST# output mode<br>0: level<br>1: pulse                    |
| WDTRST output   | 0x07(Note20) | 0xFA(Note21) | 0(Note22) | 1(Note23) | Enable/Disable time out output via WDTRST#<br>0: Disable<br>1: Enable |

## A.2 Watchdog Sample Program

```

*****
// SuperIO relative definition (Please reference to Table 1)
#define byte  SIOLIndex  //This parameter is represented from Note1
#define byte  SIODData   //This parameter is represented from Note2
#define void   IOWriteByte(byte IOPort, byte Value);
#define byte   IOReadByte(byte IOPort);
// Watch Dog relative definition (Please reference to Table 2)
#define byte   TimerLDN   //This parameter is represented from Note3
#define byte   TimerReg   //This parameter is represented from Note4
#define byte   TimerVal   // This parameter is represented from Note24
#define byte   UnitLDN    //This parameter is represented from Note5
#define byte   UnitReg    //This parameter is represented from Note6
#define byte   UnitBit    //This parameter is represented from Note7
#define byte   UnitVal    //This parameter is represented from Note8
#define byte   EnableLDN  //This parameter is represented from Note9
#define byte   EnableReg  //This parameter is represented from Note10
#define byte   EnableBit  //This parameter is represented from Note11
#define byte   EnableVal  //This parameter is represented from Note12
#define byte   StatusLDN  // This parameter is represented from Note13
#define byte   StatusReg  // This parameter is represented from Note14
#define byte   StatusBit  // This parameter is represented from Note15
#define byte   ModeLDN    // This parameter is represented from Note16
#define byte   ModeReg    // This parameter is represented from Note17
#define byte   ModeBit    // This parameter is represented from Note18
#define byte   ModeVal    // This parameter is represented from Note19
#define byte   WDTRstLDN  // This parameter is represented from Note20
#define byte   WDTRstReg  // This parameter is represented from Note21
#define byte   WDTRstBit  // This parameter is represented from Note22
#define byte   WDTRstVal  // This parameter is represented from Note23
*****

```

```
*****
VOID  Main(){
    // Procedure : AaeonWDTConfig
    // (byte)Timer : Time of WDT timer.(0x00~0xFF)
    // (boolean)Unit : Select time unit(0: second, 1: minute).
    AaeonWDTConfig();

    // Procedure : AaeonWDTEnable
    // This procedure will enable the WDT counting.
    AaeonWDTEnable();
}
*****
```

```

*****
// Procedure : AaeonWDTEnable
VOID  AaeonWDTEnable (){
    WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 1);
}

// Procedure : AaeonWDTConfig
VOID  AaeonWDTConfig (){
    // Disable WDT counting
    WDTEnableDisable(EnableLDN, EnableReg, EnableBit, 0);
    // Clear Watchdog Timeout Status
    WDTClearTimeoutStatus();
    // WDT relative parameter setting
    WDTParameterSetting();
}

VOID  WDTEnableDisable(byte LDN, byte Register, byte BitNum, byte Value){
    SIOBitSet(LDN, Register, BitNum, Value);
}

VOID  WDTParameterSetting(){
    // Watchdog Timer counter setting
    SIOByteSet(TimerLDN, TimerReg, TimerVal);
    // WDT counting unit setting
    SIOBitSet(UnitLDN, UnitReg, UnitBit, UnitVal);
    // WDT output mode setting, level / pulse
    SIOBitSet(ModelLDN, ModeReg, ModeBit, ModeVal);
    // Watchdog timeout output via WDTRST#
    SIOBitSet(WDTRstLDN, WDTRstReg, WDTRstBit, WDTRstVal);
}

VOID  WDTClearTimeoutStatus(){
    SIOBitSet(StatusLDN, StatusReg, StatusBit, 1);
}
*****

```

```

*****
VOID  SIOEnterMBPnPMode(){
    IOWriteByte(SIOIndex, 0x87);
    IOWriteByte(SIOIndex, 0x87);
}

VOID  SIOExitMBPnPMode(){
    IOWriteByte(SIOIndex, 0xAA);
}

VOID  SIOSelectLDN(byte LDN){
    IOWriteByte(SIOIndex, 0x07); // SIO LDN Register Offset = 0x07
    IOWriteByte(SIOData, LDN);
}

VOID  SIOBitSet(byte LDN, byte Register, byte BitNum, byte Value){
    Byte TmpValue;

    SIOEnterMBPnPMode();
    SIOSelectLDN(byte LDN);
    IOWriteByte(SIOIndex, Register);
    TmpValue = IOReadByte(SIOData);
    TmpValue &= ~(1 << BitNum);
    TmpValue |= (Value << BitNum);
    IOWriteByte(SIOData, TmpValue);
    SIOExitMBPnPMode();
}

VOID  SIOByteSet(byte LDN, byte Register, byte Value){
    SIOEnterMBPnPMode();
    SIOSelectLDN(LDN);
    IOWriteByte(SIOIndex, Register);
    IOWriteByte(SIOData, Value);
    SIOExitMBPnPMode();
}
*****

```

# Appendix B

---

I/O Information

## B.1 I/O Address Map

| Input/output (IO)                                                                   |                                                                         |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
|    | [0000000000000000 - 000000000000006F] PCI Express Root Complex          |
|    | [0000000000000020 - 0000000000000021] Programmable interrupt controller |
|    | [0000000000000024 - 0000000000000025] Programmable interrupt controller |
|    | [0000000000000028 - 0000000000000029] Programmable interrupt controller |
|    | [000000000000002C - 000000000000002D] Programmable interrupt controller |
|    | [000000000000002E - 000000000000002F] Motherboard resources             |
|    | [0000000000000030 - 0000000000000031] Programmable interrupt controller |
|    | [0000000000000034 - 0000000000000035] Programmable interrupt controller |
|    | [0000000000000038 - 0000000000000039] Programmable interrupt controller |
|    | [000000000000003C - 000000000000003D] Programmable interrupt controller |
|    | [0000000000000040 - 0000000000000043] System timer                      |
|    | [000000000000004E - 000000000000004F] Motherboard resources             |
|    | [0000000000000050 - 0000000000000053] System timer                      |
|    | [0000000000000061 - 0000000000000061] Motherboard resources             |
|    | [0000000000000063 - 0000000000000063] Motherboard resources             |
|    | [0000000000000065 - 0000000000000065] Motherboard resources             |
|    | [0000000000000067 - 0000000000000067] Motherboard resources             |
|    | [0000000000000070 - 0000000000000070] Motherboard resources             |
|    | [0000000000000070 - 0000000000000077] System CMOS/real time clock       |
|    | [0000000000000078 - 00000000000000CF7] PCI Express Root Complex         |
|    | [0000000000000080 - 000000000000008F] Motherboard resources             |
|    | [0000000000000092 - 0000000000000092] Motherboard resources             |
|    | [00000000000000A0 - 00000000000000A1] Programmable interrupt controller |
|    | [00000000000000A4 - 00000000000000A5] Programmable interrupt controller |
|   | [00000000000000A8 - 00000000000000A9] Programmable interrupt controller |
|  | [00000000000000AC - 00000000000000AD] Programmable interrupt controller |
|  | [00000000000000B0 - 00000000000000B1] Programmable interrupt controller |
|  | [00000000000000B2 - 00000000000000B3] Motherboard resources             |
|  | [00000000000000B4 - 00000000000000B5] Programmable interrupt controller |
|  | [00000000000000B8 - 00000000000000B9] Programmable interrupt controller |
|  | [00000000000000BC - 00000000000000BD] Programmable interrupt controller |
|  | [00000000000002F8 - 00000000000002FF] Communications Port (COM2)        |
|  | [00000000000003E8 - 00000000000003EF] Communications Port (COM3)        |
|  | [00000000000003F8 - 00000000000003FF] Communications Port (COM1)        |
|  | [0000000000000400 - 000000000000047F] Motherboard resources             |
|  | [00000000000004D0 - 00000000000004D1] Programmable interrupt controller |
|  | [0000000000000500 - 00000000000005FE] Motherboard resources             |
|  | [0000000000000680 - 000000000000069F] Motherboard resources             |
|  | [0000000000000A00 - 0000000000000A0F] Motherboard resources             |
|  | [0000000000000A10 - 0000000000000A1F] Motherboard resources             |

|                                                                                   |                                                                                                             |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
|  | [000000000000A10 - 000000000000A1F] Motherboard resources                                                   |
|  | [000000000000A20 - 000000000000A2F] Motherboard resources                                                   |
|  | [000000000000D00 - 000000000000FFFF] PCI Express Root Complex                                               |
|  | [000000000000D000 - 000000000000DFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9 |
|  | [000000000000E000 - 000000000000EFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8 |
|  | [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics                                                  |
|  | [000000000000F040 - 000000000000F05F] Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4                 |
|  | [000000000000F060 - 000000000000F07F] Standard SATA AHCI Controller                                         |
|  | [000000000000F080 - 000000000000F083] Standard SATA AHCI Controller                                         |
|  | [000000000000F090 - 000000000000F097] Standard SATA AHCI Controller                                         |

## B.2 Memory Address Map

| Memory                                  |                                                                       |
|-----------------------------------------|-----------------------------------------------------------------------|
| [000000007B800001 - 000000007BFFFFFF]   | PCI Express Root Complex                                              |
| [000000007C000001 - 000000007CFFFFFF]   | PCI Express Root Complex                                              |
| [0000000080000000 - 000000008FFFFFFF]   | Intel(R) HD Graphics                                                  |
| [0000000080000000 - 00000000CFFFFFFF]   | PCI Express Root Complex                                              |
| [0000000090000000 - 0000000090FFFFFF]   | Intel(R) HD Graphics                                                  |
| [0000000091000000 - 00000000910FFFFF]   | High Definition Audio Controller                                      |
| [0000000091100000 - 00000000911FFFFF]   | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9 |
| [00000000911DC000 - 00000000911DFFFF]   | Intel(R) I211 Gigabit Network Connection #2                           |
| [00000000911E0000 - 00000000911FFFFF]   | Intel(R) I211 Gigabit Network Connection #2                           |
| [0000000091200000 - 00000000912FFFFF]   | Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8 |
| [00000000912DC000 - 00000000912DFFFF]   | Intel(R) I211 Gigabit Network Connection                              |
| [00000000912E0000 - 00000000912Fffff]   | Intel(R) I211 Gigabit Network Connection                              |
| [0000000091300000 - 000000009130FFFF]   | Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)         |
| [0000000091310000 - 0000000091313FFF]   | High Definition Audio Controller                                      |
| [0000000091314000 - 0000000091315FFF]   | Standard SATA AHCI Controller                                         |
| [0000000091318000 - 00000000913180FF]   | Intel(R) Celeron(R)/Pentium(R) Processor SMBUS - 5AD4                 |
| [0000000091319000 - 00000000913197FF]   | Standard SATA AHCI Controller                                         |
| [000000009131A000 - 000000009131A0FF]   | Standard SATA AHCI Controller                                         |
| [000000009131E000 - 000000009131EFFF]   | Intel(R) Trusted Execution Engine Interface                           |
| [00000000D0C00000 - 00000000D0C00653]   | Intel(R) Serial IO GPIO Host Controller - INT3452                     |
| [00000000D0C40000 - 00000000D0C40763]   | Intel(R) Serial IO GPIO Host Controller - INT3452                     |
| [00000000D0C50000 - 00000000D0C5076B]   | Intel(R) Serial IO GPIO Host Controller - INT3452                     |
| [00000000D0C70000 - 00000000D0C70763]   | Intel(R) Serial IO GPIO Host Controller - INT3452                     |
| [00000000E0000000 - 00000000EFFFFFFF]   | Motherboard resources                                                 |
| [00000000E0000000 - 00000000EFFFFFFF]   | PCI Express Root Complex                                              |
| [00000000FEA00000 - 00000000FEAFFFFFFF] | Motherboard resources                                                 |
| [00000000FED00000 - 00000000FED003FF]   | High precision event timer                                            |
| [00000000FED01000 - 00000000FED01FFF]   | Motherboard resources                                                 |
| [00000000FED03000 - 00000000FED03FFF]   | Motherboard resources                                                 |
| [00000000FED06000 - 00000000FED06FFF]   | Motherboard resources                                                 |
| [00000000FED08000 - 00000000FED09FFF]   | Motherboard resources                                                 |
| [00000000FED1C000 - 00000000FED1CFFF]   | Motherboard resources                                                 |
| [00000000FED40000 - 00000000FED44FFF]   | Trusted Platform Module 2.0                                           |
| [00000000FED80000 - 00000000FEDBFFFF]   | Motherboard resources                                                 |
| [00000000FEE00000 - 00000000FEEFFFFFFF] | Motherboard resources                                                 |

## B.3 IRQ Mapping Chart

---

|                                                                                     |                                                                         |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| ▼  | Interrupt request (IRQ)                                                 |
|    | (ISA) 0x00000000 (00) System timer                                      |
|    | (ISA) 0x00000003 (03) Communications Port (COM2)                        |
|    | (ISA) 0x00000004 (04) Communications Port (COM1)                        |
|    | (ISA) 0x00000008 (08) High precision event timer                        |
|    | (ISA) 0x0000000B (11) Communications Port (COM3)                        |
|    | (ISA) 0x0000000E (14) Intel(R) Serial IO GPIO Host Controller - INT3452 |
|    | (ISA) 0x0000000E (14) Intel(R) Serial IO GPIO Host Controller - INT3452 |
|    | (ISA) 0x0000000E (14) Intel(R) Serial IO GPIO Host Controller - INT3452 |
|    | (ISA) 0x0000000E (14) Intel(R) Serial IO GPIO Host Controller - INT3452 |

# Appendix C

---

## Glue Removal Procedure

## C.1 Removing Glue from Your System

---

To protect components from damage and ensure proper operation out of the box, glue may have been applied to some cables or connectors to keep them in place during shipping. This glue must be removed before attempting to swap components or perform maintenance. This section details the steps needed to remove the glue.

Before performing any kind of system maintenance, ensure the system is shut down (not in sleep or hibernate mode) and the power cable has been removed. Follow steps in Chapter 2 to access the components inside.

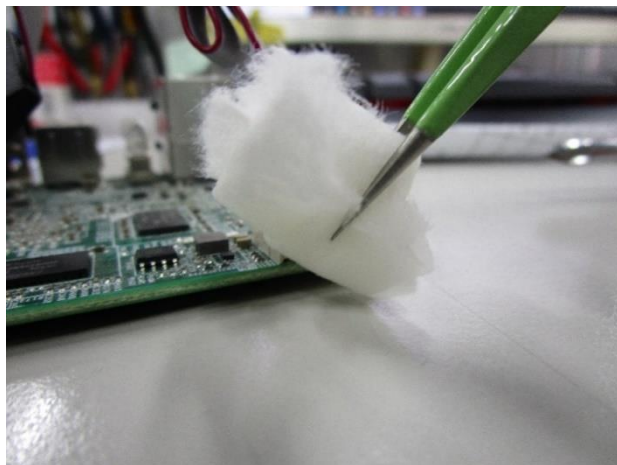
You will need the following items for this step:

- Cotton or cotton swab
- Anti-static tweezers
- An alcohol solution that is at least 99.5% alcohol (ethanol solution or denatured alcohol). AAEON recommends using an eye dropper or a bottle with a nozzle as in the picture below:

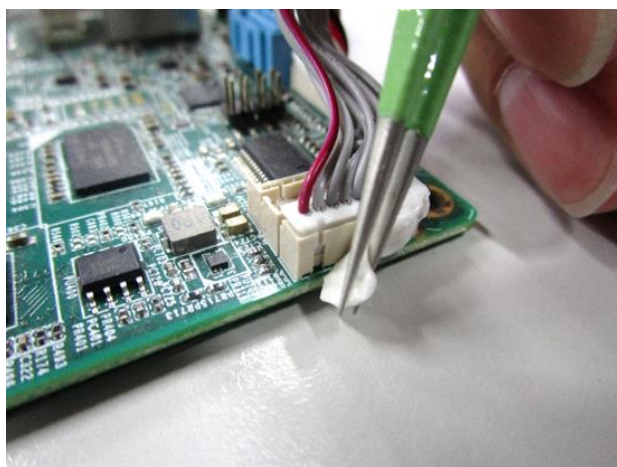


**Step 1:** Using an eyedropper or bottle as shown above, apply a few drops of alcohol to the glue.

**Step 2:** Allow the alcohol to soak for 10 seconds, then use a cotton swab or cotton with anti-static tweezers to evenly rub the alcohol over the glue.



**Step 3:** Let soak for 10 more seconds, then use anti-static tweezers to remove the glue.



If you encounter any issues or need support, please contact your AAEON representative or visit our [Support Page](#) at AAEON.com.