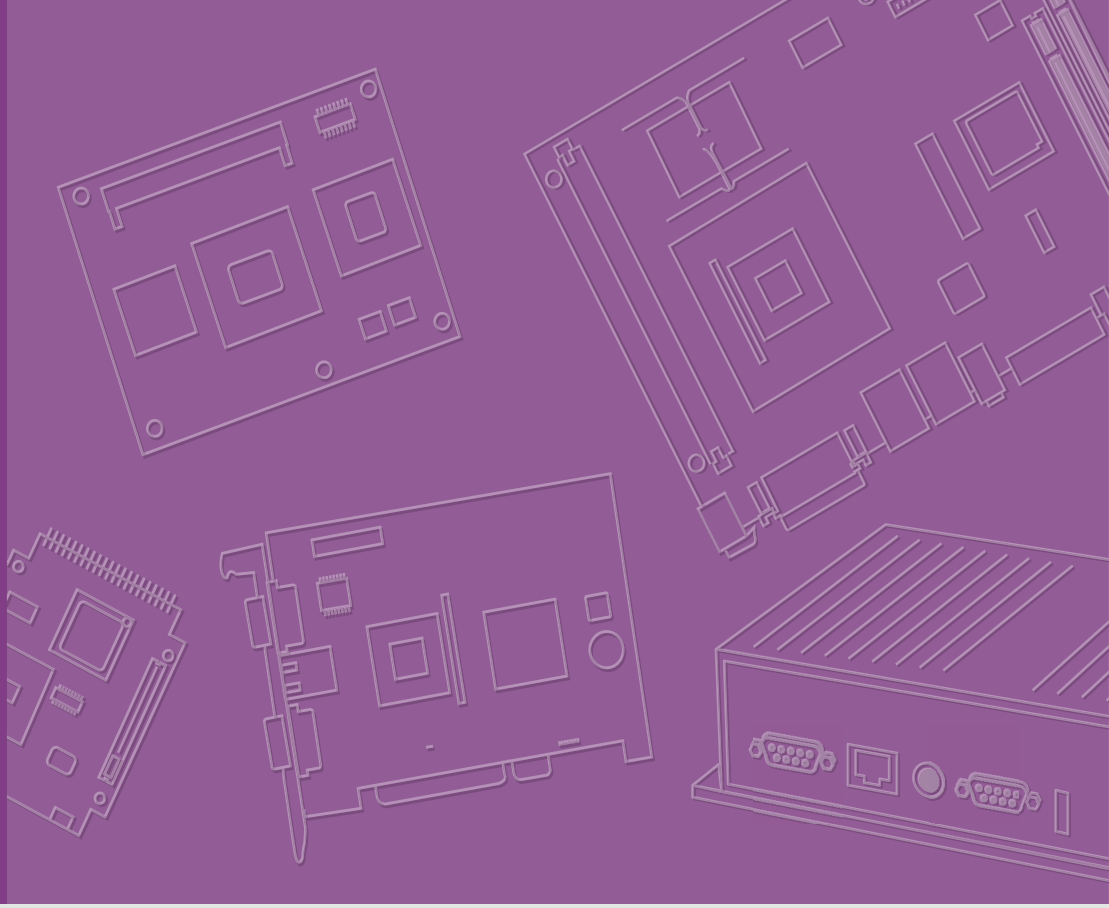

User Manual

# AIMB-508

## 12th/13th Gen Intel® Core™ i9/i7/ i5/i3 Processors (LGA1700), Micro ATX with DP/HDMI/VGA/ eDP (LVDS), 1 x GbE LAN, 1 x 2.5GbE LAN, 8 x USB 3.2, 2 x PCI slot, 10 x COM

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Part No. 2006050801 Edition 2

Printed in China January 2024

# Declaration of Conformity

### FCC Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for assistance.

# CPU Compatibility

| CPU Family | Code Name | Cores Number (P+E)** | TDP (W) | Max. Speed | L3 Cache |
|---|---|---|---|---|---|
| i9-13900E | Raptor Lake | 8P+16E | 65W | 5.20GHz | 36MB |
| i9-13900TE | Raptor Lake | 8P+16E | 35W | 5.00GHz | 36MB |
| i7-13700E | Raptor Lake | 8P+8E | 65W | 5.10GHz | 30MB |
| i7-13700TE | Raptor Lake | 8P+8E | 35W | 4.80GHz | 30MB |
| i5-13500E | Raptor Lake | 6P+8E | 65W | 4.60GHz | 24MB |
| i5-13500TE | Raptor Lake | 6P+8E | 35W | 4.50GHz | 24MB |
| i3-13100E | Raptor Lake | 4P+0E | 65W | 4.40GHz | 12MB |
| i3-13100TE | Raptor Lake | 4P+0E | 35W | 4.10GHz | 12MB |
| i9-13900 | Raptor Lake | 8P+16E | 35W | 5.60GHz | 36MB |
| i7-13700 | Raptor Lake | 8P+8E | 35W | 5.20GHz | 30MB |
| i5-13500 | Raptor Lake | 6P+8E | 65W | 4.80GHz | 24MB |
| i5-13400 | Raptor Lake | 6P+4E | 65W | 4.80GHz | 20MB |
| i3-13100 | Raptor Lake | 4P+0E | 60W | 4.50GHz | 12MB |
| i9-12900E | Alder Lake | 8P+8E | 65W | 5.0GHz | 30 MB |
| i9-12900TE | Alder Lake | 8P+8E | 35W | 4.8GHz | 30 MB |
| i7-12700E | Alder Lake | 8P+4E | 65W | 4.8GHz | 25 MB |
| i7-12700TE | Alder Lake | 8P+4E | 35W | 4.7GHz | 25 MB |
| i5-12500E | Alder Lake | 6P+0E | 65W | 4.5GHz | 18 MB |
| i5-12500TE | Alder Lake | 6P+0E | 35W | 4.3GHz | 18 MB |
| i3-12100E | Alder Lake | 4P+0E | 60W | 4.2GHz | 12 MB |
| i3-12100TE | Alder Lake | 4P+0E | 35W | 4.0GHz | 12 MB |
| G7400E | Alder Lake | 2P+0E | 46W | 3.6GHz | 6 MB |
| G7400TE | Alder Lake | 2P+0E | 35W | 3.0GHz | 6 MB |
| G6900E | Alder Lake | 2P+0E | 46W | 3.0GHz | 4 MB |
| G6900TE | Alder Lake | 2P+0E | 35W | 2.4GHz | 4 MB |

| | | | | | |
|---|---|---|---|---|---|
| i9-12900 | Alder Lake | 8P+8E | 65W | 5.10GHz | 30 MB |
| i7-12700 | Alder Lake | 8P+4E | 65W | 4.9GHz | 25 MB |
| i5-12500 | Alder Lake | 6P+0E | 65W | 4.6GHz | 18 MB |
| i5-12400 | Alder Lake | 6P+0E | 65W | 4.4GHz | 18 MB |
| i3-12100 | Alder Lake | 4P+0E | 60W | 4.3GHz | 12 MB |

# Ordering Information

| Model | Chipset | Memory | Display | eDP/ LVDS | USB 3.2 Gen1 | USB 2.0 | COM | GbE LAN | SATA | M.2 M-Key 2280 | PCIe x16 slot Gen4 | PCIe x4 slot Gen3 | PCI slot | TPM | AMP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AIMB-508HF-EAA1 | H610E | 2 x DDR4 | HDMI + DP + VGA | 1/(1) | 8 | 6 | 10 | 1GbE + 2.5GbE | 4 | 1 | 1 | 1 | 2 | Reference | 1 |
| AIMB-508HL-0AA1 | H610E | 2 x DDR4 | VGA | (1)/(1) | 4 | 6 | 5 | 1GbE | 4 | 1 | 1 | 1 | 2 | Reference | (1) |

() means BOM option.

*Reference: Refer to optional accessories for TPM module

# Initial Inspection

Before you begin installing your motherboard, please make sure that the following materials have been shipped:

- 1 x AIMB-508 Intel LGA 1700 Micro ATX Motherboard
- 1 x SATA HDD cable
- 1 x I/O port bracket
- 1 x Startup Manual
- 2 x M.2 screws

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-508 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the AIMB-508, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

# Contents


## Chapter 1 General Information .....1

1.1 Introduction ..... 2
1.2 Features ..... 2
1.3 Specifications ..... 2
1.3.1 Processor ..... 2
1.3.2 Memory ..... 2
1.3.3 Input/Output ..... 2
1.3.4 Graphics ..... 3
1.3.5 Ethernet LAN ..... 3
1.3.6 Industrial Features ..... 3
1.3.7 Mechanical and Environmental Specifications ..... 3
1.4 Jumpers and Connectors ..... 4
1.5 Board Layout: Jumper and Connector Locations ..... 4
Figure 1.1 Jumper and Connector Locations ..... 4
Table 1.1: Jumper Setting List ..... 5
Table 1.2: Connector/Header List ..... 5
Figure 1.2 AIMB-508 Rear I/O ..... 6
Figure 1.3 AIMB-508HF Rear I/O ..... 6
Figure 1.4 AIMB-508HL Rear I/O ..... 6
1.6 AIMB-508 Board Diagram ..... 7
Figure 1.5 AIMB-508 Block Diagram ..... 7
1.7 Safety Precautions ..... 7
1.8 Jumper Settings ..... 8
1.8.1 How to Set Jumpers ..... 8
1.8.2 Flash Descriptor Security Override Jumper Setting (JME1) ..... 8
Table 1.3: Flash Descriptor Security Override Jumper Setting (JME1) ..... 8
1.8.3 CMOS Clear Jumper (JCMOS1) ..... 8
Table 1.4: ..... 8
Table 1.5: ..... 8
1.8.4 COM3_RI# Pin RI#/5V/12V Selection (JSETCOM3_V1) ..... 9
Table 1.6: COM3_RI# Pin RI#/5V/12V Selection (JSET-COM3_V1) ..... 9
1.8.5 Watchdog Timer Output and OBS Beep (JOBS1+JWDT1) ..... 9
Table 1.7: Watchdog Timer Output and OBS Beep (JOBS1+JWDT1) ..... 9
1.8.6 Power Switch / HDD LED / SMBUS / Speaker Pin Header (JFP1) 10
Table 1.8: ..... 10
Table 1.9: ..... 10
1.8.7 ATX/AT Mode Selection (PSON1) ..... 10
Table 1.10: ..... 10
Table 1.11: ..... 10
1.8.8 EDP Panel / LVDS Panel Voltage Selection (JLVDS1) ..... 11
Table 1.12: ..... 11
Table 1.13: ..... 11
1.9 System Memory ..... 11

## Chapter 2 Connecting Peripherals .....13

2.1 Introduction ..... 14
2.2 USB Ports (LAN1_USB12/LAN2_USB34/USB5678/USB910/USB1112/USB1314) ..... 14
2.3 DisplayPort + HDMI Connector (DP1+HDMI1) ..... 15

2.4 Serial Ports (COM1/COM2/COM3456/COM78910) ..... 16
2.5 CPU Fan Connector (CPUFAN1) ..... 17
2.6 System FAN Connector (SYSFAN1/SYSFAN2/SYSFAN3/SYSFAN4) .. 18
2.7 Power LED Pin Header (JFP2) ..... 19
2.8 Audio Jack (AUDIO1) ..... 20
2.9 Serial ATA Interface Connector (SATA1~4) ..... 21
2.10 Front Panel Audio Connector (FPAUD1) ..... 22
2.11 PCI Express x16 Slot (PCIEX16_1)
PCI Express x1 Slot (PCIEX1_1) ..... 23
2.12 PCI Slot (PCI1/PCI2) ..... 24
2.13 NGFF M.2 M-Key Connector for 2280 Module (M2M1) ..... 25
2.14 General Purpose I/O Connector (GPIO1) ..... 26
2.15 Case Open Connector (JCASE1) ..... 27
2.16 ATX Power Connector (EATXPWR1, ATX12V1) ..... 28
2.17 DDR4 U-DIMM Socket (DIMMA1/DIMMB1) ..... 29
2.18 SPDIF Interface Connector (SPDIF1) ..... 30
2.19 Battery Wafer Box (BAT1) ..... 31
2.20 SPI BIOS Flash Socket (SPI1) ..... 32
2.21 eDP Backlight Inverter Power Connector (INV1) ..... 33
2.22 SMBUS Connector (SMBUS1) ..... 34
2.23 -V5/+V5/-V12/+V12/+V3.3/+V5_DUAL Power Supply Connector (VOLT1) 35
2.24 eDP Connector / LVDS Connector (EDP1_LVDS1) ..... 36
2.25 Audio Amplifier Output Pin Header (AMP1) ..... 37
2.26 LVDS VESA, JEIDA Format Selection Pin Header (JLVDS_VCON1) .... 38
2.27 EDP Panel / LVDS Panel Voltage Selection (JLVDS1) ..... 39
2.28 AT/ATX Mode Selection (PSON1) ..... 40
2.29 Intel® ME Header (JME1) ..... 41
2.30 CMOS Clear Jumper (JCMOS1) ..... 42
2.31 Watchdog Timer Output and OBS Beep (JWDT1+JOBS1) ..... 43
2.32 PWRBTN# / RESET# / HDD LED / Serial Bus from HW Monitor IC / Internal Buzzer / External Speaker Header (JFP1) ..... 44
2.33 SPI TPM Module Connector (SPI_TPM1) ..... 45
2.34 SPI Pin Header (SPI1_CN1) ..... 46
2.35 Case Open Connector (JCASE1) ..... 47
2.36 COM3 RI# Selection Pin Header (JSETCOM3_V1) ..... 48
2.37 LED Port 80 Connector (LED_P80) ..... 49
2.38 VGA1 Force on Pin Header (JFV1) ..... 50

## Chapter 3 BIOS Operation ..... 51

3.1 Introduction ..... 52
3.2 BIOS Setup ..... 52
Table 3.1: Control Keys ..... 52
3.2.1 Main Menu ..... 53
3.2.2 Advanced BIOS Features ..... 54
3.2.3 Chipset Configuration Setting ..... 90
3.2.4 Security Settings ..... 104
3.2.5 Boot Setting ..... 105
3.2.6 Save & Exit Configuration ..... 106
3.2.7 MEBx ..... 107

## Chapter 4 Software Introduction & Service ... 109

4.1 Introduction ..... 110
4.2 Value-Added Software Services ..... 110
4.2.1 Software API ..... 110
4.2.2 Software Utility ..... 112

# Chapter 5 Chipset Software Installation Utility .... 113


5.1 Before You Begin ..... 114
5.2 Introduction ..... 114


# Appendix A Pin Assignments .....115


A.1 D-Sub Connector (VGA1) ..... 116
Table A.1: D-Sub Connector (VGA1) ..... 116
A.2 DisplayPort + HDMI Connector (DP1+HDMI1) ..... 117
Table A.2: DisplayPort + HDMI Connector (DP1+HDMI1)..... 117
A.3 Universal Serial Bus Port 5/6/7/8 (USB5678) ..... 118
Table A.3: ..... 118
Table A.4: ..... 118
A.4 RJ-45 + USB 3.2 Gen1 Stack Connector (LAN1_USB12)..... 119
Table A.5: ..... 119
Table A.6: ..... 119
A.5 RJ-45 + USB 3.2 Gen1 Stack Connector (LAN2_USB34)..... 120
Table A.7: ..... 120
Table A.8: ..... 120
A.6 HD Audio Interface (AUDIO1)..... 121
Table A.9: HD Audio Interface (AUDIO1) ..... 121
A.7 PCI Express x16 Slot (PCIEX16_1)..... 121
Table A.10:PCI Express x16 Slot (PCIEX16_1) ..... 121
A.8 Front Panel Audio Header (FPAUD1)..... 123
Table A.11:Front Panel Audio Header (FPAUD1) ..... 123
A.9 PCI Slot (PCI1/PCI2)..... 124
Table A.12:PCI Slot (PCI1/PCI2)..... 124
A.10 Audio Amplifier Output Pin Header (AMP1)..... 125
Table A.13:Audio Amplifier Output Pin Header (AMP1) ..... 125
A.11 HD Audio Interface (SPDIF1)..... 126
Table A.14:HD Audio Interface (SPDIF1) ..... 126
A.12 PCI Express x1 Slot (PCIEX1_1)..... 126
Table A.15:PCI Express x1 Slot (PCIEX1_1) ..... 126
A.13 LVDS VESA, JEIDA Format Selection Pin Header (JLVDS_VCON1).. 127
Table A.16:LVDS VESA, JEIDA Format Selection Pin Header (JL-VDS_VCON1)..... 127
A.14 EDP Connector/LVDS Connector (EDP1_LVDS1)..... 128
Table A.17:LVDS1 ..... 128
Table A.18:EDP1 ..... 128
A.15 EDP Panel/LVDS Panel Voltage Selection (JLVDS1) ..... 129
Table A.19:EDP Panel / LVDS Panel Voltage Selection (JLVDS1) 129
A.16 EDP/LVDS Backlight Inverter Power Connector (INV1) ..... 129
Table A.20:EDP/LVDS Backlight Inverter Power Connector (INV1) 129
A.17 SMBUS Connector from PCH (SMBUS1)..... 130
Table A.21:SMBUS Connector from PCH (SMBUS1) ..... 130
A.18 Alarm Board / CMM Power Connector (VOLT1)..... 130
Table A.22:Alarm Board / CMM Power Connector (VOLT1) .... 130
A.19 ATX/AT Mode Selection (PSON1) ..... 131
Table A.23:..... 131
Table A.24:..... 131
A.20 Intel® ME Header (JME1)..... 131
Table A.25:Intel® ME Header (JME1) ..... 131
A.21 COMS Mode (JCMOS1) ..... 132
Table A.26:..... 132

Table A.27: ..... 132
A.22 COM3 RI# Selection Pin Header (JSETCOM3_V1) ..... 132
Table A.28:COM3 RI# Selection Pin Header (JSETCOM3_V1)..... 132
A.23 CMOS Clear (JCMOS1)..... 133
Table A.29:CMOS Clear (JCMOS1)..... 133
A.24 Serial ATA Interface Connector (SATA1~4) ..... 133
Table A.30:Serial ATA Interface Connector (SATA1~4)..... 133
A.25 Coin Battery Connector (BAT1) ..... 134
Table A.31:Coin Battery Connector (BAT1)..... 134
A.26 Power LED Pin Header (JFP2)..... 134
Table A.32:Power LED Pin Header (JFP2) ..... 134
A.27 Watchdog Timer Output and OBS Beep (JOBS1+JWDT1)..... 135
Table A.33: ..... 135
Table A.34: ..... 135
A.28 Power Switch / HDD LED / SMBUS / Speaker Pin Header (JFP1) ..... 135
Table A.35: ..... 135
Table A.36: ..... 135
A.29 Extended Power Button Pin Header (JFP3) ..... 136
Table A.37:Power Button Pin Header (JFP3)..... 136
A.30 Extended Power LED Pin Header (JFP4)..... 136
Table A.38:Power LED Pin Header (JFP4) ..... 136
A.31 Universal Serial Bus 3.0 Port 11/12 (USB1112) ..... 136
Table A.39:Universal Serial Bus 3.0 Port 11/12 (USB1112)..... 136
A.32 Universal Serial Bus 3.0 Port 13/14 (USB1314) ..... 137
Table A.40:Universal Serial Bus 3.0 Port 13/14 (USB1314)..... 137
A.33 SPI BIOS Flash Socket1 (SPI1)..... 137
Table A.41:SPI BIOS Flash Socket1 (SPI1)..... 137
A.34 SPI TPM Module Connector (For Optional TPM Module) (SPI_TPM1) 138
Table A.42:SPI TPM Module Connector (For Optional TPM Module) (SPI_TPM1)..... 138
A.35 SPI Pin Header (SPI_CN1)..... 138
Table A.43:SPI Pin Header (SPI_CN1) ..... 138
A.36 Universal Serial Bus 2.0 Port 9/10 (USB910) ..... 139
Table A.44:Universal Serial Bus 2.0 Port 9/10 (USB910)..... 139
A.37 Case Open Connector (JCASE1) ..... 139
Table A.45:Case Open Connector (JCASE1)..... 139
A.38 ATX 24-Pin Power Connector (EATXPWR1)..... 140
Table A.46:ATX 24-Pin Power Connector (EATXPWR1)..... 140
A.39 COM 3/4/5/6 Connector, COM 7/8/9/10 Connector (COM3456/ COM78910) ..... 141
Table A.47:COM 3/4/5/6 Connector, COM 7/8/9/10 Connector (COM3456/COM78910) ..... 141
A.40 COM3 RI# Selection Pin Header (JSETCOM3_V1) ..... 142
Table A.48:COM3 RI# Selection Pin Header (JSETCOM3_V1)..... 142
A.41 8-Bit General Purpose I/O Pin Header (GPIO1) ..... 142
Table A.49:8-Bit General Purpose I/O Pin Header (GPIO1)..... 142
A.42 COM2 Connector (COM2) ..... 142
Table A.50:COM2 Connector (COM2)..... 142
A.43 System Fan #4 Connector (SYSFAN4/ SYSFAN3/SYSFAN2/SYSFAN1) . 143
Table A.51:System Fan #4 Connector (SYSFAN4/ SYSFAN3/ SYSFAN2/SYSFAN1) ..... 143
A.44 LED Port 80 Connector (LED_P80)..... 143
Table A.52:LED Port 80 Connector (LED_P80) ..... 143
A.45 CPU FAN Connector (CPUFAN1) ..... 144
Table A.53:CPU FAN Connector (CPUFAN1)..... 144
A.46 M.2 M-Key Connector (M2M1)..... 144
Table A.54:M.2 M-Key Connector (M2M1)..... 144

A.47 ATX 8-Pin Main Power Connector (ATX12V1) ..... 145
Table A.55:ATX 8-Pin Main Power Connector (ATX12V1)..... 145
A.48 VGA1 Force on Pin Header (JFV1)..... 146
Table A.56:VGA1 Force on Pin Header (JFV1)..... 146
A.49 COM1 Connector (COM1) ..... 146
Table A.57:COM1 Connector (COM1)..... 146

# Chapter 1

## General Information

## 1.1 Introduction

AIMB-508 is designed with the Intel® H610E chipset for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports an Intel® Core™ i9/i7/i5/i3 processor with up to 36MB L3 cache and DDR4 3200MHz up to 64GB (up to 32GB per slot). It is equipped with abundant I/O connectivity with 10 x serial ports, 6 x USB 2.0, 8 x USB 3.2 Gen2, 1 x GbE LAN, 1 x 2.5GbE LAN, and 4 x SATA III ports.

## 1.2 Features

- **Abundant I/O connectivity:** Up to 1 x GbE LAN and 1 x 2.5 GbE LAN, 1 x PCIe x16 slot (Gen4), 1 x PCIe x4 slot (Gen3), 2 x PCI slots, 6 x USB 2.0 ports, and 8 x USB 3.2 Gen1
- **Standard Micro ATX form factor with industrial features:** The AIMB-508 is a full-featured Micro ATX motherboard with balanced expandability and performance.
- **Diverse Storage Devices:** SATA HDD, M.2 M-Key (2280) SSD

## 1.3 Specifications

### 1.3.1 Processor

- **CPU:** 12th/13th Gen Intel® Core™ i9/i7/i5/i3 processor (up to 65W)
- **BIOS:** AMI EFI 256 Mbit SPI BIOS
- **System chipset:** Intel® H610E

### 1.3.2 Memory

- **RAM:** Up to 64GB (32GB per DIMM) in 2 slots (288-pin DIMM sockets). Supports dual-channel DDR4 up to 3200MHz.

### 1.3.3 Input/Output

- **Expansion slot:** 1 x PCIe x16 Gen4 expansion slot, 1 x PCIe x4 Gen3 expansion slot, 2 x PCI expansion slot
- **Serial port:** 10 x serial ports, the one at the rear I/O is RS-232/422/485 with hardware auto-flow control and the other nine are RS-232
- **USB port:** Supports up to 6 x USB 2.0 ports with transmission rates up to 480 Mbps, 8 x USB 3.2 Gen1 ports with transmission rates up to 5Gbps
- **GPIO:** AIMB-508 supports 8-bit GPIO from super I/O for general-purpose control applications.

### 1.3.4 Graphics

- **Controller:** Intel® UHD Graphics 770
- **HDMI:** 1 x HDMI supporting max resolution 4096 x 2160 @ 30Hz
- **Display Port:** 1 x DP supporting max resolution 4096 x 2304 @60Hz
- **eDP (default):** 1 x eDP supporting max resolution 3840 x 2160 @ 60 Hz, co-design with LVDS
- **Triple Display:** eDP+HDMI+DP, eDP+VGA+DP, HDMI+DP+VGA, HDMI+eDP+VGA
- **Dual Display:** DP+VGA, DP+eDP, DP+HDMI, HDMI+eDP, HDMI+VGA, eDP+VGA

### 1.3.5 Ethernet LAN

- **Controller:** LAN1: Intel I219V (508HF/508HL); LAN2: Intel I226V (508HF)
- Supports up to one 10/100/1000 Mbps Ethernet port via PCI Express x1 bus which provides 500 MB/s data transmission rate and one 10/100/1000/2500 Mbps Ethernet port via PCI Express x1 bus which provides 500 MB/s data transmission rate.

### 1.3.6 Industrial Features

- **Watchdog timer:** It can generate a system reset. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels).

### 1.3.7 Mechanical and Environmental Specifications

- **Operating temperature:** 0 ~ 60°C (14 ~ 158°F, Depending on CPU)
- **Storage temperature:** -40 ~ 85°C (-40 ~ 185°F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** +5 V, +3.3 V, +12 V, +12V_8P, 5 Vsb
- Power consumption:

| +5 V | 3.3 V | 12 V | +12V_8P | 5 Vsb |
|---|---|---|---|---|
| 19.6 A | 24.04 A | 19 A | 18.5 A | 2.5 A |

  Measure the maximum current value with the system under maximum load (CPU: 13th Gen Intel® Core™ i9-13900E 1.80GHz, RAM: ADVANTECH 32GB 2Rx8 DDR4 3200 *2PCS with full loading)
- **Input mode:** ATX input
- **Board size:** 244 mm x 244 mm (9.6" x 9.6")
- **Board weight:** 0.5 kg

## 1.4 Jumpers and Connectors

Connectors on the AIMB-508 motherboard link it to devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers used to configure your system for your application.

The tables below list the function of each of the board jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

## 1.5 Board Layout: Jumper and Connector Locations

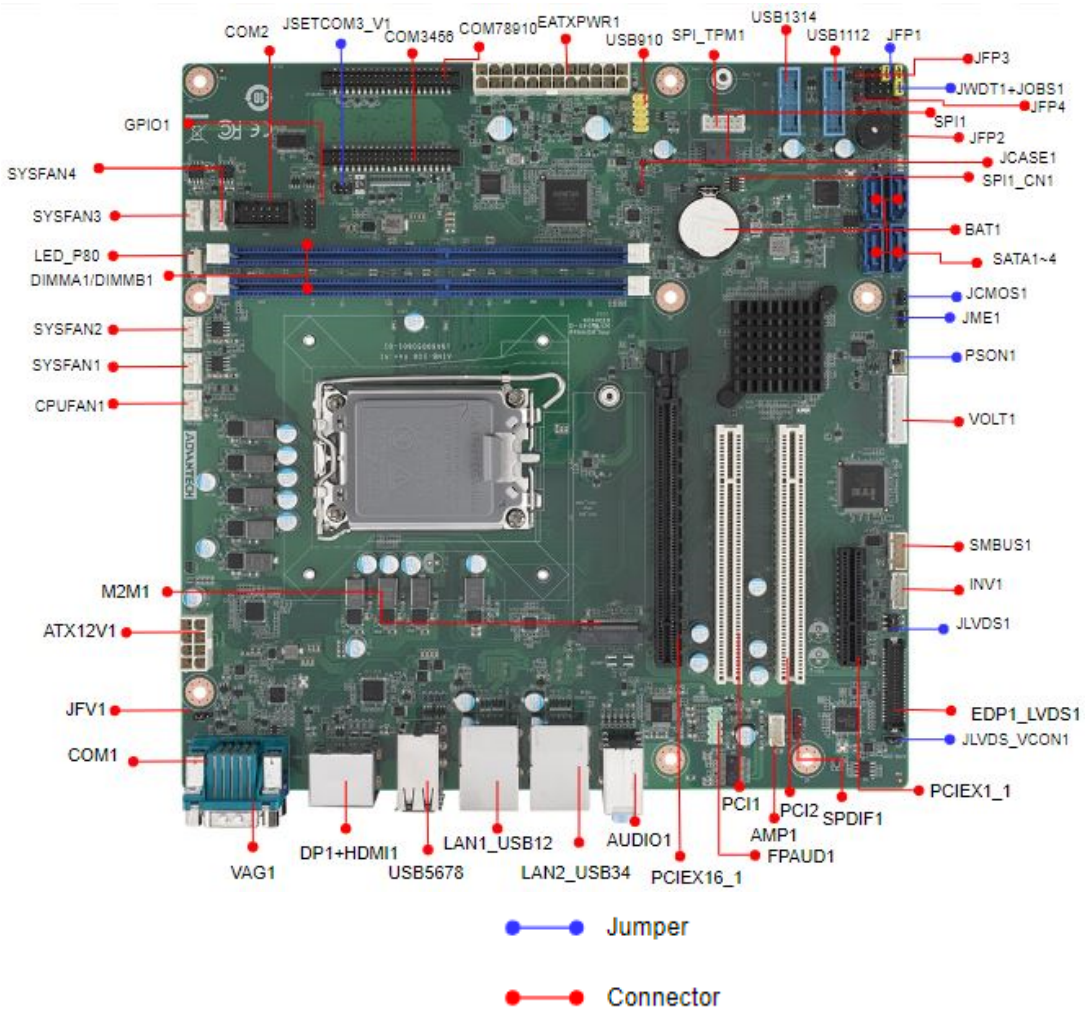



**Figure 1.1 Jumper and Connector Locations**

## Table 1.1: Jumper Setting List

| | Description | Part Reference |
|---|---|---|
| 1 | EDP/LVDS Panel Voltage Selection | JLVDS1 |
| 2 | RTC/CMOS clear | JCMOS1 |
| 3 | PWRBTN# / RESET#/HDD LED / Serial bus from HW monitor IC / Internal Buzzer / External Speaker header | JFP1 |
| 4 | Watchdog timer output and OBS beep | JOBS1+JWDT1 |
| 5 | AT/ATX Mode selection | PSON1 |
| 6 | LVDS VESA, JEIDA format selection pin header | JLVDS_VCON1 |
| 7 | COM3 RI# selection pin header | JSETCOM3_V1 |
| 8 | Intel ME header | JME1 |

## Table 1.2: Connector/Header List

| | Description | Part Reference |
|---|---|---|
| 1 | D-Sub connector | VGA1 |
| 2 | DisplayPort + HDMI connector | DP1+HDMI1 |
| 3 | Universal Serial Bus Port 5/6/7/8 | USB5678 |
| 4 | RJ-45 + USB 3.2 Gen1 stack connector | LAN1_USB12 |
| 5 | RJ-45 + USB 3.2 Gen1 stack connector | LAN2_USB34 |
| 6 | HD Audio Interface (Analog) | AUDIO1 |
| 7 | PCI Express x16 slot | PCIEX16_1 |
| 8 | Front panel audio header | FPAUD1 |
| 9 | PCI slot | PCI1 |
| 10 | Audio amplifier output pin header | AMP1 |
| 11 | HD Audio interface (Digital) | SPDIF1 |
| 12 | PCI slot | PCI2 |
| 13 | PCI Express x1 slot | PCIEX1_1 |
| 14 | LVDS VESA, JEIDA format selection pin header | JLVDS_VCON1 |
| 15 | EDP Connector / LVDS Connector | EDP1_LVDS1 |
| 16 | EDP Panel / LVDS Panel Voltage Selection | JLVDS1 |
| 17 | EDP/LVDS Backlight Inverter Power Connector | INV1 |
| 18 | SMBUS connector from PCH | SMBUS1 |
| 19 | Alarm Board / CMM Power Connector | VOLT1 |
| 20 | AT/ATX Mode selection | PSON1 |
| 21 | Intel ME header | JME1 |
| 22 | COMS Mode selection | JCMOS1 |
| 23 | Serial ATA interface connector | SATA1~4 |
| 24 | Coin battery connector | BAT1 |
| 25 | Power LED pin header | JFP2 |
| 26 | Watchdog timer output and OBS beep | JWDT1+JOBS1 |
| 27 | PWRBTN# / RESET# / HDD LED / Serial bus from HW monitor IC / Internal Buzzer / External Speaker header | JFP1 |
| 28 | Universal Serial Bus 3.0 Port 11/12 | USB1112 |
| 29 | Universal Serial Bus 3.0 Port 13/14 | USB1314 |
| 30 | SPI BIOS flash socket1 | SPI1 |
| 31 | SPI TPM Module connector (for optional TPM module) | SPI_TPM1 |

| Table 1.2: Connector/Header List | | |
|---|---|---|
| 32 | SPI pin header | SPI1_CN1 |
| 33 | Universal Serial Bus 2.0 Port 9/10 | USB910 |
| 34 | Case open connector | JCASE1 |
| 35 | ATX 24-pin power connector | EATXPWR1 |
| 36 | COM 7/8/9/10 connector | COM78910 |
| 37 | COM 3/4/5/6 connector | COM3456 |
| 38 | COM3 RI# selection pin header | JSETCOM3_V1 |
| 39 | 8-bit general purpose I/O pin header | GPIO1 |
| 40 | COM 2 connector | COM2 |
| 41 | System fan #4 connector | SYSFAN4 |
| 42 | System fan #3 connector | SYSFAN3 |
| 43 | LED port 80 connector | LED_P80 |
| 44 | System fan #2 connector | SYSFAN2 |
| 45 | System fan #1 connector | SYSFAN1 |
| 46 | Extended power button pin header | JFP3 |
| 47 | Extended power LED pin header | JFP4 |

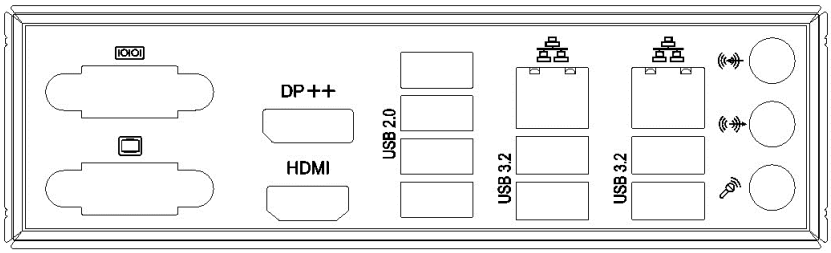



**Figure 1.2 AIMB-508 Rear I/O**

AIMB-508HF

**Figure 1.3 AIMB-508HF Rear I/O**

AIMB-508HL

**Figure 1.4 AIMB-508HL Rear I/O**

## 1.6 AIMB-508 Board Diagram

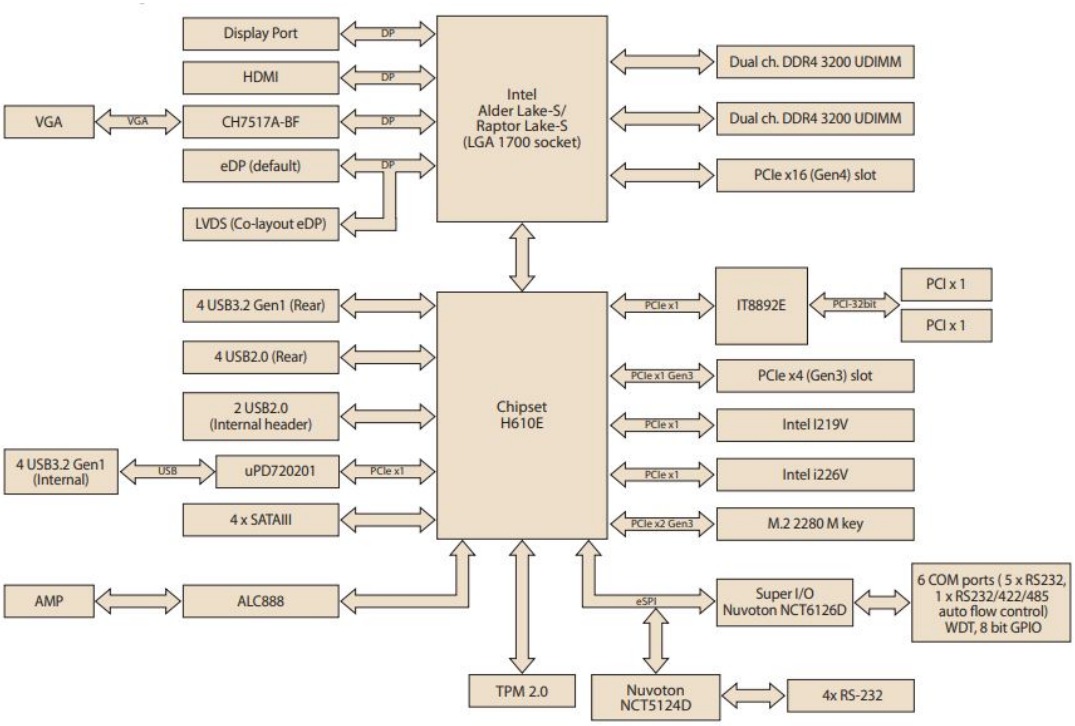



**Figure 1.5 AIMB-508 Block Diagram**

## 1.7 Safety Precautions

***Warning!*** *Always completely disconnect the power cord from the chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.*

***Caution!*** *Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to electrostatic discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

***Caution!*** *The computer is provided with a battery-powered real-time clock circuit. There is a danger of explosion if the battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

***Caution!*** *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manmanufacturer. Discard used batteries according to the manufacturer's instructions.*

# 1.8 Jumper Settings

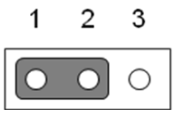
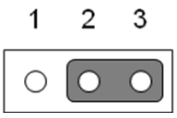
This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboard's default settings and your options for each jumper.

## 1.8.1 How to Set Jumpers

Users can configure the motherboard to match specific applications by setting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" (or turn ON) a jumper, you connect the pins with the clip. To "open" (or turn OFF) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when setting jumpers.

## 1.8.2 Flash Descriptor Security Override Jumper Setting (JME1)

**Table 1.3: Flash Descriptor Security Override Jumper Setting (JME1)**

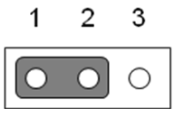
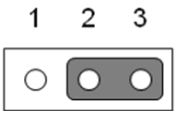
| Function | Jumper Setting |
|---|---|
| Disable Flash Descriptor Security (Default) |  |
| Enable Security measures defined in the Flash Descriptor. |  |

## 1.8.3 CMOS Clear Jumper (JCMOS1)

**Table 1.4:**

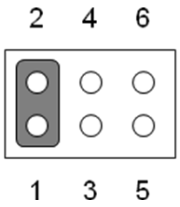
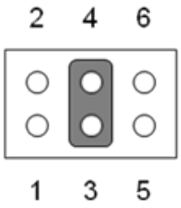
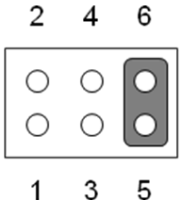
| Pin | Signal Pin Definition |
|---|---|
| 1 | VBAT |
| 2 | RTC RESET# |
| 3 | GND |

**Table 1.5:**

| Function | Jumper Setting |
|---|---|
| Keep COMS Data (Default) |  |
| Clear CMOS Data |  |

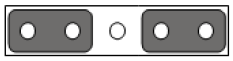
### 1.8.4 COM3_RI# Pin RI#/5V/12V Selection (JSETCOM3_V1)

**Table 1.6: COM3_RI# Pin RI#/5V/12V Selection (JSETCOM3_V1)**

| Function | Setting |
|---|---|
| Set COM3_RI# as RI# (Default) |  |
| Set COM3_RI# as 5V |  |
| Set COM3_RI# as 12V |  |

### 1.8.5 Watchdog Timer Output and OBS Beep (JOBS1+JWDT1)

**Table 1.7: Watchdog Timer Output and OBS Beep (JOBS1+JWDT1)**

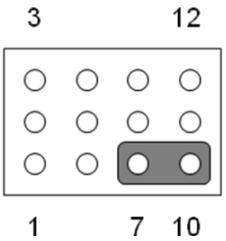
| Function | Setting |
|---|---|
| Watchdog Timer Output (2-3) (Default)<br>OBS BEEP (4-5) (Default) | |
| Watchdog Timer Disable (1-2)<br>OBS BEEP (4-5) (Default) |  |

## 1.8.6 Power Switch / HDD LED / SMBUS / Speaker Pin Header (JFP1)

**Table 1.8:**

| Pin | Signal Pin Definition | Pin | Signal Pin Definition |
|---|---|---|---|
| 1 | +5V | 2 | HDD LED+ |
| 3 | Power Button+ | 4 | SPK_P2 |
| 5 | HDD LED- | 6 | Power Button- |
| 7 | SPK_P3 | 8 | SMB_DATA |
| 9 | System Reset+ | 10 | SPK_P4 |
| 11 | SMB_CLK | 12 | System Reset- |

**Table 1.9:**

| Function | Jumper Setting |
|---|---|
| Internal Buzzer (Default) |  |

## 1.8.7 ATX/AT Mode Selection (PSON1)

**Table 1.10:**

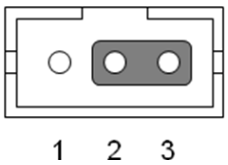
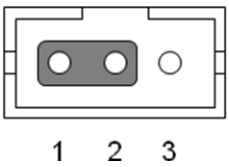
| Function | Jumper Setting |
|---|---|
| ATX Mode (Default) |  |
| AT Mode |  |

**Table 1.11:**

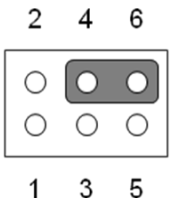
| Pin | Signal |
|---|---|
| 1 | AT |
| 2 | +VCC |
| 3 | ATX |

### 1.8.8 EDP Panel / LVDS Panel Voltage Selection (JLVDS1)

**Table 1.12:**

| Pin | Signal Pin Definition | Pin | Signal Pin Definition |
|---|---|---|---|
| 1 | NC | 2 | +5V |
| 3 | +12V | 4 | VDD |
| 5 | NC | 6 | +3.3V |

**Table 1.13:**

| Function | Jumper Setting |
|---|---|
| Jumper position for +3.3V (Default) |  |

## 1.9 System Memory

AIMB-508 has four 288-pin DDR4 memory sockets for 3200MHz memory modules with maximum capacity of 64GB (Maximum 32GB for each DIMM).

# Chapter 2

## Connecting Peripherals

## 2.1 Introduction

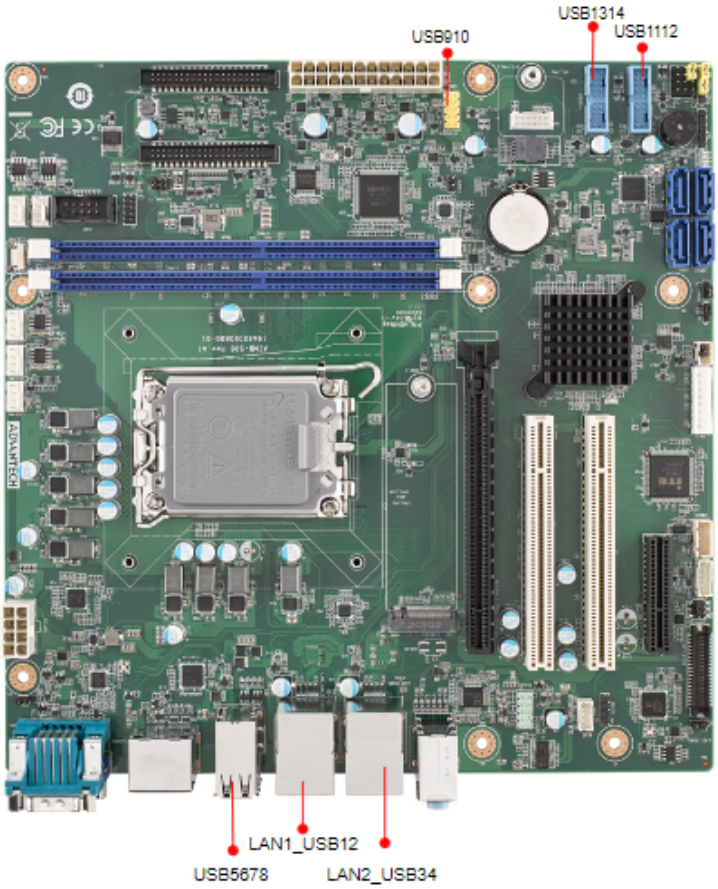
You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

## 2.2 USB Ports (LAN1_USB12/LAN2_USB34/ USB5678/USB910/USB1112/USB1314)

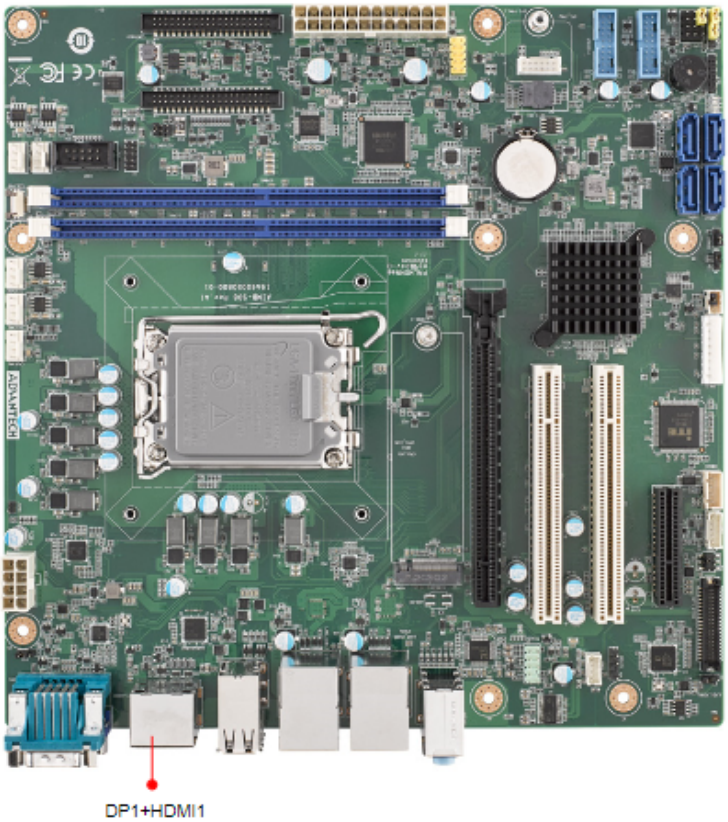
The AIMB-508 provides up to 14 USB ports (4 x USB 3.2 Gen1, 4 x USB 2.0 on the rear side, 4 x USB 3.2 Gen1 via internal header and 2 x USB 2.0 via vertical connector). The USB interface complies with USB Specification Rev 2.0 supporting transmission rates up to 480Mbps and Rev 3.0 supporting transmission up to 5Gbps, Rev 3.1 Gen2 supporting transmission up to 10Gbps while fuse-protected. The USB interface can be disabled in the system BIOS setup.

The AIMB-508 is equipped with up to one high-performance 1000Mbps Ethernet LAN adapter and one 2500Mbps Ethernet LAN adapter, with both supported by all major network operating systems.

The RJ-45 jacks on the rear panel provide convenient LAN connections.



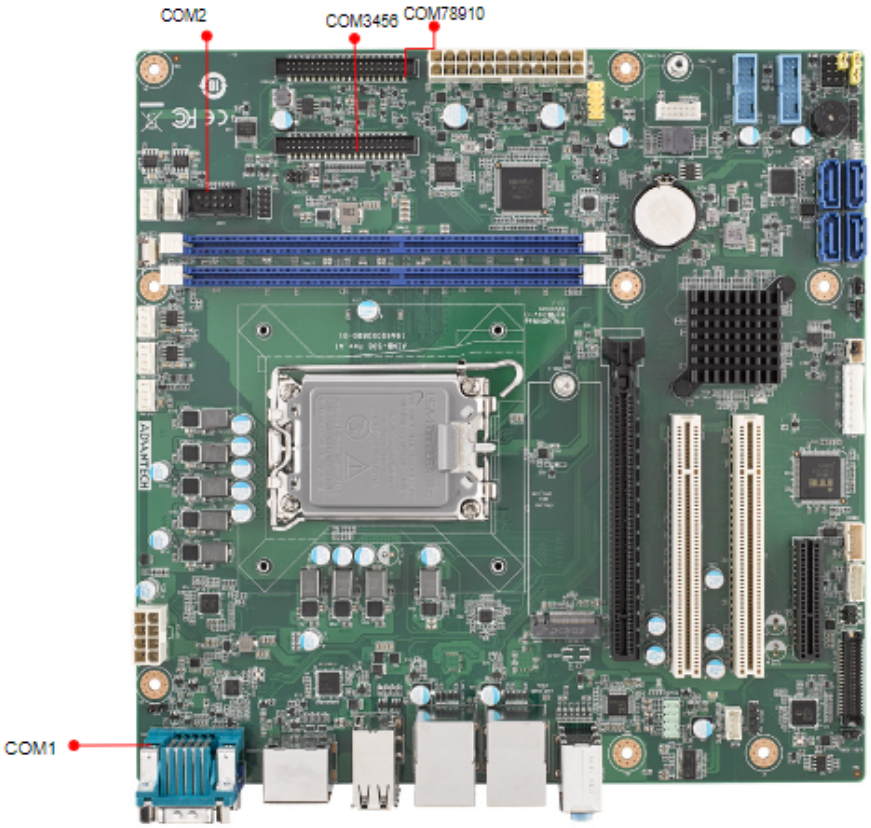
## 2.3 DisplayPort + HDMI Connector (DP1+HDMI1)




DP connector has max resolution support of 4096 x 2304 @ 60 Hz.
HDMI connector has max resolution support of 4096 x 2160 @ 30 Hz.

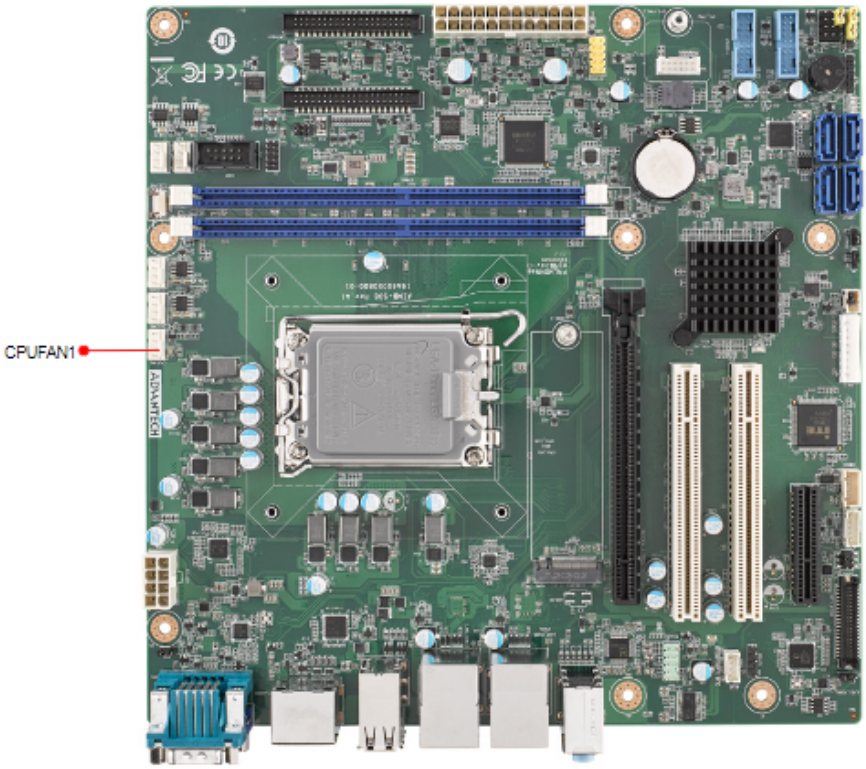
## 2.4 Serial Ports (COM1/COM2/COM3456/COM78910)

AIMB-508 supports six serial ports. COM1 supports RS-232/422/485 and COM2-10 supports RS-232.

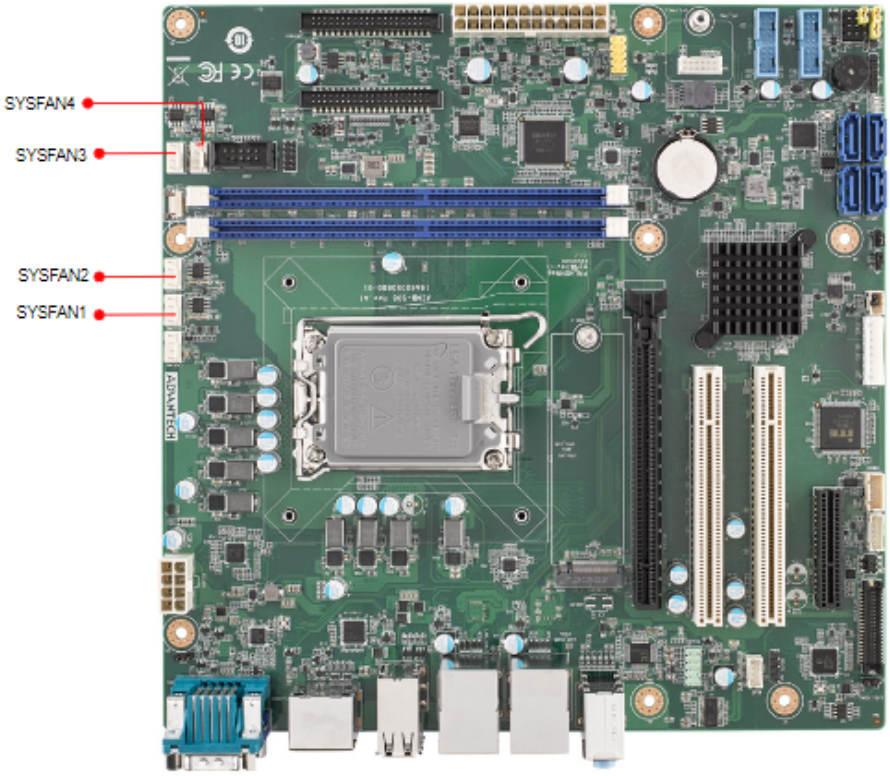



These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

## 2.5 CPU Fan Connector (CPUFAN1)

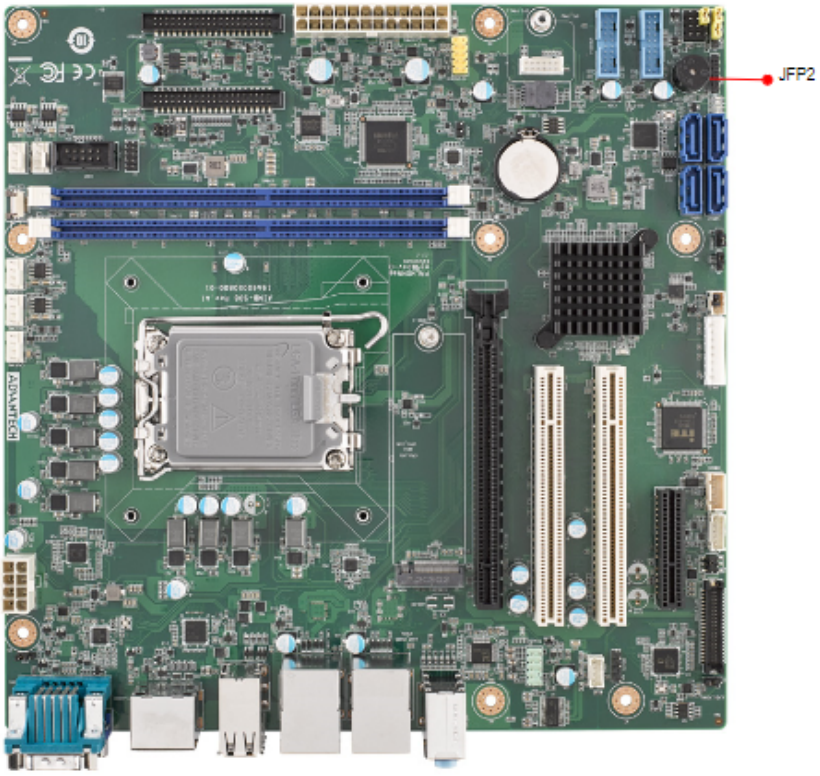


## 2.6 System FAN Connector (SYSFAN1/SYSFAN2/SYSFAN3/SYSFAN4)

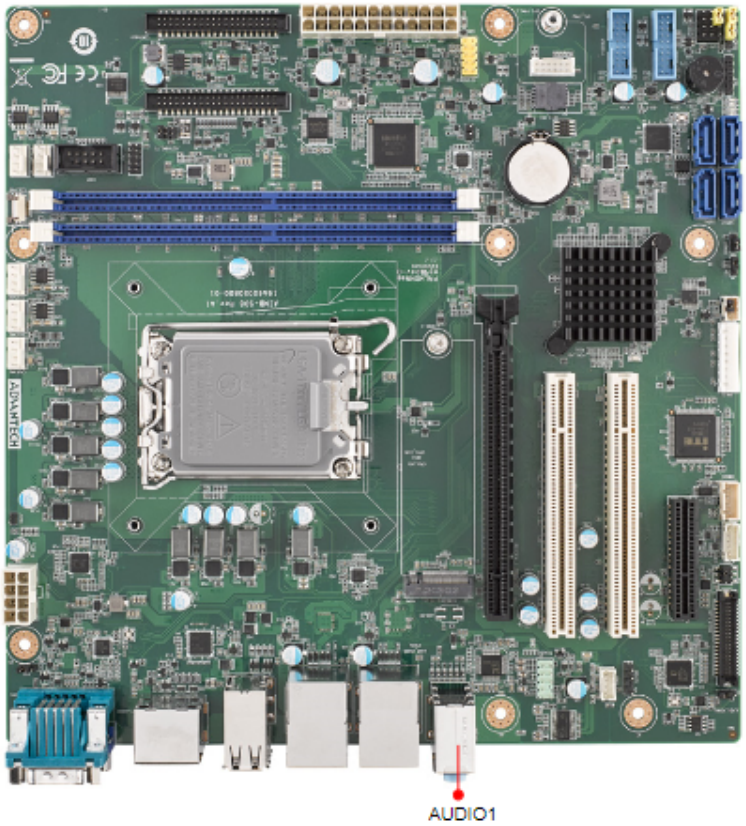



If a fan is used, this connector supports cooling fans at 1500 mA (18 W) or less.

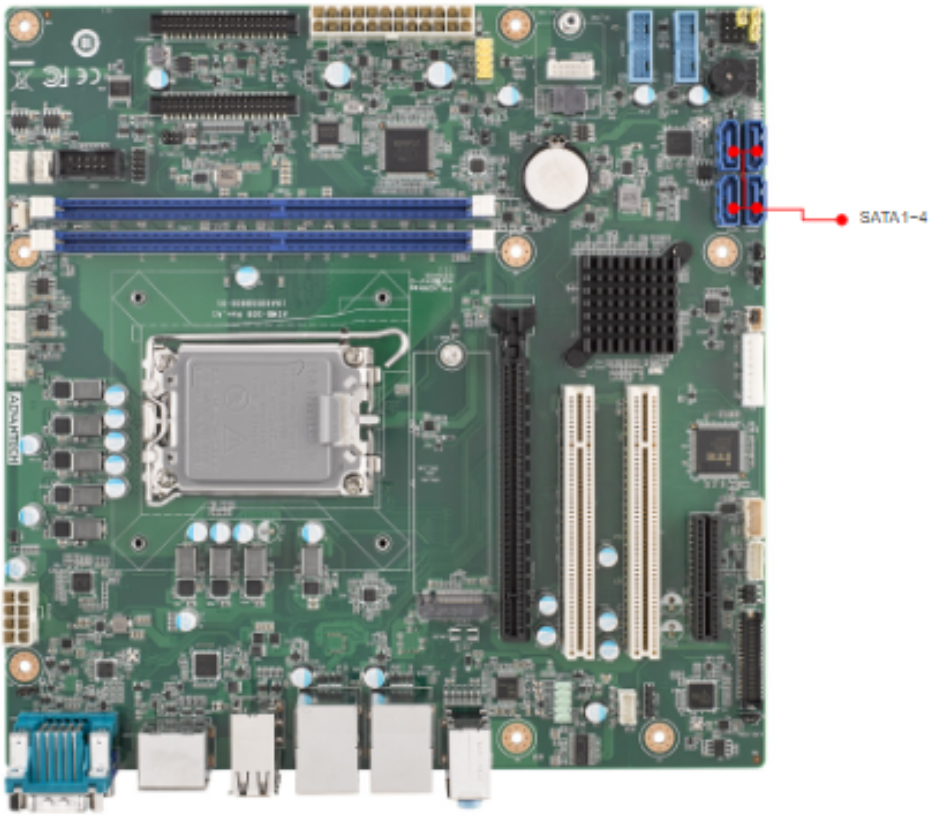
## 2.7 Power LED Pin Header (JFP2)



## 2.8 Audio Jack (AUDIO1)

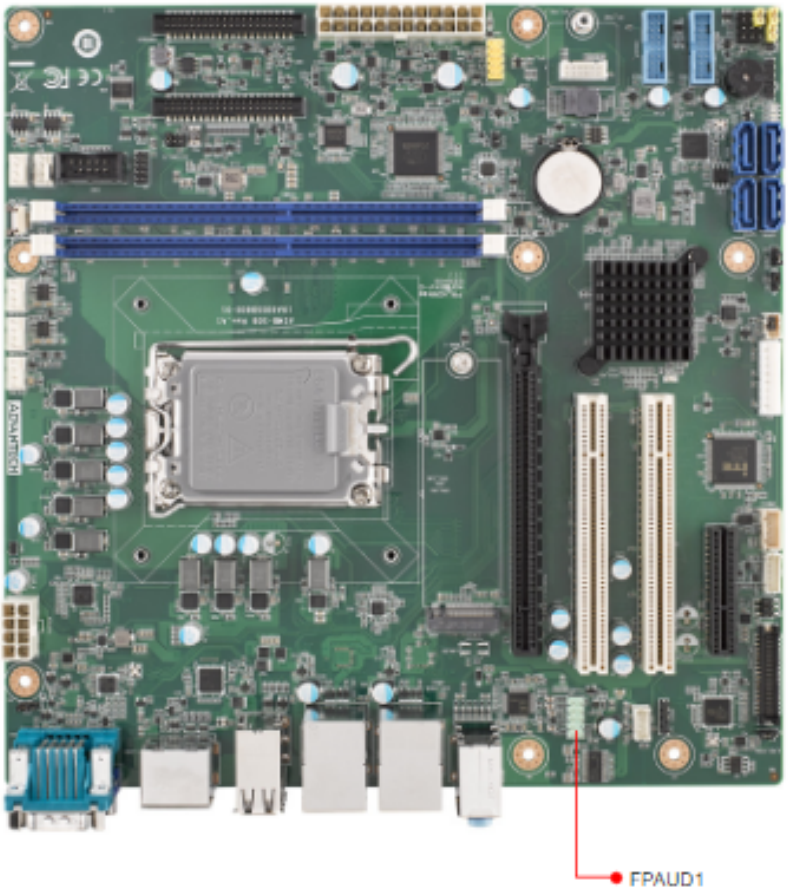


## 2.9 Serial ATA Interface Connector (SATA1~4)

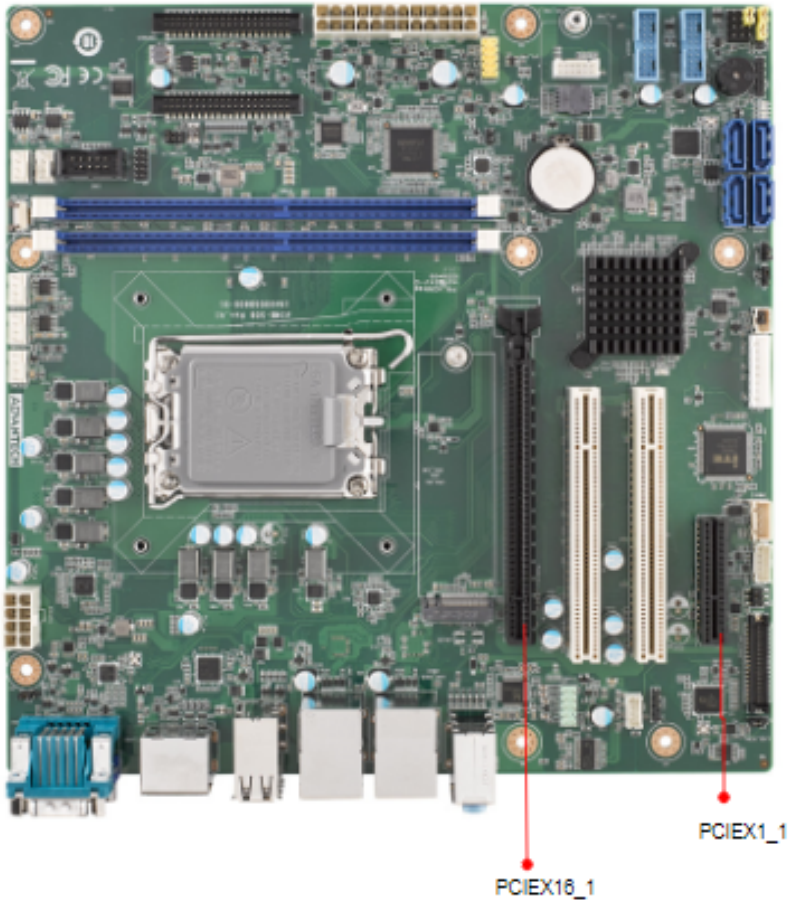



AIMB-508 features a high performance Serial ATA III interface (up to 600 MB/s) which eases hard drive cabling with thin, space-saving cables.

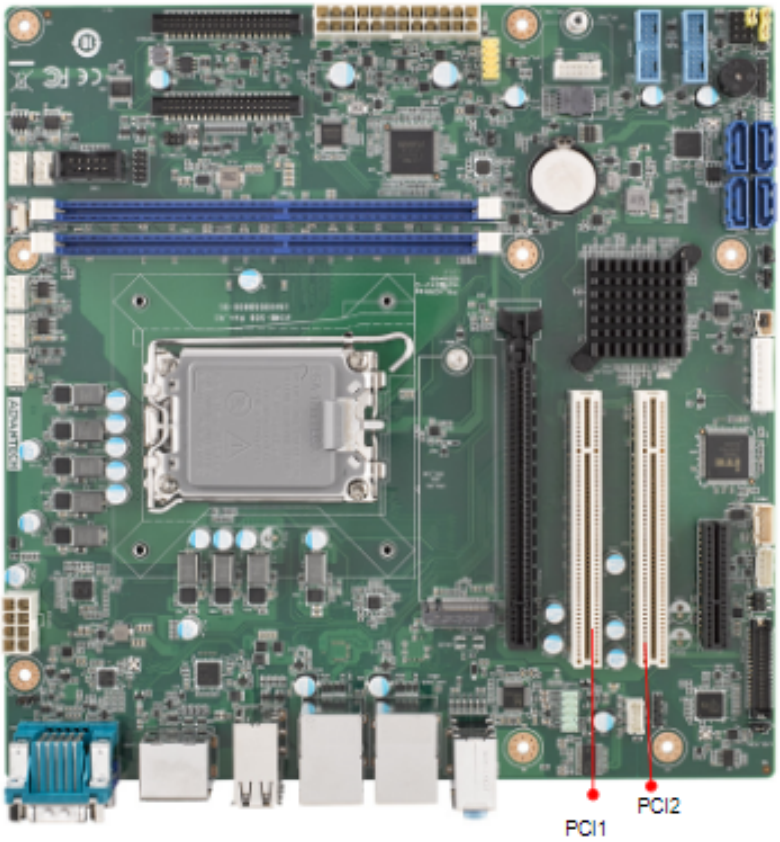
## 2.10 Front Panel Audio Connector (FPAUD1)



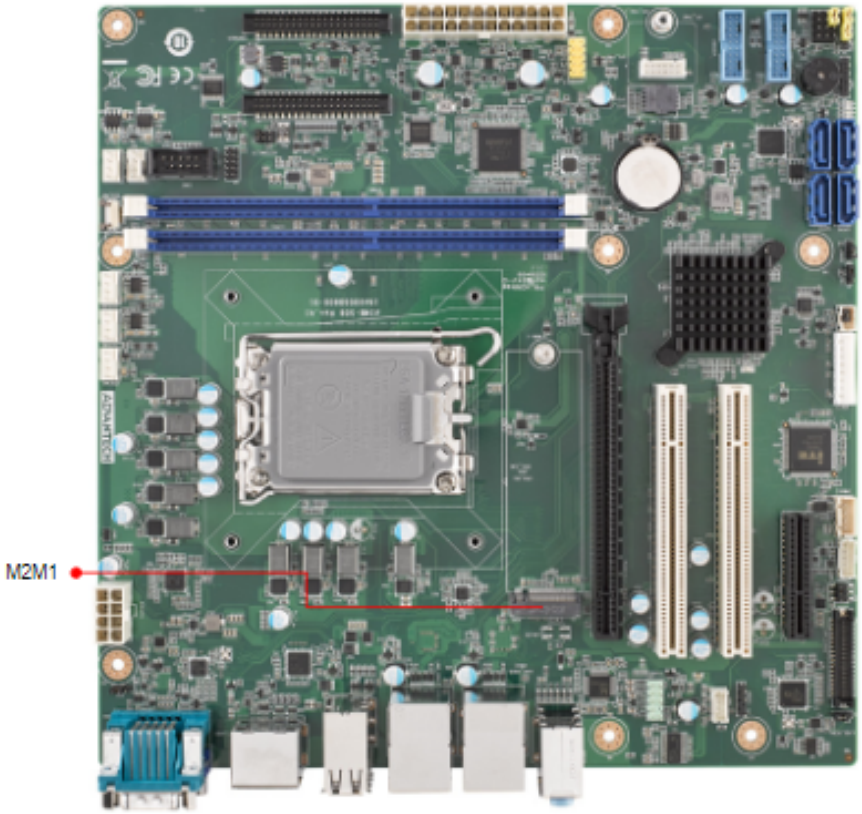
## 2.11 PCI Express x16 Slot (PCIEX16_1) PCI Express x1 Slot (PCIEX1_1)



## 2.12 PCI Slot (PCI1/PCI2)

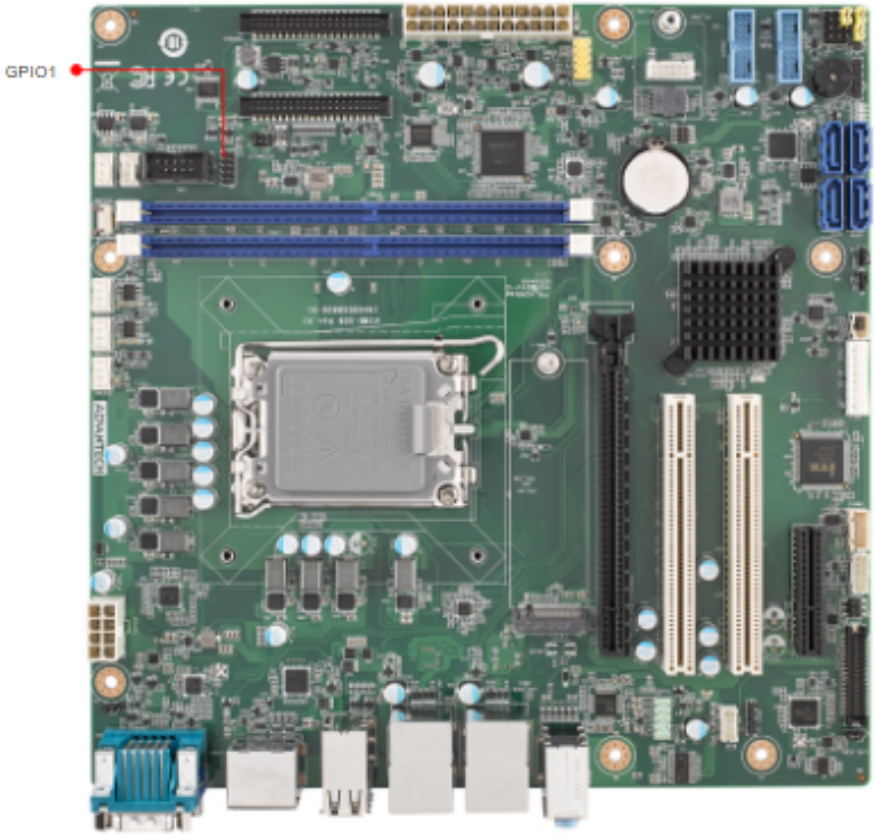


## 2.13 NGFF M.2 M-Key Connector for 2280 Module (M2M1)

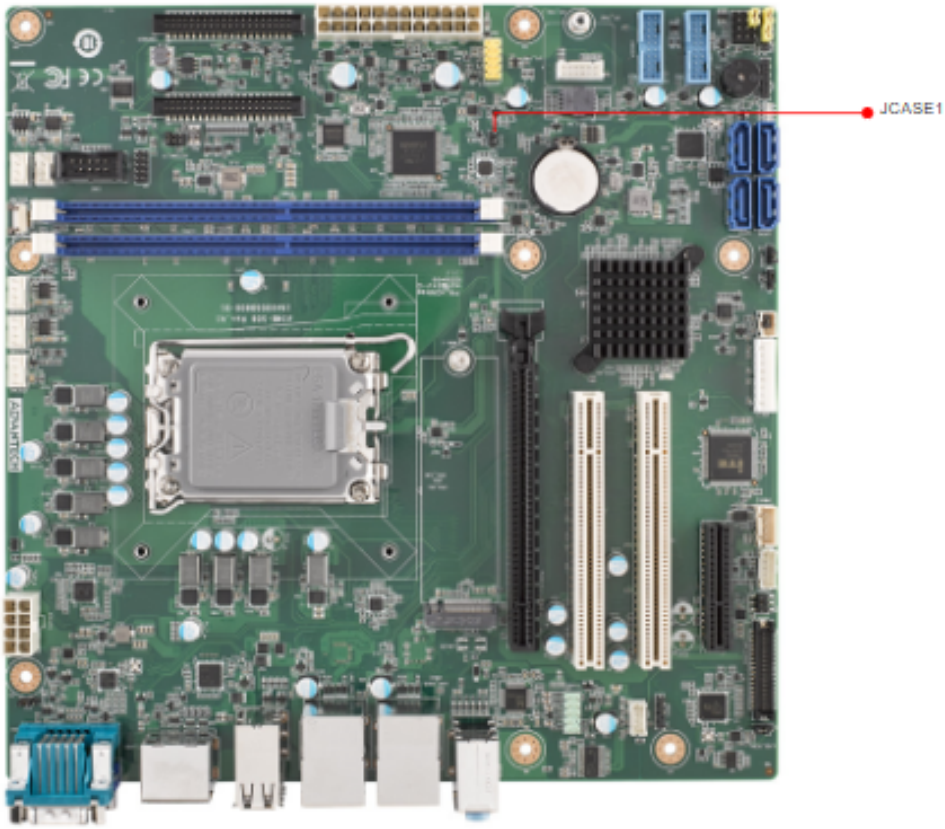



M.2 M-key: 2280, PCIe x2 interface with support for NVMe devices.

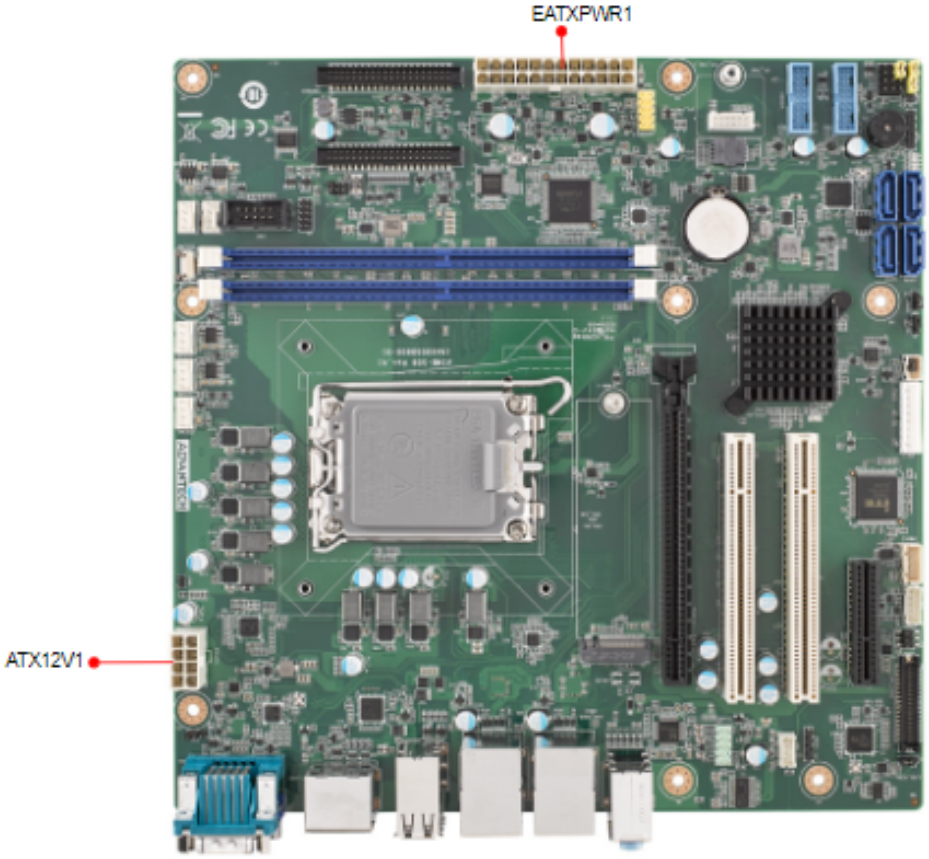
## 2.14 General Purpose I/O Connector (GPIO1)



## 2.15 Case Open Connector (JCASE1)



## 2.16 ATX Power Connector (EATXPWR1, ATX12V1)



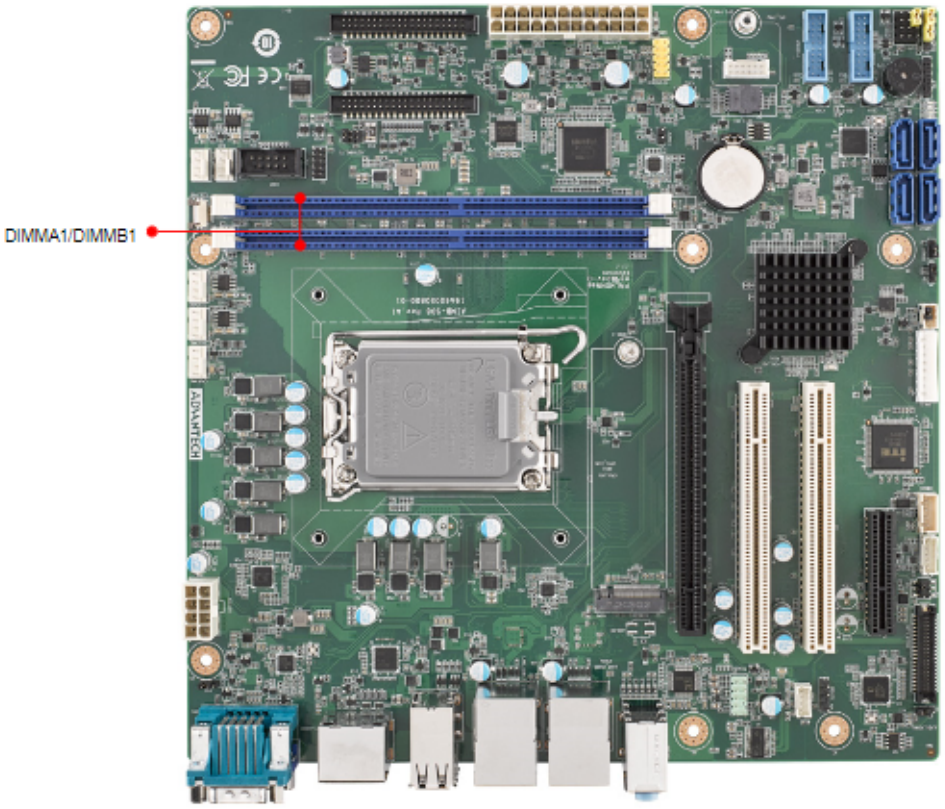

This connector is for an ATX Micro-Fit power supply. The plugs from the power supply are designed to fit these connectors in only one direction. Determine the proper orientation and push down firmly until the connectors connect completely.

***Note!***

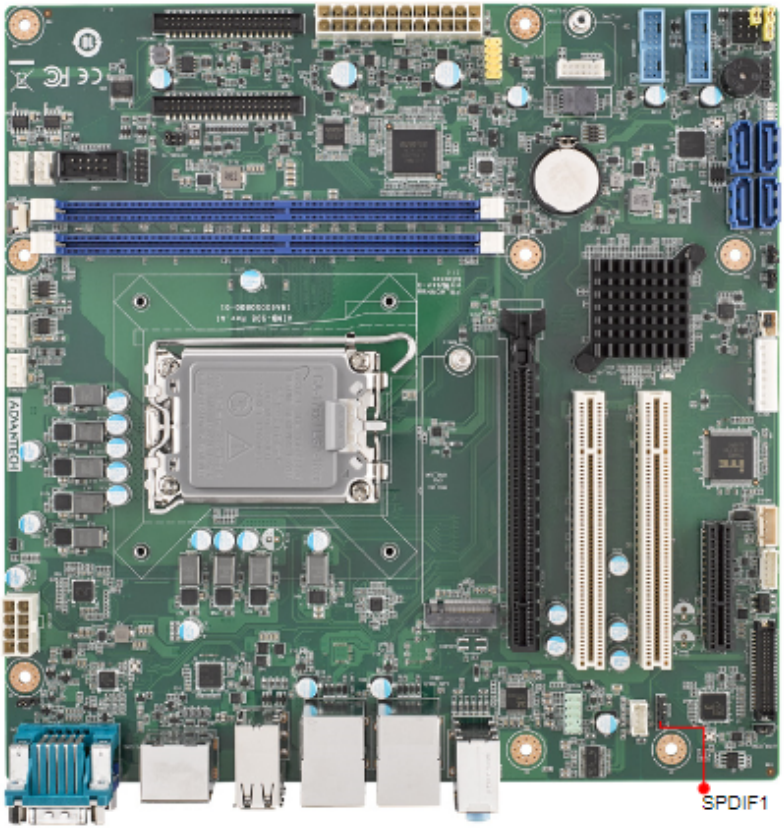
*1. Please connect the ATX12V1 connector with the PSU ATX 12V 8-pin connector.*

*2. For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12V Specification 2.0 (or later version) and provides a minimum power of 180 W.*

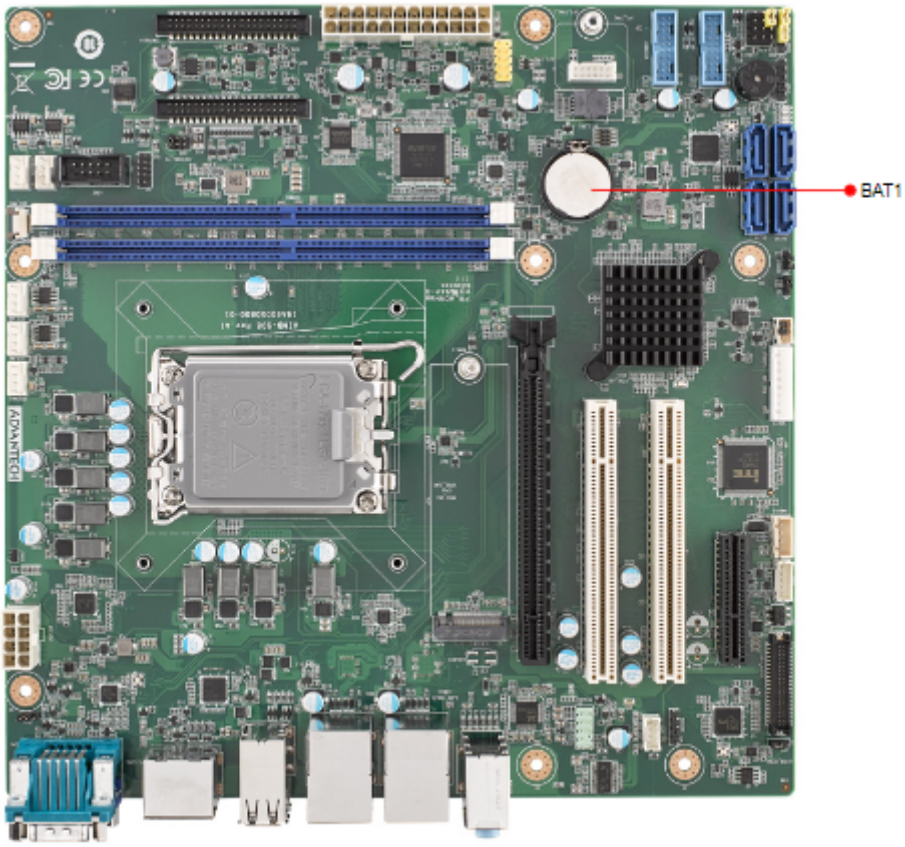
## 2.17 DDR4 U-DIMM Socket (DIMMA1/DIMMB1)



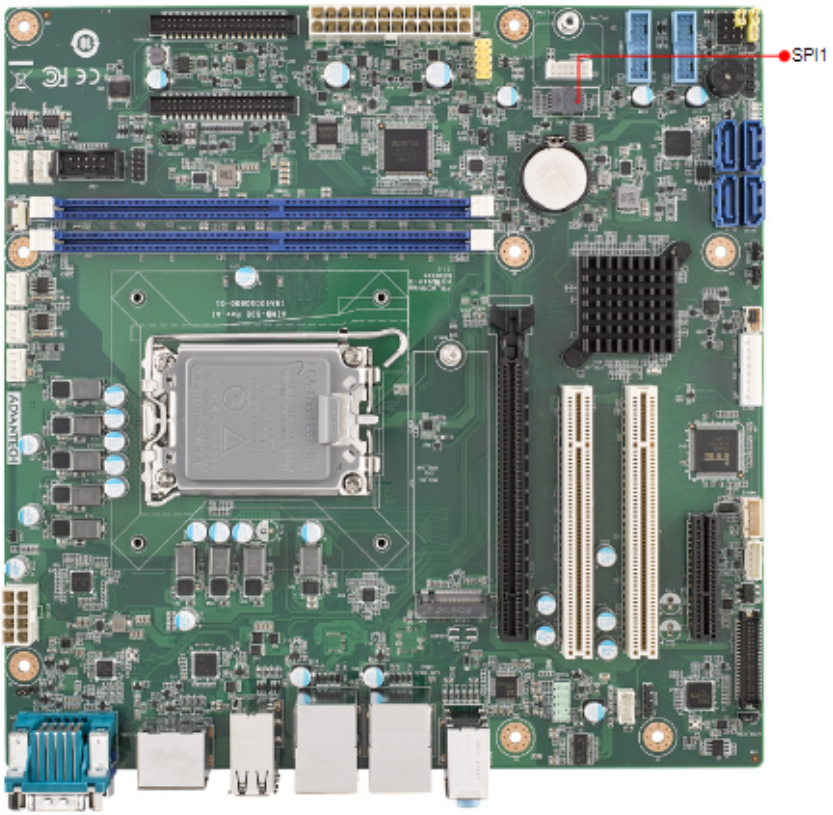
## 2.18 SPDIF Interface Connector (SPDIF1)



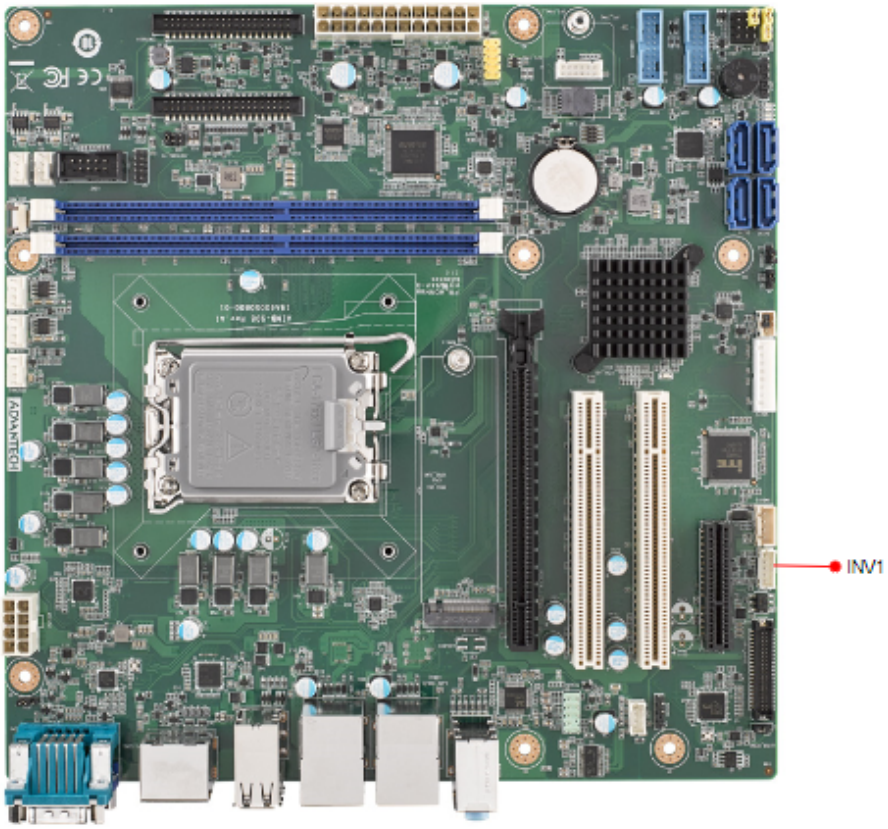
## 2.19 Battery Wafer Box (BAT1)



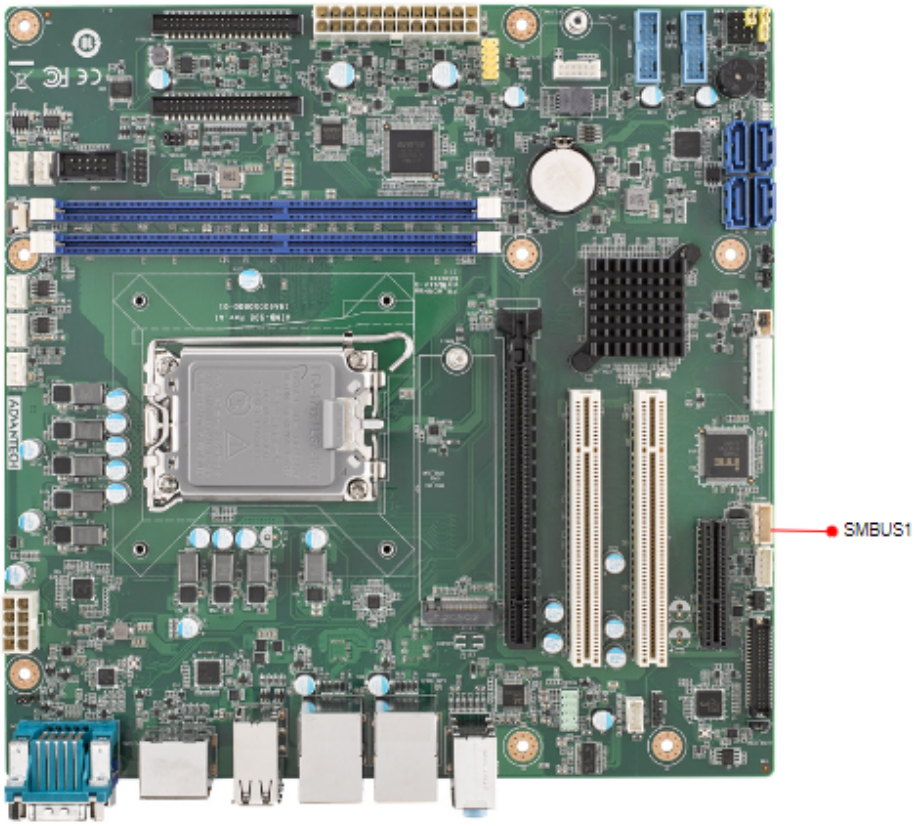
## 2.20 SPI BIOS Flash Socket (SPI1)



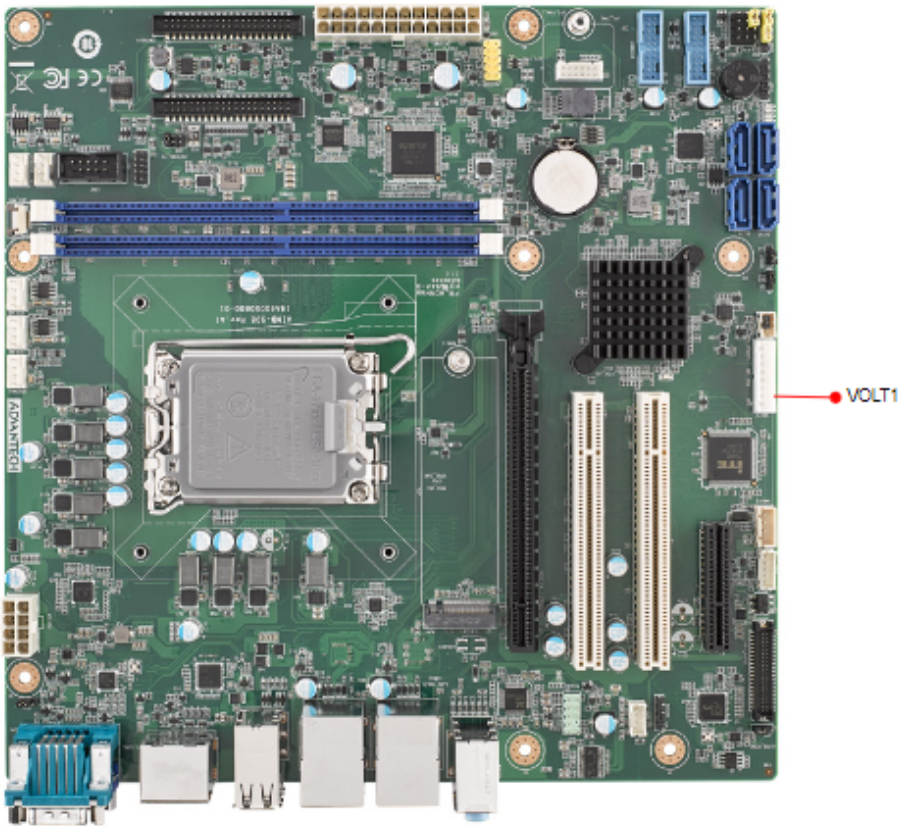
## 2.21 eDP Backlight Inverter Power Connector (INV1)



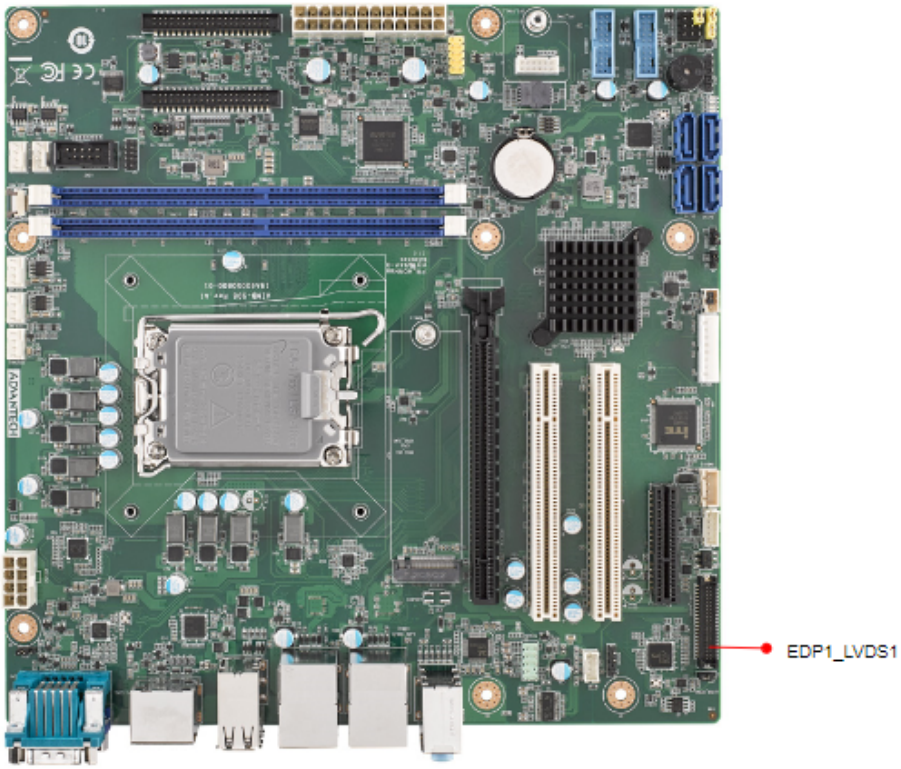
## 2.22 SMBUS Connector (SMBUS1)



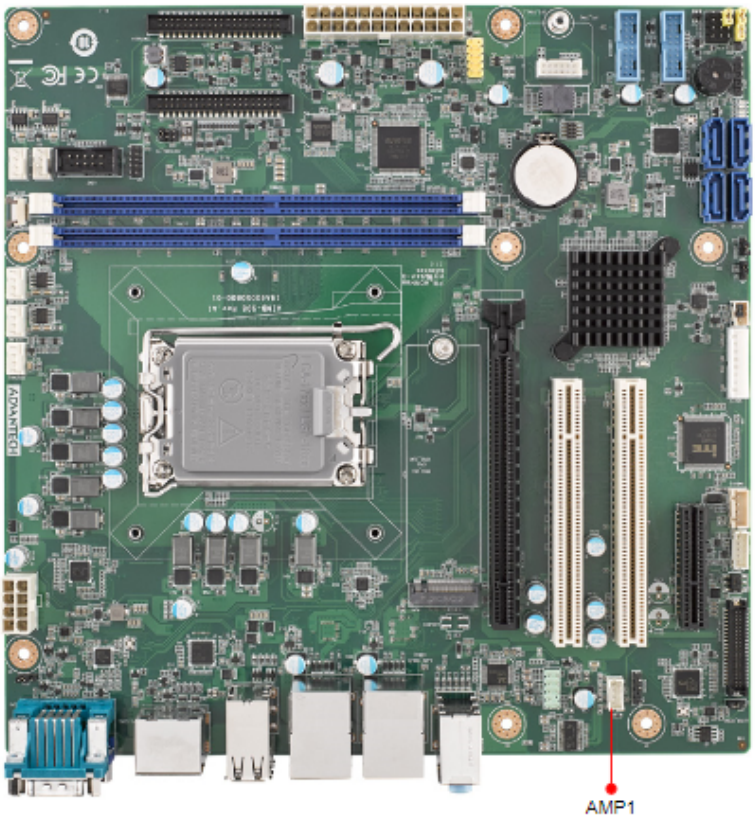
## 2.23 -V5/+V5/-V12/+V12/+V3.3/+V5_DUAL Power Supply Connector (VOLT1)



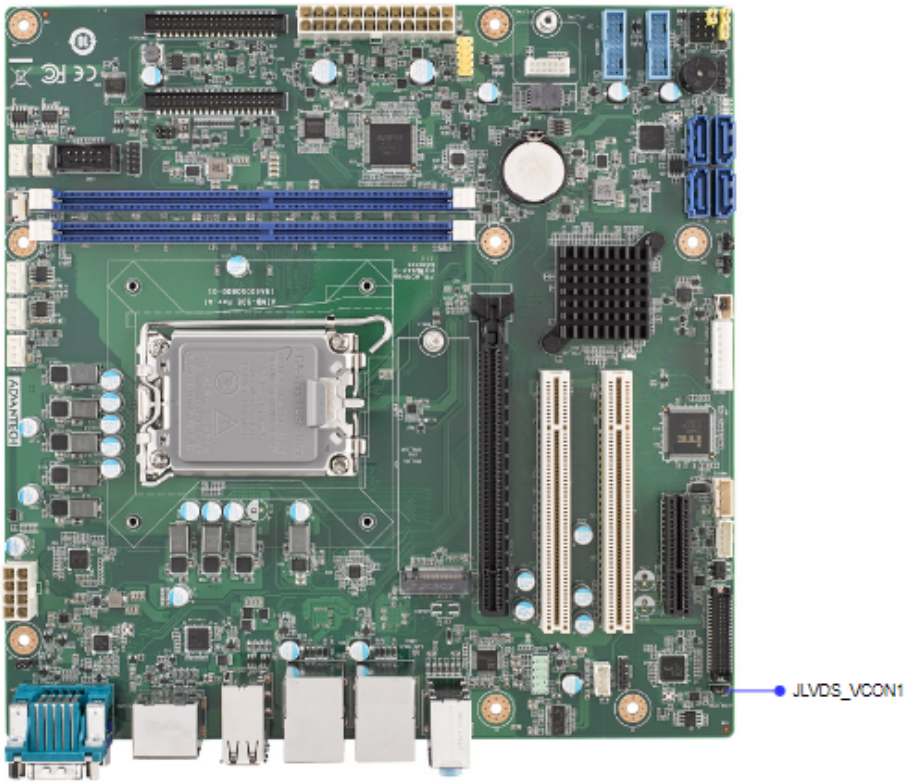
## 2.24 eDP Connector / LVDS Connector (EDP1_LVDS1)



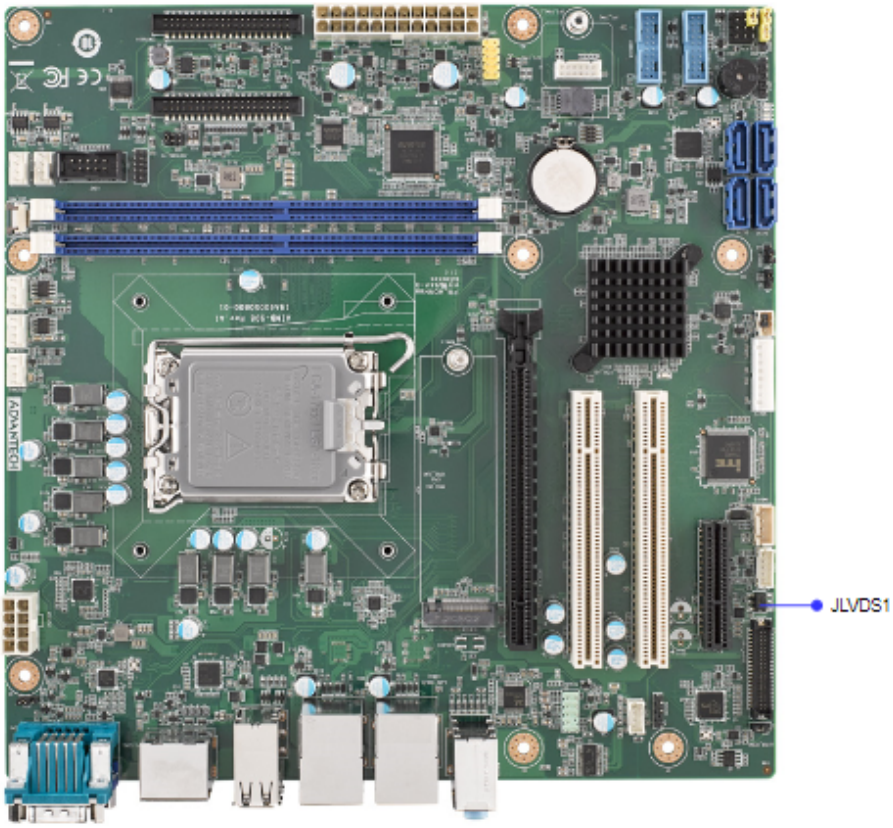
## 2.25 Audio Amplifier Output Pin Header (AMP1)



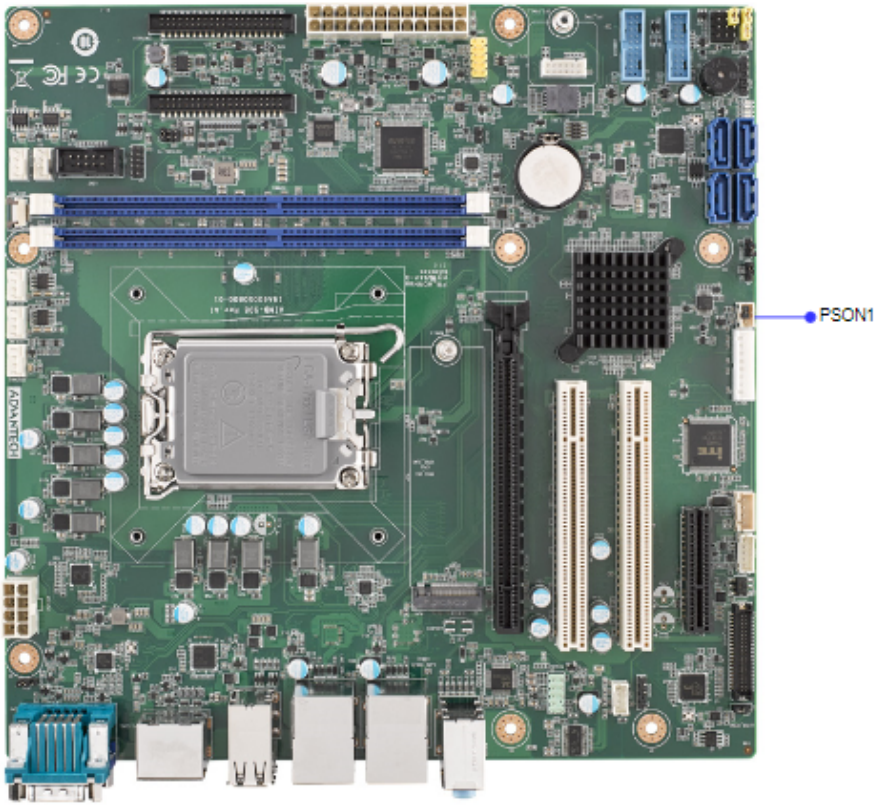
## 2.26 LVDS VESA, JEIDA Format Selection Pin Header (JLVDS_VCON1)



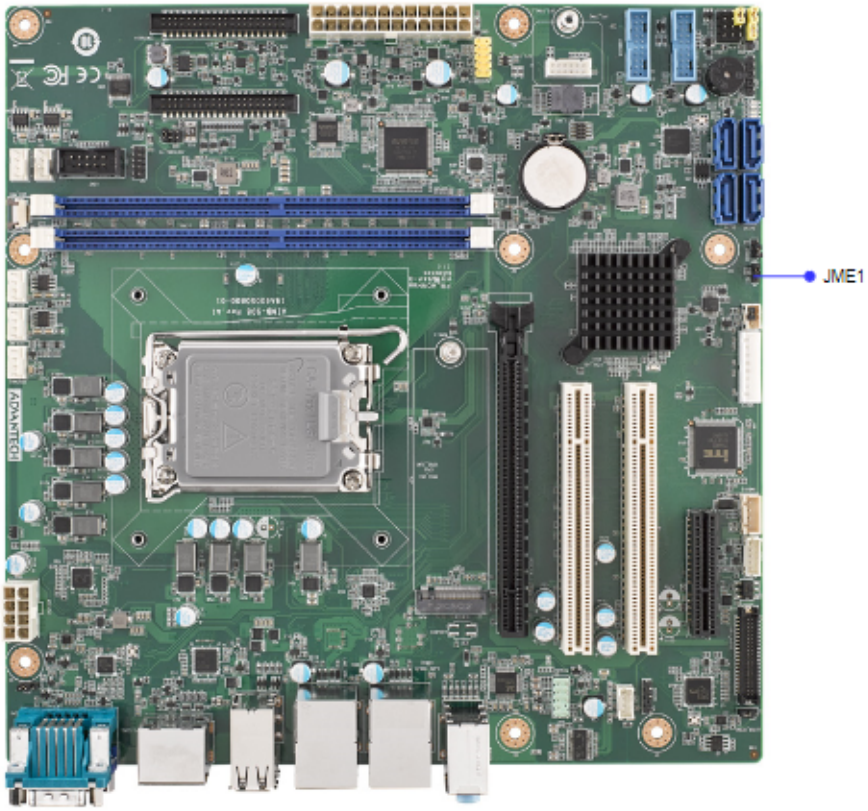
## 2.27 EDP Panel / LVDS Panel Voltage Selection (JLVDS1)



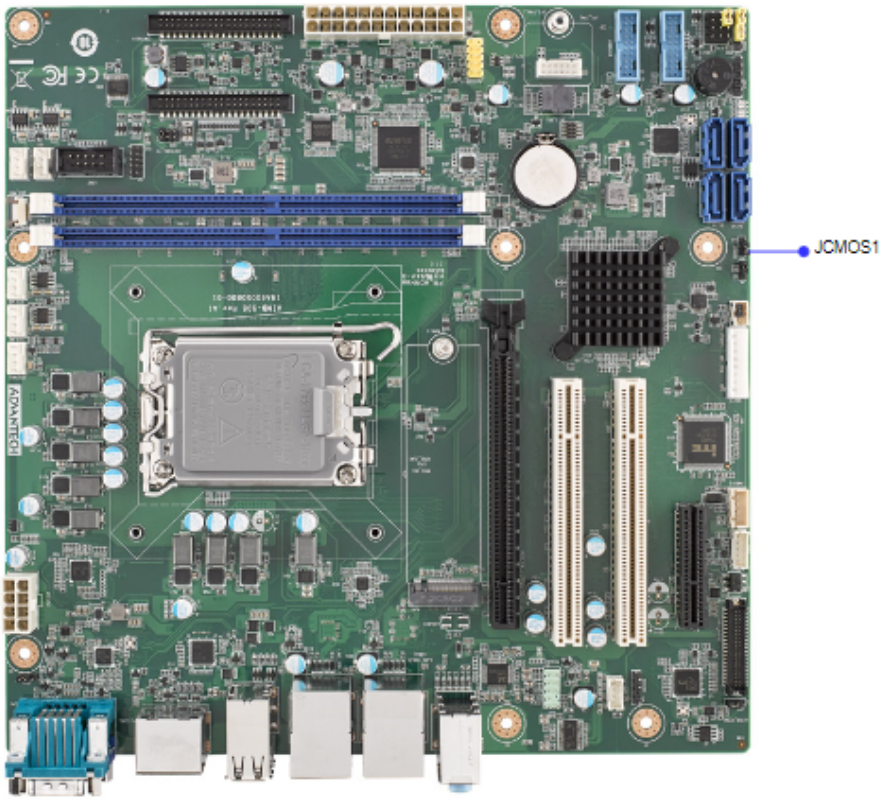
## 2.28 AT/ATX Mode Selection (PSON1)



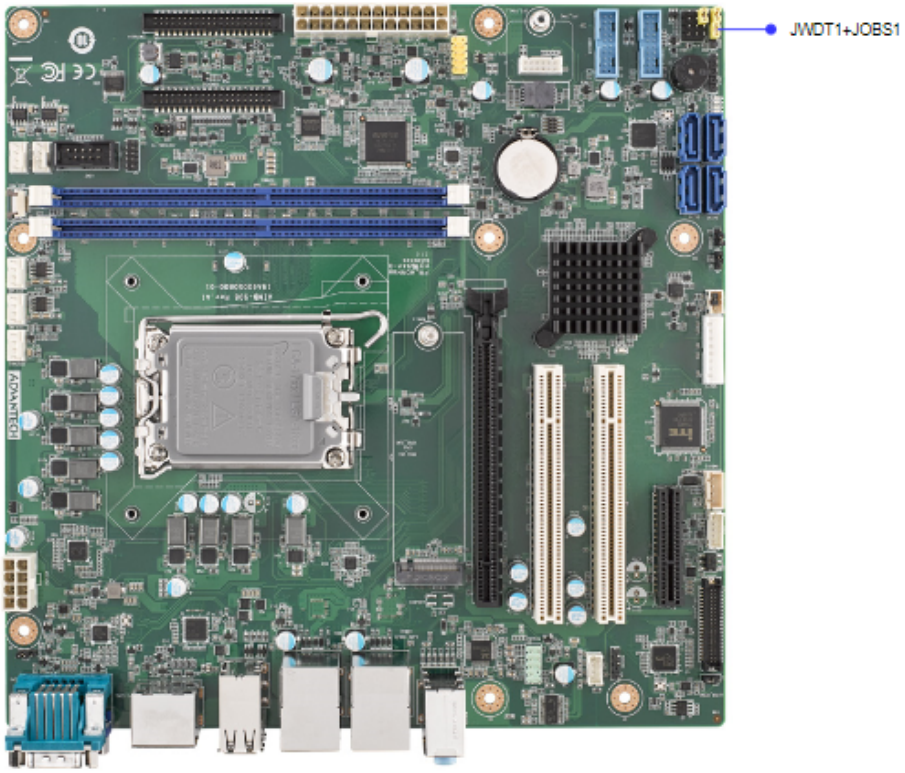
## 2.29 Intel® ME Header (JME1)



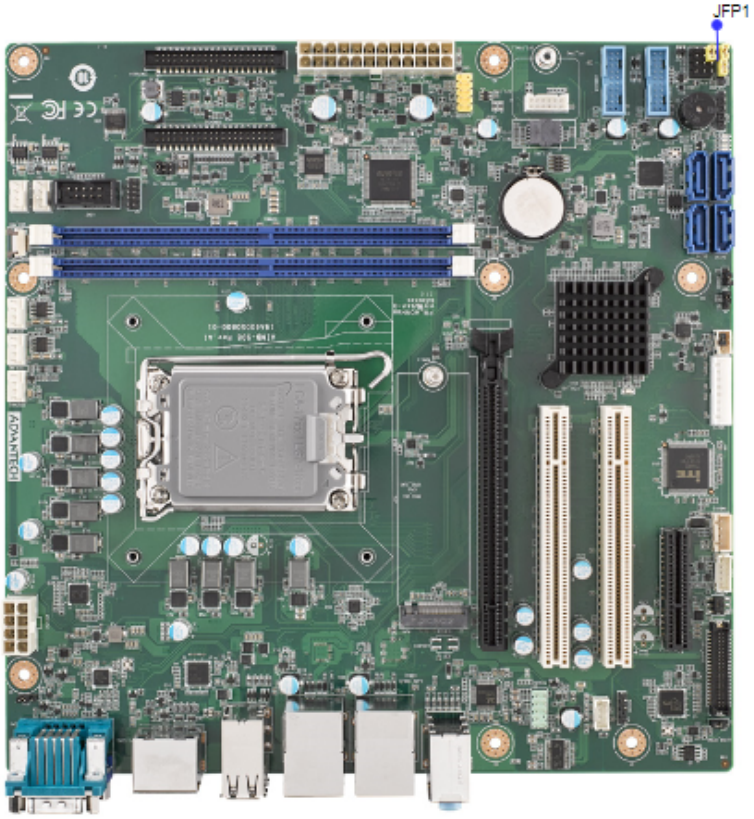
## 2.30 CMOS Clear Jumper (JCMOS1)



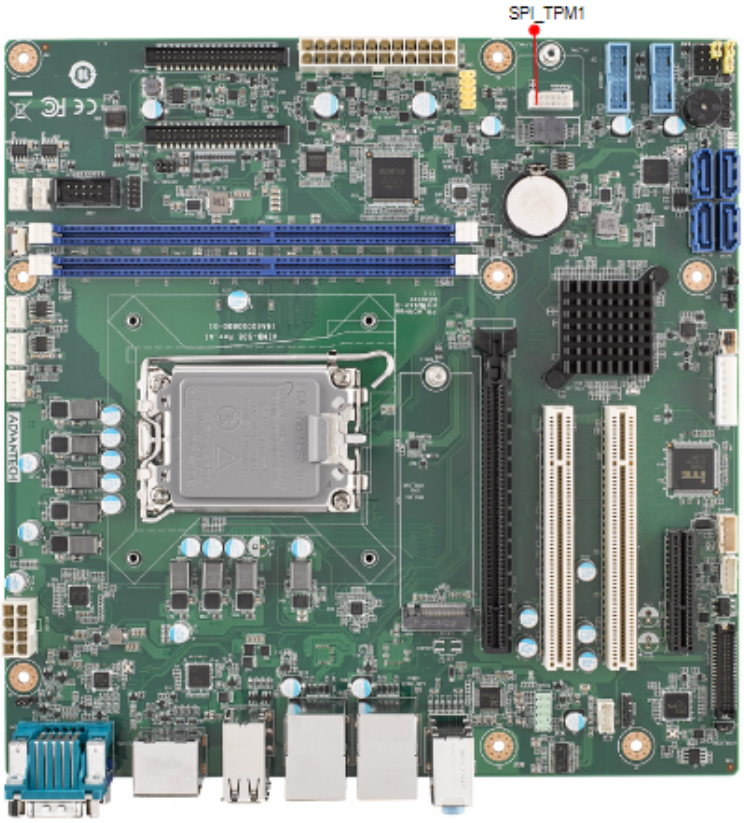
## 2.31 Watchdog Timer Output and OBS Beep (JWDT1+JOBS1)



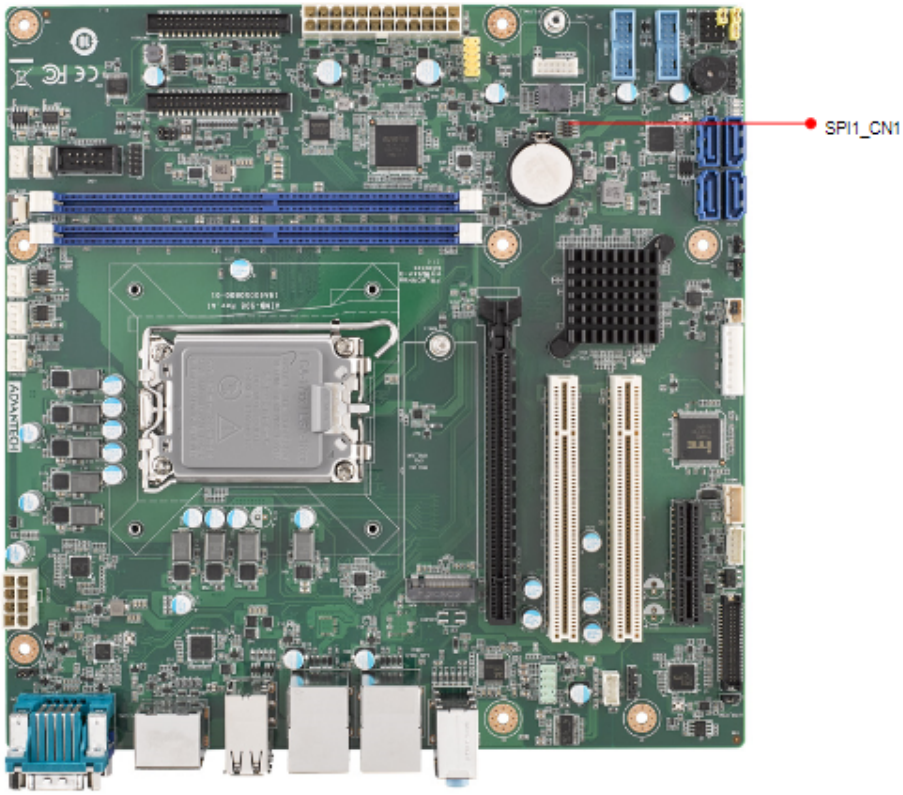
## 2.32 PWRBTN# / RESET# / HDD LED / Serial Bus from HW Monitor IC / Internal Buzzer / External Speaker Header (JFP1)



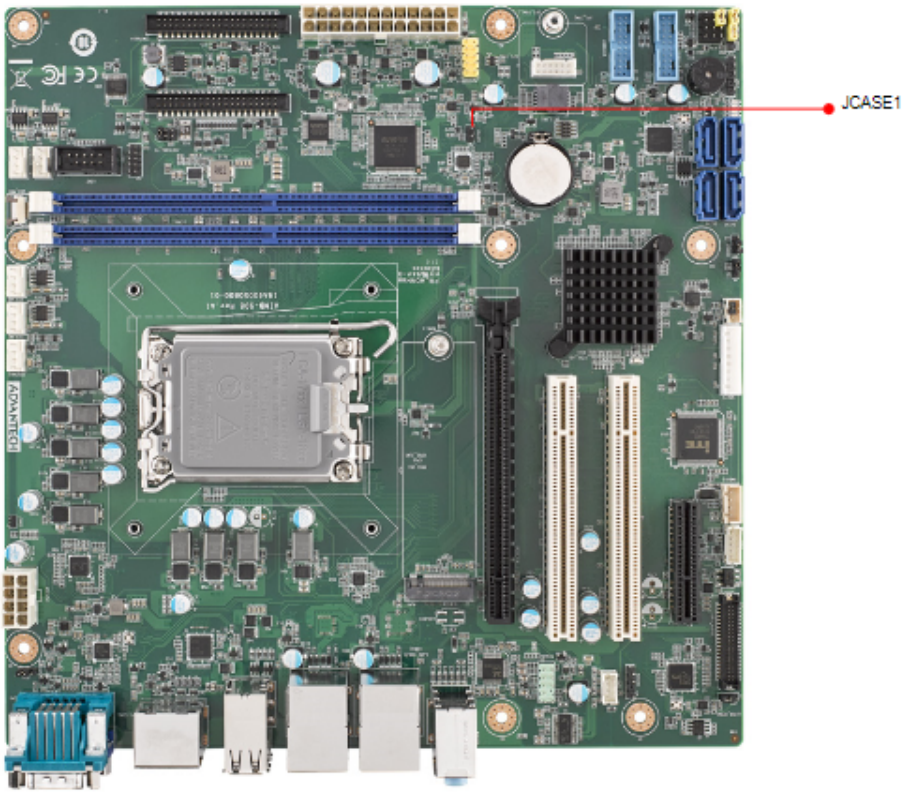
## 2.33 SPI TPM Module Connector (SPI_TPM1)



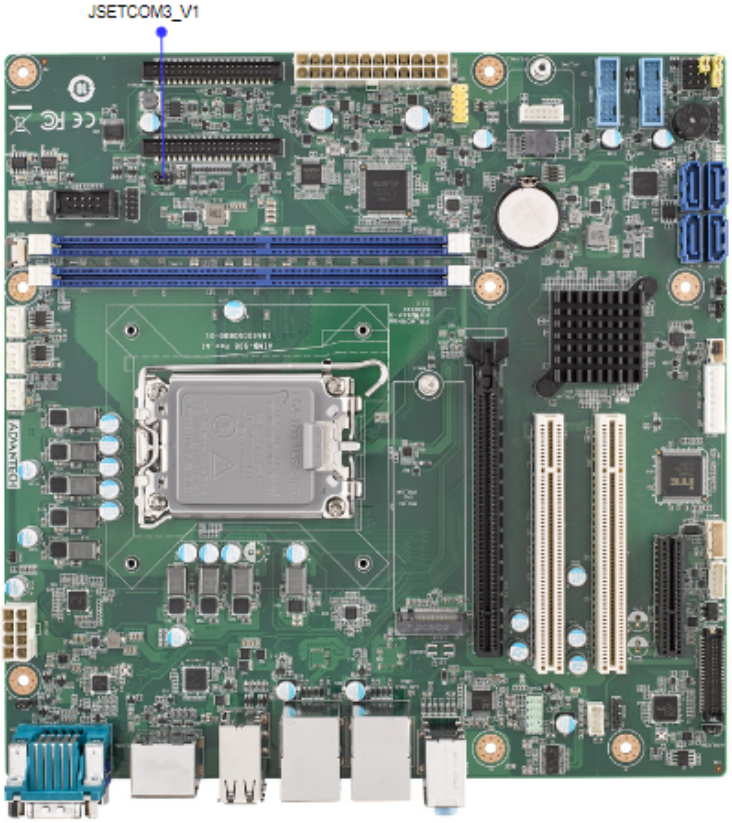
## 2.34 SPI Pin Header (SPI1_CN1)



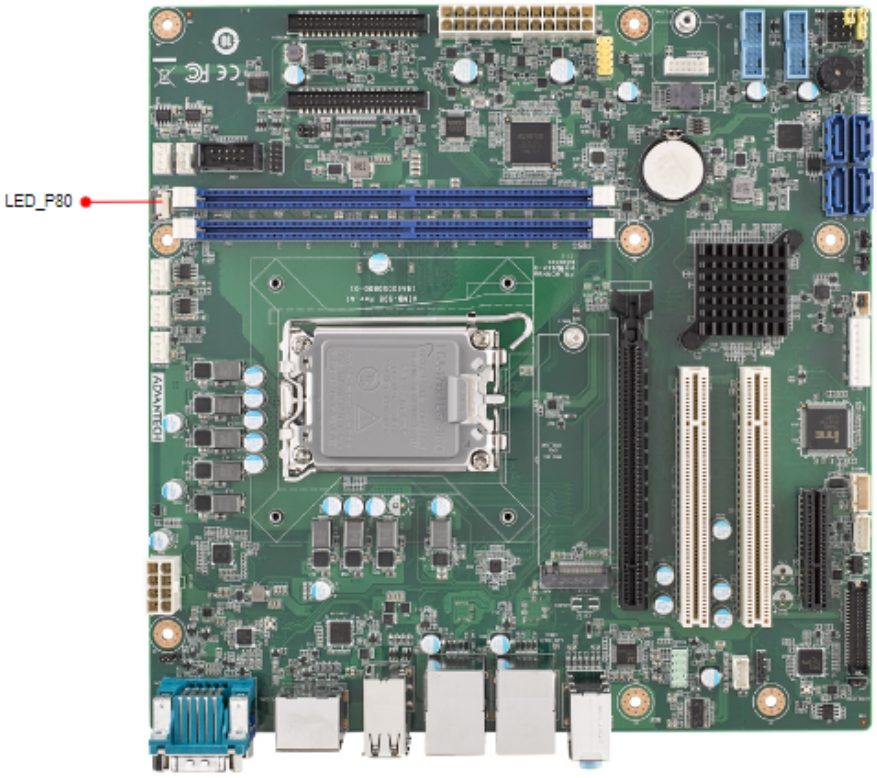
## 2.35 Case Open Connector (JCASE1)



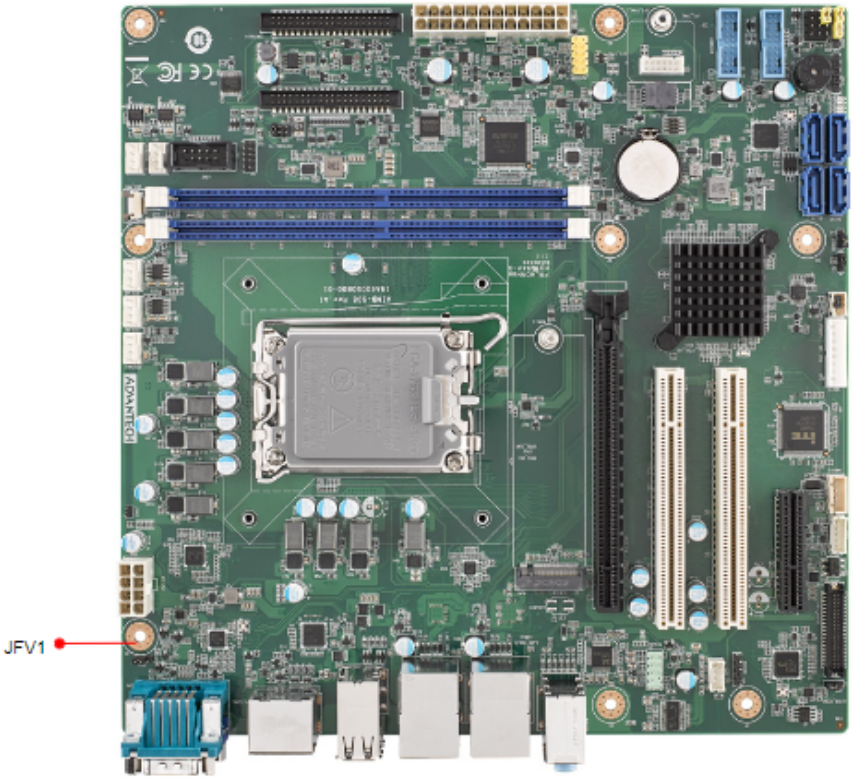
## 2.36 COM3 RI# Selection Pin Header (JSETCOM3_V1)



## 2.37 LED Port 80 Connector (LED_P80)



## 2.38 VGA1 Force on Pin Header (JFV1)



# Chapter 3

## BIOS Operation

## 3.1 Introduction

AMI BIOS has been integrated into many motherboards and has been very popular for over a decade. With the AMI BIOS Setup program, you can modify BIOS settings to control the special features of your computer. The Setup program uses a number of menus for making changes. This chapter describes the basic navigation of the AIMB-508 setup screens.

## 3.2 BIOS Setup

The AIMB-508 Series system has AMI BIOS built in, with a setup utility that allows users to configure required settings or to activate certain system features.

The setup saves the configuration in the flash memory of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the flash memory.

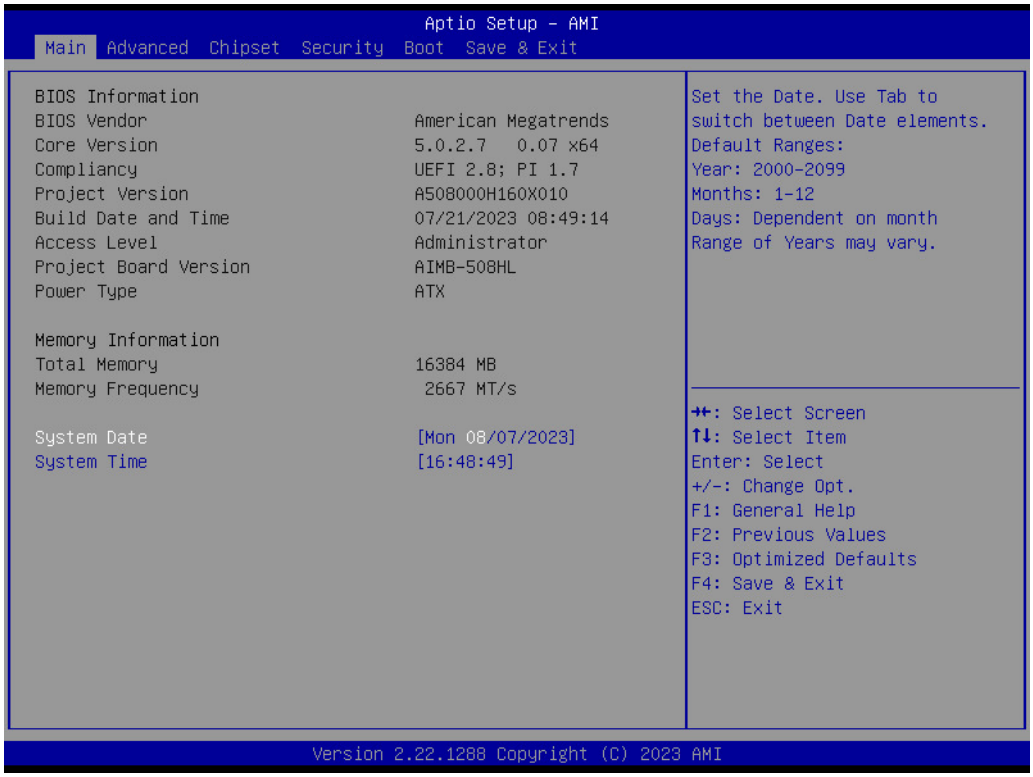
When the power is turned on, press the <Del> or <Esc> button during the BIOS POST (Power-On Self Test) to access the CMOS Setup screen.

**Table 3.1: Control Keys**

| | |
|---|---|
| < ← >< → > | Select Screen |
| < ↑ >< ↓ > | Select Item |
| <Enter> | Select |
| <+/-> | Change Opt |
| <F1> | General help |
| <F2> | Previous Values |
| <F3> | Optimized Defaults |
| <F4> | Save & Exit |
| <Esc> | Exit |

### 3.2.1 Main Menu

Press <Del> or <Esc> to enter AMI BIOS CMOS Setup Utility, the Main Menu will appear on the screen. Use arrow keys to select among the items and press <Enter> to accept or enter the sub-menu.



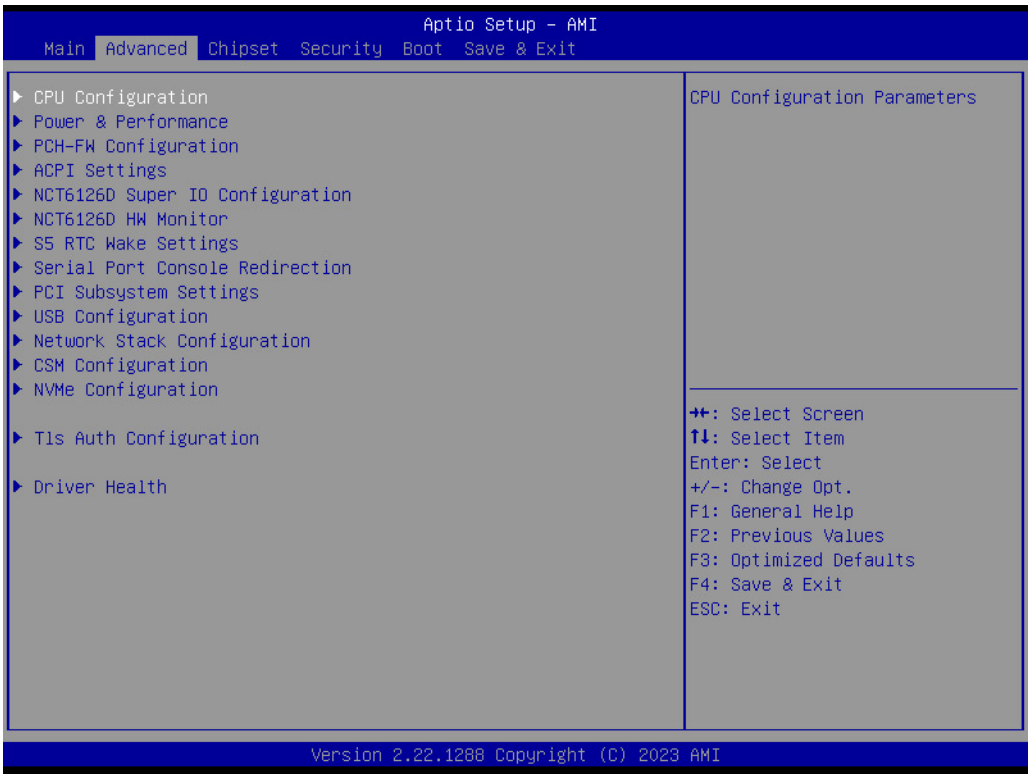

The Main BIOS setup screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured; options in blue can. The right frame displays the key legend.

Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

- **System Time / System Date**
  Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> or <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

## 3.2.2 Advanced BIOS Features

Select the Advanced tab from the AIMB-508 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration and go to the sub-menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub-menus are described on the following pages.



### 3.2.2.1 CPU Configuration

```
Aptio Setup - AMI
Advanced

CPU Configuration                                  Displays the E-core Information

▶ Efficient-core Information
▶ Performance-core Information

ID                                  0xB0671
Brand String                        13th Gen Intel(R)
                                    Core(TM) i7-13700E
Microcode Revision                  112
VMX                                 Supported
SMX/TXT                             Supported
TXT Crash Code                      0x00000000
TXT SPAD                            0x0000000000000000
Boot Guard Status                   0x00000000
Boot Guard ACM Policy Status        0x0000000000000000
Boot Guard SACM Information         0x0000001000000000

C6DRAM                              [Enabled]
CPU Flex Ratio Override             [Disabled]
CPU Flex Ratio Settings             18
Hardware Prefetcher                 [Enabled]
Adjacent Cache Line Prefetch        [Enabled]
Intel (VMX) Virtualization          [Enabled]
Technology
PECI                                [Enabled]

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

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```

■ **Performance-core Information**
Displays the P-core information.

```
Aptio Setup - AMI
Advanced

Performance-core Information

L1 Data Cache                       48 KB x 8
L1 Instruction Cache                32 KB x 8
L2 Cache                            2048 KB x 8
L3 Cache                            30 MB

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

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```
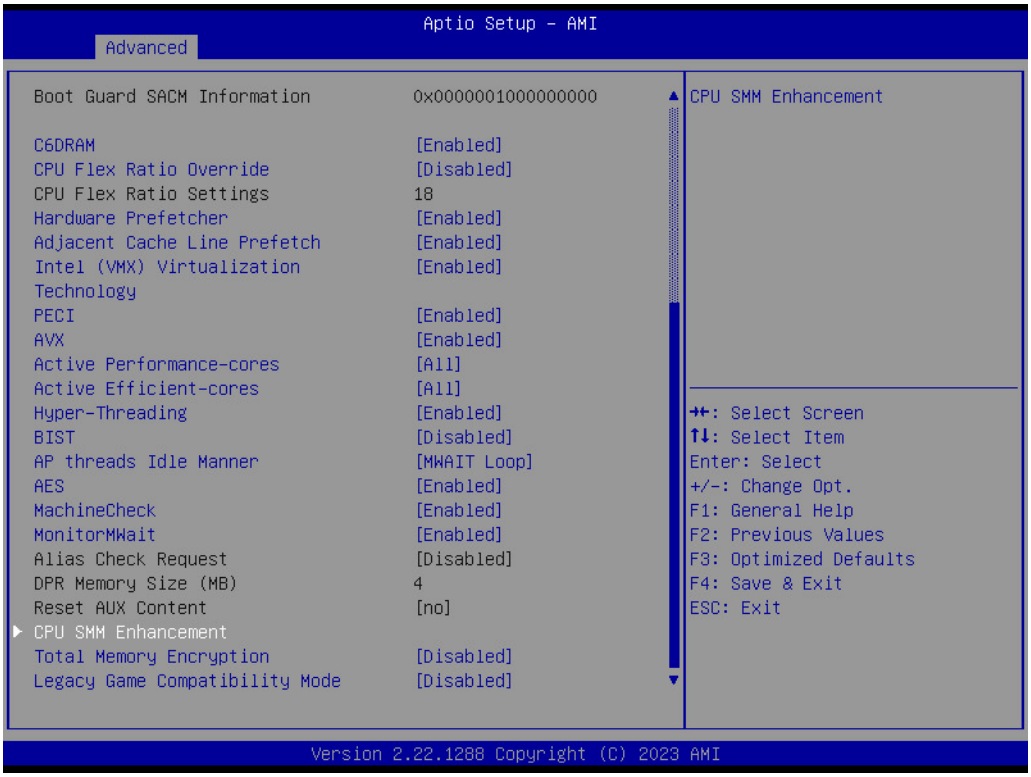
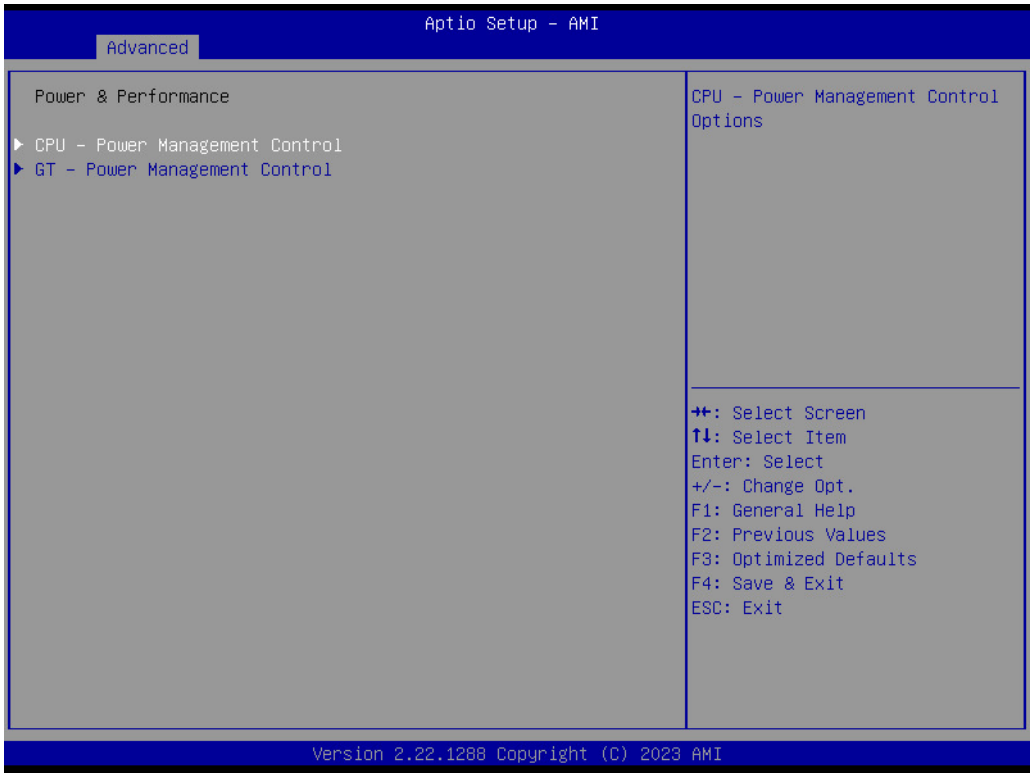

### 3.2.2.2 CPU SMM Enhancement



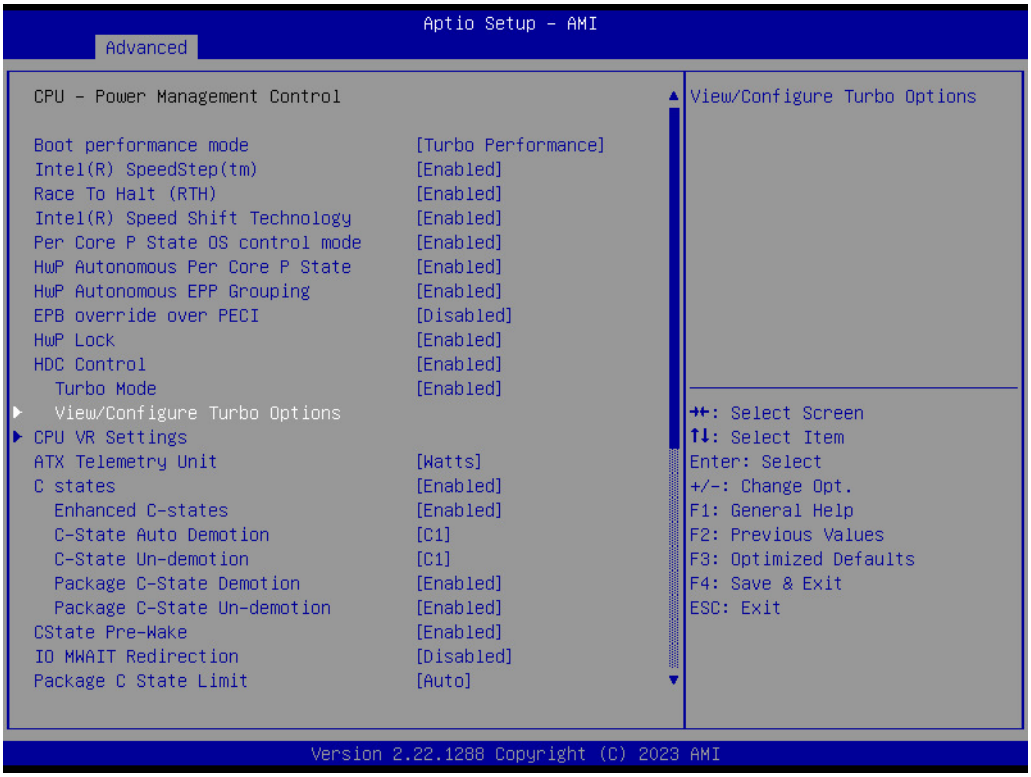

- **SMM Use Delay Indication [Enable]**
  Enable/disable usage of SMM_DELAYED MSR for MP sync in SMI.
- **SMM Use Block Indication [Enable]**
- **SMM Use SMM en-US Indication [Enable]**

### 3.2.2.3 Power & Performance

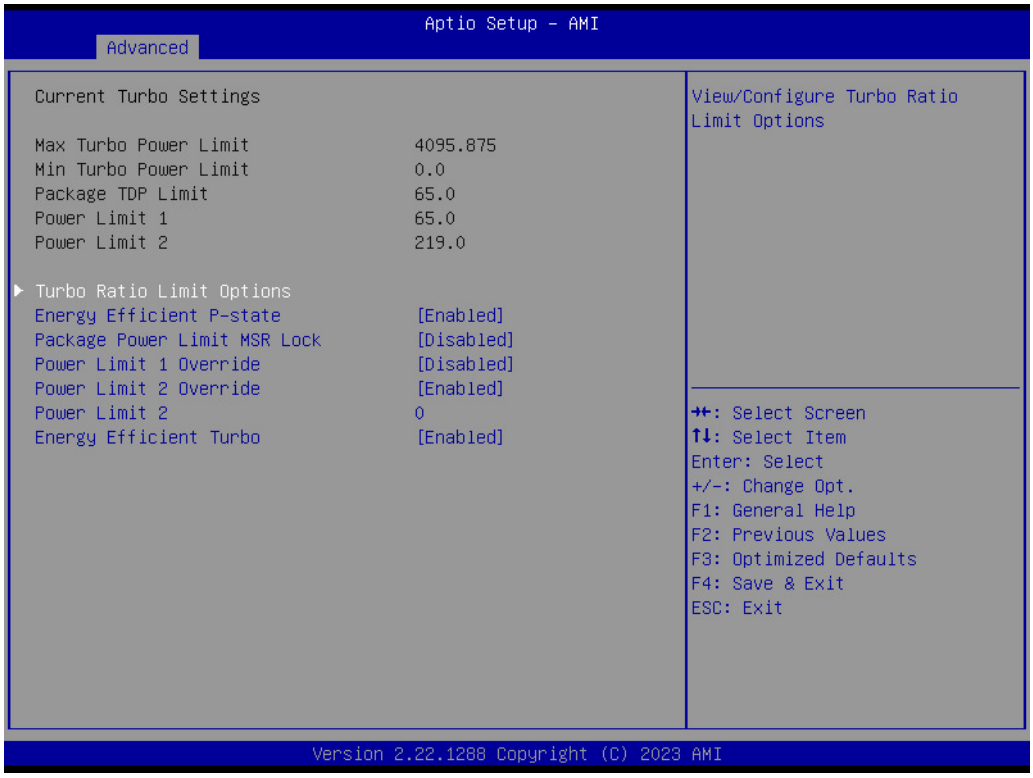



- **CPU – Power Management Control**
  CPU – Power Management Control Options.
- **GT – Power Management Control**

### 3.2.2.3.1 CPU – Power Management Control

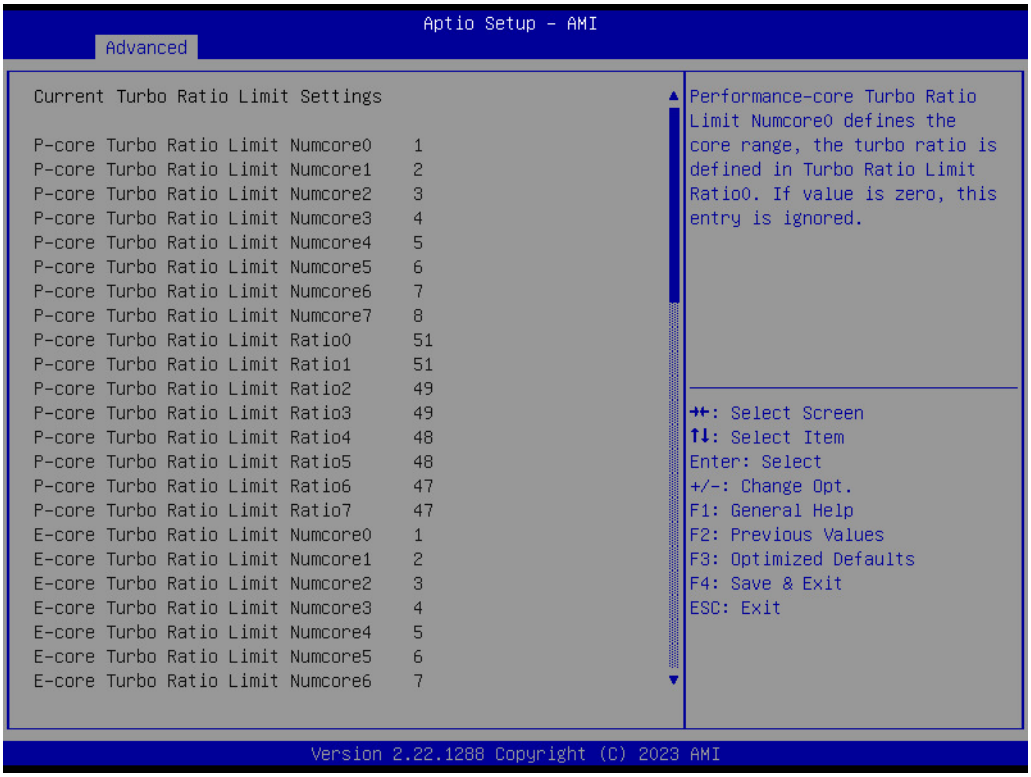


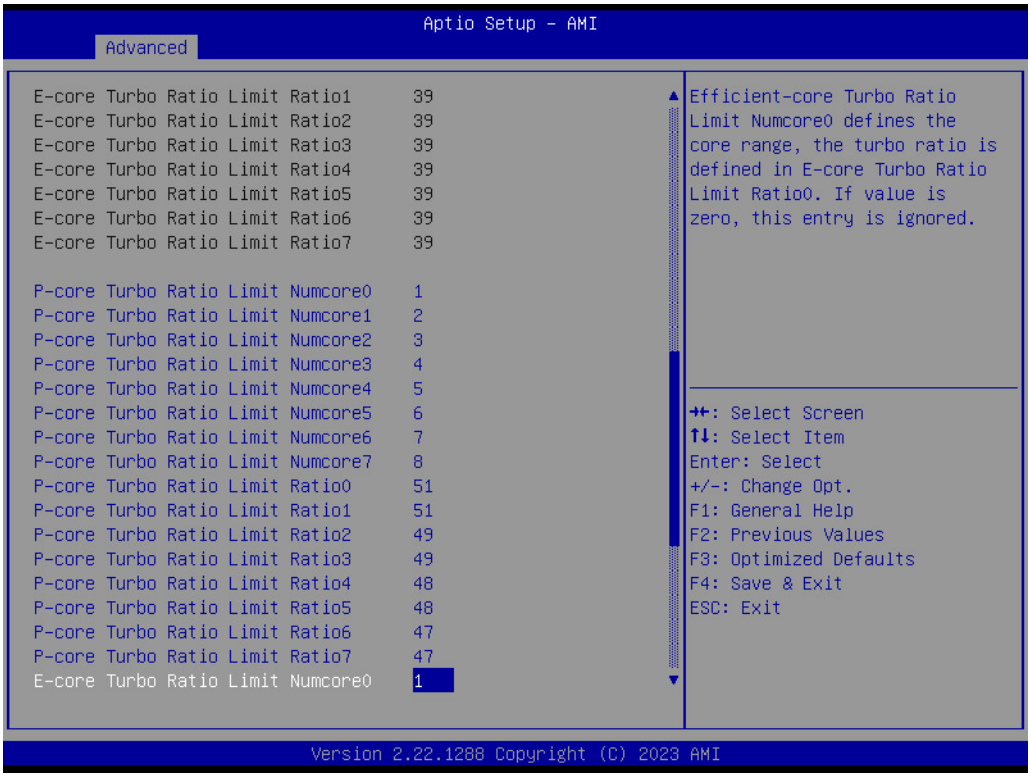

- **Boot performance mode [Turbo Performance]**
  Select the performance state that the BIOS will set starting from reset vector.



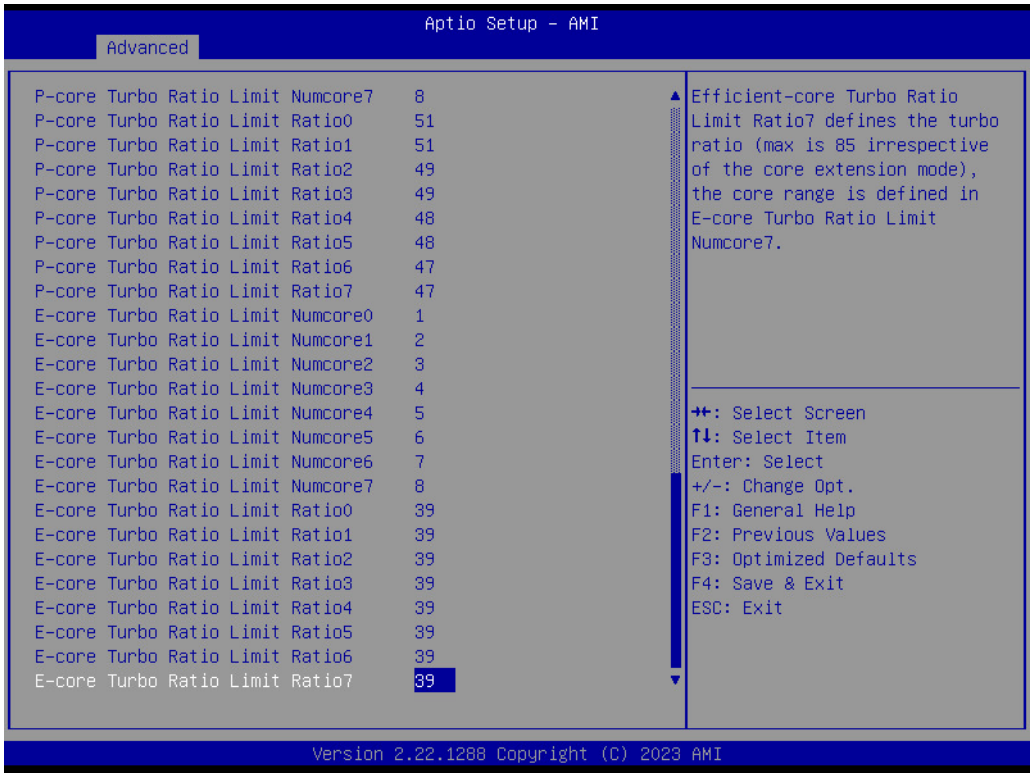

- **Turbo Ratio Limit Options**
  View/Configure Turbo Ratio Limit Options.
  - **Energy Efficient P-state [Enable]**
  - **Package Power Limit MSR Lock [Disabled]**
  - **Power Limit 1 Override [Disabled]**
  - **Power Limit 2 Override [Enabled]**
  - **Power Limit 2 0**
  - **Energy Efficient P-state [Enabled]**

## Current Turbo Ratio Limit Settings




– **E-core Turbo Ratio Limit Numcore0 1**
Efficient-core Turbo Ratio Limit Numcore0 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio0. If the value is zero, this entry is ignored.

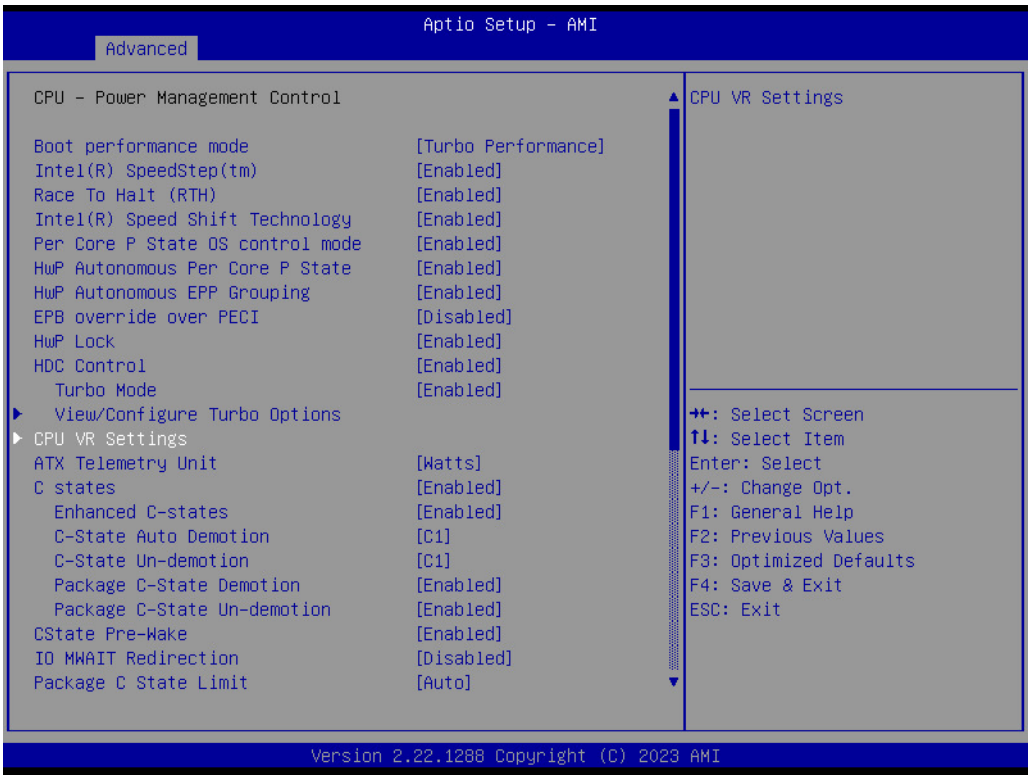



– **E-core Turbo Ratio Limit Ratio7 39**
  Efficient-core Turbo Ratio Limit Ratio7 defines the turbo ratio (max is 85 irrespective of the core extension mode). The core range is defined in E-core Turbo Ratio Limit Numcore7.

### 3.2.2.3.2 CPU VR Settings

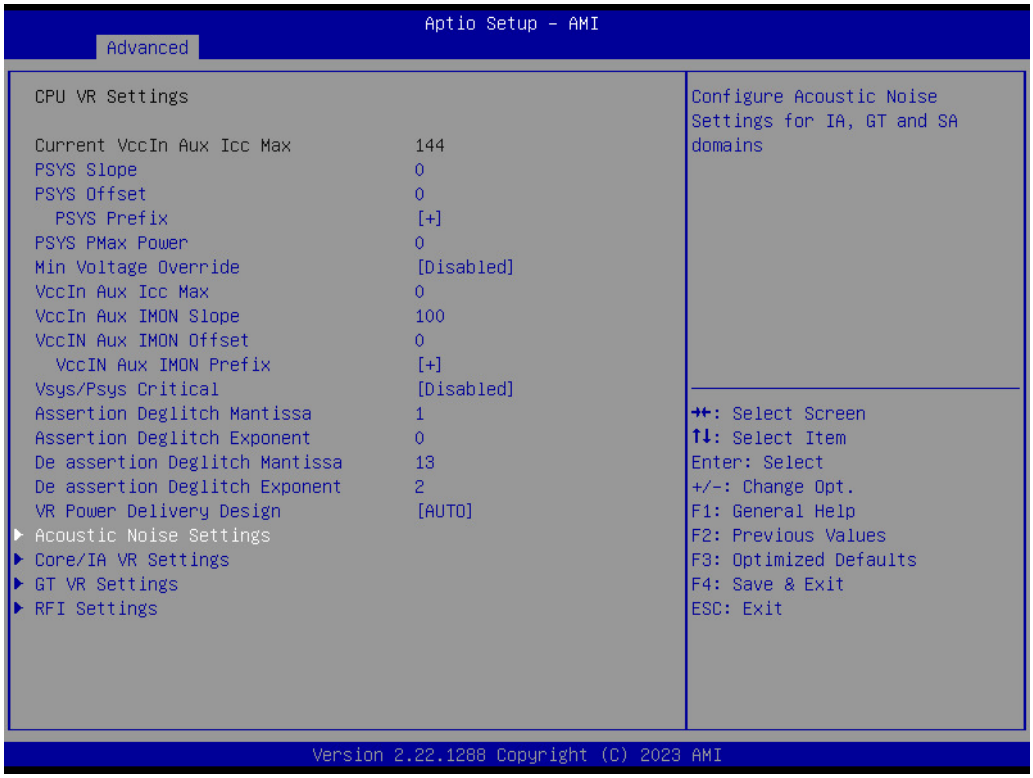
- **PSYS Slope**

  PSYS Slope defined in 1/100 increments. Range is 0-200.
  For a 1.25 slope, enter 125. 0=Auto. Users BIOS VR mailbox command 0x9.



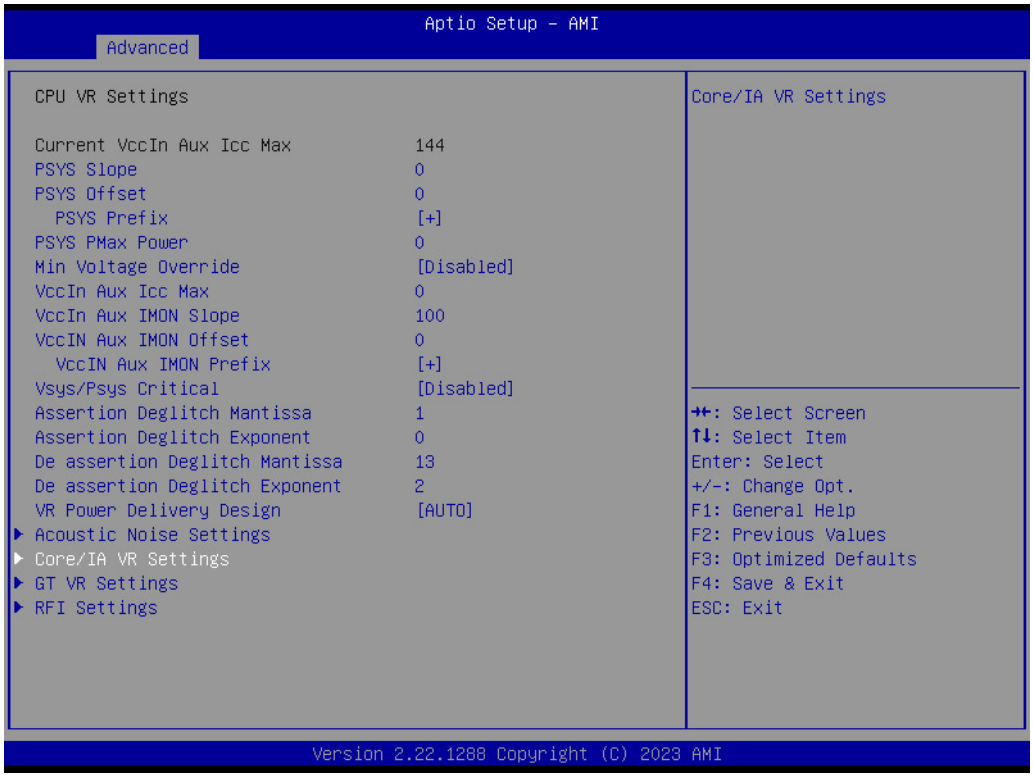
## Acoustic Noise Settings

Configure Acoustic Noise Settings for IA, GT, and SA domains.



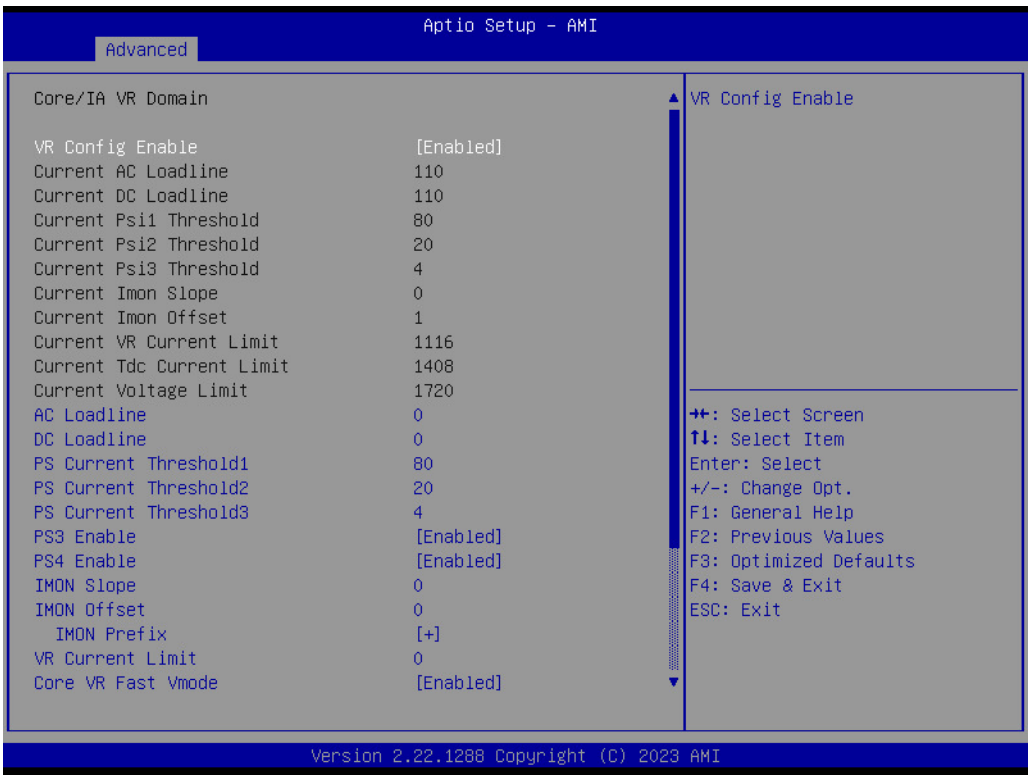

## Core/IA VR Domain

Core/IA VR Settings.



## Core/IA VR Domain

– **VR Config Enable [Enabled]**
VR Config Enable.




## IRMS [Disabled]

Enable/Disable IRMS – Current root mean square.

## GT VR Settings

GT VR Settings.

```
Aptio Setup - AMI
Advanced

CPU VR Settings                                   GT VR Settings

Current VccIn Aux Icc Max          144
PSYS Slope                         0
PSYS Offset                        0
  PSYS Prefix                      [+]
PSYS PMax Power                    0
Min Voltage Override               [Disabled]
VccIn Aux Icc Max                  0
VccIn Aux IMON Slope               100
VccIN Aux IMON Offset              0
  VccIN Aux IMON Prefix            [+]
Vsys/Psys Critical                 [Disabled]
Assertion Deglitch Mantissa        1                 →←: Select Screen
Assertion Deglitch Exponent        0                 ↑↓: Select Item
De assertion Deglitch Mantissa     13                Enter: Select
De assertion Deglitch Exponent     2                 +/-: Change Opt.
VR Power Delivery Design           [AUTO]            F1: General Help
▶ Acoustic Noise Settings                            F2: Previous Values
▶ Core/IA VR Settings                                F3: Optimized Defaults
▶ GT VR Settings                                     F4: Save & Exit
▶ RFI Settings                                       ESC: Exit

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```

## RFI Settings

RFI Settings.

```
Aptio Setup - AMI
Advanced

CPU VR Settings                                   RFI Settings

Current VccIn Aux Icc Max          144
PSYS Slope                         0
PSYS Offset                        0
  PSYS Prefix                      [+]
PSYS PMax Power                    0
Min Voltage Override               [Disabled]
VccIn Aux Icc Max                  0
VccIn Aux IMON Slope               100
VccIN Aux IMON Offset              0
  VccIN Aux IMON Prefix            [+]
Vsys/Psys Critical                 [Disabled]
Assertion Deglitch Mantissa        1                 →←: Select Screen
Assertion Deglitch Exponent        0                 ↑↓: Select Item
De assertion Deglitch Mantissa     13                Enter: Select
De assertion Deglitch Exponent     2                 +/-: Change Opt.
VR Power Delivery Design           [AUTO]            F1: General Help
▶ Acoustic Noise Settings                            F2: Previous Values
▶ Core/IA VR Settings                                F3: Optimized Defaults
▶ GT VR Settings                                     F4: Save & Exit
▶ RFI Settings                                       ESC: Exit

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```
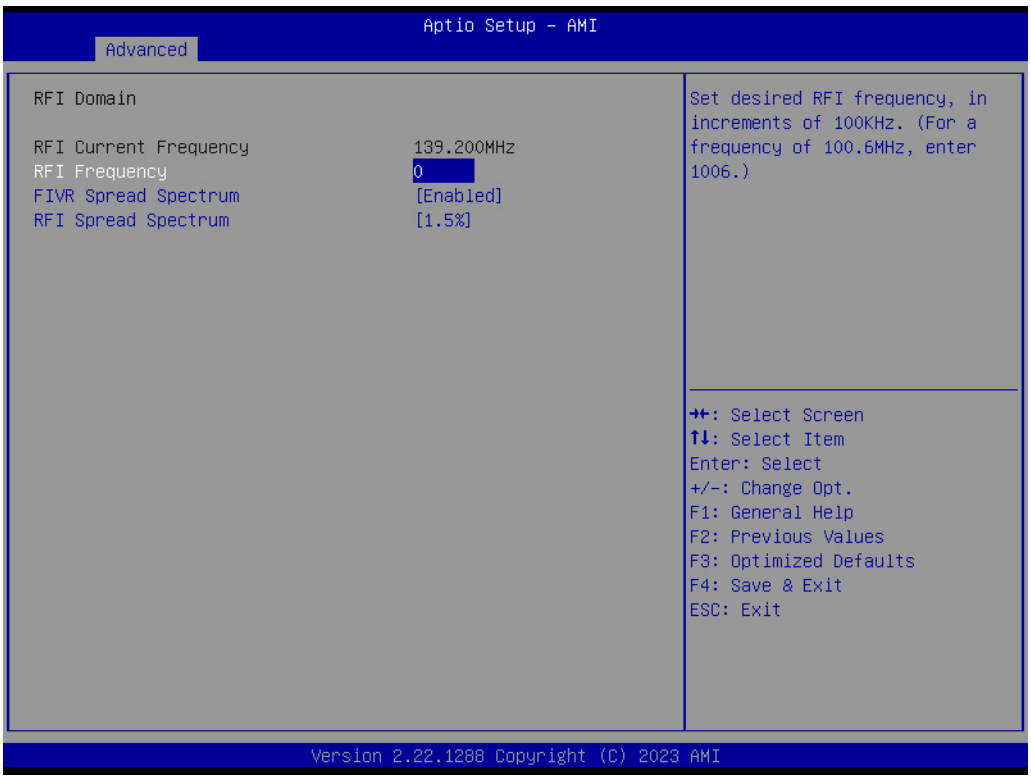
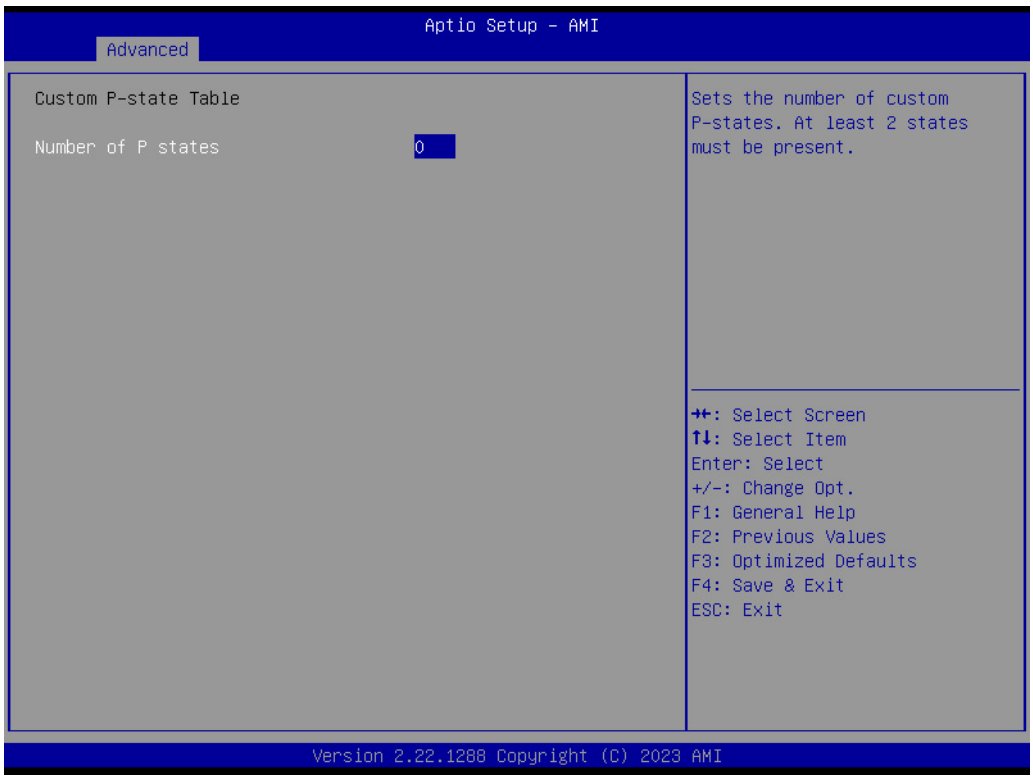

- **RFI Domain**
  - **RFI Current Frequency 139.200MHz**
  - **RFI Current Frequency 0**
    Set the desired RFI frequency, in increments of 100KHz. (For a frequency of 100.6MHz, enter 1006.)
  - **FIVR Spread Spectrum [Enabled]**
  - **RFI Spread Spectrum [1.5%]**



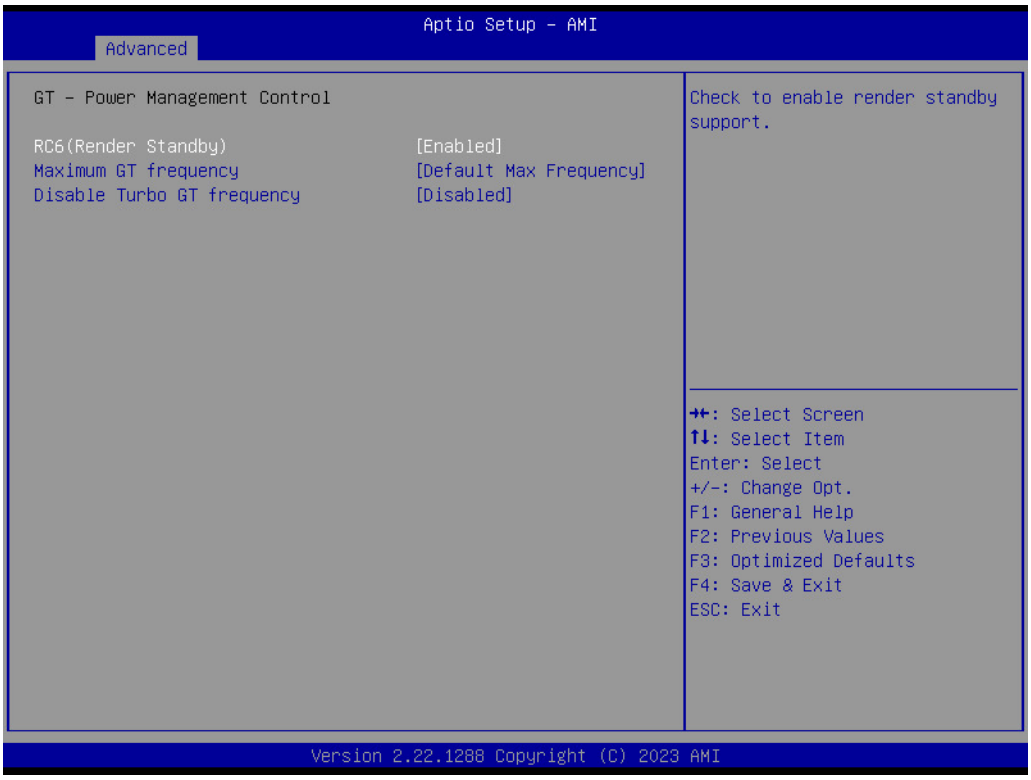
#### 3.2.2.3.3 Custom P-state Table

- **Number of P states 0**
  Sets the number of custom P-states. At least 2 states must be present.



#### 3.2.2.3.4 GT – Power Management Control

- **RC6(Render Standby) [Enabled]**
  Check to enable render standby support.
- **Maximum GT frequency [Default Max Frequency]**
- **Disable Turbo GT frequency [Disabled]**



### 3.2.2.4 PCH-FW Configuration

Configure Management Engine Technology Parameters.

```
                          Aptio Setup - AMI
 Advanced

 ME Firmware Version                  16.1.25.2101      Configure Management Engine
 ME Firmware Mode                     Normal Mode       Technology Parameters
 ME Firmware SKU                      Consumer SKU
 ME Firmware Status 1                 0x90000255
 ME Firmware Status 2                 0x3B850106
 ME Firmware Status 3                 0x00000020
 ME Firmware Status 4                 0x00004000
 ME Firmware Status 5                 0x00000000
 ME Firmware Status 6                 0x00400002

 ME State                             [Enabled]
 ME Unconfig on RTC Clear             [Enabled]
 Comms Hub Support                    [Disabled]
 JHI Support                          [Disabled]        →←: Select Screen
 Core Bios Done Message               [Enabled]         ↑↓: Select Item
 CSE Data Resilience Support          [Enabled]         Enter: Select
                                                        +/-: Change Opt.
▶ Firmware Update Configuration                         F1: General Help
▶ PTT Configuration                                     F2: Previous Values
▶ FIPS Configuration                                    F3: Optimized Defaults
▶ ME Debug Configuration                                F4: Save & Exit
▶ Anti-Rollback SVN Configuration                       ESC: Exit
▶ OEM Key Revocation Configuration
 Extend CSME Measurement to TPM-PCR   [Disabled]

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```
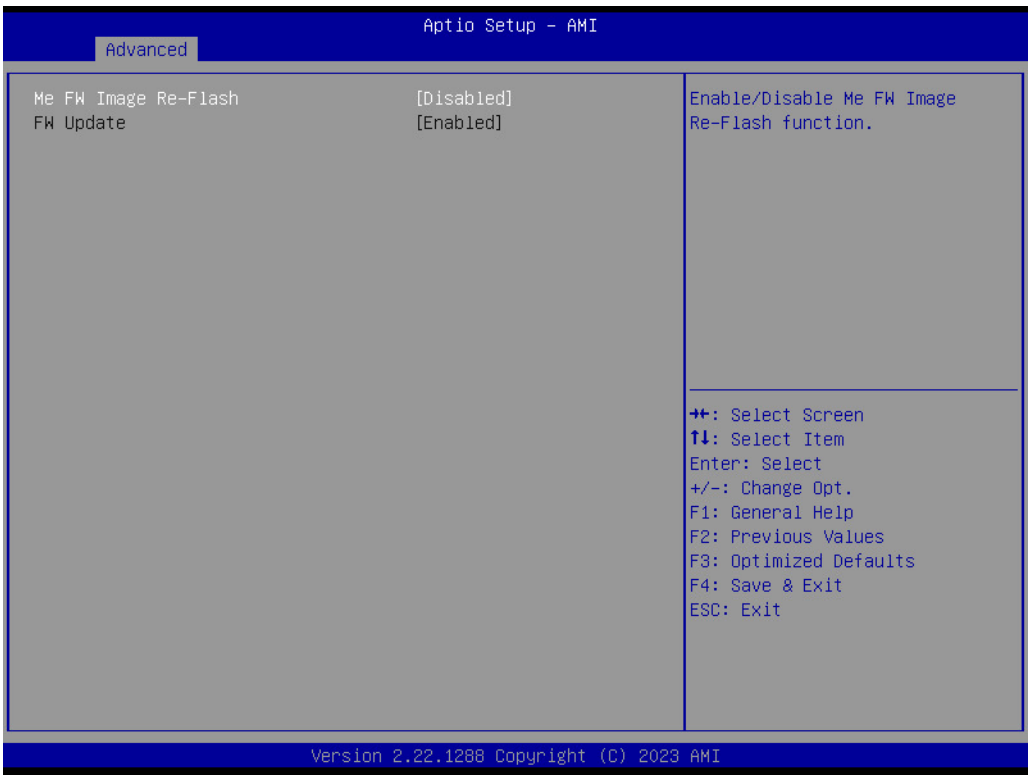
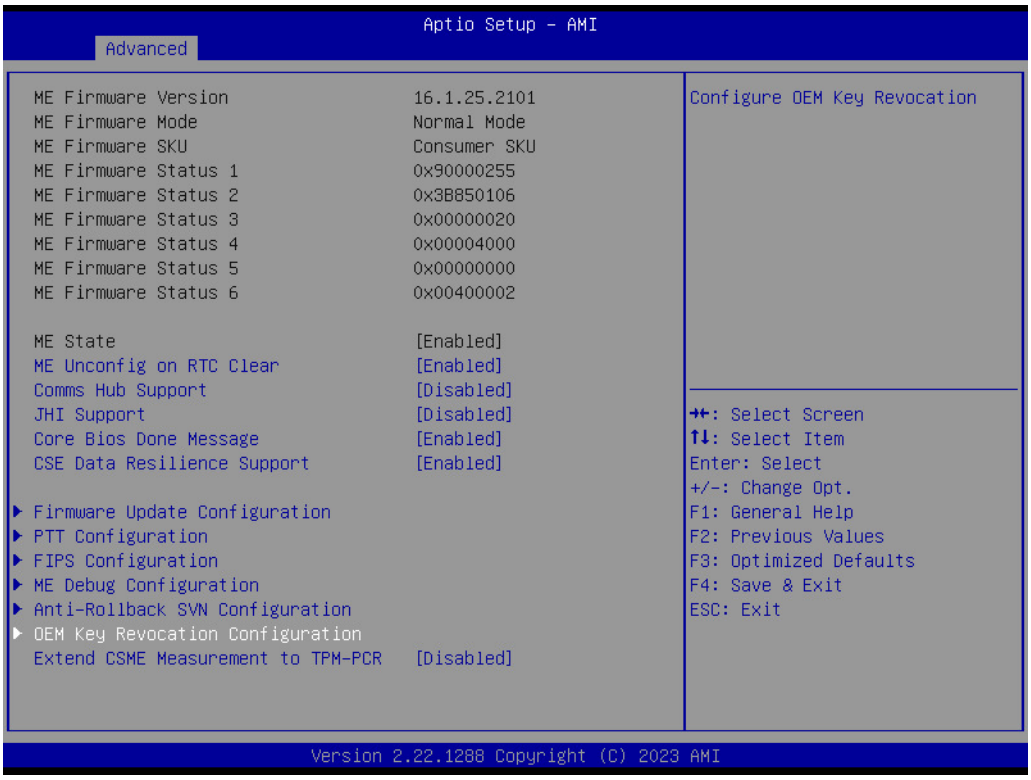

- **ME FW Image Re-Flash [Disabled]**
  Enable/Disable ME FW Image Re-Flash function.
- **FW Update [Enabled]**




- **OEM Key Revocation Configuration**
  Configure OEM.



■ **Anti-Rollback SVN Configuration**
Configure Anti-Rollback SVN.

```
                                Aptio Setup - AMI
        Advanced

  ME Firmware Version                  16.1.25.2101        Configure Anti-Rollback SVN
  ME Firmware Mode                     Normal Mode
  ME Firmware SKU                      Consumer SKU
  ME Firmware Status 1                 0x90000255
  ME Firmware Status 2                 0x3B850106
  ME Firmware Status 3                 0x00000020
  ME Firmware Status 4                 0x00004000
  ME Firmware Status 5                 0x00000000
  ME Firmware Status 6                 0x00400002

  ME State                             [Enabled]
  ME Unconfig on RTC Clear             [Enabled]
  Comms Hub Support                    [Disabled]
  JHI Support                          [Disabled]          →←: Select Screen
  Core Bios Done Message               [Enabled]           ↑↓: Select Item
  CSE Data Resilience Support          [Enabled]           Enter: Select
                                                           +/-: Change Opt.
▶ Firmware Update Configuration                            F1: General Help
▶ PTT Configuration                                        F2: Previous Values
▶ FIPS Configuration                                       F3: Optimized Defaults
▶ ME Debug Configuration                                   F4: Save & Exit
▶ Anti-Rollback SVN Configuration                          ESC: Exit
▶ OEM Key Revocation Configuration
  Extend CSME Measurement to TPM-PCR   [Disabled]

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```

### 3.2.2.5 ACPI Settings

System ACPI Parameters.

```
                                Aptio Setup - AMI
   Main  Advanced  Chipset  Security  Boot  Save & Exit

▶ CPU Configuration                                        System ACPI Parameters.
▶ Power & Performance
▶ PCH-FW Configuration
▶ ACPI Settings
▶ NCT6126D Super IO Configuration
▶ NCT6126D HW Monitor
▶ S5 RTC Wake Settings
▶ Serial Port Console Redirection
▶ PCI Subsystem Settings
▶ USB Configuration
▶ Network Stack Configuration
▶ CSM Configuration
▶ NVMe Configuration
                                                           →←: Select Screen
▶ Tls Auth Configuration                                   ↑↓: Select Item
                                                           Enter: Select
▶ Driver Health                                            +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit

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```
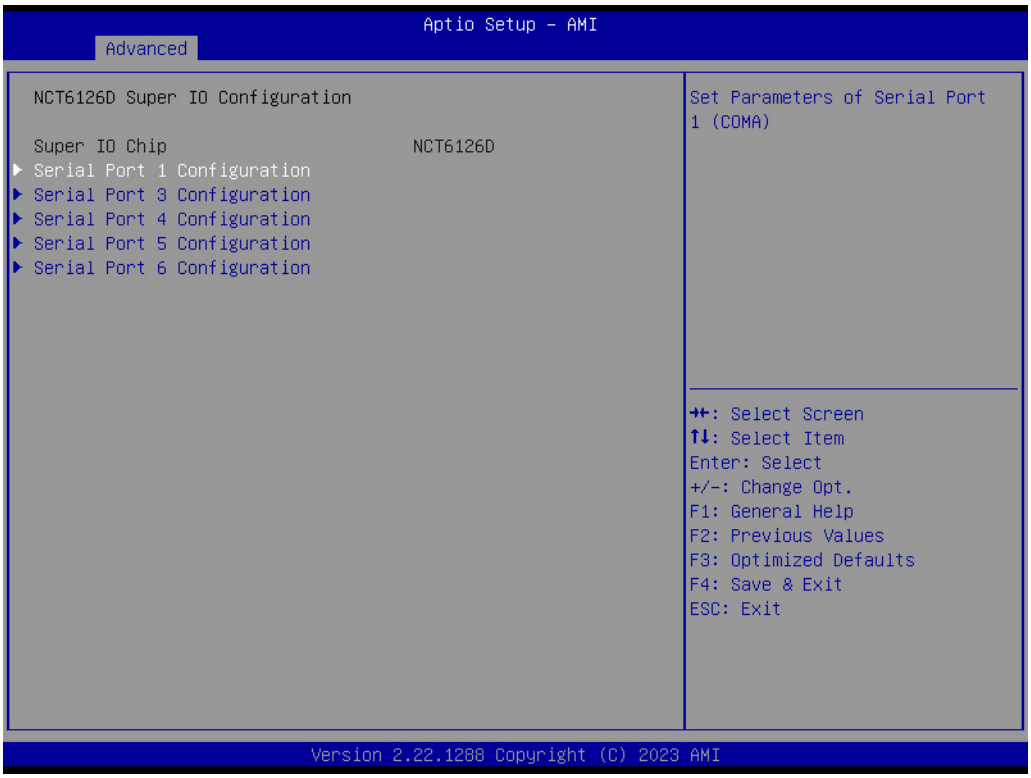
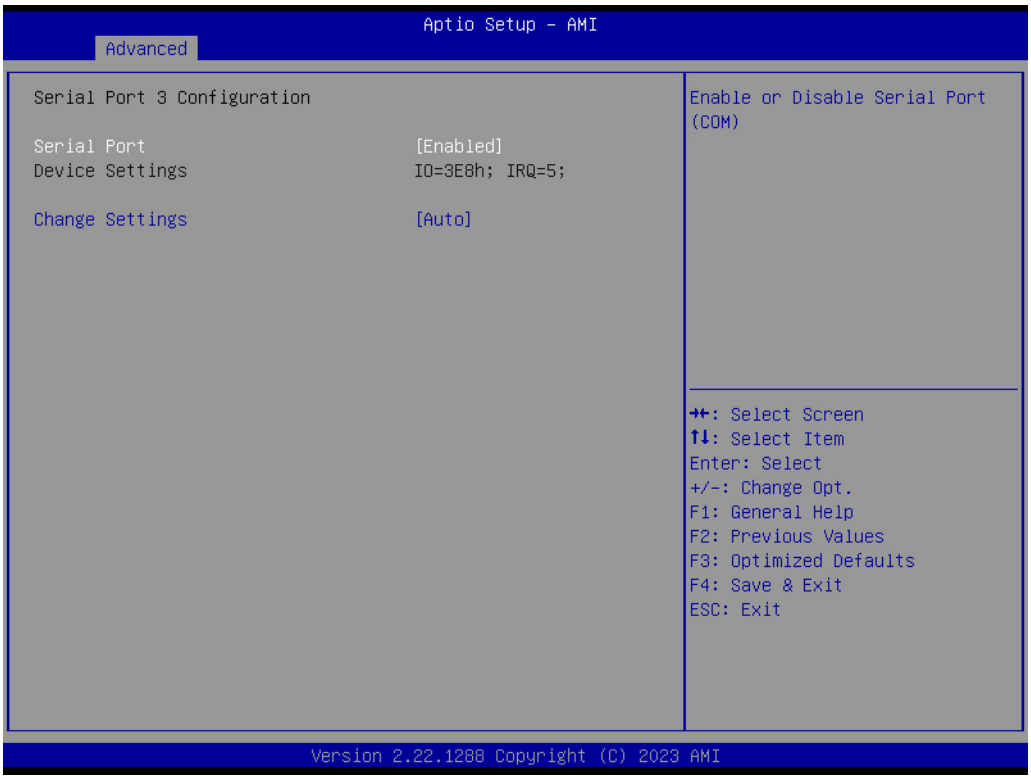

### 3.2.2.6 NCT6126D Super IO Configuration

Set Parameters of Serial Port 1 (COMA).

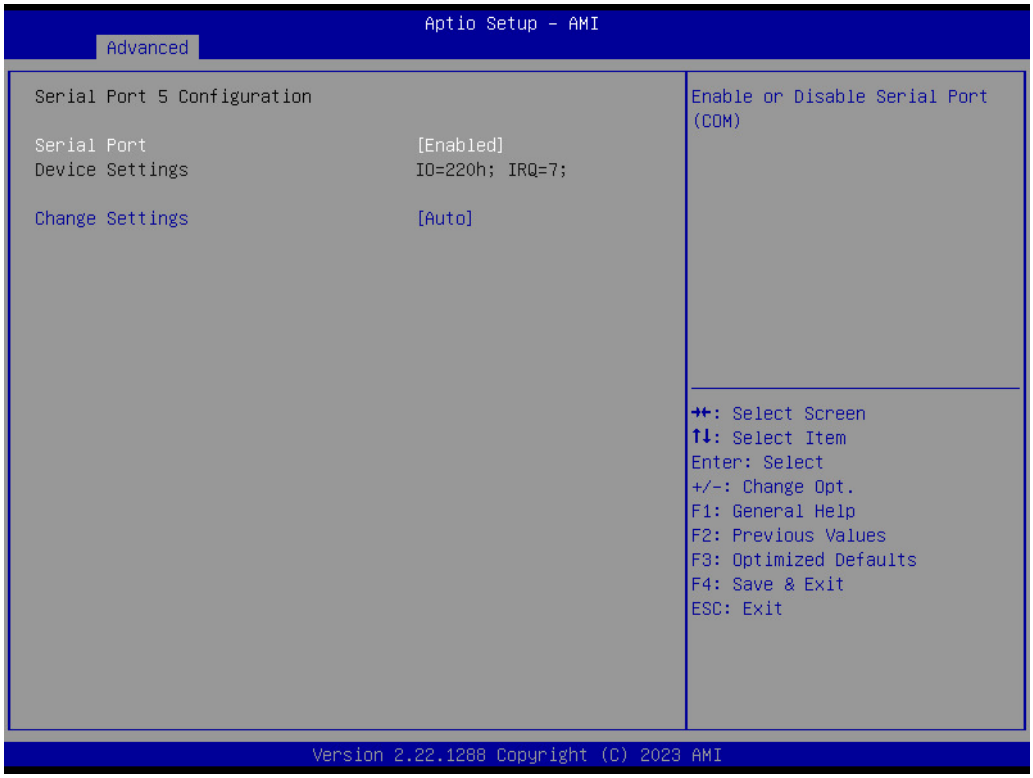



■ **Serial Port 3 Configuration**

Enable or Disable Serial Port (COM).



■ **Serial Port 5 Configuration**
Enable or Disable Serial Port (COM).




– **Serial Port [Enabled]**
  Enable or Disable Serial Port (COM).
– **Device Settings: IO=220h; IRQ =7**
– **Change Settings [Auto]**
  To select an optimal setting for serial port 5.

### 3.2.2.7 NCT6126D HW Monitor

```
Aptio Setup - AMI
Main  Advanced  Chipset  Security  Boot  Save & Exit

▶ CPU Configuration                          Monitor hardware status
▶ Power & Performance
▶ PCH-FW Configuration
▶ ACPI Settings
▶ NCT6126D Super IO Configuration
▶ NCT6126D HW Monitor
▶ S5 RTC Wake Settings
▶ Serial Port Console Redirection
▶ PCI Subsystem Settings
▶ USB Configuration
▶ Network Stack Configuration
▶ CSM Configuration
▶ NVMe Configuration
                                             →←: Select Screen
▶ Tls Auth Configuration                     ↑↓: Select Item
                                             Enter: Select
▶ Driver Health                              +/-: Change Opt.
                                             F1: General Help
                                             F2: Previous Values
                                             F3: Optimized Defaults
                                             F4: Save & Exit
                                             ESC: Exit

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```

- **PC Health Status**
  Configure the digital I/O pins.

```
Aptio Setup - AMI
Advanced

PC Health Status                             Configure the digital I/O pins

System temperature          : +38°C/ +100°F
CPU Temperature             : +52°C/ +125°F
CPU FAN1 Speed              : 2156 RPM
SYS FAN1 Speed              : 0 RPM
SYS FAN2 Speed              : 0 RPM
VCORE                       : +1.160 V
VBAT                        : +3.040 V
+5V                         : +5.080 V
+12V                        : +12.192 V
+3.3V                       : +3.328 V

Smart Fan Function          [Enabled]        →←: Select Screen
▶ Smart Fan Function                         ↑↓: Select Item
▶ Digital I/O Configuration                  Enter: Select
                                             +/-: Change Opt.
CPU Warning Temperature     [Disabled]       F1: General Help
ACPI Shutdown Temperature   [Disabled]       F2: Previous Values
Case Open Warning           [Disabled]       F3: Optimized Defaults
Wake On Ring                [Disabled]       F4: Save & Exit
Watch Dog Timer             [Disabled]       ESC: Exit

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```

- **Smart Fan Configuration**
  - **CPU Fan Mode [SMART FAN IV Mode]**
  - **System Fan1 Mode [SMART FAN IV Mode]**

```
Aptio Setup - AMI
Advanced

CPUFAN Critical Temp Tolerance        1

System Fan1 Mode                      [SMART FAN IV Mode]
SYSFAN1 Temperature 1                 30
SYSFAN1 DC/PWM 1                      0
SYSFAN1 Temperature 2                 40
SYSFAN1 DC/PWM 2                      84
SYSFAN1 Temperature 3                 50
SYSFAN1 DC/PWM 3                      168
SYSFAN1 Temperature 4                 60
SYSFAN1 DC/PWM 4                      255
SYSFAN1 Critical Temperature          90
SYSFAN1 Critical Temp Tolerance       1

System Fan2 Mode                      [SMART FAN IV Mode]
SYSFAN2 Temperature 1                 30
SYSFAN2 DC/PWM 1                      0
SYSFAN2 Temperature 2                 40
SYSFAN2 DC/PWM 2                      84
SYSFAN2 Temperature 3                 50
SYSFAN2 DC/PWM 3                      168
SYSFAN2 Temperature 4                 60
SYSFAN2 DC/PWM 4                      255
SYSFAN2 Critical Temperature          90
SYSFAN2 Critical Temp Tolerance       1

Input Tolerance of Critical
Temperature (Range:0 - 7)

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

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```

## Digital I/O Configuration

Configure Digital I/O Pin.

```
Aptio Setup - AMI
Advanced

Digital I/O Configuration

Digital I/O Pin 1                     [Input]
Digital I/O Pin 2                     [Input]
Digital I/O Pin 3                     [Input]
Digital I/O Pin 4                     [Input]
Digital I/O Pin 5                     [Input]
Digital I/O Pin 6                     [Input]
Digital I/O Pin 7                     [Input]
Digital I/O Pin 8                     [Input]

Configure Digital I/O Pin.

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

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```
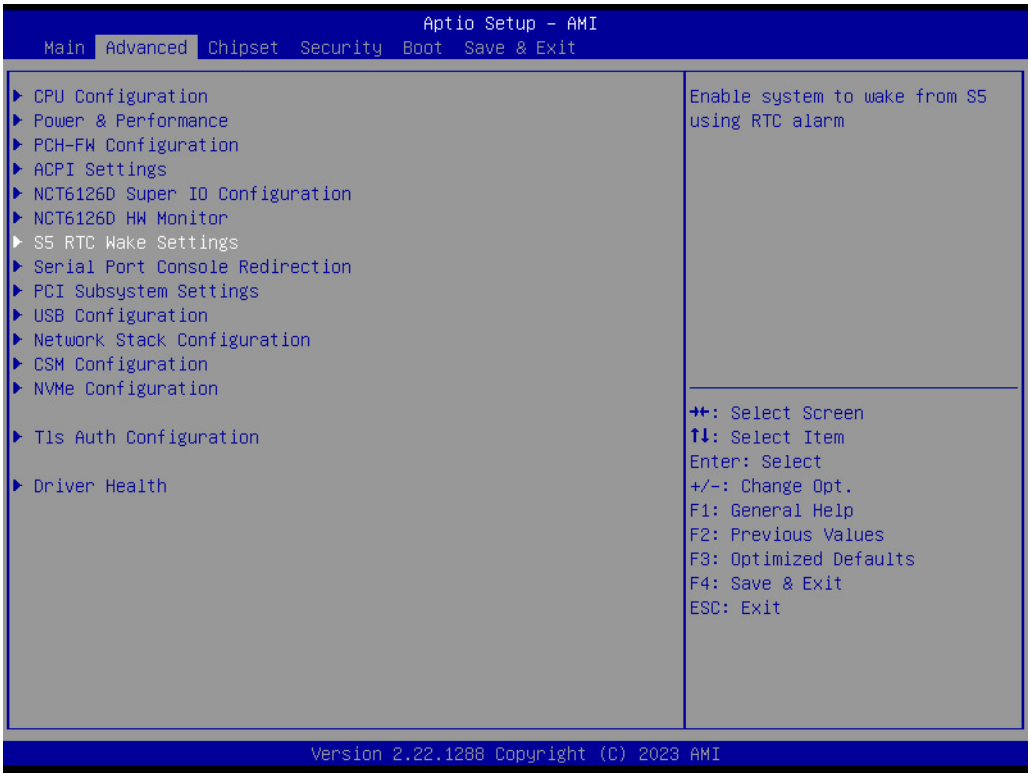

### 3.2.2.8 S5 RTC Wake Settings




■ **Wake system from S5 [Disabled]**
The item allows you enable or disable system wake up on alarm event.

### 3.2.2.9 S5 RTC Wake Settings

```
Aptio Setup - AMI
Main  Advanced  Chipset  Security  Boot  Save & Exit

▶ CPU Configuration
▶ Power & Performance
▶ PCH-FW Configuration
▶ ACPI Settings
▶ NCT6126D Super IO Configuration
▶ NCT6126D HW Monitor
▶ S5 RTC Wake Settings
▶ Serial Port Console Redirection
▶ PCI Subsystem Settings
▶ USB Configuration
▶ Network Stack Configuration
▶ CSM Configuration
▶ NVMe Configuration

▶ Tls Auth Configuration

▶ Driver Health

Serial Port Console Redirection

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

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```

```
Aptio Setup - AMI
Advanced

  COM1
  Console Redirection                    [Disabled]
▶ Console Redirection Settings

  COM1(Pci Bus0,Dev0,Func0) (Disabled)
  Console Redirection                    Port Is Disabled

  Legacy Console Redirection
▶ Legacy Console Redirection Settings

  Serial Port for Out-of-Band Management/
  Windows Emergency Management Services (EMS)
  Console Redirection EMS                [Disabled]
▶ Console Redirection Settings

Console Redirection Enable or
Disable.

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

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```
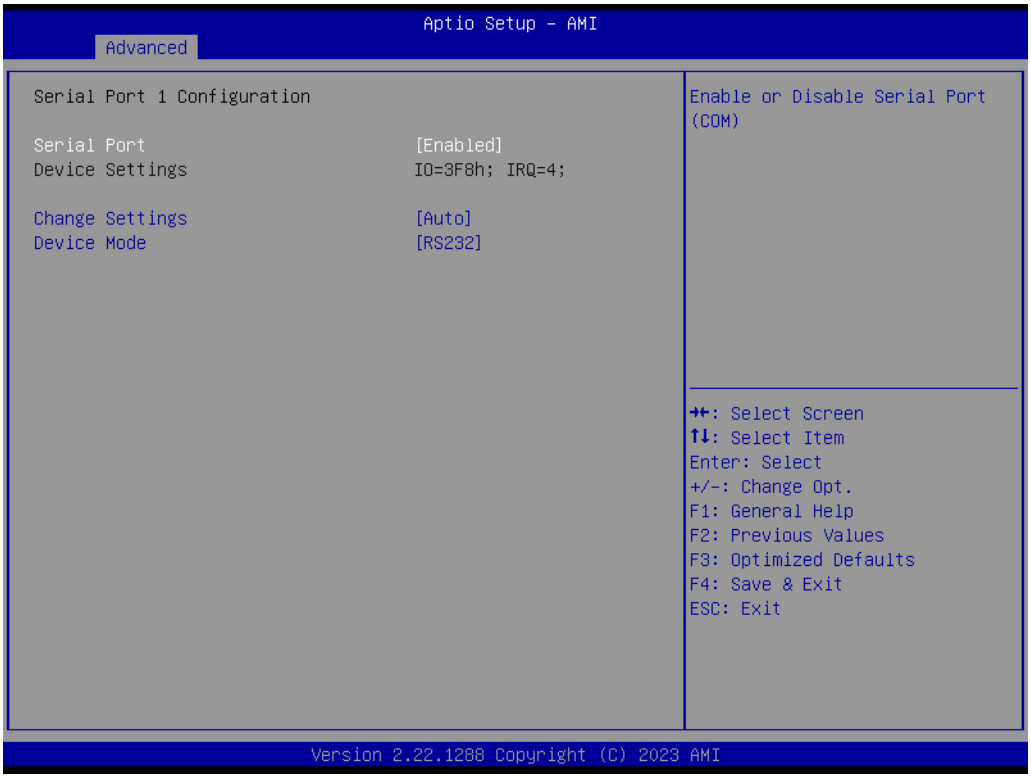

- **Console Redirection [Disabled]**
- **Console Redirection EMS [Disabled].**

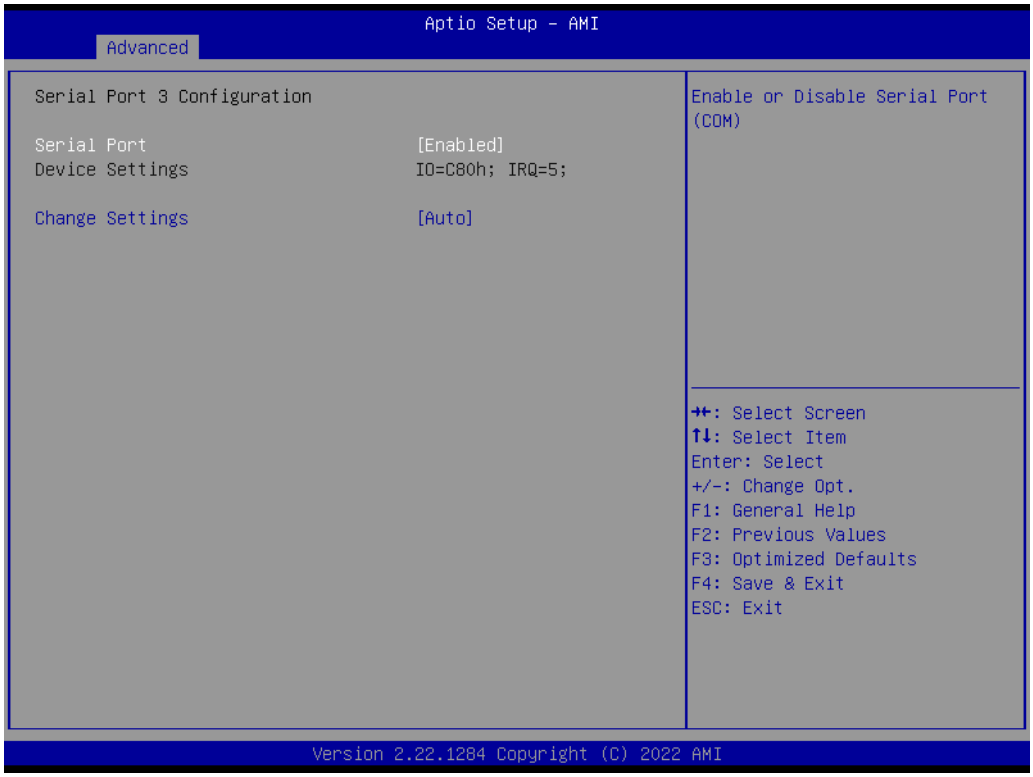
## Serial Port 1 Configuration

Enable or Disable Serial Port (COM).



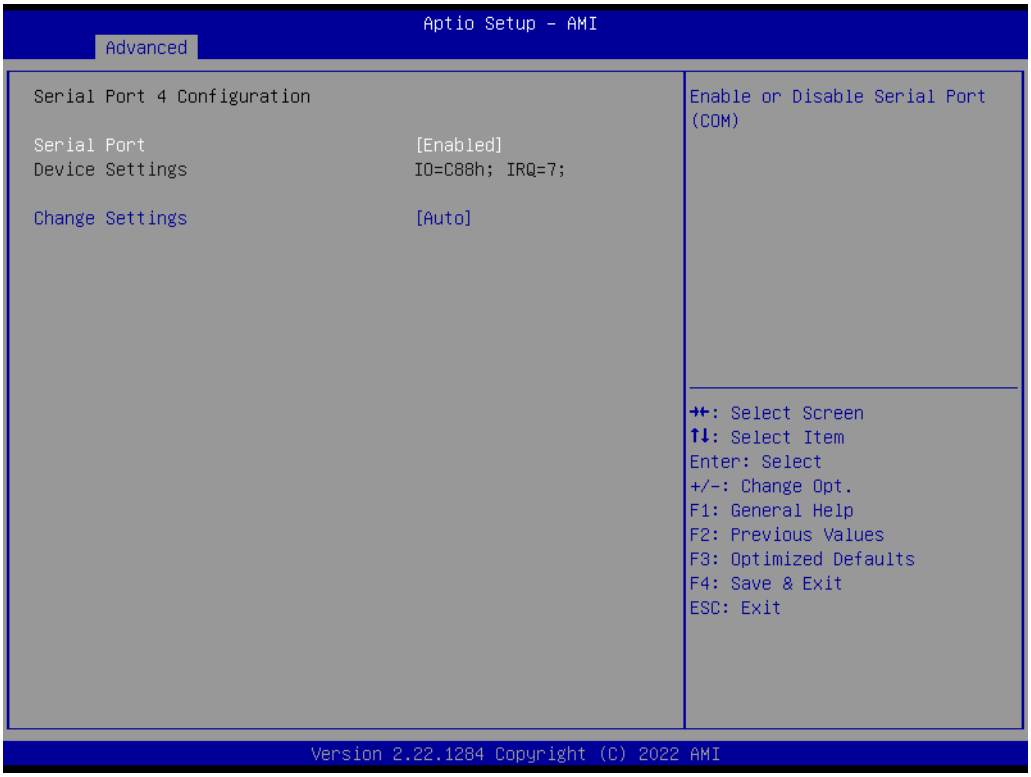

- **Serial Port [Enabled]**
- **Device Settings: IO=3F8h; IRQ =4;**
- **Change Settings [Auto]**
- **Device Mode [RS2]**

## Serial Port 3 Configuration



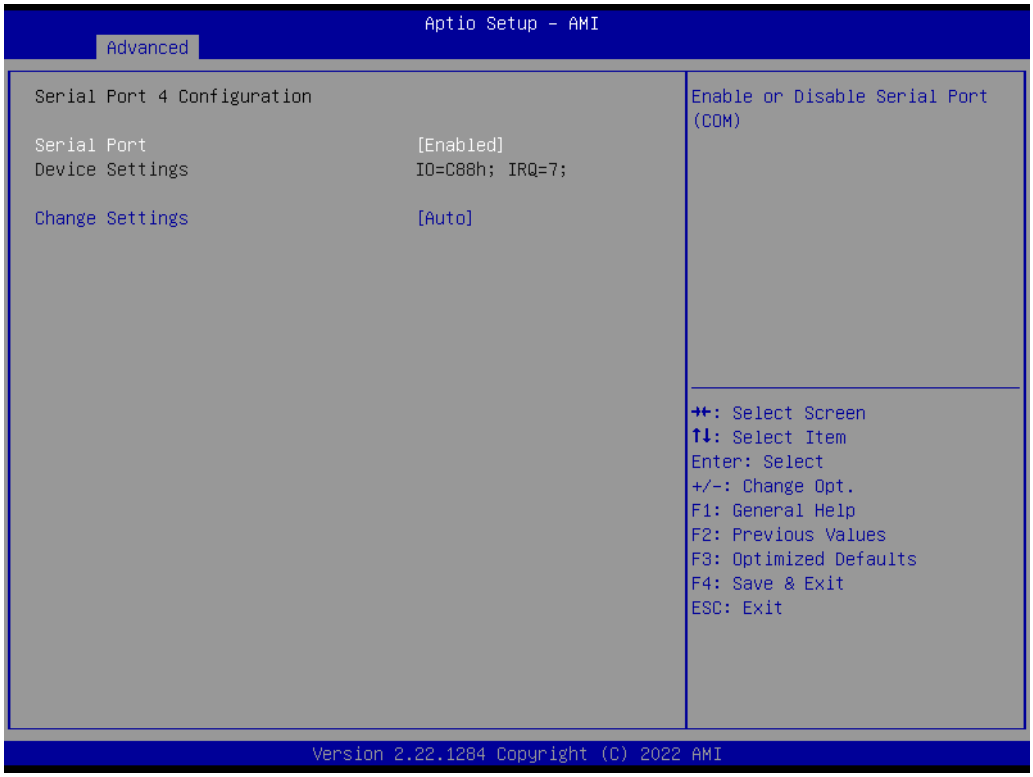

- **Serial Port [Enabled]**
- **Device Settings: IO=C80h; IRQ =5;**
- **Change Settings [Auto]**
  To select an optimal setting for serial port 3.

## Serial Port 4 Configuration



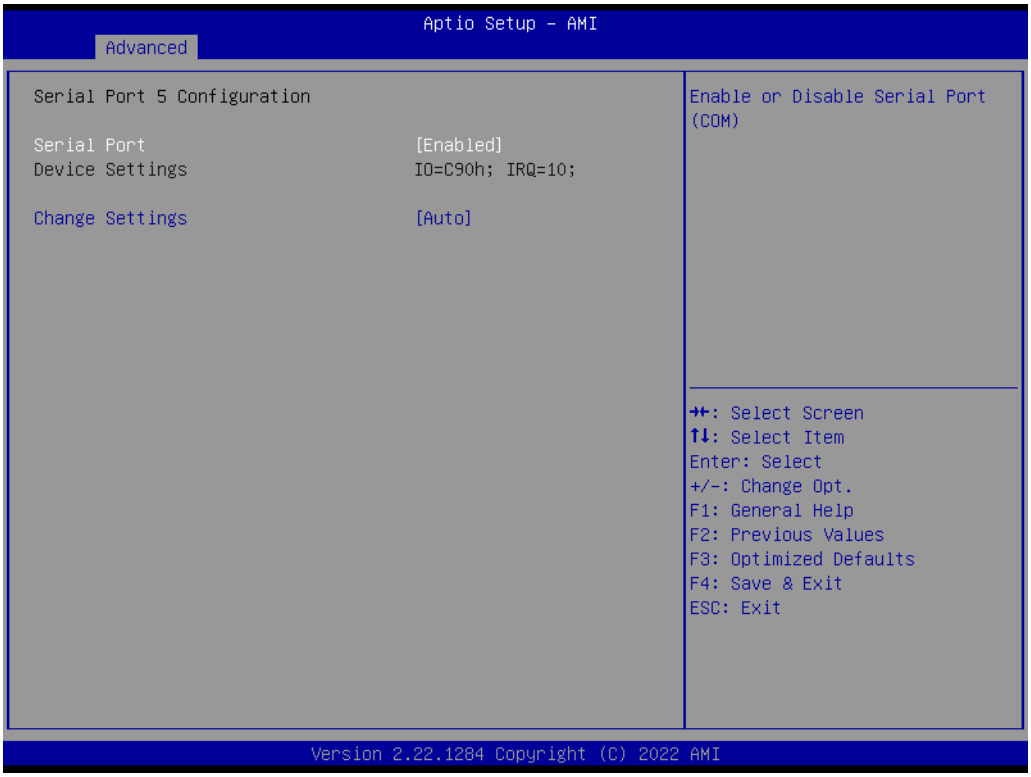

- **Serial Port [Enabled]**
- **Device Settings: IO=C88h; IRQ =7;**
- **Change Settings [Auto]**
  To select an optimal setting for serial port 4.

## Serial Port 5 Configuration




- **Serial Port [Enabled]**
- **Device Settings: IO=C90h; IRQ =10;**
- **Change Settings [Auto]**
  To select an optimal setting for serial port 5.

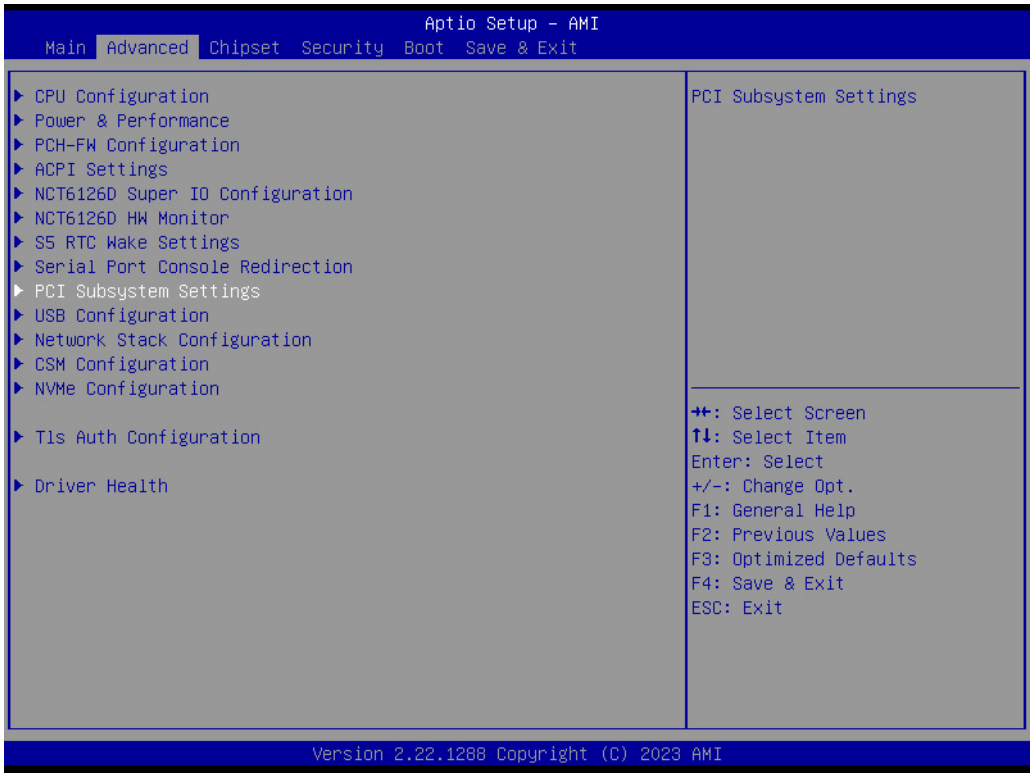
## Serial Port 6 Configuration



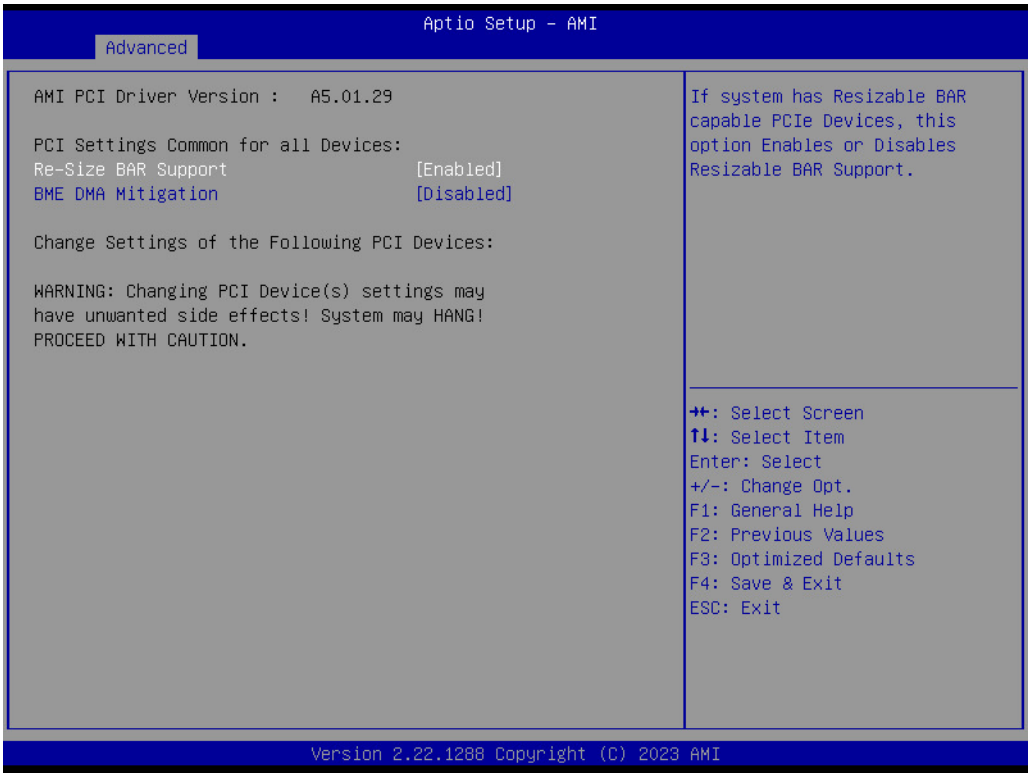

**Serial Port [Enabled]**

- **Device Settings: IO=228h; IRQ =11;**
- **Change Settings [Auto]**
  To select an optimal setting for serial port 6.

### 3.2.2.10 PCI Subsystem Settings

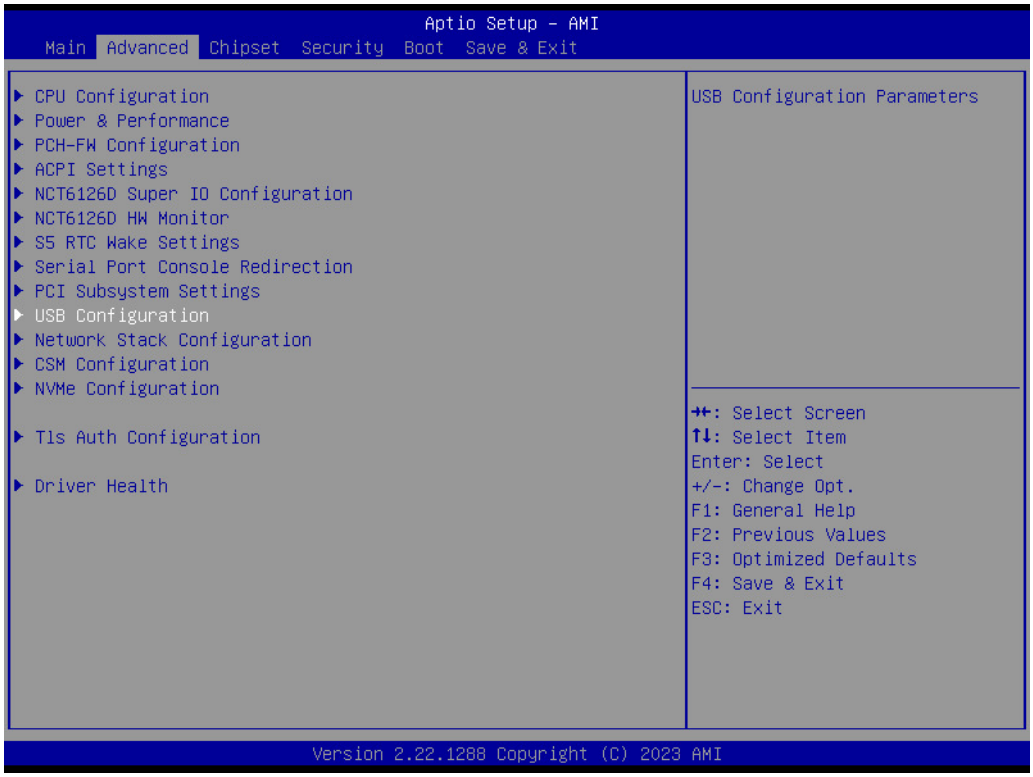


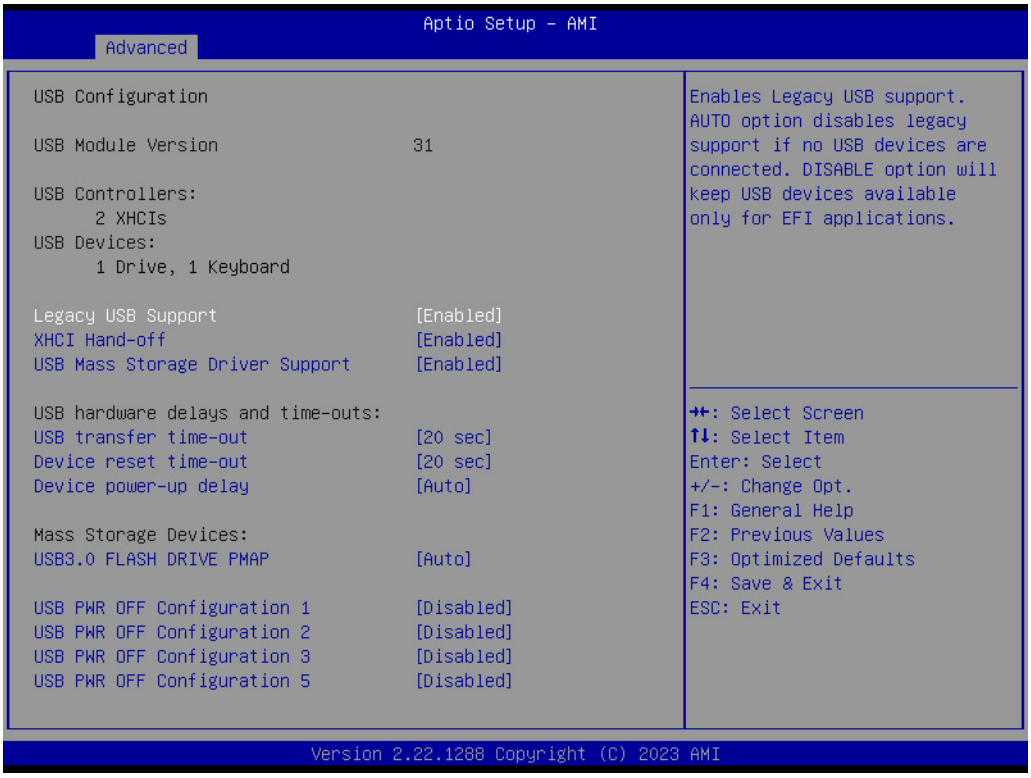
## PCI Settings Common for all Devices




- **Re-Size BAR Support [Enabled]**
  If the system has Resizable BAR Capable PCIe Devices, this option Enables or Disables Resizable BAR Support.
- **BME DMA Mitigation [Disabled]**

### 3.2.2.11 USB Configuration






- **Legacy USB Support [Enabled]**
- **XHCI Hand-off [Enabled]**
- **USB Mass Storage Driver Support [Enabled]**
- **USB hardware delays and time-outs**
  USB Device transfer & reset time-out and delay setting.
- **Mass Storage Devices**
  Shows USB mass storage device information.

### 3.2.2.12 Network Stack Configuration

```
Aptio Setup - AMI
Main  Advanced  Chipset  Security  Boot  Save & Exit

▶ CPU Configuration
▶ Power & Performance
▶ PCH-FW Configuration
▶ ACPI Settings
▶ NCT6126D Super IO Configuration
▶ NCT6126D HW Monitor
▶ S5 RTC Wake Settings
▶ Serial Port Console Redirection
▶ PCI Subsystem Settings
▶ USB Configuration
▶ Network Stack Configuration
▶ CSM Configuration
▶ NVMe Configuration

▶ Tls Auth Configuration

▶ Driver Health

Network Stack Settings

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

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```

### 3.2.2.13 CSM Configuration

```
Aptio Setup - AMI
Advanced

Compatibility Support Module Configuration

CSM Support                    [Disabled]

Enable/Disable CSM Support.

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

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```
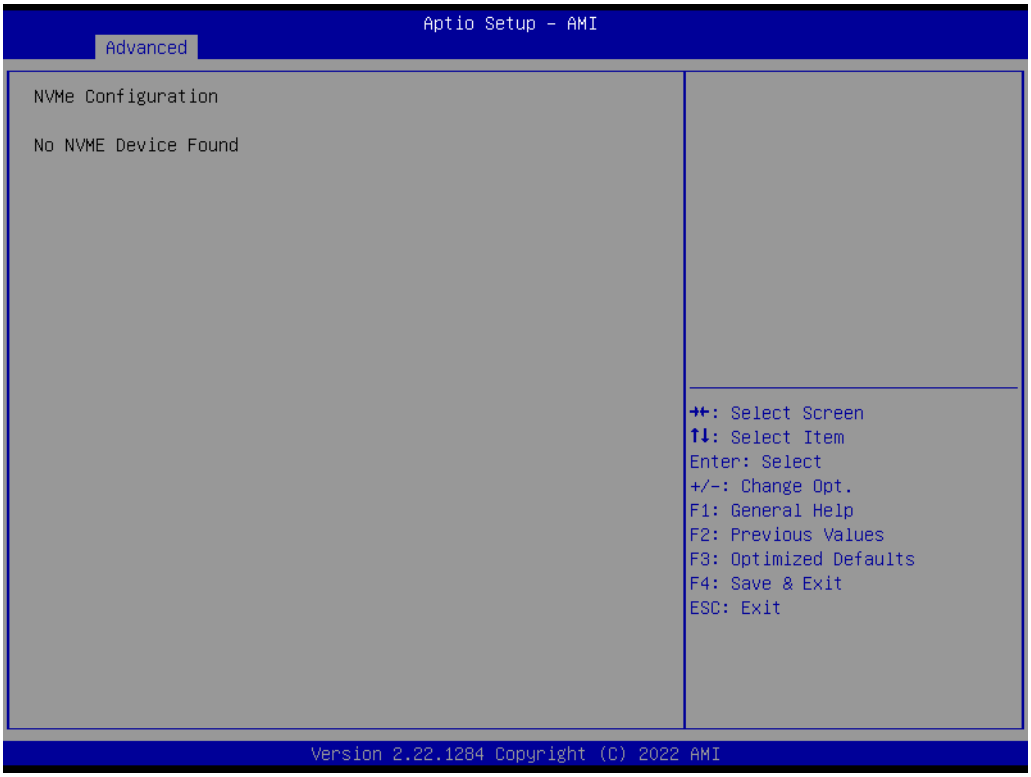
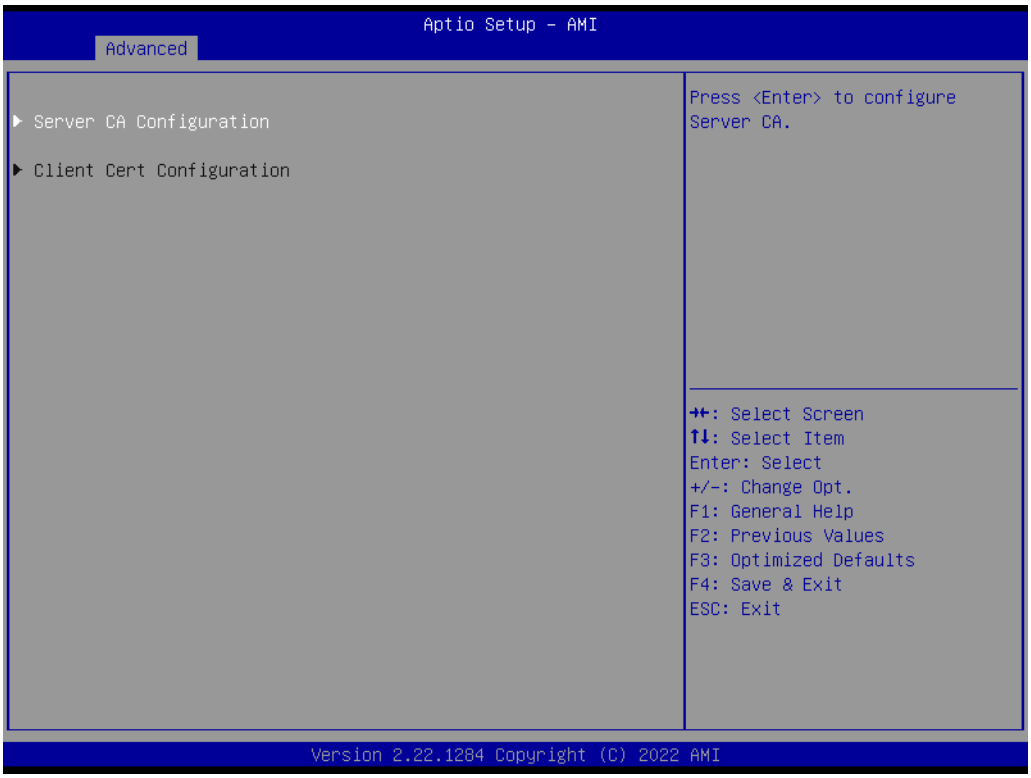

- **CSM Support [Disabled]**

### 3.2.2.14 NVMe Configuration

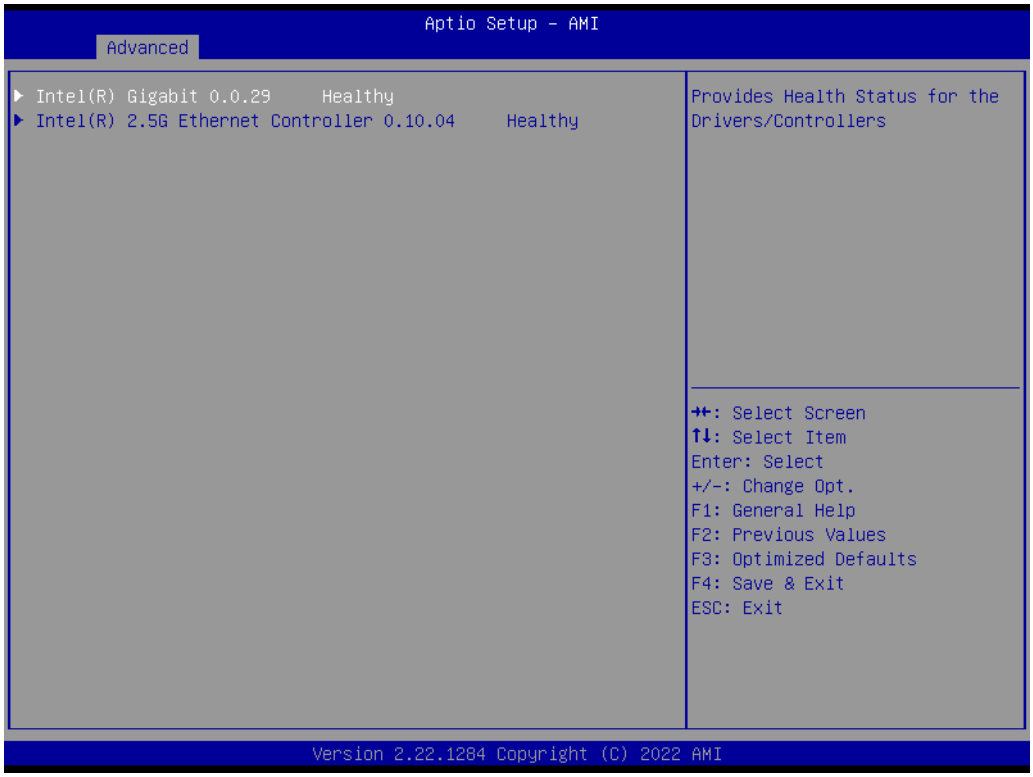



### 3.2.2.15 Tls Auth Configuration




- **Server CA Configuration**
- **Client Cert Configuration**

### 3.2.2.16 Driver Health



## 3.2.3 Chipset Configuration Setting

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as PCI express Configuration, to go to the sub-menu for that item. Users can display a Chipset Setup option by highlighting it using the keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub-menus are described on the following pages.

### 3.2.3.1 Chipset Configuration Setting - System Agent (SA) Configuration

```
Aptio Setup - AMI
Chipset

System Agent (SA) Configuration                    Memory Configuration Parameters

VT-d                                Supported

▶ Memory Configuration
▶ Graphics Configuration
▶ DMI/OPI Configuration
▶ VMD setup menu
▶ PCI Express Configuration

VT-d                                [Enabled]
Control Iommu Pre-boot Behavior     [Disable IOMMU]
Above 4GB MMIO BIOS assignment      [Enabled]

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

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```

- **VT-d [Enabled]**
  Disable or enable the VT-d function on MCH.

### 3.2.3.1.1 Memory Configuration

```
Aptio Setup - AMI
Chipset

Memory Configuration

Memory RC Version                    0.0.3.128
Memory Frequency                      4000 MT/s
DIMMA1                               Populated & Enabled
    Size                             16384 MB (DDR5)
    Number of Ranks                  1
    Manufacturer                     A-DATA Technology
DIMMA2                               Populated & Enabled
    Size                             16384 MB (DDR5)
    Number of Ranks                  1
    Manufacturer                     A-DATA Technology
DIMMB1                               Populated & Enabled
    Size                             16384 MB (DDR5)
    Number of Ranks                  1
    Manufacturer                     A-DATA Technology
DIMMB2                               Populated & Enabled
    Size                             16384 MB (DDR5)
    Number of Ranks                  1
    Manufacturer                     A-DATA Technology

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

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```

- **SIO Port 80 Control [Disabled]**
- **CPU Warning Temperature [Disabled]**
- **ACPI Shutdown Temperature [Disabled]**
- **Case Open Warning [Disabled]**
- **Wake On Ring [Disabled]**

### 3.2.3.1.2 Graphics Configuration

```
Aptio Setup - AMI
Chipset

Graphics Configuration                                  Graphics turbo IMON current
                                                        values supported (14-31)
Graphics Turbo IMON Current          31
Skip Scaning of External Gfx Card    [Disabled]

Primary Display                      [Auto]
▶ External Gfx Card Primary Display Configuration
Internal Graphics                    [Auto]
GTT Size                             [8MB]
Aperture Size                        [256MB]
PSMI SUPPORT                         [Disabled]
DVMT Pre-Allocated                   [60M]
Intel Graphics Pei Display Peim      [Disabled]
VDD Enable                           [Enabled]          →←: Select Screen
Configure GT for use                 [Enabled]          ↑↓: Select Item
RC1p Support                         [Disabled]         Enter: Select
PAVP Enable                          [Enabled]          +/-: Change Opt.
Cdynmax Clamping Enable              [Disabled]         F1: General Help
Cd Clock Frequency                   [Max CdClock freq  F2: Previous Values
                                     based on Reference Clk]  F3: Optimized Defaults
▶ LCD Control                                           F4: Save & Exit
                                                        ESC: Exit

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```

```
Aptio Setup - AMI
Chipset

External Gfx Card Primary Display Configuration

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

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```
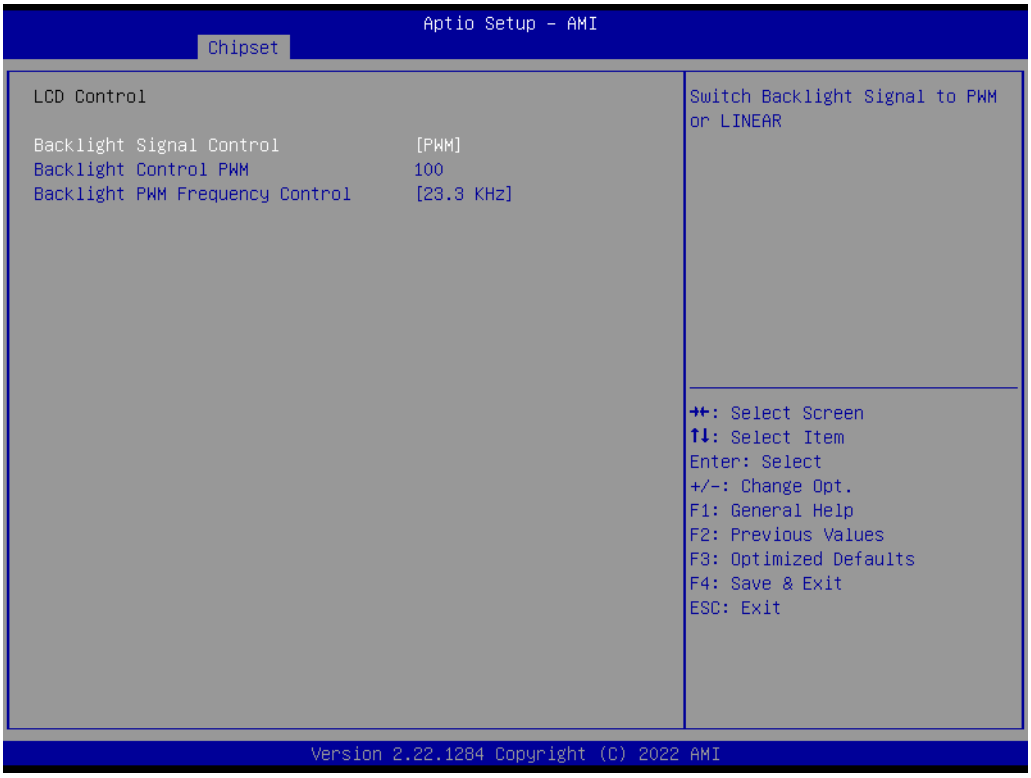

- **External Gfx Card Primary Display Configuration**




- **LCD Control**
  - **Backlight Signal Control [PWM]**
  - **Backlight Control PWM 100**
  - **Backlight PWM Frequency Control [23.3 KHz]**

### 3.2.3.1.3 Graphics Configuration

```
Aptio Setup - AMI
Chipset

DMI/OPI Configuration                                  Set DMI Speed Gen1/Gen2/Gen3

DMI                                  X8  Gen4

DMI Max Link Speed                   [Gen4]
CDR Relock for CPU DMI               [Disabled]
DMI ASPM                             [ASPM L1]
DMI Gen3 L1 Exit Latency             4
New FOM for CPU DMI                  [Disabled]
▶ DMI Advanced Menu

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

Version 2.22.1284 Copyright (C) 2022 AMI
```

■ **DMI/OPI Configuration**

```
Aptio Setup - AMI
Chipset

DMI Advanced Menu                                      DMI Gen4 EQ Mode

DMI Gen4 EQ Mode                     [Fixed EQ]
DMI Gen4 RTCO Cpre Lane0             10
DMI Gen4 RTCO Cpost Lane0            6
DMI Gen4 RTCO Cpre Lane1             10
DMI Gen4 RTCO Cpost Lane1            6
DMI Gen4 RTCO Cpre Lane2             10
DMI Gen4 RTCO Cpost Lane2            6
DMI Gen4 RTCO Cpre Lane3             10
DMI Gen4 RTCO Cpost Lane3            6
DMI Gen4 RTCO Cpre Lane4             10
DMI Gen4 RTCO Cpost Lane4            6
DMI Gen4 RTCO Cpre Lane5             10
DMI Gen4 RTCO Cpost Lane5            6
DMI Gen4 RTCO Cpre Lane6             14
DMI Gen4 RTCO Cpost Lane6            7
DMI Gen4 RTCO Cpost Lane7            10
DMI Gen4 RTCO Cpre Lane7             6
DMI Gen3 RTCO Cpre Lane0             3
DMI Gen3 RTCO Cpost Lane0            3
DMI Gen3 RTCO Cpre Lane1             5
DMI Gen3 RTCO Cpost Lane1            5
DMI Gen3 RTCO Cpre Lane2             5
DMI Gen3 RTCO Cpost Lane2            5
                                     →←: Select Screen
                                     ↑↓: Select Item
                                     Enter: Select
                                     +/-: Change Opt.
                                     F1: General Help
                                     F2: Previous Values
                                     F3: Optimized Defaults
                                     F4: Save & Exit
                                     ESC: Exit

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```
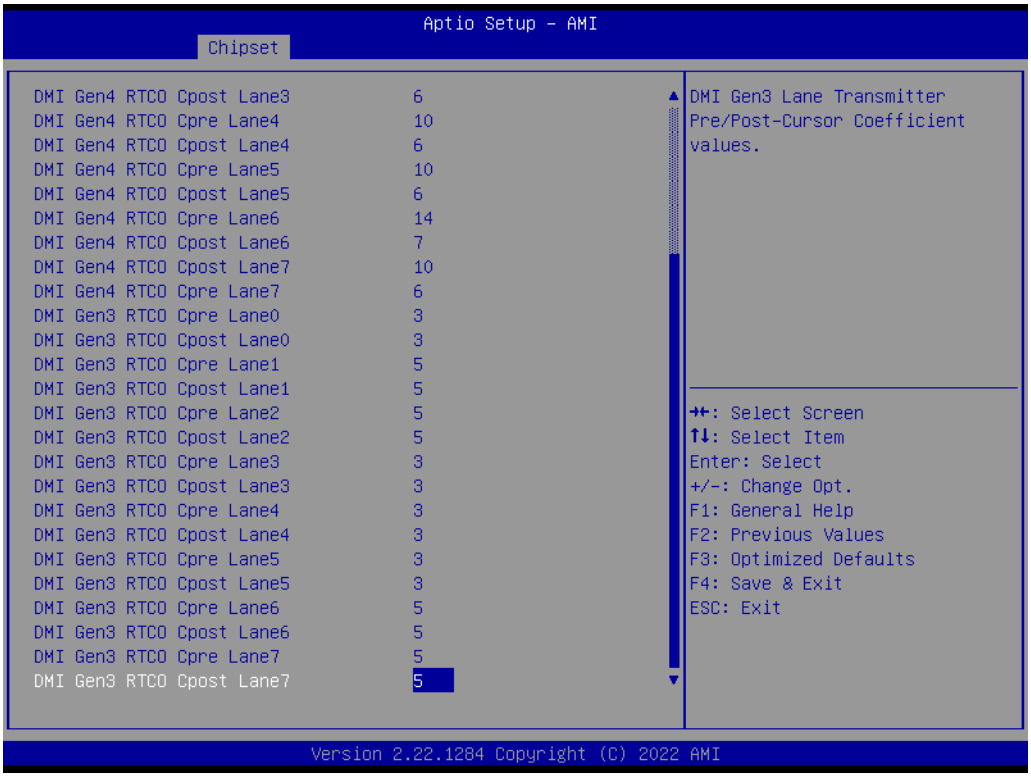
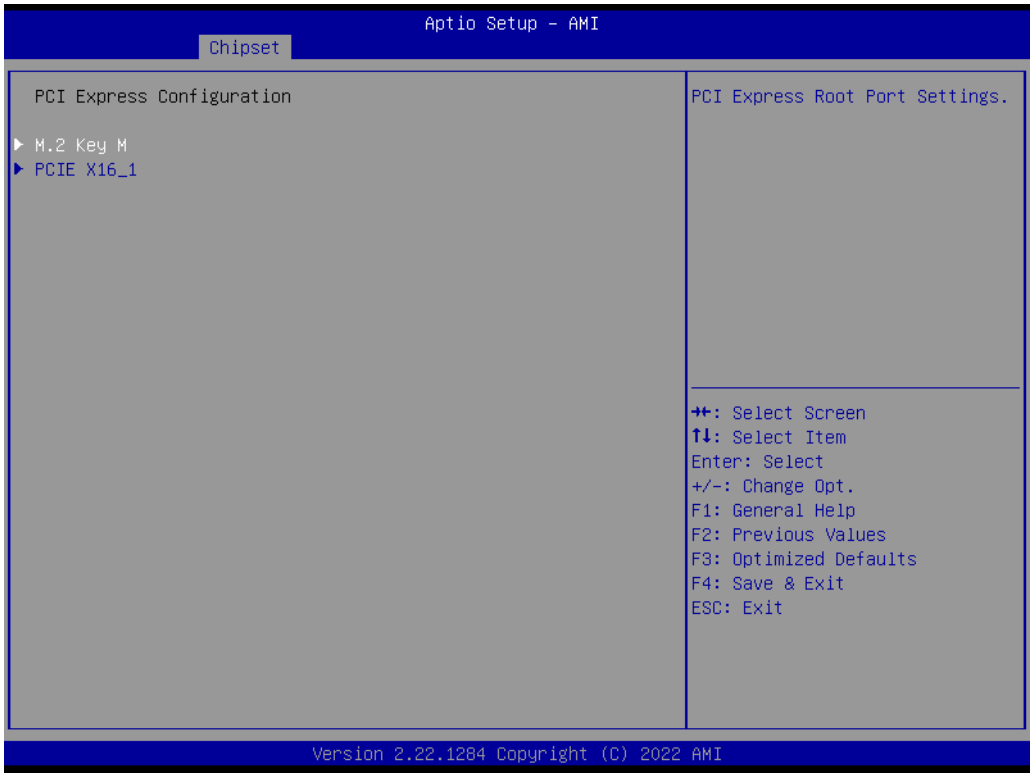

■ **DMI Advanced Menu**




### 3.2.3.1.4 VMD Configuration

■ **Enable VMD controller [Disabled]**

### 3.2.3.1.5 PCI Express Configuration




- **M.2 Key M**
- **PCIE X16_1**

### 3.2.3.2 Chipset Configuration Setting – PCH-IO Configuration

```
Aptio Setup - AMI
Chipset

PCH-IO Configuration                                  PCI Express Configuration
                                                      settings
▶ PCI Express Configuration
▶ SATA Configuration
▶ Security Configuration
▶ HD Audio Configuration

LAN1 Controller                    [Enabled]
  LAN1 PXE OpROM                   [Disabled]
LAN2 Controller                    [Enabled]
  LAN2 PXE OpROM                   [Disabled]
LAN3 Controller                    [Enabled]
  LAN3 PXE OpROM                   [Disabled]          →←: Select Screen
LAN4 Controller                    [Enabled]           ↑↓: Select Item
  LAN4 PXE OpROM                   [Disabled]          Enter: Select
                                                       +/-: Change Opt.
PCIE Wake                          [Disabled]          F1: General Help
ErP Support                        [Disabled]          F2: Previous Values
Restore AC Power Loss              [Power Off]         F3: Optimized Defaults
PCIE Device Initial Delay          0                   F4: Save & Exit
Legacy IO Low Latency              [Disabled]          ESC: Exit
Flash Protection Range Registers   [Disabled]
(FPRR)
SPD Write Disable                  [TRUE]

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```

- **PCI Express Configuration**
- **SATA Configuration**
- **Security Configuration**
- **HD Audio Configuration**

### 3.2.3.2.1 PCI Express Configuration

```
Aptio Setup - AMI
Chipset

PCI Express Configuration

DMI Link ASPM Control                [L1]
PCIe function swap                   [Enabled]
▶ PCIe EQ settings

▶ LAN2
▶ LAN3
▶ LAN4
▶ PCIE X4_1
▶ PCIE X4_2

The control of Active State
Power Management of the DMI
Link.

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

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```

- **DMI Link ASPM Control [L1]**
- **PCIe function swap [Enabled]**
- **PCIe EQ settings**

```
Aptio Setup - AMI
Chipset

PCIe EQ override                     [Disabled]

Choose your own PCIe EQ
settings, only for users who
have a thorough understanding
of equalization process

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

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```

- **PCIe EQ override [Disabled]**

```
Aptio Setup - AMI
Chipset

LAN2                                  [Enabled]
Connection Type                       [Slot]
ASPM                                  [Disabled]
L1 Substates                          [Disabled]
L1 Low                                [Enabled]
ACS                                   [Enabled]
PTM                                   [Enabled]
DPC                                   [Disabled]
EDPC                                  [Enabled]
  URR                                 [Disabled]
  FER                                 [Disabled]
  NFER                                [Disabled]
  CER                                 [Disabled]
  SEFE                                [Disabled]
  SENFE                               [Disabled]
  SECE                                [Disabled]
  PME SCI                             [Enabled]
  Advanced Error Reporting            [Enabled]
PCIe Speed                            [Auto]
  Transmitter Half Swing              [Disabled]
Detect Timeout                        0
Extra Bus Reserved                    0
Reserved Memory                       10
Reserved I/O                          4

Control the PCI Express Root
Port.

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

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```

```
Aptio Setup - AMI
Chipset

EDPC                                  [Enabled]
  URR                                 [Disabled]
  FER                                 [Disabled]
  NFER                                [Disabled]
  CER                                 [Disabled]
  SEFE                                [Disabled]
  SENFE                               [Disabled]
  SECE                                [Disabled]
  PME SCI                             [Enabled]
  Advanced Error Reporting            [Enabled]
PCIe Speed                            [Auto]
  Transmitter Half Swing              [Disabled]
Detect Timeout                        0
Extra Bus Reserved                    0
Reserved Memory                       10
Reserved I/O                          4

PCH PCIe LTR Configuration
LTR                                   [Enabled]
  Snoop Latency Override              [Auto]
  Non Snoop Latency Override          [Auto]
  Force LTR Override                  [Disabled]

LTR Lock                              [Disabled]
Peer Memory Write Enable              [Disabled]

PCIE LTR Configuration Lock

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

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```

### 3.2.3.2.2 SATA Configuration

```
Aptio Setup - AMI
Chipset

SATA Configuration                                  Enable/Disable SATA Device.

SATA Controller(s)                  [Enabled]
SATA Mode Selection                 [AHCI]
Aggressive LPM Support              [Enabled]
SATA Controller Speed               [Default]

Serial ATA Port 1                   Empty
  Software Preserve                 Unknown
  Port 1                            [Enabled]
  External                          [Disabled]
  Spin Up Device                    [Disabled]
  SATA Device Type                  [Hard Disk Drive]
  Topology                          [Unknown]          →←: Select Screen
  SATA Port 1 DevSlp                [Enabled]          ↑↓: Select Item
  DITO Configuration                [Disabled]         Enter: Select
  DITO Value                        625                +/-: Change Opt.
  DM Value                          15                 F1: General Help
Serial ATA Port 2                   Empty              F2: Previous Values
  Software Preserve                 Unknown            F3: Optimized Defaults
  Port 2                            [Enabled]          F4: Save & Exit
  External                          [Disabled]         ESC: Exit
  Spin Up Device                    [Disabled]
  SATA Device Type                  [Hard Disk Drive]
  Topology                          [Unknown]

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```

```
Aptio Setup - AMI
Chipset

  DITO Configuration                [Disabled]         Enable/Disable DITO
  DITO Value                        625                Configuration
  DM Value                          15
Serial ATA Port 7                   Empty
  Software Preserve                 Unknown
  Port 7                            [Enabled]
  External                          [Disabled]
  Spin Up Device                    [Disabled]
  SATA Device Type                  [Hard Disk Drive]
  Topology                          [Unknown]
  SATA Port 7 DevSlp                [Disabled]
  DITO Configuration                [Disabled]
  DITO Value                        625
  DM Value                          15                 →←: Select Screen
Serial ATA Port 8                   Empty              ↑↓: Select Item
  Software Preserve                 Unknown            Enter: Select
  Port 8                            [Enabled]          +/-: Change Opt.
  External                          [Disabled]         F1: General Help
  Spin Up Device                    [Disabled]         F2: Previous Values
  SATA Device Type                  [Hard Disk Drive]  F3: Optimized Defaults
  Topology                          [Unknown]          F4: Save & Exit
  SATA Port 8 DevSlp                [Disabled]         ESC: Exit
  DITO Configuration                [Disabled]
  DITO Value                        625
  DM Value                          15

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```
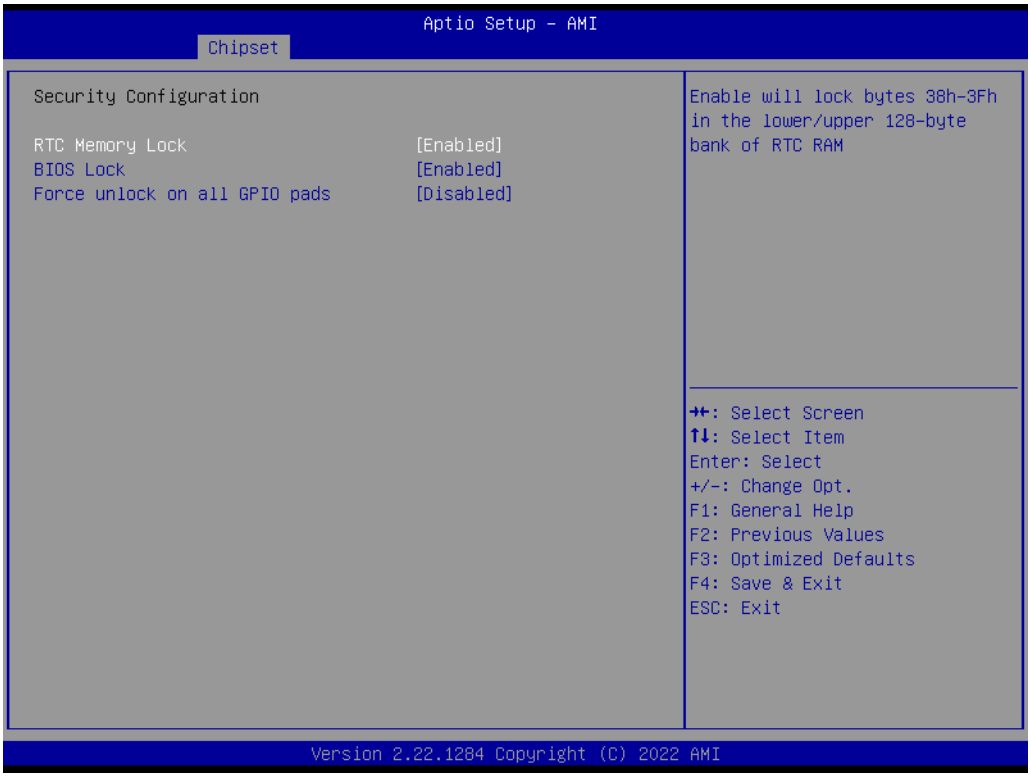
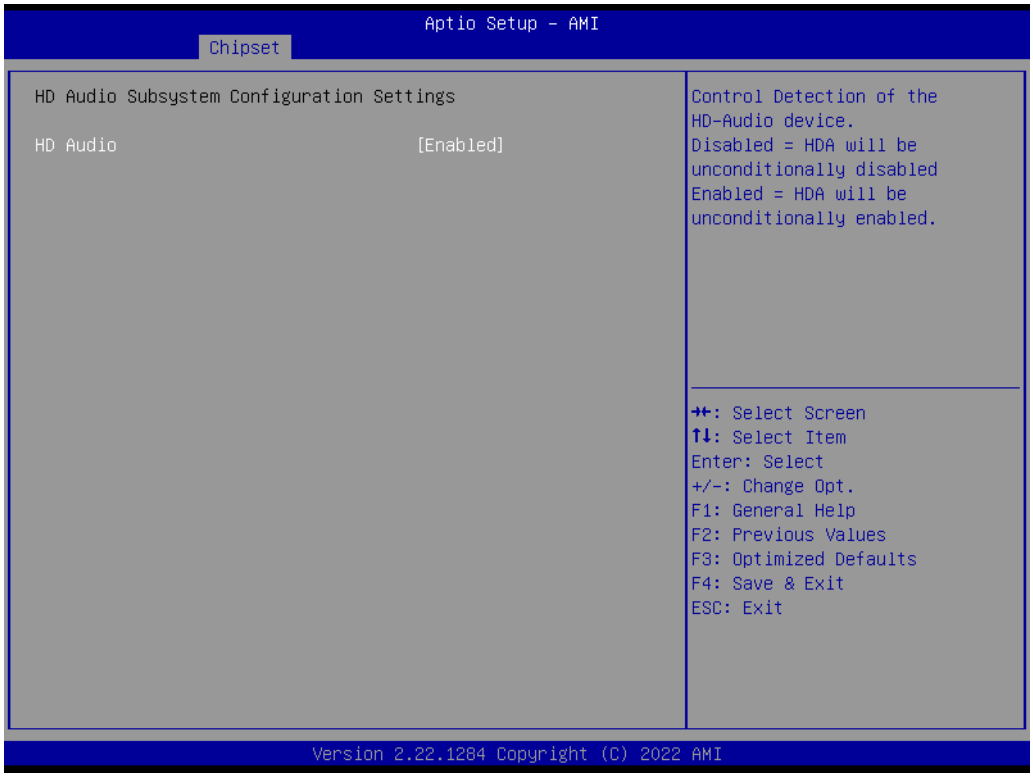

### 3.2.3.2.3 Security Configuration



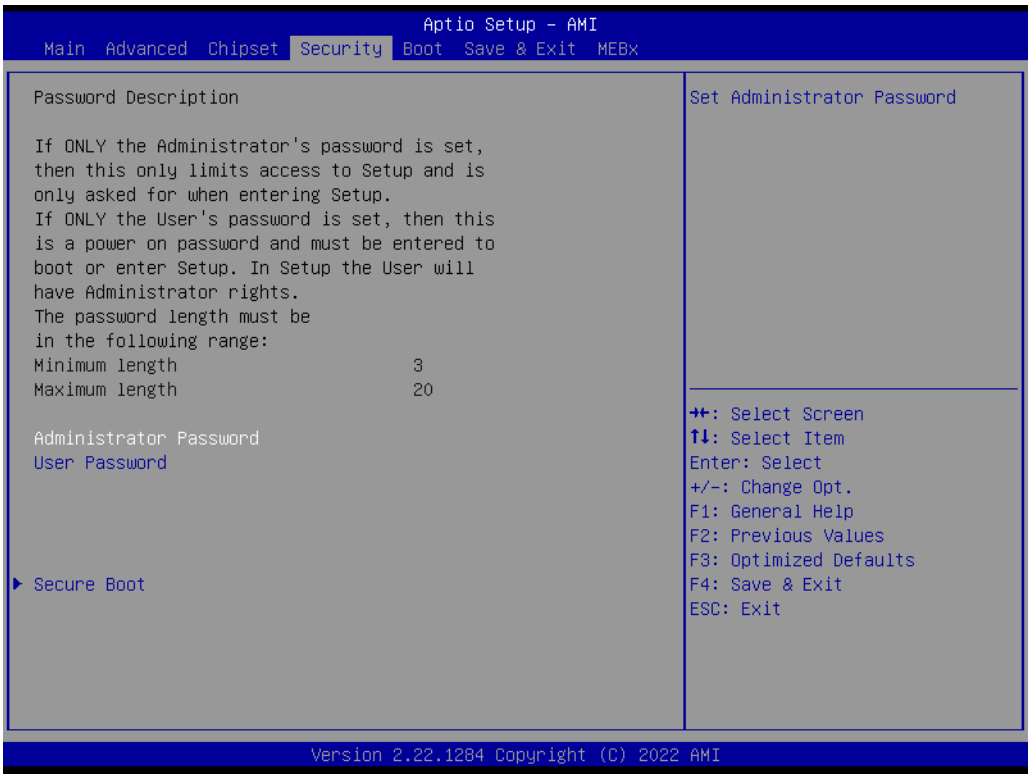

- **RTC Memory Lock [Enabled]**
- **BIOS Lock [Enabled]**
- **Force unlock on all GPIO pads [Disabled]**

### 3.2.3.2.4 HD Audio Subsystem Configuration Settings



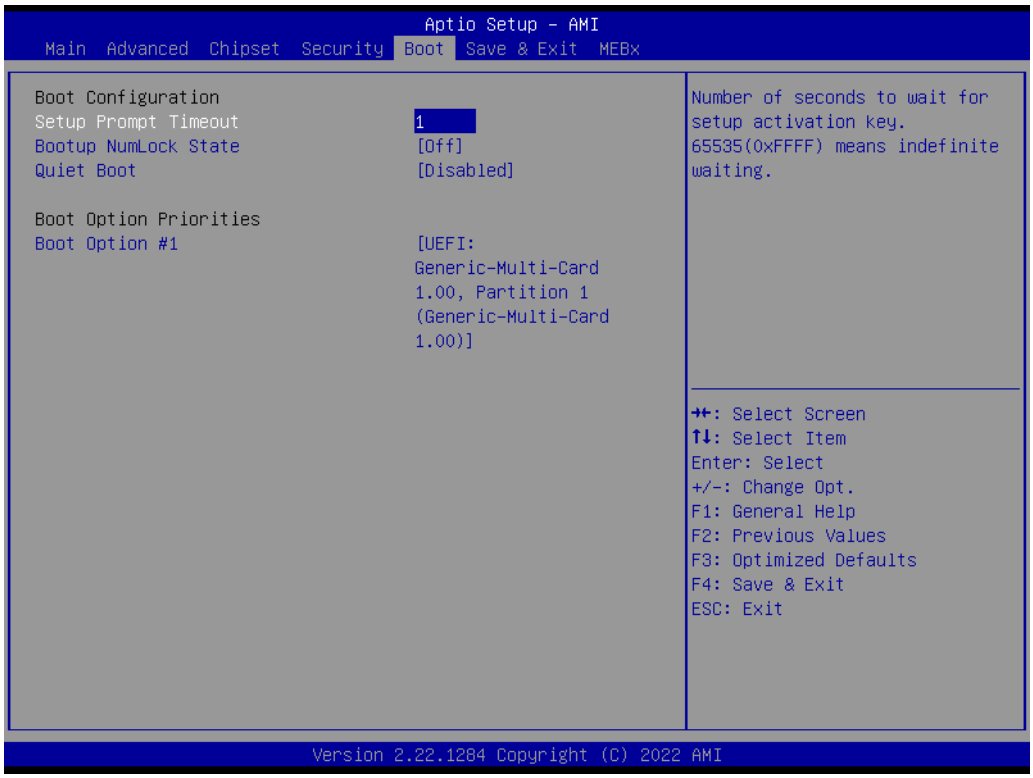

- **HD Audio [Enabled]**

## 3.2.4 Security Settings



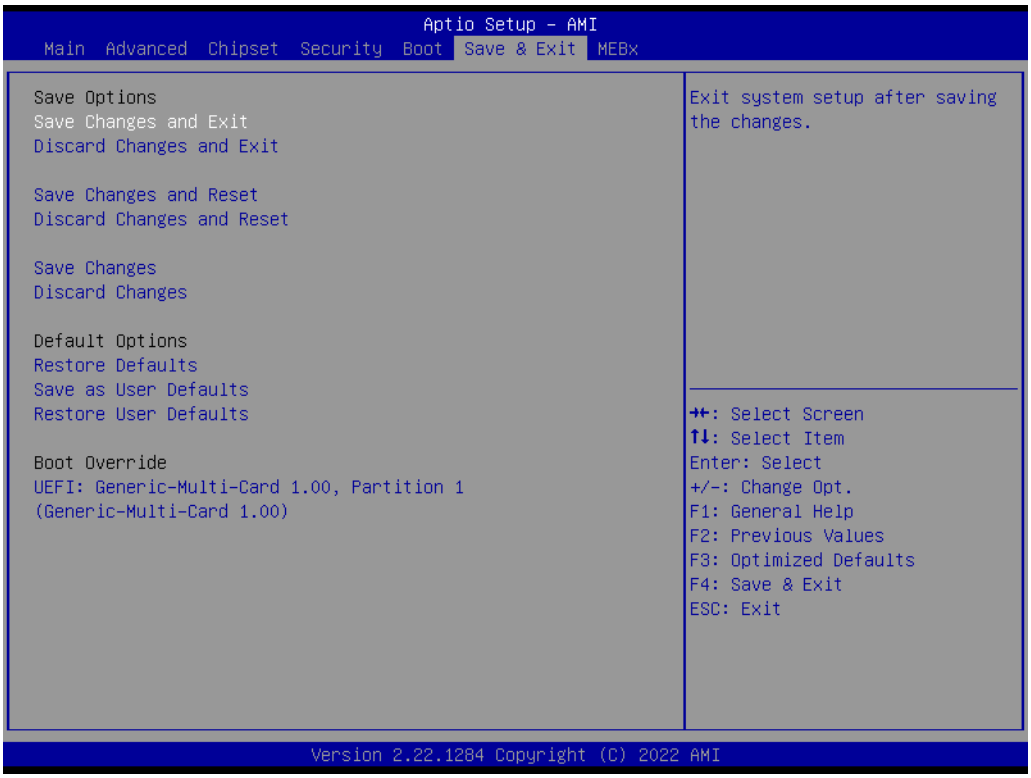

- **Administrator Password**
  Select this option and press to access the sub-menu, then type in the password. Set the Administrator password.
- **User Password**
  Select this option and press to access the sub-menu, then type in the password. Set the User Password.
- **Security Boot**

### 3.2.5 Boot Setting




- **Setup Prompt Timeout**
  Use the < and > keys to adjust the number of seconds to wait for the setup activation key.
- **Bootup NumLock State [Off]**
  On or Off power on state for the NumLock.
- **Quiet Boot [Disabled]**
  If this option is set to disabled, the BIOS displays normal POST messages. If enabled, an OEM logo is shown instead of POST messages.
- **Boot Option #1**
  Choose boot priority from boot device.

## 3.2.6 Save & Exit Configuration




- **Save Changes and Exit**
  When users have completed system configuration, select this option to save changes, exit the BIOS setup menu and reboot the computer to take effect of all system configuration parameters.
  1. Select Exit Saving Changes from the Exit menu and press <Enter>.
  The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
  2. Select Ok or Cancel.
- **Discard Changes and Exit**
  Select this option to quit Setup without making any permanent changes to the system configuration.
  1. Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]
  2. Select Ok to discard changes and exit. Discard Changes Select Discard Changes from the Exit menu and press <Enter>.
- **Save Changes and Reset**
  When users have completed system configuration, select this option to save changes, exit the BIOS setup menu, and reboot the computer to take effect of all system configuration parameters.
  1. Select Exit Saving Changes from the Exit menu and press <Enter>. The Following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]
  2. Select Ok or Cancel.
- **Discard Changes and Reset**
  Select this option to quit Setup without making any permanent changes to the system configuration.
  1. Select Reset Discarding Changes from the Exit menu and press <Enter>.
  The following message appears: Discard Changes and Exit Setup Now? [Ok]

[Cancel]
2. Select Ok to discard changes and reset. Discard Changes Select Discard Changes from the Exit menu and press <Enter>.

- **Restore Defaults**
  The BIOS automatically configures all setup items to optimal settings when users select this option. Defaults are designed for maximum system performance, but it may not work best for all computer applications. In particular, do not use the defaults if the user's computer is experiencing system configuration problems. Select Restore Defaults from the Exit menu and press <Enter>.
- **Save as User Default**
  Save the all current settings as a user default.
- **Restore User Default**
  Restore all settings to user default values.

### 3.2.7 MEBx

# Chapter 4

## Software Introduction & Service

# 4.1 Introduction

The mission of Advantech Embedded Software Services is to "Enhance quality of life with Advantech platforms and Microsoft® Windows® embedded technology." We enable Windows® Embedded software products on Advantech platforms to more effectively support the embedded computing community. Customers are freed from the hassle of dealing with multiple vendors (hardware suppliers, system integrators, embedded OS distributors) for projects. Our goal is to make Windows® Embedded Software solutions easily and widely available to the embedded computing community.

# 4.2 Value-Added Software Services

Software API: An interface that defines the ways by which an application program may request services from libraries and/or operating systems. It provides not only the underlying drivers required but also a rich set of user-friendly, intelligent and integrated interfaces, which speeds development, enhances security, and offers add-on value for Advantech platforms. It plays the role of catalyst between developer and solution, and makes Advantech embedded platforms easier and simpler to adopt and operate with customer applications.

## 4.2.1 Software API

### 4.2.1.1 Control

**GPIO**

General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

**SMBus**

SMBus is the System Management Bus defined by Intel Corporation in 1995. It is used in personal computers and servers for low-speed system management communications. The SMBus API allows a developer to interface with an embedded system environment and transfer serial messages using the SMBus protocols, allowing simultaneous control of multiple devices.

#### 4.2.1.2 Display

**Brightness Control**

The Brightness Control API allows a developer to access embedded devices and easily control brightness.

**Backlight**

The Backlight API allows a developer to control the backlight (screen) on/off in embedded devices.

#### 4.2.1.3 Monitor

**Watchdog**

A watchdog timer (WDT) is a device that performs a specific operation after a certain period of time if something goes wrong and the system does not recover on its own. A watchdog timer can be programmed to perform a warm boot (restarting the system) after a certain number of seconds.

**Hardware Monitor**

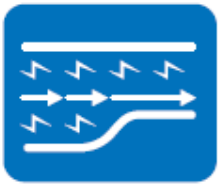
The Hardware Monitor (HWM) API is a system health supervision API that inspects certain condition indexes, such as fan speed, temperature and voltage.

#### 4.2.1.4 Power Saving

**CPU Speed**

This makes use of Intel SpeedStep® technology to save power consumption. The system will automatically adjust the CPU speed depending on the system loading.

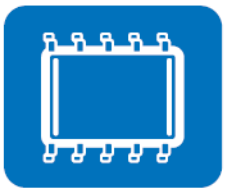
**System Throttling**



This refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

## 4.2.2 Software Utility

**BIOS Flash**



The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up the current BIOS by copying it from the flash chip to a file on the customers' disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

**Monitoring**

The monitoring utility is a utility for customers to monitor system health in areas such as voltage, CPU and system temperature, and fan speed. These items are important to a device; if critical errors occur and are not solved immediately, permanent damage may be caused.

# Chapter 5

## Chipset Software Installation Utility

## 5.1 Before You Begin

To ensure problem-free installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for AIMB-508 can be downloaded from the Advantech website. Updates are provided via Microsoft service packs.

## 5.2 Introduction

The Intel® Chipset Software Installation (CSI) utility installs the Windows INF files that outline to the operating system how the chipset components will be configured. This is needed for the proper functioning of the following features:

- Serial ATA interface support
- USB 2.0/3.1 support
- Identification of Intel® chipset components in the Device Manager

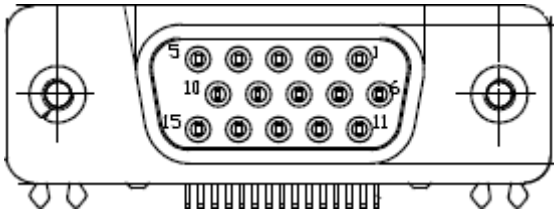
***Note!*** *This utility is used for the following versions of Windows, and it has to be installed before installing all the other drivers:*

- *Windows 10 (64-bit)*

# Appendix A

## Pin Assignments

# A.1 D-Sub Connector (VGA1)




| Table A.1: D-Sub Connector (VGA1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | RED | 9 | VCC (+5V) |
| 2 | GREEN | 10 | GND |
| 3 | BLUE | 11 | NC |
| 4 | NC | 12 | DDC DAT |
| 5 | GND | 13 | HSYNC |
| 6 | Advantech define | 14 | VSYNC |
| 7 | GND | 15 | DDC CLK |
| 8 | GND | | |

## A.2 DisplayPort + HDMI Connector (DP1+HDMI1)

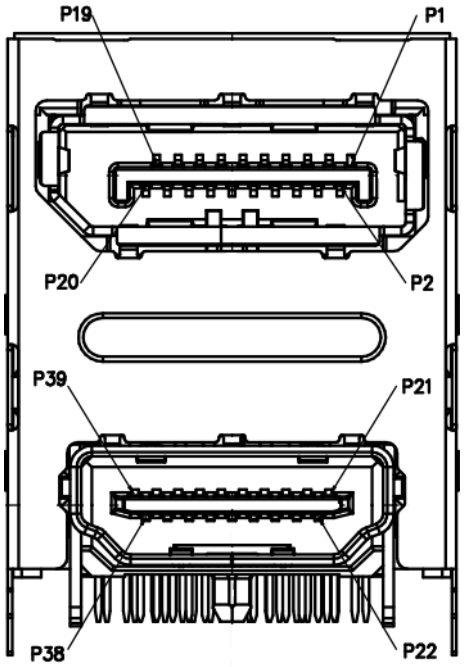
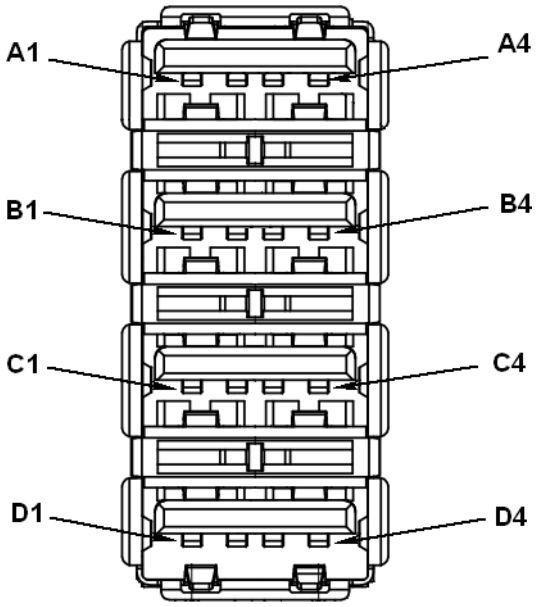



**Table A.2: DisplayPort + HDMI Connector (DP1+HDMI1)**

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| P1 | ML_Lane 0+ | P21 | TMDS Data2+ |
| P2 | GND | P22 | GND |
| P3 | ML_Lane 0- | P23 | TMDS Data2- |
| P4 | ML_Lane 1+ | P24 | TMDS Data1+ |
| P5 | GND | P25 | GND |
| P6 | ML_Lane 1- | P26 | TMDS Data1- |
| P7 | ML_Lane 2+ | P27 | TMDS Data0+ |
| P8 | GND | P28 | GND |
| P9 | ML_Lane 2- | P29 | TMDS Data0- |
| P10 | ML_Lane 3+ | P30 | TMDS Clock+ |
| P11 | GND | P31 | GND |
| P12 | ML_Lane 3- | P32 | TMDS Clock- |
| P13 | AUX_EN# | P33 | NC |
| P14 | GND | P34 | NC |
| P15 | AUX+ | P35 | SCL |
| P16 | GND | P36 | SDA |
| P17 | AUX- | P37 | GND |
| P18 | HPD | P38 | HDMI_PWR |
| P19 | GND | P39 | HPD |
| P20 | DP_PWR | | |

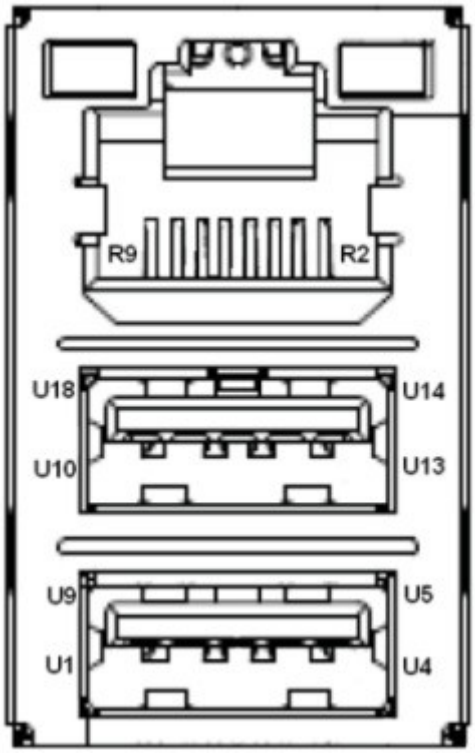
# A.3 Universal Serial Bus Port 5/6/7/8 (USB5678)




| Table A.3: | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| A1 | VBUS | B1 | VBUS |
| A2 | D- | B2 | D- |
| A3 | D+ | B3 | D+ |
| A4 | GND | B4 | GND |

| Table A.4: | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| C1 | VBUS | D1 | VBUS |
| AC | D- | D2 | D- |
| C3 | D+ | D3 | D+ |
| C4 | GND | D4 | GND |

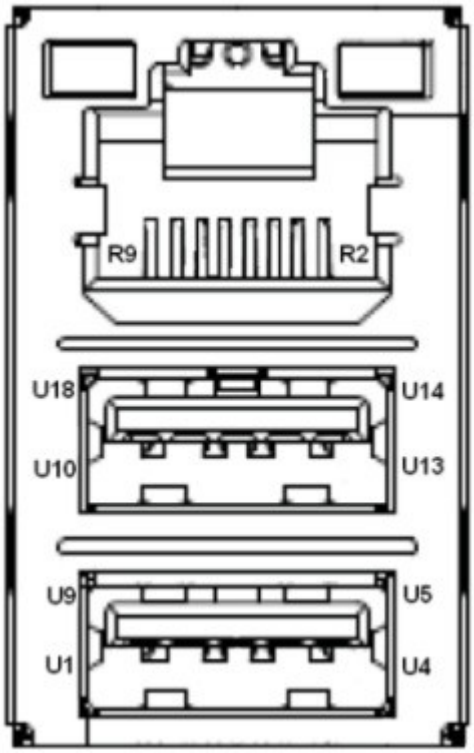
## A.4 RJ-45 + USB 3.2 Gen1 Stack Connector (LAN1_USB12)




| Table A.5: | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| U1 | VBUS | U10 | VBUS |
| U2 | D- | U11 | D- |
| U3 | D+ | U12 | D+ |
| U4 | GND | U13 | GND |
| U5 | RX- | U14 | RX- |
| U6 | RX+ | U15 | RX+ |
| U7 | GND | U16 | GND |
| U8 | TX- | U17 | TX- |
| U9 | TX+ | U18 | TX+ |

| Table A.6: | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| R2 | MDI_0+ | R6 | MDI_2+ |
| R3 | MDI_0- | R7 | MDI_2- |
| R4 | MDI_1+ | R8 | MDI_3+ |
| R5 | MDI_1- | R9 | MDI_3- |

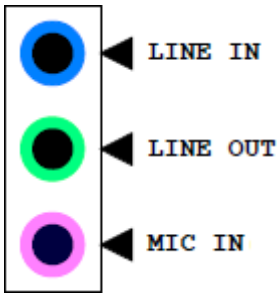
## A.5 RJ-45 + USB 3.2 Gen1 Stack Connector (LAN2_USB34)




| Table A.7: | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| U1 | VBUS | U10 | VBUS |
| U2 | D- | U11 | D- |
| U3 | D+ | U12 | D+ |
| U4 | GND | U13 | GND |
| U5 | RX- | U14 | RX- |
| U6 | RX+ | U15 | RX+ |
| U7 | GND | U16 | GND |
| U8 | TX- | U17 | TX- |
| U9 | TX+ | U18 | TX+ |

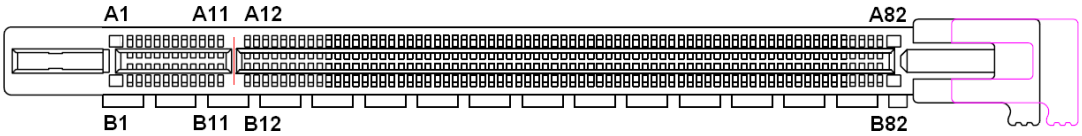
| Table A.8: | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| R2 | MDI_0+ | R6 | MDI_2+ |
| R3 | MDI_0- | R7 | MDI_2- |
| R4 | MDI_1+ | R8 | MDI_3+ |
| R5 | MDI_1- | R9 | MDI_3- |

## A.6 HD Audio Interface (AUDIO1)




| Table A.9: HD Audio Interface (AUDIO1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | MIC IN |
| 2 | LINE OUT |
| 3 | LINE IN |

## A.7 PCI Express x16 Slot (PCIEX16_1)

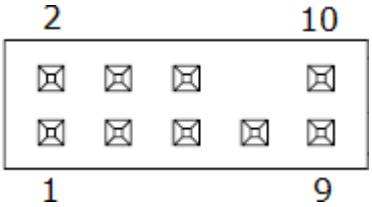



| Table A.10: PCI Express x16 Slot (PCIEX16_1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| B1 | +12V | A1 | PRSNT1# |
| B2 | +12V | A2 | +12V |
| B3 | +12V | A3 | +12V |
| B4 | GND | A4 | GND |
| B5 | SMB_CLK | A5 | Reserved |
| B6 | SMB_DATA | A6 | Reserved |
| B7 | GND | A7 | Reserved |
| B8 | +3.3V | A8 | Reserved |
| B9 | Reserved | A9 | +3.3V |
| B10 | +3.3VAUX | A10 | +3.3V |
| B11 | WAKE# | A11 | PWRGD |
| B12 | Reserved | A12 | GND |
| B13 | GND | A13 | REFCLK+ |
| B14 | TX0+ | A14 | REFCLK- |
| B15 | TX0- | A15 | GND |
| B16 | GND | A16 | RX0+ |
| B17 | Reserved | A17 | RX0- |
| B18 | DETECT# | A18 | GND |
| B19 | TX1+ | A19 | Advantech defined |
| B20 | TX1- | A20 | GND |

| Table A.10: PCI Express x16 Slot (PCIEX16_1) | | | |
|---|---|---|---|
| B21 | GND | A21 | RX1+ |
| B22 | GND | A22 | RX1- |
| B23 | TX2+ | A23 | GND |
| B24 | TX2- | A24 | GND |
| B25 | GND | A25 | RX2+ |
| B26 | GND | A26 | RX2- |
| B27 | TX3+ | A27 | GND |
| B28 | TX3- | A28 | GND |
| B29 | GND | A29 | RX3+ |
| B30 | Reserved | A30 | RX3- |
| B31 | Reserved | A31 | GND |
| B32 | GND | A32 | Advantech defined |
| B33 | TX4+ | A33 | Reserved |
| B34 | TX4- | A34 | GND |
| B35 | GND | A35 | RX4+ |
| B36 | GND | A36 | RX4- |
| B37 | TX5+ | A37 | GND |
| B38 | TX5- | A38 | GND |
| B39 | GND | A39 | RX5+ |
| B40 | GND | A40 | RX5- |
| B41 | TX6+ | A41 | GND |
| B42 | TX6- | A42 | GND |
| B43 | GND | A43 | RX6+ |
| B44 | GND | A44 | RX6- |
| B45 | TX7+ | A45 | GND |
| B46 | TX7- | A46 | GND |
| B47 | GND | A47 | RX7+ |
| B48 | Reserved | A48 | RX7- |
| B49 | GND | A49 | GND |
| B50 | TX8+ | A50 | Reserved |
| B51 | TX8- | A51 | GND |
| B52 | GND | A52 | RX8+ |
| B53 | GND | A53 | RX8- |
| B54 | TX9+ | A54 | GND |
| B55 | TX9- | A55 | GND |
| B56 | GND | A56 | RX9+ |
| B57 | GND | A57 | RX9- |
| B58 | TX10+ | A58 | GND |
| B59 | TX10- | A59 | GND |
| B60 | GND | A60 | RX10+ |
| B61 | GND | A61 | RX10- |
| B62 | TX11+ | A62 | GND |
| B63 | TX11- | A63 | GND |
| B64 | GND | A64 | RX11+ |
| B65 | GND | A65 | RX11- |
| B66 | TX12+ | A66 | GND |
| B67 | TX12- | A67 | GND |

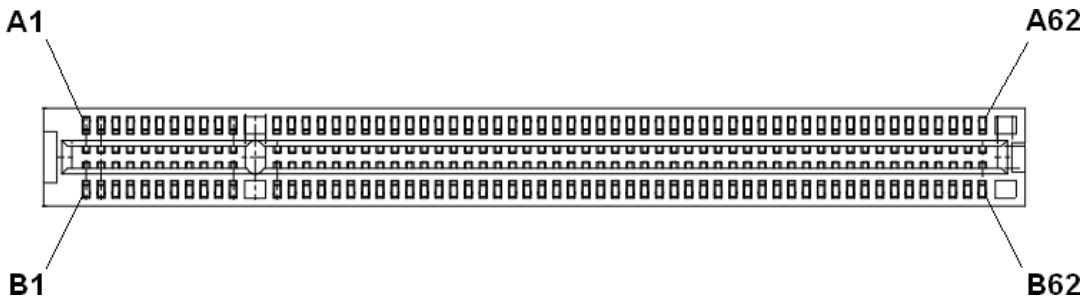
| Table A.10: PCI Express x16 Slot (PCIEX16_1) | | | |
|---|---|---|---|
| B68 | GND | A68 | RX12+ |
| B69 | GND | A69 | RX12- |
| B70 | TX13+ | A70 | GND |
| B71 | TX13- | A71 | GND |
| B72 | GND | A72 | RX13+ |
| B73 | GND | A73 | RX13- |
| B74 | TX14+ | A74 | GND |
| B75 | TX14- | A75 | GND |
| B76 | GND | A76 | RX14+ |
| B77 | GND | A77 | RX14- |
| B78 | TX15+ | A78 | GND |
| B79 | TX15- | A79 | GND |
| B80 | GND | A80 | RX15+ |
| B81 | Reserved | A81 | RX15- |
| B82 | Reserved | A82 | GND |

## A.8 Front Panel Audio Header (FPAUD1)




| Table A.11: Front Panel Audio Header (FPAUD1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | MIC IN-L | 2 | GND |
| 3 | MIC IN-R | 4 | FPAUD_DETECT# |
| 5 | LINE OUT-R | 6 | SENSE R1 |
| 7 | SENSE | 8 | KEY |
| 9 | LINE OUT-L | 10 | SENSE R2 |

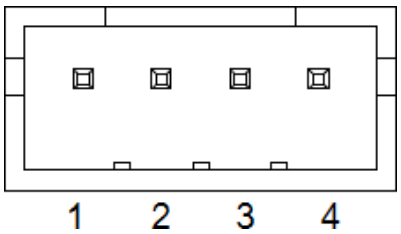
# A.9 PCI Slot (PCI1/PCI2)




| Table A.12: PCI Slot (PCI1/PCI2) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| A1 | TRST# | B1 | -12V |
| A2 | +12V | B2 | TCK |
| A3 | TMS | B3 | GND |
| A4 | TDI | B4 | NC |
| A5 | +5V | B5 | +5V |
| A6 | INT#A | B6 | +5V |
| A7 | INT#C | B7 | INT#B |
| A8 | +5V | B8 | INT#D |
| A9 | GNT#1 | B9 | CLK33M_PCI2 |
| A10 | +5V | B10 | REQ#1 |
| A11 | GNT#2 | B11 | CLK33M_PCI3 |
| A12 | GND | B12 | GND |
| A13 | GND | B13 | GND |
| A14 | +3.3V_AUX | B14 | REQ#2 |
| A15 | RST# | B15 | GND |
| A16 | +5V | B16 | CLK33M_PCI1 |
| A17 | GNT#0 | B17 | GND |
| A18 | GND | B18 | REQ#0 |
| A19 | PME# | B19 | +5V |
| A20 | AD30 | B20 | AD31 |
| A21 | +3.3V | B21 | AD29 |
| A22 | AD28 | B22 | GND |
| A23 | AD26 | B23 | AD27 |
| A24 | GND | B24 | AD25 |
| A25 | AD24 | B25 | +3.3V |
| A26 | AD16 | B26 | CBE#3 |
| A27 | +3.3V | B27 | AD23 |
| A28 | AD22 | B28 | GND |
| A29 | AD20 | B29 | AD21 |
| A30 | GND | B30 | AD19 |
| A31 | AD18 | B31 | +3.3V |
| A32 | AD16 | B32 | AD17 |
| A33 | +3.3V | B33 | CBE#2 |
| A34 | FRAME# | B34 | GND |
| A35 | GND | B35 | IRDY# |

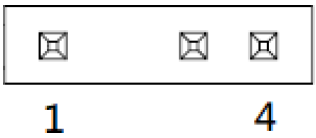
| Table A.12: PCI Slot (PCI1/PCI2) | | | |
|---|---|---|---|
| A36 | TRDY# | B36 | +3.3V |
| A37 | GND | B37 | DEVSEL# |
| A38 | STOP# | B38 | GND |
| A39 | +3.3V | B39 | LOCK# |
| A40 | SMB_CLK | B40 | PERR# |
| A41 | SMB_DAT | B41 | +3.3V |
| A42 | GND | B42 | SERR# |
| A43 | PAR | B43 | +3.3V |
| A44 | AD15 | B44 | CBE#1 |
| A45 | +3.3V | B45 | AD14 |
| A46 | AD13 | B46 | GND |
| A47 | AD11 | B47 | AD12 |
| A48 | GND | B48 | AD10 |
| A49 | AD9 | B49 | GND |
| A52 | CBE#0 | B52 | AD8 |
| A53 | +3.3V | B53 | AD7 |
| A54 | AD6 | B54 | +3.3V |
| A55 | AD4 | B55 | AD5 |
| A56 | GND | B56 | AD3 |
| A57 | AD2 | B57 | GND |
| A58 | AD0 | B58 | AD1 |
| A59 | +5V | B59 | +5V |
| A60 | REQ64#_PCI1 | B60 | ACK64# |
| A61 | +5V | B61 | +5V |
| A62 | +5V | B62 | +5V |

## A.10 Audio Amplifier Output Pin Header (AMP1)



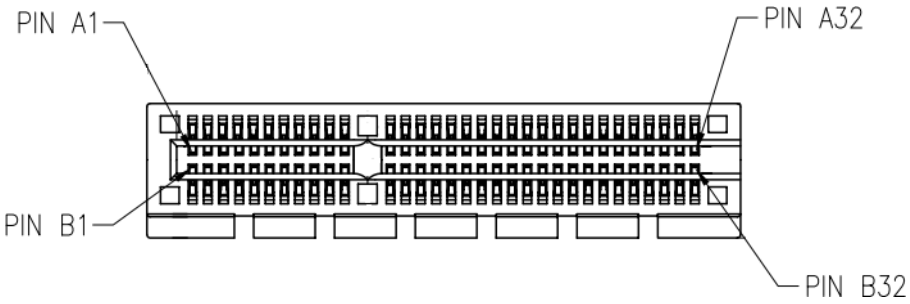

| Table A.13: Audio Amplifier Output Pin Header (AMP1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | AMP OUT – R+ |
| 2 | AMP OUT – R- |
| 3 | AMP OUT – L- |
| 4 | AMP OUT – L+ |

## A.11 HD Audio Interface (SPDIF1)




| Table A.14: HD Audio Interface (SPDIF1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | +5V |
| 2 | KEY |
| 3 | SPDIF OUT |
| 4 | GND |

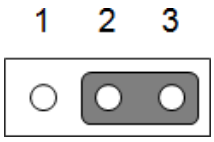
## A.12 PCI Express x1 Slot (PCIEX1_1)




| Table A.15: PCI Express x1 Slot (PCIEX1_1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| A1 | PRSNT1# | B1 | +12V |
| A2 | +12V | B2 | +12V |
| A3 | +12V | B3 | +12V |
| A4 | GND | B4 | GND |
| A5 | RSVD | B5 | SMB_CLK |
| A6 | RSVD | B6 | SMB_DAT |
| A7 | NC | B7 | GND |
| A8 | RSVD | B8 | +3.3V |
| A9 | +3.3V | B9 | RSVD |
| A10 | +3.3V | B10 | +3.3V_AUX |
| A11 | PWRGD | B11 | WAKE# |
| A12 | GND | B12 | NC |
| A13 | REFCLK+ | B13 | GND |
| A14 | REFCLK- | B14 | TX0+ |
| A15 | GND | B15 | TX0- |
| A16 | RX0+ | B16 | GND |
| A17 | RX0- | B17 | NC |
| A18 | GND | B18 | GND |
| A19 | NC | B19 | NC |

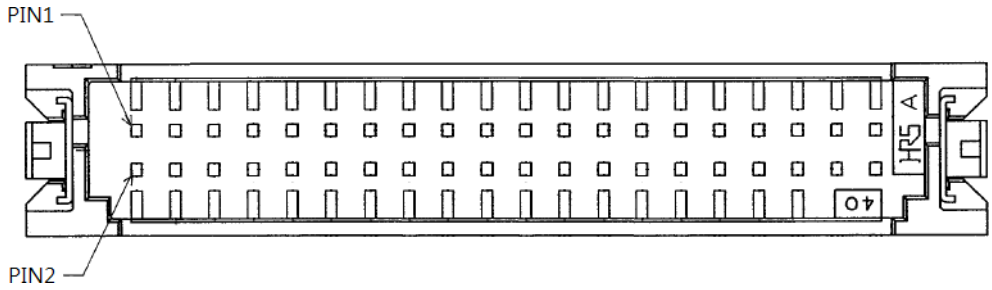
| Table A.15: PCI Express x1 Slot (PCIEX1_1) | | | |
|---|---|---|---|
| A20 | NC | B20 | NC |
| A21 | NC | B21 | NC |
| A22 | NC | B22 | NC |
| A23 | NC | B23 | NC |
| A24 | NC | B24 | NC |
| A25 | NC | B25 | NC |
| A26 | NC | B26 | NC |
| A27 | NC | B27 | NC |
| A28 | NC | B28 | NC |
| A29 | NC | B29 | NC |
| A30 | NC | B30 | NC |
| A31 | NC | B31 | NC |
| A32 | NC | B32 | NC |

## A.13 LVDS VESA, JEIDA Format Selection Pin Header (JLVDS_VCON1)




| Table A.16: LVDS VESA, JEIDA Format Selection Pin Header (JLVDS_VCON1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | +3.3V |
| 2 | Advantech define |
| 3 | GND |

# A.14 EDP Connector/LVDS Connector (EDP1_LVDS1)

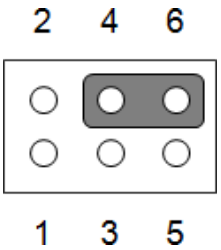



| Table A.17: LVDS1 | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | VDD | 2 | VDD |
| 3 | LVDS DETECT# | 4 | GND |
| 5 | VDD | 6 | VDD |
| 7 | LVDS_OD0- | 8 | LVDS_ED0- |
| 9 | LVDS_OD0+ | 10 | LVDS_ED0+ |
| 11 | GND | 12 | GND |
| 13 | LVDS_OD1- | 14 | LVDS_ED1- |
| 15 | LVDS_OD1+ | 16 | LVDS_ED1+ |
| 17 | GND | 18 | GND |
| 19 | LVDS_OD2- | 20 | LVDS_ED2- |
| 21 | LVDS_OD2+ | 22 | LVDS_ED2+ |
| 23 | GND | 24 | GND |
| 25 | LVDS_OCK- | 26 | LVDS_ECK- |
| 27 | LVDS_OCK+ | 28 | LVDS_ECK+ |
| 29 | GND | 30 | GND |
| 31 | N.C | 32 | N.C |
| 33 | GND | 34 | GND |
| 35 | LVDS_OD3- | 36 | LVDS_ED3- |
| 37 | LVDS_OD3+ | 38 | LVDS_ED3+ |
| 39 | LVDS ENBKL | 40 | LVDS VCON |

| Table A.18: EDP1 | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | VDD | 2 | VDD |
| 3 | LVDS DETECT# | 4 | GND |
| 5 | VDD | 6 | VDD |
| 7 | EDP_TX2- | 8 | N.C |
| 9 | EDP_TX2+ | 10 | N.C |
| 11 | GND | 12 | GND |
| 13 | EDP_TX1- | 14 | N.C |
| 15 | EDP_TX1+ | 16 | N.C |
| 17 | GND | 18 | GND |
| 19 | EDP_TX0- | 20 | N.C |
| 21 | EDP_TX0+ | 22 | N.C |

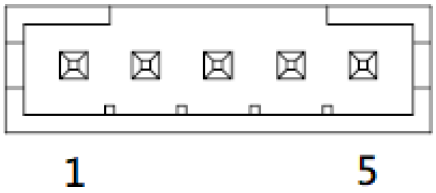
| Table A.18: EDP1 | | | |
|---|---|---|---|
| 23 | GND | 24 | GND |
| 25 | EDP_TX3- | 26 | N.C |
| 27 | EDP_TX3+ | 28 | N.C |
| 29 | GND | 30 | GND |
| 31 | EDP_AUX+ | 32 | EDP_AUX- |
| 33 | GND | 34 | EDP_HPD |
| 35 | N.C | 36 | N.C |
| 37 | N.C | 38 | N.C |
| 39 | N.C | 40 | GND |

## A.15 EDP Panel/LVDS Panel Voltage Selection (JLVDS1)



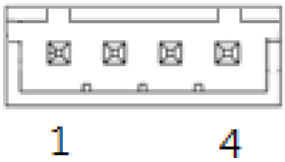

| Table A.19: EDP Panel / LVDS Panel Voltage Selection (JLVDS1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | NC | 2 | +5V |
| 3 | +12V | 4 | VDD |
| 5 | NC | 6 | +3.3V |

## A.16 EDP/LVDS Backlight Inverter Power Connector (INV1)



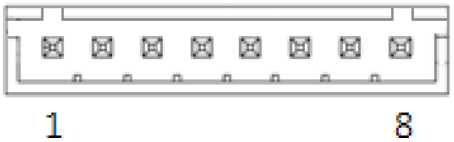

| Table A.20: EDP/LVDS Backlight Inverter Power Connector (INV1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | +12V |
| 2 | GND |
| 3 | BKL EN |
| 4 | BKL CTRL |
| 5 | +5V |

## A.17 SMBUS Connector from PCH (SMBUS1)




| Table A.21: SMBUS Connector from PCH (SMBUS1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | +5VSB |
| 2 | SMB CLK |
| 3 | SMB DAT |
| 4 | GND |

## A.18 Alarm Board / CMM Power Connector (VOLT1)




| Table A.22: Alarm Board / CMM Power Connector (VOLT1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | +5VSB | 5 | +5V |
| 2 | GND | 6 | +3.3V |
| 3 | GND | 7 | -12V |
| 4 | -5V | 8 | +12V |

## A.19 ATX/AT Mode Selection (PSON1)

**Table A.23:**

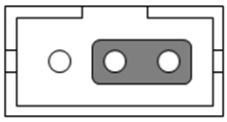
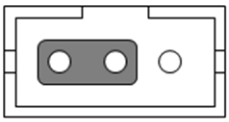
| Function | Jumper Setting |
|---|---|
| ATX Mode (Default) |  1 2 3 |
| AT Mode |  1 2 3 |

**Table A.24:**

| Pin | Signal |
|---|---|
| 1 | AT |
| 2 | +VCC |
| 3 | ATX |

## A.20 Intel® ME Header (JME1)

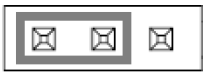
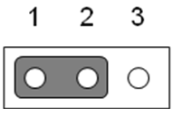
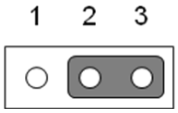



**Table A.25: Intel® ME Header (JME1)**

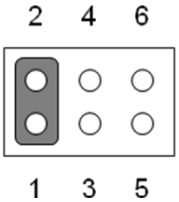
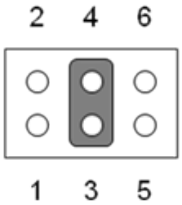
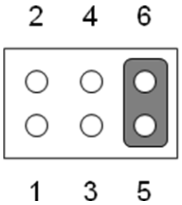
| Pin | Signal |
|---|---|
| 1 | NC |
| 2 | AZA_SDO_R |
| 3 | +V3.3_DUAL |

## A.21 COMS Mode (JCMOS1)

| Table A.26: | |
|---|---|
| **Function** | **Jumper Setting** |
| Keep COMS Data (Default) |  |
| Clear CMOS Data |  |

| Table A.27: | |
|---|---|
| **Pin** | **Signal Pin Definition** |
| 1 | NC |
| 2 | RTC RESET# |
| 3 | GND |

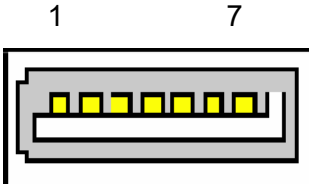
## A.22 COM3 RI# Selection Pin Header (JSETCOM3_V1)

| Table A.28: COM3 RI# Selection Pin Header (JSETCOM3_V1) | |
|---|---|
| **Function** | **Setting** |
| Jumper position for RI# (Default) |  |
| Jumper position for +5V |  |
| Jumper position for +12V |  |

## A.23 CMOS Clear (JCMOS1)

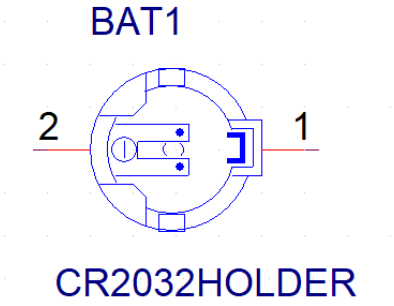
| Table A.29: CMOS Clear (JCMOS1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | NC |
| 2 | RTC_RESET# |
| 3 | GND |

## A.24 Serial ATA Interface Connector (SATA1~4)




| Table A.30: Serial ATA Interface Connector (SATA1~4) | |
|---|---|
| **Pin** | **Signal** |
| 1 | GND |
| 2 | TX+ |
| 3 | TX- |
| 4 | GND |
| 5 | RX- |
| 6 | RX+ |
| 7 | GND |

## A.25 Coin Battery Connector (BAT1)




| Table A.31: Coin Battery Connector (BAT1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | VBAT |
| 2 | GND |

## A.26 Power LED Pin Header (JFP2)

| Table A.32: Power LED Pin Header (JFP2) | |
|---|---|
| **Pin** | **Signal** |
| 1 | LED_PWR |
| 2 | NC |
| 3 | SUSLED |
| 4 | NC |
| 5 | GND |

## A.27 Watchdog Timer Output and OBS Beep (JOBS1+JWDT1)

**Table A.33:**

| Function | Setting |
|---|---|
| Watchdog Timer Output(2-3) (Default)<br>OBS BEEP(4-5) (Default) | |
| Watchdog Timer Disable(1-2)<br>OBS BEEP(4-5) (Default) | |

**Table A.34:**

| Pin | Signal |
|---|---|
| 1 | NC |
| 2 | Watch Dog Reset# output |
| 3 | System Reset input# |
| 4 | SIO Warning Beep output |
| 5 | SP1 Buzzer Beep input |

## A.28 Power Switch / HDD LED / SMBUS / Speaker Pin Header (JFP1)

**Table A.35:**

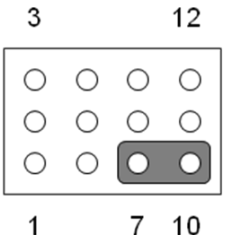
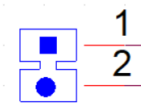
| Function | Jumper Setting |
|---|---|
| Internal Buzzer (Default) |   |

**Table A.36:**

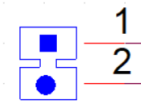
| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | +5V | 2 | HDD LED+ |
| 3 | Power Button+ | 4 | SPK_P2 |
| 5 | HDD LED- | 6 | Power Button- |
| 7 | SPK_P3 | 8 | SMB_DATA |
| 9 | System Reset+ | 10 | SPK_P4 |
| 11 | SMB_CLK | 12 | System Reset- |

## A.29 Extended Power Button Pin Header (JFP3)



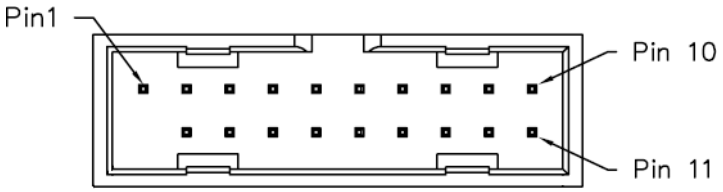

| Table A.37: Power Button Pin Header (JFP3) | |
|---|---|
| **Pin** | **Signal** |
| 1 | Power Button+ |
| 2 | GND |

## A.30 Extended Power LED Pin Header (JFP4)



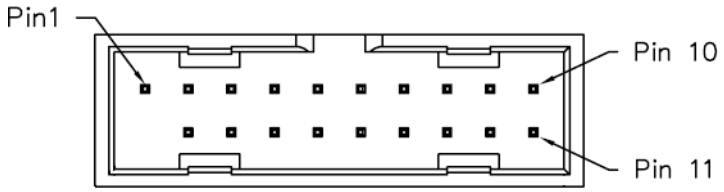

| Table A.38: Power LED Pin Header (JFP4) | |
|---|---|
| **Pin** | **Signal** |
| 1 | LED_PWR |
| 2 | SUSLED |

## A.31 Universal Serial Bus 3.0 Port 11/12 (USB1112)



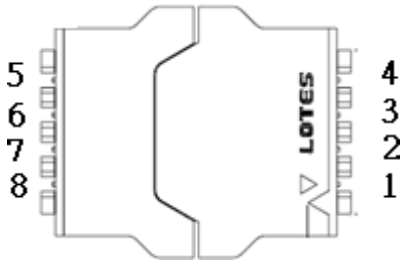

| Table A.39: Universal Serial Bus 3.0 Port 11/12 (USB1112) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | +5V_USB | 11 | D+ |
| 2 | RX- | 12 | D- |
| 3 | RX+ | 13 | GND |
| 4 | GND | 14 | TX+ |
| 5 | TX- | 15 | TX- |
| 6 | TX+ | 16 | GND |
| 7 | GND | 17 | RX+ |
| 8 | D- | 18 | RX- |
| 9 | D+ | 19 | +5V_USB |
| 10 | NC | | |

## A.32 Universal Serial Bus 3.0 Port 13/14 (USB1314)



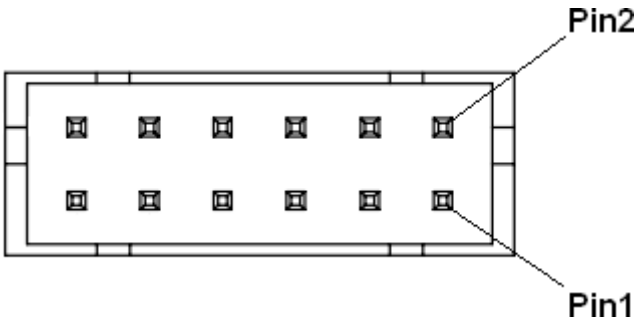

| Table A.40: Universal Serial Bus 3.0 Port 13/14 (USB1314) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | +5V_USB | 11 | D+ |
| 2 | RX- | 12 | D- |
| 3 | RX+ | 13 | GND |
| 4 | GND | 14 | TX+ |
| 5 | TX- | 15 | TX- |
| 6 | TX+ | 16 | GND |
| 7 | GND | 17 | RX+ |
| 8 | D- | 18 | RX- |
| 9 | D+ | 19 | +5V_USB |
| 10 | NC | | |

## A.33 SPI BIOS Flash Socket1 (SPI1)



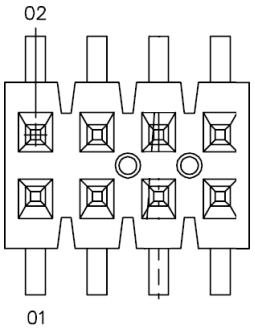

| Table A.41: SPI BIOS Flash Socket1 (SPI1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | CS# | 5 | MOSI |
| 2 | MISO | 6 | SCLK |
| 3 | WP# / IO2 | 7 | HOLD# / IO3 |
| 4 | GND | 8 | +V3.3_SPI |

## A.34 SPI TPM Module Connector (For Optional TPM Module) (SPI_TPM1)



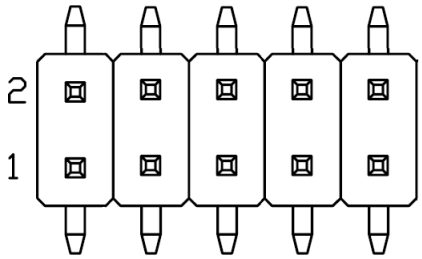

| Table A.42: SPI TPM Module Connector (For Optional TPM Module) (SPI_TPM1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | CS# | 2 | RSVD |
| 3 | SCLK | 4 | GND |
| 5 | MOSI | 6 | GND |
| 7 | MISO | 8 | NC |
| 9 | IRQ# | 10 | GND |
| 11 | PWRGD | 12 | +3.3V_AUX |

## A.35 SPI Pin Header (SPI_CN1)



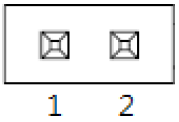

| Table A.43: SPI Pin Header (SPI_CN1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | +3.3V_AUX | 2 | GND |
| 3 | CS# | 4 | SCLK |
| 5 | MISO | 6 | MOSI |
| | | 8 | NC |

## A.36 Universal Serial Bus 2.0 Port 9/10 (USB910)




| Table A.44: Universal Serial Bus 2.0 Port 9/10 (USB910) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | +5V_USB | 2 | +5V_USB |
| 3 | D- | 4 | D- |
| 5 | D+ | 6 | D+ |
| 7 | GND | 8 | GND |
| 9 | NC | 10 | NC |

## A.37 Case Open Connector (JCASE1)




| Table A.45: Case Open Connector (JCASE1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | Case Open |
| 2 | GND |

# A.38 ATX 24-Pin Power Connector (EATXPWR1)

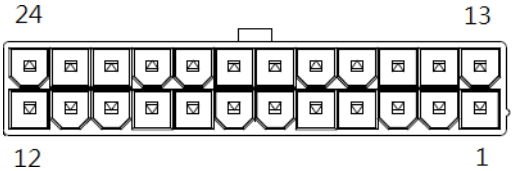



**Table A.46: ATX 24-Pin Power Connector (EATXPWR1)**

| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | +3.3V | 13 | +3.3V |
| 2 | +3.3V | 14 | -12V |
| 3 | GND | 15 | GND |
| 4 | +5V | 16 | PSON# |
| 5 | GND | 17 | GND |
| 6 | +5V | 18 | GND |
| 7 | GND | 19 | GND |
| 8 | PWROK | 20 | -5V |
| 9 | +5VSB | 21 | +5V |
| 10 | +12V | 22 | +5V |
| 11 | +12V | 23 | +5V |
| 12 | +3.3V | 24 | GND |

# A.39 COM 3/4/5/6 Connector, COM 7/8/9/10 Connector (COM3456/COM78910)

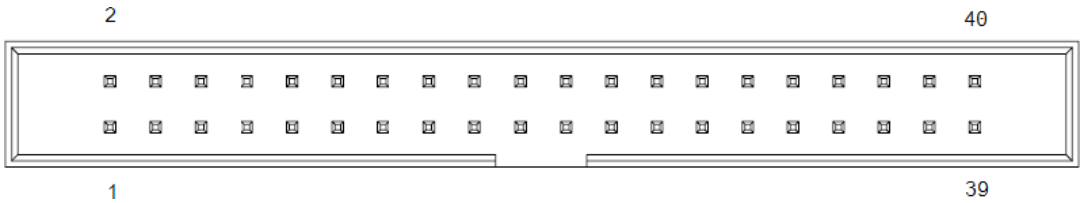
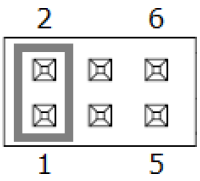



**Table A.47: COM 3/4/5/6 Connector, COM 7/8/9/10 Connector (COM3456/COM78910)**

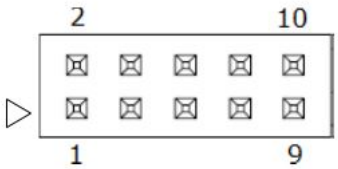
| Pin | Signal | Pin | Signal |
|---|---|---|---|
| 1 | DCD# [3] | 2 | DSR# [3] |
| 3 | RXD [3] | 4 | RST# [3] |
| 5 | TXD [3] | 6 | CTS# [3] |
| 7 | DTR# [3] | 8 | RI# [3] |
| 9 | GND | 10 | GND |
| 11 | DCD# [4] | 12 | DSR# [4] |
| 13 | RXD [4] | 14 | RST# [4] |
| 15 | TXD [4] | 16 | CTS# [4] |
| 17 | DTR# [4] | 18 | RI# [4] |
| 19 | GND | 20 | GND |
| 21 | DCD# [5] | 22 | DSR# [5] |
| 23 | RXD [5] | 24 | RST# [5] |
| 25 | TXD [5] | 26 | CTS# [5] |
| 27 | DTR# [5] | 28 | RI# [5] |
| 29 | GND | 30 | GND |
| 31 | DCD# [6] | 32 | DSR# [6] |
| 33 | RXD [6] | 34 | RST# [6] |
| 35 | TXD [6] | 36 | CTS# [6] |
| 37 | DTR# [6] | 38 | RI# [6] |
| 39 | GND | 40 | GND |

## A.40 COM3 RI# Selection Pin Header (JSETCOM3_V1)



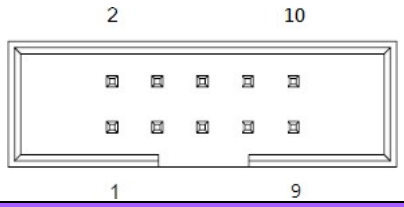

| Table A.48: COM3 RI# Selection Pin Header (JSETCOM3_V1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | RI# [3] | 2 | Advantech define |
| 3 | Advantech define | 4 | +5V |
| 5 | +12V | 6 | Advantech define |

## A.41 8-Bit General Purpose I/O Pin Header (GPIO1)




| Table A.49: 8-Bit General Purpose I/O Pin Header (GPIO1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | GPIO0 | 2 | GPIO4 |
| 3 | GPIO1 | 4 | GPIO5 |
| 5 | GPIO2 | 6 | GPIO6 |
| 7 | GPIO3 | 8 | GPIO7 |
| 9 | VCC_GPIO | 10 | GND |

## A.42 COM2 Connector (COM2)




| Table A.50: COM2 Connector (COM2) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | DCD# [2] | 2 | DSR# [2] |
| 3 | RXD [2] | 4 | RST# [2] |
| 5 | TXD [2] | 6 | CTS# [2] |
| 7 | DTR# [2] | 8 | RI# [2] |
| 9 | GND | | |

## A.43 System Fan #4 Connector (SYSFAN4/ SYSFAN3/ SYSFAN2/SYSFAN1)

**Table A.51: System Fan #4 Connector (SYSFAN4/ SYSFAN3/SYSFAN2/ SYSFAN1)**

| Pin | Signal |
|---|---|
| 1 | GND |
| 2 | SYSTEM FAN VCC |
| 3 | SYSTEM FAN SPEED |
| 4 | SYSTEM FAN PWM |

## A.44 LED Port 80 Connector (LED_P80)

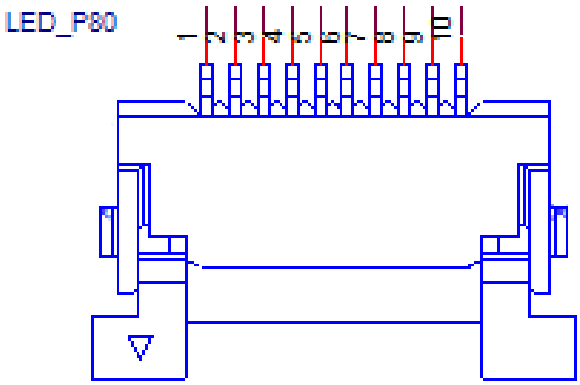
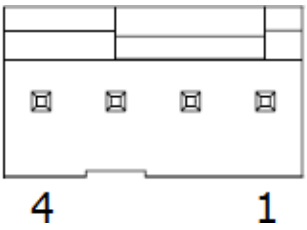



**Table A.52: LED Port 80 Connector (LED_P80)**

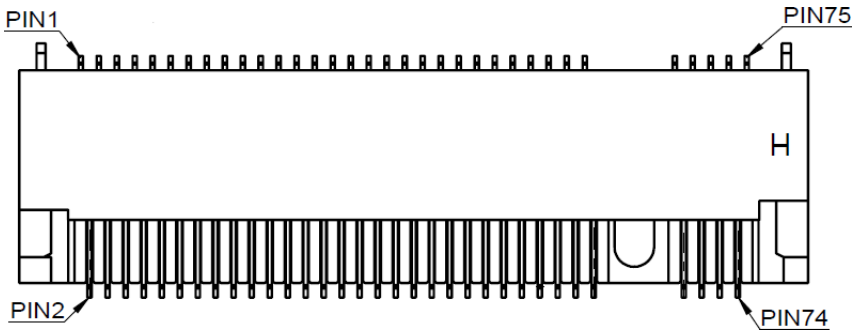
| Pin | Signal |
|---|---|
| 1 | GND |
| 2 | LED_A |
| 3 | LED_B |
| 4 | LED_C |
| 5 | LED_D |
| 6 | LED_E |
| 7 | LED_F |

## A.45 CPU FAN Connector (CPUFAN1)




| Table A.53: CPU FAN Connector (CPUFAN1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | GND |
| 2 | CPU FAN VCC |
| 3 | CPU FAN SPEED |
| 4 | CPU FAN PWM |

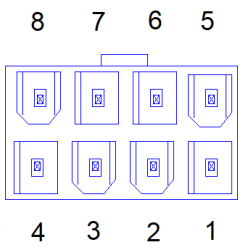
## A.46 M.2 M-Key Connector (M2M1)




| Table A.54: M.2 M-Key Connector (M2M1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | GND | 2 | 3.3V |
| 3 | GND | 4 | 3.3V |
| 5 | NC | 6 | N/C |
| 7 | NC | 8 | N/C |
| 9 | GND | 10 | DAS/DSS# (I/O)/ LED1# |
| 11 | NC | 12 | 3.3V |
| 13 | NC | 14 | 3.3V |
| 15 | GND | 16 | 3.3V |
| 17 | NC | 18 | 3.3V |
| 19 | NC | 20 | N/C |
| 21 | GND | 22 | N/C |
| 23 | NC | 24 | N/C |
| 25 | NC | 26 | N/C |
| 27 | GND | 28 | N/C |
| 29 | PERn1 | 30 | N/C |

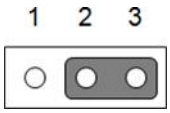
| Table A.54: M.2 M-Key Connector (M2M1) | | | |
|---|---|---|---|
| 31 | PERp1 | 32 | N/C |
| 33 | GND | 34 | N/C |
| 35 | PETn1 | 36 | N/C |
| 37 | PETp1 | 38 | DEVSLP (O) |
| 39 | GND | 40 | N/C |
| 41 | PERn0 | 42 | N/C |
| 43 | PERp0 | 44 | N/C |
| 45 | GND | 46 | N/C |
| 47 | PETn0 | 48 | N/C |
| 49 | PETp0 | 50 | PERST# (O)(0/3.3V) or N/C |
| 51 | GND | 52 | CLKREQ# (I/O)(0/3.3V) or N/C |
| 53 | REFCLKn | 54 | PEWAKE# (I/O)(0/3.3V) or N/C |
| 55 | REFCLKp | 56 | N/C |
| 57 | GND | 58 | N/C |
| 59 | Connector Key | 60 | Connector Key |
| 61 | Connector Key | 62 | Connector Key |
| 63 | Connector Key | 64 | Connector Key |
| 65 | Connector Key | 66 | Connector Key |
| 67 | N/C | 68 | SUSCLK(32kHz)(O)(0/3.3V) |
| 69 | PEDET (NC- | 70 | 3.3V |
| 71 | GND | 72 | 3.3V |
| 73 | GND | 74 | 3.3V |
| 75 | GND | | |

## A.47 ATX 8-Pin Main Power Connector (ATX12V1)



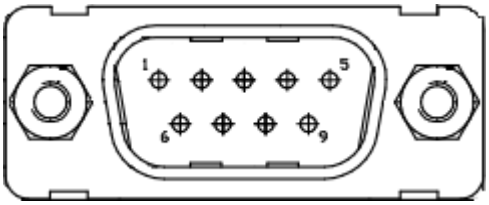

| Table A.55: ATX 8-Pin Main Power Connector (ATX12V1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | GND | 5 | +12V |
| 2 | GND | 6 | +12V |
| 3 | GND | 7 | +12V |

## A.48 VGA1 Force on Pin Header (JFV1)




| Table A.56: VGA1 Force on Pin Header (JFV1) | |
|---|---|
| **Pin** | **Signal** |
| 1 | NC |
| 2 | Advantech define |
| 3 | GND |

## A.49 COM1 Connector (COM1)




| Table A.57: COM1 Connector (COM1) | | | |
|---|---|---|---|
| **Pin** | **Signal** | **Pin** | **Signal** |
| 1 | DCD# [1] | 2 | RXD [1] |
| 3 | TXD [1] | 4 | DTR# [1] |
| 5 | GND | 6 | DSR# [1] |
| 7 | RST# [1] | 8 | CTS# [1] |
| 9 | RI# [1] | | |

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