RX680R

12th/13th Gen Intel® Core™ Processors Micro ATX Motherboard with Intel® R680E Chipset

User's Manual

1st Ed –12 January 2024

Part No. E2047RX6R00R

FCC Statement

THIS DEVICE COMPLIES WITH PART 15 FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:

(1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE.

(2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. 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.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

Notice

This guide is designed for experienced users to setup the system within the shortest time. For detailed information, please always refer to the electronic user's manual.

Copyright Notice

Trademark Acknowledgement

Brand and product names are trademarks or registered trademarks of their respective owners.

Disclaimer

Avalue Technology Inc. reserves the right to make changes, without notice, to any product, including circuits and/or software described or contained in this manual in order to improve design and/or performance. Avalue Technology assumes no responsibility or liability for the use of the described product(s), conveys no license or title under any patent, copyright, or masks work rights to these products, and makes no representations or warranties that

these products are free from patent, copyright, or mask work right infringement, unless otherwise specified. Applications that are described in this manual are for illustration purposes only. Avalue Technology Inc. makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

Life Support Policy

Avalue Technology's PRODUCTS ARE NOT FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE PRIOR WRITTEN APPROVAL OF Avalue Technology Inc.

As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into body, or (b) support or sustain life and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

A Message to the Customer

Avalue Customer Services

Each and every Avalue's product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Avalue device is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Avalue has come to be known.

Your satisfaction is our primary concern. Here is a guide to Avalue's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

We want you to get the maximum performance from your products. So if you run into technical difficulties, we are here to help. For the most frequently asked questions, you can easily find answers in your product documentation. These answers are normally a lot more detailed than the ones we can give over the phone. So please consult the user's manual first.

To receive the latest version of the user's manual; please visit our Web site at:
http://www.avalue.com.tw/

Product Warranty

Avalue warrants to you, 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 which have been repaired or altered by persons other than repair personnel authorized by Avalue, or which have been subject to misuse, abuse, accident or improper installation. Avalue assumes no liability under the terms of this warranty as a consequence of such events. Because of Avalue's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If any of Avalue's products is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details. If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, CPU type and speed, Avalue's products model name, hardware & BIOS revision number, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information available.
3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your good return more quickly.
4. Carefully pack the defective product, a complete Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Content

1. Getting Started 8
1.1 Safety Precautions 8
1.2 Packing List 8
1.3 Document Amendment History 9
1.4 Manual Objectives 10
1.5 System Specifications 11
1.6 Architecture Overview—Block Diagram 15
2. Hardware Configuration 16
2.1 Product Overview 17
2.2 Jumper and Connector List 18
2.3 Setting Jumpers & Connectors 21
2.3.1 Clear CMOS (JCMOS1) 21
2.3.2 AT/ATX Power Mode Select (JSATX1) 21
2.3.3 COM POWER SETTING (J56,J45~J48,J25) 22
2.3.4 LVDS Panel Power Select (PANEL_SEL1) 22
2.3.5 LVDS Blacklight Voltage Selection (BKLVOL1) 23
2.3.6 CPU fan connector (CPUFAN1) 23
2.3.7 System fan connector (SYS_FAN 1/2) 24
2.3.8 System Panel (FIO_PANEL1) 24
2.3.9 ATX Power connector (ATXPWR1) 25
2.3.10 ATX Power connector (ATXPWR1) 25
2.3.11 Serial Port connectors (COM1~6) 26
2.3.12 Serial Port connectors (COM1~6) 26
2.3.13 USB connectors (USB2_HR1, USB2_HR2, USB2_HR3, USB2_HR4) 27
2.3.14 USB3.2 connector (USB3_HR1) 27
2.3.15 Front Audio connector (FIO_AUD1) 28
2.3.16 Amplifier connector (SPK1) 28
2.3.17 LVDS connector (LVDS1) 29
2.3.18 LVDS Backlight connector (BKLT1) 30
2.3.19 LAN LED status connector (LAN_LED1) 30
2.3.20 Chassis intrusion connector (INTRUD1) 31
2.3.22 SMBUS connector (J_SMB1) 32
2.3.23 I2C connector (J_I2C1) 32
2.3.24 KMBS connector (J57) 33
3.BIOS Setup 34
3.1 Introduction 35
3.2 Starting Setup 35

3.3 Using Setup 36
3.4 Getting Help 37
3.5 In Case of Problems 37
3.6 BIOS setup 38
3.6.1 Main Menu 38
3.6.1.1 System Date 38
3.6.1.2 System Time 38
3.6.2 Advanced Menu 39
3.6.2.1 CPU Configuration 39
3.6.2.1.1 Performance-core Information 40
3.6.2.2 PCH-FW Configuration 40
3.6.2.2.1 TPM Config 41
3.6.2.3 Trusted Computing 42
3.6.2.4 ACPI Settings 42
3.6.2.5 NCT6126D Super IO Configuration 43
3.6.2.5.1 Serial Port 1 Configuration 44
3.6.2.5.2 Serial Port 2 Configuration 45
3.6.2.5.3 Serial Port 3 Configuration 46
3.6.2.5.4 Serial Port 4 Configuration 47
3.6.2.5.5 Serial Port 5 Configuration 48
3.6.2.5.6 Serial Port 6 Configuration 49
3.6.2.5.7 Parallel Port Configuration 50
3.6.2.6 Hardware Monitor 51
3.6.2.6.1 Smart Fan Function 51
3.6.2.6.1.1 Front Fan setting 52
3.6.2.6.1.2 CPU Fan setting 53
3.6.2.6.1.3 Rear Fan setting 54
3.6.2.7 AMI Graphic Output Protocol Policy 55
3.6.2.8 USB Configuration 56
3.6.2.9 Network Stack Configuration 57
3.6.2.10 NVMe Configuration 58
3.6.3 Chipset 58
3.6.3.1 System Agent (SA) Configuration 59
3.6.3.1.1 Memory Configuration 59
3.6.3.2 PCH-IO Configuration 62
3.6.3.2.1.1 PCI Express M.2 E 63
3.6.3.2.1.2 PCI Express M.2 M 64
3.6.3.2.1.3 PCI Express X4 Open End 65
3.6.3.2.1.4 PCI Express X4 SLOT3 66
3.6.3.2.1.5 PCI Express X4 SLOT4 67

3.6.3.2.1.6 Connectivity Configuration 68
3.6.3.2.2 SATA Configuration 69
3.6.3.2.3 USB Configuration 69
3.6.3.2.4 HD Audio Configuration 70
3.6.4 Security 71
3.6.4.1 P7:Patriot Burst Eilte 120GB 72
3.6.4.2 Secure Boot 72
3.6.5 Boot 73
3.6.6 Save & Exit 75
3.6.6.1 Save Changes and Reset 75
3.6.6.2 Discard Changes and Reset 75
3.6.6.3 Restore Defaults 75
3.6.6.4 AMIFWUpdate 75
3.6.7 Save & Exit 76
4. Mechanical Drawing 77
4.1 Mechanical Drawing 78

1. Getting Started

1.1 Safety Precautions

Warning!

Always completely disconnect the power cord from your 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 CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

1.2 Packing List

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

- 1 x RX680R Motherboard
- 1 x I/O Shield

If any of the above items is damaged or missing, contact your retailer.

1.3 Document Amendment History

Revision	Date	By	Comment
1st	November 2023	Avalue	Initial Release

1.4 Manual Objectives

This manual describes in details Avalue Technology RX680R Single Board.

We have tried to include as much information as possible but we have not duplicated information that is provided in the standard IBM Technical References, unless it proved to be necessary to aid in the understanding of this board.

We strongly recommend that you study this manual carefully before attempting to set up RX680R or change the standard configurations. Whilst all the necessary information is available in this manual we would recommend that unless you are confident, you contact your supplier for guidance.

Please be aware that it is possible to create configurations within the CMOS RAM that make booting impossible. If this should happen, clear the CMOS settings, (see the description of the Jumper Settings for details).

If you have any suggestions or find any errors regarding this manual and want to inform us of these, please contact our Customer Service department with the relevant details.

1.5 System Specifications

System	
CPU	Intel® 12/13th Gen Core™ i9/i7/i5/i3 Processor, supports LGA 1700 CPU Up to 65W Max
BIOS	AMI uEFI BIOS, 256Mbit SPI Flash ROM
System Chipset	Intel® R680E chipsets
I/O Chip	Nuvoton NCT6126D (eSPI super IO)
System Memory	4 DIMM Up to 128GB Max Dual Channel DDR5 4400 MHz with ECC Support (Optional ECC Support depending on selected CPU)
Watchdog Timer	H/W Reset, 5~255 seconds/5~255 minutes
H/W Status Monitor	CPU temperature monitoring Voltages monitoring CPU fan speed control
RAID	Support RAID 0, 1, 5, 10
TPM	Onboard Infineon® TPM 2.0
iAMT	Intel® AMT 16
Expansion Slot	
M.2	1 x M.2 2230 E Key with CNVi Support (PCIe x1 + USB 2.0)
PCIe	1 x Gen 5 PCIe x16 (x16 Physical Black) (Slot 1) 2 x Gen 4 PCIe x4 (x16 Physical Yellow) (Slot 3 & 4) 1 x Gen 3 PCIe x4 Open Ended (Slot 2)
Storage	
M.2	1 x M.2 2242/2280/22110 M Key NVMe (Gen 4 PCIe x4 + SATA III) 1 x M.2 2242/2280/22110 M Key NVMe (Gen 3 PCIe x4 + SATA III)
SATA	4 x SATA III
Edge I/O	
LAN	2 x 2.5 Gigabit Ethernet
USB 3.2	6 x USB 3.2 Gen 2x1 Type-A Connectors 1 x USB 3.2 Gen 2x2 Type-C Connector
DP	4 x DP++
Audio	Line out, Mic in
Onboard I/O	
COM	COM1 ~ 5: support RS232 5 x 2 x 5 pin, pitch 2.00mm connector for COM1~COM5 to support RS232 5 x 2 x 3 pin, pitch 2.54mm connector for COM1~ COM5 pin9 RI/5V/12V jumper select. COM6: support RS232/422/485

	1 x 2 x 5 pin, pitch 2.00mm connector for COM6 to support RS232/RS422/RS485 by BIOS Selection 1 x 2 x 3 pin, pitch 2.54mm connector for COM6 pin9 RI/5V/12V jumper select.
USB 2.0	4 x 2 x 5 pin, pitch 2.54mm connector for 8 x USB 2.0
USB 3.2	1 x 2 x 10 pin, pitch 2.00mm connector for 2 x USB 3.2 Gen 2×1
GPIO	1 x 2 x 6 pin, pitch 2.00mm connector for GPIO: 8 bits
CPU/System FAN	1 x 1 x 4 pin, pitch 2.54mm CPU fan connector with smart fan function supported 1 x 1 x 4 pin, pitch 2.54mm System fan connector with smart fan function supported 1 x 1 x 4 pin, pitch 2.54mm System fan connector with smart fan function supported
Buzzer	Onboard Buzzer
Front Panel	1 x 2 x 5 pin, pitch 2.54mm connector for front panel
RTC Battery	1 x Horizontal type battery connector (CR2032 Coin Battery)
LVDS	1 x 2 x 20 pin, pitch 1.25mm connector for LVDS
LCD Backlight Brightness	1 x 1 x 5 pin, pitch 2.00mm Wafer connector for LCD inverter connector
LCD Inverter Power	1 x 1 x 3 pin, pitch 2.00mm connector for LVDS Backlight Control Select 1 x 2 x 3 pin, pitch 2.54mm connector for LVDS Backlight Power 3V/5V/12V Select
eDP	1 x 1 x 40 pin, pitch 0.5mm connector for eDP by BOM optional
AT/ATX Selector	1 x 1 x 3 pin pitch 2.54mm connector for AT/ATX jumper 1 x 2 x 12 pin ATX power connector 1 x 2 x 4 pin ATX 12V power connector
Clear CMOS	1 x 1 x 3pin, pitch 2.00mm connector for CMOS Clear
I2C	1 x 1 x 4 pin, pitch 2.00mm connector for I2C
SMBus	1 x 1 x 5 pin, pitch 2.00mm connector for SMBus
Chassis Intrusion	1 x 1 x 2 pin, pitch 2.54mm connector for Chassis Intrusion Switch
PS/2 KB&MS	1 x 1 x 6 pin, pitch 2.54mm connector for PS/2 KB&MS
LAN LED	1 x 2 x 5 pin, pitch 2.54mm connector for LAN LED status connector
BIOS SPI	1 x 2 x 4 pin, pitch 2.54mm connector for BIOS SPI
eSPI	1 x 2 x 5 pin, pitch 2.00mm connector for eSPI
Audio	1 x 2 x 5 pin, pitch 2.54mm connector for front Audio 1 x 1 x 4 pin, pitch 2.00mm connector for Amplifier
LPT	1 x 2 x 13pin, pitch 2.00mm connector for LPT
Display	
Graphic Chipset	Intel® 12th /13th Generation CPU integrated
Spec. & Resolution	4 x Dual Mode DisplayPort 1.4a 4K@60Hz
Multiple Display	4 Independent Displays
Ethernet	
LAN Chipset	2 x Intel® i225-LM 2.5G Gigabit Controller

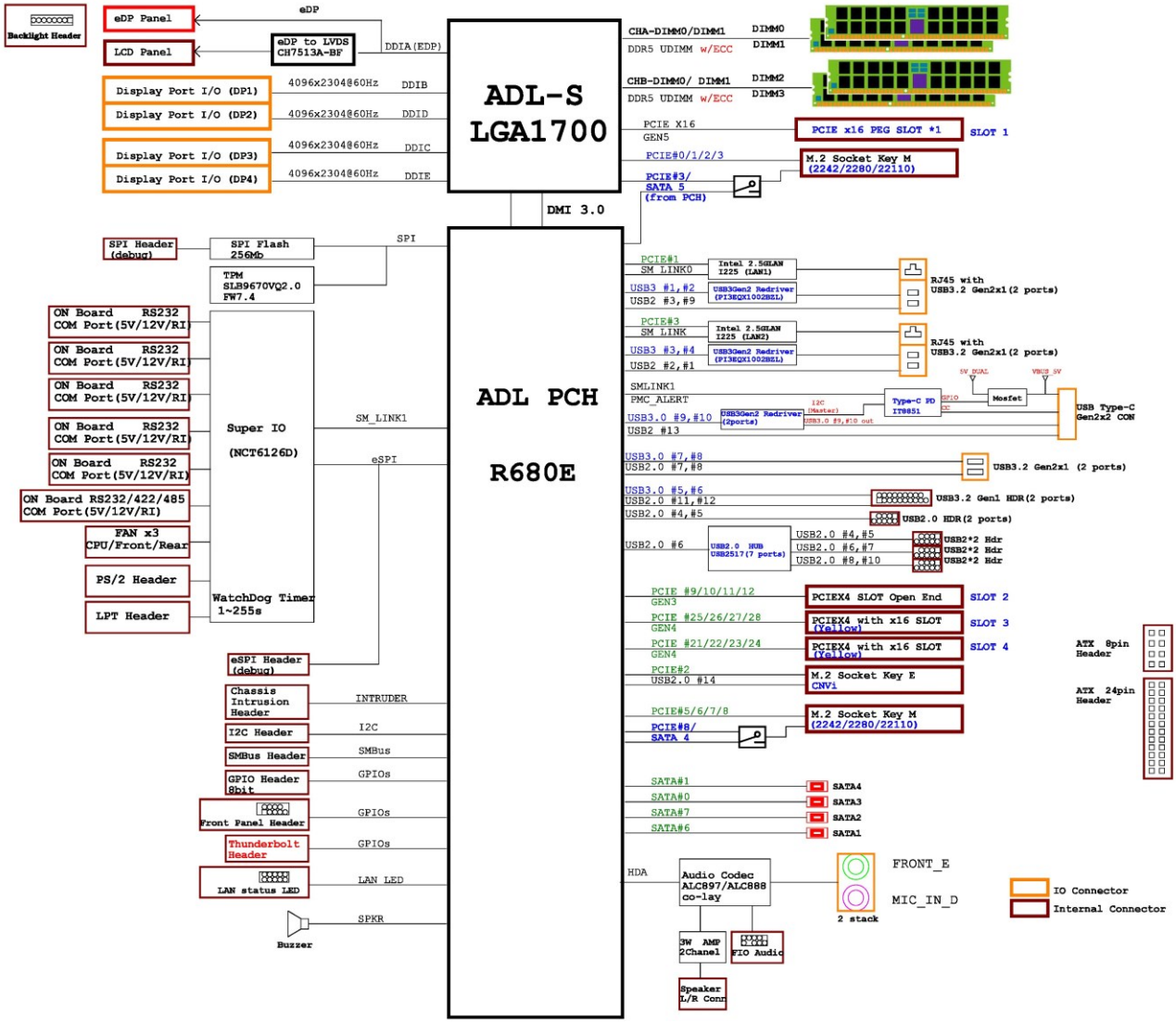
LAN Spec.	Intel® i225-LM: 10/100/1000/2500 Base-Tx GbE compatible
Mechanical & Environmental Specification	
Power Requirement	+12V / +5V / 5VSB /+3.3V /-12V
ACPI	Single power ATX Support S0, S3, S4, S5
Power Mode	AT / ATX mode Switchable Through Jumper
Operating Temp.	0~60°C (32~140°F), 0.5m/s airflow **Note: Intel PTAT suggests** Turbo off Workload – IA 100% / GT 100% PL2(Power Limit) set as default
Storage Temp.	-20~ +80°C (-4 ~ 176°F)
Operating Humidity	40°C @ 5% to 90% Relative Humidity, Non-condensing
Size (L x W)	9.6" x 9.6" (243.84mm x 243.84mm)
Weight	1.45lbs (0.66kg)
Vibration Test	Package Vibration Test Reference IEC60068-2-64 Testing procedures Test Fh: Vibration broadband random Test 1. PSD: 0.026G²/Hz, 2.16 Grms 2. Non-operation mode 3. Test Frequency: 5-500Hz 4. Test Axis: X,Y and Z axis 5. 30 min. per each axis 6. IEC 60068-2-64 Test: Fh Random Vibration Operation Reference IEC60068-2-64 Testing procedures Test Fh : Vibration broadband random Test 1. PSD: 0.00202023G²/Hz 0.5 Grms 2. Operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis 5. 30 minutes per each axis 6. IEC 60068-2-64 Test:Fh Random Vibration Non Operation Reference IEC60068-2-64 Testing procedures Test Fh : Vibration broadband random Test 1. PSD: 0.00202023G²/Hz 0.5 Grm

	2. Non Operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis 5. 30 minutes per each axis 6. IEC 60068-2-64 Test:Fh
Drop Test	Package Drop Reference ISTA 2A, Method : IEC-60068-2-32 Test: Ed Drop Test 1 One corner , three edges, six faces 2 ISTA 2A, IEC-60068-2-32 Test:Ed
OS Information	Win11 64bit UEFI **Note: Windows 11 is not a LTSC release and will be supported on the Intel CCG Client roadmap. NEX Network & Edge customers may install non-LTSC releases(e.g. Win11) on NEX Network & Edge processors.** Win10 64bit UEFI Linux

Note: Specifications are subject to change without notice.

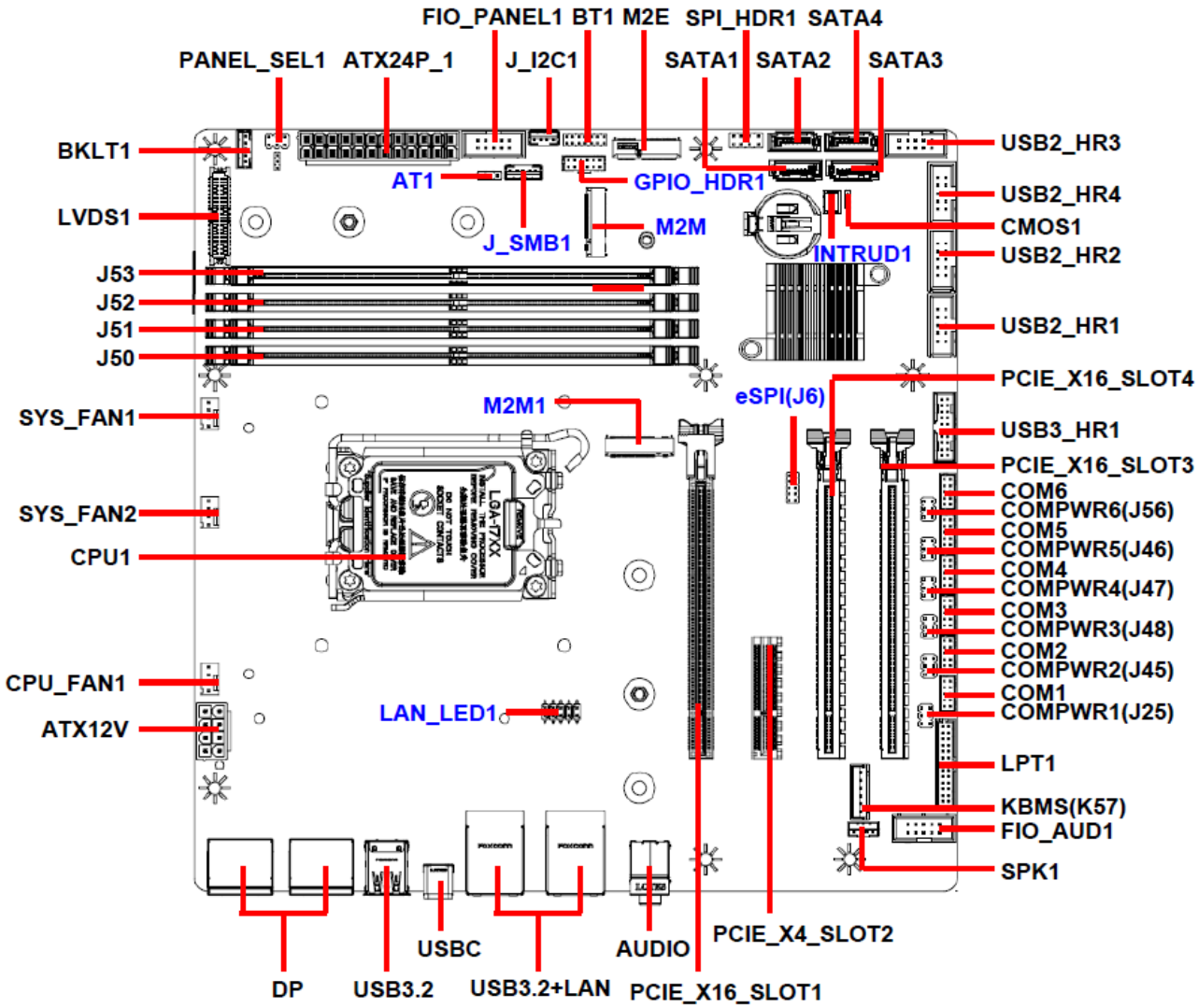
1.6 Architecture Overview—Block Diagram

The following block diagram shows the architecture and main components of RX680R.



2. Hardware Configuration

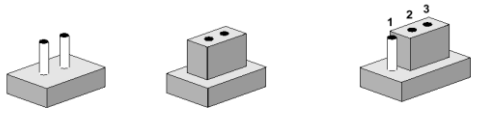
2.1 Product Overview



2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

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" a jumper you connect the pins with the clip. To "open" a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



Open Closed Closed 2-3

The jumper settings are schematically depicted in this manual as follows:

Open Closed Closed 2-3

A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

Jumpers

Label	Function	Note
PANEL_SEL1	LVDS Panel Power Select	3 x 2 header, pitch 2.54mm
BKLVOL1	LVDS Blacklight Control	3 x 1 header, pitch 2.00mm
AT1	AT/ATX Mode Select	3 x 1 header, pitch 2.54mm
CMOS1	Clear CMOS	3 x 1 header, pitch 2.00mm
J56,J45~J48,J25	COM1~COM6 Power Setting	3 x 2 header, pitch 2.54mm

Connectors

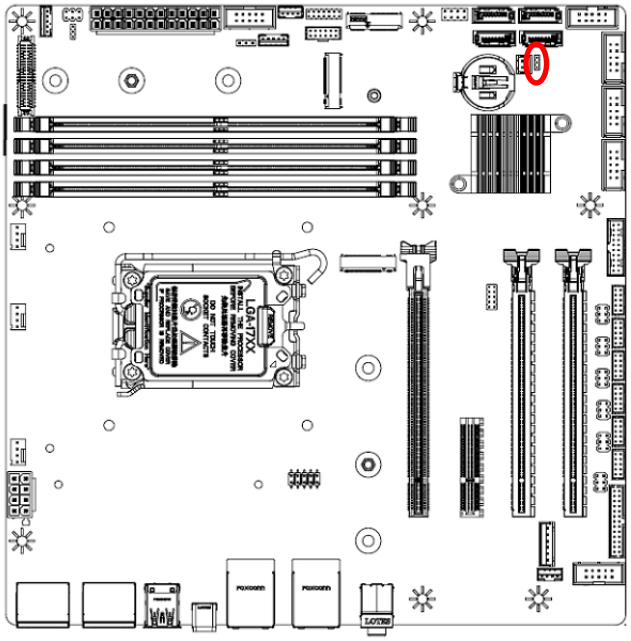
Label	Function	Note
CPU_FAN1	CPU FAN Connector	4 x 1 wafer, pitch 2.54mm
SYS_FAN1	Chassis Fan Connector	4 x 1 wafer, pitch 2.54mm
SYS_FAN2	Chassis Fan Connector	4 x 1 wafer, pitch 2.54mm

FIO_PANEL1	Front Panel Connector	5 x 2 header, pitch 2.54mm
ATX24P_1	ATX Power Connector	12 x 2 wafer, pitch 4.20mm
ATX12V	12V ATX Power Connector	4 x 2 wafer, pitch 4.20mm
COM1~COM6	Serial Port Connectors	5 x 2 wafer, pitch 2.54mm
SATA1~4	SATA Connectors	Male Connectors (RED)
USB2_HR1~4	Front USB 2.0 Headers	5 x 2 header, pitch 2.54mm
USB3_HR1	Front USB 3.2 Header	10 x 2 header, pitch 2.00mm
FIO_AUD1	Front Audio Connector	5 x 2 header, pitch 2.54mm
SPK1	Amplifier Connector	4 x 1 wafer, pitch 2.00mm
LVDS1	LVDS signals connector	20 x 2 header, pitch 1.25 mm
INTRUD1	Chassis Intrusion Header	2 x 1 header, pitch 2.54mm
LAN_LED1	LAN LED Header	5 x 2 header, pitch 2.54mm
BKLT1	LVDS Backlight Control header	5 x 1 wafer, pitch 2.00mm
LPT1	Parallel Port Connector	13 x 2 wafer, pitch 2.00mm
GPIO_HDR1	GPIO 8 bits Connector	6 x 2 wafer, pitch 2.00mm
J_I2C1	I2C Connector	4 x 1 wafer, pitch 2.00mm
J_SMB1	SMBUS Connector	5 x 1 wafer, pitch 2.00mm
SPI_HDR1	SPI Header	4 x 2 header, pitch 2.54mm
J6	eSPI Header	5 x 2 header, pitch 2.00mm
J57	KBMS Header	6 x 1 wafer, pitch 2.54mm
CPU1	LGA 1700 Socket	
J50~J53	DDR5 UDIMM Slots	Dual channel (2DPC)
PCIE_X16_SLOT1	Gen 5 PCIe	
PCIE_X4_SLOT2	Gen 3 PCIe	
PCIE_X16_SLOT4	Gen 4 PCIe	
PCIE_X16_SLOT3	Gen 4 PCIe	
M2M1	Gen 4 PCIe x 4 + SATA III	M Key
M2M	Gen 3 PCIe x 4 + SATA III	
M2E	PCIe x 1 + USB 2.0 support CNVi	
DisplayPort	DisplayPort Connectors x 4	
USB3.2	USB 3.2 Type A Connectors x 2	

USBC	USB 3.2 Type C Connector	
USB3.2+LAN	RJ45 Ethernet Connectors x 2 USB 3.2 Type A Connectors x 4	2.5 Gigabit Ethernet
AUDIO	Audio Phone Jack	Lin-out, Mic-in

2.3 Setting Jumpers & Connectors

2.3.1 Clear CMOS (JCMOS1)

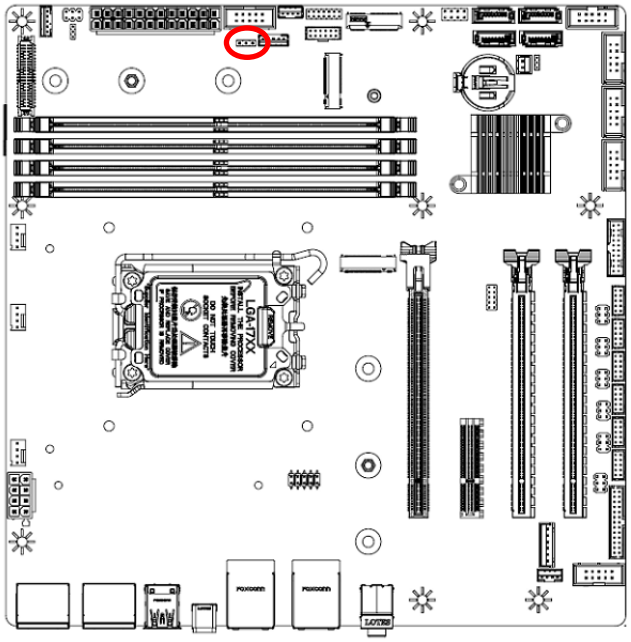


Normal*

Clear CMOS

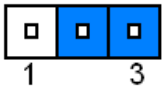
*** Default**

2.3.2 AT/ATX Power Mode Select (JSATX1)



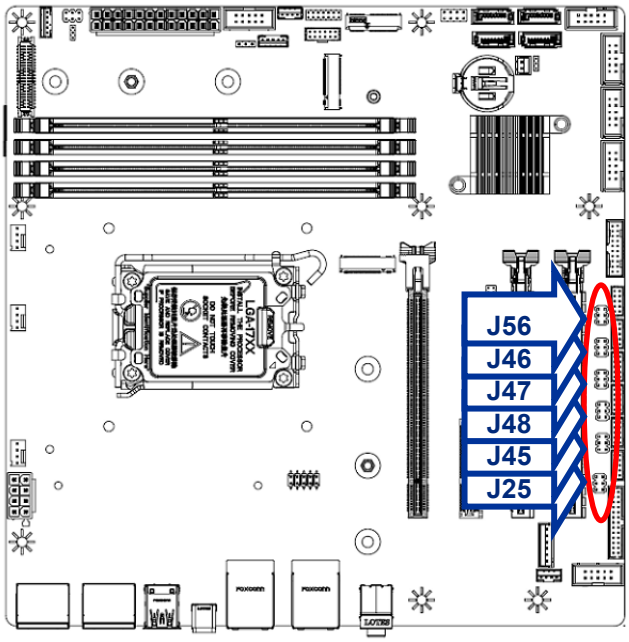
ATX*

AT

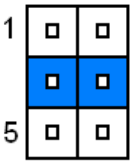


*** Default**

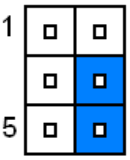
2.3.3 COM POWER SETTING (J56,J45~J48,J25)



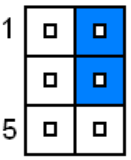
Ring*



+5V

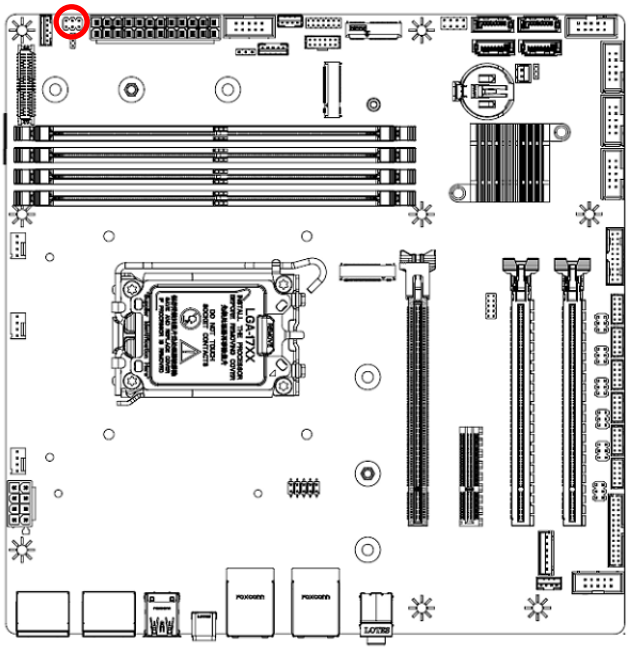


+12V

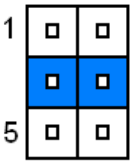


*** Default**

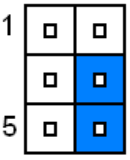
2.3.4 LVDS Panel Power Select (PANEL_SEL1)



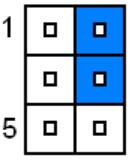
+12V



+5V*

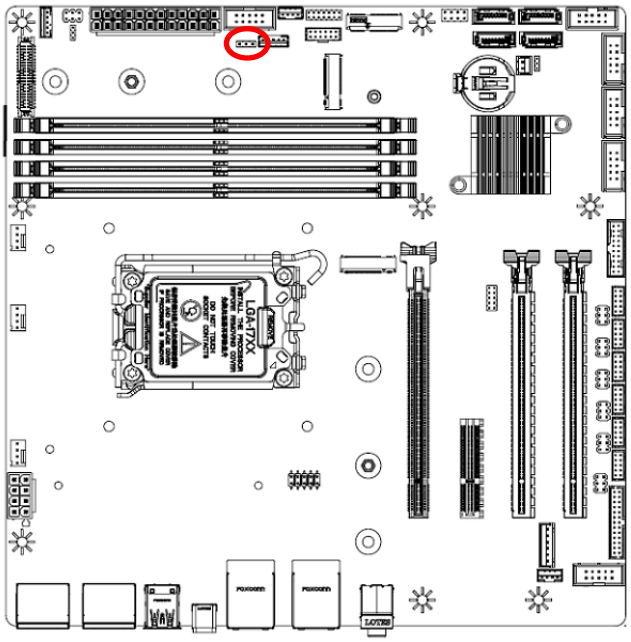


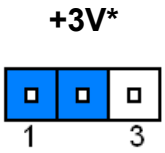
+3V

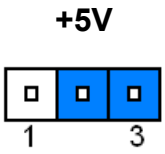


*** Default**

2.3.5 LVDS Blacklight Voltage Selection (BKLVOL1)

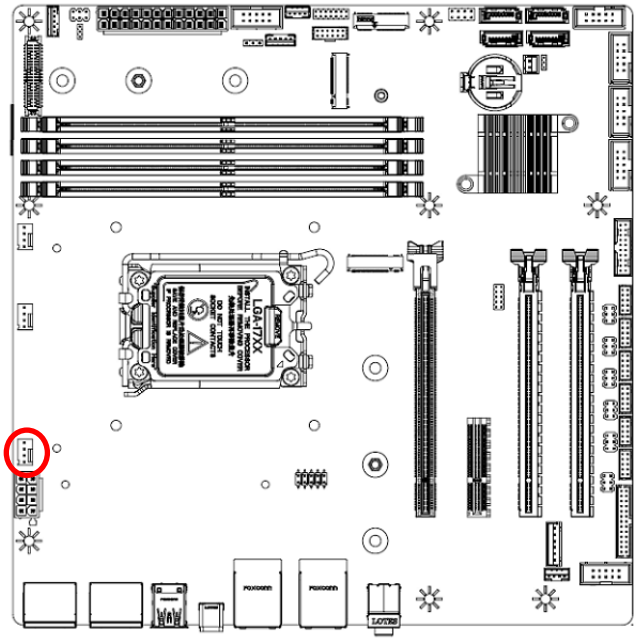


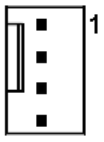




*** Default**

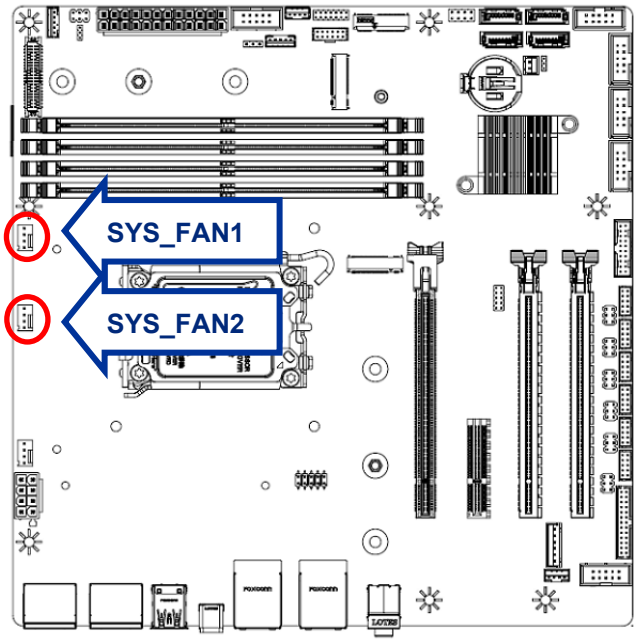
2.3.6 CPU fan connector (CPUFAN1)

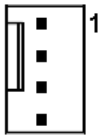




Signal	PIN
GND	1
+12V	2
FAN_TACH	3
FAN_CTRL	4

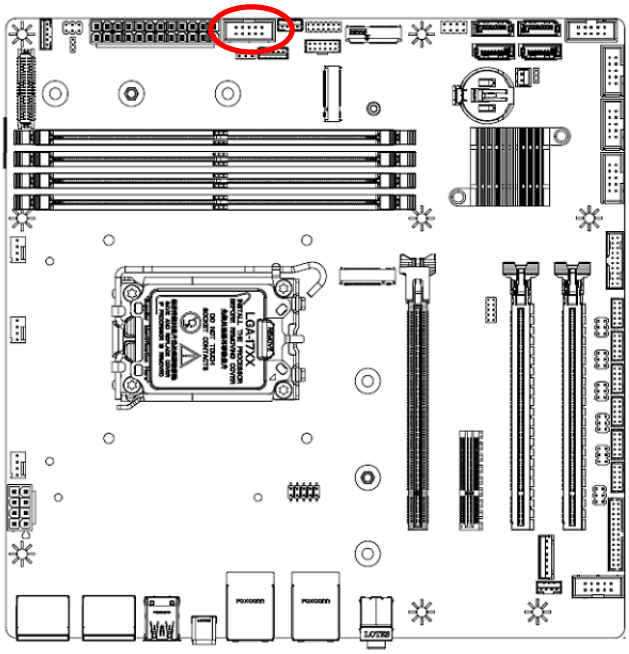
2.3.7 System fan connector (SYS_FAN 1/2)

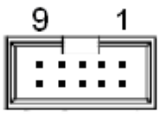




Signal	PIN
GND	1
+12V	2
FAN_TACH	3
FAN_CTRL	4

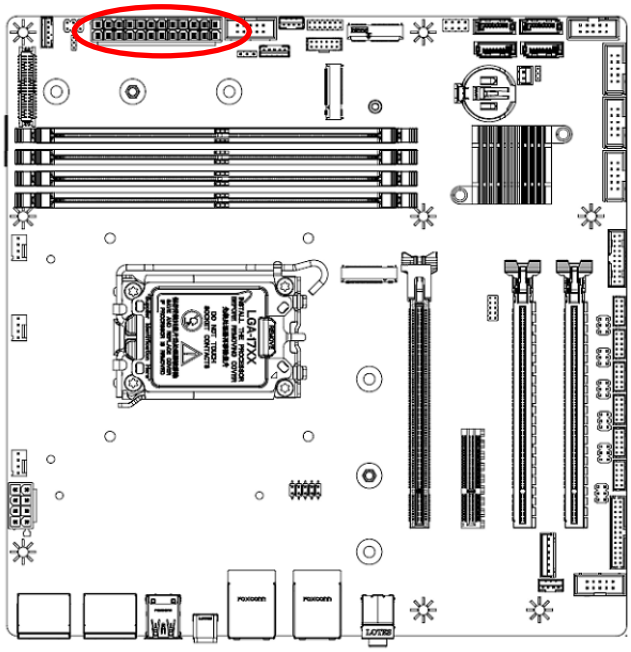
2.3.8 System Panel (FIO_PANEL1)





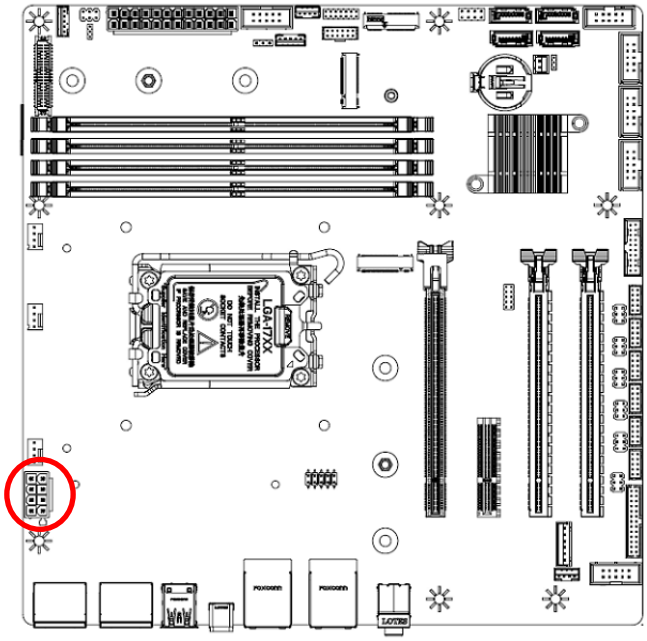
Signal	PIN	PIN	Signal
HHD LED+	1	2	PWR LED+
HHD LED-	3	4	PWR LED-
GND	5	6	PWR_BTN
RST	7	8	GND
+5V	9	10	KEY

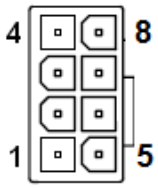
2.3.9 ATX Power connector (ATXPWR1)



Signal	PIN	PIN	Signal
+3V	1	13	+3V
+3V	2	14	-12V
GND	3	15	GND
+5V	4	16	PS_ON
GND	5	17	GND
+5V	6	18	GND
GND	7	19	GND
PWRER OK	8	20	NC
+5 VSB	9	21	+5V
+12V	10	22	+5V
+12V	11	23	+5V
+3V	12	24	GND

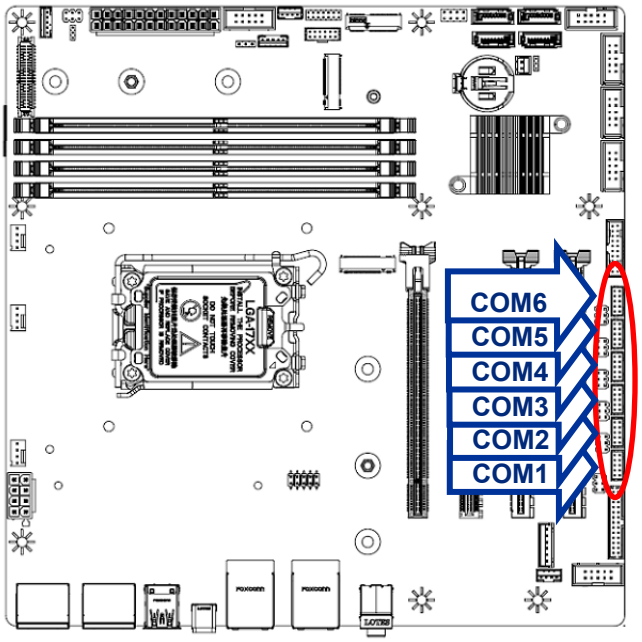
2.3.10 ATX Power connector (ATXPWR1)

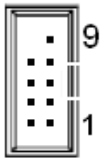




Signal	PIN	PIN	Signal
GND	4	8	+12V
GND	3	7	+12V
GND	2	6	+12V
GND	1	5	+12V

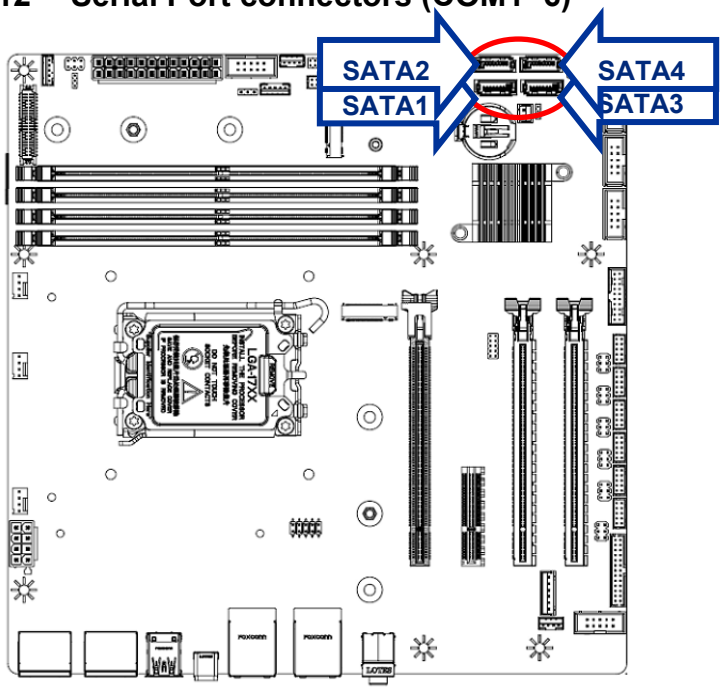
2.3.11 Serial Port connectors (COM1~6)

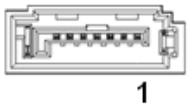




Signal	PIN	PIN	Signal
		9	IRxPWRxJMP
NCTS	8	7	NRTS
NDSR	6	5	GND
NDTR	4	3	NTX
NRX	2	1	NDCD

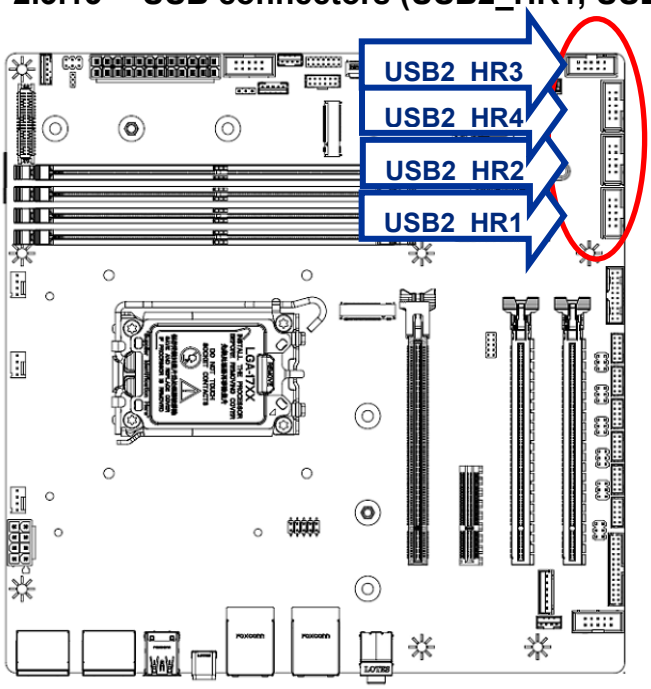
2.3.12 Serial Port connectors (COM1~6)

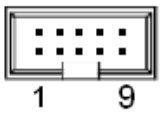




PIN	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

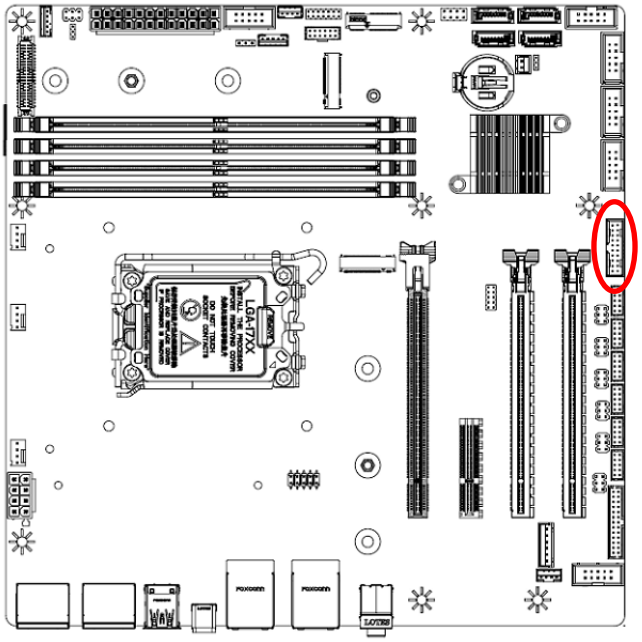
2.3.13 USB connectors (USB2_HR1, USB2_HR2, USB2_HR3, USB2_HR4)

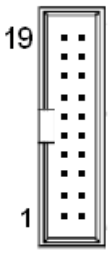




Signal	PIN	PIN	Signal
NC	9	10	KEY
GND	7	8	GND
USB2 D+	5	6	USB2 D+
USB2 D-	3	4	USB2 D-
+5V USB	1	2	+5V USB

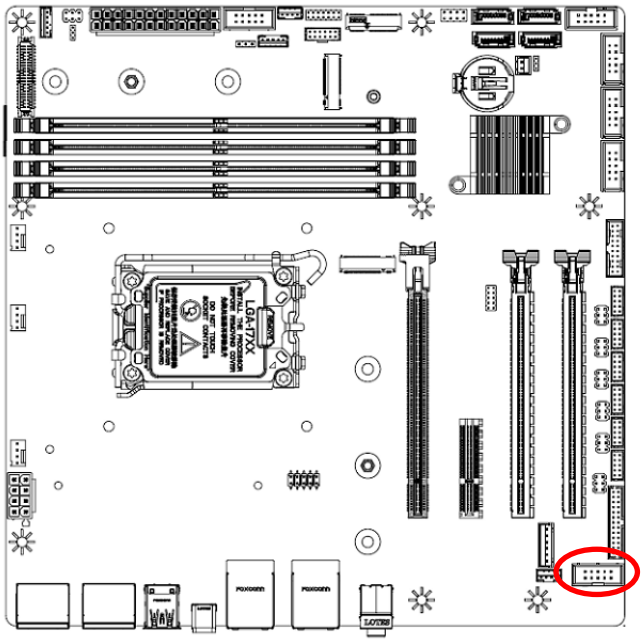
2.3.14 USB3.2 connector (USB3_HR1)

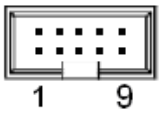




Signal	PIN	PIN	Signal
NC	10	11	USB2 D+
USB2 D+	9	12	USB2 D-
USB2 D-	8	13	GND
GND	7	14	USB3 TX+
USB3 TX+	6	15	USB3 TX-
USB3 TX-	5	16	GND
GND	4	17	USB3 RX+
USB3 RX+	3	18	USB3 RX-
USB3 RX-	2	19	+5V USB
+5V USB	1		

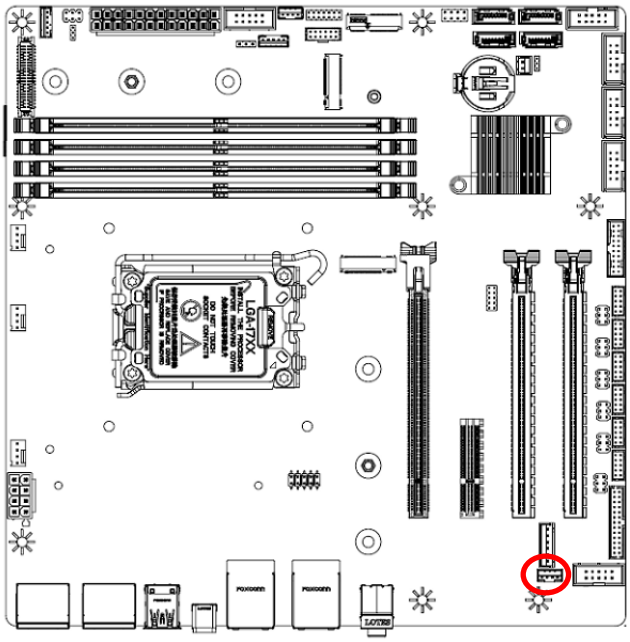
2.3.15 Front Audio connector (FIO_AUD1)

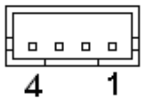




Signal	PIN	PIN	Signal
MIC2_L	1	2	AGND
MIC2_R	3	4	FP_HDADET
LINE2_R	5	6	MIC2_JD
FR-IO-SENSE	7	8	
LINE2_L	9	10	LINE2_JD

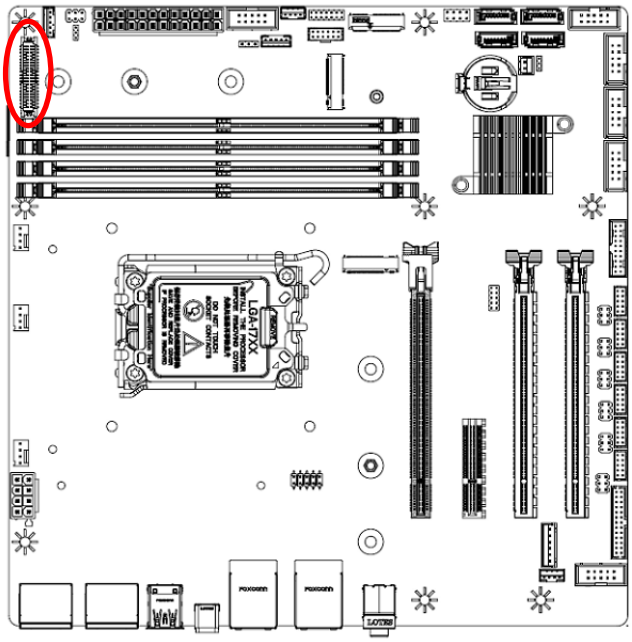
2.3.16 Amplifier connector (SPK1)

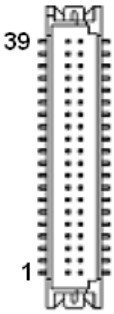




PIN	Signal
1	ROUT-
2	ROUT+
3	LOUT-
4	LOUT+

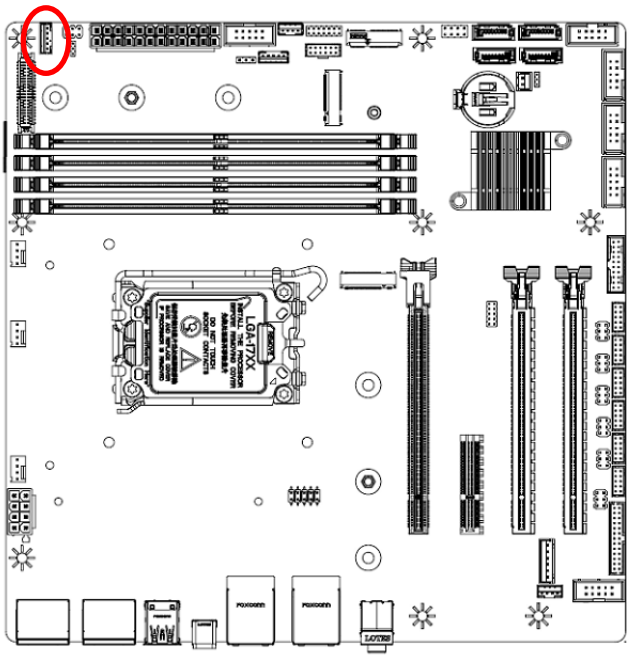
2.3.17 LVDS connector (LVDS1)





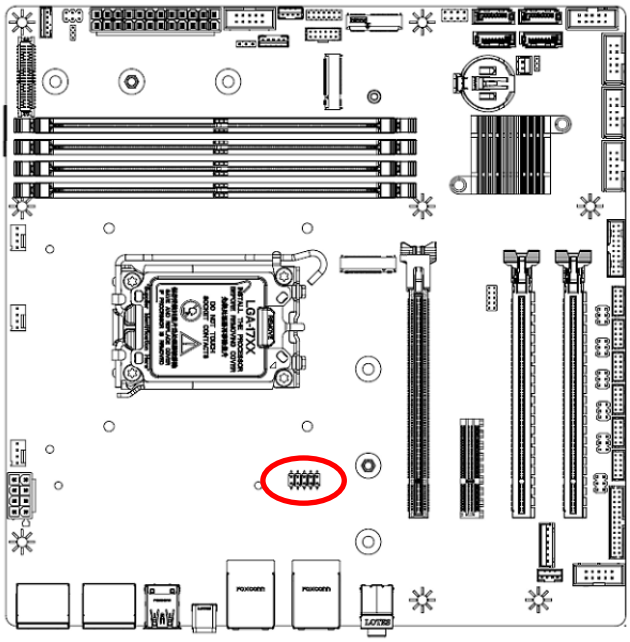
Signal	PIN	PIN	Signal
BKLT_+12V	39	40	BKLT_+12V
GND	37	38	GND
LS1_CLK_D-	35	36	LS0_CLK_D-
LS1_CLK_D+	33	34	LS0_CLK_D+
GND	31	32	GND
LS1_L3_D-	29	30	LS1_L2_D-
LS1_L3_D+	27	28	LS1_L2_D+
GND	25	26	GND
LS1_L1_D-	23	24	LS1_L0_D-
LS1_L1_D+	21	22	LS1_L0_D+
GND	19	20	GND
LS0_L3_D-	17	18	LS0_L2_D-
LS0_L3_D+	15	16	LS0_L2_D+
GND	13	14	GND
LS0_L1_D-	11	12	LS0_L0_D-
LS0_L1_D+	9	10	LS0_L0_D+
CABLE_ID1	7	8	GND
LS_SCL	5	6	LS_SDA
+3V	3	4	+5V (PANEL_PWR)
+3V	1	2	+5V (PANEL_PWR)

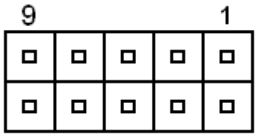
2.3.18 LVDS Backlight connector (BKLT1)



PIN	Signal
1	+12V_BL
2	GND
3	BKLT_EN
4	BKLT_PWM
5	+5V_BL

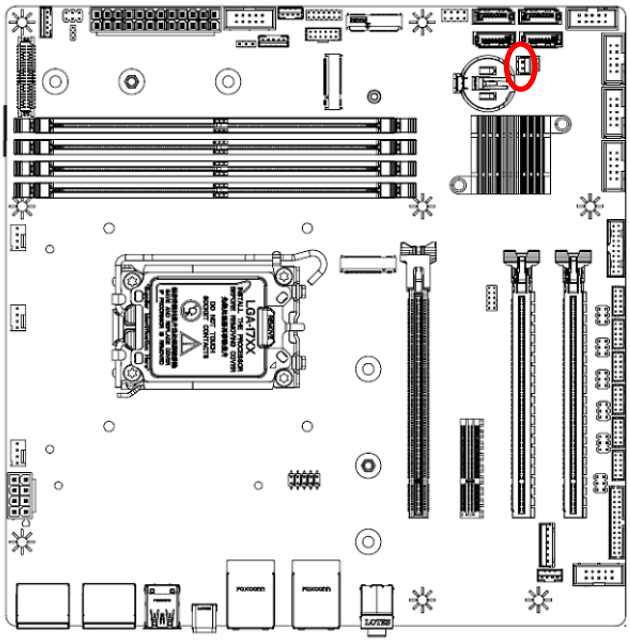
2.3.19 LAN LED status connector (LAN_LED1)





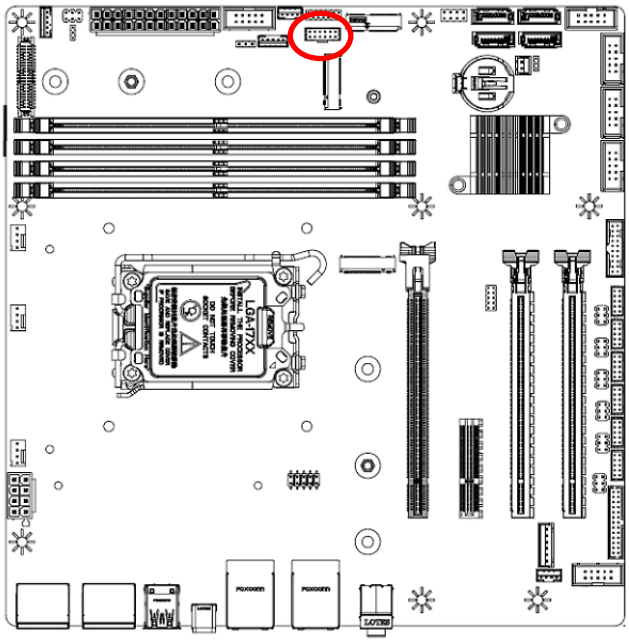
Signal	PIN	PIN	Signal
1G_LAN1_LED	1	2	1G_LAN2_LED
GND	3	4	GND
2.5G_LAN1_LED	5	6	2.5G_LAN2_LED
GND	7	8	GND
LAN1_ACT	9	10	LAN2_ACT

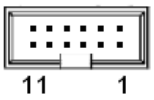
2.3.20 Chassis intrusion connector (INTRUD1)



PIN	Signal
2	GND
1	PCH_INTRUDER#

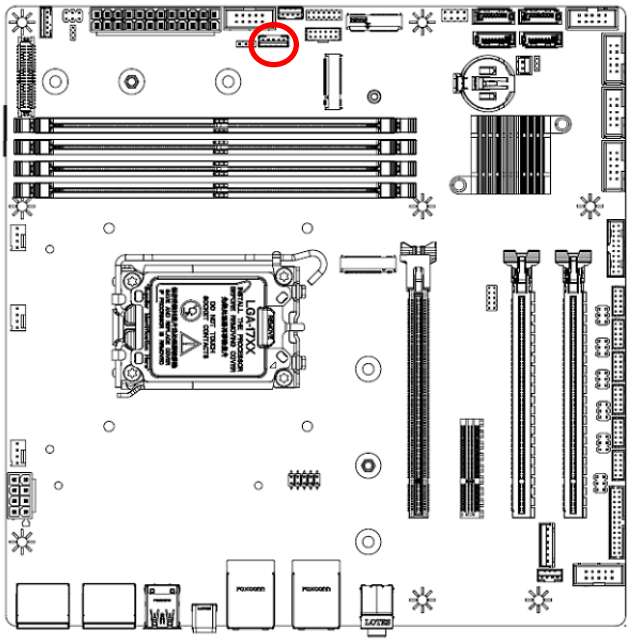
2.3.21 8 bit GPIO header (GPIO_HDR1)

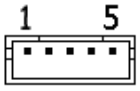




Signal	PIN	PIN	Signal
AP_GPIO5	2	1	AP_GPIO1
AP_GPIO6	4	3	AP_GPIO2
AP_GPIO7	6	5	AP_GPIO3
AP_GPIO8	8	7	AP_GPIO4
SMB_DATA	10	9	SMB_CLK
+3V_DUAL	12	11	11. GND

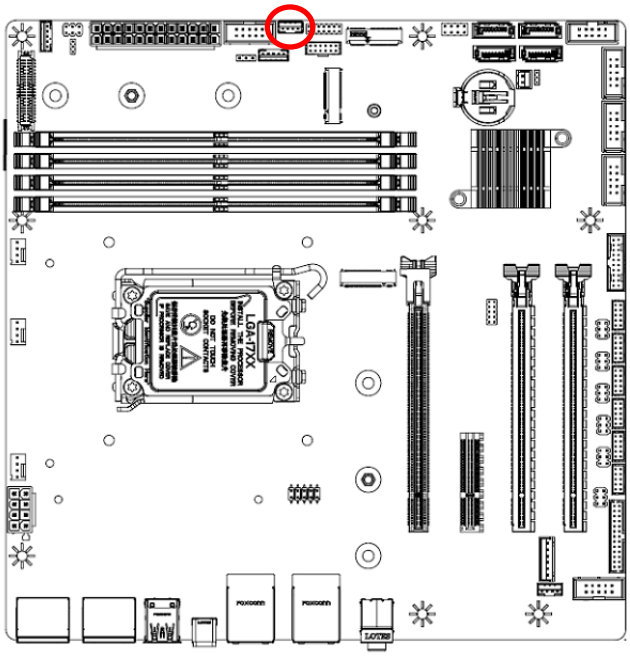
2.3.22 SMBUS connector (J_SMB1)

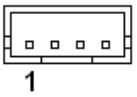




PIN	Signal
1	SMB_CLK
2	SMB_DATA
3	SMB_ALERT
4	GND
5	+3.3V

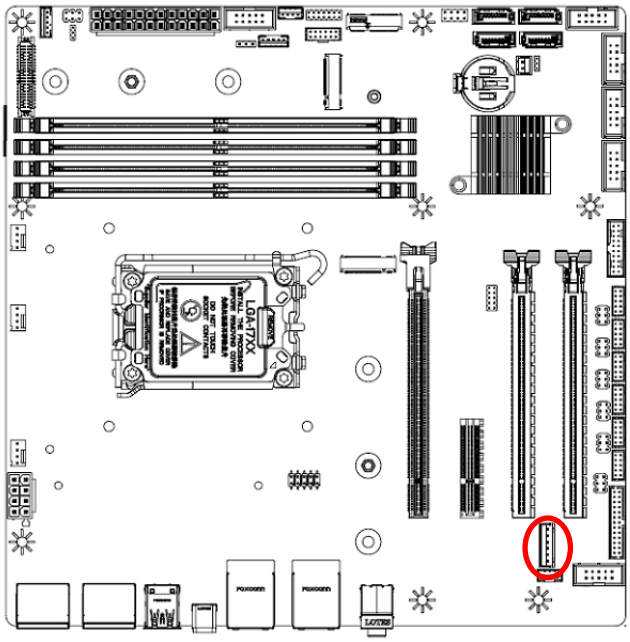
2.3.23 I2C connector (J_I2C1)





PIN	Signal
1	+3V_DAUL
2	I2C1_SCL
3	I2C1_SDA
4	GND

2.3.24 KMBS connector (J57)



PIN	Signal
1	KCLK
2	KDAT
3	MDAT
4	GND
5	+5V_DUAL
6	MCLK

3.BIOS Setup

3.1 Introduction

The BIOS setup program allows users to modify the basic system configuration. In this following chapter will describe how to access the BIOS setup program and the configuration options that may be changed.

3.2 Starting Setup

The AMI BIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:
By pressing <Del> or <F2> immediately after switching the system on, or
By pressing the <Del> or <F2> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

Press <Del> or <F2> to enter SETUP

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys. If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to.

Press F1 to Continue, DEL to enter SETUP

3.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values.
F3 key	Optimized defaults
F4 key	Save & Exit Setup

- **Navigating Through The Menu Bar**
  Use the left and right arrow keys to choose the menu you want to be in.

Note: Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**
  Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A "➢" pointer marks all sub menus.

3.4 Getting Help

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

3.5 In Case of Problems

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the AMI BIOS supports an override to the NVRAM settings which resets your system to its defaults.

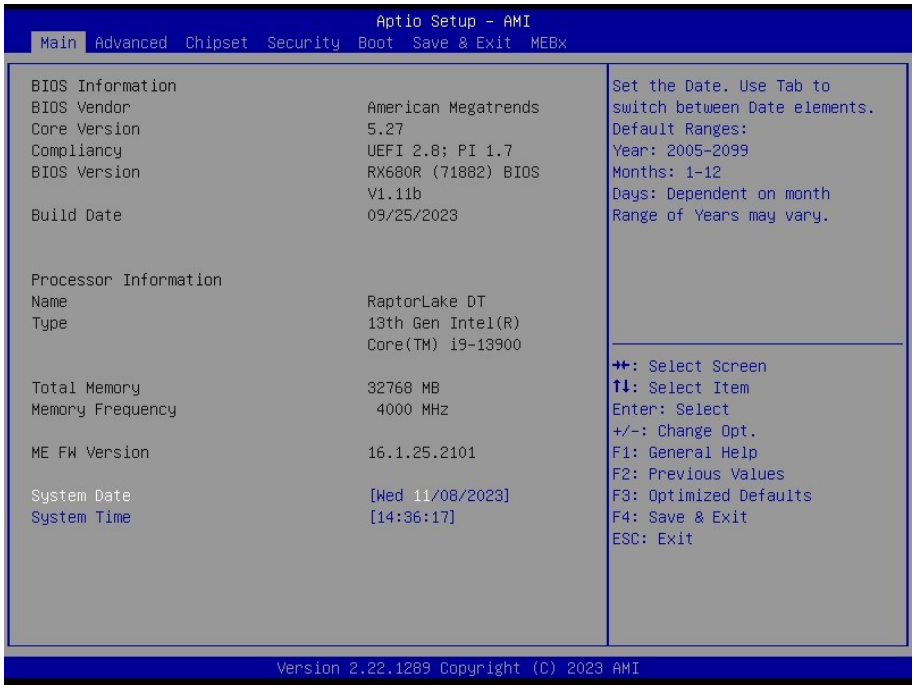
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

3.6 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

3.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.



3.6.1.1 System Date

Use the system date option to set the system date. Manually enter the day, month and year.

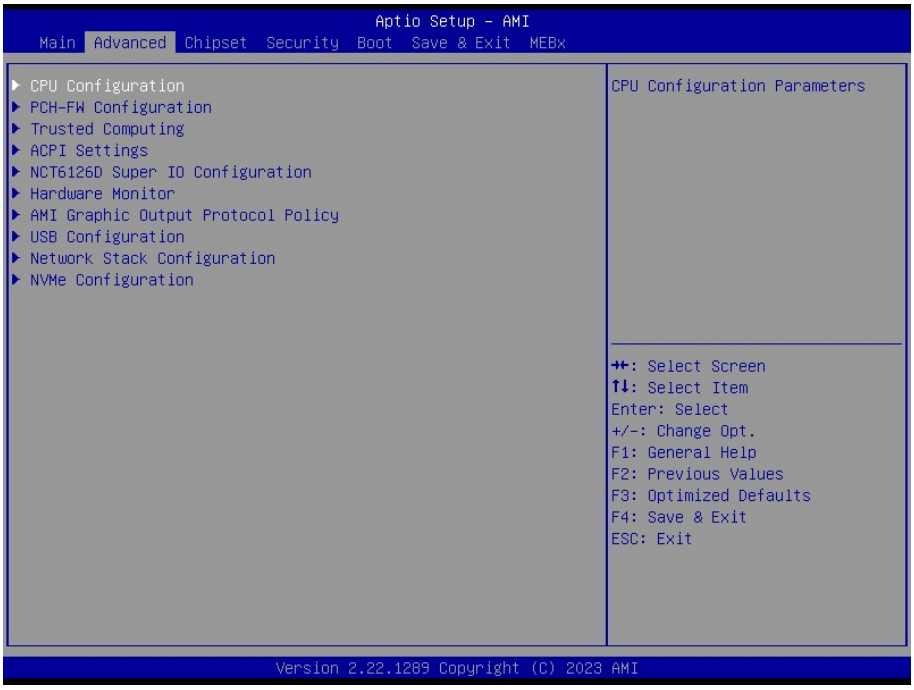
3.6.1.2 System Time

Use the system time option to set the system time. Manually enter the hours, minutes and seconds.

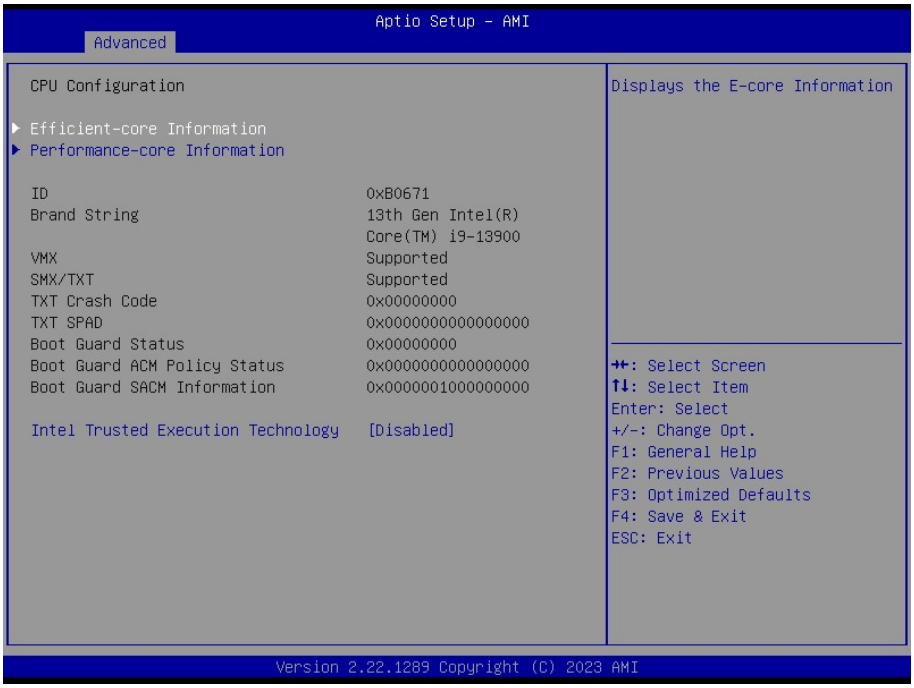
Note: The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.
Visit the Avalue website (www.avalue.com.tw) to download the latest product and BIOS information.

3.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.

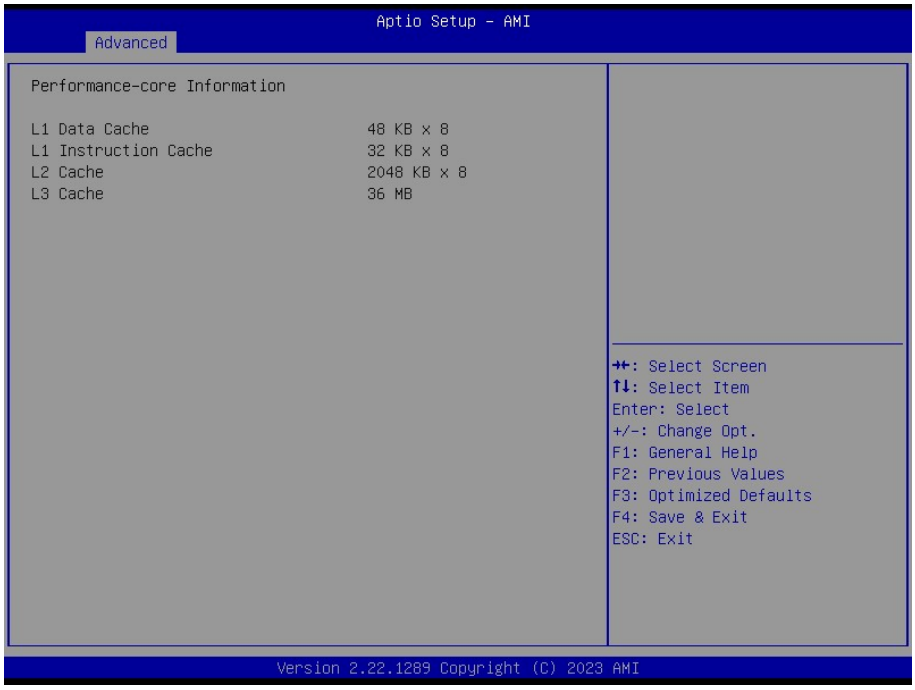


3.6.2.1 CPU Configuration

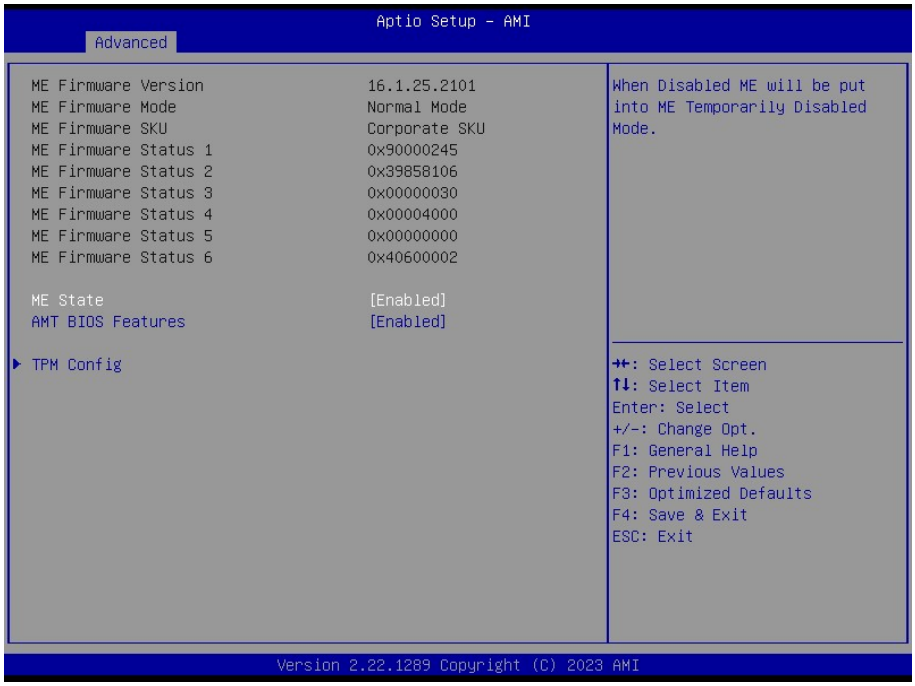


Item	Options	Description
Intel Trusted Execution Technology	Disabled**[Default]**, Enabled	Enables utilization of additional hardware capabilities provided by Intel ® Trusted Execution Technology. Changes require a full power cycle to take effect.

3.6.2.1.1 Performance-core Information



3.6.2.2 PCH-FW Configuration

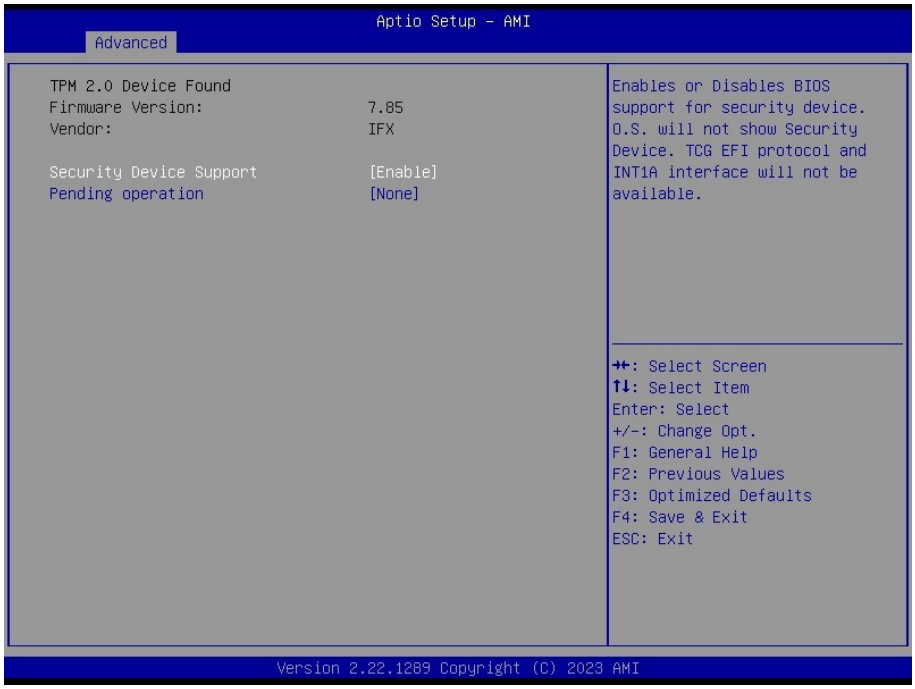


Item	Options	Description
ME State	Disabled Enabled**[Default]**,	When Disabled ME will be put into ME Temporarily Disabled Mode.
AMT BIOS Features	Disabled Enabled**[Default]**,	When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW.

3.6.2.2.1 TPM Config

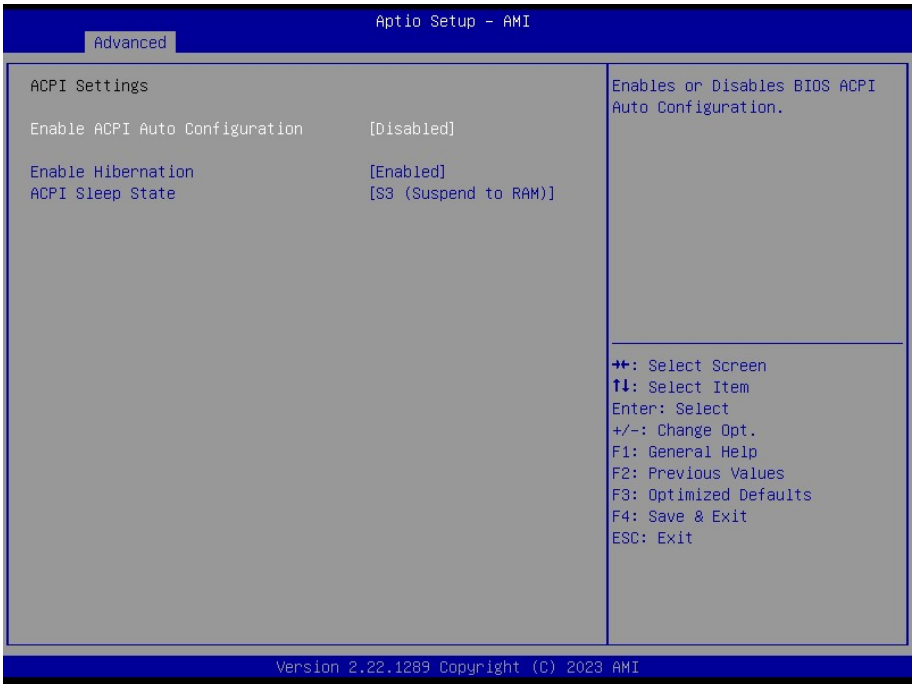
Item	Option	Description
TPM Device Selection	dTPM**[Default]**, PTT	Selects TPM device: PTT or dTPM. PTT - Enables PTT in SkuMgr dTPM 1.2 - Disables PTT in SkuMgr Warning ! PTT/dTPM will be disabled and all data saved on it will be lost.

3.6.2.3 Trusted Computing



Item	Options	Description
Security Device Support	Disabled Enabled**[Default]**,	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Pending operation	None**[Default]**, TPM Clear	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.

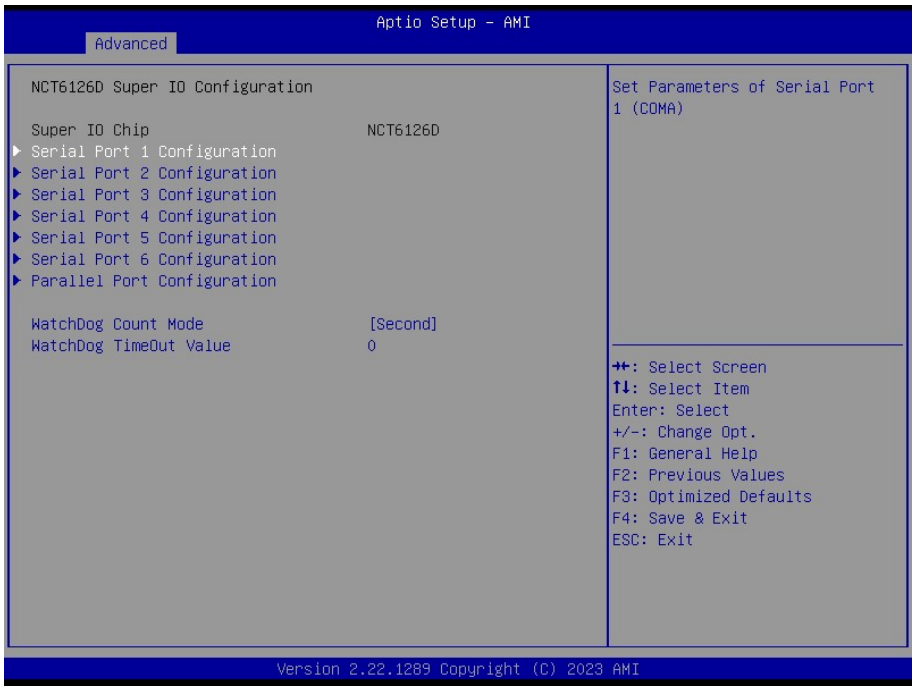
3.6.2.4 ACPI Settings



Item	Options	Description
Enable ACPI Auto Configuration	Disabled**[Default]**, Enabled	Enables or Disables BIOS ACPI Auto Configuration.
Enable Hibernation	Disabled Enabled**[Default]**,	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.
ACPI Sleep State	Suspend Disabled, S3 (Suspend to RAM)**[Default]**	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

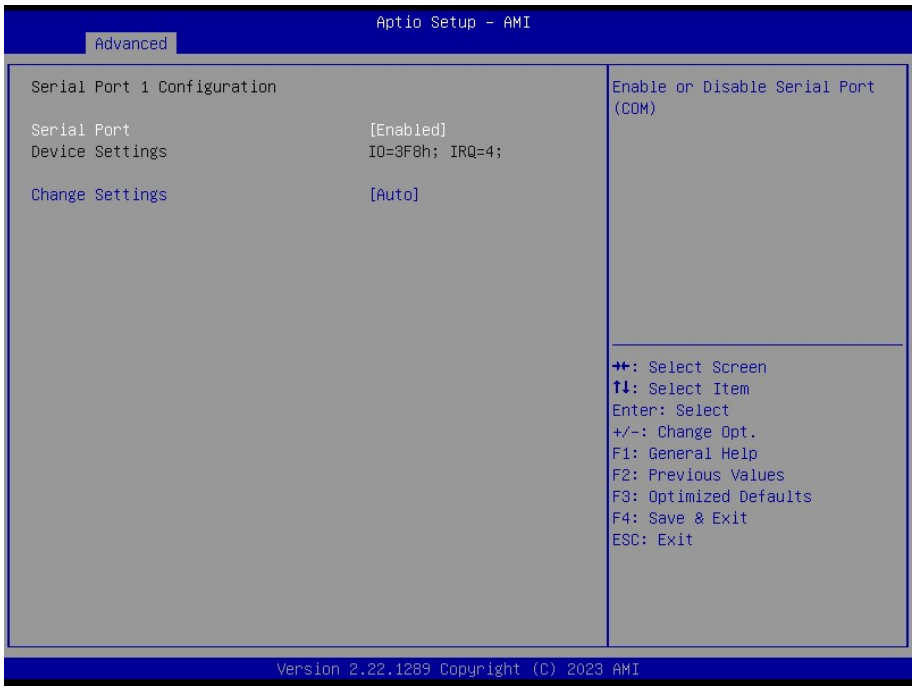
3.6.2.5 NCT6126D Super IO Configuration

You can use this item to set up or change the Super IO configuration for serial ports. Please refer to 3.6.2.5.1~ 3.6.2.5.7 for more information.



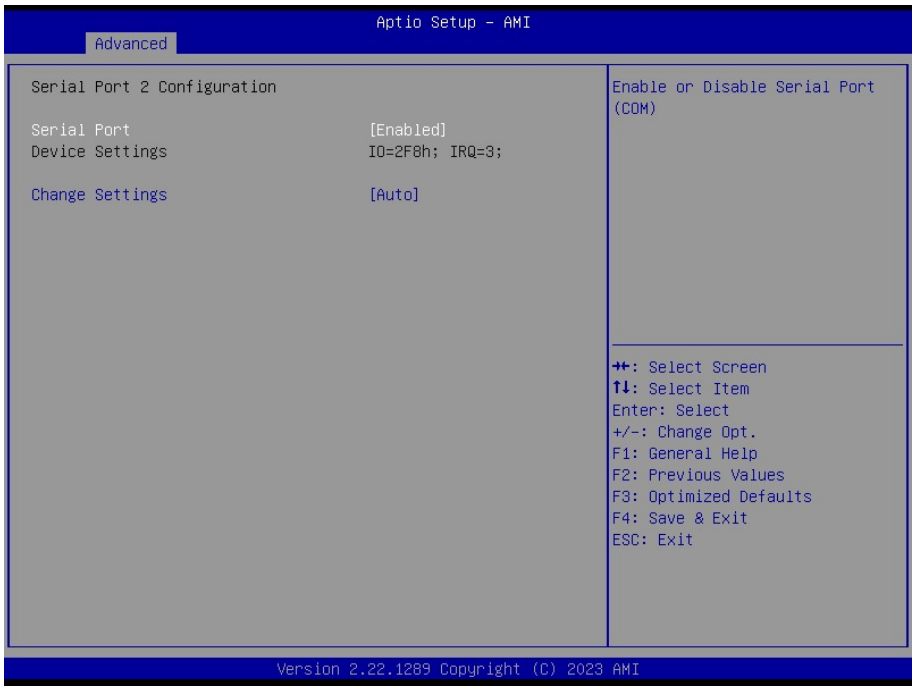
Item	Options	Description
WatchDog Count Mode	Second**[Default]**, Minute	Configure watchdog count mode.
WatchDog Timeout Value	0	Configure watchdog Timeout Value.
Serial Port 1 Configuration	Set Parameters of Serial Port 1 (COMA).	
Serial Port 2 Configuration	Set Parameters of Serial Port 2 (COMB).	
Serial Port 3 Configuration	Set Parameters of Serial Port 3 (COMC).	
Serial Port 4 Configuration	Set Parameters of Serial Port 4 (COMD).	
Serial Port 5 Configuration	Set Parameters of Serial Port 5 (COME).	
Serial Port 6 Configuration	Set Parameters of Serial Port 6 (COMF).	

3.6.2.5.1 Serial Port 1 Configuration



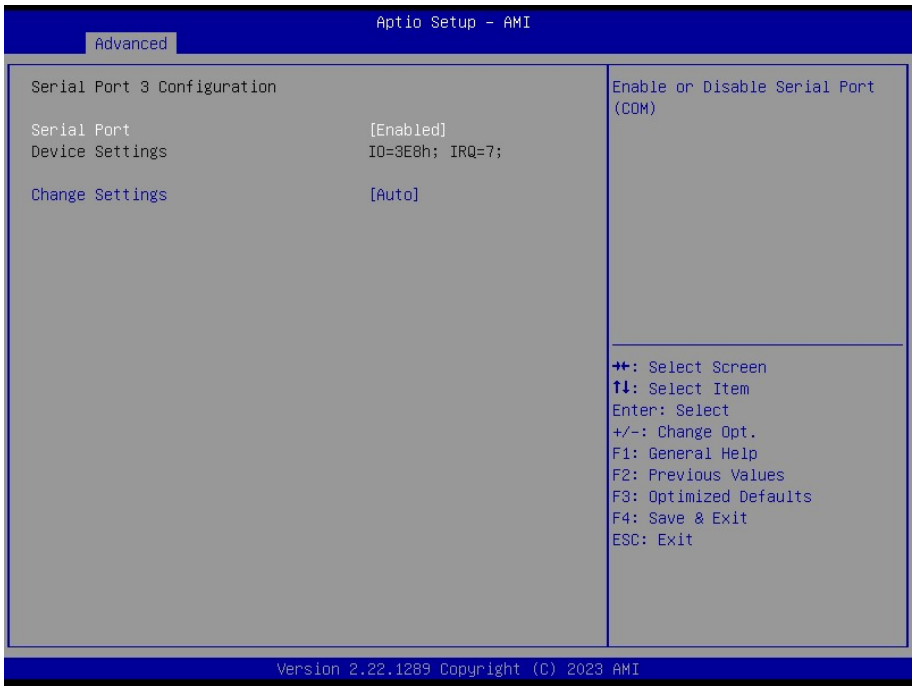
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=3F8h; IRQ4; IO=3F8h; IRQ3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.5.2 Serial Port 2 Configuration



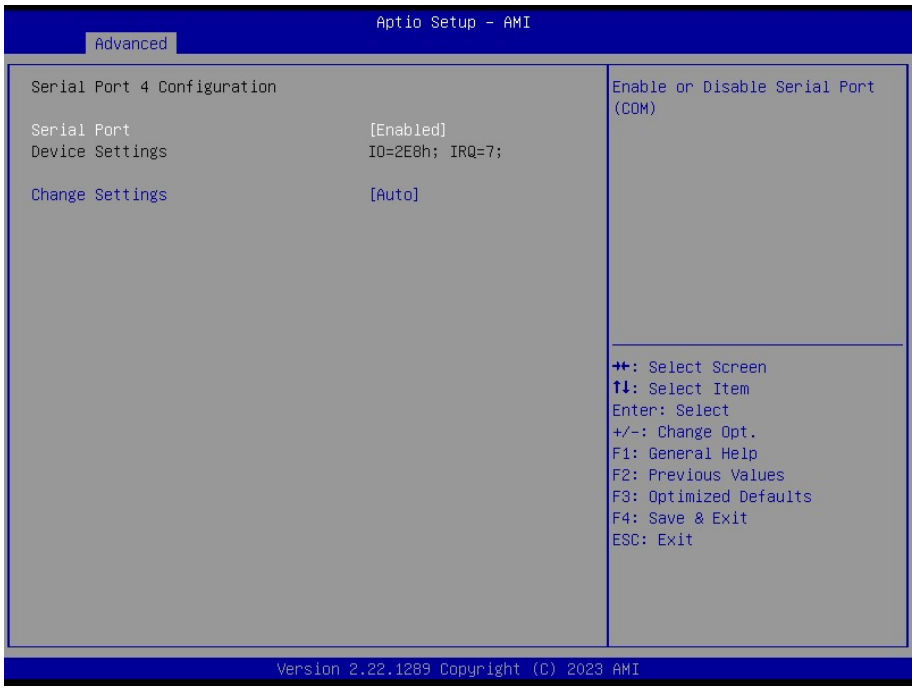
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=2F8h; IRQ4; IO=3F8h; IRQ3,4,5,6,7,9,10,11,12; IO=2F8h; IRQ3,4,5,6,7,9,10,11,12; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.5.3 Serial Port 3 Configuration



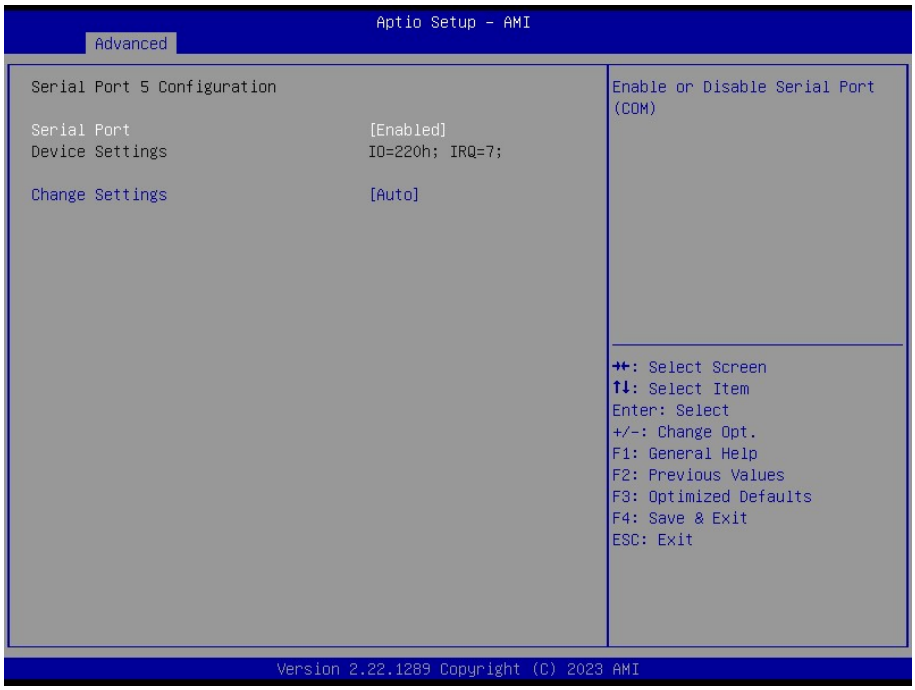
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=3E8h; IRQ7; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.5.4 Serial Port 4 Configuration



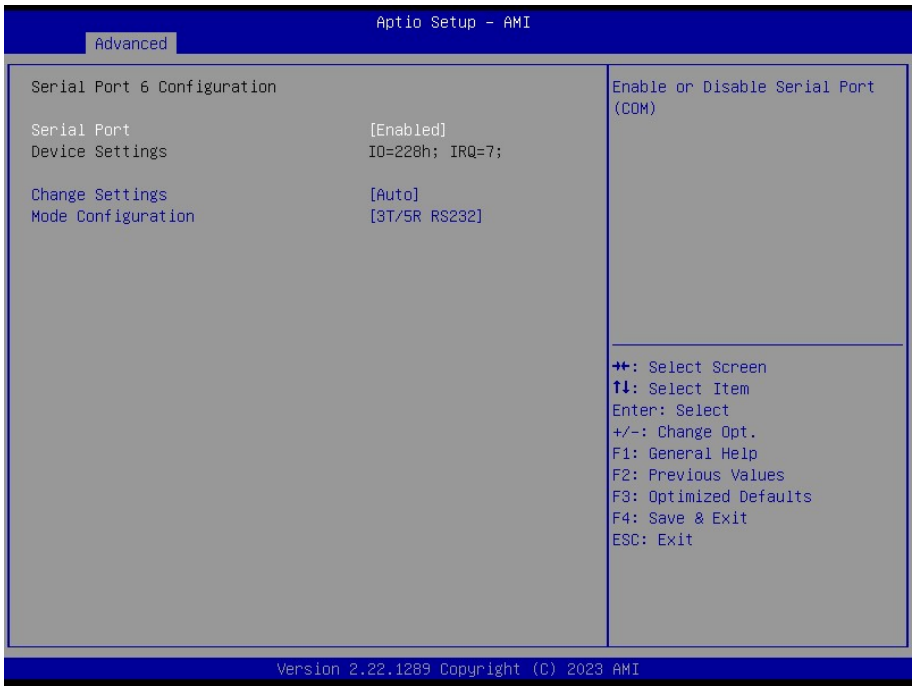
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=2E8h; IRQ6; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.5.5 Serial Port 5 Configuration



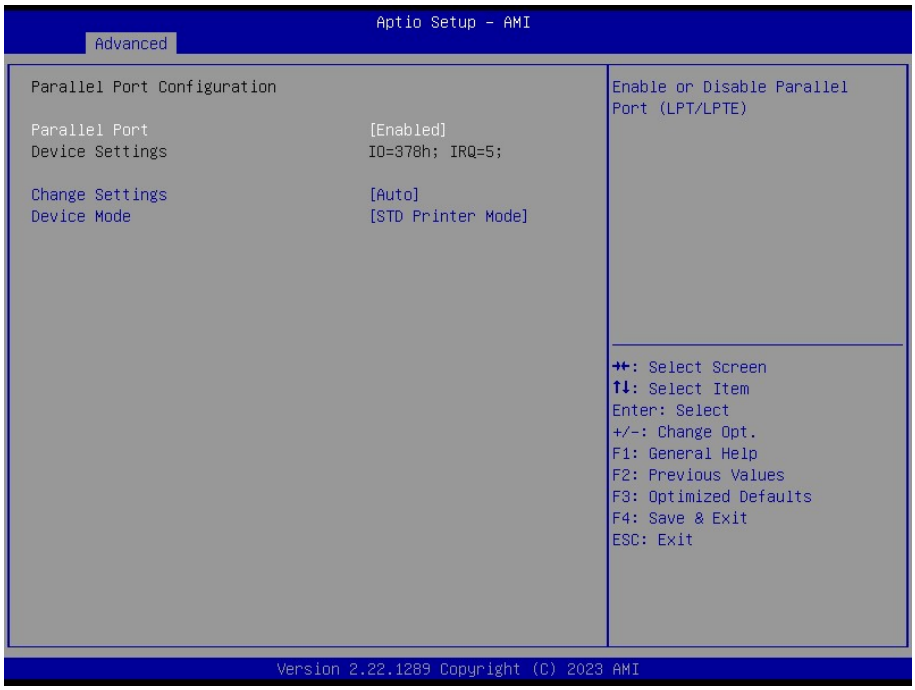
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=220h; IRQ=10; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device

3.6.2.5.6 Serial Port 6 Configuration



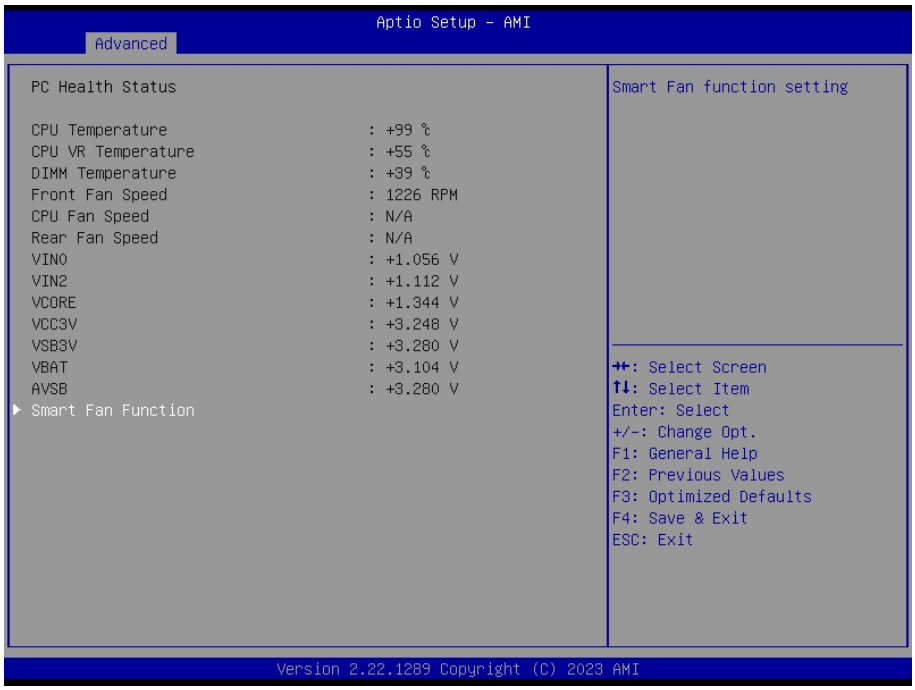
Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Serial Port (COM).
Change Settings	Auto**[Default]**, IO=228h; IRQ=11; IO=3E8h; IRQ3,4,5,6,7,9,10,11,12; IO=2E8h; IRQ3,4,5,6,7,9,10,11,12; IO=220h; IRQ3,4,5,6,7,9,10,11,12; IO=228h; IRQ3,4,5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device
Mode Configuration	1T/1R RS422 3T/5R RS232**[Default]**, 1T/1R RS485 TX ENABLE Low Active 1T/1R RS485 TX ENABLE High Active 1T/1R RS422 with termination resistor 1T/1R RS485 with termination resistor TX ENABLE Low Active Disabled	Configure serial port as RS232/RS422/RS485.

3.6.2.5.7 Parallel Port Configuration

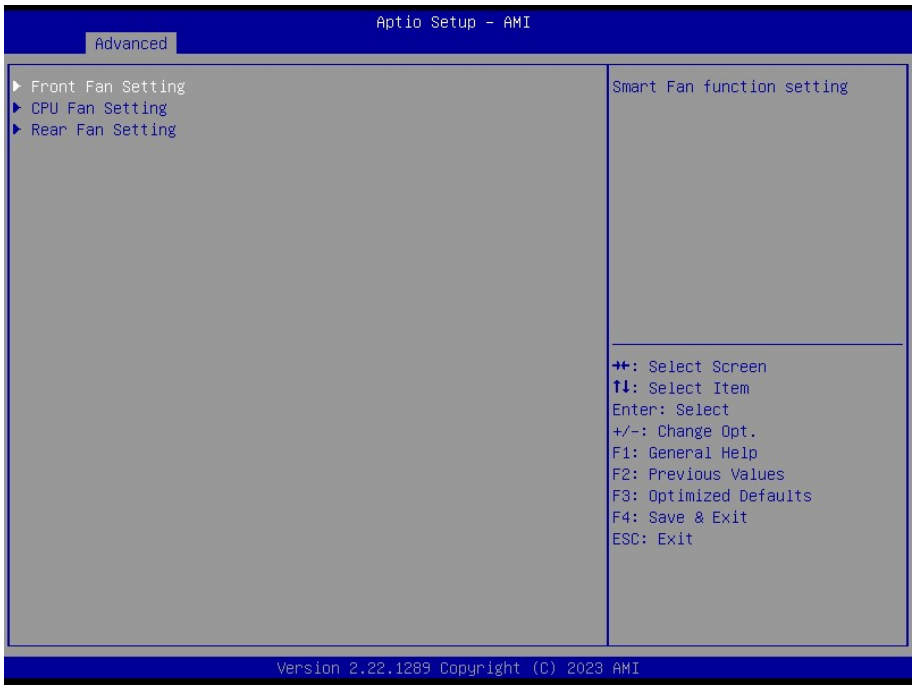


Item	Option	Description
Serial Port	Disabled Enabled**[Default]**,	Enable or Disable Parallel Port(LPT/LPTE)
Change Settings	Auto**[Default]**, IO=378h; IRQ=5; IO=378h; IRQ5,6,7,9,10,11,12; IO=278h; IRQ5,6,7,9,10,11,12; IO=3BCh; IRQ5,6,7,9,10,11,12;	Select an optimal settings for Super IO Device
Device Mode	STD Printer Mode**[Default]**, SPP Mode EPP-1.9 and SPP Mode EPP-1.7 and SPP Mode ECP Mode ECP and EPP 1.9 Mode ECP and EPP 1.7 Mode	Change the Printer Port mode.

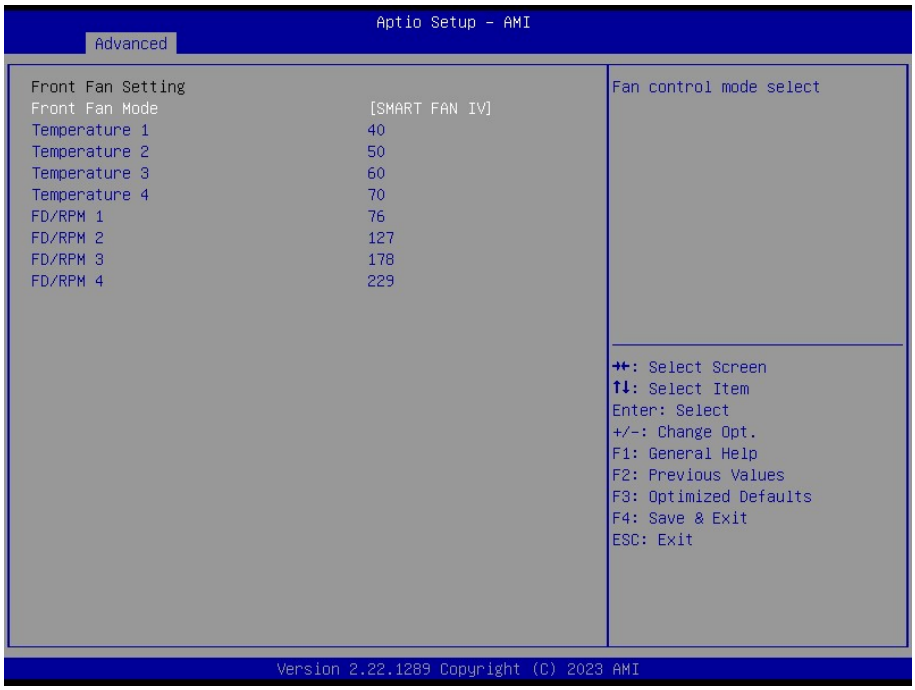
3.6.2.6 Hardware Monitor



3.6.2.6.1 Smart Fan Function

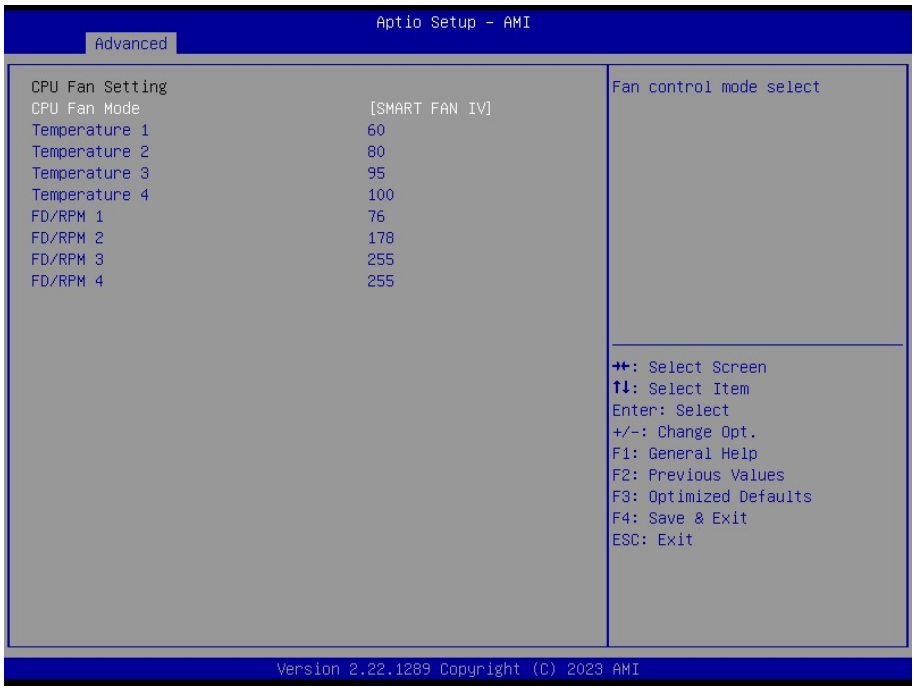


3.6.2.6.1.1 Front Fan setting



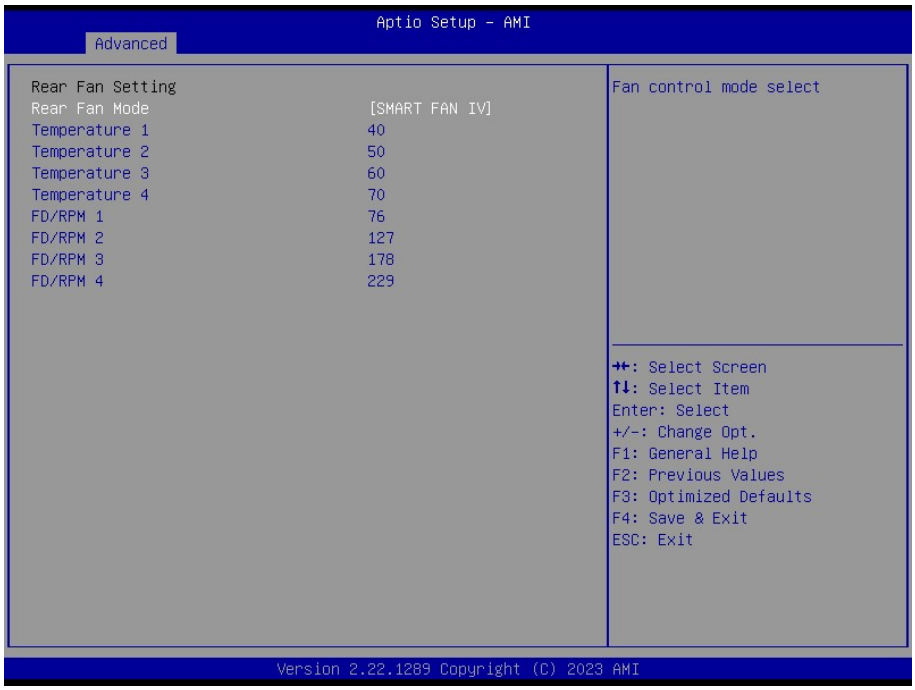
Item	Option	Description
Front Fan Mode	Manual mode SMART FAN IV**[Default]**,	Fan control mode select
Temperature 1	40	The value of temperature 1
Temperature 2	50	The value of temperature 2
Temperature 3	60	The value of temperature 3
Temperature 4	70	The value of temperature 4
FD/RPM 1	76	The value of Fan Duty/RPM when temperature is T1.
FD/RPM 2	127	The value of Fan Duty/RPM when temperature is T2.
FD/RPM 3	178	The value of Fan Duty/RPM when temperature is T3.
FD/RPM 4	229	The value of Fan Duty/RPM when temperature is T4.

3.6.2.6.1.2 CPU Fan setting



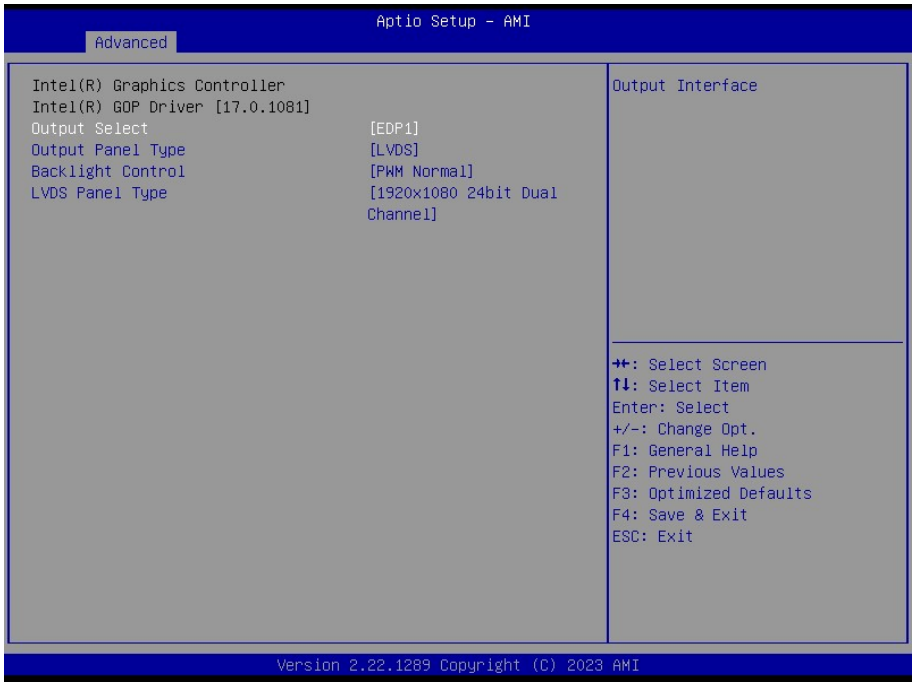
Item	Option	Description
CPU Fan Mode	Manual mode SMART FAN IV**[Default]**,	Fan control mode select
Temperature 1	60	The value of temperature 1
Temperature 2	80	The value of temperature 2
Temperature 3	95	The value of temperature 3
Temperature 4	100	The value of temperature 4
FD/RPM 1	76	The value of Fan Duty/RPM when temperature is T1.
FD/RPM 2	127	The value of Fan Duty/RPM when temperature is T2.
FD/RPM 3	255	The value of Fan Duty/RPM when temperature is T3.
FD/RPM 4	255	The value of Fan Duty/RPM when temperature is T4.

3.6.2.6.1.3 Rear Fan setting



Item	Option	Description
Rear Fan Mode	Manual mode SMART FAN IV**[Default]**,	Fan control mode select
Temperature 1	40	The value of temperature 1
Temperature 2	50	The value of temperature 2
Temperature 3	60	The value of temperature 3
Temperature 4	70	The value of temperature 4
FD/RPM 1	76	The value of Fan Duty/RPM when temperature is T1.
FD/RPM 2	127	The value of Fan Duty/RPM when temperature is T2.
FD/RPM 3	178	The value of Fan Duty/RPM when temperature is T3.
FD/RPM 4	229	The value of Fan Duty/RPM when temperature is T4.

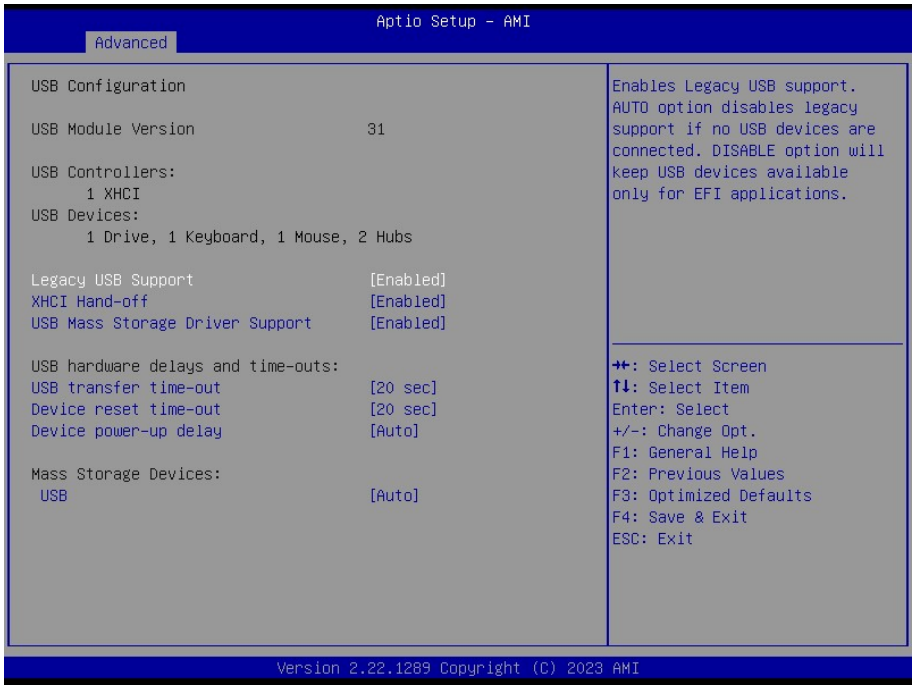
3.6.2.7 AMI Graphic Output Protocol Policy



Item	Options	Description
Output Select	Unknown Device	Output Interface
Output Panel Type	LVDS eDP Disabled**[Default]**,	Select Output Panel Type
Backlight Control	PWM Inverted PWM Normal**[Default]**,	Back Light Control Setting
LVDS Panel Type	800x600 18bit Single Channel 1024x768 18bit Single Channel 1024x768 24bit Single Channel 1280x768 18bit Single Channel 1280x800 24bit Single Channel 1280x960 18bit Single Channel 1280x1024 24bit Dual Channel 1366x768 18bit Single Channel 1366x768 24bit Single Channel 1440x900 24bit Dual Channel 1440x1050 24bit Dual Channel 1600x900 24bit Dual Channel 1680x1050 24bit Dual Channel 1600x1200 24bit Dual Channel 1920x1080 24bit Dual Channel**[Default]**, 1920x1200 24bit Dual Channel	Select LVDS panel used by Internal Graphics Device by selecting the appropriate setup item.

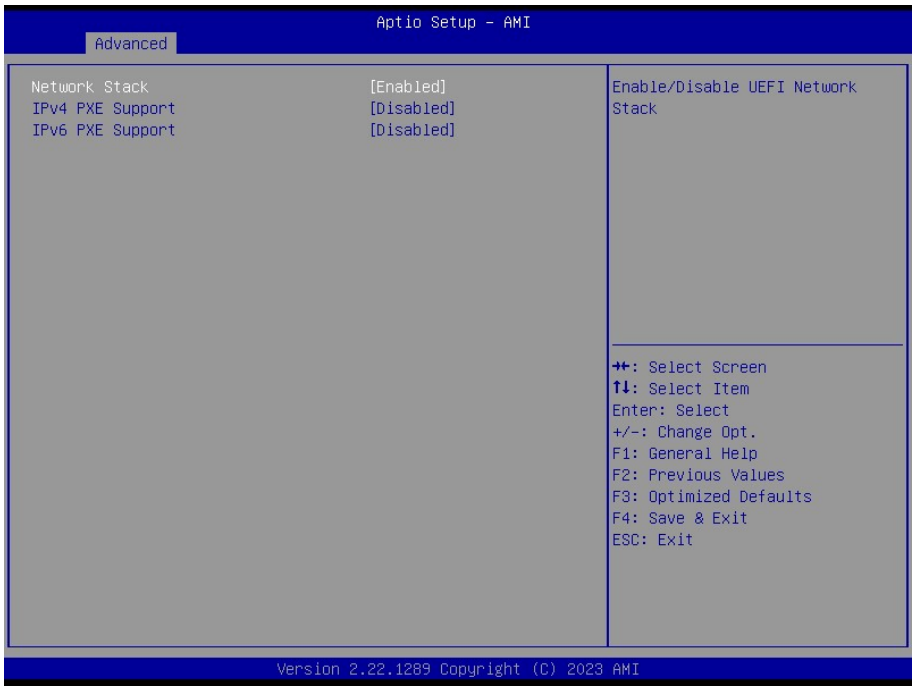
3.6.2.8 USB Configuration

The USB Configuration menu helps read USB information and configures USB settings.



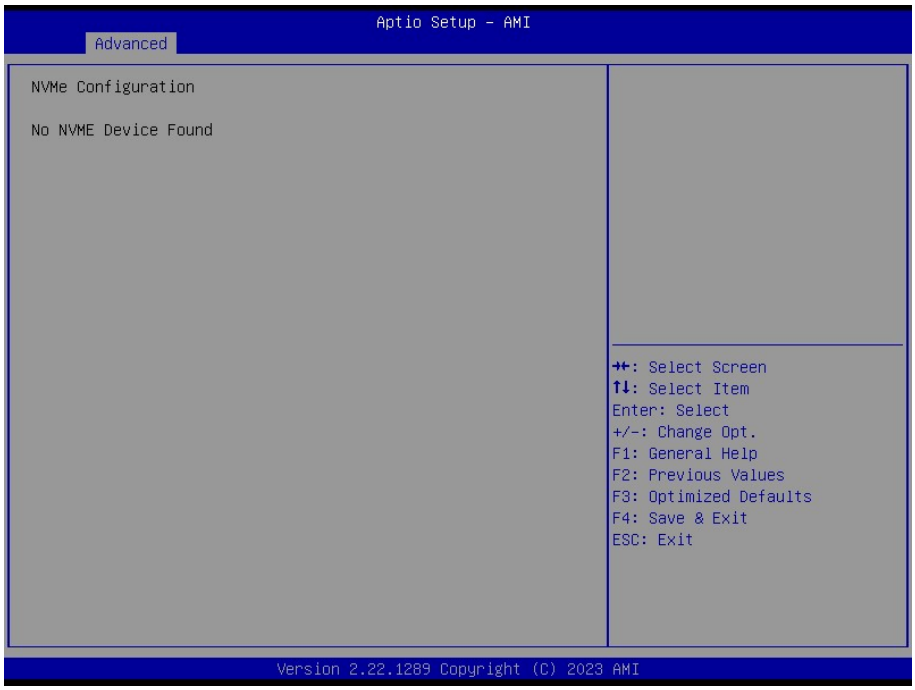
Item	Options	Description
Legacy USB Support	Enabled**[Default]**, Disabled Auto	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
EHCI Hand-off	Disabled Enabled**[Default]**,	This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.
USB Mass Storage Driver Support	Disabled Enabled**[Default]**,	Enable/Disable USB Mass Storage Driver Support.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec**[Default]**,	The time-out value for Control, Bulk, and Interrupt transfers.
Device reset time-out	10 sec 20 sec**[Default]**, 30 sec 40 sec	USB mass storage device Start Unit command time-out.
Device power-up delay	Auto**[Default]**, Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.

3.6.2.9 Network Stack Configuration



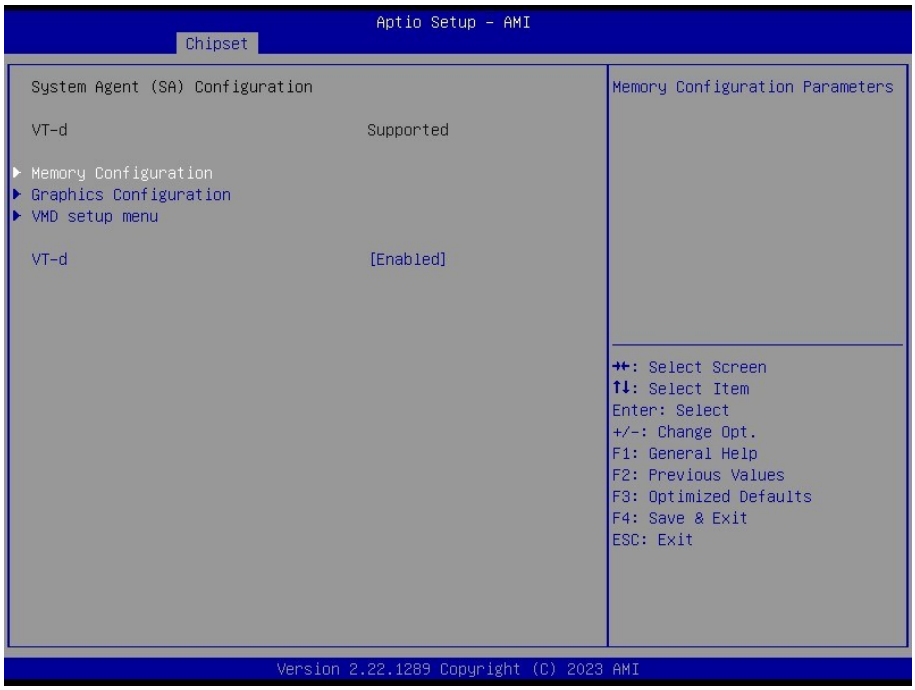
Item	Options	Description
Network stack	Disabled Enabled**[Default]**,	Enable/Disable UEFI Network stack.
Ipv4 PXE Support	Disabled**[Default]**, Enabled	Enable/Disable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot support will not be available.
Ipv6 PXE Support	Disabled**[Default]**, Enabled	Enable/Disable Ipv6 PXE Boot Support. If disabled IPV6 PXE boot support will not be available.

3.6.2.10 NVMe Configuration



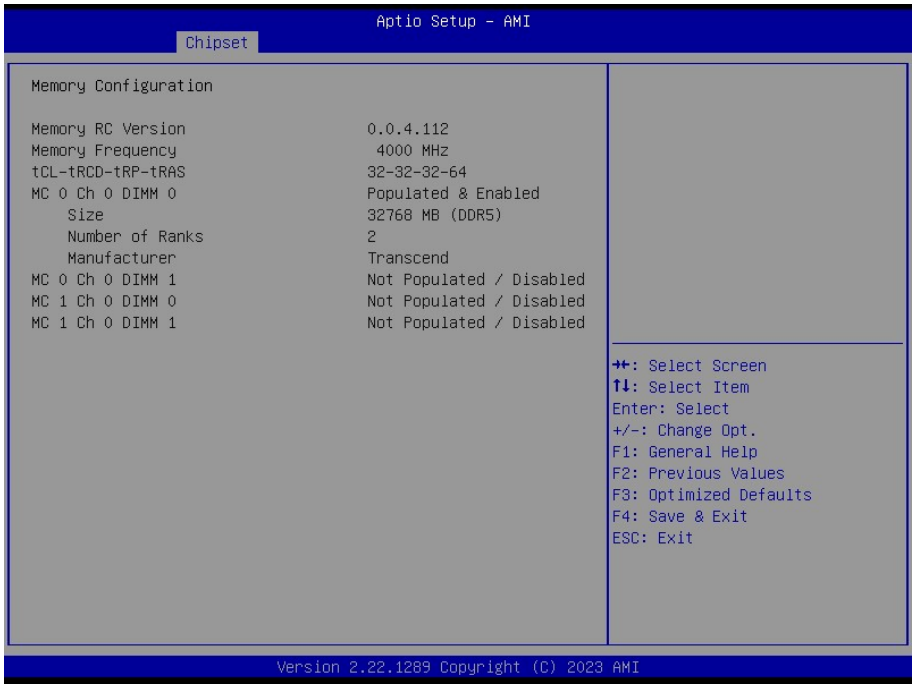
3.6.3 Chipset

3.6.3.1 System Agent (SA) Configuration

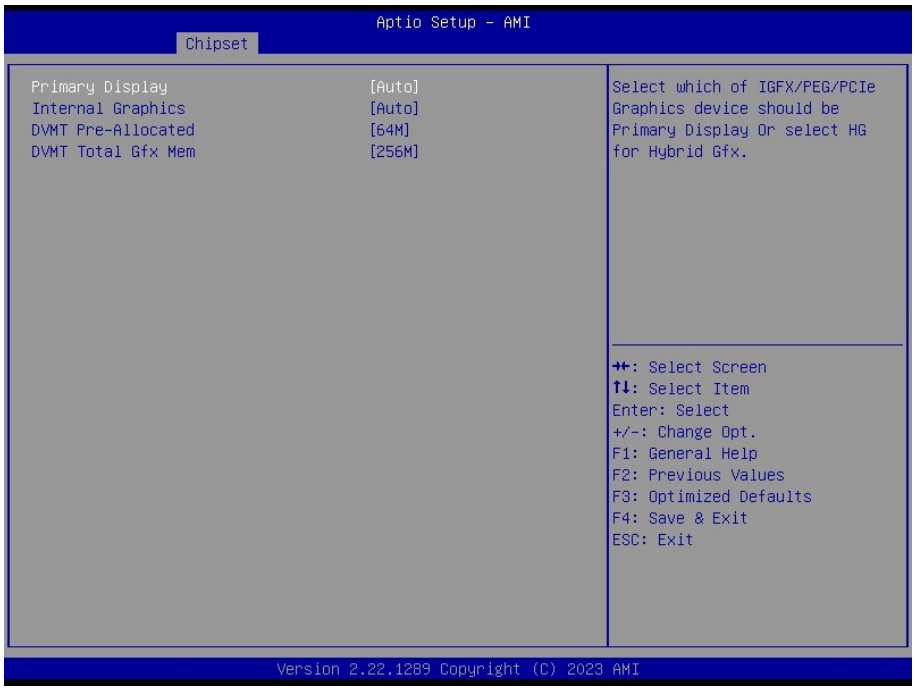


Item	Options	Description
VT-d	Disabled Enabled**[Default]**,	VT-d capability

3.6.3.1.1 Memory Configuration



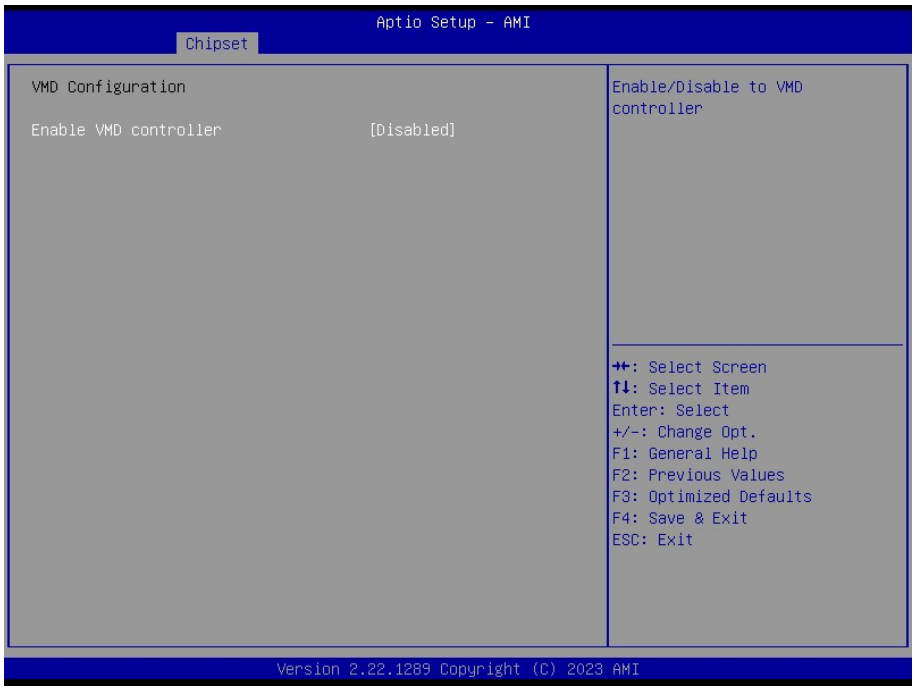
3.6.3.1.2 Graphics Configuration



Item	Options	Description
Primary Display	Auto**[Default]**, IGFX PEG Slot PCH PCIe HG	Select which of IGFX/PEG/PCIe Graphics device should be Primary Display Or select HG for Hybrid Gfx.
Internal Graphics	Auto**[Default]**, Disabled Enabled	Keep IGFX enabled based on the setup options.
PSMI SUPPORT	Disabled**[Default]**, Enabled	PSMI Enable/Disable
DVMT Pre-Allocated	0M 32M 64M**[Default]**, 96M 128M 160M 4M 8M 12M 16M 20M 24M 28M 32M/F7 36M 40M	Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

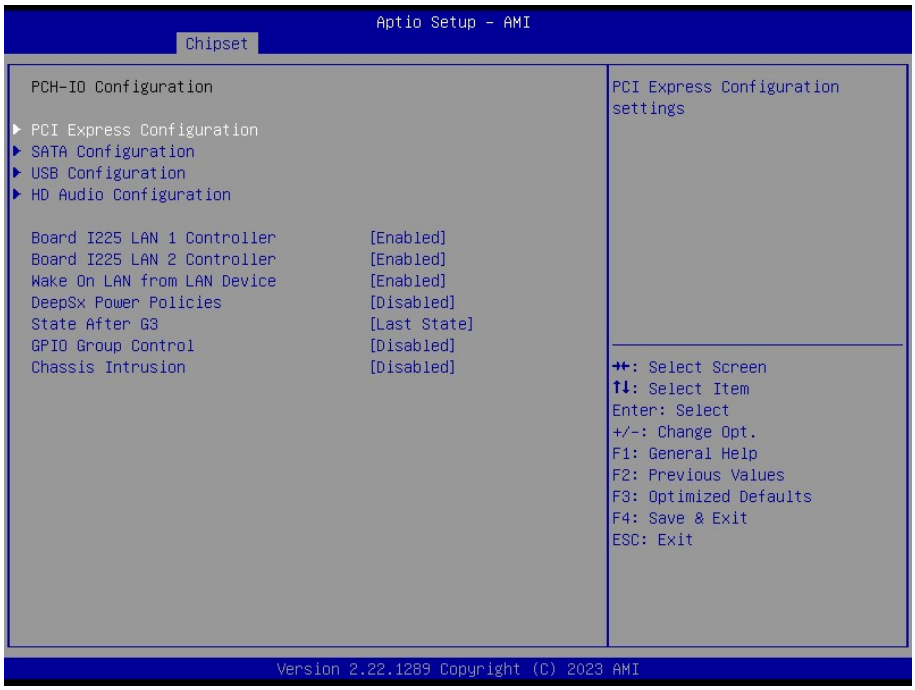
	44M 48M 52M 56M 60M	
DVMT Total Gfx Mem	128M 256M**[Default]**, MAX	Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

3.6.3.1.3 VMD setup menu



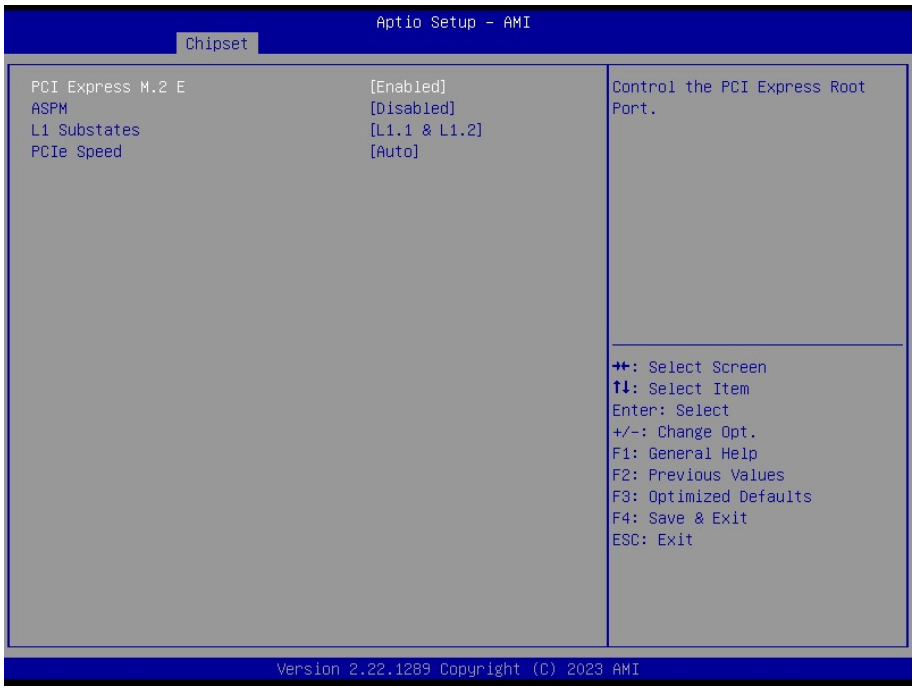
Item	Options	Description
Enabled VMD controller	Disabled**[Default]**, Enabled	Enable/Disable to VMD controller

3.6.3.2 PCH-IO Configuration



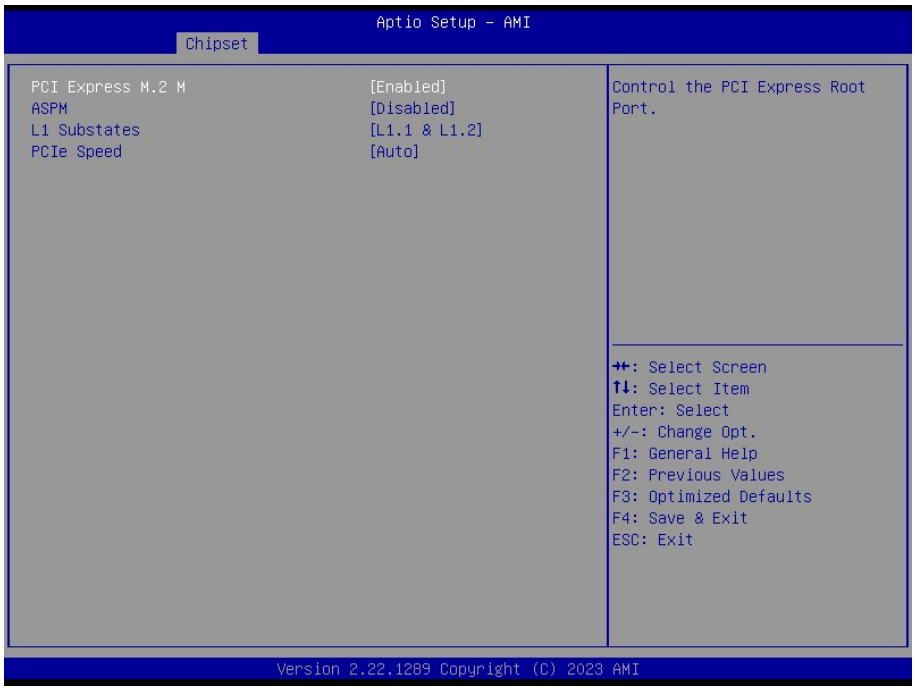
Item	Options	Description
LVDS Board I225 LAN 1 Controller	Enabled**[Default]**, Disabled	Enable or disable onboard I225 LAN 1
LVDS Board I225 LAN 2 Controller	Enabled**[Default]**, Disabled	Enable or disable onboard I225 LAN 2
Wake On Lan from LAN Device	Enabled**[Default]**, Disabled	Enable or disable WOL from I225 LAN Device.
DeepSx Power Policies	Disabled**[Default]**, Enabled in S4-S5-Battery Enabled in S5-Battery Enabled in S4-S5 Enabled in S5	configure the DeepSx Mode configuration.
State After G3	S0 State S5 State Last State**[Default]**,	Specify what state to go to when power is re-applied after a power failure (G3 state).
GPIO Group Control	Disabled**[Default]**, Enabled	GPIO Header Control Enable/Disable.
Chassis Intrusion	Disabled**[Default]**, Enabled Reset	Configure Chassis Intrusion.

3.6.3.2.1.1 PCI Express M.2 E



Item	Options	Description
PCI Express M.2 E	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled L1**[Default]**, Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]**, Gen1 Gen2 Gen3	Configure PCIe Speed

3.6.3.2.1.2 PCI Express M.2 M

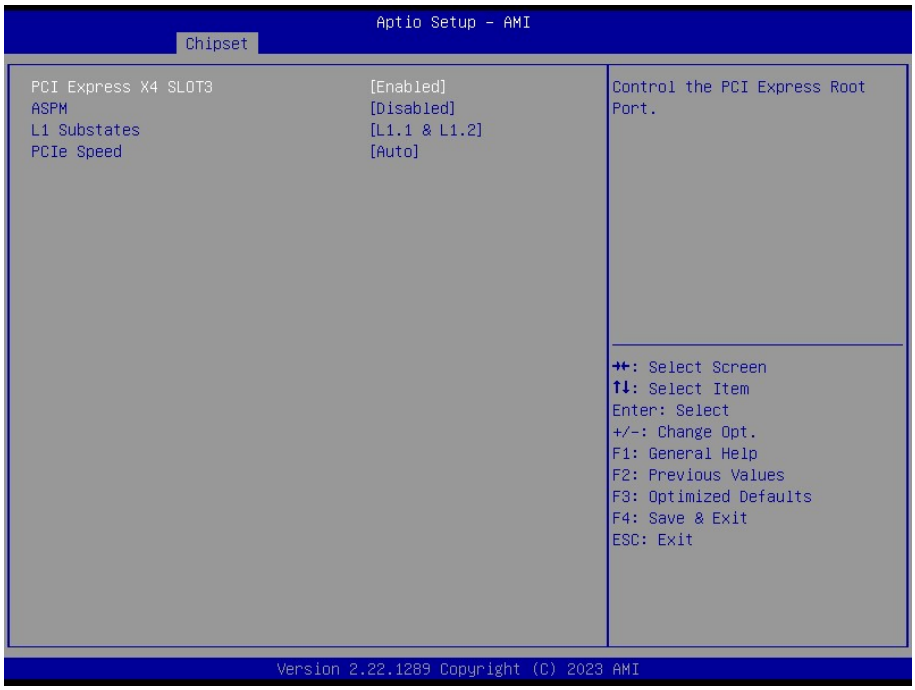


Item	Options	Description
PCI Express M.2 M	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled L1**[Default]**, Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]**, Gen1 Gen2 Gen3	Configure PCIe Speed

3.6.3.2.1.3 PCI Express X4 Open End

Item	Options	Description
PCI Express X4 Open End	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled L1**[Default]**, Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]**, Gen1 Gen2 Gen3	Configure PCIe Speed

3.6.3.2.1.4 PCI Express X4 SLOT3

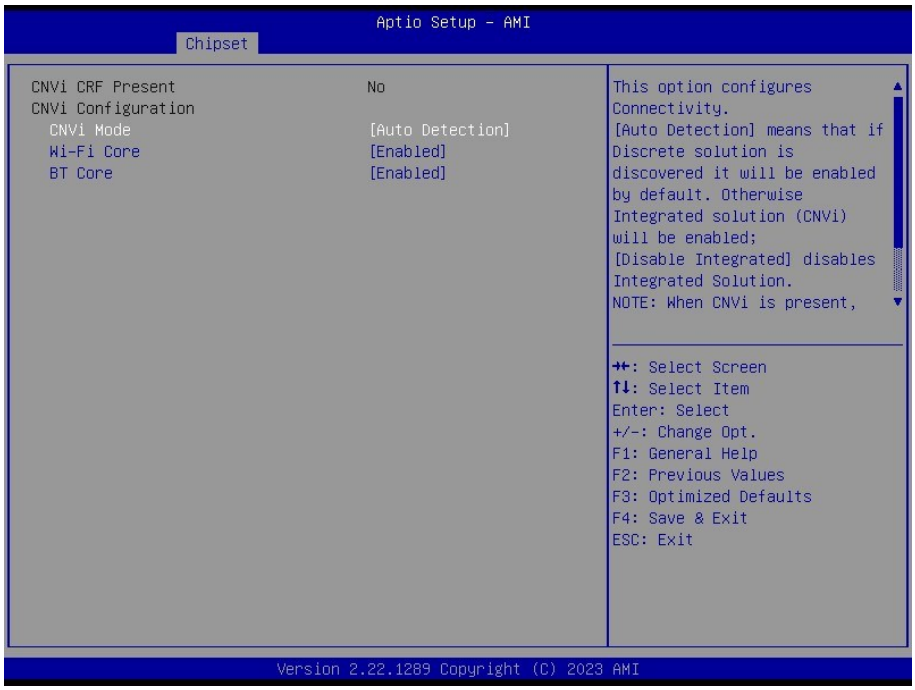


Item	Options	Description
PCI Express X4 SLOT3	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled L1**[Default]**, Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]**, Gen1 Gen2 Gen3	Configure PCIe Speed

3.6.3.2.1.5 PCI Express X4 SLOT4

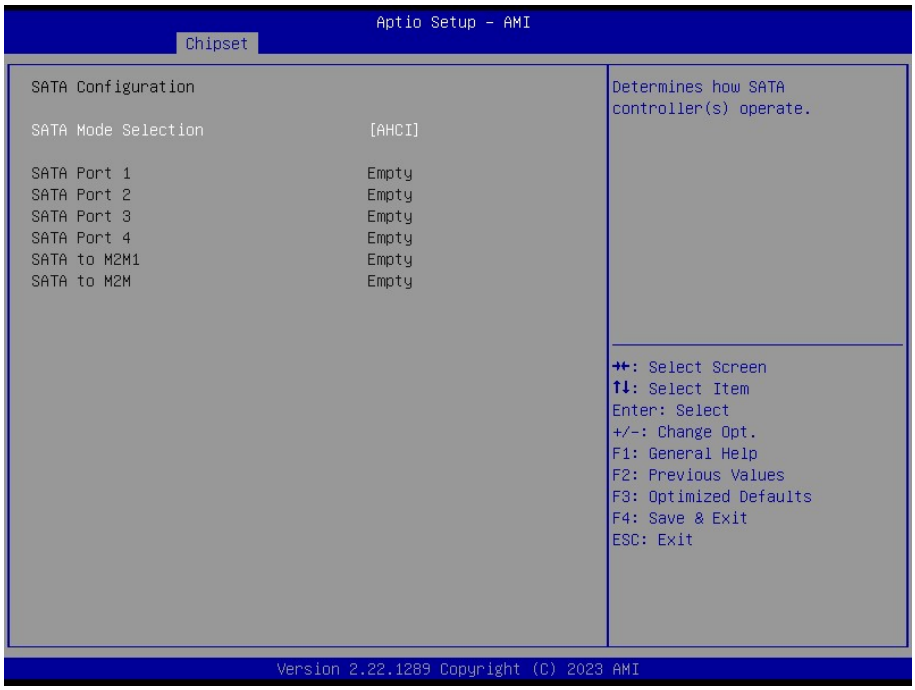
Item	Options	Description
PCI Express X4 SLOT4	Disabled Enabled**[Default]**,	Control the PCI Express Root Port.
ASPM	Disabled L1**[Default]**, Auto	Set the ASPM Level: Force L0s - Force all links to L0s State AUTO - BIOS auto configure DISABLE - Disables ASPM
L1 Substates	Disabled L1.1 L1.1 & L1.2**[Default]**,	PCI Express L1 Substates settings.
PCIe Speed	Auto**[Default]**, Gen1 Gen2 Gen3	Configure PCIe Speed

3.6.3.2.1.6 Connectivity Configuration



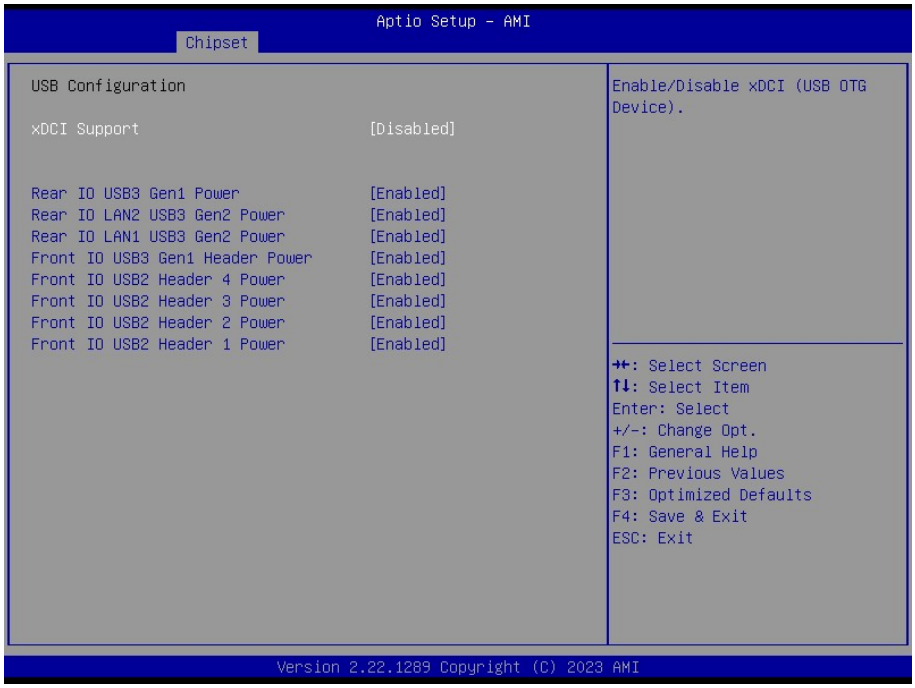
Item	Options	Description
CNVi Mode	Disable Integrated Auto Detection**[Default]**,	This option configures Connectivity. [Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVi) will be enabled; [Disable Integrated] is disables Integrated Solution. NOTE: When CNVi is present, the GPIO pins that are used for radio
Wi-Fi Core	Enabled**[Default]**, Disabled	This is an option intended to Enable/Disable Wi-Fi Core in CNVi
BT Core	Enabled**[Default]**, Disabled	This is an option intended to Enable/Disable BT Core in CNVi

3.6.3.2.2 SATA Configuration



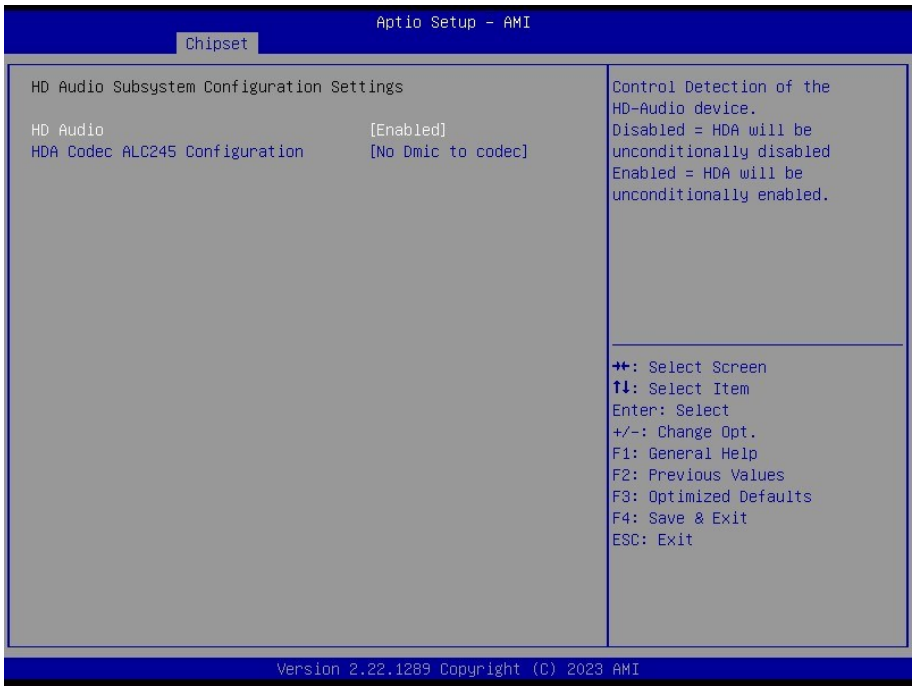
Item	Options	Description
SATA Mode Selection	AHCI	Determines how SATA controller(s) operate.

3.6.3.2.3 USB Configuration



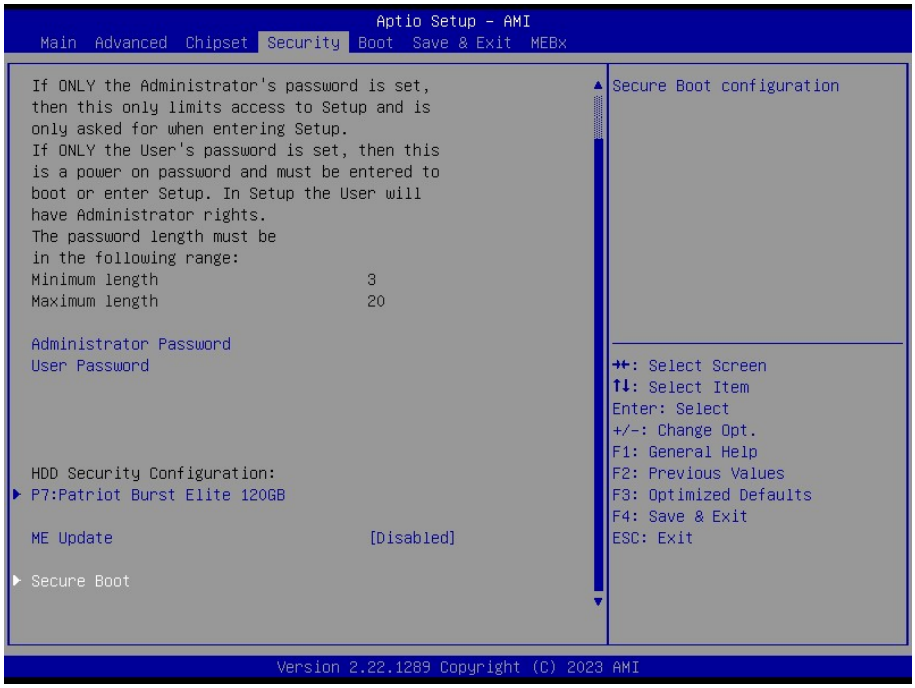
Item	Options	Description
xDCI Support	Disabled**[Default]**, Enabled	Enable/Disable xDCI (USB OTG Device).
Rear IO USB3 Gen1 Power	Disabled Enabled**[Default]**,	Enable/Disable Upper/Lower USB ports of USB3 Rack.
Rear IO LAN2 USB3 Gen2 Power	Disabled Enabled**[Default]**,	Enable/Disable Upper/Lower USB ports of i225 RJ45 Rack.
Rear IO LAN1 USB3 Gen2 Power	Disabled Enabled**[Default]**,	Enable/Disable Upper/Lower USB ports of i225 RJ45 Rack.
Front IO USB3 Gen1 Header Power	Disabled Enabled**[Default]**,	Enable/Disable USB3 Gen1 ports of USB3 Header.
Front IO USB2 Header 4 Power	Disabled Enabled**[Default]**,	Enable/Disable USB ports of USB2 Header 4.
Front IO USB2 Header 3 Power	Disabled Enabled**[Default]**,	Enable/Disable USB ports of USB2 Header 3.
Front IO USB2 Header 2 Power	Disabled Enabled**[Default]**,	Enable/Disable USB ports of USB2 Header 2.
Front IO USB2 Header 1 Power	Disabled Enabled**[Default]**,	Enable/Disable USB ports of USB2 Header 1.

3.6.3.2.4 HD Audio Configuration



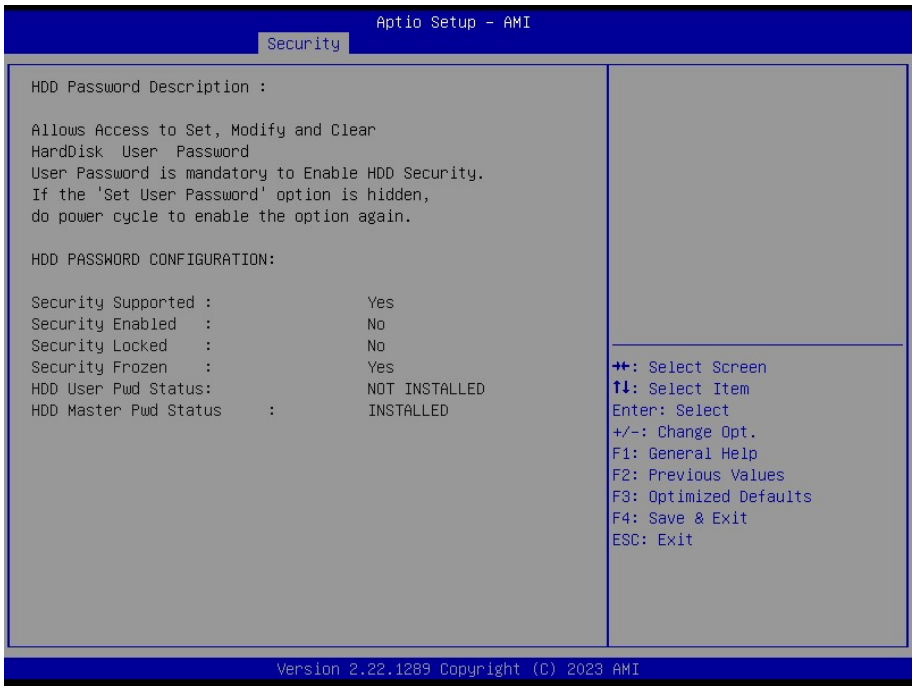
Item	Options	Description
HD Audio	Disabled Enabled**[Default]**,	Control Detection of HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled

3.6.4 Security

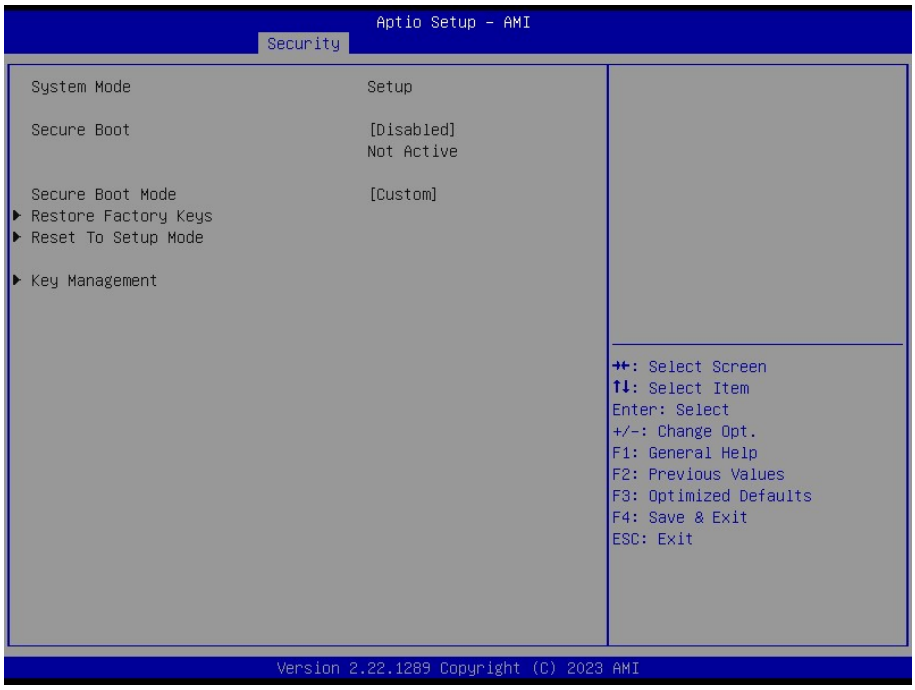


Item	Description
Administrator Password	Set Administrator Password
User Password	Set User Password
ME Update	Flash Security Override.

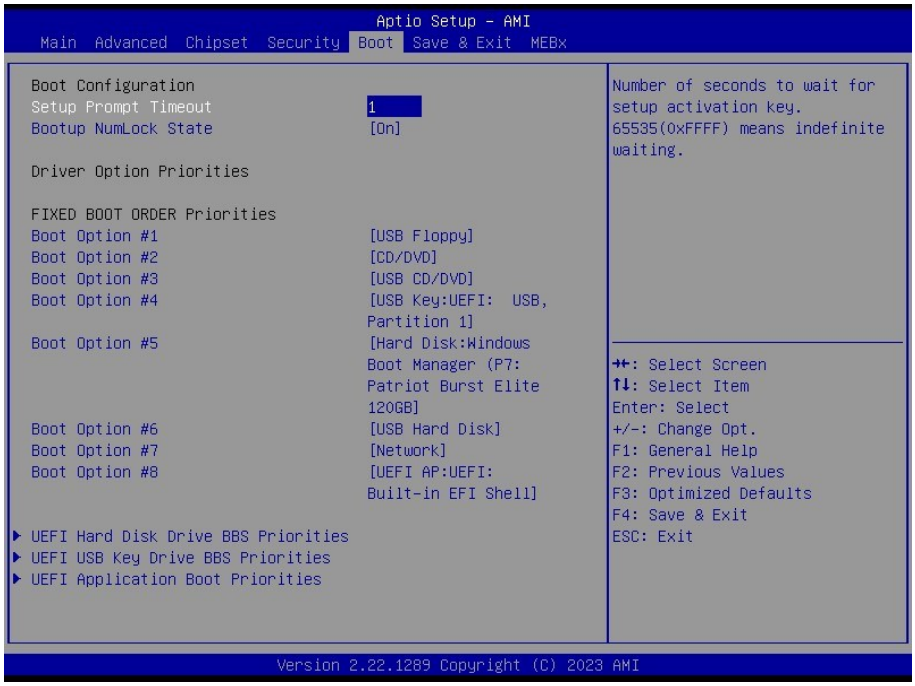
3.6.4.1 P7:Patriot Burst Eilte 120GB



3.6.4.2 Secure Boot



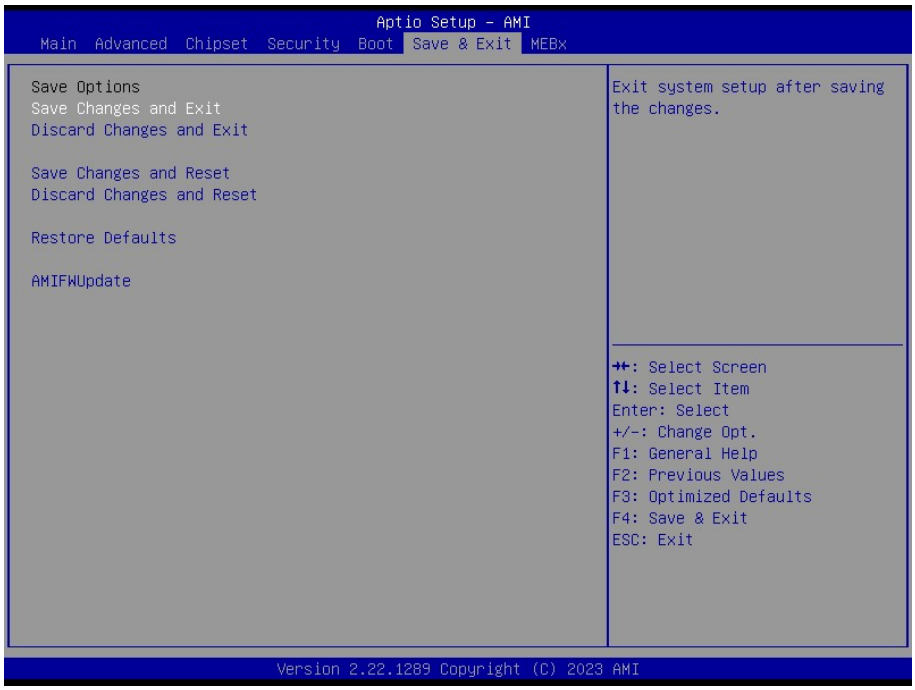
3.6.5 Boot



Item	Options	Description
Setup Prompt Timeout	1	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinit waiting.
Bootup NumLock State	On**[Default]**, Off	Select the keyboard NumLock state
Boot Option #1	USB Floppy**[Default]**, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #2	USB Floppy, CD/DVD**[Default]**, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #3	USB Floppy, CD/DVD, USB CD/DVD**[Default]**, Hard Disk , USB Key, USB Hard Disk , NVME, Network, UEFI AP, Disabled	Sets the system boot order

Boot Option #4	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk**[Default]** , USB Key, USB Hard Disk , NVME, Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #5	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key**[Default]**, USB Hard Disk , NVME, Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #6	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk**[Default]** , NVME, Network, UEFI AP, Disabled	Sets the system boot order
Boot Option #7	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network**[Default]**, UEFI AP, Disabled	Sets the system boot order
Boot Option #8	USB Floppy, CD/DVD, USB CD/DVD, Hard Disk , USB Key, USB Hard Disk , NVME, Network, UEFI AP**[Default]**, Disabled	Sets the system boot order

3.6.6 Save & Exit



3.6.6.1 Save Changes and Reset

Reset the system after saving the changes.

3.6.6.2 Discard Changes and Reset

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The setup program then exits and reboots the controller.

3.6.6.3 Restore Defaults

This option restores all BIOS settings to the factory default. This option is useful if the controller exhibits unpredictable behavior due to an incorrect or inappropriate BIOS setting.

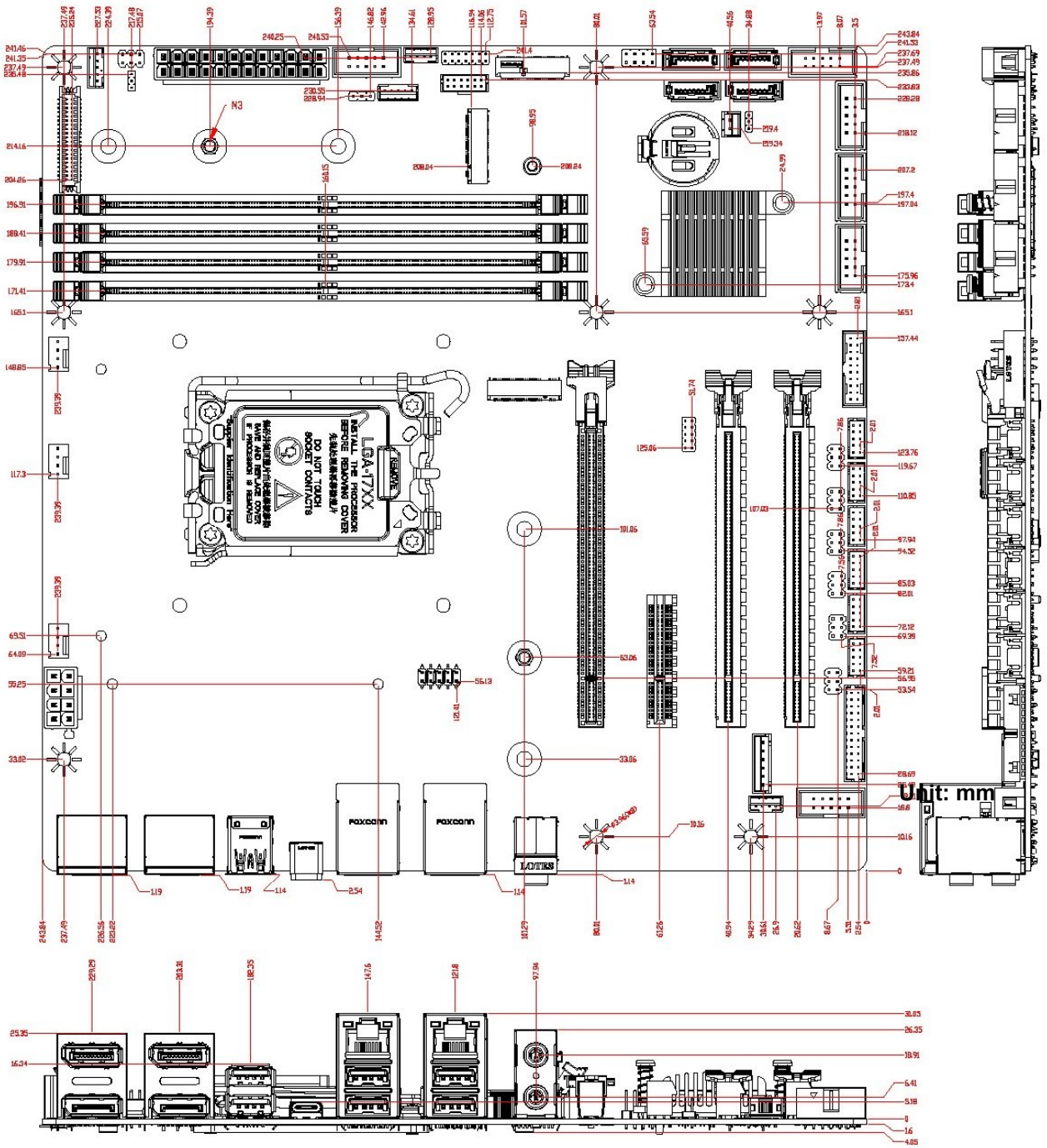
3.6.6.4 AMIFWUpdate

Launches AMFWUpdate.

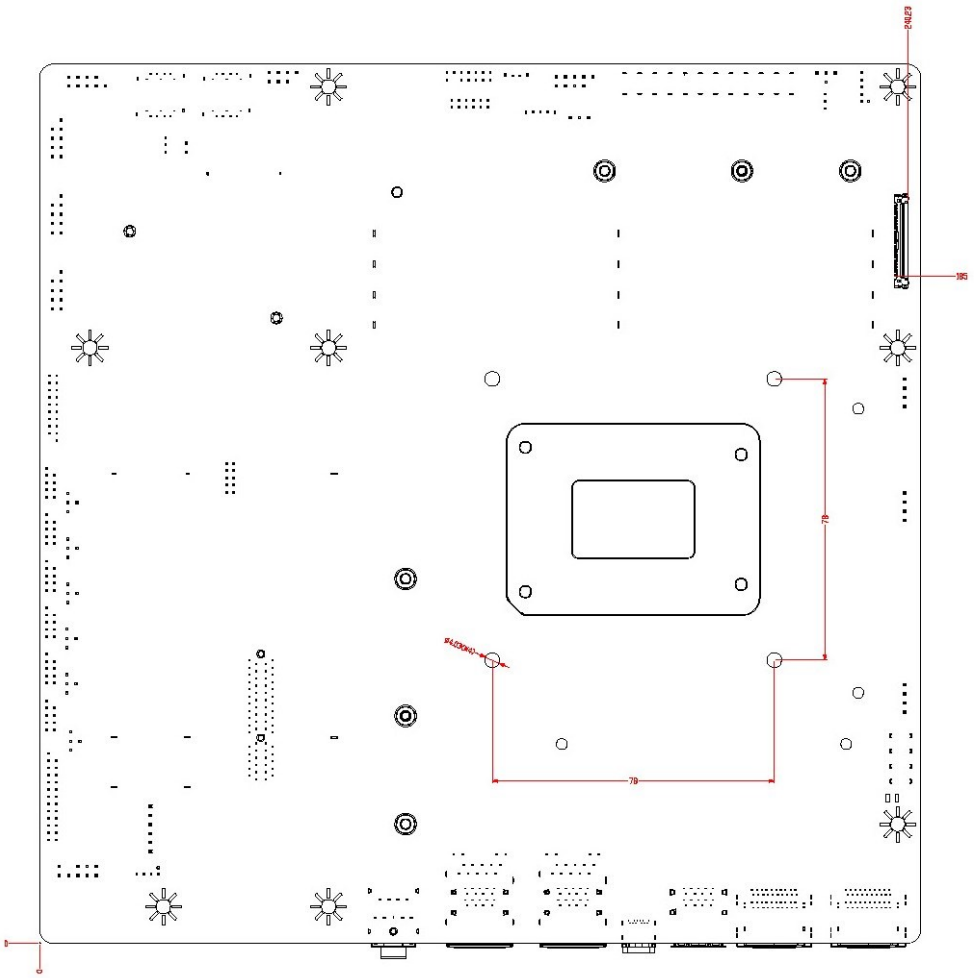
3.6.7 Save & Exit

4. Mechanical Drawing

4.1 Mechanical Drawing



Unit: mm



Unit: mm