

BOXER-6645U-RPL

Fanless Embedded Box PC

User's Manual 1st Ed

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Packing List

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

| Item | Quantity |
|-------------------------------|----------|
| ● BOXER-6645U-RPL | 1 |
| ● Wallmount Bracket | 2 |
| ● 3 Pin DC-In Power Connector | 1 |
| ● Remote ON/OFF Cable | 1 |
| ● Screw Package | 1 |

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

About this Document

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 for the latest version of this document.

Safety Precautions

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. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. 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.
7. Always disconnect this device from any power supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls.
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. 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.

17. If any of the following situations arises, please 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
18. Do not leave this device in an uncontrolled environment with temperatures beyond the device's permitted storage temperatures (see chapter 1) to prevent damage.
19. Do NOT disassemble the motherboard so as not to damage the system or void your warranty.
20. If the thermal pad had been damaged, please contact AAEON's salesperson to purchase a new one. Do NOT use those of other brands.
21. The Hex Cylinder Coppers on the front panel are not removable.
22. Repeatedly assemble and disassemble the system may cause damages to the exterior paint and surface and screw holes.
23. Use the right size screwdriver.
24. Use the screwdriver correctly to remove screws from the system.

FCC Statement

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.

产品中有毒有害物质或元素名称及含量

AAEON System

QO4-381 Rev.A0

| 部件名称 | 有毒有害物质或元素 | | | | | |
|-----------------|-----------|-----------|-----------|-----------------|---------------|-----------------|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯 醚(PBDE) |
| 印刷电路板 及其电子组件 | × | ○ | ○ | ○ | ○ | ○ |
| 外部信号 连接器及线材 | × | ○ | ○ | ○ | ○ | ○ |
| 外壳 | ○ | ○ | ○ | ○ | ○ | ○ |
| 中央处理器 与内存 | × | ○ | ○ | ○ | ○ | ○ |
| 硬盘 | × | ○ | ○ | ○ | ○ | ○ |
| 液晶模块 | × | × | ○ | ○ | ○ | ○ |
| 光驱 | × | ○ | ○ | ○ | ○ | ○ |
| 触控模块 | × | ○ | ○ | ○ | ○ | ○ |
| 电源 | × | ○ | ○ | ○ | ○ | ○ |
| 电池 | × | ○ | ○ | ○ | ○ | ○ |

本表格依据 SJ/T 11364 的规定编制。

○：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。

×：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。

备注：

- 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。
- 二、上述部件物质中央处理器、内存、硬盘、光驱、电源为选购品。
- 三、上述部件物质液晶模块、触控模块仅一体机产品适用。

Hazardous and Toxic Materials List

AAEON System

QO4-381 Rev.A0

| Component Name | Hazardous or Toxic Materials or Elements | | | | | |
|--|--|--------------|--------------|------------------------------|---------------------------------|-------------------------------|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr(VI)) | Polybrominated biphenyls (PBBS) | Polybrominated ethers (PBDES) |
| PCB and Components | X | O | O | O | O | O |
| Wires & Connectors for Ext.Connections | X | O | O | O | O | O |
| Chassis | O | O | O | O | O | O |
| CPU & RAM | X | O | O | O | O | O |
| HDD Drive | X | O | O | O | O | O |
| LCD Module | X | X | O | O | O | O |
| Optical Drive | X | O | O | O | O | O |
| Touch Control Module | X | O | O | O | O | O |
| PSU | X | O | O | O | O | O |
| Battery | X | O | O | O | O | O |

This form is prepared in compliance with the provisions of SJ/T 11364.

O: The level of toxic or hazardous materials present in this component and its parts is below the limit specified by GB/T 26572.

X: The level of toxic of hazardous materials present in the component exceed the limits specified by GB/T 26572, but is still in compliance with EU Directive 2011/65/EU (RoHS 2).

Notes:

1. The Environment Friendly Use Period indicated by labelling on this product is applicable only to use under normal conditions.
2. Individual components including the CPU, RAM/memory, HDD, optical drive, and PSU are optional.
3. LCD Module and Touch Control Module only applies to certain products which feature these components.

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Chapter 1

Product Specifications

1.1 Specifications

System

| | |
|--------------------------|---|
| CPU | 13th/14th Generation Intel® Core™ LGA 1700 Socket-Type Processor, Max TDP 65W 13th Generation Intel® Core™ Processors: Intel® Core™ i9-13900TE/Intel® Core™ i9-13900E Intel® Core™ i7-13700TE/Intel® Core™ i7-13700E Intel® Core™ i5-13500TE/Intel® Core™ i5-13500E Intel® Core™ i3-13100TE/Intel® Core™ i3-13100E 14th Generation Intel® Core™ Processors: Intel® Core™ i9 processor 14900 Intel® Core™ i9 processor 14900T Intel® Core™ i7 processor 14700 Intel® Core™ i7 processor 14700T Intel® Core™ i5 processor 14500 Intel® Core™ i5 processor 14500T Intel® Core™ i3 processor 14100 Intel® Core™ i3 processor 14100T |
| Chipset | Intel® H610E |
| System Memory | DDR5 SODIMM x 2, up to 64GB |
| Display Interface | HDMI 1.4a (Type-A) x 2, 4K @30Hz |
| Storage | 2.5" SATA Drive Bay x 2 M.2 2280 M-Key x 1 (PCIe Gen 3 [x4]) for NVMe |
| Ethernet | Intel® Ethernet Connection I219-LM, GbE RJ-45 x 1 Intel® Ethernet Controller I226-LM, 2.5GbE RJ-45 x 1 |
| I/O | USB 3.2 Gen 2 x 4 USB 2.0 x 2 |

System

| | |
|------------|--|
| I/O Cont. | DB-9 x 2 for RS-232/422/485 Audio x 1 (Mic-in/Line-out) Power Button with Power LED x 1 Remote Power On/Off x 1 |
| Expansion | M.2 2280 M-Key x 1 (NVMe) M.2 2230 E-Key x 1 (Wi-Fi/Bluetooth) Full Size mPCIe x 1 (optional for mSATA) |
| Indicator | System Power LED x 1 |
| OS Support | Windows® 10 IoT Enterprise (64-bit) Windows® 11 Pro (64-bit) Linux Ubuntu 22.04 |

Power Supply

| | |
|-------------------|-----------------------|
| Power Requirement | 3-pin DC Input 10~35V |
|-------------------|-----------------------|

Mechanical

| | |
|------------------------|--|
| Mounting | Wall Mount |
| Dimensions (W x H x D) | 7.09" x 3.04" x 8.66" (180mm x 77.2mm x 220mm) 8.43" x 3.31" x 8.66" (214mm x 84.2mm x 220mm) with brackets |
| Gross Weight | 8.5 lb. (3.9Kg) |
| Net Weight | 6.3 lb. (2.9Kg) |

Environmental

| | |
|-----------------------|--|
| Operating Temperature | -13°F ~ 131°F (-25°C ~ 55°C), IEC60068-2 with 0.7 m/s Airflow, with W.T memory/storage (TDP 65W CPU) |
| | -13°F ~ 158°F (-25°C ~ 70°C), IEC60068-2 with 0.7 m/s Airflow, with W.T memory/storage (TDP 35W CPU) |
| Storage Temperature | -40 °F ~ 176°F (-40°C ~ 80°C) |
| Storage Humidity | 5 ~ 95% @ 40°C, non-condensing |
| Anti-Vibration | 3 Grms/ 5 ~ 500Hz/ operation (with SSD) |
| Anti-Shock | 50G, IEC68-2-27, half sine, 11ms duration (with SSD) |
| Certification | CE/FCC Class A/LVD |

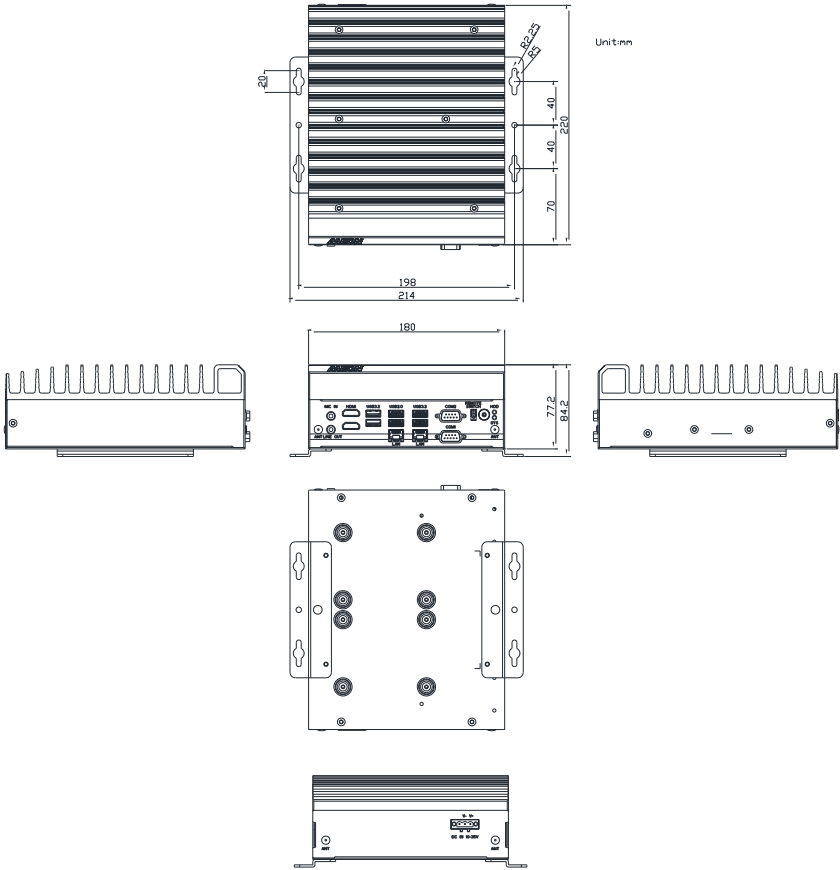
Note: Industrial grade memory modules are recommended (temperature range: -40°F ~ 185°F (-40°C ~ 85°C) or above).

Note: For Gen 4 storage module, a thermal solution is mandatory for heat-dissipation. Please check with your AAEON representative if you have any queries regarding this requirement.

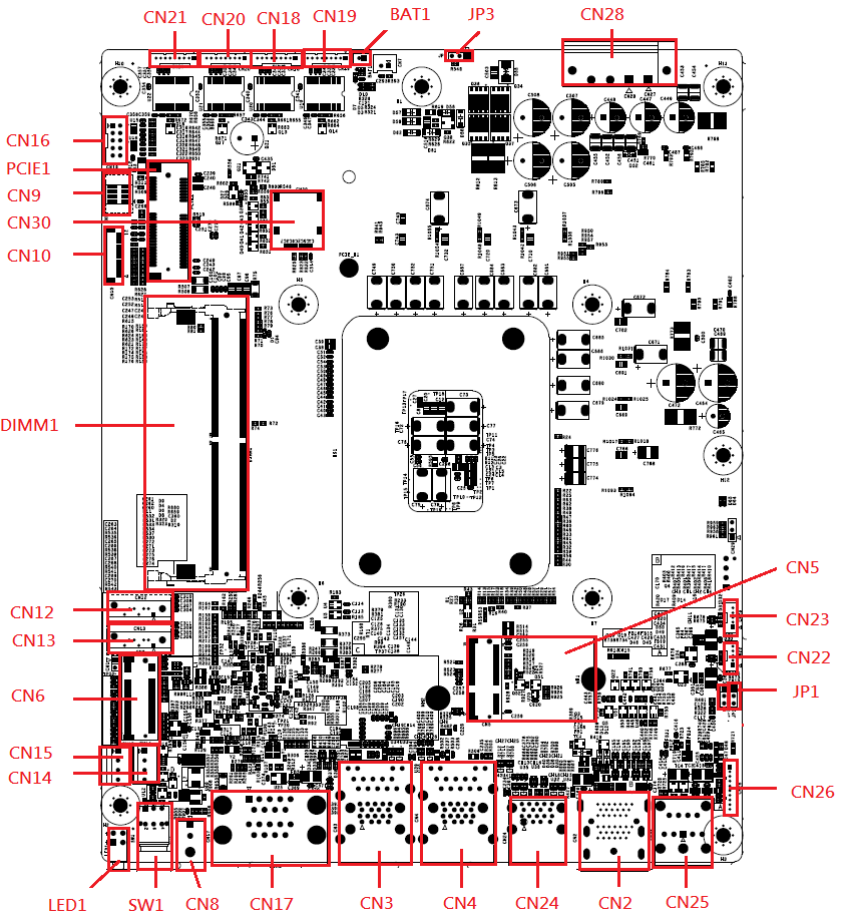
Chapter 2

Hardware Information

2.1 Dimensions



2.2 Jumpers and Connectors



2.3 List of Jumpers

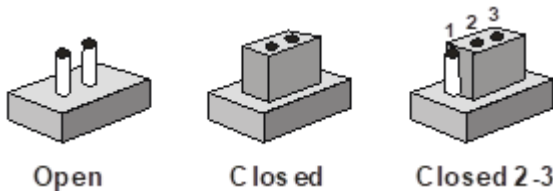
Please refer to the table below for all of the system's jumpers that you can configure for your application.

| Label | Function |
|-------|-----------------------------|
| JP1 | CMOS Control Selection |
| JP3 | Auto-Power Button Selection |

2.3.1 Setting Jumpers

The BOXER-6645U-RPL comes with several jumpers which allow you to configure the system by either setting the jumper to "open" or "closed"; or by selecting certain pins. A closed jumper has two pins connected with a jumper clip, while an open jumper has no pins connected.

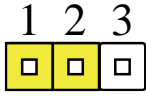
For jumpers with multiple pins, this guide uses "pins A-B" to notate which pins should be connected by a jumper clip. For example, "pins 1-2" means you should connect pins 1 and 2, while "pins 2-3" means you should connect pins 2 and 3.



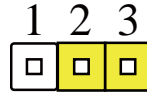
A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any questions about how best to configure the system for your application, contact your AAEON representative or visit our website to talk with our support team.

2.3.2 Clear CMOS Jumper (JP1)

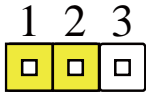


Normal (Default)

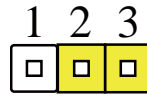


Clear CMOS

2.3.3 ATX/AT Mode Selection (JP3)



ATX (default)



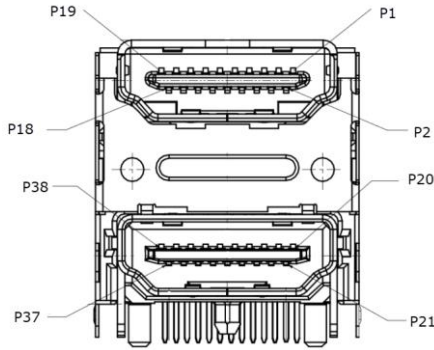
AT

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 |
|-------|------------------------|
| CN2 | HDMI |
| CN3 | 2.5GbE LAN + USB Port |
| CN4 | GbE LAN + USB Port |
| CN5 | M.2 2230 E-Key |
| CN6 | M.2 2280 M-Key |
| CN8 | Remote Button |
| CN9 | SPI Flash Port |
| CN10 | eSPI Connector |
| CN12 | SATA Connector |
| CN13 | SATA Connector |
| CN14 | SATA Power Connector n |
| CN15 | SATA Power Connector |
| CN16 | DIO |
| CN17 | COM 1 + COM 2 |
| CN18 | COM 3 |
| CN19 | COM 4 |
| CN20 | COM 5 |
| CN21 | COM 6 |
| CN22 | USB 2.0 Wafer |
| CN23 | USB 2.0 Wafer |
| CN24 | Dual USB 3.2 Port |
| CN25 | Audio |
| CN26 | Audio Wafer |
| CN28 | DC Terminal Block |
| CN30 | SIM Slot |
| PCIE1 | Mini Card Slot |

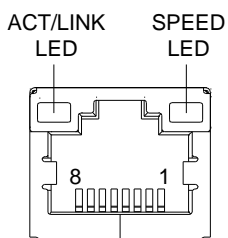
2.4.1 HDMI (CN2)



| Pin | Pin Name | Signal Type | Signal level |
|-----|---------------|-------------|--------------|
| P1 | HDMI1_DATA2_P | DIFF | |
| P2 | GND | GND | |
| P3 | HDMI1_DATA2_N | DIFF | |
| P4 | HDMI1_DATA1_P | DIFF | |
| P5 | GND | GND | |
| P6 | HDMI1_DATA1_N | DIFF | |
| P7 | HDMI1_DATA0_P | | |
| P8 | GND | GND | |
| P9 | HDMI1_DATA0_n | | |
| P10 | HDMI1_CLK_P | DIFF | |
| P11 | GND | GND | |
| P12 | HDMI1_CLK_N | DIFF | |
| P13 | CEC | | 3.3V |
| P14 | NC | | |
| P15 | HDMI1_SCL | | |
| P16 | HDMI1_SDA | | |
| P17 | GND | GND | |
| P18 | +V5S_HDMI_CON | PWR | 5V |
| P19 | HDMI1_HPD | | 5V |
| P20 | HDMI2_DATA2_P | | |

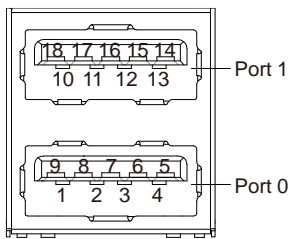
| Pin | Pin Name | Signal Type | Signal level |
|-----|---------------|-------------|--------------|
| P21 | GND | GND | |
| P22 | HDMI2_DATA2_N | | |
| P23 | HDMI2_DATA1_P | | |
| P24 | GND | GND | |
| P25 | HDMI2_DATA1_N | | |
| P26 | HDMI2_DATA0_P | | |
| P27 | GND | GND | |
| P28 | HDMI2_DATA0_N | | |
| P29 | HDMI2_CLK_P | | |
| P30 | GND | GND | |
| P31 | HDMI2_CLK_N | | |
| P32 | CEC | | 3.3V |
| P33 | NC | | |
| P34 | HDMI2_SCL | | |
| P35 | HDMI2_SDA | | |
| P36 | GND | GND | |
| P37 | +V5S_HDMI_CON | | 5V |
| P38 | HDMI2_HPD | | 5V |

2.4.2 2.5GbE LAN + USB (CN3)



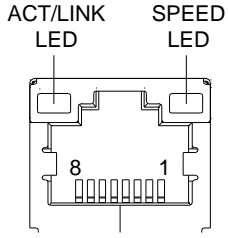
| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | MDIO+ | DIFF | |
| 2 | MDIO- | DIFF | |
| 3 | MDI1+ | DIFF | |
| 4 | MDI2+ | DIFF | |

| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 5 | MDI2- | DIFF | |
| 6 | MDI1- | DIFF | |
| 7 | MDI3+ | DIFF | |
| 8 | MDI3- | DIFF | |

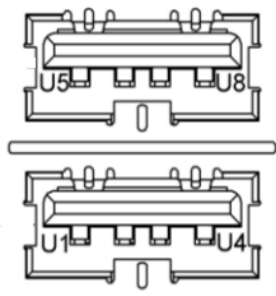


| Pin | Pin Name | Signal Type | Signal level |
|-----|------------|-------------|--------------|
| 1 | +5VSB | PWR | +5V |
| 2 | USB1_D- | DIFF | |
| 3 | USB1_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | USB1_SSRX- | DIFF | |
| 6 | USB1_SSRX+ | DIFF | |
| 7 | GND | GND | |
| 8 | USB1_SSTX- | DIFF | |
| 9 | USB1_SSTX+ | DIFF | |
| 10 | +5VSB | PWR | +5V |
| 11 | USB2_D- | DIFF | |
| 12 | USB2_D+ | DIFF | |
| 13 | GND | GND | |
| 14 | USB2_SSRX- | DIFF | |
| 15 | USB2_SSRX+ | DIFF | |
| 16 | GND | GND | |
| 17 | USB2_SSTX- | DIFF | |
| 18 | USB2_SSTX+ | DIFF | |

2.4.3 GbE LAN + USB Port (CN4)



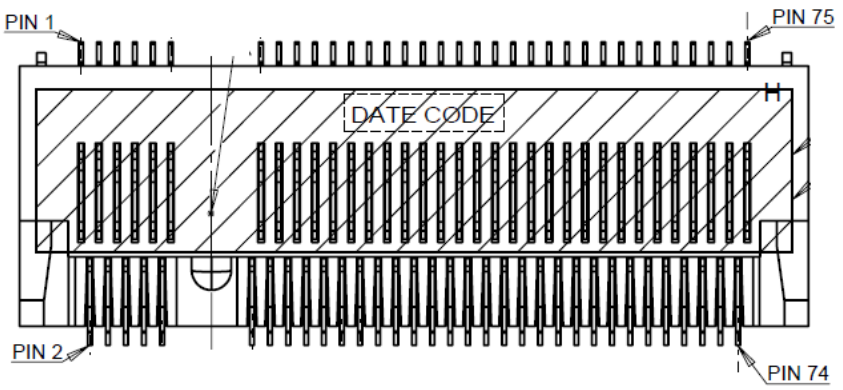
| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | MDI0+ | DIFF | |
| 2 | MDI0- | DIFF | |
| 3 | MDI1+ | DIFF | |
| 4 | MDI2+ | DIFF | |
| 5 | MDI2- | DIFF | |
| 6 | MDI1- | DIFF | |
| 7 | MDI3+ | DIFF | |
| 8 | MDI3- | DIFF | |



| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | +5VSB | PWR | +5V |
| 2 | USB2_D- | DIFF | |
| 3 | USB2_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | +5VSB | PWR | +5V |

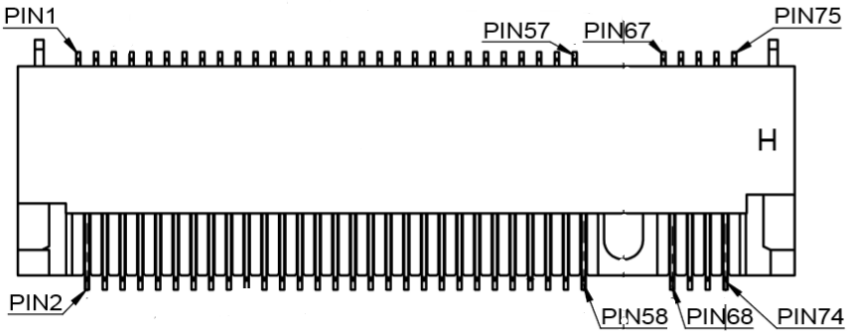
| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 6 | USB2_D- | DIFF | |
| 7 | USB2_D+ | DIFF | |
| 8 | GND | GND | |

2.4.4 M.2 2230 E-Key (CN5)



Standard specification.

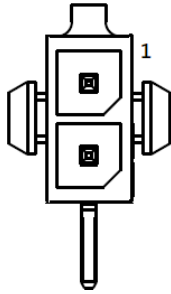
2.4.5 M.2 2280 M-Key (CN6)



| Pin | Pin Name | Signal Type | Signal Level | Pin | Pin Name | Signal Type | Signal Level |
|-----|-----------|-------------|--------------|-----|----------------|-------------|--------------|
| 1 | GND | GND | | 2 | +3.3V | PWR | +3.3V |
| 3 | GND | GND | | 4 | +3.3V | PWR | +3.3V |
| 5 | PCIE_RXN0 | IN | | 6 | CARD_PWR_OFF_N | OUT | +3.3V |
| 7 | PCIE_RXP0 | IN | | 8 | NC | | |
| 9 | GND | GND | | 10 | NC | | |
| 11 | PCIE_TXN0 | OUT | | 12 | +3.3V | PWR | +3.3V |
| 13 | PCIE_TXP0 | OUT | | 14 | +3.3V | PWR | +3.3V |
| 15 | GND | PWR | | 16 | +3.3V | PWR | +3.3V |
| 17 | PCIE_RXN1 | IN | | 18 | +3.3V | PWR | +3.3V |
| 19 | PCIE_RXP1 | IN | | 20 | NC | | |
| 21 | GND | PWR | | 22 | NC | | |
| 23 | PCIE_TXN1 | OUT | | 24 | NC | | |
| 25 | PCIE_TXP1 | OUT | | 26 | NC | | |
| 27 | GND | PWR | | 28 | NC | | |
| 29 | PCIE_RXN2 | IN | | 30 | NC | | |
| 31 | PCIE_RXP2 | IN | | 32 | NC | | |
| 33 | GND | GND | | 34 | NC | | |
| 35 | PCIE_TXN2 | OUT | | 36 | NC | | |
| 37 | PCIE_TXP2 | OUT | | 38 | DEVS_LP | IN | +3.3V |
| 39 | GND | GND | | 40 | SMB_CLK_M2 | | +1.8V |
| 41 | PCIE_RXP3 | IN | | 42 | SMB_DATA_M2 | | +1.8V |
| 43 | PCIE_RXN3 | IN | | 44 | NC | | |
| 45 | GND | GND | | 46 | NC | | |
| 47 | PCIE_TXN3 | OUT | | 48 | NC | | |

| Pin | Pin Name | Signal Type | Signal Level | Pin | Pin Name | Signal Type | Signal Level |
|-----|---------------|-------------|--------------|-----|----------|-------------|--------------|
| 49 | PCIE_TXP3 | OUT | | 50 | RESET# | IN | +3.3V |
| 51 | GND | PWR | | 52 | CLKREQ# | OUT | +3.3V |
| 53 | PCIE_M.2_CLK# | OUT | | 54 | WAKE# | OUT | +3.3V |
| 55 | PCIE_M.2_CLK | OUT | | 56 | NC | | |
| 57 | GND | GND | | 58 | NC | | |
| | | | | | | | |
| 67 | NC | | | 68 | NC | | |
| 69 | NC | | | 70 | +3.3V | PWR | +3.3V |
| 71 | GND | GND | | 72 | +3.3V | PWR | +3.3V |
| 73 | GND | GND | | 74 | +3.3V | PWR | +3.3V |
| 75 | GND | GND | | | | | |

2.4.6 Remote Button (CN8)

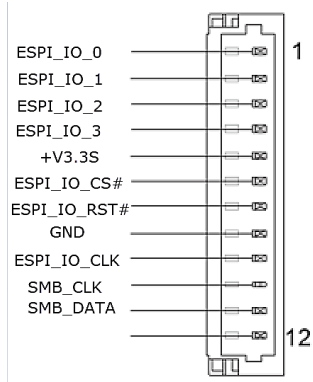


| Pin | Pin Name | Signal Type | Signal level |
|-----|------------|-------------|--------------|
| 1 | PWR_BUTTON | IN | |
| 2 | GND | GND | |

2.4.7 SPI Flash Port (CN9)

| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | SPI_MISO | OUT | |
| 2 | GND | GND | |
| 3 | SPI_CLK | IN | |
| 4 | +3.3VSB | PWR | +3.3V |
| 5 | SPI_MOSI | IN | |
| 6 | SPI_CS | IN | |
| 7 | NC | | |
| 8 | NC | | |

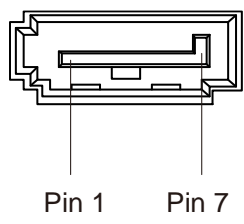
2.4.8 eSPI Connector (CN10)



| Pin | Pin Name | Signal Type | Signal level |
|-----|--------------|-------------|--------------|
| 1 | ESPI_IO_0 | I/O | +1.8V |
| 2 | ESPI_IO_1 | I/O | +1.8V |
| 3 | ESPI_IO_2 | I/O | +1.8V |
| 4 | ESPI_IO_3 | I/O | +1.8V |
| 5 | +3.3V | PWR | +3.3V |
| 6 | ESPI_IO_CS# | IN | |
| 7 | ESPI_IO_RST# | IN | |
| 8 | GND | GND | |

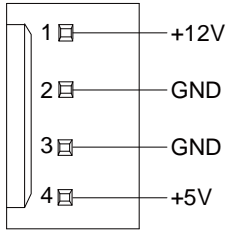
| Pin | Pin Name | Signal Type | Signal level |
|-----|--------------|-------------|--------------|
| 9 | EPSI_IO_LCLK | IN | |
| 10 | SMCLK | IN | |
| 11 | SMDAT | I/O | |
| 12 | NC | | |

2.4.9 SATA Connector (CN12/CN13)



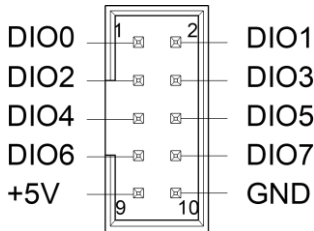
| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | GND | GND | |
| 2 | SATA_TX+ | DIFF | |
| 3 | SATA_TX- | DIFF | |
| 4 | GND | GND | |
| 5 | SATA_RX- | DIFF | |
| 6 | SATA_RX+ | DIFF | |
| 7 | GND | GND | |

2.4.10 SATA Power Connector (CN14/CN15)



| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | +12V | PWR | +12V |
| 2 | GND | GND | |
| 3 | GND | GND | |
| 4 | +5V | PWR | +5V |

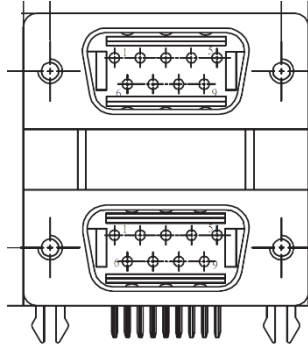
2.4.11 DIO Port (CN16)



| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | DIO0 | I/O | +5V |
| 2 | DIO1 | I/O | +5V |
| 3 | DIO2 | I/O | +5V |
| 4 | DIO3 | I/O | +5V |
| 5 | DIO4 | I/O | +5V |
| 6 | DIO5 | I/O | +5V |
| 7 | DIO6 | I/O | +5V |
| 8 | DIO7 | I/O | +5V |

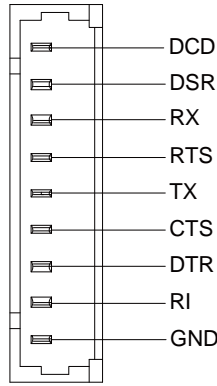
| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 9 | +5V | PWR | +5V |
| 10 | GND | GND | |

2.4.12 COM 1 + COM 2 (CN17)



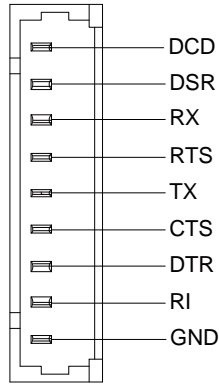
| Pin | Pin Name | Signal Type | RS-422 | RS-485 |
|-----|----------|-------------|-----------|----------|
| 1 | DCD | IN | RS422_TX- | RS485_D- |
| 2 | RX | IN | RS422_TX+ | RS485_D+ |
| 3 | TX | OUT | RS422_RX+ | |
| 4 | DTR | OUT | RS422_RX- | |
| 5 | GND | GND | | |
| 6 | DSR | IN | | |
| 7 | RTS | OUT | | |
| 8 | CTS | IN | | |
| 9 | RI1 | IN | | |

2.4.13 COM Port 3 (Wafer Box, Optional) (CN18)



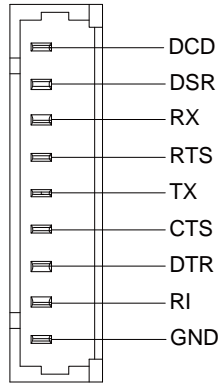
| Pin | Pin Name | Signal Type | RS-422 | RS-485 |
|-----|----------|-------------|-----------|----------|
| 1 | DCD | IN | RS422_TX- | RS485_D- |
| 2 | DSR | IN | | |
| 3 | RX | IN | RS422_TX+ | RS485_D+ |
| 4 | RTS | OUT | | |
| 5 | TX | OUT | RS422_RX+ | |
| 6 | CTS | IN | | |
| 7 | DTR | OUT | RS422_RX- | |
| 8 | RI | IN | | |
| 9 | GND | GND | | |

2.4.14 COM Port 4 (Wafer Box, Optional) (CN19)



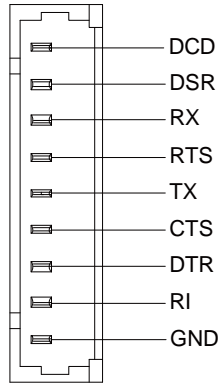
| Pin | Pin Name | Signal Type | RS-422 | RS-485 |
|-----|----------|-------------|-----------|----------|
| 1 | DCD | IN | RS422_TX- | RS485_D- |
| 2 | DSR | IN | | |
| 3 | RX | IN | RS422_TX+ | RS485_D+ |
| 4 | RTS | OUT | | |
| 5 | TX | OUT | RS422_RX+ | |
| 6 | CTS | IN | | |
| 7 | DTR | OUT | RS422_RX- | |
| 8 | RI | IN | | |
| 9 | GND | GND | | |

2.4.15 COM Port 5 (Wafer Box, Optional) (CN20)



| Pin | Pin Name | Signal Type | RS-422 | RS-485 |
|-----|----------|-------------|-----------|----------|
| 1 | DCD | IN | RS422_TX- | RS485_D- |
| 2 | DSR | IN | | |
| 3 | RX | IN | RS422_TX+ | RS485_D+ |
| 4 | RTS | OUT | | |
| 5 | TX | OUT | RS422_RX+ | |
| 6 | CTS | IN | | |
| 7 | DTR | OUT | RS422_RX- | |
| 8 | RI | IN | | |
| 9 | GND | GND | | |

2.4.16 COM Port 6 (Wafer Box, Optional) (CN21)

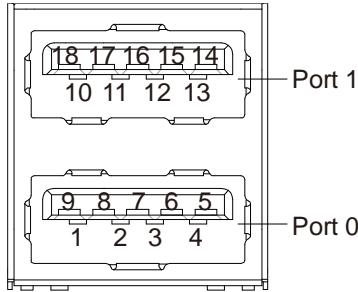


| Pin | Pin Name | Signal Type | RS-422 | RS-485 |
|-----|----------|-------------|-----------|----------|
| 1 | DCD | IN | RS422_TX- | RS485_D- |
| 2 | DSR | IN | | |
| 3 | RX | IN | RS422_TX+ | RS485_D+ |
| 4 | RTS | OUT | | |
| 5 | TX | OUT | RS422_RX+ | |
| 6 | CTS | IN | | |
| 7 | DTR | OUT | RS422_RX- | |
| 8 | RI | IN | | |
| 9 | GND | GND | | |

2.4.17 USB 2.0 Wafer (CN22, CN23)

| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | +5V | GND | +5V |
| 2 | USBD- | DIFF | |
| 3 | USBD+ | DIFF | |
| 4 | GND | GND | |
| 5 | GND | GND | |

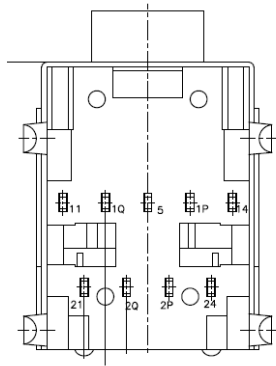
2.4.18 Dual USB 3.2 Port (CN24)



| Pin | Pin Name | Signal Type | Signal level |
|-----|------------|-------------|--------------|
| 1 | +5VSB | PWR | +5V |
| 2 | USB1_D- | DIFF | |
| 3 | USB1_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | USB1_SSRX- | DIFF | |
| 6 | USB1_SSRX+ | DIFF | |
| 7 | GND | GND | |
| 8 | USB1_SSTX- | DIFF | |
| 9 | USB1_SSTX+ | DIFF | |
| 10 | +5VSB | PWR | +5V |
| 11 | USB2_D- | DIFF | |
| 12 | USB2_D+ | DIFF | |

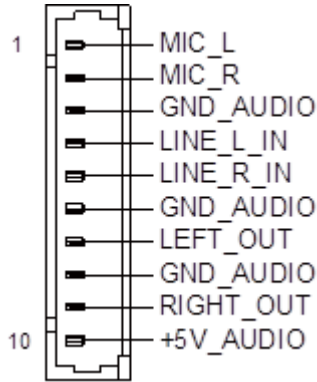
| Pin | Pin Name | Signal Type | Signal level |
|-----|------------|-------------|--------------|
| 13 | GND | GND | |
| 14 | USB2_SSRX- | DIFF | |
| 15 | USB2_SSRX+ | DIFF | |
| 16 | GND | GND | |
| 17 | USB2_SSTX- | DIFF | |
| 18 | USB2_SSTX+ | DIFF | |

2.4.19 Audio Connector (CN25)



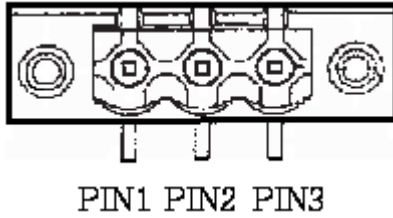
| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 5 | AUD_GND | GND | |
| 24 | LOUT_L | OUT | |
| 21 | LOUT_R | OUT | |
| 2P | HP_DET_3 | IN | |
| 2Q | HP_DET_4 | IN | |
| 14 | MIC_L | IN | |
| 11 | MIC_R | IN | |
| 1P | HP_DET_1 | IN | |
| 1Q | HP_DET2 | IN | |

2.4.20 Audio Wafer (CN26)



| Pin | Pin Name | Signal Type | Signal level |
|-----|-----------|-------------|--------------|
| 1 | MIC_L | IN | |
| 2 | MIC_R | IN | |
| 3 | GND_AUDIO | GND | |
| 4 | LINE_L_IN | IN | |
| 5 | LINE_R_IN | IN | |
| 6 | GND_AUDIO | GND | |
| 7 | LEFT_OUT | OUT | |
| 8 | GND_AUDIO | GND | |
| 9 | RIGHT_OUT | OUT | |
| 10 | +5V_AUDIO | PWR | +5V |

2.4.21 DC Terminal Block (CN28)

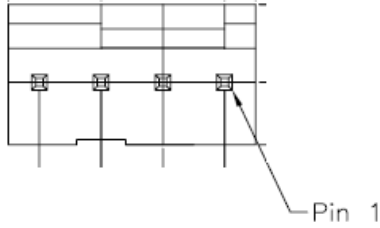


| Pin | Pin Name | Signal Type | Signal level |
|-----|-----------|-------------|--------------|
| 1 | VIN | PWR | +12V ~ +24V |
| 2 | GND | GND | |
| 3 | GND_EARTH | | |

2.4.22 SIM Slot (CN30)

| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | UIM_PWR | PWR | |
| 2 | UIM_RST | IN | |
| 3 | UIM_CLK | IN | |
| 4 | GND | GND | |
| 5 | UIM_VPP | PWR | |
| 6 | UIM_DATA | I/O | |

2.4.23 Fan Connector (CN32)

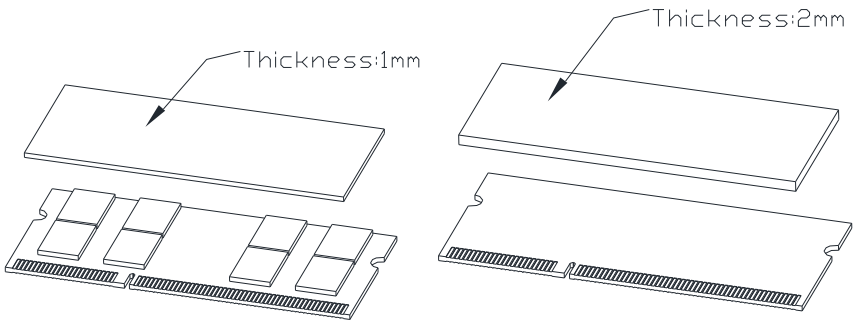


| Pin | Pin Name | Signal Type | Signal level |
|-----|----------|-------------|--------------|
| 1 | GND | GND | |
| 2 | +V12S | PWR | +12V |
| 3 | FAN_PWM | OUT | |
| 4 | FAN_CTL | OUT | |

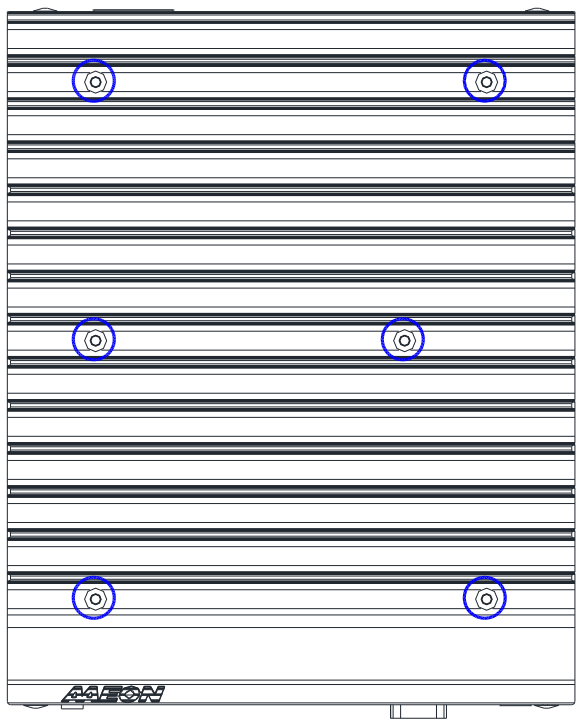
2.5 CPU & RAM Installation

Before installing the CPU, RAM, or any other components, ensure the system is powered down and disconnect the power cord from the system. See Chapter 1 Specifications for list of compatible CPU/processors.

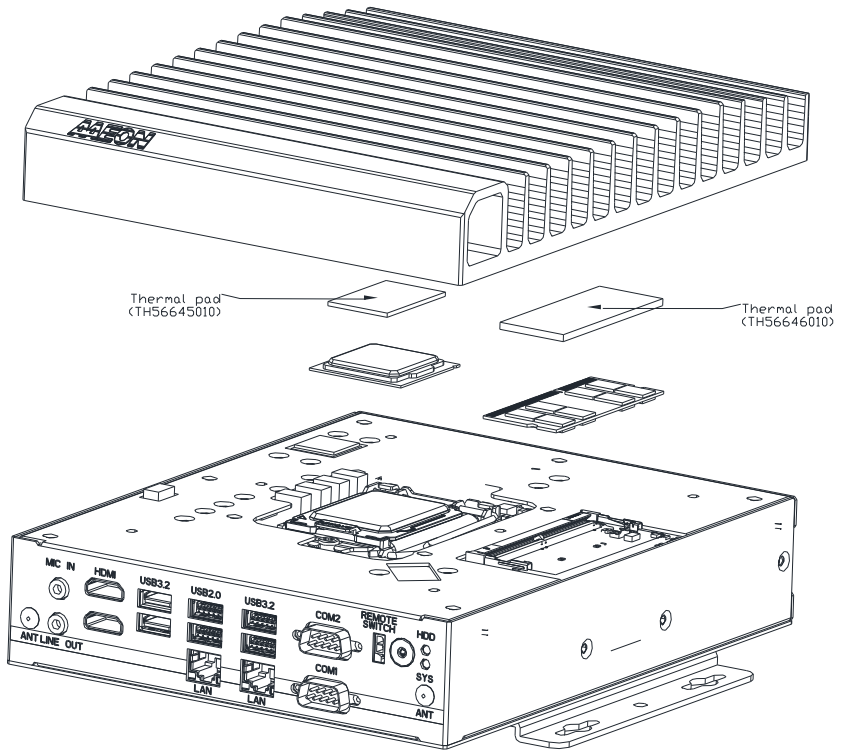
Note: When using memory modules with ICs on both sides, choose a thin thermal pad (1 mm thickness) to ensure proper contact with their heatsinks. Conversely, if the memory modules have ICs on only one side, choose a thick thermal pad (2mm thickness) to ensure effective contact with their heatsinks.



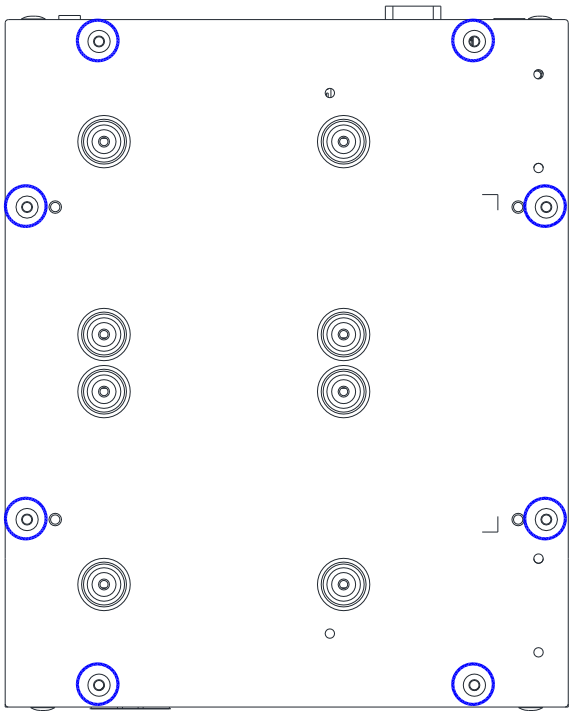
Step 1: Remove the six (6) screws on the top of the BOXER-6645U-RPL as shown in the figure below, and remove the top heatsink.



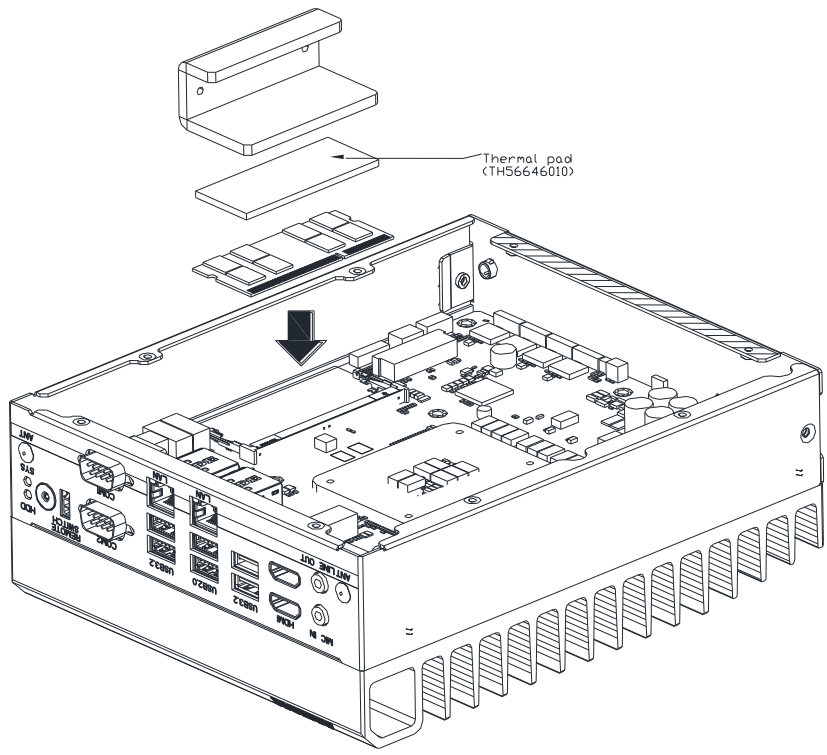
Step 2: Insert CPU and your first SODIMM into the slots on the system's motherboard. Reference section 2.2 for DIMM1 location. Ensure thermal pads are placed between the modules being installed and the motherboard.



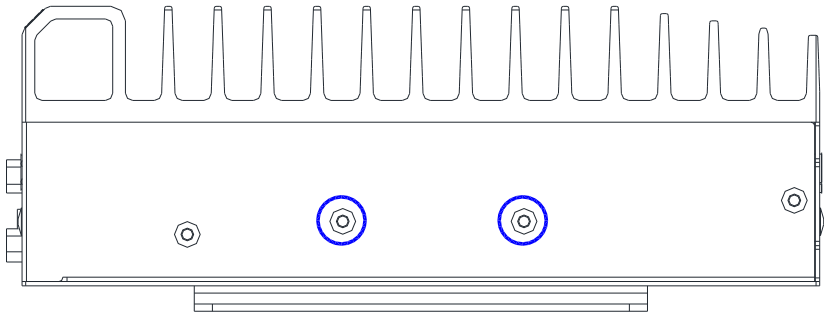
Step 3: Remove the bottom panel of the system by removing the eight (8) screws, as shown below.



Step 4: Insert second SODIMM module, noting the location of the slot as shown below. Ensure a thermal pad is placed between the module being installed and the motherboard.



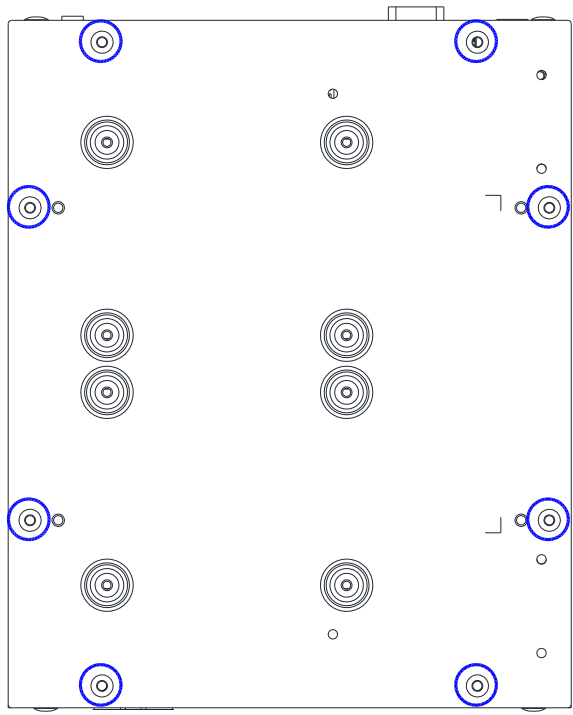
Step 5: Reassemble system, ensuring to affix the side panel with the two (2) screws as below.



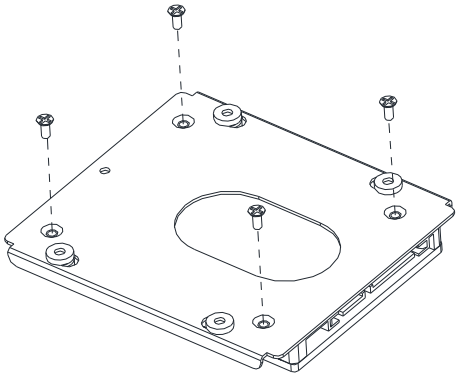
2.6 2.5" SATA Drive Installation

Before installing the SATA Drives, ensure the system is powered down and disconnect the power cord from the system. Make sure you have the SATA Drive ready to install. See Chapter 1 for SATA drive specifications for compatibility.

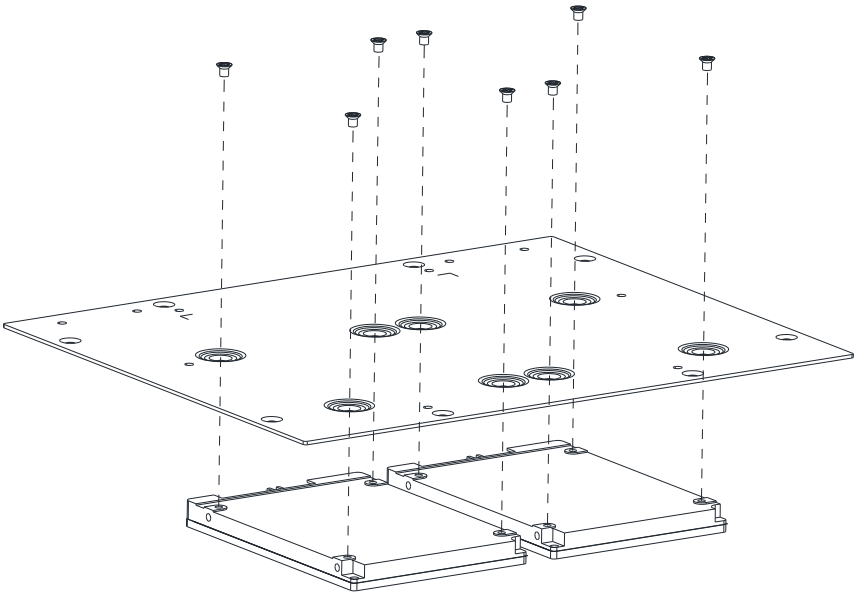
Step 1: Remove the bottom panel of the system by removing the eight (8) screws, as shown below.



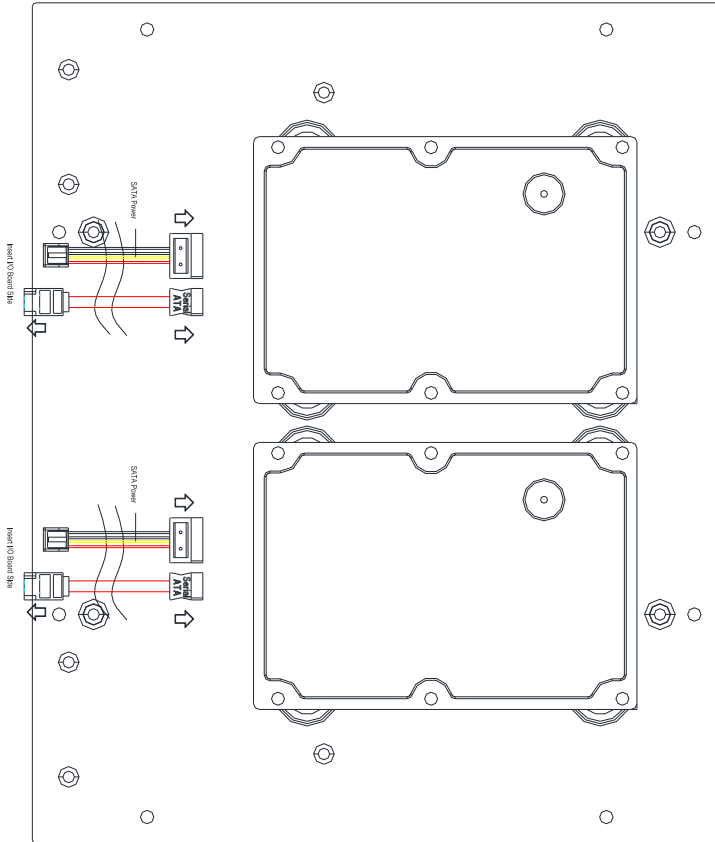
Step 2: Attach each SATA drive to the HDD Brackets using the screws provided.



Step 3: Attach the HDD Brackets for each drive to the bottom panel using four (4) screws per drive as shown in the figure below.



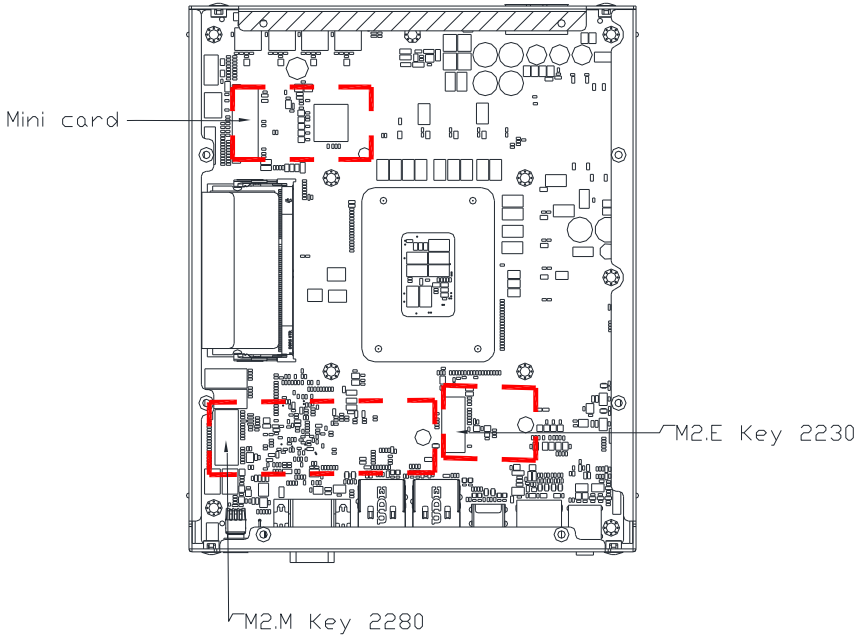
Step 4: Attach the SATA and SATA Power cables to the board and the SATA drives.



Step 5: Replace the bottom panel and secure with the eight (8) screws you removed in Step 1.

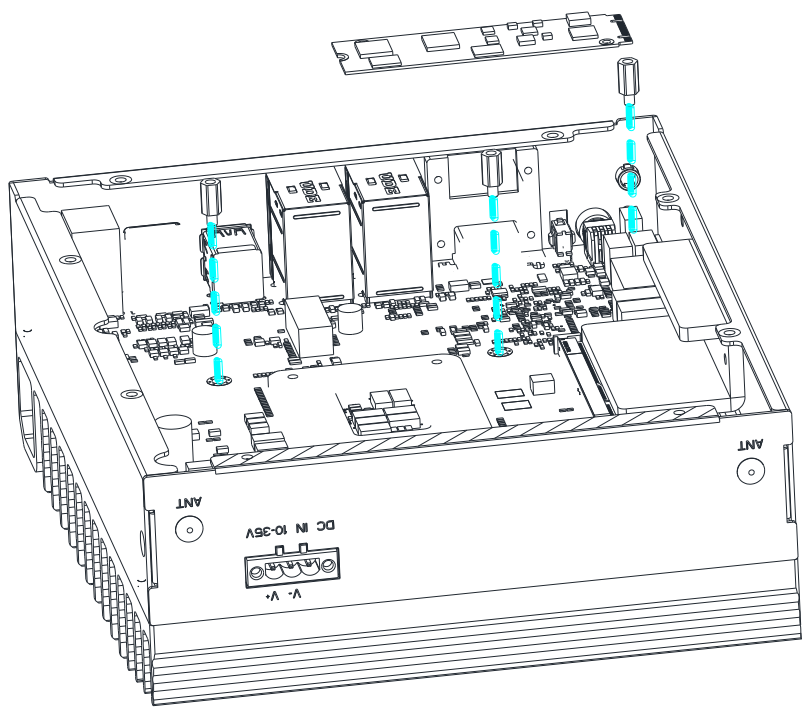
2.7 Expansion Module Installation

Step 1: Note the location of each expansion slot. Follow standard practice for module installation.

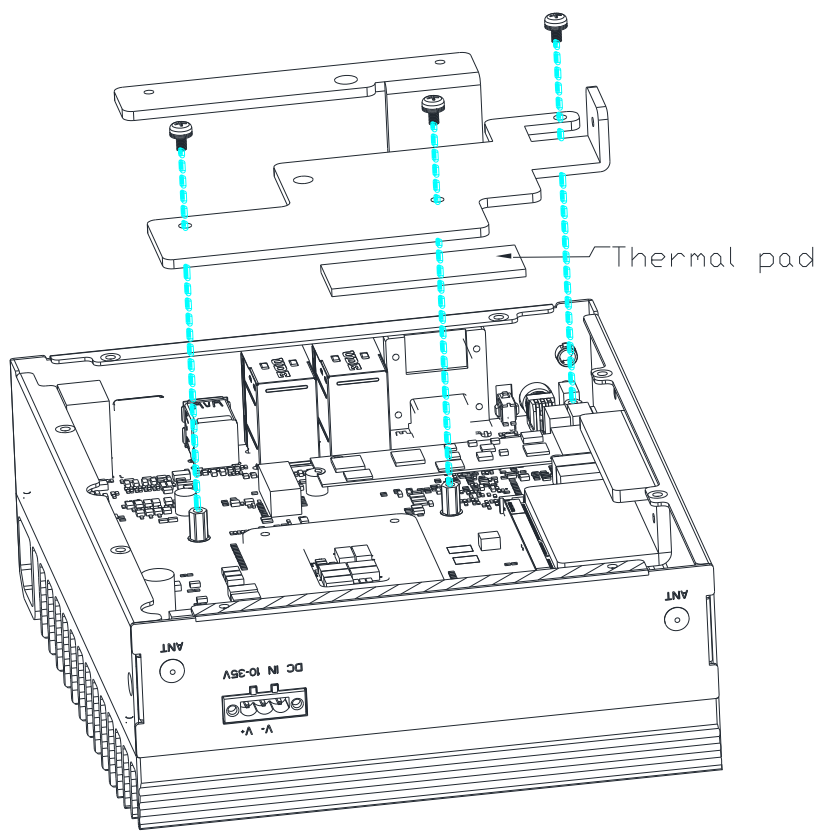


2.7.1 NVMe Module Installation

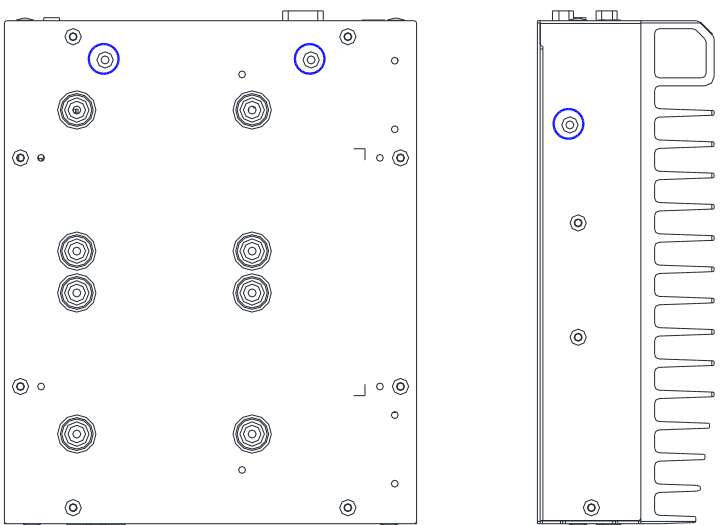
Step 1: Remove the three (3) screws as shown, then affix the NVMe module to the motherboard.



Step 2: Install the thermal pad and heatsink panel using the three (3) screws previously removed.

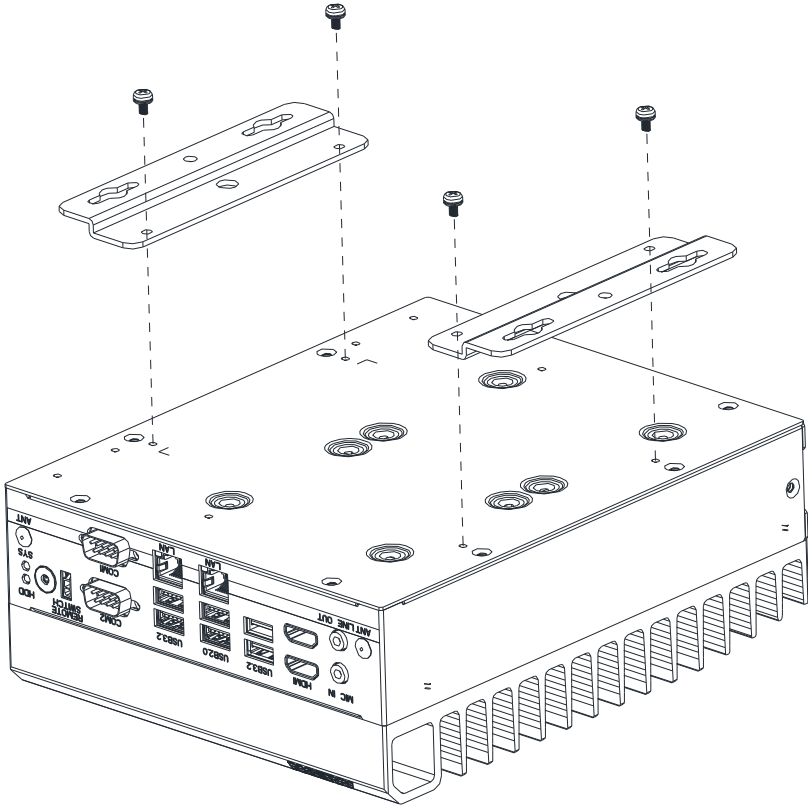


Step 3: Secure chassis panel via the screws shown in the below diagram.



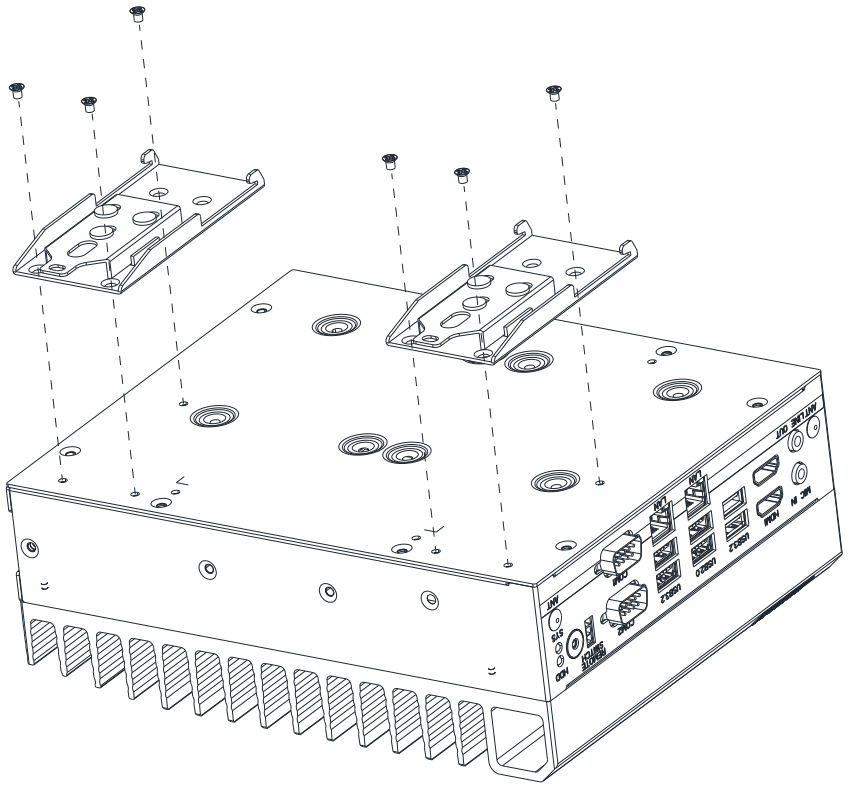
2.8 Wall Mount Installation

Affix each wall mounting bracket by securing them to the chassis using the two (2) screws per bracket provided.



2.9 DIN Rail Installation

Affix each DIN rail bracket by securing them to the chassis using the three (3) screws per bracket provided.



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 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

System I/O – Enable/ Disable system I/O device

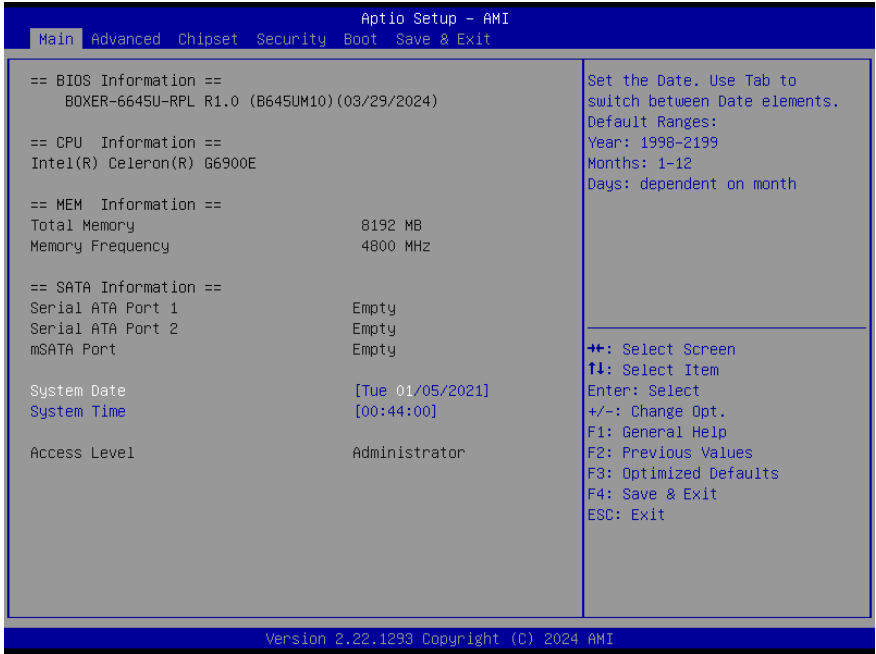
Security – The setup administrator password can be set here

Boot – Enable/ Disable quiet Boot Option

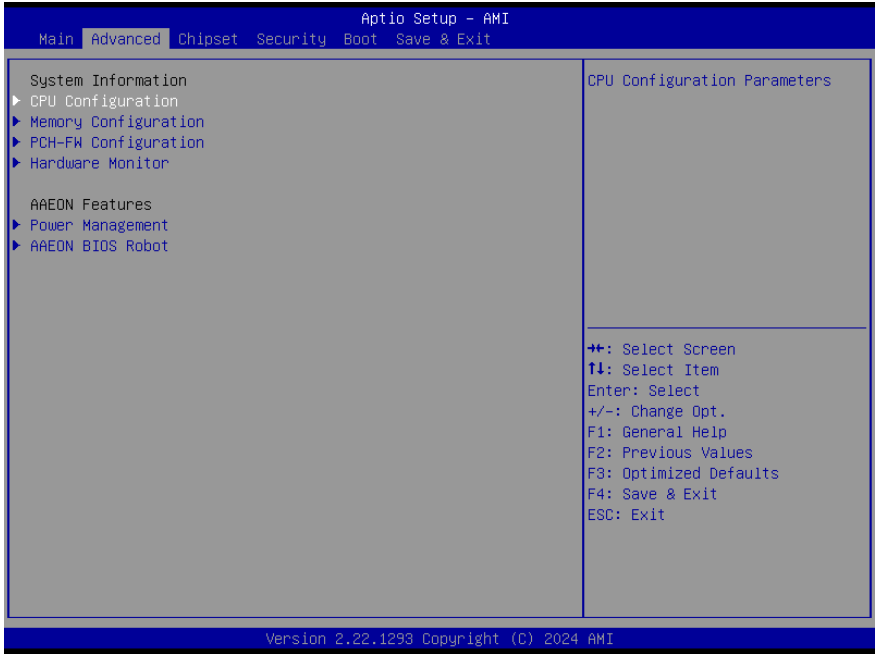
Save & Exit – Save your changes and exit the program

MEBx – Intel® Management Engine BIOS Extension

3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced



3.4.1 CPU Configuration



| Options Summary | | |
|---|----------|-----------------------------------|
| Intel (VMX)Virtualization Technology | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. | | |
| Hyper-Threading | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Hyper-Threading Technology | | |
| Intel® SpeedStep™ | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Allows more than two frequency ranges to be supported | | |
| Turbo Mode | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable/Disable processor Turbo Mode (requires EMTTM enabled too). | | |
| AUTO means enabled. | | |

| Options Summary | | |
|--|----------|-----------------------------------|
| C states | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized. | | |

3.4.2 Memory Configuration

Aptio Setup - AMI

Advanced

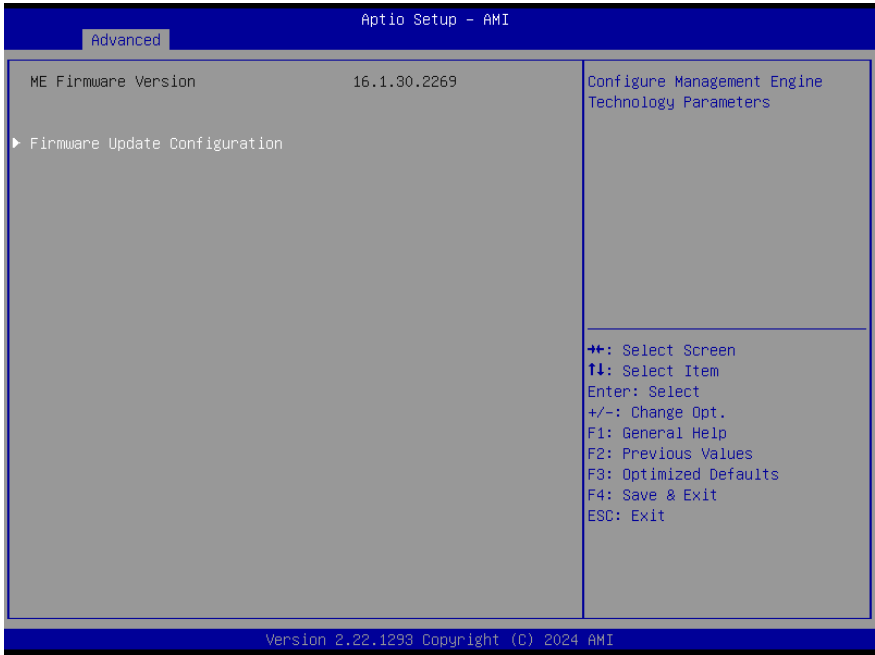
Memory Configuration

| | |
|-------------------|--------------------------|
| Total Memory | 8192 MB |
| Memory Frequency | 4800 MHz |
| tCL-tRCD-tRP-tRAS | 40-39-39-77 |
| MC 0 Ch 0 DIMM 0 | Populated & Enabled |
| Size | 8192 MB (DDR5) |
| MC 0 Ch 1 DIMM 0 | Not Populated / Disabled |
| MC 1 Ch 0 DIMM 0 | Not Populated / Disabled |
| MC 1 Ch 1 DIMM 0 | Not Populated / Disabled |

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

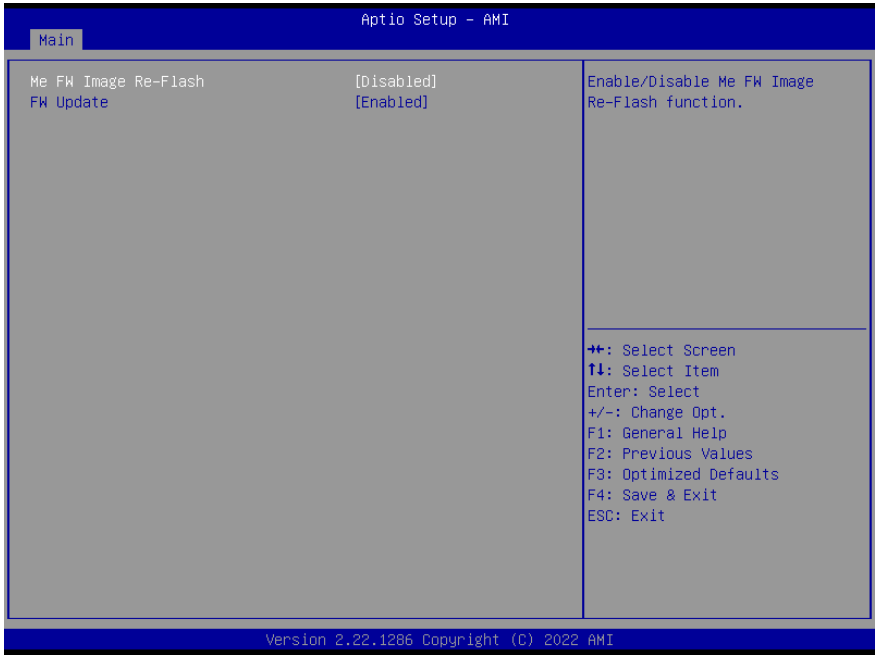
Version 2.22.1293 Copyright (C) 2024 AMI

3.4.3 PCH-FW Configuration



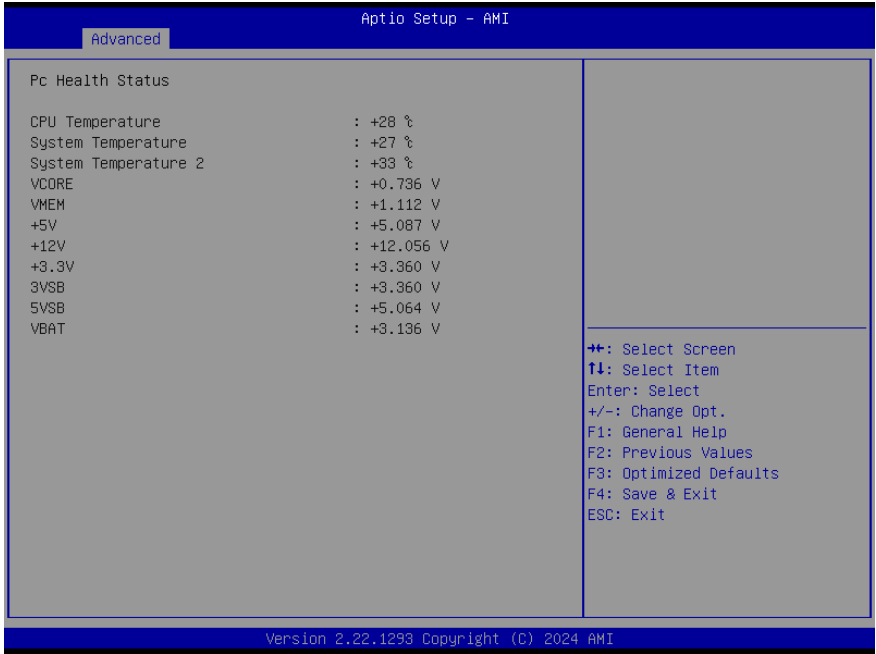
| Options Summary | | |
|---|----------|-----------------------------------|
| AMT BIOS Features | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| <p>When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup.</p> <p>Note: This option does not disable Manageability Features in FW.</p> | | |

3.4.3.1 Firmware Update Configuration

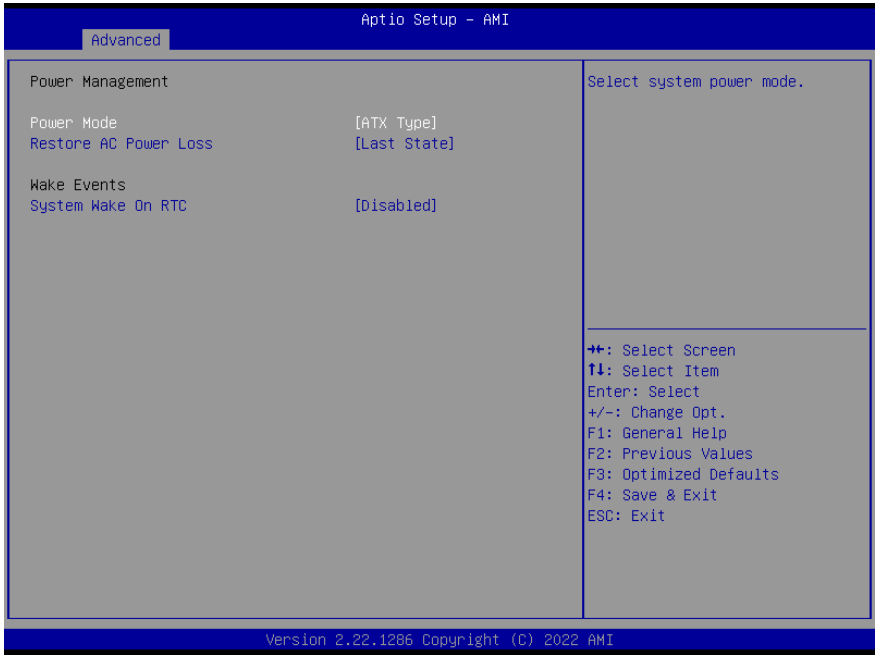


| Options Summary | | |
|---|----------|-----------------------------------|
| Me FW Image Re-Flash | Enabled | |
| | Disabled | Optimal Default, Failsafe Default |
| Enabled/ Disable Me FW Image Re-Flash function. | | |
| FW Update | Enabled | |
| | Disabled | Optimal Default, Failsafe Default |
| Enabled/ Disable Me FW Update function. | | |

3.4.4 Hardware Monitor



3.4.5 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 |
| | Always On | |
| | Always Off | |
| Set GPI [3:0] Output as Hi or Low | | |
| System Wake On RTC | Disabled | Optimal Default, Failsafe Default |
| | By Date | |
| | By Weekday | |
| | Bypass | |
| By Date: System will wake on the day with hr::min::sec specified./n By Weekday: System will wake on the enabled weekday with hr::min::sec specified./n Bypass: BIOS will not control RTC wake function | | |

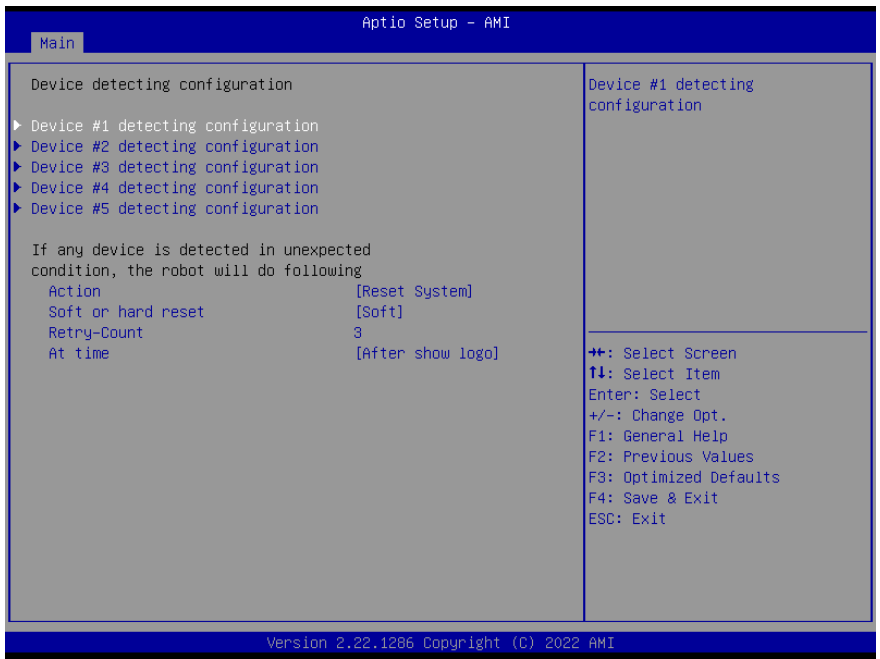
3.4.6 AAEON BIOS Robot



| Options Summary | | |
|--|----------|-----------------------------------|
| Sends watch dog before BIOS POST | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enabled – Robot set Watch Dog Timer (WDT) right after power on, before BIOS start POST process. And then Robot will clear WDT on completion of POST. WDT on completion of POST. WDT will reset system automatically if it is not cleared before its timer counts down to zero. | | |
| Sends watch dog before booting OS | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enabled – Robot set Watch Dog Timer (WDT) after POST completion, before BIOS transfer control to OS. WARNING: Before enabling this function, a program in OS must be in responsible for clearing WDT. Also, this function should be disabled if OS I going to update itself. | | |
| Delayed POST (PEI phase) | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |

| Options Summary | | |
|--|----------|-----------------------------------|
| Enabled -Robot holds BIOS from starting POST, right after power on. This allows BIOS POST to start with stable power or start after system is physically warmed-up. Note: Robot does this before 'Sends watch dog'. | | |
| Delayed POST (DXE phase) | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enabled -Robot holds BIOS before POST completion. This allows BIOS POST to start with stable power or start after system is physically warmed-up. Note: Robot does this after 'Sends watch dog before BIOS POST'. | | |

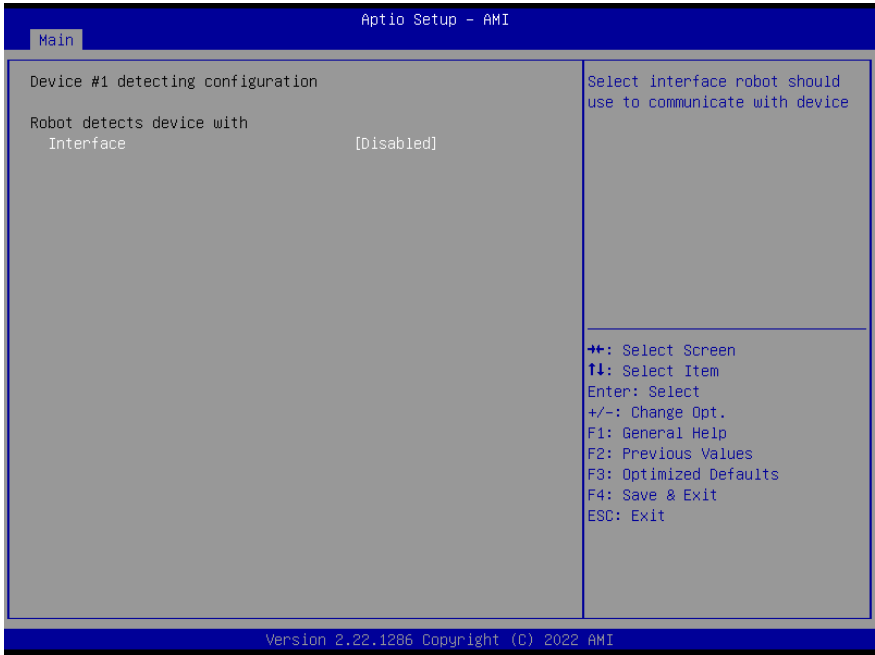
3.4.6.1 Device Detecting Configuration



| Options Summary | | |
|-------------------------------------|--------------|-----------------------------------|
| Action | Reset System | Optimal Default, Failsafe Default |
| | Hold System | |
| Select action that robot should do. | | |

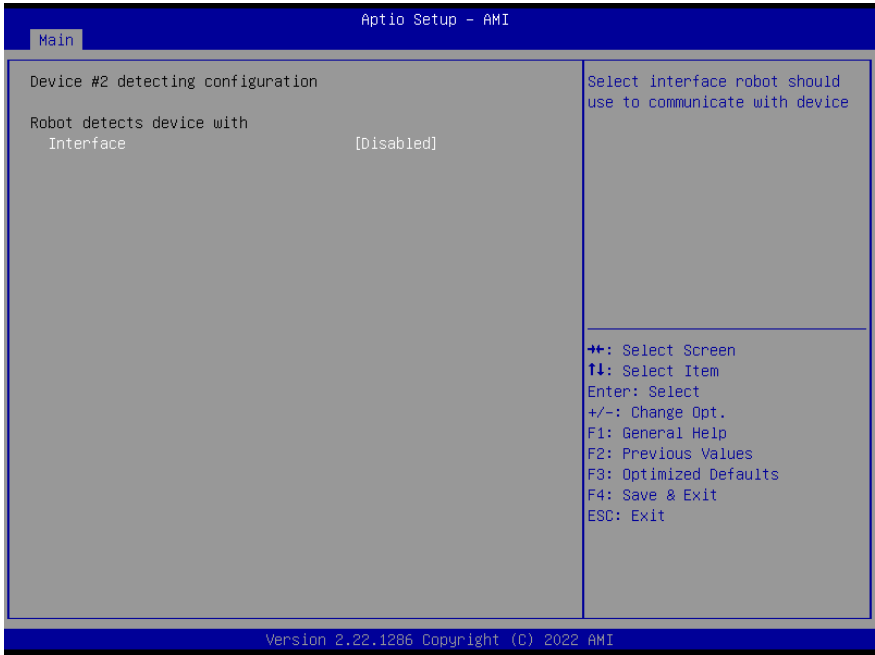
| Options Summary | | |
|---|------------------|-----------------------------------|
| Soft or hard reset | Soft | Optimal Default, Failsafe Default |
| | Hard | |
| Select reset type robot should send on each boot. | | |
| Retry-Count | 3 | Optimal Default, Failsafe Default |
| Fill retry counter here. Robot will reset system at most counter times, and then let system continue its POST. | | |
| At time | After show logo | Optimal Default, Failsafe Default |
| | Before show logo | |
| Select robot action time: After show logo -Robot will do action after logo is displayed. System devices are almost ready. Before show logo - Robot will do action earlier before logo, but some devices may not be ready. | | |

3.4.6.1.1 Device #1 Detecting Configuration



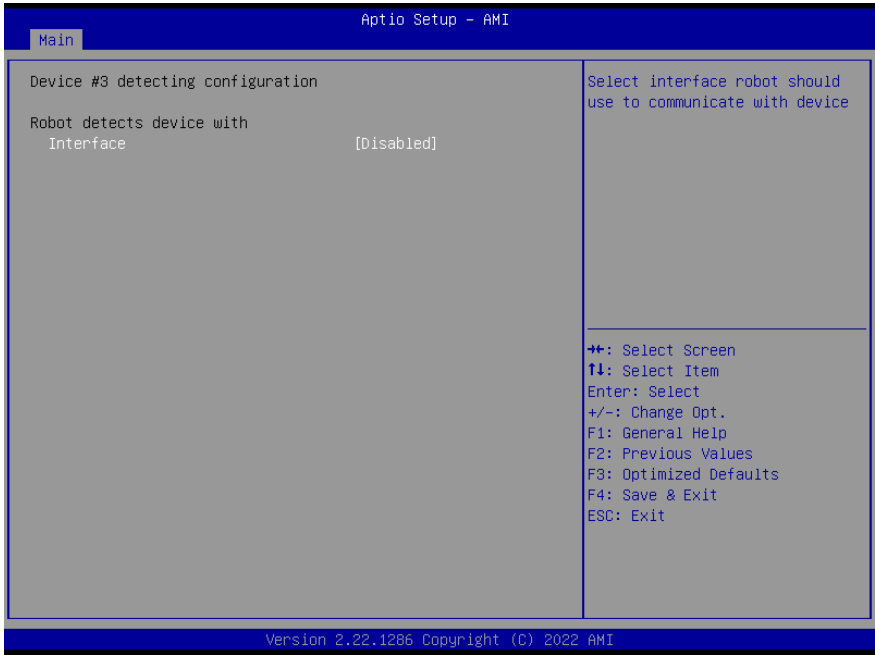
| Options Summary | | |
|--|------------|-----------------------------------|
| Interface | Disabled | Optimal Default, Failsafe Default |
| | PCI | |
| | DIO | |
| | SMBUS | |
| | Legacy I/O | |
| | Super I/O | |
| | MMIO | |
| Select interface robot should use to communicate with device | | |

3.4.6.1.2 Device #2 Detecting Configuration



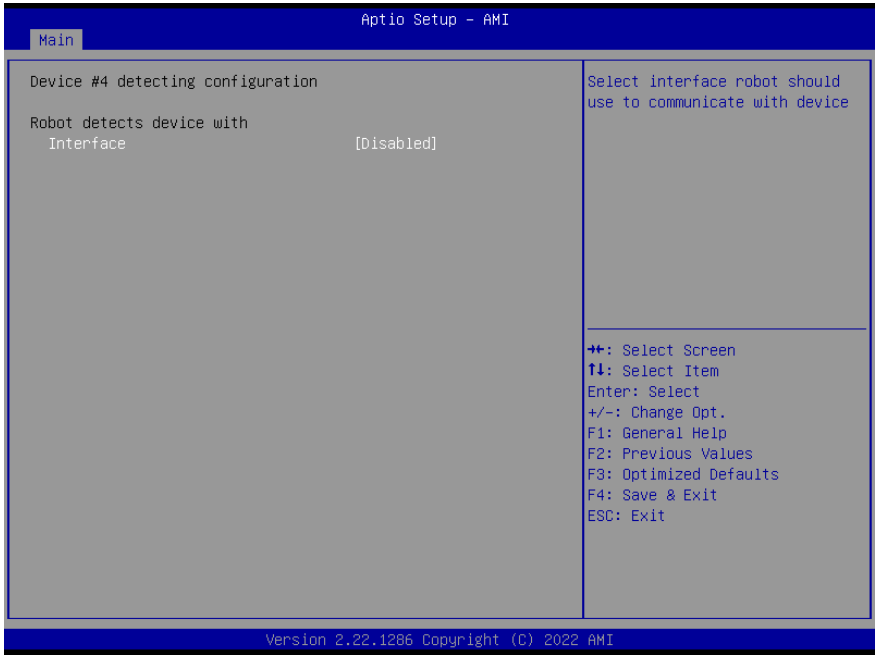
| Options Summary | | |
|--|------------|-----------------------------------|
| Interface | Disabled | Optimal Default, Failsafe Default |
| | PCI | |
| | DIO | |
| | SMBUS | |
| | Legacy I/O | |
| | Super I/O | |
| | MMIO | |
| Select interface robot should use to communicate with device | | |

3.4.6.1.3 Device #3 Detecting Configuration



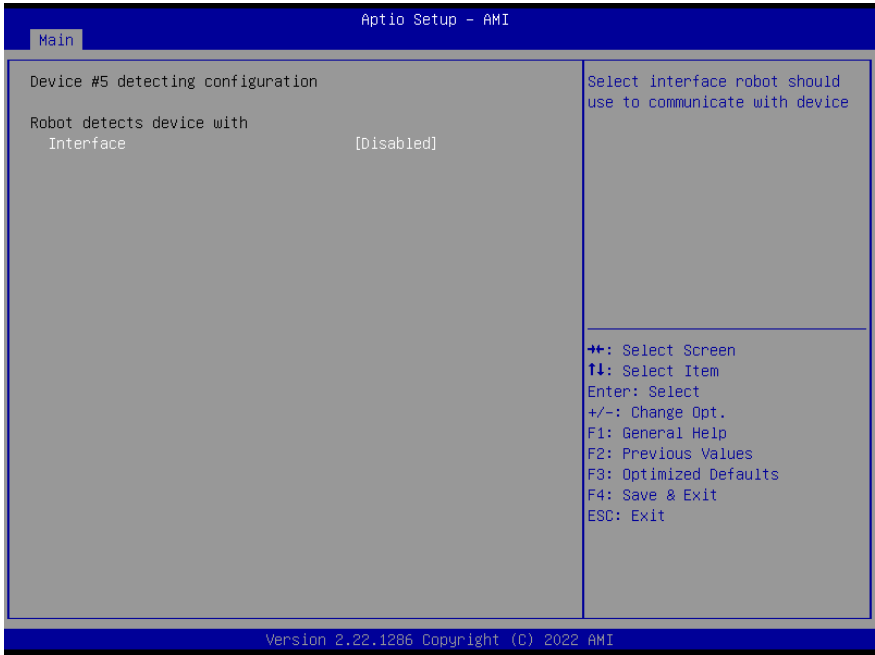
| Options Summary | | |
|--|------------|-----------------------------------|
| Interface | Disabled | Optimal Default, Failsafe Default |
| | PCI | |
| | DIO | |
| | SMBUS | |
| | Legacy I/O | |
| | Super I/O | |
| | MMIO | |
| Select interface robot should use to communicate with device | | |

3.4.6.1.4 Device #4 Detecting Configuration



| Options Summary | | |
|--|------------|-----------------------------------|
| Interface | Disabled | Optimal Default, Failsafe Default |
| | PCI | |
| | DIO | |
| | SMBUS | |
| | Legacy I/O | |
| | Super I/O | |
| | MMIO | |
| Select interface robot should use to communicate with device | | |

3.4.6.1.5 Device #5 Detecting Configuration

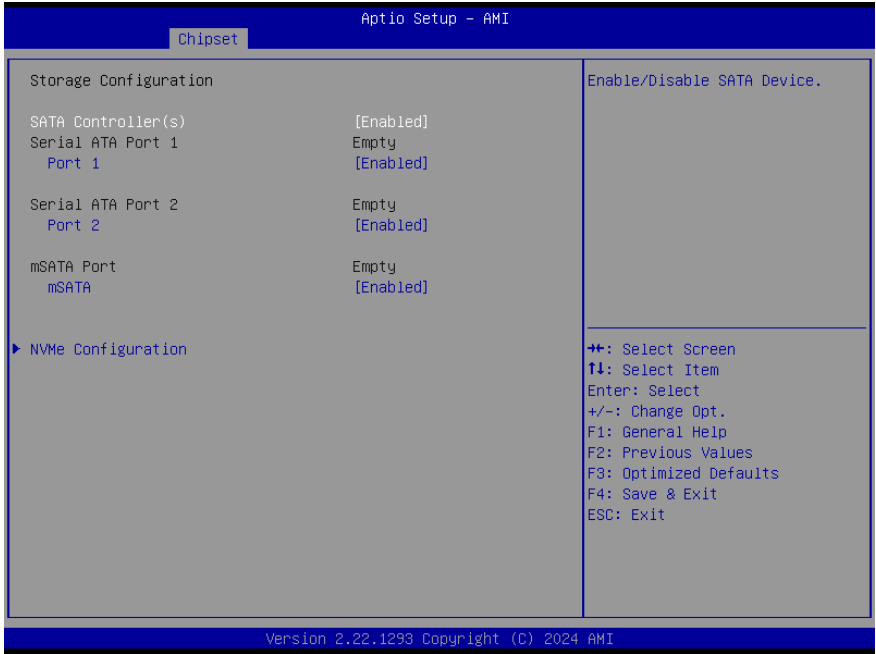


| Options Summary | | |
|--|------------|-----------------------------------|
| Interface | Disabled | Optimal Default, Failsafe Default |
| | PCI | |
| | DIO | |
| | SMBUS | |
| | Legacy I/O | |
| | Super I/O | |
| | MMIO | |
| Select interface robot should use to communicate with device | | |

3.5 Setup Submenu: System I/O

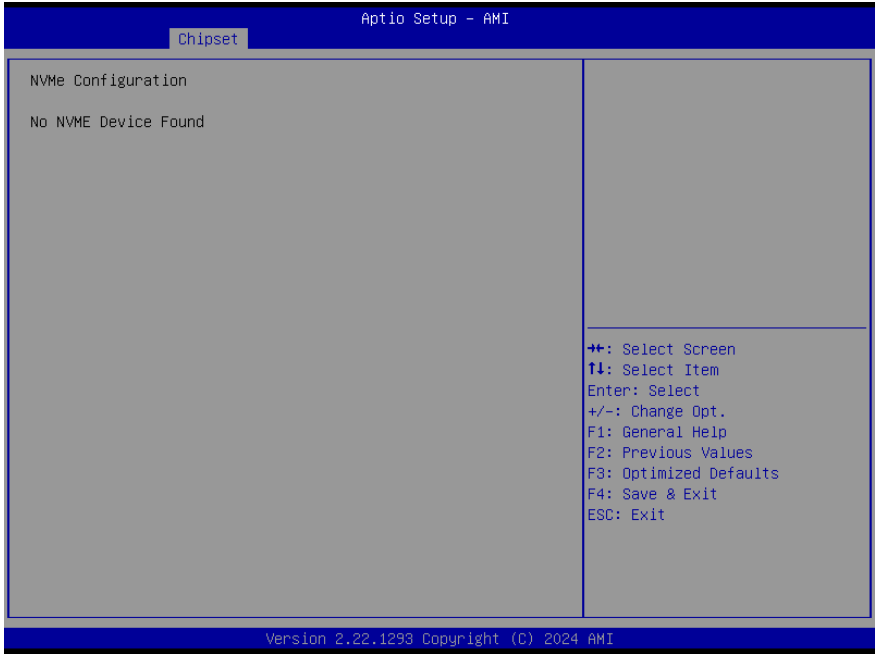


3.5.1 Storage Configuration



| Options Summary | | |
|-------------------------------|----------|-----------------------------------|
| SATA Controller(s) | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable/Disable to SATA Device | | |
| Port 1 | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or Disable SATA Port | | |
| Port 2 | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or Disable SATA Port | | |
| mSATA | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or Disable SATA Port | | |

3.5.2 NVMe Configuration



3.5.3 HD Audio Configuration

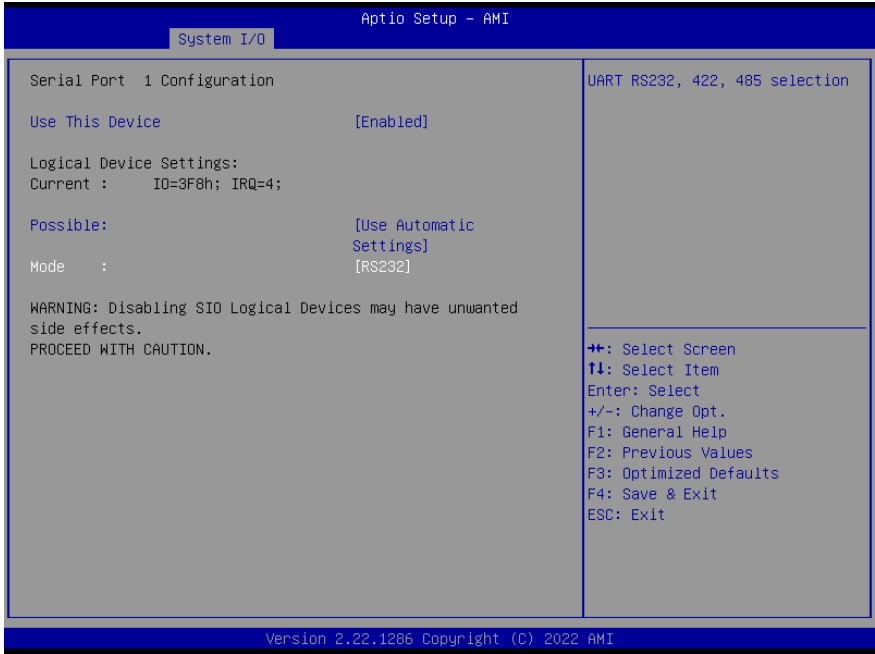


| Options Summary | | |
|--|----------|-----------------------------------|
| HD Audio | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled. | | |

3.5.4 Legacy Logical Devices Configuration

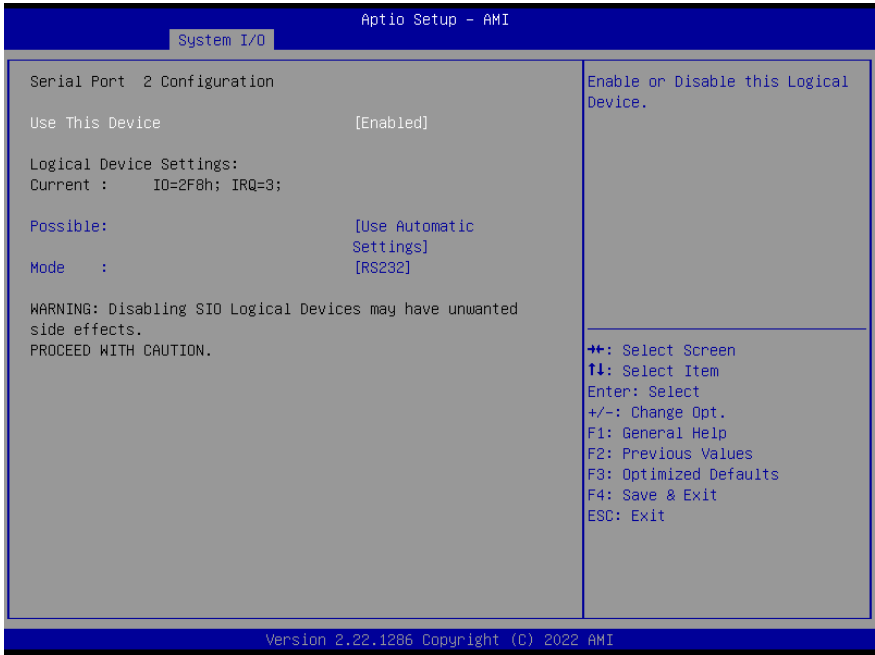


3.5.4.1 Serial Port 1



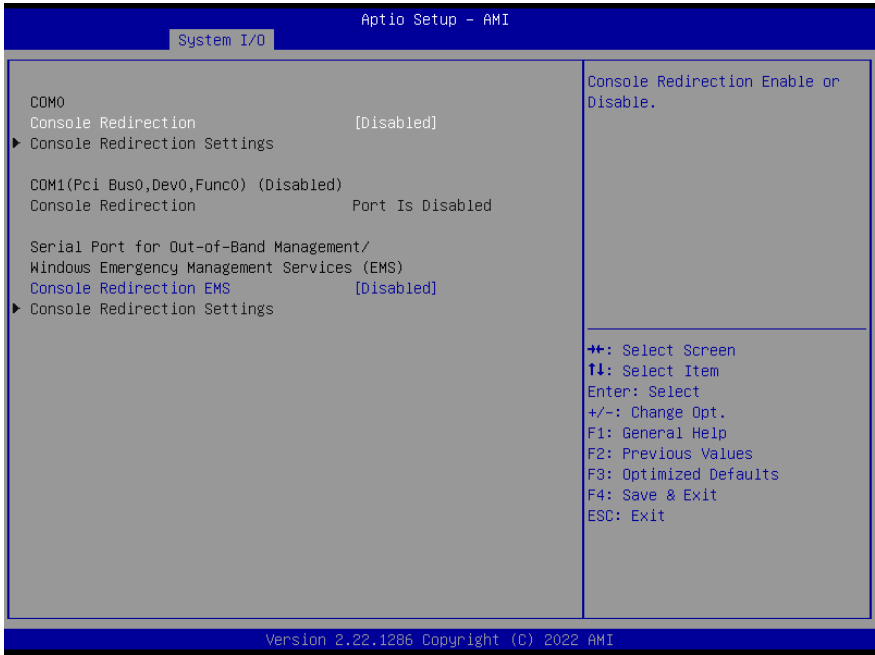
| Options Summary | | |
|--|------------------------|-----------------------------------|
| Use This Device | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=3F8; 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 | |
| | RS485 | |
| UART RS232, 422, 485, selection | | |

3.5.4.2 Serial Port 2



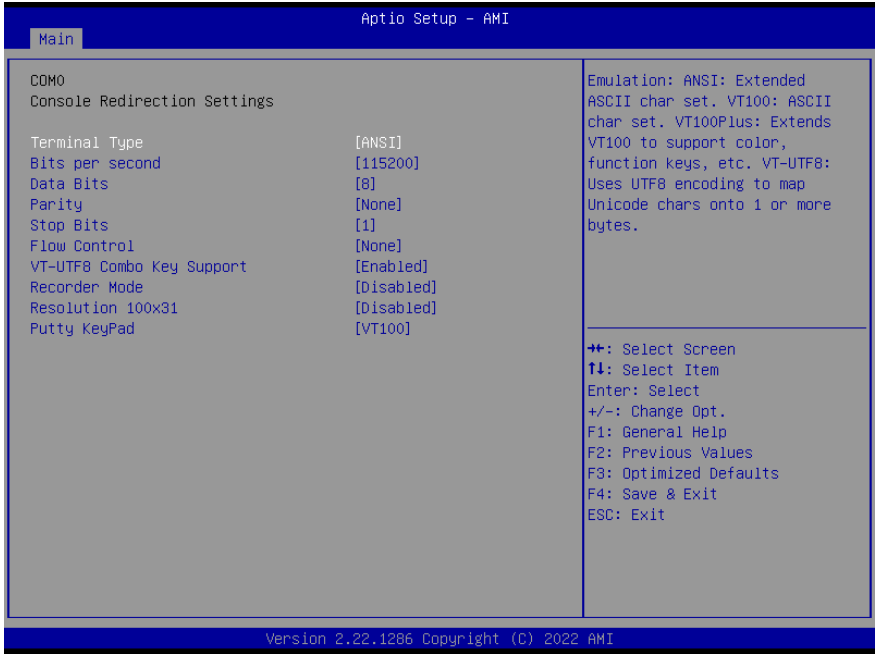
| Options Summary | | |
|--|------------------------|-----------------------------------|
| Use This Device | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2F8; 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 | |
| | RS485 | |
| UART RS232, 422, 485, selection | | |

3.5.5 Serial Port Console Redirection



| Options Summary | | |
|---------------------------------------|----------|-----------------------------------|
| Console Redirection | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Console Redirection Enable or Disable | | |
| Console Redirection EMS | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Console Redirection Enable or Disable | | |

3.5.5.1 Console Redirection Settings (COM0)



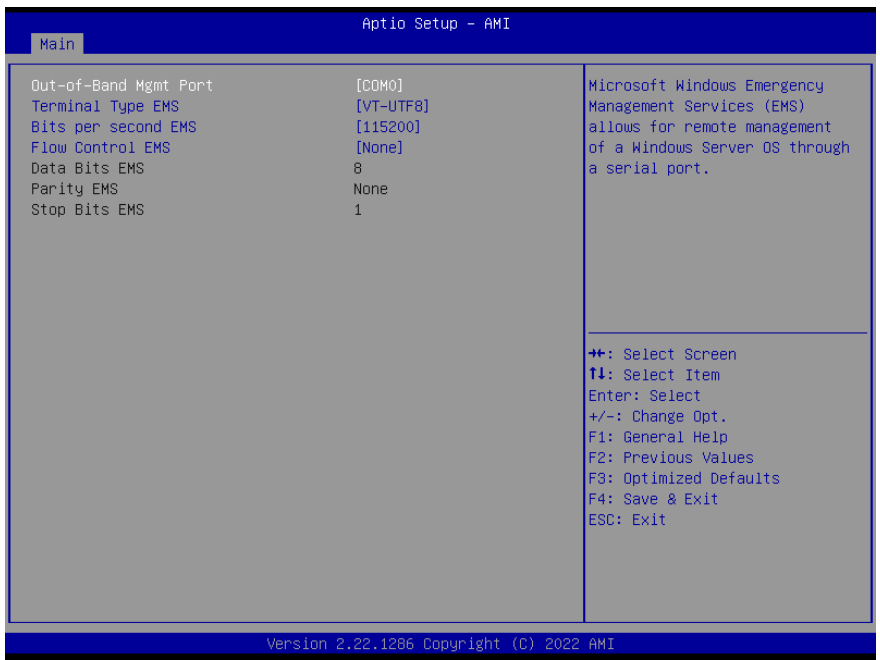
| Options Summary | | |
|--|-----------|-----------------------------------|
| Terminal Type | VT100 | |
| | VT100Plus | |
| | VT-UTF8 | |
| | ANSI | Optimal Default, Failsafe Default |
| Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100Plus: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. | | |
| Bits per second | 9600 | |
| | 19200 | |
| | 38400 | |
| | 57600 | |
| | 115200 | Optimal Default, Failsafe Default |
| Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. | | |

| Options Summary | | |
|--|------------------|-----------------------------------|
| Data Bits | 7 | |
| | 8 | Optimal Default, Failsafe Default |
| Data Bits | | |
| Parity | None | Optimal Default, Failsafe Default |
| | Even | |
| | Odd | |
| | Mark | |
| | Space | |
| <p>A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.</p> | | |
| Stop Bits | 1 | Optimal Default, Failsafe Default |
| | 2 | |
| <p>Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.</p> | | |
| Flow Control | None | Optimal Default, Failsafe Default |
| | Hardware RTS/CTS | |
| <p>Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.</p> | | |
| VT-UTF8 Combo Key Support | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| <p>Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals</p> | | |
| Recorder Mode | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| <p>With this mode enabled only text will be sent. This is to capture Terminal data.</p> | | |
| Resolution 100x31 | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| <p>Enables or disables extended terminal resolution</p> | | |
| Putty KeyPad | VT100 | Optimal Default, Failsafe Default |
| | LINUX | |
| | XTERMR6 | |
| | SCO | |
| | ESCN | |
| | VT400 | |

Options Summary

Select FunctionKey and KeyPad on Putty.

3.5.5.2 Console Redirection Settings (Out-of-Band Mgmt Port)



Options Summary

| | | |
|------------------------------|---|-----------------------------------|
| Out-of-Band Mgmt Port | COM0 | Optimal Default, Failsafe Default |
| | COM1 (Pci Bus0, Dev0, Func0) (Disabled) | |

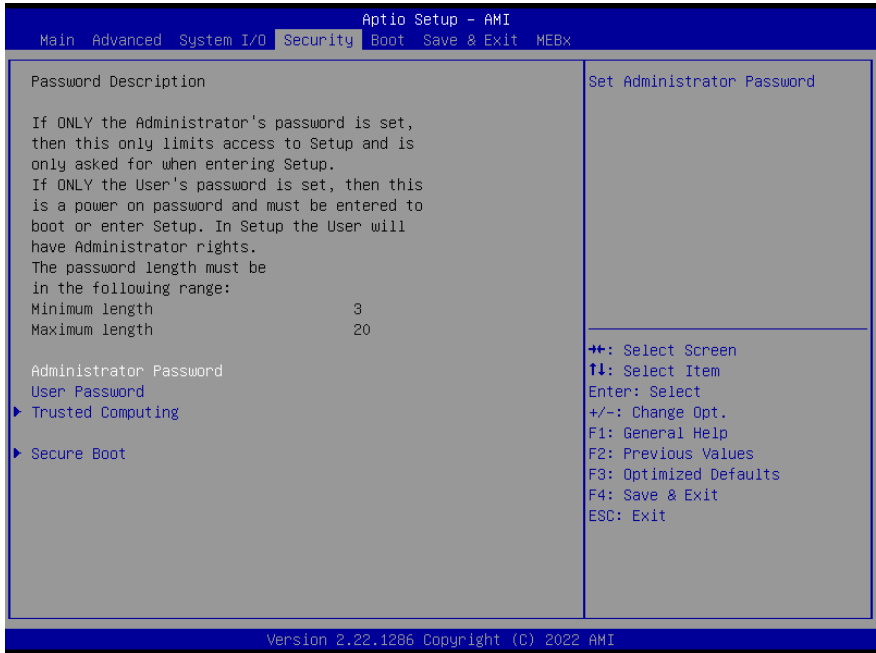
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.

| | | |
|--------------------------|-----------|-----------------------------------|
| Terminal Type EMS | VT100 | |
| | VT100Plus | |
| | VT-UTF8 | Optimal Default, Failsafe Default |
| | ANSI | |

VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.

| Options Summary | | |
|---|-------------------|-----------------------------------|
| Bits per second EMS | 9600 | |
| | 19200 | |
| | 57600 | |
| | 115200 | Optimal Default, Failsafe Default |
| Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. | | |
| Flow Control EMS | None | Optimal Default, Failsafe Default |
| | Hardware RTS/CTS | |
| | Software Xon/Xoff | |
| Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. | | |

3.6 Setup Submenu: Security



Change User/Administrator Password

You can set a User Password once an Administrator Password. 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.

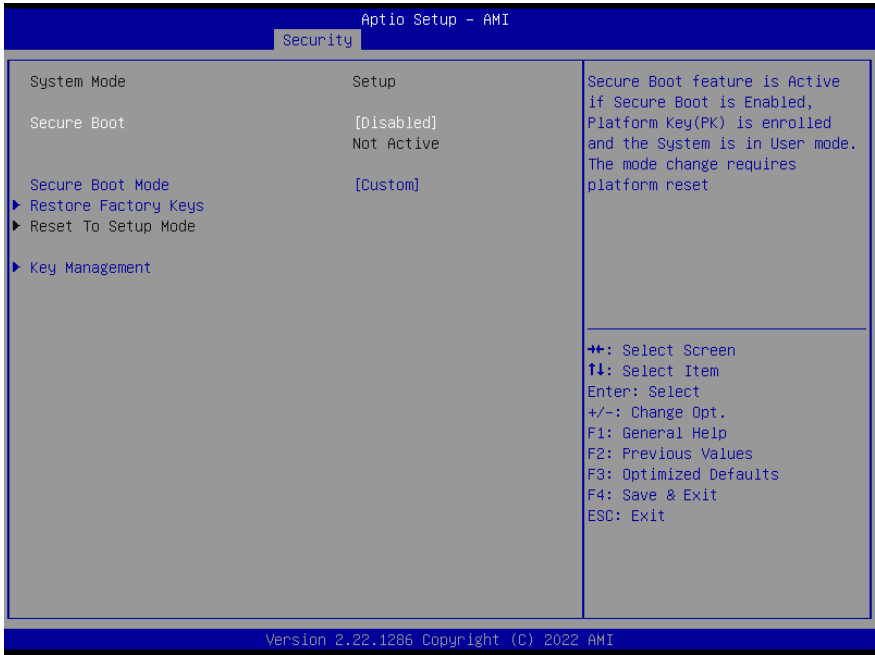
3.6.1 Trusted Computing



| Options Summary | | |
|---|-----------|-----------------------------------|
| Security Device Support | Enable | Optimal Default, Failsafe Default |
| | Disable | |
| Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available. | | |
| SHA256 PCR Bank | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable SHA256 PCR Bank | | |
| SHA384 PCR Bank | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or Disable SHA384 PCR Bank | | |
| Pending operation | None | Optimal Default, Failsafe Default |
| | TPM Clear | |
| Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device. | | |

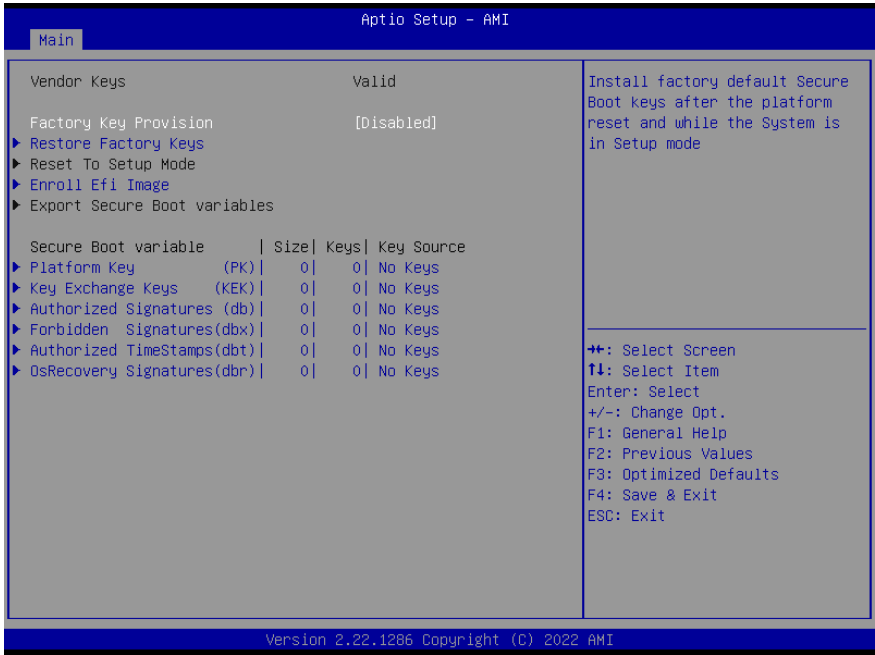
| Options Summary | | |
|---|----------|-----------------------------------|
| Platform Hierarchy | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Platform Hierarchy | | |
| Storage Hierarchy | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Storage Hierarchy | | |
| Endorsement Hierarchy | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Endorsement Hierarchy | | |
| Physical Presence Spec Version | 1.2 | |
| | 1.3 | Optimal Default, Failsafe Default |
| Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3. | | |
| Device Select | TPM 1.2 | |
| | TPM 2.0 | |
| | Auto | Optimal Default, Failsafe Default |
| TPM 1.2 will restrict support to TPM 1.2 devices. TPM 2.0 will restrict support to TPM 2.0 devices. Auto will support both with the default set to TPM 2.0 devices if not found. TPM 1.2 devices will be enumerated. | | |

3.6.2 Secure Boot



| Options Summary | | |
|---|----------|-----------------------------------|
| Secure Boot | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset | | |
| Secure Boot Mode | Standard | |
| | Custom | Optimal Default, Failsafe Default |
| Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication | | |
| Restore Factory Keys | Yes | |
| | No | |
| Force System to User Mode. Install factory default Secure Boot key databases | | |

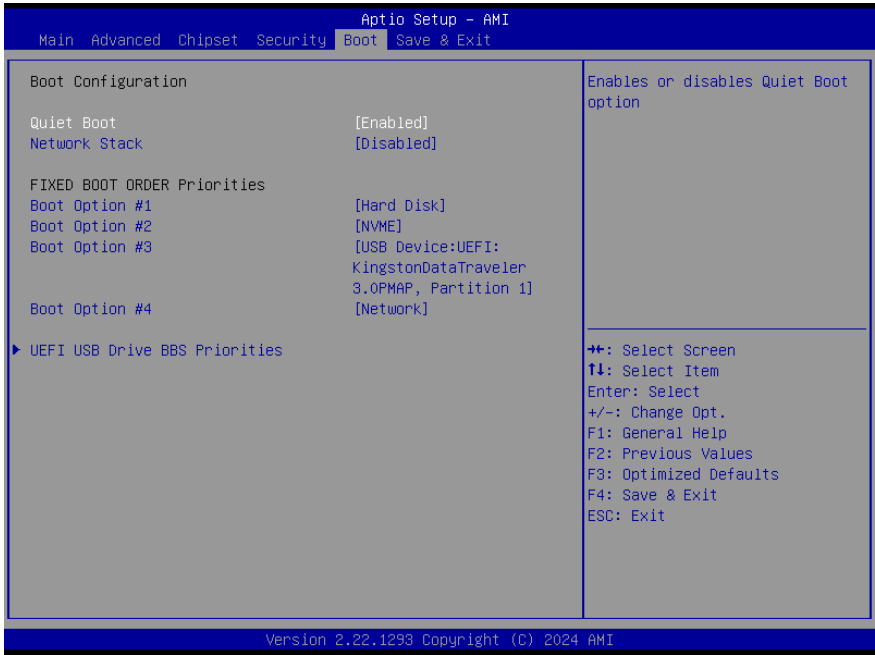
3.6.2.1 Key Management



| Options Summary | | |
|--|----------|-----------------------------------|
| Factory Key Provision | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode | | |
| Restore Factory Keys | Yes | |
| | No | |
| Force System to User Mode. Install factory default Secure Boot key databases | | |
| Enroll Efi Image | | |
| Allow Efi image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db) | | |
| Platform Key (PK) | Update | |
| Key Exchange Keys (KEK) | Update | |
| | Append | |
| Authorized Signatures (db) | Update | |
| | Append | |

| Options Summary | | |
|--|--------|--|
| Forbidden Signatures (dbx) | Update | |
| | Append | |
| Authorized TimeStamps (dnt) | Update | |
| | Append | |
| OsRecovery Signatures (dbr) | Update | |
| | Append | |
| Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: <ul style="list-style-type: none"> a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048 (bin) d) EFI_CERT_SHAXXX 2. Authenticated UEFI Variable 3. EFI PE/COFF Image (SHA256) <p>Key Source: Factory, External, Mixed</p> | | |

3.7 Setup Submenu: Boot



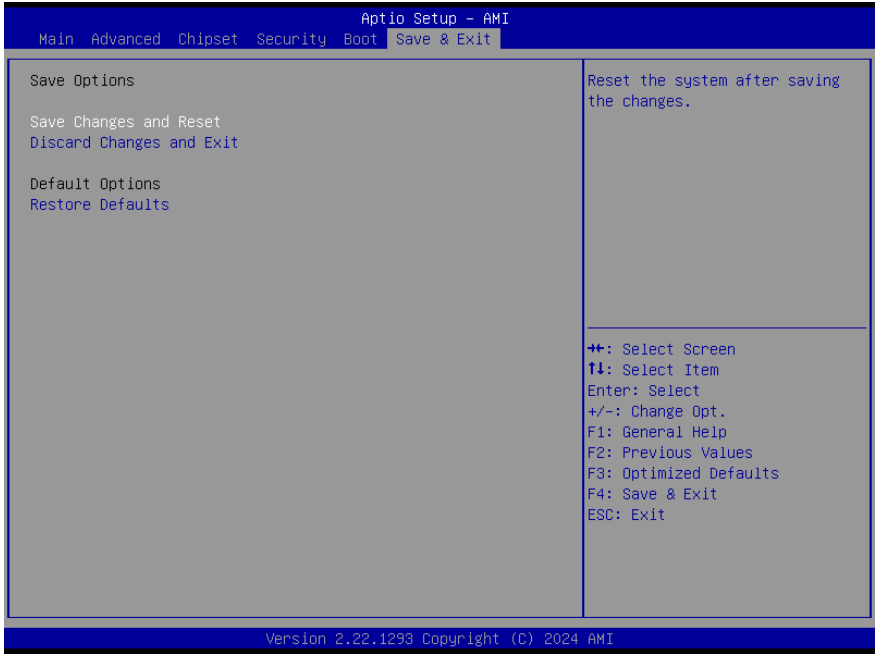
| Options Summary | | |
|-------------------------------------|------------|---------|
| Quiet Boot | Disabled | |
| | Enabled | Default |
| Enables/disables Quiet Boot option. | | |
| Network Stack | Disabled | Default |
| | Enabled | |
| Enable/Disable UEFI Network Stack. | | |
| Boot Option #1 | Hard Disk | |
| Boot Option #2 | NVME | |
| Boot Option #3 | USB Device | |
| Boot Option #4 | Network | |
| Sets the system boot order | | |

3.7.1 UEFI BBS Priorities



| Options Summary | | |
|-------------------------------------|------------|---------|
| Quiet Boot | Disabled | |
| | Enabled | Default |
| Enables/disables Quiet Boot option. | | |
| Network Stack | Disabled | Default |
| | Enabled | |
| Enable/Disable UEFI Network Stack. | | |
| Boot Option #1 | Hard Disk | |
| Boot Option #2 | NVME | |
| Boot Option #3 | USB Device | |
| Boot Option #4 | Network | |
| Sets the system boot order | | |

3.8 Setup Submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Drivers Download and Installation

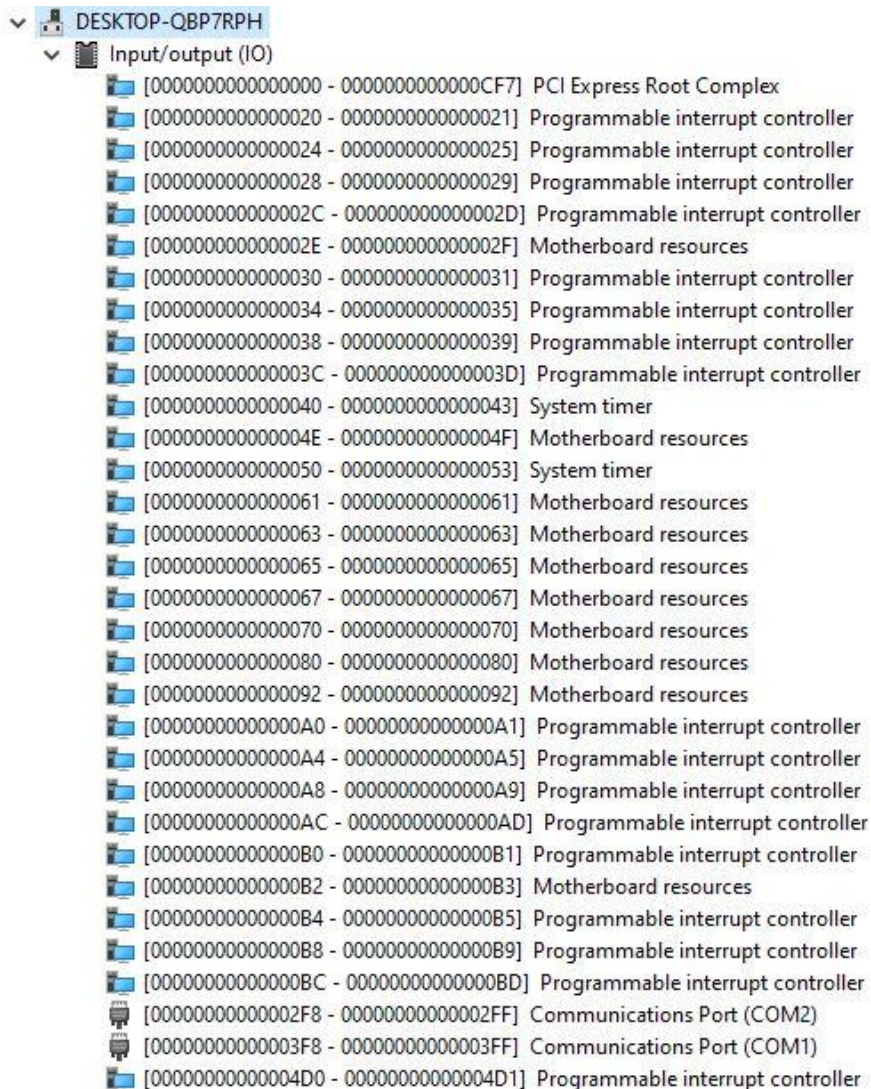
Drivers for the BOXER-6645U-RPL can be downloaded from the product page on the AAEON website:

<https://www.aaeon.com/en/>

Appendix A















I/O Information

A.1 I/O Address Map




































The image shows a screenshot of the Windows Device Manager's I/O Address Map. The tree view is expanded to 'DESKTOP-QBP7RPH' > 'Input/output (IO)'. The list contains 34 entries, each with a folder icon, a hexadecimal address range, and a device name. The devices include PCI Express Root Complex, multiple Programmable interrupt controllers, System timers, Motherboard resources, and Communications Ports (COM1 and COM2).






| Address Range | Device Name |
|--|-----------------------------------|
| [0000000000000000 - 00000000000000CF7] | 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 |
| [0000000000000080 - 0000000000000080] | 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) |
| [00000000000003F8 - 00000000000003FF] | Communications Port (COM1) |
| [00000000000004D0 - 00000000000004D1] | Programmable interrupt controller |

| | | |
|---|---------------------------------------|-----------------------------------|
|  | [00000000000004D0 - 00000000000004D1] | Programmable interrupt controller |
|  | [0000000000000680 - 000000000000069F] | Motherboard resources |
|  | [0000000000000A00 - 0000000000000A0F] | Motherboard resources |
|  | [0000000000000A10 - 0000000000000A1F] | Motherboard resources |
|  | [0000000000000A20 - 0000000000000A2F] | Motherboard resources |
|  | [0000000000000D00 - 000000000000FFFF] | PCI Express Root Complex |
|  | [000000000000164E - 000000000000164F] | Motherboard resources |
|  | [0000000000001854 - 0000000000001857] | Motherboard resources |
|  | [0000000000002000 - 00000000000020FE] | Motherboard resources |
|  | [0000000000003000 - 000000000000303F] | Intel(R) UHD Graphics 710 |
|  | [0000000000003060 - 000000000000307F] | Standard SATA AHCI Controller |
|  | [0000000000003080 - 0000000000003083] | Standard SATA AHCI Controller |
|  | [0000000000003090 - 0000000000003097] | Standard SATA AHCI Controller |
|  | [000000000000EFA0 - 000000000000EFBF] | Intel(R) SMBus - 7AA3 |

A.2 Memory Address Map

- ▼  DESKTOP-QBP7RPH
 - >  Input/output (IO)
 - >  Interrupt request (IRQ)
 - ▼  Large Memory
 -  [0000004000000000 - 0000007FFFFFFF] PCI Express Root Complex
 - ▼  Memory
 -  [0000000000A0000 - 0000000000BFFFF] PCI Express Root Complex
 -  [0000000080400000 - 00000000804FFFFFF] Intel(R) Ethernet Controller I226-LM
 -  [0000000080400000 - 00000000805FFFFFF] Intel(R) PCI Express Root Port #4 - 7ABB
 -  [0000000080400000 - 00000000BFFFFFFF] PCI Express Root Complex
 -  [0000000080500000 - 0000000080503FFF] Intel(R) Ethernet Controller I226-LM
 -  [0000000080620000 - 0000000080621FFF] Standard SATA AHCI Controller
 -  [0000000080622000 - 00000000806227FF] Standard SATA AHCI Controller
 -  [0000000080623000 - 00000000806230FF] Standard SATA AHCI Controller
 -  [00000000BFFE0000 - 00000000BFFFFFFF] Intel(R) Ethernet Connection (17) I219-LM
 -  [00000000C0000000 - 00000000CFFFFFFF] Motherboard resources
 -  [00000000FE010000 - 00000000FE010FFF] Intel(R) SPI (flash) Controller - 7AA4
 -  [00000000FED00000 - 00000000FED003FF] High precision event timer
 -  [00000000FED20000 - 00000000FED7FFFF] Motherboard resources
 -  [00000000FED40000 - 00000000FED44FFF] Trusted Platform Module 2.0
 -  [00000000FED45000 - 00000000FED8FFFF] Motherboard resources
 -  [00000000FED90000 - 00000000FED93FFF] Motherboard resources
 -  [00000000FEDA0000 - 00000000FEDA0FFF] Motherboard resources
 -  [00000000FEDA1000 - 00000000FEDA1FFF] Motherboard resources
 -  [00000000FEDC0000 - 00000000FEDC7FFF] Motherboard resources
 -  [00000000FEE00000 - 00000000FEEFFFFF] Motherboard resources
 -  [0000004000000000 - 000000400FFFFFFF] Intel(R) UHD Graphics 710
 -  [0000006000000000 - 0000006000FFFFFFF] Intel(R) UHD Graphics 710
 -  [0000006001100000 - 000000600110FFFFF] Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
 -  [0000006001118000 - 00000060011180FFF] Intel(R) SMBus - 7AA3
 -  [0000007FFFEFB000 - 0000007FFFEFBFFF] Intel(R) Management Engine Interface #1
 -  [0000007FFFEFC000 - 0000007FFFEFCFFF] Intel® Smart Sound Technology BUS
 -  [0000007FFFEF0000 - 0000007FFFEF7FFF] Intel® Smart Sound Technology BUS

A.3 IRQ Mapping Chart

- ▼  DESKTOP-QBP7RPH
 - >  Input/output (IO)
 - ▼  Interrupt request (IRQ)
 -  (ISA) 0x00000000 (00) System timer
 -  (ISA) 0x00000003 (03) Communications Port (COM2)
 -  (ISA) 0x00000004 (04) Communications Port (COM1)