

AIMB-508

**12th/13th/14th 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**

Copyright

The documentation and the software included with this product are copyrighted 2025 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. The information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties that may result from its use.

Acknowledgments

AMI is a trademark of American Megatrends International, LLC.

IBM and PC are trademarks of International Business Machines Corporation.

Intel® Core™ i9/i7/i5/i3, Pentium®, and Celeron® are trademarks of Intel Corporation.

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

Product Warranty (2 Years)

Advantech warrants the original purchaser that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than repair personnel authorized by Advantech, or products that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced free of charge during the warranty period. For out-of-warranty repairs, customers will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product to be defective, follow the steps outlined below.

1. Collect all the information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any onscreen messages displayed when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order Card, and a proof of purchase date (such as a photocopy of your sales receipt) into a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the package and ship the package prepaid to your dealer.

Part No. 2006050803

Printed in China

Edition 4

April 2025

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

Processor Number	Code Name	Max TDP	Freq (GHz)	Lithography	Smart Cache (L3)	Package Type	Result
i9-14900	Raptor Lake-Refresh	65W	5.8 GHz	Intel 7	36MB	LGA 1700	PASS
i9-14900T	Raptor Lake-Refresh	35W	5.5 GHz	Intel 7	36MB	LGA 1700	PASS
i7-14700	Raptor Lake-Refresh	65W	5.4 GHz	Intel 7	33MB	LGA 1700	PASS
i7-14700T	Raptor Lake-Refresh	35W	5.2 GHz	Intel 7	33MB	LGA 1700	PASS
i5-14500	Raptor Lake-Refresh	65W	5.0 GHz	Intel 7	24MB	LGA 1700	PASS
i5-14500T	Raptor Lake-Refresh	35W	4.8 GHz	Intel 7	24MB	LGA 1700	PASS
i5-14400	Raptor Lake-Refresh	65W	4.7 GHz	Intel 7	20MB	LGA 1700	PASS
i5-14400T	Raptor Lake-Refresh	35W	4.5 GHz	Intel 7	20MB	LGA 1700	PASS
i3-14100	Raptor Lake-Refresh	60W	4.7 GHz	Intel 7	12MB	LGA 1700	PASS
i3-14100T	Raptor Lake-Refresh	35W	4.4 GHz	Intel 7	12MB	LGA 1700	PASS
i9-13900	Raptor Lake	65W	5.6 GHz	Intel 7	36MB	LGA 1700	PASS
i9-13900E	Raptor Lake	65W	5.2 GHz	Intel 7	36MB	LGA 1700	PASS
i9-13900TE	Raptor Lake	35W	5.0 GHz	Intel 7	36MB	LGA 1700	PASS
i7-13700	Raptor Lake	65W	5.2 GHz	Intel 7	30 MB	LGA 1700	PASS
i7-13700E	Raptor Lake	65W	5.1 GHz	Intel 7	30 MB	LGA 1700	PASS
i7-13700TE	Raptor Lake	35W	4.8 GHz	Intel 7	30 MB	LGA 1700	PASS
i5-13500	Raptor Lake	65W	4.8 GHz	Intel 7	24 MB	LGA 1700	PASS
i5-13500E	Raptor Lake	65W	4.6 GHz	Intel 7	24 MB	LGA 1700	PASS
i5-13500TE	Raptor Lake	35W	4.5 GHz	Intel 7	24 MB	LGA 1700	PASS
i5-13400	Raptor Lake	65W	4.8 GHz	Intel 7	20 MB	LGA 1700	PASS
i3-13100	Raptor Lake	60W	4.5 GHz	Intel 7	12 MB	LGA 1700	PASS
i3-13100E	Raptor Lake	60W	4.4 GHz	Intel 7	12MB	LGA 1700	PASS
i3-13100TE	Raptor Lake	35W	4.1 GHz	Intel 7	12MB	LGA 1700	PASS
i9-12900	Alder Lake	65W	5.1 GHz	Intel 7	30MB	LGA 1700	PASS
i9-12900E	Alder Lake	65W	5.0 GHz	Intel 7	30MB	LGA 1700	PASS
i9-12900TE	Alder Lake	35W	4.8 GHz	Intel 7	30MB	LGA 1700	PASS
i7-12700	Alder Lake	65W	4.9 GHz	Intel 7	25MB	LGA 1700	PASS
i7-12700E	Alder Lake	65W	4.8 GHz	Intel 7	25MB	LGA 1700	PASS
i7-12700TE	Alder Lake	35W	4.7 GHz	Intel 7	25MB	LGA 1700	PASS
i5-12500	Alder Lake	65W	4.6 GHz	Intel 7	18MB	LGA 1700	PASS
i5-12500E	Alder Lake	65W	4.5 GHz	Intel 7	18MB	LGA 1700	PASS
i5-12500TE	Alder Lake	35W	4.3 GHz	Intel 7	18MB	LGA 1700	PASS
i5-12400	Alder Lake	65W	4.4 GHz	Intel 7	18MB	LGA 1700	PASS
i3-12100	Alder Lake	60W	4.3 GHz	Intel 7	12MB	LGA 1700	PASS
i3-12100E	Alder Lake	60W	4.2 GHz	Intel 7	12MB	LGA 1700	PASS
i3-12100TE	Alder Lake	35W	4.0 GHz	Intel 7	12MB	LGA 1700	PASS

G7400E	Alder Lake	46W	3.6 GHz	Intel 7	6MB	LGA 1700	PASS
G7400TE	Alder Lake	35W	3.0 GHz	Intel 7	6MB	LGA 1700	PASS
G6900E	Alder Lake	46W	3.0 GHz	Intel 7	4MB	LGA 1700	PASS
G6900TE	Alder Lake	35W	2.4 GHz	Intel 7	4MB	LGA 1700	PASS

Memory Compatibility

Category	Speed	Capacity	Vendor	Module P/N	Chip P/N	Advantech P/N	ECC	Result
DDR4	2400	4GB	Advantech	SQR-UD4N4G2K4HN EAC	H5AN4G8NA FR	SQR-UD4N4G2K4 HNEAC	N	PASS
DDR4	3200	8GB	Advantech	SQR-UD4N8G3K2SN BGB	SEC340 K4A8G08 5WBCWE	SQR-UD4N8G3K2 SNBGB	N	PASS
DDR4	2133	16GB	Advantech	AQD-D4U16N21-SE	SEC 543 K4A8G08 5WB BCPB	AQD-D4U16N21-SE	N	PASS
DDR4	3200	32GB	Advantech	SQR-UD4N32G3K2S NCB	SEC346 K4AAG08 5WCBCWE	SQR-UD4N32G3K 2SNCB	N	PASS
DDR4	2666	16GB	Advantech	SQR-UD4N16G2K6S NCB	SEC 807 K4A8G08 5WC BCTD	SQR-UD4N16G2K 6SNCB	N	PASS
DDR4	3200	16GB	Advantech	SQR-UD4N16G3K2S NGB	SEC346 K4A8G08 5WBCWE	SQR-UD4N16G3K 2SNGB	N	PASS
DDR4	3200	32GB	Advantech	AQD-D4U32GN32-SB2	SEC319 K4A8F08 5WCBCWE	AQD-D4U32GN32-SB2	N	PASS

Ordering Information

P/N	Chipset	Memory (Non-ECC)	USB 3.2 Gen 1	USB 2.0	PCIex16 slot Gen4	PCI slot	PCIex4 slot Gen3	GbE LAN	2.5GbE LAN	DP	HDMI	VGA	eDP/ LVDS	SATA III	COM	M.2 M-key 2280	TPM module	AMP
AIMB-508HF-EAA1	H610E	2 x DDR4	8	6	1	2	1	1	1	1	1	1	1/(1)	4	10	1	*(1)	1
AIMB-508HM-EAA1	H610E	2 x DDR4	4	6	1	2	1	1	1	1	1	1	1/(1)	4	6	1	*(1)	1
AIMB-508HL-OAA1	H610E	2 x DDR4	4	6	1	2	1	1	0	0	0	1	(1)/(1)	4	5	1	*(1)	(1)

() Means BOM option

*Please refer to the 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
- 2 x SATA HDD cables
- 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 Information1

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-508HF/AIMB-508HM Rear I/O	6
	Figure 1.3 AIMB-508HL Rear I/O	6
1.6	AIMB-508 Board Diagram	7
	Figure 1.4 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: CMOS Clear Jumper Pins	8
	Table 1.5: CMOS Clear Jumper	9
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: JFP1 Jumper Pins	10
	Table 1.9: JFP1 Jumper Setting	10
1.8.7	ATX/AT Mode Selection (PSON1)	10
	Table 1.10: PSON1 Jumper Setting	10
	Table 1.11: PSON1 Jumper Pins	10
1.8.8	EDP Panel / LVDS Panel Voltage Selection (JLVDS1)	11
	Table 1.12: JLVDS1 Jumper Pins	11
	Table 1.13: JLVDS1 Jumper Setting	11
1.9	System Memory	11

Chapter 2 Connecting Peripherals13

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 x4 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 UDIMM 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 Settings	90
3.2.4	Security Settings.....	104
3.2.5	Boot Settings	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 Assignments115

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: USB5678	118
	Table A.4: USB5678	118
A.4	RJ-45 + USB 3.2 Gen1 Stack Connector (LAN1_USB12)	119
	Table A.5: LAN1_USB12	119
	Table A.6: LAN1_USB12	119
A.5	RJ-45 + USB 3.2 Gen1 Stack Connector (LAN2_USB34)	120
	Table A.7: LAN2_USB34	120
	Table A.8: LAN2_USB34	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 x4 Slot (PCIEX1_1)	126
	Table A.15: PCI Express x4 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 (JLVDS_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: PSON1 Jumper Setting	131
	Table A.24: PSON1	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: JCMOS1 Jumper Setting	132

	Table A.27:JCMOS1	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:Watchdog Timer Output and OBS Beep Jumper Setting	135
	Table A.34:Watchdog Timer Output and OBS Beep	135
A.28	Power Switch / HDD LED / SMBUS / Speaker Pin Header (JFP1)	135
	Table A.35:Power Switch / HDD LED / SMBUS / Speaker Pin	
	Header Jumper Setting	135
	Table A.36:Power Switch / HDD LED / SMBUS / Speaker Pin	
	Header.....	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 Mod-	
	ule) (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 Gen1, 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/14th Gen Intel® Core™ i9/i7/i5/i3 processor (up to 65W)
- **BIOS:** AMI BIOS UEFI 256 Mbit SPI
- **System chipset:** Intel® H610E

1.3.2 Memory

- **RAM:** Up to 64GB (32GB per DIMM) in 2 slots (288-pin DIMM sockets). There is support for 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 (only PCIe x1 function), 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
- **DisplayPort:** 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/508HM/508HL); LAN2: Intel I226V (508HF/508HM)
- There is support for 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
- **Power requirements:**

Operation	+5V	3.3V	12V	12V_8P
Configuration: Intel® Core™ i9-13900E 24-Core Processor 1.8GHz with UDIMM DDR4 3200 32GB*2pcs	1.85050A	1.26153A	0.61588A	25.49300A
Standby (5Vsb)	3A			

- **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

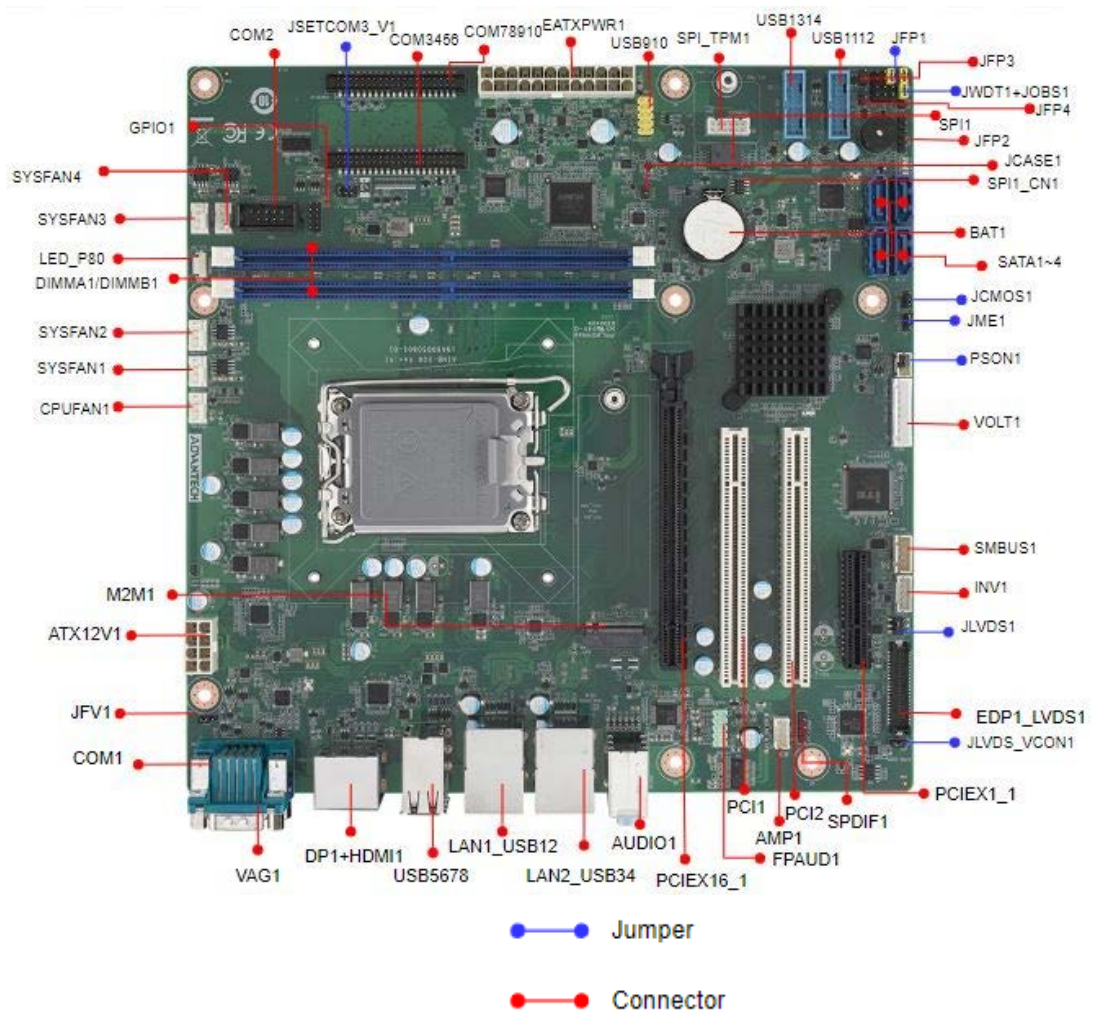


Figure 1.1 Jumper and Connector Locations

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	PSO1
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 x4 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	PSO1
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



AIMB-508HF/AIMB-508HM

Figure 1.2 AIMB-508HF/AIMB-508HM Rear I/O



AIMB-508HL

Figure 1.3 AIMB-508HL Rear I/O

1.6 AIMB-508 Board Diagram

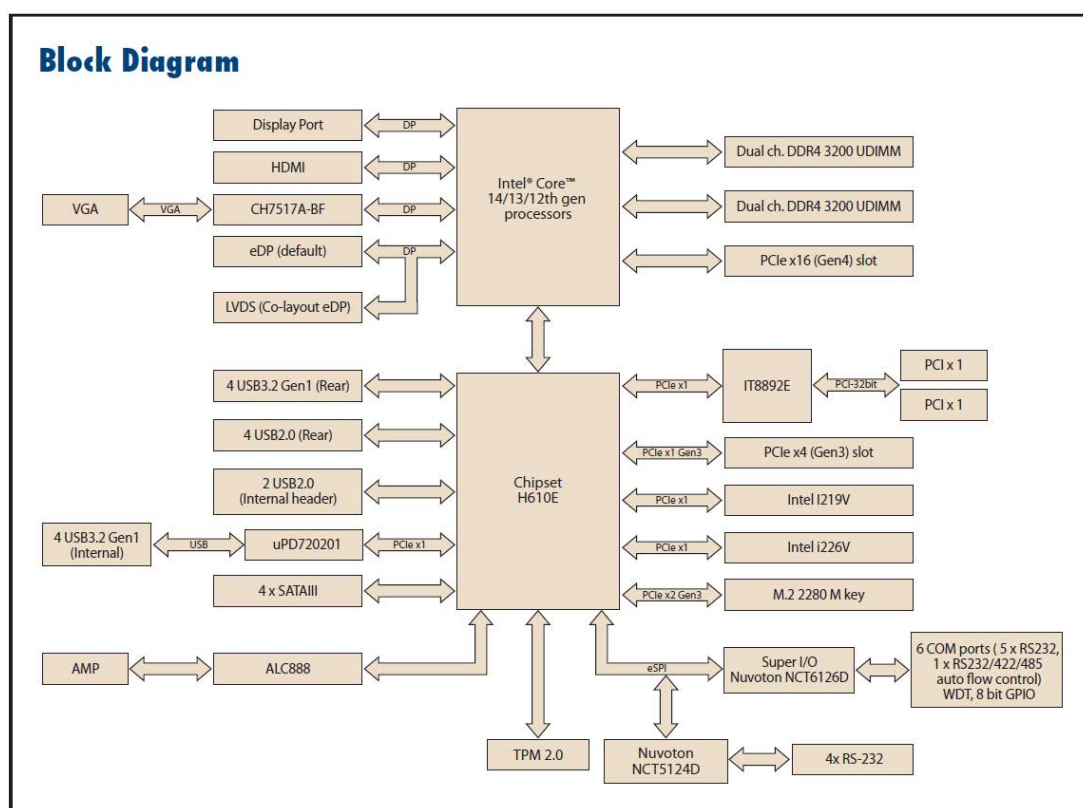


Figure 1.4 AIMB-508 Block Diagram

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 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 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 manufacturer. 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)

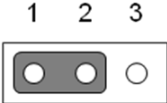
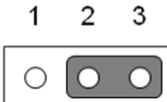
Function	Jumper Setting
Disable Flash Descriptor Security (Default)	1 2 3
Enable Security measures defined in the Flash Descriptor.	1 2 3

1.8.3 CMOS Clear Jumper (JCMOS1)

Table 1.4: CMOS Clear Jumper Pins

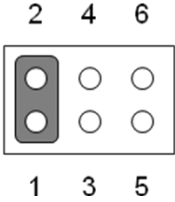
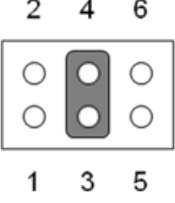
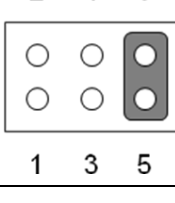
Pin	Signal Pin Definition
1	VBAT
2	RTC RESET#
3	GND

Table 1.5: CMOS Clear Jumper

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)

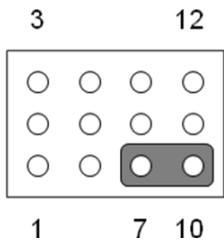
Function	Setting
Watchdog Timer Output (2-3) (Default) OBS BEEP (4-5) (Default)	
Watchdog Timer Disable (1-2) OBS BEEP (4-5) (Default)	

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

Table 1.8: JFP1 Jumper Pins

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: JFP1 Jumper Setting

Function	Jumper Setting
Internal Buzzer (Default)	

1.8.7 ATX/AT Mode Selection (PSON1)

Table 1.10: PSON1 Jumper Setting

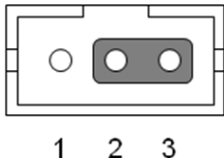
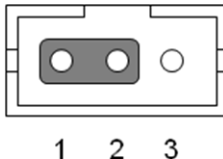
Function	Jumper Setting
ATX Mode (Default)	
AT Mode	

Table 1.11: PSON1 Jumper Pins

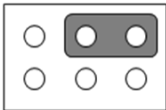
Pin	Signal
1	AT
2	+VCC
3	ATX

1.8.8 EDP Panel / LVDS Panel Voltage Selection (JLVDS1)

Table 1.12: JLVDS1 Jumper Pins

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

Table 1.13: JLVDS1 Jumper Setting

Function	Jumper Setting
	2 4 6
Jumper position for +3.3V (Default)	
	1 3 5

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

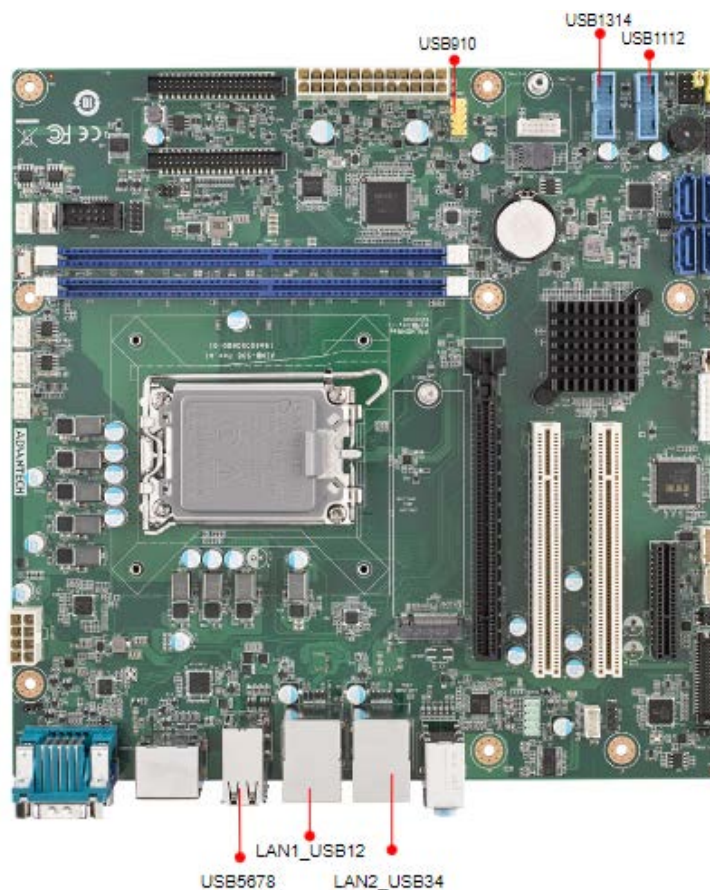
You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

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

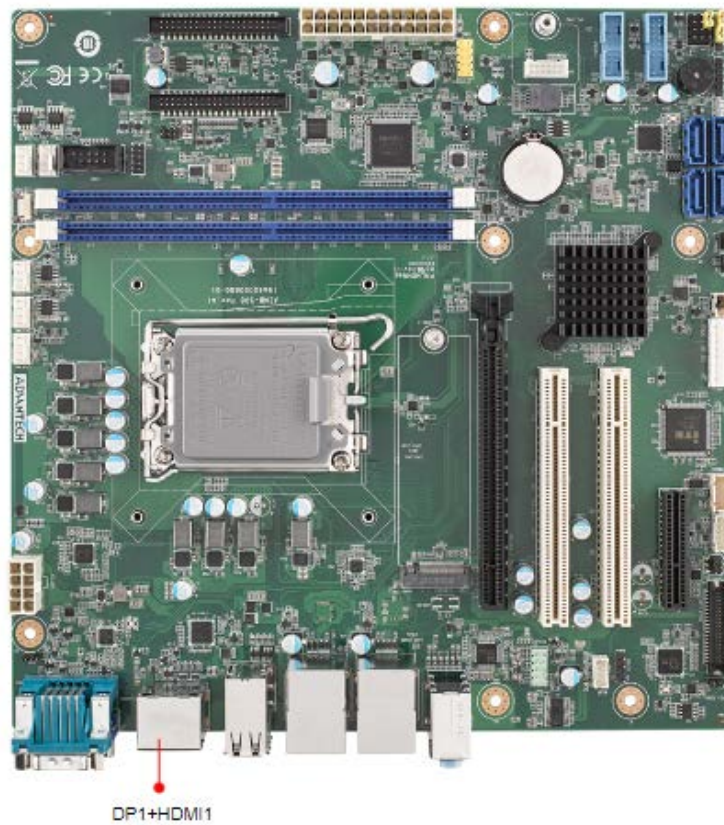
The AIMB-508 provides up to 14 x USB ports (4 x USB 3.2 Gen1, 4 x USB 2.0 on the rear side, 4 x USB 3.2 Gen1 via internal header and 2 x USB 2.0 via vertical connector). The USB interface complies with USB Specification Rev 2.0 supporting transmission rates up to 480Mbps and Rev 3.0 supporting transmission 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)

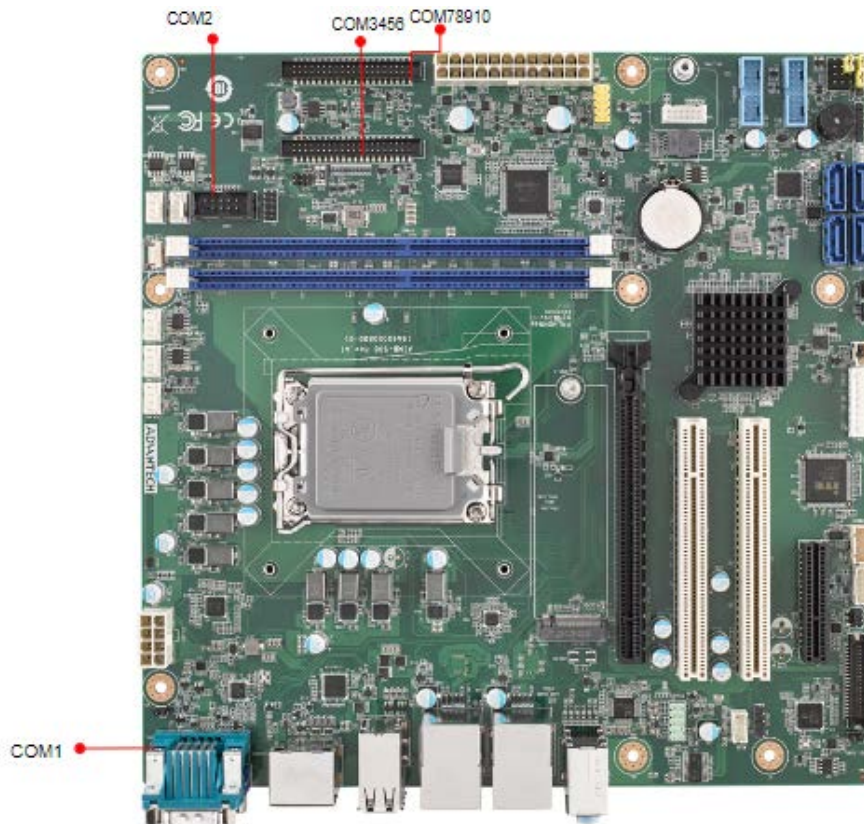


The DP connector has max resolution support of 4096 x 2304 @ 60 Hz.

The HDMI connector has max resolution support of 4096 x 2160 @ 30 Hz.

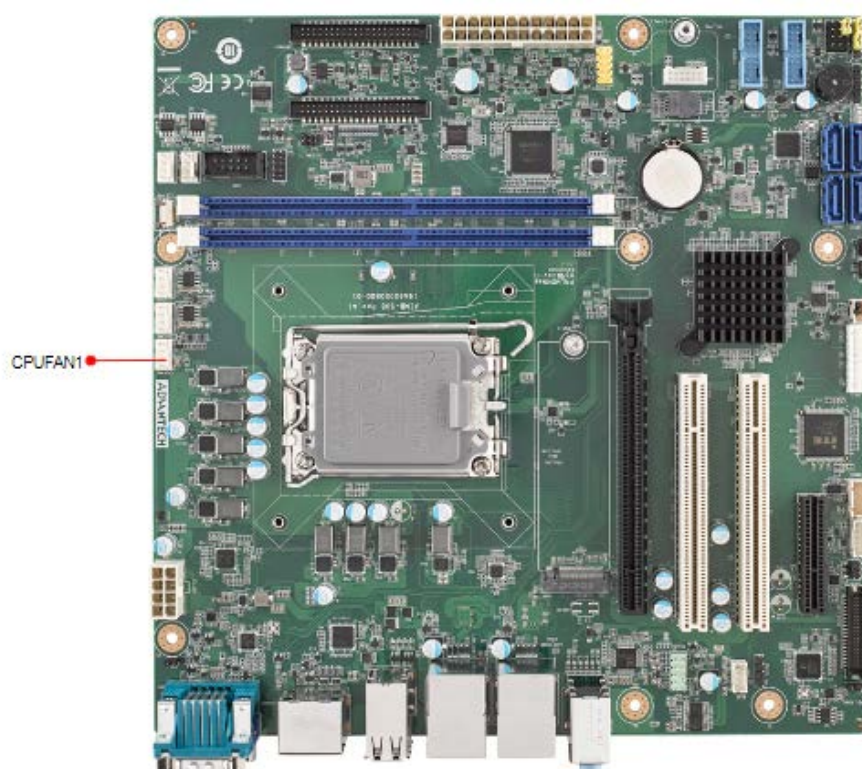
2.4 Serial Ports (COM1/COM2/COM3456/COM78910)

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

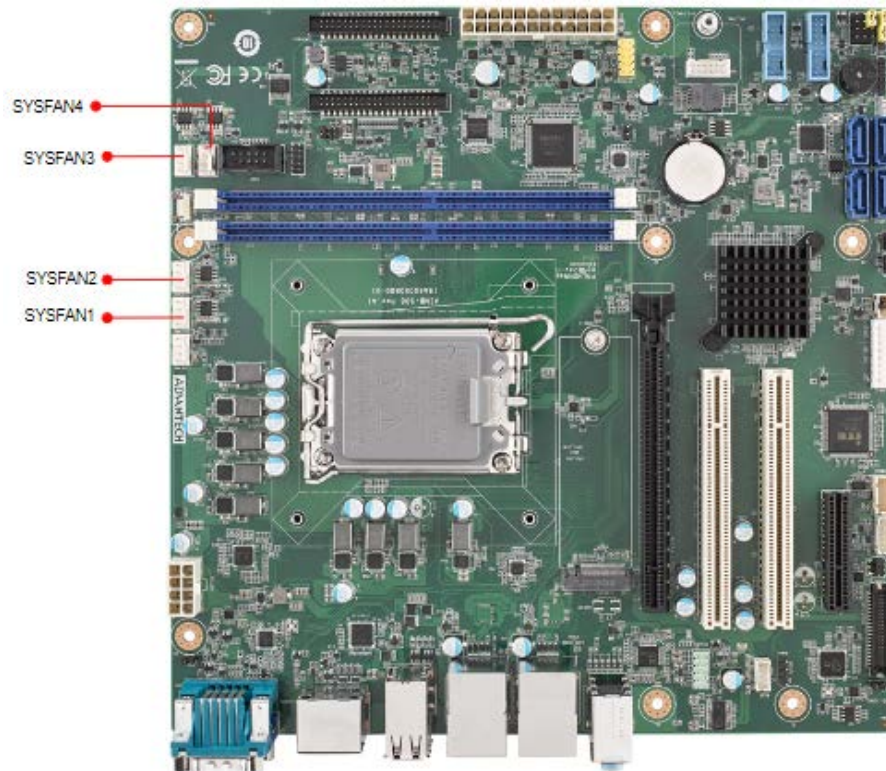


These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

2.5 CPU Fan Connector (CPUFAN1)

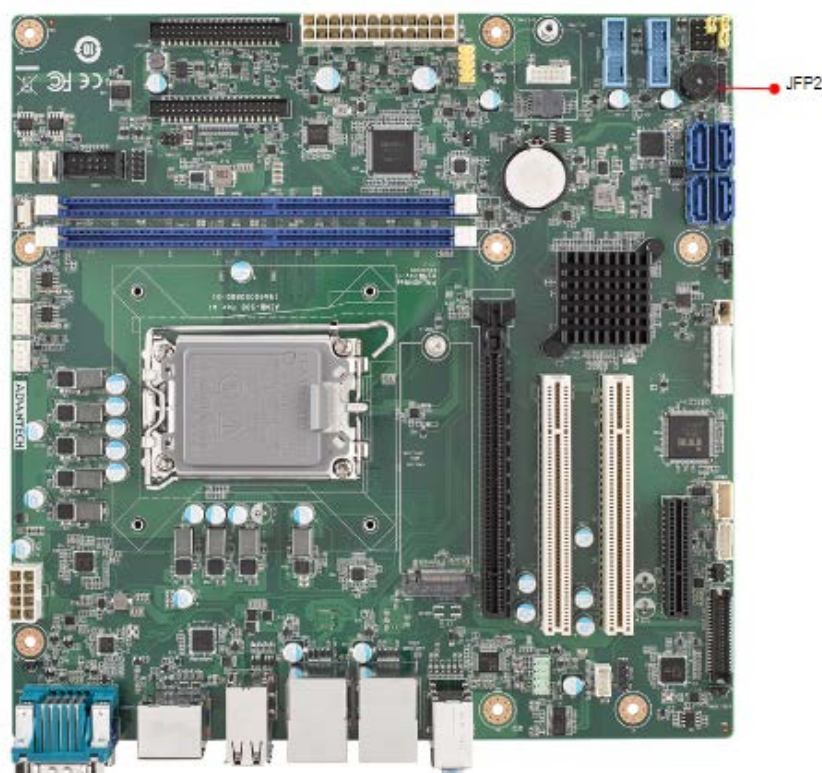


2.6 System FAN Connector (SYSFAN1/SYSFAN2/SYSFAN3/SYSFAN4)

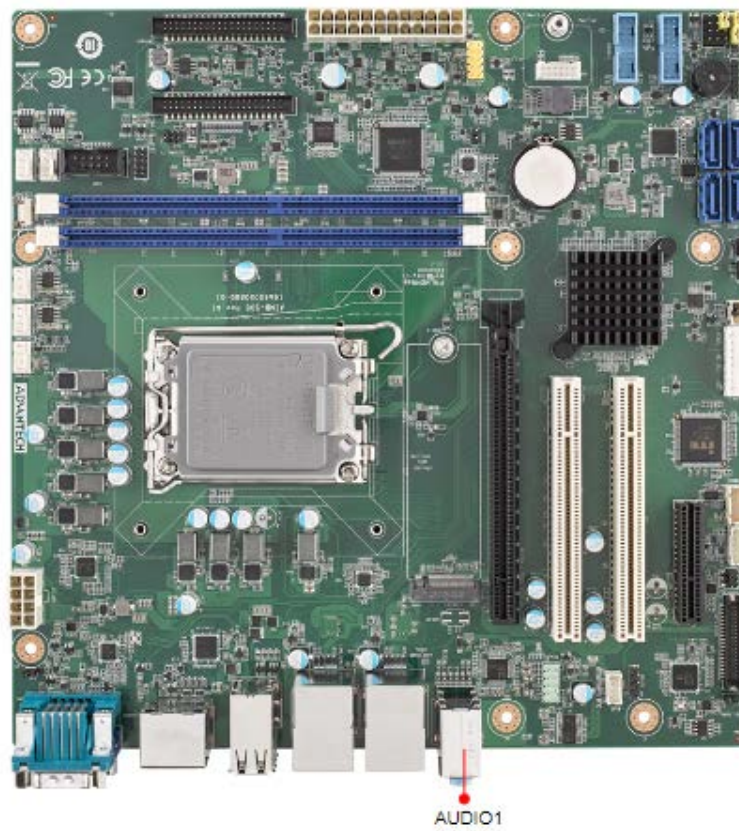


If a fan is used, this connector supports cooling fans at 1500 mA (18 W) or less.

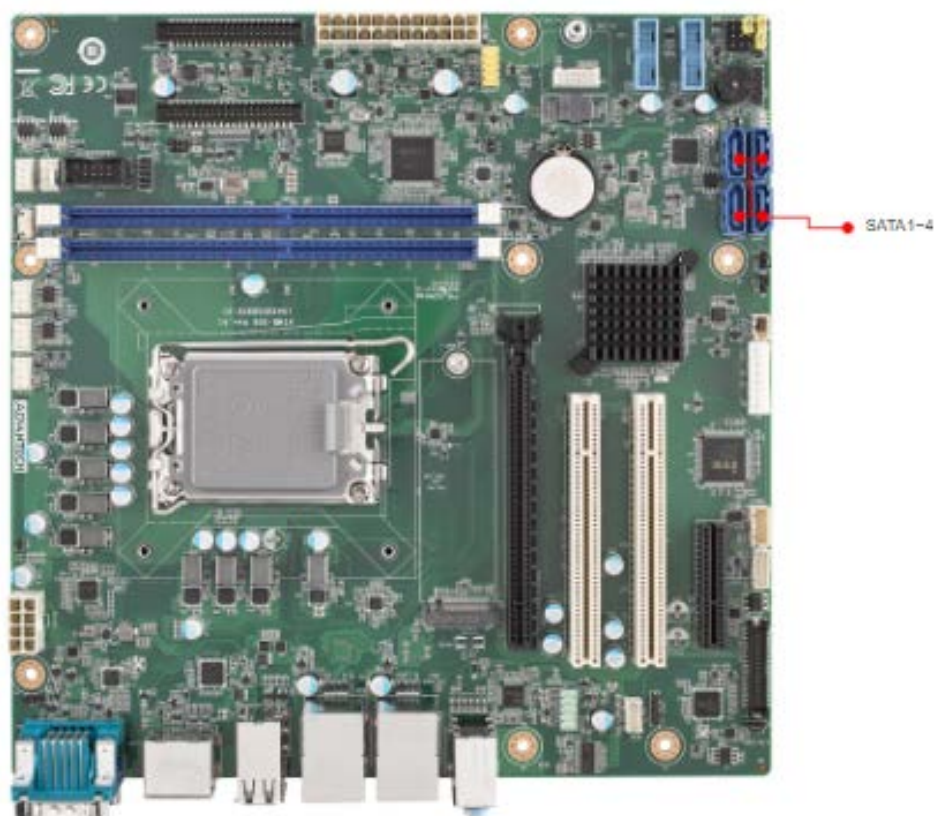
2.7 Power LED Pin Header (JFP2)



2.8 Audio Jack (AUDIO1)

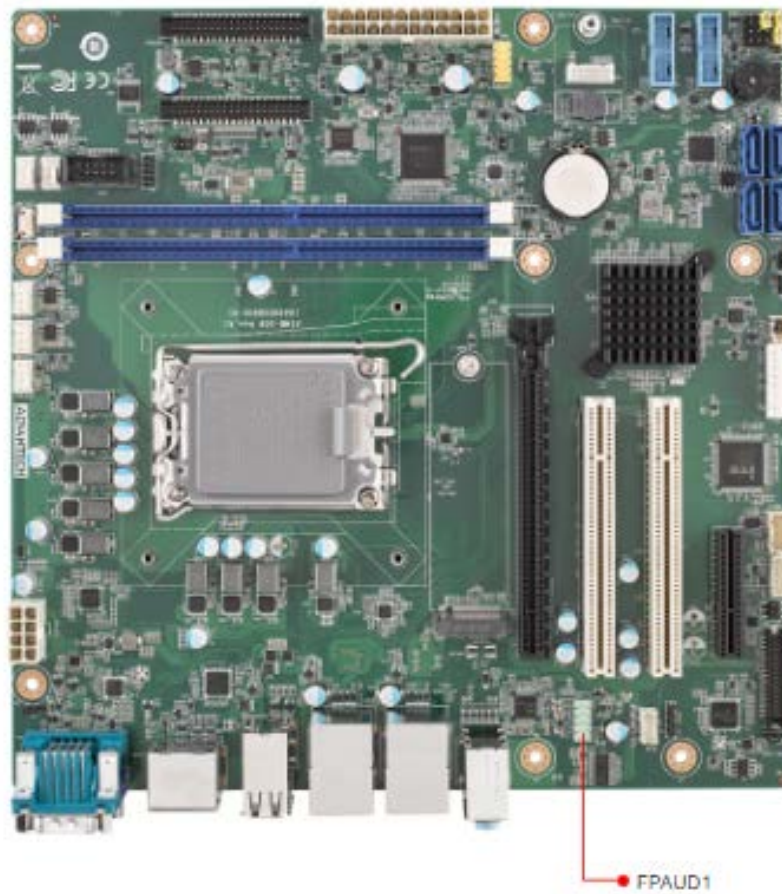


2.9 Serial ATA Interface Connector (SATA1~4)

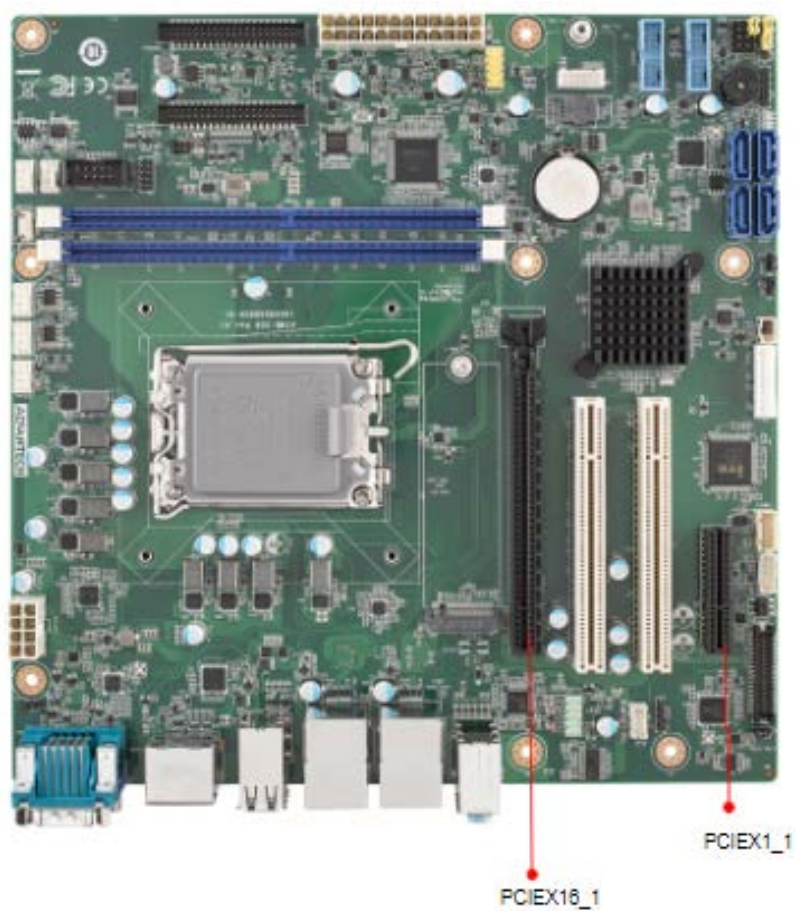


AIMB-508 features a high-performance Serial ATA III interface (up to 600 MB/s) which eases hard drive cabling with thin, space-saving cables.

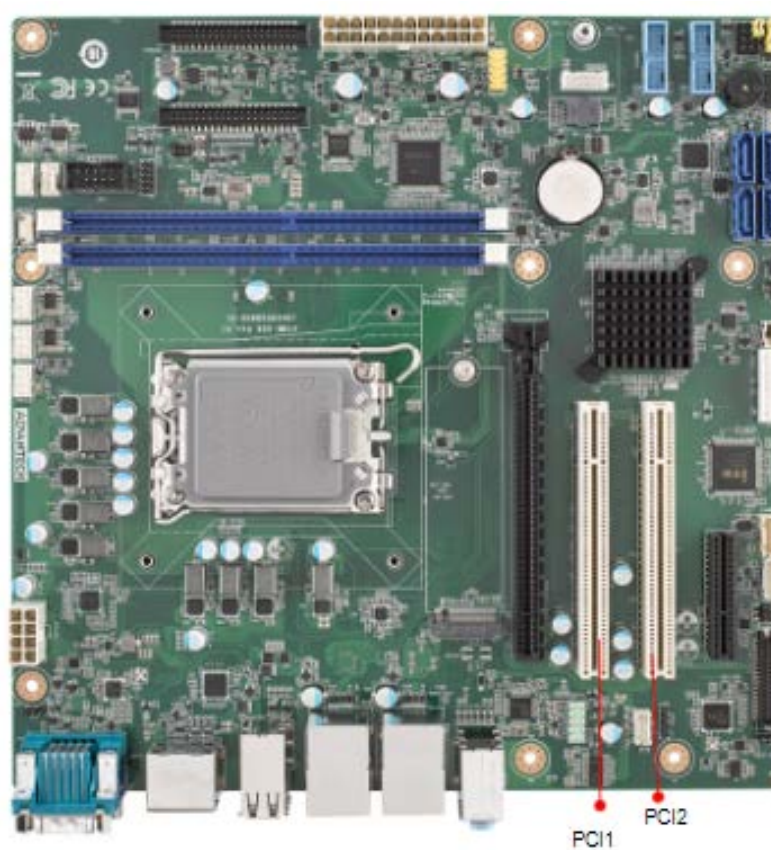
2.10 Front Panel Audio Connector (FPAUD1)



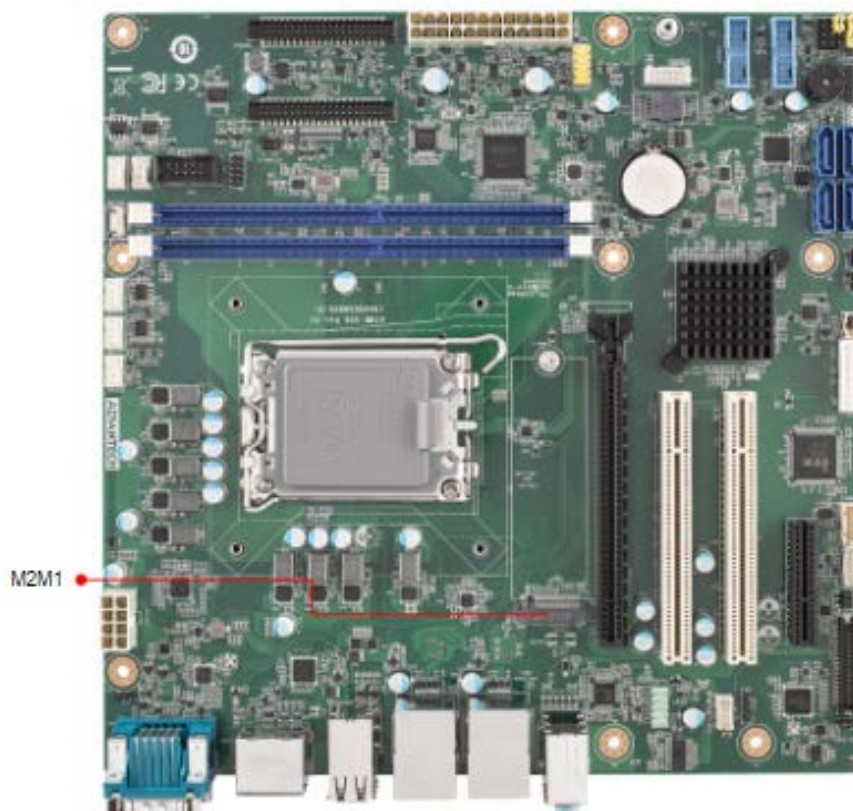
2.11 PCI Express x16 Slot (PCIEX16_1) PCI Express x4 Slot (PCIEX1_1)



2.12 PCI Slot (PCI1/PCI2)

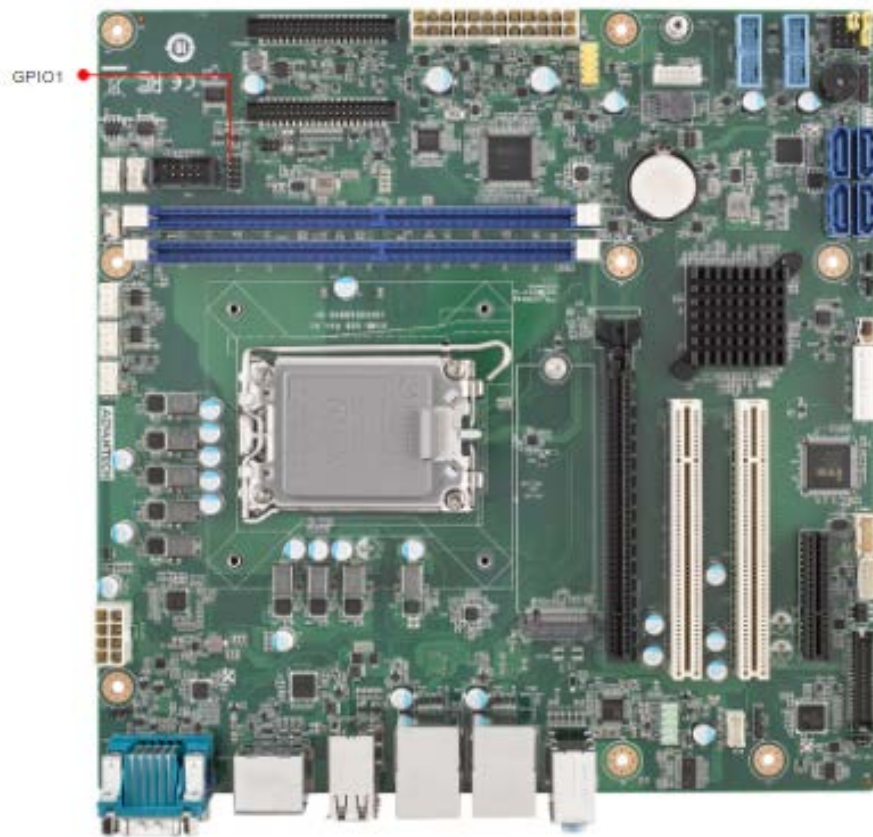


2.13 NGFF M.2 M-Key Connector for 2280 Module (M2M1)

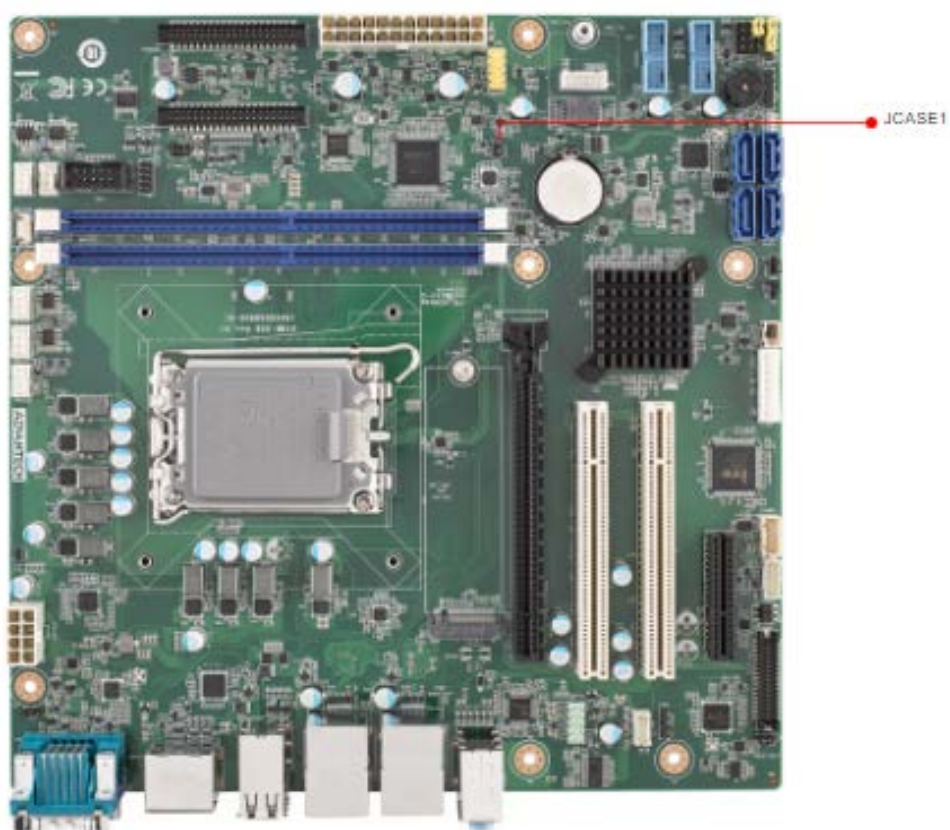


M.2 M-Key: 2280, PCIe x2 interface with support for NVMe devices.

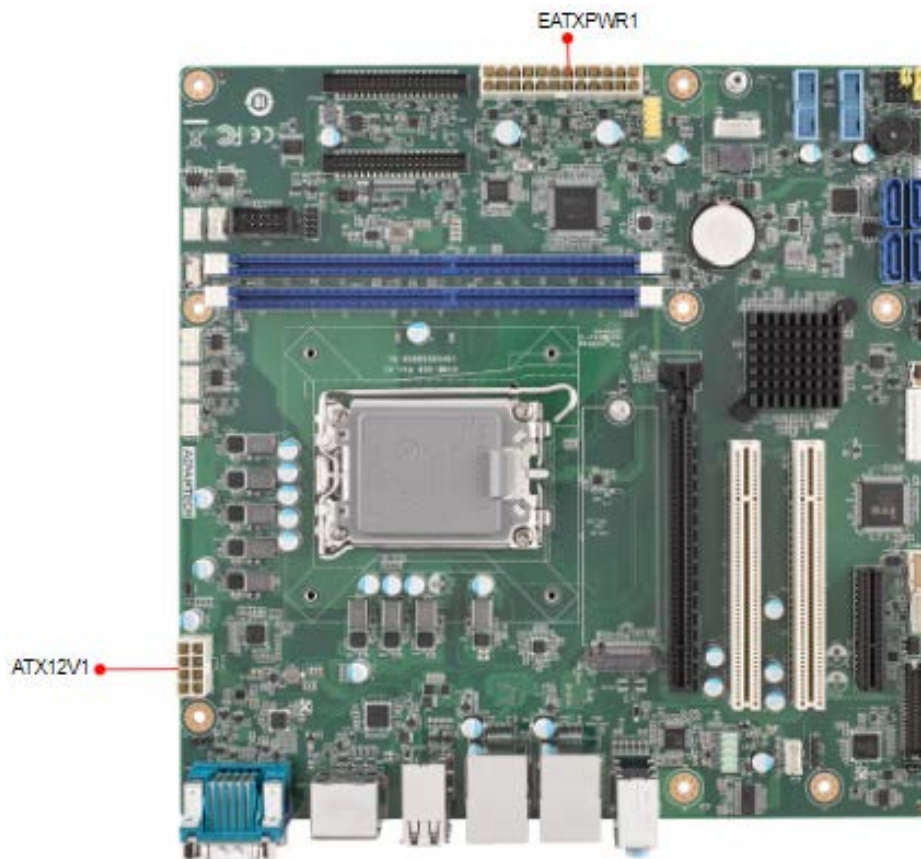
2.14 General Purpose I/O Connector (GPIO1)



2.15 Case Open Connector (JCASE1)



2.16 ATX Power Connector (EATXPWR1, ATX12V1)



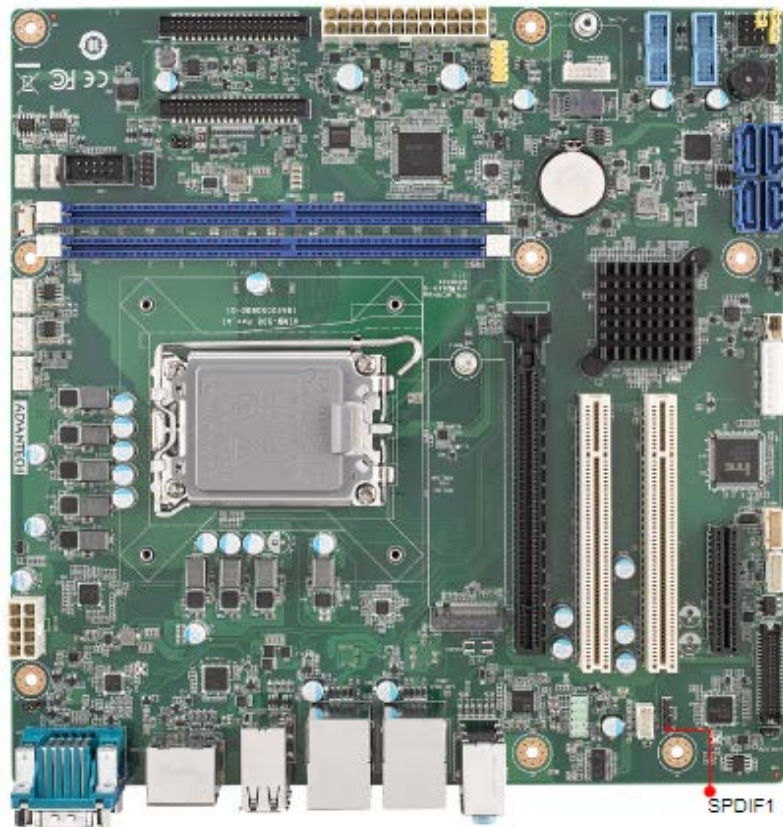
This connector is for an ATX Micro-Fit power supply. The plugs from the power supply are designed to fit these connectors in only one direction. Determine the proper orientation and push down firmly until the connectors connect completely.

Note!

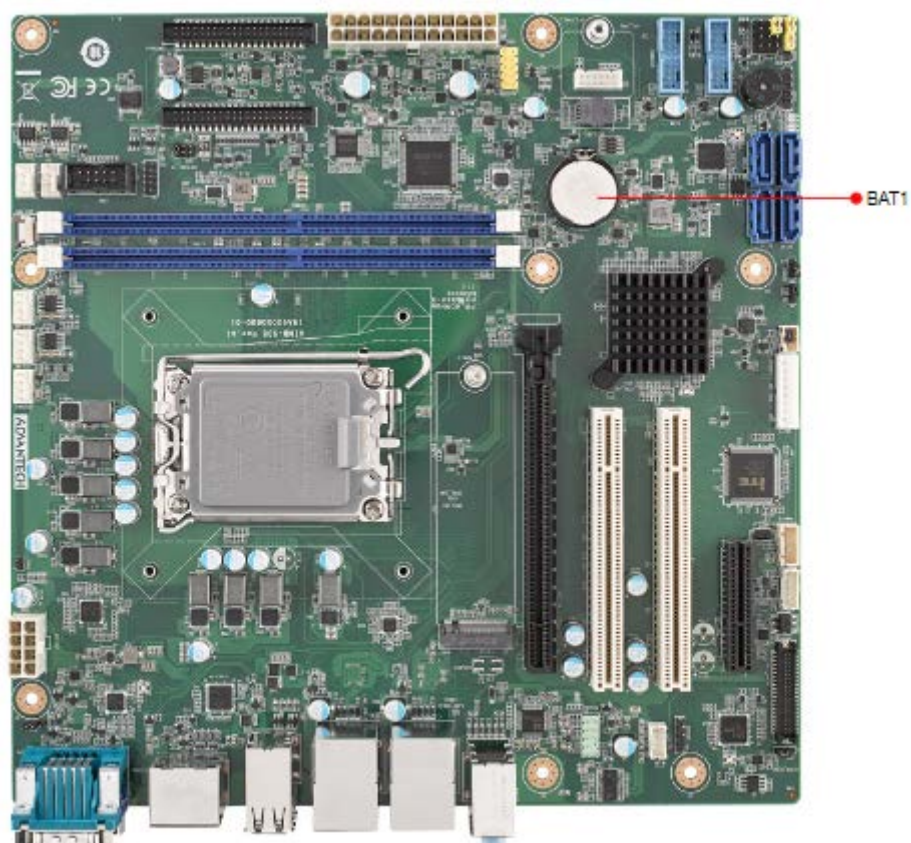


1. Please connect the ATX12V1 connector with the PSU ATX 12V 8-pin connector.
2. For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12V Specification 2.0 (or later version) and provides minimum power of 180 W.

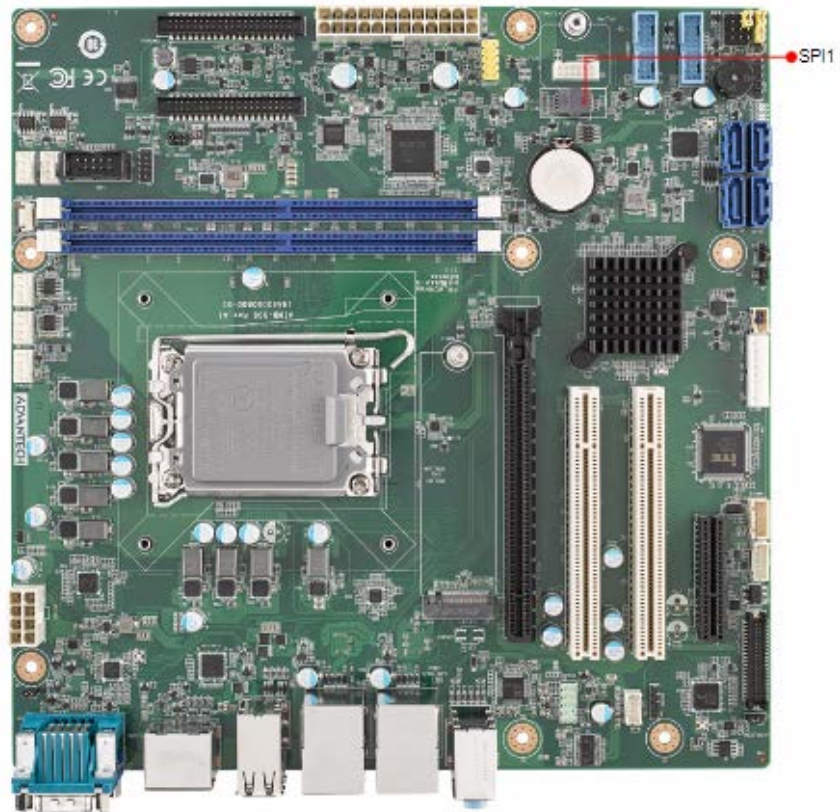
2.18 SPDIF Interface Connector (SPDIF1)



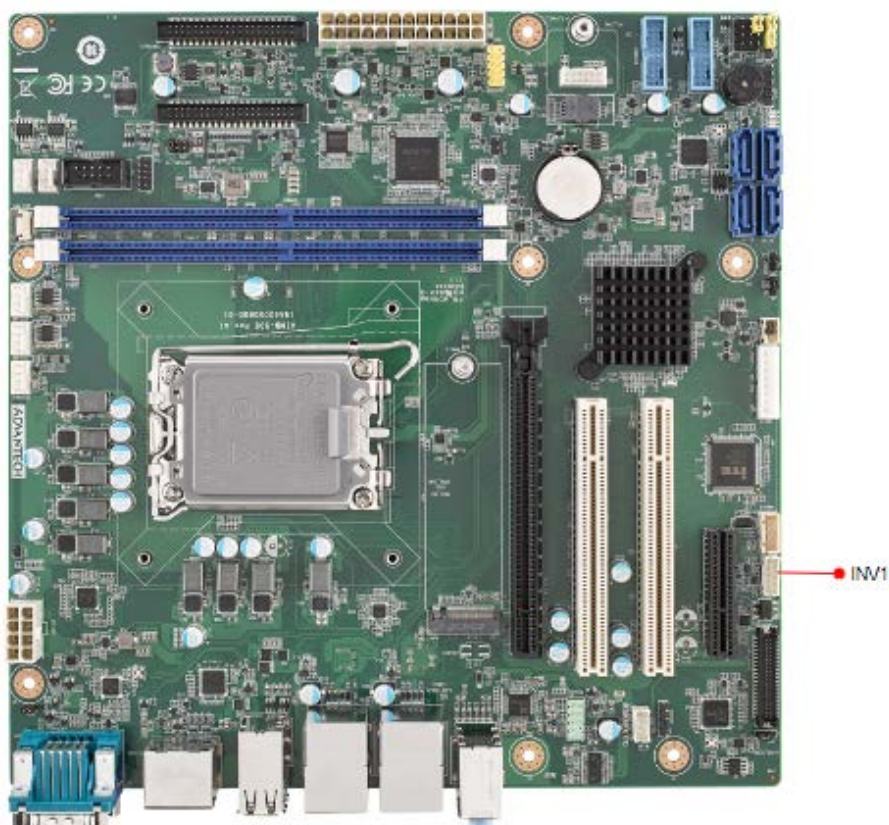
2.19 Battery Wafer Box (BAT1)



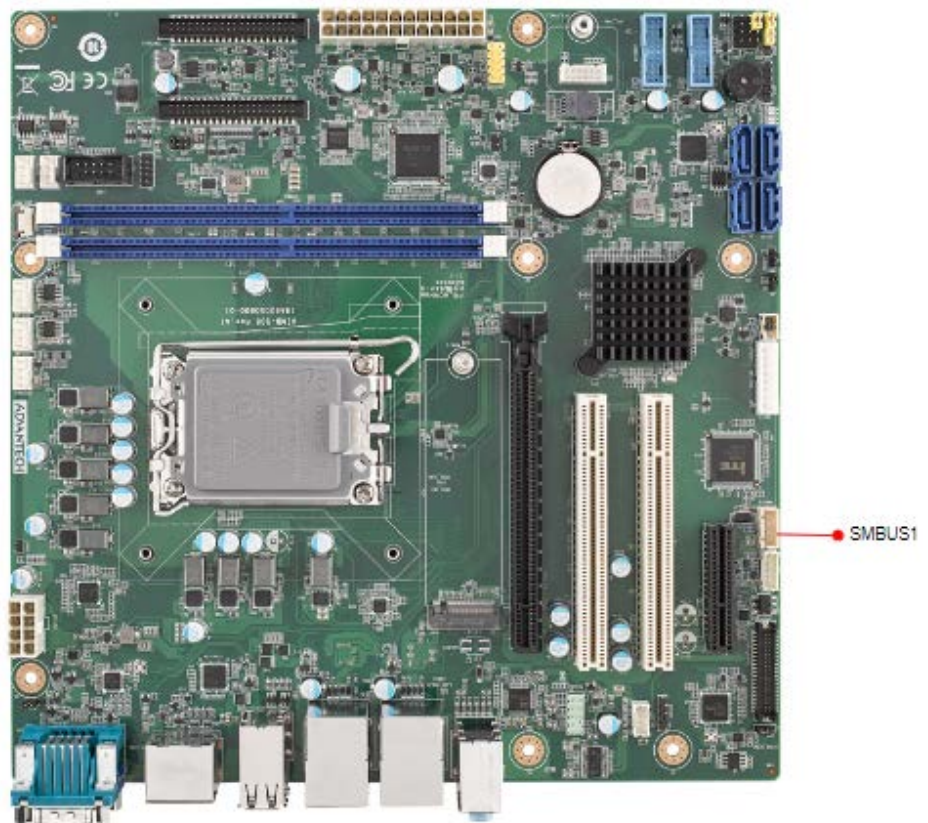
2.20 SPI BIOS Flash Socket (SPI1)



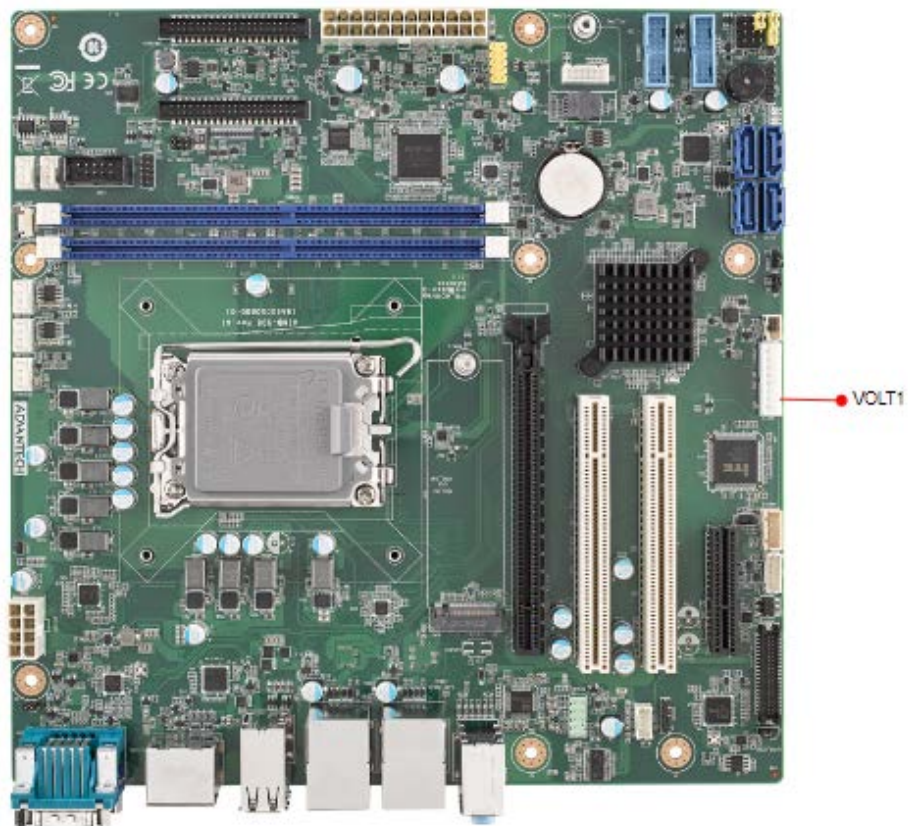
2.21 eDP Backlight Inverter Power Connector (INV1)



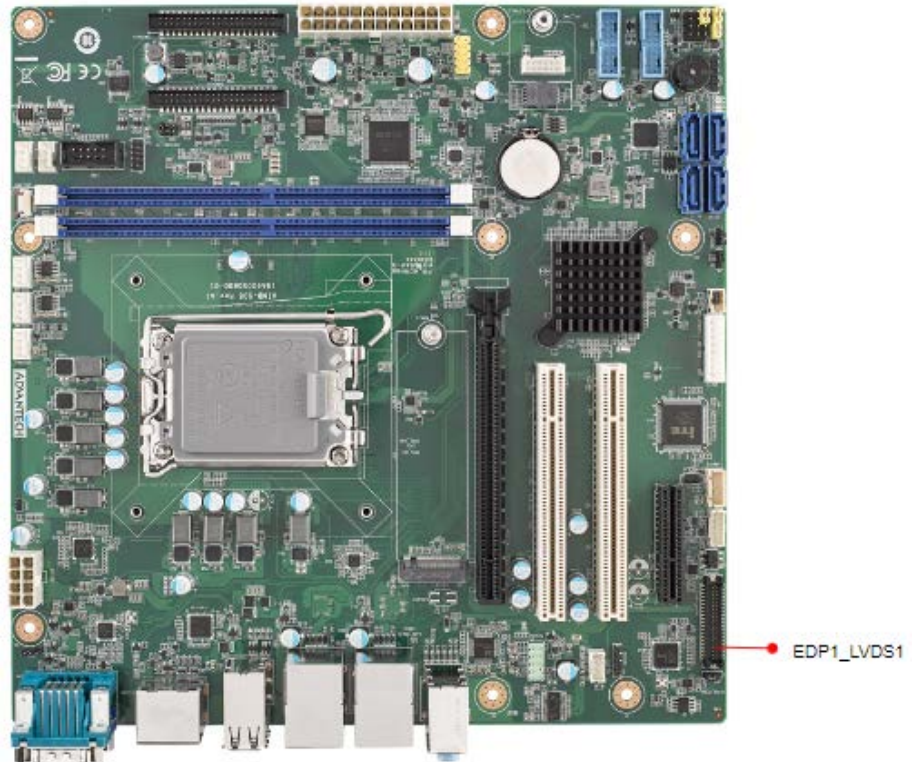
2.22 SMBUS Connector (SMBUS1)



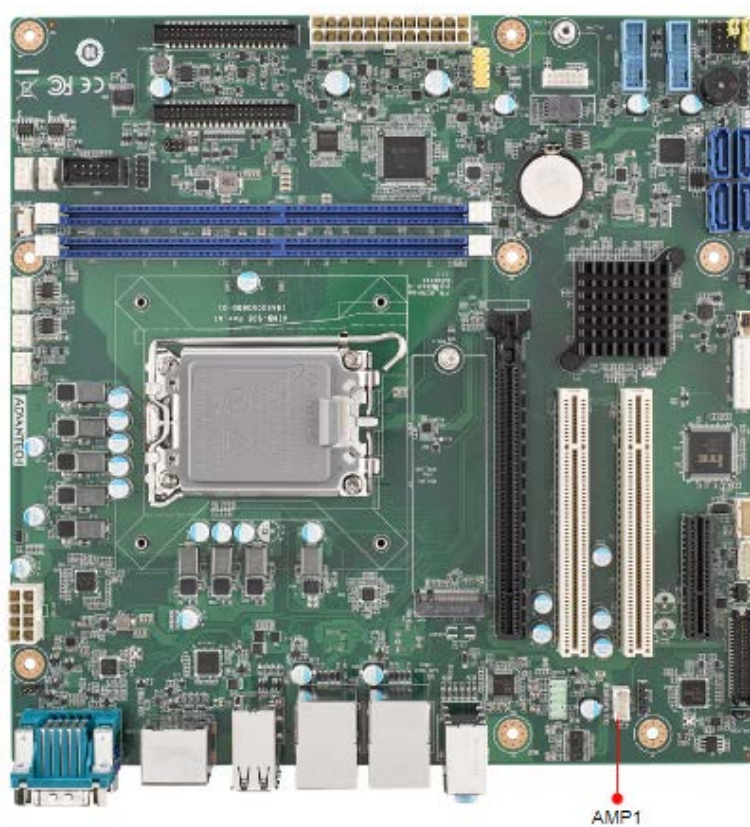
2.23 -V5/+V5/-V12/+V12/+V3.3/+V5_DUAL Power Supply Connector (VOLT1)



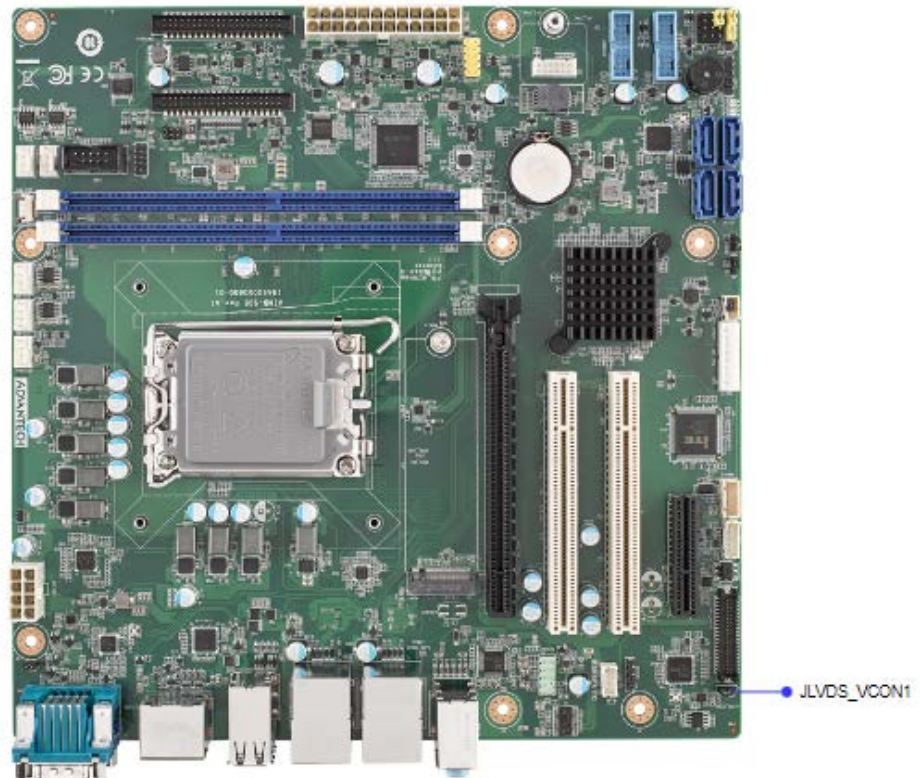
2.24 eDP Connector / LVDS Connector (EDP1_LVDS1)



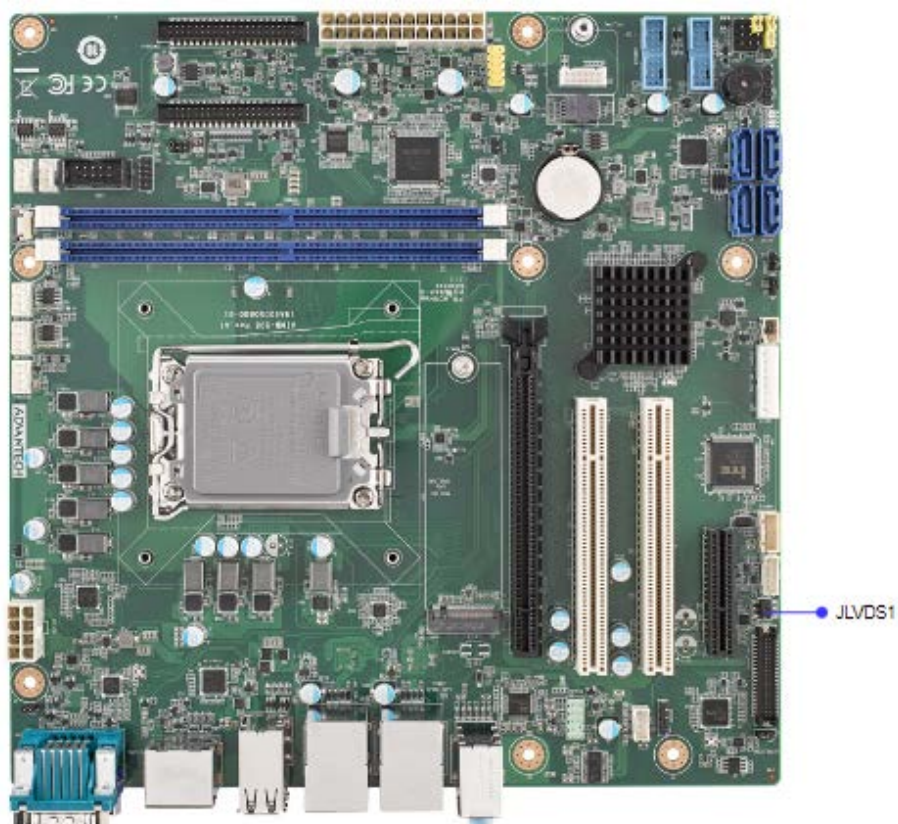
2.25 Audio Amplifier Output Pin Header (AMP1)



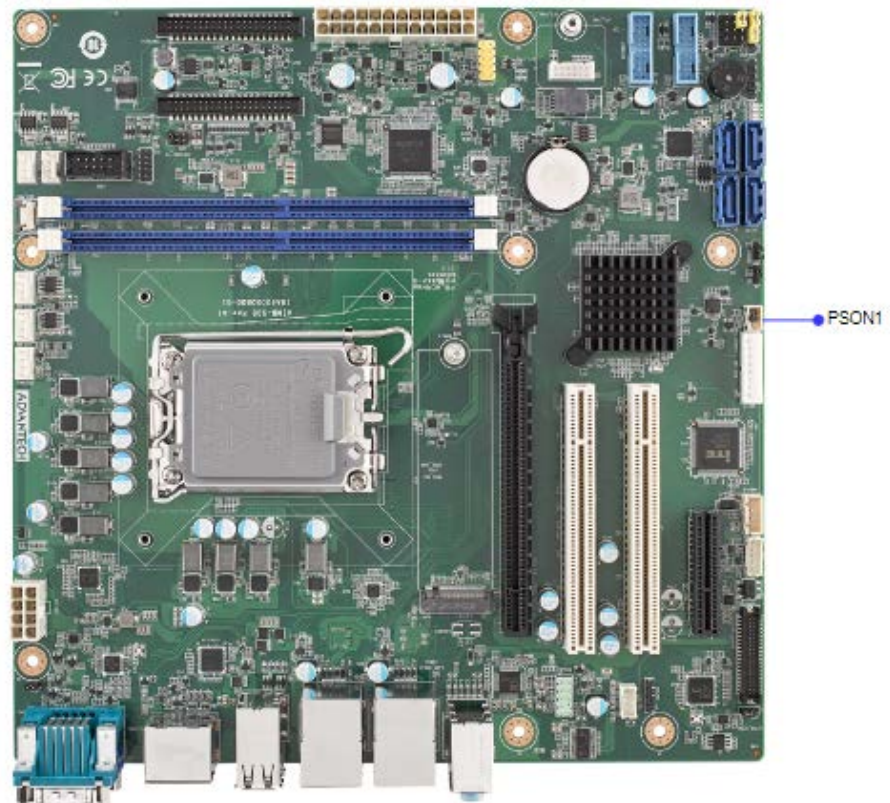
2.26 LVDS VESA, JEIDA Format Selection Pin Header (JLVDS_VCON1)



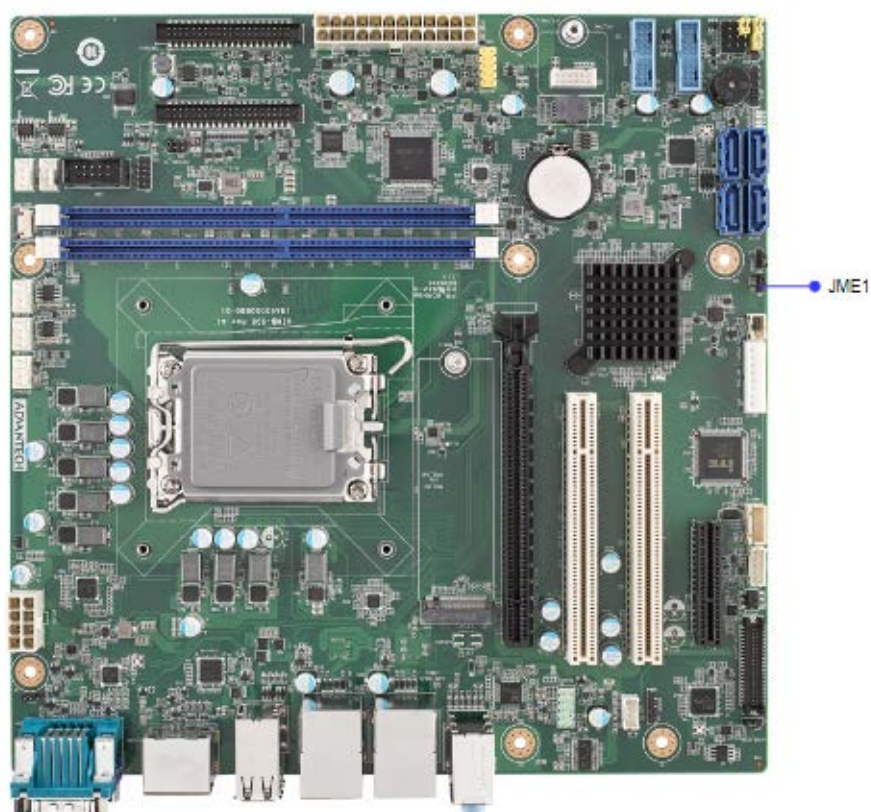
2.27 EDP Panel / LVDS Panel Voltage Selection (JLVDS1)



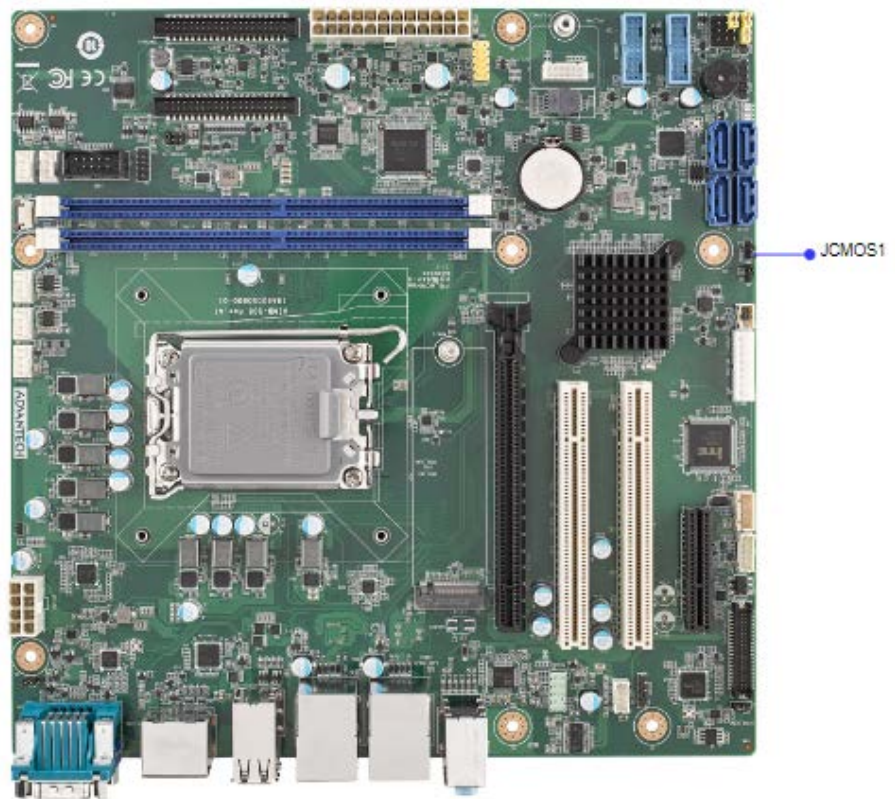
2.28 AT/ATX Mode Selection (PSON1)



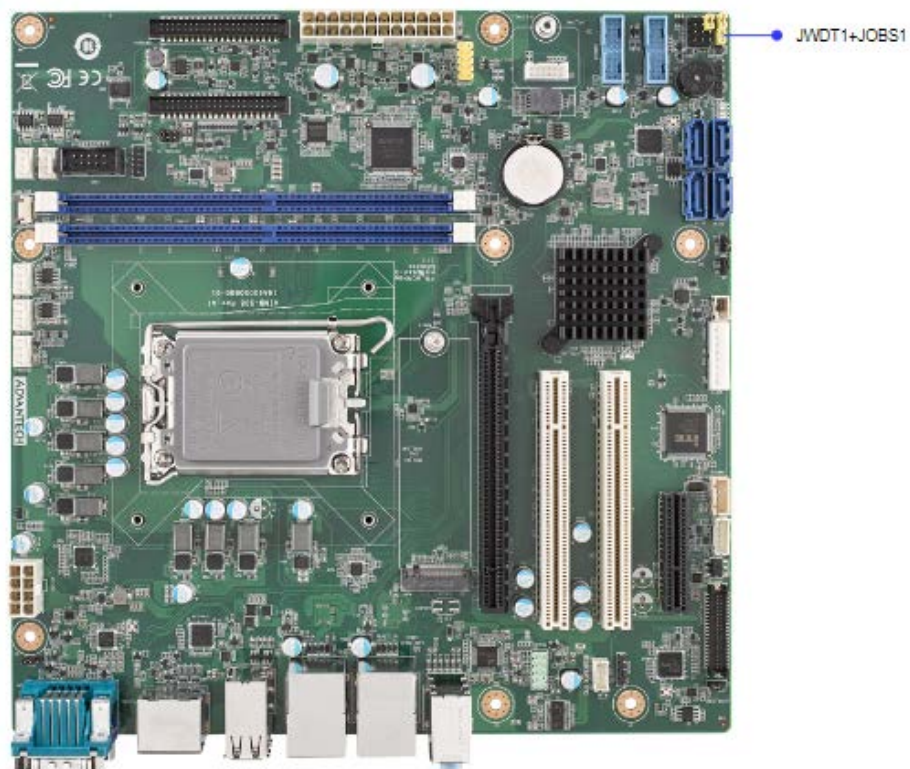
2.29 Intel® ME Header (JME1)



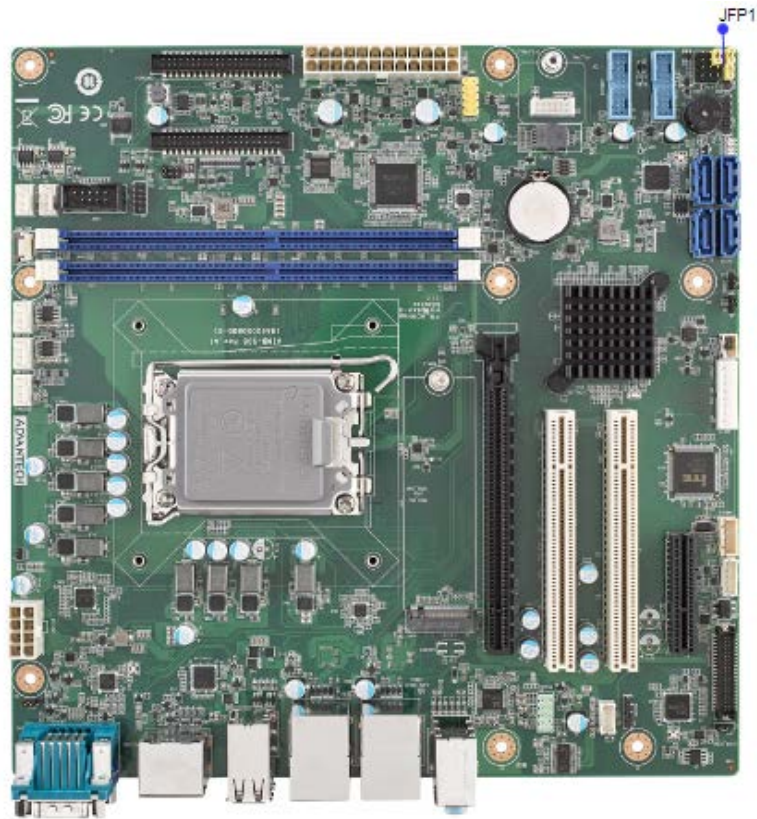
2.30 CMOS Clear Jumper (JCMOS1)



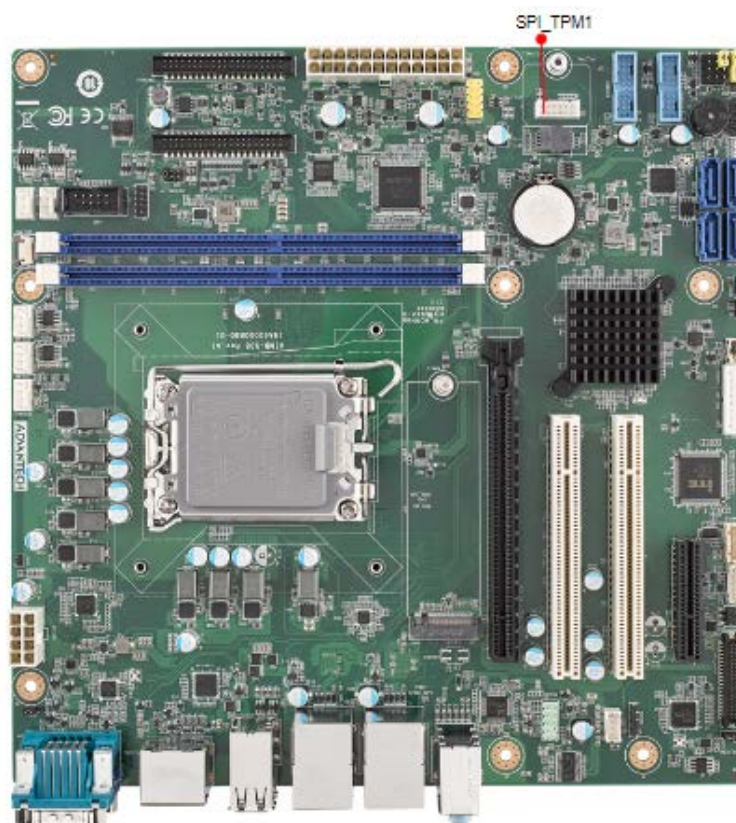
2.31 Watchdog Timer Output and OBS Beep (JWDT1+JOBS1)



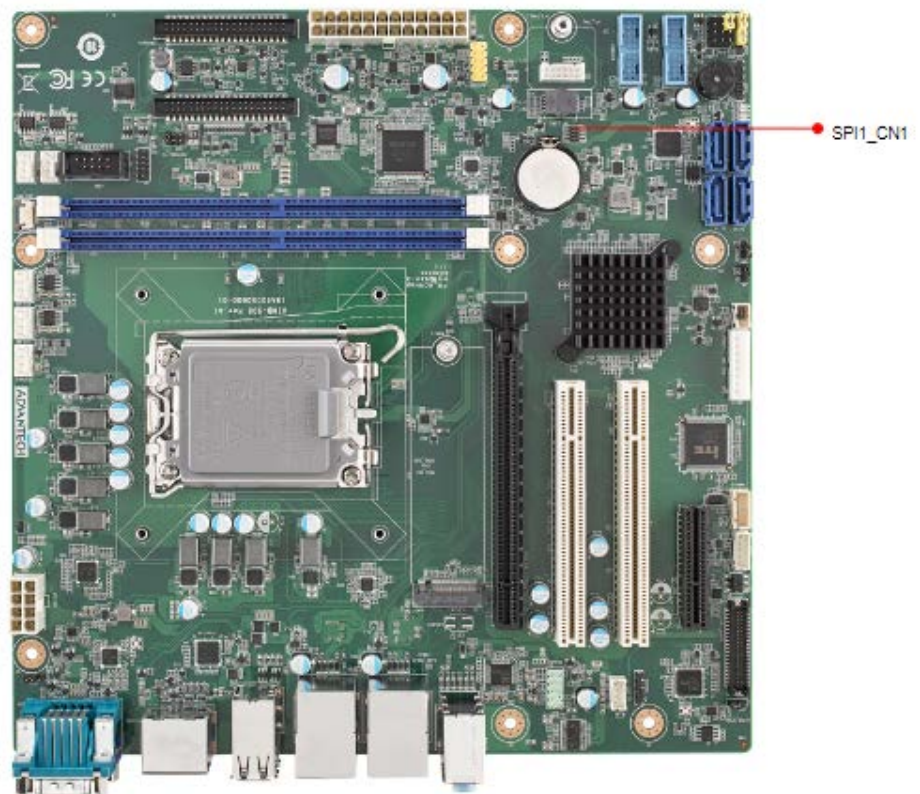
2.32 PWRBTN# / RESET# / HDD LED / Serial Bus from HW Monitor IC / Internal Buzzer / External Speaker Header (JFP1)



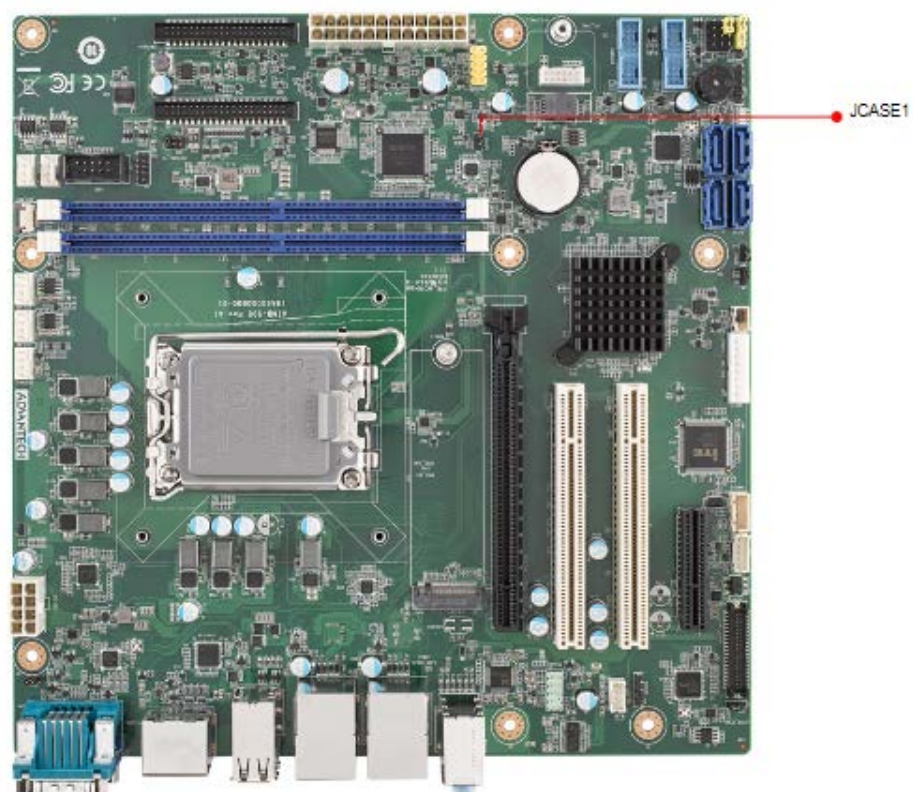
2.33 SPI TPM Module Connector (SPI_TPM1)



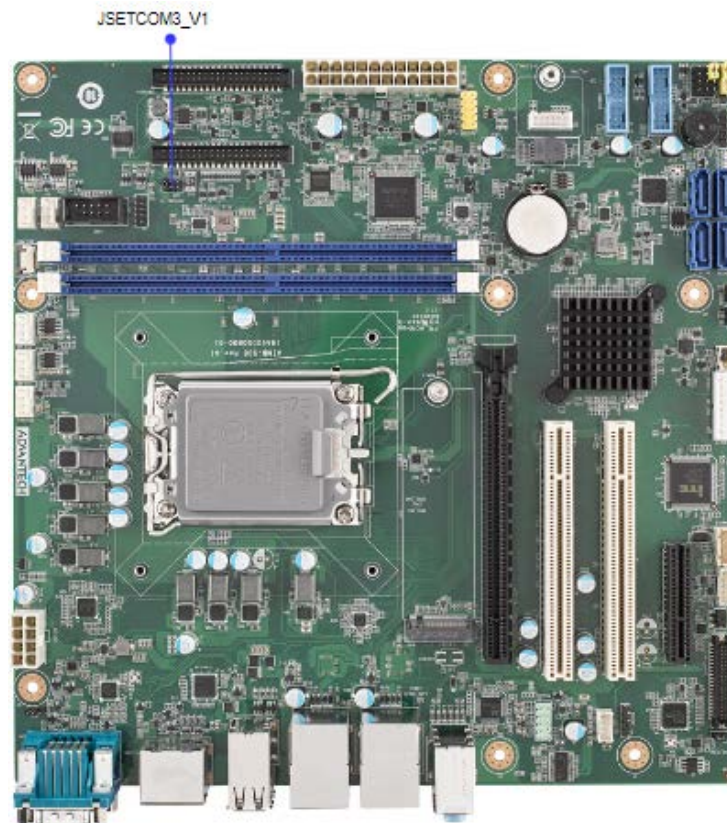
2.34 SPI Pin Header (SPI1_CN1)



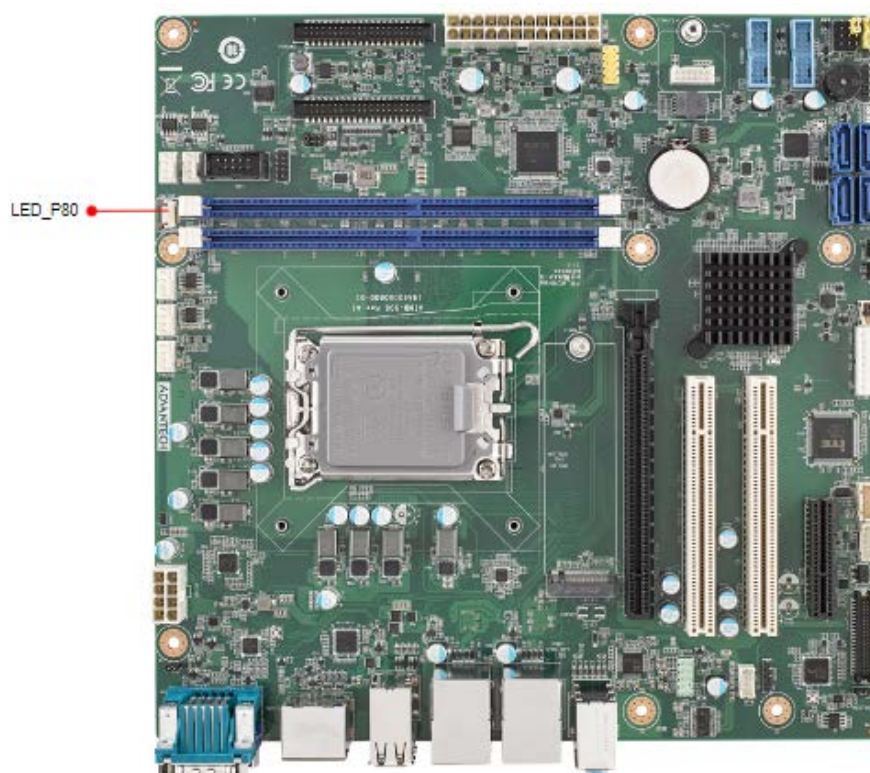
2.35 Case Open Connector (JCASE1)



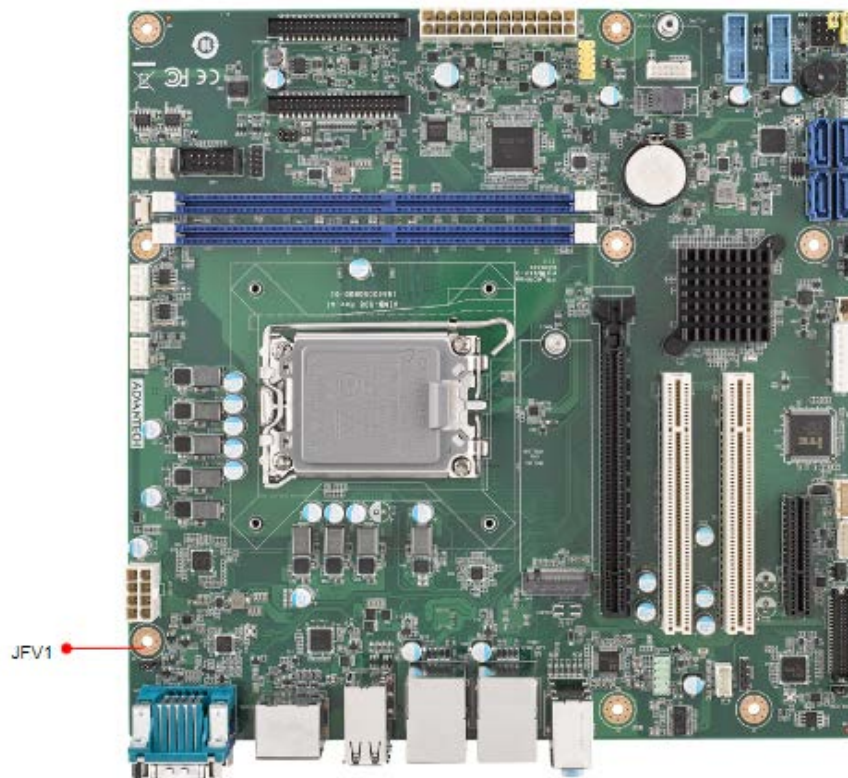
2.36 COM3 RI# Selection Pin Header (JSETCOM3_V1)



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 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 or <Esc> to enter the 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.

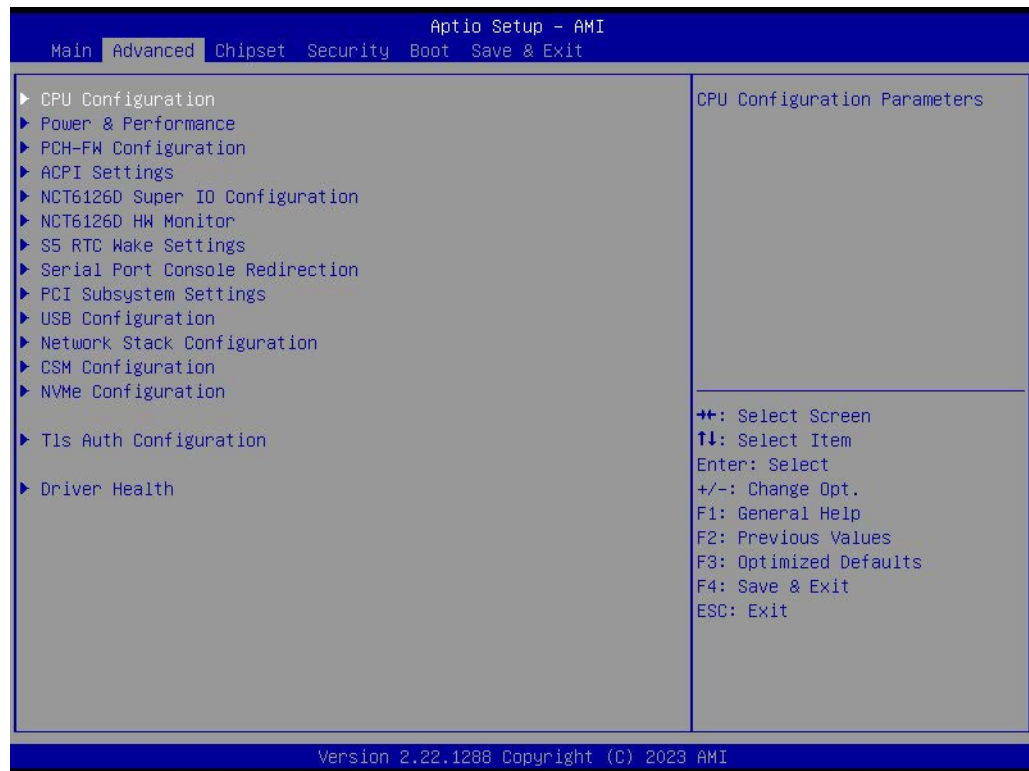
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ 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

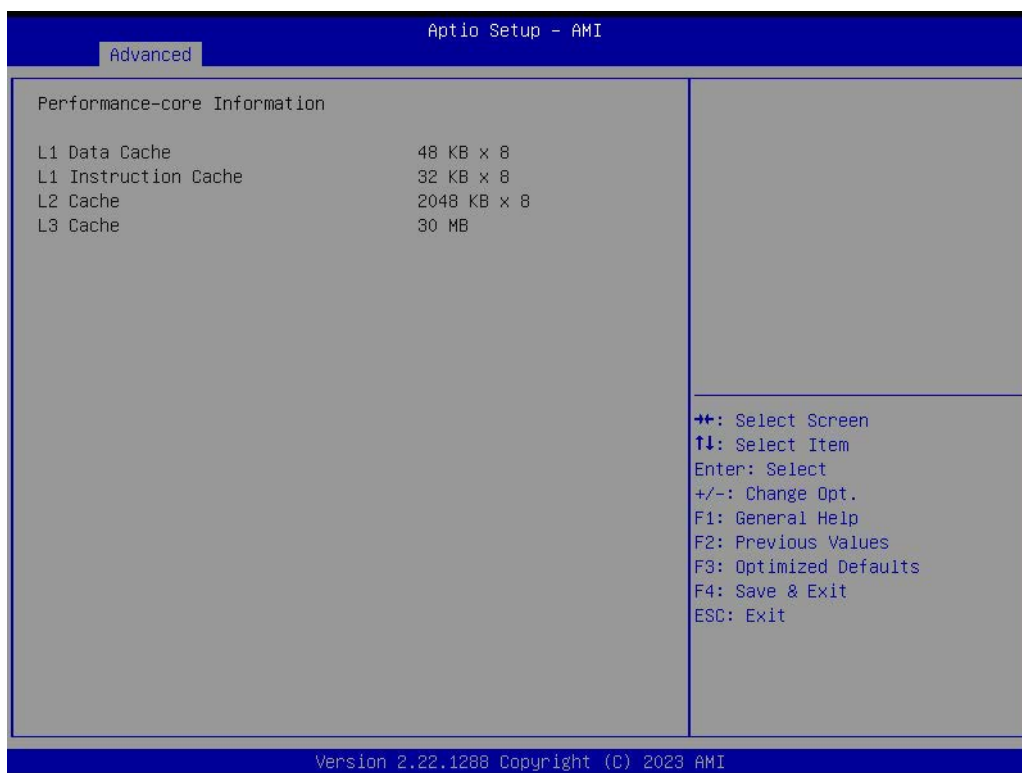
Select the Advanced tab from the AIMB-508 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration and go to the sub-menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <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.



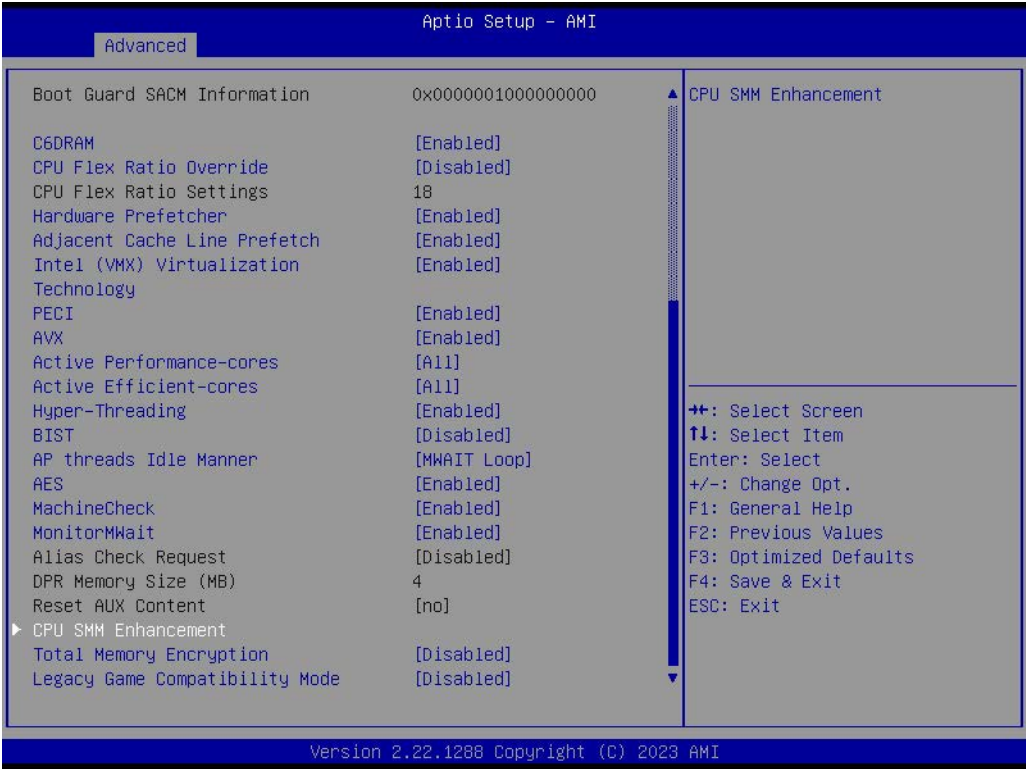
3.2.2.1 CPU Configuration



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



3.2.2.2 CPU SMM Enhancement



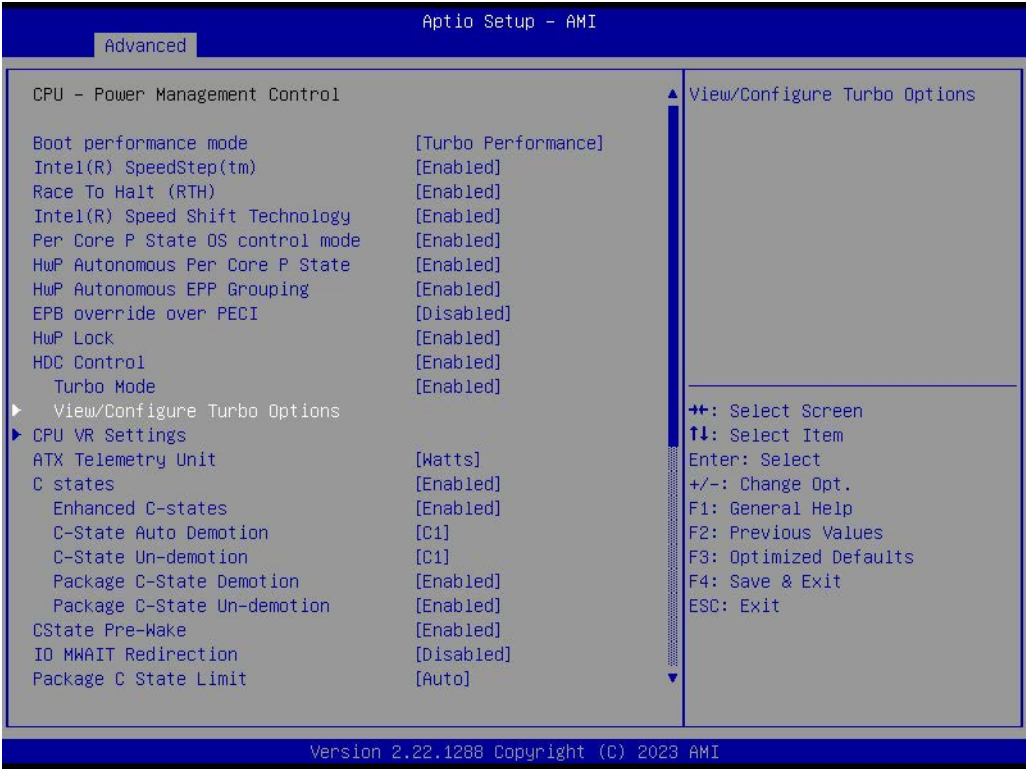
- **SMM Use Delay Indication [Enable]**
Enable/disable usage of SMM_DELAYED MSR for MP sync in SMI.
- **SMM Use Block Indication [Enable]**
- **SMM Use SMM en-US Indication [Enable]**

3.2.2.3 Power & Performance

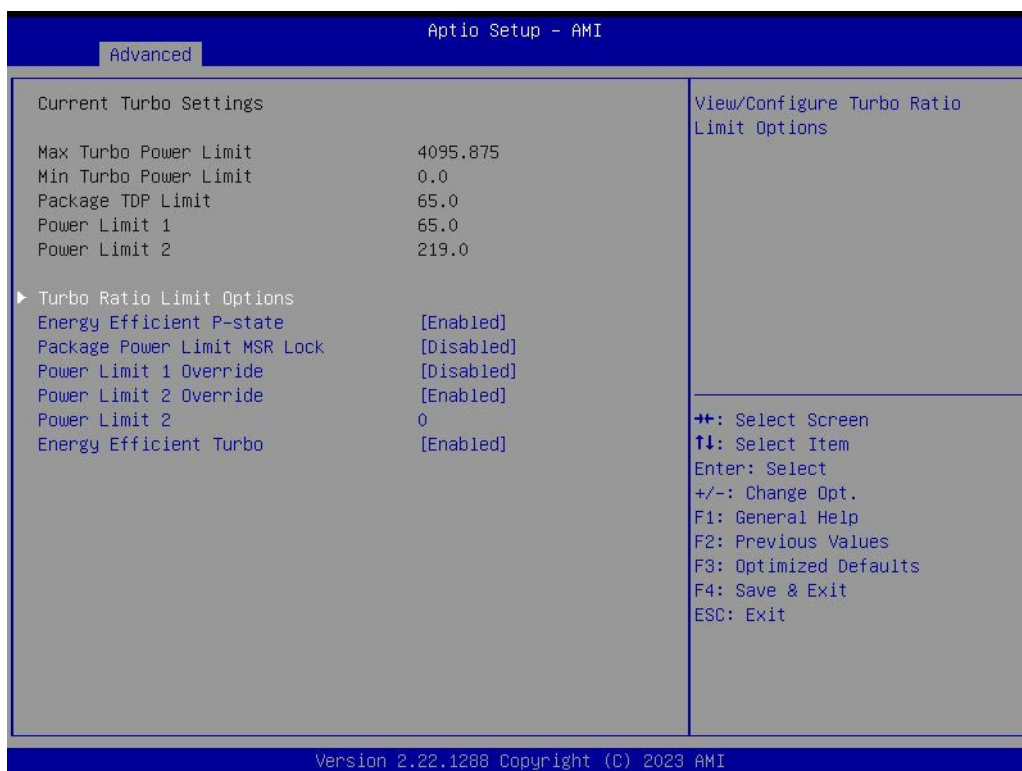


- **CPU – Power Management Control**
CPU – Power Management Control Options.
- **GT – Power Management Control**

3.2.2.3.1 CPU – Power Management Control

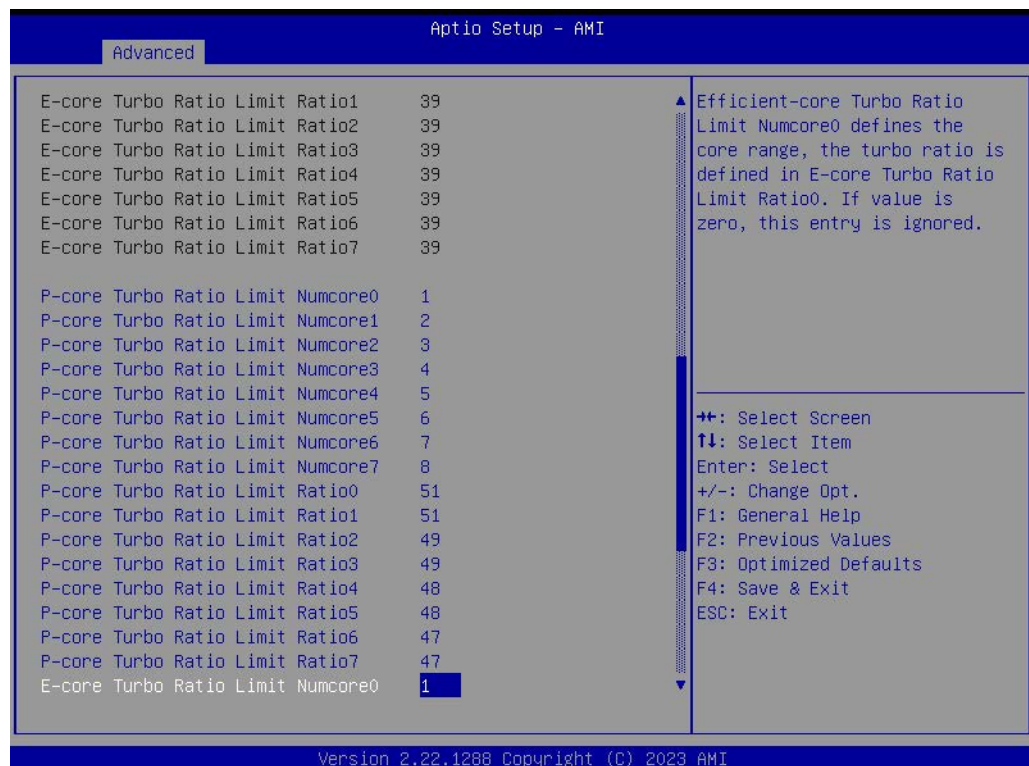
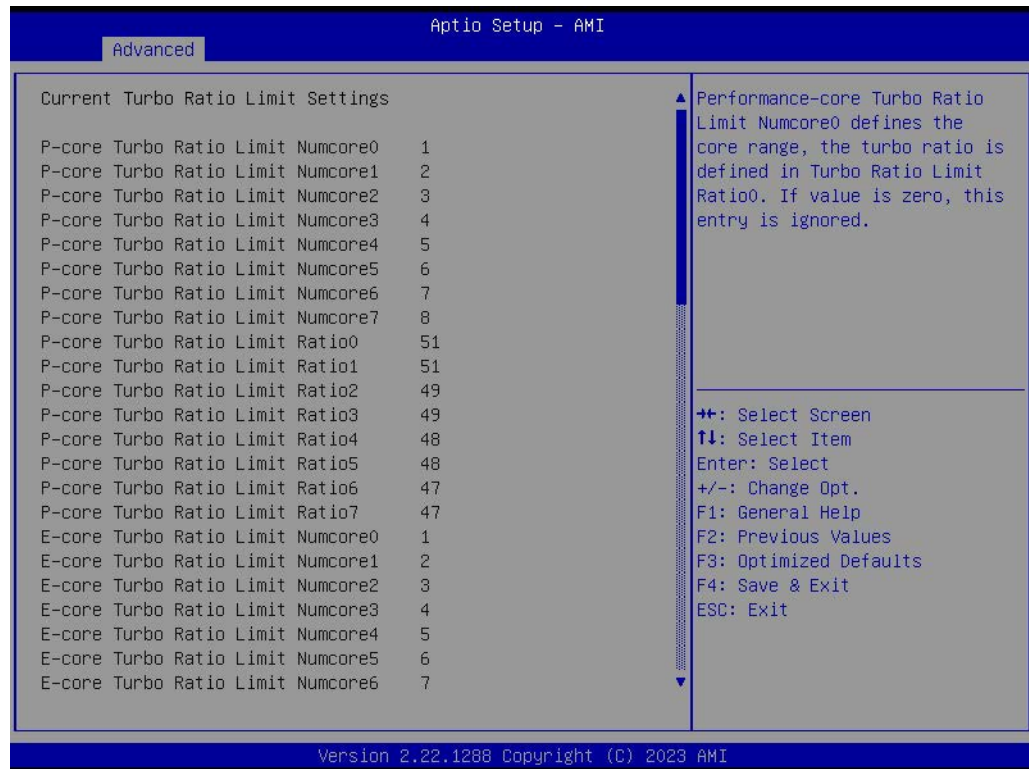


- **Boot performance mode [Turbo Performance]**
Select the performance state that the BIOS will set starting from reset vector.



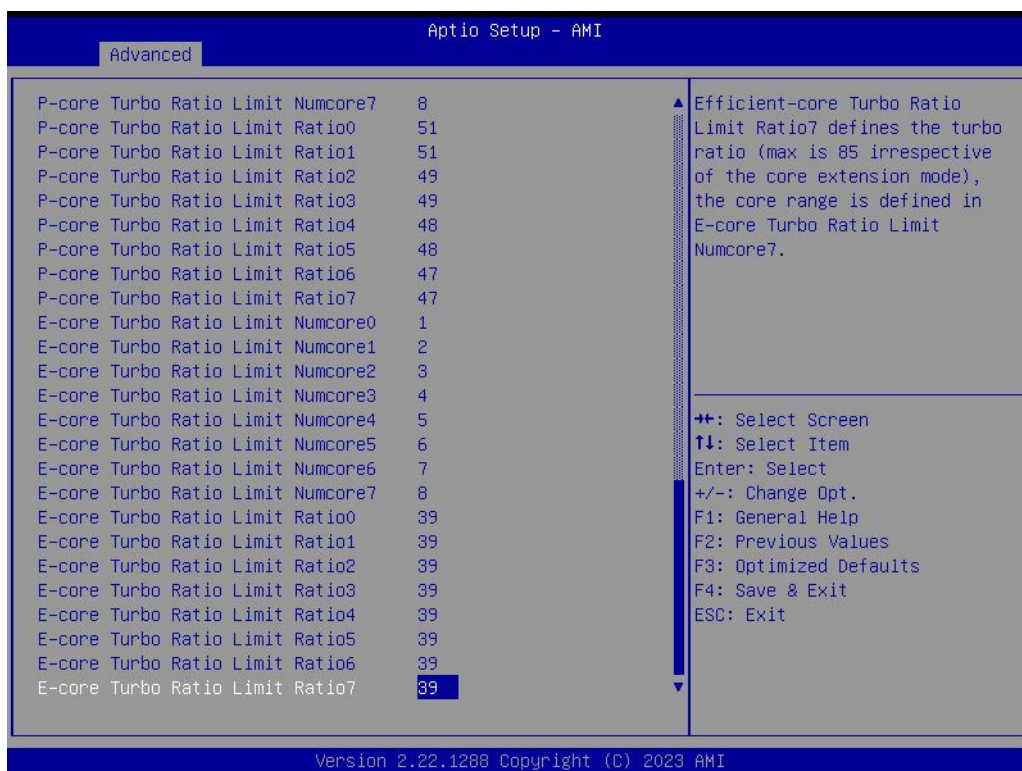
- **Turbo Ratio Limit Options**
View/Configure Turbo Ratio Limit Options.
 - **Energy Efficient P-state [Enable]**
 - **Package Power Limit MSR Lock [Disabled]**
 - **Power Limit 1 Override [Disabled]**
 - **Power Limit 2 Override [Enabled]**
 - **Power Limit 2 0**
 - **Energy Efficient P-state [Enabled]**

■ 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.

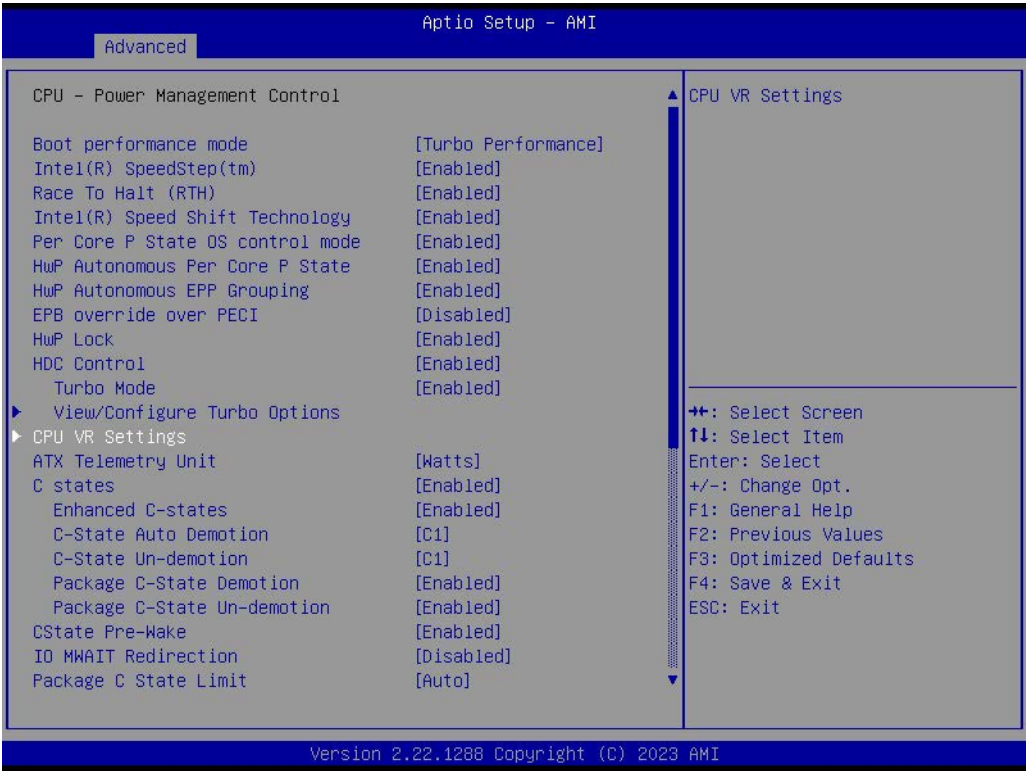


– **E-core Turbo Ratio Limit Ratio7 39**

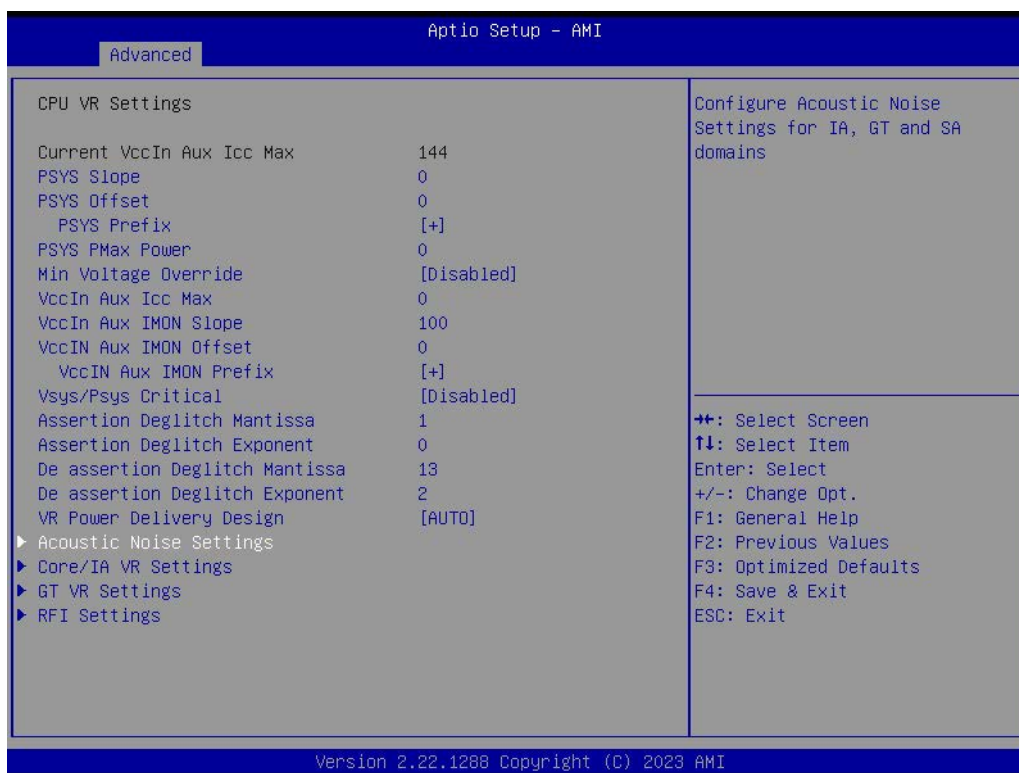
Efficient-core Turbo Ratio Limit Ratio7 defines the turbo ratio (max is 85 irrespective of the core extension mode). The core range is defined in E-core Turbo Ratio Limit Numcore7.

3.2.2.3.2 CPU VR Settings

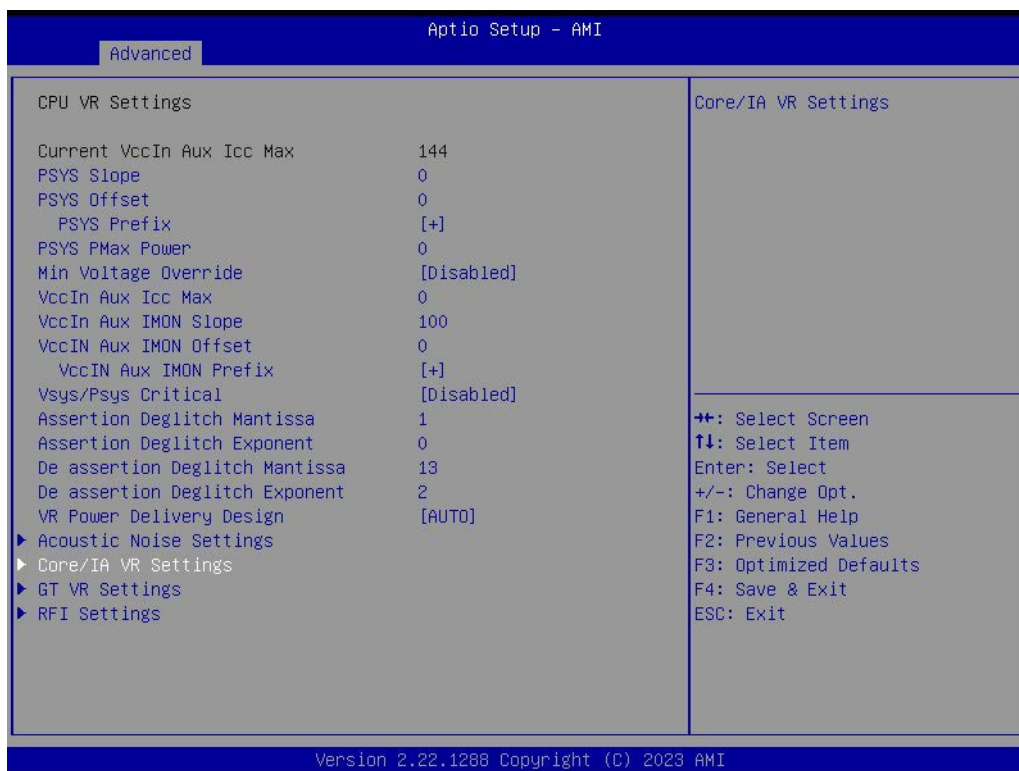
- **PSYS Slope**
PSYS Slope defined in 1/100 increments. Range is 0-200.
For a 1.25 slope, enter 125. 0=Auto. Users BIOS VR mailbox command 0x9.



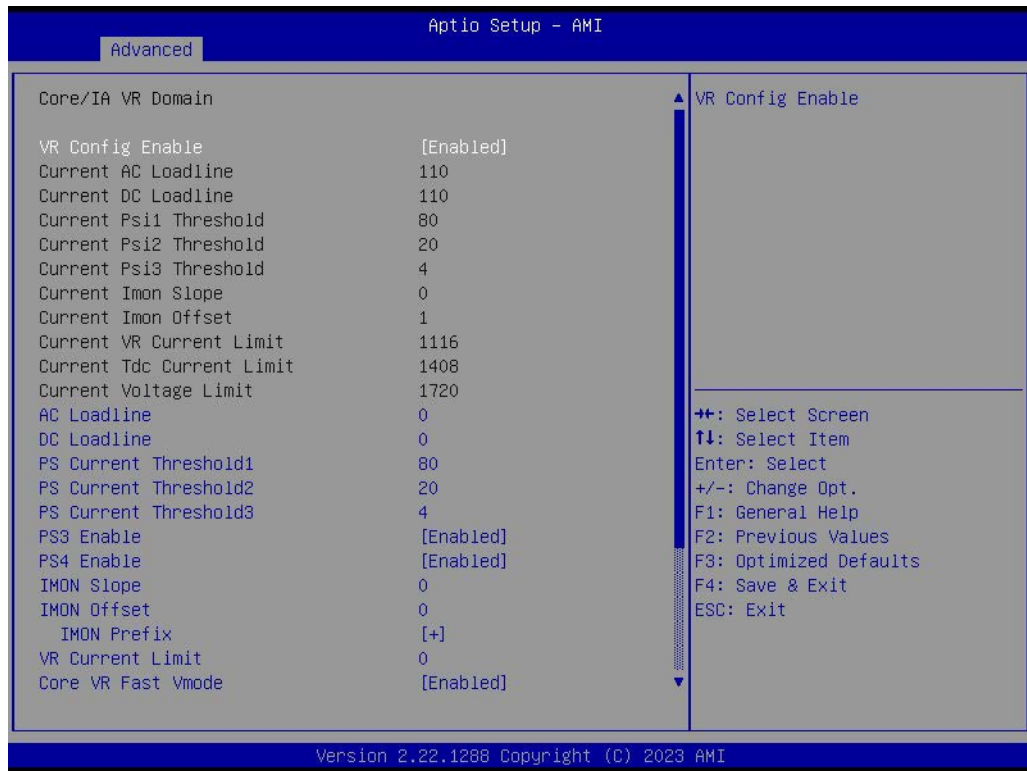
- **Acoustic Noise Settings**
Configure Acoustic Noise Settings for IA, GT, and SA domains.



- **Core/IA VR Domain**
Core/IA VR Settings.



- **Core/IA VR Domain**
 - **VR Config Enable [Enabled]**
VR Config Enable.

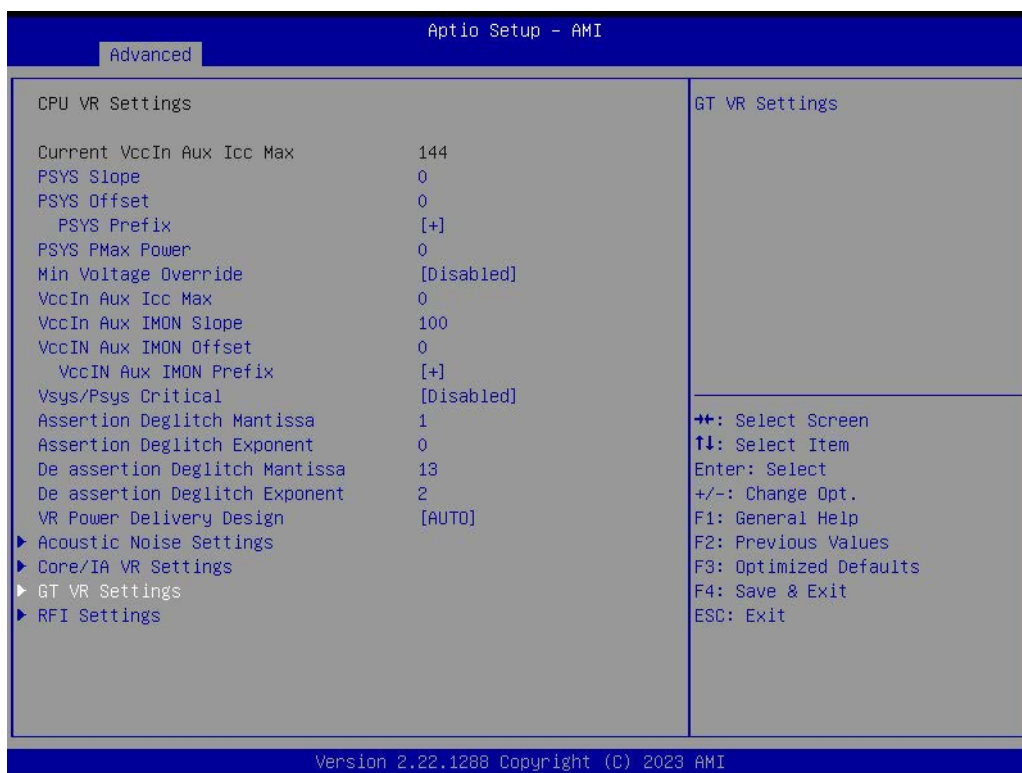


- **IRMS [Disabled]**
Enable/Disable IRMS – Current root mean square.



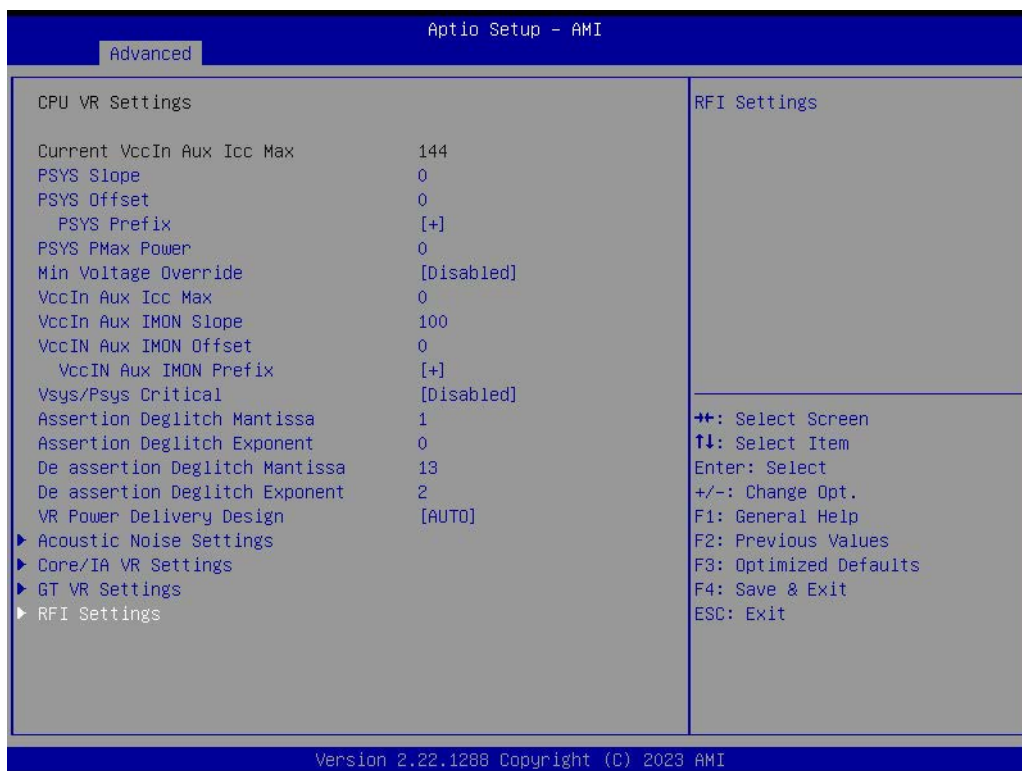
■ GT VR Settings

GT VR Settings.



■ RFI Settings

RFI Settings.



■ **RFI Domain**

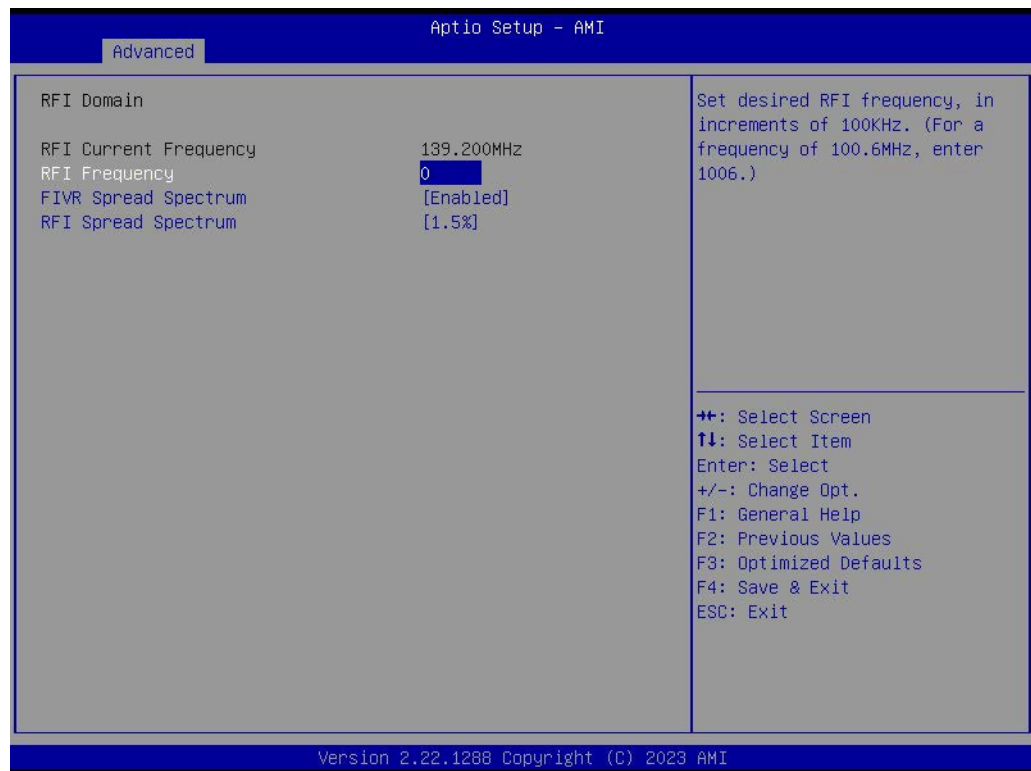
– **RFI Current Frequency 139.200MHz**

– **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]**

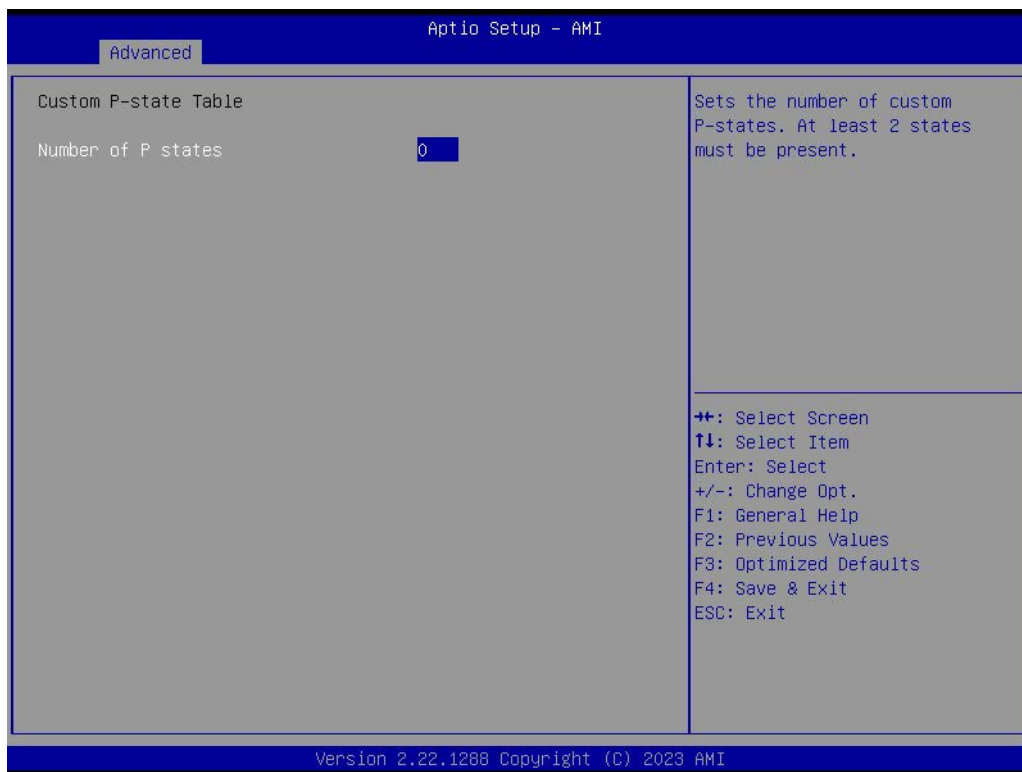
– **RFI Spread Spectrum [1.5%]**



3.2.2.3.3 Custom P-state Table

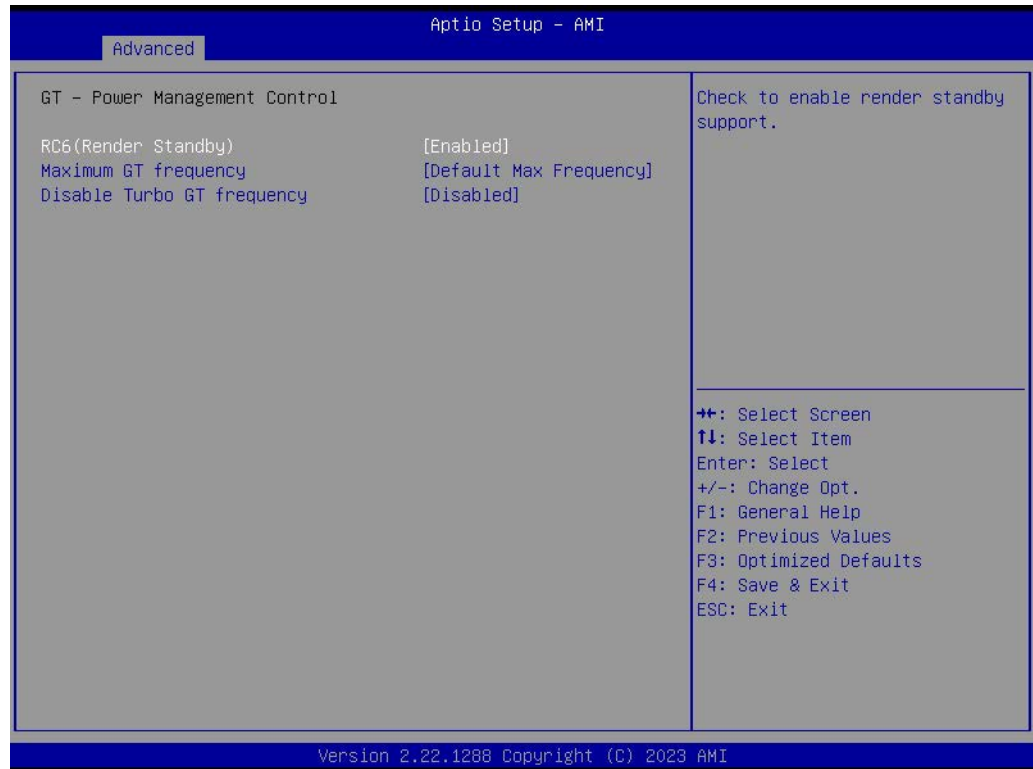
■ Number of P states 0

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



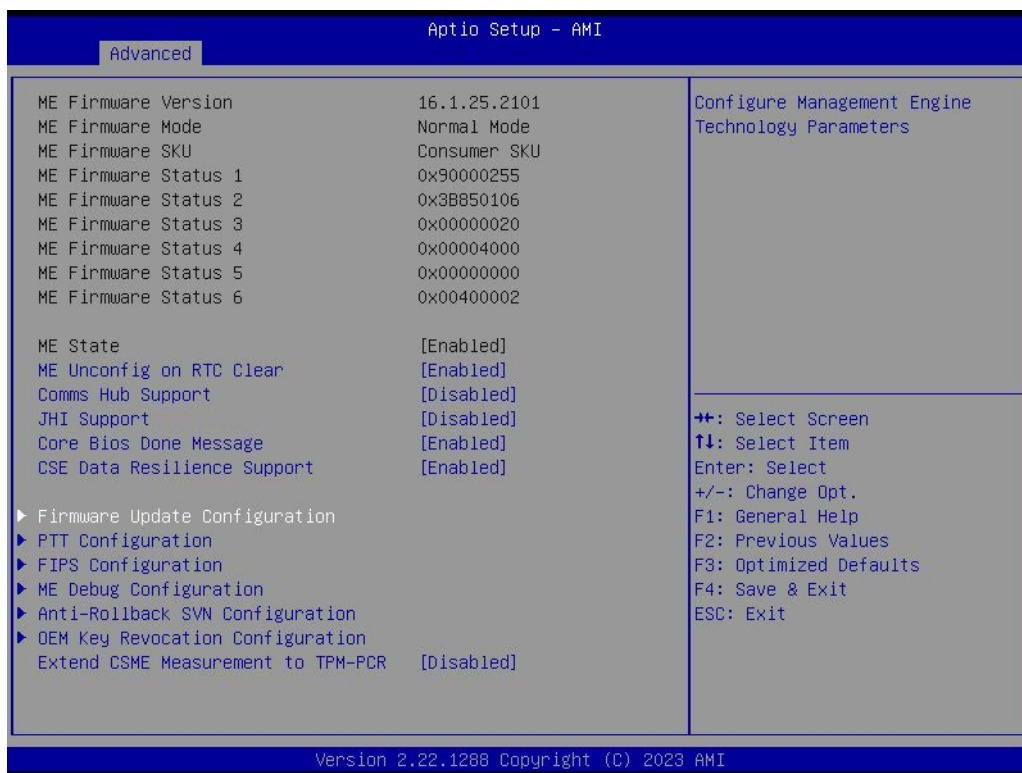
3.2.2.3.4 GT – Power Management Control

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

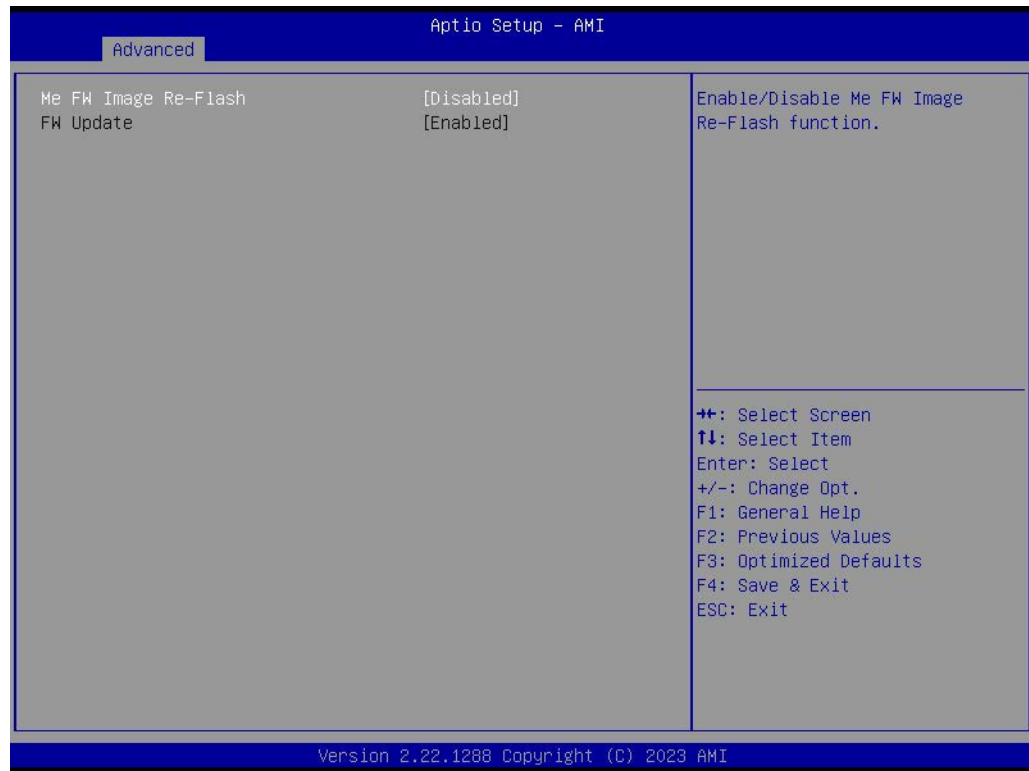


3.2.2.4 PCH-FW Configuration

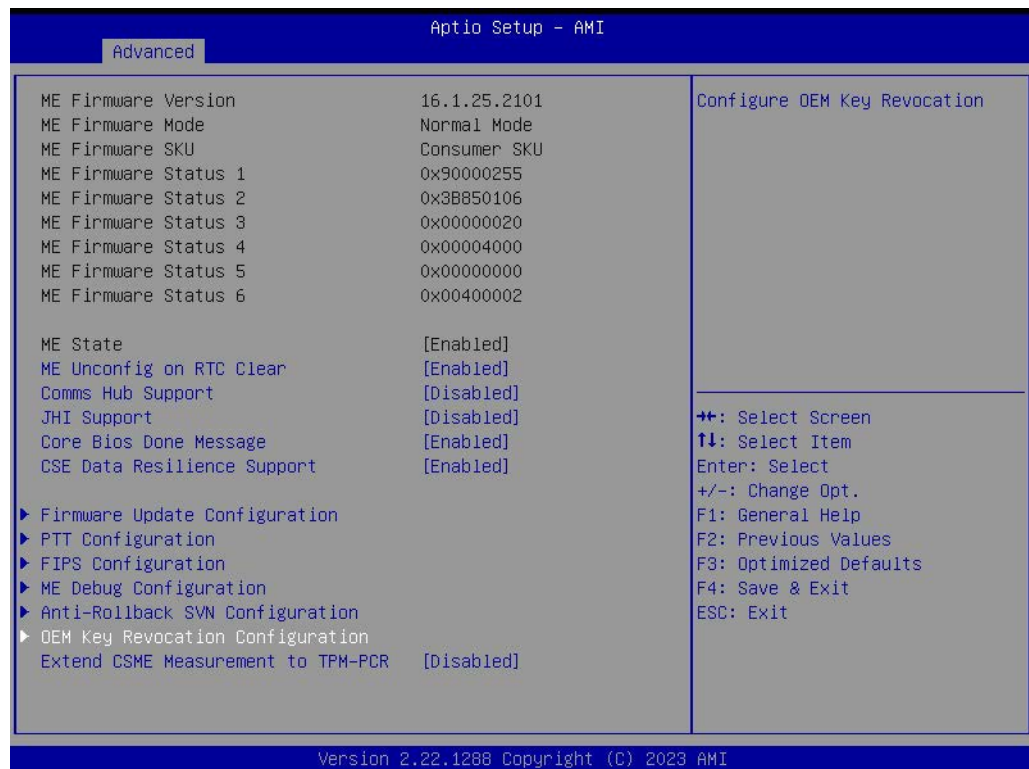
Configure Management Engine Technology Parameters.



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

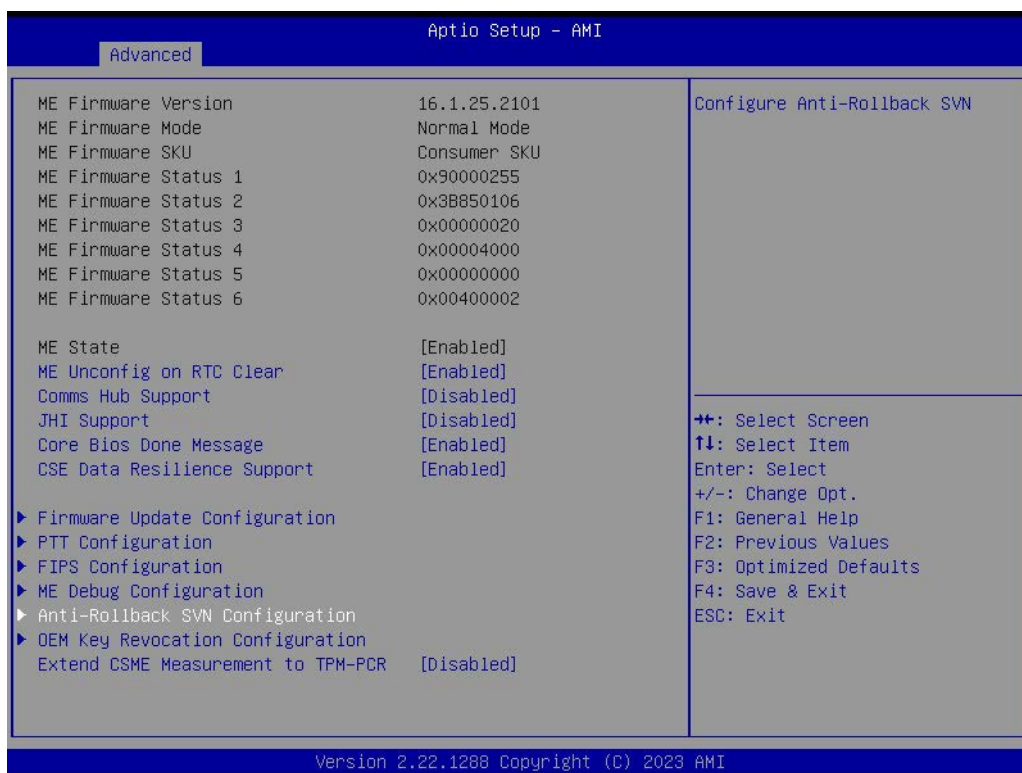


- **OEM Key Revocation Configuration**
Configure OEM.



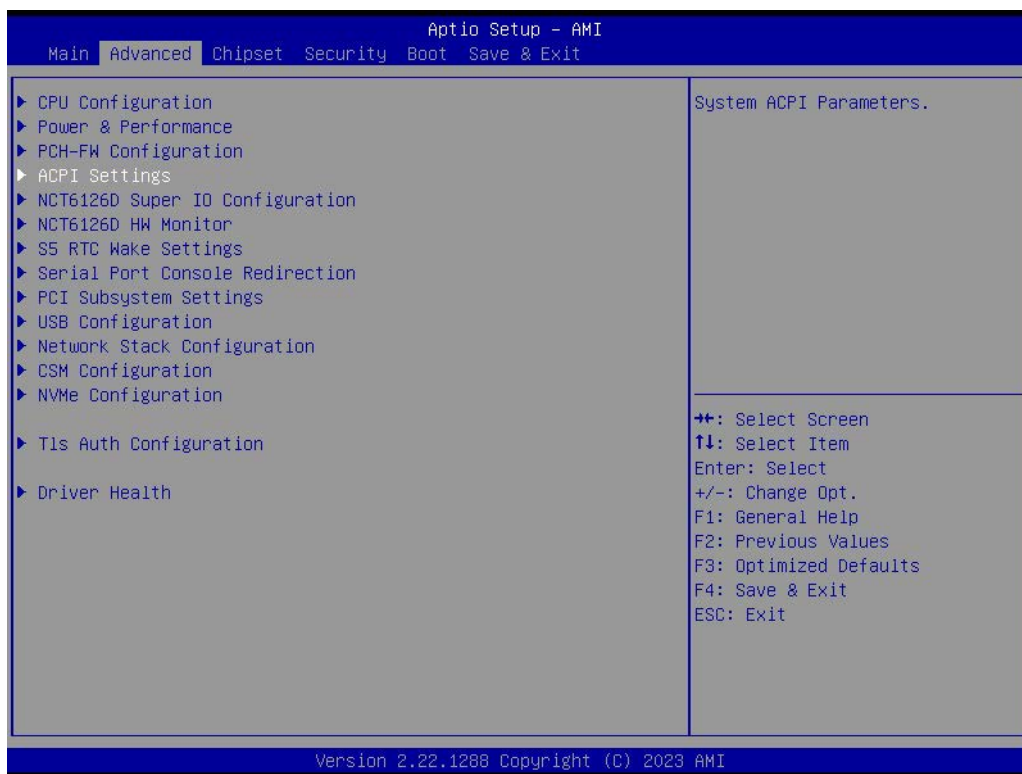
■ Anti-Rollback SVN Configuration

Configure Anti-Rollback SVN.



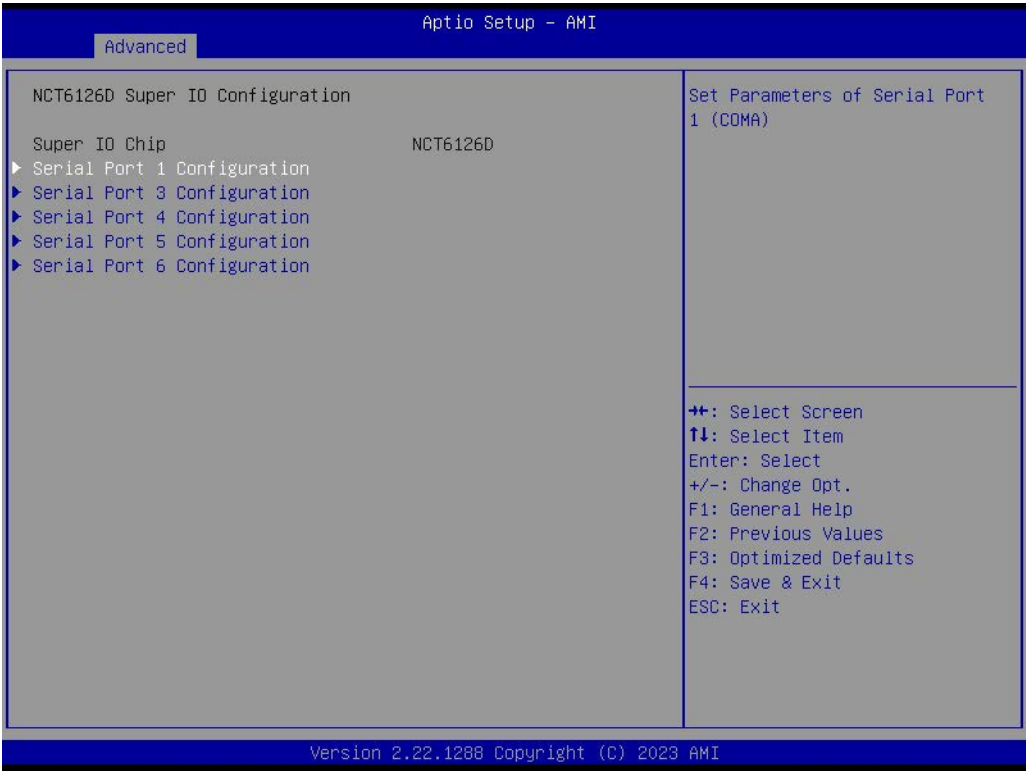
3.2.2.5 ACPI Settings

System ACPI Parameters.



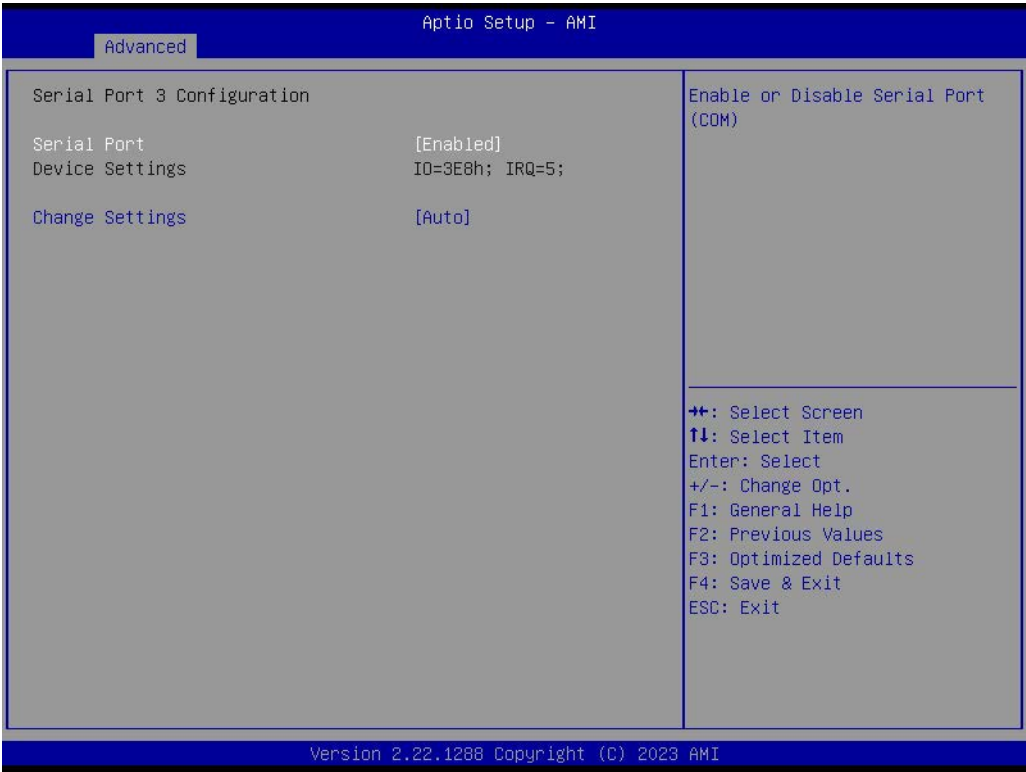
3.2.2.6 NCT6126D Super IO Configuration

Set Parameters of Serial Port 1 (COMA).

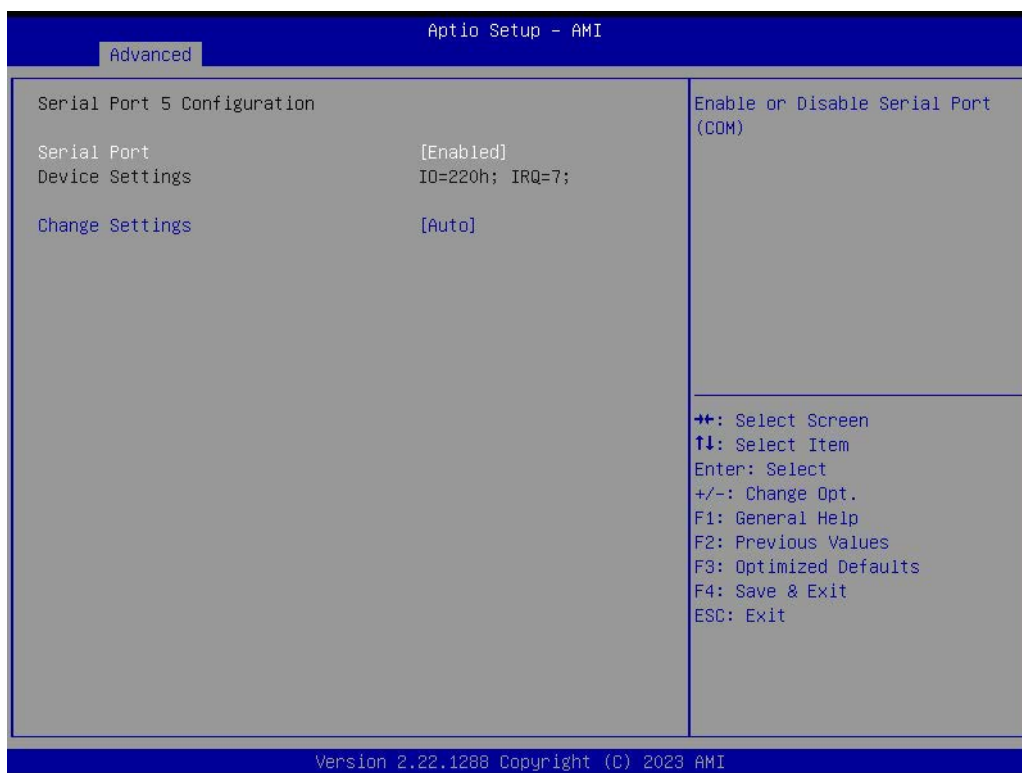


■ Serial Port 3 Configuration

Enable or Disable Serial Port (COM).

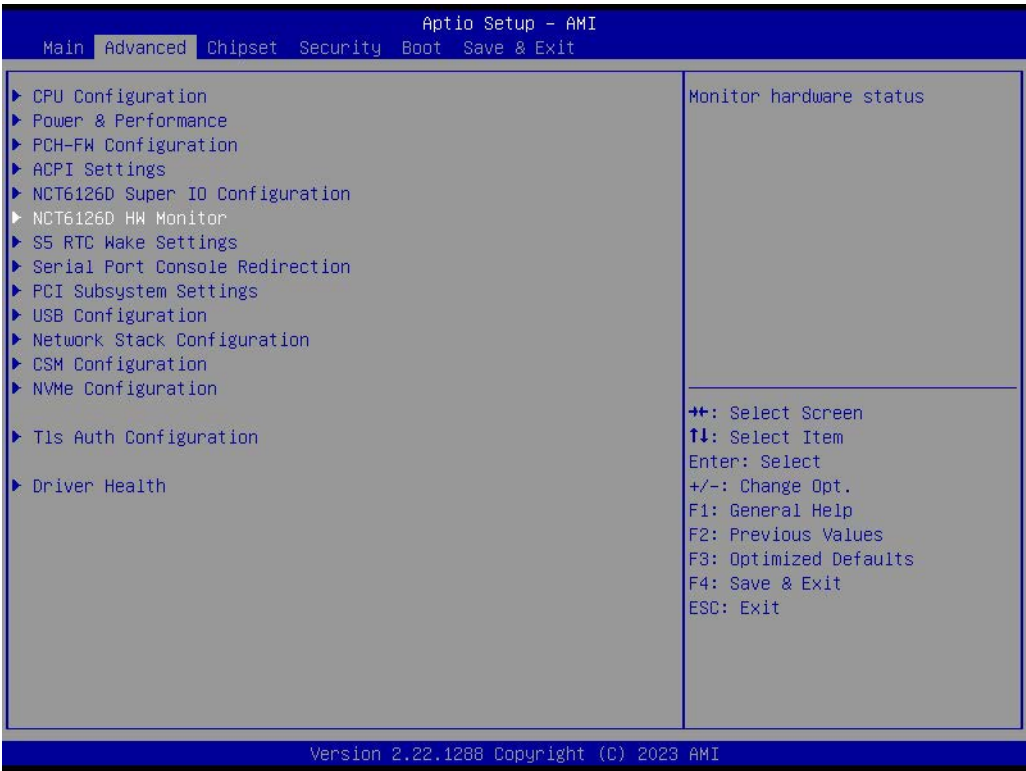


- **Serial Port 5 Configuration**
Enable or Disable Serial Port (COM).

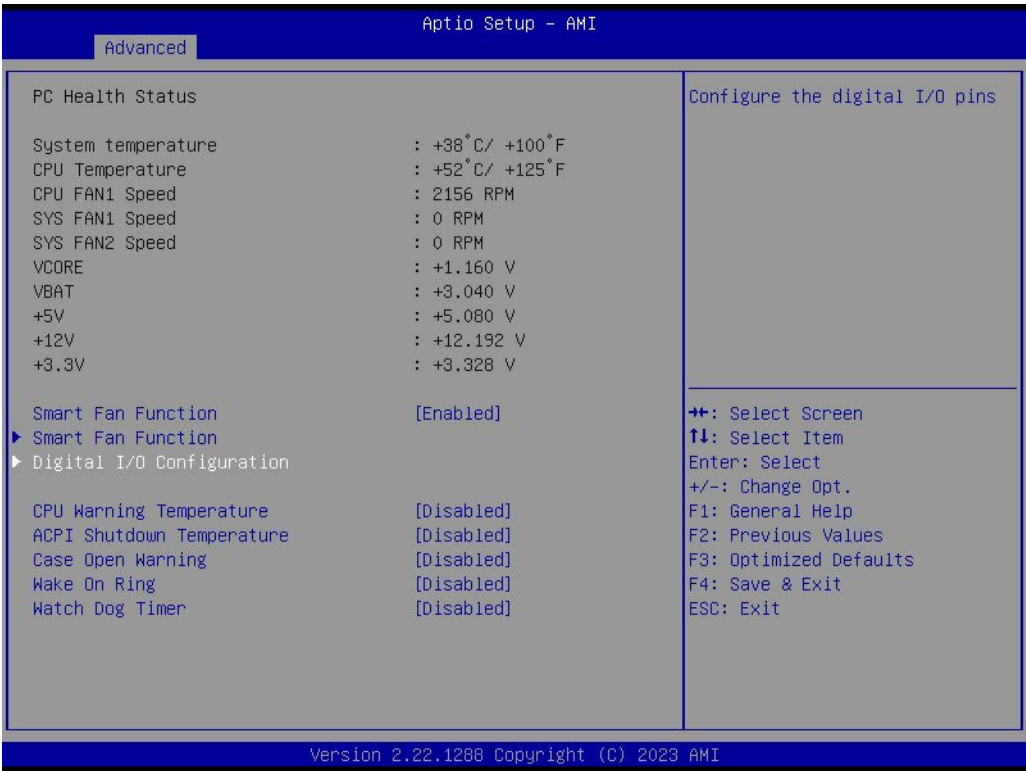


- **Serial Port [Enabled]**
Enable or Disable Serial Port (COM).
- **Device Settings: IO=220h; IRQ =7**
- **Change Settings [Auto]**
To select an optimal setting for serial port 5.

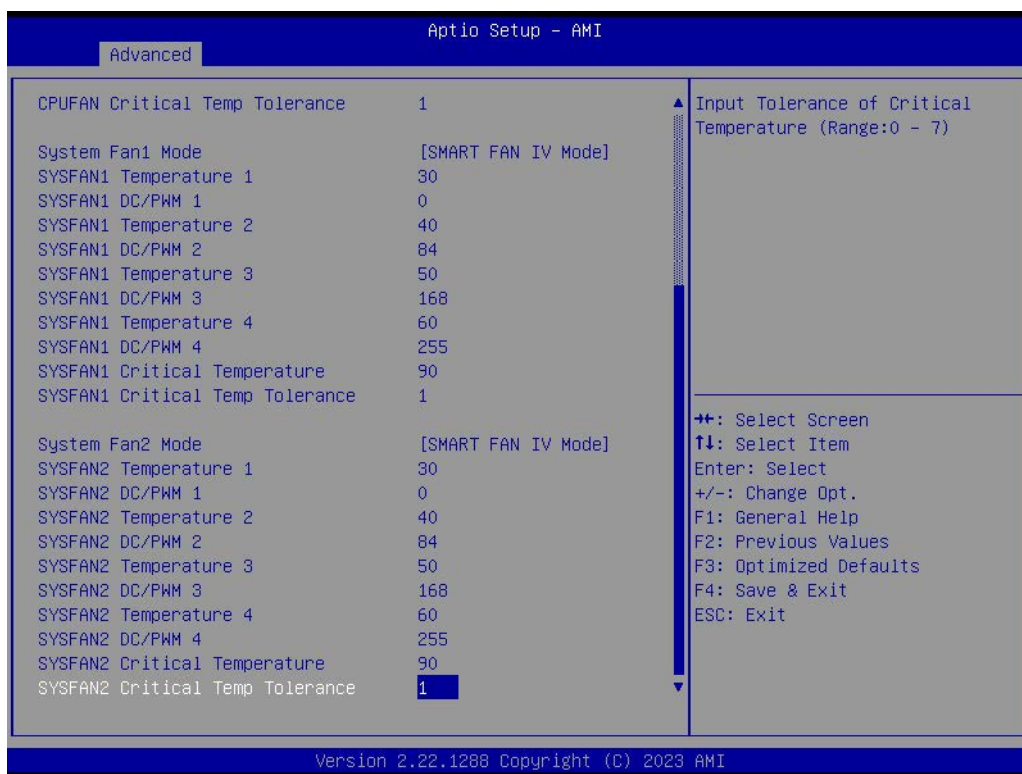
3.2.2.7 NCT6126D HW Monitor



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

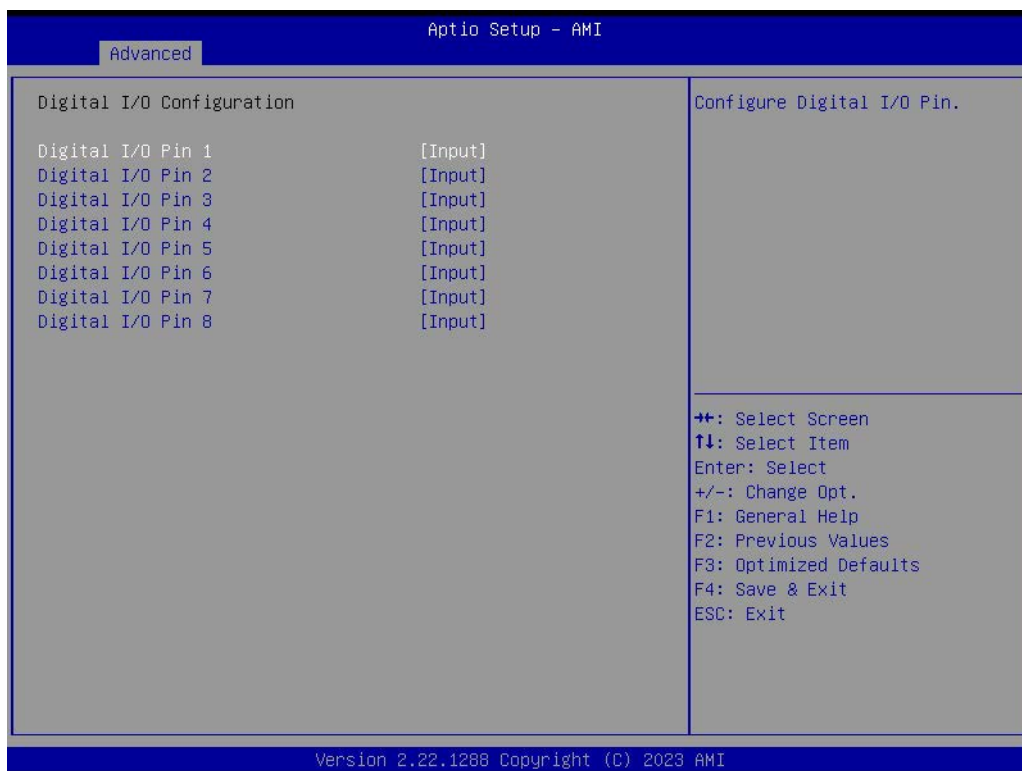


- **Smart Fan Configuration**
 - CPU Fan Mode [SMART FAN IV Mode]
 - System Fan1 Mode [SMART FAN IV Mode]

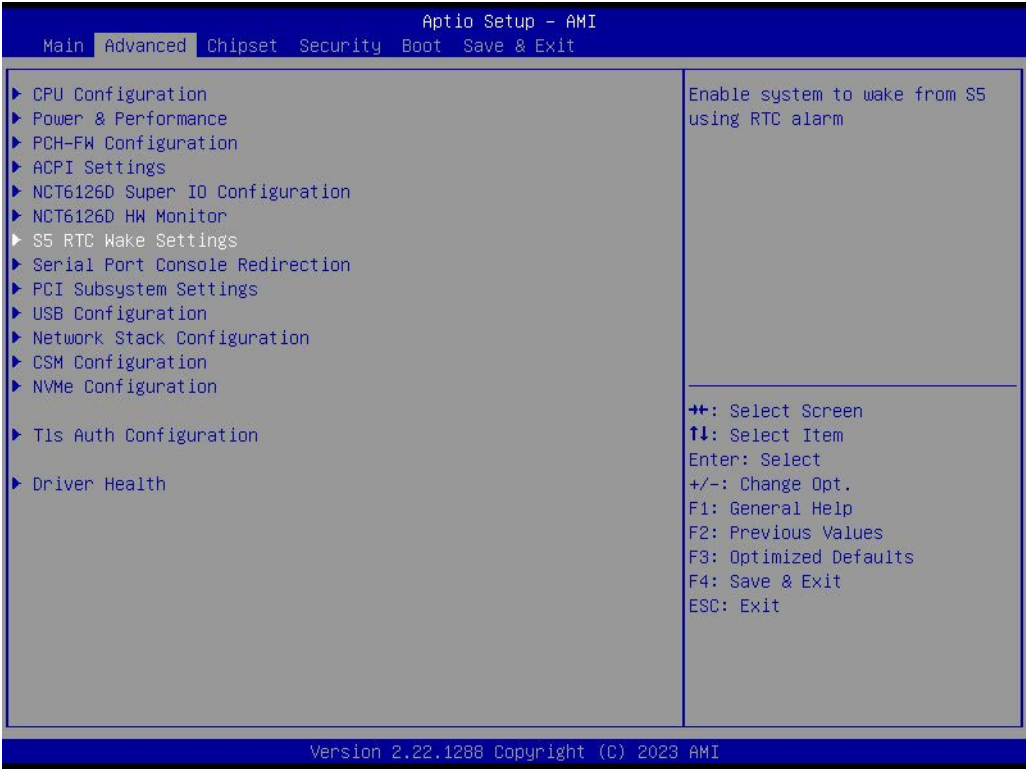


■ Digital I/O Configuration

Configure Digital I/O Pins.



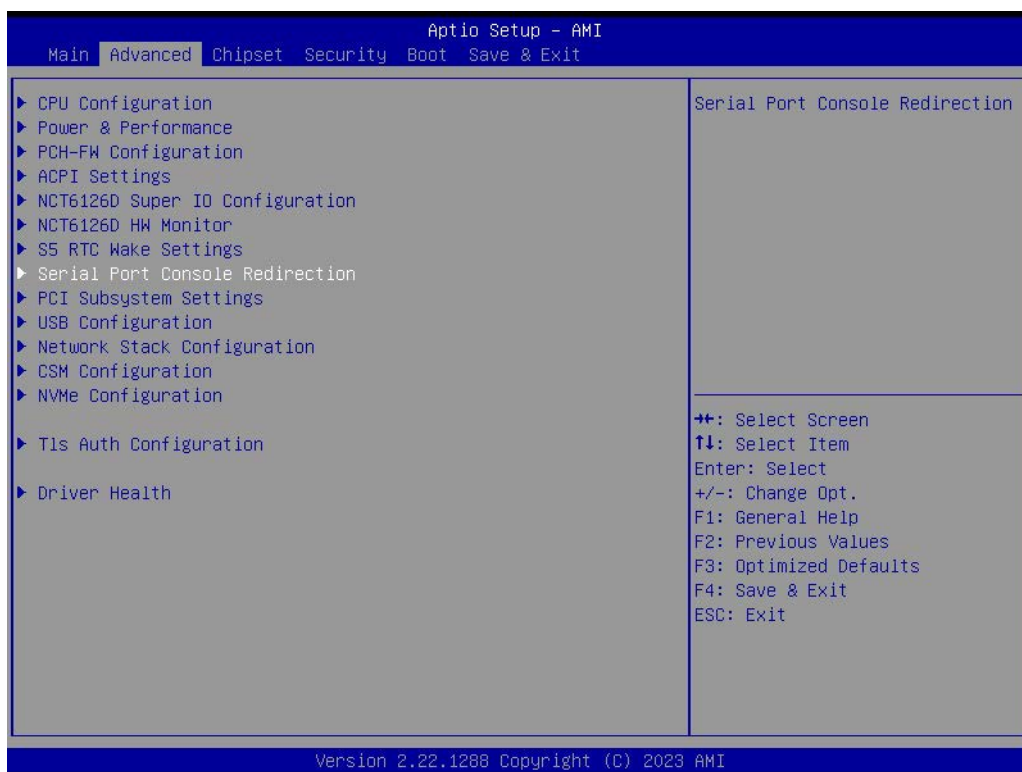
3.2.2.8 S5 RTC Wake Settings



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

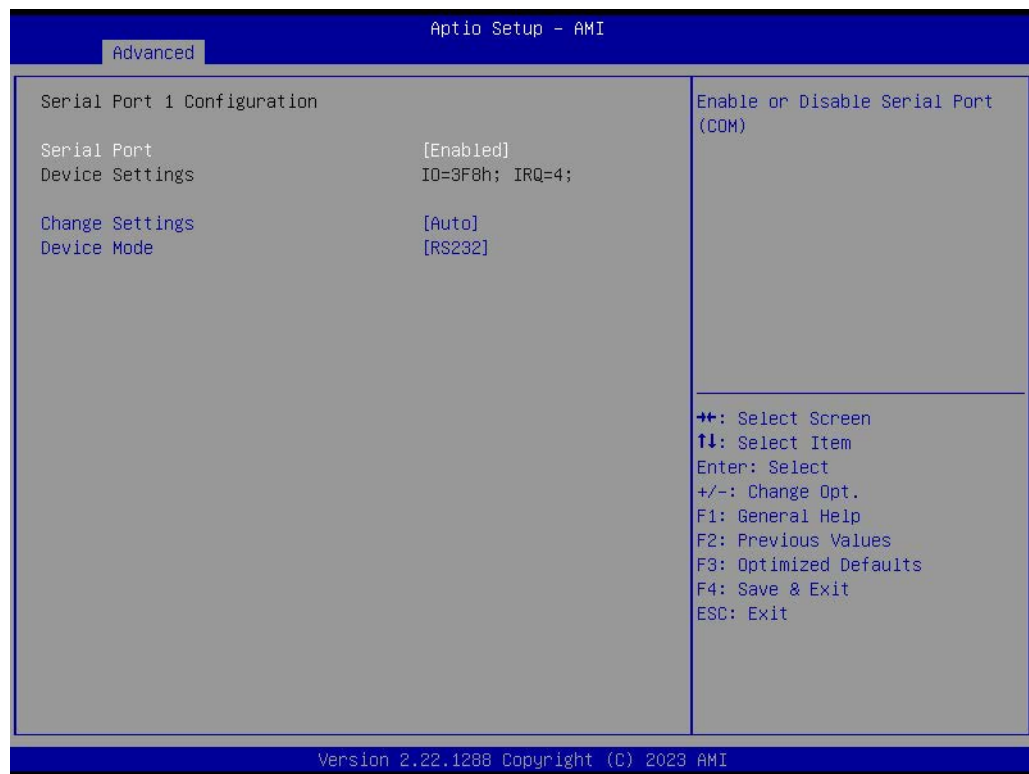


3.2.2.9 S5 RTC Wake Settings



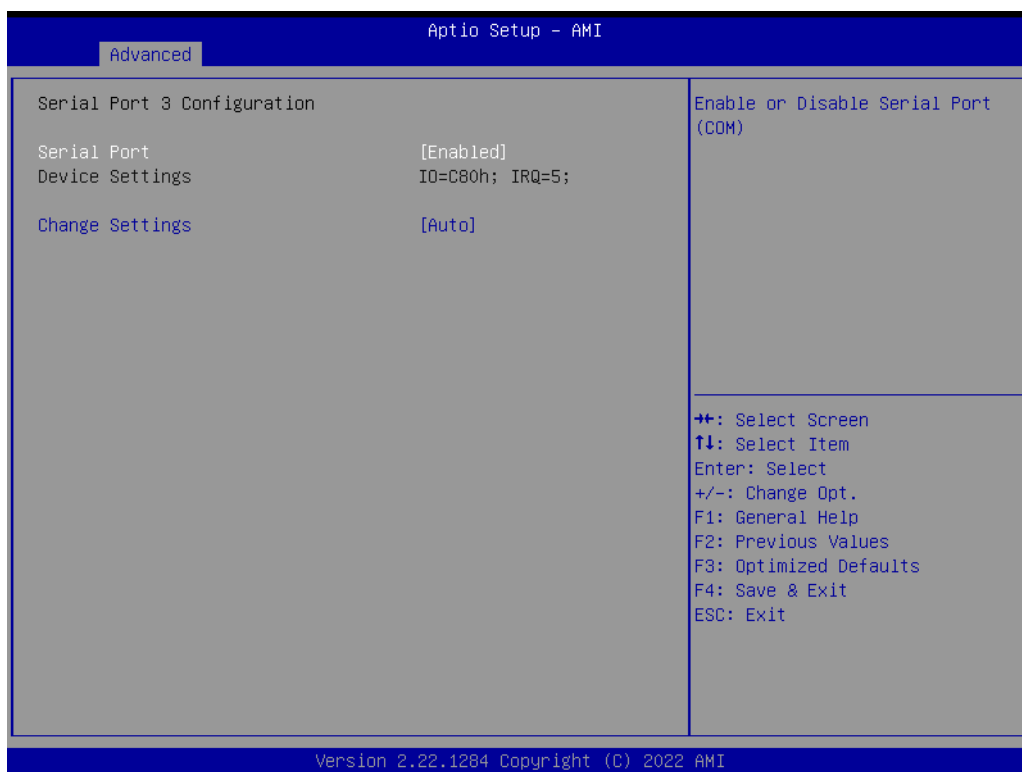
- **Console Redirection [Disabled]**
- **Console Redirection EMS [Disabled].**

- **Serial Port 1 Configuration**
Enable or Disable Serial Port (COM).



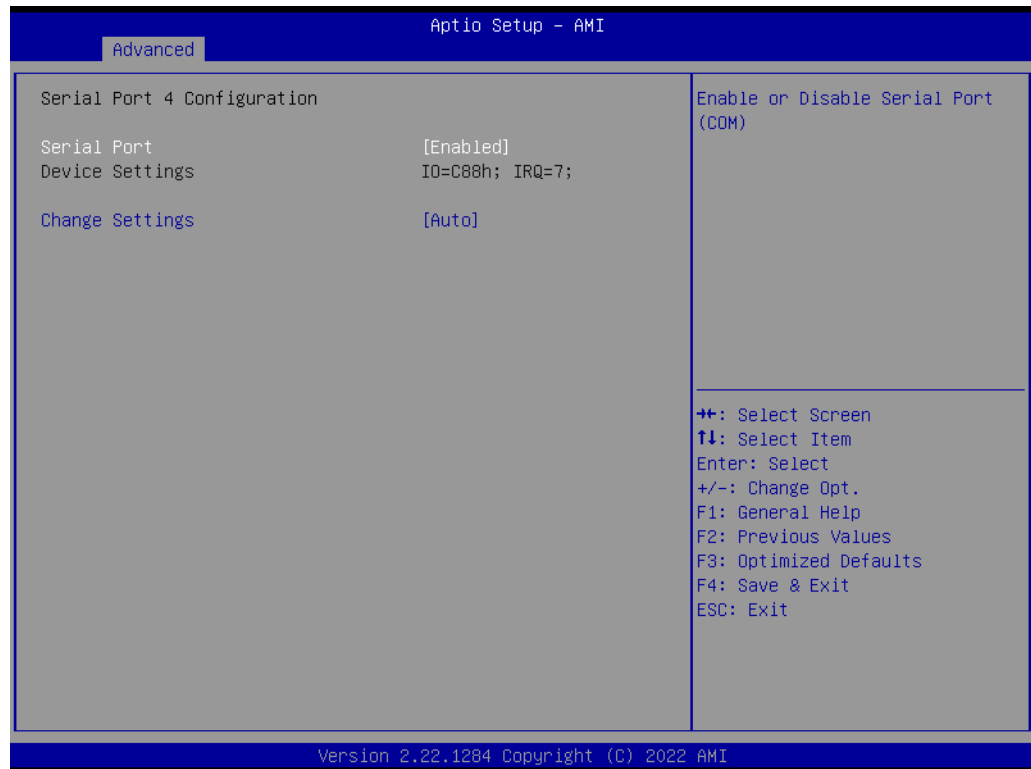
- **Serial Port [Enabled]**
- **Device Settings: IO=3F8h; IRQ =4;**
- **Change Settings [Auto]**
- **Device Mode [RS2]**

■ Serial Port 3 Configuration



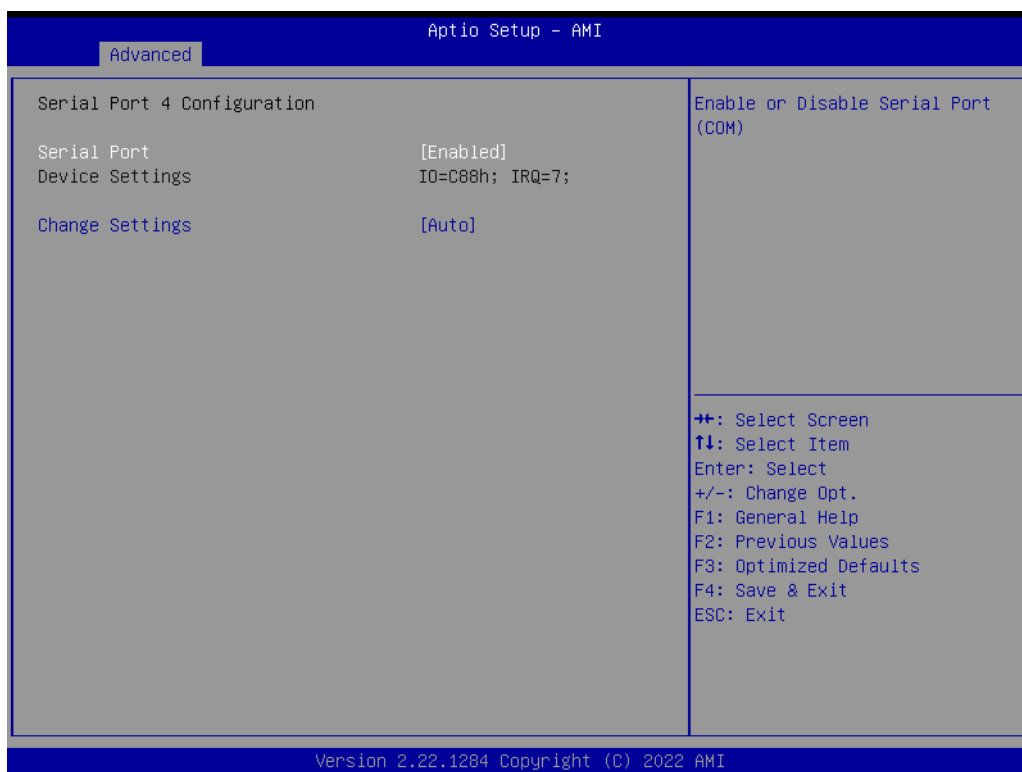
- **Serial Port [Enabled]**
- **Device Settings: IO=C80h; IRQ =5;**
- **Change Settings [Auto]**
To select an optimal setting for serial port 3.

■ Serial Port 4 Configuration



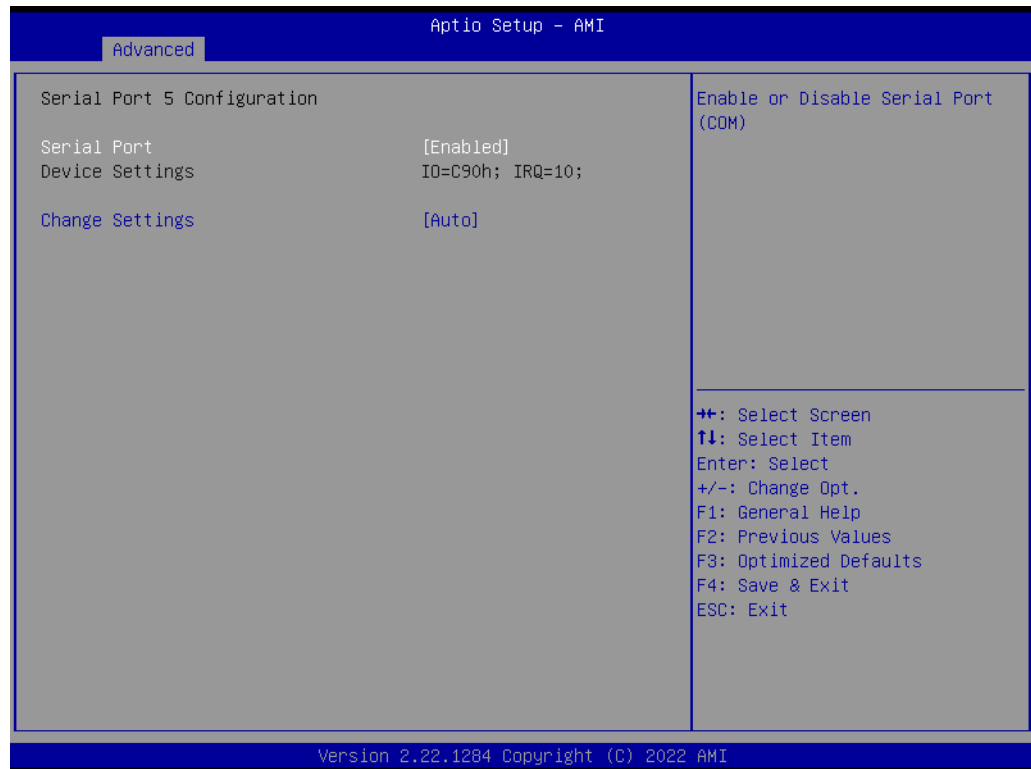
- **Serial Port [Enabled]**
- **Device Settings: IO=C88h; IRQ =7;**
- **Change Settings [Auto]**
To select an optimal setting for serial port 4.

■ 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.

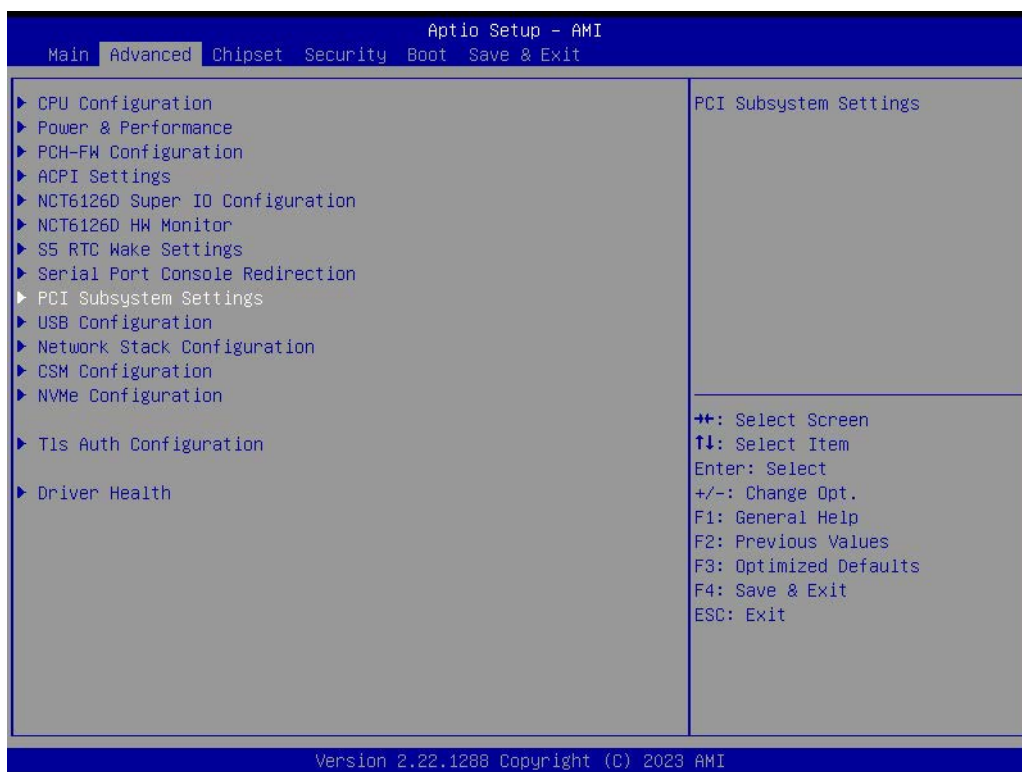
■ Serial Port 6 Configuration



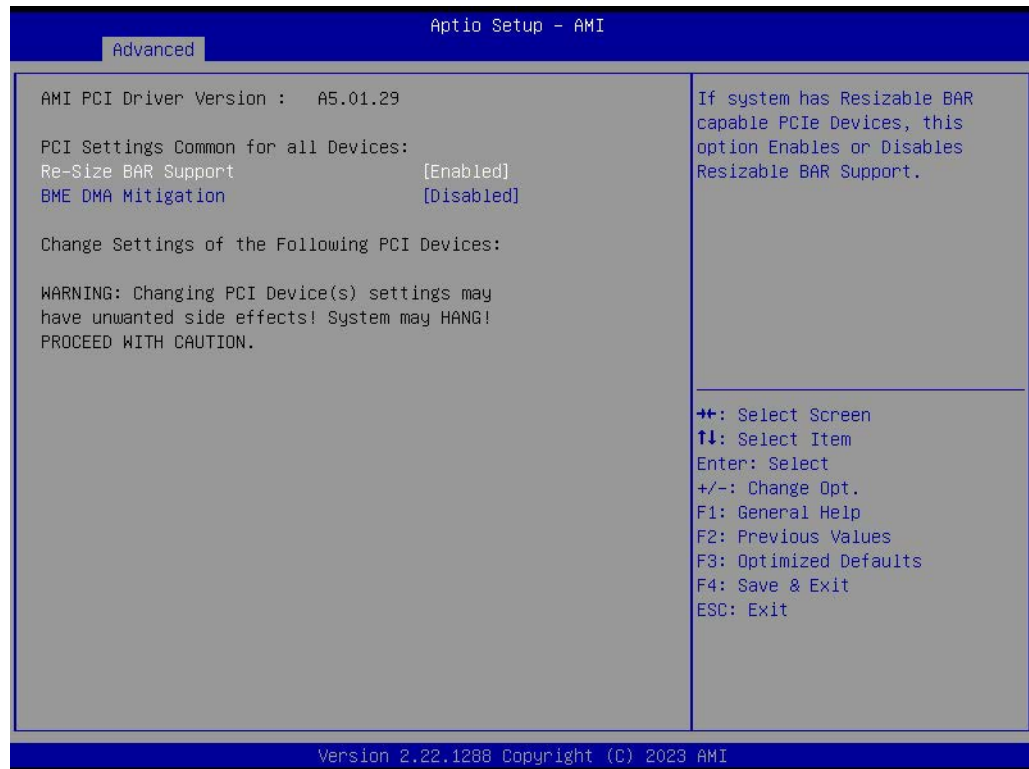
Serial Port [Enabled]

- **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

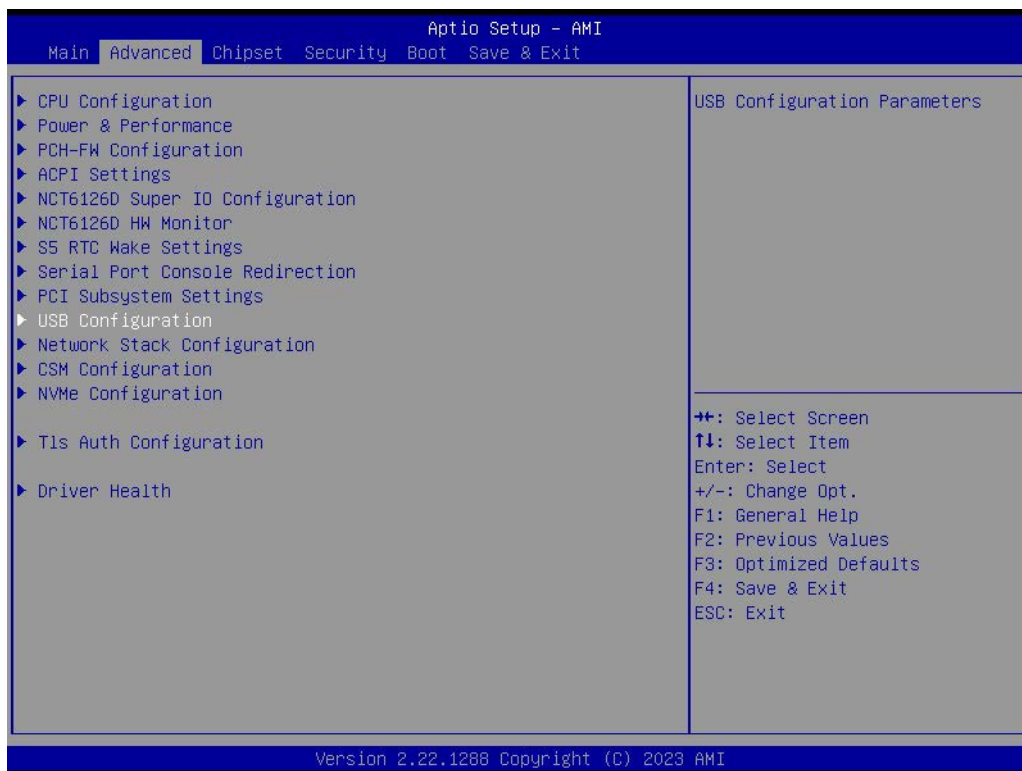


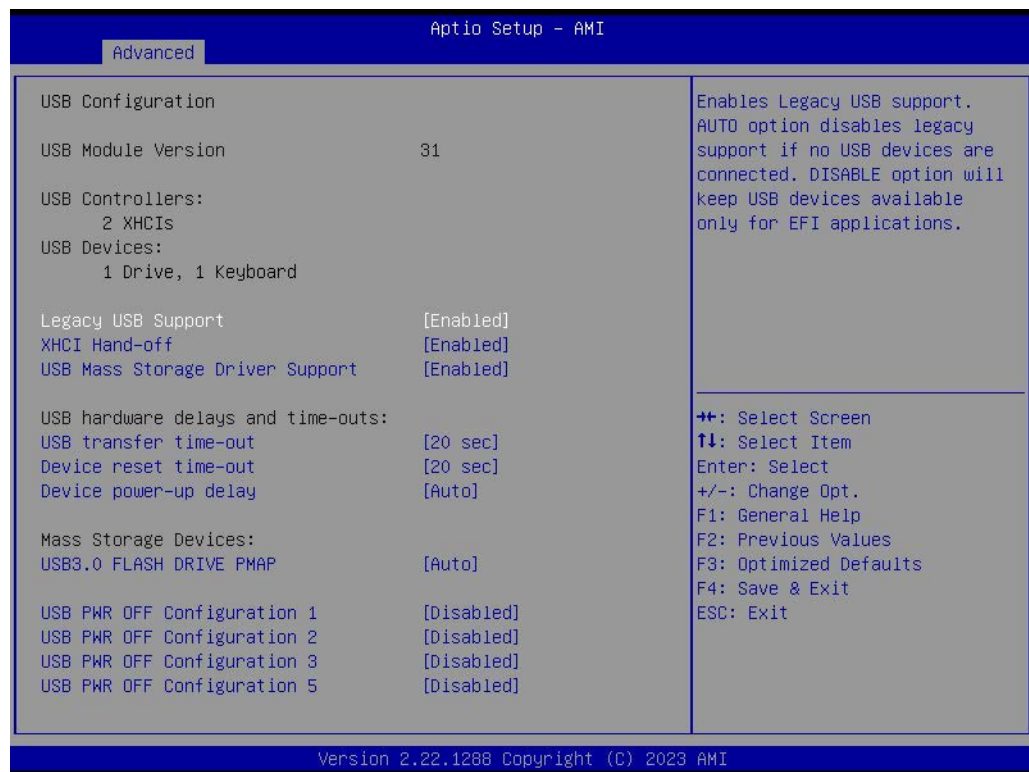
■ PCI Settings Common for all Devices



- **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]**

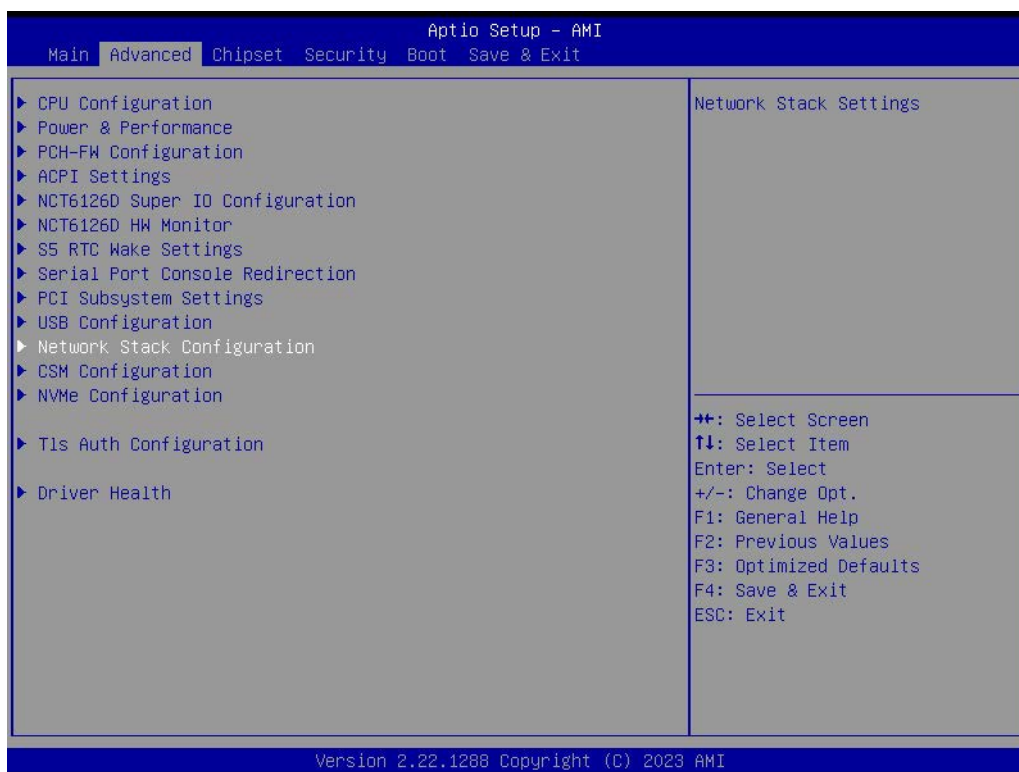
3.2.2.11 USB Configuration





- **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

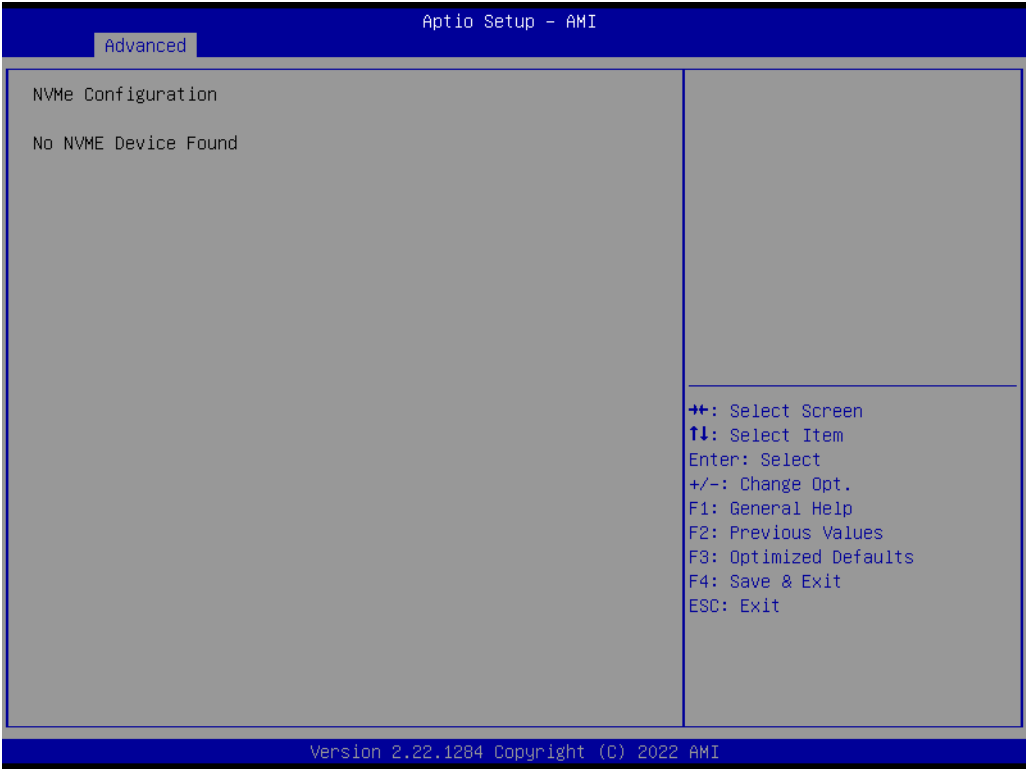


3.2.2.13 CSM Configuration

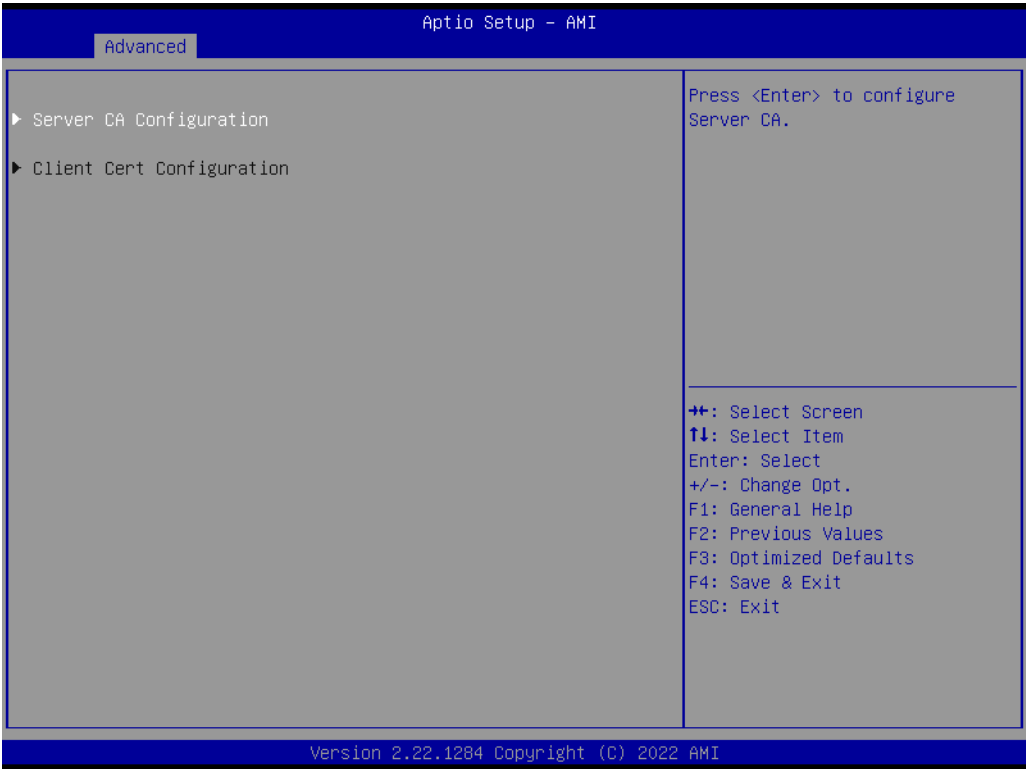


■ CSM Support [Disabled]

3.2.2.14 NVMe Configuration

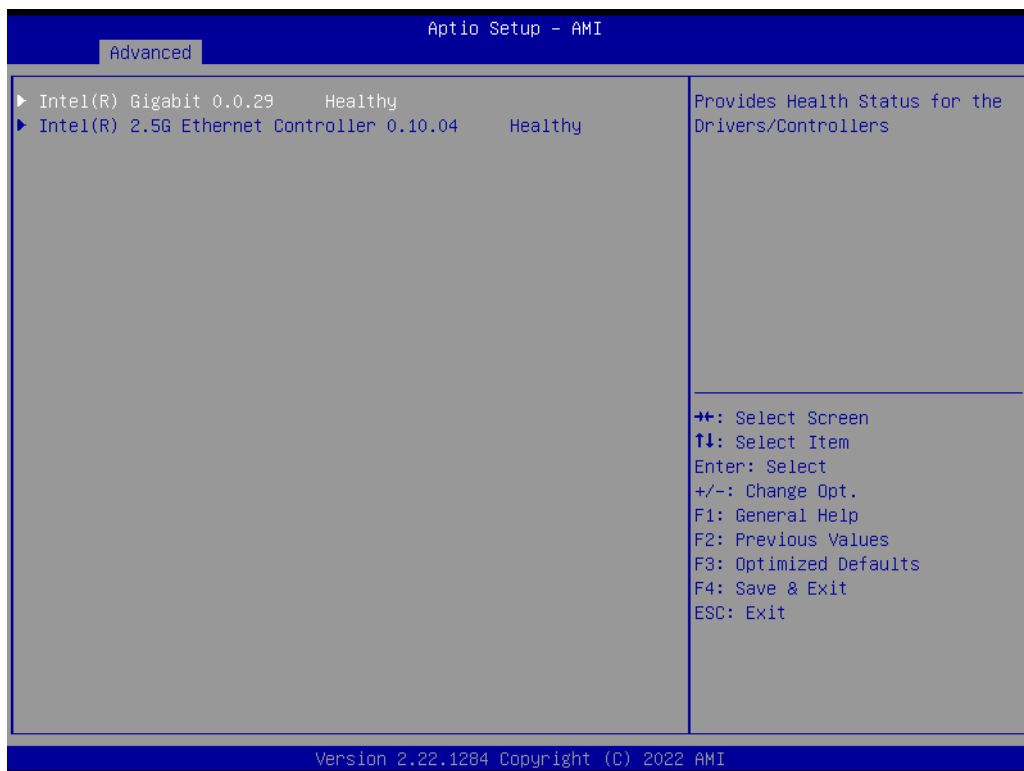


3.2.2.15 Tls Auth Configuration



- Server CA Configuration
- Client Cert Configuration

3.2.2.16 Driver Health

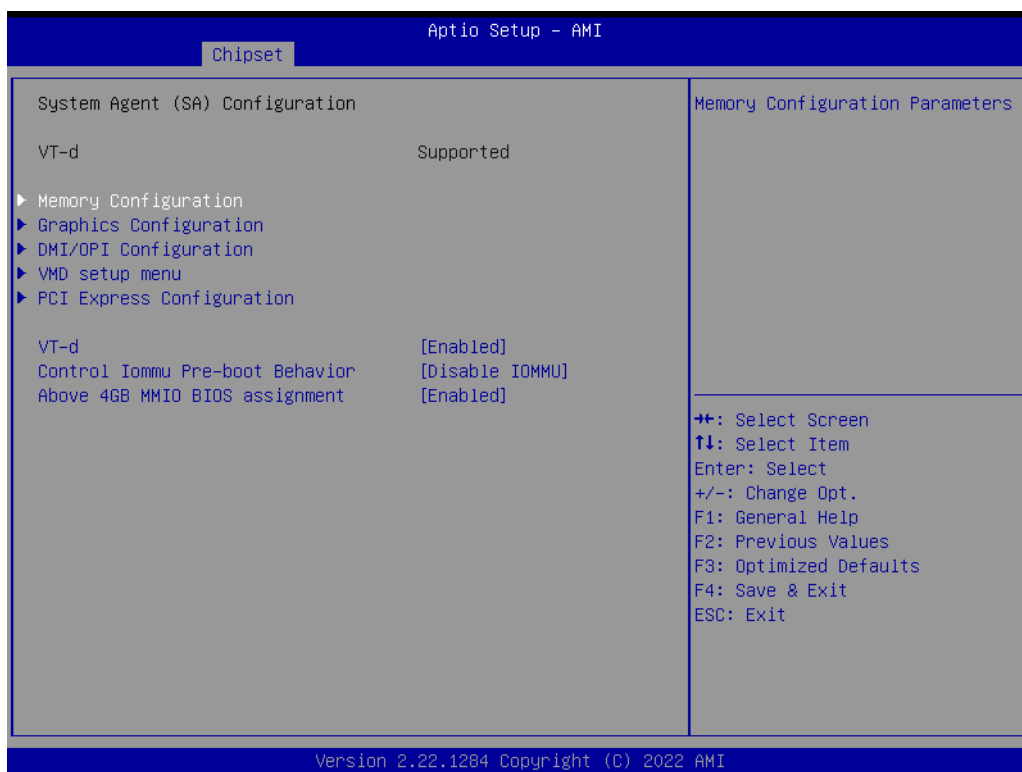


3.2.3 Chipset Configuration Settings

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.

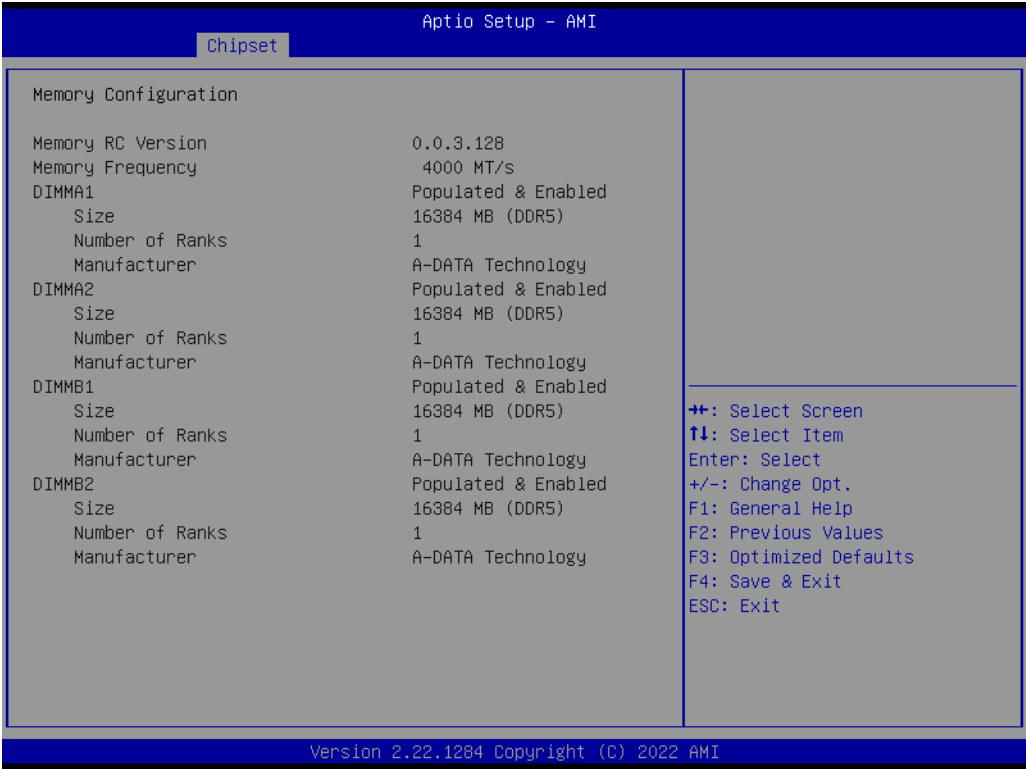


3.2.3.1 Chipset Configuration Setting - System Agent (SA) Configuration



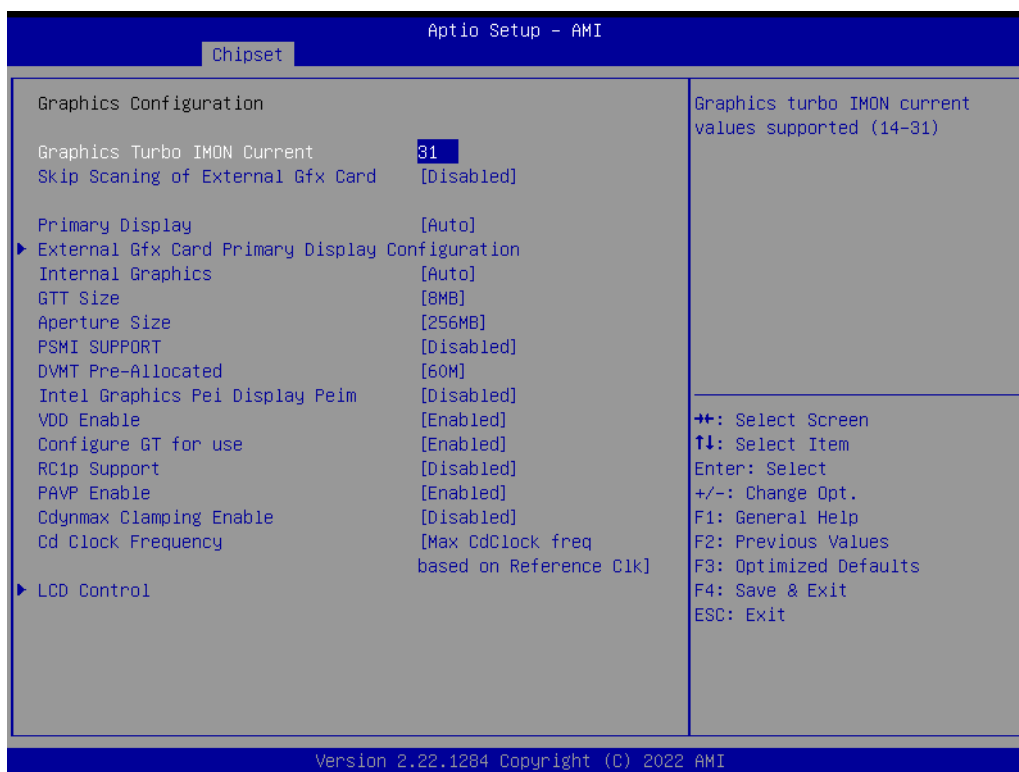
- **VT-d [Enabled]**
Disable or enable the VT-d function on MCH.

3.2.3.1.1 Memory Configuration

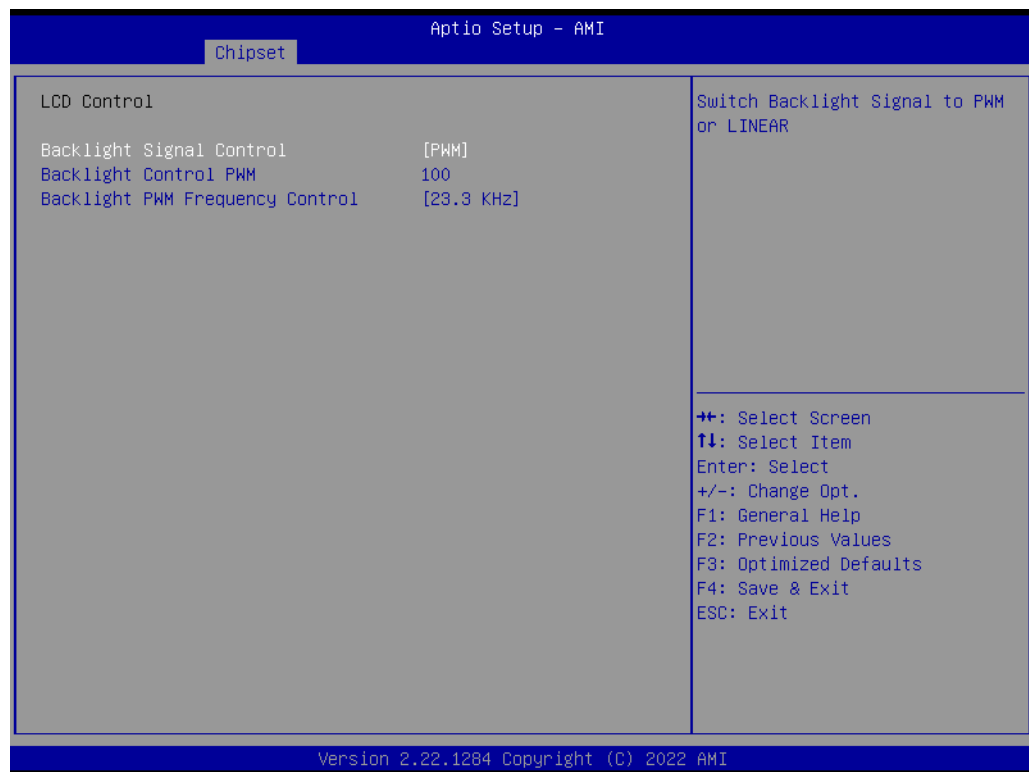


- SIO Port 80 Control [Disabled]
- CPU Warning Temperature [Disabled]
- ACPI Shutdown Temperature [Disabled]
- Case Open Warning [Disabled]
- Wake On Ring [Disabled]

3.2.3.1.2 Graphics Configuration



■ External Gfx Card Primary Display Configuration

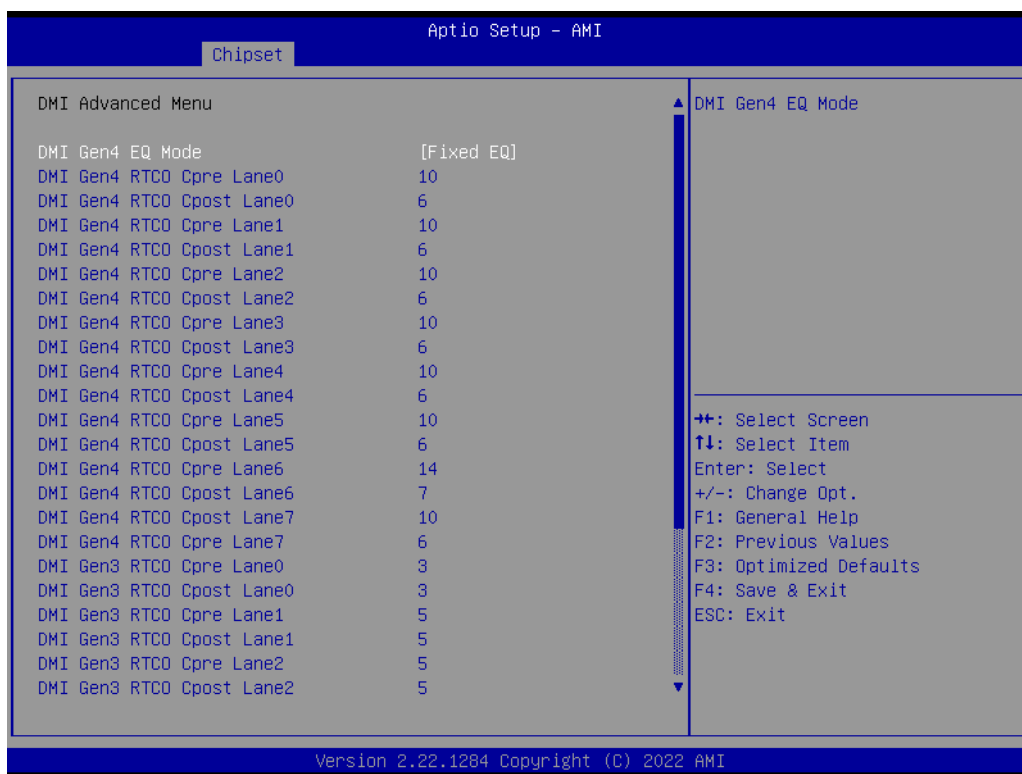


- **LCD Control**
 - **Backlight Signal Control [PWM]**
 - **Backlight Control PWM 100**
 - **Backlight PWM Frequency Control [23.3 KHz]**

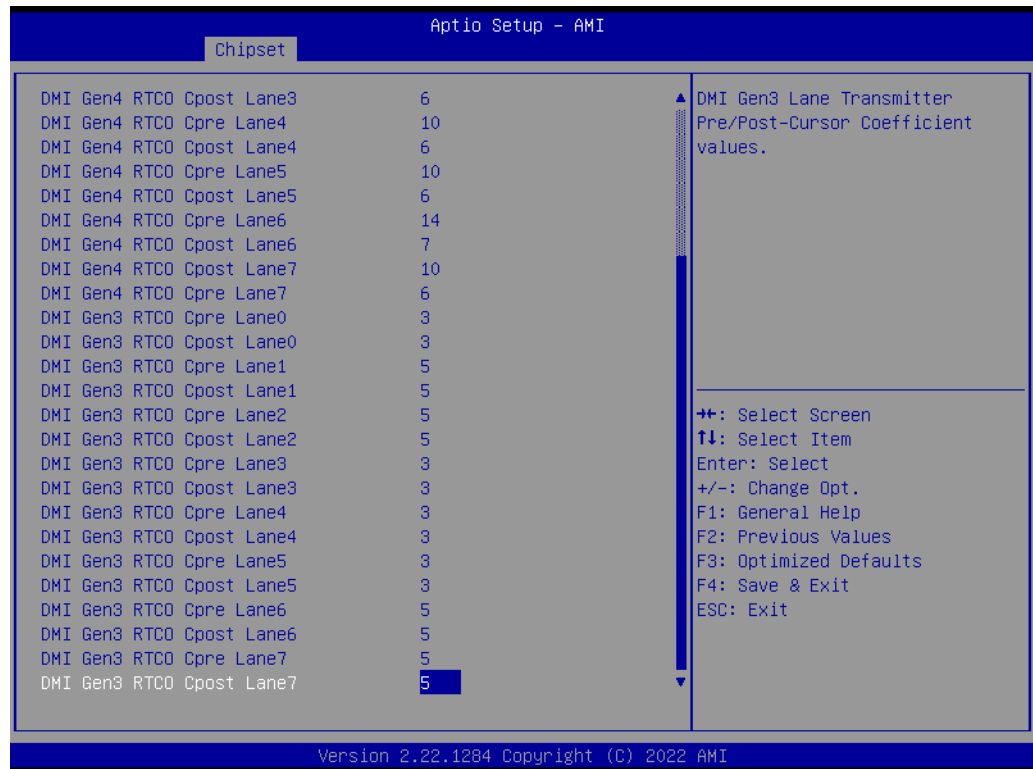
3.2.3.1.3 Graphics Configuration



■ DMI/OPI Configuration



■ DMI Advanced Menu

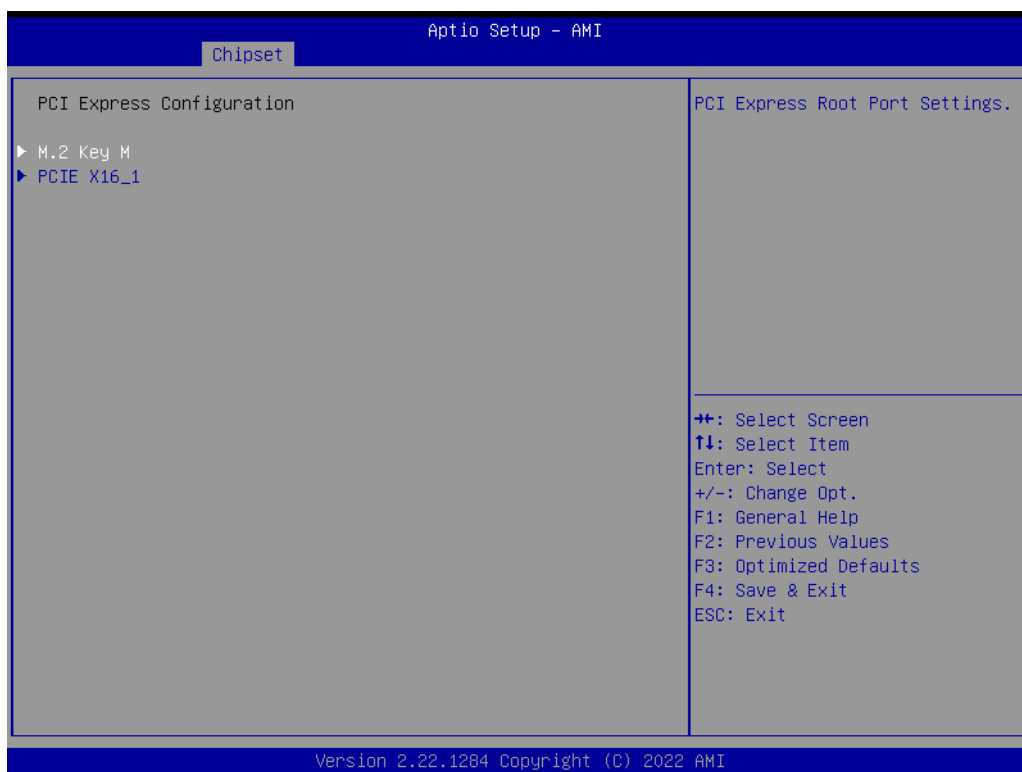


3.2.3.1.4 VMD Configuration



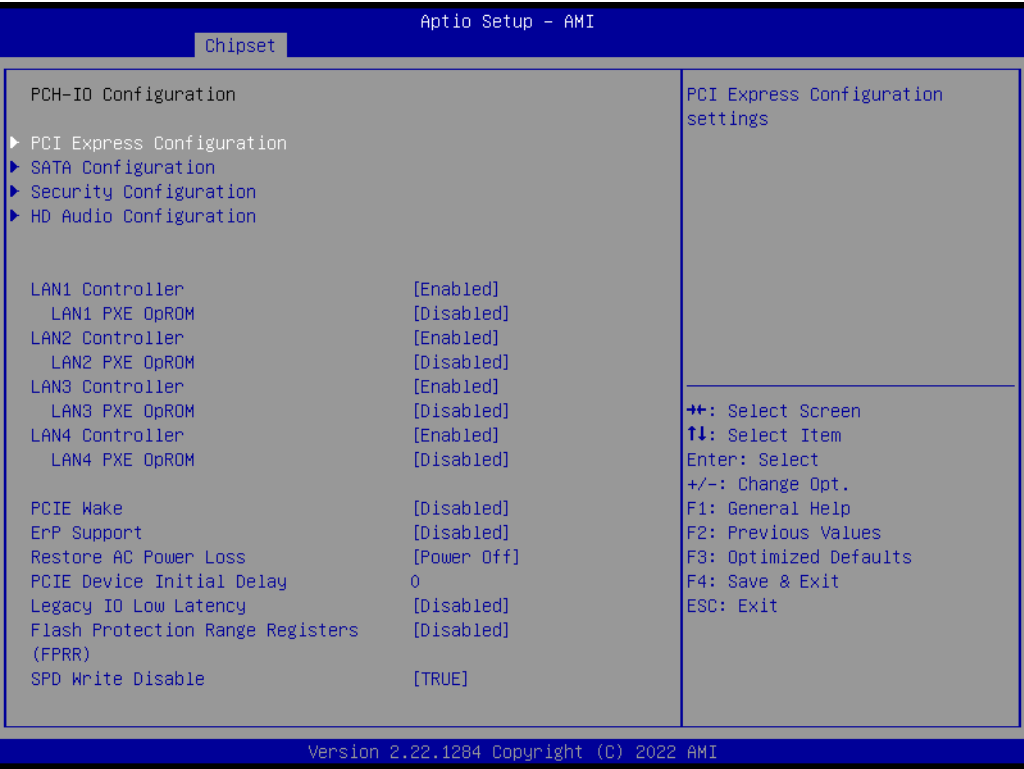
■ Enable VMD controller [Disabled]

3.2.3.1.5 PCI Express Configuration



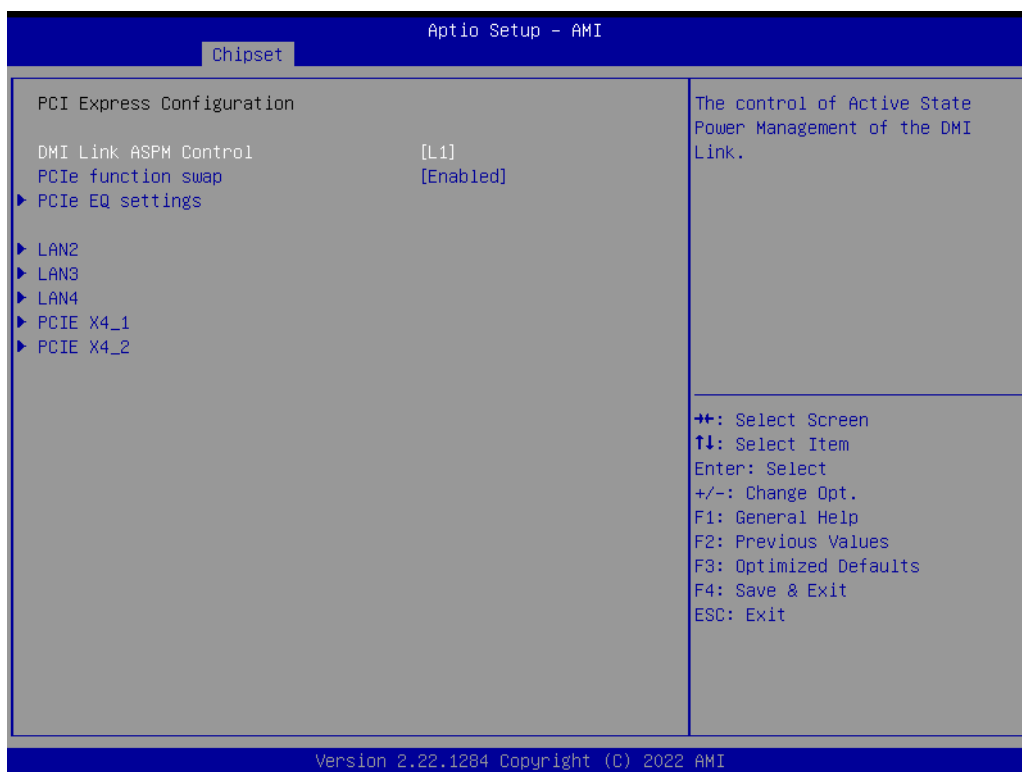
- M.2 Key M
- PCIe X16_1

3.2.3.2 Chipset Configuration Setting – PCH-IO Configuration

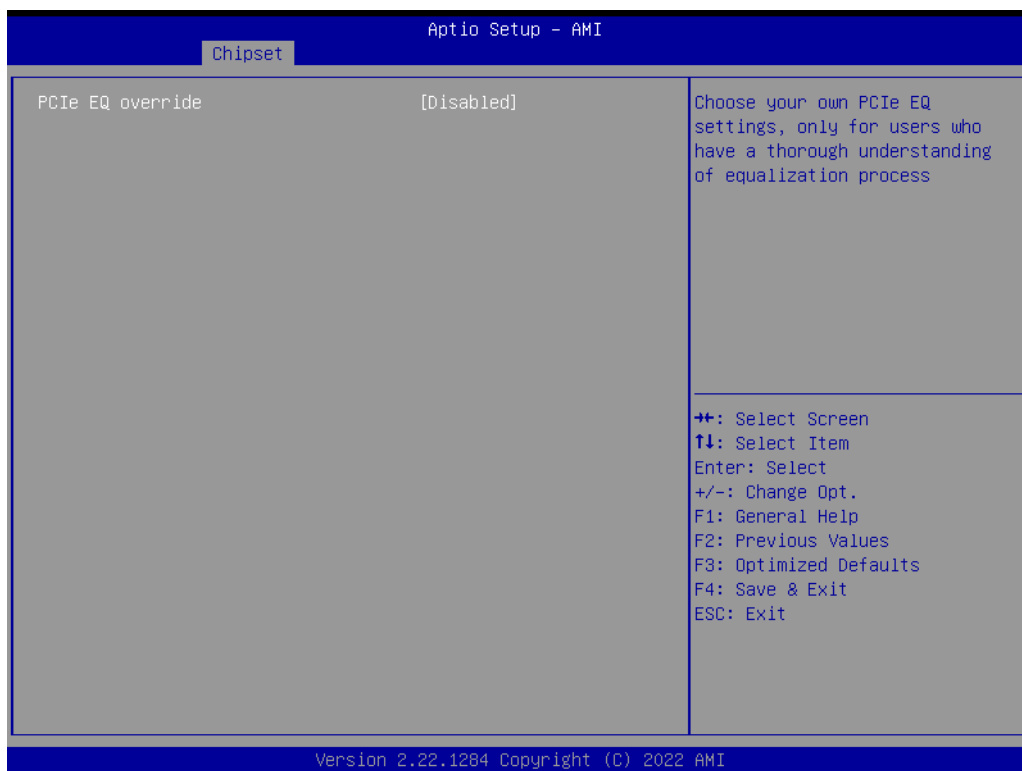


- **PCI Express Configuration**
- **SATA Configuration**
- **Security Configuration**
- **HD Audio Configuration**

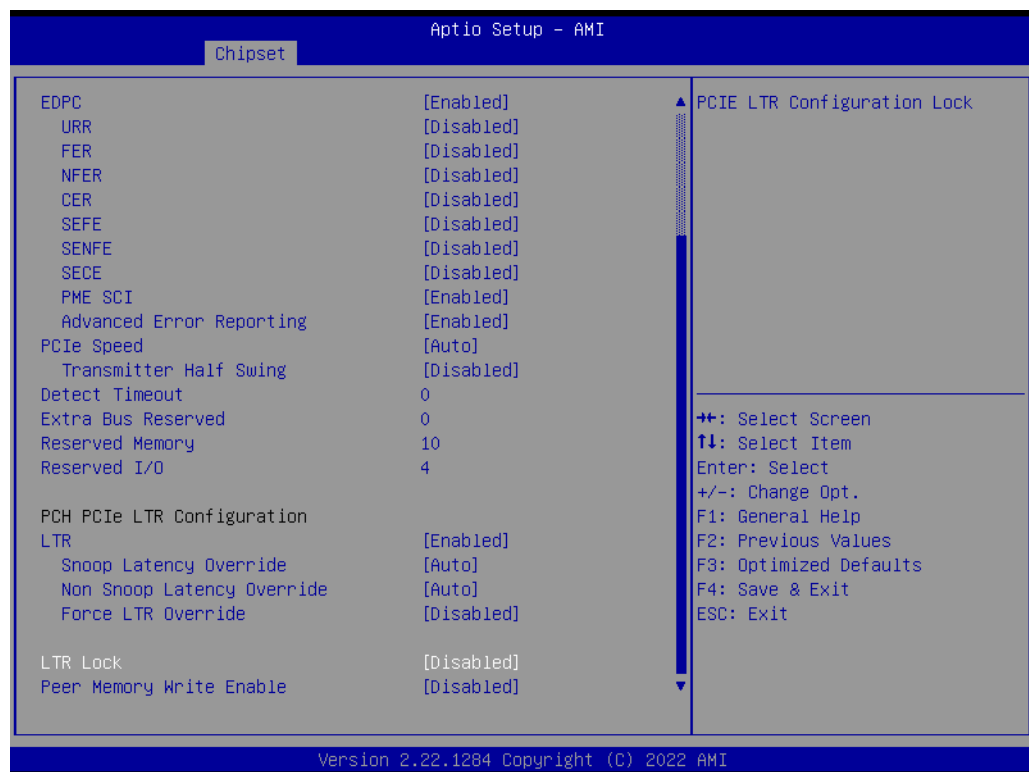
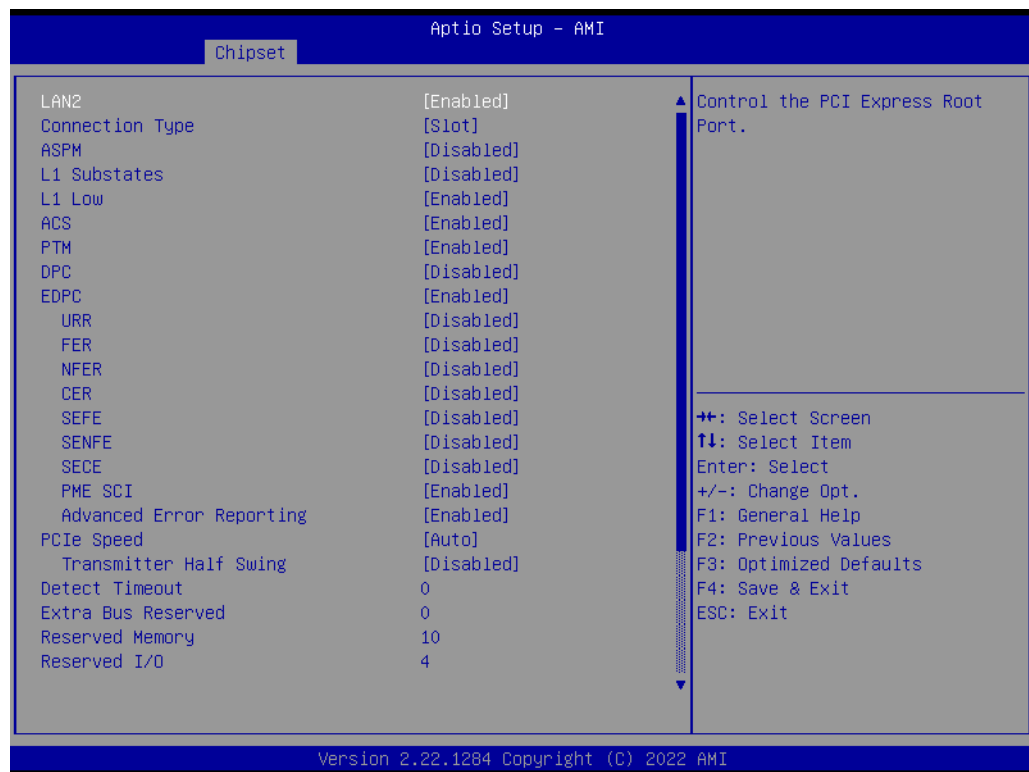
3.2.3.2.1 PCI Express Configuration



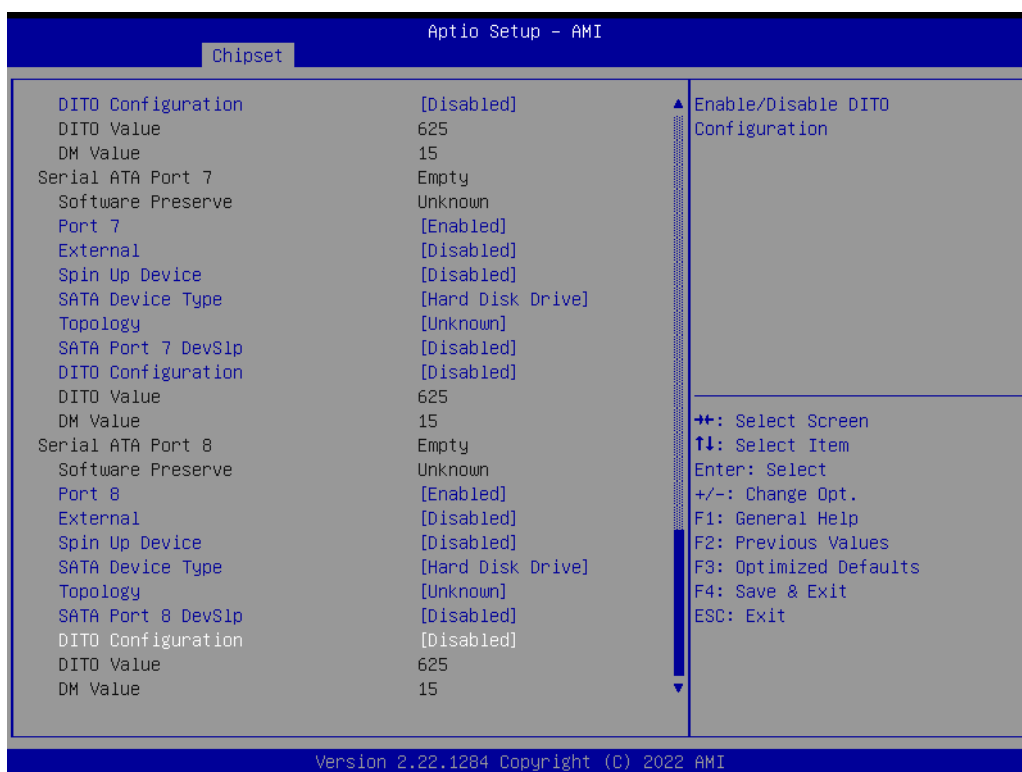
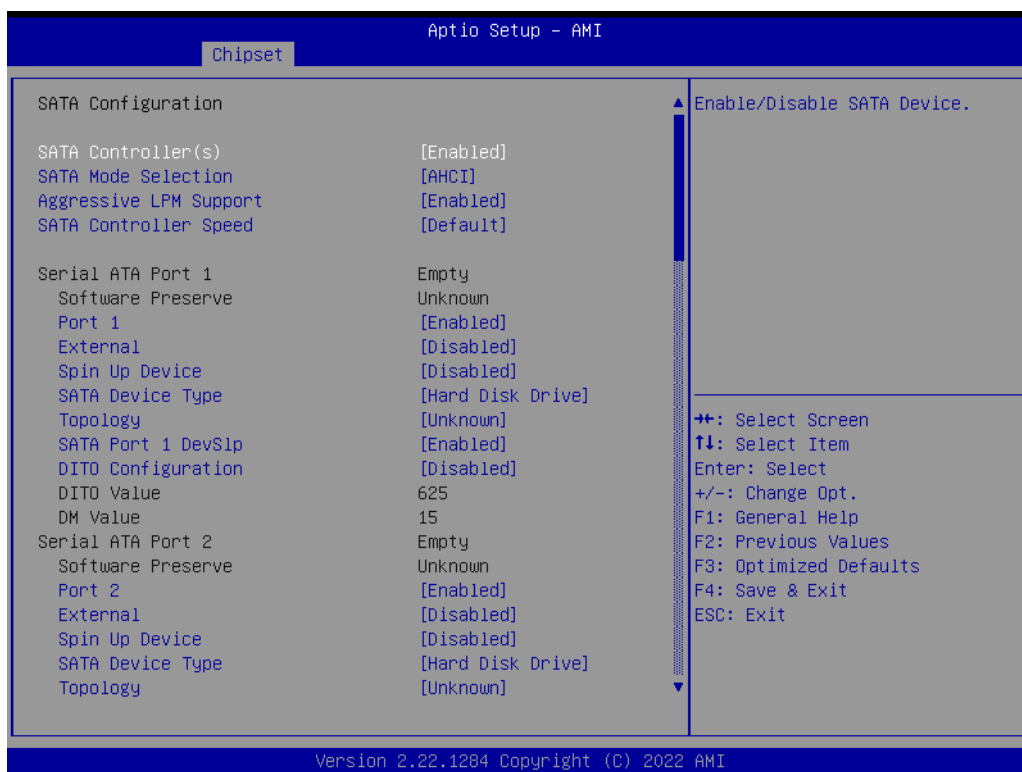
- **DMI Link ASPM Control [L1]**
- **PCIe function swap [Enabled]**
- **PCIe EQ settings**



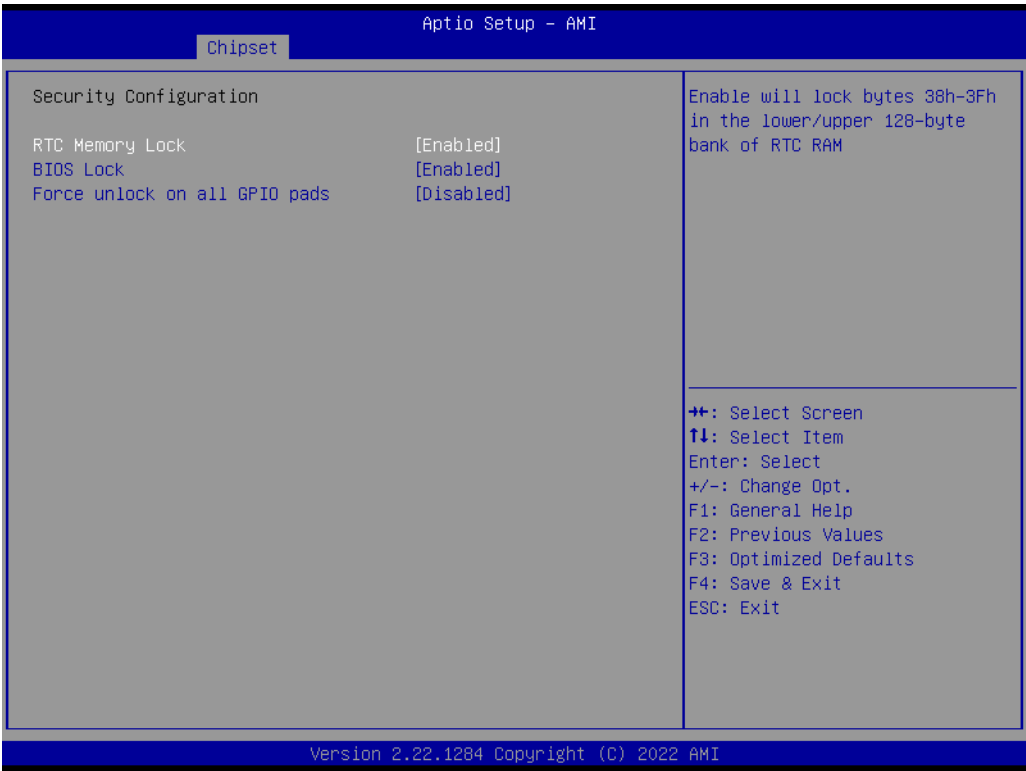
- **PCIe EQ override [Disabled]**



3.2.3.2.2 SATA Configuration



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



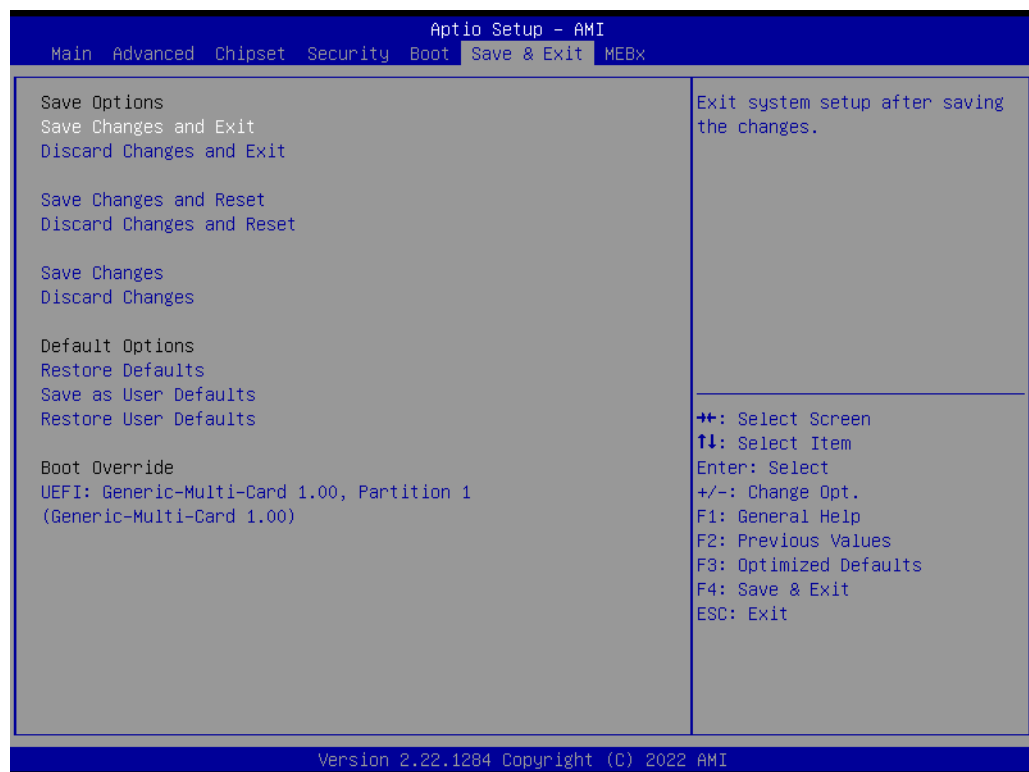
- **Administrator Password**
Select this option and press to access the sub-menu, then type in the password.
Set the Administrator password.
- **User Password**
Select this option and press to access the sub-menu, then type in the password.
Set the User Password.
- **Security Boot**

3.2.5 Boot Settings



- **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.

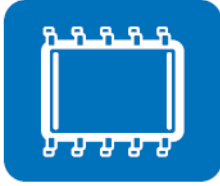
System Throttling



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)

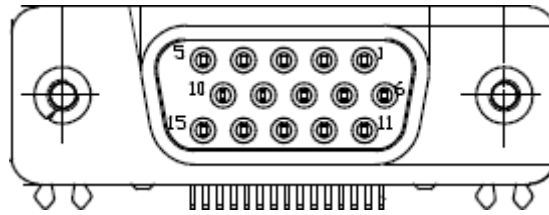


Table A.1: D-Sub Connector (VGA1)

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 defined	14	VSYNC
7	GND	15	DDC CLK
8	GND		

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

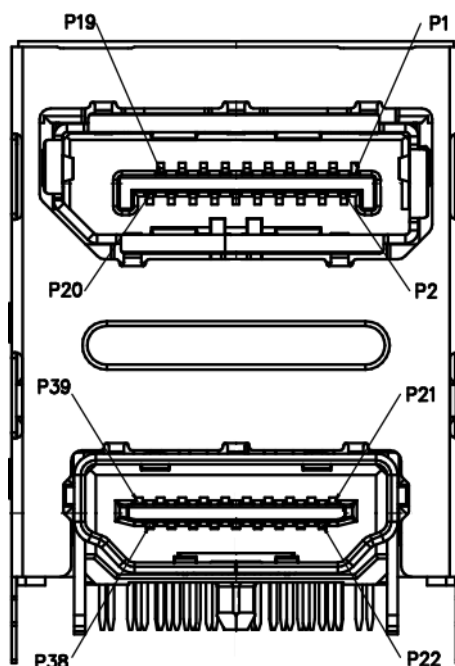


Table A.2: DisplayPort + HDMI Connector (DP1+HDMI1)

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)

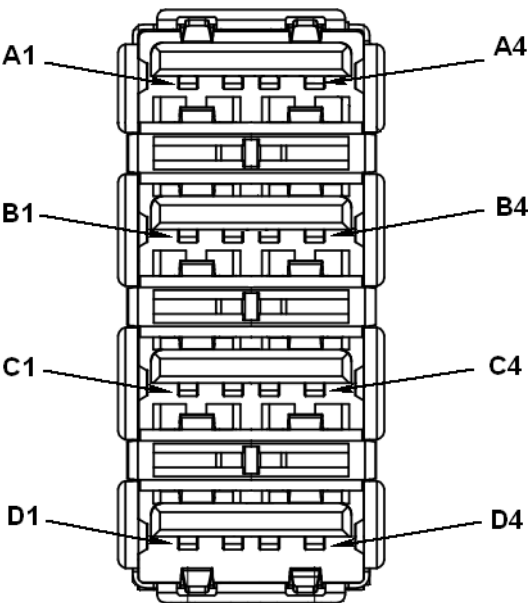


Table A.3: USB5678

Pin	Signal	Pin	Signal
A1	VBUS	B1	VBUS
A2	D-	B2	D-
A3	D+	B3	D+
A4	GND	B4	GND

Table A.4: USB5678

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)

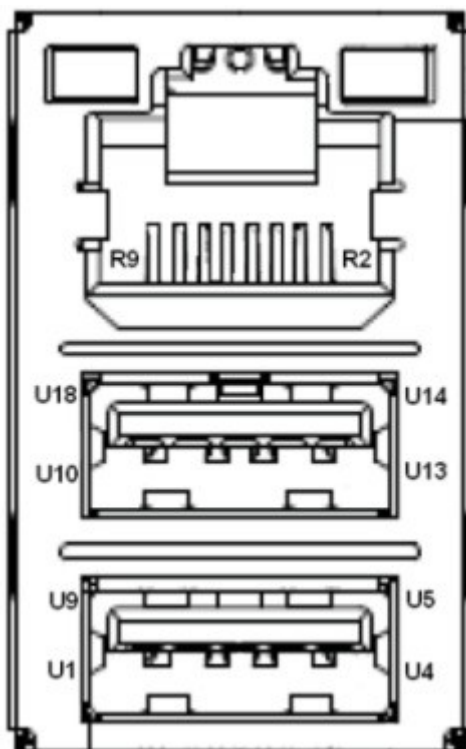


Table A.5: LAN1_USB12

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: LAN1_USB12

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)

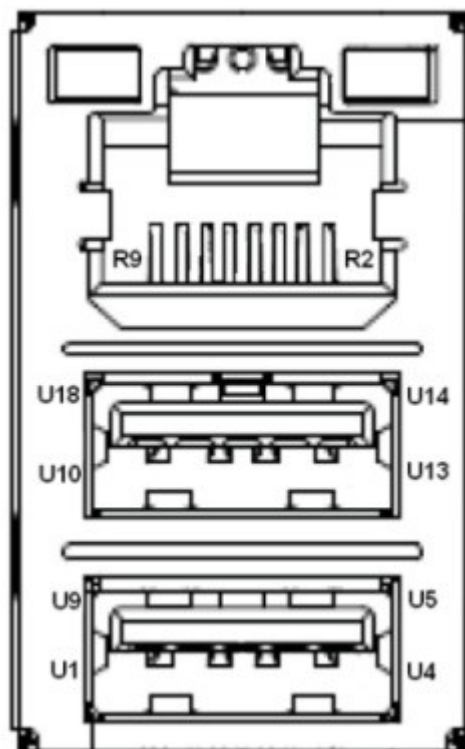


Table A.7: LAN2_USB34

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: LAN2_USB34

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)

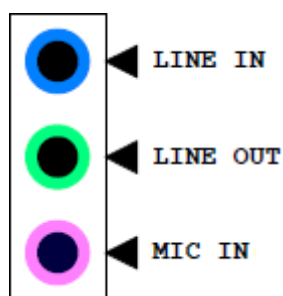


Table A.9: HD Audio Interface (AUDIO1)

Pin	Signal
1	MIC IN
2	LINE OUT
3	LINE IN

A.7 PCI Express x16 Slot (PCIEX16_1)

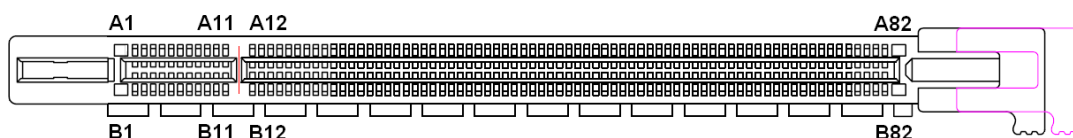


Table A.10: PCI Express x16 Slot (PCIEX16_1)

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

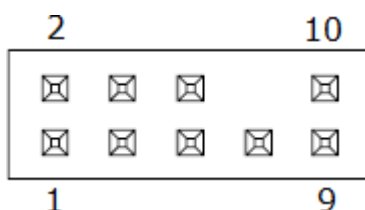
Table A.10: PCI Express x16 Slot (PCIEX16_1)

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)

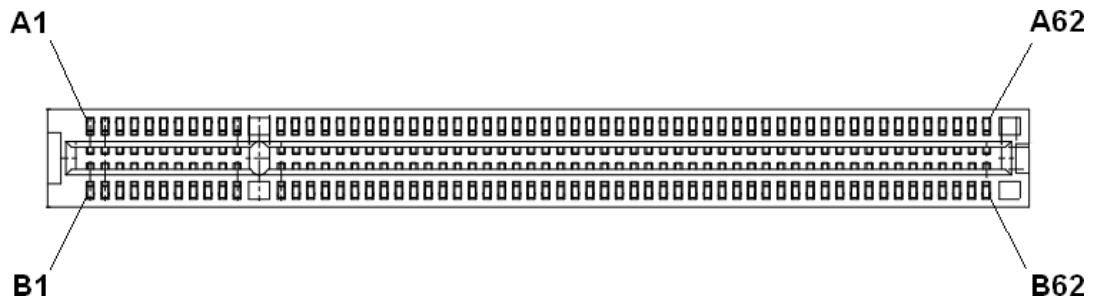


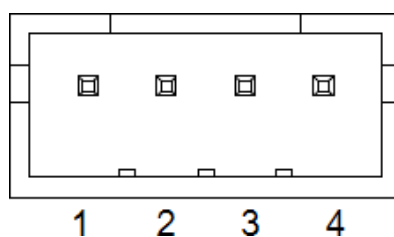
Table A.12: PCI Slot (PCI1/PCI2)

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)

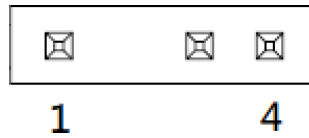


Table A.14: HD Audio Interface (SPDIF1)

Pin	Signal
1	+5V
2	KEY
3	SPDIF OUT
4	GND

A.12 PCI Express x4 Slot (PCIEX1_1)

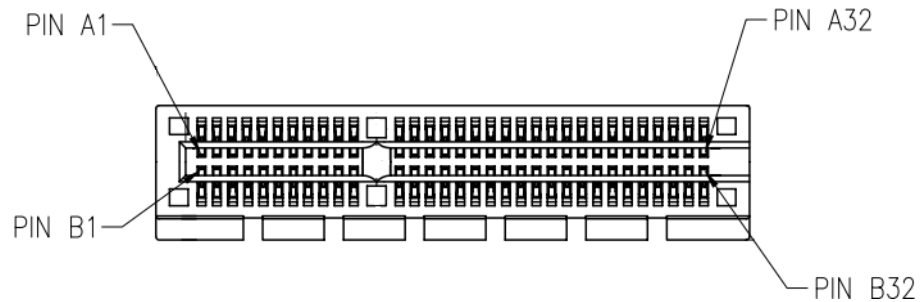


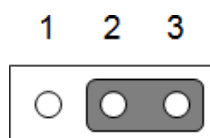
Table A.15: PCI Express x4 Slot (PCIEX1_1)

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 x4 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)

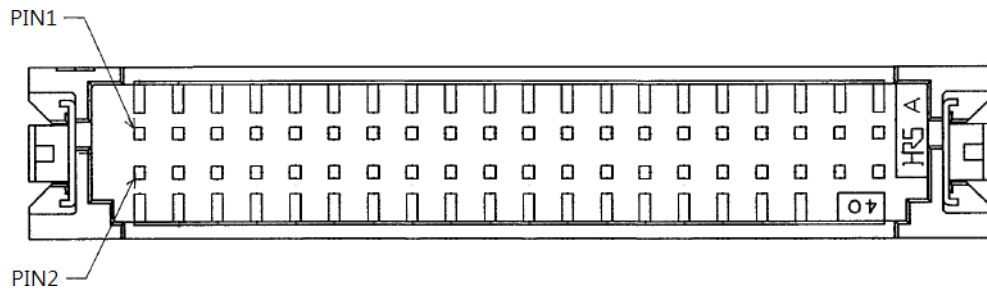


Table A.17: LVDS1

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

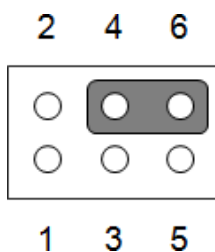
Table A.18: EDP1

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

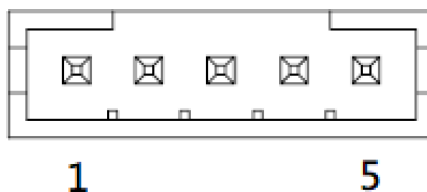
23	GND	24	GND
25	EDP_TX3-	26	N.C
27	EDP_TX3+	28	N.C
29	GND	30	GND
31	EDP_AUX+	32	EDP_AUX-
33	GND	34	EDP_HPDP
35	N.C	36	N.C
37	N.C	38	N.C
39	N.C	40	GND

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)

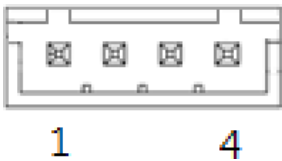


Table A.21: SMBUS Connector from PCH (SMBUS1)

Pin	Signal
1	+5VSB
2	SMB CLK
3	SMB DAT
4	GND

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

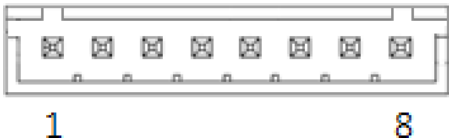


Table A.22: Alarm Board / CMM Power Connector (VOLT1)

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: PSON1 Jumper Setting

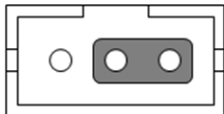
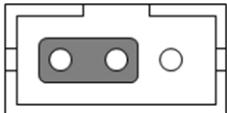
Function	Jumper Setting
ATX Mode (Default)	 1 2 3
AT Mode	 1 2 3

Table A.24: PSON1

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: JCMOS1 Jumper Setting

Function	Jumper Setting
Keep COMS Data (Default)	123
Clear CMOS Data	123

Table A.27: JCMOS1

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)	246 135
Jumper position for +5V	246 135
Jumper position for +12V	246 135

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)

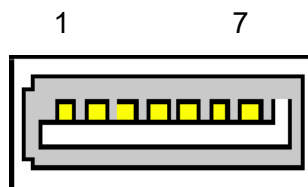


Table A.30: Serial ATA Interface Connector (SATA1~4)

Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

A.25 Coin Battery Connector (BAT1)

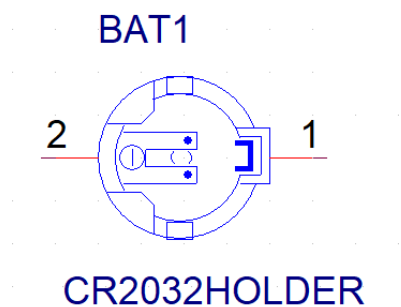


Table A.31: Coin Battery Connector (BAT1)

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)

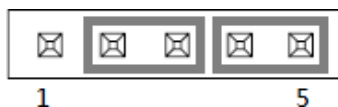


Table A.33: Watchdog Timer Output and OBS Beep Jumper Setting

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

Table A.34: Watchdog Timer Output and OBS Beep

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: Power Switch / HDD LED / SMBUS / Speaker Pin Header Jumper Setting

Function	Jumper Setting
Internal Buzzer (Default)	

Table A.36: Power Switch / HDD LED / SMBUS / Speaker Pin Header

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)

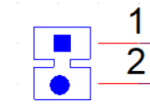


Table A.37: Power Button Pin Header (JFP3)

Pin	Signal
1	Power Button+
2	GND

A.30 Extended Power LED Pin Header (JFP4)

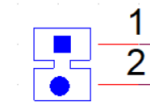


Table A.38: Power LED Pin Header (JFP4)

Pin	Signal
1	LED_PWR
2	SUSLED

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

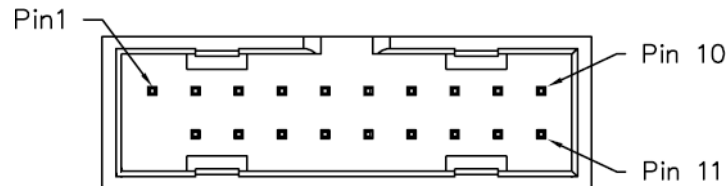


Table A.39: Universal Serial Bus 3.0 Port 11/12 (USB1112)

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)

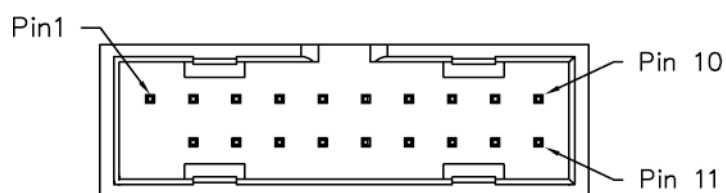


Table A.40: Universal Serial Bus 3.0 Port 13/14 (USB1314)

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)

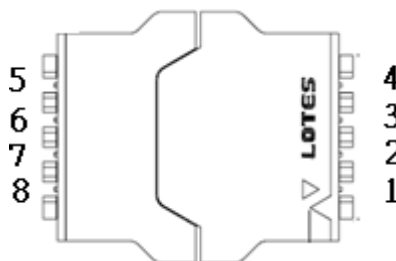


Table A.41: SPI BIOS Flash Socket1 (SPI1)

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)

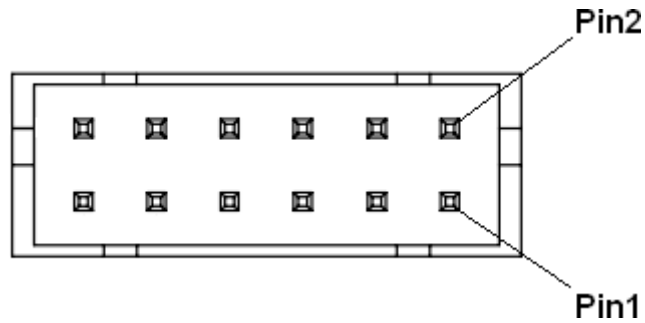


Table A.42: SPI TPM Module Connector (For Optional TPM Module) (SPI_TPM1)

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)

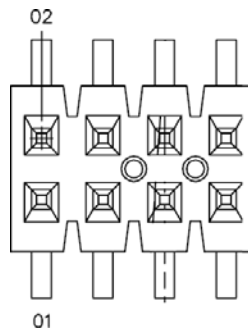


Table A.43: SPI Pin Header (SPI_CN1)

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)

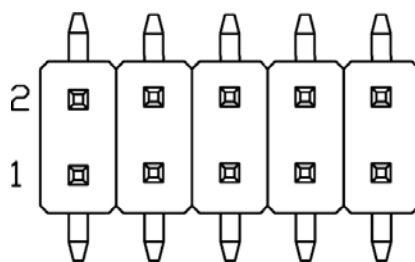


Table A.44: Universal Serial Bus 2.0 Port 9/10 (USB910)

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)

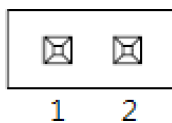


Table A.45: Case Open Connector (JCASE1)

Pin	Signal
1	Case Open
2	GND

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

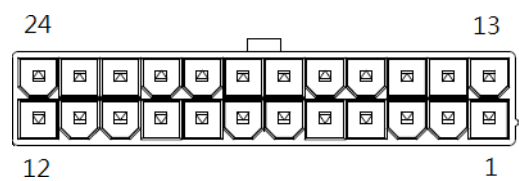


Table A.46: ATX 24-Pin Power Connector (EATXPWR1)

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)

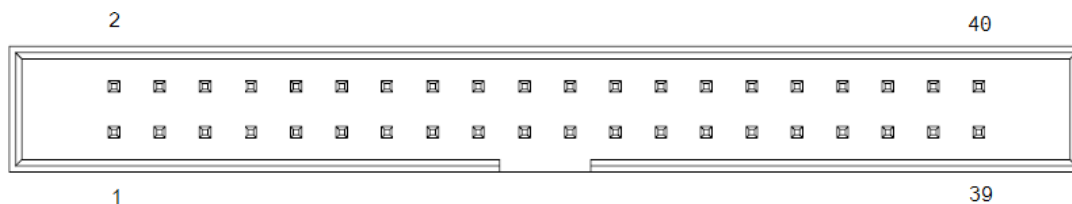


Table A.47: COM 3/4/5/6 Connector, COM 7/8/9/10 Connector (COM3456/COM78910)

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)

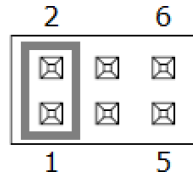


Table A.48: COM3 RI# Selection Pin Header (JSETCOM3_V1)

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)

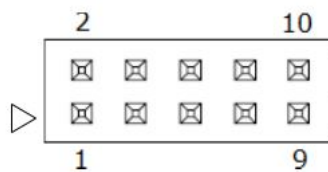


Table A.49: 8-Bit General Purpose I/O Pin Header (GPIO1)

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)

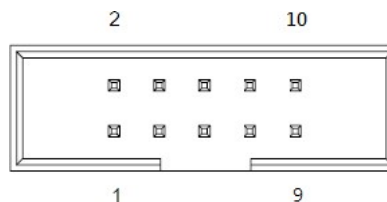


Table A.50: COM2 Connector (COM2)

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)

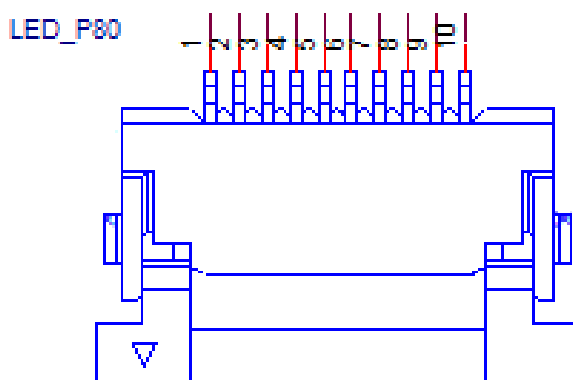


Table A.52: LED Port 80 Connector (LED_P80)

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)

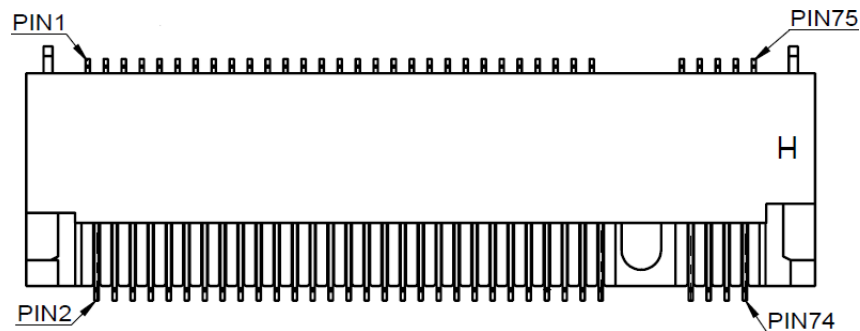


Table A.54: M.2 M-Key Connector (M2M1)

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)

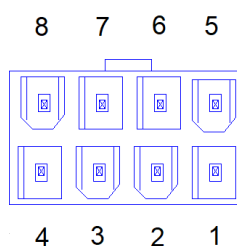


Table A.55: ATX 8-Pin Main Power Connector (ATX12V1)			
Pin	Signal	Pin	Signal
1	GND	5	+12V
2	GND	6	+12V
3	GND	7	+12V

A.48 VGA1 Force on Pin Header (JFV1)

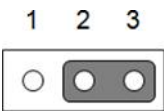


Table A.56: VGA1 Force on Pin Header (JFV1)

Pin	Signal
1	NC
2	Advantech define
3	GND

A.49 COM1 Connector (COM1)

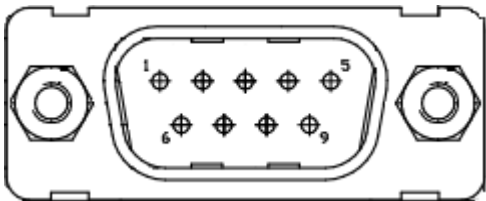


Table A.57: COM1 Connector (COM1)

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]		



Enabling an Intelligent Planet

www.advantech.com

Please verify specifications before quoting. This guide is intended for reference purposes only.

All product specifications are subject to change without notice.

No part of this publication may be reproduced in any form or by any means, such as electronically, by photocopying, recording, or otherwise, without prior written permission from the publisher.

All brand and product names are trademarks or registered trademarks of their respective companies.

© Advantech Co., Ltd. 2025