

GENE-ASL6

3.5" Subcompact Board

User's Manual 1st Ed

Copyright Notice

This document is copyrighted, 2024. All rights are reserved. The original manufacturer reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of the original manufacturer. Information provided in this manual is intended to be accurate and reliable. However, the original manufacturer assumes no responsibility for its use, or for any infringements upon the rights of third parties that may result from its use.

The material in this document is for product information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, AAEMON assumes no liabilities resulting from errors or omissions in this document, or from the use of the information contained herein.

AAEMON reserves the right to make changes in the product design without notice to its users.

Acknowledgements

All other products' name or trademarks are properties of their respective owners.

- Microsoft Windows is a registered trademark of Microsoft Corp.
- Intel Atom® is a registered trademark of Intel Corporation
- Intel® Core™ is a trademark of Intel Corporation
- Realtek is a trademark of Realtek Semiconductor Corporation.
- Ubuntu is a trademark of Canonical.
- Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries

All other product names or trademarks are properties of their respective owners.

Packing List

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

| Item | Quantity |
|-----------|----------|
| GENE-ASL6 | 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 AC 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 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
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.**

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 Main Board/ Daughter Board/ Backplane

| 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 | X | X | ○ | ○ | ○ | ○ |
| 外部信号 连接器及线材 | X | X | ○ | ○ | ○ | ○ |
| <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 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注: 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> | | | | | | |

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

| Component | Poisonous or Hazardous Substances or Elements | | | | | |
|---|---|--------------|--------------|------------------------------|--------------------------------|---------------------------------------|
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr(VI)) | Polybrominated Biphenyls (PBB) | Polybrominated Diphenyl Ethers (PBDE) |
| PCB & Other Components | X | X | ○ | ○ | ○ | ○ |
| Wires & Connectors for External Connections | X | X | ○ | ○ | ○ | ○ |
| <p>O: The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.</p> <p>X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.</p> <p>Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only</p> | | | | | | |

Table of Contents

| | |
|---|----------|
| Chapter 1 – Product Specifications | 1 |
| 1.1 Specifications | 2 |
| 1.2 Block Diagram | 6 |
| Chapter 2 – Hardware Information | 7 |
| 2.1 Dimensions | 8 |
| 2.2 Jumpers and Connectors..... | 10 |
| 2.3 List of Jumpers | 12 |
| 2.3.1 COM 2 Pin 9 Function Selection (JP1)..... | 13 |
| 2.3.2 COM 1 Pin 9 Function Selection (JP2)..... | 13 |
| 2.3.3 Auto Power Button Enable/Disable Selection (JP3) | 13 |
| 2.3.4 LVDS 1 Operating Voltage Selection (JP4) | 14 |
| 2.3.5 LVDS 1 Backlight Inverter Voltage Selection (JP4) | 14 |
| 2.3.6 Clear CMOS Jumper (JP5)..... | 14 |
| 2.4 List of Connectors..... | 15 |
| 2.4.1 +5V Output for SATA HDD (CN1) | 17 |
| 2.4.2 Front Panel (CN2)..... | 17 |
| 2.4.3 Port 80 Debug Port Connector (CN3)..... | 18 |
| 2.4.4 SPI Flash Programming Port (CN4)..... | 19 |
| 2.4.5 SATA Port (CN5) | 20 |
| 2.4.6 External +12V Input (Optional) (CN8)..... | 20 |
| 2.4.7 External Power Input (CN9)..... | 21 |
| 2.4.8 Audio I/O Port (CN11) | 21 |
| 2.4.9 DDR5 SO-DIMM Channel (CN12)..... | 22 |
| 2.4.10 External +5VSB Input (CN13)..... | 22 |
| 2.4.11 GPIO Port (CN18) | 23 |
| 2.4.12 M.2 2230 E-Key (CN21)..... | 24 |

| | | |
|--------|--|----|
| 2.4.13 | LAN Port 1 LED Connector (CN22) | 24 |
| 2.4.14 | LAN Port 3 LED Connector (CN23)..... | 25 |
| 2.4.15 | LAN Port 2 LED Connector (CN24) | 25 |
| 2.4.16 | M.2 3052 B-Key (CN25)..... | 26 |
| 2.4.17 | Full Size Mini Card Slot/mSATA (CN27)..... | 26 |
| 2.4.18 | LVDS 1 Connector (CN28) | 28 |
| 2.4.19 | Nano SIM Card Socket (CN29) | 30 |
| 2.4.20 | 4-pin FAN Connector (CN33)..... | 30 |
| 2.4.21 | LVDS Inverter/Backlight Connector (CN34) | 31 |
| 2.4.22 | RJ-45 LAN Port 3 (CN35)..... | 32 |
| 2.4.23 | RJ-45 LAN Port 1/Port 2 (CN36)..... | 33 |
| 2.4.24 | USB 3.2/USB 2.0 Port 1/Port 2 (CN37)..... | 34 |
| 2.4.25 | RTC Battery Connector (CN39)..... | 35 |
| 2.4.26 | CRT Connector (CN40)..... | 35 |
| 2.4.27 | I2C/SMBus Connector (CN42) | 36 |
| 2.4.28 | HDMI Connector (CN43)..... | 37 |
| 2.4.29 | COM Port 1 (CN44)..... | 38 |
| 2.4.30 | COM Port 2 (CN45)..... | 41 |
| 2.4.31 | COM Port 3 (CN46)..... | 44 |
| 2.4.32 | COM Port 4 (CN47)..... | 45 |
| 2.4.33 | USB 2.0 Port 3 (CN48) | 46 |
| 2.4.34 | USB 2.0 Port 4 (CN49) | 46 |
| 2.4.35 | USB 2.0 Port 5 (CN50) | 47 |
| 2.4.36 | USB 2.0 Port 6 (CN53) | 47 |
| 2.5 | Thermal Solutions..... | 48 |
| 2.5.1 | Heatspreader - GENE-ADN6-HSP01..... | 48 |
| 2.5.2 | Heatsink Option 1- GENE-ADN6-HSK01..... | 50 |
| 2.5.3 | Heatsink Option 2- GENE-ADN6-HSK02..... | 52 |

| | |
|---|-----------|
| Chapter 3 - AMI BIOS Setup | 54 |
| 3.1 System Test and Initialization | 55 |
| 3.2 AMI BIOS Setup | 56 |
| 3.3 Setup Submenu: Main | 57 |
| 3.4 Setup Submenu: Advanced..... | 58 |
| 3.4.1 CPU Configuration..... | 59 |
| 3.4.2 PCH-FW Configuration..... | 60 |
| 3.4.3 Firmware Update Configuration | 61 |
| 3.4.4 PTT Configuration..... | 62 |
| 3.4.5 Trusted Computing..... | 63 |
| 3.4.6 SATA Configuration..... | 65 |
| 3.4.7 Hardware Monitor | 66 |
| 3.4.7.1 Smart Fan Mode Configuration | 67 |
| 3.4.8 SIO Configuration | 68 |
| 3.4.8.1 Serial Port 1 Configuration | 69 |
| 3.4.8.2 Serial Port 2 Configuration | 70 |
| 3.4.8.3 Serial Port 3 Configuration | 71 |
| 3.4.8.4 Serial Port 4 Configuration | 72 |
| 3.4.9 Serial Port Console Redirection | 73 |
| 3.4.10 Legacy Console Redirection Settings..... | 74 |
| 3.4.11 AAEON BIOS Robot | 75 |
| 3.4.12 Power Management..... | 77 |
| 3.4.13 GPIO Port Configuration | 78 |
| 3.4.14 AAEON Smart Boost..... | 79 |
| 3.5 Setup Submenu: Chipset | 80 |
| 3.5.1 System Agent (SA) Configuration..... | 81 |
| 3.5.2 Memory Configuration..... | 82 |
| 3.5.3 LVDS Panel Configuration | 83 |

| | | |
|---|------------------------------------|------------|
| 3.5.4 | PCH-IO Configuration | 85 |
| 3.6 | Setup Submenu: Security..... | 86 |
| 3.6.1 | Secure Boot..... | 87 |
| 3.6.2 | Key Management..... | 88 |
| 3.7 | Setup Submenu: Boot | 90 |
| 3.7.1 | BBS Priorities | 91 |
| 3.8 | Setup Submenu: Save & Exit..... | 92 |
| Chapter 4 – Driver Installation | | 93 |
| 4.1 | Driver Download/Installation | 94 |
| Appendix A - I/O Information..... | | 97 |
| A.1 | I/O Address Map | 98 |
| A.2 | Memory Address Map | 104 |
| A.3 | IRQ Mapping Chart..... | 108 |
| Appendix B – Mating Connectors and Cables..... | | 111 |
| B.1 | Mating Connectors and Cables..... | 112 |

Chapter 1

Product Specifications

1.1 Specifications

System

| | |
|-----------------------|---|
| Form Factor | 3.5" SubCompact Board |
| CPU | Intel Atom® Processors x7000RE Series Processors: Intel Atom® x7213RE Processor (2C, 2.0 GHz, 9W) Intel Atom® x7433RE Processor (4C, 1.5 GHz, 9W) Intel Atom® x7835RE Processor (8C, 1.3 GHz, 12W) |
| Chipset | Integrated with Intel® SoC |
| Memory Type | DDR5 4800, Single Channel SODIMM x 1, Max. 16GB, Non-ECC |
| BIOS | UEFI |
| Wake on Lan | Yes |
| Watchdog Timer | 255 Levels |
| Security | TPM 2.0 (Optional) |
| RTC Battery | Lithium Battery 3V/240mAH |
| Dimension | 5.75" x 4" (146mm x 101.6mm) |
| Weight | 0.94 lb. (0.43Kg) |
| OS Support | Windows® 10 (64-bit) Ubuntu 22.04/Kernel 5.15.0-25-generic |

Power

| | |
|--------------------------|--|
| Power Requirement | +9V ~ 36V (Optional: +12V) |
| Power Supply Type | AT/ATX |
| Connector | Phoenix 2-pin Connector |
| Power Consumption | Intel Atom® x7835RE Processor, DDR5 16GB, 3.20A @+12V (Typical) |

Power

| | |
|--------------------------------|---|
| Power Consumption Cont. | Intel Atom® x7835RE Processor, DDR5 16GB, 4.80A @+12V (Max) |
|--------------------------------|---|

Display

| | |
|--------------------------|---|
| Controller | Intel® UHD Graphics |
| LVDS/eDP | LVDS x 1, Dual Channel 18/24-bit, up to 1920 x 1080 |
| Display Interface | HDMI 1.4 x 1, up to 3840 x 2160 @30Hz VGA x 1, up to 1920 x 1080 |
| Multiple Display | Up to 3 Simultaneous Displays |

Audio

| | |
|------------------------|---|
| Codec | Realtek ALC897 |
| Audio Interface | Line-In/Line-Out/Mic (audio function not available on WiTAS SKUs) |
| Speaker | — |

External I/O

| | |
|--------------------|---|
| Ethernet | Intel® Ethernet Controller I226 2.5GbE, RJ-45 x 3 |
| USB | USB 3.2 Gen 2 x 2 |
| Serial Port | — |
| Video | HDMI 1.4 x 1 VGA x 1 |

Internal I/O

| | |
|-------------|--|
| USB | USB 2.0 x 4 |
| Serial Port | COM 1, COM 2 (RS-232/422/485, supports 5V/12V/RI) COM 3, COM 4 (RS-232) |
| Video | LVDS x 1 Inverter x 1 (12V/2A) |
| SATA | SATA 6Gb/s x 1 +5V SATA Power Connector x 1 |
| Audio | Audio Header x 1 (Optional, audio function not available on WiTAS SKUs) |
| DIO/GPIO | GPIO 8-bit |
| SMBus/I2C | SMBus/I2C x 1 (Default: SMBus) |
| Touch | — |
| Fan | 4-pin Smart Fan x 1 |
| SIM | Nano SIM x 1 |
| Front Panel | HDD LED, PWR LED, Power Button, Buzzer, Reset |
| Others | — |

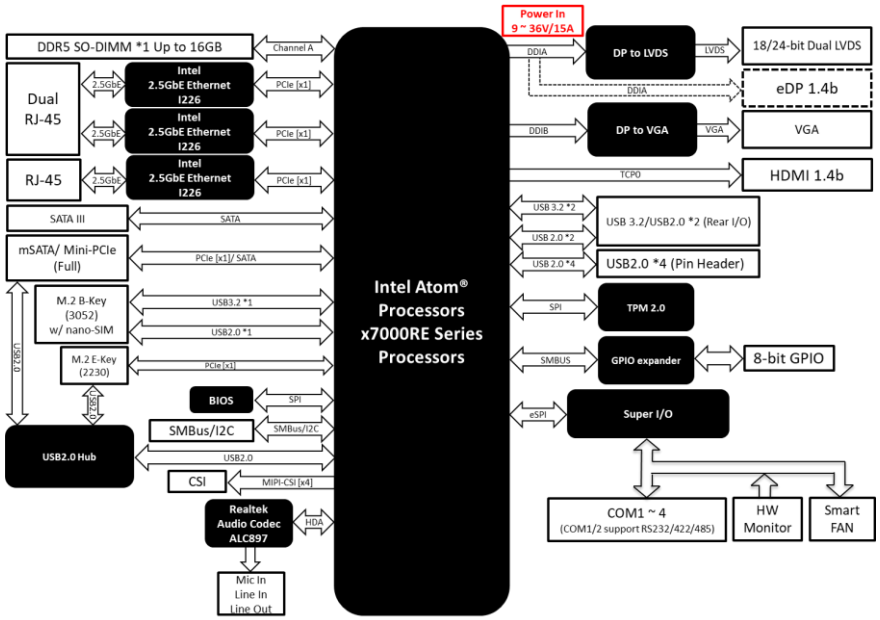
Expansion

| | |
|-----------------|--|
| Mini PCIe/mSATA | Full-size mSATA/mPCIe x 1 (Default: mSATA, select by BIOS) |
| M.2 | M.2 2230 E-Key x 1 (PCIe 3.0 [x1] + USB 2.0) M.2 3052 B-Key x 1 (USB 3.2 Gen 2 + USB 2.0) |
| Others | — |

Environmental

| | |
|-----------------------|--|
| Operating Temperature | WiTAS 2: -40°F ~ 185°F (-40°C ~ 85°C) |
| Storage Temperature | -40°F ~ 185°F (-40°C ~ 85°C) |
| Operating Humidity | 0% ~ 90% relative humidity, non-condensing |
| MTBF (Hours) | 333,008 |
| EMC | CE/FCC Class A |

1.2 Block Diagram

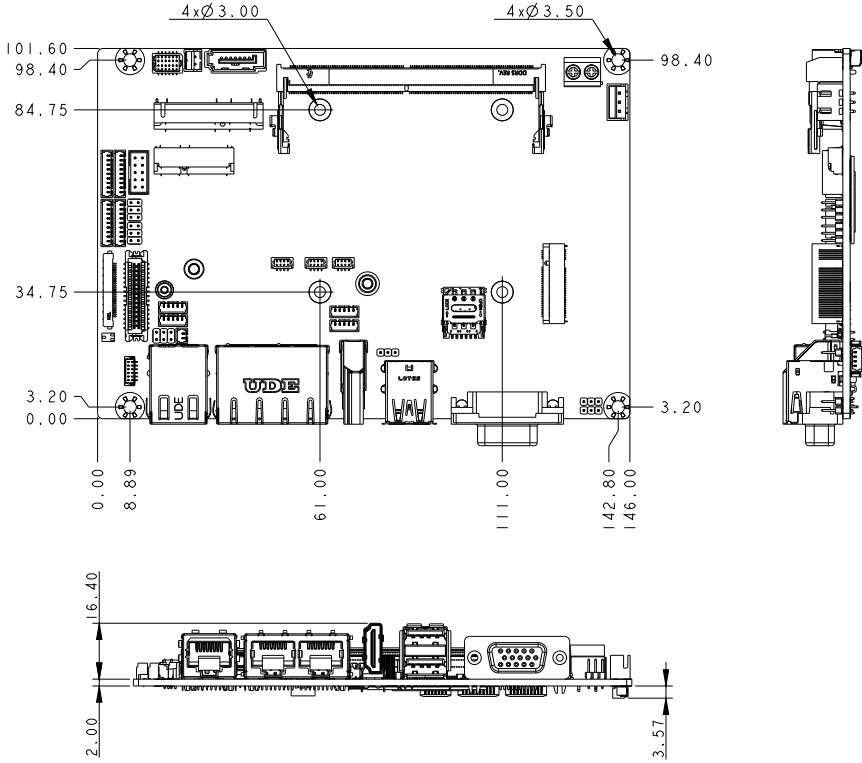


Chapter 2

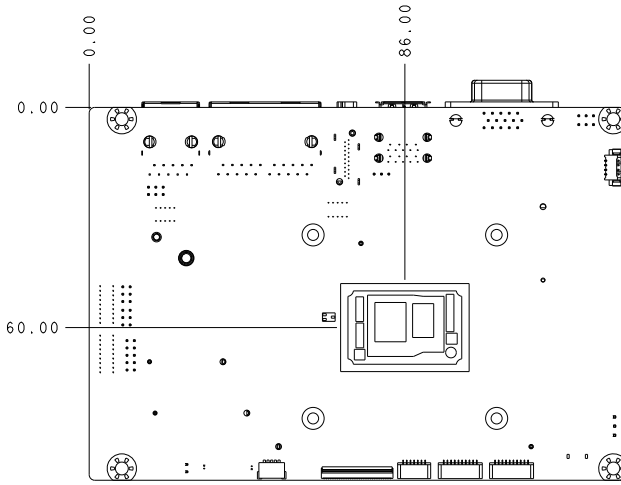
Hardware Information

2.1 Dimensions

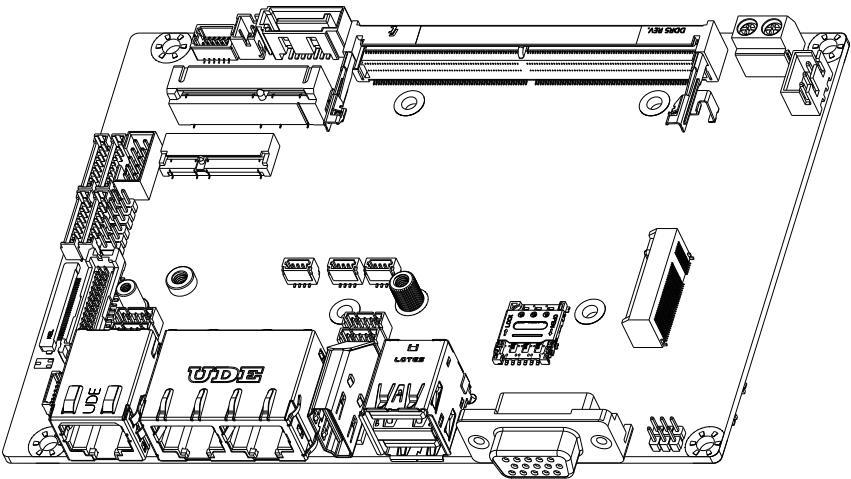
Component Side



Component Side

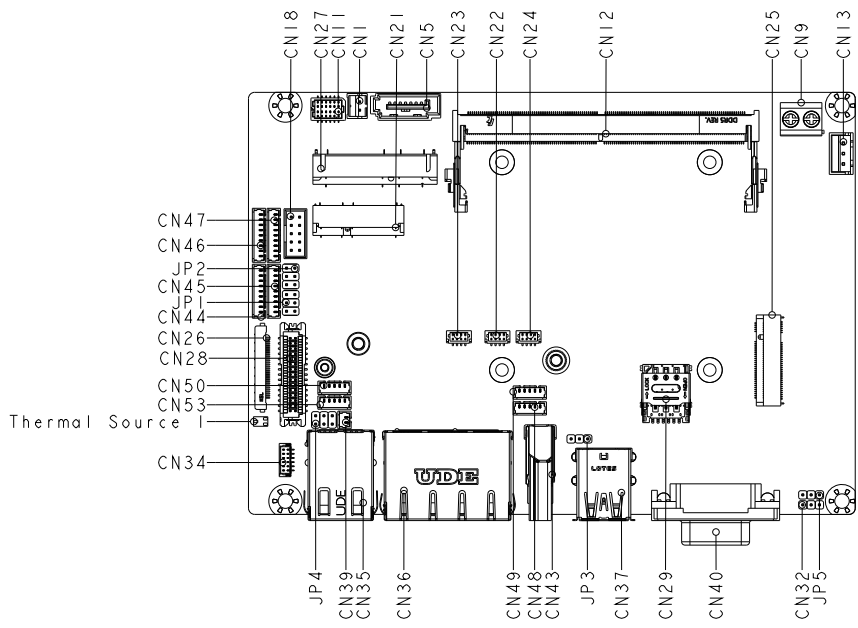


3D View

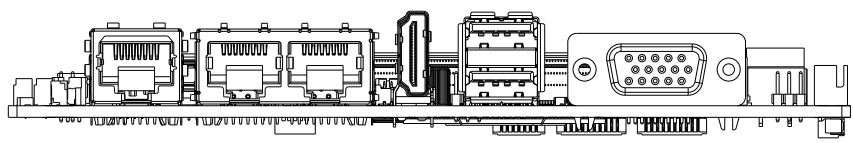


2.2 Jumpers and Connectors

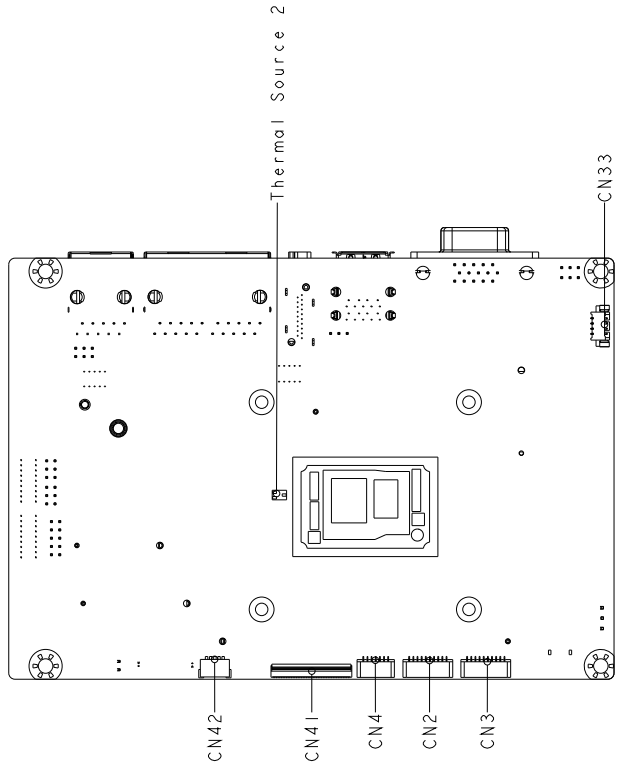
Top View



Front I/O View



Bottom View

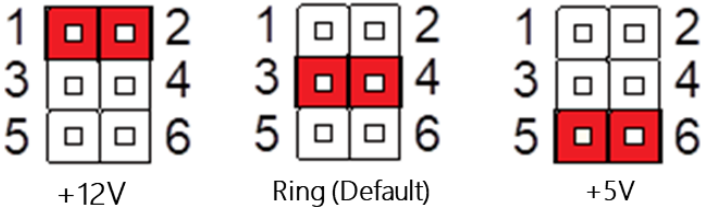


2.3 List of Jumpers

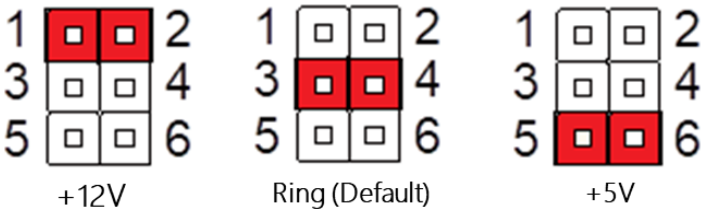
Please refer to the table below for all of the board's jumpers that you can configure for your application

| Label | Function |
|-------|---|
| JP1 | COM 2 Pin 9 Function Selection |
| JP2 | COM 1 Pin 9 Function Selection |
| JP3 | Auto Power Button Enable/Disable Selection |
| JP4 | LVDS 1 Operating Voltage Selection LVDS 1 Backlight Inverter Voltage Selection |
| JP5 | Clear CMOS Jumper |

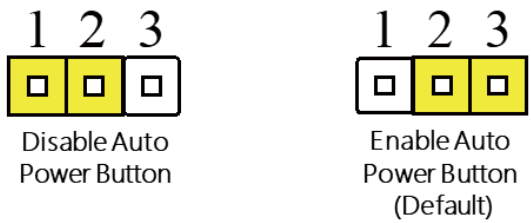
2.3.1 COM 2 Pin 9 Function Selection (JP1)



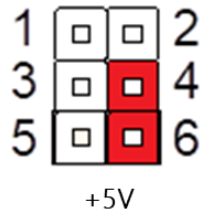
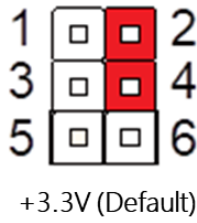
2.3.2 COM 1 Pin 9 Function Selection (JP2)



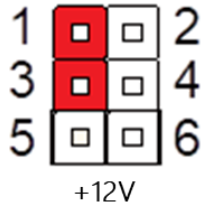
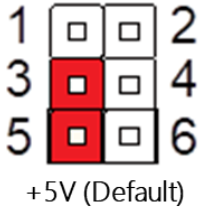
2.3.3 Auto Power Button Enable/Disable Selection (JP3)



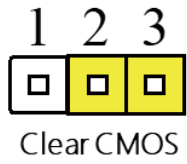
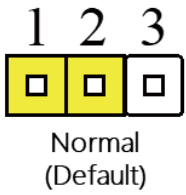
2.3.4 LVDS 1 Operating Voltage Selection (JP4)



2.3.5 LVDS 1 Backlight Inverter Voltage Selection (JP4)



2.3.6 Clear CMOS Jumper (JP5)



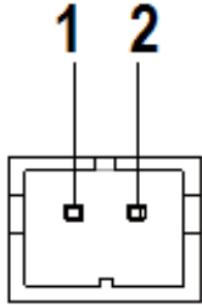
2.4 List of Connectors

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

| Label | Function |
|-------|-----------------------------------|
| CN1 | +5V Output for SATA HDD |
| CN2 | Front Panel |
| CN3 | Port 80 Debug Port Connector |
| CN4 | SPI Flash Programming Port |
| CN5 | SATA Port |
| CN8 | External +12V Input (Optional) |
| CN9 | External Power Input |
| CN11 | Audio I/O Port |
| CN12 | DDR5 SODIMM |
| CN13 | External +5VSB Input |
| CN18 | GPIO Port |
| CN21 | M.2 2230 E-Key |
| CN22 | LAN Port 1 LED Connector |
| CN23 | LAN Port 3 LED Connector |
| CN24 | LAN Port 2 LED Connector |
| CN25 | M.2 3052 B-Key |
| CN27 | Full Size Mini Card Slot/mSATA |
| CN28 | LVDS 1 Connector |
| CN29 | Nano SIM Card Socket |
| CN33 | 4-pin FAN Connector |
| CN34 | LVDS Inverter/Backlight Connector |
| CN35 | RJ-45 LAN Port 3 |
| CN36 | RJ-45 LAN Port 1/Port 2 |
| CN37 | USB 3.2/USB 2.0 Port 1/Port 2 |
| CN39 | RTC Battery Connector |
| CN40 | CRT Connector |
| CN42 | I2C/SMBus Connector |
| CN43 | HDMI Connector |

| Label | Function |
|-------|----------------|
| CN44 | COM Port 1 |
| CN45 | COM Port 2 |
| CN46 | COM Port 3 |
| CN47 | COM Port 4 |
| CN48 | USB 2.0 Port 3 |
| CN49 | USB 2.0 Port 4 |
| CN50 | USB 2.0 Port 5 |
| CN53 | USB 2.0 Port 6 |

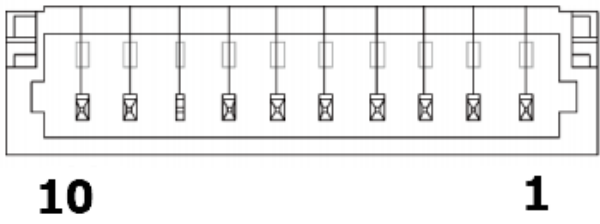
2.4.1 +5V Output for SATA HDD (CN1)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +V5S | PWR | +5V |
| 2 | GND | GND | - |

Note: The driving current of +V5S supports up to 2A.

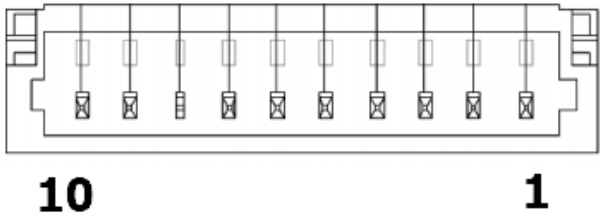
2.4.2 Front Panel (CN2)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|-------------|-------------|--------------|
| 1 | GND | GND | GND |
| 2 | EXT_PWRBTN# | IN | |
| 3 | SATA_LED- | OUT | |
| 4 | SATA_LED+ | OUT | |
| 5 | BUZZER- | OUT | |
| 6 | BUZZER+ | OUT | |

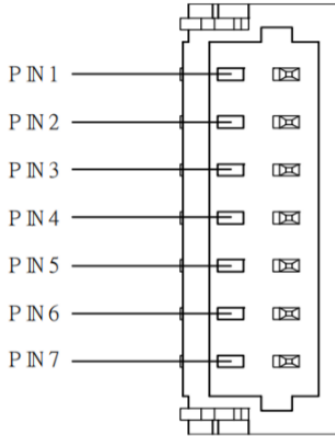
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 7 | GND | GND | GND |
| 8 | PWR_LED+ | OUT | |
| 9 | GND | GND | GND |
| 10 | HWRST# | IN | |

2.4.3 Port 80 Debug Port Connector (CN3)



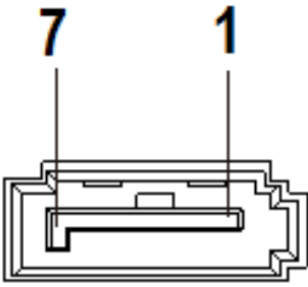
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | ESP_IO0 | I/O | +1.8V |
| 2 | ESP_IO1 | I/O | +1.8V |
| 3 | ESP_IO2 | I/O | +1.8V |
| 4 | ESP_IO3 | I/O | +1.8V |
| 5 | +V3P3S | PWR | +3.3V |
| 6 | ESPI_CS | IN | |
| 7 | ESPI_RST | OUT | +3.3V |
| 8 | GND | GND | GND |
| 9 | ESPI_CLK | OUT | +1.8V |
| 10 | +V3P3A | PWR | +3.3V |

2.4.4 SPI Flash Programming Port (CN4)



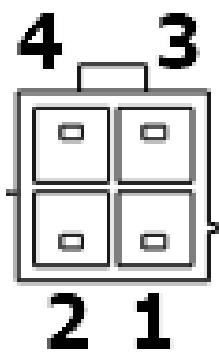
| Pin | Pin Name | Signal Type | Signal Level |
|-----|------------|-------------|--------------|
| 1 | SPI_MISO | OUT | |
| 2 | GND | GND | GND |
| 3 | SPI_CLK | IN | |
| 4 | +V3P3A_SPI | PWR | +3.3V |
| 5 | SPI_MOSI | IN | |
| 6 | SPI_CS | IN | |
| 7 | NC | | |

2.4.5 SATA Port (CN5)



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

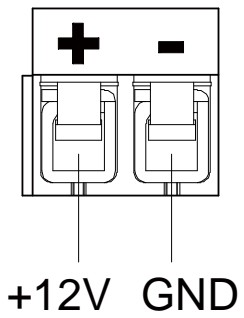
2.4.6 External +12V Input (Optional) (CN8)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | GND | GND | GND |
| 2 | GND | GND | GND |

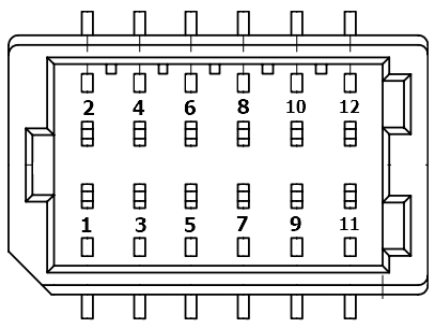
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 3 | +12V | PWR | +12V |
| 4 | +12V | PWR | +12V |

2.4.7 External Power Input (CN9)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +12V | PWR | +12V |
| 2 | GND | GND | GND |

2.4.8 Audio I/O Port (CN11)



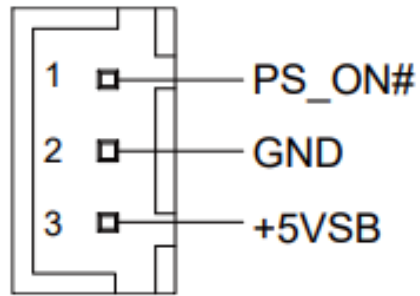
| Pin | Pin Name | Signal Type | Signal Level |
|-----|-----------|-------------|--------------|
| 1 | RIGHT_OUT | OUT | |
| 2 | MIC_R | IN | |
| 3 | LEFT_OUT | OUT | |

| Pin | Pin Name | Signal Type | Signal Level |
|-----|-----------|-------------|--------------|
| 4 | MIC_L | IN | |
| 5 | JD_LOUT | IN | |
| 6 | JD_MIC | IN | |
| 7 | GND_AUDIO | GND | |
| 8 | GND_AUDIO | GND | |
| 9 | JD_LIN | IN | |
| 10 | LINE_R_IN | IN | |
| 11 | +5V_AUDIO | PWR | +5V |
| 12 | LINE_L_IN | IN | |

2.4.9 DDR5 SO-DIMM Channel (CN12)

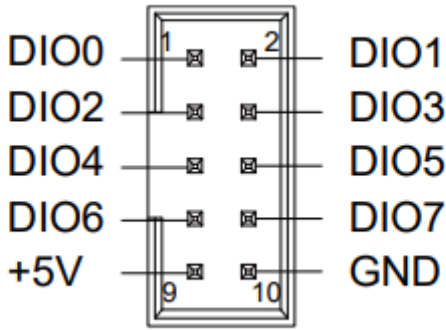
Standard Specifications.

2.4.10 External +5VSB Input (CN13)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | PS_ON# | OUT | +5V |
| 2 | GND | GND | |
| 3 | +5VSB | PWR | +5V at 2A |

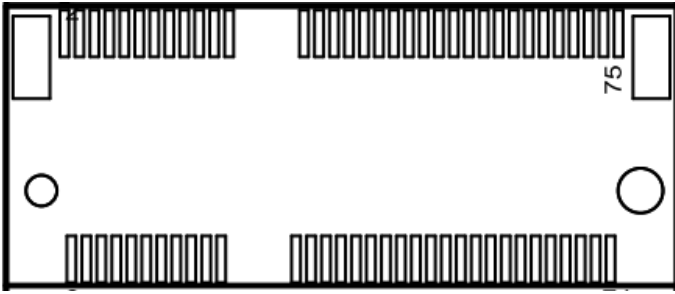
2.4.11 GPIO Port (CN18)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | GPIO_0 | IN/OUT | |
| 2 | GPIO_1 | IN/OUT | |
| 3 | GPIO_2 | IN/OUT | |
| 4 | GPIO_3 | IN/OUT | |
| 5 | GPIO_4 | IN/OUT | |
| 6 | GPIO_5 | IN/OUT | |
| 7 | GPIO_6 | IN/OUT | |
| 8 | GPIO_7 | IN/OUT | |
| 9 | +V5S | PWR | +5V |
| 10 | GND | GND | GND |

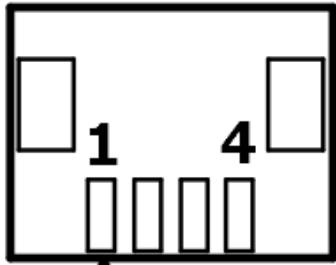
Note: The driving current of +V5S supports up to 0.5A.

2.4.12 M.2 2230 E-Key (CN21)



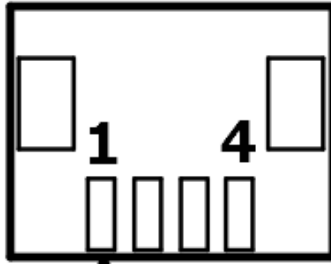
Note: Standard specifications.

2.4.13 LAN Port 1 LED Connector (CN22)



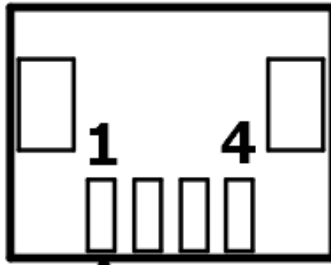
| Pin | Pin Name | Signal Type | Signal Level |
|-----|------------|-------------|--------------|
| 1 | +V3P3A | PWR | +3.3V |
| 2 | LAN1_1000# | I/O | |
| 3 | LAN1_ACT# | I/O | |
| 4 | LAN1_2500# | I/O | |

2.4.14 LAN Port 3 LED Connector (CN23)



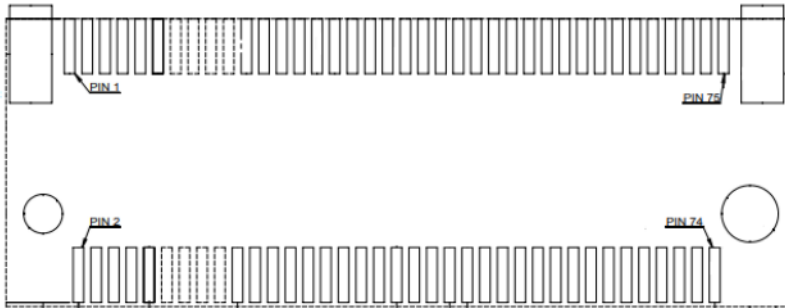
| Pin | Pin Name | Signal Type | Signal Level |
|-----|------------|-------------|--------------|
| 1 | +V3P3A | PWR | +3.3V |
| 2 | LAN3_1000# | I/O | |
| 3 | LAN3_ACT# | I/O | |
| 4 | LAN3_2500# | I/O | |

2.4.15 LAN Port 2 LED Connector (CN24)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|------------|-------------|--------------|
| 1 | +V3P3A | PWR | +3.3V |
| 2 | LAN2_1000# | I/O | |
| 3 | LAN2_ACT# | I/O | |
| 4 | LAN2_2500# | I/O | |

2.4.16 M.2 3052 B-Key (CN25)



Note: Standard specifications.

2.4.17 Full Size Mini Card Slot/mSATA (CN27)

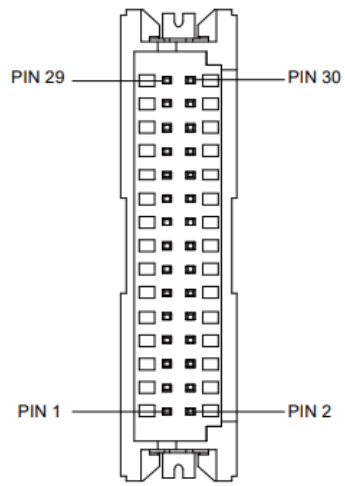
| Pin | Pin Name | Signal Type | Signal Level |
|-----|---------------|-------------|--------------|
| 1 | PCIE_WAKE# | IN | |
| 2 | +3.3V | PWR | +3.3V |
| 3 | NC | NC | NC |
| 4 | GND | GND | GND |
| 5 | NC | NC | NC |
| 6 | +1.5V | PWR | +1.5V |
| 7 | PCIE_CLK_REQ# | IN | |
| 8 | NC | NC | NC |
| 9 | GND | GND | GND |
| 10 | NC | NC | NC |
| 11 | PCIE_REF_CLK- | DIFF | |
| 12 | NC | NC | NC |
| 13 | PCIE_REF_CLK+ | DIFF | |
| 14 | NC | NC | NC |
| 15 | GND | GND | GND |
| 16 | NC | NC | NC |

| Pin | Pin Name | Signal Type | Signal Level |
|-----|-------------------|-------------|--------------|
| 17 | NC | NC | NC |
| 18 | GND | GND | GND |
| 19 | NC | NC | NC |
| 20 | W_DISABLE# | OUT | +3.3V |
| 21 | GND | GND | GND |
| 22 | PCIE_RST# | OUT | +3.3V |
| 23 | PCIE_RX-/SATA_RX+ | DIFF | GND |
| 24 | +3.3V | PWR | +3.3V |
| 25 | PCIE_RX+/SATA_RX- | DIFF | |
| 26 | GND | GND | GND |
| 27 | GND | GND | GND |
| 28 | +1.5V | PWR | +1.5V |
| 29 | GND | GND | GND |
| 30 | SMB_CLK | I/O | +3.3V |
| 31 | PCIE_TX-/SATA_TX- | DIFF | |
| 32 | SMB_DATA | I/O | +3.3V |
| 33 | PCIE_TX+/SATA_TX+ | DIFF | |
| 34 | GND | GND | GND |
| 35 | GND | GND | GND |
| 36 | USB_D- | DIFF | |
| 37 | GND | GND | GND |
| 38 | USB_D+ | DIFF | |
| 39 | +3.3V | PWR | +3.3V |
| 40 | GND | GND | GND |
| 41 | +3.3V | PWR | +3.3V |
| 42 | NC | NC | NC |
| 43 | GND | GND | GND |
| 44 | NC | NC | NC |
| 45 | NC | NC | NC |
| 46 | NC | NC | NC |
| 47 | NC | NC | NC |
| 48 | +1.5V | PWR | +1.5V |
| 49 | NC | | |

| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 50 | GND | GND | GND |
| 51 | NC | NC | NC |
| 52 | +3.3V | PWR | +3.3V |

Note: Mini Card/mSATA function can be set by BIOS. Default is mSATA.

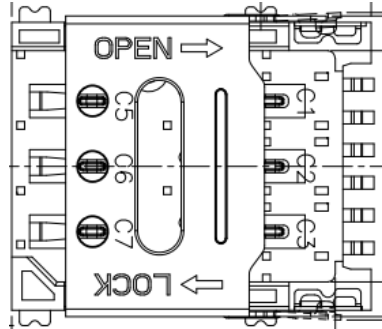
2.4.18 LVDS 1 Connector (CN28)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|--------------|-------------|--------------|
| 1 | BKL1_ENABLE | OUT | |
| 2 | BKL1_CONTROL | OUT | |
| 3 | LCD1_PWR | PWR | +3.3V/+5V |
| 4 | GND | GND | |
| 5 | LVDS1_A_CLK- | DIFF | |
| 6 | LVDS1_A_CLK+ | DIFF | |
| 7 | LCD1_PWR | PWR | +3.3V/+5V |
| 8 | GND | GND | |
| 9 | LVDS1_DA0- | DIFF | |
| 10 | LVDS1_DA0+ | DIFF | |

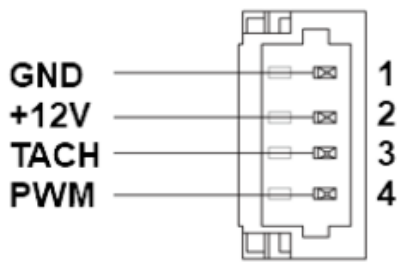
| Pin | Pin Name | Signal Type | Signal Level |
|-----|--------------|-------------|--------------|
| 11 | LVDS1_DA1- | DIFF | |
| 12 | LVDS1_DA1+ | DIFF | |
| 13 | LVDS1_DA2- | DIFF | |
| 14 | LVDS1_DA2+ | DIFF | |
| 15 | LVDS1_DA3- | DIFF | |
| 16 | LVDS1_DA3+ | DIFF | |
| 17 | DDC1_DATA | I/O | +3.3V |
| 18 | DDC1_CLK | I/O | +3.3V |
| 19 | LVDS1_DB0- | DIFF | |
| 20 | LVDS1_DB0+ | DIFF | |
| 21 | LVDS1_DB1- | DIFF | |
| 22 | LVDS1_DB1+ | DIFF | |
| 23 | LVDS1_DB2- | DIFF | |
| 24 | LVDS1_DB2+ | DIFF | |
| 25 | LVDS1_DB3- | DIFF | |
| 26 | LVDS1_DB3+ | DIFF | |
| 27 | LCD1_PWR | PWR | +3.3V/+5V |
| 28 | GND | GND | |
| 29 | LVDS1_B_CLK- | DIFF | |
| 30 | LVDS1_B_CLK+ | DIFF | |

2.4.19 Nano SIM Card Socket (CN29)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | UIM_PWR | PWR | |
| 2 | UIM_RST | IN | |
| 3 | UIM_CLK | IN | |
| 4 | N/A | N/A | |
| 5 | GND | GND | GND |
| 6 | N/A | N/A | |
| 7 | UIM_DATA | I/O | |
| 8 | N/A | N/A | |

2.4.20 4-pin FAN Connector (CN33)

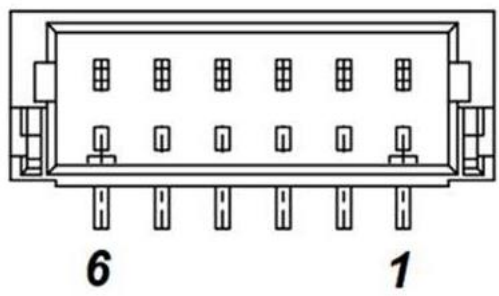


| Pin | Pin Name | Signal Type | Signal Level |
|-----|-----------|-------------|--------------|
| 1 | GND | GND | GND |
| 2 | FAN_POWER | PWR | +12V |
| 3 | FAN_TAC | IN | |

| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 4 | FAN_CTL | | |

Note: The driving current of FAN_POWER supports up to 1A.

2.4.21 LVDS Inverter/Backlight Connector (CN34)



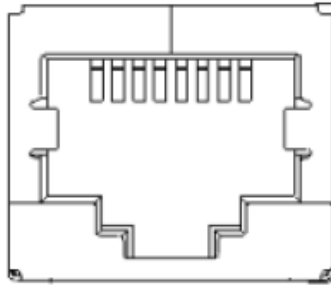
| Pin | Pin Name | Signal Type | Signal Level |
|-----|--------------|-------------|-------------------|
| 1 | BKL1_PWR | PWR | +5V(Default)/+12V |
| 2 | BKL1_PWR | PWR | +5V(Default)/+12V |
| 3 | BK1L_CONTROL | OUT | |
| 4 | GND | GND | |
| 5 | GND | GND | |
| 6 | BKL1_ENABLE | OUT | +3.3V |

Note: LVDS/BKL_PWR can be set to +12V or +5V by JP4.

Note: The driving current of BKL_PWR supports up to 2A.

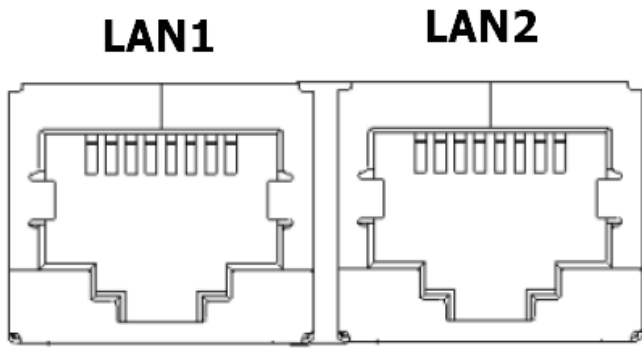
2.4.22 RJ-45 LAN Port 3 (CN35)

LAN3



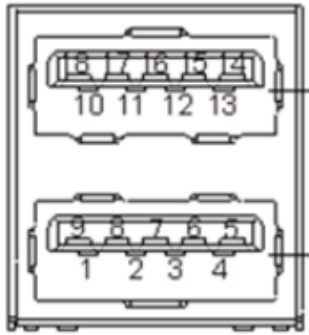
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | MDI0+ | DIFF | |
| 2 | MDI0- | DIFF | |
| 3 | MDI1+ | DIFF | |
| 4 | MDI2+ | DIFF | |
| 5 | MDI2- | DIFF | |
| 6 | MDI1- | DIFF | |
| 7 | MDI3+ | DIFF | |
| 8 | MDI3- | DIFF | |

2.4.23 RJ-45 LAN Port 1/Port 2 (CN36)



| Pin | Pin Name | Signal Type | Signal Level |
|------|-------------|-------------|--------------|
| 1P1 | LAN2_MDI0_P | DIFF | |
| 1P2 | LAN2_MDI0_N | DIFF | |
| 1P3 | LAN2_MDI1_P | DIFF | |
| 1P4 | LAN2_MDI1_N | DIFF | |
| 1P7 | LAN2_MDI2_P | DIFF | |
| 1P8 | LAN2_MDI2_N | DIFF | |
| 1P9 | LAN2_MDI3_P | DIFF | |
| 1P10 | LAN2_MDI3_N | DIFF | |
| 2P1 | LAN1_MDI0_P | DIFF | |
| 2P2 | LAN1_MDI0_N | DIFF | |
| 2P3 | LAN1_MDI1_P | DIFF | |
| 2P4 | LAN1_MDI1_N | DIFF | |
| 2P7 | LAN1_MDI2_P | DIFF | |
| 2P8 | LAN1_MDI2_N | DIFF | |
| 2P9 | LAN1_MDI3_P | DIFF | |
| 2P10 | LAN1_MDI3_N | DIFF | |

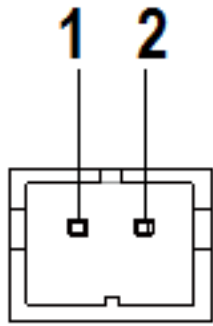
2.4.24 USB 3.2/USB 2.0 Port 1/Port 2 (CN37)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|------------|-------------|--------------|
| 1 | +5VSB | PWR | +5V |
| 2 | USB2_1_DN | DIFF | |
| 3 | USB2_1_DP | DIFF | |
| 4 | GND | GND | GND |
| 5 | USB3_1_RXN | DIFF | |
| 6 | USB3_1_RXP | DIFF | |
| 7 | GND | GND | GND |
| 8 | USB3_1_TXN | DIFF | |
| 9 | USB3_1_TXP | DIFF | |
| 10 | +5VSB | PWR | +5V |
| 11 | USB2_2_DN | DIFF | |
| 12 | USB2_2_DP | DIFF | |
| 13 | GND | GND | GND |
| 14 | USB3_2_RXN | DIFF | |
| 15 | USB3_2_RXP | DIFF | |
| 16 | GND | GND | GND |
| 17 | USB3_2_TXN | DIFF | |
| 18 | USB3_2_TXP | DIFF | |

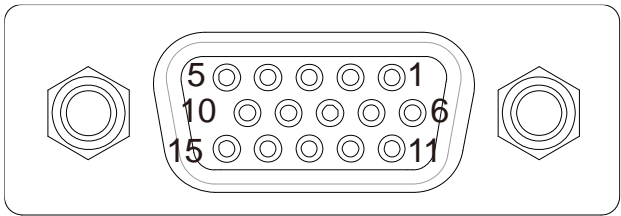
Note: The driving current of +5VSB supports up to 0.9A/Port.

2.4.25 RTC Battery Connector (CN39)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +3.3V | PWR | +3.3V |
| 2 | GND | GND | GND |

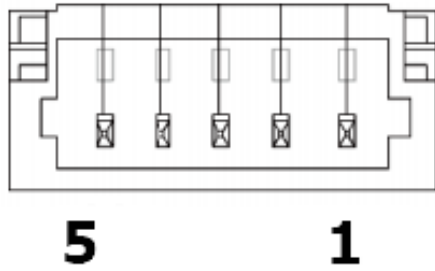
2.4.26 CRT Connector (CN40)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|---------------|-------------|--------------|
| 1 | RED | OUT | |
| 2 | GREEN | OUT | |
| 3 | BLUE | OUT | |
| 4 | NC | NC | |
| 5 | GND | GND | |
| 6 | RED_GND_RTN | GND | |
| 7 | GREEN_GND_RTN | GND | |
| 8 | BLUE_GND_RTN | GND | |
| 9 | +5V | PWR | +5V |

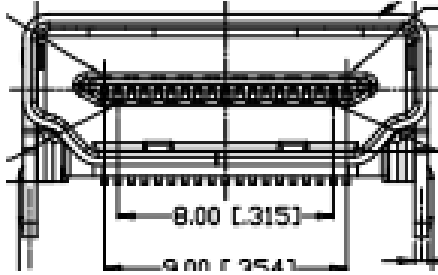
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 10 | GND | GND | |
| 11 | NC | NC | |
| 12 | DDC_DATA | I/O | +5V |
| 13 | HSYNC | OUT | |
| 14 | VSYNC | OUT | |
| 15 | DDC_CLK | I/O | +5V |

2.4.27 I2C/SMBus Connector (CN42)



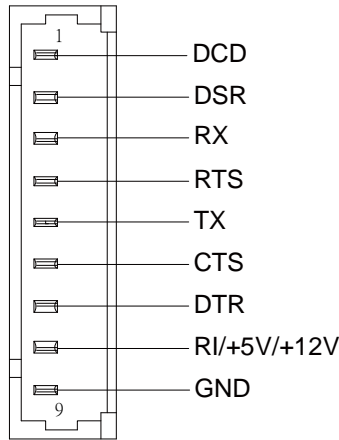
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------------------------------|-------------|--------------|
| 1 | +V3P3A/ +V3P3S | PWR | +3.3V |
| 2 | SMB_CLK/ I2C_CLK/TIME_SYNC0 | OUT | |
| 3 | SMB_DAT/ I2C_DAT/TIME_SYNC1 | I/O | |
| 4 | SMB_ALERT/ INT_SERIRQ/LAN_SDP | IN | |
| 5 | GND | GND | GND |

2.4.28 HDMI Connector (CN43)



| Pin | Pin Name | Signal Type | Signal Level |
|-----|-----------|-------------|--------------|
| 1 | HDMI_TX2+ | DIFF | |
| 2 | GND | GND | GND |
| 3 | HDMI_TX2- | DIFF | |
| 4 | HDMI_TX1+ | DIFF | |
| 5 | GND | GND | GND |
| 6 | HDMI_TX1- | DIFF | |
| 7 | HDMI_TX0+ | DIFF | |
| 8 | GND | GND | GND |
| 9 | HDMI_TX0- | DIFF | |
| 10 | HDMI_CLK+ | DIFF | |
| 11 | GND | GND | GND |
| 12 | HDMI_CLK- | DIFF | |
| 13 | N/A | N/A | N/A |
| 14 | N/A | N/A | N/A |
| 15 | DDC_CLK | I/O | |
| 16 | DDC_DATA | I/O | |
| 17 | GND | GND | GND |
| 18 | +V5S | PWR | +5V |
| 19 | HDMI_HPD | IN | |

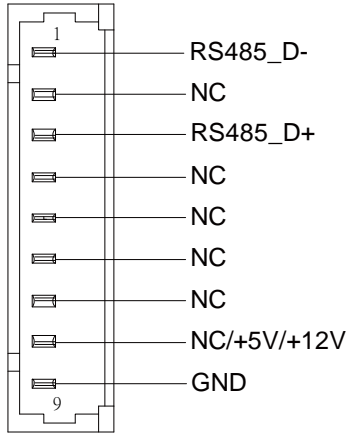
2.4.29 COM Port 1 (CN44)



RS-232

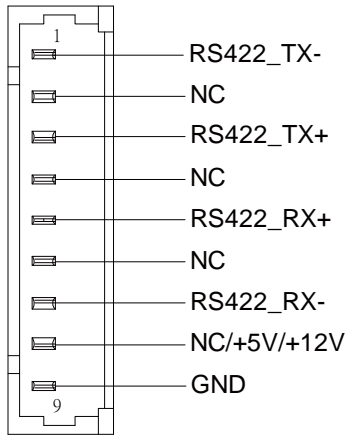
| Pin | Pin Name | Signal Type | Signal Level |
|-----|-------------|-------------|--------------|
| 1 | DCD | IN | |
| 2 | DSR | IN | |
| 3 | RX | IN | |
| 4 | RTS | OUT | ±9V |
| 5 | TX | OUT | ±9V |
| 6 | CTS | IN | |
| 7 | DTR | OUT | ±9V |
| 8 | RI/+5V/+12V | IN/ PWR | +5V/+12V |
| 9 | GND | GND | |

RS-485



| RS-485 | | | |
|--------|-------------|-------------|--------------|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | RS485_D- | I/O | ±5V |
| 2 | NC | | |
| 3 | RS485_D+ | I/O | ±5V |
| 4 | NC | | |
| 5 | NC | | |
| 6 | NC | | |
| 7 | NC | | |
| 8 | NC/+5V/+12V | PWR | +5V/+12V |
| 9 | GND | GND | |

RS-422

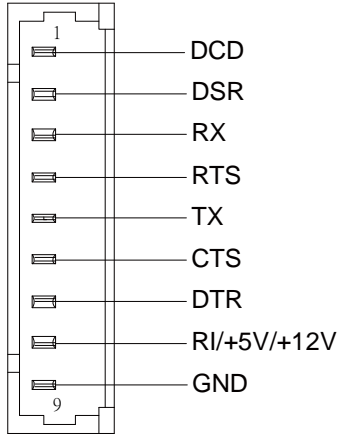


| RS-422 | | | |
|--------|-------------|-------------|--------------|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | RS422_TX- | OUT | ±5V |
| 2 | NC | | |
| 3 | RS422_TX+ | OUT | ±5V |
| 4 | NC | | |
| 5 | RS422_RX+ | IN | |
| 6 | NC | | |
| 7 | RS422_RX- | IN | |
| 8 | NC/+5V/+12V | PWR | +5V/+12V |
| 9 | GND | GND | |

Note: COM1 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

Note: Pin 8 function can be set by JP2.

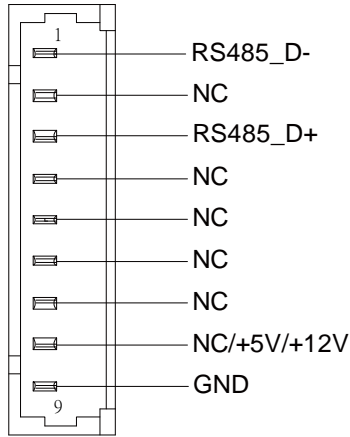
2.4.30 COM Port 2 (CN45)



RS-232

| Pin | Pin Name | Signal Type | Signal Level |
|-----|-------------|-------------|--------------|
| 1 | DCD | IN | |
| 2 | DSR | IN | |
| 3 | RX | IN | |
| 4 | RTS | OUT | ±9V |
| 5 | TX | OUT | ±9V |
| 6 | CTS | IN | |
| 7 | DTR | OUT | ±9V |
| 8 | RI/+5V/+12V | IN/ PWR | +5V/+12V |
| 9 | GND | GND | |

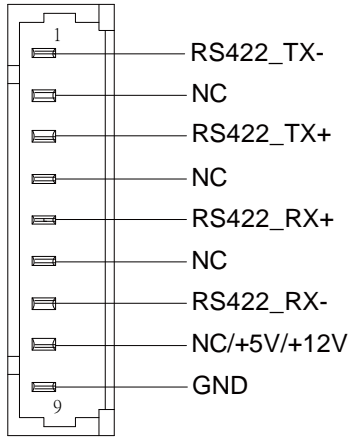
RS-485



RS-485

| Pin | Pin Name | Signal Type | Signal Level |
|-----|-------------|-------------|--------------|
| 1 | RS485_D- | I/O | ±5V |
| 2 | NC | | |
| 3 | RS485_D+ | I/O | ±5V |
| 4 | NC | | |
| 5 | NC | | |
| 6 | NC | | |
| 7 | NC | | |
| 8 | NC/+5V/+12V | PWR | +5V/+12V |
| 9 | GND | GND | |

RS-422

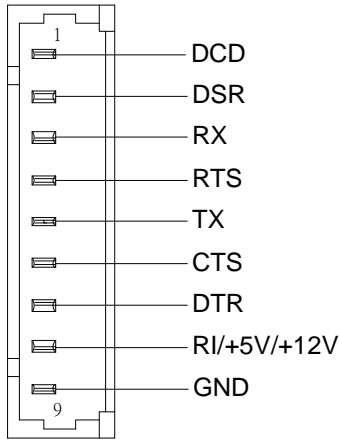


| RS-422 | | | |
|--------|-------------|-------------|--------------|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | RS422_TX- | OUT | ±5V |
| 2 | NC | | |
| 3 | RS422_TX+ | OUT | ±5V |
| 4 | NC | | |
| 5 | RS422_RX+ | IN | |
| 6 | NC | | |
| 7 | RS422_RX- | IN | |
| 8 | NC/+5V/+12V | PWR | +5V/+12V |
| 9 | GND | GND | |

Note: COM2 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

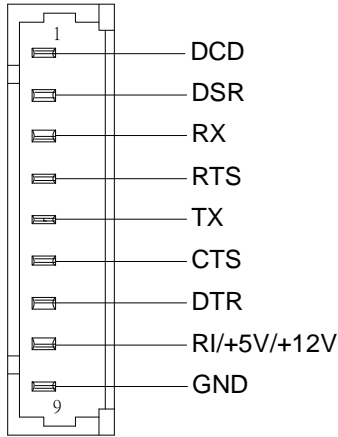
Note: Pin 8 function can be set by JP1.

2.4.31 COM Port 3 (CN46)



| RS-232 | | | |
|--------|----------|-------------|--------------|
| Pin | Pin Name | Signal Type | Signal Level |
| 1 | DCD | IN | |
| 2 | DSR | IN | |
| 3 | RX | IN | |
| 4 | RTS | OUT | ±9V |
| 5 | TX | OUT | ±9V |
| 6 | CTS | IN | |
| 7 | DTR | OUT | ±9V |
| 8 | RI | IN | |
| 9 | GND | GND | |

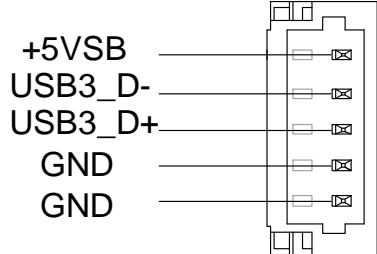
2.4.32 COM Port 4 (CN47)



RS-232

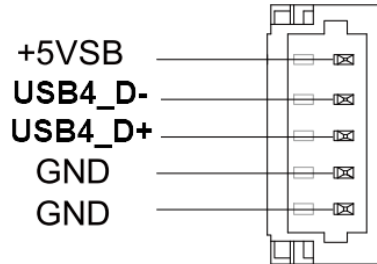
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | DCD | IN | |
| 2 | DSR | IN | |
| 3 | RX | IN | |
| 4 | RTS | OUT | ±9V |
| 5 | TX | OUT | ±9V |
| 6 | CTS | IN | |
| 7 | DTR | OUT | ±9V |
| 8 | RI | IN | |
| 9 | GND | GND | |

2.4.33 USB 2.0 Port 3 (CN48)



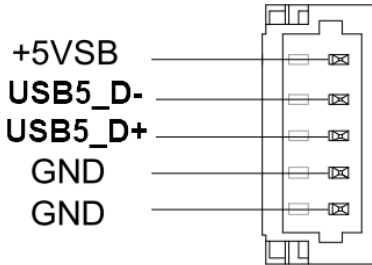
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +5VSB | PWR | +5V |
| 2 | USB_D- | DIFF | |
| 3 | USB_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | GND | GND | |

2.4.34 USB 2.0 Port 4 (CN49)



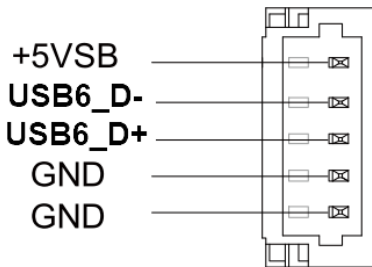
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +5VSB | PWR | +5V |
| 2 | USB_D- | DIFF | |
| 3 | USB_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | GND | GND | |

2.4.35 USB 2.0 Port 5 (CN50)



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

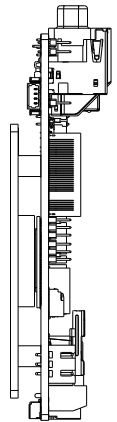
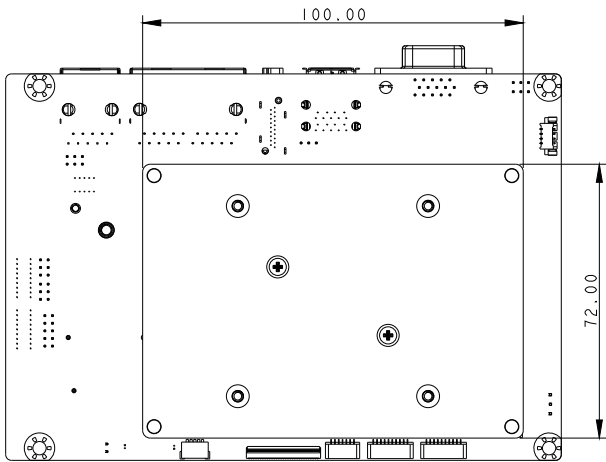
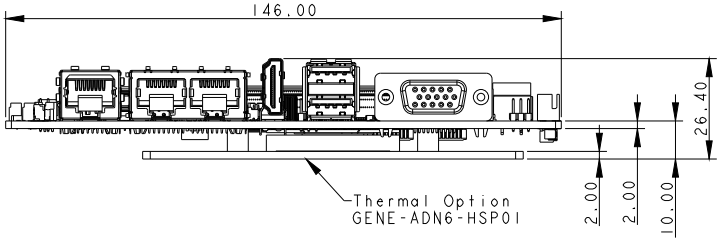
2.4.36 USB 2.0 Port 6 (CN53)



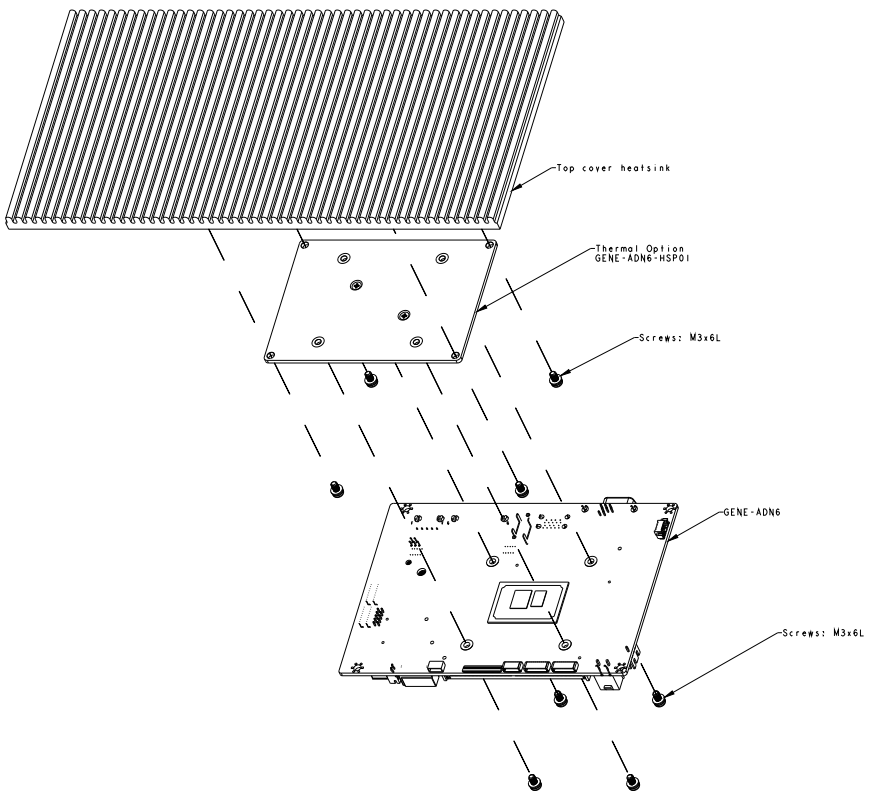
| Pin | Pin Name | Signal Type | Signal Level |
|-----|----------|-------------|--------------|
| 1 | +5VSB | PWR | +5V |
| 2 | USB_D- | DIFF | |
| 3 | USB_D+ | DIFF | |
| 4 | GND | GND | |
| 5 | GND | GND | |

2.5 Thermal Solutions

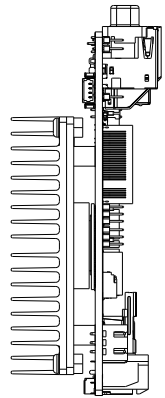
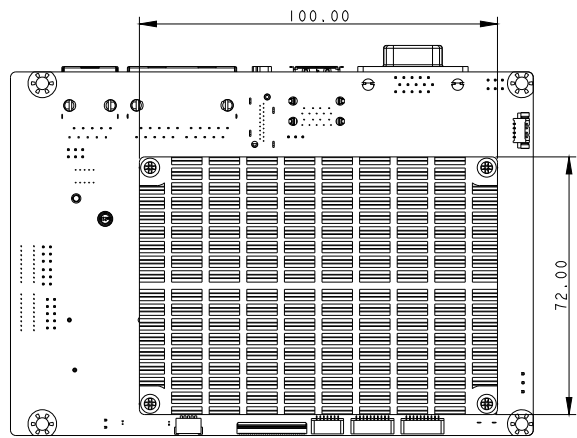
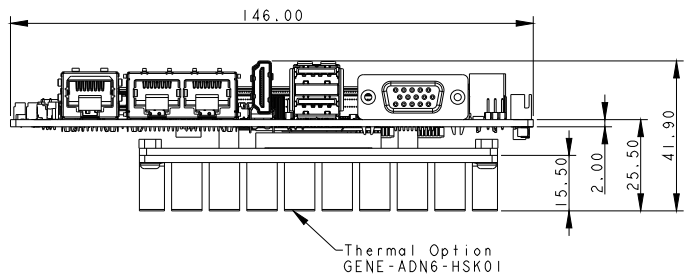
2.5.1 Heatspreader - GENE-ADN6-HSP01



GENE-ADN6-HSP01 Assembly



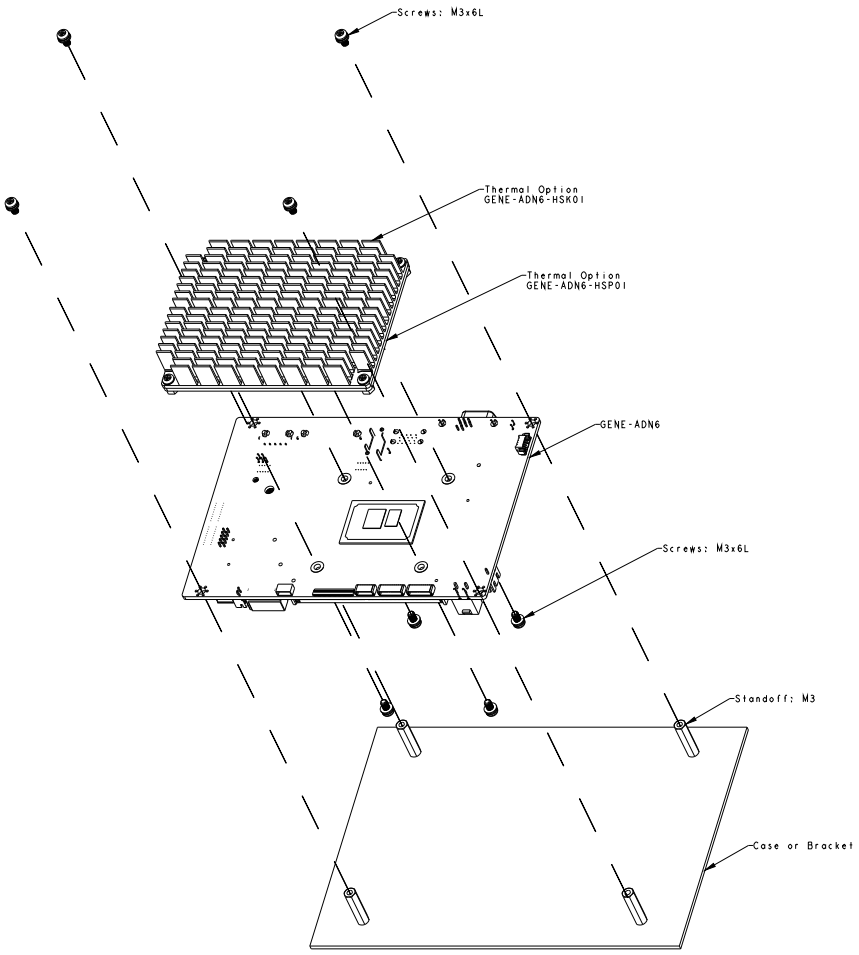
2.5.2 Heatsink Option 1- GENE-ADN6-HSK01



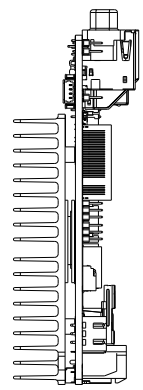
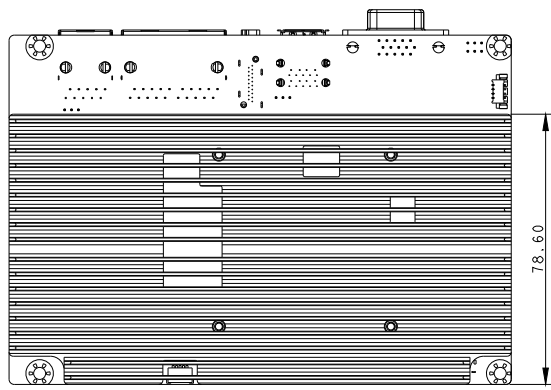
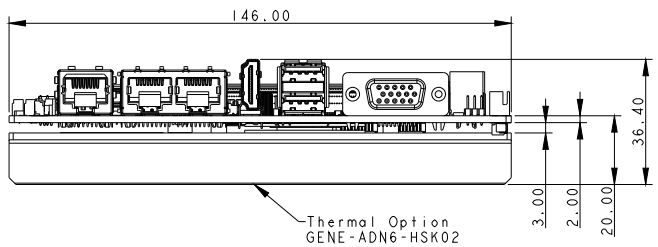
GENE-ADN6-HSK01 Assembly

3.5" Subcompact Board

GENE-ASL6



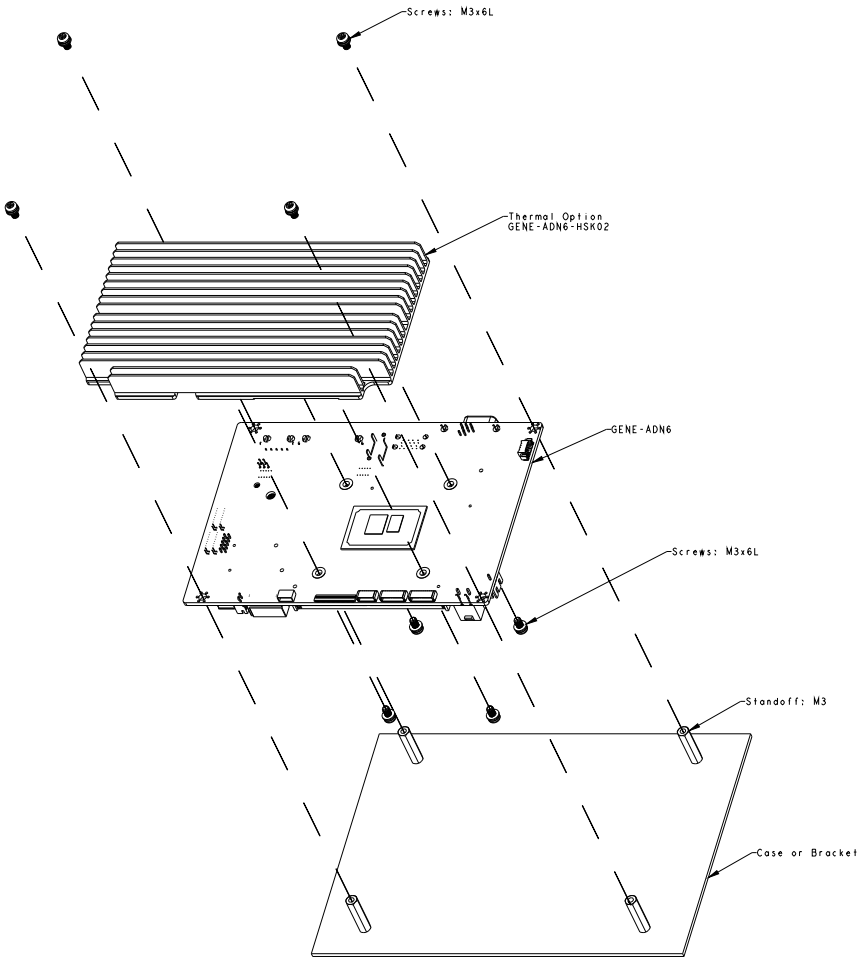
2.5.3 Heatsink Option 2- GENE-ADN6-HSK02



GENE-ADN6-HSK02 Assembly

3.5" Subcompact Board

GENE-ASL6



Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

These routines check the current system configuration stored in the CMOS memory and BIOS NVRAM. If system configuration is not found or system configuration data error is detected, system will load optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The system configuration is reset by Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The EPIC-ADN9 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM and BIOS NVRAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press or <ESC> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable/disable boot option for legacy network devices.

Chipset

Host bridge parameters.

Boot

Enables/disables quiet boot option.

Security

Set setup administrator password.

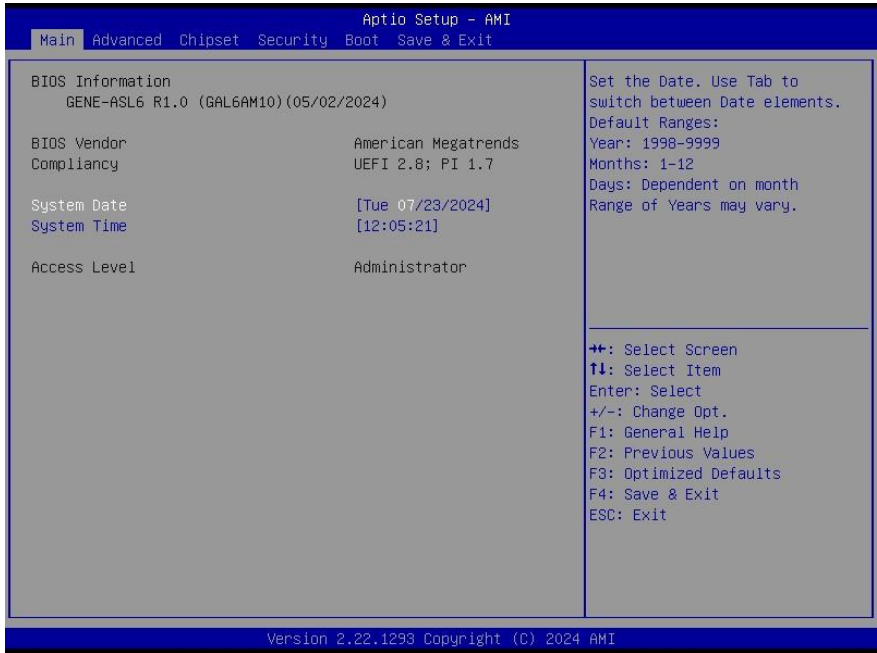
Save & Exit

Exit system setup after saving the changes.

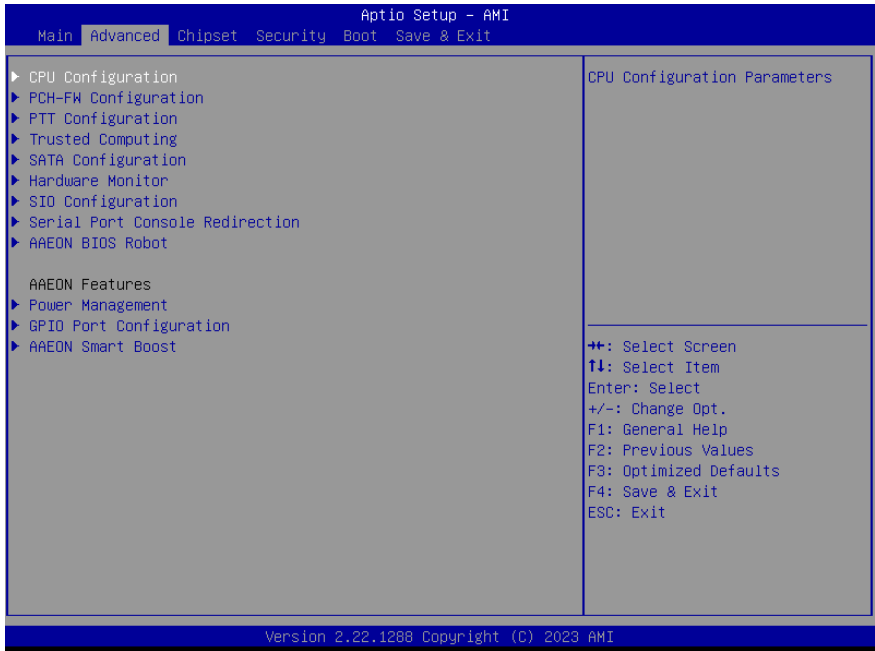
Intel® AMT Configuration

Configure user content preferences.

3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced

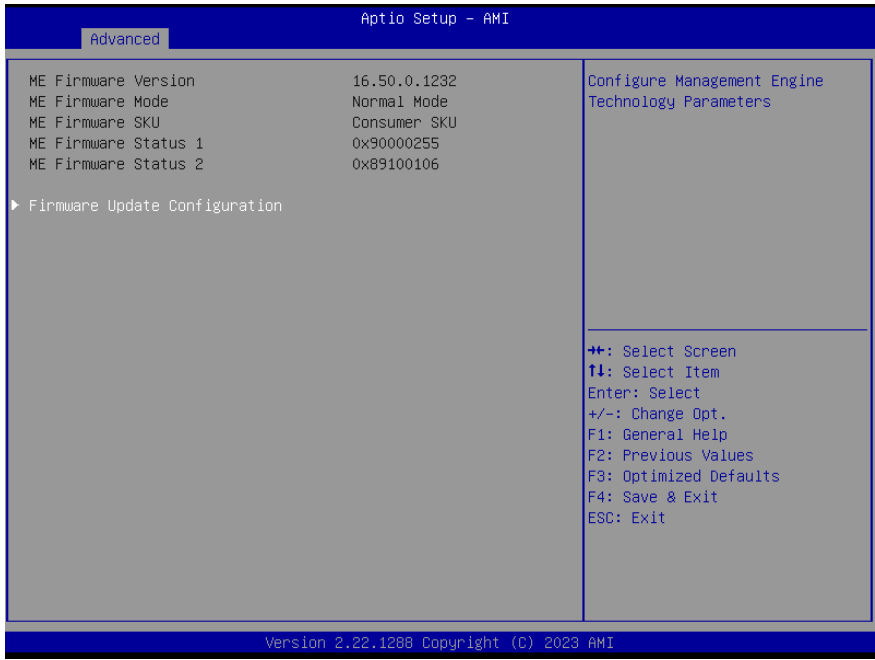


3.4.1 CPU Configuration

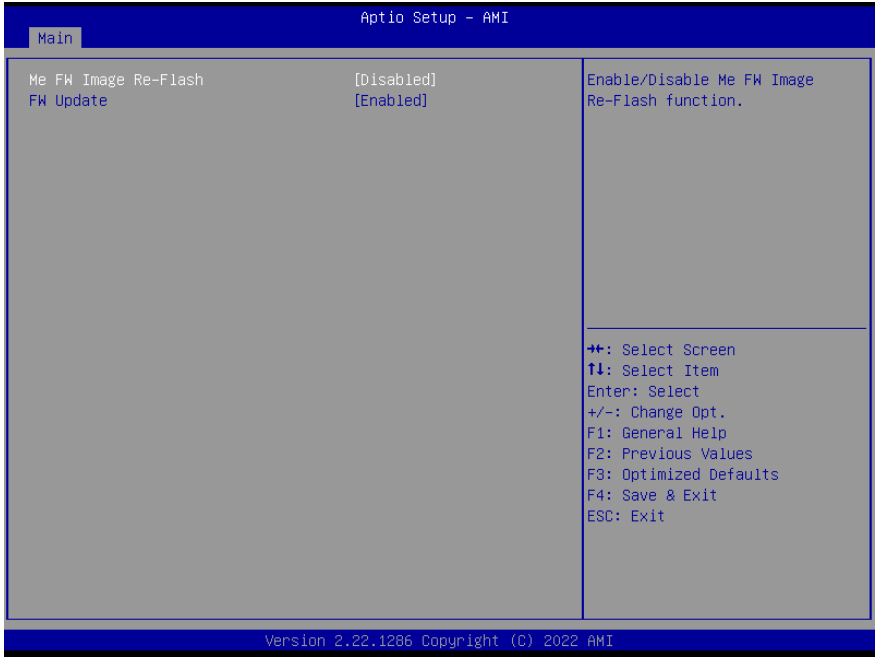


| Options Summary | | |
|---|----------|-----------------------------------|
| Intel (VMX) Virtualization Technology | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. | | |
| Intel® 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 or Disable processor Turbo Mode (requires EMTTM enable too). AUTO means enabled | | |
| 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 PCH-FW Configuration



3.4.3 Firmware Update Configuration



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

3.4.4 PTT Configuration



| Options Summary | | |
|---|------|-----------------------------------|
| TPM Device Selection | dTPM | Optimal Default, Failsafe Default |
| | PTT | |
| <p>Selects TPM device: PTT or discrete TPM. PTT - enables PTT in SkuMgr. dTPM - disables PTT in SkuMgr. Warning! PTT/dTPM will be disabled and all data saved on it will be lost.</p> | | |

3.4.5 Trusted Computing

Aptio Setup - AMI

Advanced

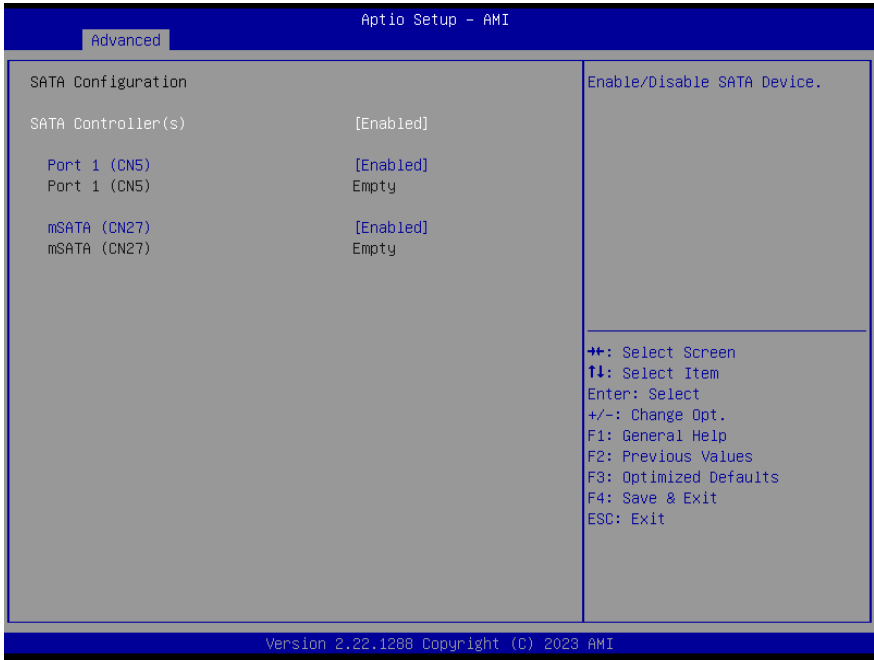
| | |
|--|--|
| <p>TPM 2.0 Device Found Firmware Version: 7.2 Vendor: NTC</p> <p>Security Device Support [Enabled] Active PCR banks SHA256 Available PCR banks SHA256,SHA384</p> <p>SHA256 PCR Bank [Enabled] SHA384 PCR Bank [Disabled]</p> <p>Pending operation [None] Platform Hierarchy [Enabled] Storage Hierarchy [Enabled] Endorsement Hierarchy [Enabled] Physical Presence Spec Version [1.3] TPM 2.0 InterfaceType [TIS] Device Select [TPM 2.0]</p> | <p>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.</p> <hr/> <p> ++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </p> |
|--|--|

Version 2.22.1286 Copyright (C) 2022 AMI

| Options Summary | | |
|---|-----------|-----------------------------------|
| Security Deice 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 | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or Disable SHA256 PCR Bank. | | |
| SHA384 PCR Bank | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| 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. | | |

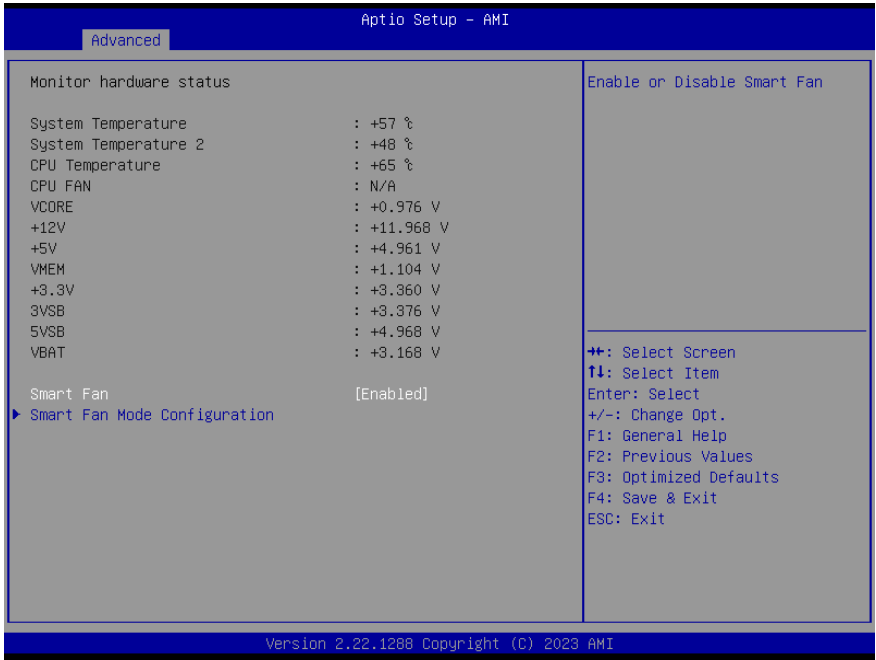
| Options Summary | | |
|---|----------|-----------------------------------|
| Platform Hierarchy | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or Disable Platform Hierarchy | | |
| Storage Hierarchy | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or Disable Storage Hierarchy | | |
| Endorsement Hierarchy | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or Disable Endorsement Hierarchy | | |
| 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 | | |
| Device Select | Auto | |
| | TPM 1.2 | |
| | TPM 2.0 | 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. | | |

3.4.6 SATA Configuration



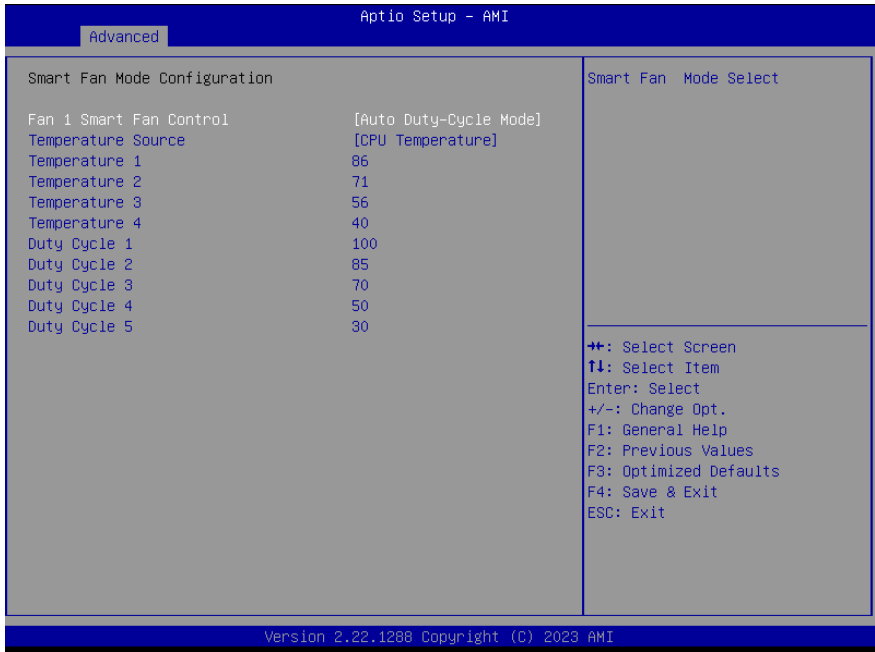
| Options Summary | | |
|------------------------------|----------|-----------------------------------|
| SATA Controller(s) | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable/Disable SATA Device. | | |
| Port 1(CN5) | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or Disable SATA Port. | | |
| mSATA (CN27) | Enabled | Optimal Default, Failsafe Default |
| | Disabled | |
| Enable or Disable SATA Port. | | |

3.4.7 Hardware Monitor



| Options Summary | | |
|--------------------------------|---------|-----------------------------------|
| Smart Fan | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enables or Disables Smart Fan. | | |

3.4.7.1 Smart Fan Mode Configuration

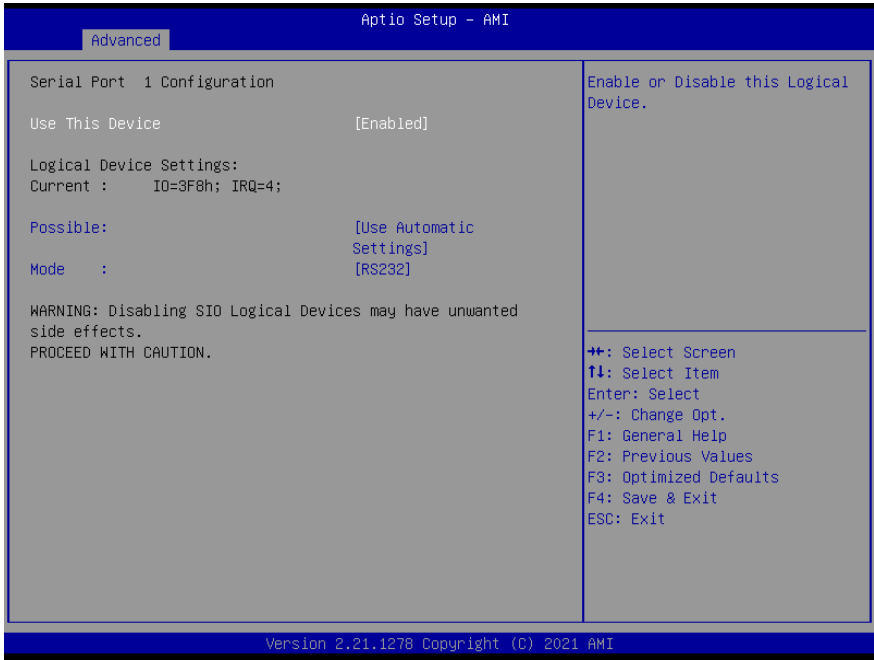


| Options Summary | | |
|--|----------------------|-----------------------------------|
| Fan 1 Smart Fan Control | Manual Duty Mode | |
| | Auto Duty-Cycle Mode | Optimal Default, Failsafe Default |
| Smart Fan Mode Select. | | |
| Temperature Source | CPU Temperature | Optimal Default, Failsafe Default |
| | System Temperature | |
| | System Temperature 2 | |
| Select the monitored temperature source for this fan. | | |
| Temperature 1 | 86 | |
| Duty Cycle 1 | 100 | |
| Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100. | | |

3.4.8 SIO Configuration

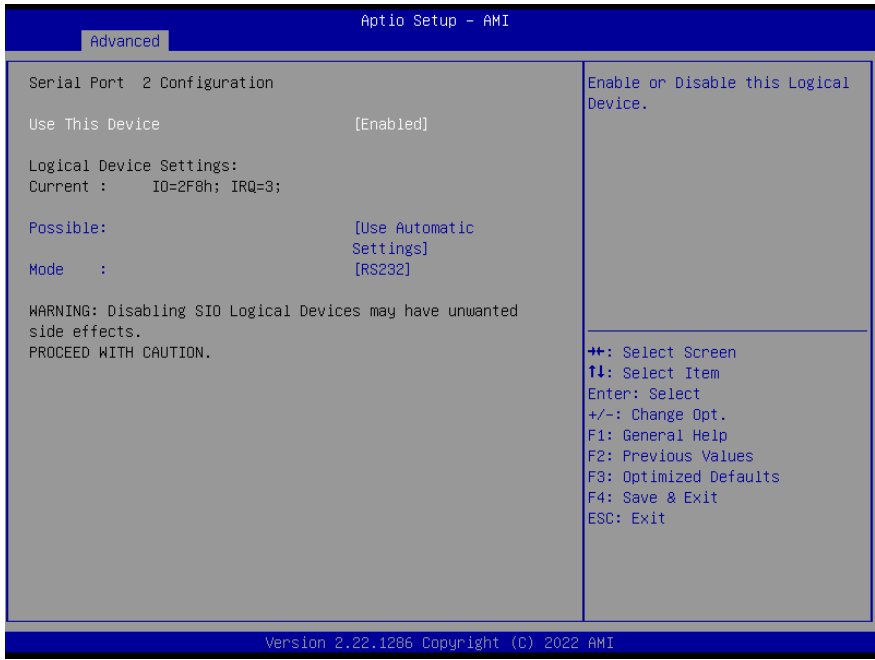


3.4.8.1 Serial Port 1 Configuration



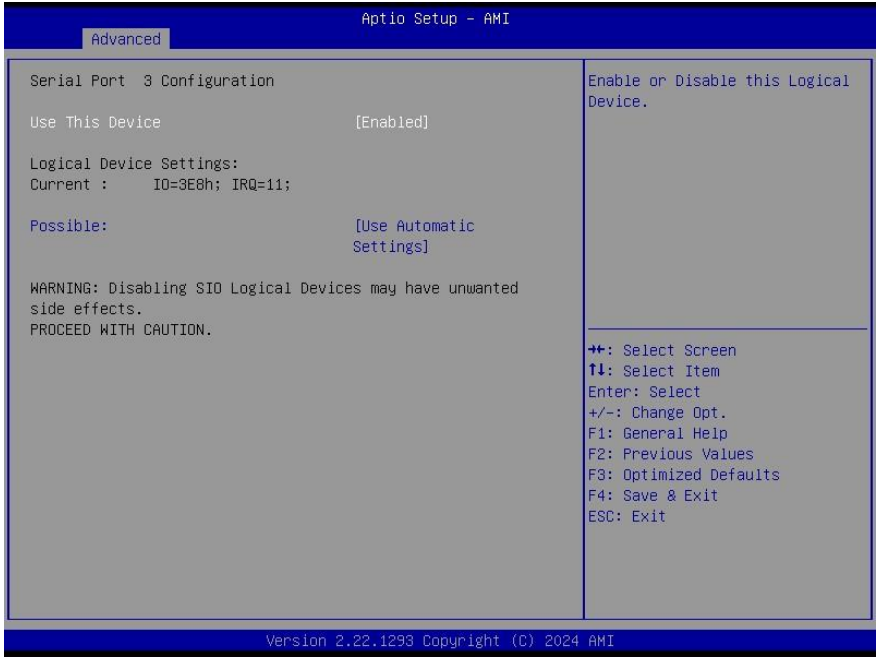
| Options Summary | | |
|--|------------------------|-----------------------------------|
| Use This Device | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device. | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=3F8h; IRQ=4 | |
| | IO=2F8h; IRQ=3 | |
| Allows user to change Device's 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. | | |

3.4.8.2 Serial Port 2 Configuration



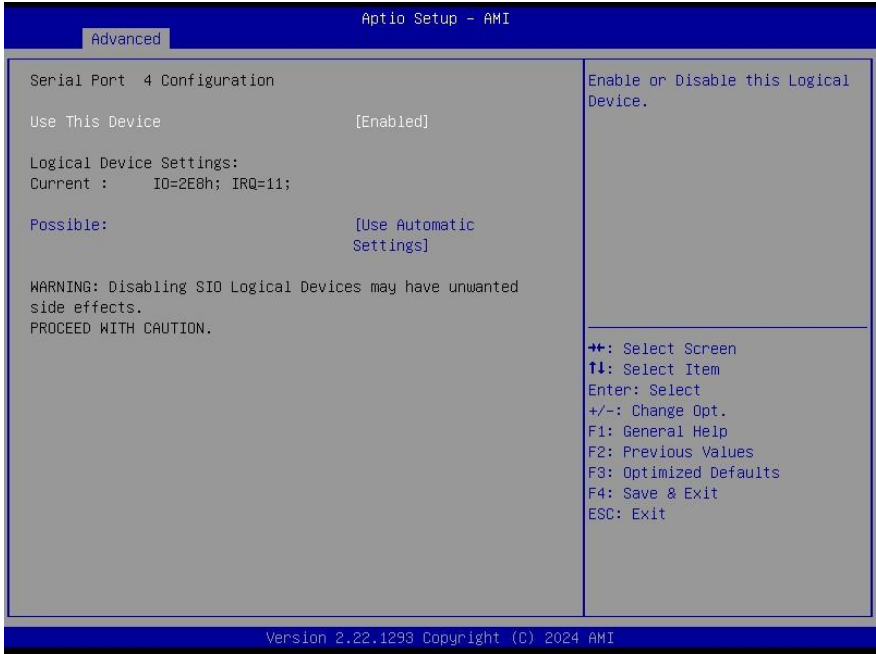
| Options Summary | | |
|--|------------------------|-----------------------------------|
| Use This Device | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device. | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2F8h; IRQ=3 | |
| | IO=3F8h; IRQ=4 | |
| Allows user to change Device's 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. | | |

3.4.8.3 Serial Port 3 Configuration



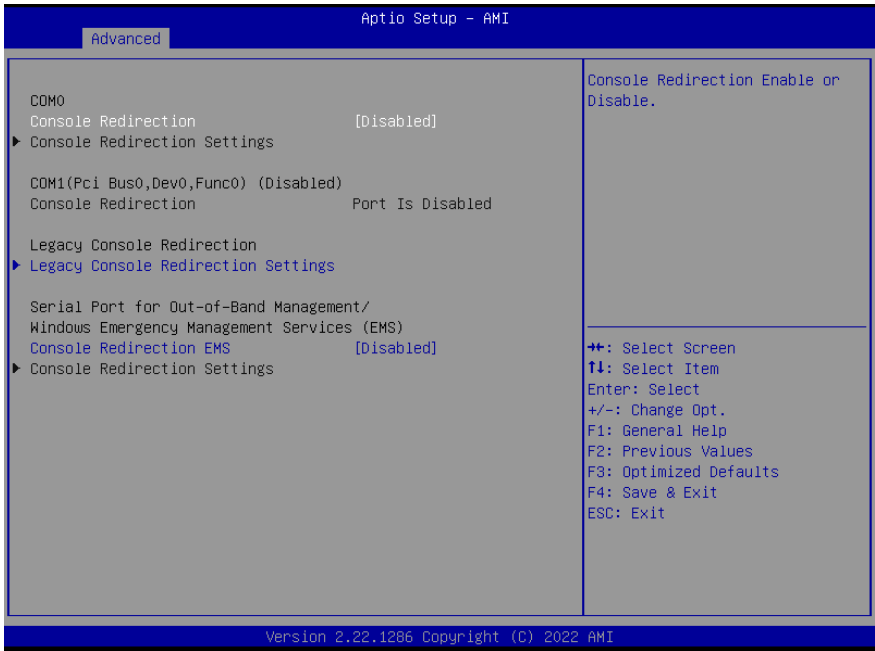
| Options Summary | | |
|--|------------------------|-----------------------------------|
| Use This Device | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device. | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=3E8h; IRQ=11 | |
| | IO=2E8h; IRQ=11 | |
| Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts. | | |

3.4.8.4 Serial Port 4 Configuration



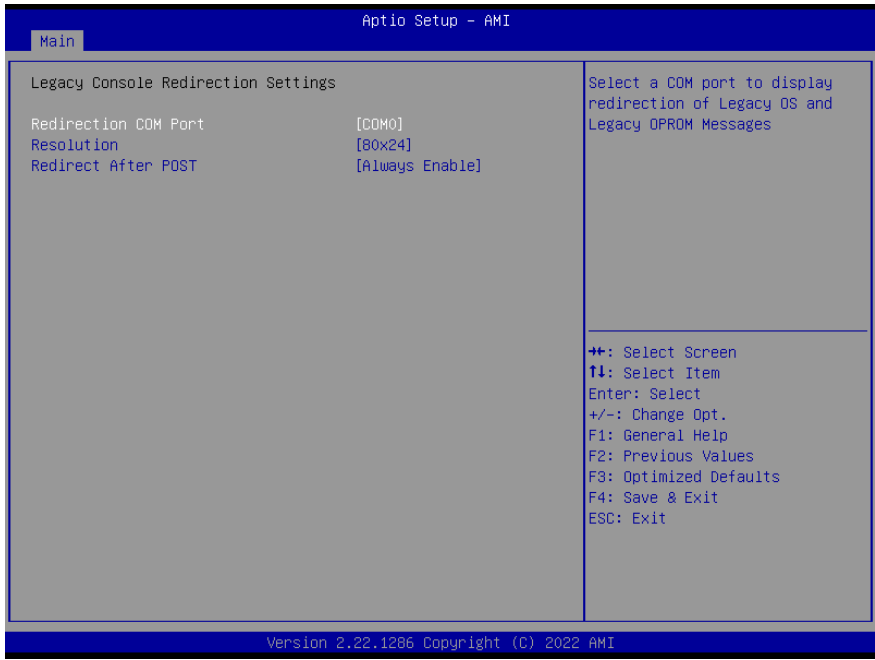
| Options Summary | | |
|--|------------------------|-----------------------------------|
| Use This Device | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device. | | |
| Possible: | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2E8h; IRQ=11 | |
| | IO=3E8h; IRQ=11 | |
| Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts. | | |

3.4.9 Serial Port Console Redirection



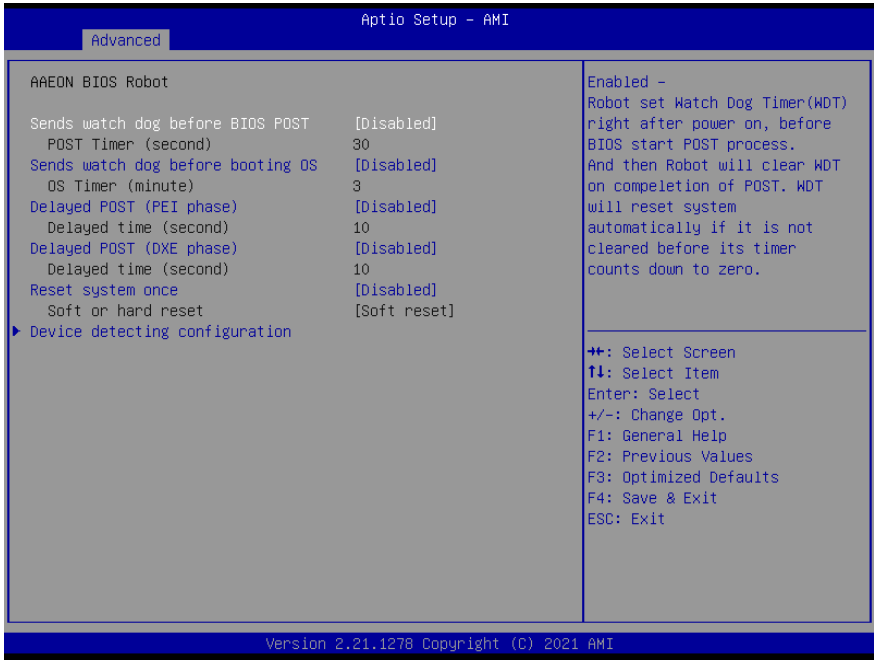
| Options Summary | | |
|--|----------|-----------------------------------|
| Console Redirection | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Console Redirection Enable or Disable. | | |
| Console Redirection EMS | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |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

3.4.10 Legacy Console Redirection Settings



| Options Summary | | |
|--|--|-----------------------------------|
| Redirection COM port | COM0 | Optimal Default, Failsafe Default |
| | COM1(Pci Bus0, Dev0, Func0) (Disabled) | |
| Select a COM Port to display redirection of Legacy OS and Legacy OPRM message. | | |
| Resolution | 80x24 | Optimal Default, Failsafe Default |
| | 80x25 | |
| On Legacy OS, the number of Rows and Columns supported redirection. | | |
| Redirect After POST | Always Enable | Optimal Default, Failsafe Default |
| | BootLoader | |
| When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable. | | |

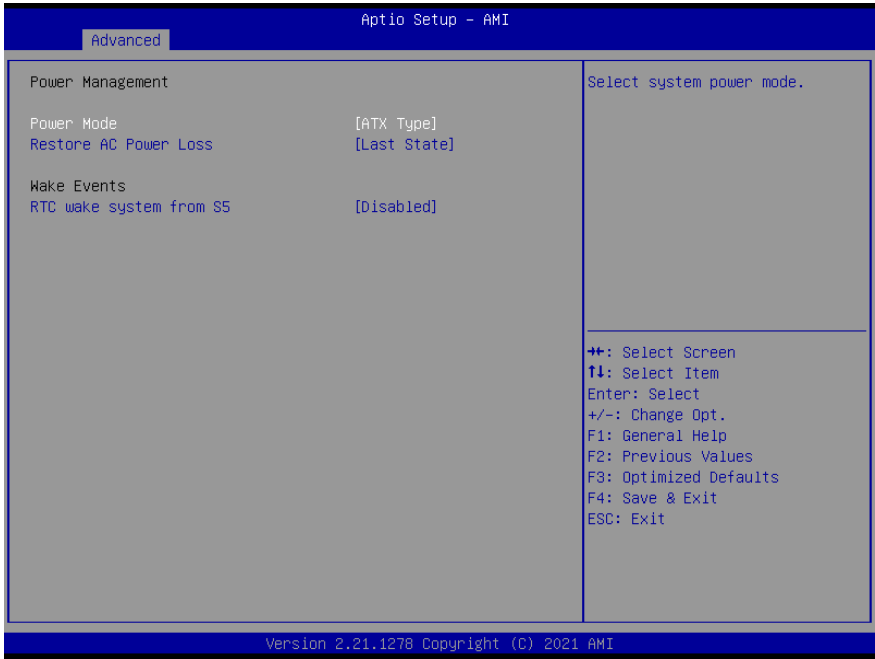
3.4.11 AAEON BIOS Robot



| 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 will reset system automatically if it is not cleared before its timer counts down to zero. | | |
| POST Timer (second) | 30 | Optimal Default, Failsafe Default |
| Timer count set to Watch Dog Timer for POST. WARNING: Do not set to a value equal or shorter than normal POST time, otherwise system may never complete POST unless clearing BIOS settings. More than 2x normal POST time is suggested. | | |
| 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 is going to update itself. | | |

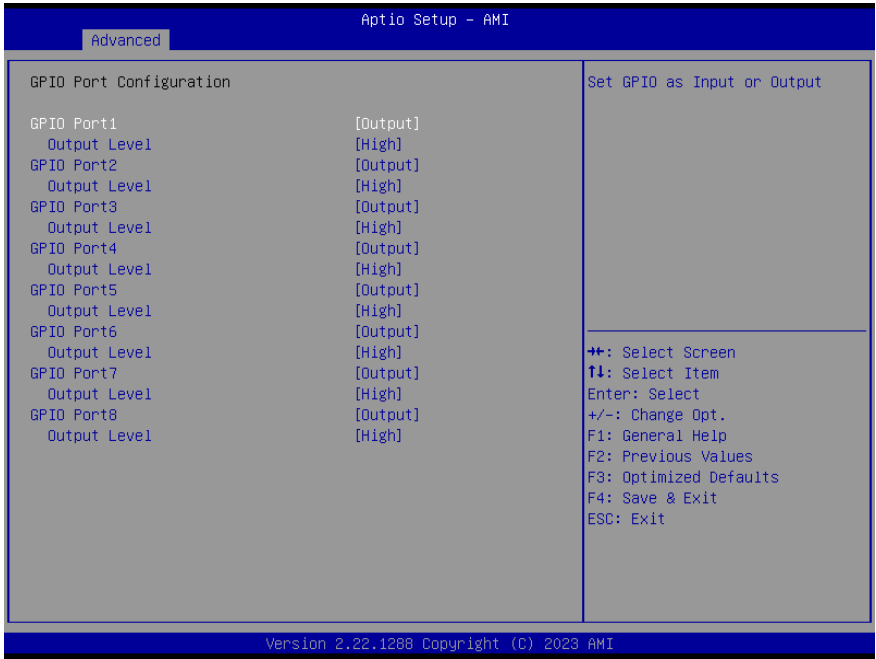
| Options Summary | | |
|--|-------------|-----------------------------------|
| OS Timer (minute) | 3 | Optimal Default, Failsafe Default |
| Timer count set to Watch Dog Timer for OS loading. | | |
| Delayed POST (PEI phase) | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enabled - 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 time (second) | 10 | Optimal Default, Failsafe Default |
| Period of time for Robot to hold BIOS from POST. | | |
| 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'. | | |
| Delayed time (second) | 10 | Optimal Default, Failsafe Default |
| Period of time for Robot to hold BIOS from POST. | | |
| Reset system once | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enabled - Robot resets system for one time on each boot. This will send a soft or hard reset to onboard devices, thus puts devices to more stable state. | | |
| Soft or hard reset | Soft reset | Optimal Default, Failsafe Default |
| | Hard reset" | |
| Select reset type robot should send on each boot. | | |

3.4.12 Power Management



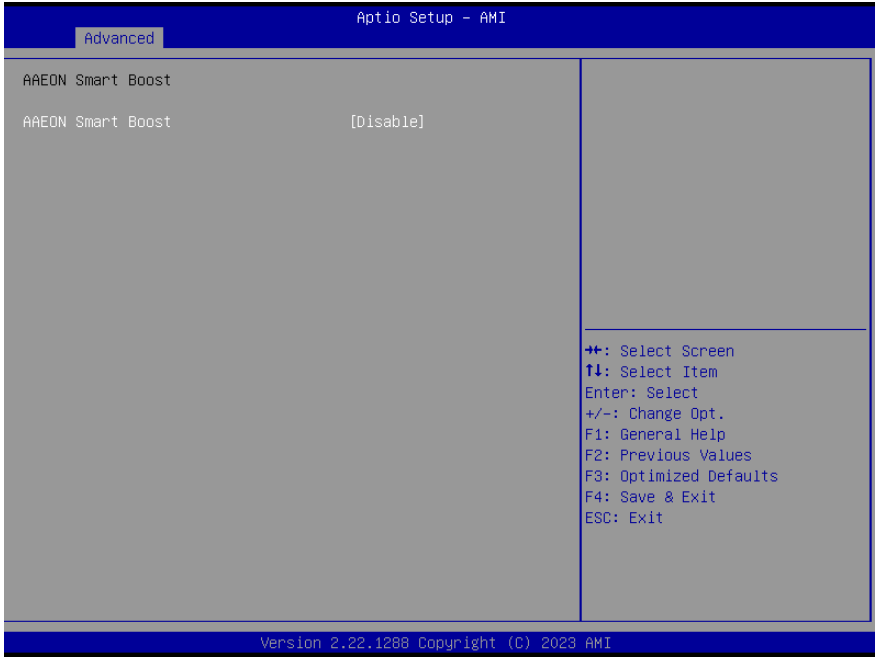
| Options Summary | | |
|---|------------|-----------------------------------|
| Power Mode | ATX Type | Optimal Default, Failsafe Default |
| | AT Type | |
| Select power supply mode. | | |
| Restore AC Power Loss | Last State | Optimal Default, Failsafe Default |
| | Always On | |
| | Always Off | |
| Select power state when power is re-applied after a power failure. | | |
| Soft-Off (S5) Wake On RTC | Disable | Optimal Default, Failsafe Default |
| | By Date | |
| | By Weekday | |
| | Bypass | |
| By Date: System will wake on the with hr::min::sec specified. By Weekday: System will wake on the enabled weekday with hr::min::sec specified. Bypass: BIOS will not control RTC wake function. | | |

3.4.13 GPIO Port Configuration



| Options Summary | | |
|---|--------|--|
| GPIO Port* | Output | |
| | Input | |
| Set GPIO as Input or Output. | | |
| Output Level | High | |
| | Low | |
| Set output level when GPIO pin is Output. | | |

3.4.14 AAEON Smart Boost

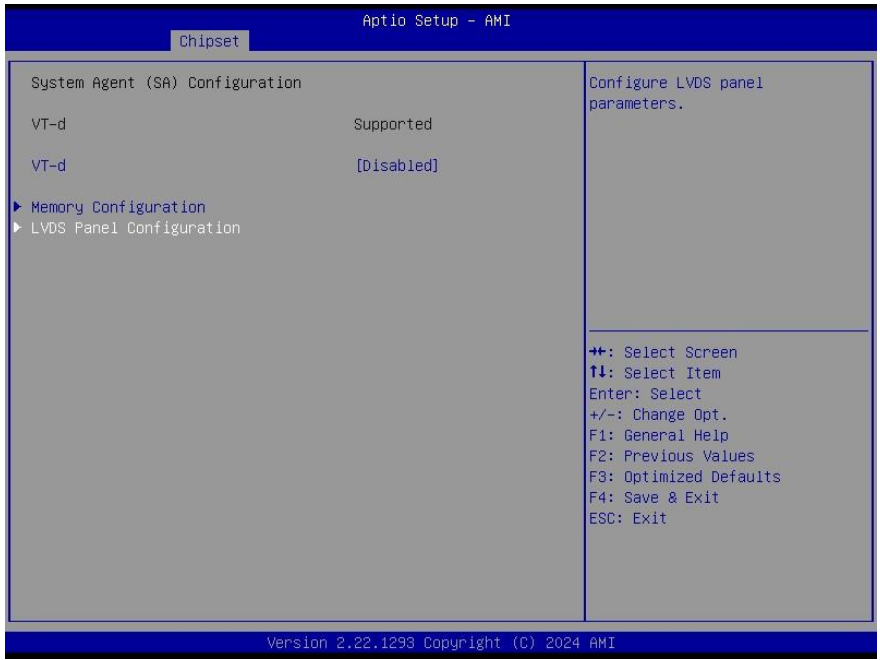


| Options Summary | | |
|-------------------|---------------------|-----------------------------------|
| AAEON Smart Boost | Smart Boost | |
| | Maximum Performance | |
| | Good Stability | |
| | Disabled | Optimal Default, Failsafe Default |

3.5 Setup Submenu: Chipset



3.5.1 System Agent (SA) Configuration

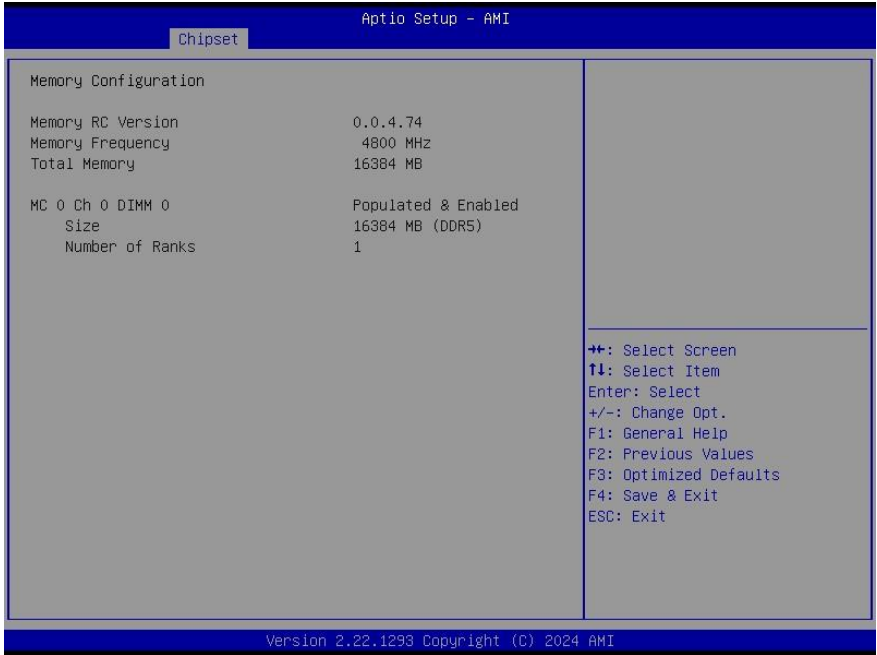


| Options Summary | | |
|------------------|----------|-----------------------------------|
| VT-d | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| VT-d capability. | | |

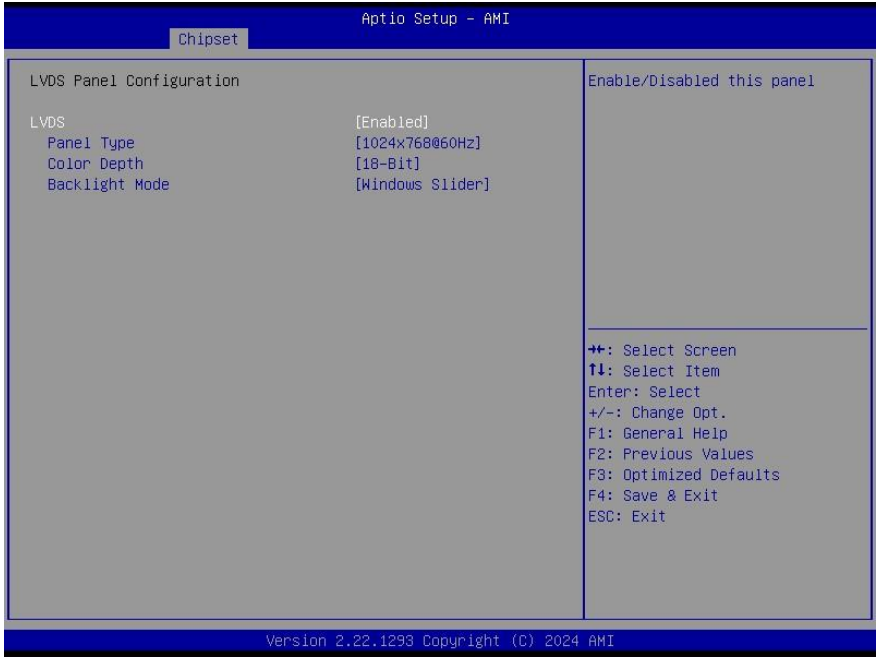
3.5.2 Memory Configuration

3.5" Subcompact Board

GENE-ASL6



3.5.3 LVDS Panel Configuration



| Options Summary | | |
|----------------------------|----------------|-----------------------------------|
| LVDS | 640x480@60Hz | |
| | 800x480@60Hz | |
| | 800x600@60Hz | |
| | 1024x600@60Hz | |
| | 1024x768@60Hz | Default |
| | 1280x768@60Hz | |
| | 1280x800@60Hz | |
| | 1280x1024@60Hz | |
| | 1366x768@60Hz | |
| | 1440x900@60Hz | |
| | 1600x1200@60Hz | |
| | 1920x1080@60Hz | |
| | 1920x1200@60Hz | |
| Enable/Disable this panel. | | |
| Panel Type | 18-Bit | Optimal Default, Failsafe Default |

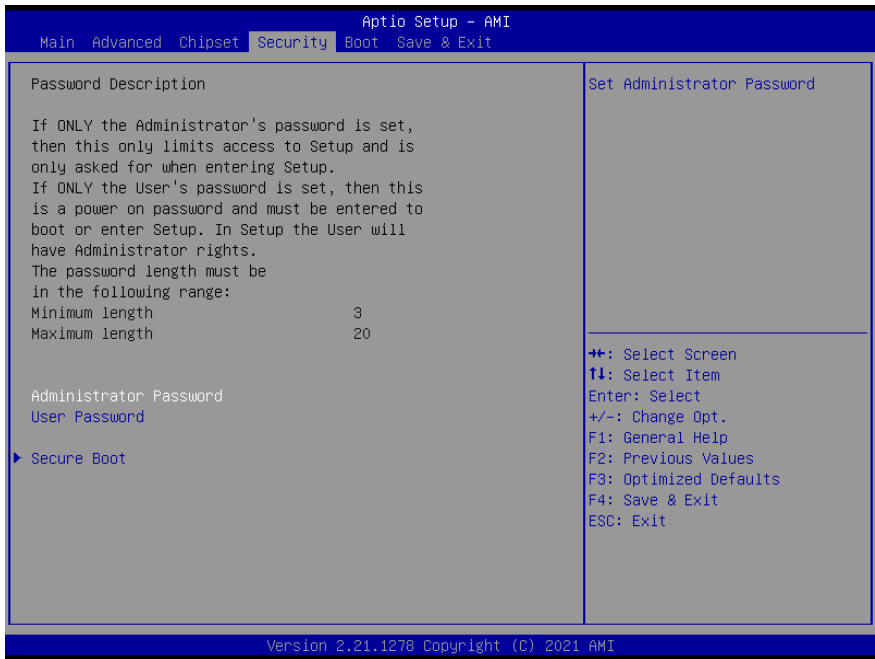
| Options Summary | | |
|---------------------------------------|--------------------|---------|
| | 24-Bit | |
| | 36-Bit | |
| | 48-Bit | |
| Select panel type. | | |
| Backlight Mode | BIOS & Application | Default |
| | Windows Slider | |
| Select backlight control signal type. | | |

3.5.4 PCH-IO Configuration



| Options Summary | | |
|--|----------|-----------------------------------|
| HD Audio | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Control Detection of the HD-Audio device. Disable = HAD will be unconditionally disabled Enable = HAD will be unconditionally enabled. | | |
| Full-Mini Card Slot Function (CN27) | SATA | Optimal Default, Failsafe Default |
| | PCIe | |
| Select function enabled for Full-Mini Card (CN27) slot. | | |

3.6 Setup Submenu: Security



Change User/Supervisor Password

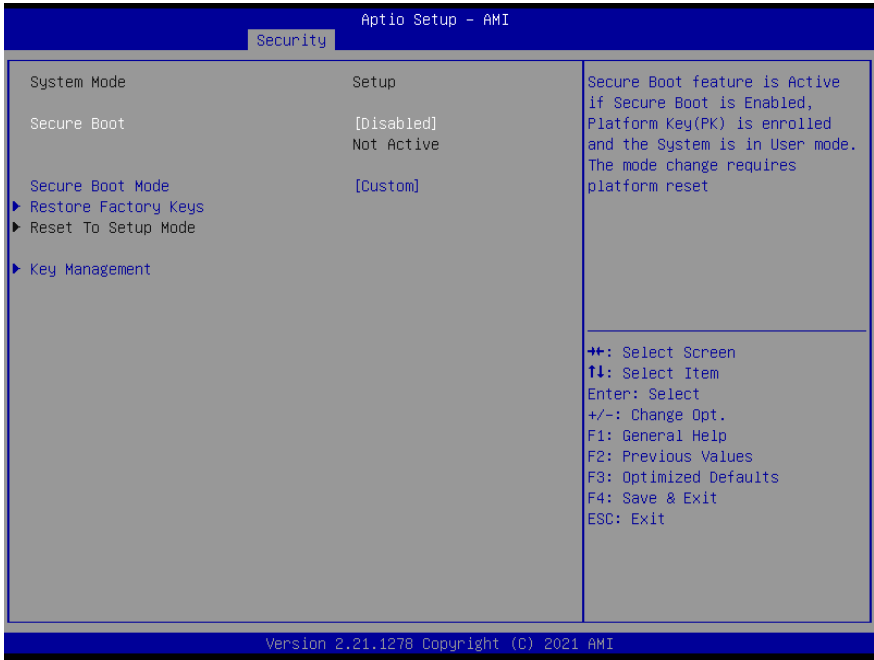
You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

If you highlight these items and press Enter, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

Removing the Password

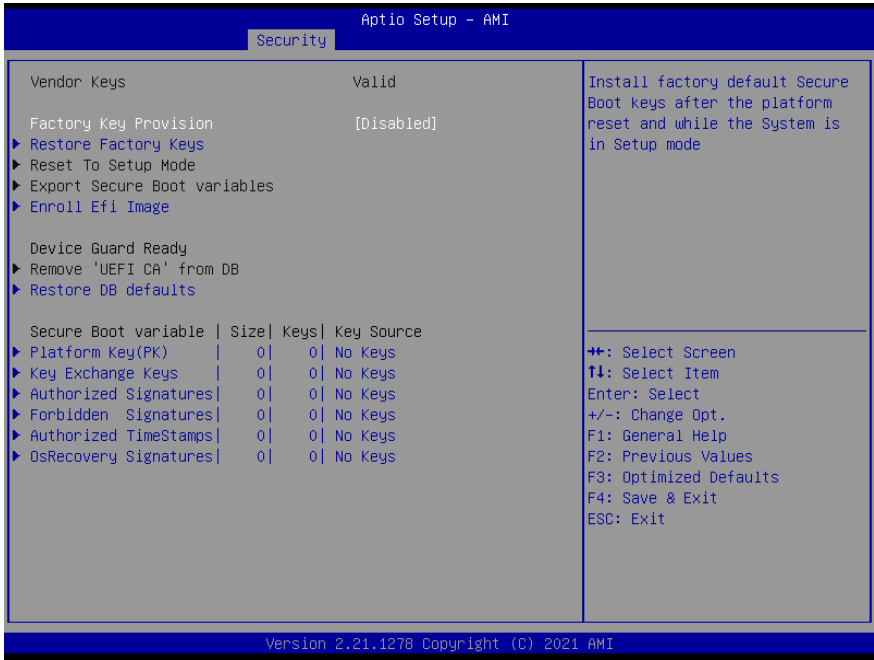
Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

3.6.1 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 | Custom | Optimal Default, Failsafe Default |
| | Standard | |
| 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 | | |
| Force System to User Mode. Install factory default Secure Boot key databases. | | |
| Reset to Setup Mode | | |
| Delete all Secure Boot key databases from NVRAM. | | |

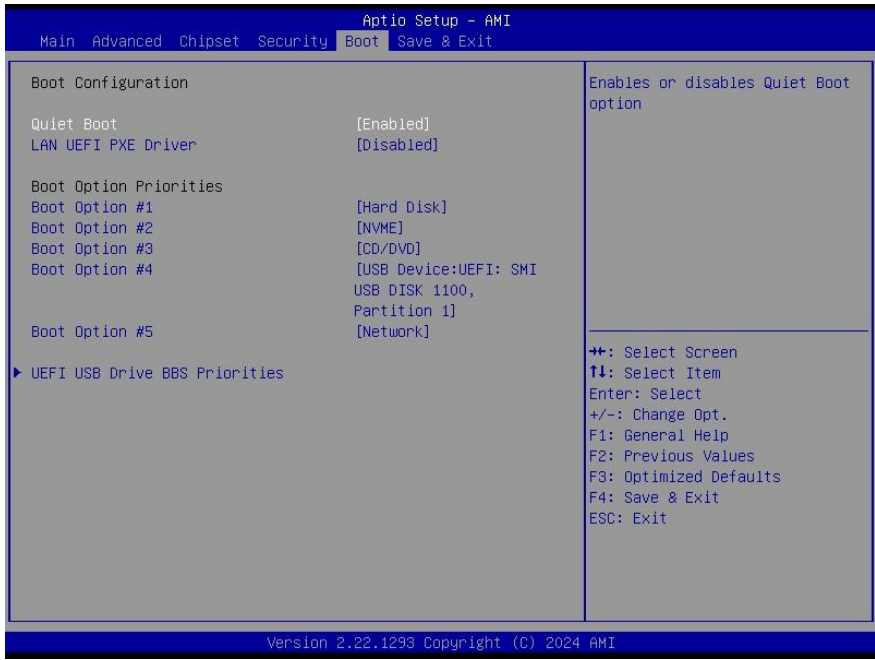
3.6.2 Key Management



| Options Summary | | |
|--|----------|-----------------------------------|
| Factory Key Provision | 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. | | |
| Restore Factory Keys | | |
| Force System to User Mode. Install factory default Secure Boot key databases. | | |
| Reset to Setup Mode | | |
| Delete all Secure Boot key databases from NVRAM. | | |
| Export Secure Boot variables | | |
| Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device. | | |
| Enroll Efi Image | | |
| Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db). | | |

| Options Summary | |
|--|---------|
| Remove 'UEFI CA' from DB | |
| Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db). | |
| Restore DB defaults | |
| Restore DB variable to factory defaults. | |
| Platform Key (PK) | Details |
| | Export |
| | Update |
| | Delete |
| Key Exchange Keys | Details |
| | Export |
| | Update |
| | Append |
| | Delete |
| Authorized Signatures | Details |
| | Export |
| | Update |
| | Append |
| | Delete |
| Forbidden Signatures | Details |
| | Export |
| | Update |
| | Append |
| | Delete |
| Authorized TimeStamps | Update |
| | Append |
| OsRecovery Signatures | Update |
| | Append |
| Enroll Factory Defaults or load certificates from a file: | |
| 1.Public Key Certificate: | |
| 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) | |
| Key Source: Factory, External, Mixed | |

3.7 Setup Submenu: Boot

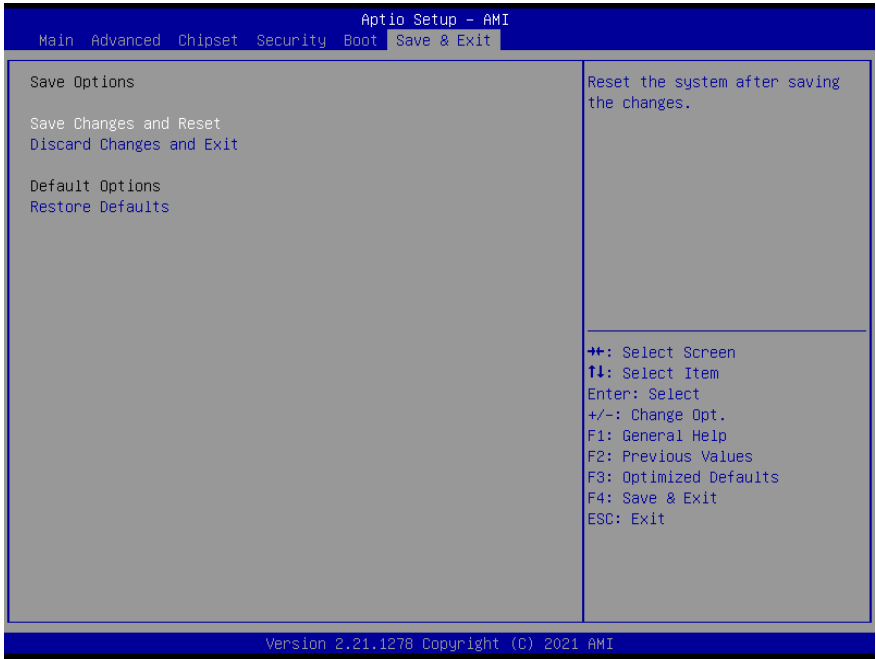


| Options Summary | | |
|--------------------------------------|----------|-----------------------------------|
| Quiet Boot | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Quiet Boot option. | | |
| UEFI PXE Support | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable/Disable UEFI Network Stack. | | |
| FIXED BOOT ORDER Priorities | | |
| Sets the system boot order. | | |

3.7.1 BBS Priorities



3.8 Setup Submenu: Save & Exit



| Options Summary | |
|--------------------------|--|
| Save Changes and Reset | Reset the system after saving the changes. |
| Discard Changes and Exit | Exit system setup without saving any changes. |
| Restore Defaults | Restore/Load Default values for all the setup options. |

Chapter 4

Driver Installation

4.1 Driver Download/Installation

Drivers for the GENE-ASL6 can be downloaded from the product page on the AAEON website by following this link:

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

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

Chipset Driver

1. Open the folder where you unzipped the **Chipset Drivers**.
2. Run the **SetupChipset.exe** file in the folder.
3. Follow the instructions.
4. Drivers will be installed automatically.

Graphics Driver

1. Open the **Graphics Driver** folder
2. Run the **Installer.exe** file in the folder.
3. Follow the instructions.
4. Drivers will be installed automatically.
5. Refer to the ReadMe.txt for any assistance.

LAN Driver

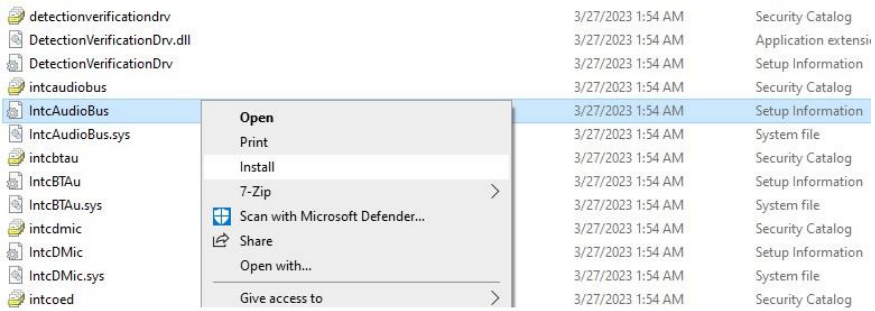
1. Open the folder where you unzipped the **LAN Drivers**.
2. Open the Device Manager by pressing Win + X and selecting "Device Manager."
3. Find the network adapter that corresponds to Intel I225/I226. It may be listed under "Network adapters."
4. Right-click on the network adapter and select "Update driver."
5. Choose "Browse my computer for drivers."
6. Navigate to the location where you extracted the driver files.
7. Follow the instructions.
8. Drivers will be installed automatically.

Install Intel Smart Sound Driver

1. Open the **Intel Smart Sound** folder
2. Navigate the folder as follows: **Production > Driver**, then follow the below instructions to install the BUS Driver (IntcAudioBus.inf) and OED Driver (IntcOED.inf).

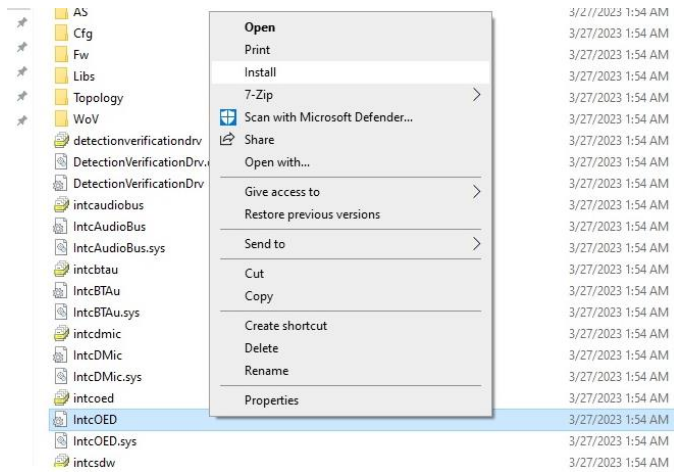
Install BUS driver (IntcAudioBus.inf)

- a. Press Right Key -> Install



Install OED driver (IntcOED.inf)

- b. Press Right Key -> Install



Install Realtek Audio Driver

1. Open the **Windows Audio** folder followed by **Setup.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Install Peripheral Driver

1. Open the **Peripheral Driver** folder
2. Open the **SetupSerialO.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

Install SIO Driver

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

Install Intel CSME Driver

1. Open the **Intel CSME** folder
2. Open the **SetupME.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

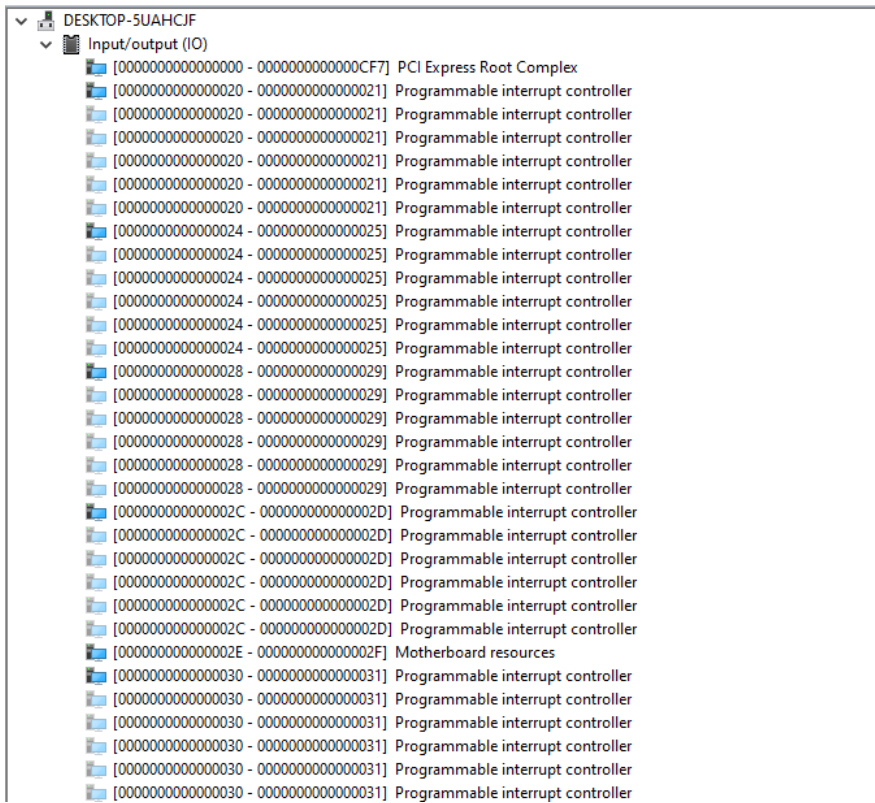
Install Camera Driver

1. Open the **Camera Driver** folder
2. Follow the instructions provided in the **Documentation** subfolder to manually install drivers

Appendix A



































I/O Information


































A.1 I/O Address Map




































| | |
|-------------------------------------|-----------------------------------|
| [000000000000030 - 000000000000031] | Programmable interrupt controller |
| [000000000000034 - 000000000000035] | Programmable interrupt controller |
| [000000000000034 - 000000000000035] | Programmable interrupt controller |
| [000000000000034 - 000000000000035] | Programmable interrupt controller |
| [000000000000034 - 000000000000035] | Programmable interrupt controller |
| [000000000000034 - 000000000000035] | Programmable interrupt controller |
| [000000000000034 - 000000000000035] | Programmable interrupt controller |
| [000000000000038 - 000000000000039] | Programmable interrupt controller |
| [000000000000038 - 000000000000039] | Programmable interrupt controller |
| [000000000000038 - 000000000000039] | Programmable interrupt controller |
| [000000000000038 - 000000000000039] | Programmable interrupt controller |
| [000000000000038 - 000000000000039] | Programmable interrupt controller |
| [000000000000038 - 000000000000039] | Programmable interrupt controller |
| [000000000000038 - 000000000000039] | Programmable interrupt controller |
| [000000000000038 - 000000000000039] | Programmable interrupt controller |
| [000000000000038 - 000000000000039] | Programmable interrupt controller |
| [00000000000003C - 00000000000003D] | Programmable interrupt controller |
| [00000000000003C - 00000000000003D] | Programmable interrupt controller |
| [00000000000003C - 00000000000003D] | Programmable interrupt controller |
| [00000000000003C - 00000000000003D] | Programmable interrupt controller |
| [00000000000003C - 00000000000003D] | Programmable interrupt controller |
| [00000000000003C - 00000000000003D] | Programmable interrupt controller |
| [00000000000003C - 00000000000003D] | Programmable interrupt controller |
| [000000000000040 - 000000000000043] | System timer |
| [000000000000040 - 000000000000043] | System timer |
| [000000000000040 - 000000000000043] | System timer |
| [000000000000040 - 000000000000043] | System timer |
| [000000000000040 - 000000000000043] | System timer |
| [000000000000040 - 000000000000043] | System timer |
| [000000000000040 - 000000000000043] | System timer |
| [00000000000004E - 00000000000004F] | Motherboard resources |
| [000000000000050 - 000000000000053] | System timer |
| [000000000000050 - 000000000000053] | System timer |
| [000000000000050 - 000000000000053] | System timer |
| [000000000000050 - 000000000000053] | System timer |
| [000000000000050 - 000000000000053] | System timer |
| [000000000000050 - 000000000000053] | System timer |
| [000000000000050 - 000000000000053] | System timer |
| [000000000000060 - 000000000000060] | PS/2 Compatible Mouse |
| [000000000000060 - 000000000000060] | Standard PS/2 Keyboard |

































| | |
|---------------------------------------|--|
| [0000000000000060 - 0000000000000060] | Standard PS/2 Keyboard |
| [0000000000000061 - 0000000000000061] | Motherboard resources |
| [0000000000000063 - 0000000000000063] | Motherboard resources |
| [0000000000000064 - 0000000000000064] | PS/2 Compatible Mouse |
| [0000000000000064 - 0000000000000064] | Standard PS/2 Keyboard |
| [0000000000000065 - 0000000000000065] | Motherboard resources |
| [0000000000000067 - 0000000000000067] | Motherboard resources |
| [0000000000000068 - 0000000000000068] | Microsoft ACPI-Compliant Embedded Controller |
| [000000000000006C - 000000000000006C] | Microsoft ACPI-Compliant Embedded Controller |
| [0000000000000070 - 0000000000000070] | Motherboard resources |
| [0000000000000070 - 0000000000000077] | System CMOS/real time clock |
| [0000000000000070 - 0000000000000077] | System CMOS/real time clock |
| [0000000000000080 - 0000000000000080] | Motherboard resources |
| [0000000000000092 - 0000000000000092] | Motherboard resources |
| [00000000000000A0 - 00000000000000A1] | Programmable interrupt controller |
| [00000000000000A0 - 00000000000000A1] | Programmable interrupt controller |
| [00000000000000A0 - 00000000000000A1] | Programmable interrupt controller |
| [00000000000000A0 - 00000000000000A1] | Programmable interrupt controller |
| [00000000000000A0 - 00000000000000A1] | Programmable interrupt controller |
| [00000000000000A0 - 00000000000000A1] | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5] | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5] | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5] | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5] | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5] | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5] | Programmable interrupt controller |
| [00000000000000A4 - 00000000000000A5] | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
| [00000000000000A8 - 00000000000000A9] | Programmable interrupt controller |
| [00000000000000AC - 00000000000000AD] | Programmable interrupt controller |
| [00000000000000AC - 00000000000000AD] | Programmable interrupt controller |



































| | | |
|---|-------------------------------------|-----------------------------------|
|  | [0000000000000B0 - 0000000000000B1] | Programmable interrupt controller |
|  | [0000000000000B0 - 0000000000000B1] | Programmable interrupt controller |
|  | [0000000000000B0 - 0000000000000B1] | Programmable interrupt controller |
|  | [0000000000000B0 - 0000000000000B1] | Programmable interrupt controller |
|  | [0000000000000B2 - 0000000000000B3] | Motherboard resources |
|  | [0000000000000B4 - 0000000000000B5] | Programmable interrupt controller |
|  | [0000000000000B4 - 0000000000000B5] | Programmable interrupt controller |
|  | [0000000000000B4 - 0000000000000B5] | Programmable interrupt controller |
|  | [0000000000000B4 - 0000000000000B5] | Programmable interrupt controller |
|  | [0000000000000B4 - 0000000000000B5] | Programmable interrupt controller |
|  | [0000000000000B4 - 0000000000000B5] | Programmable interrupt controller |
|  | [0000000000000B8 - 0000000000000B9] | Programmable interrupt controller |
|  | [0000000000000B8 - 0000000000000B9] | Programmable interrupt controller |
|  | [0000000000000B8 - 0000000000000B9] | Programmable interrupt controller |
|  | [0000000000000B8 - 0000000000000B9] | Programmable interrupt controller |
|  | [0000000000000B8 - 0000000000000B9] | Programmable interrupt controller |
|  | [0000000000000B8 - 0000000000000B9] | Programmable interrupt controller |
|  | [0000000000000B8 - 0000000000000B9] | Programmable interrupt controller |
|  | [0000000000000BC - 0000000000000BD] | Programmable interrupt controller |
|  | [0000000000000BC - 0000000000000BD] | Programmable interrupt controller |
|  | [0000000000000BC - 0000000000000BD] | Programmable interrupt controller |
|  | [0000000000000BC - 0000000000000BD] | Programmable interrupt controller |
|  | [0000000000000BC - 0000000000000BD] | Programmable interrupt controller |
|  | [0000000000000BC - 0000000000000BD] | Programmable interrupt controller |
|  | [0000000000000F0 - 0000000000000F0] | Numeric data processor |
|  | [0000000000002E8 - 0000000000002EF] | Communications Port (COM4) |
|  | [0000000000002F8 - 0000000000002FF] | Communications Port (COM2) |
|  | [0000000000002F8 - 0000000000002FF] | Communications Port (COM2) |
|  | [0000000000003E8 - 0000000000003EF] | Communications Port (COM3) |
|  | [0000000000003F8 - 0000000000003FF] | Communications Port (COM1) |
|  | [0000000000003F8 - 0000000000003FF] | Communications Port (COM1) |
|  | [0000000000003F8 - 0000000000003FF] | Communications Port (COM1) |
|  | [0000000000004D0 - 0000000000004D1] | Programmable interrupt controller |
|  | [0000000000004D0 - 0000000000004D1] | Programmable interrupt controller |



































| | | |
|--|---------------------------------------|--|
|  | [0000000000004D0 - 0000000000004D1] | Programmable interrupt controller |
|  | [0000000000004D0 - 0000000000004D1] | Programmable interrupt controller |
|  | [0000000000004D0 - 0000000000004D1] | Programmable interrupt controller |
|  | [0000000000004D0 - 0000000000004D1] | Programmable interrupt controller |
|  | [000000000000680 - 00000000000069F] | Motherboard resources |
|  | [000000000000A00 - 000000000000A0F] | Motherboard resources |
|  | [000000000000A00 - 000000000000A0F] | Motherboard resources |
|  | [000000000000A00 - 000000000000A0F] | Motherboard resources |
|  | [000000000000A10 - 000000000000A1F] | Motherboard resources |
|  | [000000000000A10 - 000000000000A1F] | Motherboard resources |
|  | [000000000000A10 - 000000000000A1F] | Motherboard resources |
|  | [000000000000A20 - 000000000000A2F] | Motherboard resources |
|  | [000000000000A20 - 000000000000A2F] | Motherboard resources |
|  | [000000000000D00 - 000000000000FFFF] | PCI Express Root Complex |
|  | [000000000000164E - 000000000000164F] | Motherboard resources |
|  | [0000000000001854 - 0000000000001857] | Motherboard resources |
|  | [0000000000001854 - 0000000000001857] | Motherboard resources |
|  | [0000000000001854 - 0000000000001857] | Motherboard resources |
|  | [0000000000001854 - 0000000000001857] | Motherboard resources |
|  | [0000000000001854 - 0000000000001857] | Motherboard resources |
|  | [0000000000002000 - 00000000000020FE] | Motherboard resources |
|  | [0000000000003000 - 000000000000303F] | Intel(R) UHD Graphics |
|  | [0000000000003000 - 000000000000303F] | Intel(R) UHD Graphics 620 |
|  | [0000000000003000 - 0000000000003FFF] | PCI Express Root Port #9 - 54B0 |
|  | [0000000000003000 - 0000000000003FFF] | Intel(R) PCI Express Root Port #1 - 7AB8 |
|  | [0000000000003060 - 000000000000307F] | Standard SATA AHCI Controller |
|  | [0000000000003060 - 000000000000307F] | Standard SATA AHCI Controller |
|  | [0000000000003080 - 0000000000003083] | Standard SATA AHCI Controller |
|  | [0000000000003080 - 0000000000003083] | Standard SATA AHCI Controller |
|  | [0000000000003090 - 0000000000003097] | Standard SATA AHCI Controller |
|  | [0000000000003090 - 0000000000003097] | Standard SATA AHCI Controller |
|  | [0000000000004000 - 000000000000403F] | Intel(R) UHD Graphics |
|  | [0000000000004000 - 000000000000403F] | Microsoft Basic Display Adapter |



































| | | |
|---|---------------------------------------|---|
|  | [0000000000003090 - 0000000000003097] | Standard SATA AHCI Controller |
|  | [0000000000003090 - 0000000000003097] | Standard SATA AHCI Controller |
|  | [0000000000004000 - 000000000000403F] | Intel(R) UHD Graphics |
|  | [0000000000004000 - 000000000000403F] | Microsoft Basic Display Adapter |
|  | [0000000000004060 - 000000000000407F] | Standard SATA AHCI Controller |
|  | [0000000000004060 - 000000000000407F] | Standard SATA AHCI Controller |
|  | [0000000000004080 - 0000000000004083] | Standard SATA AHCI Controller |
|  | [0000000000004080 - 0000000000004083] | Standard SATA AHCI Controller |
|  | [0000000000004090 - 0000000000004097] | Standard SATA AHCI Controller |
|  | [0000000000004090 - 0000000000004097] | Standard SATA AHCI Controller |
|  | [0000000000006000 - 000000000000603F] | Microsoft Basic Display Adapter |
|  | [000000000000D000 - 000000000000D01F] | Intel(R) I210 Gigabit Network Connection #4 |
|  | [000000000000D000 - 000000000000D0FF] | Realtek PCIe GbE Family Controller #2 |
|  | [000000000000D000 - 000000000000DFFF] | PCI Express Root Port |
|  | [000000000000D000 - 000000000000DFFF] | PCI Express Root Port |
|  | [000000000000E000 - 000000000000E01F] | Intel(R) I210 Gigabit Network Connection #3 |
|  | [000000000000E000 - 000000000000E0FF] | Realtek PCIe GbE Family Controller |
|  | [000000000000E000 - 000000000000EFFF] | PCI Express Root Port |
|  | [000000000000E000 - 000000000000EFFF] | PCI Express Root Port |
|  | [000000000000EFA0 - 000000000000EFBF] | SMBus - 54A3 |
|  | [000000000000EFA0 - 000000000000EFBF] | Intel(R) SMBus - 43A3 |
|  | [000000000000EFA0 - 000000000000EFBF] | Intel(R) SMBus - 7AA3 |
|  | [000000000000EFA0 - 000000000000EFBF] | SM Bus Controller |
|  | [000000000000F000 - 000000000000F03F] | Intel(R) HD Graphics 505 |
|  | [000000000000F000 - 000000000000F03F] | Intel(R) HD Graphics 620 |
|  | [000000000000F040 - 000000000000F05F] | SM Bus Controller |
|  | [000000000000F040 - 000000000000F05F] | SM Bus Controller |
|  | [000000000000F060 - 000000000000F07F] | Standard SATA AHCI Controller |
|  | [000000000000F060 - 000000000000F07F] | Standard SATA AHCI Controller |
|  | [000000000000F080 - 000000000000F083] | Standard SATA AHCI Controller |
|  | [000000000000F080 - 000000000000F083] | Standard SATA AHCI Controller |
|  | [000000000000F090 - 000000000000F097] | Standard SATA AHCI Controller |
|  | [000000000000F090 - 000000000000F097] | Standard SATA AHCI Controller |

A.2 Memory Address Map

- ▼  Large Memory
 - ▼  Memory
 -  [0000000000A0000 - 0000000000BFFFF] PCI Express Root Complex
 -  [0000000040000000 - 00000000403FFFF] Motherboard resources
 -  [0000000050400000 - 00000000504FFFF] Ethernet Controller
 -  [0000000050400000 - 00000000505FFFF] Intel(R) PCI Express Root Port #9 - 43B0
 -  [0000000050500000 - 0000000050503FFF] Ethernet Controller
 -  [0000000050600000 - 0000000050601FFF] Standard SATA AHCI Controller
 -  [0000000050602000 - 00000000506027FF] Standard SATA AHCI Controller
 -  [0000000050603000 - 00000000506030FF] Standard SATA AHCI Controller
 -  [0000000080000000 - 000000008FFFFFFF] Intel(R) HD Graphics 505
 -  [0000000080400000 - 0000000080DFFFF] PCI Express Root Port #9 - 54B0
 -  [0000000080400000 - 0000000080DFFFF] Intel(R) PCI Express Root Port #1 - 7AB8
 -  [0000000080400000 - 00000000BFFFFFFF] PCI Express Root Complex
 -  [0000000080E00000 - 0000000080EFFFF] Ethernet Controller
 -  [0000000080E00000 - 0000000080FFFFFF] PCI Express Root Port #10 - 54B1
 -  [0000000080E00000 - 0000000080FFFFFF] Intel(R) PCI Express Root Port #3 - 7ABA
 -  [0000000080F00000 - 0000000080F03FFF] Ethernet Controller
 -  [0000000081000000 - 000000008101FFFF] Intel(R) Ethernet Connection (17) I219-LM
 -  [0000000081000000 - 00000000810FFFF] Ethernet Controller
 -  [0000000081000000 - 00000000811FFFF] PCI Express Root Port #7 - 54BE
 -  [0000000081020000 - 0000000081021FFF] Standard SATA AHCI Controller
 -  [0000000081022000 - 00000000810227FF] Standard SATA AHCI Controller
 -  [0000000081023000 - 00000000810230FF] Standard SATA AHCI Controller
 -  [0000000081100000 - 0000000081103FFF] Ethernet Controller
 -  [0000000081200000 - 00000000812FFFF] Ethernet Controller
 -  [0000000081200000 - 00000000813FFFF] PCI Express Root Port #4 - 54BB
 -  [0000000081300000 - 0000000081303FFF] Ethernet Controller
 -  [0000000081400000 - 0000000081401FFF] Standard SATA AHCI Controller
 -  [0000000081402000 - 00000000814027FF] Standard SATA AHCI Controller
 -  [0000000081403000 - 00000000814030FF] Standard SATA AHCI Controller
 -  [0000000090000000 - 0000000090FFFFFF] Intel(R) HD Graphics 505



































| | | |
|---|---|--|
|  | [0000000090000000 - 0000000090FFFFFF] | Intel(R) HD Graphics 505 |
|  | [0000000090000000 - 000000009FFFFFFF] | Intel(R) UHD Graphics 620 |
|  | [0000000091000000 - 00000000910FFFFF] | High Definition Audio Controller |
|  | [0000000091100000 - 0000000091103FFF] | Realtek PCIe GbE Family Controller #2 |
|  | [0000000091100000 - 00000000911FFFFFFF] | PCI Express Root Port |
|  | [0000000091104000 - 0000000091104FFF] | Realtek PCIe GbE Family Controller #2 |
|  | [0000000091200000 - 0000000091203FFF] | Realtek PCIe GbE Family Controller |
|  | [0000000091200000 - 00000000912FFFFFFF] | PCI Express Root Port |
|  | [0000000091204000 - 0000000091204FFF] | Realtek PCIe GbE Family Controller |
|  | [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] | SM Bus Controller |
|  | [0000000091319000 - 0000000091319FFF] | Intel SD Host Controller |
|  | [000000009131A000 - 000000009131AFFF] | Intel SD Host Controller |
|  | [000000009131B000 - 000000009131B7FF] | Standard SATA AHCI Controller |
|  | [000000009131C000 - 000000009131C0FF] | Standard SATA AHCI Controller |
|  | [0000000091320000 - 0000000091320FFF] | PCI Simple Communications Controller |
|  | [00000000A0000000 - 00000000A0FFFFFF] | Intel(R) UHD Graphics 620 |
|  | [00000000A1100000 - 00000000A111FFFF] | Intel(R) Ethernet Connection (6) I219-LM |
|  | [00000000A1120000 - 00000000A112FFFF] | Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft) |
|  | [00000000A113C000 - 00000000A113DFFF] | Standard SATA AHCI Controller |
|  | [00000000A1140000 - 00000000A11400FF] | SM Bus Controller |
|  | [00000000A1141000 - 00000000A1141FFF] | Intel SD Host Controller |
|  | [00000000A1143000 - 00000000A11437FF] | Standard SATA AHCI Controller |
|  | [00000000A1144000 - 00000000A11440FF] | Standard SATA AHCI Controller |
|  | [00000000C0000000 - 00000000CFFFFFFF] | Intel(R) HD Graphics 620 |
|  | [00000000C0000000 - 00000000CFFFFFFF] | Motherboard resources |
|  | [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 - 00000000D0C70673] | Intel(R) Serial IO GPIO Host Controller - INT3452 |
|  | [00000000DE000000 - 00000000DEFFFFFF] | Intel(R) HD Graphics 620 |
|  | [00000000DF000000 - 00000000DF01FFFF] | Intel(R) I210 Gigabit Network Connection #4 |



































| | | |
|---|---------------------------------------|---|
|  | [00000000DF000000 - 00000000DF01FFFF] | Intel(R) I210 Gigabit Network Connection #4 |
|  | [00000000DF000000 - 00000000DF0FFFFF] | PCI Express Root Port |
|  | [00000000DF020000 - 00000000DF023FFF] | Intel(R) I210 Gigabit Network Connection #4 |
|  | [00000000DF100000 - 00000000DF11FFFF] | Intel(R) I210 Gigabit Network Connection #3 |
|  | [00000000DF100000 - 00000000DF1FFFFF] | PCI Express Root Port |
|  | [00000000DF120000 - 00000000DF123FFF] | Intel(R) I210 Gigabit Network Connection #3 |
|  | [00000000DF210000 - 00000000DF21FFFF] | Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft) |
|  | [00000000DF228000 - 00000000DF229FFF] | Standard SATA AHCI Controller |
|  | [00000000DF22A000 - 00000000DF22A0FF] | SM Bus Controller |
|  | [00000000DF22B000 - 00000000DF22B7FF] | Standard SATA AHCI Controller |
|  | [00000000DF22C000 - 00000000DF22C0FF] | Standard SATA AHCI Controller |
|  | [00000000DF22D000 - 00000000DF22DFFF] | PCI Data Acquisition and Signal Processing Controller |
|  | [00000000E0690000 - 00000000E069FFFF] | Intel(R) Serial IO GPIO Host Controller - INTC1056 |
|  | [00000000E06A0000 - 00000000E06AFFFF] | Intel(R) Serial IO GPIO Host Controller - INTC1056 |
|  | [00000000E06B0000 - 00000000E06BFFFF] | Intel(R) Serial IO GPIO Host Controller - INTC1056 |
|  | [00000000E06D0000 - 00000000E06DFFFF] | Intel(R) Serial IO GPIO Host Controller - INTC1056 |
|  | [00000000E06E0000 - 00000000E06EFFFF] | Intel(R) Serial IO GPIO Host Controller - INTC1056 |
|  | [00000000FD000000 - 00000000FDABFFFF] | Motherboard resources |
|  | [00000000FD690000 - 00000000FD69FFFF] | Intel(R) GPIO Controller - 34C6 |
|  | [00000000FD690000 - 00000000FD69FFFF] | Unknown device |
|  | [00000000FD6A0000 - 00000000FD6AFFFF] | Intel(R) GPIO Controller - 34C6 |
|  | [00000000FD6A0000 - 00000000FD6AFFFF] | Intel(R) Serial IO GPIO Host Controller - INT34BB |
|  | [00000000FD6A0000 - 00000000FD6AFFFF] | Unknown device |
|  | [00000000FD6B0000 - 00000000FD6BFFFF] | Intel(R) GPIO Controller - 34C6 |
|  | [00000000FD6D0000 - 00000000FD6DFFFF] | Intel(R) GPIO Controller - 34C6 |
|  | [00000000FD6D0000 - 00000000FD6DFFFF] | Intel(R) Serial IO GPIO Host Controller - INT34BB |
|  | [00000000FD6D0000 - 00000000FD6DFFFF] | Unknown device |
|  | [00000000FD6E0000 - 00000000FD6EFFFF] | Intel(R) GPIO Controller - 34C6 |
|  | [00000000FD6E0000 - 00000000FD6EFFFF] | Intel(R) Serial IO GPIO Host Controller - INT34BB |
|  | [00000000FD6E0000 - 00000000FD6EFFFF] | Unknown device |
|  | [00000000FDAD0000 - 00000000FDADFFFF] | Motherboard resources |
|  | [00000000FDB00000 - 00000000FDF0FFFF] | Motherboard resources |
|  | [00000000FE000000 - 00000000FE01FFFF] | Motherboard resources |
|  | [00000000FE010000 - 00000000FE010FFF] | SPI (flash) Controller - 54A4 |

| | | |
|---|---------------------------------------|---|
|  | [00000000FE010000 - 00000000FE010FFF] | SPI (flash) Controller - 54A4 |
|  | [00000000FE010000 - 00000000FE010FFF] | Intel(R) SPI (flash) Controller - 43A4 |
|  | [00000000FE010000 - 00000000FE010FFF] | Intel(R) SPI (flash) Controller - 7AA4 |
|  | [00000000FE010000 - 00000000FE010FFF] | PCI Device |
|  | [00000000FE036000 - 00000000FE03BFFF] | Motherboard resources |
|  | [00000000FE03D000 - 00000000FE3FFFFF] | Motherboard resources |
|  | [00000000FE410000 - 00000000FE7FFFFF] | Motherboard resources |
|  | [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 |
|  | [00000000FF000000 - 00000000FFFFFFFF] | Legacy device |
|  | [0000004000000000 - 0000004000FFFFFF] | Intel(R) UHD Graphics |
|  | [0000004000000000 - 0000004000FFFFFF] | Intel(R) UHD Graphics |
|  | [0000004000000000 - 0000004000FFFFFF] | Microsoft Basic Display Adapter |
|  | [0000004000000000 - 0000004000FFFFFF] | Microsoft Basic Display Adapter |
|  | [0000006000000000 - 00000060009FFFFF] | PCI Express Root Port #9 - 54B0 |
|  | [0000006000000000 - 00000060009FFFFF] | Intel(R) PCI Express Root Port #1 - 7AB8 |
|  | [0000006000000000 - 0000006000FFFFFF] | Intel(R) UHD Graphics |
|  | [0000006000000000 - 0000006001FFFFFF] | Intel(R) UHD Graphics |
|  | [0000006001000000 - 0000006001FFFFFF] | Microsoft Basic Display Adapter |
|  | [0000006001000000 - 0000006001FFFFFF] | Microsoft Basic Display Adapter |
|  | [0000006001100000 - 000000600110FFFF] | Intel(R) USB 3.2o eXtensible Host Controller - 1.20 (Microsoft) |
|  | [0000006001118000 - 00000060011180FF] | Intel(R) SMBus - 43A3 |
|  | [0000006002100000 - 000000600210FFFF] | Intel(R) USB 3.1o eXtensible Host Controller - 1.20 (Microsoft) |
|  | [0000006002100000 - 000000600210FFFF] | Intel(R) USB 3.2o eXtensible Host Controller - 1.20 (Microsoft) |
|  | [0000006002110000 - 0000006002117FFF] | Performance Monitor |
|  | [0000006002118000 - 00000060021180FF] | Intel(R) SMBus - 7AA3 |
|  | [0000006002128000 - 00000060021280FF] | SMBus - 54A3 |

A.3 IRQ Mapping Chart

| Device Name | IRQ |
|---|-----------------------|
| System timer | (ISA) 0x00000000 (00) |
| System timer | (ISA) 0x00000000 (00) |
| System timer | (ISA) 0x00000000 (00) |
| System timer | (ISA) 0x00000000 (00) |
| System timer | (ISA) 0x00000000 (00) |
| System timer | (ISA) 0x00000000 (00) |
| Standard PS/2 Keyboard | (ISA) 0x00000001 (01) |
| Communications Port (COM2) | (ISA) 0x00000003 (03) |
| Communications Port (COM2) | (ISA) 0x00000003 (03) |
| Communications Port (COM1) | (ISA) 0x00000004 (04) |
| Communications Port (COM1) | (ISA) 0x00000004 (04) |
| Communications Port (COM1) | (ISA) 0x00000004 (04) |
| System CMOS/real time clock | (ISA) 0x00000008 (08) |
| Communications Port (COM3) | (ISA) 0x0000000B (11) |
| Communications Port (COM4) | (ISA) 0x0000000B (11) |
| Intel(R) HD Graphics 620 | (ISA) 0x0000000B (11) |
| Intel(R) I210 Gigabit Network Connection #3 | (ISA) 0x0000000B (11) |
| Intel(R) I210 Gigabit Network Connection #4 | (ISA) 0x0000000B (11) |
| Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft) | (ISA) 0x0000000B (11) |
| PCI Data Acquisition and Signal Processing Controller | (ISA) 0x0000000B (11) |
| PCI Express Root Port | (ISA) 0x0000000B (11) |
| PCI Express Root Port | (ISA) 0x0000000B (11) |
| SM Bus Controller | (ISA) 0x0000000B (11) |
| Standard SATA AHCI Controller | (ISA) 0x0000000B (11) |
| PS/2 Compatible Mouse | (ISA) 0x0000000C (12) |
| Numeric data processor | (ISA) 0x0000000D (13) |
| Intel(R) GPIO Controller - 34C6 | (ISA) 0x0000000E (14) |
| Intel(R) Serial IO GPIO Host Controller - INT34BB | (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 | (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) |

| | |
|---|----------------------------------|
|  (ISA) 0x00000019 (25) | High Definition Audio Controller |
|  (ISA) 0x00000027 (39) | Intel SD Host Controller |
|  (ISA) 0x00000037 (55) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000038 (56) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000039 (57) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000003A (58) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000003B (59) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000003C (60) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000003D (61) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000003E (62) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000003F (63) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000040 (64) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000041 (65) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000042 (66) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000043 (67) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000044 (68) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000045 (69) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000046 (70) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000047 (71) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000048 (72) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000049 (73) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000004A (74) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000004B (75) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000004C (76) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000004D (77) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000004E (78) | Microsoft ACPI-Compliant System |
|  (ISA) 0x0000004F (79) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000050 (80) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000051 (81) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000052 (82) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000053 (83) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000054 (84) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000055 (85) | Microsoft ACPI-Compliant System |
|  (ISA) 0x00000056 (86) | Microsoft ACPI-Compliant System |

| | |
|---|---|
|  (ISA) 0x000001E3 (483) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E4 (484) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E5 (485) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E6 (486) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E7 (487) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E8 (488) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001E9 (489) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EA (490) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EB (491) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EC (492) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001ED (493) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EE (494) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001EF (495) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F0 (496) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F1 (497) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F2 (498) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F3 (499) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F4 (500) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F5 (501) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F6 (502) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F7 (503) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F8 (504) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001F9 (505) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FA (506) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FB (507) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FC (508) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FD (509) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FE (510) | Microsoft ACPI-Compliant System |
|  (ISA) 0x000001FF (511) | Microsoft ACPI-Compliant System |
|  (PCI) 0x00000013 (19) | High Definition Audio Controller |
|  (PCI) 0xFFFFFFF8 (-5) | Intel(R) Management Engine Interface #1 |
|  (PCI) 0xFFFFFFF4 (-4) | Intel(R) UHD Graphics |
|  (PCI) 0xFFFFFFF3 (-3) | Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft) |
|  (PCI) 0xFFFFFFF2 (-2) | Standard SATA AHCI Controller |

Appendix B

Mating Connectors and Cables

B.1 Mating Connectors and Cables

| Label | Function | Vendor | Model No | Cable P/N |
|-------|---------------------------------------|--------|-------------------|------------|
| CN1 | SATA Power | JST | PHR-2 | 1702150155 |
| CN2 | Front Panel | JST | SHR-10V-S-B | 170X000287 |
| CN3 | Port 80 Debug Port | JST | SHR-10V-S-B | 1703100133 |
| CN5 | SATA | Molex | 887505318 | N/A |
| CN9 | Power | N/A | N/A | 170204010R |
| CN11 | Audio with detect | Aces | 50247-012H0H0-001 | 170X000156 |
| CN13 | External +5VSB Power Input and PS_ON# | JST | XHP-3 | 170220020B |
| CN18 | GPIO | MOLEX | 51110-1050 | N/A |
| CN22 | LAN1 LED | JST | SHR-04V-S-B | 170X000634 |
| CN23 | LAN3 LED | JST | SHR-04V-S-B | 170X000634 |
| CN24 | LAN2 LED | JST | SHR-04V-S-B | 170X000634 |
| CN28 | LVDS | Hirose | DF13-30DS-1.25C | 170430030Y |
| CN33 | CPU FAN | Molex | 51021-0400 | N/A |
| CN34 | LVDS Inverter | JST | SHR-06V-S-B | 170X000152 |
| CN39 | External RTC | Molex | 51021-0200 | 175011301K |
| CN42 | I2C/SMBUS | JST | SHR-05V-S-B | 170X000743 |
| CN44 | COM Port1 | Molex | 51021-0900 | 1701090150 |
| CN45 | COM Port2 | Molex | 51021-0900 | 1701090150 |
| CN46 | COM Port3 | Molex | 51021-0900 | 1701090150 |
| CN47 | COM Port4 | Molex | 51021-0900 | 1701090150 |
| CN48 | USB 2.0 Port3 | Molex | 51021-0500 | 1700050207 |
| CN49 | USB 2.0 Port4 | Molex | 51021-0500 | 1700050207 |
| CN50 | USB 2.0 Port5 | Molex | 51021-0500 | 1700050207 |
| CN51 | USB 2.0 Port6 | Molex | 51021-0500 | 1700050207 |