

AIMB-522

**AMD AM4 Ryzen™ 5000 Series
Micro-ATX with 1 DP/HDMI/VGA,
6 x COM, 4 x GbE LANs, 8 x USB
3.2, 3 x USB 2.0**

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 Inc.

IBM and PC are trademarks of International Business Machines Corporation.

AMD AM4 Ryzen™ 5000 Series is a trademark of AMD 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.

CPU Compatibility

Processor Number	Code Name	Max TDP	Freq (GHz)	Mfg. Tech	Smart cache (L3)	Result
AMD Ryzen 9 5950E	Vermeer	105W	3.4GHz	7nm	64MB	Pass
AMD Ryzen 9 5900E	Vermeer	105W	3.7GHz	7nm	64MB	Pass
AMD Ryzen 7 5800E	Vermeer	100W	3.7GHz	7nm	32MB	Pass
AMD Ryzen 5 5600E	Vermeer	65W	3.6GHz	7nm	32MB	Pass
AMD Ryzen 9 5950X	Vermeer	105W	3.4GHz	7nm	64MB	Pass
AMD Ryzen 9 5900X	Vermeer	105W	3.7GHz	7nm	64MB	Pass
AMD Ryzen 7 5800X	Vermeer	105W	3.8GHz	7nm	32MB	Pass
AMD Ryzen 5 5600G	Cezanne	65W	3.9GHz	7nm	16MB	Pass
AMD Ryzen 7 5700G	Cezanne	65W	3.8GHz	7nm	16MB	Pass

Memory Compatibility

Category	Speed	Capacity	Vendor	Module P/N	Chip P/N	ADVANTECH P/N	ECC	Result
DDR4	2400	4GB	Advantech	SQR-UD4N4G2K4HNEAC	H5AN4G8NAFR	SQR-UD4N4G2K4HNEAC	N	PASS
DDR4	2666	8GB	Advantech	SQR-UD4N8G2K6SNB5CB	SEC016 K4A8G085WCBCTD	SQR-UD4N8G2K6SNB5CB	N	PASS
DDR4	2133	16GB	Advantech	AQD-D4U16N21-SE	SEC 543 K4A8G085WB BCPB	AQD-D4U16N21-SE	N	PASS
DDR4	2666	32GB	Advantech	SQR-UD4N32G2K6SNME	SEC 916 K4AAG085WMBCTD	SQR-UD4N32G2K6SNME	N	PASS
DDR4	2666	16GB	Advantech	SQR-UD4N16G2K6SN5CB	SEC 807 K4A8G085WC BCTD	SQR-UD4N16G2K6SN5CB	N	PASS
DDR4	3200	16GB	Advantech	SQR-UD4N16G3K2SN5CB	SEC 037 K4A8G085WC BCWE	SQR-UD4N16G3K2SN5CB	N	PASS
DDR4	3200	16GB	Advantech	96D4-16G3200NN-MI	8ZJ45 D9WSM	96D4-16G3200NN-MI	N	PASS

ECC Memory Compatibility

Category	Speed	Capacity	Vendor	Module P/N	Chip P/N	ADVANTECH P/N	ECC	Result
DDR4	2400	16GB	Advantech	AQD-D4U16E24-HE	H5AN8G8NCJ	AQD-D4U16E24-HE	ECC	PASS
DDR4	2133	16GB	Advantech	AQD-D4U16E21-SE	SEC 546 K4A8G08 5WB BCPB	AQD-D4U16E21-SE	ECC	PASS
DDR4	2666	8GB	Advantech	SQR-UD4N8G2K6SEBCB	SEC 807 K4A8G08 5WC BCTD	SQR-UD4N8G2K6SEBCB	ECC	PASS
DDR4	2666	16GB	Advantech	SQR-UD4N16G2K6SECB	SEC 807 K4A8G08 5WC BCTD	SQR-UD4N16G2K6SECB	ECC	PASS
DDR4	3200	16GB	Advantech	SQR-UD4N16G3K2SECB	SEC025 K4A8G08 5WC BCWD	SQR-UD4N16G3K2SECB	ECC	PASS
DDR4	2666	32GB	Advantech	SQR-UD4N32G2K6SEME	SEC922 K4AAG08 5WMBCTD	SQR-UD4N32G2K6SEME	ECC	PASS

Ordering Information

P/N	Chipset	Rear I/O USB 3.2	Internal USB 2.0 Header	Internal USB 2.0 Type A	DP++/VGA	HDMI	GbE LAN	2.5 Gbe LAN	SATA A III	CO M	M.2 E-key	M.2 M-key	TP M	AMP (6W)
AIMB-522G 4-00A1	X570	8	2	1	1/1	1	2	2	4	6	1	1	1	(1)
AIMB-522G 2-00A1	X570	8	2	1	1/1	1	2 (Realtek 8119i only)	0	4	6	1	1	1	(1)

() means BOM option

Initial Inspection

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

- 1 x AIMB-522 AMD AM4 Ryzen™ 5000 Series Micro-ATX Motherboard
- 2 x SATA HDD cable
- 1 x I/O port bracket
- 1 x Warranty Card
- 2 x M.2 screws
- 2 x 1-to-1 serial port cable
- 1 x Startup Manual

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-522 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-522, 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	3
1.5	Board Layout: Jumper and Connector Locations	4
	Table 1.1: Jumper Setting List	4
	Table 1.2: Connector/Header List	5
	Figure 1.1 AIMB-522G4-00A1 I/O Connectors	6
	Figure 1.2 I/O AIMB-522G2-00A1 Connectors	6
1.6	AIMB-522 Board Diagram	7
	Figure 1.3 AIMB-522 Block Diagram	7
1.7	Safety Precautions	7
1.8	Jumper Settings	8
1.8.1	How to Set Jumpers	8
1.8.2	CMOS Clear Jumper (JCMOS1)	8
1.8.3	COM1/2 RS232/RS422/RS485 Selection Pin Header (JSETCOM1/2)	9
1.8.4	Watchdog Timer Output and OBS Beep (JOBS1+JWDT1)	9
1.8.5	Power Switch / HDD LED / SMBUS / Speaker Pin Header (JFP1) 10	
1.8.6	ATX/AT Mode Selection (PSON1)	10
1.8.7	Case Open Selection Pin Header (JCASEOP_SW1)	11
1.8.8	USB Power Selection for LAN1_USB12/LAN2_USB34/ LAN3_USB56/LAN4_USB78/USB13_14/USB15(JUSBPWR1/2/3/ 4)	11
1.9	System Memory	11
1.10	Memory Installation Procedures	11

Chapter 2 Connecting Peripherals13

2.1	Introduction	14
2.2	USB Ports (LAN1_USB12, LAN2_USB34, LAN3_USB56, LAN4_USB78, USB13_14, USB15)	14
2.3	DP1 Connector (DP1)	14
2.4	Serial Ports (COM1/COM2/COM3456)	15
2.5	PS/2 Keyboard and Mouse Connector	15
2.6	CPU Fan Connector (CPUFAN1)	16
2.7	System FAN (SYSFAN1/SYSFAN2/SYSFAN3/SYSFAN4)	16
2.8	Power LED and Keyboard Lock Pin Header (JFP2)	17
2.9	Audio Jack (AUDIO2)	17
2.10	Serial ATA Interface Connector (SATA1~4)	18
2.11	Front Panel Audio Connector (FPAUD1)	18
2.12	PCI Express x16 Slot (PCIEX16_1) PCI Express x4 Slot(PCIEX4_1/PCIEX4_2)	19
2.13	NGFF M.2 M-Key and E-Key Connector (M.2_M1/M.2_E1)	19
2.14	General Purpose I/O Connector (GPI01)	20

2.15	Case Open Connector (JCASE2)	20
2.16	ATX Power Connector (ATXPWR1, ATX12V1)	21
2.17	VGA+HDMI (HDMI_VGA1)	21
2.18	DDR4 UDIMM Socket (DIMMA1/DIMMA2/DIMMB1/DIMMB2)	22
2.19	System Indicator LED (JFP3)	22
Chapter 3	BIOS Operation	23
3.1	Introduction	24
3.2	BIOS Setup	24
3.2.1	Main Menu	25
3.2.2	Advanced BIOS Features	26
3.3	Chipset Configuration Setting	59
3.3.1	SB USB Configuration	60
3.3.2	GFX Configuration	61
3.3.3	North Bridge	62
3.3.4	HD Audio Configuration	63
3.4	Security Settings	64
3.4.1	Secure Boot	65
3.5	Boot Settings	65
3.6	Save & Exit	66
Chapter 4	Software Introduction & Service	67
4.1	Introduction	68
4.2	Value-Added Software Services	68
4.2.1	Software API	68
4.2.2	Software Utility	70
Chapter 5	Chipset Software Installation Utility	71
5.1	Before You Begin	72
5.2	Introduction	72
5.3	Windows 10 Driver Setup	73
Chapter 6	LAN Configuration	75
6.1	Introduction	76
6.2	Windows 10 Driver Setup	76
Appendix A	I/O Pin Assignments	77
A.1	CMOS Clear Jumper (JCMOS1)	78
A.2	COM1/2 RS232/RS422/RS485 Selection Pin Header (JSETCOM1/2) ..	78
A.3	Watchdog Timer Output and OBS Beep (JOBS1+JWDT1)	79
A.4	Power Switch / HDD LED / SMBUS / Speaker Pin Header (JFP1)	79
A.5	ATX/AT Mode Selection (PSON1)	79
A.6	Case Open Selection Pin Header (JCASEOP_SW1)	80
A.7	USB Power Selection for LAN1_USB12/LAN2_USB34/LAN3_USB56/ LAN4_USB78/USB13_14/USB15 (JUSBPWR1/2/3/4)	80
A.8	HDMI+VGA (HDMI_VGA1)	81
A.9	DisplayPort (DP1)	82
A.10	RJ-45 1 port + USB 3 2port (LAN1_USB12, LAN2_USB34, LAN3_USB56, LAN4_USB78)	84
A.11	Audio Jack (AUDIO2)	92
A.12	Front Panel Audio Header (FPAUD1)	92

A.13	PCI Express x16 Slot (PCIEX16_1)	93
A.14	NGFF M.2 M-Key Connector for 2280 Module (M.2_M1)	96
A.15	PCI Express Slot (PCIEX4_1, PCIEX4_2)	98
A.16	ATX 12V Power Supply Connector (ATX12V1)	99
A.17	System FAN (SYSFAN1~4)	100
A.18	DDR4 UDIMM Socket (DIMMA1, DIMMA2, DIMMB1, DIMMB2)	100
A.19	COM2 RS 232/422/485 (COM2)	101
A.20	COM1 RS 232/422/485 (COM1)	101
A.21	A.21 ATX 12/5V/3V/5VSBV Power Supply Connector (ATXPWR1)	102
A.22	Serial ATA Interface Connector (SATA1~4)	103
A.23	NGFF M.2 E-Key Connector for 2230 Module (M.2_E1)	104
A.24	8-Bit General Purpose I/O Pin Header (GPIO1)	105
A.25	Keyboard and Mouse Box Header (KBMS1)	106
A.26	COM3, 4, 5, 6 Box Header (COM3456)	106
A.27	Vertical USB2 Connector (USB15)	107
A.28	USB2 Pin Header 2port (USB13_14)	108
A.29	CPU FAN Connector (CPUFAN1)	108
A.30	Power LED and Keyboard Lock Pin Header (JFP2)	108
A.31	System Indicator LED (JFP3)	109
A.32	Case Open Connector (JCASE2)	109

Chapter 1

General Information

1.1 Introduction

The AIMB-522 is designed with the AMD AM4 Ryzen™ 5000 series processor with the X570 chipset for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports the AMD AM4 Ryzen™ 5000 Series; AMD AM4 Ryzen™ 5000 series processor with X570 chipset up to 64MB L3 cache and DDR4 3200 MHz up to 128GB (per slot up to 32GB). There is abundant I/O connectivity with 6 x serial ports, 3 x USB 2.0, 8 x USB 3.2 Gen2, up to 2 x GbE LAN, 2 x 2.5 GbE LAN, and up to 4 x SATA III ports.

1.2 Features

- **Abundant I/O connectivity:** up to 2 x GbE LAN and 2 x 2.5 GbE LAN via PCIe x1 bus, 1 x PCIe x16 slot (Gen 4), 2 x PCIe x4 slots (Gen 4), 8 x USB 3.2 Gen2, 1 x HDMI, 1 x DP, 1 x VGA, 4 x Ethernet RJ-45 ports.
- **Standard Micro-ATX form factor with industrial features:** The AIMB-522 is a full-featured Micro-ATX motherboard with balanced expandability and performance.
- **Diverse storage devices:** SATA HDD, M.2 (2230/2280) SSD
- **Optimized integrated graphics:** AMD Radeon™ Graphics

1.3 Specifications

1.3.1 Processor

- **CPU:** AMD AM4 Ryzen™ 5000 series processor
- **BIOS:** AMI EFI 256 Mbit SPI
- **System chipset:** AMD X570
- **SATA hard disk drive interface:** On-board SATA connectors with data transmission rates up to 600MB

1.3.2 Memory

- **RAM:** Up to 128GB in 4 slots, 288-pin DIMM sockets. Supports dual-channel up to DDR4 3200MHz SDRAM
 - The ECC compatibility of AIMB-522 depends on CPU.

1.3.3 Input/Output

- **PCIe slots:** 1 x PCIe x16 expansion slot, 2 x PCIe x4 expansion slot.
- **Serial ports:** 6 x serial ports, 2 x RS-232/422/485 with 10-pin box header and 4 x RS-232 with 40-pin box header (1.27mm pitch type)
- **USB ports:** Supports up to 8 x USB 3.2 Gen2 ports with transmission rates up to 10 Gbps. (4 ports from CPU/APU, 4 ports from X570)
- **GPIO:** AIMB-522 supports 8-bit GPIO from super I/O for general purpose control applications.

1.3.4 Graphics

- **Controller:** AMD APU: Radeon™ Graphics
- **Display memory:** 1GB maximum shared memory with 2GB and above system memory installed
- **VGA:** VGA up to 1920 x 1200 @ 60Hz, 2048 x 1152 @ 60Hz
- **DisplayPort:** 1, up to 4096 x 2304 @ 30Hz
- **HDMI:** 1, up to 4096 x 2304 @ 30Hz
- **Triple Display:** VGA+DP+HDMI (5600G/5700G only)
- **Dual Display:** VGA+DP, VGA+HDMI, HDMI+DP

1.3.5 Ethernet LAN

- **Controller:** LAN1/LAN2: Intel i225LM; LAN3/LAN4: Realtek 8119i
- Supports up to 4 x 10/100/1000/2500 Mbps Ethernet ports via a PCI Express x1 bus which provides 500 MB/s data transmission rates.

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 (depend on CPU)
- **Storage temperature:** -40 ~ 85°C
- **Power supply voltage:** +5V, 3.3V, 12V, 12V_8P
- **Power requirements:**

Operation	+5V	3.3V	12V	12V_8P
Configuration: AMD Ryzen 9 3900X 12-Core Processor 3.79GHz with UDIMM DDR4 3200 8GB*4pcs	4.424A	0.843A	2.344A	11.876A
Standby (5Vsb)	2A			

Measure the maximum current value which system under maximum load (CPU: Top speed, RAM & Graphic: Full loading)
Input Mode: ATX input

- **Board size:** 244 x 244 mm (9.6" x 9.6")
- **Board weight:** 0.365 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-522 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

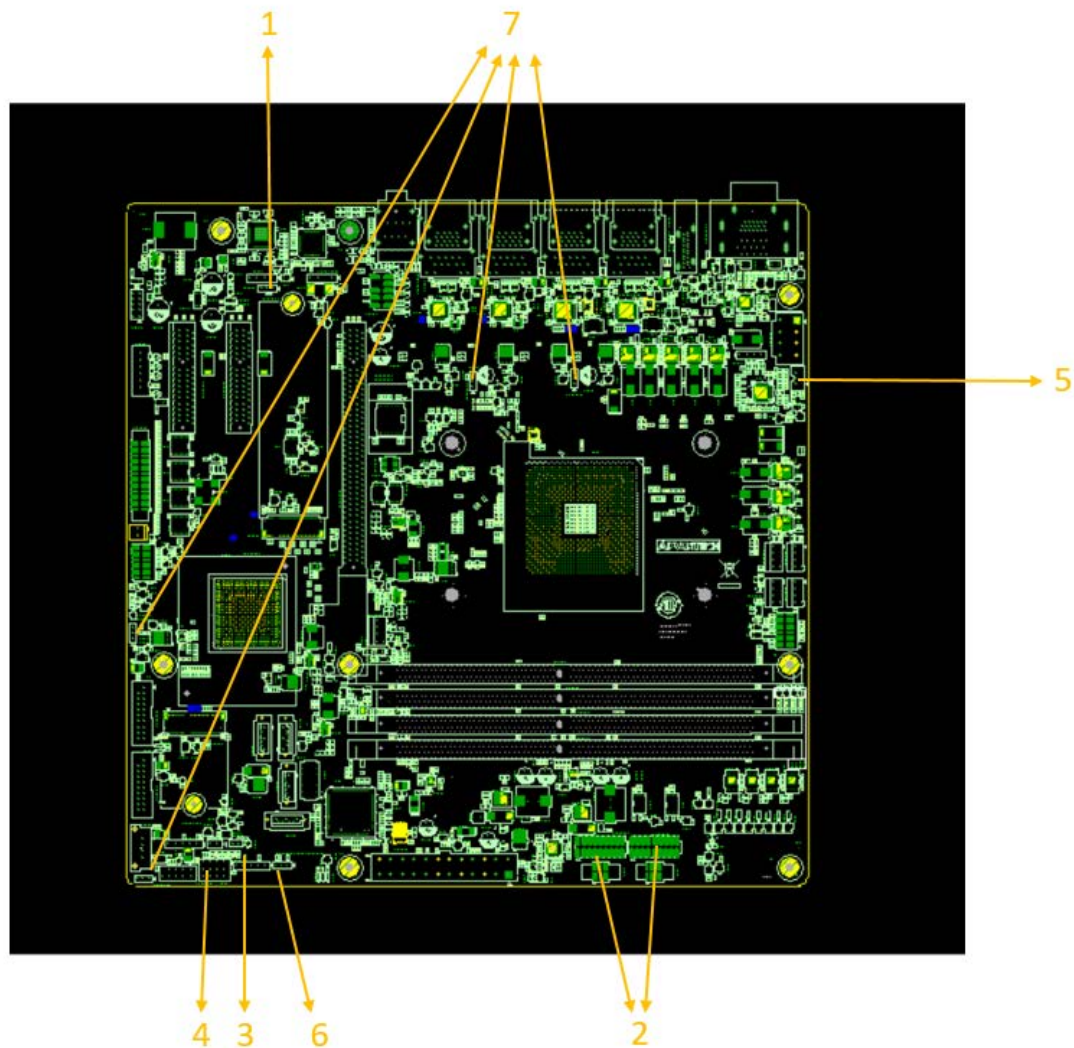
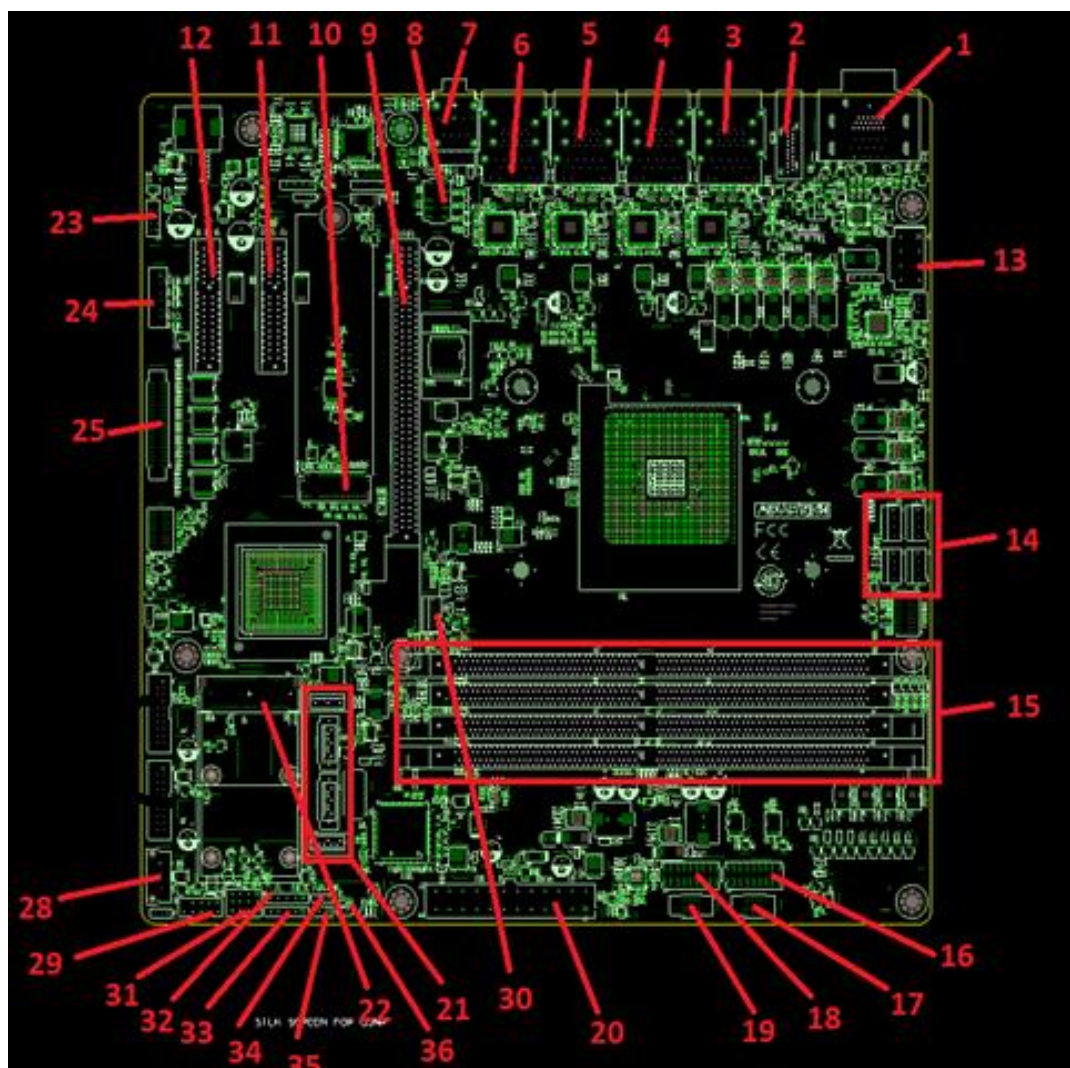


Table 1.1: Jumper Setting List

	Description	Part Reference
1	CMOS Clear Jumper	JCMOS1
2	COM1/2 RS 232/422/485 selection	JSETCOM1/2
3	Watchdog Timer Output and OBS Beep	JWDT1+JOBS1
4	Power Switch / HDD LED / SMBUS / Speaker Pin Header	JFP1
5	ATX/AT Mode Selection	PSON1
6	Case open selection pin header	JCASEOP_SW1

Table 1.1: Jumper Setting List

7	USB Power selection for LAN1_USB12/LAN2_USB34/ LAN3_USB56/LAN4_USB78/ USB13_14/USB15	JUSBPWR1/2/3/4
---	---	----------------

**Table 1.2: Connector/Header List:**

	Description	Part Reference
1	High Definition Multimedia Interface + USB 3.1	HDMI_VGA1
2	DisplayPort	DP1
3	RJ-45 1 port+ USB 3 2port	LAN1_USB12
4	RJ-45 1 port+ USB 3 2port	LAN2_USB34
5	ATX/AT Mode Selection	PSON1
6	Case open selection pin header	JCASEOP_SW1

Table 1.2: Connector/Header List:

7	USB Power selection for LAN1_USB12/LAN2_USB34/ LAN3_USB56/LAN4_USB78/ USB13_14/USB15	JUSBPWR1/2/3/4
8	Front panel audio pin header	FPAUD1
9	PCI Express x16 Slot	PCIEX16_1
10	M.2 M-Key connector for 2280 module	M.2_M1
11	PCI Express x4 Slot	PCIEX4_1
12	PCI Express x4 Slot	PCIEX4_2
13	ATX 12V Power Supply Connector	ATX12V1
14	SYSTEM FAN Power Connector	SYSFAN1~4
15	DDR4 UDIMM Socket	DIMMA1,DIM- MA2,DIMMB1, DIMMB2
16	COM2 RS 232/422/485 selection	JSETCOM2
17	COM2 box header	COM2
18	COM1 RS 232/422/485 selection	JSETCOM1
19	COM1 box header	COM1
20	ATX 12/5V/3V/5VSBV Power Supply Connector	ATXPWR1
21	Serial ATA interface connector	SATA1~4
22	NGFF M.2 E-Key connector for 2230 module	MINI_CARD1
23	8-bit General Purpose I/O Pin Header	GPIO1
24	Keyboard and Mouse box header	KBMS1
25	COM3, 4, 5, 6 box header	COM3456
26	Vertical USB 2 connector	USB15
27	USB 2 pin header 2port	USB13_14
28	CPU FAN connector	CPUFAN1
29	PWRBTN#/ RESET#/HDD LED/ Serial bus from HW mon- itor IC/Internal Buzzer / External Speaker header	JFP1
30	Watchdog timer output and OBS beep	JWDT1+JOBS1
31	Power LED and keyboard lock pin header	JFP2
32	Case Open selection pin header	JCASEOP_SW1
33	System indicator LED	JFP3
34	Case Open connector	JCASE2

**Figure 1.1 AIMB-522G4-00A1 I/O Connectors**

1.6 AIMB-522 Board Diagram

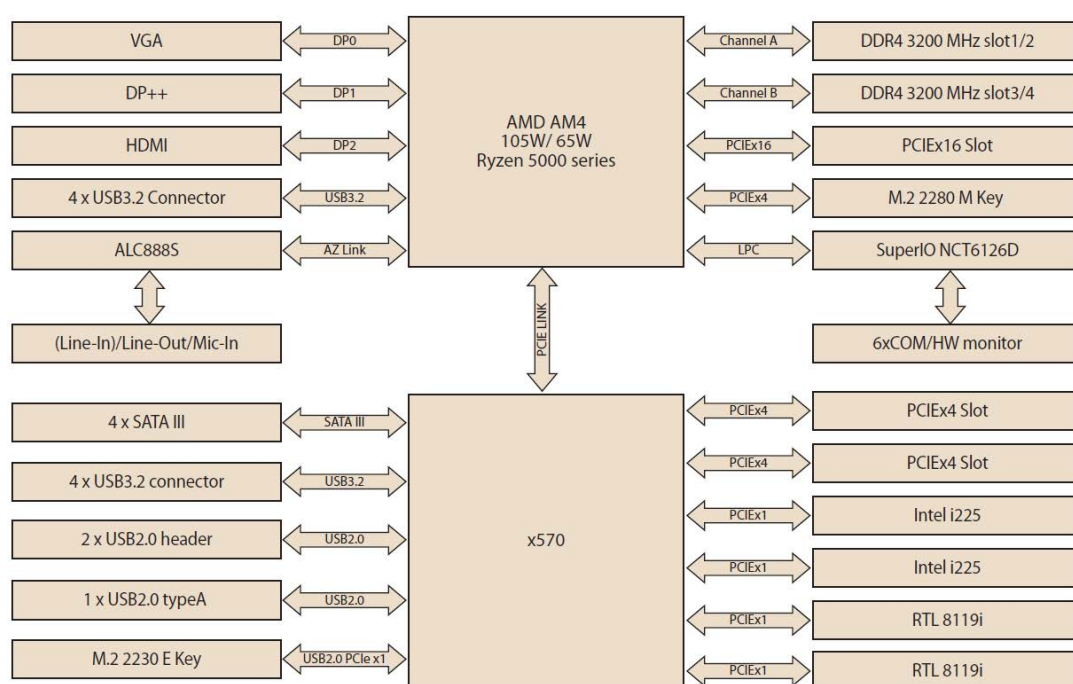


Figure 1.3 AIMB-522 Block Diagram

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 the 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 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 your motherboard to match the needs of your application 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 CMOS Clear Jumper (JCMOS1)

Pin	Signal Pin Definition
1	VBAT
2	+V1.5_RTC
3	GND

Function	Jumper Setting
Keep COMS Data (Default)	1 2 3 
Clear CMOS Date	1 2 3 

1.8.3 COM1/2 RS232/RS422/RS485 Selection Pin Header (JSETCOM1/2)

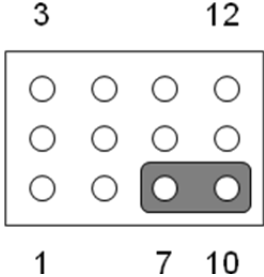
Function	Jumper Setting
RS-232 Mode (Default) (5-6) (7-9) (8-10) (13-15) (14-16)	
RS-422 Mode (3-4) (9-11) (10-12) (15-17) (16-18)	
RS-485 Mode (1-2) (9-11) (10-12) (15-17) (16-18)	

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

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

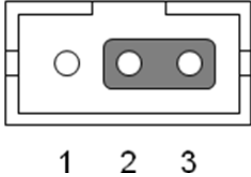
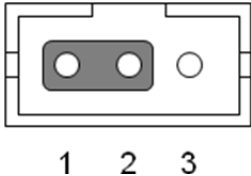
1.8.5 Power Switch / HDD LED / SMBUS / Speaker Pin Header (JFP1)

Pin	Signal Pin Definition	Pin	Signal Pin Definition
1	+V5	2	FP_HDD_LED
3	FP_PANSWIN#	4	FRP_SPK2
5	FP_HDD_LED#	6	GND
7	FRP_SPK3	8	SMBDAT_JFP
9	FP_SYS_RESET#	10	FRP_SPK4
11	SMBCLK_JFP	12	GND

Function	Jumper Setting
Internal Buzzer (Default)	

1.8.6 ATX/AT Mode Selection (PSON1)

Pin	Signal Pin Definition
1	ATX selection
2	+VCC
3	AT selection

Function	Jumper Setting
ATX Mode (Default)	
AT Mode	

1.8.7 Case Open Selection Pin Header (JCASEOP_SW1)

Function	Jumper Setting
Normal Close	1 2 3 
Normal Open (Default)	1 2 3 

1.8.8 USB Power Selection for LAN1_USB12/LAN2_USB34/LAN3_USB56/LAN4_USB78/USB13_14/USB15(JUSBPWR1/2/3/4)

Function	Jumper Setting
Set USB VBUS as +5V _{SB} (Default)	1 2 3 
Set USB VBUS as +5V	1 2 3 

1.9 System Memory

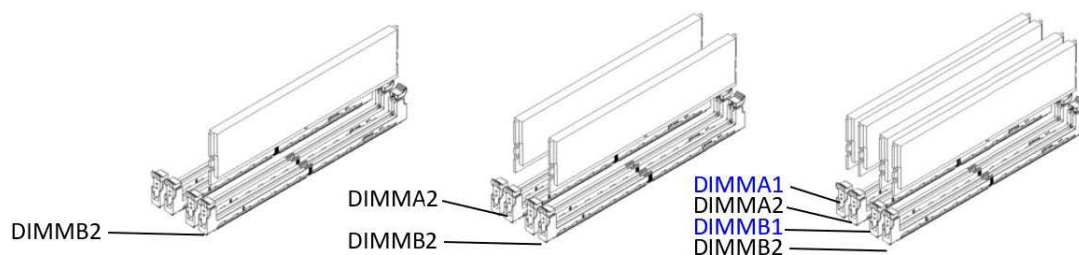
The AIMB-522 has four 288-pin memory sockets and supports dual-channel DDR4 3200MHz SDRAM with maximum capacity of 128GB (maximum 32GB for each DIMM).

1.10 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the “open” position, i.e., the handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then firmly but gently (avoid pushing down too hard) press the DIMM module well down into the socket, until you hear a click when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism.

DIMM Installation

It is recommended that you use the same UDIMM memory module on the same channel and load the module from the 2nd slot if a single module is used, as shown in the picture below.



Chapter 2

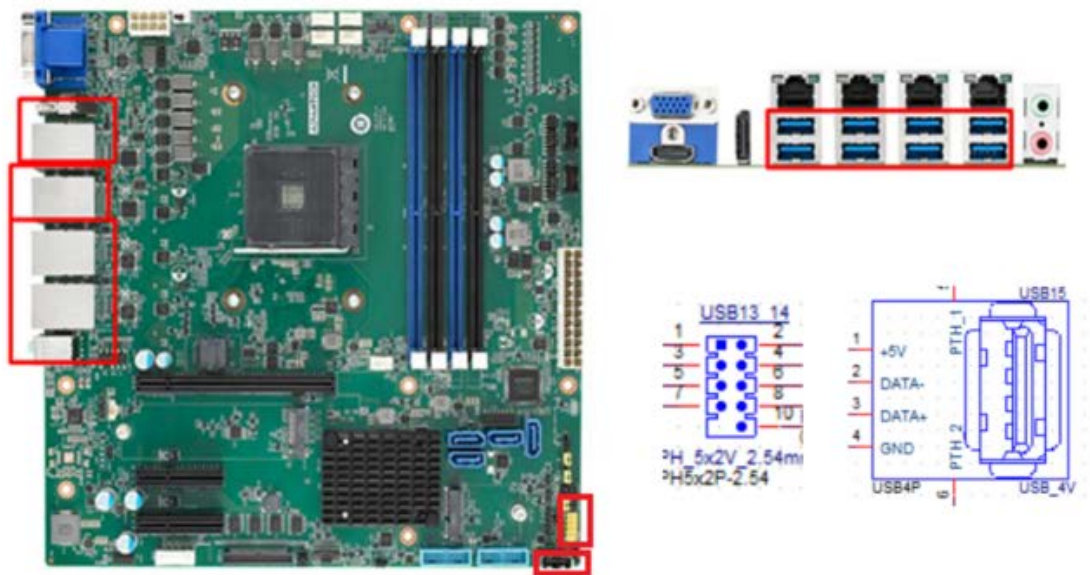
Connecting
Peripherals

2.1 Introduction

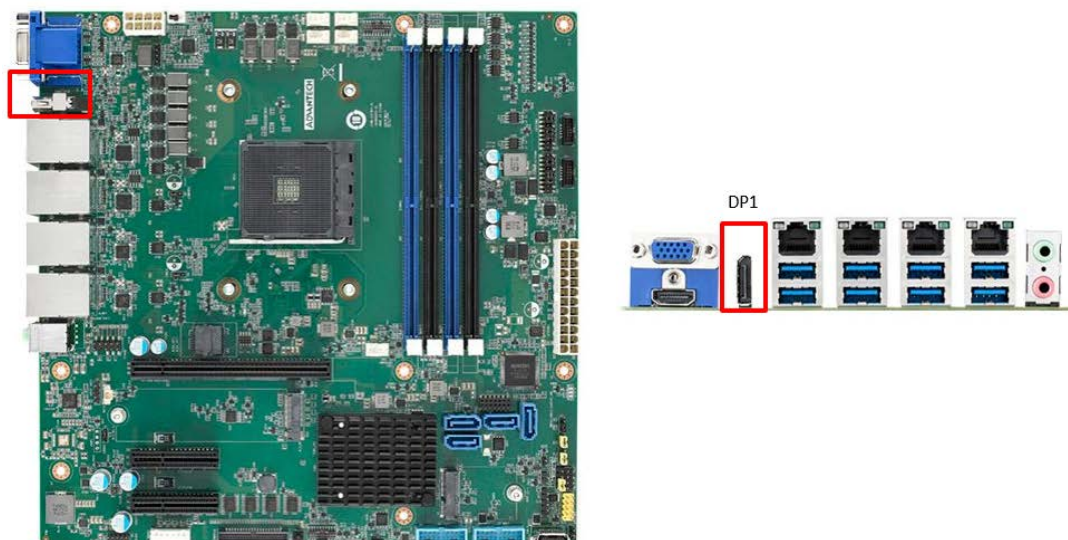
You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed or have a packed chassis, you may need to partially remove the card to make all the connections.

2.2 USB Ports (LAN1_USB12, LAN2_USB34, LAN3_USB56, LAN4_USB78, USB13_14, USB15)

The AIMB-522 provides up to 11 USB ports (8 x USB 3.2 Gen2 on the rear side, 2 x USB 2.0 via the board pin header and 1 x USB 2.0 via vertical connector). The USB interface complies with USB Specification Rev 2.0 supporting transmission rates up to 480 Mbps and Rev 3.2 supporting transmission rates up to 10 Gbps. The USB interface can be disabled in the system BIOS setup.

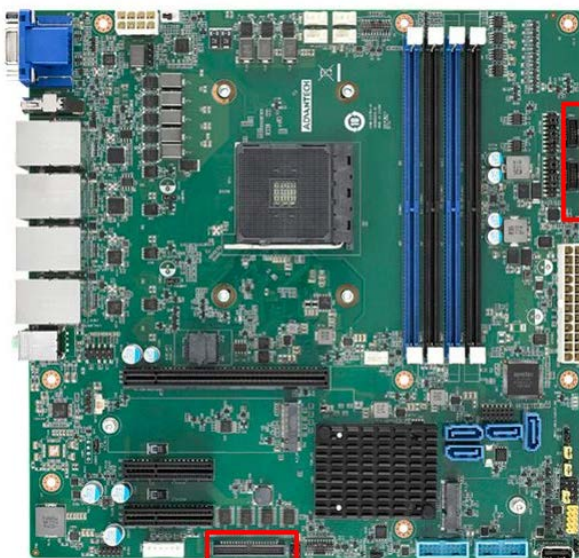


2.3 DP1 Connector (DP1)



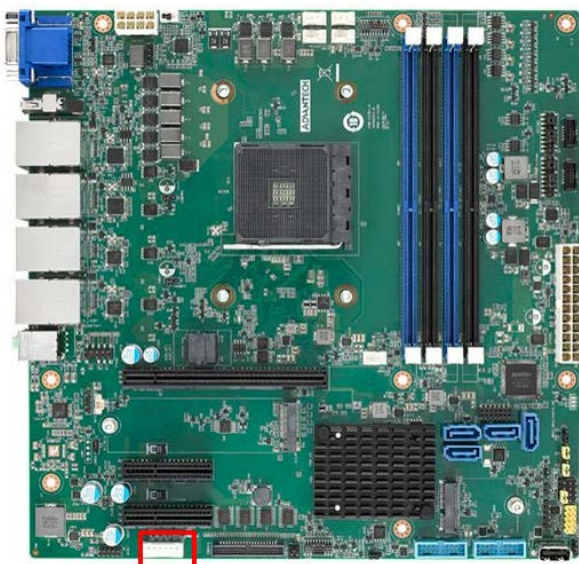
The AIMB-522 DP connector has resolution support up to 4096 x 2304 @ 30 Hz.

2.4 Serial Ports (COM1/COM2/COM3/4/5/6)



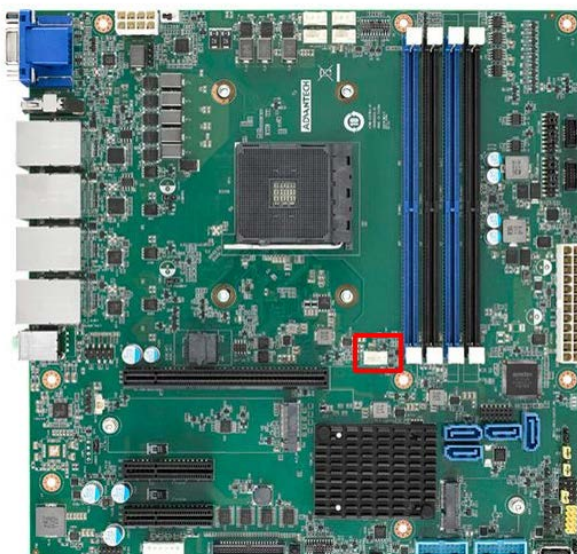
The AIMB-522 supports six serial ports. There are COM1, COM2 with 10-pin box header and support for RS-232/422/485, COM 3-6 with 40-pin box header and support for RS-232. These ports can connect to serial devices, such as a mouse or a printer, or to a communications network.

2.5 PS/2 Keyboard and Mouse Connector

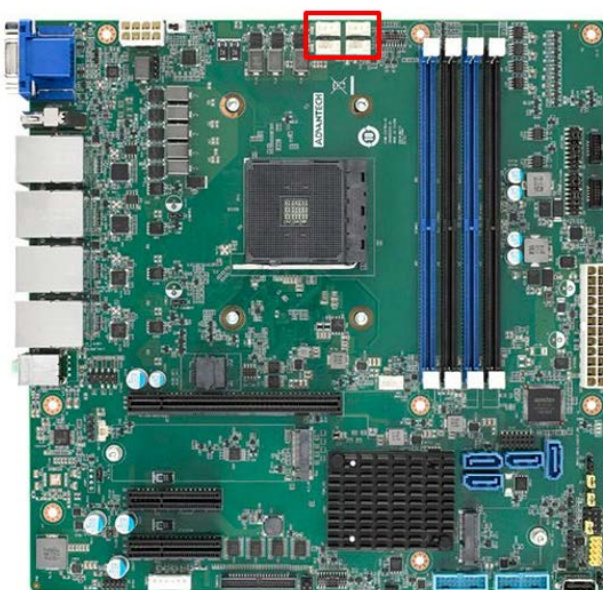


6-pin mini-DIN connectors (KBMS1, 2.54pitch) are for the PS/2 keyboard and PS/2 mouse.

2.6 CPU Fan Connector (CPUFAN1)

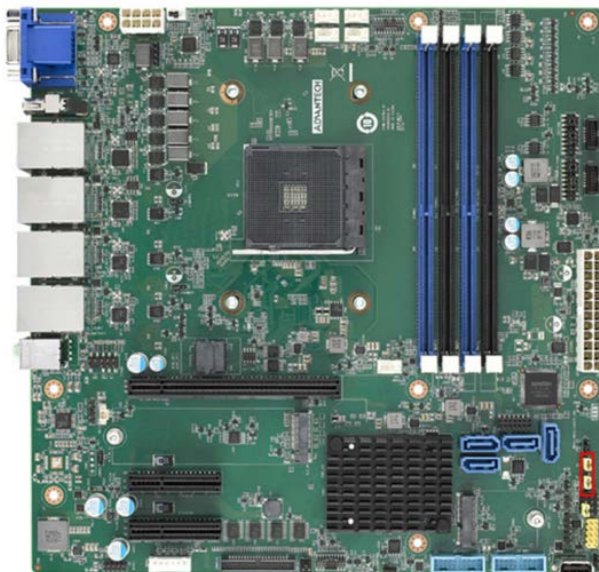


2.7 System FAN (SYSFAN1/SYSFAN2/SYSFAN3/SYSFAN4)

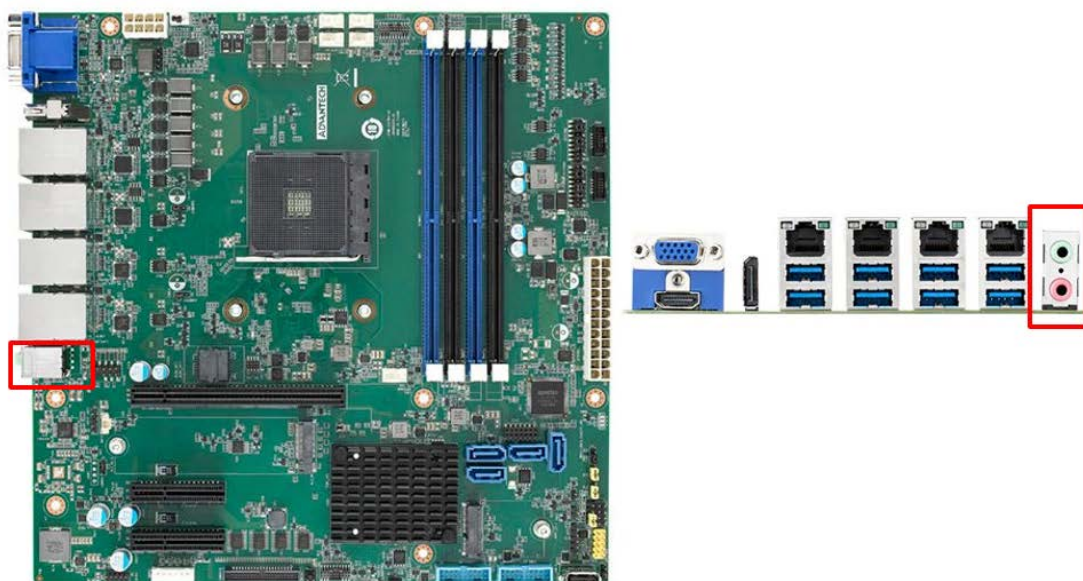


If a fan is used, this connector supports cooling fans of 1500 mA (18 W) or less.

2.8 Power LED and Keyboard Lock Pin Header (JFP2)



2.9 Audio Jack (AUDIO2)

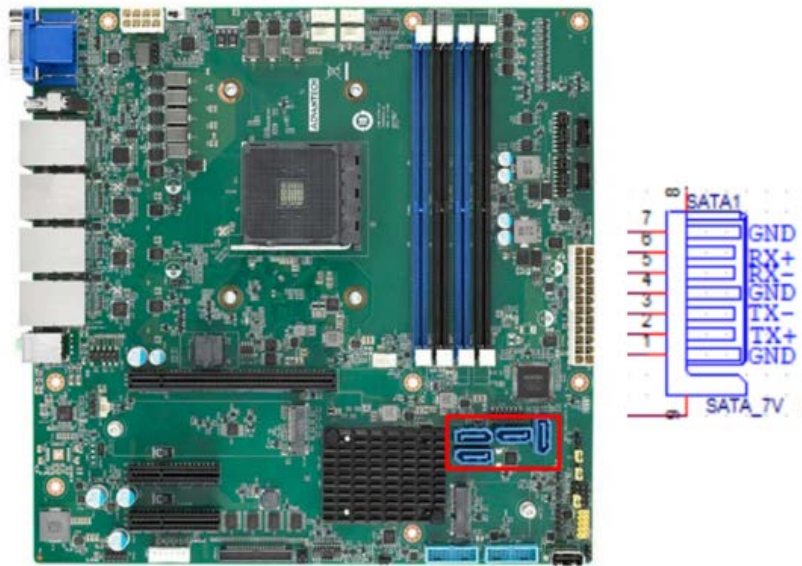


Note! Default audio support 2 ports.



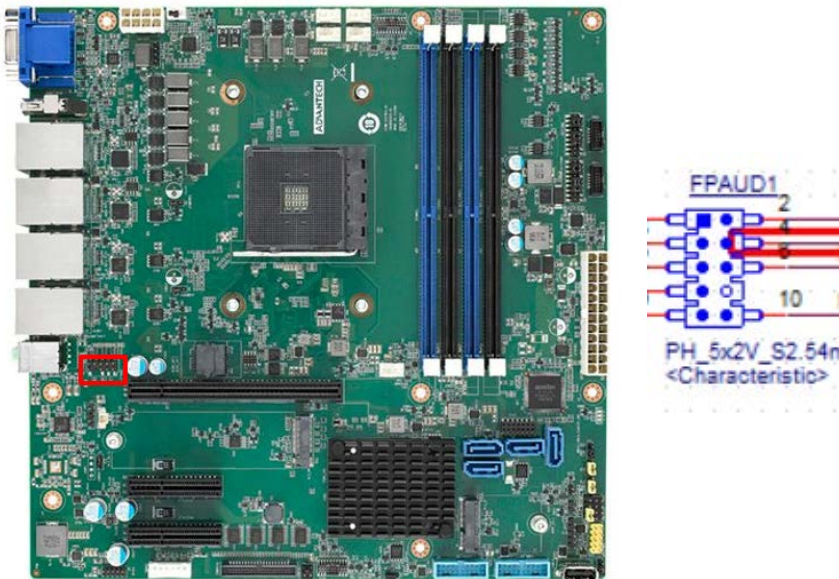
There is a BOM option to support 3 ports.(Line-in/Line-out/Mic-in)

2.10 Serial ATA Interface Connector (SATA1~4)



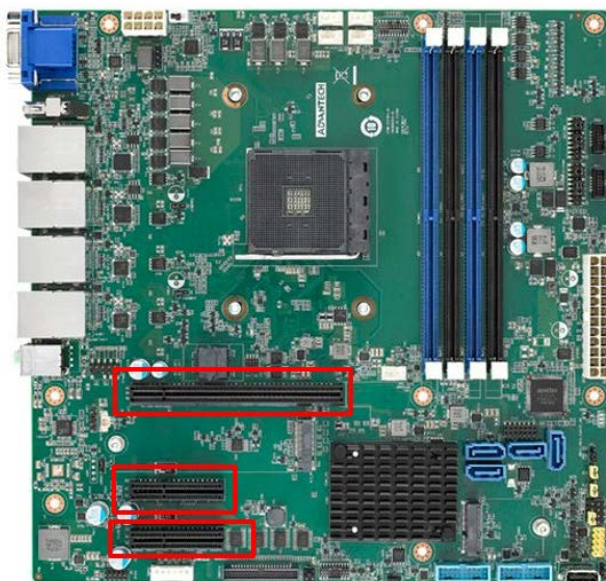
The AIMB-522 features a high-performance Serial ATA III interface (up to 600 MB/s) which eases hard drive cabling with thin, space-saving cables.

2.11 Front Panel Audio Connector (FPAUD1)



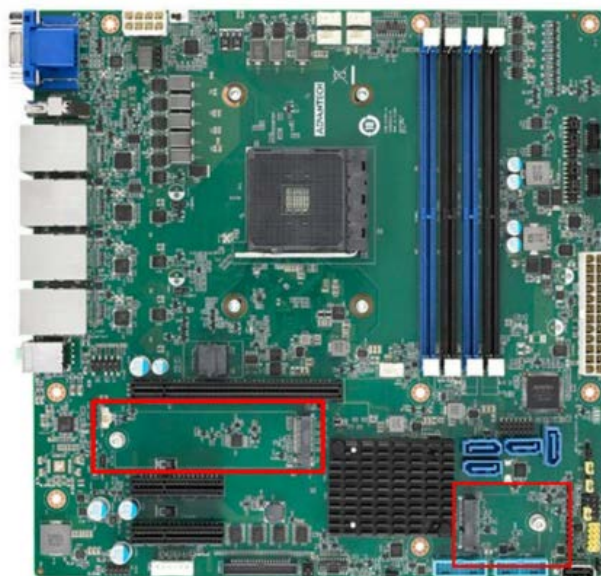
Pin	Signal	Pin	Signal
1	MIC IN-L	2	GND
3	MIC IN-R	4	FPAUD_DETECT#
5	LINE OUT-R	6	MIC2-JD
7	FRONT-IO-SENSE	8	NA
9	LINE OUT-L	10	LINE2-JD

2.12 PCI Express x16 Slot (PCIEX16_1) PCI Express x4 Slot(PCIEX4_1/PCIEX4_2)



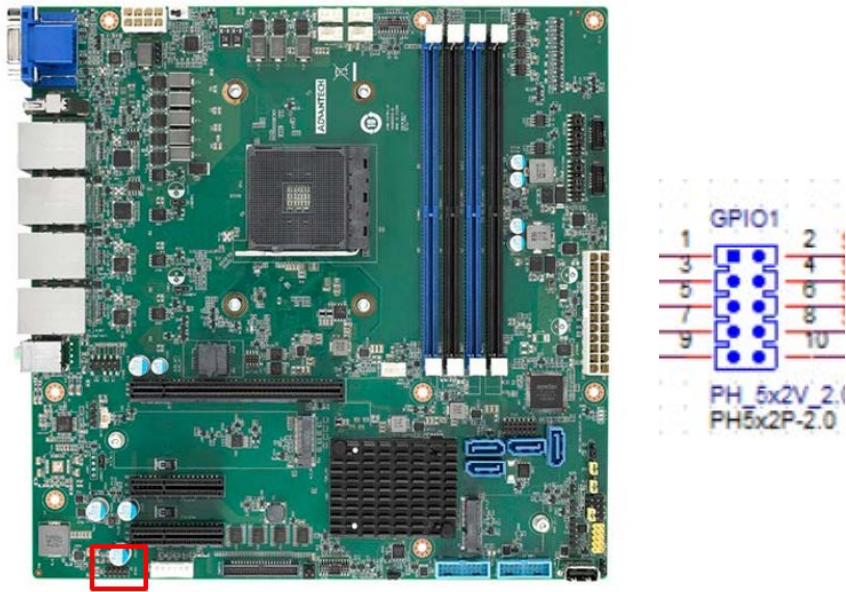
The AIMB-522 provides a PCIe x16 slot and two PCIe x4 slots which can support half-length cards and up-to a PCIe x8 card.

2.13 NGFF M.2 M-Key and E-Key Connector (M.2_M1/ M.2_E1)

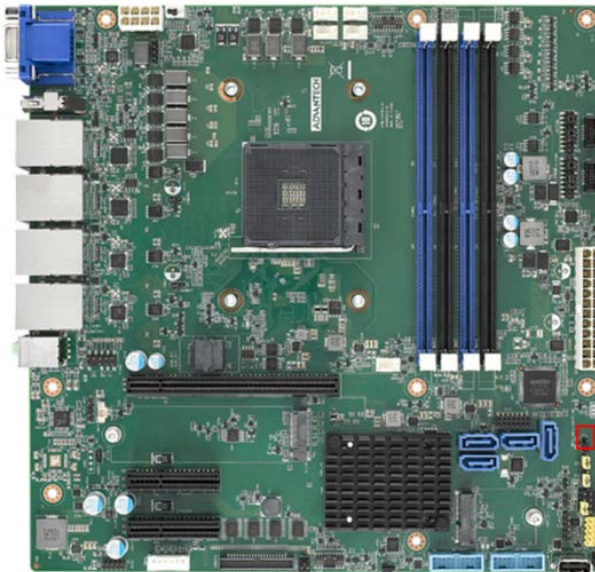


- M.2 M-Key: 2280, support SATA III or PCIe x4 interface, and can support NVMe devices.
- M.2 E-Key: 2230, support USB 2.0 or PCIe x1 interface, and can support NVMe devices.

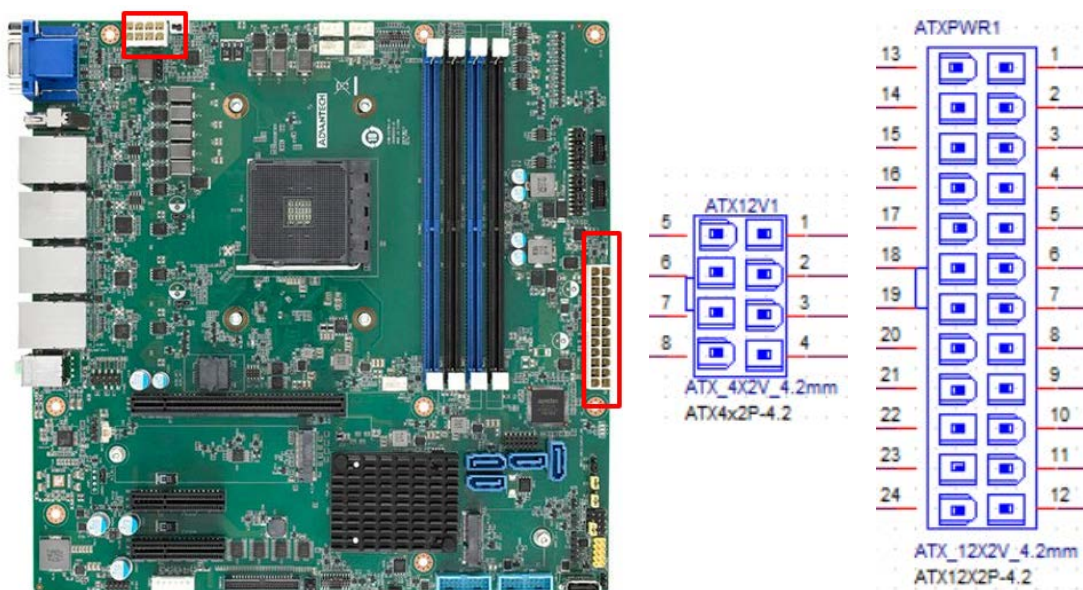
2.14 General Purpose I/O Connector (GPIO1)



2.15 Case Open Connector (JCASE2)



2.16 ATX Power Connector (ATXPWR1, ATX12V1)



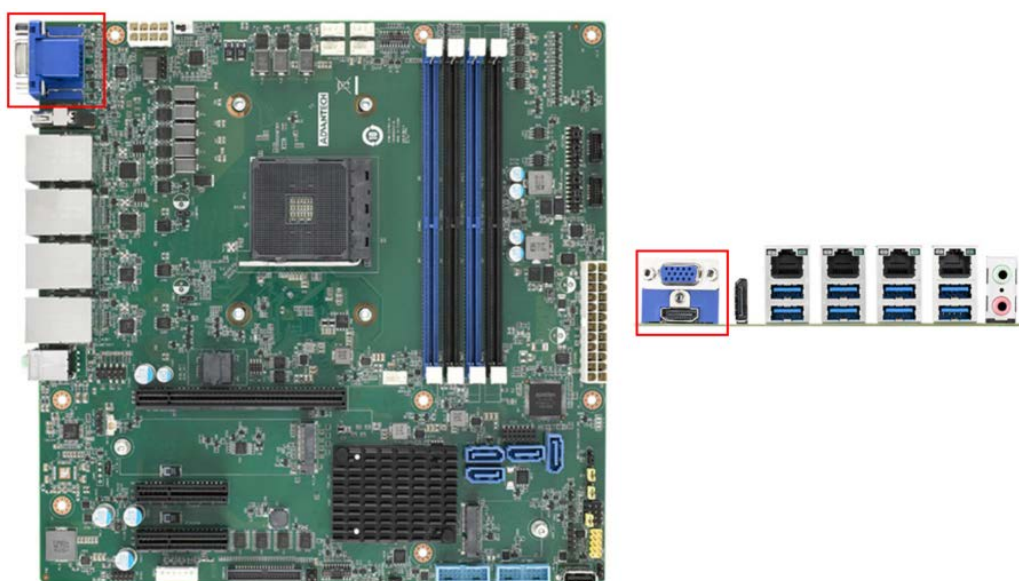
This connector is for an ATX Micro-Fit power supply. The plugs from the power supply are designed to fit these connectors in only one direction. Determine the proper orientation and push down firmly until the connectors mate completely.

Note!

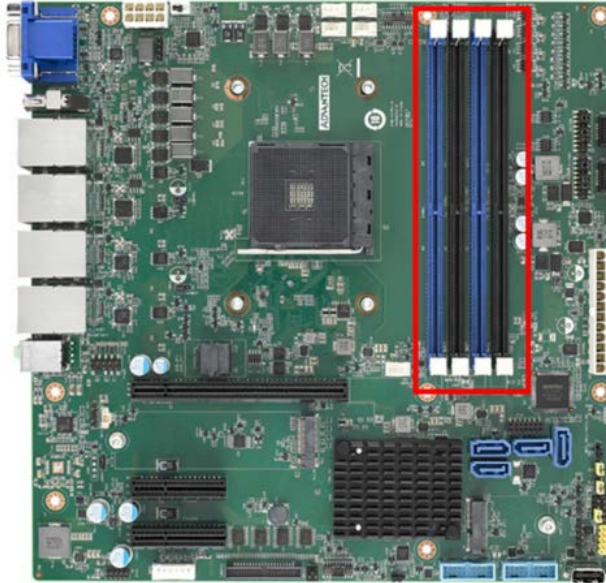


1. Please connect the ATX12V1 connector with the PSU ATX 12V 8-pin connector.
2. For a fully configured system, we recommend that you use a power supply unit (PSU) that complies with ATX 12 V Specification 2.0 (or later version) and provides a minimum power of 180 W.

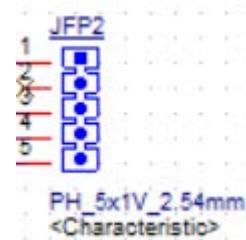
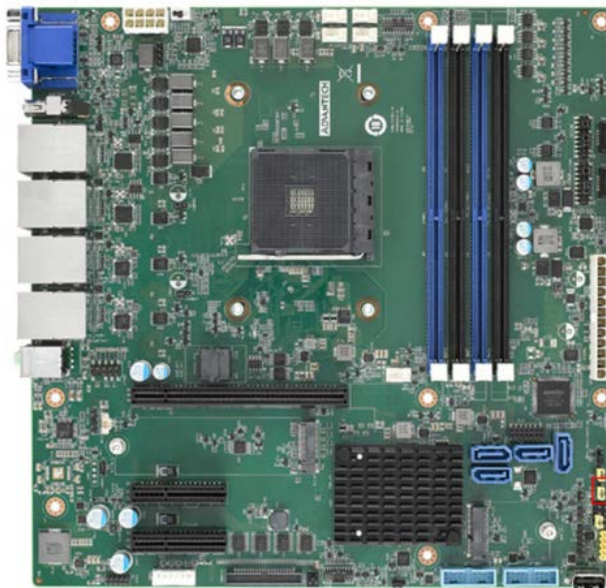
2.17 VGA+HDMI (HDMI_VGA1)



2.18 DDR4 UDIMM Socket (DIMMA1/DIMMA2/ DIMMB1/DIMMB2)



2.19 System Indicator LED (JFP3)



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-522 setup screens.

3.2 BIOS Setup

The AIMB-522 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 of the motherboard. When the power is turned off, the battery on the board supplies the necessary power to preserve the FLASH.

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.

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 the 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.

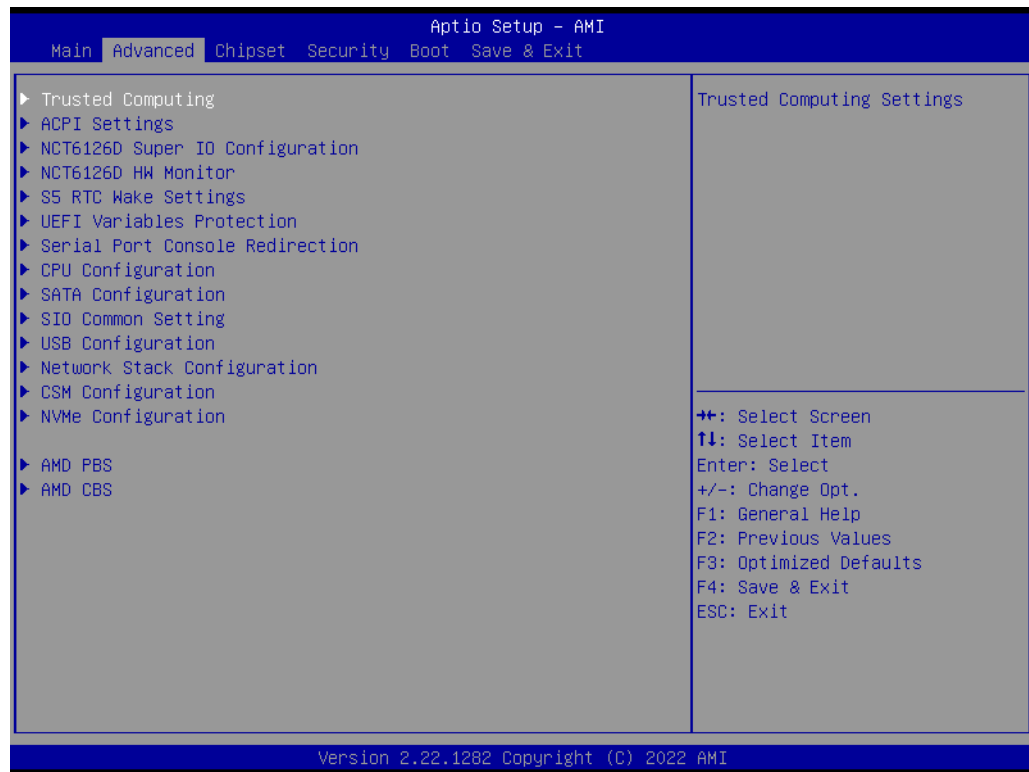
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System Time / System Date

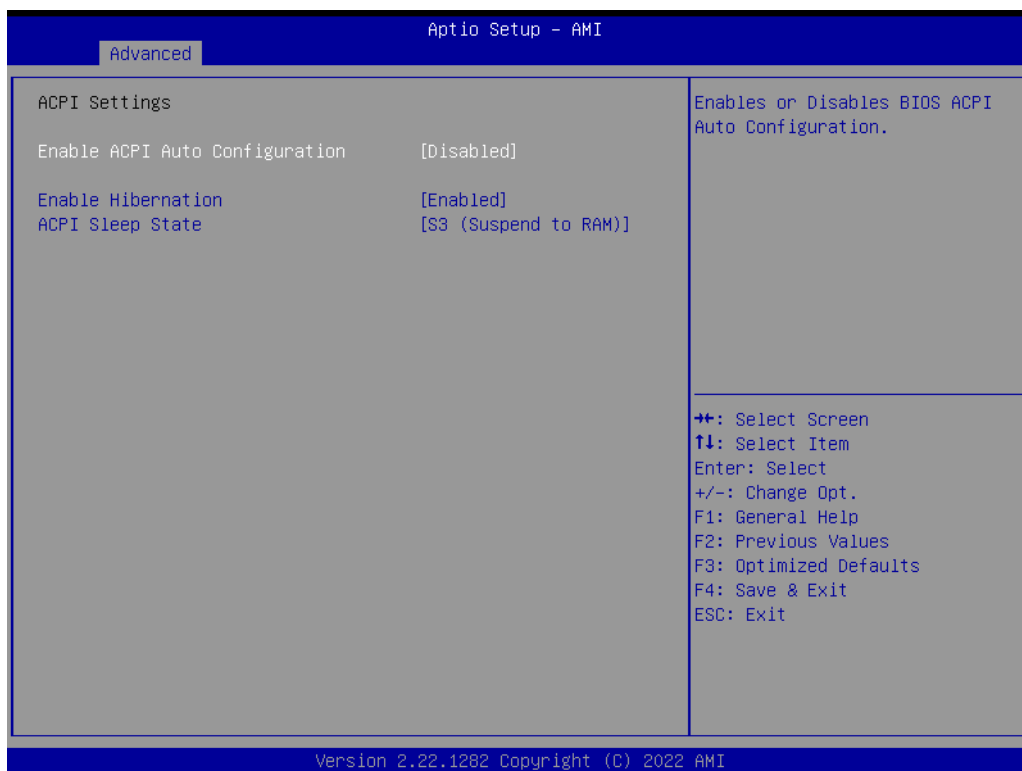
Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.2.2 Advanced BIOS Features

Select the Advanced tab from the AIMB-522 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.

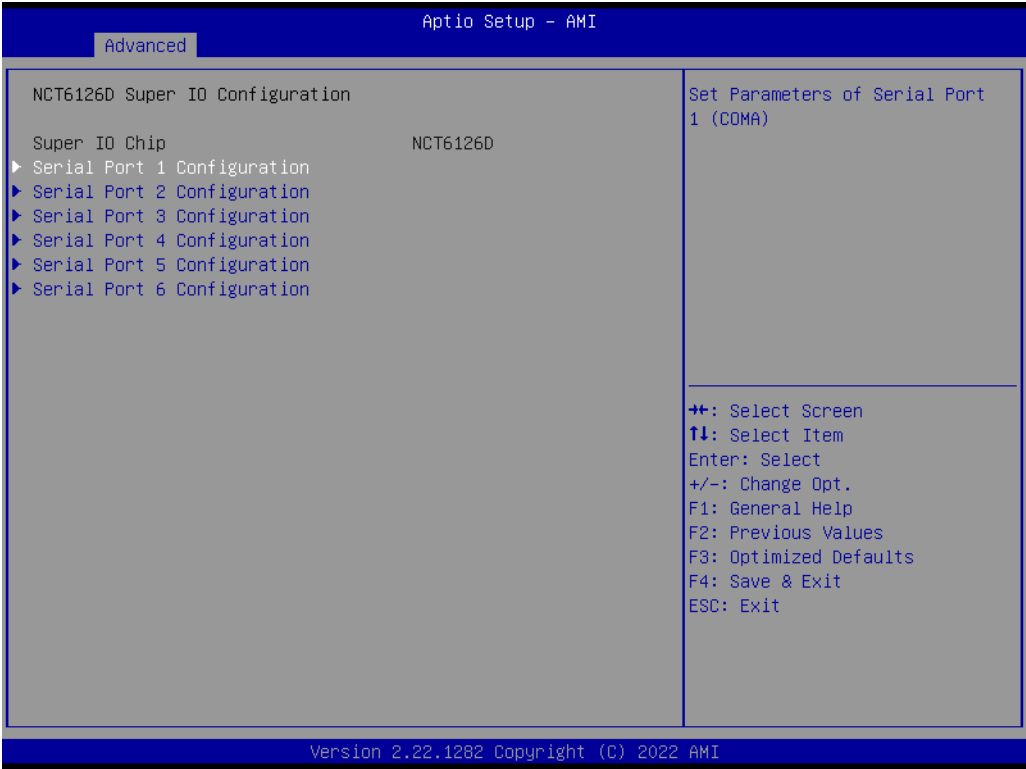
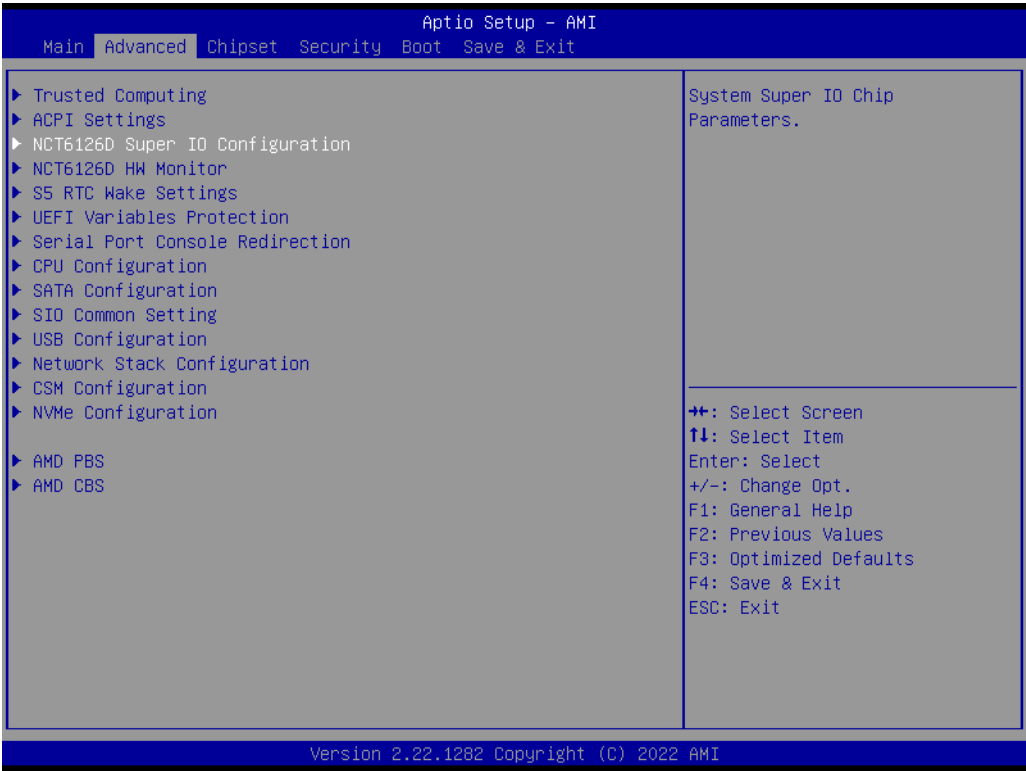


3.2.2.1 ACPI Settings

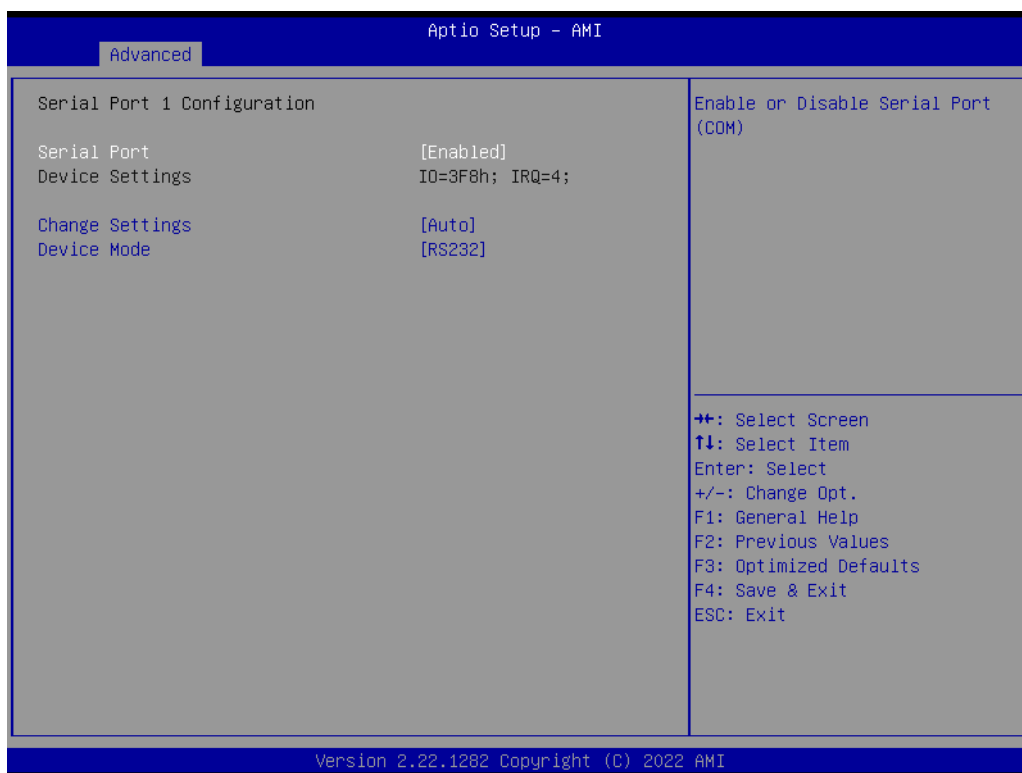


- **Enable ACPI Auto Configuration [Disabled]**
Enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation [Enabled]**
Enable or Disable the System ability to Hibernate (OS/S4 Sleep State). This option may be not effective with some OS.
- **ACPI Sleep State [S3 (Suspend to RAM)]**
Select ACPI sleep state the system will enter when the SUSPEND button is pressed.

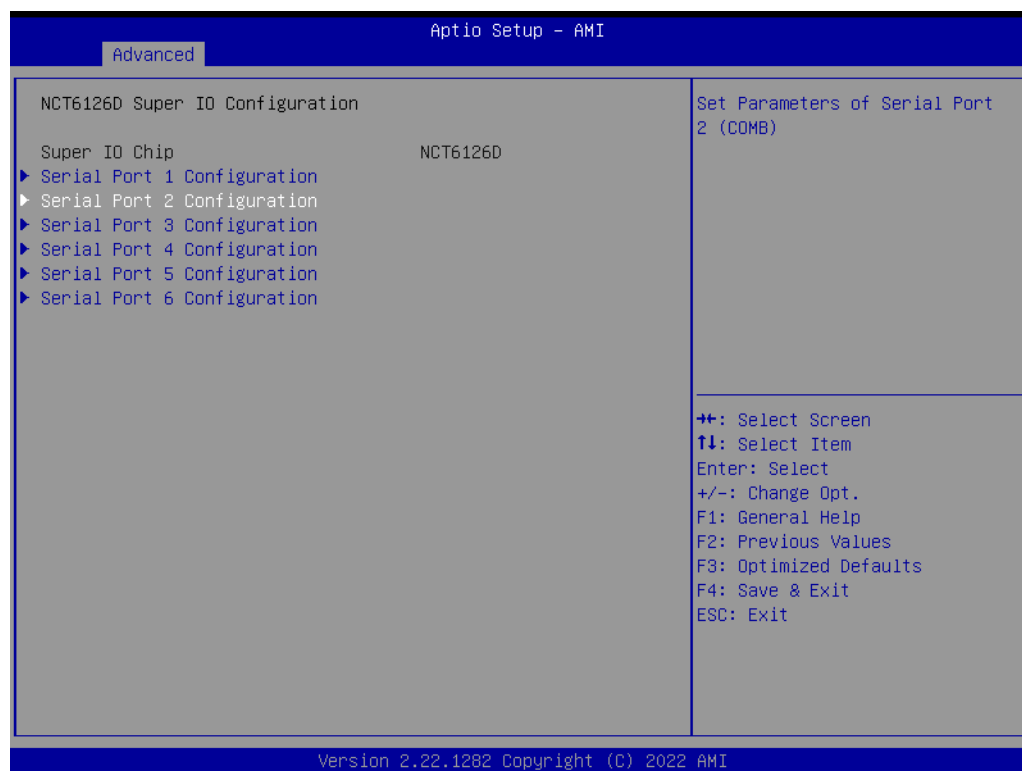
3.2.2.2 NCT6126D Super IO Configuration



- **Serial Port 1 Configuration**
Set Parameters of Serial Port1 (COMA).



- **Serial Port**
Enable or Disable Serial Port (COM).
 - **Serial Port [Enable]**
 - **Device Settings IO=3F8h; IRQ=4;**
 - **Change Settings [Auto]**
 - **Device Mode [RS232]**



- **Serial Port 2 Configuration**
Set the Parameters of Serial Port2 (COMB).

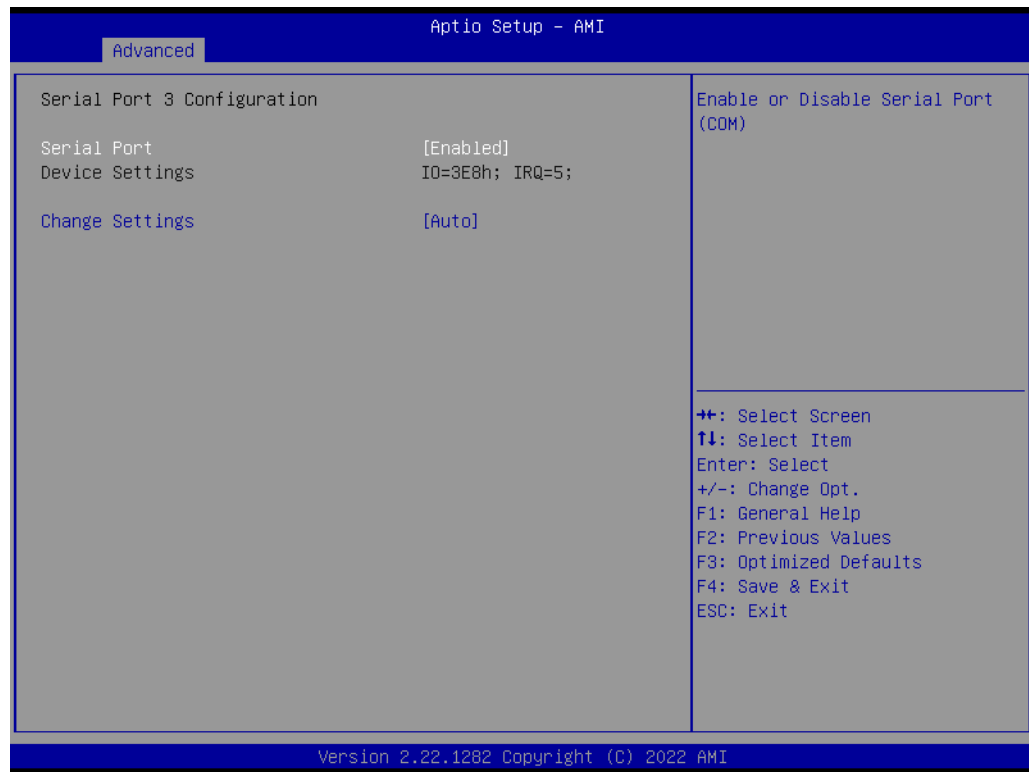


- **Serial Port**
Enable or Disable Serial Port (COM).
– **Serial Port [Enable]**

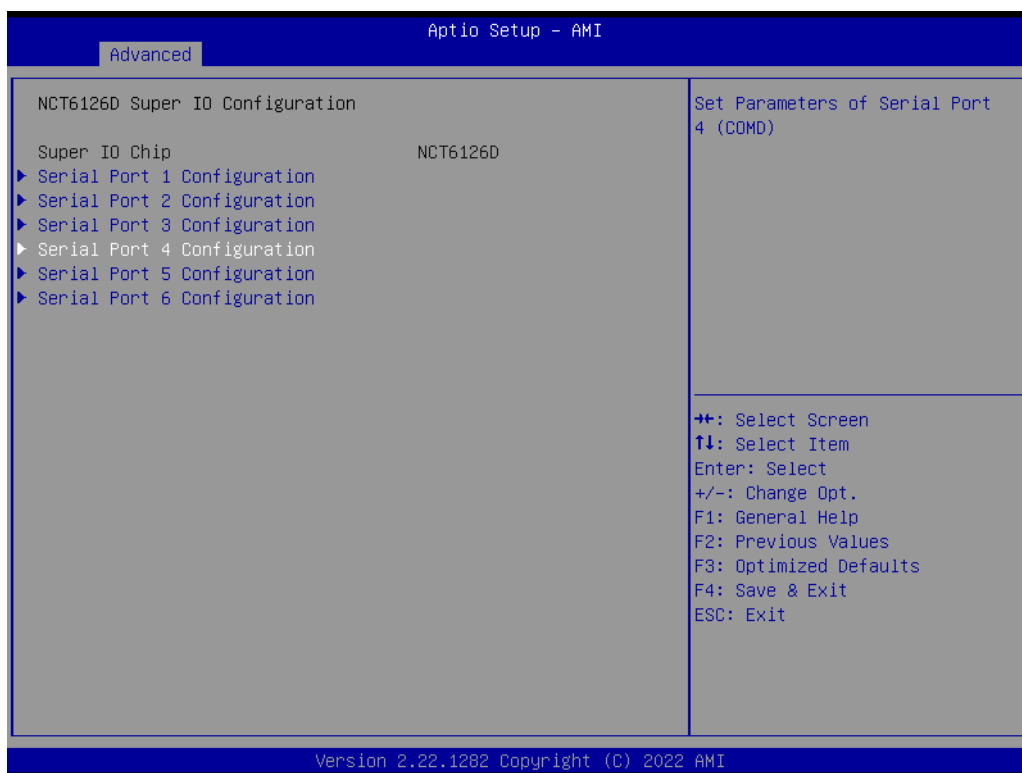
- **Device Settings IO=2F8h; IRQ=3;**
- **Change Settings [Auto]**
- **Device Mode [RS232]**



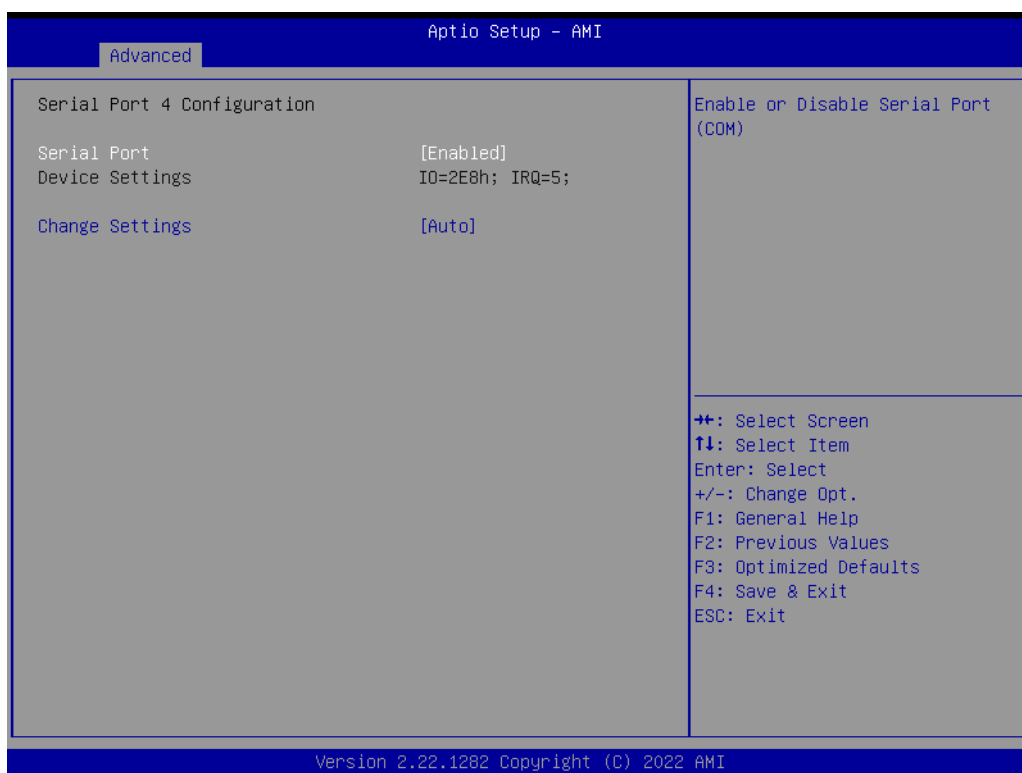
- **Serial Port 3 Configuration**
Set the Parameters of Serial Port3 (COMC).



- **Serial Port**
Enable or Disable Serial Port (COM).
 - **Serial Port [Enable]**
 - **Device Settings IO=3E8h; IRQ=5;**
 - **Change Settings [Auto]**

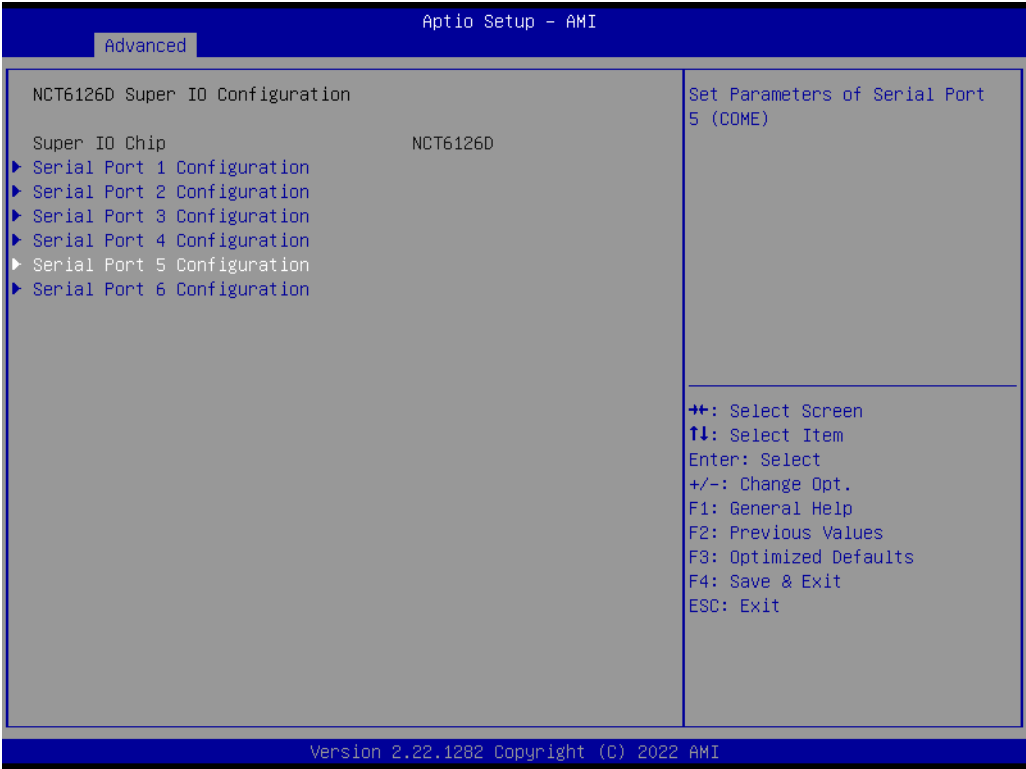


- **Serial Port 4 Configuration**
Set Parameters of Serial Port4 (COMD).

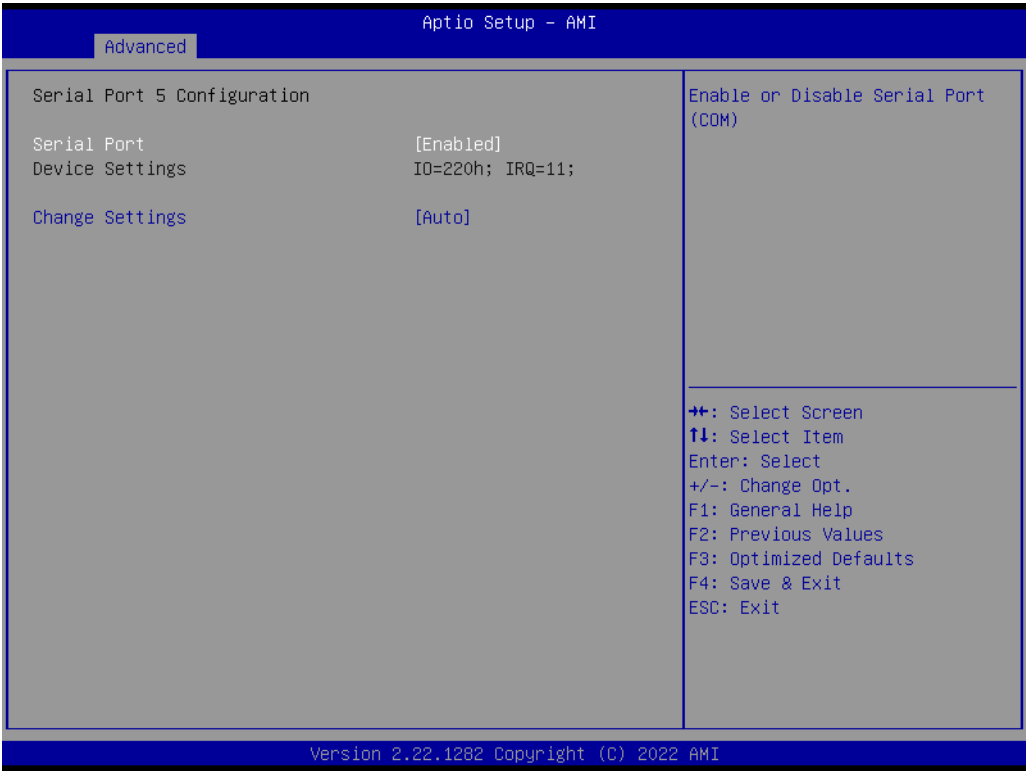


- **Serial Port**
Enable or Disable Serial Port (COM)
– **Serial Port [Enable]**

- **Device Settings IO=2E8h; IRQ=5;**
- **Change Settings [Auto]**

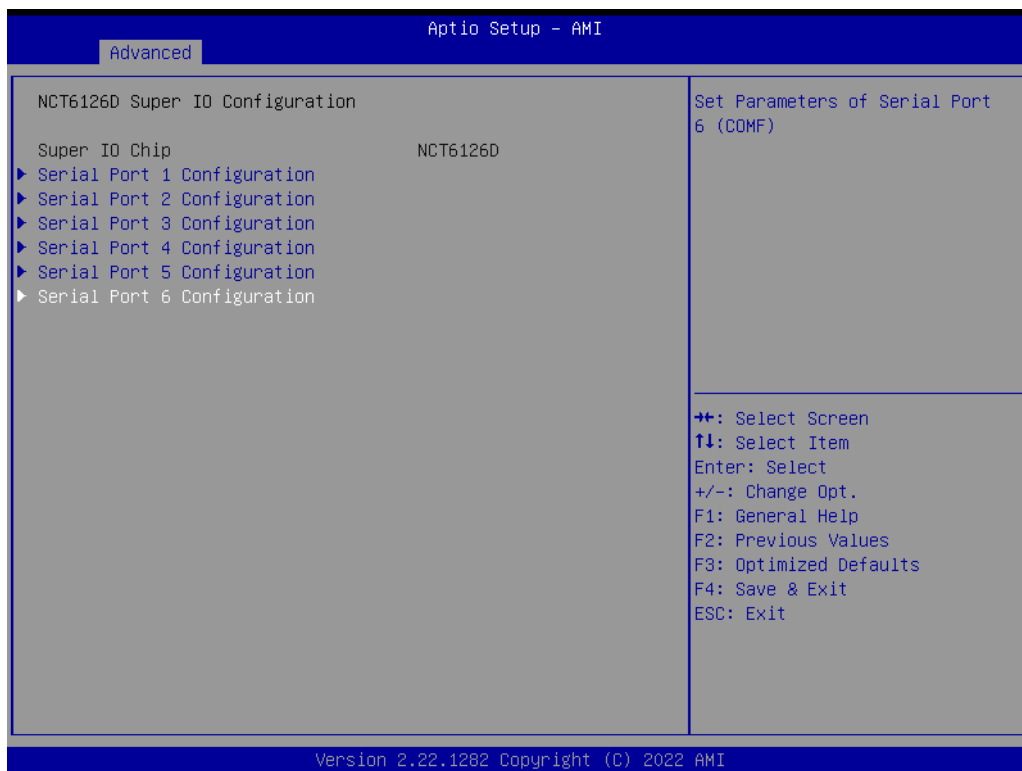


- **Serial Port 5 Configuration**
Set Parameters of Serial Port5 (COM5).



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

- **Serial Port [Enable]**
- **Device Settings IO=220h; IRQ=11;**
- **Change Settings [Auto]**



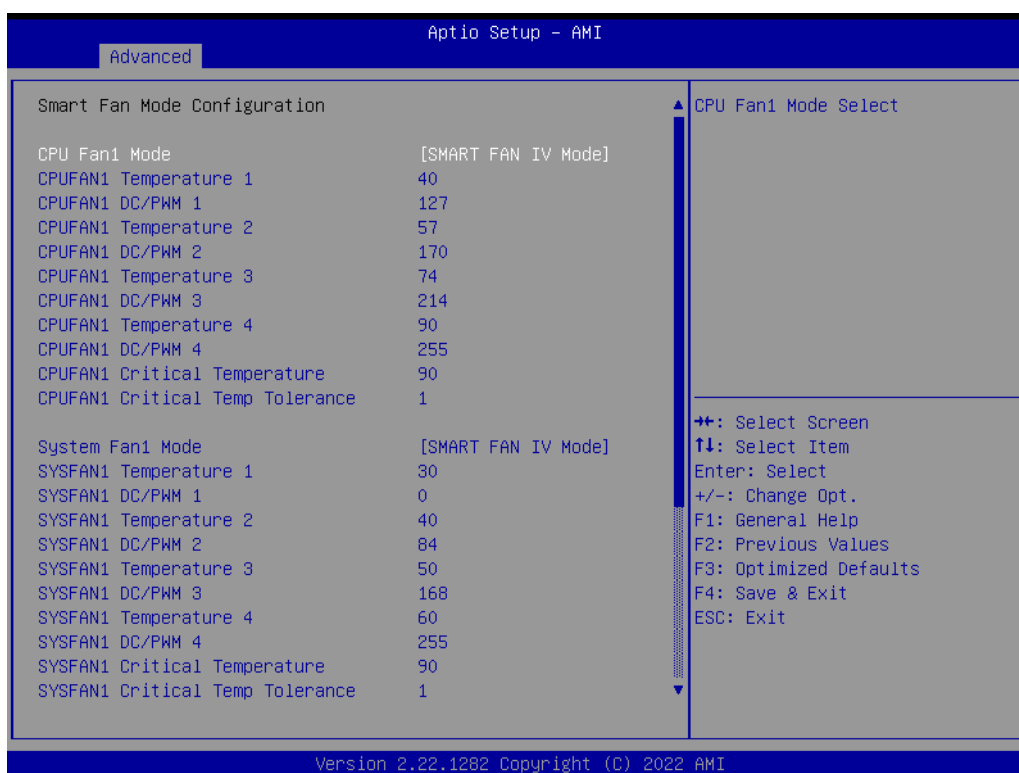
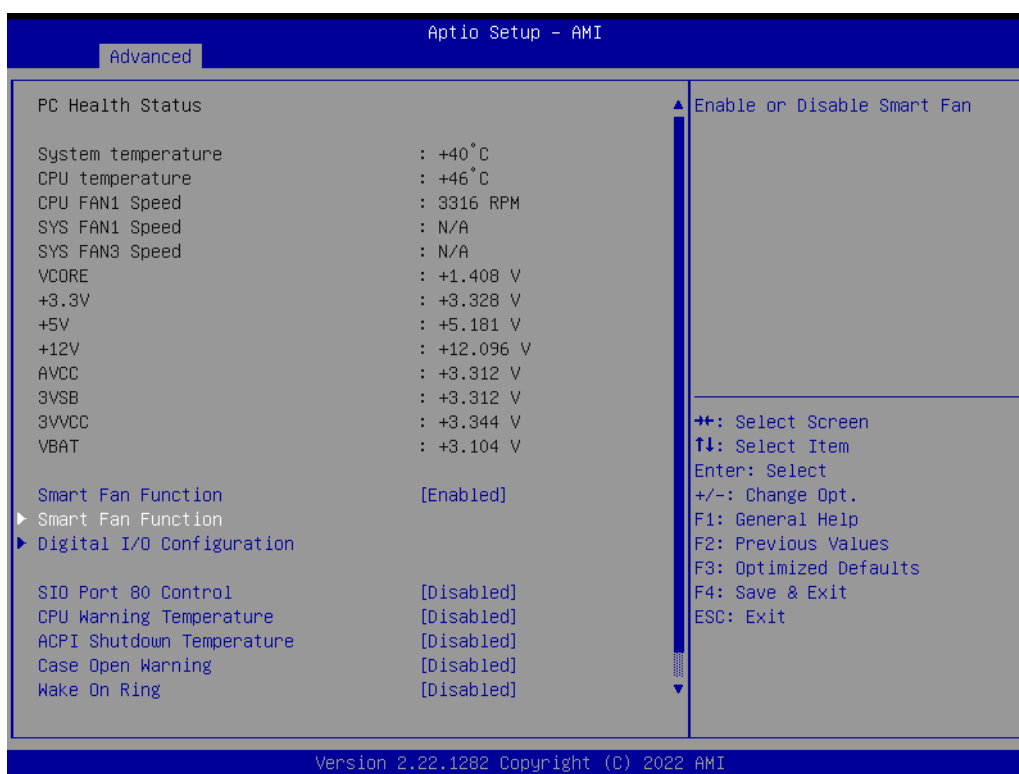
- **Serial Port 6 Configuration**
Set Parameters of Serial Port6 (COMF).



- **Serial Port**
Enable or Disable Serial Port (COM).
 - **Serial Port [Enable]**
 - **Device Settings IO=228h; IRQ=11;**
 - **Change Settings [Auto]**

3.2.2.3 NCT6126D HW Monitor

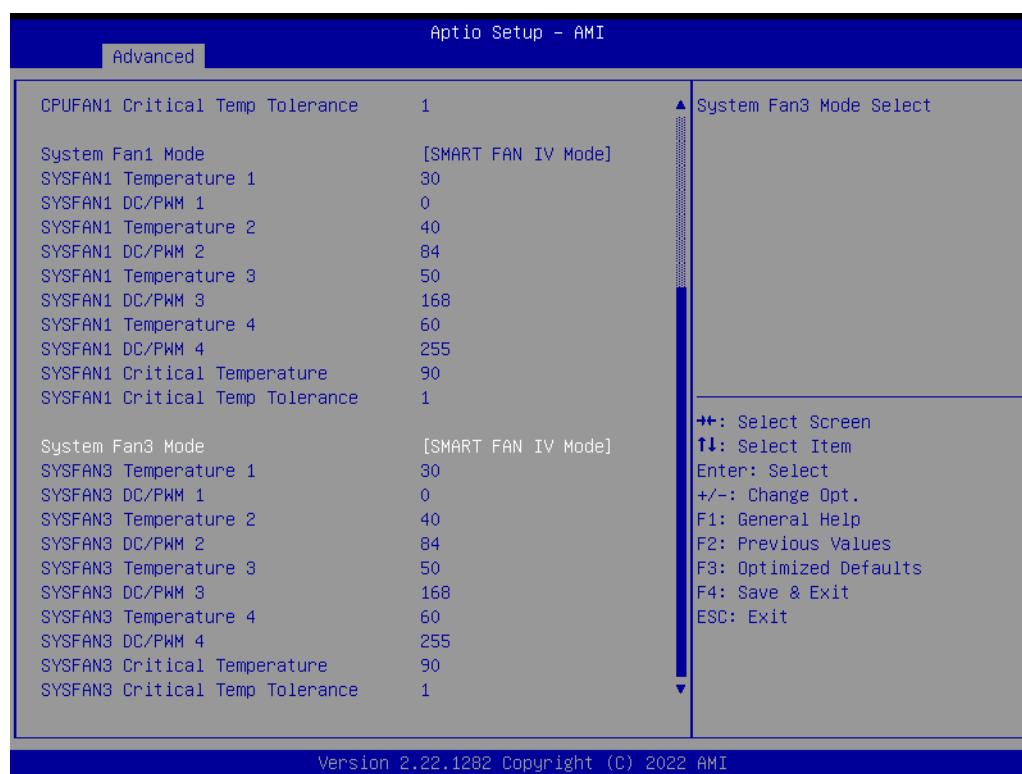
■ PC Health Status



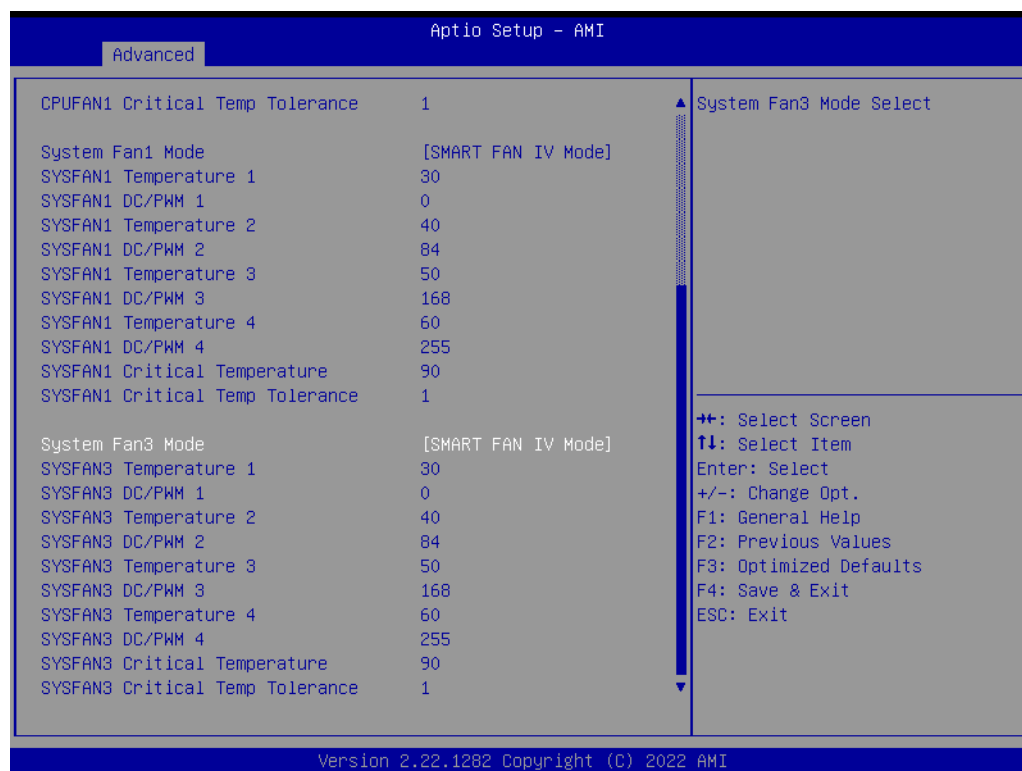
■ Smart Fan Function [Enabled]

Smart Fan Mode Configuration – CPU Fan1 Mode [SMART FAN IV Mode].

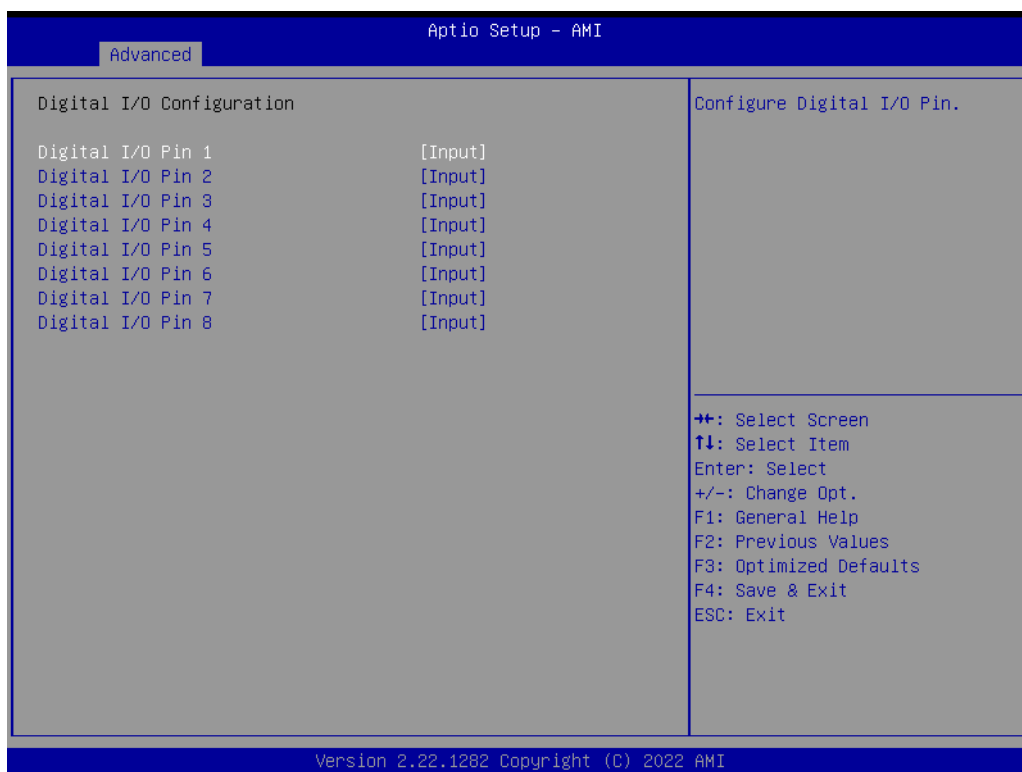
Smart Fan Mode Configuration – System Fan3 Mode [SMART FAN IV Mode]



■ Digital I/O Configuration

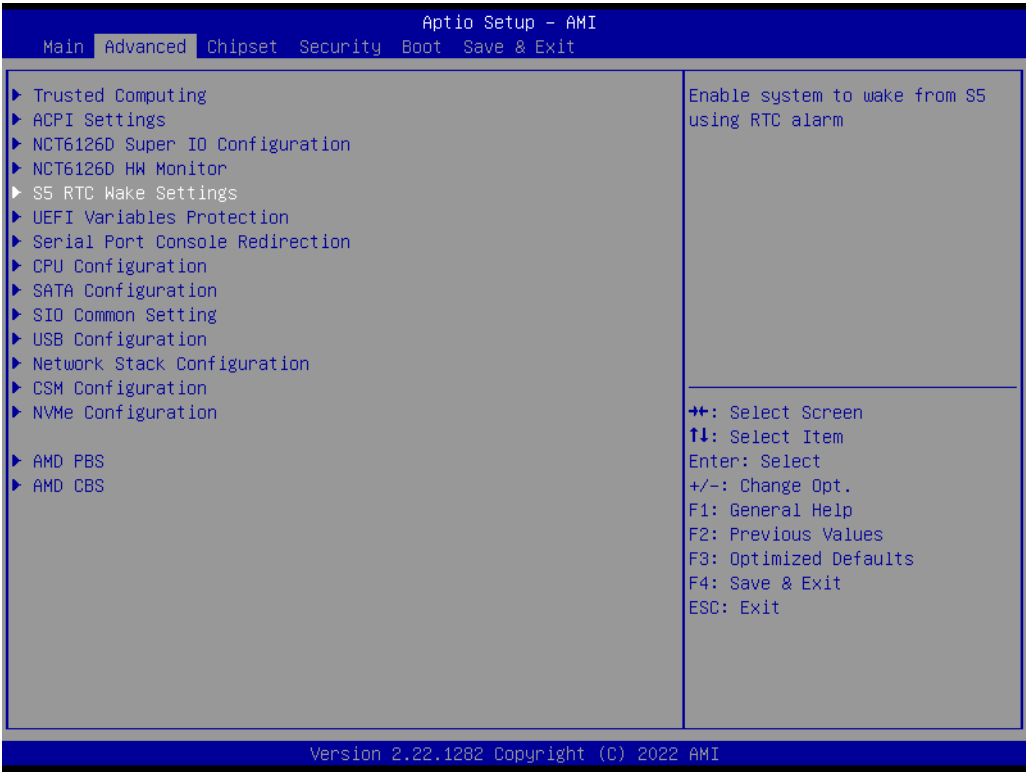


Digital I/O Pin1 [Input] – Configure Digital I/O pins



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

3.2.2.4 S5 RTC Wake Settings

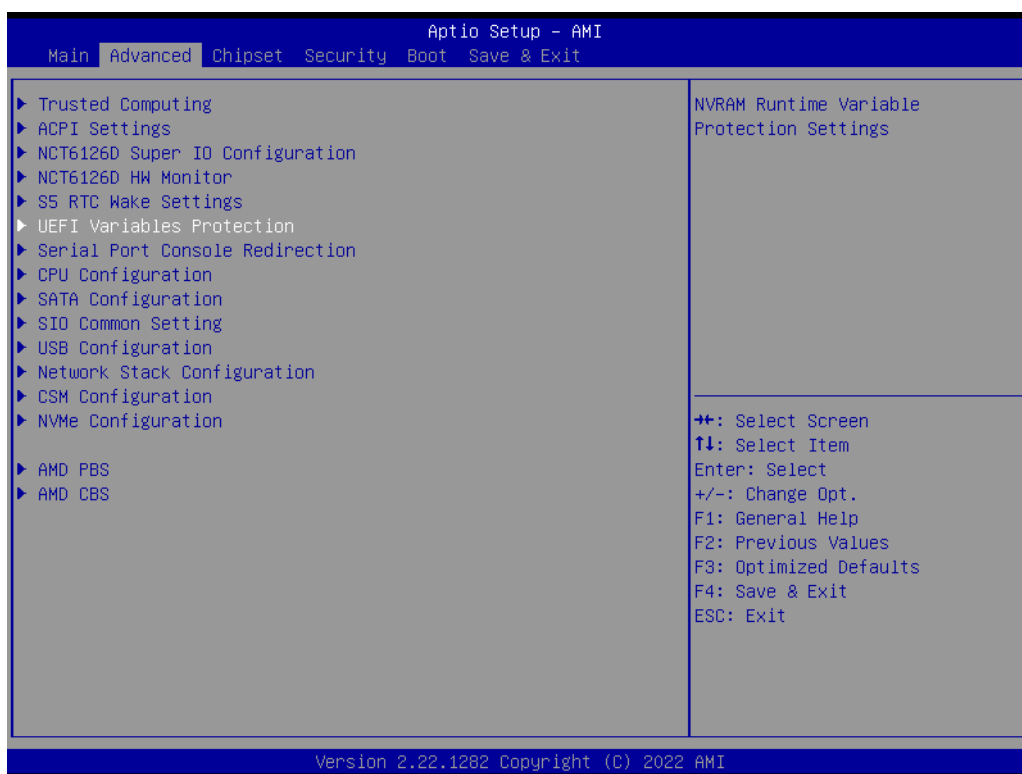


- **Wake system from S5 [Disabled]**
Enable or disable System wake on alarm event. Select FixedTime for the system to wake at the hr:min:sec specified. Select DynamicTime, System will wake on the current time + Increase minute(s).

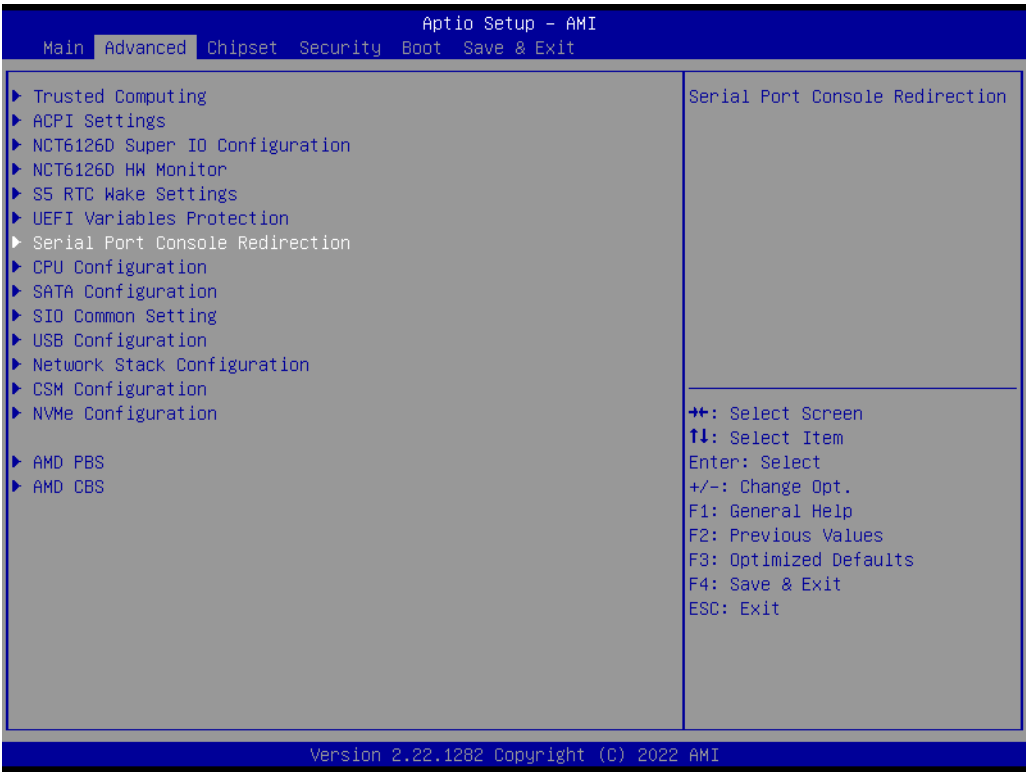


- **Password protection of Runtime Variables [Enable]**
Control the NVRAM Runtime Variable protection through the System Admin Password.

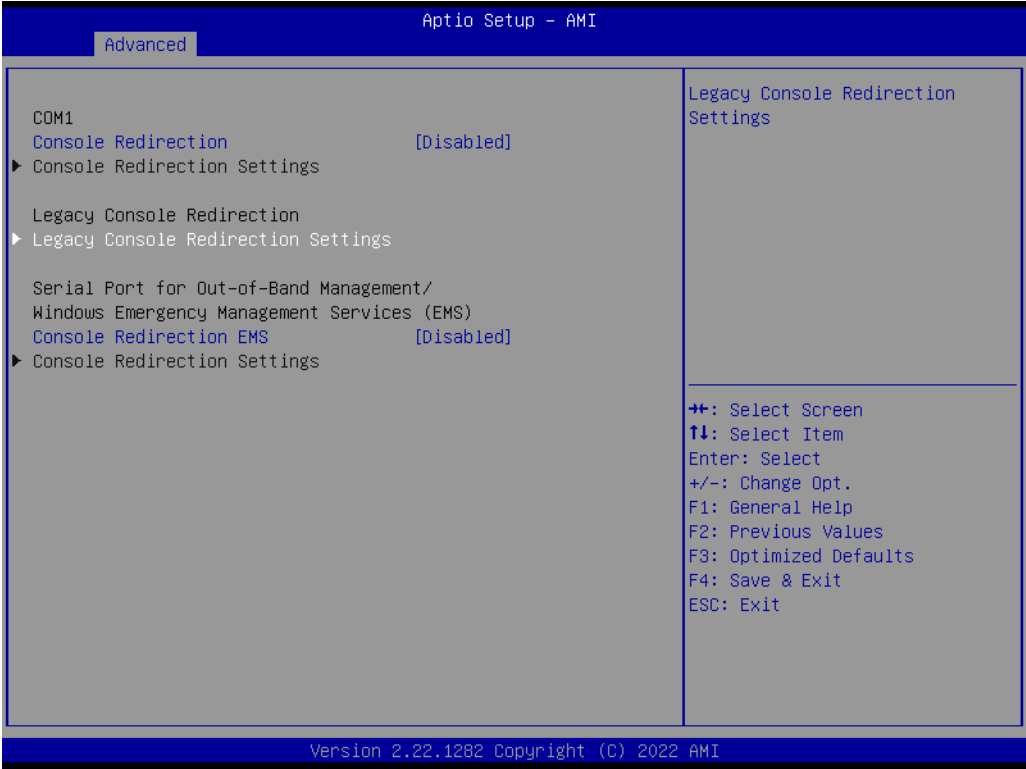
3.2.2.5 UEFI Variables Protection



3.2.2.6 Serial Port Console Redirection



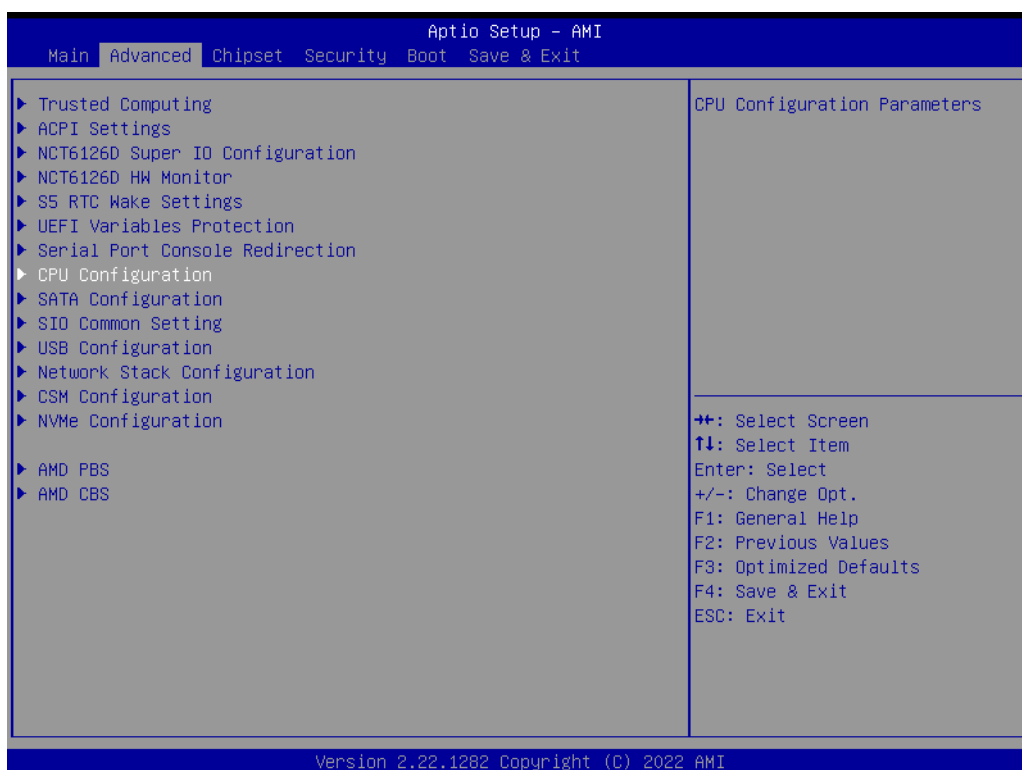
■ Legacy Console Redirection Settings



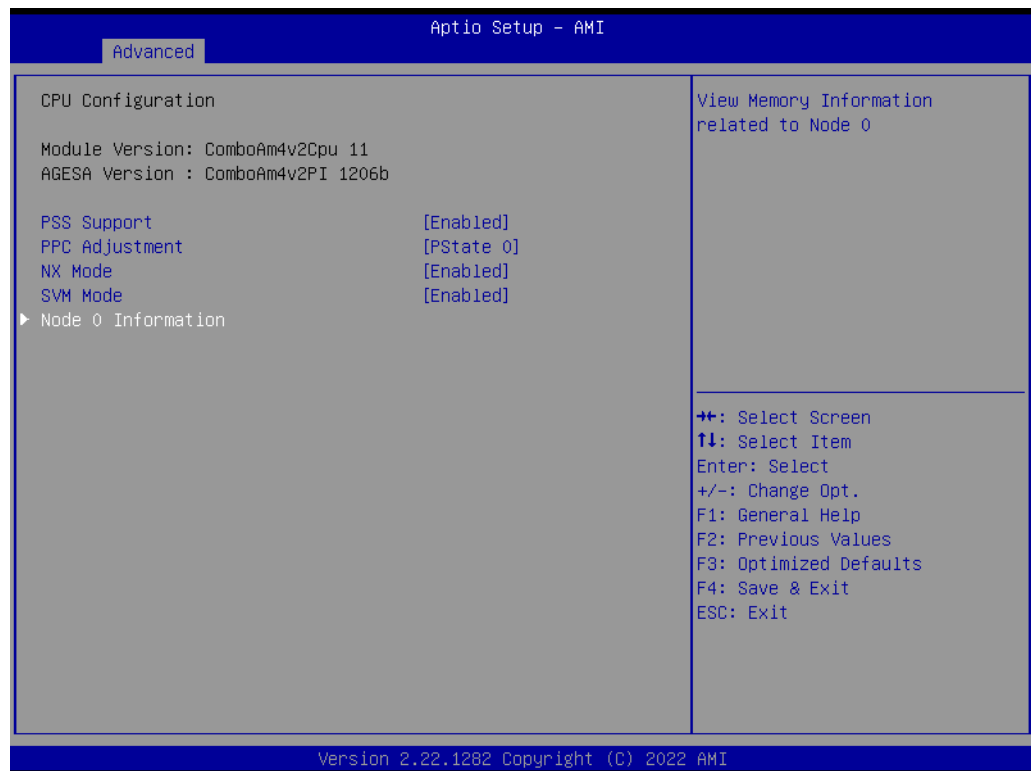


- **Redirection COM Port [COM1]**
Select a COM port to display redirection of Legacy OS and Legacy OPRM Messages

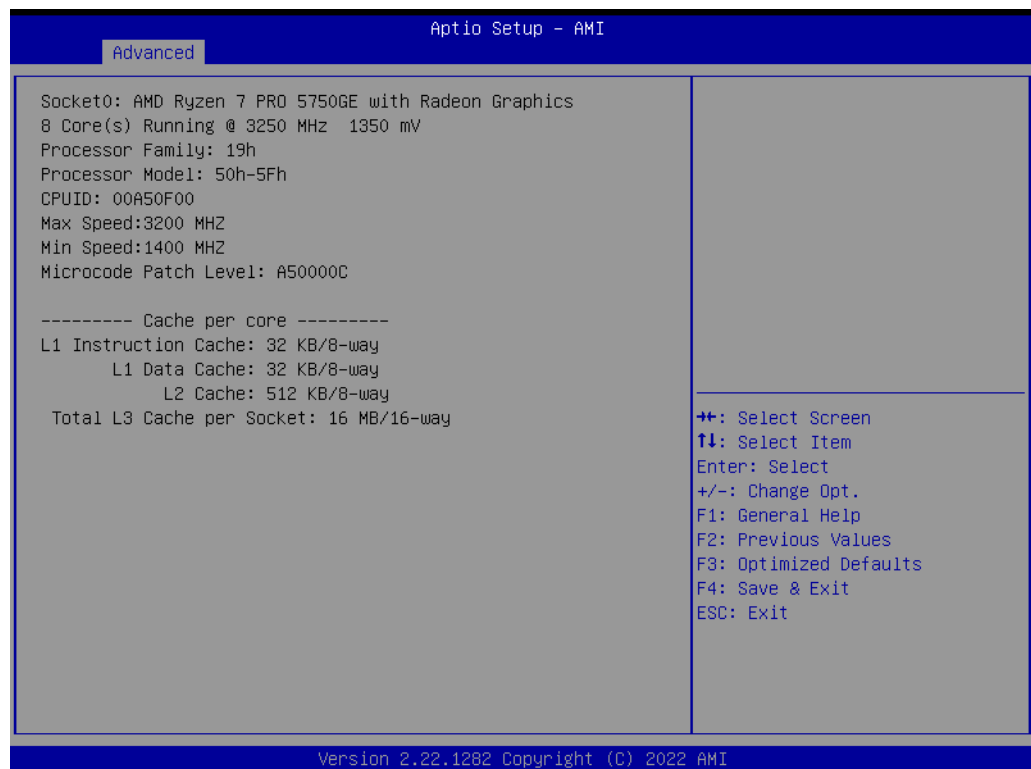
3.2.2.7 CPU Configuration



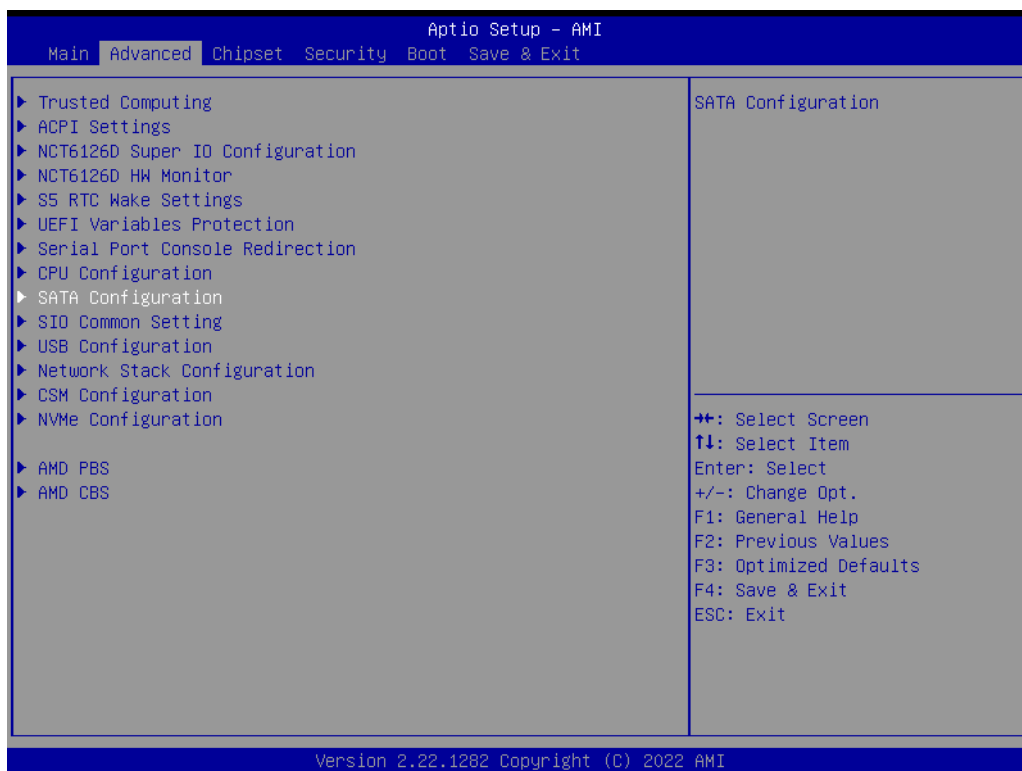
■ Node 0 Information



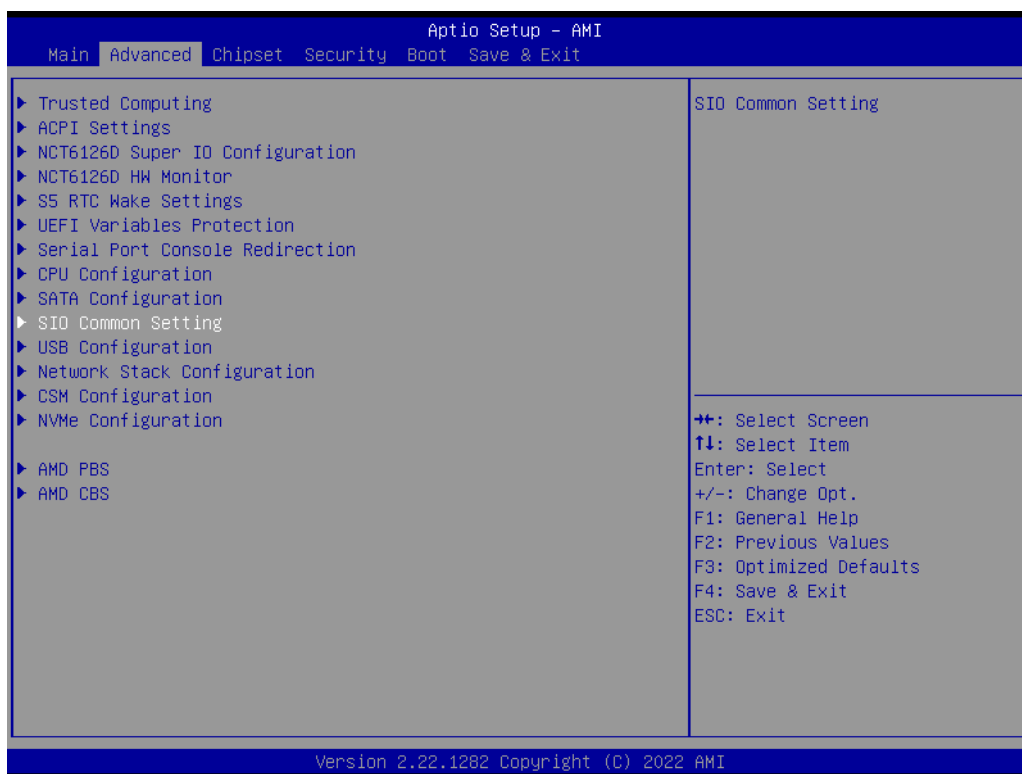
View Memory Information related to Node 0.

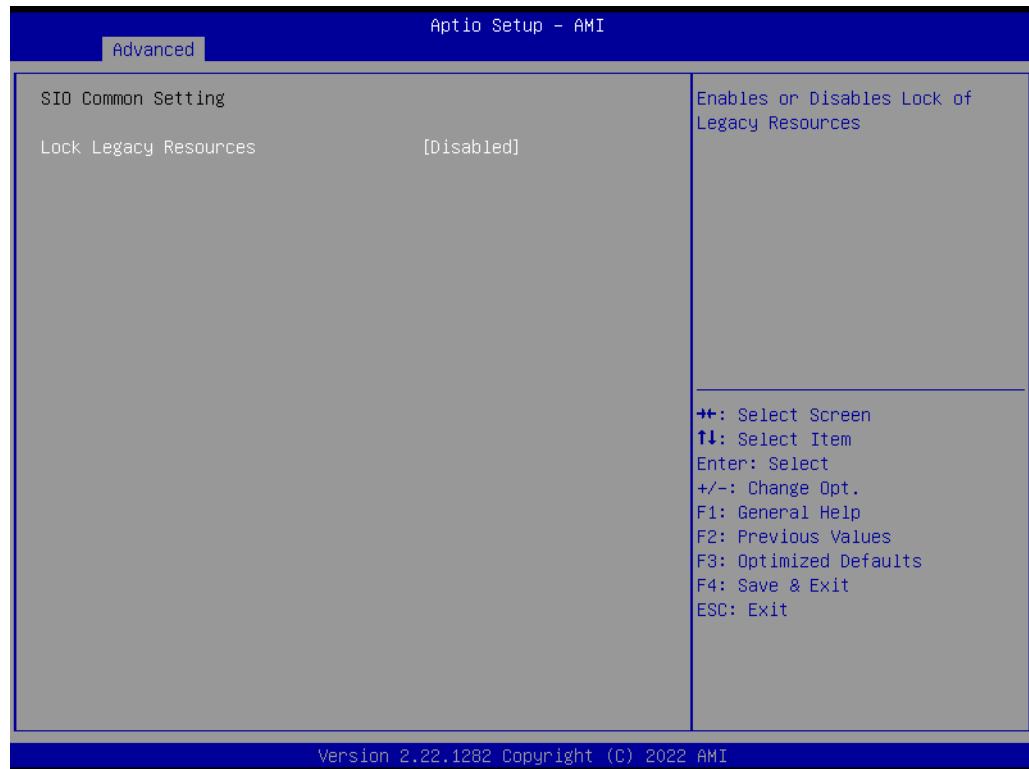


3.2.2.8 SATA Configuration



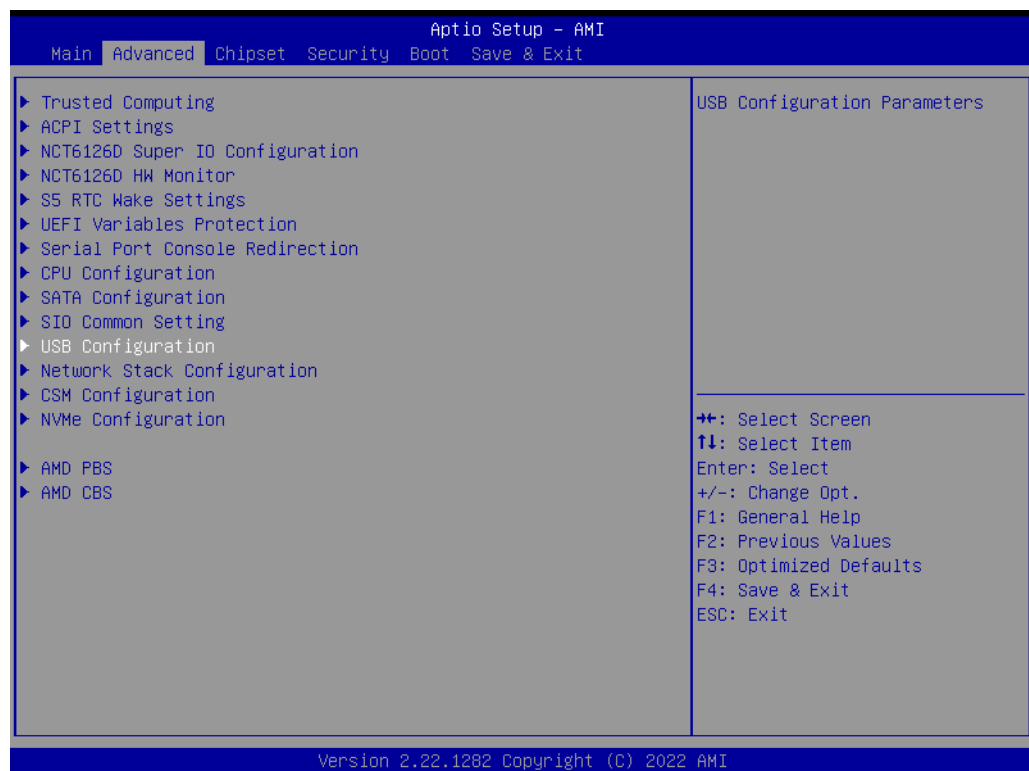
3.2.2.9 SIO Common Settings

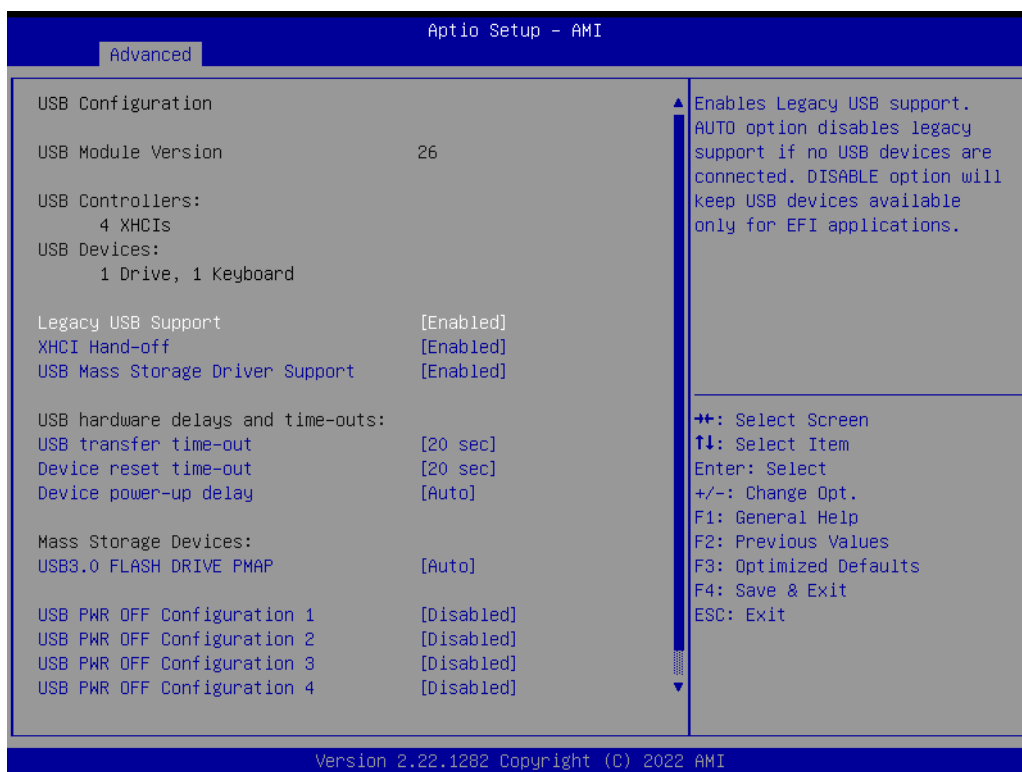




- **Enable ACPI Auto Configuration**
Enables or Disables Lock of Legacy Resources.

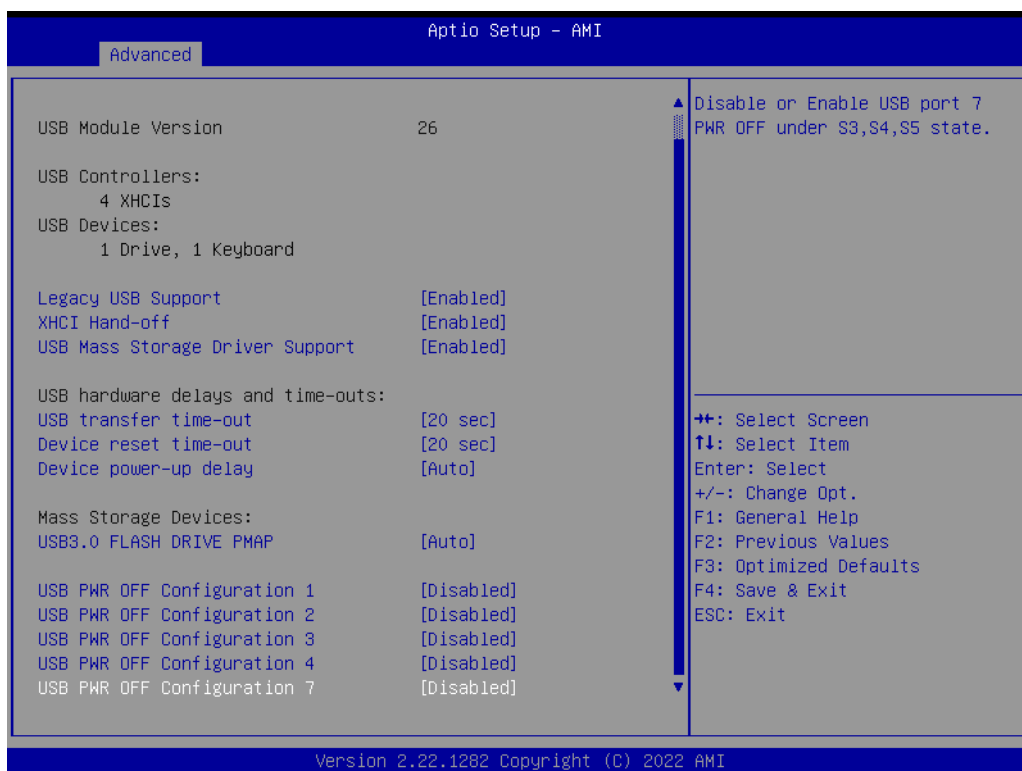
3.2.2.10 USB Configuration





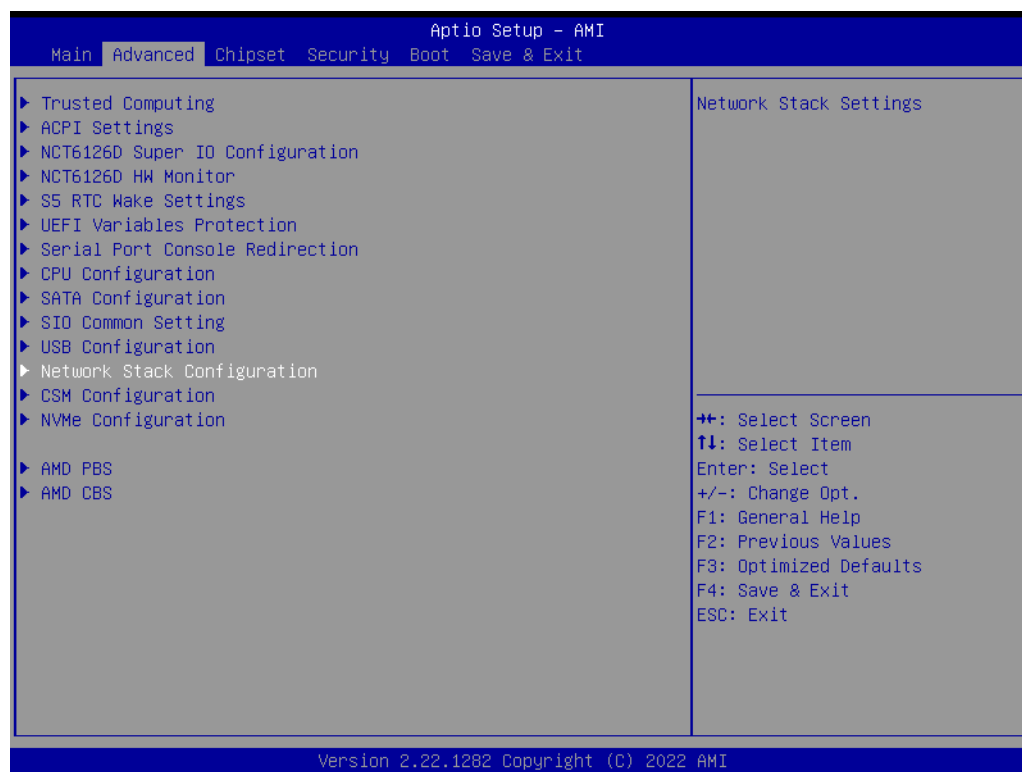
■ Legacy USB Support

Enables Legacy USB support. AUTO option disables legacy support if not USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.



■ USB PWR OFF Configuration 7 [Disabled]

Disable or Enable USB port 7 PWR OFF under S3, S4, S5 state.



3.2.2.11 Network Stack Configuration



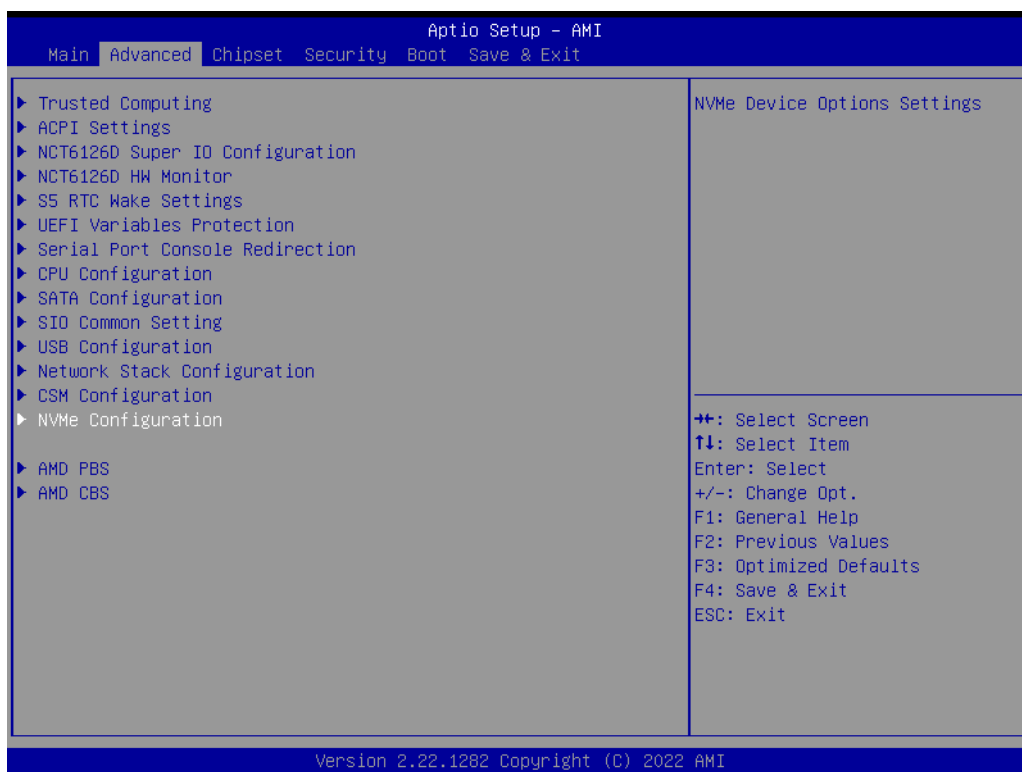
- **Network Stack [Disabled]**
Enable/Disable UEFI Network Stack.

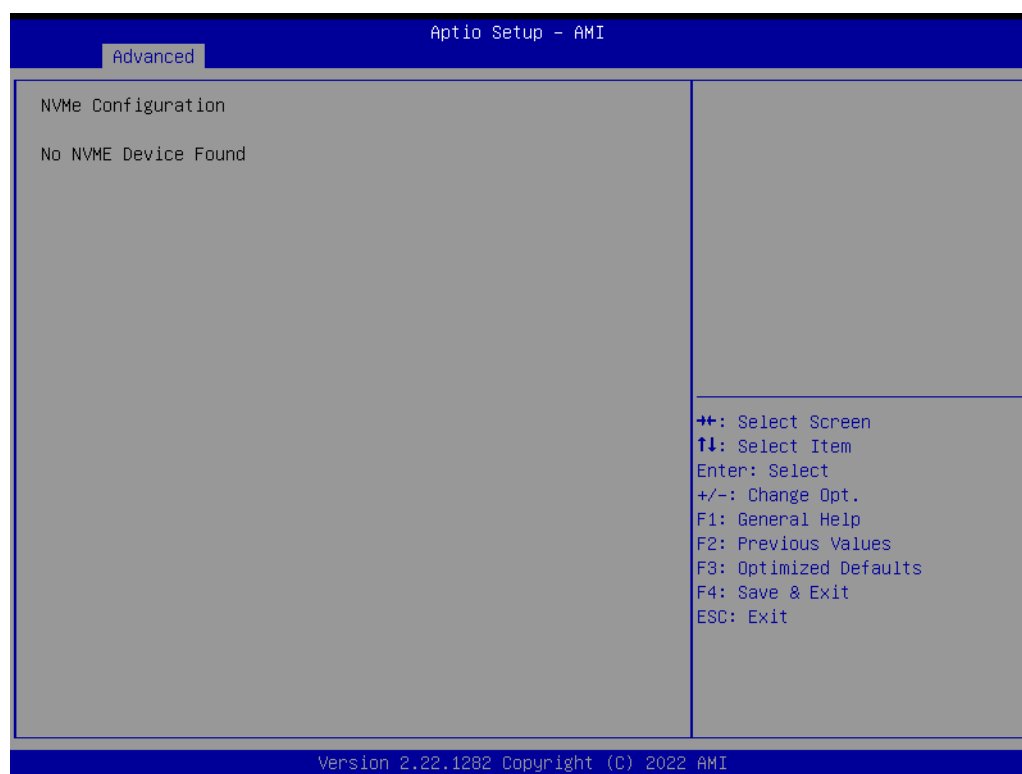
3.2.2.12 CSM Configuration



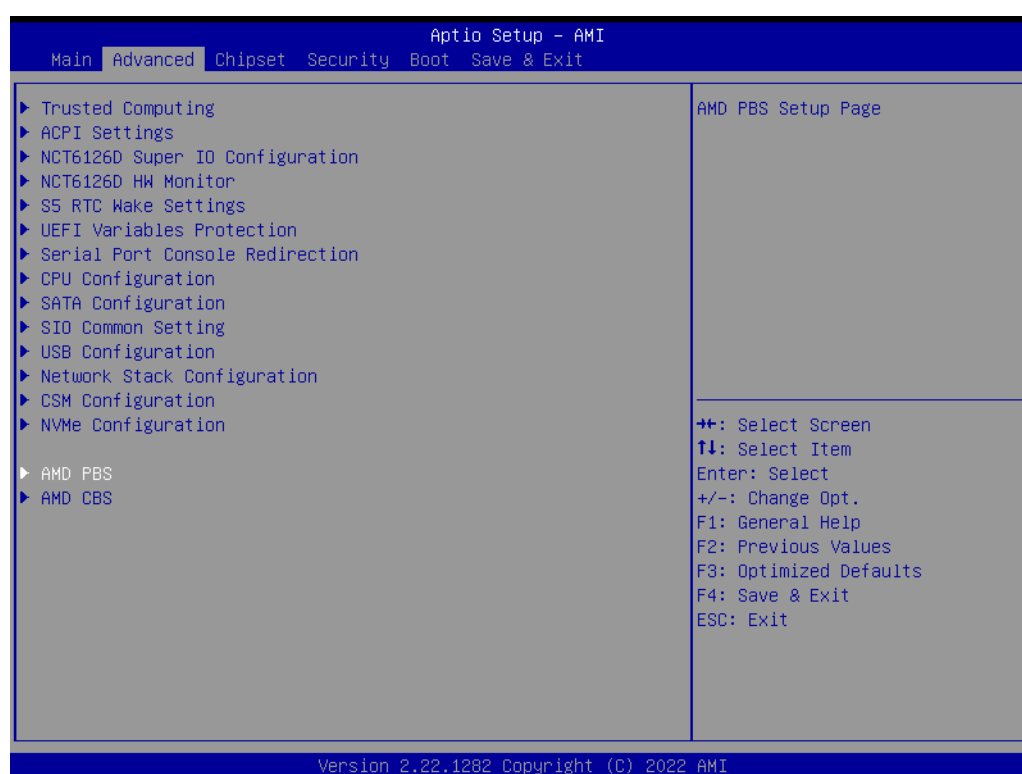
- **CSM Support [Disabled]**
Enable/Disable CSM Support.

3.2.2.13 NVMe Configuration

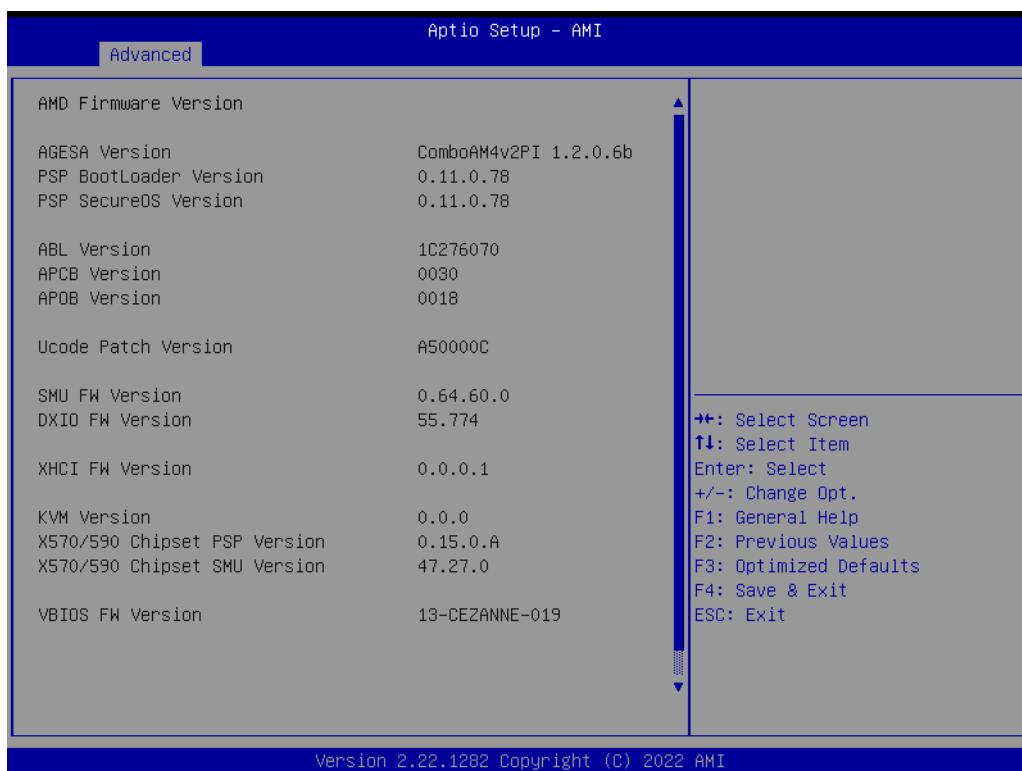




3.2.2.14 AMD PBS

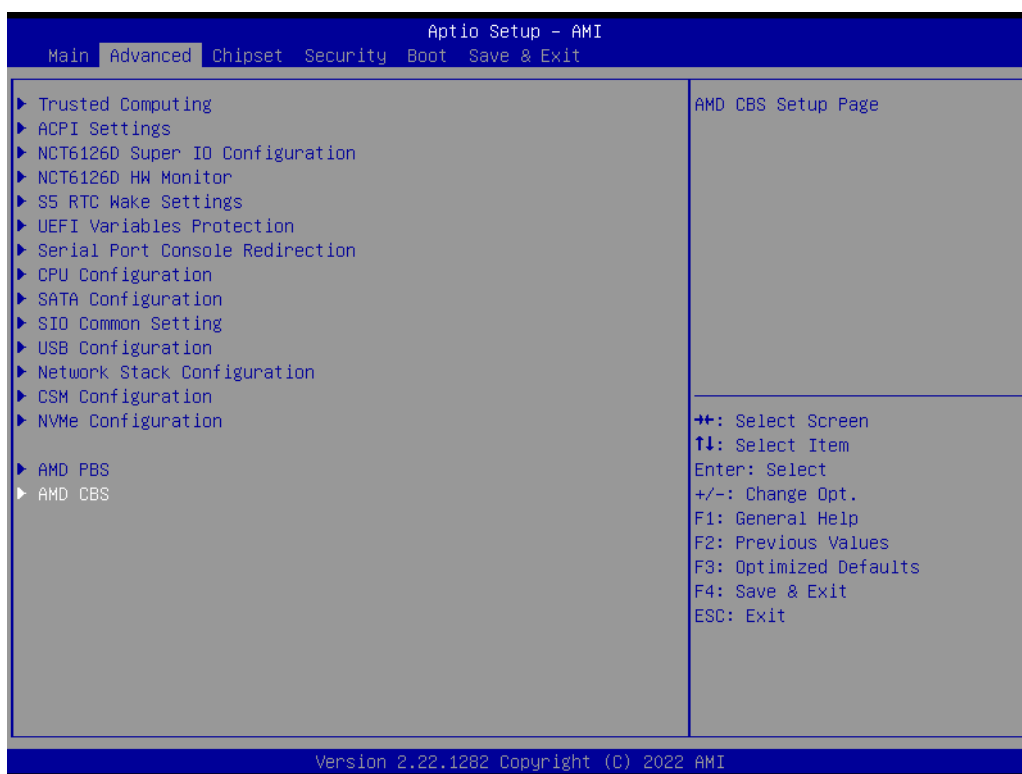


AMD PBS Setup Page

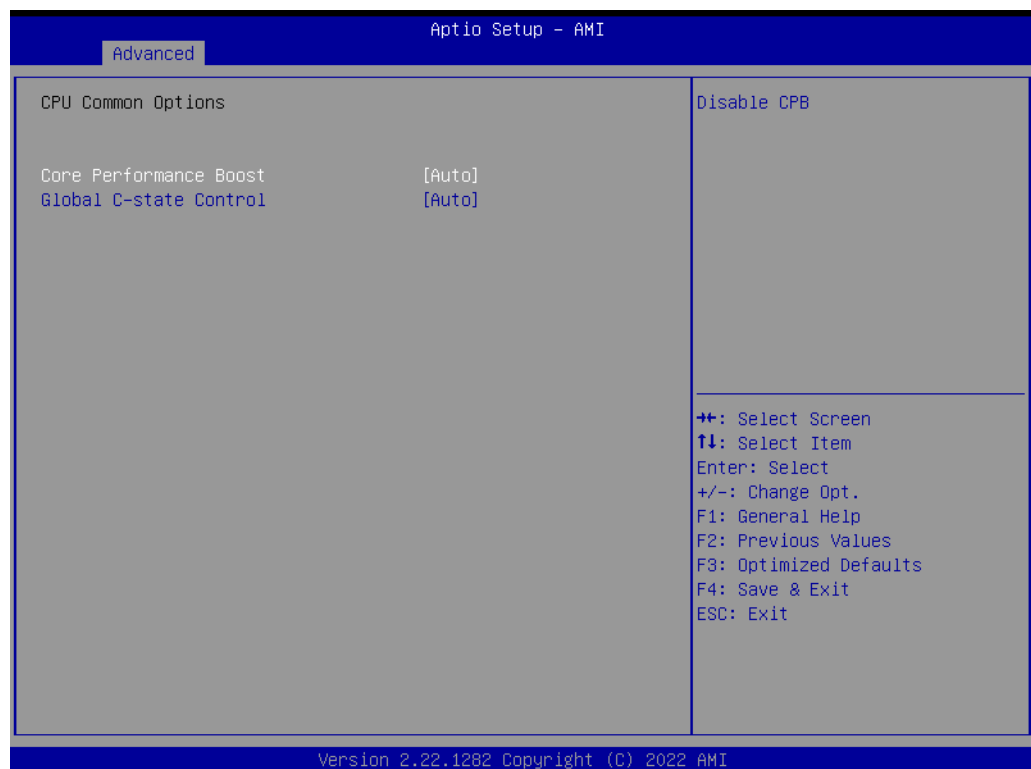


3.2.2.15 AMD CBS

AMD CBS Setup Page



■ AMD CBS



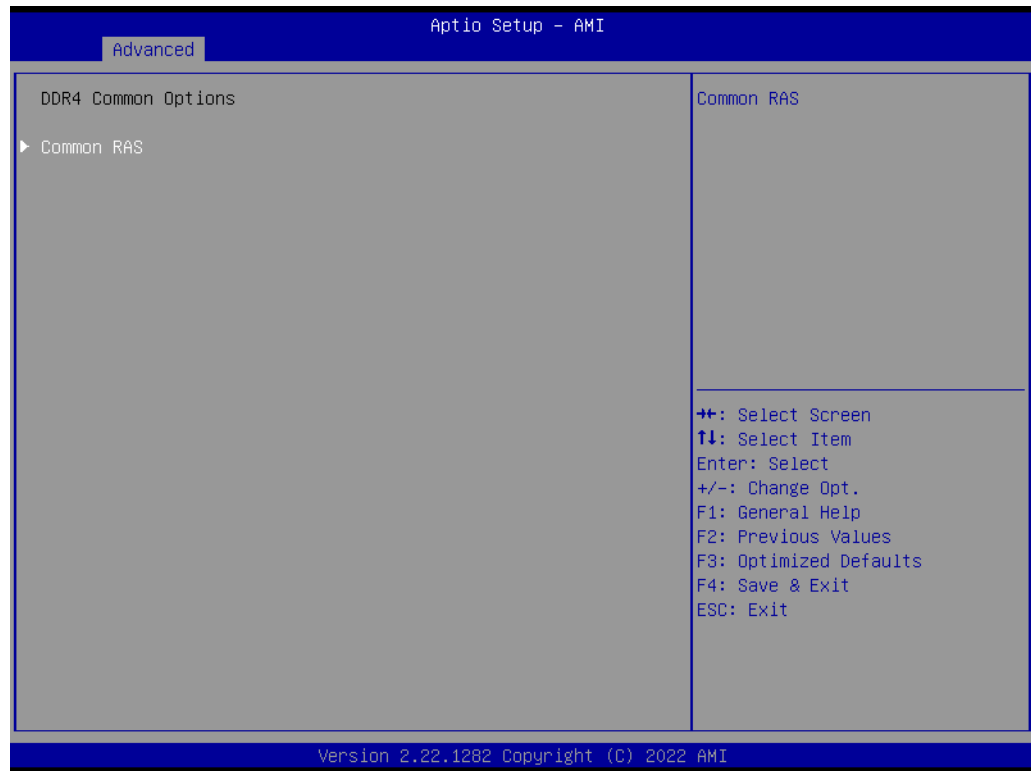
- **CPU Common Options**
 - Core Performance Boost [Auto]
 - Global C-state Control [Auto]

■ UMC Common Options

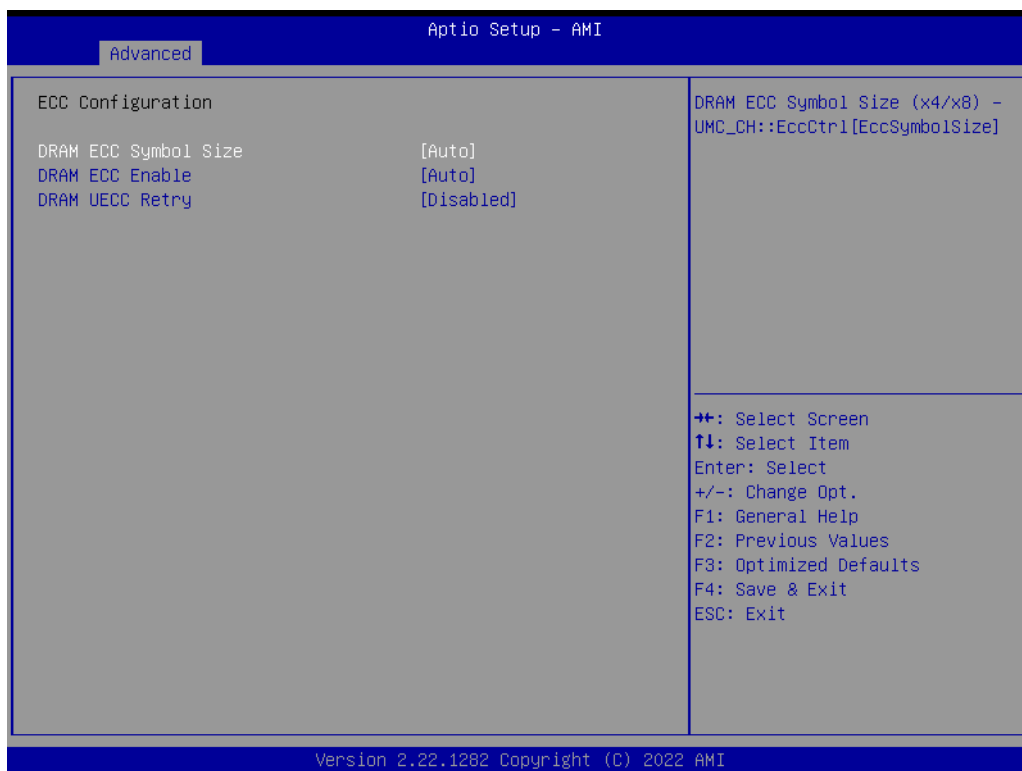


■ DDR4 Common Options





- **Common RAS**
 - Data Poisoning [Auto]
 - Disable Memory Error Injection [True]



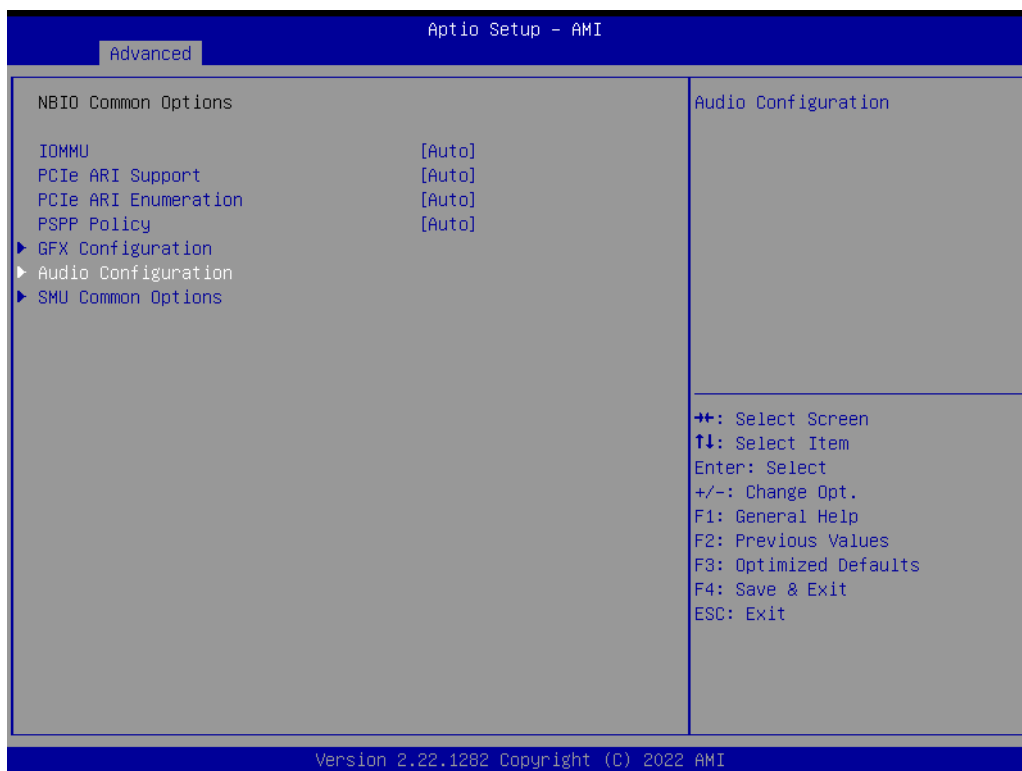
- **ECC Configuration**
 - DRAM ECC Symbol Size [Auto]
 - DRAM ECC Enable [Auto]
 - DRAM UECC Retry [Disabled]
- **NBIO Common Options**





- **GFX Configuration**
 - iGPU Configuration [Auto]
 - GPU Host Translation Cache [Auto]

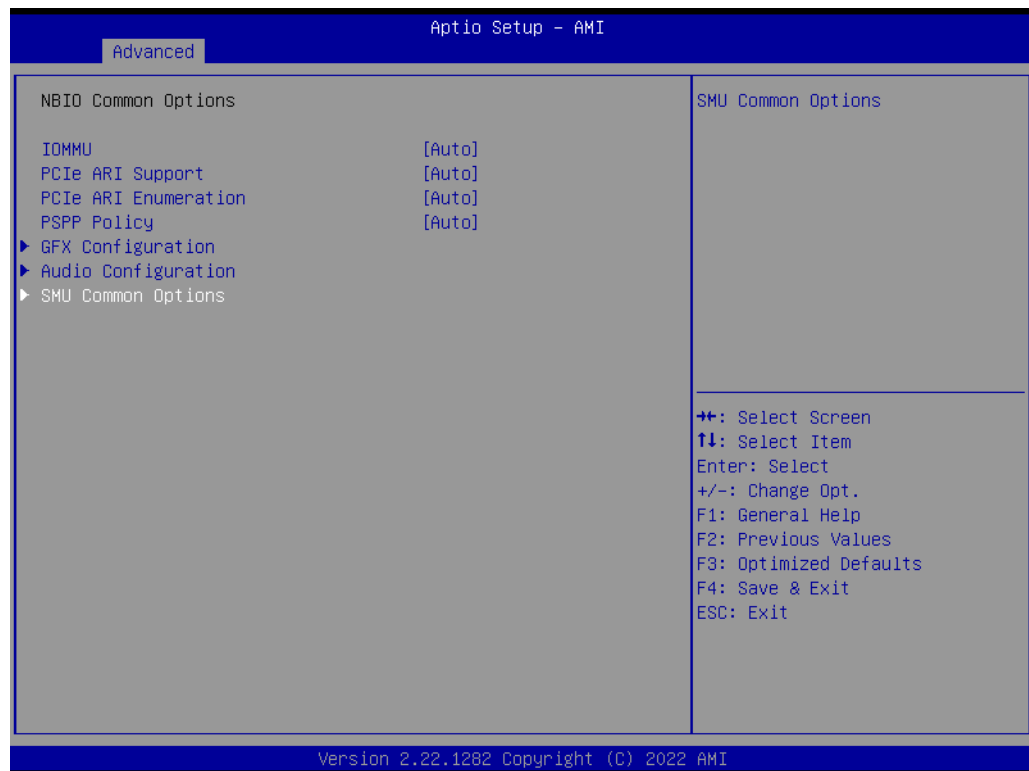




- **Audio Configuration**
 - NB Azalia [Auto]
 - PDM Mic Selection [Auto]



■ SMU Common Options

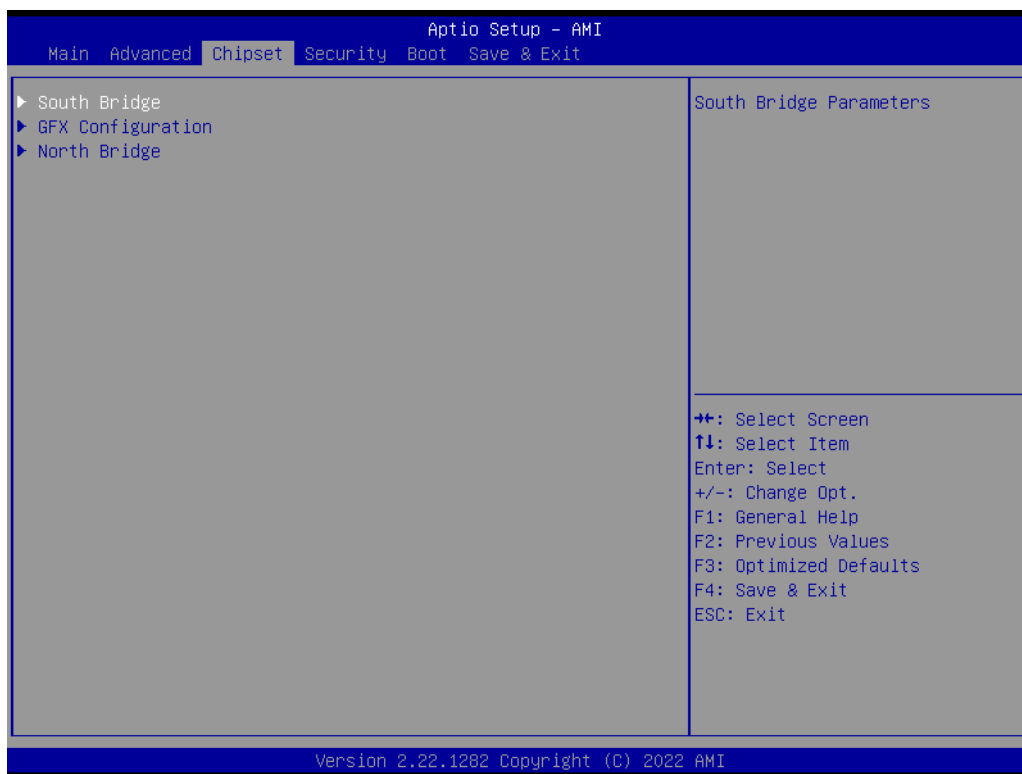


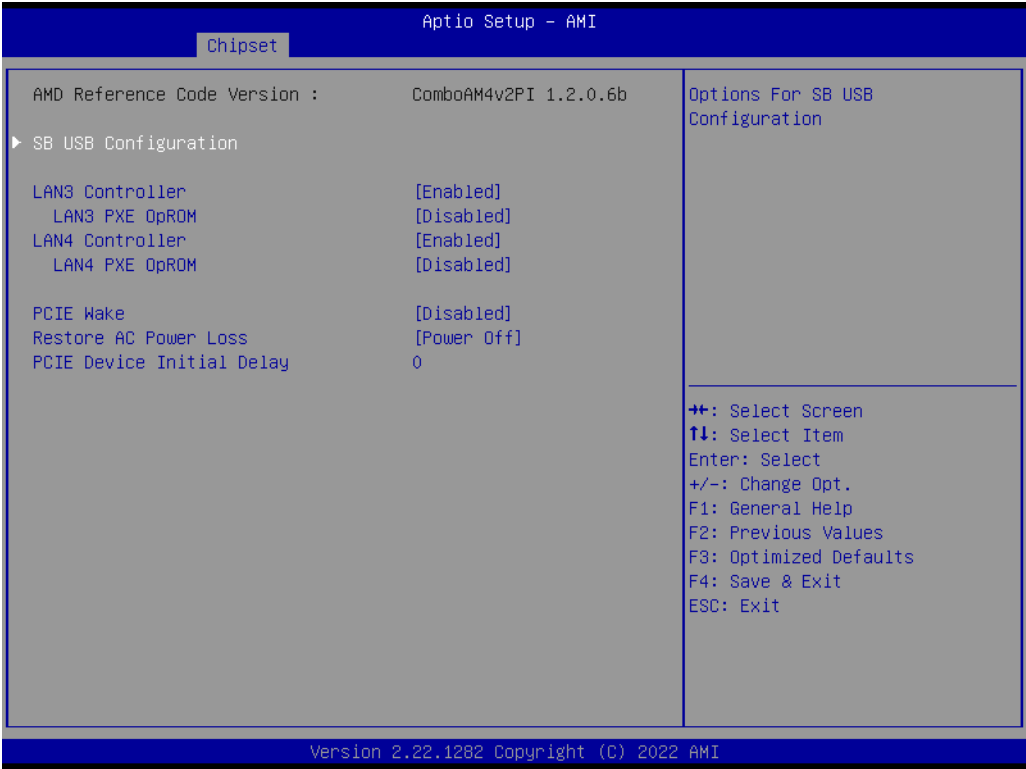
System Configuration AM4 [Auto]



3.3 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 South Bridge Parameters, to go to the sub-menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> 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.



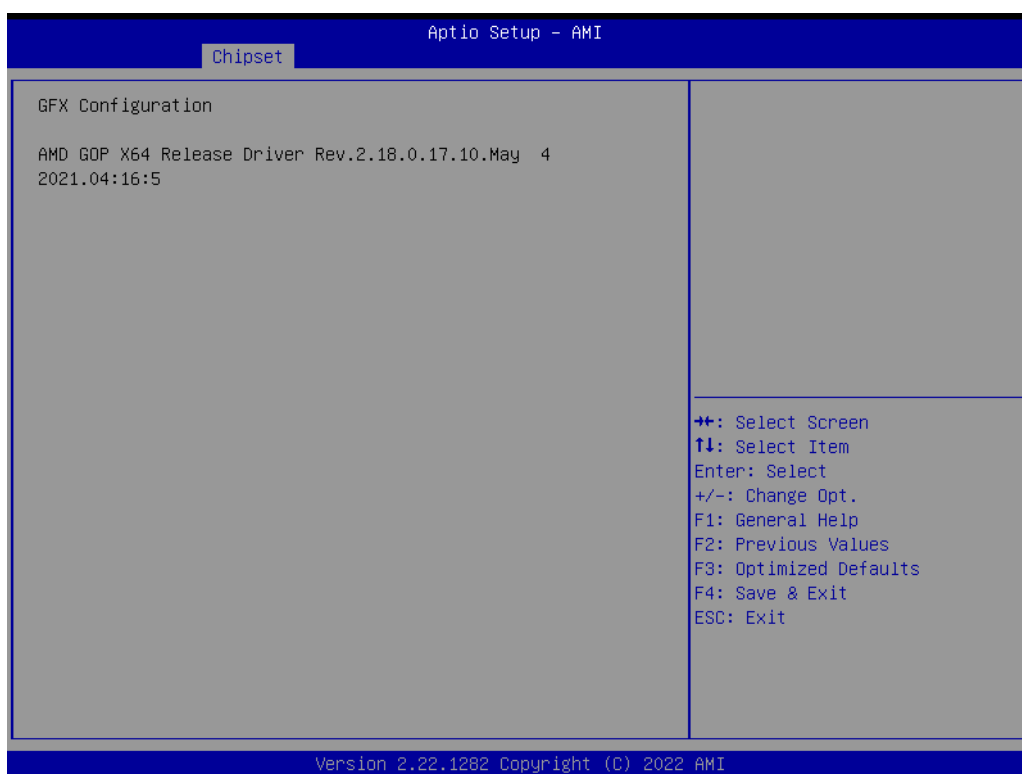


3.3.1 SB USB Configuration



- **USB Port 1**
[Enabled] Enabled/Disabled USB Port 1.

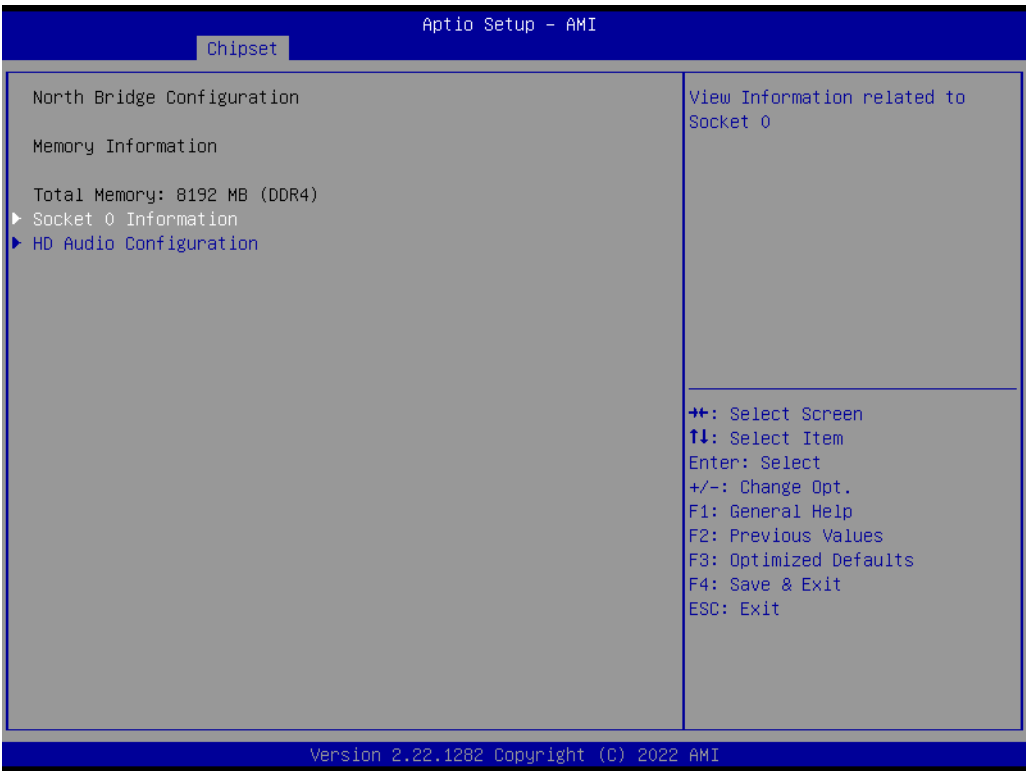
3.3.2 GFX Configuration

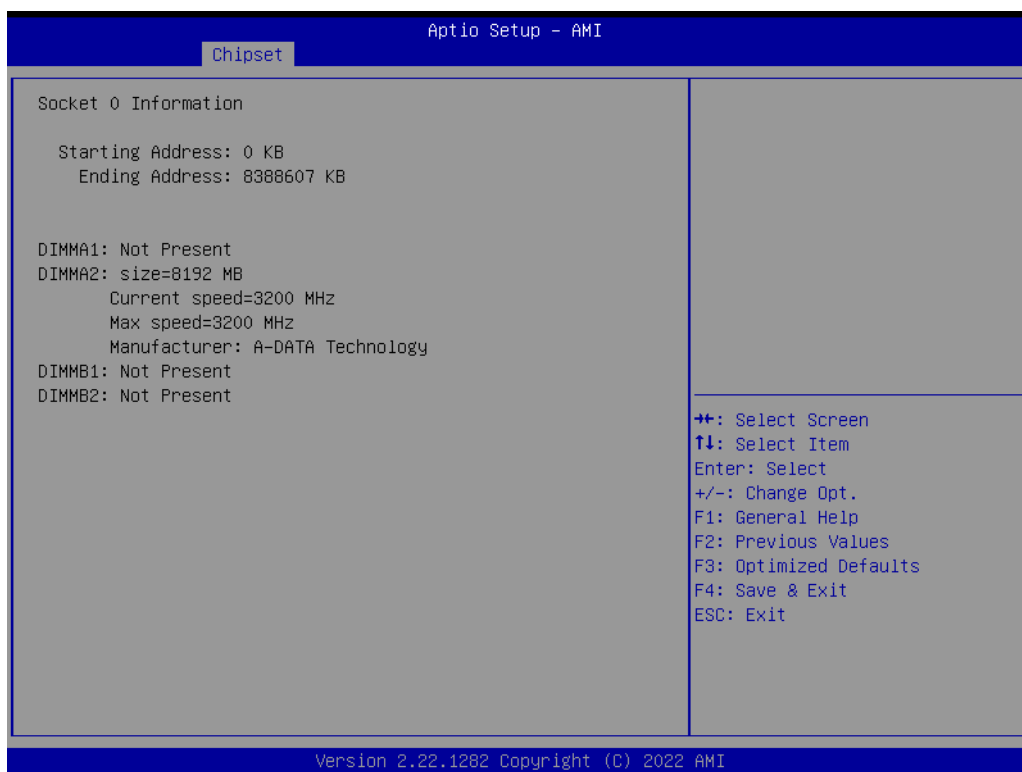


3.3.3 North Bridge



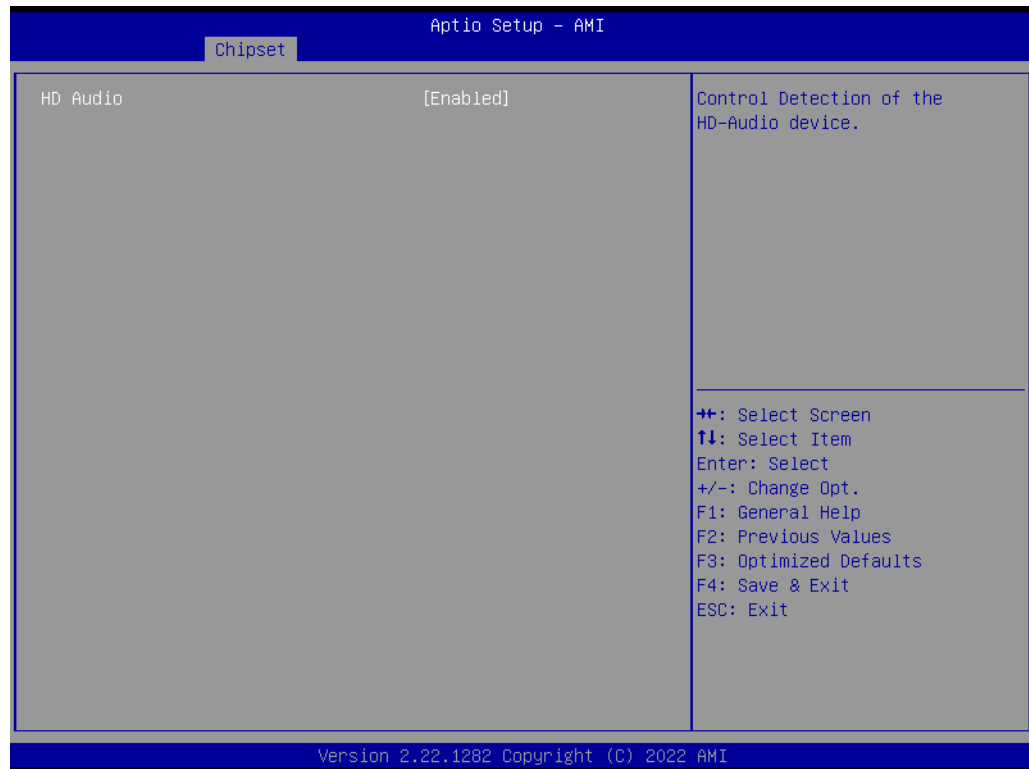
■ **Socket 0 Information**





3.3.4 HD Audio Configuration





- **HD Audio**
Control Detection of the HD-Audio device.

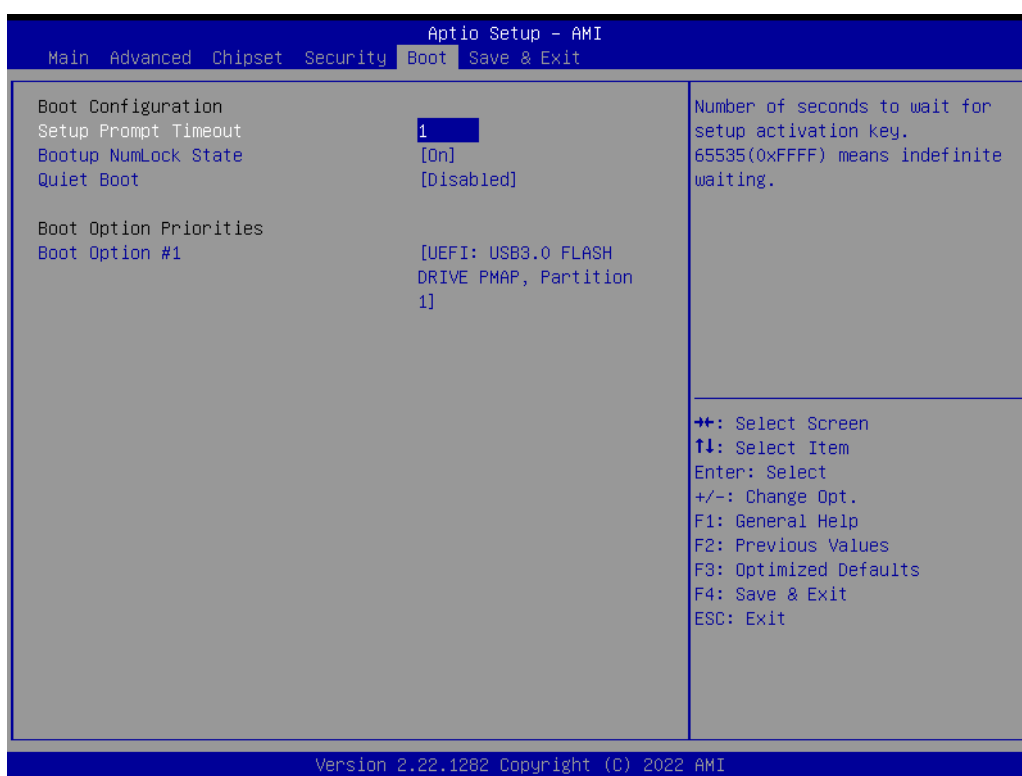
3.4 Security Settings



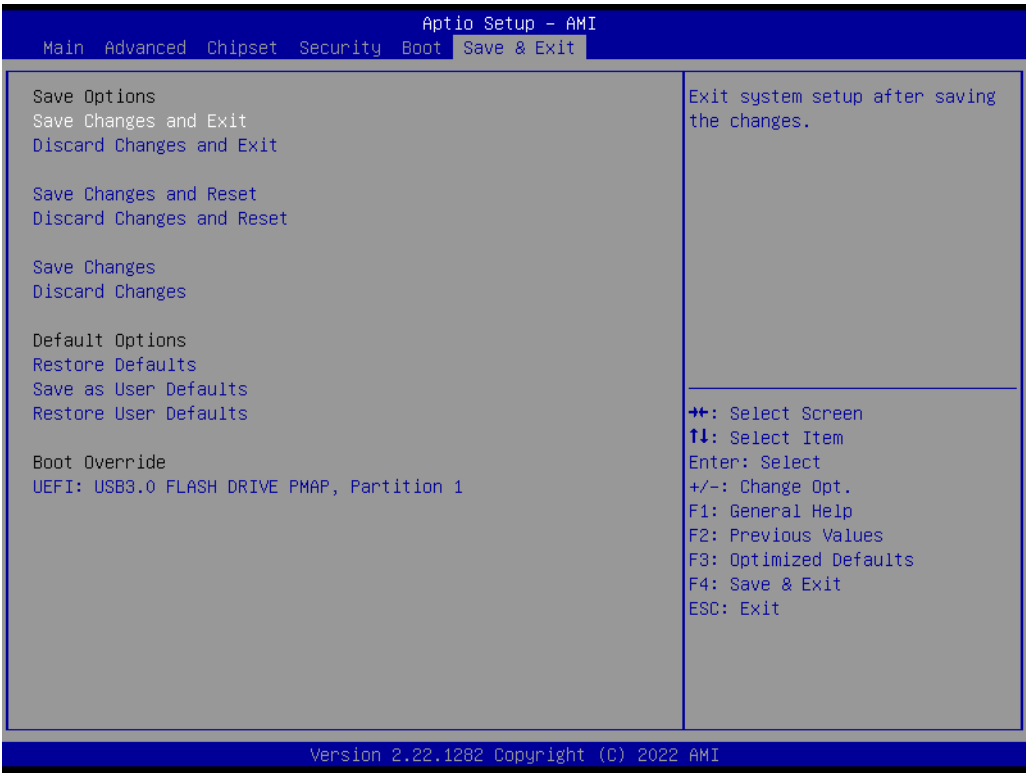
3.4.1 Secure Boot



3.5 Boot Settings



3.6 Save & Exit



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 provide 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 a embedded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

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

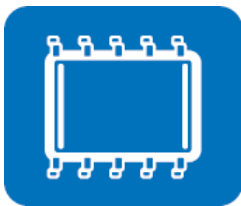
System Throttling



System throttling 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 a customer's disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

Monitoring



Monitoring is a utility for customers to monitor system health parameters 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 result.

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-522 can be downloaded from the Advantech website. Updates are provided via Microsoft service packs.

5.2 Introduction

The AMD 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 2.0/3.2 support
- Identification of AMD 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)

5.3 Windows 10 Driver Setup

Go to the Advantech website, then search for AIMB-522. This will locate the "Chipset" driver.

Win10 driver for AIMB-522

2022-10-25 | Driver | Document No.1-5005989641

Related Product:

AIMB-522

Solution:

Win10(64bit) driver for AIMB-522 ^

Win10 driver for AIMB-522

AIMB-522_Chipset_Win10(64bit) 2022-10-25	Download
AIMB-522_Graphic_Win10(64bit) 2022-10-25	Download
AIMB-522_LAN-Intel_Win10(64bit) 2022-10-25	Download
AIMB-522_LAN-Realtek_Win10(64bit) 2022-10-25	Download
AIMB-522_Audio_Win10(64bit) 2022-10-25	Download



Chapter 6

LAN Configuration

6.1 Introduction

The AIMB-522 features dual 2.5 Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel i225LM for LAN1&2) that support 10/100/1000/2500 Mbps Ethernet speed and dual Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Realtek RTL8119i for LAN3&4) that support 10/100/1000 Mbps Ethernet speed.

6.2 Windows 10 Driver Setup

Go to the Advantech website, then search for AIMB-522. There is will be a "LAN" driver inside.



Win10(64bit) driver for AIMB-522

Win10 driver for AIMB-522

AIMB-522_Chipset_Win10(64bit) 2022-10-25	Download
AIMB-522_Graphic_Win10(64bit) 2022-10-25	Download
AIMB-522_LAN-Intel_Win10(64bit) 2022-10-25	Download
AIMB-522_LAN-Realtek_Win10(64bit) 2022-10-25	Download
AIMB-522_Audio_Win10(64bit) 2022-10-25	Download

Appendix **A**

I/O Pin Assignments

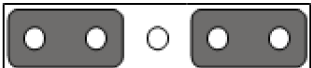
A.1 CMOS Clear Jumper (JCMOS1)

Function	Jumper Setting
Keep COMS Data (Default)	123
Clear CMOS Date	123
Pin	Signal Pin Definition
1	VBAT
2	+V1.5_RTC
3	GND

A.2 COM1/2 RS232/RS422/RS485 Selection Pin Header (JSETCOM1/2)

Function	Jumper Setting
RS-232 Mode (Default) (5-6) (7-9) (8-10) (13-15) (14-16)	24681012141618 1357911131517
RS-422 Mode (3-4) (9-11) (10-12) (15-17) (16-18)	24681012141618 1357911131517
RS-485 Mode (1-2) (9-11) (10-12) (15-17) (16-18)	24681012141618 1357911131517

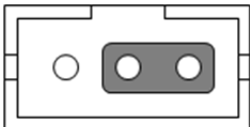
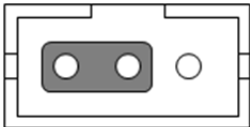
A.3 Watchdog Timer Output and OBS Beep (JOBS1+JWDT1)

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

A.4 Power Switch / HDD LED / SMBUS / Speaker Pin Header (JFP1)

Pin	Signal Pin Definition	Pin	Signal Pin Definition
1	+V5	2	FP_HDD_LED
3	FP_PANSWIN#	4	FRP_SPK2
5	FP_HDD_LED#	6	GND
7	FRP_SPK3	8	SMBDAT_JFP
9	FP_SYS_RESET#	10	FRP_SPK4
11	SMBCLK_JFP	12	GND

A.5 ATX/AT Mode Selection (PSON1)

Function	Jumper Setting
ATX Mode (Default)	
AT Mode	
Pin	Signal Pin Definition
1	ATX selection
2	+VCC
3	AT selection

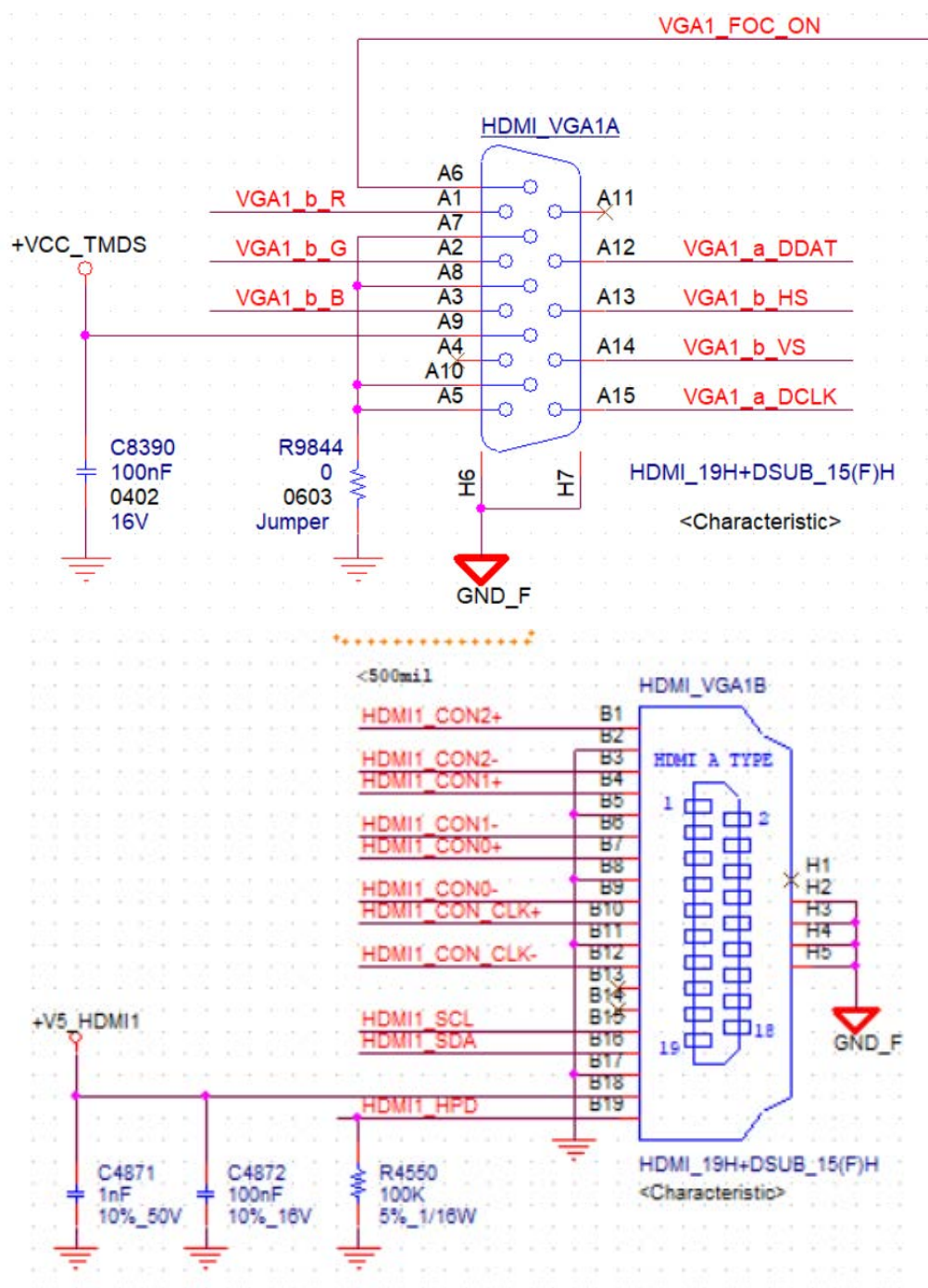
A.6 Case Open Selection Pin Header (JCASEOP_SW1)

Function	Jumper Setting
Normal Close	123
Normal Open (Default)	123

A.7 USB Power Selection for LAN1_USB12/ LAN2_USB34/LAN3_USB56/LAN4_USB78/ USB13_14/USB15 (JUSBPWR1/2/3/4)

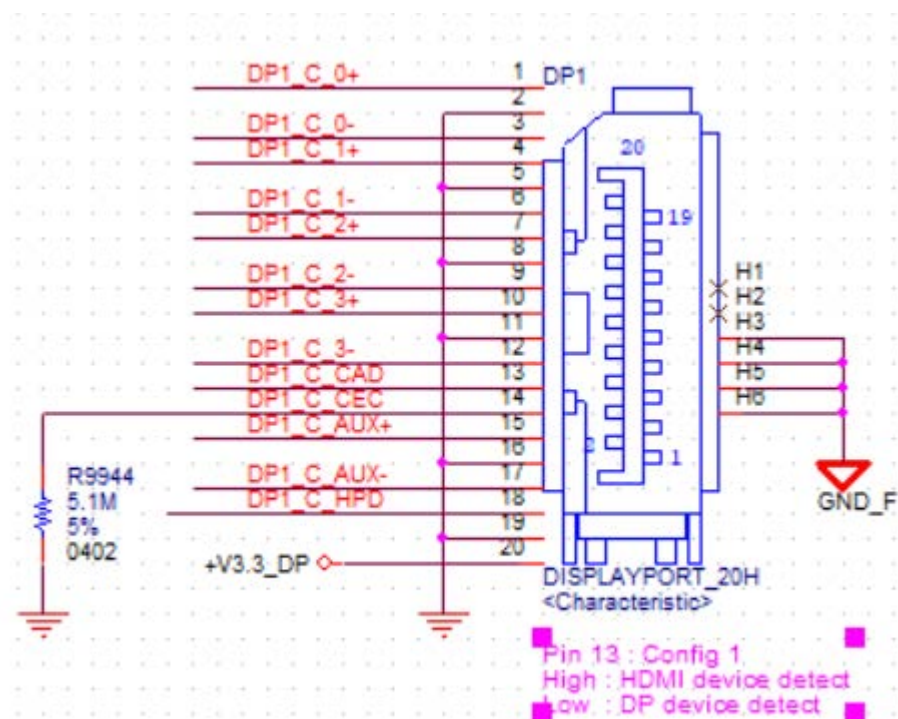
Function	Jumper Setting
Set USB VBUS as +5V _{SB} (Default)	123
Set USB VBUS as +5V	123

A.8 HDMI+VGA (HDMI_VGA1)



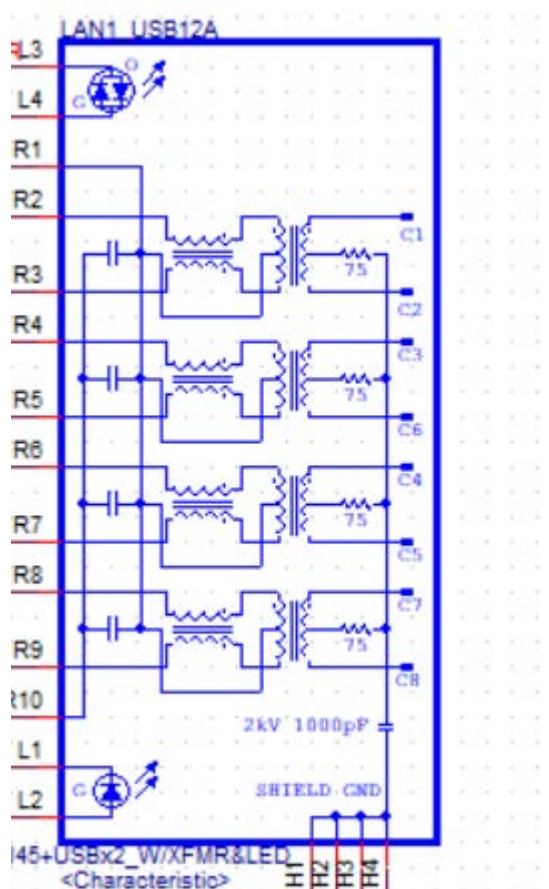
Pin	Signal	Pin	Signal
A1	VGA1_b_R	B1	HDMI1_CON2+
A2	VGA1_b_G	B2	GND
A3	VGA1_b_B	B3	HDMI1_CON2-
A4	NA	B4	HDMI1_CON1+
A5	GND	B5	GND
A6	VGA1_FOC_ON	B6	HDMI1_CON1-
A7	GND	B7	HDMI1_CON0+
A8	GND	B8	GND
A9	+VCC_TMDS	B9	HDMI1_CON0-
A10	GND	B10	HDMI1_CON_CLK+
A11	NA	B11	GND
A12	VGA1_a_DDAT	B12	HDMI1_CON_CLK-
A13	VGA1_b_HS	B13	NA
A14	VGA1_b_VS	B14	NA
A15	VGA1_a_DCLK	B15	HDMI1_SCL
		B16	HDMI1_SDA
		B17	GND
		B18	+V5_HDMI1
		B19	HDMI1_HPD

A.9 DisplayPort (DP1)

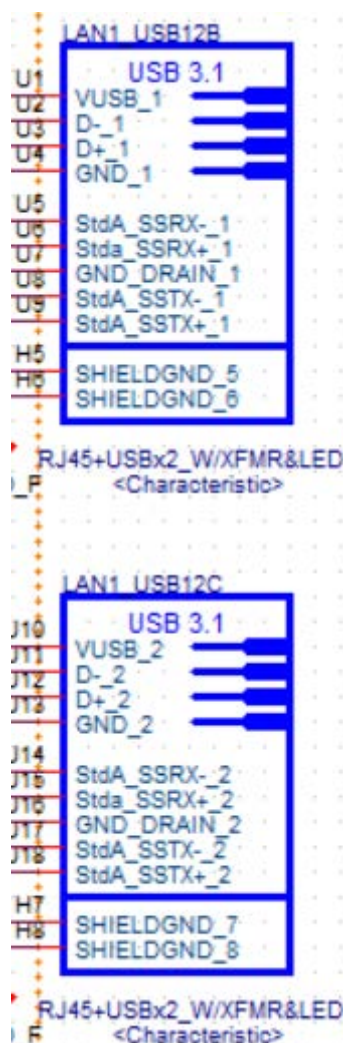


Pin	Signal
P1	DP1_C_0+
P2	GND
P3	DP1_C_0-
P4	DP1_C_1+
P5	GND
P6	DP1_C_1-
P7	DP1_C_2+
P8	GND
P9	DP1_C_2-
P10	DP1_C_3+
P11	GND
P12	DP1_C_3-
P13	DP1_C_CAD
P14	DP1_C_CEC
P15	DP1_C_AUX+
P16	GND
P17	DP1_C_AUX-
P18	DP1_C_HPDP
P19	GND
P20	+V3.3_DP

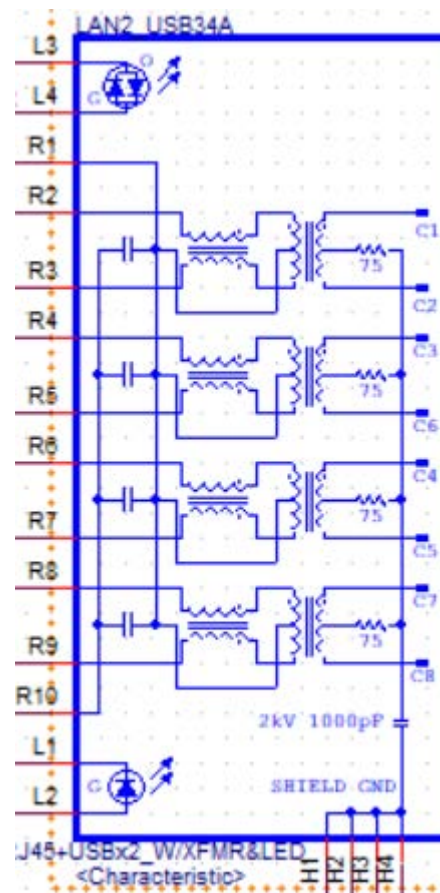
A.10 RJ-45 1 port + USB 3 2port (LAN1_USB12, LAN2_USB34, LAN3_USB56, LAN4_USB78)



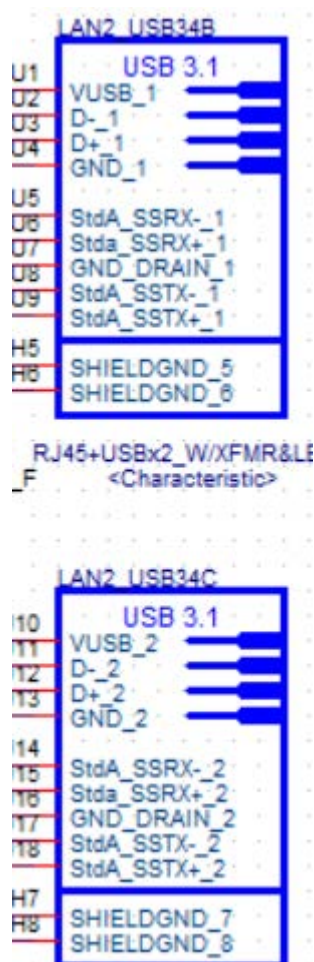
Pin	Signal
L3	LAN1_LED0_2.5G#_R
L4	LAN1_LED1_1G#_R
R1	GND
R2	LAN1_MDI0+
R3	LAN1_MDI0-
R4	LAN1_MDI1+
R5	LAN1_MDI1-
R6	LAN1_MDI2+
R7	LAN1_MDI2-
R8	LAN1_MDI3+
R9	LAN1_MDI3-
R10	GND
L1	LAN1_LED0_ACT#_R
L2	+V3.3LAN1



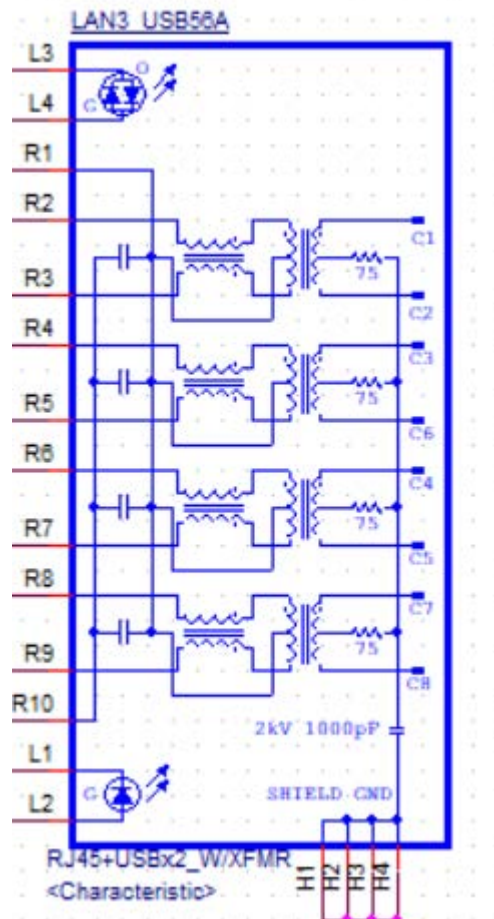
Pin	Signal	Pin	Signal
U1	+V5_USB3C1	U10	+V5_USB3C1
U2	USB2_0-	U11	USB2_1-
U3	USB2_0+	U12	USB2_1+
U4	GND	U13	GND
U5	USB3_RX0-	U14	USB3_RX1-
U6	USB3_RX0+	U15	USB3_RX1+
U7	GND	U16	GND
U8	USB3_TX0-	U17	USB3_TX1-
U9	USB3_TX0+	U18	USB3_TX1+
H5/H6	GND	H7/H8	GND



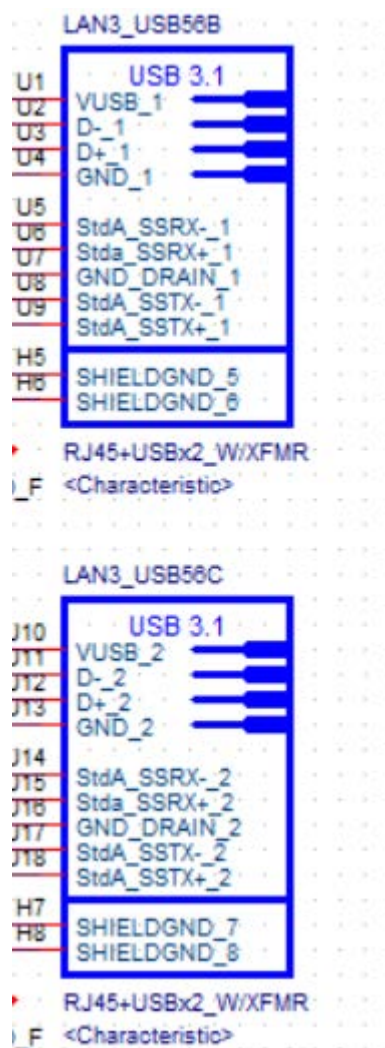
Pin	Signal
L3	LAN2_LED0_2.5G#_R
L4	LAN2_LED1_1G#_R
R1	GND
R2	LAN2_MDI0+
R3	LAN2_MDI0-
R4	LAN2_MDI1+
R5	LAN2_MDI1-
R6	LAN2_MDI2+
R7	LAN2_MDI2-
R8	LAN2_MDI3+
R9	LAN2_MDI3-
R10	GND
L1	LAN2_LED0_ACT#_R
L2	+V3.3LAN2



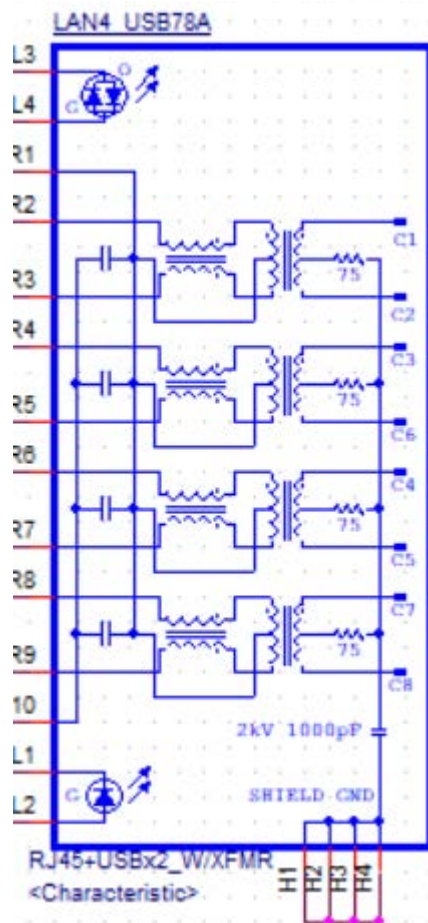
Pin	Signal	Pin	Signal
U1	+V5_USB3C2	U10	+V5_USB3C2
U2	USB2_2-	U11	USB2_3-
U3	USB2_2+	U12	USB2_3+
U4	GND	U13	GND
U5	USB3_RX2-	U14	USB3_RX3-
U6	USB3_RX2+	U15	USB3_RX3+
U7	GND	U16	GND
U8	USB3_TX2-	U17	USB3_TX3-
U9	USB3_TX2+	U18	USB3_TX3+
H5/H6	GND	H7/H8	GND



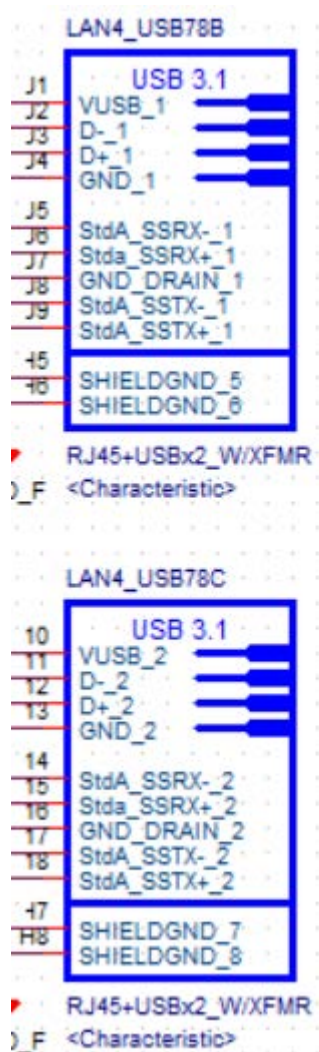
Pin	Signal
L3	LAN3_LED1_1G#_R
L4	LAN3_LED2_100M#_R
R1	GND
R2	LAN3_MDI0+
R3	LAN3_MDI0-
R4	LAN3_MDI1+
R5	LAN3_MDI1-
R6	LAN3_MDI2+
R7	LAN3_MDI2-
R8	LAN3_MDI3+
R9	LAN3_MDI3-
R10	GND
L1	LAN3_LED0_ACT#_R
L2	+V3.3LAN3



Pin	Signal	Pin	Signal
U1	+V5_USB3C3	U10	+V5_USB3C3
U2	USB2_FCH_C_0-	U11	USB2_FCH_C_1-
U3	USB2_FCH_C_0+	U12	USB2_FCH_C_1+
U4	GND	U13	GND
U5	USB3_FCH_C_RX0-	U14	USB3_FCH_C_RX1-
U6	USB3_FCH_C_RX0+	U15	USB3_FCH_C_RX1+
U7	GND	U16	GND
U8	USB3_FCH_C_TX0-	U17	USB3_FCH_C_TX1-
U9	USB3_FCH_C_TX0+	U18	USB3_FCH_C_TX1+
H5/H6	GND	H7/H8	GND

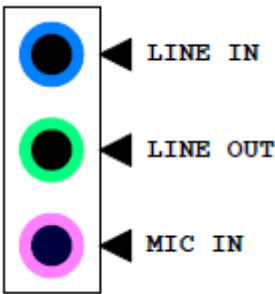


Pin	Signal
L3	LAN4_LED1_1G#_R
L4	LAN4_LED2_100M#_R
R1	GND
R2	LAN4_MDIO+
R3	LAN4_MDIO-
R4	LAN4_MDII+
R5	LAN4_MDII-
R6	LAN4_MDI2+
R7	LAN4_MDI2-
R8	LAN4_MDI3+
R9	LAN4_MDI3-
R10	GND
L1	LAN4_LED0_ACT#_R
L2	+V3.3LAN4



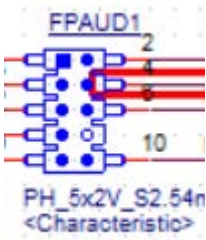
Pin	Signal	Pin	Signal
U1	+V5_USB3C4	U10	+V5_USB3C4
U2	USB2_FCH_C_2-	U11	USB2_FCH_C_3-
U3	USB2_FCH_C_2+	U12	USB2_FCH_C_3+
U4	GND	U13	GND
U5	USB3_FCH_C_RX2-	U14	USB3_FCH_C_RX3-
U6	USB3_FCH_C_RX2+	U15	USB3_FCH_C_RX3+
U7	GND	U16	GND
U8	USB3_FCH_C_TX2-	U17	USB3_FCH_C_TX3-
U9	USB3_FCH_C_TX2+	U18	USB3_FCH_C_TX3+
H5/H6	GND	H7/H8	GND

A.11 Audio Jack (AUDIO2)



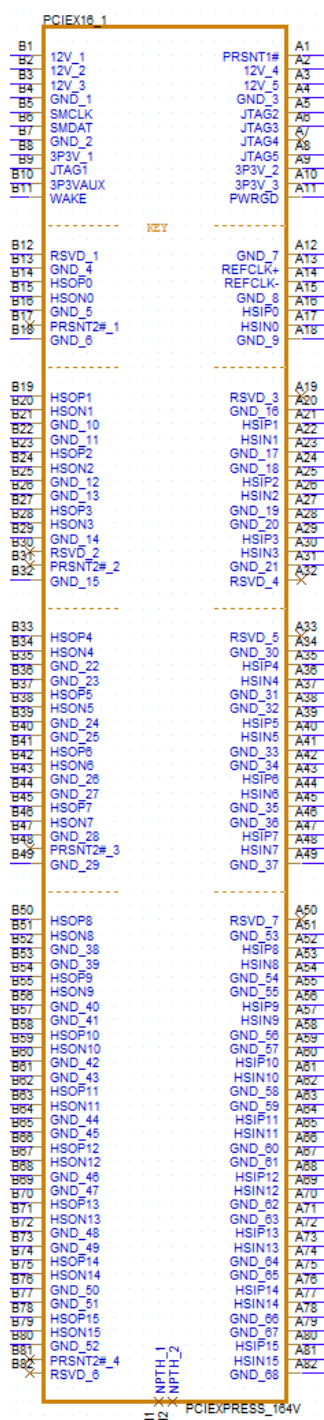
Pin	Signal
1	MIC IN
2	LINE OUT
3	LINE IN

A.12 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	MIC2-JD
7	FRONT-IO-SENSE	8	NA
9	LINE OUT-L	10	LINE2-JD

A.13 PCI Express x16 Slot (PCIEX16_1)

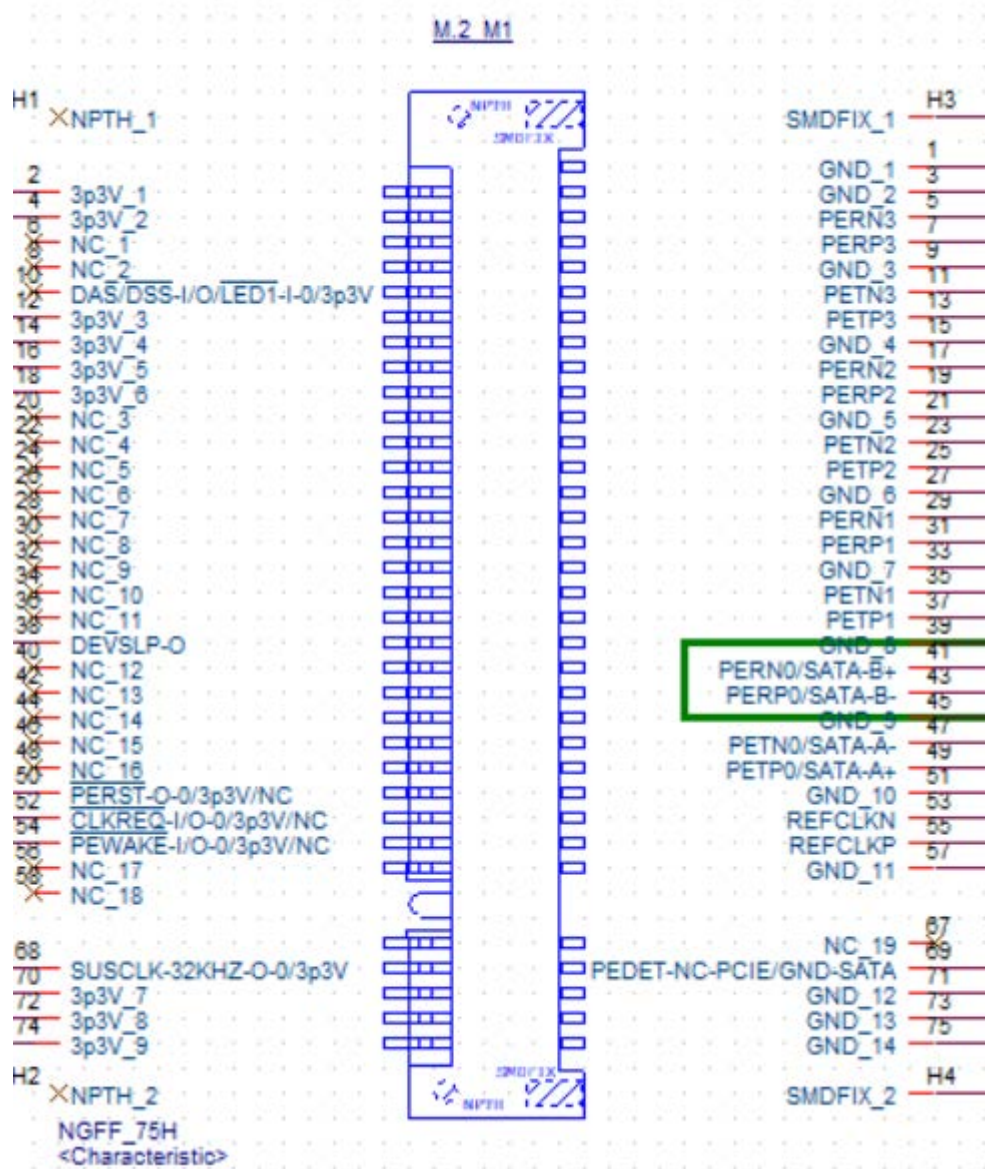


Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMB_CLK	A5	Reserved
B6	SMB_DATA	A6	Reserved
B7	GND	A7	Reserved

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	NA
B20	TX1-	A20	GND
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	NA
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
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

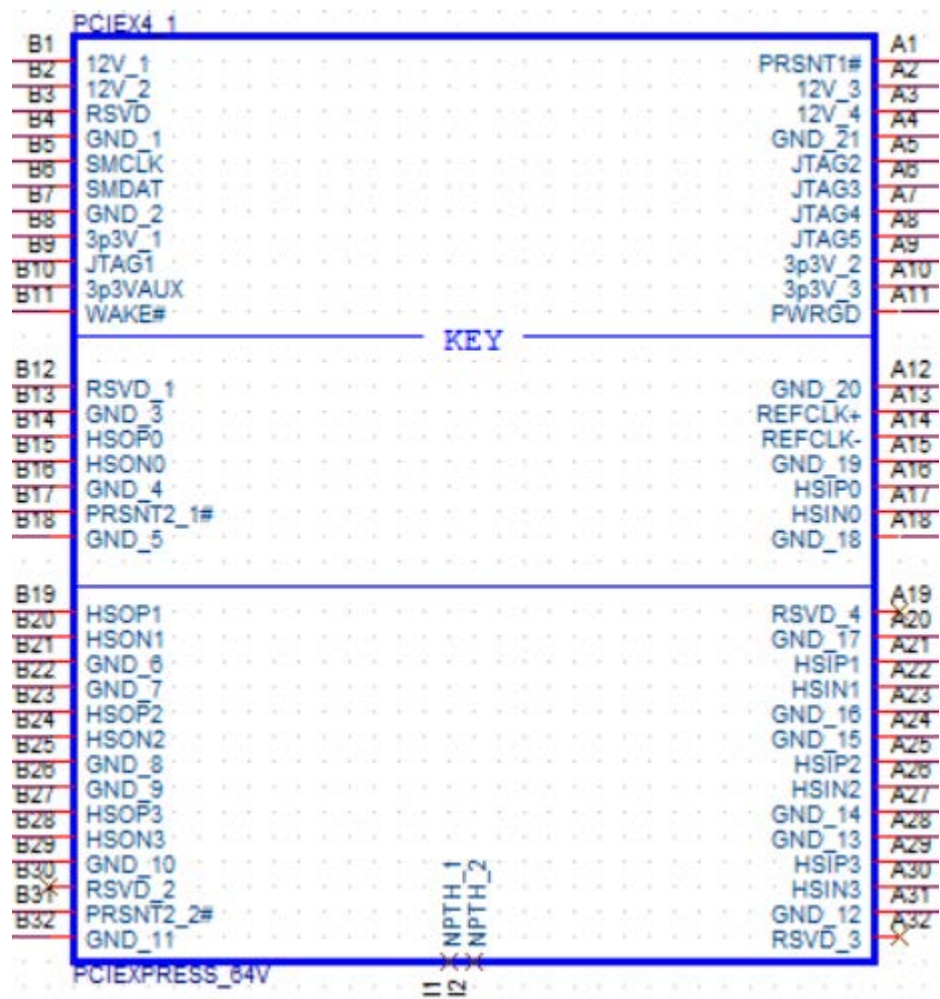
A.14 NGFF M.2 M-Key Connector for 2280 Module (M.2_M1)



Pin	Signal	Pin	Signal
1	GND_1	2	3p3V_1
3	GND_2	4	3p3V_2
5	PERN3	6	NC_1
7	PERP3	8	NC_2
9	GND_3	10	DAS/DSS-I/O/LED1-I-O-0/3p3V
11	PETN3	12	3p3V_3
13	PETP3	14	3p3V_4
15	GND_4	16	3p3V_5
17	PERN2	18	3p3V_6
19	PERP2	20	NC_3
21	GND_5	22	NC_4
23	PETN2	24	NC_5
25	PETP2	26	NC_6

27	GND_6	28	NC_7
29	PERN1	30	NC_8
31	PERP1	32	NC_9
33	GND_7	34	NC_10
35	PETN1	36	NC_11
37	PETP1	38	DEVSLP-O
39	GND_8	40	NC_12
41	PERN0/SATA-B+	42	NC_13
43	PERP0/SATA-B-	44	NC_14
45	GND_9	46	NC_15
47	PETN0/SATA-A-	48	NC_16
49	PETP0/SATA-A+	50	PERST-O-0/3p3V/NC
51	GND_10	52	CLKREQ-I/O-0/3p3V/NC
53	REFCLKN	54	PEWAKE-I/O-0/3p3V/NC
55	REFCLKP	56	NC_17
57	GND_11	58	NC_18
59		60	
61		62	
63		64	
65		66	
67	NC_19	68	SUSCLK-32KHZ-O-0/3p3V
69	PEDET-NC-PCIE/GND-SATA	70	3p3V_7
71	GND_12	72	3p3V_8
73	GND_13	74	3p3V_9
75	GND_14		
B62	TX11+	A62	GND
B63	TX11-	A63	GND
B64	GND	A64	RX11+
B65	GND	A65	RX11-
B66	TX12+	A66	GND
B67	TX12-	A67	GND
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

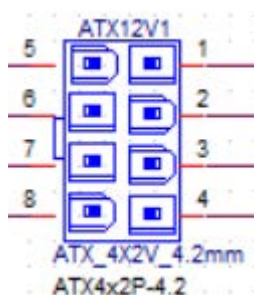
A.15 PCI Expres Slot (PCIEX4_1, PCIEX4_2)



Pin	Signal	Pin	Signal
B1	12V_1	A1	PRSNT1
B2	12V_2	A2	12V_4
B3	12V_3	A3	12V_5
B4	GND_1	A4	GND_20
B5	SMCLK	A5	JTAG2
B6	SMDAT	A6	JTAG3
B7	GND_2	A7	JTAG4
B8	3_3V_1	A8	JTAG5
B9	JTAG1	A9	3_3V_2
B10	3_3VAUX	A10	3_3V_3
B11	WAKE	A11	PWRGD
B12	RSVD_1	A12	GND_21
B13	GND_3	A13	REFCLK+
B14	HSOP0	A14	REFCLK-
B15	HSON0	A15	GND_22
B16	GND_4	A16	HSIP0
B17	PRSNT2_1	A17	HSIN0
B18	GND_5	A18	GND_23

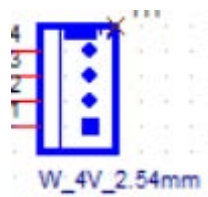
B19	HSOP1	A19	RSVD_3
B20	HSOP1	A20	GND_24
B21	GND_6	A21	HSIP1
B22	GND_7	A22	HSIN1
B23	HSOP2	A23	GND_25
B24	HSOP2	A24	GND_26
B25	GND_8	A25	HSIP2
B26	GND_9	A26	HSIN2
B27	HSOP3	A27	GND_27
B28	HSOP3	A28	GND_28
B29	GND_10	A29	HSIP3
B30	RSVD_2	A30	HSIN3
B31	PRCNT2_2	A31	GND_29
B32	GND_11	A32	RSVD_4

A.16 ATX 12V Power Supply Connector (ATX12V1)



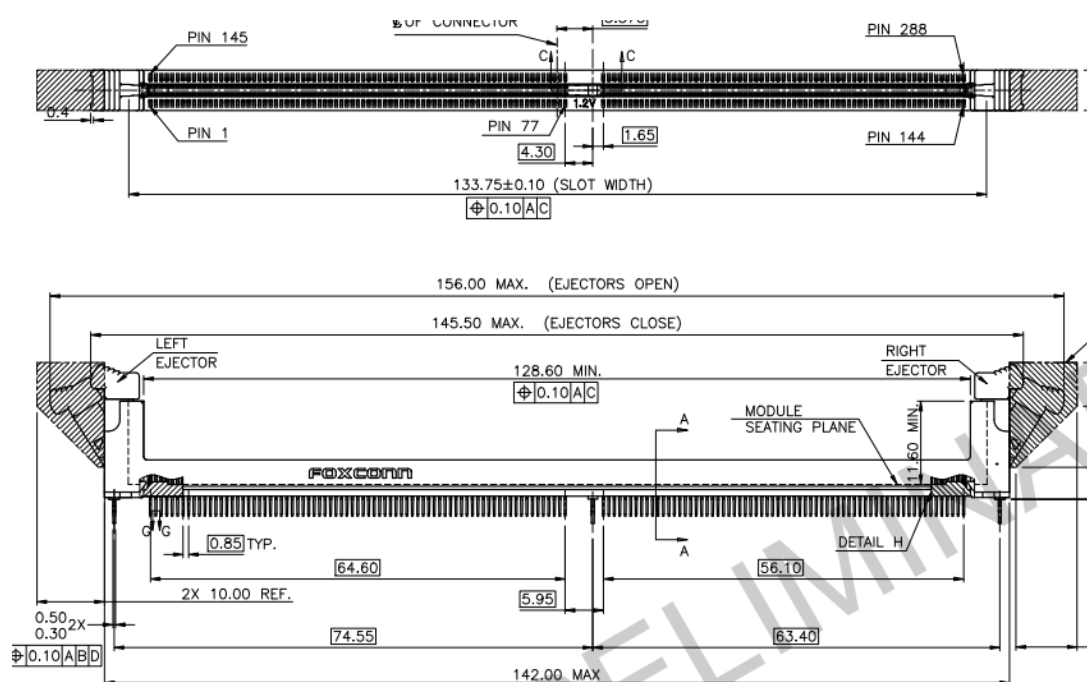
Pin	Signal
1	GND
2	GND
3	GND
4	GND
5	+12V
6	+12V
7	+12V
8	+12V

A.17 System FAN (SYSFAN1~4)

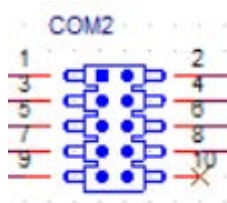


Pin	Signal
1	GND
2	SYSTEM FAN VCC
3	SYSTEM FAN SPEED
4	SYSTEM FAN PWM

A.18 DDR4 UDIMM Socket (DIMMA1, DIMMA2, DIMMB1, DIMMB2)

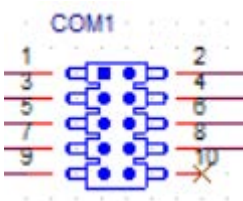


A.19 COM2 RS 232/422/485 (COM2)



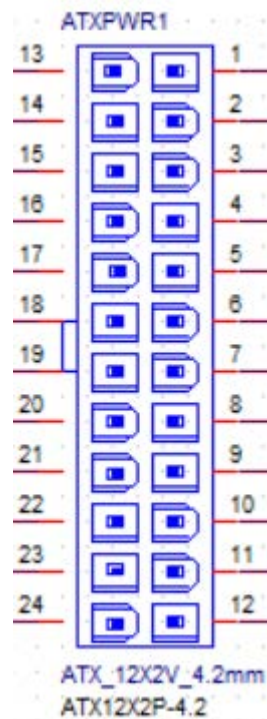
Pin	Signal	Pin	Signal
1	#COM2_DCD	2	COM2_DSR#
3	COM2_SIN	4	COM2_RTS#
5	COM2_SOUT	6	COM2_CTS#
7	#COM2_DTR	8	COM2_RI#
9	GND		

A.20 COM1 RS 232/422/485 (COM1)



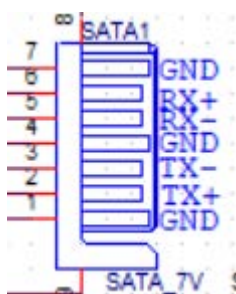
Pin	Signal	Pin	Signal
1	#COM1_DCD	2	COM1_DSR#
3	COM1_SIN	4	COM1_RTS#
5	COM1_SOUT	6	COM1_CTS#
7	#COM1_DTR	8	COM1_RI#
9	GND		

A.21 A.21 ATX 12/5V/3V/5VSBV Power Supply Connector (ATXPWR1)



Pin	Signal	Pin	Signal
1	+3.3V_1	13	+3.3V_4
2	+3.3V_2	14	-12V
3	GND	15	GND
4	+5V_1	16	PS_ON#
5	GND	17	GND
6	+5V_2	18	GND
7	COM_3	19	GND
8	PWR_OK	20	NC
9	+5VSB	21	+5V_3
10	+12V1_1	22	+5V_4
11	+12V1_2	23	+5V_5
12	+3.3V_3	24	GND

A.22 Serial ATA Interface Connector (SATA1~4)



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

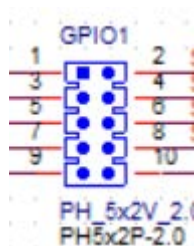
A.23 NGFF M.2 E-Key Connector for 2230 Module (M.2_E1)



Pin	Signal	Pin	Signal
1	GND	2	3p3V_1
3	USB2_FCH_11+	4	3p3V_2
5	USB2_FCH_11-	6	M2E1_WiFi_LED1#
7	NA	8	NA
9	NA	10	NA
11	NA	12	NA
13	NA	14	NA
15	NA	16	M2E1_BT_LED2#
17	NA	18	GND
19	NA	20	NA
21	NA	22	NA
23	NA	24	NA
25	NA	26	NA
27	NA	28	NA

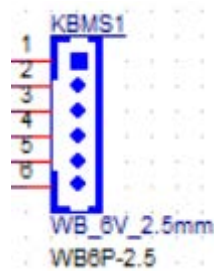
29	NA	30	NA
31	NA	32	NA
33	GND	34	NA
35	PCIE_FCH_M2E_TX9+	36	NA
37	PCIE_FCH_M2E_TX9-	38	NA
39	GND	40	NA
41	PCIE_FCH_M2E_RX9+	42	NA
43	PCIE_FCH_M2E_RX9-	44	NA
45	GND	46	NA
47	CLK100M_M2E1+	48	NA
49	CLK100M_M2E1-	50	M2E1_SUSCLK
51	GND	52	M2E1_PERST0#
53	M2E_CLKREQ#	54	M2E1_BT_DISABLE#
55	PCIE_WAKE#	56	M2E1_WiFi_DISABLE#
57	GND	58	NA
59	NA	60	NA
61	NA	62	NA
63	GND	64	NA
65	NA	66	NA
67	NA	68	NA
69	GND	70	NA
71	NA	72	3p3V_8
73	NA	74	3p3V_9
75	GND		

A.24 8-Bit General Purpose I/O Pin Header (GPIO1)



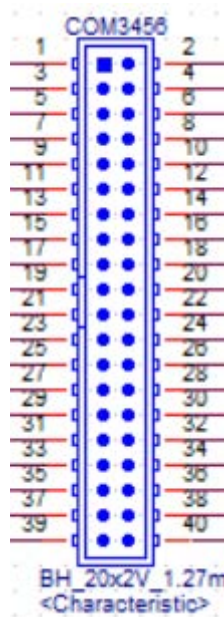
Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	+V5A_GPIO	10	GND

A.25 Keyboard and Mouse Box Header (KBMS1)



Pin	Signal
1	KB_CLK#
2	KB_DAT#
3	MS_DAT#
4	GND
5	VCC (+5VSB)
6	MS_CLK#

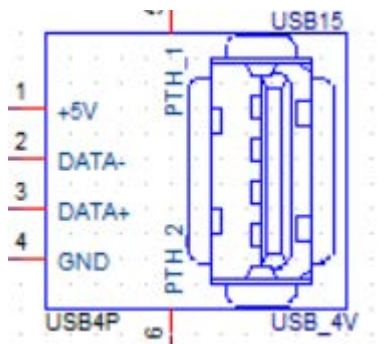
A.26 COM3, 4, 5, 6 Box Header (COM3456)



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]

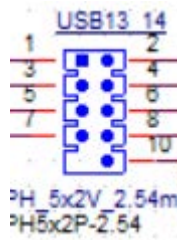
17	DTR# [4]	18	RI# [4]
19	GND	20	GND
21	DCD# [5]	22	DSR# [5]
23	RXD [5]	24	RST# [5]
25	TXD [5]	26	CTS# [5]
27	DTR# [5]	28	RI# [5]
29	GND	30	GND
31	DCD# [6]	32	DSR# [6]
33	RXD [6]	34	RST# [6]
35	TXD [6]	36	CTS# [6]
37	DTR# [6]	38	RI# [6]
39	GND	40	GND

A.27 Vertical USB2 Connector (USB15)



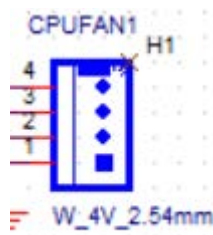
Pin	Signal
1	+V5_USB2C2
2	R_USB2_FCH_10-
3	R_USB2_FCH_10+
4	GND
5	GND
6	GND

A.28 USB2 Pin Header 2port (USB13_14)



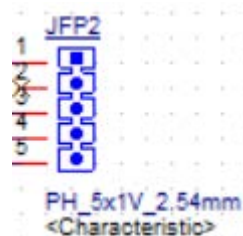
Pin	Signal	Pin	Signal
1	+V5_USB2C1	2	+V5_USB2C1
3	R_USB2_FCH_4-	4	R_USB2_FCH_5-
5	R_USB2_FCH_4+	6	R_USB2_FCH_5+
7	GND	8	GND
		10	NA

A.29 CPU FAN Connector (CPUFAN1)



Pin	Signal
1	GND
2	CPU FAN VCC
3	CPU FAN SPEED
4	CPU FAN PWM

A.30 Power LED and Keyboard Lock Pin Header (JFP2)



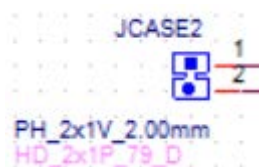
Pin	Signal	Pin	Signal
1	LED Power	4	Keyboard Lock
2	NC	5	GND
3	SIO_SUSLED		

A.31 System Indicator LED (JFP3)



Pin	Signal
1	System indicator LED +
2	System indicator LED -

A.32 Case Open Connector (JCASE2)



Pin	Signal
1	Case Open
2	GND



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