# uCOM-TWL

SMARC Module

User's Manual 1st Ed

*Last Updated: April 30, 2026*

## Copyright Notice

## Acknowledgements

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

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

All other product names or trademarks are properties of their respective owners. Omission from this list does not imply any claim of ownership by the publisher of this document.

## Packing List

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

| Item | Quantity |
| --- | --- |
| ● uCOM-TWL | 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.

## FCC Statement


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 **主板/子板/背板** QO4-381 Rev.A2

| 部件名称 | 有毒有害物质或元素 | | | | | |
|---|---|---|---|---|---|---|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| 印刷电路板及其电子组件 | × | ○ | ○ | ○ | ○ | ○ |
| 外部信号连接器及线材 | × | ○ | ○ | ○ | ○ | ○ |

本表格依据 SJ/T 11364 的规定编制。

○：表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572标准规定的限量要求以下。

×：表示该有害物质的某一均质材料超出了GB/T 26572的限量要求，然而该部件仍符合欧盟指令2011/65/EU 的规范。

环保使用期限(EFUP (Environmental Friendly Use Period)) : 10年

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。

## China RoHS Requirement (EN)

Name and content of hazardous substances in product

AAEON Main Board/Daughter Board/Backplane QO4-381 Rev.A2

| Part Name | Hazardous Substances | | | | | |
|---|---|---|---|---|---|---|
| | 铅 (Pb) | 汞 (Hg) | 镉 (Cd) | 六价铬 (Cr(VI)) | 多溴联苯 (PBB) | 多溴二苯醚 (PBDE) |
| PCB Assemblies | × | ○ | ○ | ○ | ○ | ○ |
| Connector and Cable | × | ○ | ○ | ○ | ○ | ○ |

The table is prepared in accordance with the provisions of SJ/T 11364.

○：Indicates that said hazardous substance contained in all of the homogenous materials for this product is below the limit requirement of GB/T 26572.

×：Indicates that said hazardous substance contained in at least one of the homogenous materials used for this part is above the limit requirement of GB/T 26572. But this product still be compliance with 2011/65/EU Directive (allowed with 2011/65/EU Annex III of RoHS exemption with number 6(c),7(a),7(c)-1).

EFUP (Environment Friendly Use Period) value: 10 years

Notes: This product defined period of use is under normal condition.

Table of Contents

# Chapter 1

Product Specifications

## 1.1 Specifications

| System | |
|---|---|
| Form Factor | SMARC Module |
| CPU | Intel® Core™ 3 Processor N355 (8C/8T, up to 3.9 GHz, 15W)<br>Intel® Processor N150 (4C/4T, up to 3.6 GHz, 6W) |
| Chipset | Integrated with Intel® SoC |
| Memory | Onboard LPDDR5x 4800MHz, up to 8GB |
| Onboard Storage | eMMC, up to 128GB |
| BIOS | AMI UEFI |
| Wake on LAN | Yes |
| Watchdog Timer | 255 Levels |
| Dimension (L x W) | 3.23" x 1.97" (82mm x 50mm) |
| Security | TPM 2.0 |

| Power | |
|---|---|
| Power Requirement | +5V for ATX / AT |
| Power Type | AT (default)/ATX, switch by BIOS |
| Power Consumption (Typical) | Intel® Core™ i3-N305, 4.23A @+5V |

| Display | |
|---|---|
| Graphics Controller | Intel® UHD Graphics |
| Video Output | Up to 3 Simultaneous Displays:<br>DP++ x 2 / DP++ x 1 + HDMI x 1, up to 3840 x 2160 (by SKU)<br>eDP x 1, up to 3840 x 2160 |

## I/O

| | |
|---|---|
| **Ethernet** | Intel® Ethernet Controller I226, 2.5GbE x 2 |
| **Audio** | High Definition Audio Interface (Optional: I2S) |
| **USB Port** | USB 2.0 x 6 |
| | USB 3.2 x 2 |
| **Serial Port** | 2-Wire UART x 2 (Tx/Rx) |
| | 4-Wire UART x 2 (Tx/Rx/RTS/CTS) |
| **HDD Interface** | SATA 6Gb/s x 1 |
| **Expansion** | PCIe 3.0 [x2] x 1 + [x1] x 2 (Optional: PCIe [x1] x 3) |
| | MIPI CSI x 2 |

**Note**: To get a fourth PCIe Gen 3 [x1] interface, please contact the AAEON support team

| | |
|---|---|
| **GPIO** | 7-bit (up to 14-bit by customization) |

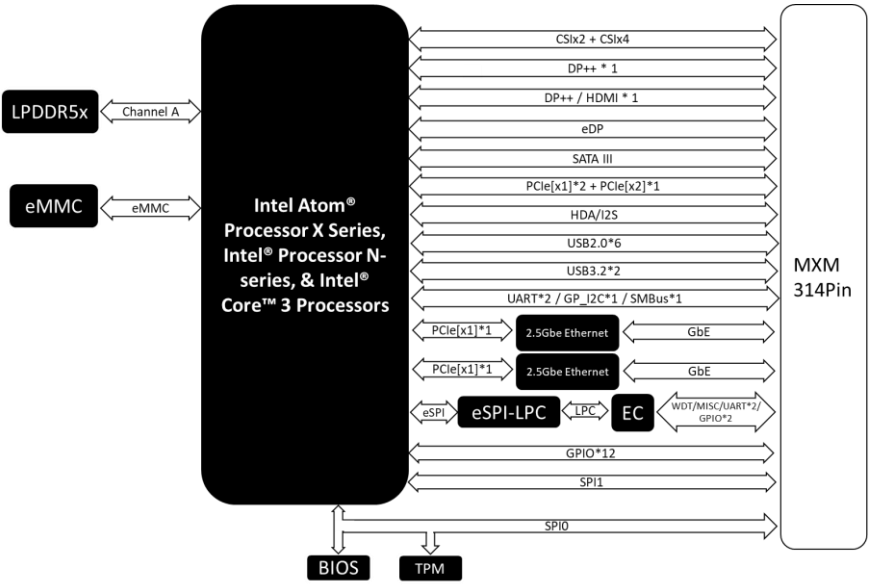
**Note**: Another 7-bit GPIO through multiplexed pins P108-P114 can be activated by custom BIOS. Please contact the AAEON support team

| | |
|---|---|
| **SMBus/I2C** | GP_I2C x 1 |
| | SMBus x 1 |

## Environmental

| | |
|---|---|
| **Operating Temperature** | -4°F – 158°F (-20°C – 70°C) |
| | Extended Temp: -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 |
| **EMC** | CE/FCC Class A |
| **OS Support** | Windows® 10 (64-bit) |
| | Windows 11® (64-bit) |
| | Linux Ubuntu 24.04/Kernel 6.11 |
| **Weight** | 0.14 lb (0.06 kg) |

## 1.2 Block Diagram




Note 1: To get a fourth PCIe Gen 3 [x1] interface, please contact the AAEON support team.

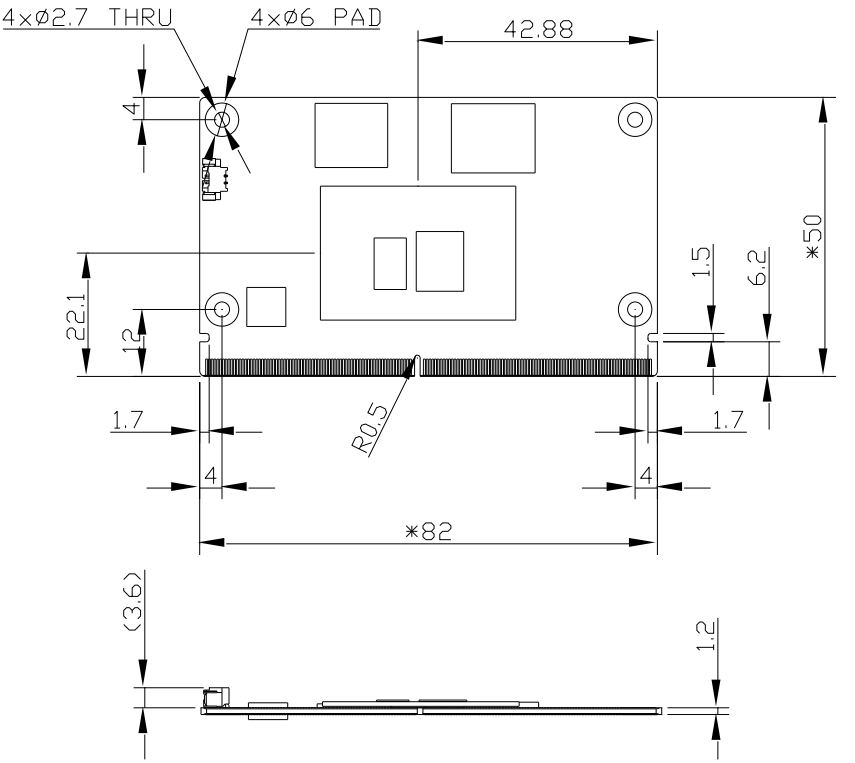
Note 2: MIPI CSI interface tested using Innodisk camera.

# Chapter 2

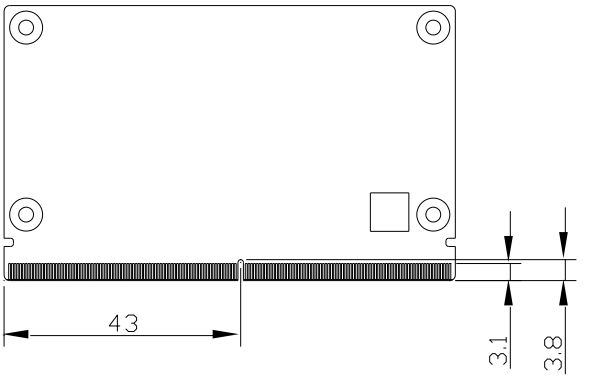
Hardware Information

## 2.1 Dimensions

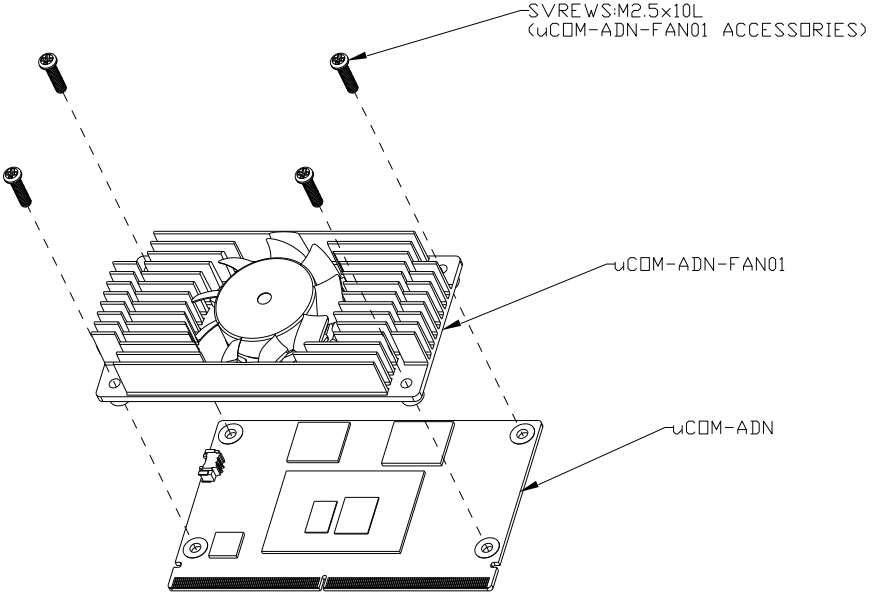
Top Side



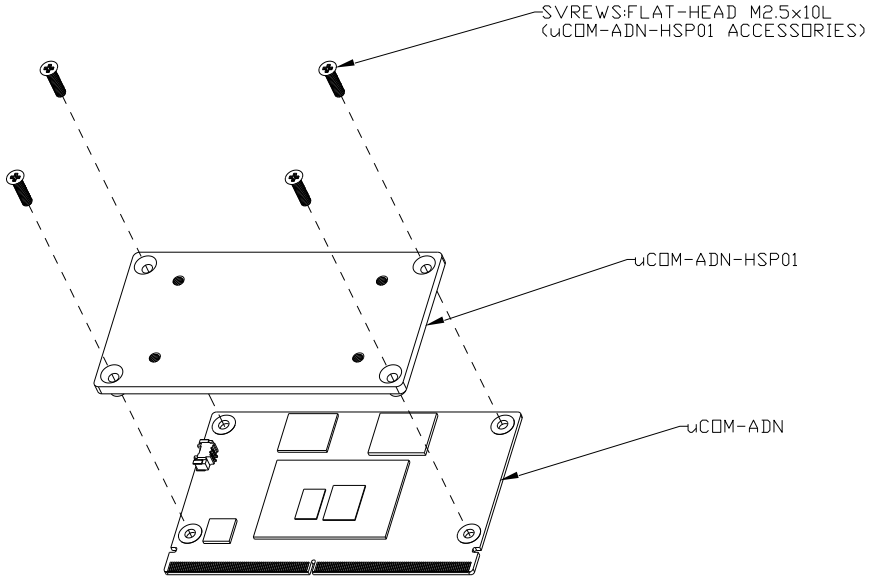

Bottom Side



With Active Cooling (Part No: uCOM-ADN-FAN01)

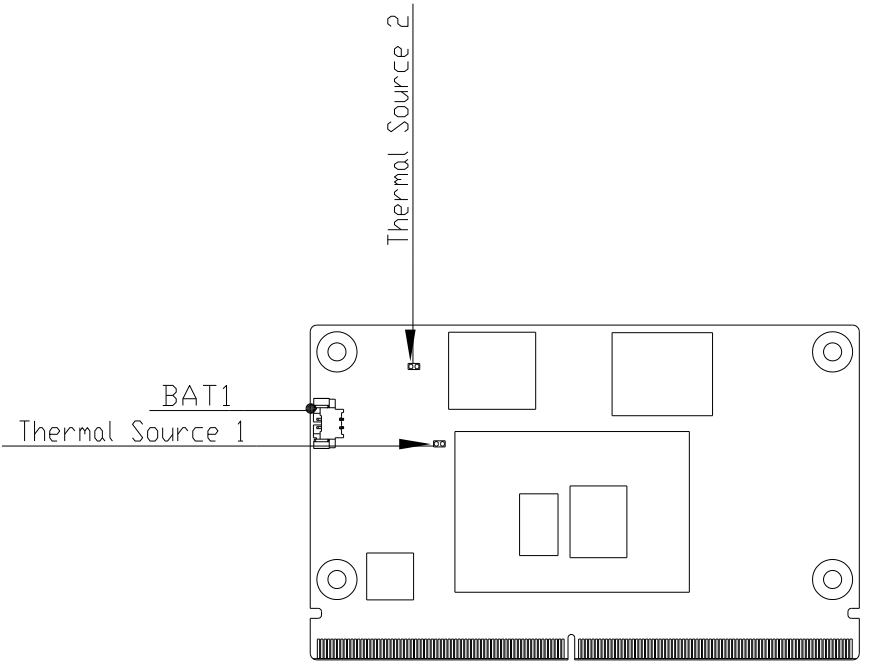



With Heatspreader (Part No: uCOM-ADN-HSP01)

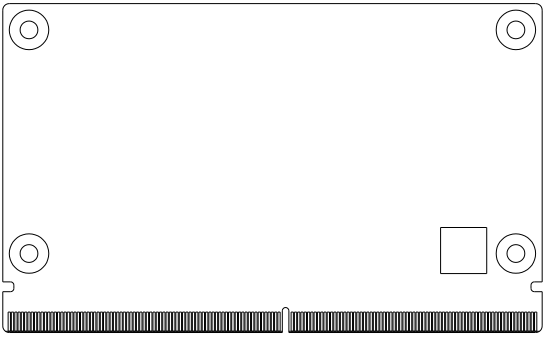


## 2.2 Jumpers and Connectors

Top Side




Bottom Side



## 2.3 Extra DC 5V Power in (BAT1)

| Pin | Pin Name |
|---|---|
| 1 | +5V |
| 2 | GND |

## 2.4 MXM Gold Finger (GF2)

| Pin | Pin Name | Pin | Pin Name |
|---|---|---|---|
| P1 | SMB_ALERT# | S1 | CSI1_TX+/I2C_CAM1_CK |
| P2 | GND | S2 | CSI1_TX-/I2C_CAM1_DAT |
| P3 | CSI1_CK+ | S3 | GND |
| P4 | CSI1_CK- | S4 | RSVD |
| P5 | GBE1_SDP | S5 | CSI0_TX+/I2C_CAM0_CK |
| P6 | GBE0_SDP | S6 | CAM_MCK |
| P7 | CSI_B_DP_0 | S7 | CSI0_TX1/I2C_CAM0_DAT |
| P8 | CSI_B_DN_0 | S8 | CSI0_CK+ |
| P9 | GND | S9 | CSI0_CK- |
| P10 | CSI_B_DP_1 | S10 | GND |
| P11 | CSI_B_DN_1 | S11 | CSI_C_DP_0 |
| P12 | GND | S12 | CSI_C_DN_0 |
| P13 | CSI_B_DP_2 | S13 | GND |
| P14 | CSI_B_DN_2 | S14 | CSI_C_DP_1 |
| P15 | GND | S15 | CSI_C_DN_1 |
| P16 | CSI_B_DP_3 | S16 | GND |
| P17 | CSI_B_DN_3 | S17 | GBE1_MDI0+ |
| P18 | GND | S18 | GBE1_MDI0- |
| P19 | GBE0_MDI3- | S19 | GBE1_LINK1000# |
| P20 | GBE0_MDI3+ | S20 | GBE1_MDI1+ |
| P21 | GBE0_LINK1000# | S21 | GBE1_MDI1- |
| P22 | GBE0_LINK2500# | S22 | GBE1_LINK2500# |
| P23 | GBE0_MDI2- | S23 | GBE1_MDI2+ |
| P24 | GBE0_MDI2+ | S24 | GBE1_MDI2- |
| P25 | GBE0_LINK_ACT# | S25 | GND |
| P26 | GBE0_MDI1- | S26 | GBE1_MDI3+ |
| P27 | GBE0_MDI1+ | S27 | GBE1_MDI3- |
| P28 | GBE0_CTREF | S28 | GBE1_CTREF |
| P29 | GBE0_MDI0- | S29 | PCIE_D_TX+/SERDES_0_TX+ |
| P30 | GBE0_MDI0+ | S30 | PCIE_D_TX-/SERDES_0_TX- |

| Pin | Pin Name | Pin | Pin Name |
|---|---|---|---|
| P31 | SPI0_CS1# | S31 | GBE1_LINK_ACT# |
| P32 | GND | S32 | **PCIE_D_RX+**/SERDES_0_RX+ |
| P33 | SDIO_WP | S33 | **PCIE_D_RX-**/SERDES_0_RX- |
| P34 | SDIO_CMD | S34 | GND |
| P35 | SDIO_CD# | S35 | USB4+ |
| P36 | SDIO_CK | S36 | USB4- |
| P37 | SDIO_PWR_EN | S37 | USB3_VBUS_DET |
| P38 | GND | S38 | AUDIO_MCK |
| P39 | SDIO_D0 | S39 | I2S0_LRCK |
| P40 | SDIO_D1 | S40 | I2S0_SDOUT |
| P41 | SDIO_D2 | S41 | I2S0_SDIN |
| P42 | SDIO_D3 | S42 | I2S0_CK |
| P43 | SPI0_CS0# | S43 | ESPI_ALERT0# |
| P44 | SPI0_CK | S44 | ESPI_ALERT1# |
| P45 | SPI0_DIN | S45 | MDIO_CLK |
| P46 | SPI0_DO | S46 | MDIO_DAT |
| P47 | GND | S47 | GND |
| P48 | SATA_TX+ | S48 | I2C_GP_CK |
| P49 | SATA_TX- | S49 | I2C_GP_DAT |
| P50 | GND | S50 | **HDA_SYNC**/I2S2_LRCK |
| P51 | SATA_RX+ | S51 | **HDA_SDO**/I2S2_SDOUT |
| P52 | SATA_RX- | S52 | **HDA_SDI**/I2S2_SDIN/ |
| P53 | GND | S53 | **HDA_CK**/I2S2_CK |
| P54 | **ESPI_CS0#**/SPI1_CS0#/QSPI_CS0# | S54 | SATA_ACT# |
| P55 | ESPI_CS1#/SPI1_CS1#/QSPI_CS1# | S55 | USB5_EN_OC# |
| P56 | **ESPI_CK**/SPI1_CK/QSPI_CK | S56 | **ESPI_IO_2**/QSPI_IO_2 |
| P57 | **ESPI_IO_1**/SPI1_DIN/QSPI_IO_1 | S57 | **ESPI_IO_3**/QSPI_IO_3 |
| P58 | **ESPI_IO_0**/SPI1_DO/QSPI_IO_0 | S58 | ESPI_RESET# |
| P59 | GND | S59 | USB5+ |
| P60 | USB0+ | S60 | USB5- |
| P61 | USB0- | S61 | GND |
| P62 | USB0_EN_OC# | S62 | USB3_SSTX+ |
| P63 | USB0_VBUS_DET | S63 | USB3_SSTX- |
| P64 | USB0_OTG_ID | S64 | GND |
| P65 | USB1+ | S65 | USB3_SSRX+ |
| P66 | USB1- | S66 | USB3_SSRX- |
| P67 | USB1_EN_OC# | S67 | GND |
| P68 | GND | S68 | USB3+ |
| P69 | USB2+ | S69 | USB3- |

| Pin | Pin Name | Pin | Pin Name |
|---|---|---|---|
| P70 | USB2- | S70 | GND |
| P71 | USB2_EN_OC# | S71 | USB2_SSTX+ |
| P72 | RSVD | S72 | USB2_SSTX- |
| P73 | RSVD | S73 | GND |
| P74 | USB3_EN_OC# | S74 | USB2_SSRX+ |
| P75 | PCIE_A_RST# | S75 | USB2_SSRX- |
| P76 | USB4_EN_OC# | S76 | PCIE_B_RST# |
| P77 | PCIE_B_CLKREQ# | S77 | PCIE_C_RST# |
| P78 | PCIE_A_CLKREQ# | S78 | **PCIE_C_RX+**/SERDES_1_RX+ |
| P79 | GND | S79 | **PCIE_C_RX-**/SERDES_1_RX- |
| P80 | PCIE_C_REFCK+ | S80 | GND |
| P81 | PCIE_C_REFCK- | S81 | **PCIE_C_TX+**/SERDES_1_TX+ |
| P82 | GND | S82 | **PCIE_C_TX-**/SERDES_1_TX- |
| P83 | PCIE_A_REFCK+ | S83 | GND |
| P84 | PCIE_A_REFCK- | S84 | PCIE_B_REFCK+ |
| P85 | GND | S85 | PCIE_B_REFCK- |
| P86 | PCIE_A_RX+ | S86 | GND |
| P87 | PCIE_A_RX- | S87 | PCIE_B_RX+ |
| P88 | GND | S88 | PCIE_B_RX- |
| P89 | PCIE_A_TX+ | S89 | GND |
| P90 | PCIE_A_TX- | S90 | PCIE_B_TX+ |
| P91 | GND | S91 | PCIE_B_TX- |
| P92 | HDMI_D2+/**DP1_LANE0+** | S92 | GND |
| P93 | HDMI_D2-/**DP1_LANE0-** | S93 | DP0_LANE0+ |
| P94 | GND | S94 | DP0_LANE0- |
| P95 | HDMI_D1+/**DP1_LANE1+** | S95 | DP0_AUX_SEL |
| P96 | HDMI_D1-/**DP1_LANE1-** | S96 | DP0_LANE1+ |
| P97 | GND | S97 | DP0_LANE1- |
| P98 | HDMI_D0+/**DP1_LANE2+** | S98 | DP0_HPD |
| P99 | HDMI_D0-/**DP1_LANE2-** | S99 | DP0_LANE2+ |
| P100 | GND | S100 | DP0_LANE2- |
| P101 | HDMI_CK+/**DP1_LANE3+** | S101 | GND |
| P102 | HDMI_CK-/**DP1_LANE3-** | S102 | DP0_LANE3+ |
| P103 | GND | S103 | DP0_LANE3- |
| P104 | HDMI_HPD/**DP1_HDP** | S104 | USB3_OTG_ID |
| P105 | HDMI_CTRL_CK/**DP1_AUX+** | S105 | DP0_AUX+ |
| P106 | HDMI_CTRL_DAT/**DP1_AUX-** | S106 | DP0_AUX- |
| P107 | DP1_AUX_SEL | S107 | LCD1_BKLT_EN |

| Pin | Pin Name | Pin | Pin Name |
|---|---|---|---|
| P108 | GPIO0/CAM0_PWR# | S108 | LVDS1_CK+/eDP1_AUX+/DSI1_CLK+ |
| P109 | GPIO1/CAM1_PWR# | S109 | LVDS1_CK-/eDP1_AUX-/DSI1_CLK- |
| P110 | GPIO2/CAM0_RST# | S110 | GND |
| P111 | GPIO3/CAM1_RST# | S111 | LVDS1_0+/eDP1_TX0+/DSI1_D0+ |
| P112 | GPIO4/HDA_RST# | S112 | LVDS1_0-/eDP1_TX0-/DSI1_D0- |
| P113 | GPIO5/PWM_OUT | S113 | eDP1_HPD/DSI1_TE |
| P114 | GPIO6/TACHIN | S114 | LVDS1_1+/eDP1_TX1+/DSI1_D1+ |
| P115 | GPIO7 | S115 | LVDS1_1-/eDP1_TX1-/DSI1_D1- |
| P116 | GPIO8 | S116 | LCD1_VDD_EN |
| P117 | GPIO9 | S117 | LVDS1_2+/eDP1_TX2+/DSI1_D2+ |
| P118 | GPIO10 | S118 | LVDS1_2-/eDP1_TX2-/DSI1_D2- |
| P119 | GPIO11 | S119 | GND |
| P120 | GND | S120 | LVDS1_3+/eDP1_TX3+/DSI1_D3+ |
| P121 | I2C_PM_CK | S121 | LVDS1_3-/eDP1_TX3-/DSI1_D3- |
| P122 | I2C_PM_DAT | S122 | LCD1_BKLT_PWM |
| P123 | BOOT_SEL0# | S123 | GPIO13 |
| P124 | BOOT_SEL1# | S124 | GND |
| P125 | BOOT_SEL2# | S125 | LVDS0_0+/eDP0_TX0+/DSI0_D0+ |
| P126 | RESET_OUT# | S126 | LVDS0_0-/eDP0_TX0-/DSI0_D0- |
| P127 | RESET_IN# | S127 | LCD0_BKLT_EN |
| P128 | POWER_BTN# | S128 | LVDS0_1+/eDP0_TX1+/DSI0_D1+ |
| P129 | SER0_TX | S129 | LVDS0_1-/eDP0_TX1-/DSI0_D1- |
| P130 | SER0_RX | S130 | GND |
| P131 | SER0_RTS# | S131 | LVDS0_2+/eDP0_TX2+/DSI0_D2+ |
| P132 | SER0_CTS# | S132 | LVDS0_2-/eDP0_TX2-/DSI0_D2- |
| P133 | GND | S133 | LCD0_VDD_EN |
| P134 | SER1_TX | S134 | LVDS0_CK+/eDP0_AUX+/DSI0_CLK+ |
| P135 | SER1_RX | S135 | LVDS0_CK-/eDP0_AUX-/DSI0_CLK- |
| P136 | SER2_TX | S136 | GND |
| P137 | SER2_RX | S137 | LVDS0_3+/eDP0_TX3+/DSI0_D3+ |
| P138 | SER2_RTS# | S138 | LVDS0_3-/eDP0_TX3-/DSI0_D3- |
| P139 | SER2_CTS# | S139 | I2C_LCD_CK |
| P140 | SER3_TX | S140 | I2C_LCD_DAT |

| Pin | Pin Name | Pin | Pin Name |
|---|---|---|---|
| P141 | SER3_RX | S141 | LCD0_BKLT_PWM |
| P142 | GND | S142 | GPIO12 |
| P143 | CAN0_TX | S143 | GND |
| P144 | CAN0_RX | S144 | **eDP0_HPD**/DSI0_TE |
| P145 | CAN1_TX | S145 | WDT_TIME_OUT# |
| P146 | CAN1_RX | S146 | PCIE_WAKE# |
| P147 | VDD_IN | S147 | VDD_RTC |
| P148 | VDD_IN | S148 | LID# |
| P149 | VDD_IN | S149 | SLEEP# |
| P150 | VDD_IN | S150 | VIN_PWR_BAD# |
| P151 | VDD_IN | S151 | CHARGING# |
| P152 | VDD_IN | S152 | CHARGER_PRSNT# |
| P153 | VDD_IN | S153 | CARRIER_STBY# |
| P154 | VDD_IN | S154 | CARRIER_PWR_ON |
| P155 | VDD_IN | S155 | FORCE_RECOV# |
| P156 | VDD_IN | S156 | BATLOW# |
| | | S157 | TEST# |
| | | S158 | GND |

**Note**: Bold: Default function.

# Chapter 3

AMI BIOS Setup

## 3.1 System Test and Initialization

The module uses certain routines to test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

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

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

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

The uCOM-TWL 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

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

To enter Setup, power on the computer and press <Del> immediately.

The function of each menu is as follows:

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

**Advanced –** Enable/disable boot option for legacy network devices.

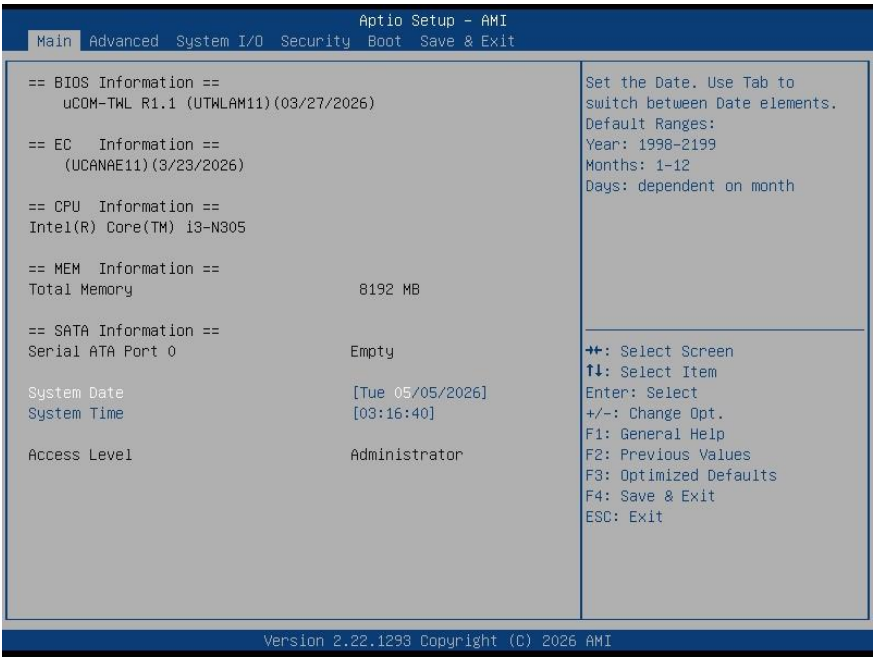
**System I/O** – For hosting bridge parameters.

**Security** – Password for setup administrator can be set here.

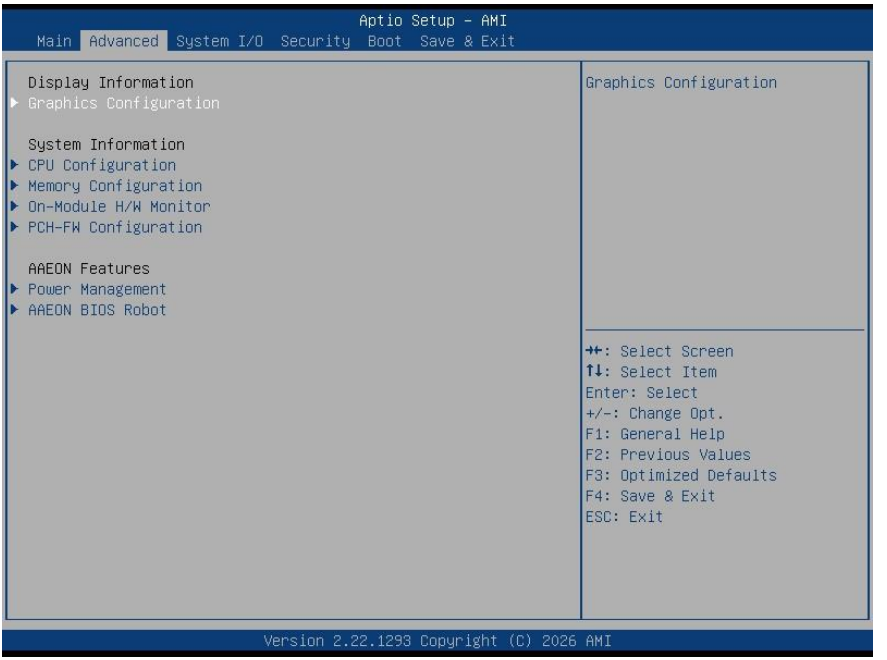
**Boot** – Enable/disable Quiet Boot option.

**Save & Exit** – Save changes and exit Setup.

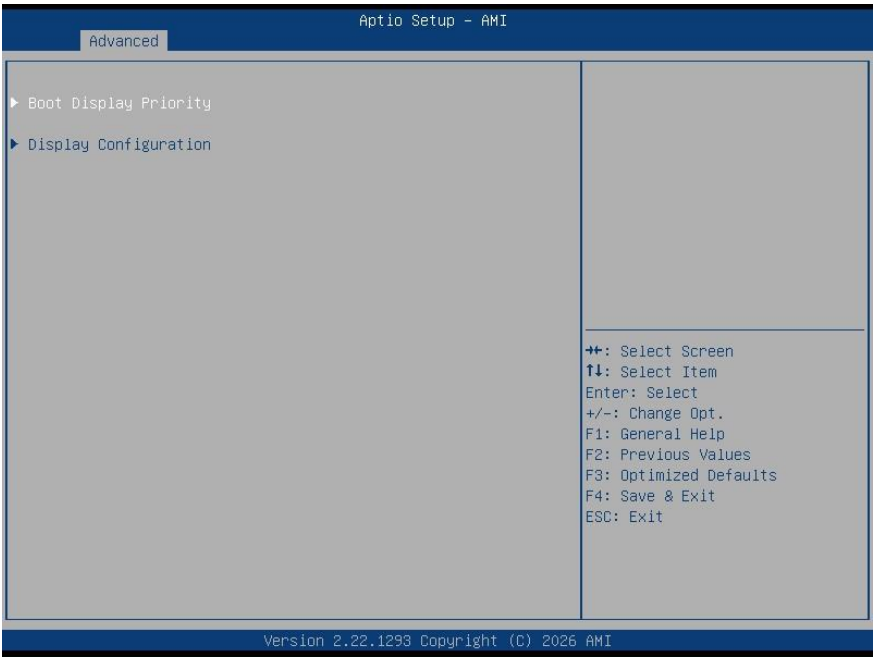
## 3.3 Setup Submenu: Main



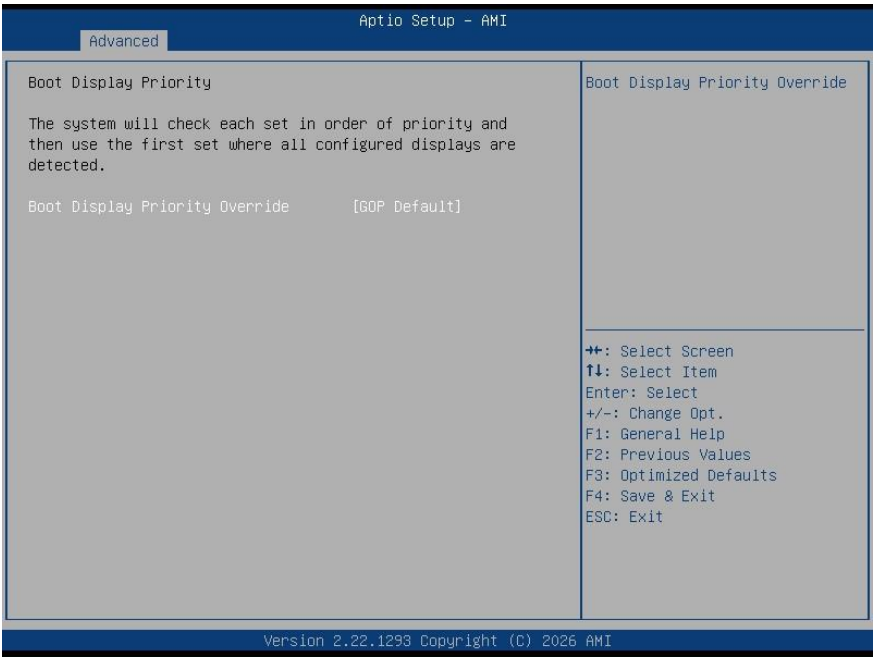
## 3.4 Setup Submenu: Advanced



### 3.4.1 Graphics Configuration

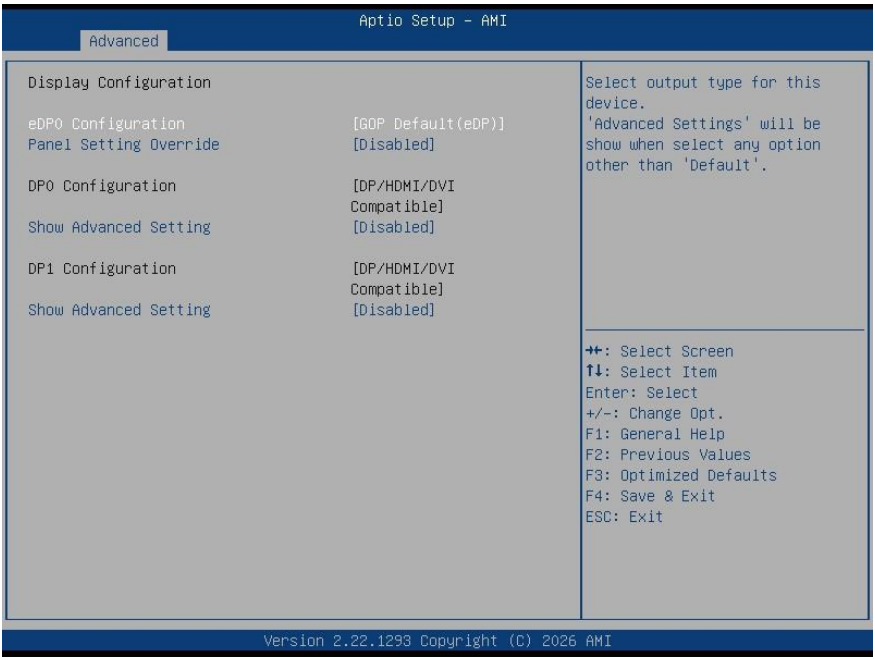


## 3.4.2 Boot Display Priority



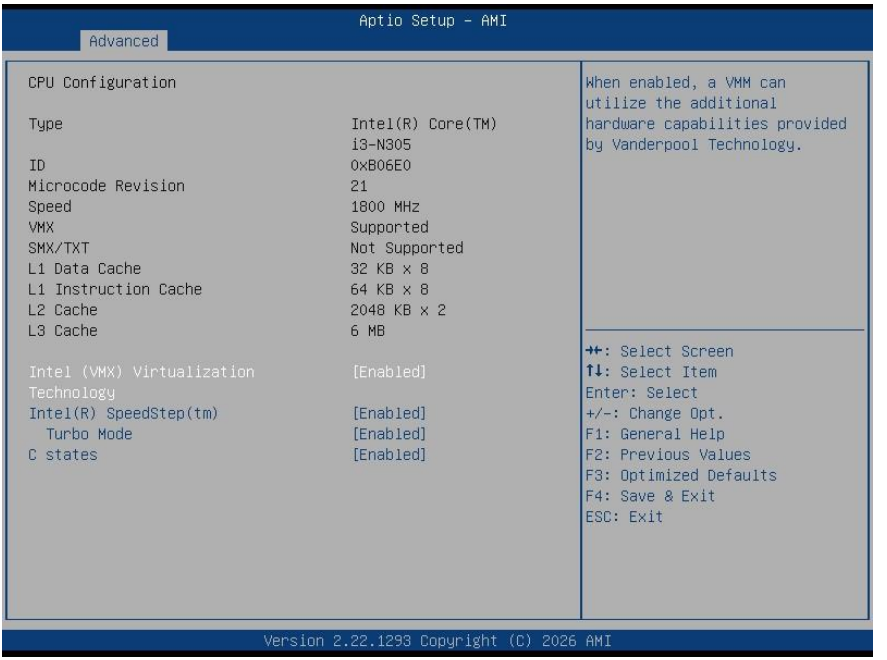

| Options Summary | | |
|---|---|---|
| Boot Display Priority Override | Enabled | |
| | GOP Default | Optimal Default, Failsafe Default |
| Boot Display Priority Override. | | |

### 3.4.2.1 Display Configuration



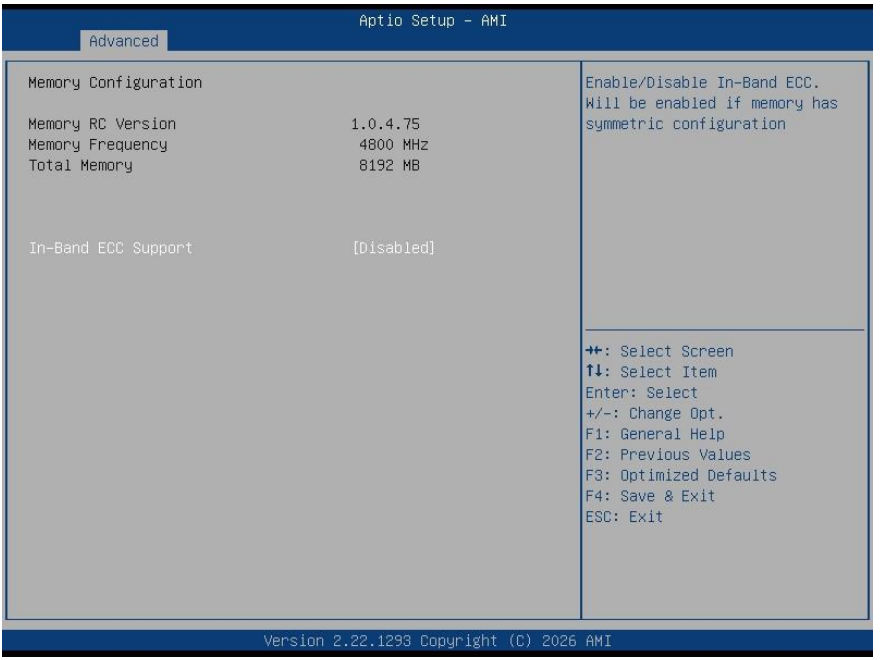

| Options Summary | | |
|---|---|---|
| **eDP0 Configuration** | GOP Default(eDP) | Optimal Default, Failsafe Default |
| | No Device (Disable) | |
| Select the output type for this device. The Advanced Settings menu will appear when any option other than Default is selected. | | |
| **Panel Setting Override** | Enabled | |
| | Disabled | Optimal Default, Failsafe Default |
| Panel Setting Override. | | |
| **DP0 Configuration** | DP/HDMI/DVI Compatible | Optimal Default, Failsafe Default |
| Select output type for this device. | | |
| **DP1 Configuration** | DP/HDMI/DVI Compatible | According to HW SKU |
| | HDMI/DVI | According to HW SKU |
| Select output type for this device. | | |

### 3.4.3 CPU Configuration



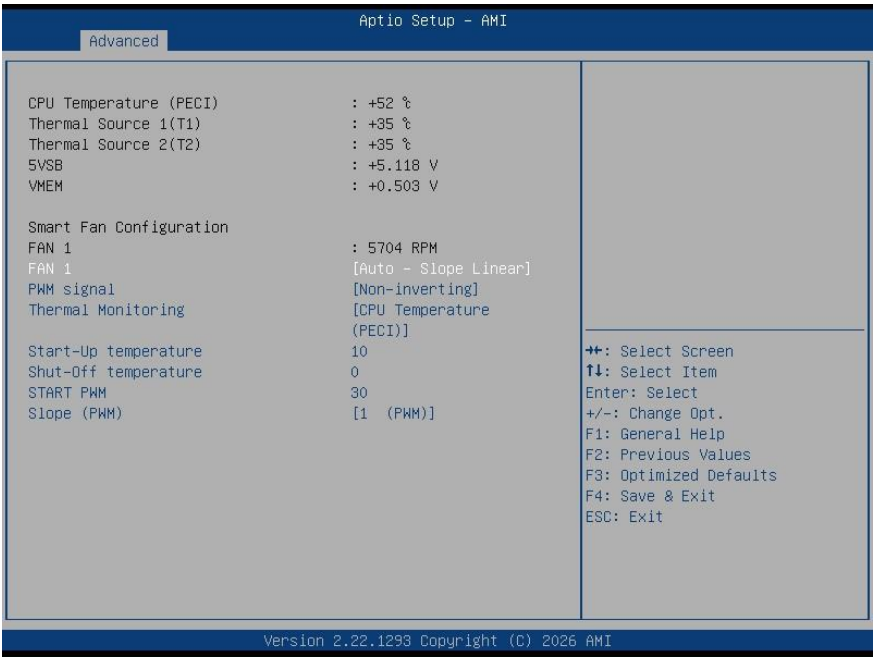

| Options Summary | | |
|---|---|---|
| Intel (VMX) Virtualization Technology | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology. | | |
| Intel® SpeedStep™ | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Allows more than two frequency ranges to be supported. | | |
| Turbo Mode | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable/Disable processor Turbo Mode. | | |
| C states | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable/Disable CPU Power Management.<br>Allows CPU to go to C states when it's not 100% utilized. | | |

### 3.4.4 Memory Configuration




| Options Summary | | |
|---|---|---|
| In-Band ECC Support | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable/Disable In-Band ECC.<br>Will be enabled if memory has symmetric configuration. | | |

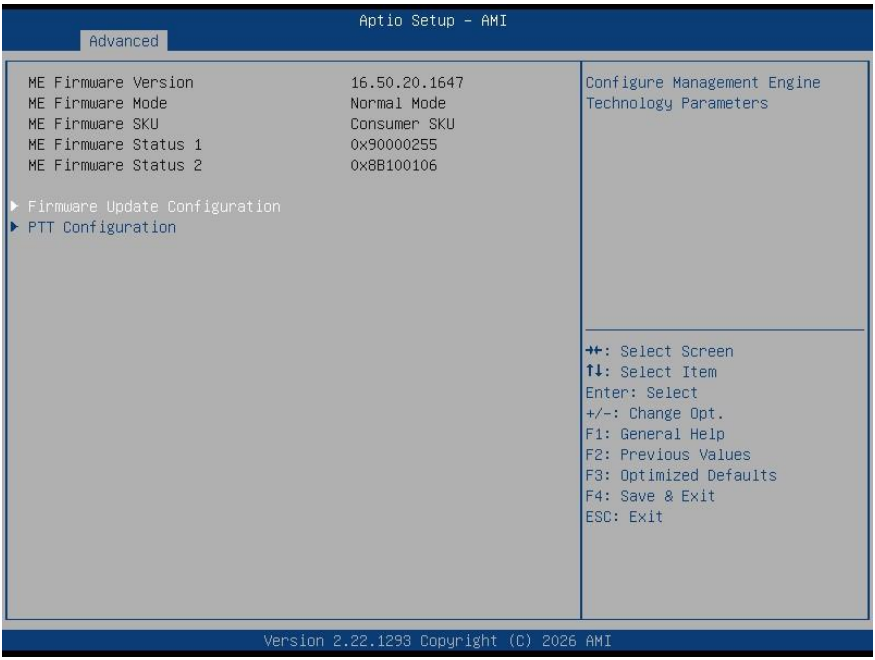
### 3.4.5 On-Module H/W Monitor




| Options Summary | | |
|---|---|---|
| **Smart Fan** | Full Mode | |
| | Manual Mode | |
| | Auto – Slope Linear | Optimal Default, Failsafe Default |
| Fan Mode select. | | |
| **PWM signal** | Non-inverting | Optimal Default, Failsafe Default |
| | Inverting | |
| Select output PWM of inverting or non-inverting signal. | | |
| **Thermal Monitoring** | CPU Temperature (PECI) | Optimal Default, Failsafe Default |
| | Thermal Source 1 (T1) | |
| | Thermal Source 2 (T2) | |
| Monitoring thermal sensor select. | | |
| **Start-Up temperature** | 10 | |
| PWM output when monitoring thermal sensor is exceeded.<br>Range: 0 - 100 | | |
| **Shut-Off temperature** | 0 | |

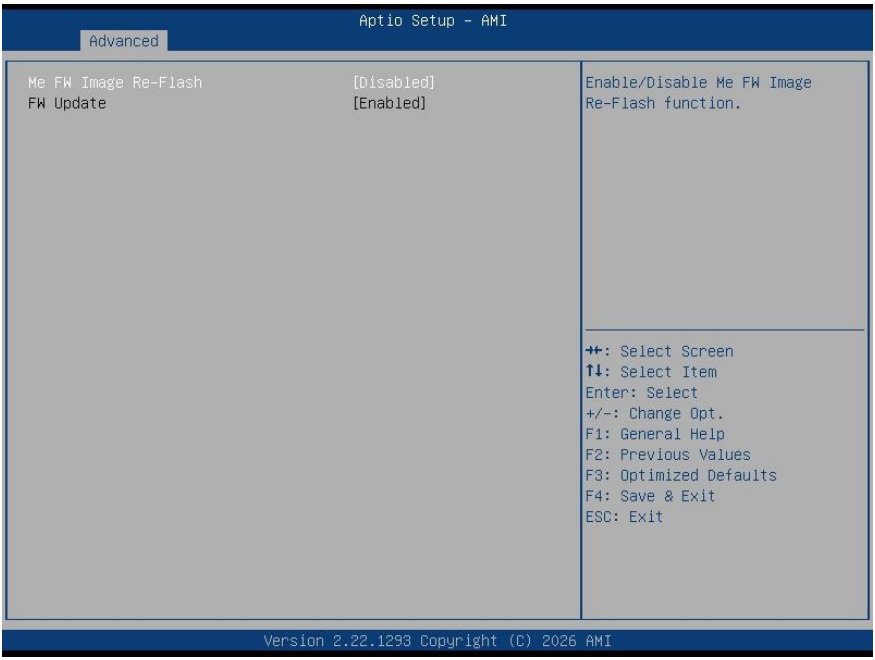
| Options Summary | | |
|---|---|---|
| PWM turns off when monitored thermal sensor is less or equal to.<br>Range: 0 – 100 | | |
| START PWM | 30 | |
| The beginning PWM output value when Start-Up temperature is triggered. | | |
| Slope (PWM) | 0 (PWM) | |
| | 1 (PWM) | Optimal Default, Failsafe Default |
| | 2 (PWM) | |
| | 4 (PWM) | |
| | 8 (PWM) | |
| | 16 (PWM) | |
| | 32 (PWM) | |
| | 64 (PWM) | |
| When the monitored temperature is higher than the Start-Up temperature, the PWM output increases per degree. | | |

### 3.4.6 PCH-FW Configuration



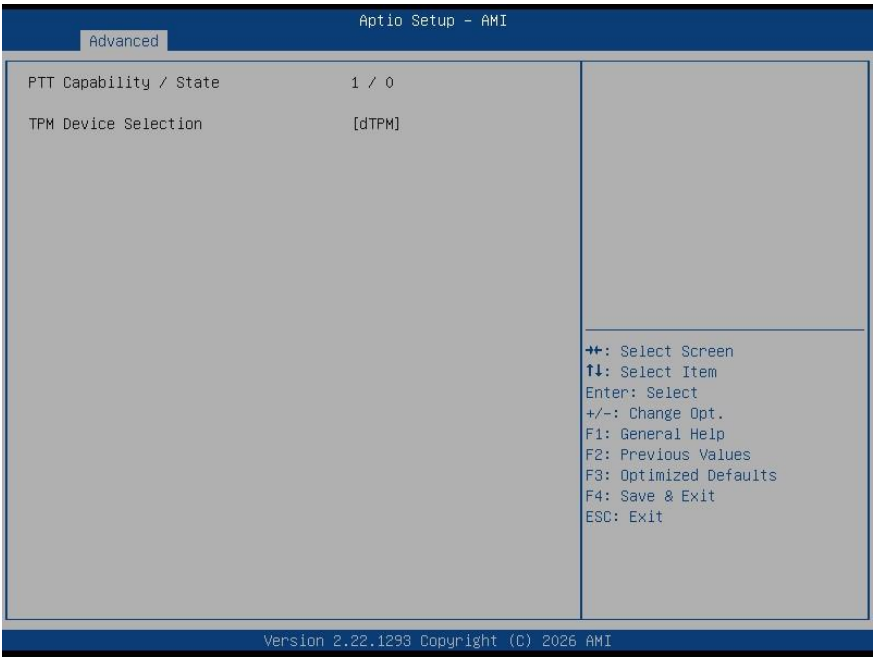

| Options Summary | | |
|---|---|---|
| TPM Device Selection | dTPM | Optimal Default, Failsafe Default |
| | PTT | |
| Select the TPM device to use: PTT or dTPM.<br><br>PTT – Enables Intel® Platform Trust Technology (PTT) in SkuMgr.<br>dTPM 1.2 – Disables PTT in SkuMgr and uses a discrete TPM 1.2 device.<br><br>**Warning:** Switching between PTT and dTPM will disable the currently active TPM device, and all data stored in it will be lost. | | |

### 3.4.6.1 Firmware Update Configuration

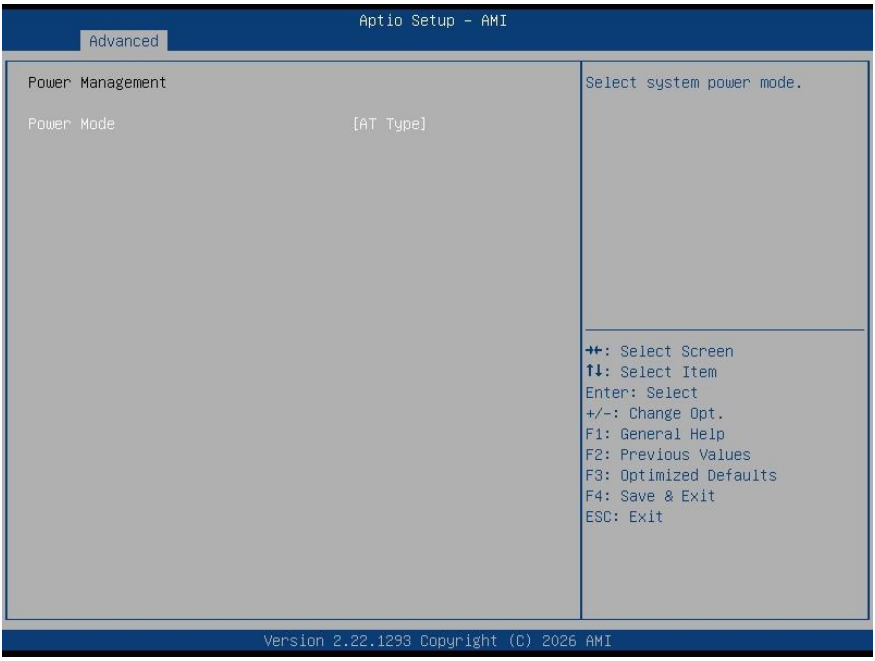



| Options Summary | | |
|---|---|---|
| Me FW Image Re-Flash | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or Disable the ME firmware image re-flash function. | | |

### 3.4.6.2 PTT Configuration

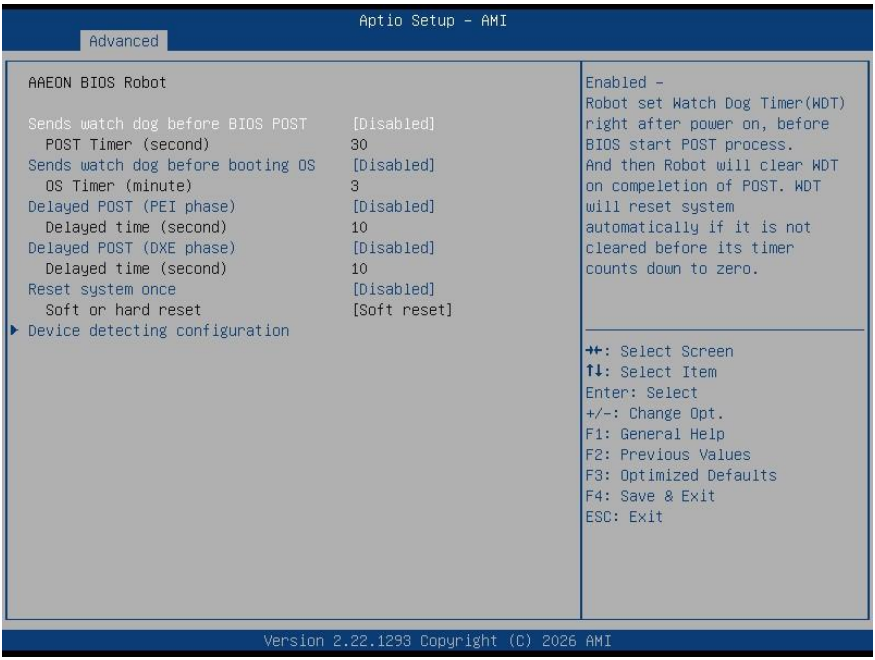


### 3.4.7 Power Management




| Options Summary | | |
|---|---|---|
| Power Mode | ATX Type | |
| | AT Type | Optimal Default, Failsafe Default |
| Select system power mode. | | |
| Restore AC Power Loss | Last State | |
| | Always On | |
| | Always Off | Optimal Default, Failsafe Default |
| Restore AC Power Loss. | | |
| Soft-Off (S5) Wake On RTC | Disabled | Optimal Default, Failsafe Default |
| | By Date | |
| | By Weekday | |
| | Bypass | |
| By Date: System will wake on the day with hr::min::sec specified.<br>By Weekday: System will wake on the enabled weekday with hr::min::sec specified.<br>Bypass: BIOS will not control RTC wake function. | | |

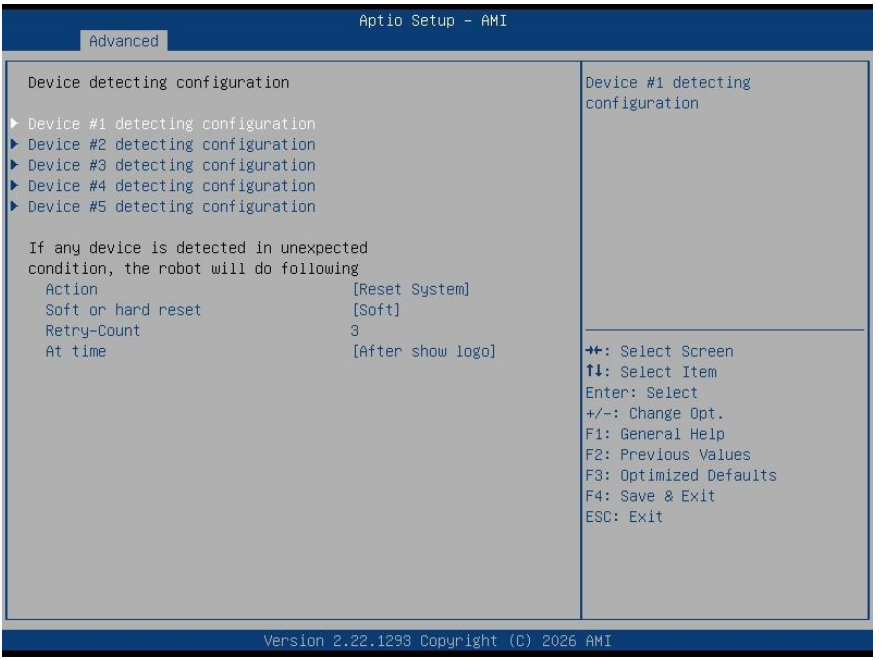
### 3.4.8 AAEON BIOS Robot



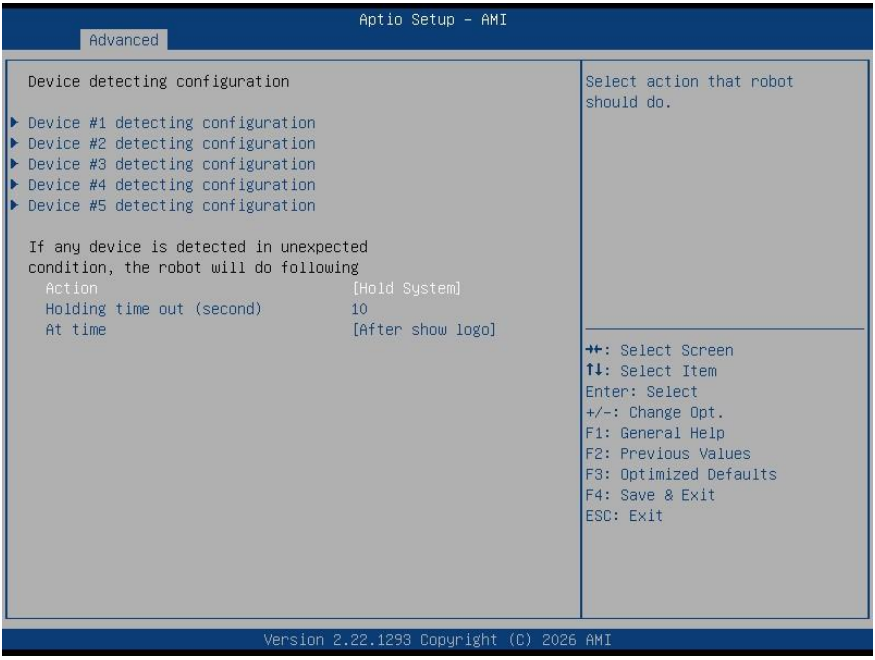

| Options Summary | | |
|---|---|---|
| Sends watch dog before BIOS POST | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enabled – The robot sets the Watch Dog Timer (WDT) immediately after power-on, before the BIOS begins the POST process. The robot clears the WDT after POST is completed. If the WDT is not cleared before the timer expires, the system will automatically reset. | | |
| POST Timer (second) | 30 | Optimal Default, Failsafe Default |
| Set the timer count for the Watch Dog Timer (WDT) during POST.<br><br>Warning: Do not set the timer value equal to or shorter than the normal POST time. Otherwise, the system may continuously reset and fail to complete POST unless the BIOS settings are cleared. It is recommended to set the value to more than twice the normal POST time. | | |
| Sends watch dog before booting OS | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |

| Options Summary | | |
|---|---|---|
| Enabled – The robot sets the Watch Dog Timer (WDT) after POST completion, before the BIOS transfers control to the operating system.<br>**Warning**: Before enabling this function, an OS-level program must be responsible for clearing the WDT. This function should be disabled if the operating system is performing an update. | | |
| **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 – The robot delays BIOS from starting POST immediately after power-on. This allows the POST process to begin with stable power or after the system has physically warmed up.<br>**Note**: This delay occurs before the Watch Dog Timer is set. | | |
| **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 – The robot holds the BIOS before POST completion. This ensures that the POST process completes under stable power or after the system has physically warmed up.<br>**Note**: This hold occurs after the Watch Dog Timer is set but before POST finishes. | | |
| **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. | | |

### 3.4.8.1 Device Detecting Configuration

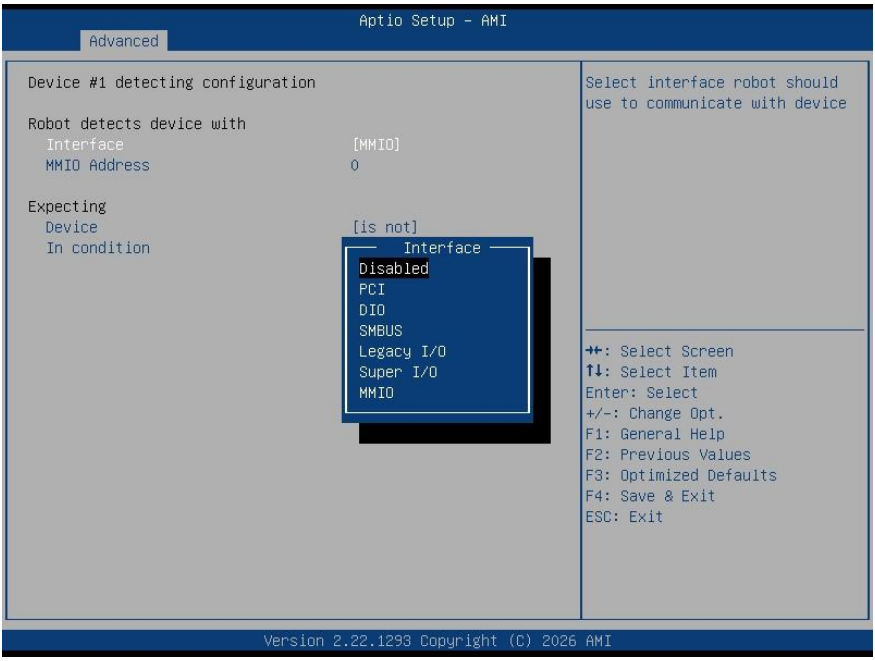



| Options Summary | | |
|---|---|---|
| Action | Reset System | Optimal Default, Failsafe Default |
| | Hold System | |
| Select action that robot should do. | | |
| Soft or hard reset | Soft | Optimal Default, Failsafe Default |
| | Hard | |
| Select reset type robot should send on each boot. | | |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

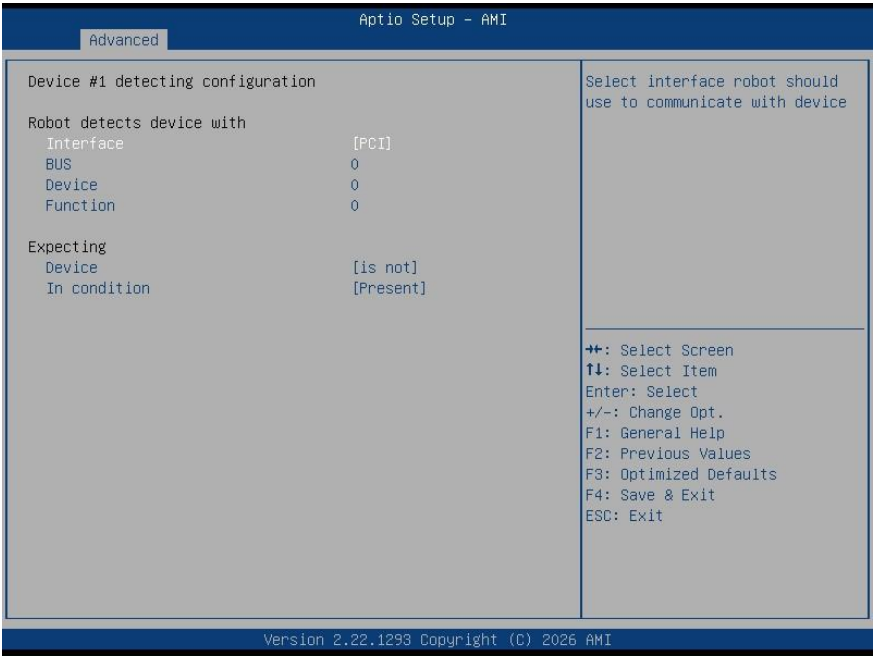



| Options Summary | | |
|---|---|---|
| Action | Reset System | |
| | Hold System | Optimal Default, Failsafe Default |
| Select action that robot should do. | | |
| Holding time out (second) | 10 | Optimal Default, Failsafe Default |
| Fill hold time out here. Robot will hold system no longer than time-out value, and then let system continue its POST. | | |
| At time | After show logo | Optimal Default, Failsafe Default |
| | Before show logo | |
| Select robot action time: After show logo - Robot will do action after logo is displayed. System devices are almost ready. Before show logo - Robot will do action earlier before logo, but some devices may not be ready. | | |

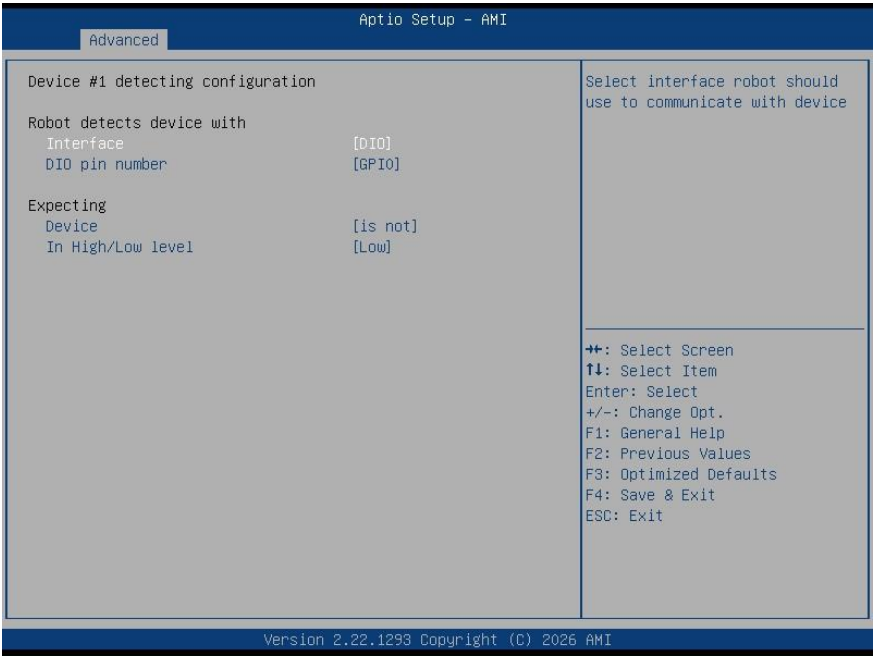
### 3.4.8.2 Device #* Detecting Configuration



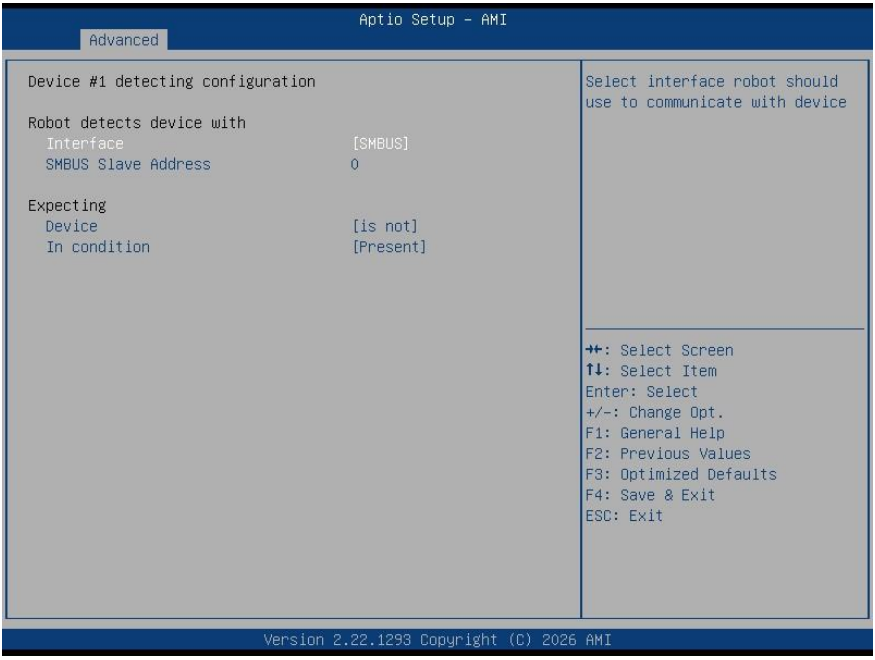

| Options Summary | | |
|---|---|---|
| Interface | Disabled | Optimal Default, Failsafe Default |
| | PCI | |
| | DIO | |
| | SMBUS | |
| | Legacy I/O | |
| | Super I/O | |
| | MMIO | |
| Select interface robot should use to communicate with device. | | |



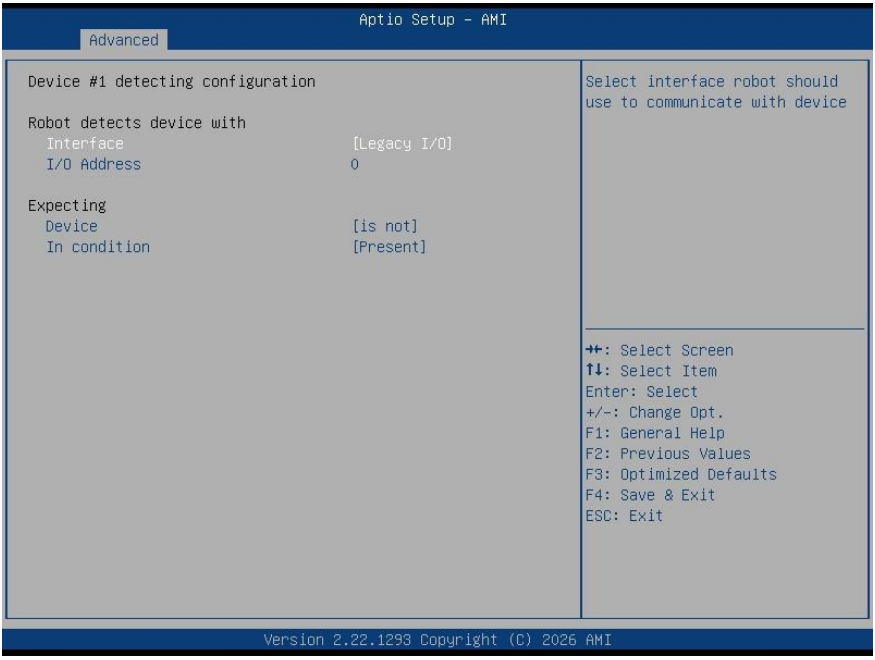

| Interface item set to "PCI" | | |
|---|---|---|
| Options Summary | | |
| BUS | 0 | Optimal Default, Failsafe Default |
| Fill BUS number to a PCI device, in hexadecimal. Range: 0 – FF. | | |
| Device | 0 | Optimal Default, Failsafe Default |
| Fill DEVICE number to a PCI device, in hexadecimal. Range: 0 – FF. | | |
| Function | 0 | Optimal Default, Failsafe Default |
| Fill FUNCTION number to a PCI device, in hexadecimal. Range: 0 – FF. | | |
| Device | is | |
| | Is not | Optimal Default, Failsafe Default |
| Select whether the robot should perform the action when the specified condition is met. | | |
| In condition | Present | Optimal Default, Failsafe Default |
| | Specified register data | |
| Select the condition that robot should check for device. Present - device is detected. According to register - Robot read register according to configuration.<br>Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF. | | |



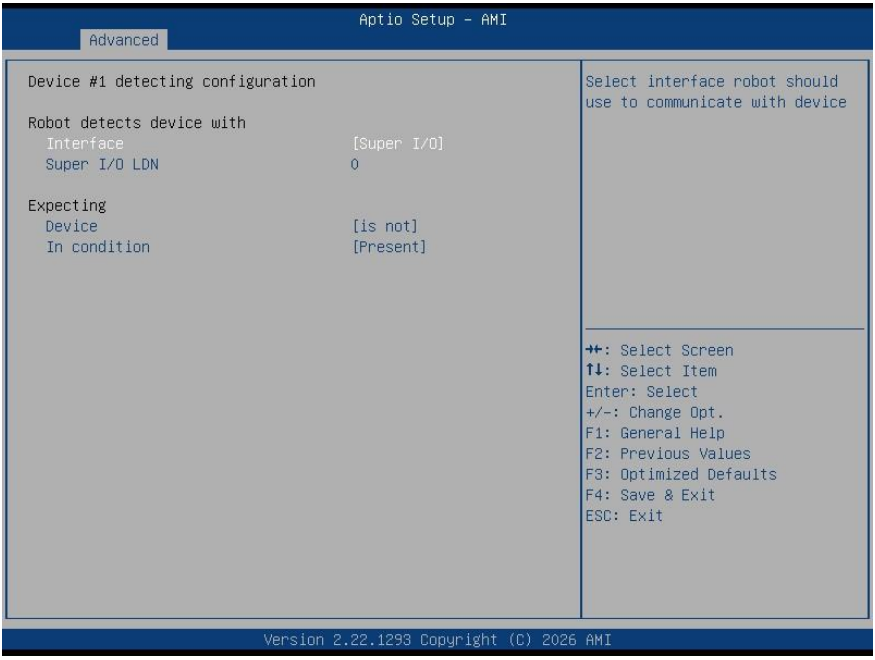

| Interface item set to "DIO" | | |
|---|---|---|
| Options Summary | | |
| DIO pin number | GPIO 0 | Optimal Default, Failsafe Default |
| | GPIO * | |
| Fill DIO pin number, 0 - DIO, 1 - DIO1, and so on.<br>For COM express product:<br>0-3 - GPI0-3<br>4-7 - GPO0-3 | | |
| Device | is | |
| | Is not | Optimal Default, Failsafe Default |
| Select whether the robot should perform the action when the specified condition is met. | | |
| In High/Low level | Low | Optimal Default, Failsafe Default |
| | High | |
| Select High/Low level of the DIO pin that robot should perform action. | | |



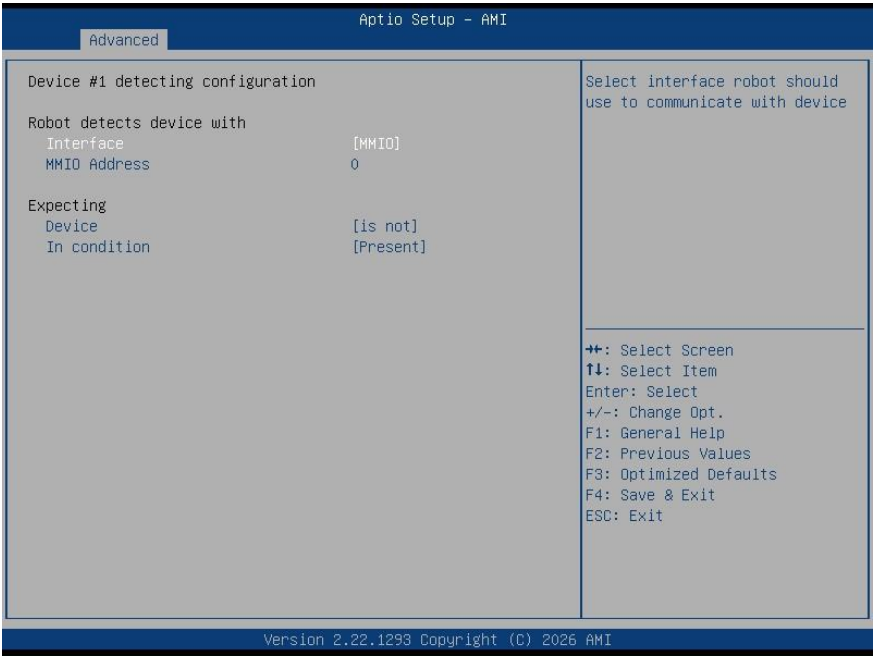

| Interface item set to "SMBUS" | | |
|---|---|---|
| Options Summary | | |
| SMBUS Slave Address | 0 | Optimal Default, Failsafe Default |
| Fill slave address to a SMBUS device, in hexadecimal. Range: 0 – FF | | |
| Device | is | |
| | Is not | Optimal Default, Failsafe Default |
| Select whether the robot should perform the action when the specified condition is met. | | |
| In condition | Present | Optimal Default, Failsafe Default |
| | Specified register data | |
| Select the condition that robot should check for device. Present - device is detected According to register - Robot read register according to configuration.<br>Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF. | | |




| Interface item set to "Legacy I/O" | | |
|---|---|---|
| Options Summary | | |
| I/O Address | 0 | Optimal Default, Failsafe Default |
| Fill I/O address device is responding to. Range: 0~FFFF | | |
| Device | is | |
| | Is not | Optimal Default, Failsafe Default |
| Select whether the robot should perform the action when the specified condition is met. | | |
| In condition | Present | Optimal Default, Failsafe Default |
| | Specified register data | |
| Select the condition that robot should check for device. Present - device is detected. According to register - Robot read register according to configuration.<br>Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF. | | |

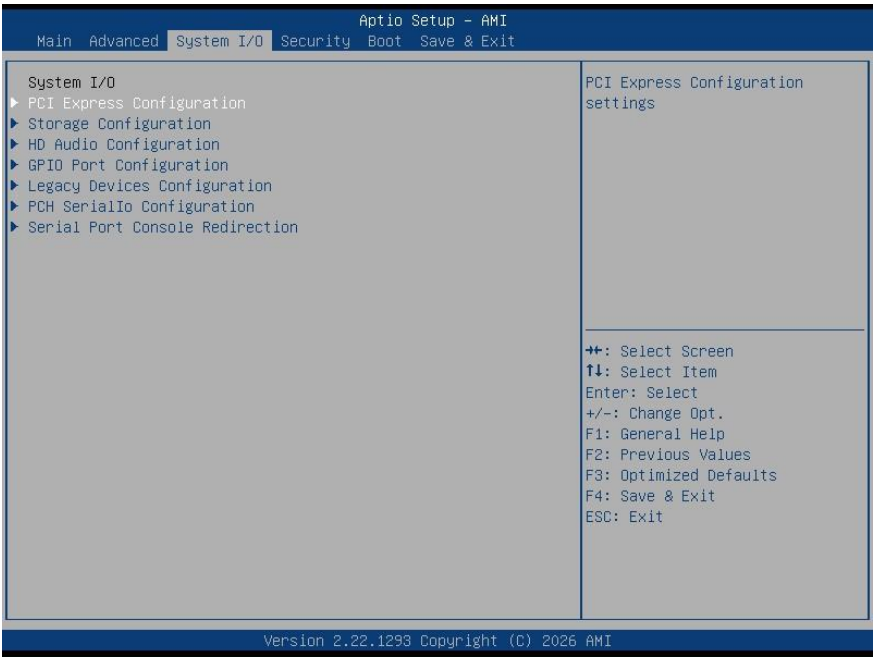



| Interface item set to "Super I/O" | | |
|---|---|---|
| Options Summary | | |
| Super I/O LDN | 0 | Optimal Default, Failsafe Default |
| Fill LDN number to a Super I/O device. Range: 0~FF. | | |
| Device | is | |
| | Is not | Optimal Default, Failsafe Default |
| Select whether the robot should perform the action when the specified condition is met. | | |
| In condition | Present | Optimal Default, Failsafe Default |
| | Specified register data | |
| Select the condition that robot should check for device. Present - device is detected. According to register - Robot read register according to configuration.<br>Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF | | |




| Interface item set to "MMIO" | | |
|---|---|---|
| Options Summary | | |
| MMIO Address | 0 | Optimal Default, Failsafe Default |
| Fill Memory Mapped I/O address device is responding to. Range: 0~FFFFFFFF. | | |
| Device | is | |
| | Is not | Optimal Default, Failsafe Default |
| Select whether the robot should perform the action when the specified condition is met. | | |
| In condition | Present | Optimal Default, Failsafe Default |
| | Specified register data | |
| Select the condition that robot should check for device. Present - device is detected. According to register - Robot read register according to configuration.<br>Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF. | | |

## 3.5 Setup Submenu: System I/O

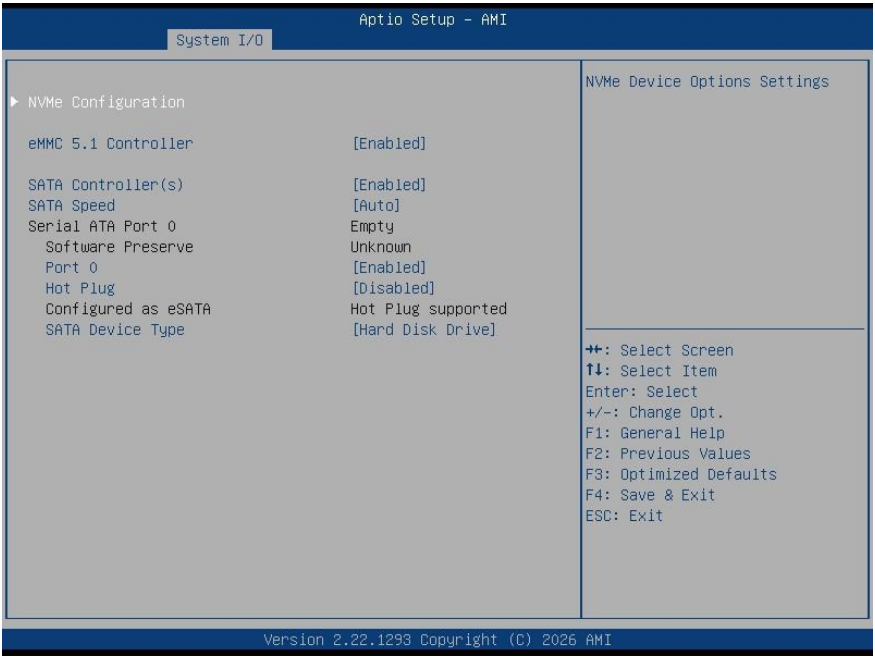


### 3.5.1 PCI Express Configuration


| Options Summary | | |
|---|---|---|
| Pcie Ref Pll SSC | Auto | |
| | 0.0% | |
| | 0.1% | |
| | 0.2% | |
| | 0.3% | |
| | 0.4% | |
| | 0.5% | |
| | Disable | Optimal Default, Failsafe Default |
| Configure the PCIe Reference PLL Spread Spectrum Clocking (SSC) percentage.<br>Auto – Uses the hardware default setting with no BIOS override.<br>0.0%–0.5% – Manually set the SSC percentage within the supported range.<br>Disable – Disables PCIe Reference PLL SSC. | | |
| PCIE_A C D | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Control the PCI Express Root Port. | | |

| Options Summary | | |
|---|---|---|
| PCIe Speed | Auto | Optimal Default, Failsafe Default |
| | Gen1 | |
| | Gen2 | |
| | Gen3 | |
| | Gen4 | |
| Configure PCIe Speed. | | |
| Hot Plug | Disable | Optimal Default, Failsafe Default |
| | Enable | |
| Enable/Disable PCI Express Hot Plug. | | |

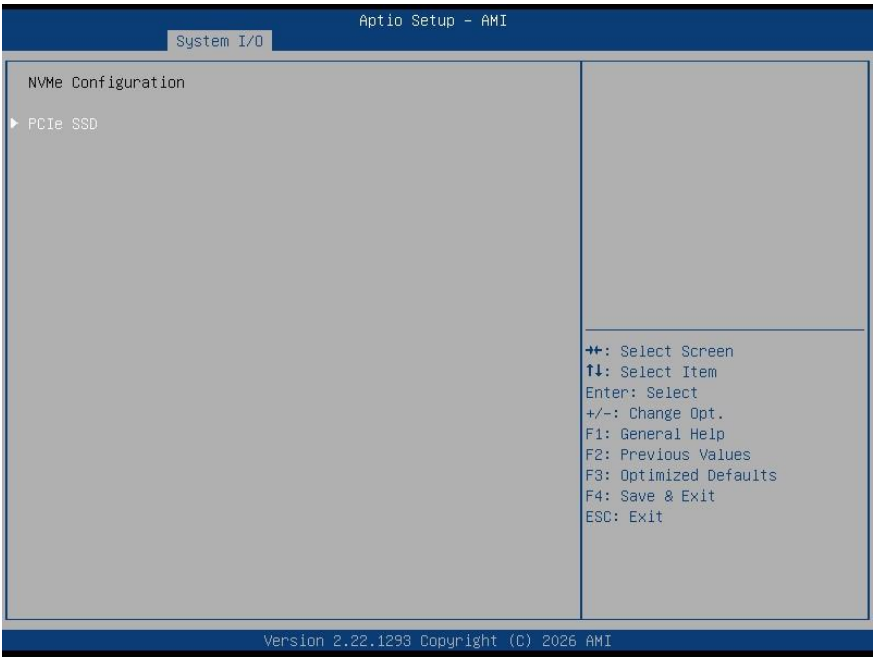
## 3.5.2 Storage Configuration



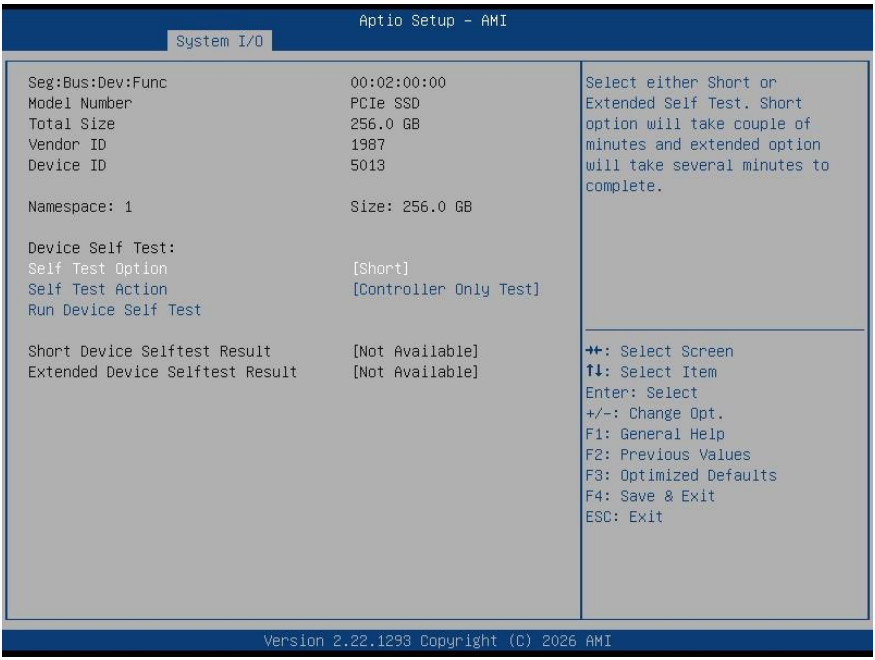

| Options Summary | | |
|---|---|---|
| eMMC 5.1 Controller | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable SCS eMMC 5.1 Controller | | |

| Options Summary | | |
|---|---|---|
| SATA Controller(s) | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable/Disable SATA Device. | | |
| SATA Controller(s) | Auto | Optimal Default, Failsafe Default |
| | Gen1 | |
| | Gen2 | |
| | Gen3 | |
| Configure the maximum supported SATA link speed:<br>Gen1 – 1.5 Gb/s<br>Gen2 – 3.0 Gb/s<br>Gen3 – 6.0 Gb/s | | |
| Port 0 | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Designates this port as Hot Pluggable. | | |
| Hot Plug | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Designates this port as Hot Pluggable. | | |
| SATA Device Type | Hard Disk Drive | Optimal Default, Failsafe Default |
| | Solid State Drive | |
| Identify whether the connected SATA device is a Solid State Drive (SSD) or a Hard Disk Drive (HDD). | | |

### 3.5.2.1 NVMe Configuration

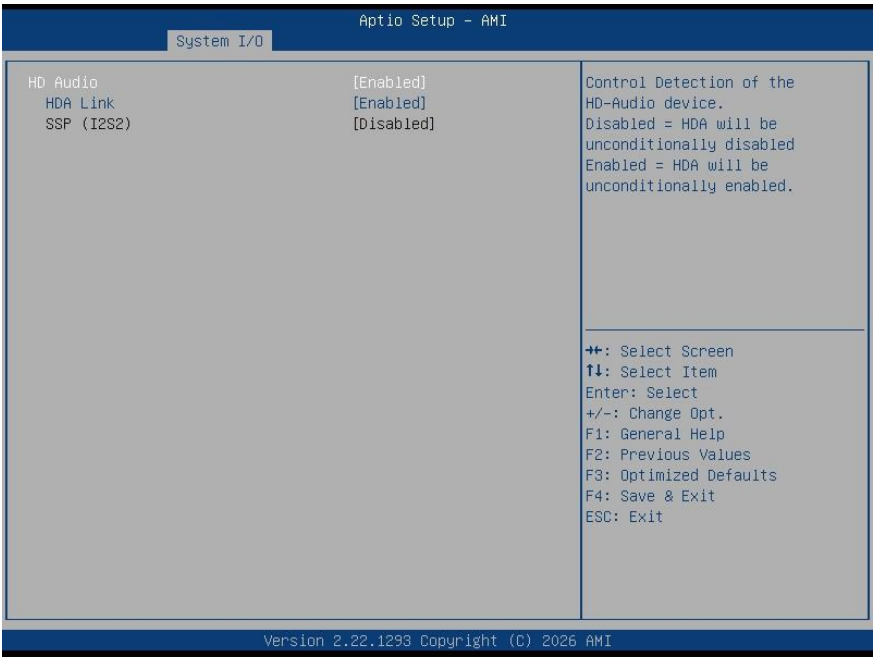


### 3.5.2.2 PCIe SSD




| Options Summary | | |
|---|---|---|
| Self Test Option | Short | Optimal Default, Failsafe Default |
| | Extended | |
| Select the type of self-test to perform on the SATA device:<br>Short – Completes in a few minutes.<br>Extended – Takes several minutes to complete for a more thorough test. | | |
| Self Test Action | Controller only test | Optimal Default, Failsafe Default |
| | Controller and NameSpace test | |
| Select the scope of the self-test for the NVMe device:<br>Controller Only – Tests the controller alone.<br>Controller and Namespace – Tests both the controller and namespace. This option takes significantly longer to complete. | | |

### 3.5.3 HD Audio Configuration

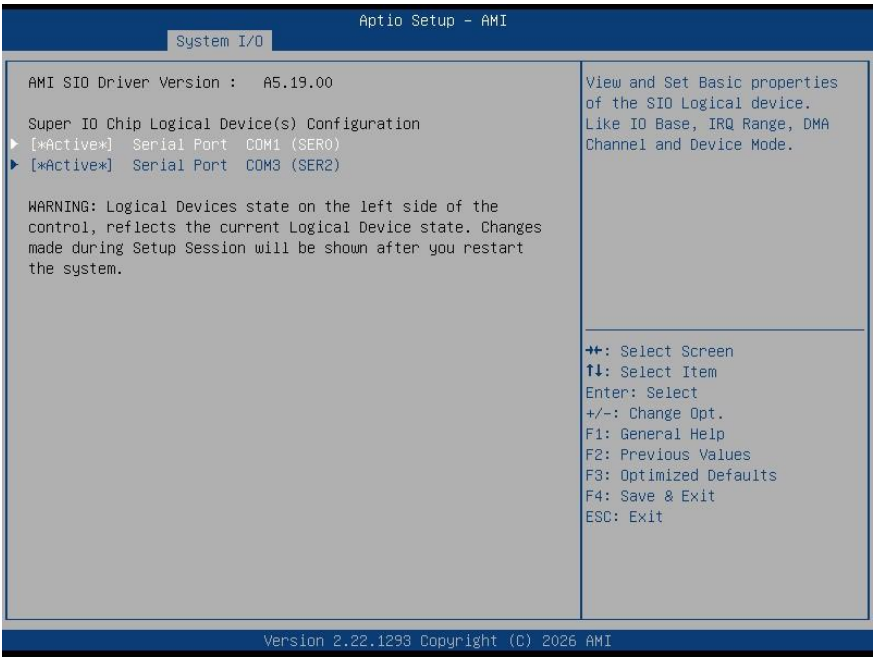



| Options Summary | | |
|---|---|---|
| HD Audio | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Control Detection of the HD-Audio device.<br>Disabled = HDA will be unconditionally disabled.<br>Enabled = HDA will be unconditionally enabled. | | |
| HAD Link | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable the HAD link.<br>Supports multiplexed interfaces: HDA or SSP (I2S2). | | |
| SSP (I2S2) | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or Disable the SSP (I2S2) interface.<br>Supports multiplexed interfaces: HDA or SSP (I2S2). | | |

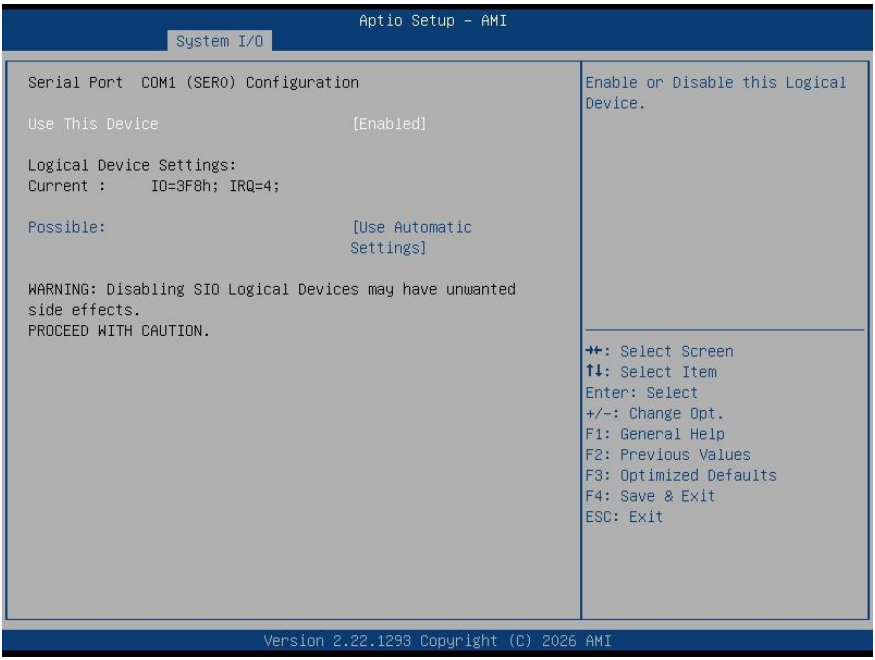
### 3.5.4 Digital IO Port Configuration


| Options Summary | | |
|---|---|---|
| GPIO 7 – 13 | Input | Optimal Default, Failsafe Default |
| | Output | |
| Set GPIO as Input or Output. | | |
| Output Level | High | |
| | Low | Optimal Default, Failsafe Default |
| Set output level when GPIO pin is output. | | |

### 3.5.5 Legacy Logical Devices Configuration

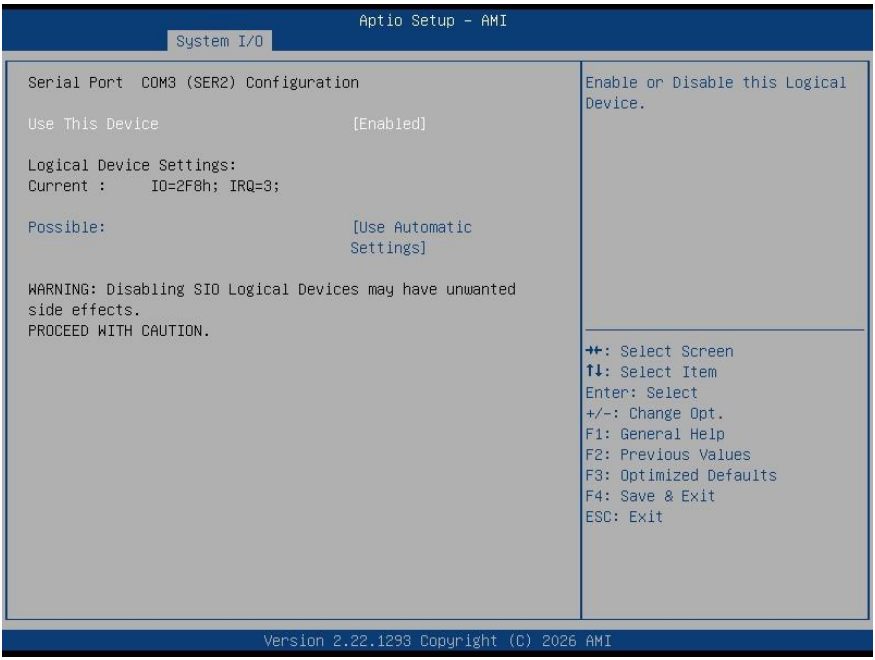


### 3.5.5.1 Serial Port COM1 (SER0)



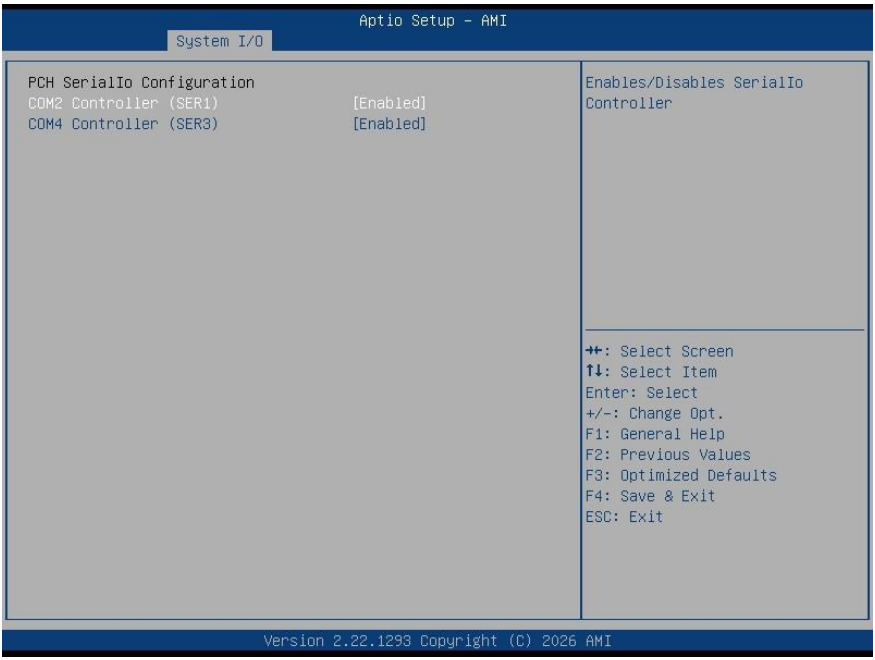

| Options Summary | | |
|---|---|---|
| Use This Device | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device. | | |
| Use This Device | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=3F8h; IRQ=4; DMA; | |
| | IO=2C8h; IRQ=11; DMA; | |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. | | |

### 3.5.5.2 Serial Port COM3 (SER2)



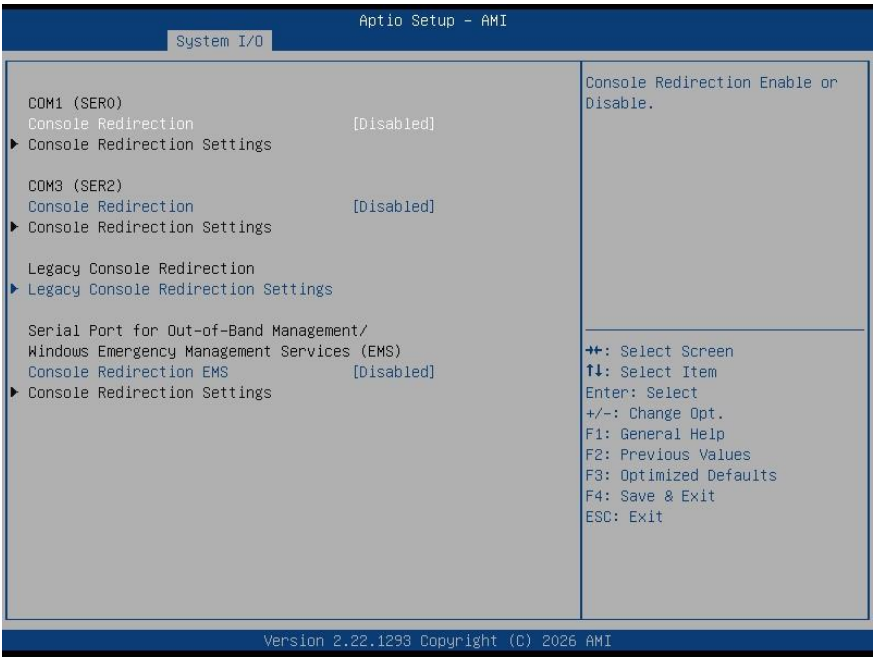

| Options Summary | | |
|---|---|---|
| Use This Device | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable this Logical Device. | | |
| Use This Device | Use Automatic Settings | Optimal Default, Failsafe Default |
| | IO=2F8h; IRQ=3; DMA; | |
| | IO=2d8h; IRQ=10; DMA; | |
| Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts. | | |

### 3.5.6 PCH Serial IO Configuration



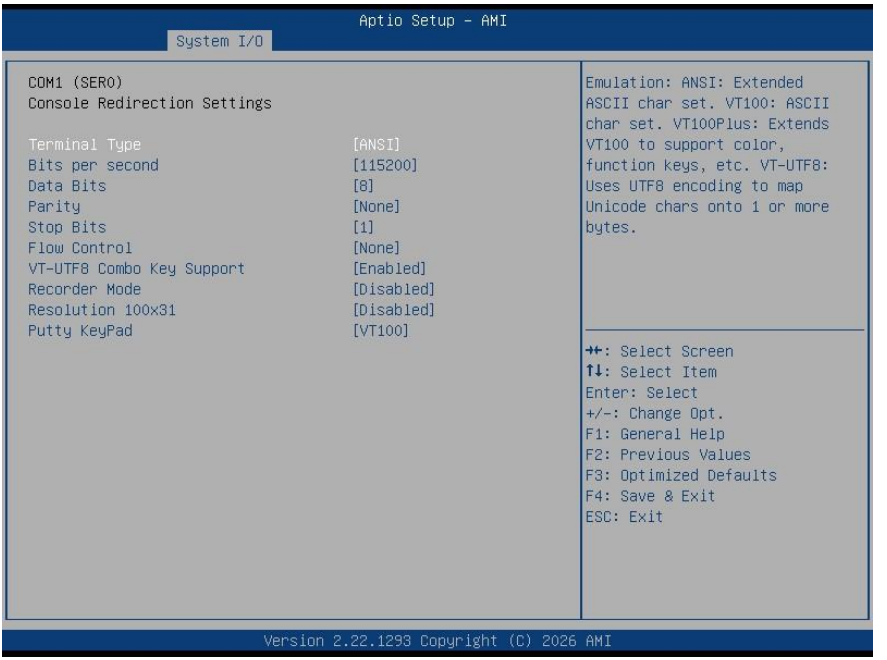

| Options Summary | | |
|---|---|---|
| COM2 Controller (SER1) | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enables/Disables Seriallo Controller | | |
| COM4 Controller (SER3) | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enables/Disables Seriallo Controller | | |

## 3.5.7 Serial Port Console Redirection




| Options Summary | | |
|---|---|---|
| COM1 (SER0) Console Redirection | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or Disable Console Redirection. | | |
| COM3 (SER2) Console Redirection | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or Disable Console Redirection. | | |
| Console Redirection EMS | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enable or Disable Console Redirection. | | |

### 3.5.7.1 COM1 (SER0) Console Redirection Settings

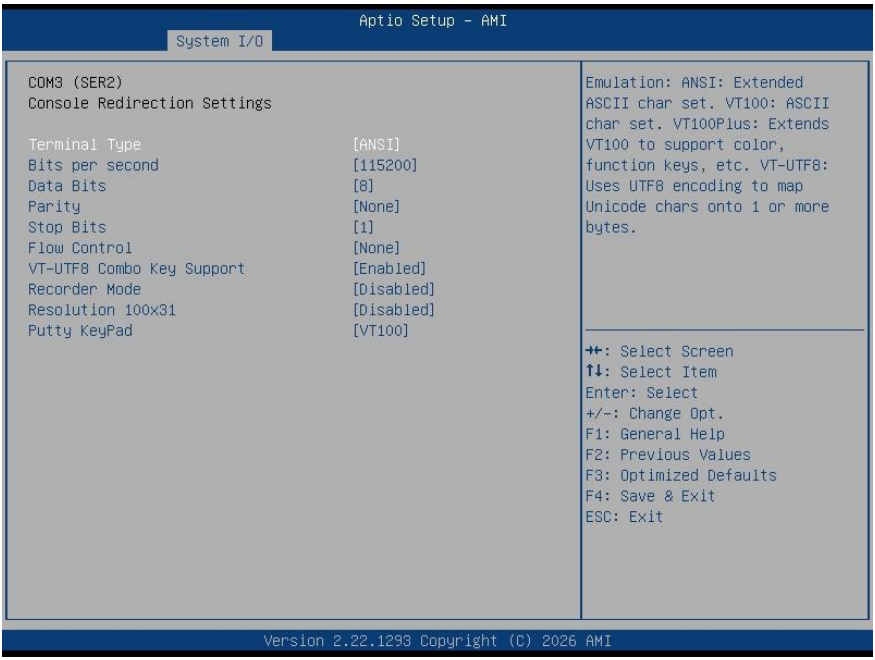



| Options Summary | | |
|---|---|---|
| COM1 (SER0) Console Redirection | VT100 | |
| | VT100Plus | |
| | VT-UTF8 | |
| | ANSI | Optimal Default, Failsafe Default |
| Emulation:<br>ANSI: Extended ASCII char set.<br>VT100: ASCII char set.<br>VT100Plus: Extends VT100 to support color, function keys.<br>VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. | | |
| Bits per second | 9600 | |
| | 19200 | |
| | 38400 | |
| | 57600 | |
| | 115200 | Optimal Default, Failsafe Default |
| | 230400 | |

| Options Summary | | |
|---|---|---|
| Bits per second (cont.) | 460800 | |
| | 921600 | |
| Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. | | |
| Data Bits | 7 | |
| | 8 | Optimal Default, Failsafe Default |
| Data Bits | | |
| Parity | None | Optimal Default, Failsafe Default |
| | Even | |
| | Odd | |
| | Mark | |
| | Space | |
| A parity bit can be sent with the data bits to detect some transmission errors.<br>Even: parity bit is 0 if the num of 1's in the data bits is even.<br>Odd: parity bit is 0 if num of 1's in the data bits is odd.<br>Mark: parity bit is always 1.<br>Space: Parity bit is always 0.<br>Mark and Space Parity do not allow for error detection.<br>They can be used as an additional data bit. | | |
| Stop Bits | 1 | Optimal Default, Failsafe Default |
| | 2 | |
| Stop bits indicate the end of a serial data packet.<br>(A start bit indicates the beginning).<br>The standard setting is 1 stop bit.<br>Communication with slow devices may require more than 1 stop bit. | | |
| Flow Control | None | Optimal Default, Failsafe Default |
| | Hardware RTS/CTS | |
| Flow control helps prevent data loss due to buffer overflow. When sending data, if the receiving buffer is full, a stop signal is sent to pause the data flow. Once the buffer has space, a start signal resumes the flow. Hardware flow control uses two wires (RTS/CTS) to transmit the start and stop signals. | | |
| VT-UTF8 Combo Key Support | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals. | | |
| Recorder Mode | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| When enabled, only text data will be sent.<br>This mode is used to capture terminal output for logging purposes. | | |
| Resolution 100x31 | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |

| Options Summary | | |
|---|---|---|
| Enables or disables extended terminal resolution. | | |
| Putty KeyPad | VT100 | Optimal Default, Failsafe Default |
| | LINUX | |
| | XTERMR6 | |
| | SCO | |
| | ESCN | |
| | VT400 | |
| Select FunctionKey and KeyPad on Putty. | | |

### 3.5.7.2 COM3 (SER2) Console Redirection Settings

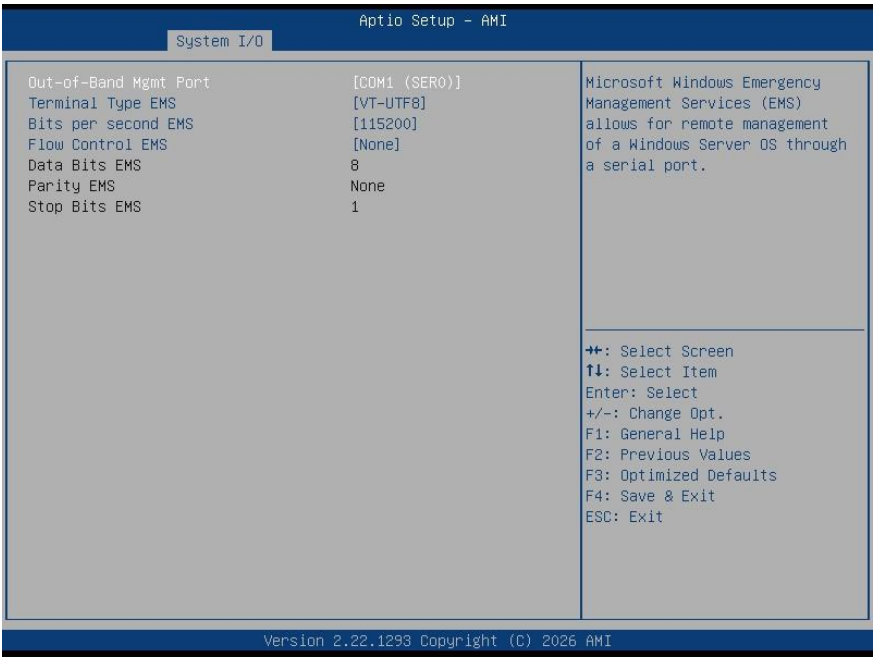



| Options Summary | | |
|---|---|---|
| Terminal Type | VT100 | |
| | VT100Plus | |
| | VT-UTF8 | |
| | ANSI | Optimal Default, Failsafe Default |

| Options Summary | | |
|---|---|---|
| Emulation:<br>ANSI: Extended ASCII char set.<br>VT100: ASCII char set.<br>VT100Plus: Extends VT100 to support color, function keys.<br>VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. | | |
| Bits per second | 9600 | |
| | 19200 | |
| | 38400 | |
| | 57600 | |
| | 115200 | Optimal Default, Failsafe Default |
| | 230400 | |
| | 460800 | |
| | 921600 | |
| Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. | | |
| Data Bits | 7 | |
| | 8 | Optimal Default, Failsafe Default |
| Data Bits | | |
| Parity | None | Optimal Default, Failsafe Default |
| | Even | |
| | Odd | |
| | Mark | |
| | Space | |
| A parity bit can be sent with the data bits to detect some transmission errors.<br>Even: parity bit is 0 if the num of 1's in the data bits is even.<br>Odd: parity bit is 0 if num of 1's in the data bits is odd.<br>Mark: parity bit is always 1.<br>Space: Parity bit is always 0.<br>Mark and Space Parity do not allow for error detection.<br>They can be used as an additional data bit. | | |
| Stop Bits | 1 | Optimal Default, Failsafe Default |
| | 2 | |
| Stop bits indicate the end of a serial data packet.<br>(A start bit indicates the beginning).<br>The standard setting is 1 stop bit.<br>Communication with slow devices may require more than 1 stop bit. | | |
| Flow Control | None | Optimal Default, Failsafe Default |
| | Hardware RTS/CTS | |

| Options Summary | | |
|---|---|---|
| Flow control prevents data loss from buffer overflow.<br>If the receiving buffer is full, a stop signal pauses data transmission. Once the buffer has space, a start signal resumes the flow.<br>Hardware flow control uses two wires (RTS/CTS) to send start and stop signals. | | |
| VT-UTF8 Combo Key Support | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals | | |
| Recorder Mode | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| When enabled, only text data will be sent.<br>This mode is used to capture terminal output for logging purposes. | | |
| Resolution 100x31 | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Enables or disables extended terminal resolution. | | |
| Putty KeyPad | VT100 | Optimal Default, Failsafe Default |
| | LINUX | |
| | XTERMR6 | |
| | SC0 | |
| | ESCN | |
| | VT400 | |
| Select FunctionKey and KeyPad on Putty. | | |

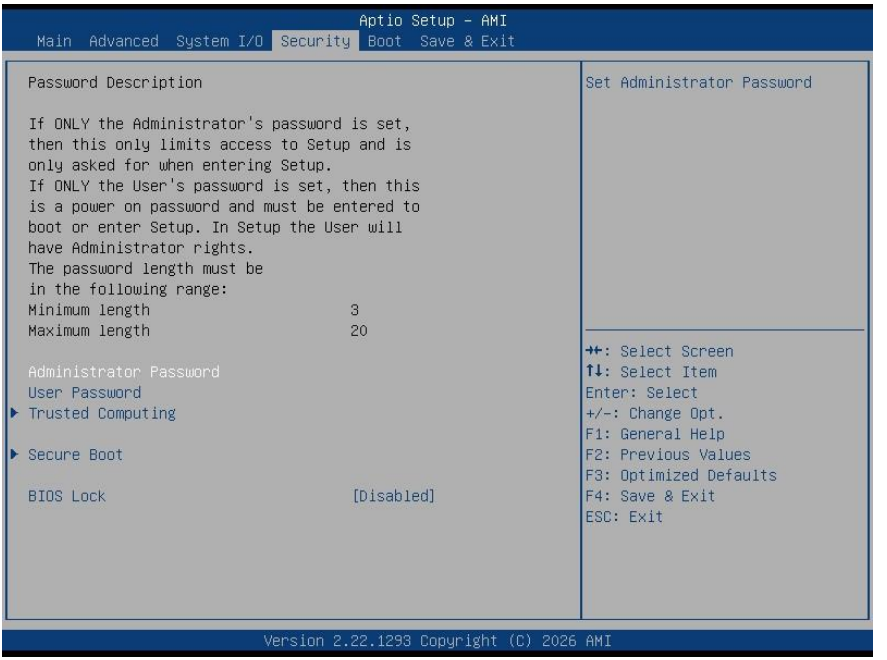
### 3.5.7.3 Console Redirection Settings – Out-of-Band Mgmt




| Options Summary | | |
|---|---|---|
| Out-of-Band Mgmt Port | COM1 | |
| | COM2 | Optimal Default, Failsafe Default |
| Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port | | |
| Terminal Type EMS | VT100 | |
| | VT100Plus | |
| | VT-UTF8 | Optimal Default, Failsafe Default |
| | ANSI | |
| VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation. | | |
| Bits per second EMS | 9600 | |
| | 19200 | |
| | 38400 | |
| | 57600 | |

| Options Summary | | |
|---|---|---|
| Bits per second EMS (cont.) | 115200 | Optimal Default, Failsafe Default |
| | 230400 | |
| | 460800 | |
| | 921600 | |
| Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds. | | |
| Flow Control EMS | None | Optimal Default, Failsafe Default |
| | Hardware RTS/CTS | |
| | Software Xon/Xoff | |
| Flow control can prevent data loss from buffer overflow.<br>When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow.<br>Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals. | | |

## 3.6 Setup Submenu: Security




### Change User/Administrator Password

You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

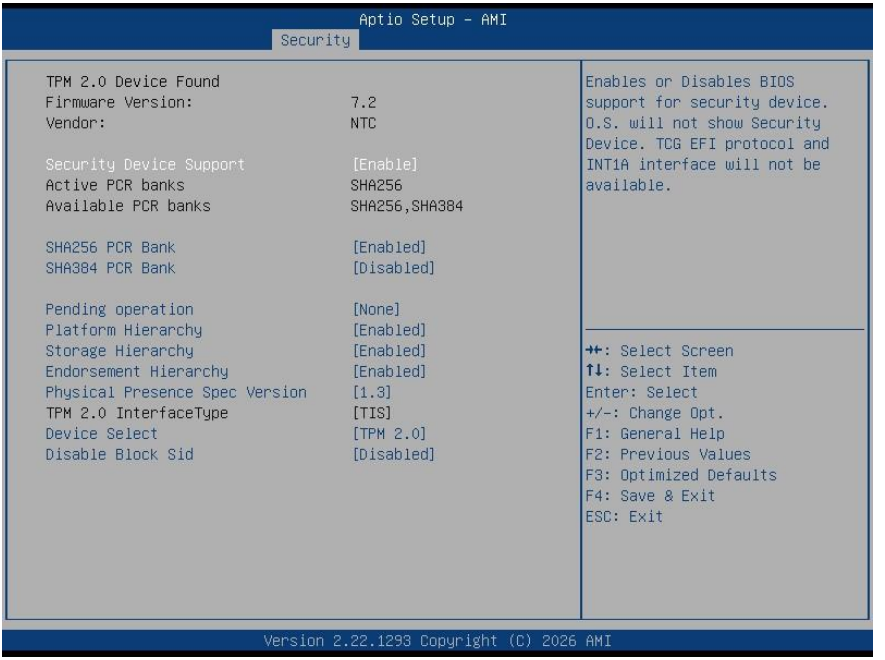
Select the password you wish to set, and press Enter. In the dialog box, enter your password (must be between 3 and 20 letters or numbers). Press Enter and retype your password to confirm. Press Enter again to set the password.

### Removing the Password

Select the password you want to remove and enter the current password. At the next dialog box press Enter to disable password protection.

| Options Summary | | |
|---|---|---|
| BIOS Lock | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable the PCH BIOS Lock feature.<br>Note: This must be enabled to ensure SMM (System Management Mode) protection of the BIOS flash. | | |

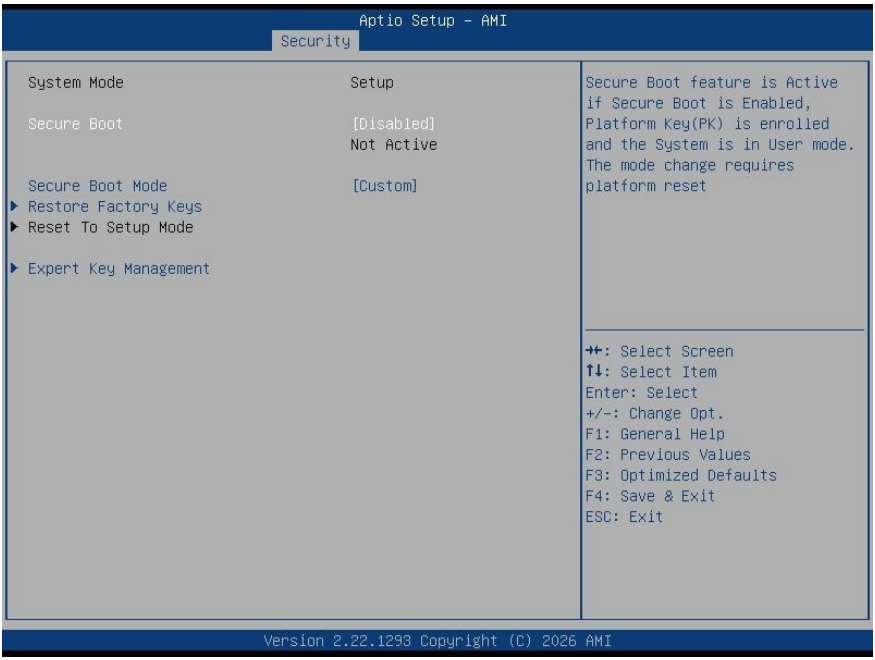
### 3.6.1 Trusted Computing




| Options Summary | | |
|---|---|---|
| Security Device Support | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable BIOS support for the security device.<br>When Disabled, the operating system will not detect the security device, and both the TCG EFI protocol and INT1A interface will be unavailable. | | |
| SHA256 PCR Bank | Disable | |
| | Enable | Optimal Default, Failsafe Default |

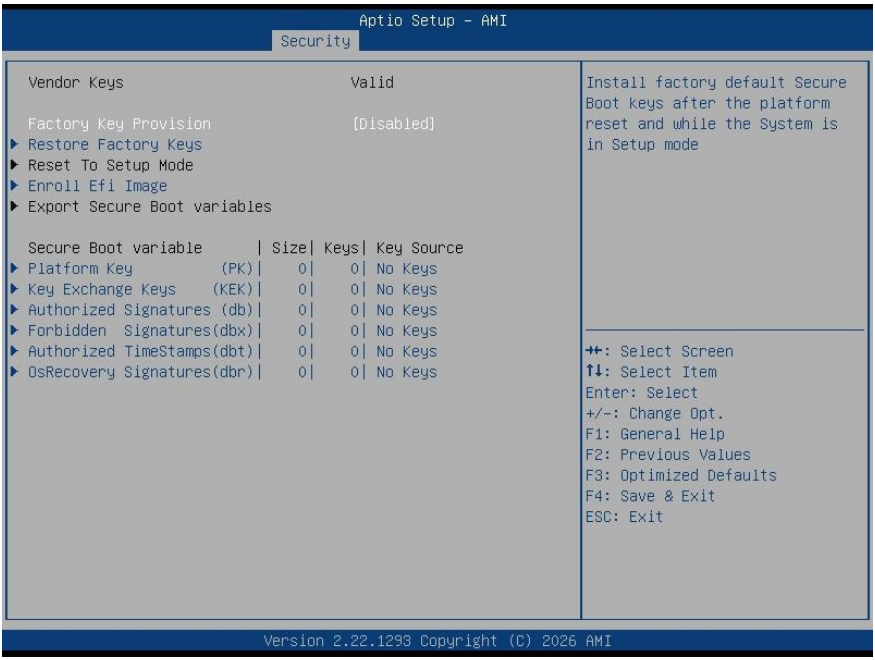
| Options Summary | | |
|---|---|---|
| Enable or Disable SHA256 PCR Bank. | | |
| SHA384 PCR Bank | Disable | |
| | Enable | Optimal Default, Failsafe Default |
| Enable or Disable SHA384 PCR Bank. | | |
| Pending Operation | None | Optimal Default, Failsafe Default |
| | TPM Clear | |
| Schedule an Operation for the Security Device. Note: Your Computer will reboot during restart in order to change State of Security Device. | | |
| Platform Hierarchy | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or disable Platform Hierarchy. | | |
| Storage Hierarchy | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Storage Hierarchy. | | |
| Endorsement Hierarchy | Disabled | |
| | Enabled | Optimal Default, Failsafe Default |
| Enable or Disable Endorsement Hierarchy. | | |
| Physical Presence Spec Version | 1.2 | |
| | 1.3 | Optimal Default, Failsafe Default |
| Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3. | | |
| Device Select | TPM 1.2 | |
| | TPM 2.0 | |
| | Auto | Optimal Default, Failsafe Default |
| TPM 1.2 will restrict support to TPM 1.2 devices.<br>TPM 2.0 will restrict support to TPM 2.0 devices.<br>Auto will support both with the default set to TPM 2.0 devices if not found.<br>TPM 1.2 devices will be enumerated. | | |

### 3.6.2 Secure Boot




| Options Summary | | |
|---|---|---|
| Secure Boot | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| The Secure Boot feature is active when Secure Boot is Enabled, the Platform Key (PK) is enrolled, and the system is in User mode.<br>Note: Changing the Secure Boot mode requires a platform reset. | | |
| Secure Boot Mode | Custom | Optimal Default, Failsafe Default |
| | Standard | |
| Select the Secure Boot mode: Standard or Custom.<br>Standard – Uses default Secure Boot policies.<br>Custom – Allows a physically present user to configure Secure Boot policy variables without full authentication. | | |
| Restore Factory Keys | | |
| Force System to User Mode. Install factory default Secure Boot key databases. | | |
| Restore To Setup Mode | | |
| Force System Delete all Secure Boot key databases from NVRAM. | | |

### 3.6.2.1 Expert Key Management




| Options Summary | | |
|---|---|---|
| Factory Key Provision | Disabled | Optimal Default, Failsafe Default |
| | Enabled | |
| Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode. | | |
| Restore Factory Keys | | |
| 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 | | |
| Save NVRAM content of Secure Boot variable to a file. | | |
| 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). | | |
| Platform Key (PK) | Details | |
| | Export | |

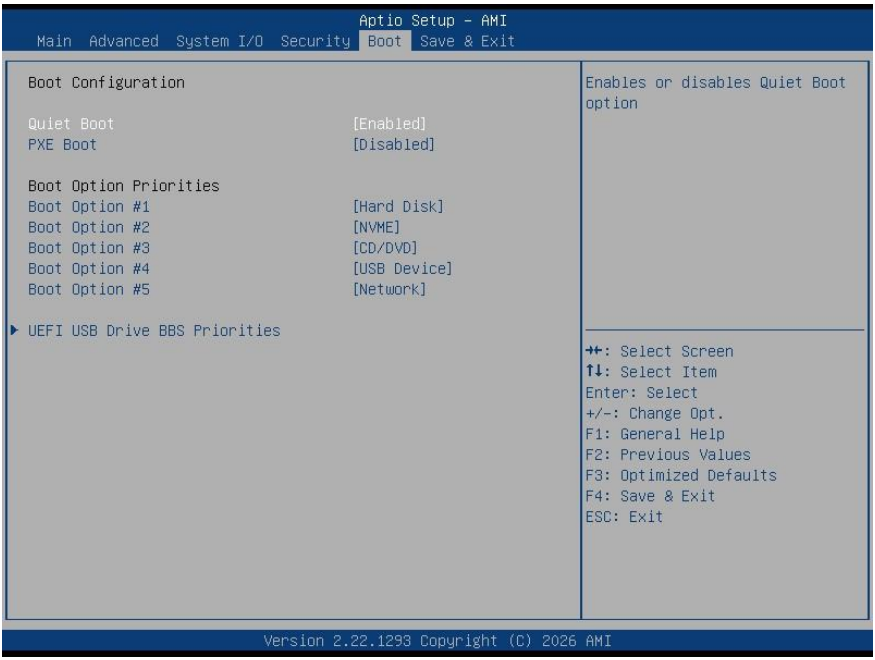
| Options Summary | |
|---|---|
| Platform Key (PK) (cont.) | Update |
| | Delete |
| Key Exchange Keys (KEK) | Details |
| | Export |
| | Update |
| | Append |
| | Delete |
| Authorized Signatures (db) | Details |
| | Export |
| | Update |
| | Append |
| | Delete |
| Forbidden Signatures (dbx) | Details |
| | Export |
| | Update |
| | Append |
| | Delete |
| Authorized TimeStamps (dbt) | Update |
| | Append |
| OsRecovery Signatures (dbr) | 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)

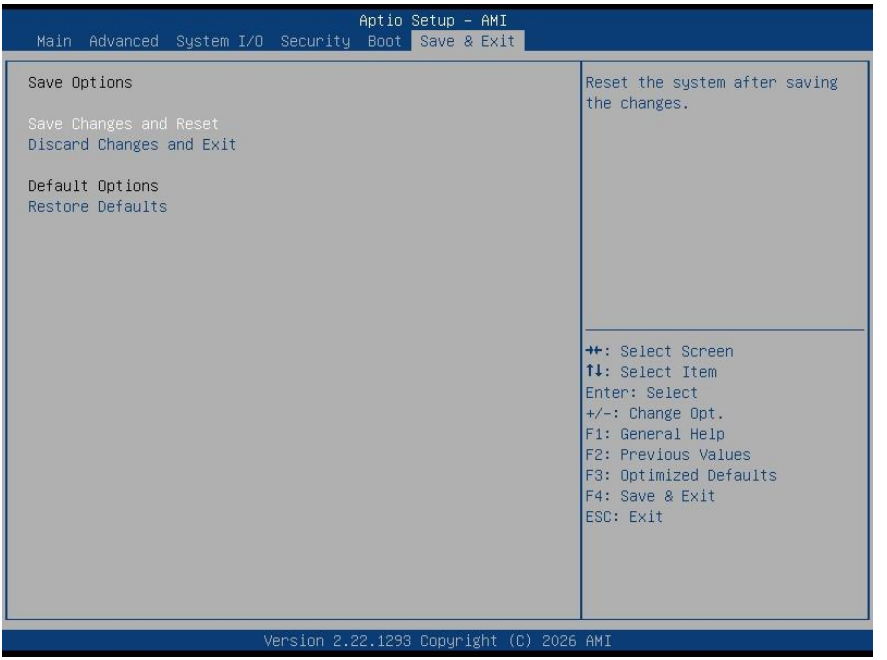
Key Source: Factory, Modified, Mixed

## 3.7 Setup Submenu: Boot




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

## 3.8 Setup Submenu: Save & Exit



# Chapter 4

Drivers Installation

## 4.1 Drivers Download and Installation

Drivers for the uCOM-TWL 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 folder where you unzipped the **Graphics Drivers**
2. Run the **gfx_win_101.4644.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### LAN Drivers

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

### Install Audio Drivers

**Note:** Ensure Intel Smart Sound Driver (**v10.29.00.7919**) is installed before the Realtek Audio driver (**Realtek Audio 6.0.9034.2**)

#### Install Intel Smart Sound Driver

1. Open the **Audio** folder
2. Open the **10.29.00.8102** subfolder
3. Follow the setup information within the file to manually install driver.

#### Install Realtek Audio Driver

1. Open the **Audio** folder
2. Open the **Realtek Audio 6.0.9034.2** folder
3. Run the **Setup.exe** file in the folder
4. Follow the instructions
5. Driver will be installed automatically

### Install ME Driver

1. Open the **ME** folder
2. Run the **SetupME.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

### Install Serial IO Driver

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

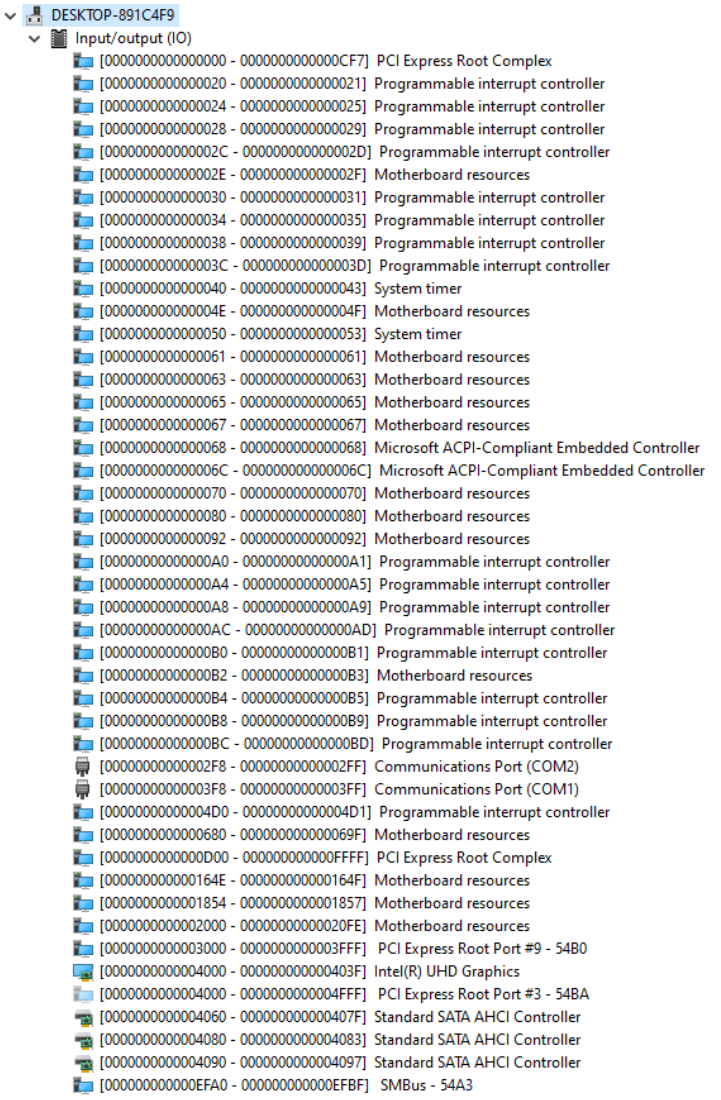
### Install Camera Driver

1. Open the **Camera Drivers** folder
2. Follow the instructions in the setup guides provided to manually install driver(s)

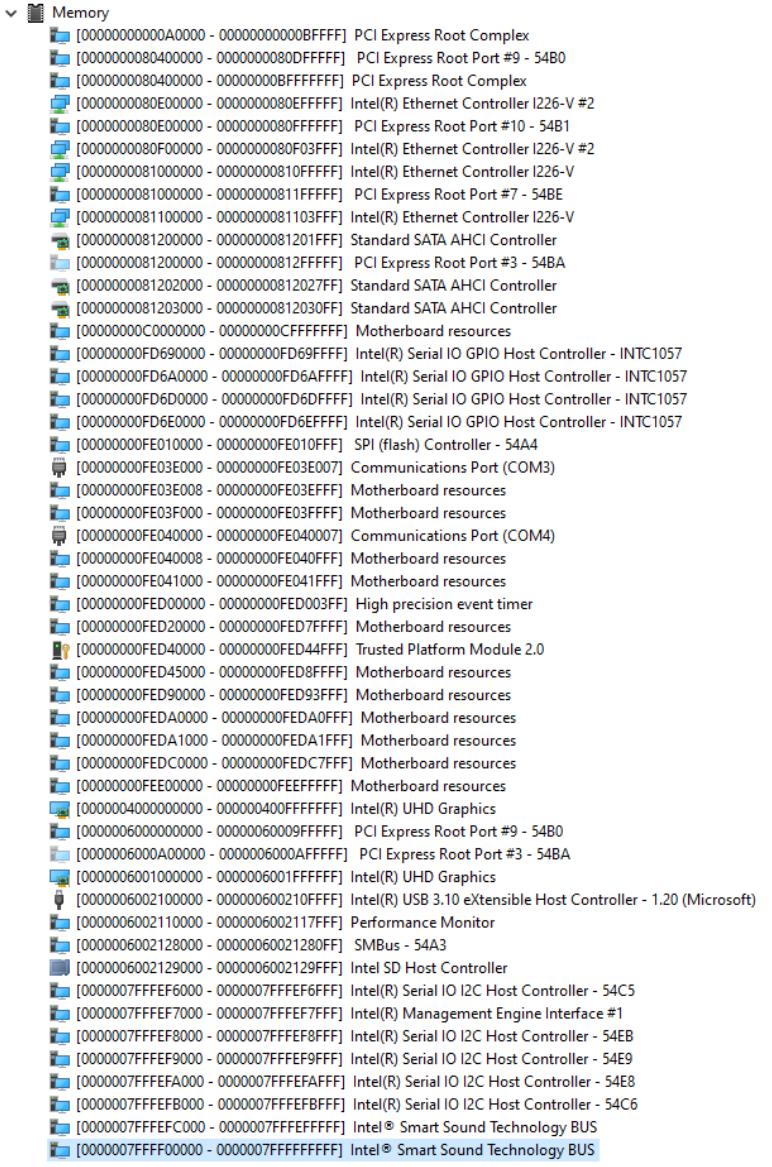
# Appendix A

I/O Information

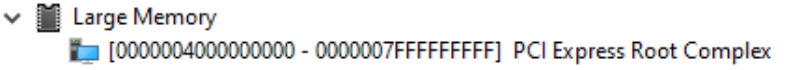
## A.1 I/O Address Map



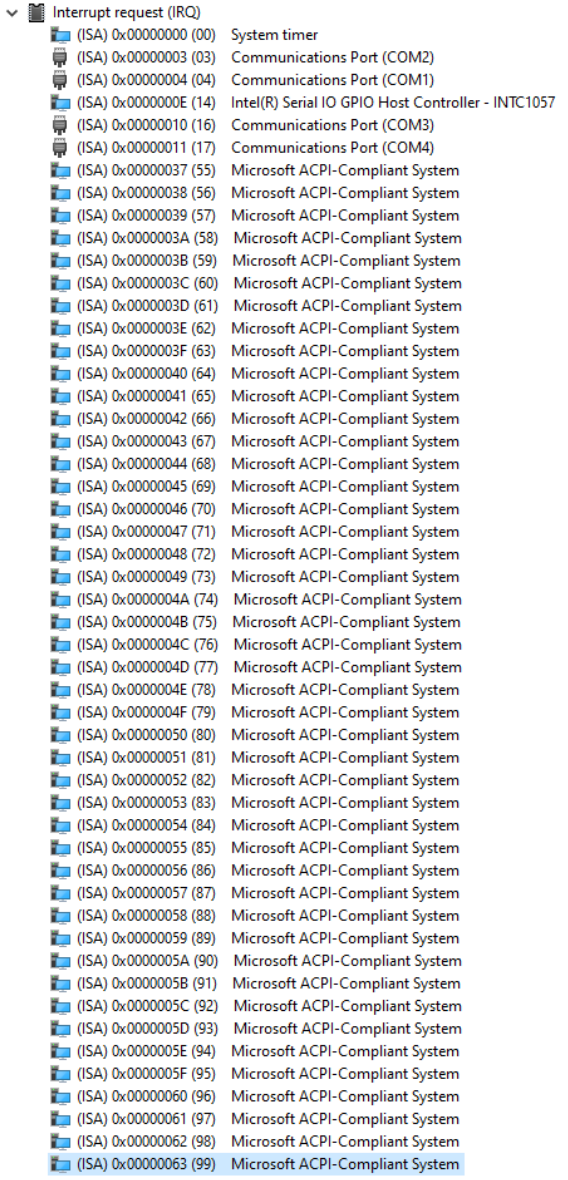
## A.2 Memory Address Map



## A.3 Large Memory Address Map

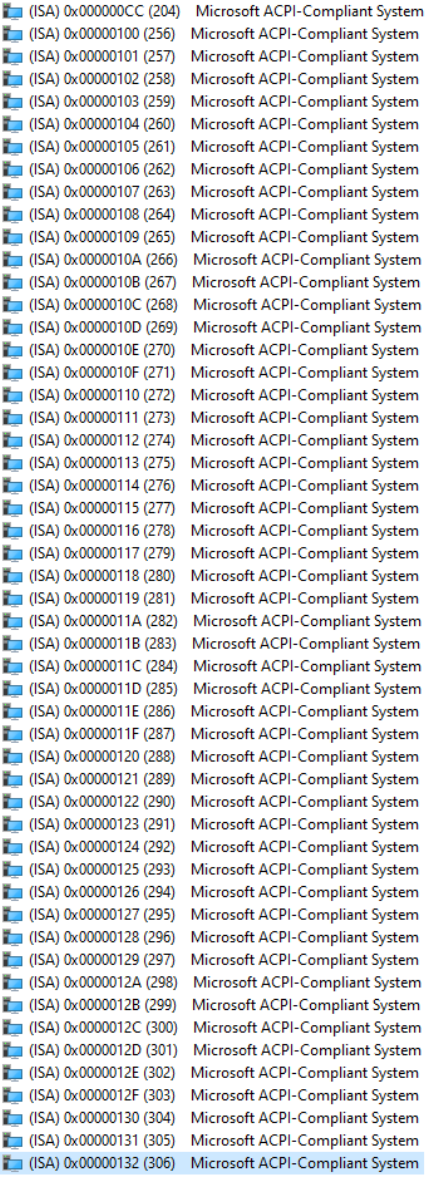


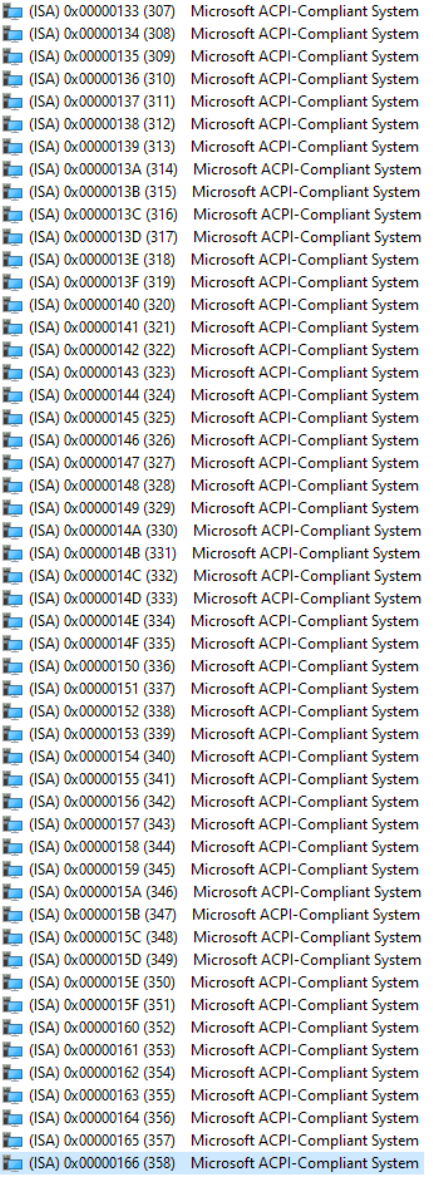
## A.4 IRQ Mapping Chart

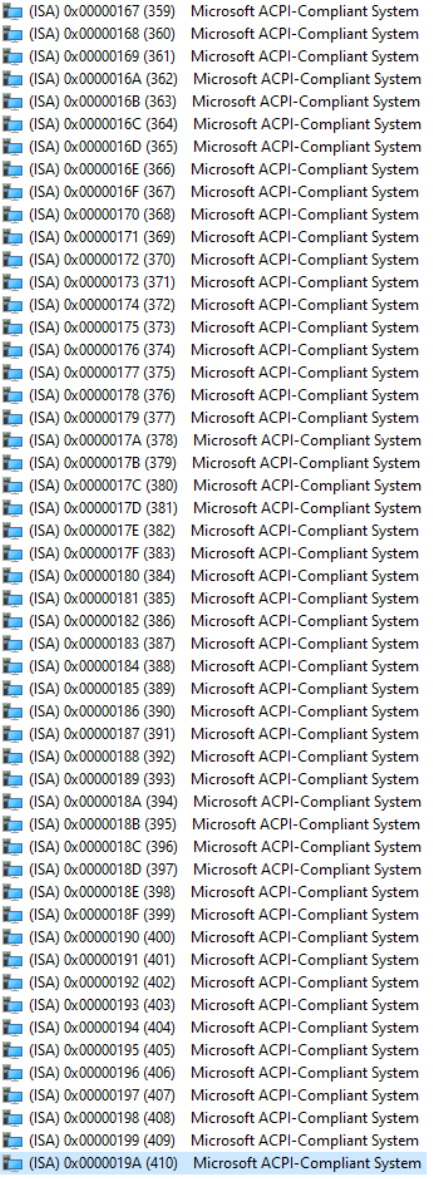


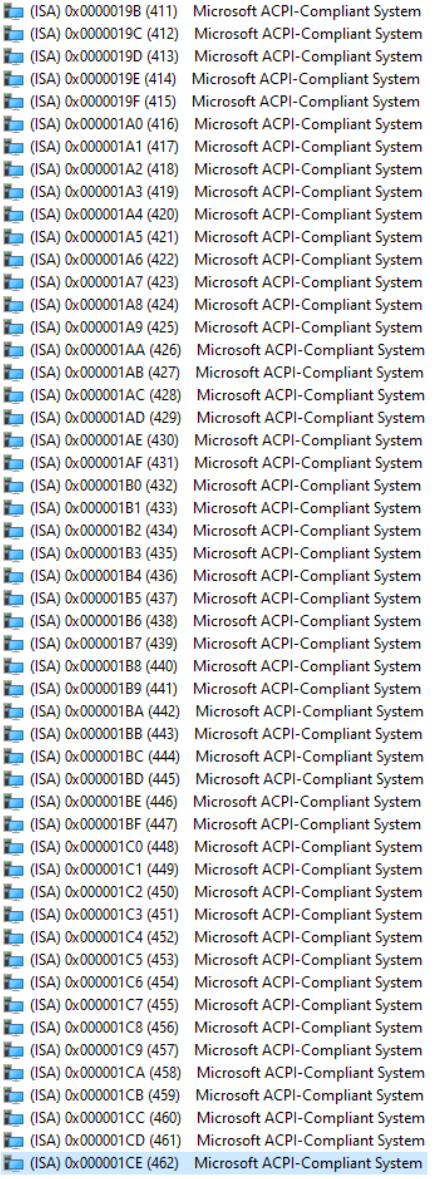
(ISA) 0x00000064 (100) Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101) Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102) Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103) Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104) Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105) Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106) Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107) Microsoft ACPI-Compliant System
(ISA) 0x0000006C (108) Microsoft ACPI-Compliant System
(ISA) 0x0000006D (109) Microsoft ACPI-Compliant System
(ISA) 0x0000006E (110) Microsoft ACPI-Compliant System
(ISA) 0x0000006F (111) Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114) Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115) Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116) Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117) Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118) Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119) Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120) Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121) Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122) Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123) Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124) Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125) Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126) Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127) Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System
(ISA) 0x00000082 (130) Microsoft ACPI-Compliant System
(ISA) 0x00000083 (131) Microsoft ACPI-Compliant System
(ISA) 0x00000084 (132) Microsoft ACPI-Compliant System
(ISA) 0x00000085 (133) Microsoft ACPI-Compliant System
(ISA) 0x00000086 (134) Microsoft ACPI-Compliant System
(ISA) 0x00000087 (135) Microsoft ACPI-Compliant System
(ISA) 0x00000088 (136) Microsoft ACPI-Compliant System
(ISA) 0x00000089 (137) Microsoft ACPI-Compliant System
(ISA) 0x0000008A (138) Microsoft ACPI-Compliant System
(ISA) 0x0000008B (139) Microsoft ACPI-Compliant System
(ISA) 0x0000008C (140) Microsoft ACPI-Compliant System
(ISA) 0x0000008D (141) Microsoft ACPI-Compliant System
(ISA) 0x0000008E (142) Microsoft ACPI-Compliant System
(ISA) 0x0000008F (143) Microsoft ACPI-Compliant System
(ISA) 0x00000090 (144) Microsoft ACPI-Compliant System
(ISA) 0x00000091 (145) Microsoft ACPI-Compliant System
(ISA) 0x00000092 (146) Microsoft ACPI-Compliant System
(ISA) 0x00000093 (147) Microsoft ACPI-Compliant System
(ISA) 0x00000094 (148) Microsoft ACPI-Compliant System
(ISA) 0x00000095 (149) Microsoft ACPI-Compliant System
(ISA) 0x00000096 (150) Microsoft ACPI-Compliant System
(ISA) 0x00000097 (151) Microsoft ACPI-Compliant System

(ISA) 0x00000098 (152) Microsoft ACPI-Compliant System
(ISA) 0x00000099 (153) Microsoft ACPI-Compliant System
(ISA) 0x0000009A (154) Microsoft ACPI-Compliant System
(ISA) 0x0000009B (155) Microsoft ACPI-Compliant System
(ISA) 0x0000009C (156) Microsoft ACPI-Compliant System
(ISA) 0x0000009D (157) Microsoft ACPI-Compliant System
(ISA) 0x0000009E (158) Microsoft ACPI-Compliant System
(ISA) 0x0000009F (159) Microsoft ACPI-Compliant System
(ISA) 0x000000A0 (160) Microsoft ACPI-Compliant System
(ISA) 0x000000A1 (161) Microsoft ACPI-Compliant System
(ISA) 0x000000A2 (162) Microsoft ACPI-Compliant System
(ISA) 0x000000A3 (163) Microsoft ACPI-Compliant System
(ISA) 0x000000A4 (164) Microsoft ACPI-Compliant System
(ISA) 0x000000A5 (165) Microsoft ACPI-Compliant System
(ISA) 0x000000A6 (166) Microsoft ACPI-Compliant System
(ISA) 0x000000A7 (167) Microsoft ACPI-Compliant System
(ISA) 0x000000A8 (168) Microsoft ACPI-Compliant System
(ISA) 0x000000A9 (169) Microsoft ACPI-Compliant System
(ISA) 0x000000AA (170) Microsoft ACPI-Compliant System
(ISA) 0x000000AB (171) Microsoft ACPI-Compliant System
(ISA) 0x000000AC (172) Microsoft ACPI-Compliant System
(ISA) 0x000000AD (173) Microsoft ACPI-Compliant System
(ISA) 0x000000AE (174) Microsoft ACPI-Compliant System
(ISA) 0x000000AF (175) Microsoft ACPI-Compliant System
(ISA) 0x000000B0 (176) Microsoft ACPI-Compliant System
(ISA) 0x000000B1 (177) Microsoft ACPI-Compliant System
(ISA) 0x000000B2 (178) Microsoft ACPI-Compliant System
(ISA) 0x000000B3 (179) Microsoft ACPI-Compliant System
(ISA) 0x000000B4 (180) Microsoft ACPI-Compliant System
(ISA) 0x000000B5 (181) Microsoft ACPI-Compliant System
(ISA) 0x000000B6 (182) Microsoft ACPI-Compliant System
(ISA) 0x000000B7 (183) Microsoft ACPI-Compliant System
(ISA) 0x000000B8 (184) Microsoft ACPI-Compliant System
(ISA) 0x000000B9 (185) Microsoft ACPI-Compliant System
(ISA) 0x000000BA (186) Microsoft ACPI-Compliant System
(ISA) 0x000000BB (187) Microsoft ACPI-Compliant System
(ISA) 0x000000BC (188) Microsoft ACPI-Compliant System
(ISA) 0x000000BD (189) Microsoft ACPI-Compliant System
(ISA) 0x000000BE (190) Microsoft ACPI-Compliant System
(ISA) 0x000000BF (191) Microsoft ACPI-Compliant System
(ISA) 0x000000C0 (192) Microsoft ACPI-Compliant System
(ISA) 0x000000C1 (193) Microsoft ACPI-Compliant System
(ISA) 0x000000C2 (194) Microsoft ACPI-Compliant System
(ISA) 0x000000C3 (195) Microsoft ACPI-Compliant System
(ISA) 0x000000C4 (196) Microsoft ACPI-Compliant System
(ISA) 0x000000C5 (197) Microsoft ACPI-Compliant System
(ISA) 0x000000C6 (198) Microsoft ACPI-Compliant System
(ISA) 0x000000C7 (199) Microsoft ACPI-Compliant System
(ISA) 0x000000C8 (200) Microsoft ACPI-Compliant System
(ISA) 0x000000C9 (201) Microsoft ACPI-Compliant System
(ISA) 0x000000CA (202) Microsoft ACPI-Compliant System
(ISA) 0x000000CB (203) Microsoft ACPI-Compliant System

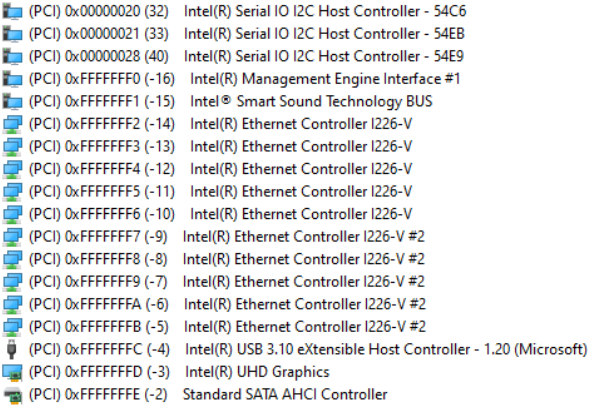

(ISA) 0x000000CC (204) Microsoft ACPI-Compliant System
(ISA) 0x00000100 (256) Microsoft ACPI-Compliant System
(ISA) 0x00000101 (257) Microsoft ACPI-Compliant System
(ISA) 0x00000102 (258) Microsoft ACPI-Compliant System
(ISA) 0x00000103 (259) Microsoft ACPI-Compliant System
(ISA) 0x00000104 (260) Microsoft ACPI-Compliant System
(ISA) 0x00000105 (261) Microsoft ACPI-Compliant System
(ISA) 0x00000106 (262) Microsoft ACPI-Compliant System
(ISA) 0x00000107 (263) Microsoft ACPI-Compliant System
(ISA) 0x00000108 (264) Microsoft ACPI-Compliant System
(ISA) 0x00000109 (265) Microsoft ACPI-Compliant System
(ISA) 0x0000010A (266) Microsoft ACPI-Compliant System
(ISA) 0x0000010B (267) Microsoft ACPI-Compliant System
(ISA) 0x0000010C (268) Microsoft ACPI-Compliant System
(ISA) 0x0000010D (269) Microsoft ACPI-Compliant System
(ISA) 0x0000010E (270) Microsoft ACPI-Compliant System
(ISA) 0x0000010F (271) Microsoft ACPI-Compliant System
(ISA) 0x00000110 (272) Microsoft ACPI-Compliant System
(ISA) 0x00000111 (273) Microsoft ACPI-Compliant System
(ISA) 0x00000112 (274) Microsoft ACPI-Compliant System
(ISA) 0x00000113 (275) Microsoft ACPI-Compliant System
(ISA) 0x00000114 (276) Microsoft ACPI-Compliant System
(ISA) 0x00000115 (277) Microsoft ACPI-Compliant System
(ISA) 0x00000116 (278) Microsoft ACPI-Compliant System
(ISA) 0x00000117 (279) Microsoft ACPI-Compliant System
(ISA) 0x00000118 (280) Microsoft ACPI-Compliant System
(ISA) 0x00000119 (281) Microsoft ACPI-Compliant System
(ISA) 0x0000011A (282) Microsoft ACPI-Compliant System
(ISA) 0x0000011B (283) Microsoft ACPI-Compliant System
(ISA) 0x0000011C (284) Microsoft ACPI-Compliant System
(ISA) 0x0000011D (285) Microsoft ACPI-Compliant System
(ISA) 0x0000011E (286) Microsoft ACPI-Compliant System
(ISA) 0x0000011F (287) Microsoft ACPI-Compliant System
(ISA) 0x00000120 (288) Microsoft ACPI-Compliant System
(ISA) 0x00000121 (289) Microsoft ACPI-Compliant System
(ISA) 0x00000122 (290) Microsoft ACPI-Compliant System
(ISA) 0x00000123 (291) Microsoft ACPI-Compliant System
(ISA) 0x00000124 (292) Microsoft ACPI-Compliant System
(ISA) 0x00000125 (293) Microsoft ACPI-Compliant System
(ISA) 0x00000126 (294) Microsoft ACPI-Compliant System
(ISA) 0x00000127 (295) Microsoft ACPI-Compliant System
(ISA) 0x00000128 (296) Microsoft ACPI-Compliant System
(ISA) 0x00000129 (297) Microsoft ACPI-Compliant System
(ISA) 0x0000012A (298) Microsoft ACPI-Compliant System
(ISA) 0x0000012B (299) Microsoft ACPI-Compliant System
(ISA) 0x0000012C (300) Microsoft ACPI-Compliant System
(ISA) 0x0000012D (301) Microsoft ACPI-Compliant System
(ISA) 0x0000012E (302) Microsoft ACPI-Compliant System
(ISA) 0x0000012F (303) Microsoft ACPI-Compliant System
(ISA) 0x00000130 (304) Microsoft ACPI-Compliant System
(ISA) 0x00000131 (305) Microsoft ACPI-Compliant System
(ISA) 0x00000132 (306) Microsoft ACPI-Compliant System


(ISA) 0x00000133 (307) Microsoft ACPI-Compliant System
(ISA) 0x00000134 (308) Microsoft ACPI-Compliant System
(ISA) 0x00000135 (309) Microsoft ACPI-Compliant System
(ISA) 0x00000136 (310) Microsoft ACPI-Compliant System
(ISA) 0x00000137 (311) Microsoft ACPI-Compliant System
(ISA) 0x00000138 (312) Microsoft ACPI-Compliant System
(ISA) 0x00000139 (313) Microsoft ACPI-Compliant System
(ISA) 0x0000013A (314) Microsoft ACPI-Compliant System
(ISA) 0x0000013B (315) Microsoft ACPI-Compliant System
(ISA) 0x0000013C (316) Microsoft ACPI-Compliant System
(ISA) 0x0000013D (317) Microsoft ACPI-Compliant System
(ISA) 0x0000013E (318) Microsoft ACPI-Compliant System
(ISA) 0x0000013F (319) Microsoft ACPI-Compliant System
(ISA) 0x00000140 (320) Microsoft ACPI-Compliant System
(ISA) 0x00000141 (321) Microsoft ACPI-Compliant System
(ISA) 0x00000142 (322) Microsoft ACPI-Compliant System
(ISA) 0x00000143 (323) Microsoft ACPI-Compliant System
(ISA) 0x00000144 (324) Microsoft ACPI-Compliant System
(ISA) 0x00000145 (325) Microsoft ACPI-Compliant System
(ISA) 0x00000146 (326) Microsoft ACPI-Compliant System
(ISA) 0x00000147 (327) Microsoft ACPI-Compliant System
(ISA) 0x00000148 (328) Microsoft ACPI-Compliant System
(ISA) 0x00000149 (329) Microsoft ACPI-Compliant System
(ISA) 0x0000014A (330) Microsoft ACPI-Compliant System
(ISA) 0x0000014B (331) Microsoft ACPI-Compliant System
(ISA) 0x0000014C (332) Microsoft ACPI-Compliant System
(ISA) 0x0000014D (333) Microsoft ACPI-Compliant System
(ISA) 0x0000014E (334) Microsoft ACPI-Compliant System
(ISA) 0x0000014F (335) Microsoft ACPI-Compliant System
(ISA) 0x00000150 (336) Microsoft ACPI-Compliant System
(ISA) 0x00000151 (337) Microsoft ACPI-Compliant System
(ISA) 0x00000152 (338) Microsoft ACPI-Compliant System
(ISA) 0x00000153 (339) Microsoft ACPI-Compliant System
(ISA) 0x00000154 (340) Microsoft ACPI-Compliant System
(ISA) 0x00000155 (341) Microsoft ACPI-Compliant System
(ISA) 0x00000156 (342) Microsoft ACPI-Compliant System
(ISA) 0x00000157 (343) Microsoft ACPI-Compliant System
(ISA) 0x00000158 (344) Microsoft ACPI-Compliant System
(ISA) 0x00000159 (345) Microsoft ACPI-Compliant System
(ISA) 0x0000015A (346) Microsoft ACPI-Compliant System
(ISA) 0x0000015B (347) Microsoft ACPI-Compliant System
(ISA) 0x0000015C (348) Microsoft ACPI-Compliant System
(ISA) 0x0000015D (349) Microsoft ACPI-Compliant System
(ISA) 0x0000015E (350) Microsoft ACPI-Compliant System
(ISA) 0x0000015F (351) Microsoft ACPI-Compliant System
(ISA) 0x00000160 (352) Microsoft ACPI-Compliant System
(ISA) 0x00000161 (353) Microsoft ACPI-Compliant System
(ISA) 0x00000162 (354) Microsoft ACPI-Compliant System
(ISA) 0x00000163 (355) Microsoft ACPI-Compliant System
(ISA) 0x00000164 (356) Microsoft ACPI-Compliant System
(ISA) 0x00000165 (357) Microsoft ACPI-Compliant System
(ISA) 0x00000166 (358) Microsoft ACPI-Compliant System


(ISA) 0x00000167 (359) Microsoft ACPI-Compliant System
(ISA) 0x00000168 (360) Microsoft ACPI-Compliant System
(ISA) 0x00000169 (361) Microsoft ACPI-Compliant System
(ISA) 0x0000016A (362) Microsoft ACPI-Compliant System
(ISA) 0x0000016B (363) Microsoft ACPI-Compliant System
(ISA) 0x0000016C (364) Microsoft ACPI-Compliant System
(ISA) 0x0000016D (365) Microsoft ACPI-Compliant System
(ISA) 0x0000016E (366) Microsoft ACPI-Compliant System
(ISA) 0x0000016F (367) Microsoft ACPI-Compliant System
(ISA) 0x00000170 (368) Microsoft ACPI-Compliant System
(ISA) 0x00000171 (369) Microsoft ACPI-Compliant System
(ISA) 0x00000172 (370) Microsoft ACPI-Compliant System
(ISA) 0x00000173 (371) Microsoft ACPI-Compliant System
(ISA) 0x00000174 (372) Microsoft ACPI-Compliant System
(ISA) 0x00000175 (373) Microsoft ACPI-Compliant System
(ISA) 0x00000176 (374) Microsoft ACPI-Compliant System
(ISA) 0x00000177 (375) Microsoft ACPI-Compliant System
(ISA) 0x00000178 (376) Microsoft ACPI-Compliant System
(ISA) 0x00000179 (377) Microsoft ACPI-Compliant System
(ISA) 0x0000017A (378) Microsoft ACPI-Compliant System
(ISA) 0x0000017B (379) Microsoft ACPI-Compliant System
(ISA) 0x0000017C (380) Microsoft ACPI-Compliant System
(ISA) 0x0000017D (381) Microsoft ACPI-Compliant System
(ISA) 0x0000017E (382) Microsoft ACPI-Compliant System
(ISA) 0x0000017F (383) Microsoft ACPI-Compliant System
(ISA) 0x00000180 (384) Microsoft ACPI-Compliant System
(ISA) 0x00000181 (385) Microsoft ACPI-Compliant System
(ISA) 0x00000182 (386) Microsoft ACPI-Compliant System
(ISA) 0x00000183 (387) Microsoft ACPI-Compliant System
(ISA) 0x00000184 (388) Microsoft ACPI-Compliant System
(ISA) 0x00000185 (389) Microsoft ACPI-Compliant System
(ISA) 0x00000186 (390) Microsoft ACPI-Compliant System
(ISA) 0x00000187 (391) Microsoft ACPI-Compliant System
(ISA) 0x00000188 (392) Microsoft ACPI-Compliant System
(ISA) 0x00000189 (393) Microsoft ACPI-Compliant System
(ISA) 0x0000018A (394) Microsoft ACPI-Compliant System
(ISA) 0x0000018B (395) Microsoft ACPI-Compliant System
(ISA) 0x0000018C (396) Microsoft ACPI-Compliant System
(ISA) 0x0000018D (397) Microsoft ACPI-Compliant System
(ISA) 0x0000018E (398) Microsoft ACPI-Compliant System
(ISA) 0x0000018F (399) Microsoft ACPI-Compliant System
(ISA) 0x00000190 (400) Microsoft ACPI-Compliant System
(ISA) 0x00000191 (401) Microsoft ACPI-Compliant System
(ISA) 0x00000192 (402) Microsoft ACPI-Compliant System
(ISA) 0x00000193 (403) Microsoft ACPI-Compliant System
(ISA) 0x00000194 (404) Microsoft ACPI-Compliant System
(ISA) 0x00000195 (405) Microsoft ACPI-Compliant System
(ISA) 0x00000196 (406) Microsoft ACPI-Compliant System
(ISA) 0x00000197 (407) Microsoft ACPI-Compliant System
(ISA) 0x00000198 (408) Microsoft ACPI-Compliant System
(ISA) 0x00000199 (409) Microsoft ACPI-Compliant System
(ISA) 0x0000019A (410) Microsoft ACPI-Compliant System


(ISA) 0x0000019B (411) Microsoft ACPI-Compliant System
(ISA) 0x0000019C (412) Microsoft ACPI-Compliant System
(ISA) 0x0000019D (413) Microsoft ACPI-Compliant System
(ISA) 0x0000019E (414) Microsoft ACPI-Compliant System
(ISA) 0x0000019F (415) Microsoft ACPI-Compliant System
(ISA) 0x000001A0 (416) Microsoft ACPI-Compliant System
(ISA) 0x000001A1 (417) Microsoft ACPI-Compliant System
(ISA) 0x000001A2 (418) Microsoft ACPI-Compliant System
(ISA) 0x000001A3 (419) Microsoft ACPI-Compliant System
(ISA) 0x000001A4 (420) Microsoft ACPI-Compliant System
(ISA) 0x000001A5 (421) Microsoft ACPI-Compliant System
(ISA) 0x000001A6 (422) Microsoft ACPI-Compliant System
(ISA) 0x000001A7 (423) Microsoft ACPI-Compliant System
(ISA) 0x000001A8 (424) Microsoft ACPI-Compliant System
(ISA) 0x000001A9 (425) Microsoft ACPI-Compliant System
(ISA) 0x000001AA (426) Microsoft ACPI-Compliant System
(ISA) 0x000001AB (427) Microsoft ACPI-Compliant System
(ISA) 0x000001AC (428) Microsoft ACPI-Compliant System
(ISA) 0x000001AD (429) Microsoft ACPI-Compliant System
(ISA) 0x000001AE (430) Microsoft ACPI-Compliant System
(ISA) 0x000001AF (431) Microsoft ACPI-Compliant System
(ISA) 0x000001B0 (432) Microsoft ACPI-Compliant System
(ISA) 0x000001B1 (433) Microsoft ACPI-Compliant System
(ISA) 0x000001B2 (434) Microsoft ACPI-Compliant System
(ISA) 0x000001B3 (435) Microsoft ACPI-Compliant System
(ISA) 0x000001B4 (436) Microsoft ACPI-Compliant System
(ISA) 0x000001B5 (437) Microsoft ACPI-Compliant System
(ISA) 0x000001B6 (438) Microsoft ACPI-Compliant System
(ISA) 0x000001B7 (439) Microsoft ACPI-Compliant System
(ISA) 0x000001B8 (440) Microsoft ACPI-Compliant System
(ISA) 0x000001B9 (441) Microsoft ACPI-Compliant System
(ISA) 0x000001BA (442) Microsoft ACPI-Compliant System
(ISA) 0x000001BB (443) Microsoft ACPI-Compliant System
(ISA) 0x000001BC (444) Microsoft ACPI-Compliant System
(ISA) 0x000001BD (445) Microsoft ACPI-Compliant System
(ISA) 0x000001BE (446) Microsoft ACPI-Compliant System
(ISA) 0x000001BF (447) Microsoft ACPI-Compliant System
(ISA) 0x000001C0 (448) Microsoft ACPI-Compliant System
(ISA) 0x000001C1 (449) Microsoft ACPI-Compliant System
(ISA) 0x000001C2 (450) Microsoft ACPI-Compliant System
(ISA) 0x000001C3 (451) Microsoft ACPI-Compliant System
(ISA) 0x000001C4 (452) Microsoft ACPI-Compliant System
(ISA) 0x000001C5 (453) Microsoft ACPI-Compliant System
(ISA) 0x000001C6 (454) Microsoft ACPI-Compliant System
(ISA) 0x000001C7 (455) Microsoft ACPI-Compliant System
(ISA) 0x000001C8 (456) Microsoft ACPI-Compliant System
(ISA) 0x000001C9 (457) Microsoft ACPI-Compliant System
(ISA) 0x000001CA (458) Microsoft ACPI-Compliant System
(ISA) 0x000001CB (459) Microsoft ACPI-Compliant System
(ISA) 0x000001CC (460) Microsoft ACPI-Compliant System
(ISA) 0x000001CD (461) Microsoft ACPI-Compliant System
(ISA) 0x000001CE (462) Microsoft ACPI-Compliant System

(ISA) 0x000001CF (463) Microsoft ACPI-Compliant System
(ISA) 0x000001D0 (464) Microsoft ACPI-Compliant System
(ISA) 0x000001D1 (465) Microsoft ACPI-Compliant System
(ISA) 0x000001D2 (466) Microsoft ACPI-Compliant System
(ISA) 0x000001D3 (467) Microsoft ACPI-Compliant System
(ISA) 0x000001D4 (468) Microsoft ACPI-Compliant System
(ISA) 0x000001D5 (469) Microsoft ACPI-Compliant System
(ISA) 0x000001D6 (470) Microsoft ACPI-Compliant System
(ISA) 0x000001D7 (471) Microsoft ACPI-Compliant System
(ISA) 0x000001D8 (472) Microsoft ACPI-Compliant System
(ISA) 0x000001D9 (473) Microsoft ACPI-Compliant System
(ISA) 0x000001DA (474) Microsoft ACPI-Compliant System
(ISA) 0x000001DB (475) Microsoft ACPI-Compliant System
(ISA) 0x000001DC (476) Microsoft ACPI-Compliant System
(ISA) 0x000001DD (477) Microsoft ACPI-Compliant System
(ISA) 0x000001DE (478) Microsoft ACPI-Compliant System
(ISA) 0x000001DF (479) Microsoft ACPI-Compliant System
(ISA) 0x000001E0 (480) Microsoft ACPI-Compliant System
(ISA) 0x000001E1 (481) Microsoft ACPI-Compliant System
(ISA) 0x000001E2 (482) 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) 0x00000010 (16) Intel SD Host Controller
(PCI) 0x0000001B (27) Intel(R) Serial IO I2C Host Controller - 54E8
(PCI) 0x0000001F (31) Intel(R) Serial IO I2C Host Controller - 54C5


(PCI) 0x00000020 (32) Intel(R) Serial IO I2C Host Controller - 54C6
(PCI) 0x00000021 (33) Intel(R) Serial IO I2C Host Controller - 54EB
(PCI) 0x00000028 (40) Intel(R) Serial IO I2C Host Controller - 54E9
(PCI) 0xFFFFFFF0 (-16) Intel(R) Management Engine Interface #1
(PCI) 0xFFFFFFF1 (-15) Intel® Smart Sound Technology BUS
(PCI) 0xFFFFFFF2 (-14) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF3 (-13) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF4 (-12) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF5 (-11) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF6 (-10) Intel(R) Ethernet Controller I226-V
(PCI) 0xFFFFFFF7 (-9) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFF8 (-8) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFF9 (-7) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFFA (-6) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFFB (-5) Intel(R) Ethernet Controller I226-V #2
(PCI) 0xFFFFFFFC (-4) Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
(PCI) 0xFFFFFFFD (-3) Intel(R) UHD Graphics
(PCI) 0xFFFFFFFE (-2) Standard SATA AHCI Controller