



User Manual

AIMB-208

**Mini-ITX Motherboard
12th/13th Gen Intel® Core™
Processor, LGA1700
(Codename: Alder Lake-S/
Raptor Lake-S)**

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A Message to the Customer

Advantech Customer Services

Each and every Advantech 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 Advantech equipment 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 Advantech has come to be known. Your satisfaction is our primary concern. Here is a guide to Advantech'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.

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In addition, free technical support is available from Advantech engineers every business day. We are always ready to give advice on application requirements or specific information on the installation and operation of any of our products.

Declaration of Conformity

FCC Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference 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 device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

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

CPU Compatibility

Processor Number	Max. TDP	Code Name	Cores/Threads	S-Spec
i9-13900	65W	Raptor Lake	8P+16E/32T	SRMB6
i9-13900E	65W	Raptor Lake	8P+16E/32T	SRMG2
i9-13900TE	35W	Raptor Lake	8P+16E/32T	SRMG1
i7-13700	65W	Raptor Lake	8P+8E/24T	SRMBA
i7-13700E	65W	Raptor Lake	8P+8E/24T	SRMG3
i7-13700TE	35W	Raptor Lake	8P+8E/24T	SRMG4
i5-13500	65W	Raptor Lake	6P+8E/20T	SRMBM
i5-13500E	65W	Raptor Lake	6P+8E/20T	SRMFW
i5-13500TE	35W	Raptor Lake	6P+8E/20T	SRMFZ
i5-13400	65W	Raptor Lake	6P+4E/16T	SRMBF
i5-13400E	65W	Raptor Lake	6P+4E/16T	SRMG5
i3-13100	60W	Raptor Lake	4P+0E/8T	SRMBU
i3-13100E	60W	Raptor Lake	4P+0E/8T	SRMFR
i3-13100TE	35W	Raptor Lake	4P+0E/8T	SRMFT
i9-12900	65W	Alder Lake	8P+8E/24T	SRL4K
i9-12900E	65W	Alder Lake	8P+8E/24T	SRL6B
i9-12900TE	35W	Alder Lake	8P+8E/24T	SRL6C
i7-12700	65W	Alder Lake	4P+8E/20T	SRL4Q
i7-12700E	65W	Alder Lake	8P+8E/24T	SRL6D
i7-12700TE	35W	Alder Lake	8P+8E/24T	SRL6E
i5-12500	65W	Alder Lake	6P+6E/12T	SRL5V
i5-12500E	65W	Alder Lake	6P+6E/12T	SRL6W
i5-12500TE	35W	Alder Lake	6P+6E/12T	SRL6V
i5-12400	65W	Alder Lake	6P+6E/12T	SRL5Y
i3-12100	60W	Alder Lake	4P+4E/8T	SRL62
i3-12100E	60W	Alder Lake	4P+4E/8T	SRL6U
i3-12100TE	35W	Alder Lake	4P+4E/8T	SRL6T
G7400E	46W	Alder Lake	2P+2E/4T	SRL6R
G7400TE	35W	Alder Lake	2P+2E/4T	SRL6S
G6900E	46W	Alder Lake	2P+2E/4T	SRL6Q
G6900TE	35W	Alder Lake	2P+2E/2T	SRL6P

Memory Compatibility

Category	Speed	Capacity	Vendor	Module_P/N	Chip_P/N	ADVANTECH P/N
DDR4	3200	32GB	Advantech	AQD-SD4U32GN32-SB	SEC019 K4AAG08 5WABCWE	AQD-SD4U32GN32-SB
DDR4	3200	32GB	Advantech	SQR-SD4N32G3K2SNAB	SEC146 K4AAG08 5WABCWE	SQR-SD4N32G3K2SNAB
DDR4	3200	16GB	Advantech	SQR-SD4N16G3K2SNCB	SEC001 K4A8G08 5WCBCWE	SQR-SD4N16G3K2SNCB
DDR4	2666	16GB	Advantech	AQD-SD4U16N26-SE	SEC 928 K4A8G08 5WC BCTD	AQD-SD4U16N26-SE
DDR4	2133	8GB	Advantech	AQD-SD4U8GN21-SG	SEC 552 BCPB K4A4G085WD	AQD-SD4U8GN21-SG
DDR4	3200	8GB	Advantech	AQD-SD4U8GN32-SE	SEC001 K4A8G08 5WCBCWE	AQD-SD4U8GN32-SE
DDR4	2666	8GB	Advantech	SQR-SD4N8G2K6SNBCB	SEC 837 K4A8G08 5WC BCTD	SQR-SD4N8G2K6SNBCB
DDR4	3200	4GB	Advantech	SQR-SD4N4G2K6SNEFB	SEC225 K4A8G16 5WCBCWE	SQR-SD4N4G3K2SNPCB
DDR4	2400	4GB	Advantech	SQR-SD4N4G2K4SNEFB	SEC007 K4A4G08 5WFBCTD	SQR-SD4N4G2K4SNEFB

Storage Compatibility

SATA SSD

Interface	Category	Capacity	Vendor	Model	ADVANTECH P/N	Bandwidth Performance
SATA	2.5" SSD	7680GB	Advantech	SQF-S25VF-7K6GCSCC	SQF-S25VF-7K6GCSCC	SATA III
SATA	2.5" SSD	1920GB	Advantech	SQF-S25ZF-1K9GCSCE	SQF-S25ZF-1K9GCSCE	SATA III
SATA	2.5" SSD	512GB	Advantech	MTFDDAK512TDL-1AW1ZABYY	96FD25-ST512G-M13	SATA III
SATA	2.5" SSD	256GB	Advantech	AMF-S25M2-256G-MAC	AMF-S25M2-256G-MAC	SATA III

M.2 Compatibility

Dimension	Interface	Bandwidth Performance	Category	Vendor	Model	ADVANTECH P/N
2230	M.2 A+E Key	PCIe / USB	Wireless LAN + Bluetooth	Advantech	EWM-W192M201E	EWM-W192M201E
2230	M.2 A+E Key	PCIe / USB	Wireless LAN + Bluetooth	Advantech	AIW-163BR	AIW-163BR
2230	M.2 A+E Key	PCIe / USB	Wireless LAN + Bluetooth	Advantech	EWM-W165M203E	EWM-W165M203E
2230	M.2 A+E Key	PCIe / USB	Wireless LAN + Bluetooth	Advantech	EWM-W159M201E	EWM-W159M201E
2230	M.2 A+E Key	SATA III	NVMe PCIe SSD	Advantech	SQF-CM3V1-512G-EDC	SQF-CM3V1-512G-EDC
2242	M.2 B+M Key	SATA III	SSD	Advantech	SQF-SM4Z2-128GCSBE	SQF-SM4Z2-128GCSBE
2242	M.2 B+M Key	SATA III	SSD	Advantech	SQF-SM4Z2-128GCSBC	SQF-SM4Z2-128GCSBC
2242	M.2 M Key	PCIe	NVMe PCIe SSD	Advantech	SQF-C4MV4-2TD-EDC	SQF-C4MV4-2TD-EDC

Ordering Information

P/N	Chipset	HDMI	DP	LVDS/eDP	GbE	COM	SATAIII	USB3.2	USB2.0	M.2 M key	M.2 E key	PCIex16	TPM	AMP
AIMB-208HF-LAA1	H610E	1	2	1/(1)	2	6	2	4	6	1	1	1	(1)	(1)
AIMB-208HL-LAA1	H610E	1	1	eDP	1	2	2	2	6	1	1	1	(1)	(1)

*() Supports by BOM options

* () supported by BOM options

Initial Inspection

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

- 1 x SATA HDD cable
- 1 x 1-to-1 serial port cable, 50 cm
- 1 x I/O port bracket
- 1 x Startup Manual for AIMB-208
- 1 x Warranty card

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-208 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-208, 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.

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Chapter 1

General Information

1.1 Introduction

AIMB-208 is designed with the Intel® H610E PCH for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel® desktop Core™ i9/i7/i5/i3/Pentium®/Celeron® processors with up to 36 MB L3 cache and 2 DDR4 3200 MT/s SO-DIMM, up to 64 GB. There is rich I/O connectivity with 6 serial ports, 10 x USB, 2 x GbE LAN, 2 x SATA III, and 1 x PCIe x16 Gen4.

1.2 Features

- **I/O expansion:** 6 x serial ports, 4 x USB 3.2 Gen1, and 6 x USB 2.0, 2 x SATA III, 1 x M.2 M-Key, 1 x M.2 E-Key, 2 x GbE LAN, and 1 x PCIe x16 Gen4.
- **Standard Mini-ITX form factor with industrial features:** The AIMB-208 is a full-featured Mini-ITX motherboard with balanced expandability and performance.
- **Wide selection of storage devices:** SATA HDD, M.2 (M-Key and E-Key), customers benefit from the flexibility of using the most suitable storage device for the capacity they need.

1.3 Specifications

1.3.1 System

- **CPU:** Supports Intel® Core™ i9/i7/i5/i3 LGA1700 CPU (up to 65W)
- **BIOS:** AMI EFI 256 Mbit SPI BIOS
- **System chipset:** Intel® H610E
- **Storage interface:**
2 x on-board Serial ATA3 connectors with a data transmission rate of up to 6.0 GB/s, supporting Advanced Host Controller Interface (AHCI) technology. 1 x M.2 (M-Key), supporting PCIe x4 (NVMe).

1.3.2 Memory

- **RAM:** 2 x 260-pin SODIMM sockets, supporting dual-channel DDR4 3200 MT/s SODIMM, up to 64GB Max.

1.3.3 Input/Output

- **Serial ports:** 6 x serial ports, supporting RS-232. COM2 supports RS-232/422/485 (optional).
- **USB ports:** Supports up to 4 x USB 3.2 Gen1 and 6 x USB 2.0.
- **GPIO connector:** 8-bit general purpose Input/Output.

1.3.4 Graphics

- **Controller:** Intel® HD graphics 770
- **eDP:** Supports max. resolution 4096 x 2304 @ 60Hz.
- **DP:** Supports max. resolution 4096 x 2304 @ 60Hz.
- **HDMI:** Supports max. resolution 3840 × 2160 @ 30Hz.
- **LVDS (default):** Supports 1 LVDS maximum resolution up to 1920 x 1200 @ 60 Hz (eDP co-design with LVDS)

1.3.5 Ethernet LAN

- Supports dual 10/100/1000 Mbps Ethernet port(s)
- **Controller:**
 - GbE LAN1: Intel i219V
 - GbE LAN2: Intel i226V

1.3.6 Industrial features

- **Watchdog timer:** 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 (32 ~ 140°F), depends on CPU speed and cooler solution
- **Storage temperature:** -40 ~ 85°C (-40 ~ 185°F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power supply voltage:** 12V ATX
- **Power consumption:**
Boost 82.2W; Typical 60W (configuration: Intel® Core™ i9-13900E 5.2 GHz, 2pcs 32 GB DDR4 3200 MT/s SODIMM)
- **Board size:** 170 mm x 170 mm (6.69" x 6.69")
- **Board weight:** 0.4144 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-208 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.

Table 1.1: I/O Connectors

	Description	Part Reference
1	DisplayPort Dual port stack up Connector (DP1_DP2)	DP1_DP2
2	RJ-45 + USB 3.2 stack connector (LAN1_USB12)	LAN1_USB12
3	RJ-45 + USB 3.2 stack connector (LAN2_USB34)	LAN2_USB34
4	USB 2.0 stack connector * 4 ports (USB5678)	USB5678
5	HD Audio Interface (Analog) (AUDIO1)	AUDIO1
6	PCI-Express x16 slot (PCIEX16_1)	PCIEX16_1
7	M.2 M-Key Connector (M2M1)	M2M1
8	M.2 E-Key Connector (M2E1)	M2E1
9	Serial ATA interface Connector (SATA1)	SATA1
10	Serial ATA interface Connector (SATA2)	SATA2
11	DDR4 SODIMM Socket A1 (DIMMA1)	DIMMA1
12	DDR4 SODIMM Socket B1 (DIMMB1)	DIMMB1

Table 1.2: Box Header

	Description	Part Reference
1	EDP Connector / LVDS Connector (EDP1_LVD1)	EDP1_LVD1
2	USB 2.0 Front panel Header (USB0914)	USB0914
3	COM1 connector(COM1)	COM1
4	COM2 connector(COM2)	COM2
5	COM3 connector(COM3)	COM3
6	COM4 connector(COM4)	COM4
7	COM5 connector(COM5)	COM5
8	COM6 connector(COM6)	COM6
9	ATX 20pin power connector (EATXPWR1)	EATXPWR1
10	EDP / LVDS Backlight Inverter Power Connector (INV1)	INV1
11	ATX 8 Pin main power connector (ATX12V1)	ATX12V1

Table 1.3: Pin Headers

	Description	Part Reference
1	HDMI Connector (HDMI1)	HDMI1
2	Power LED pin header (JFP2)	JFP2
3	Audio amplifier output pin header (AMP1)	AMP1
4	SPI BIOS flash socket1 (SPI1)	SPI1
5	Case Open connector (JCASE1)	JCASE1
6	8-bits General Purpose I/O pin header (GPIO1)	GPIO1
7	CMOS battery Connector (BAT1)	BAT1
8	CPU FAN connector (CPUFAN1)	CPUFAN1
9	System Fan #1 Connector (SYSFAN1)	SYSFAN1
10	System Fan #2 Connector (SYSFAN2)	SYSFAN2
11	Programming Header (JSMB1)	JSMB1
12	LED port 80 connector (LED_P80)	LED_P80

Table 1.4: Jumper Setting List:

	Description	Part Reference
1	EDP panel / LVDS panel voltage selection	JEDP1_LVDS1
2	PWRBTN#/ RESET#/HDD LED / Serial bus from HW monitor IC / internal buzzer / external speaker header	JFP1
3	COM1_RI# selection pin header	JSETCOM1_V1
4	AT / ATX mode selection and COMS mode selection	PERSON1+JCOMS1

1.5 Board Layout: Jumper and Connector Locations

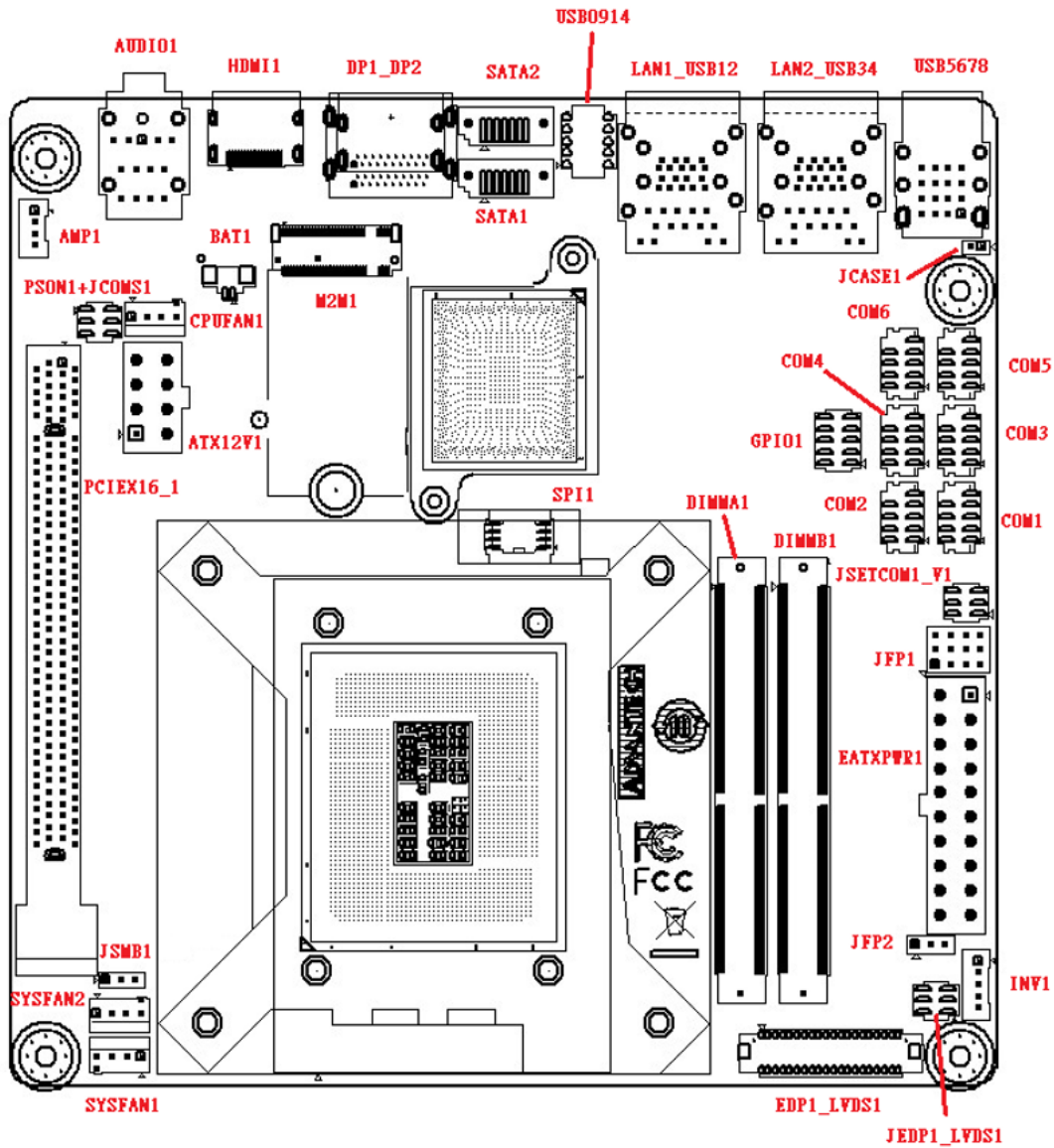


Figure 1.1 Jumper and Connector Locations (Top Side)

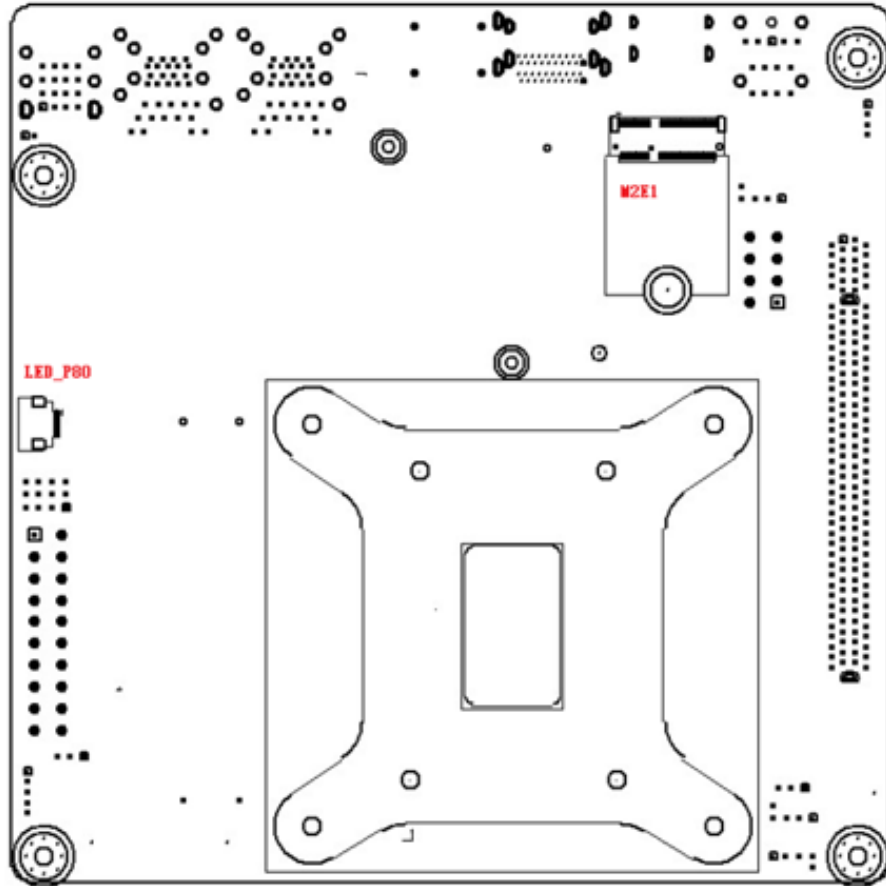


Figure 1.2 Jumper and Connector Locations (Bottom Side)

1.6 AIMB-208 Board Diagram

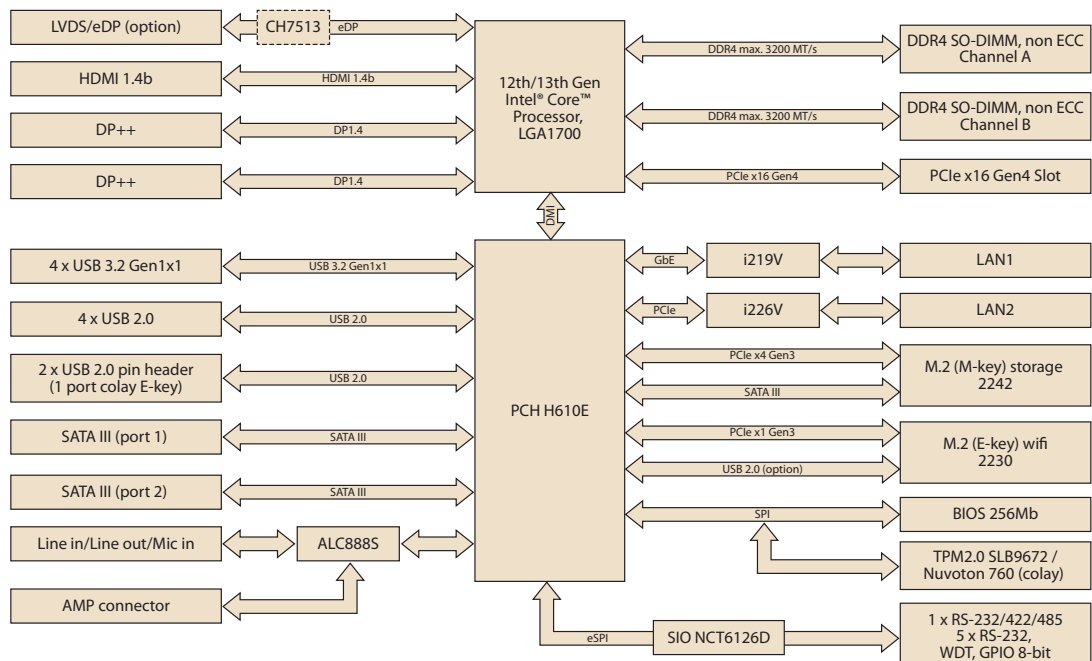


Figure 1.3 AIMB-208 Board Diagram

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.

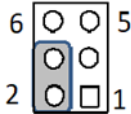
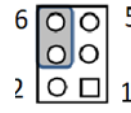
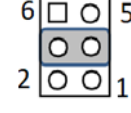
1.8.1 How to Set Jumpers

You 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 EDP Panel / LVDS Panel Voltage Selection (JEDP1_LVDS1)

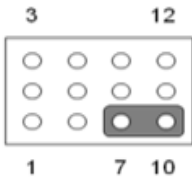
The AIMB-208 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally, this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set CMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1.5: JEDP1_LVDS1

Function	Jumper Setting
Jumper position for 5V	
Jumper position for 3.3V (Default)	
Jumper position for 12V	

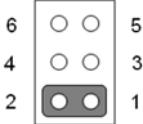
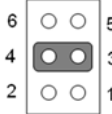
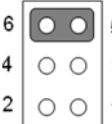
1.8.3 PWRBTN# / RESET# / HDD LED / Internal Buzzer / External Speaker Header (JFP1)

Table 1.6: JFP1

Function	Jumper Setting
Internal Buzzer (Default)	

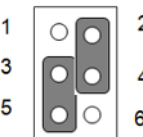
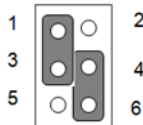
1.8.4 COM1_RI# Pin RI# / 5V / 12V Selection (JSETCOM1_V1)

Table 1.7: JSETCOM1_V1

Function	Jumper Setting
Jumper position for RI# (Default)	
Jumper position for +5V	
Jumper position for 12V	

1.8.5 AT/ATX Mode Selection and COMS Mode Selection (PSON1+JCMOS1)

Table 1.8: PSON1+JCMOS1

Function	Jumper Setting
ATX mode (3-5) (Default) Keep CMOS Data (2-4) (Default)	
AT mode (1-3) Clear CMOS Data (4-6)	

1.9 System Memory

AIMB-208 has two sockets for a 260-pin DDR4 SO-DIMM. These sockets use a 1.2 V unbuffered double data rate synchronous DRAM (DDR SDRAM). DRAM is available in capacities of 4GB, 8GB, 16GB, and 32GB. The sockets can take any combination with SODIMMs of any size, giving a total memory size between 4GB, 8GB, 16GB, and up to max 64GB. AIMB-208 does NOT support error-checking and correction (ECC).

1.10 Memory Installation Procedures

To install SODIMMs, first make sure the two handles of the SODIMM socket are in the “open” position, i.e., the handles lean outward. Slowly slide the SODIMM module along the plastic guides on both ends of the socket. Then firmly but gently (avoid pushing down too hard) press the SODIMM 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 SODIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism.

1.11 Cache Memory

The AIMB-208 supports a CPU with one of the following built-in full-speed last level caches:

Table 1.9: Cache Memory

Processor Number	Cache
i9-13900/ i9-13900E/ i9-13900TE	36 MB Intel® Smart Cache
i7-13700/ i7-13700E/ i7-13700TE	30 MB Intel® Smart Cache
i5-13500/ i5-13500E/ i5-13500TE	24 MB Intel® Smart Cache
i5-13400/ i5-13400E	20 MB Intel® Smart Cache
i3-13100/ i3-13100E/ i3-13100TE	12 MB Intel® Smart Cache
i9-12900/ i9-12900E/ i9-12900TE	30 MB Intel® Smart Cache
i7-12700/ i7-12700E/ i7-12700TE	25 MB Intel® Smart Cache
i5-12500/ i5-12500E/ i5-12500TE/ i5-12400	18 MB Intel® Smart Cache
i3-12100/ i3-12100E/ i3-12100TE	12 MB Intel® Smart Cache
G7400E/ G7400TE	6 MB Intel® Smart Cache
G6900E/ G6900TE	4 MB Intel® Smart Cache

The built-in second-level cache in the processor yields much higher performance than conventional external cache memory.

1.12 Processor Installation

The AIMB-208 is designed to support 13th Gen Intel® LGA1700, Core™ i9 / Core™ i7 / Core™ i5 / Core™ i3, Pentium®, Celeron® processors.

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 I/O Connector

2.2.1 DisplayPort Dual Port Stack-Up Connector (DP1_DP2)

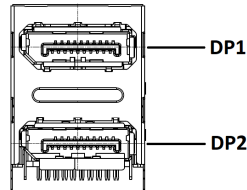


Table 2.1: DisplayPort Dual Port Stack-Up Connector (DP1_DP2)

Pin	Signal	Pin	Signal
P1	DP1_0+	P21	DP2_0+
P2	GND	P22	GND
P3	DP1_0-	P23	DP2_0-
P4	DP1_1+	P24	DP2_1+
P5	GND	P25	GND
P6	DP1_1-	P26	DP2_1-
P7	DP1_2+	P27	DP2_2+
P8	GND	P28	GND
P9	DP1_2-	P29	DP2_2-
P10	DP1_3+	P30	DP2_3+
P11	GND	P31	GND
P12	DP1_3-	P32	DP2_3-
P13	DP1_AUX_EN#	P33	DP2_AUX_EN#
P14	GND	P34	GND
P15	DP1_AUX+	P35	DP2_AUX+
P16	GND	P36	GND
P17	DP1_AUX-	P37	DP2_AUX-
P18	DP1_HPD	P38	DP2_HPD
P19	GND	P39	GND
P20	+V3.3_DP1	P40	+V3.3_DP1

2.2.2 RJ-45 + USB 3.2 Stack Connector (LAN1_USB12)

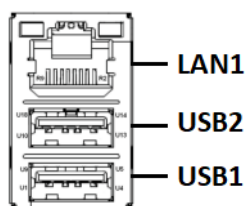


Table 2.2: LAN1_USB12

Pin	Signal	Pin	Signal
U1	VBUS	U10	VBUS
U2	D_1-	U11	D_2-
U3	D_1+	U12	D_2+
U4	GND	U13	GND
U5	RX_1-	U14	RX_2-
U6	RX_1+	U15	RX_2+
U7	GND	U16	GND
U8	TX_1-	U17	TX_2-
U9	TX_1+	U18	TX_2+
R2	MDI_0+	R6	MDI_2+
R3	MDI_0-	R7	MDI_2-
R4	MDI_1+	R8	MDI_3+
R5	MDI_1-	R9	MDI_3-

2.2.3 RJ-45 + USB 3.2 Stack Connector (LAN2_USB34)

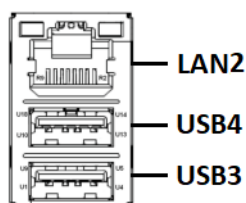


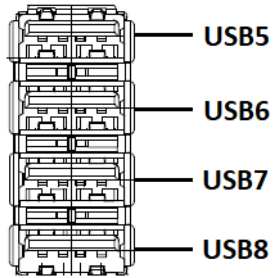
Table 2.3: LAN2_USB34

Pin	Signal	Pin	Signal
U1	VBUS	U10	VBUS
U2	D_3-	U11	D_4-
U3	D_3+	U12	D_4+
U4	GND	U13	GND
U5	RX_3-	U14	RX_4-
U6	RX_3+	U15	RX_4+
U7	GND	U16	GND
U8	TX_3-	U17	TX_4-
U9	TX_3+	U18	TX_4+
Pin	Signal	Pin	Signal

Table 2.3: LAN2_USB34

R2	MDI_0+	R6	MDI_2+
R3	MDI_0-	R7	MDI_2-
R4	MDI_1+	R8	MDI_3+
R5	MDI_1-	R9	MDI_3-

2.2.4 USB 2.0 Stack Connector * 4 Ports (USB5678)

**Table 2.4: USB5678**

Pin	Signal
A1	VBUS
A2	D_5-
A3	D_5+
A4	GND
B1	VBUS
B2	D_6-
B3	D_6+
B4	GND
C1	VBUS
C2	D_7-
C3	D_7+
C4	GND
D1	VBUS
D2	D_8-
D3	D_8+
D4	GND
H1/H2/H3/H4/H5/H6	GND

2.2.5 HD Audio Interface (Analog) (AUDIO1)

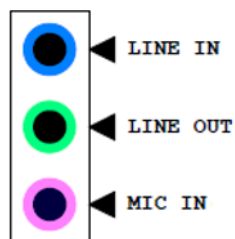


Table 2.5: AUDIO1

Pin	Signal
1	MIC IN
2	LINE OUT
3	LINE IN

2.2.6 PCI-Express x16 slot (PCIEX16_1)

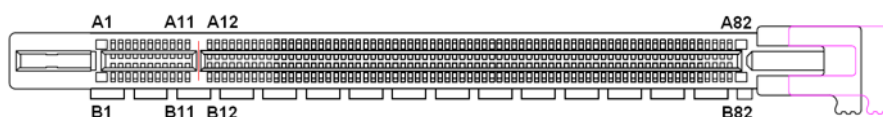


Table 2.6: PCIEX16_1

Pin	Signal	Pin	Signal
B1	+12V	A1	PRSNT1#
B2	+12V	A2	+12V
B3	+12V	A3	+12V
B4	GND	A4	GND
B5	SMB_CLK	A5	Reserved
B6	SMB_DATA	A6	Reserved
B7	GND	A7	Reserved
B8	+3.3V	A8	Reserved
B9	Reserved	A9	+3.3V
B10	+3.3VAUX	A10	+3.3V
B11	WAKE#	A11	PWRGD
B12	Reserved	A12	GND
B13	GND	A13	REFCLK+
B14	TX0+	A14	REFCLK-
B15	TX0-	A15	GND
B16	GND	A16	RX0+
B17	Reserved	A17	RX0-
B18	DETECT#	A18	GND
B19	TX1+	A19	Advantech defined
B20	TX1-	A20	GND
B21	GND	A21	RX1+

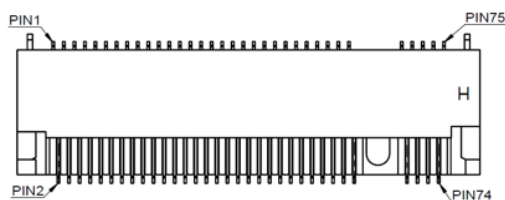
Table 2.6: PCIEX16_1

B22	GND	A22	RX1-
B23	TX2+	A23	GND
B24	TX2-	A24	GND
B25	GND	A25	RX2+
B26	GND	A26	RX2-
B27	TX3+	A27	GND
B28	TX3-	A28	GND
B29	GND	A29	RX3+
B30	Reserved	A30	RX3-
B31	Reserved	A31	GND
B32	GND	A32	Advantech defined
B33	TX4+	A33	Reserved
B34	TX4-	A34	GND
B35	GND	A35	RX4+
B36	GND	A36	RX4-
B37	TX5+	A37	GND
B38	TX5-	A38	GND
B39	GND	A39	RX5+
B40	GND	A40	RX5-
B41	TX6+	A41	GND
B42	TX6-	A42	GND
B43	GND	A43	RX6+
B44	GND	A44	RX6-
B45	TX7+	A45	GND
B46	TX7-	A46	GND
B47	GND	A47	RX7+
B48	Reserved	A48	RX7-
B49	GND	A49	GND
B50	TX8+	A50	Reserved
B51	TX8-	A51	GND
B52	GND	A52	RX8+
B53	GND	A53	RX8-
B54	TX9+	A54	GND
B55	TX9-	A55	GND
B56	GND	A56	RX9+
B57	GND	A57	RX9-
B58	TX10+	A58	GND
B59	TX10-	A59	GND
B60	GND	A60	RX10+
B61	GND	A61	RX10-
B62	TX11+	A62	GND
B63	TX11-	A63	GND
B64	GND	A64	RX11+
B65	GND	A65	RX11-
B66	TX12+	A66	GND
B67	TX12-	A67	GND
B68	GND	A68	RX12+

Table 2.6: PCIEX16_1

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

2.2.7 M.2 M-Key Connector (M2M1)

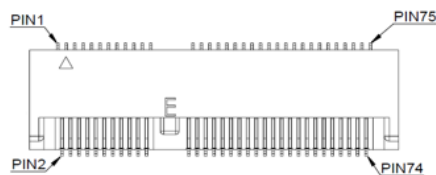
**Table 2.7: M2M1**

Pin	Signal	Pin	Signal
1	GND	2	3.3V
3	GND	4	3.3V
5	PERn3	6	N/C
7	PERp3	8	N/C
9	GND	10	DAS/DSS# (I/O)/LED1# (I)(O)/3.3V
11	PETn3	12	3.3V
13	PETp3	14	3.3V
15	GND	16	3.3V
17	PERn2	18	3.3V
19	PERp2	20	N/C
21	GND	22	N/C
23	PETn2	24	N/C
25	PETp2	26	N/C
27	GND	28	N/C
29	PERn1	30	N/C
31	PERp1	32	N/C
33	GND	34	N/C
35	PETn1	36	N/C
37	PETp1	38	DEVSLP (O)
39	GND	40	N/C
41	PERn0/SATA-B+	42	N/C

Table 2.7: M2M1

43	PERp0/SATA-B-	44	N/C
45	GND	46	N/C
47	PETn0/SATA-A-	48	N/C
49	PETp0/SATA-A+	50	PERST# (O)(0/3.3V) or N/C
51	GND	52	CLKREQ# (I/O)(0/3.3V) or N/C
53	REFCLKn	54	PEWAKE# (I/O)(0/3.3V) or N/C
55	REFCLKp	56	N/C
57	GND	58	N/C
59	Connector Key	60	Connector Key
61	Connector Key	62	Connector Key
63	Connector Key	64	Connector Key
65	Connector Key	66	Connector Key
67	N/C	68	SUSCLK(32kHz) (O)(0/3.3V)
69	PEDET (NC-PCIe/GND-SATA)	70	3.3V
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		

2.2.8 M.2 E-Key Connector (M2E1)

**Table 2.8: M2E1**

Pin	Signal	Pin	Signal
1	GND	2	+3.3V
3	USB_D+	4	+3.3V
5	USB_D-	6	WLAN_LED1#
7	GND	8	BT_PCMCLK
9	CNV_WR_D1-	10	BT_PCMFRM
11	CNV_WR_D1+	12	BT_PCMin
13	GND	14	BT_PCMOUT
15	CNV_WR_D0-	16	BT_LED#
17	CNV_WR_D0+	18	GND
19	GND	20	UART WAKE#
21	CNV_WR_CLK-	22	CNV_BRI_RSP
23	CNV_WR_CLK+	24	Connector Key
25	Connector Key	26	Connector Key
27	Connector Key	28	Connector Key
29	Connector Key	30	Connector Key
31	Connector Key	32	CNV_RGI_DT_R
33	GND	34	CNV_RGI_RSP
35	PETp0	36	CNV_BRI_DT_R
37	PETn0	38	CL_RST#

Table 2.8: M2E1			
39	GND	40	CL_DAT
41	PERp0	42	CL_CLK
43	PERn0	44	CNV_GNSS_PA_BLANKING
45	GND	46	CNV_MFUART2_TXD
47	REFCLKp0	48	CNV_MFUART2_RXD
49	REFCLKn0	50	SUSCLK
51	GND	52	WLAN_RST#
53	CLKREQ0#	54	BT_RF_KILL#
55	PEWAKE0#	56	WIFI_RF_KILL#
57	GND	58	NC
59	CNV_WT_D1-	60	NC
61	CNV_WT_D1+	62	NC
63	GND	64	NC
65	CNV_WT_D0-	66	NC
67	CNV_WT_D0+	68	NC
69	GND	70	NC
71	CNV_WT_CLK-	72	+3.3V
73	CNV_WT_CLK+	74	+3.3V
75	GND		

2.2.9 Serial ATA Interface Connector (SATA1)

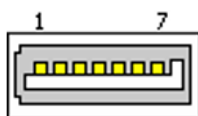


Table 2.9: SATA1	
Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

2.2.10 Serial ATA Interface Connector (SATA2)

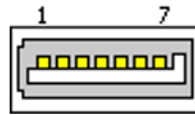


Table 2.10: SATA2

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

2.2.11 DDR4 SODIMM Socket A1 (DIMMA1)

Please refer to the JEDEC STANDARD.

2.2.12 DDR4 SODIMM Socket B1 (DIMMB1)

Please refer to the JEDEC STANDARD.

2.3 Box Header

2.3.1 EDP Connector / LVDS Connector (EDP1_LVD1)

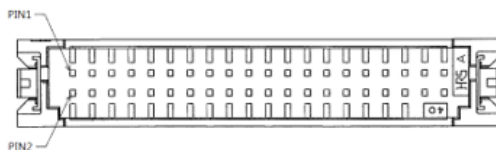


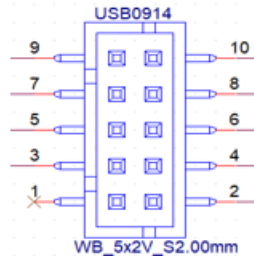
Table 2.11: LVDS1

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

Table 2.12: EDP1

Pin	Signal	Pin	Signal
1	VDD	2	VDD
3	LVDS DETECT#	4	GND
5	VDD	6	VDD
7	EDP_TX2-	8	N.C
9	EDP_TX2+	10	N.C
11	GND	12	GND
13	EDP_TX1-	14	N.C
15	EDP_TX1+	16	N.C
17	GND	18	GND
19	EDP_TX0-	20	N.C
21	EDP_TX0+	22	N.C
23	GND	24	GND
25	EDP_TX3-	26	N.C
27	EDP_TX3+	28	N.C
29	GND	30	GND
31	EDP_AUX+	32	EDP_AUX-
33	GND	34	EDP_HPDP
35	N.C	36	N.C
37	N.C	38	N.C
39	N.C	40	GND

2.3.2 USB 2.0 Front Panel Header (USB0914)

**Table 2.13: USB0914**

Pin	Signal	Pin	Signal
1	N.C	2	GND
3	GND	4	GND
5	D_9+	6	D_14+
7	D_9-	8	D_14-
9	VBUS	10	VBUS

2.3.3 COM1 Connector (COM1)

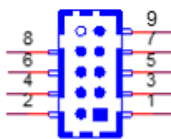


Table 2.14: COM1

Pin	Signal	Pin	Signal
1	DCD#	2	SIN
3	SOUT	4	DTR
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI		

2.3.4 COM2 Connector (COM2)

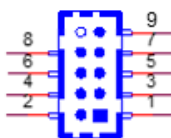


Table 2.15: COM2

Pin	Signal	Pin	Signal
1	DCD#	2	SIN
3	SOUT	4	DTR
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI		

2.3.5 COM3 Connector (COM3)

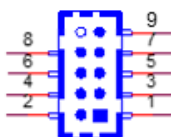


Table 2.16: COM3

Pin	Signal	Pin	Signal
1	DCD#	2	SIN
3	SOUT	4	DTR
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI		

2.3.6 COM4 Connector (COM4)

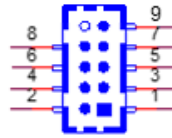


Table 2.17: COM4

Pin	Signal	Pin	Signal
1	DCD#	2	SIN
3	SOUT	4	DTR
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI		

2.3.7 COM5 Connector (COM5)

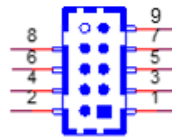


Table 2.18: COM5

Pin	Signal	Pin	Signal
1	DCD#	2	SIN
3	SOUT	4	DTR
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI		

2.3.8 COM6 Connector (COM6)

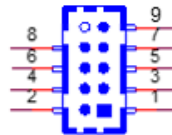


Table 2.19: COM6

Pin	Signal	Pin	Signal
1	DCD#	2	SIN
3	SOUT	4	DTR
5	GND	6	DSR#
7	RTS#	8	CTS#
9	RI		

2.3.9 ATX 20-Pin Power Connector (EATXPWR1)

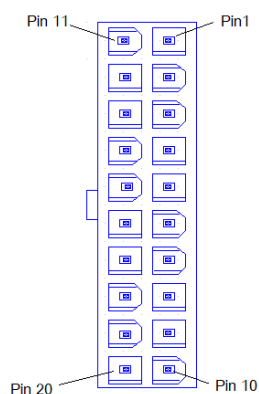


Table 2.20: EATXPWR1

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

2.3.10 EDP / LVDS Backlight Inverter Power Connector (INV1)



Table 2.21: INV1

Pin	Signal
1	+12V
2	GND
3	BKL EN
4	BKL CTRL
5	+5V

2.3.11 ATX 8-Pin Main Power Connector (ATX12V1)



Table 2.22: ATX12V1

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

2.4 Pin Header

2.4.1 HDMI Connector (HDMI1)

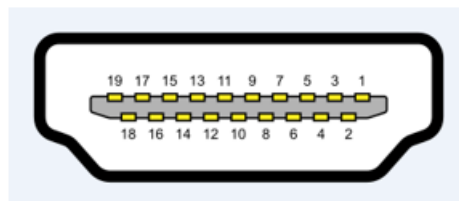


Table 2.23: HDMI1

Pin	Signal	Pin	Signal
1	TMDS Data2+	2	GND
3	TMDS Data2-	4	TMDS Data1+
5	GND	6	TMDS Data1-
7	TMDS Data0+	8	GND
9	TMDS Data0-	10	TMDS Clock+
11	GND	12	TMDS Clock-
13	NC	14	NC
15	SCL	16	SDA
17	GND	18	+5V Power
19	Hot Plug Detect		

2.4.2 Power LED Pin Header (JFP2)



Table 2.24: JFP2

Pin	Signal
1	Power LED+
2	NC
3	Power LED-

2.4.3 Audio Amplifier Output Pin Header (AMP1)



Table 2.25: AMP1

Pin	Signal
1	AMP OUT – R+
2	AMP OUT – R-
3	AMP OUT – L-
4	AMP OUT – L+

2.4.4 SPI BIOS Flash Socket1 (SPI1)

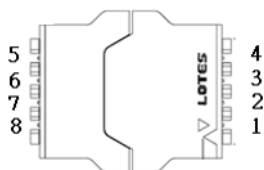


Table 2.26: SPI1

Pin	Signal	Pin	Signal
1	CS#	5	MOSI
2	MISO	6	SCLK
3	WP# / IO2	7	HOLD# / IO3
4	GND	8	+V3.3_SPI

2.4.5 Case Open Connector (JCASE1)



Table 2.27: JCASE1

Pin	Signal
1	Case Open
2	GND

2.4.6 8-Bit General Purpose I/O Pin Header (GPIO1)

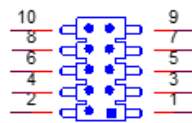


Table 2.28: GPIO1

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

2.4.7 CMOS Battery Connector (BAT1)

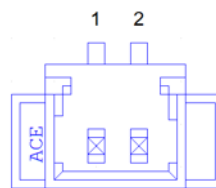


Table 2.29: BAT1

Pin	Signal
1	+VBAT
2	GND

2.4.8 CPU FAN Connector (CPUFAN1)



Table 2.30: CPUFAN1

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

2.4.9 System Fan #1 Connector (SYSFAN1)



Table 2.31: SYSFAN1

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

2.4.10 System Fan #2 Connector (SYSFAN2)



Table 2.32: SYSFAN2

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

2.4.11 Programming Header (JSMB1)



Table 2.33: JSMB1

Pin	Signal
1	CLK
2	GND
3	DATA

2.4.12 LED Port 80 Connector (LED_P80)

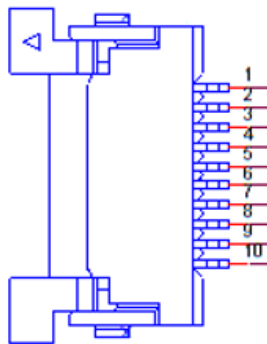


Table 2.34: LED_P80

Pin	Signal
1	GND
2	LED_A
3	LED_B
4	LED_C
5	LED_D
6	LED_E
7	LED_F
8	LED_G
9	DGH0#
10	DGL0#

2.5 Jumper Settings

2.5.1 COM1_RI# Selection Pin Header (JSETCOM1_V1)

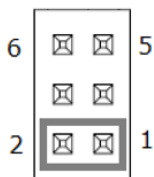


Table 2.35: JSETCOM1_V1

Pin	Signal	Pin	Signal
1	RI# [1]	2	Advantech define
3	Advantech define	4	+5V
5	+12V	6	Advantech define

2.5.2 EDP Panel / LVDS Panel Voltage Selection (JEDP1_LVDS1)

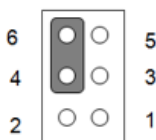


Table 2.36: JEDP1_LVDS1

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

Table 2.37: EDP Panel / LVDS Panel Voltage Selection (JEDP1_LVDS1)

Function	Jumper Setting
Jumper position for 5V	
Jumper position for 3.3V (Default)	
Jumper position for 12V	

2.5.3 PWRBTN# / RESET# /HDD LED / Internal Buzzer / External Speaker Header (JFP1)

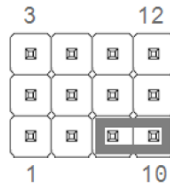


Table 2.38: JFP1

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

2.5.4 AT/ATX Mode Selection and CMOS Mode Selection (PSON1+JCOMS1)

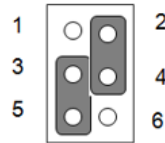


Table 2.39: PSON1+JCOMS1

Pin	Signal	Pin	Signal
1	AT	2	NC
3	+3.3V	4	RTC_RESET#
5	ATX	6	GND

Table 2.40: AT / ATX Mode Selection and CMOS Mode Selection (PSON1+JCMOS1)

Function	Jumper Setting
ATX mode (3-5) (Default) Keep CMOS Data (2-4) (Default)	
AT mode (1-3) Clear CMOS Data (4-6)	

Chapter 3

BIOS Operation

3.1 Introduction

With the AMI BIOS setup program, you can modify BIOS settings and control the special features of your computer. The setup program uses a number of menus for making changes and turning special features on or off. This chapter describes the basic navigation of the AIMB-208 setup screens.

3.2 BIOS Setup

The AIMB-208 series uses AMI BIOS and a CMOS setup utility that allows users to configure specific settings or activate certain system features. The CMOS setup utility saves the configuration in the CMOS RAM of the motherboard.

When the system power is turned off, the battery on the board supplies the necessary power to preserve the CMOS RAM.

When the power is turned on, press the button during the BIOS power-on self-test (POST) to access the CMOS setup utility screen.

Control Keys

< ↑ >> ↓ >> ← >> → >	Move to select item
----------------------	---------------------

<Enter>	Select item
---------	-------------

<Esc>	Main Menu - Quit without saving changes to the CMOS Sub-Menu - Exit current page and return to the Main Menu
-------	---

<Page Up/+>	Increase the numeric value or make changes
-------------	--

<Page Down/->	Decrease the numeric value or make changes
---------------	--

<F1>	General help, for Setup Sub-Menu
------	----------------------------------

<F2>	Item help
------	-----------

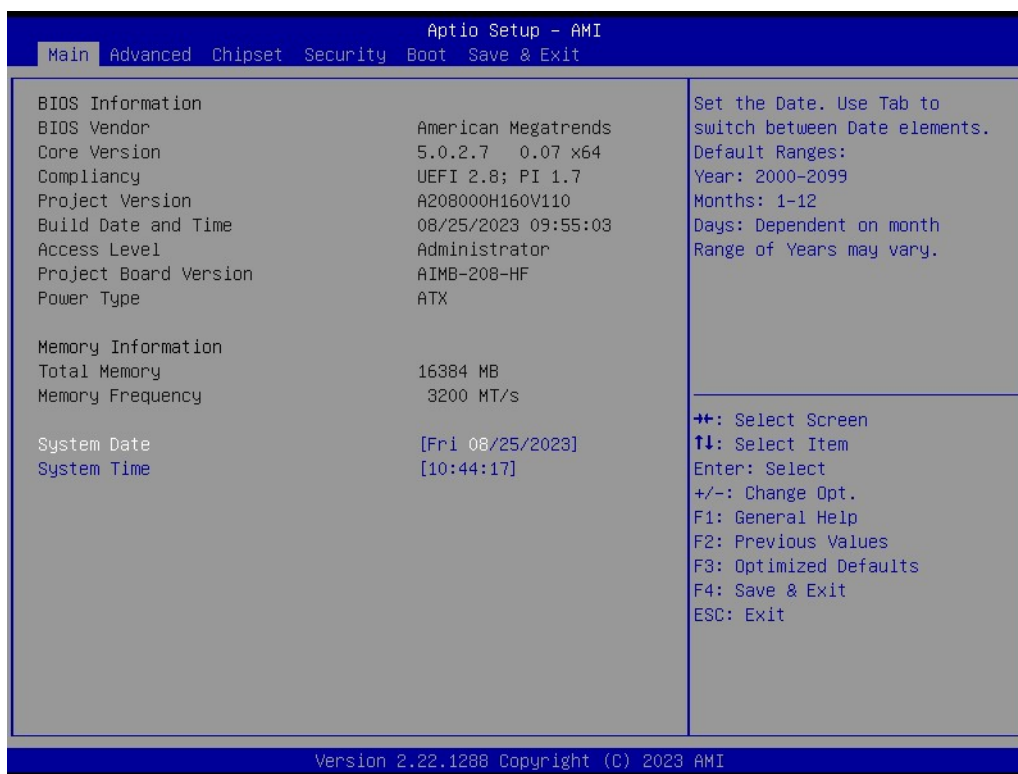
<F5>	Load previous values
------	----------------------

<F7>	Load setup defaults
------	---------------------

<F10>	Save all CMOS changes
-------	-----------------------

3.2.1 Main Menu

Press to enter the AMI BIOS CMOS setup utility, the Main Menu will appear on the screen. Use the arrow keys to select items and press <Enter> to access 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.

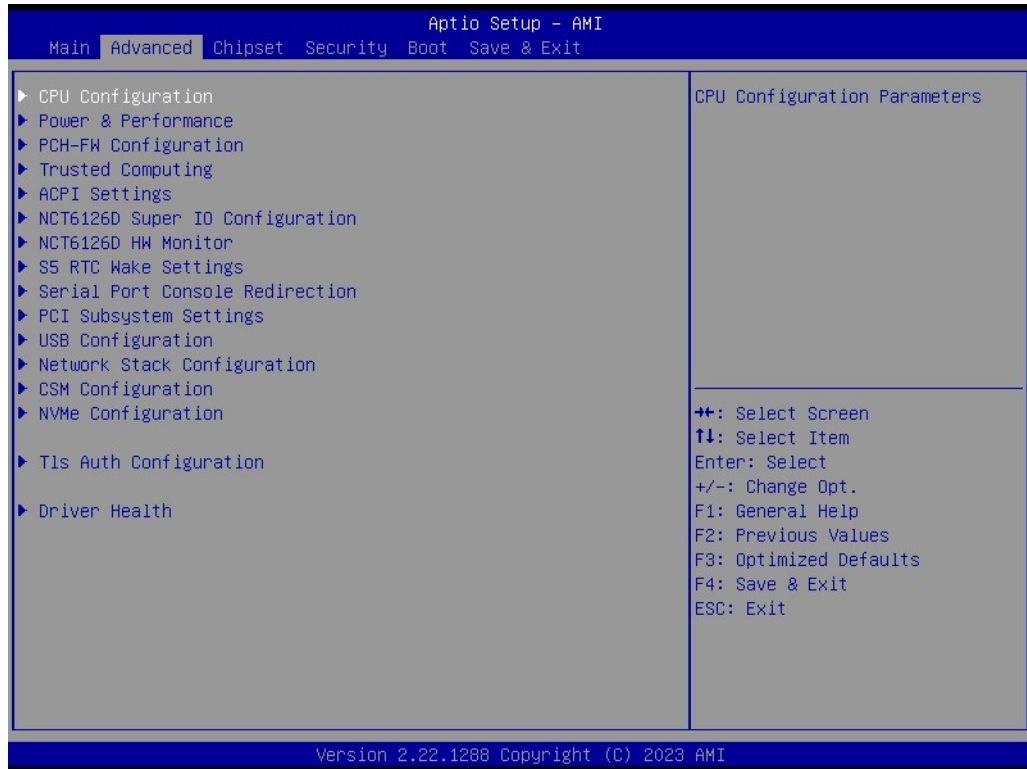
Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

■ System Time / System Date

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

3.2.2 Advanced BIOS Features

Select the Advanced tab from the AIMB-208 Setup menu to enter the Advanced BIOS Setup page. Users can select any item in the left frame of the screen, such as CPU Configuration, to access the sub-menu for that item. Select an Advanced BIOS Setup option by highlighting the text using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup menu screen is shown below. The sub-menus are described on the following pages.



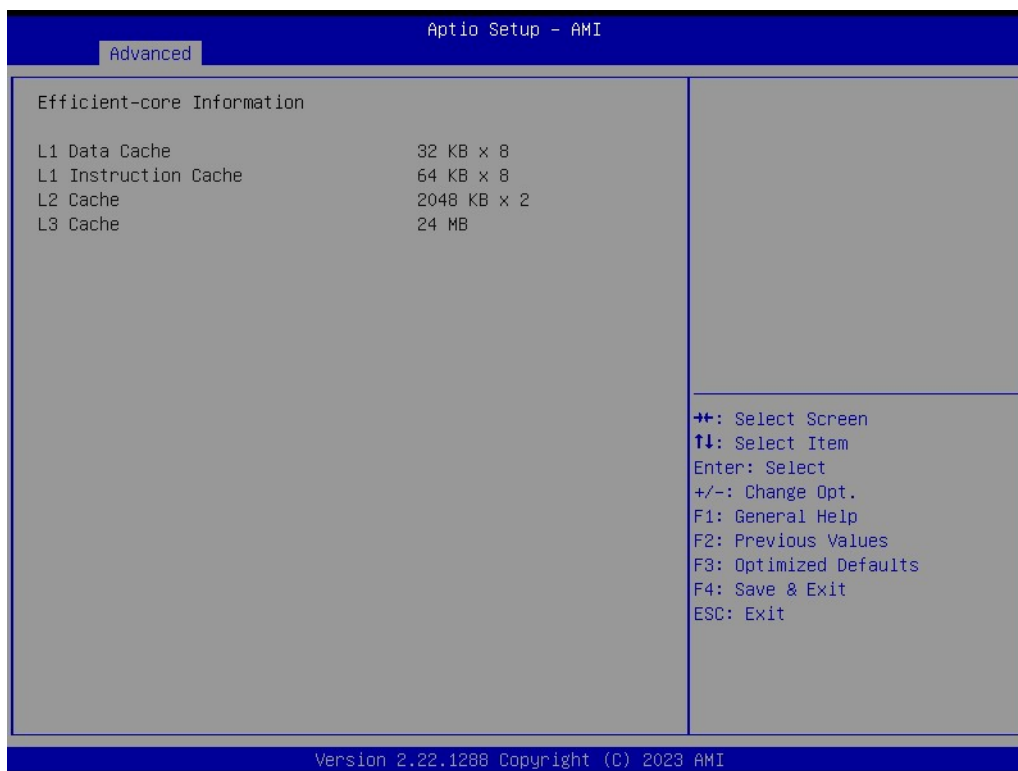
3.2.2.1 CPU Configuration

Advanced → CPU Configuration



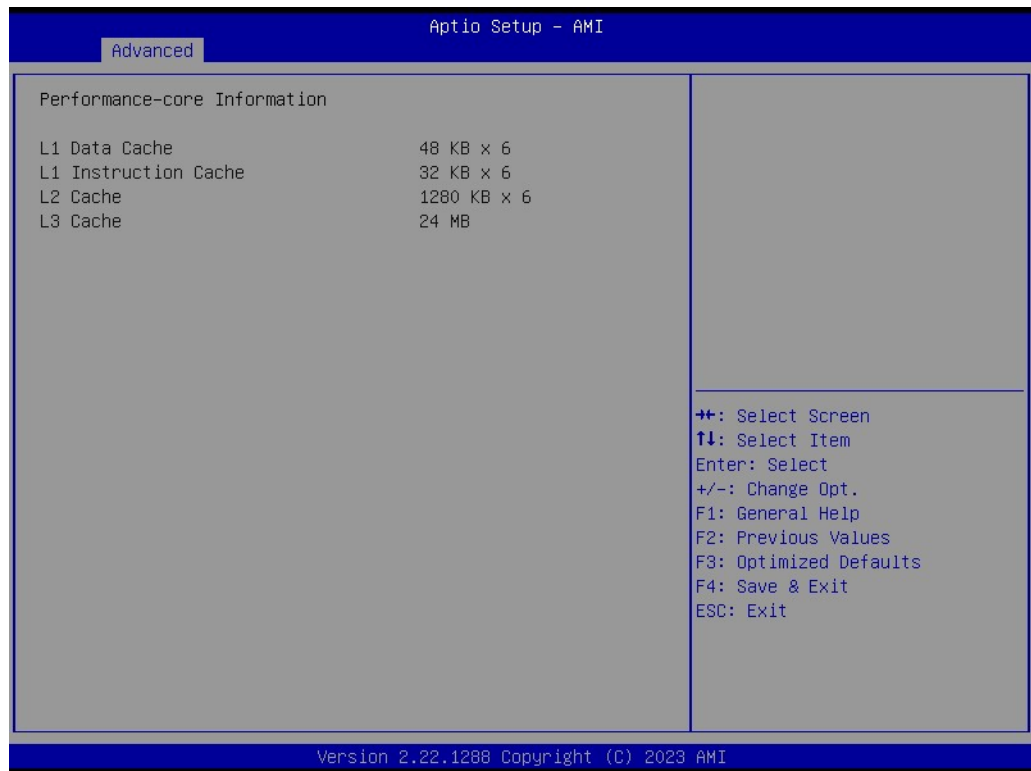
Efficient-core Information

Advanced → CPU Configuration → Efficient-core Information



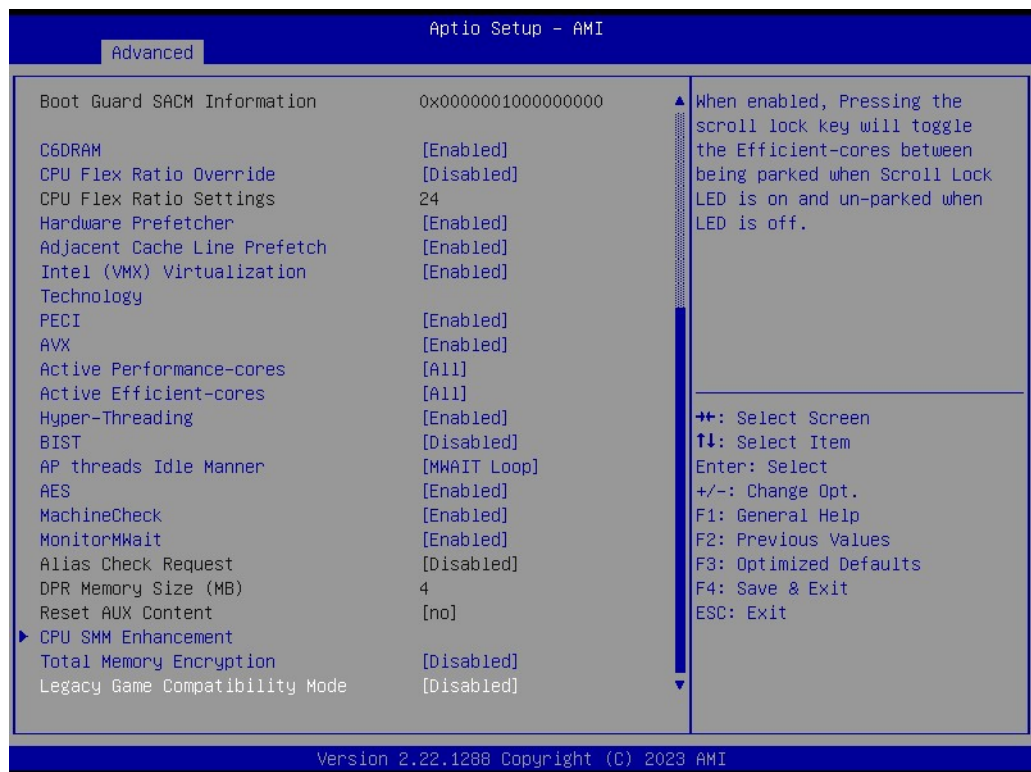
Performance-core Information

Advanced → CPU Configuration → Performance-core Information



CPU SMM Enhancement

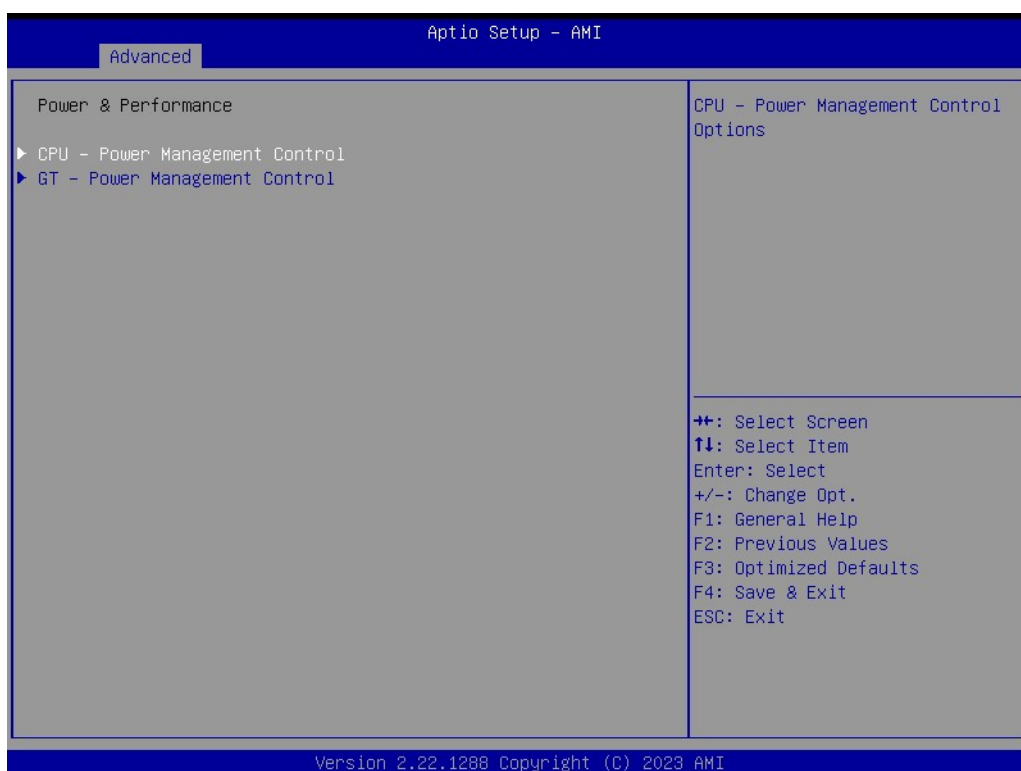
Advanced → CPU SMM Enhancement





3.2.2.2 Power & Performance

Advanced → Power & Performance



CPU - Power Management Control

Advanced → Power & performance → CPU - Power Management Control

Aptio Setup - AMI

Advanced

CPU - Power Management Control		▲ Select the performance state that the BIOS will set starting from reset vector. ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Boot performance mode	[Turbo Performance]	
Intel(R) SpeedStep(tm)	[Enabled]	
Race To Halt (RTH)	[Enabled]	
Intel(R) Speed Shift Technology	[Enabled]	
Per Core P State OS control mode	[Enabled]	
HWP Autonomous Per Core P State	[Enabled]	
HWP Autonomous EPP Grouping	[Enabled]	
EPB override over PECI	[Disabled]	
HWP Lock	[Enabled]	
HDC Control	[Enabled]	
Turbo Mode	[Enabled]	
▶ View/Configure Turbo Options		
▶ CPU VR Settings		
Platform PL2 Power	100000	
ATX Telemetry Unit	[Watts]	
Power Limit 4	120000	
Power Limit 4 Lock	[Disabled]	
C states	[Enabled]	
Enhanced C-states	[Enabled]	
C-State Auto Demotion	[C1]	
C-State Un-demotion	[C1]	
Package C-State Demotion	[Enabled]	
Package C-State Un-demotion	[Enabled]	

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Aptio Setup - AMI

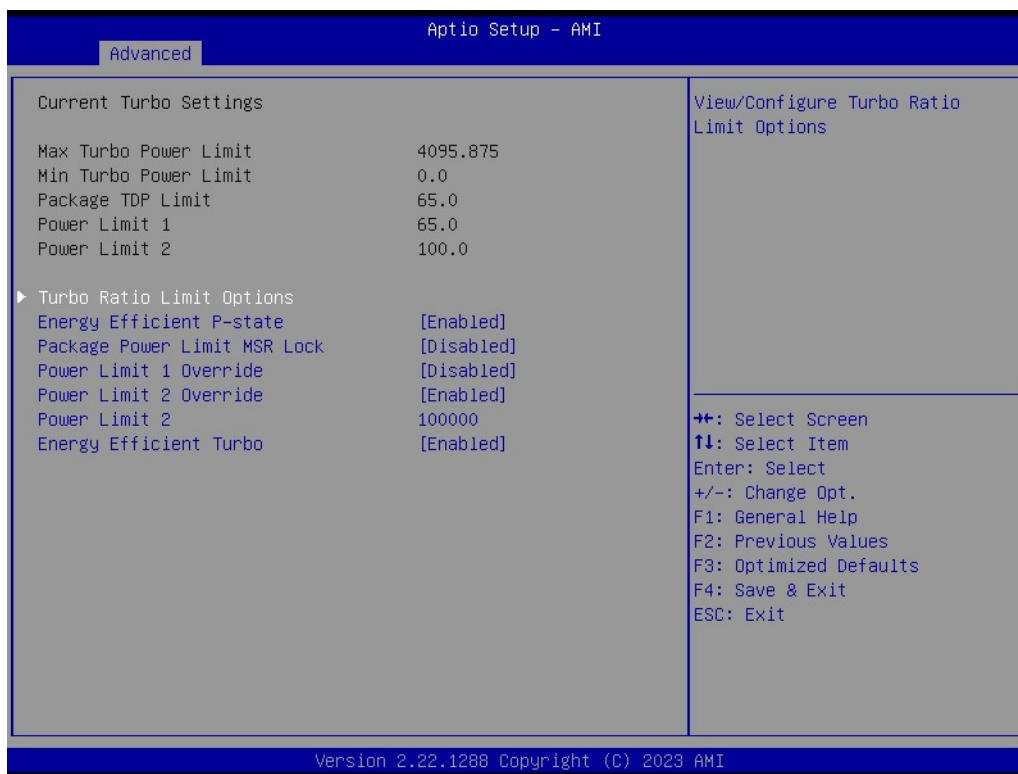
Advanced

C states		▲ CPU Lock Configuration ++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Enhanced C-states	[Enabled]	
C-State Auto Demotion	[C1]	
C-State Un-demotion	[C1]	
Package C-State Demotion	[Enabled]	
Package C-State Un-demotion	[Enabled]	
CState Pre-Wake	[Enabled]	
IO MWAIT Redirection	[Disabled]	
Package C State Limit	[Auto]	
C6/C7 Short Latency Control(MSR 0x60B)		
Time Unit	[1024 ns]	
Latency	0	
C6/C7 Long Latency Control(MSR 0x60C)		
Time Unit	[1024 ns]	
Latency	0	
Thermal Monitor	[Enabled]	
Interrupt Redirection Mode	[Fixed Priority]	
Selection		
Timed MWAIT	[Disabled]	
▶ Custom P-state Table		
Energy Performance Gain	[Disabled]	
EPG DIMM Idd3N	26	
EPG DIMM Idd3P	11	
▶ CPU Lock Configuration		
Dual Tau Boost	[Disabled]	

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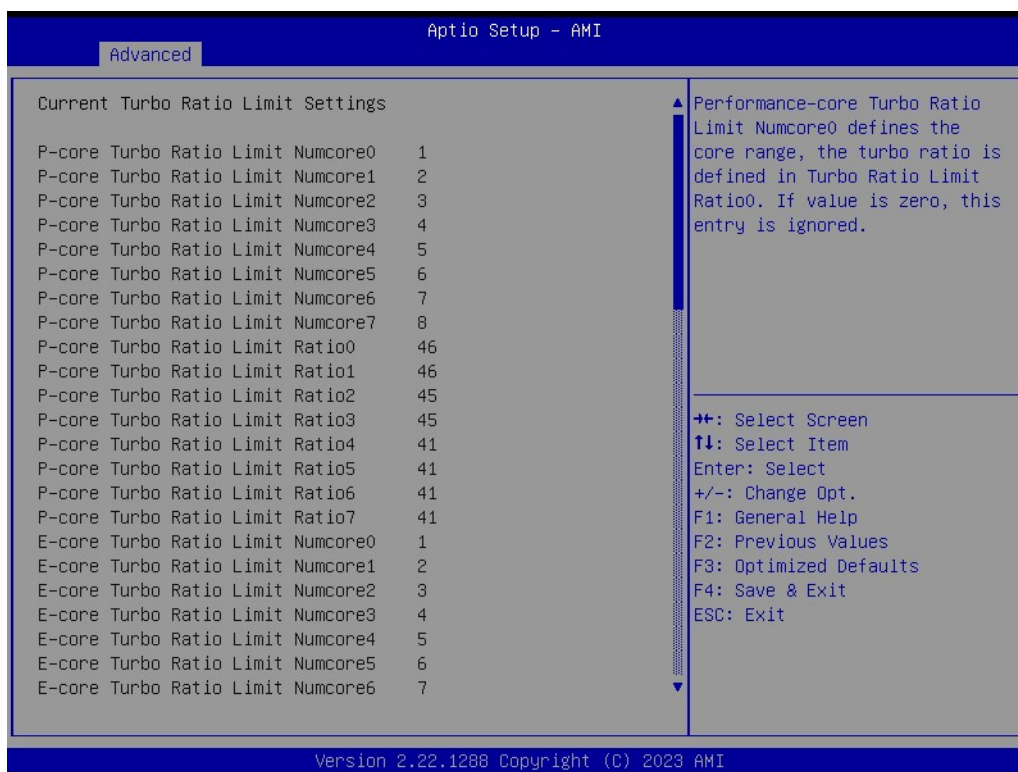
Current Turbo Settings

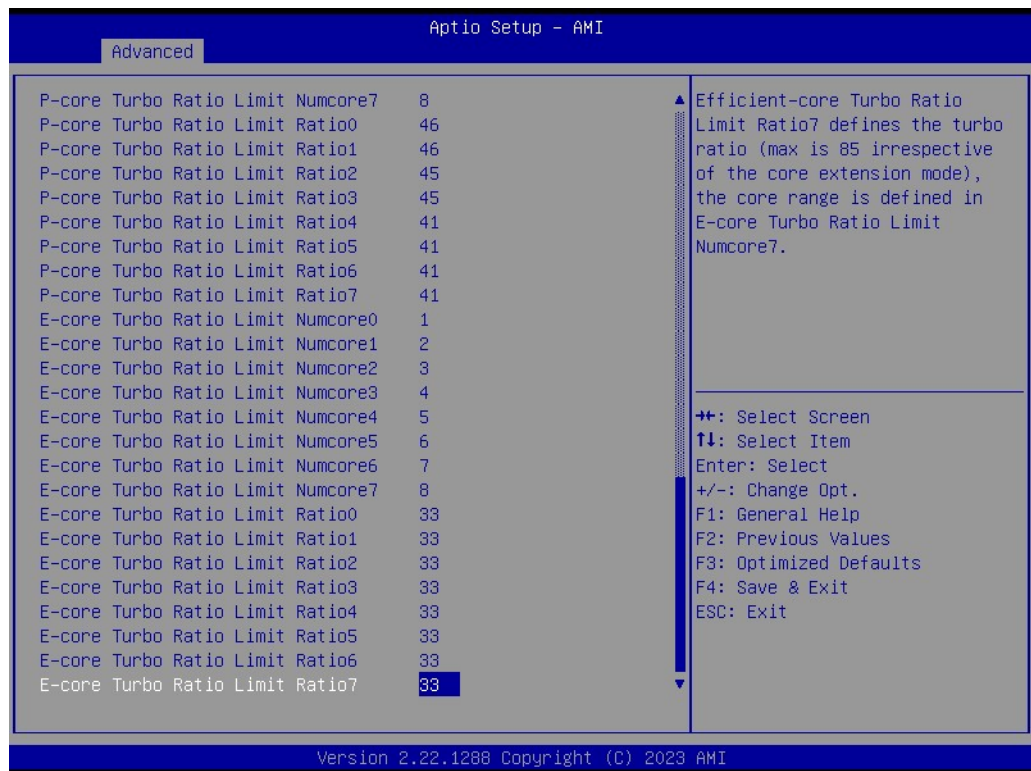
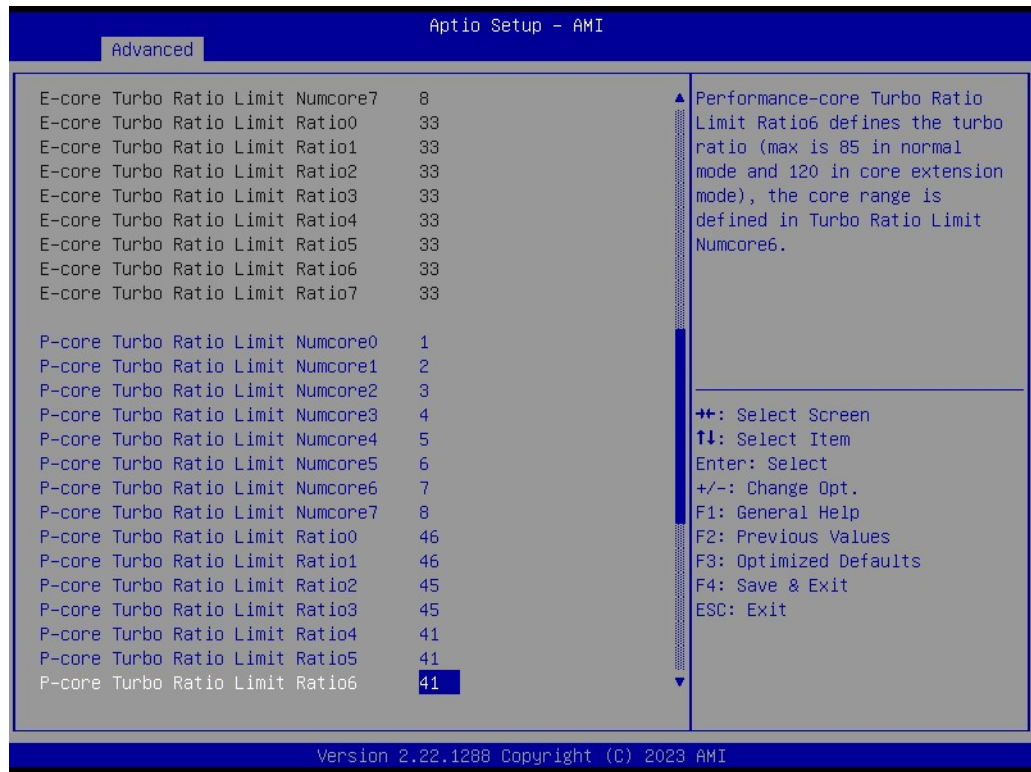
Advanced → Power & Performance → CPU - Power Management Control → View/Configure Turbo Option



Turbo Ratio Limit Options

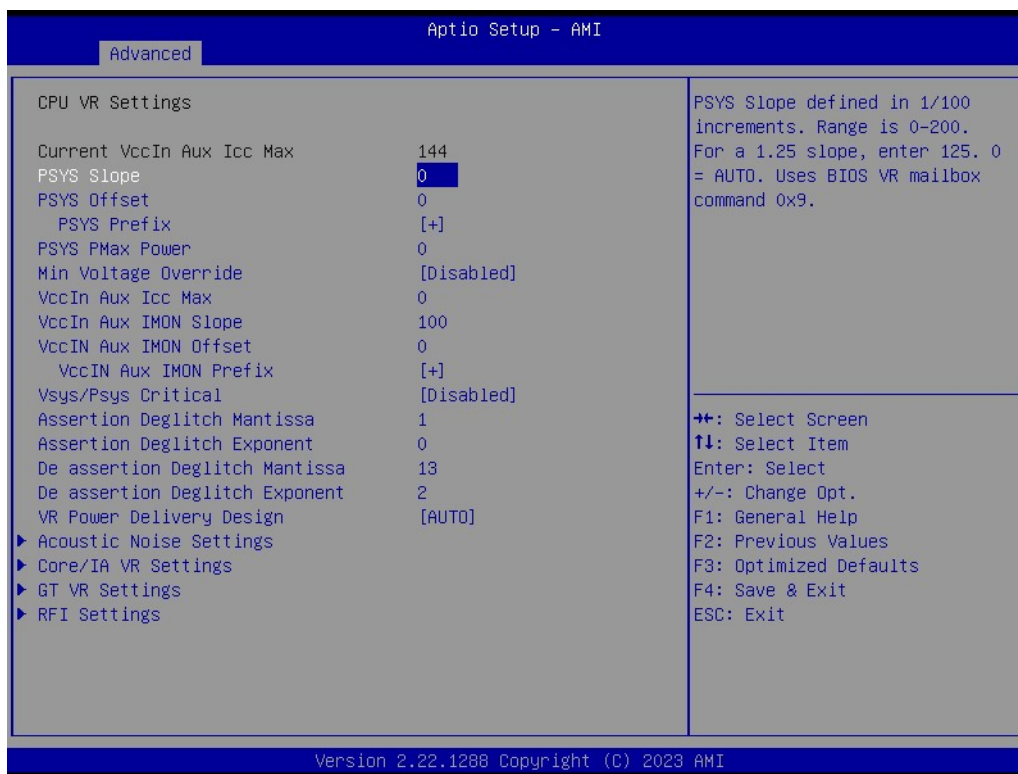
Advanced → Power & Performance → CPU - Power Management Control → View/Configure Turbo Option → Turbo Ratio Limit Options





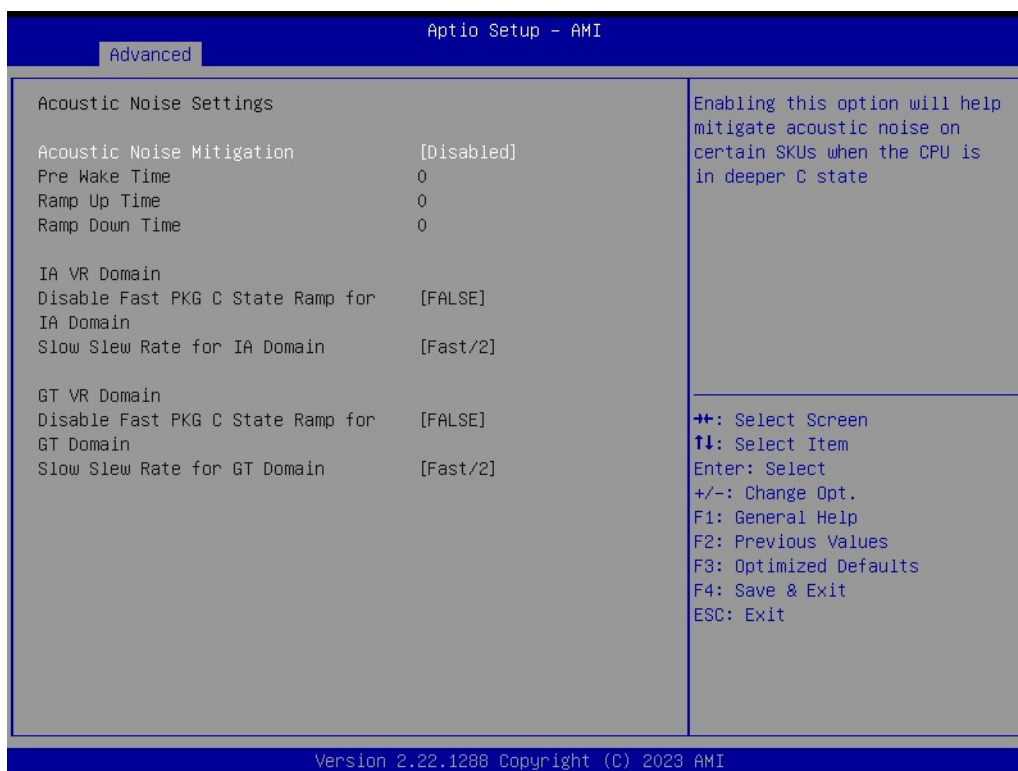
CPU VR Settings

Advanced → Power & Performance → CPU - Power Management Control → CPU VR Settings



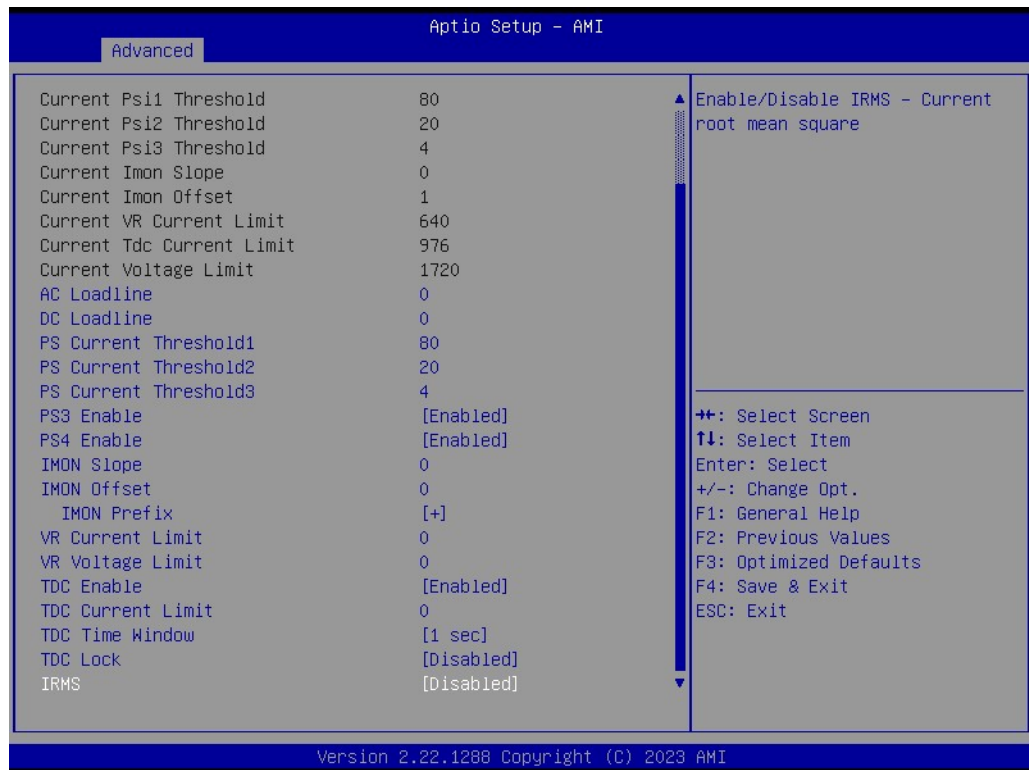
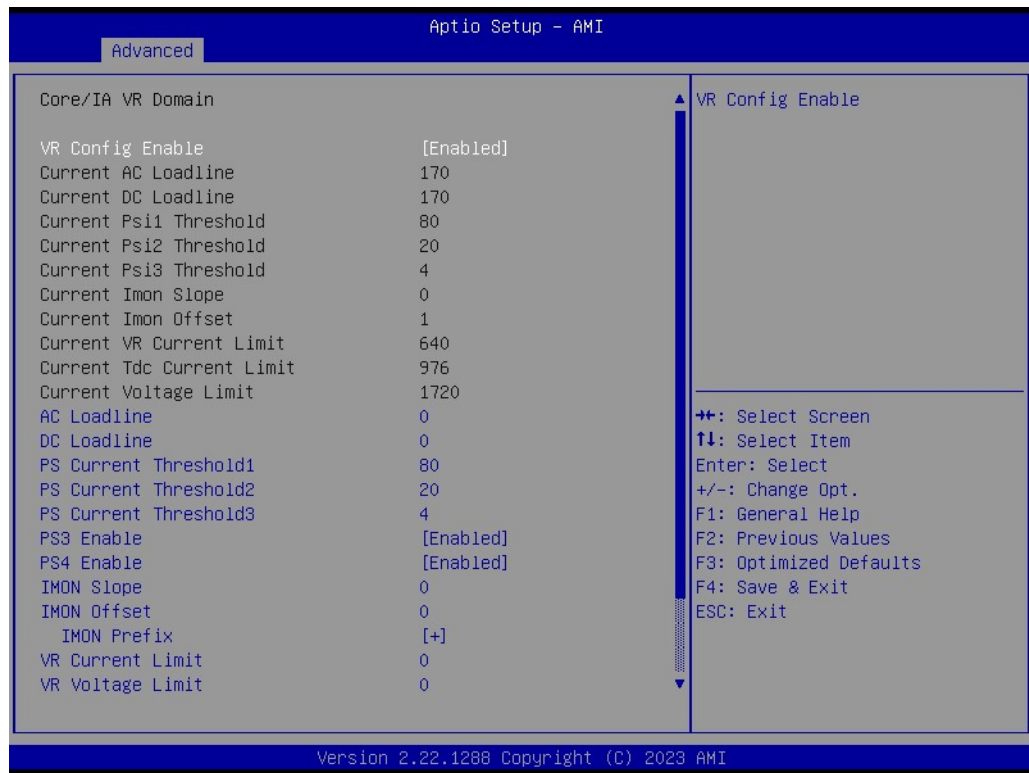
Acoustic Noise Settings

Advanced → Power & Performance → CPU – Power Management Control → CPU VR Settings → Acoustic Noise Settings



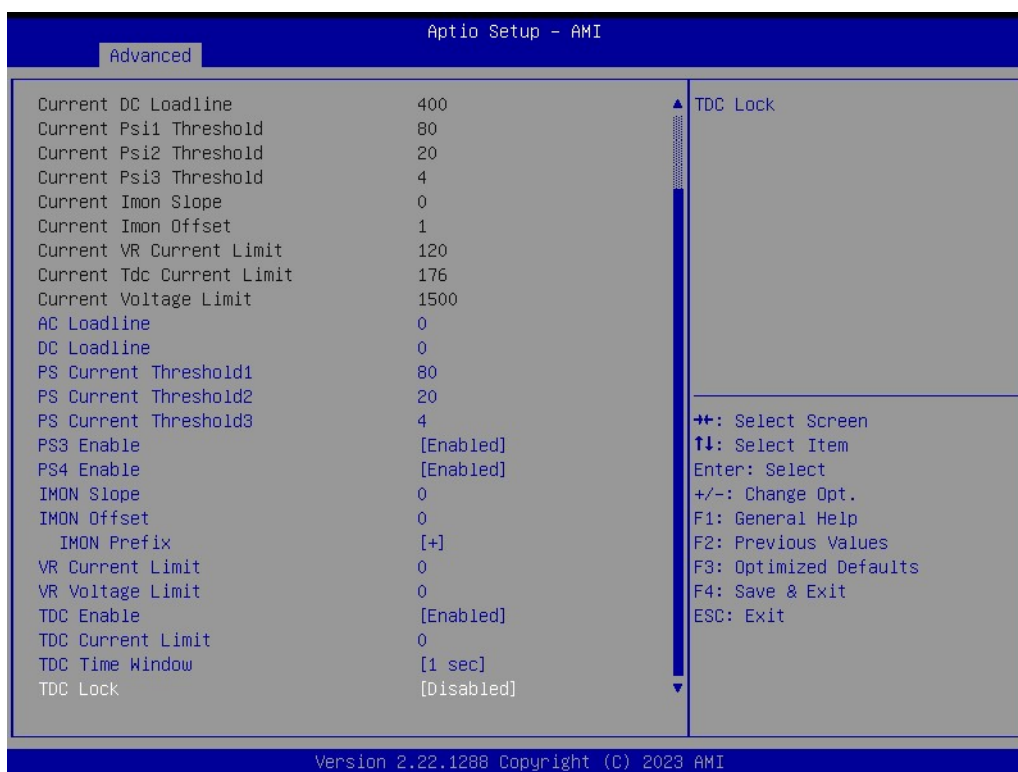
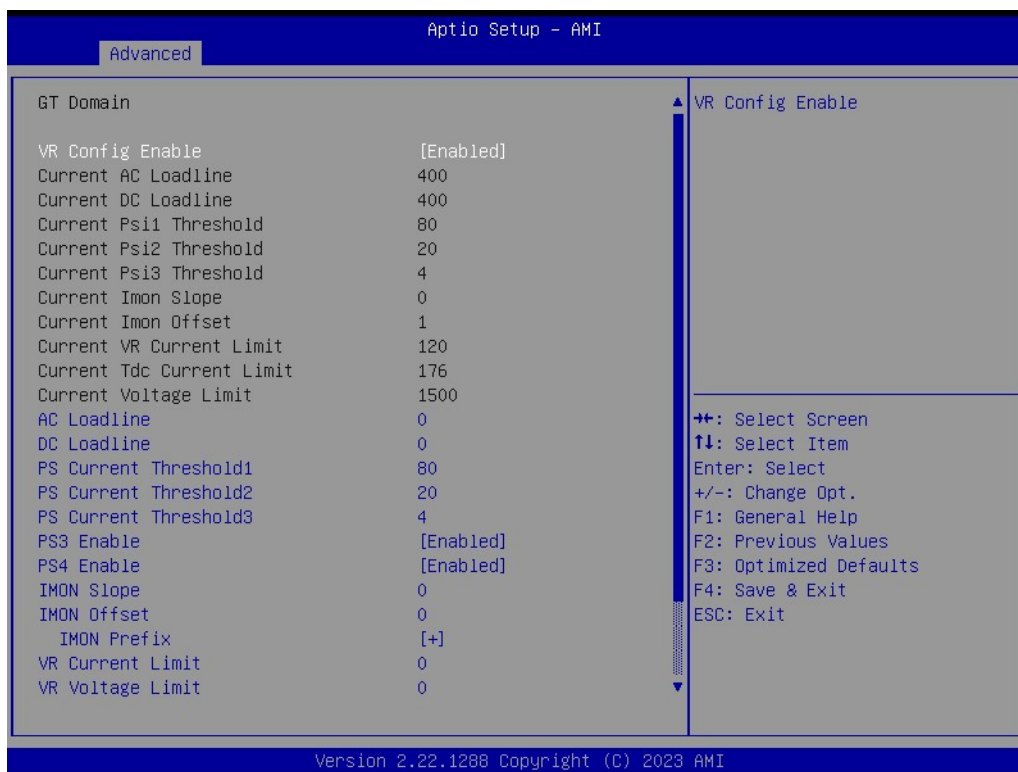
Core/IA VR Settings

Advanced → Power & Performance → CPU - Power Management Control → CPU VR Settings → Core/IA Settings



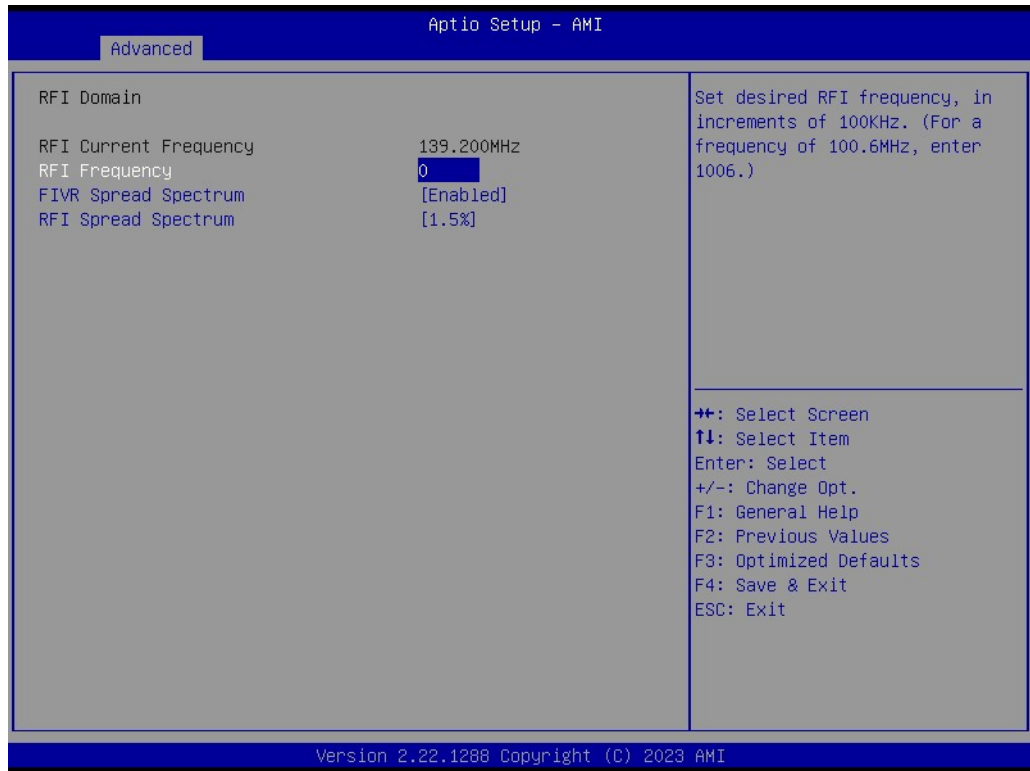
GT VR Settings

Advanced → Power & Performance → CPU - Power Management Control → CPU VR Settings → GT VR Settings



RFI Settings

Advanced → Power & Performance → CPU - Power Management Control → CPU VR Settings → RFI Settings



Custom P-state Table

Advanced → Power & Performance → CPU - Power Management Control → Custom P-state Table



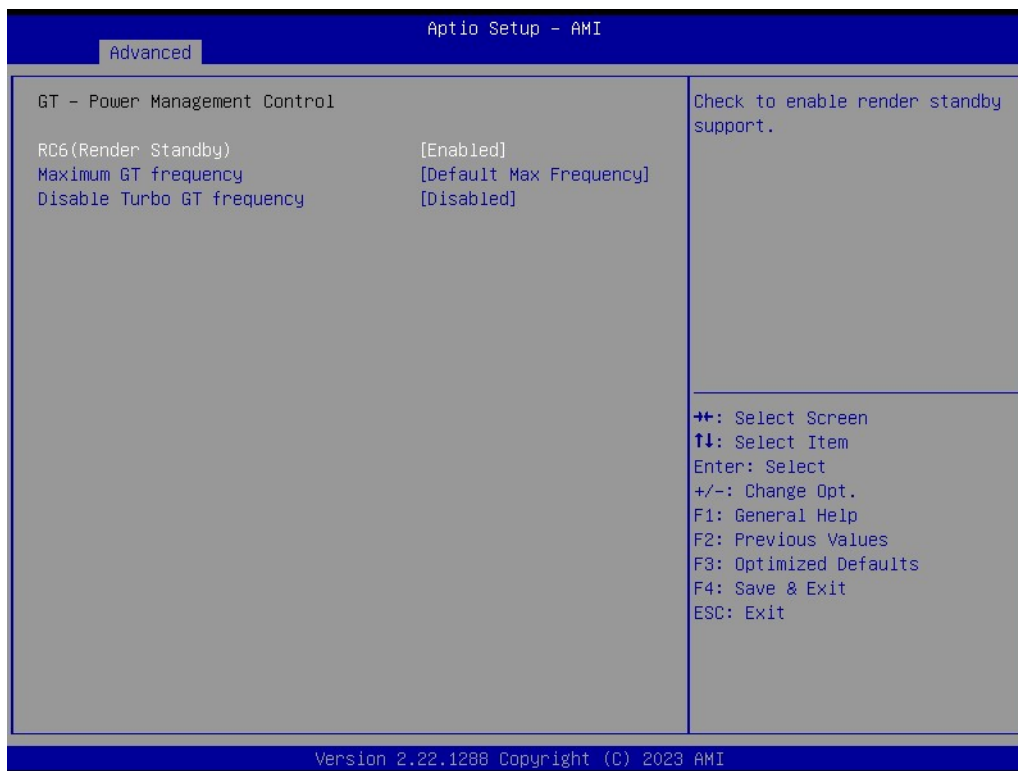
CPU Lock Configuration

Advanced → Power & Performance → CPU - Power Management Control → CPU Lock Configuration



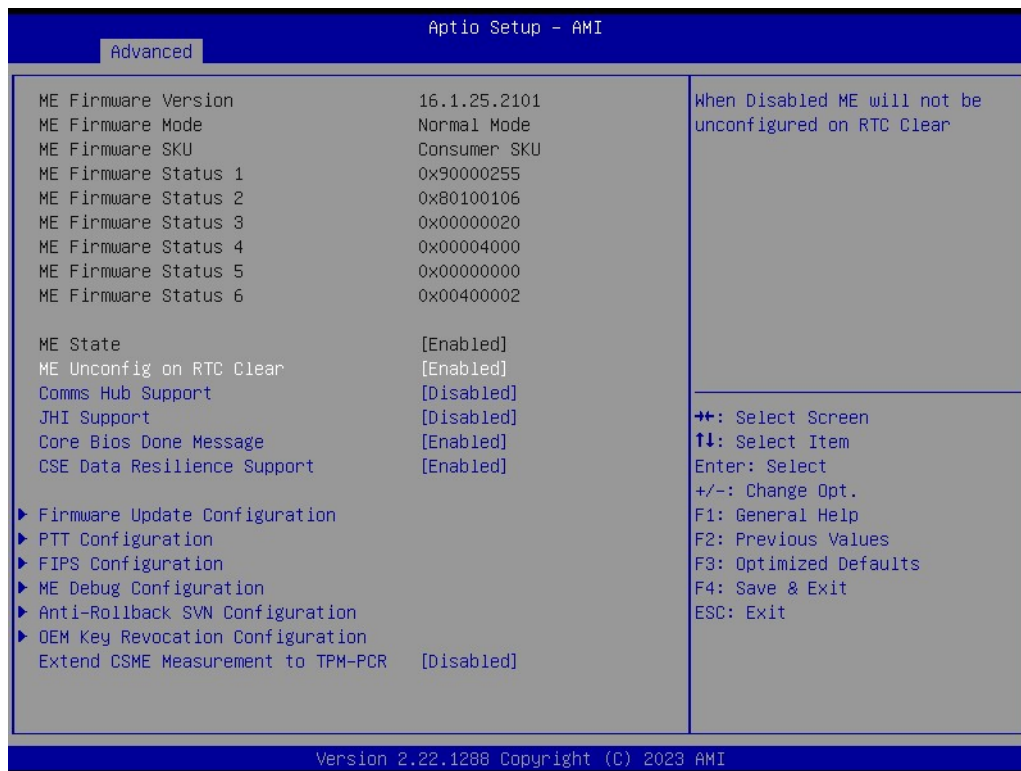
GT - Power Management Control

Advanced → Power & Performance → GT - Power Management Control



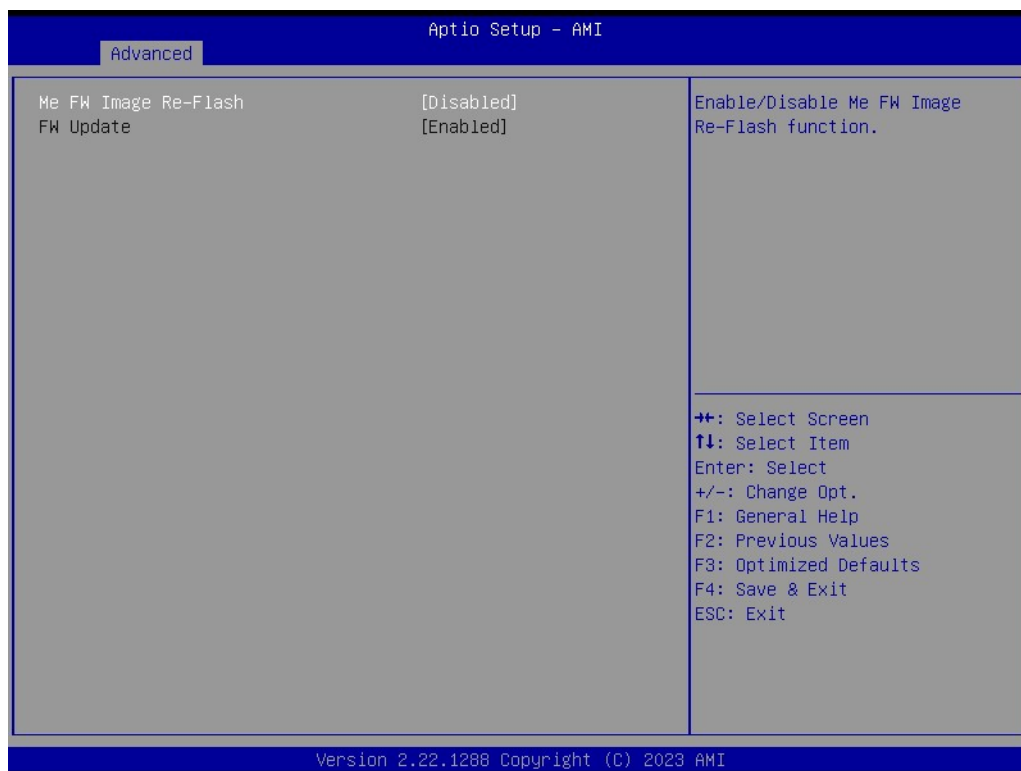
3.2.2.3 PCH-FW Configuration

Advanced → PCH-FW Configuration



Firmware Update Configuration

Advanced → PCH-FW Configuration → Firmware Update Configuration



PTT Configuration

Advanced → PCH-FW Configuration → PTT Configuration



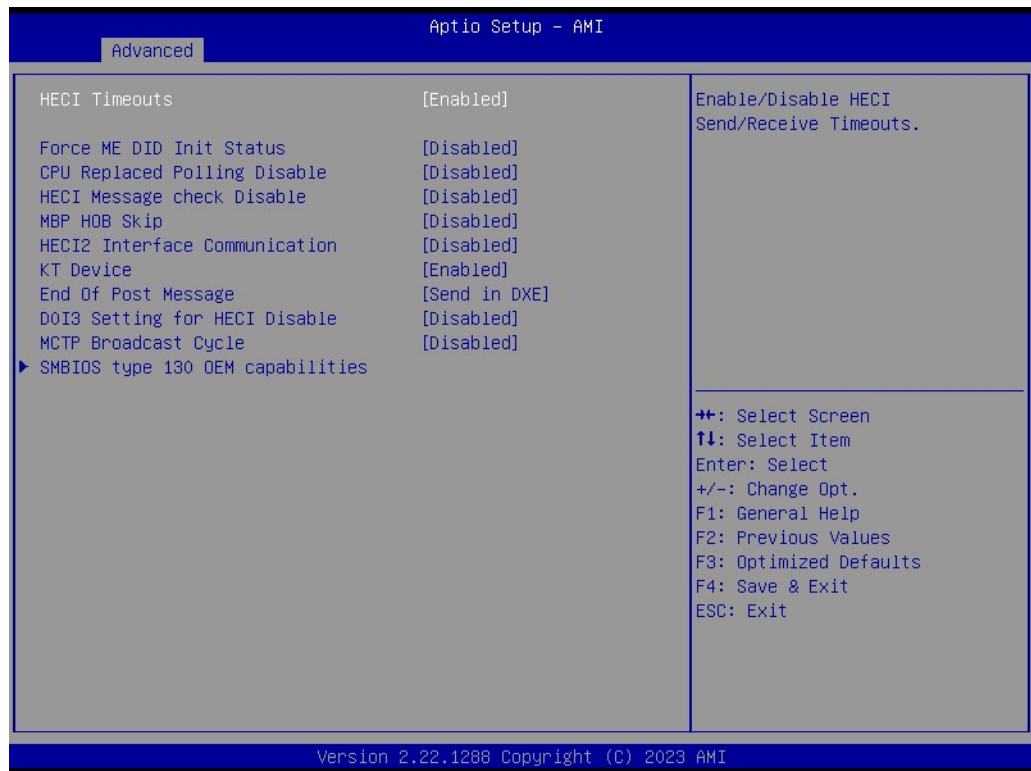
FIPS Configuration

Advanced → PCH-FW Configuration → FIPS Configuration



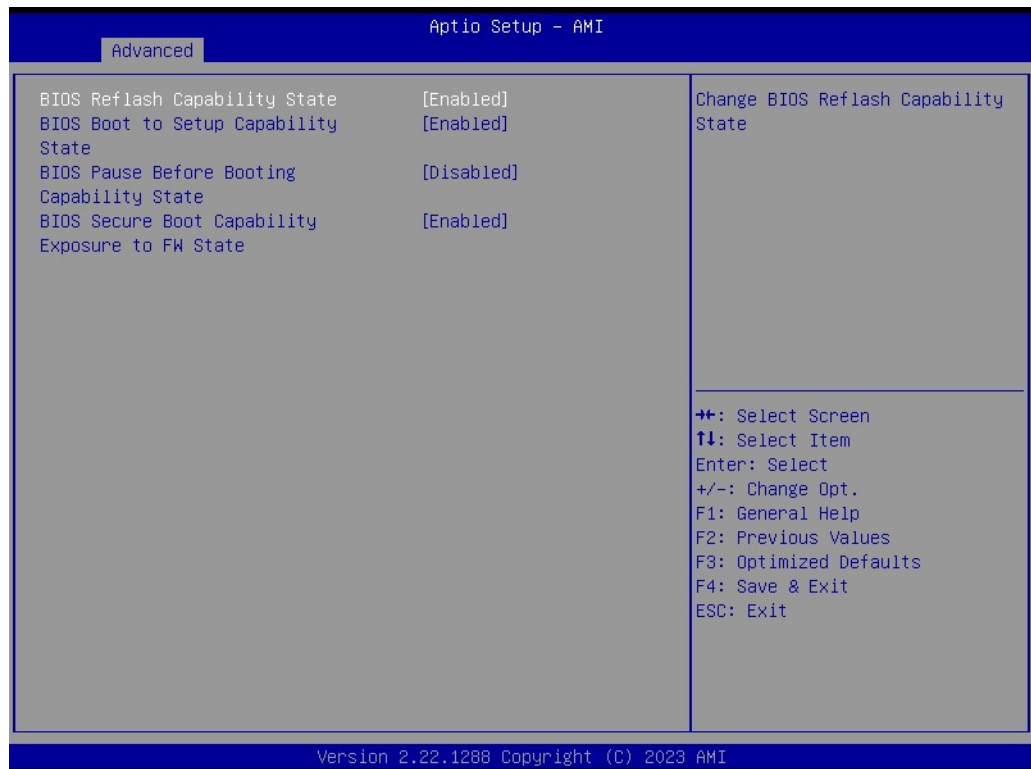
ME Debug Configuration

Advanced → PCH-FW Configuration → ME Debug Configuration



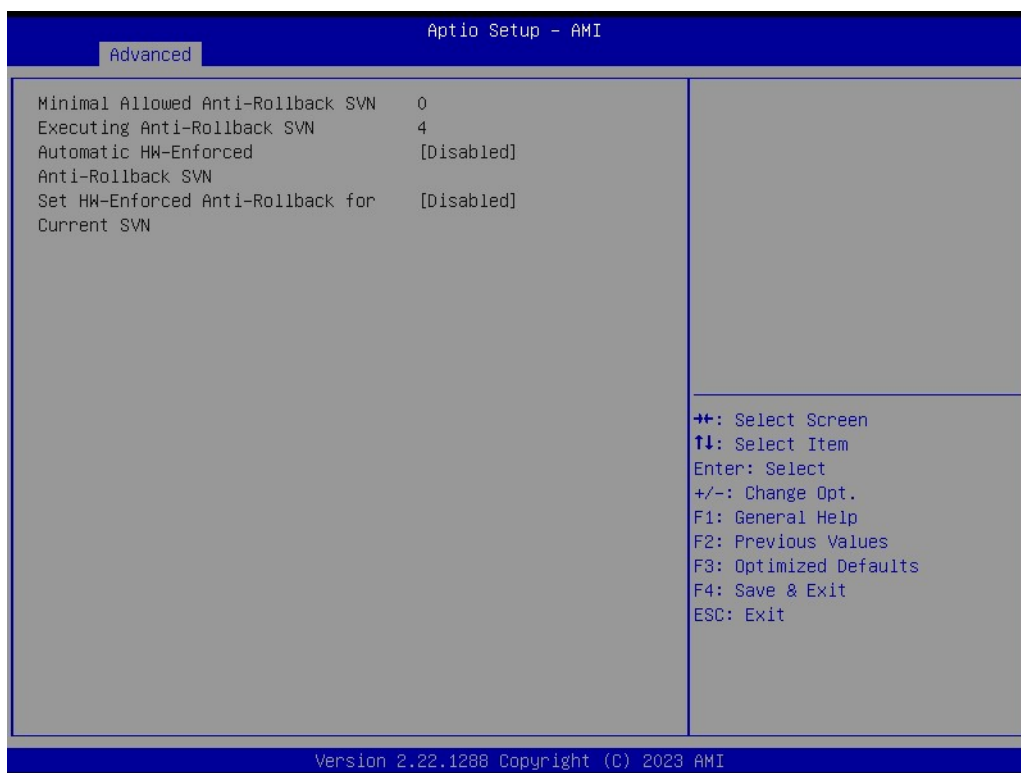
SMBIOS Type 130 OEM Capabilities

Advanced → PCH-FW Configuration → ME debug Configuration → SMBIOS Type 130 OEM Capabilities



Anti-Rollback SVN Configuration

Advanced → PCH-FW Configuration → Anti-Rollback SVN Configuration



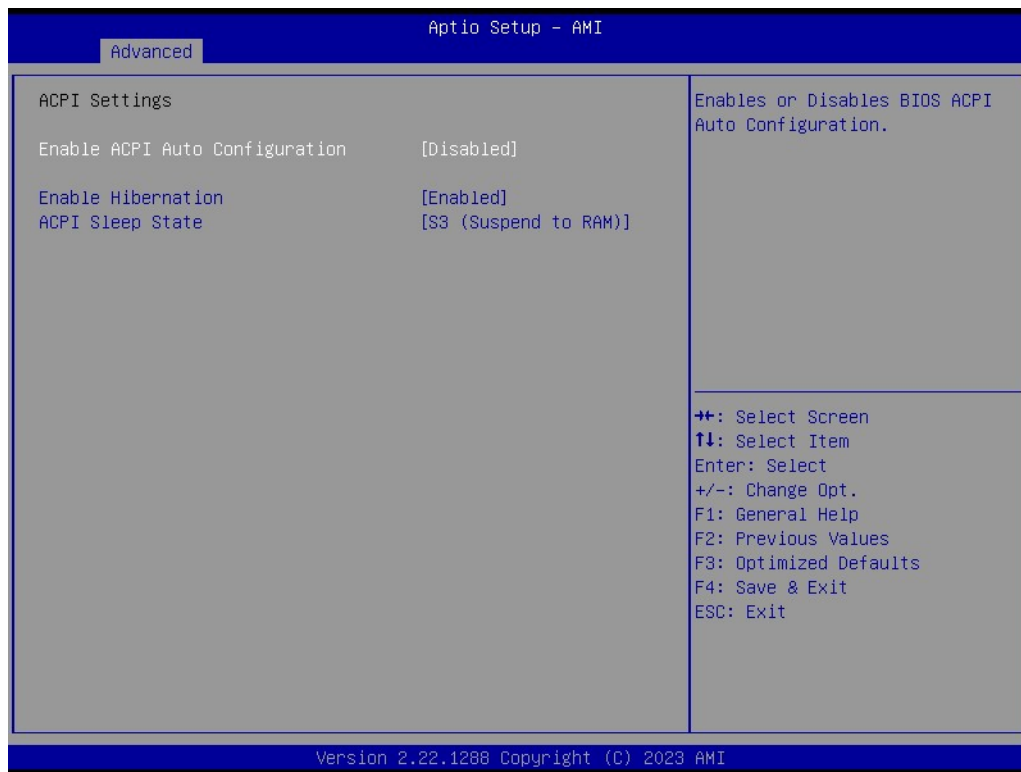
OEM Key Revocation Configuration

Advanced → PCH-FW Configuration → OEM Key Revocation Configuration



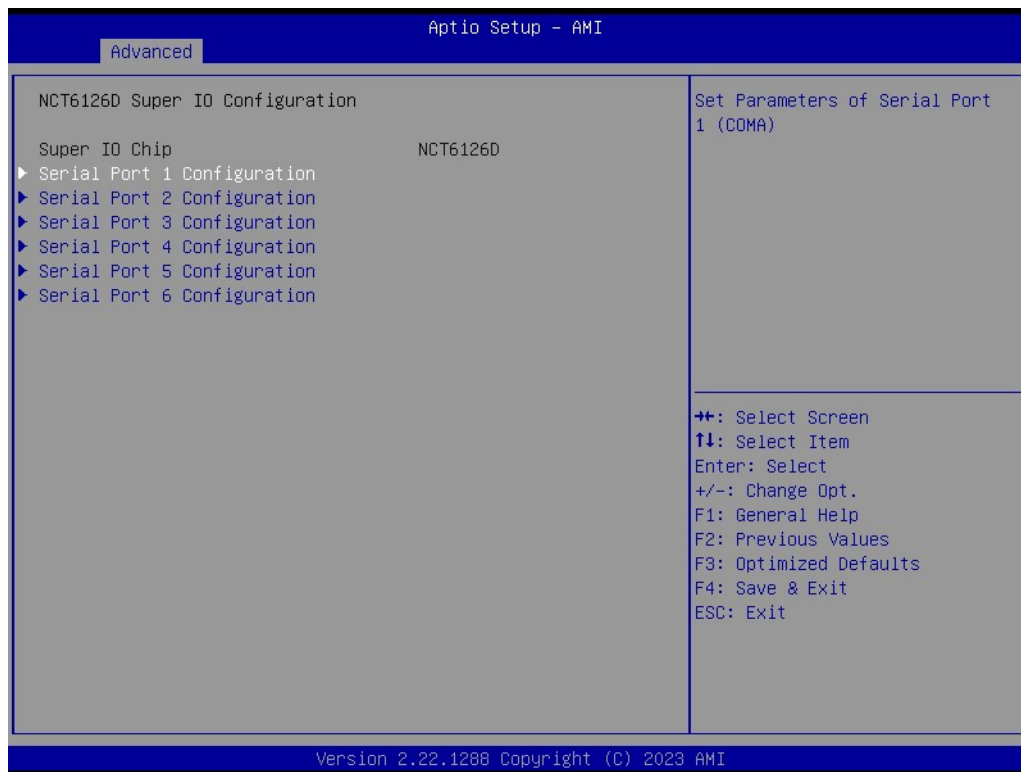
3.2.2.4 Trusted Computing Settings

Advanced → ACPI Settings



3.2.2.5 NCT6126D Super IO Configuration

Advanced → NCT6126D Super IO Configuration



Serial Port 1 Configuration

Advanced → NCT6126D Super IO Configuration → Serial Port 1 Configuration



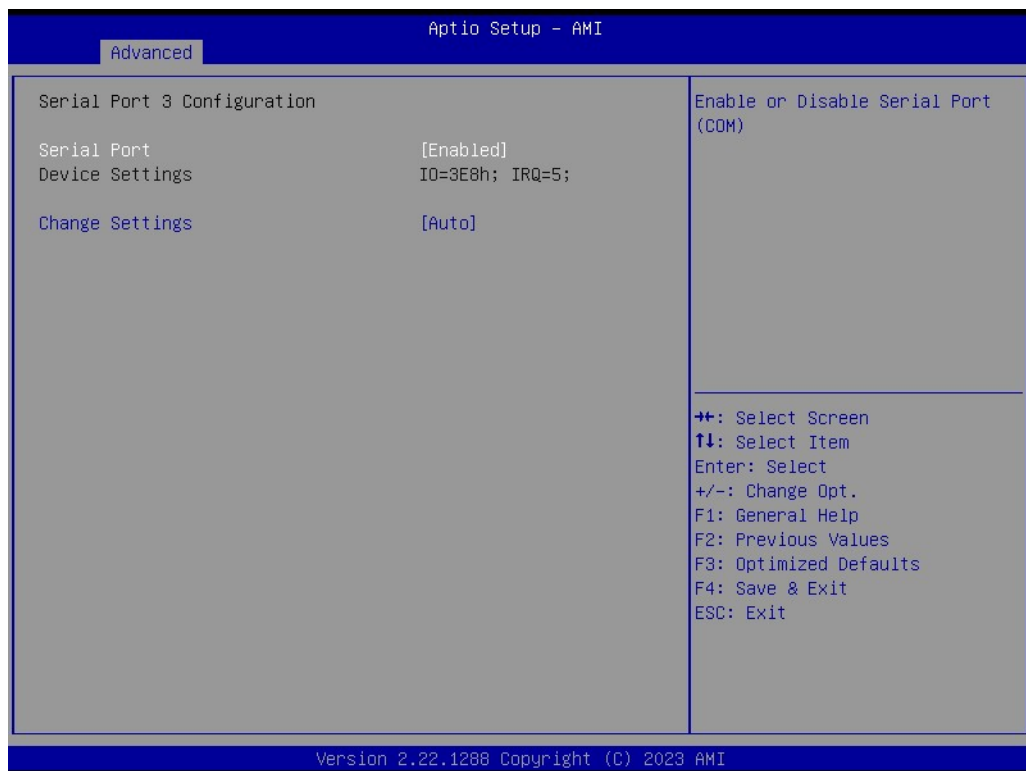
Serial Port 2 Configuration

Advanced → NCT6126D Super IO Configuration → Serial Port 2 Configuration



Serial Port 3 Configuration

Advanced → NCT6126D Super IO Configuration → Serial Port 3 Configuration



Serial Port 4 Configuration

Advanced → NCT6126D Super IO Configuration → Serial Port 4 Configuration



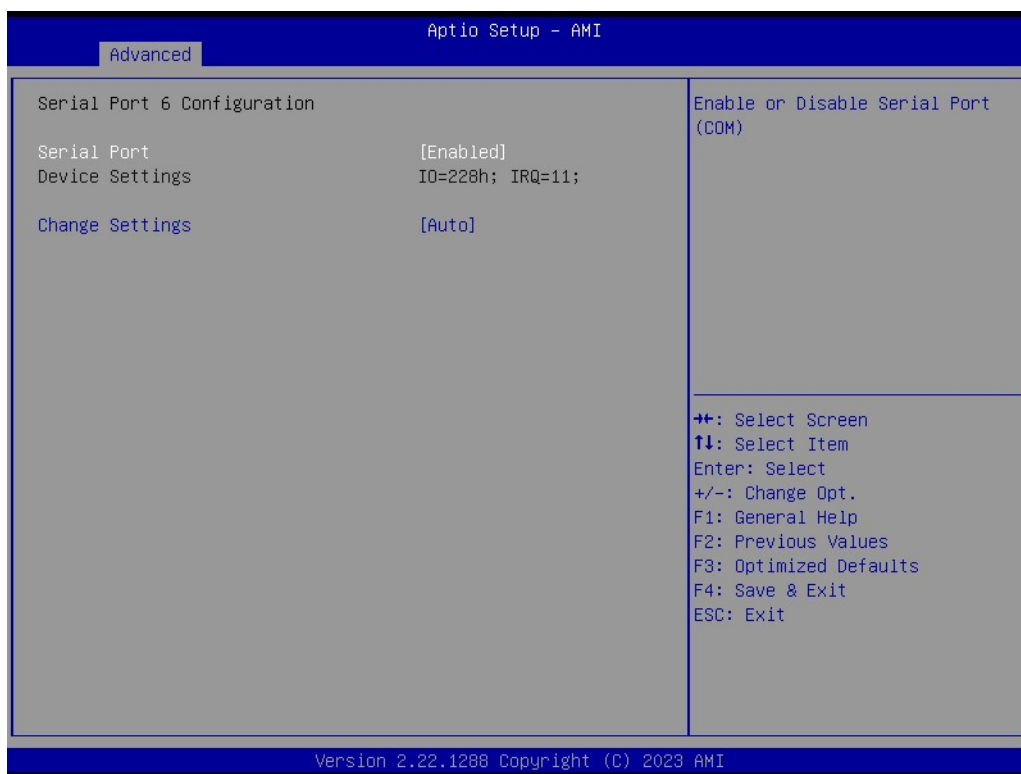
Serial Port 5 Configuration

Advanced → NCT6126D Super IO Configuration → Serial Port 5 Configuration



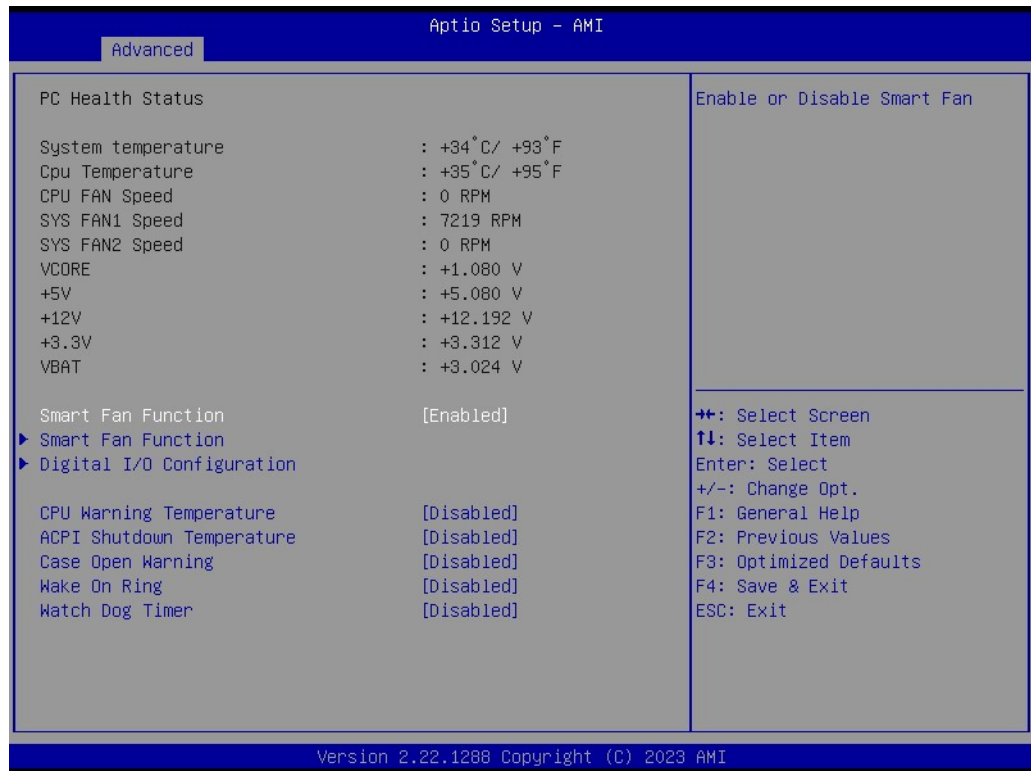
Serial Port 6 Configuration

Advanced → NCT6126D Super IO Configuration → Serial Port 6 Configuration



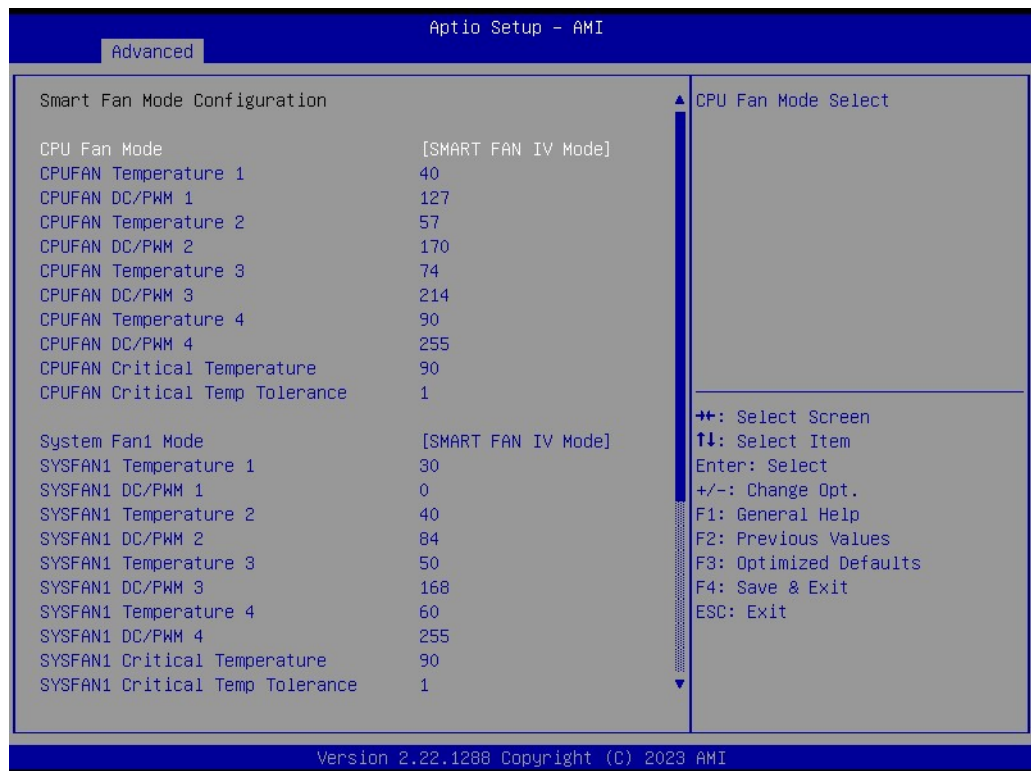
3.2.2.6 NCT6126D HW Monitor

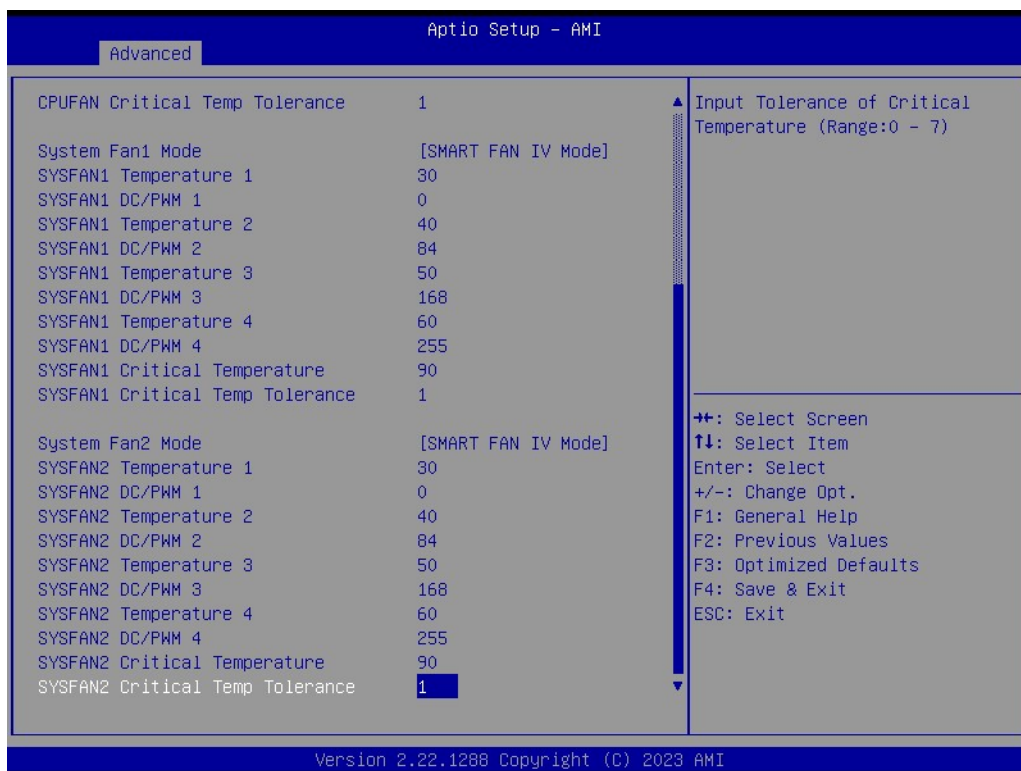
Advanced → NCT6126D HW Monitor



Smart Fan Function

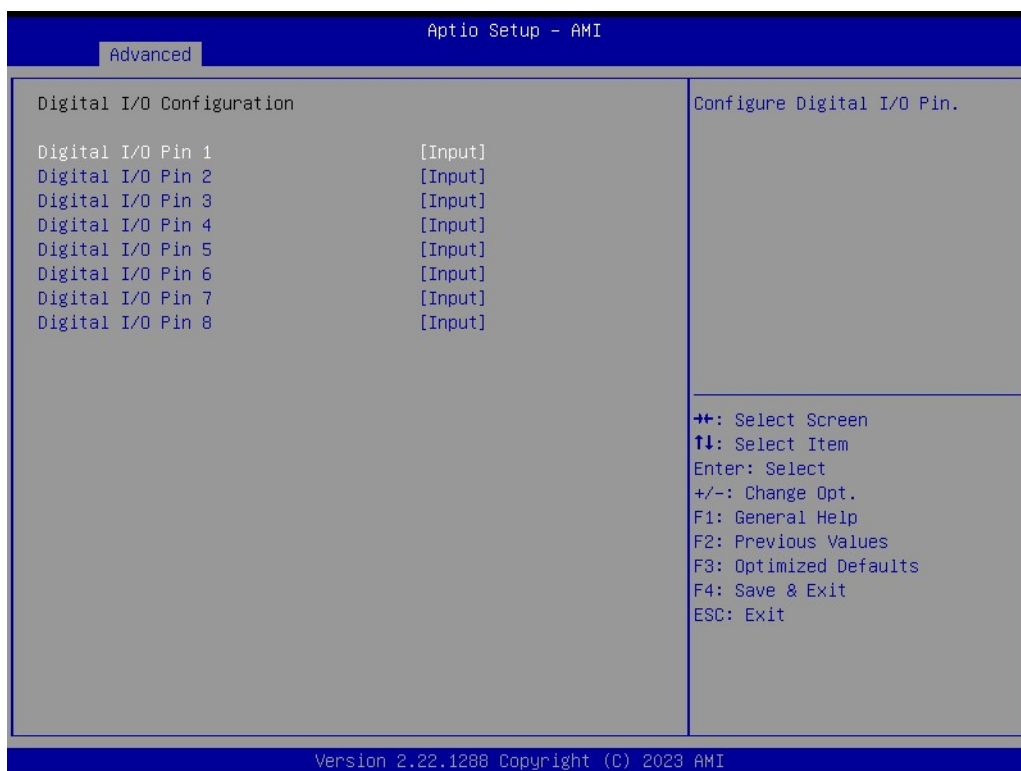
Advanced → NCT6126D HW Monitor → Smart Fan Function





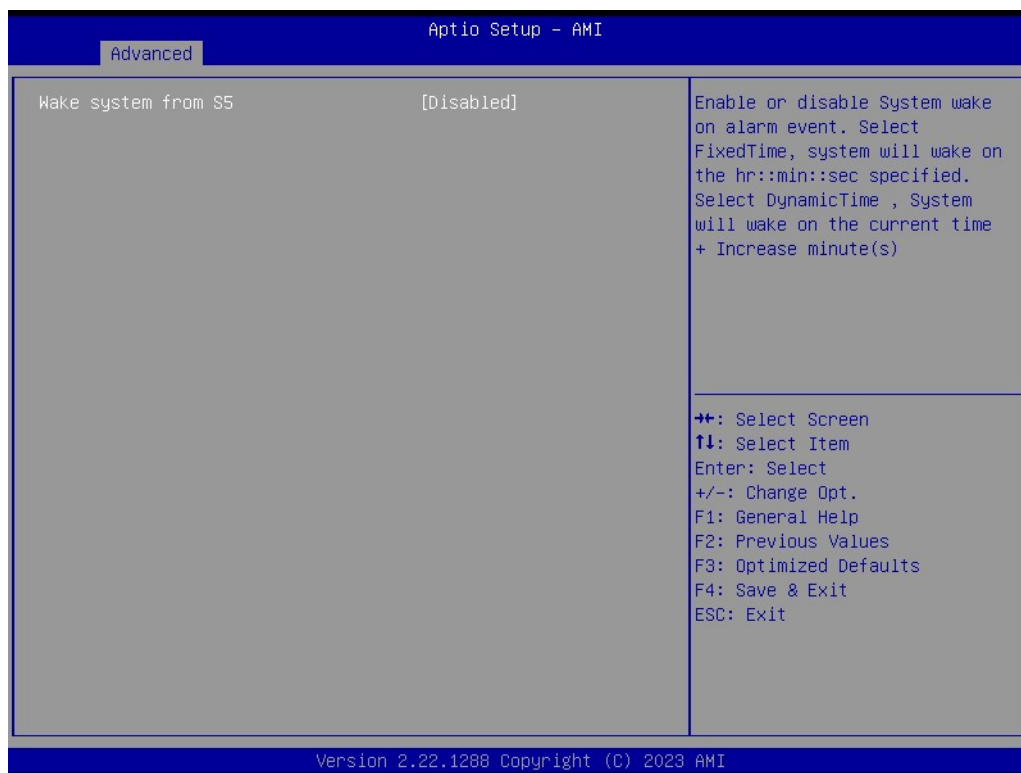
Digital I/O Configuration

Advanced → NCT6126D HW Monitor → Digital I/O Configuration



3.2.2.7 S5 RTC Wake Settings

Advanced → S5 RTC Wake Settings



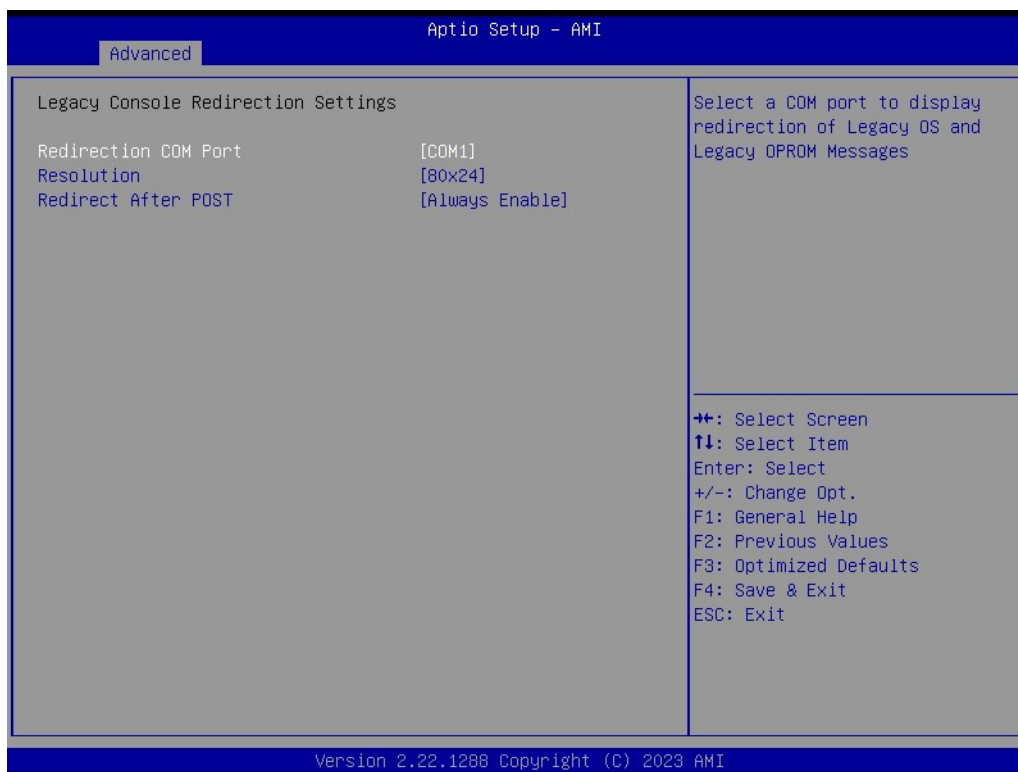
3.2.2.8 Serial Port Console Redirection

Advanced → Serial Port Console Redirection



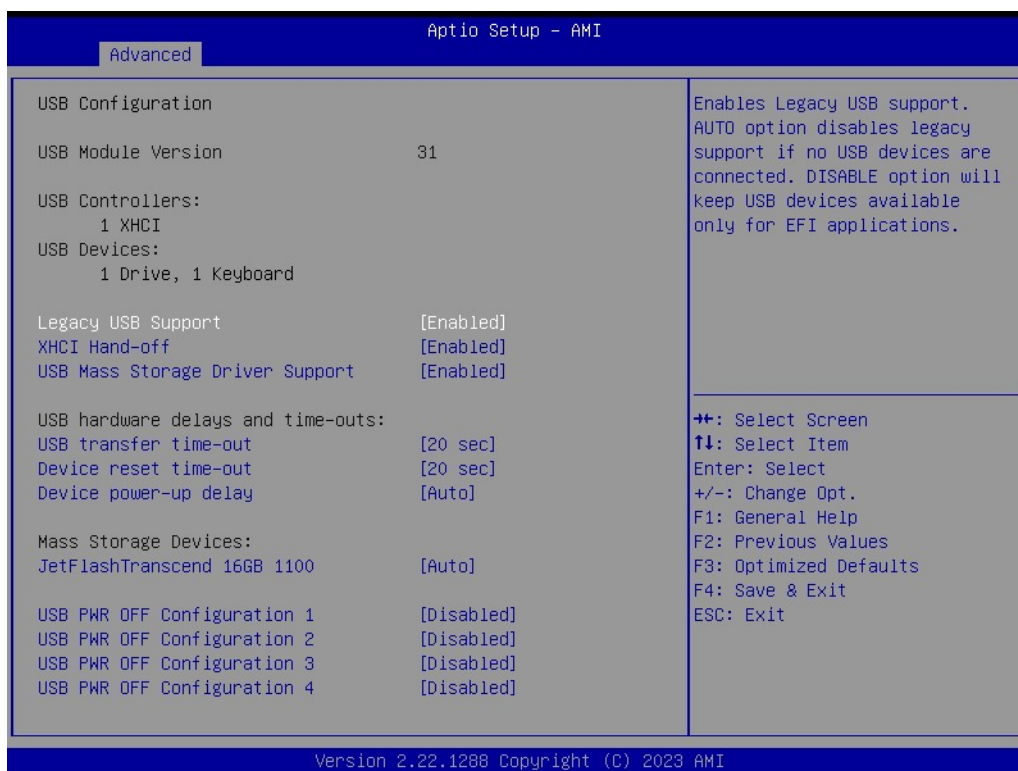
Legacy Console Redirection Settings

Advanced → Serial Port Console Redirection → Legacy Console Redirection Settings



3.2.2.9 USB Configuration

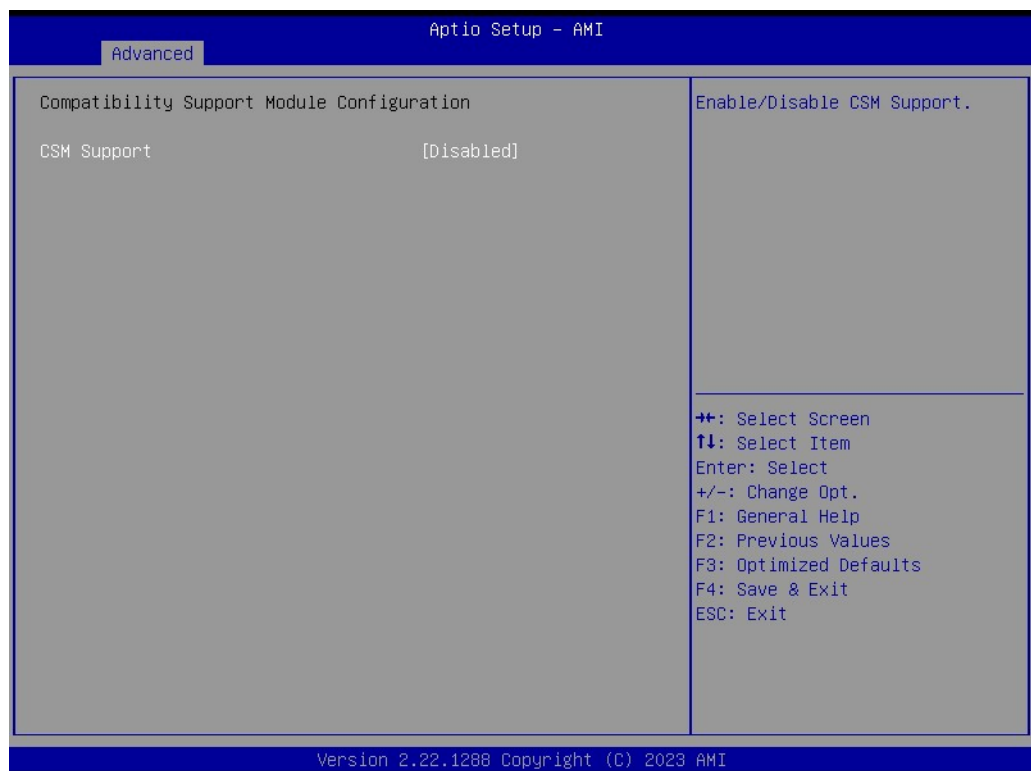
Advanced → USB Configuration



3.2.2.10 Network Stack Configuration



3.2.2.11 CSM Configuration



3.2.2.12 NVMe Configuration

Advanced → NVMe Configuration



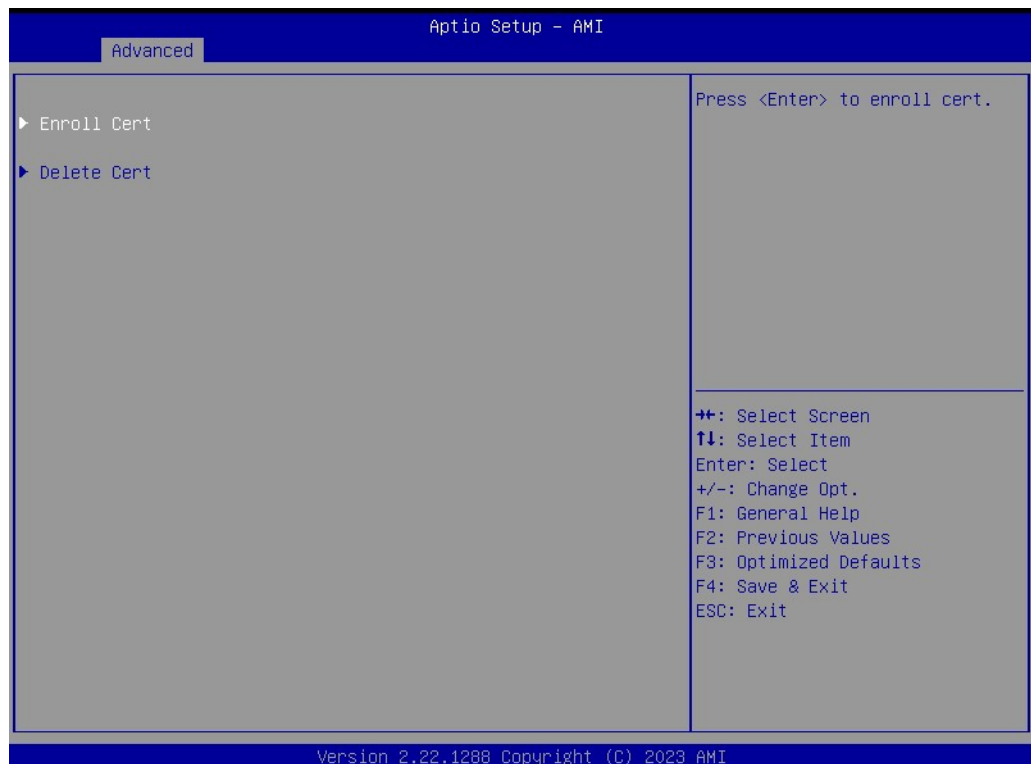
3.2.2.13 TLS Auth Configuration

Advanced → TLS Auth Configuration



3.2.2.14 Driver Health

Advanced → Driver Health



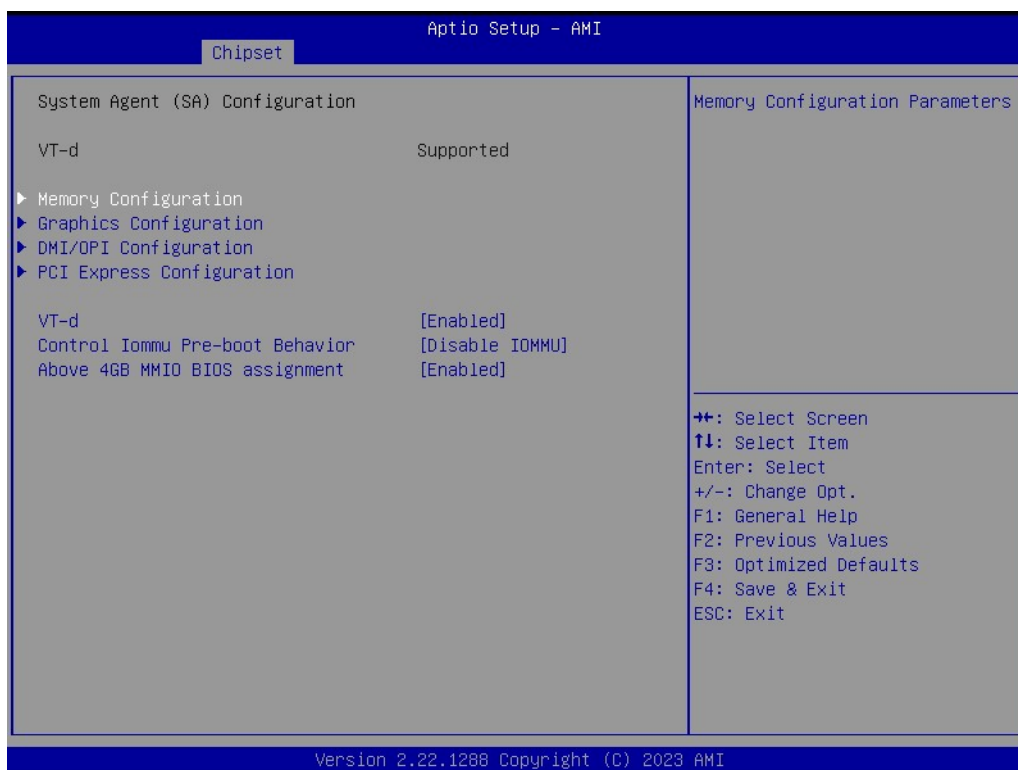
3.2.3 Chipset Configuration Setting

Select the Chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as PCI Express Configuration, to go to the sub-menu for that item. Users can display a Chipset Setup option by highlighting it using the <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.



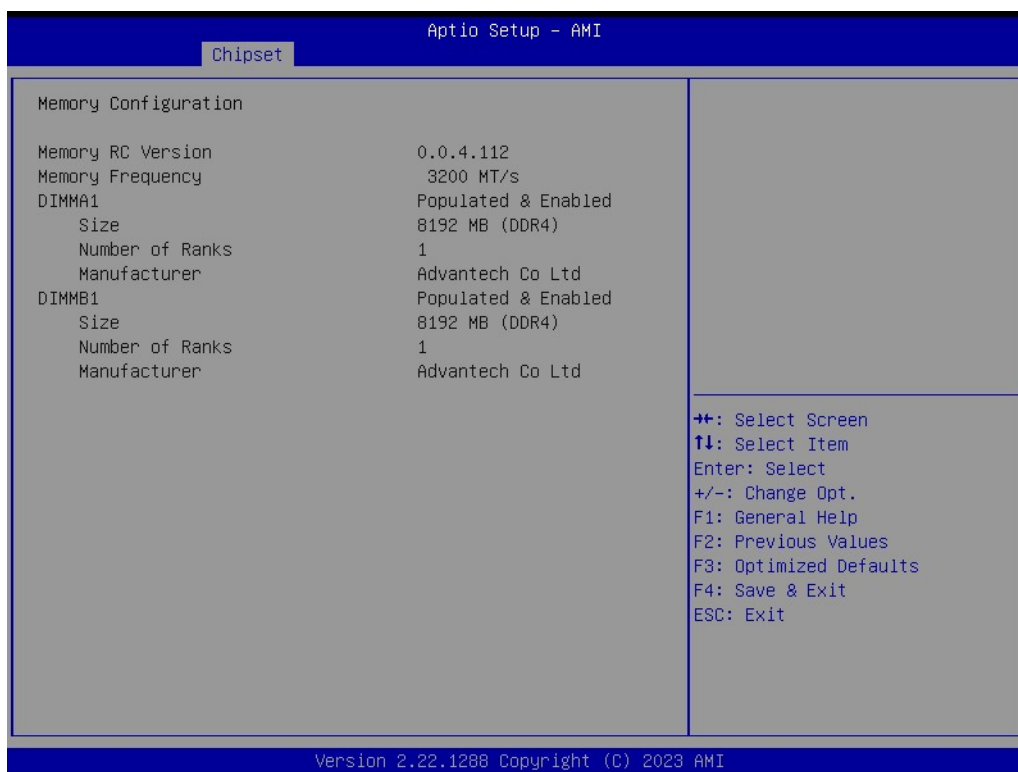
3.2.3.1 System Agent (SA) Configuration

Chipset → System Agent (SA) Configuration



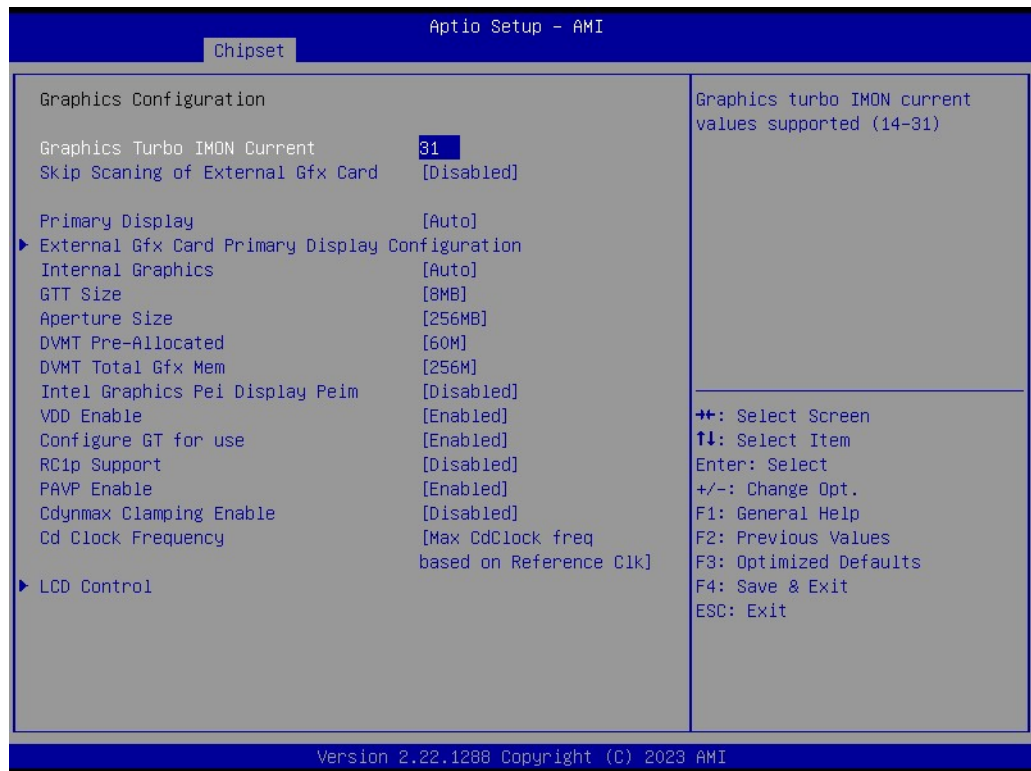
Memory Configuration

Chipset → System Agent (SA) Configuration → Memory Configuration



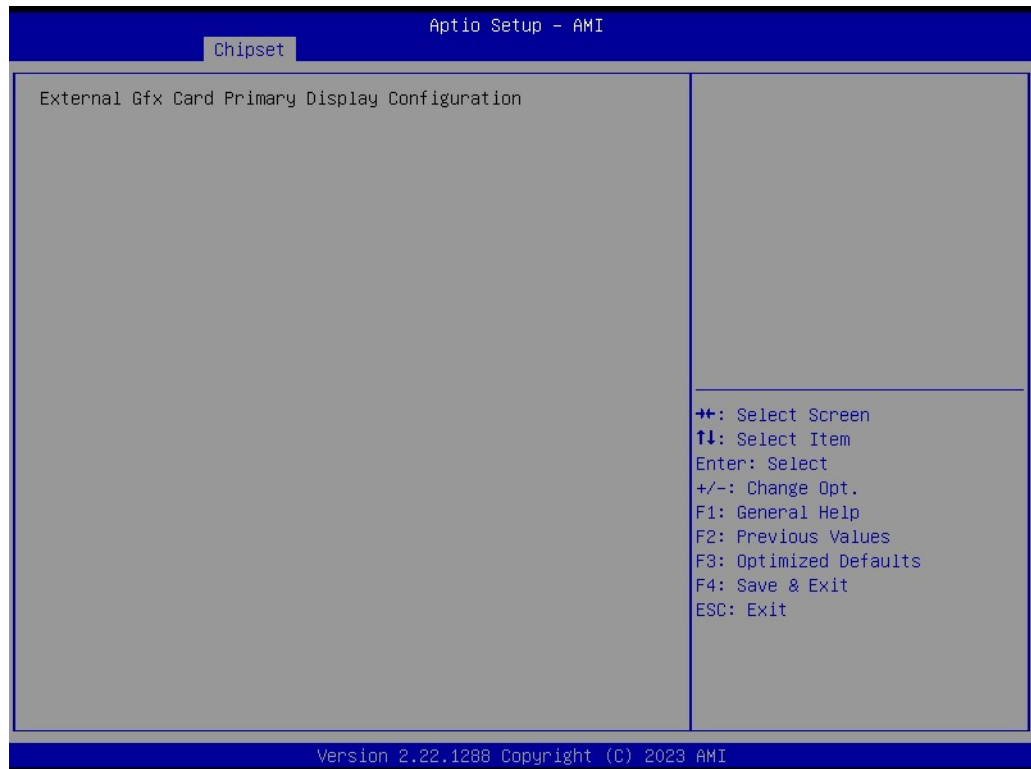
Graphics Configuration

Chipset → System Agent (SA) Configuration → Graphics Configuration



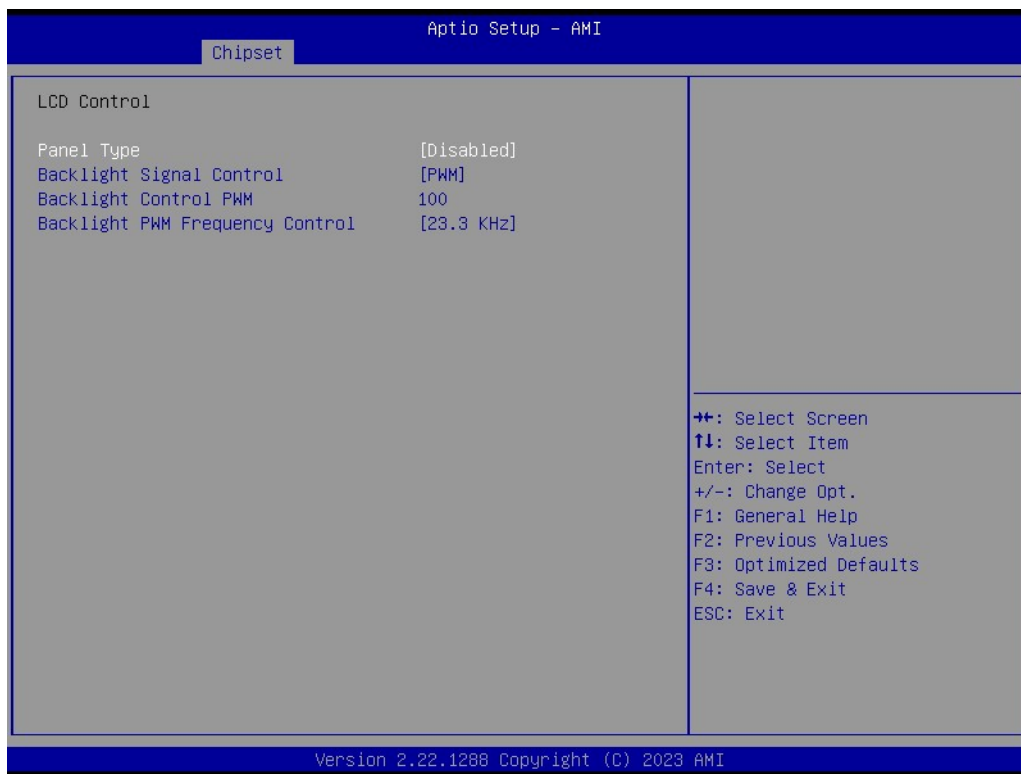
External Gfx Card Primary Display Configuration

Chipset → System Agent (SA) Configuration → Graphics Configuration → External Gfx Card Primary Display Configuration



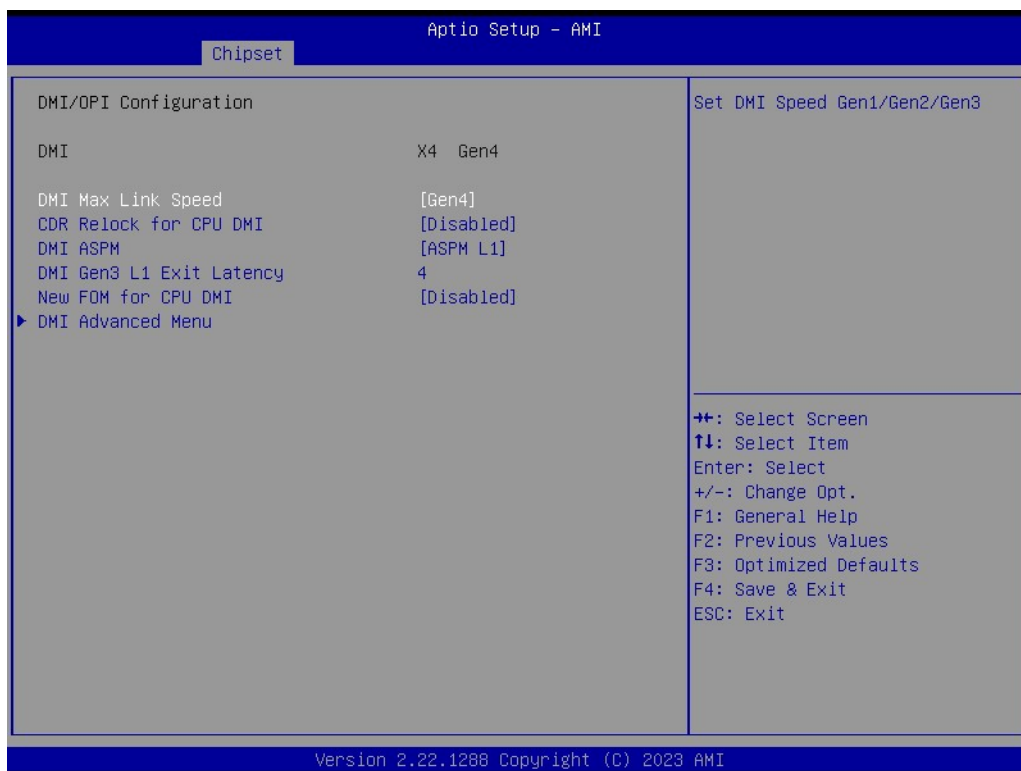
LCD Control

Chipset → System Agent (SA) Configuration → Graphics Configuration → LCD Control



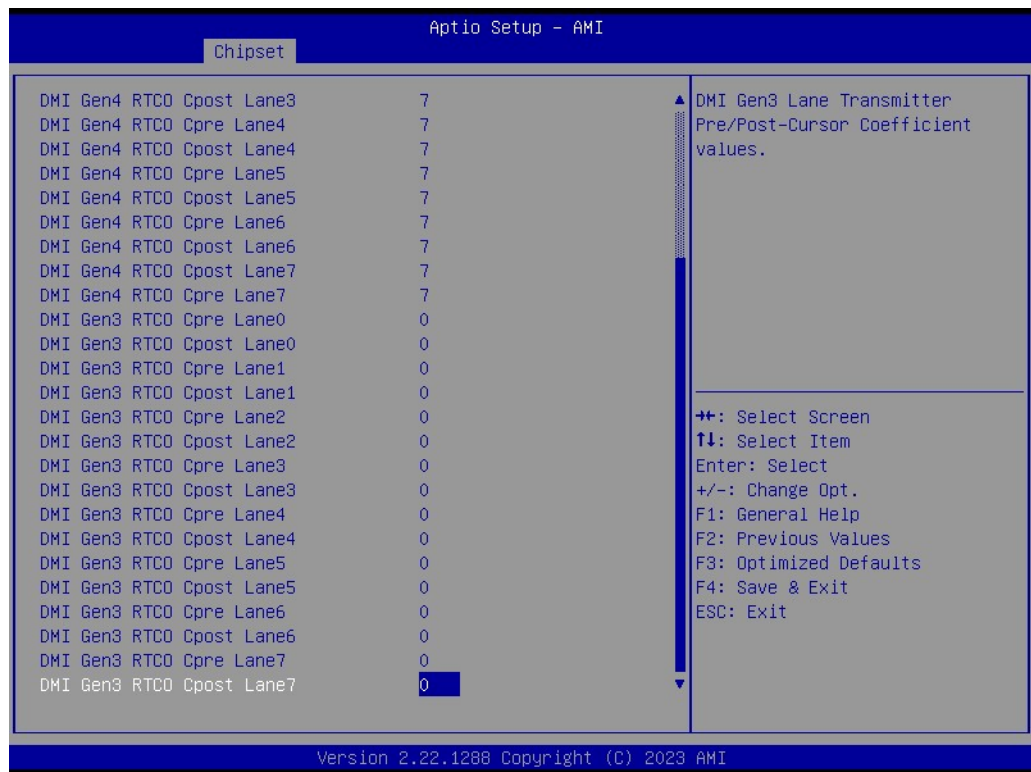
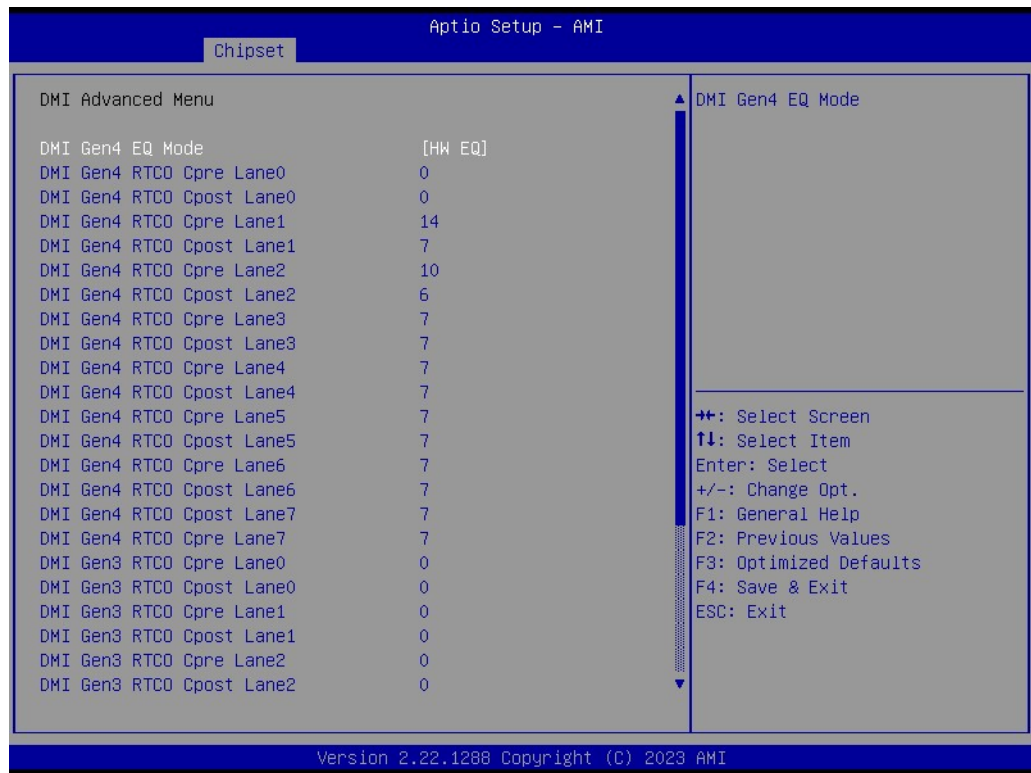
DMI/OPI Configuration

Chipset → System Agent (SA) Configuration → DMI/OPI Configuration



DMI Advanced Menu

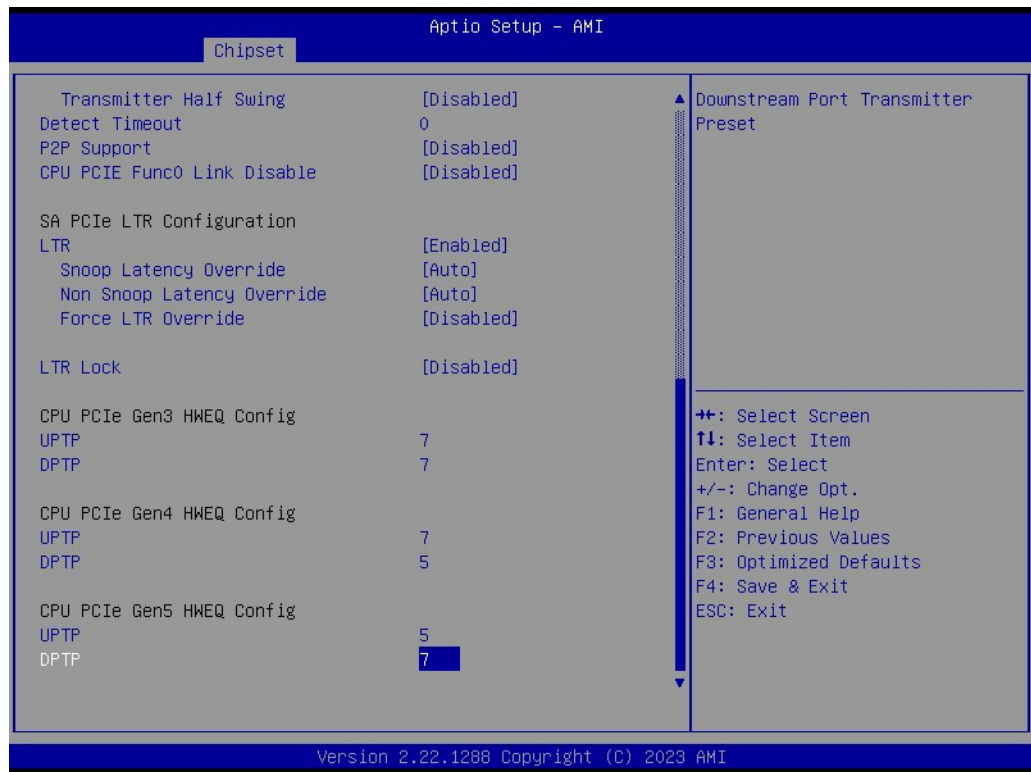
Chipset → System Agent (SA) Configuration → DMI/OPI Configuration → DMI Advanced Menu



PCI Express Configuration

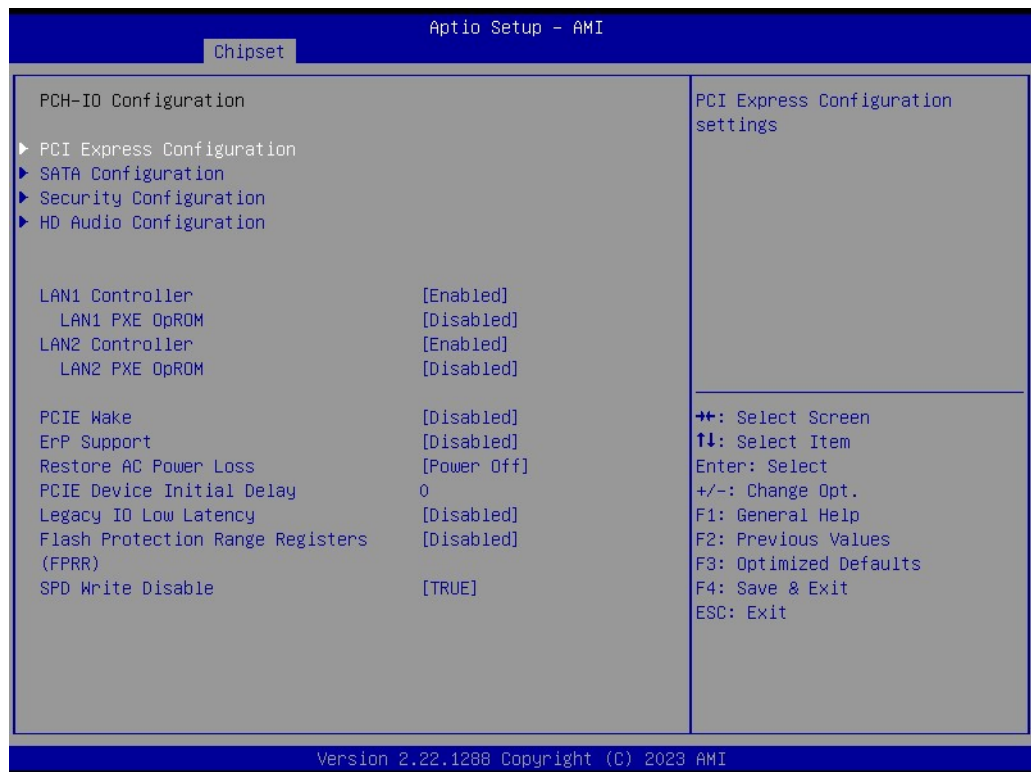
Chipset → System Agent (SA) Configuration → PCI Express Configuration





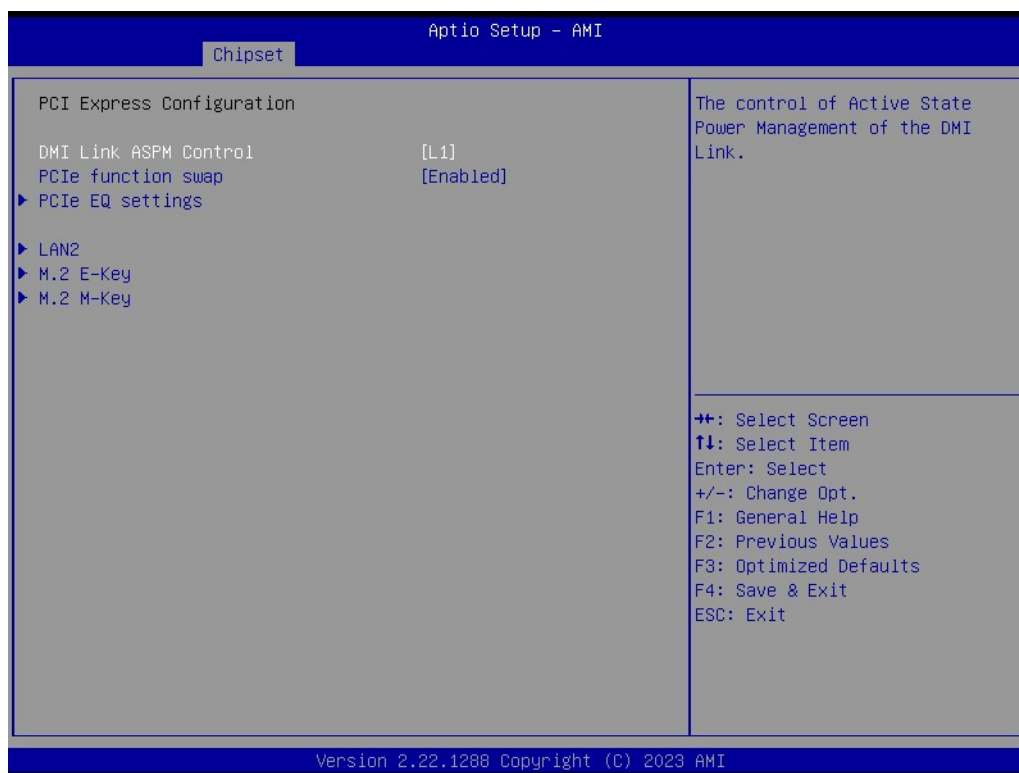
3.2.3.2 PCH-IO Configuration

Chipset → PCH-I/O Configuration



PCI Express Configuration

Chipset → PCH-I/O Configuration → PCI Express configuration



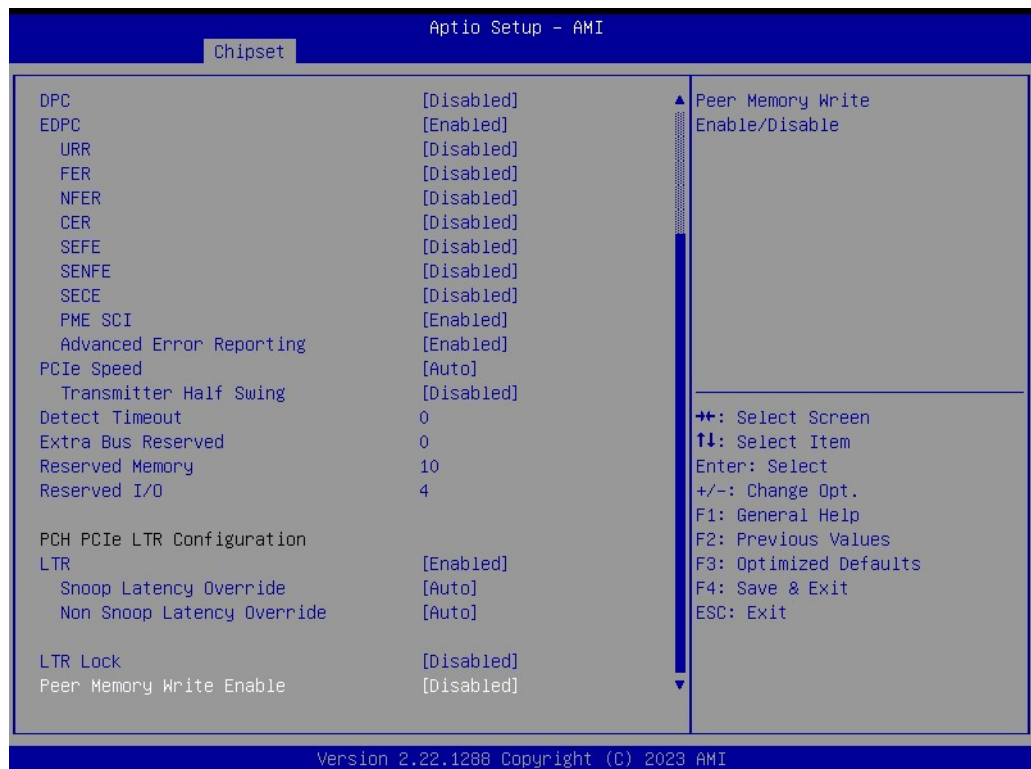
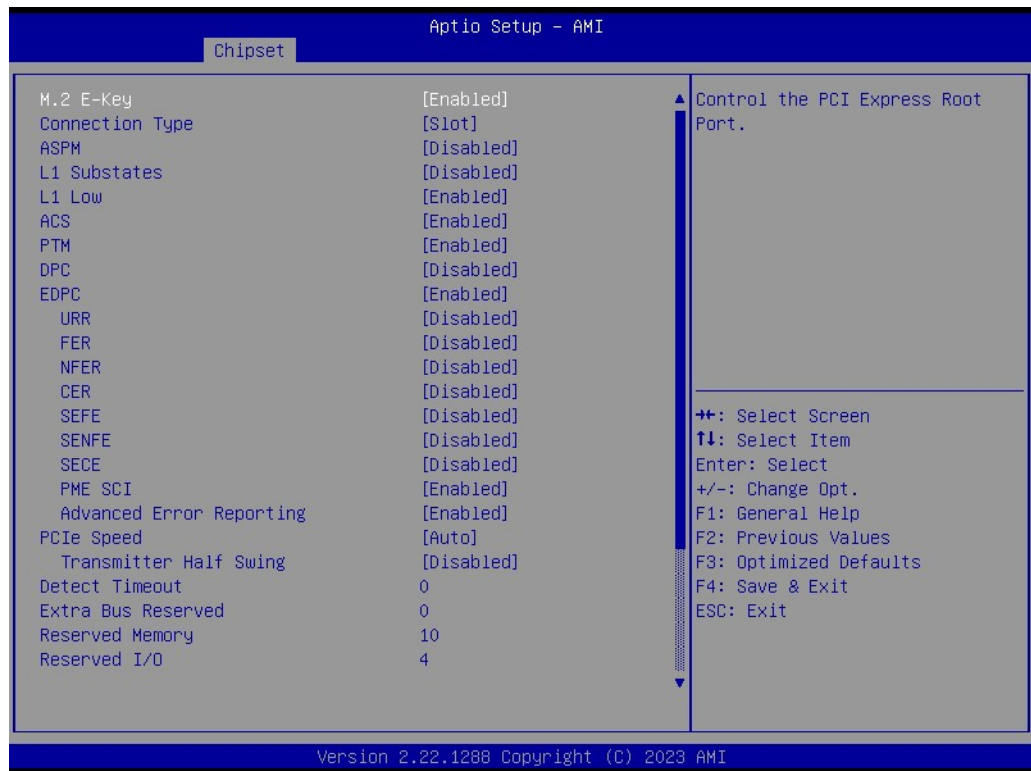
PCIe EQ Settings

Chipset → PCH-I/O Configuration → PCI Express Configuration → PCIe EQ Settings



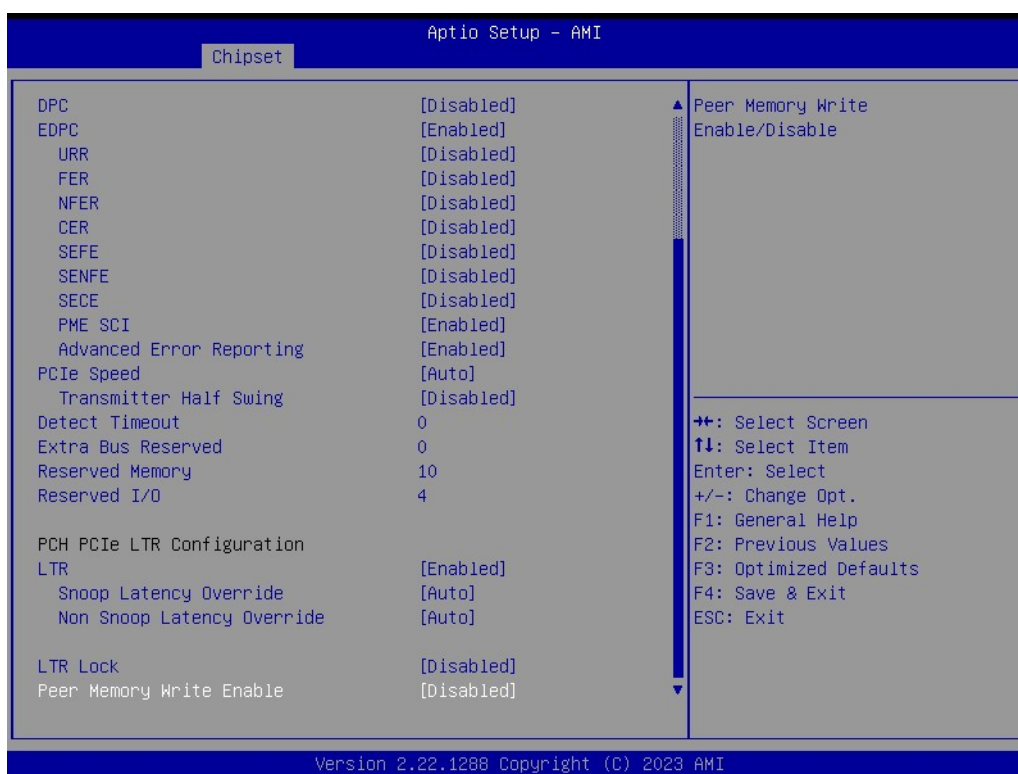
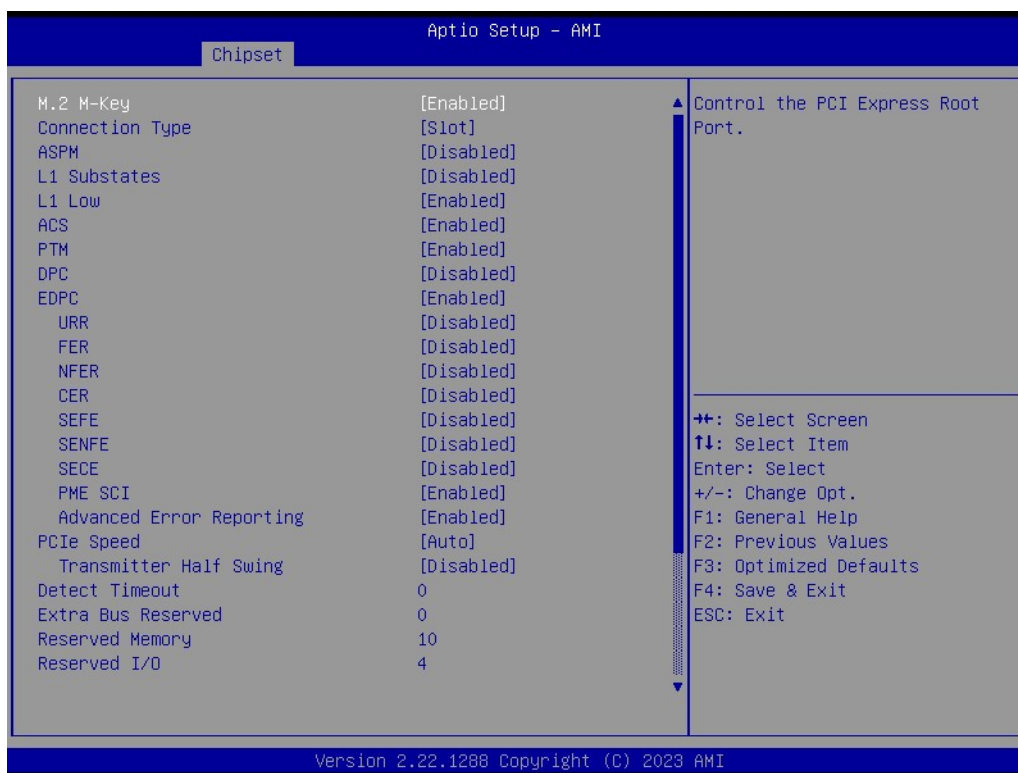
M.2 E-Key

Chipset → PCH-I/O Configuration → PCI Express Configuration → M.2 E-Key



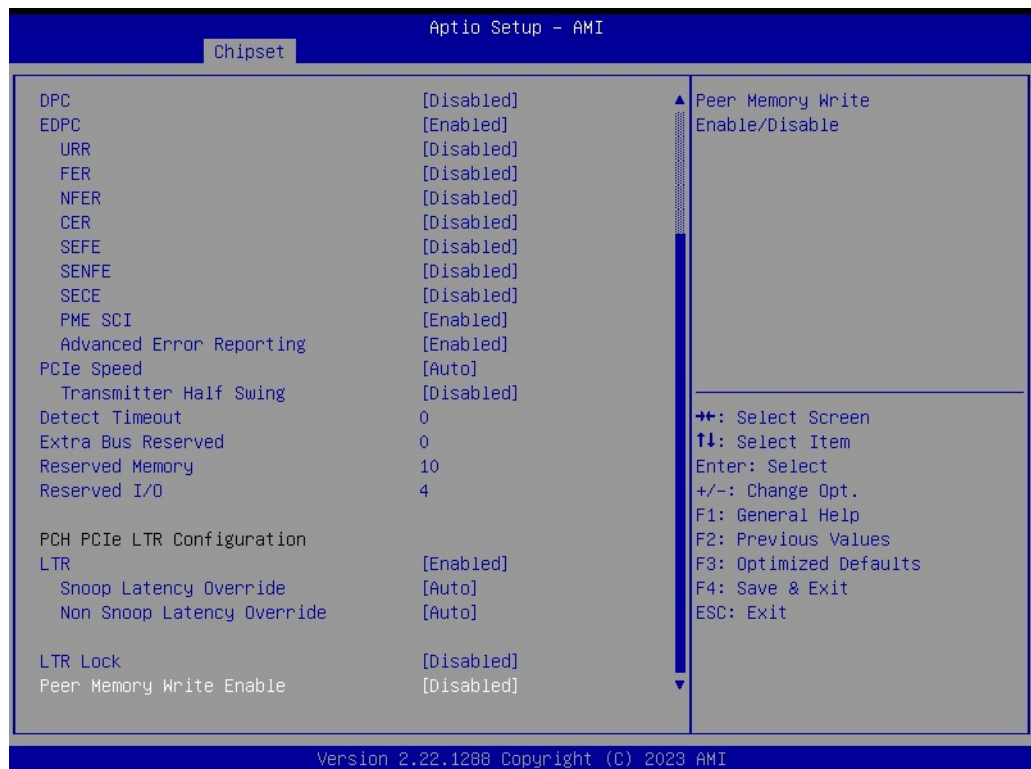
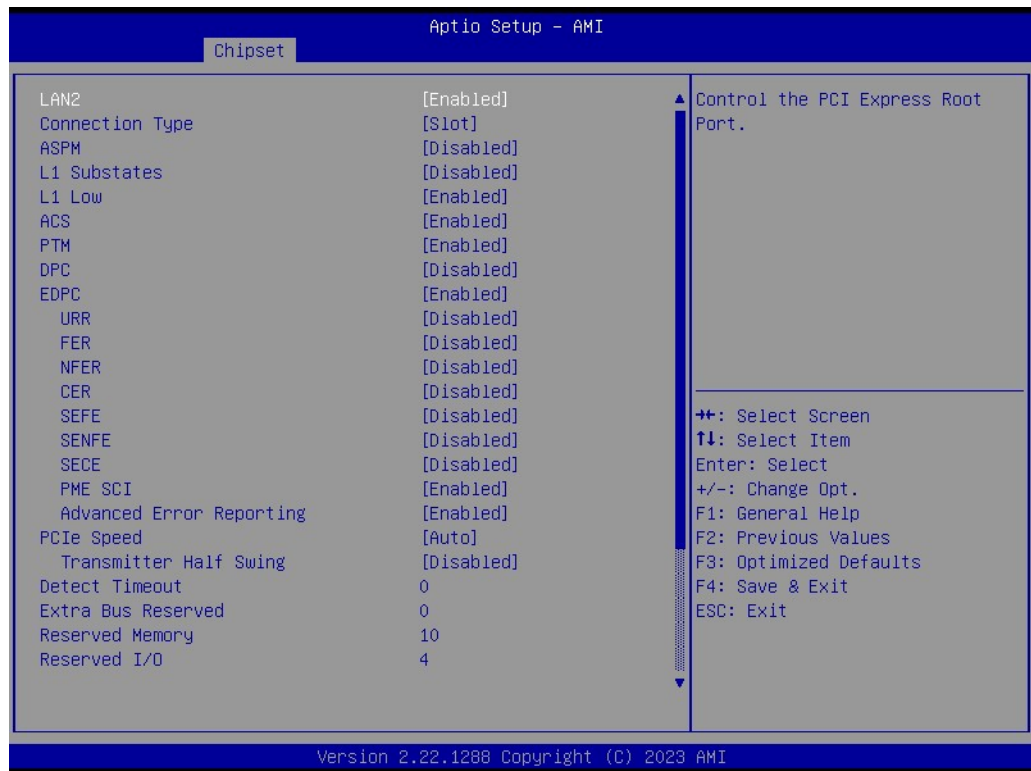
M.2 M-Key

Chipset → PCH-I/O Configuration → PCI Express Configuration → M.2 M-Key



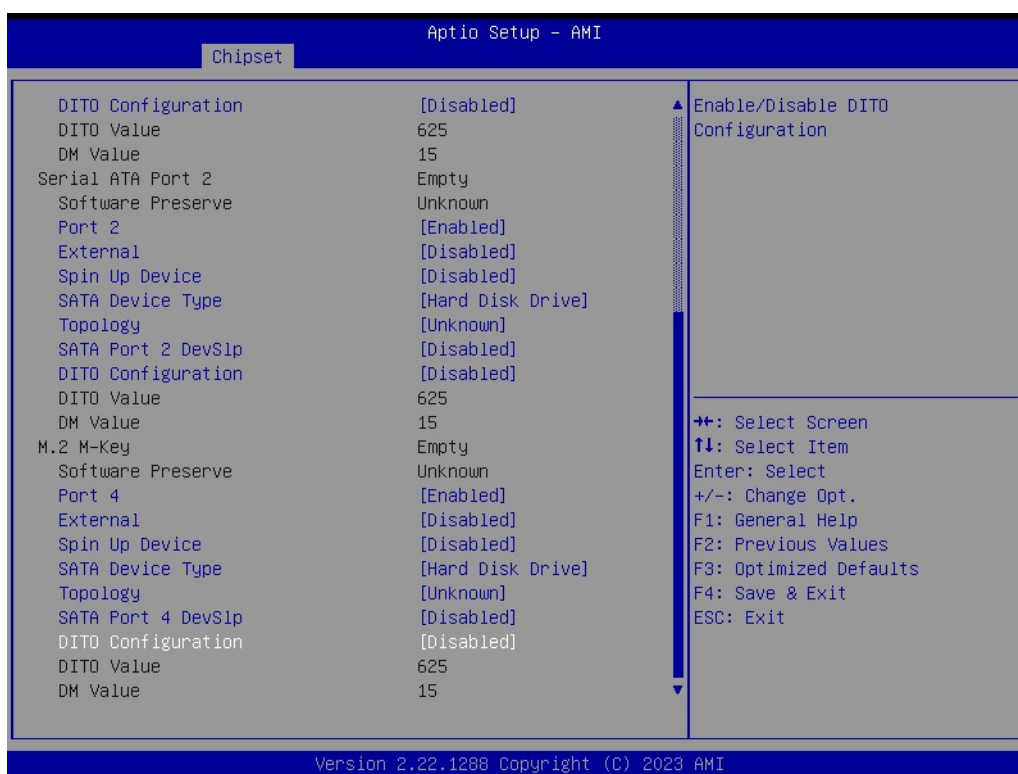
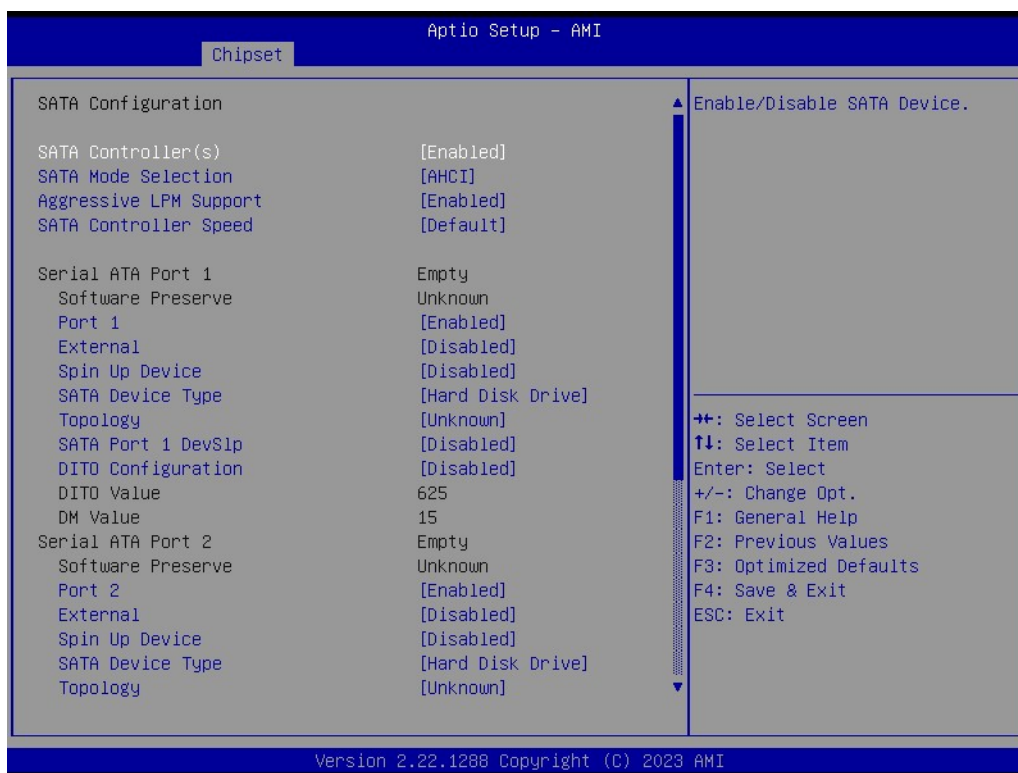
LAN2

Chipset → PCH-I/O Configuration → PCI Express Configuration → LAN2



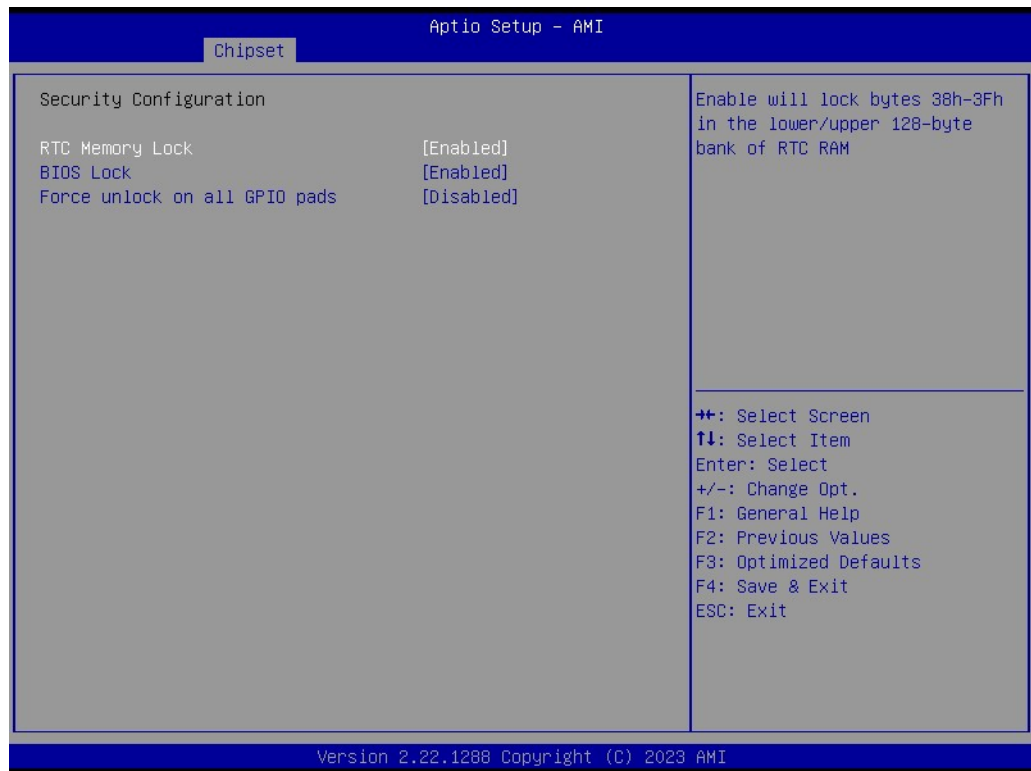
SATA Configuration

Chipset → PCH-I/O Configuration → SATA Configuration



Security Configuration

Chipset → PCH-I/O Configuration → Security Configuration



HD Audio Subsystem Configuration Settings

Chipset → PCH-I/O Configuration → HD Audio Subsystem Configuration Settings



3.2.4 Security

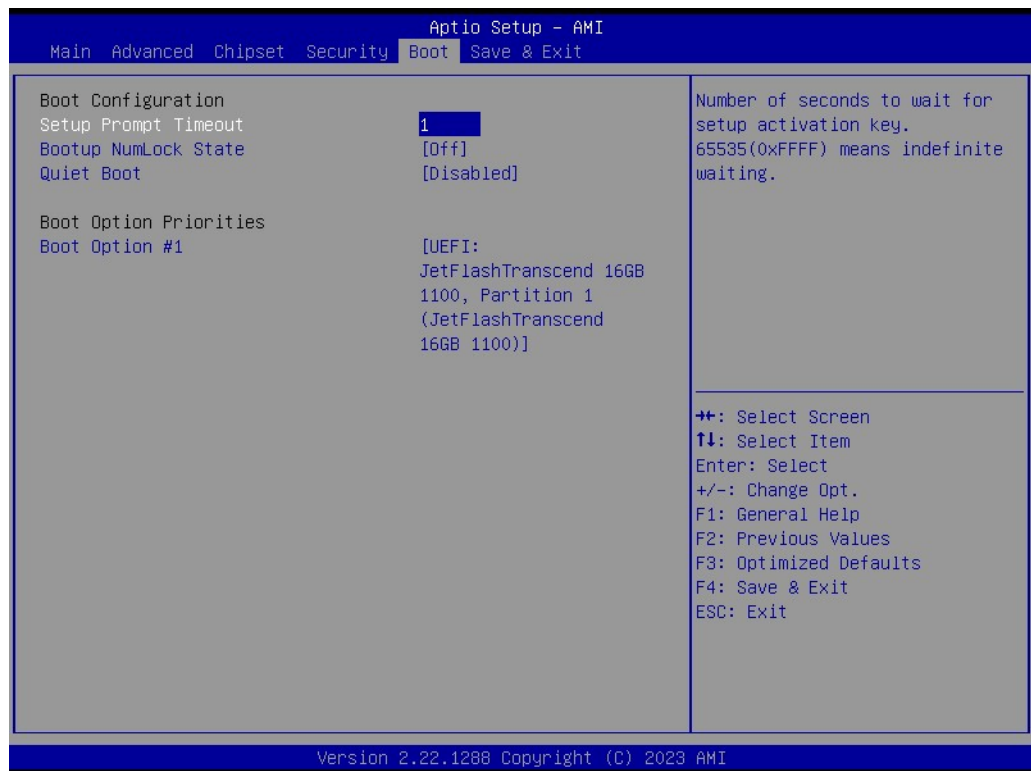


Secure Boot

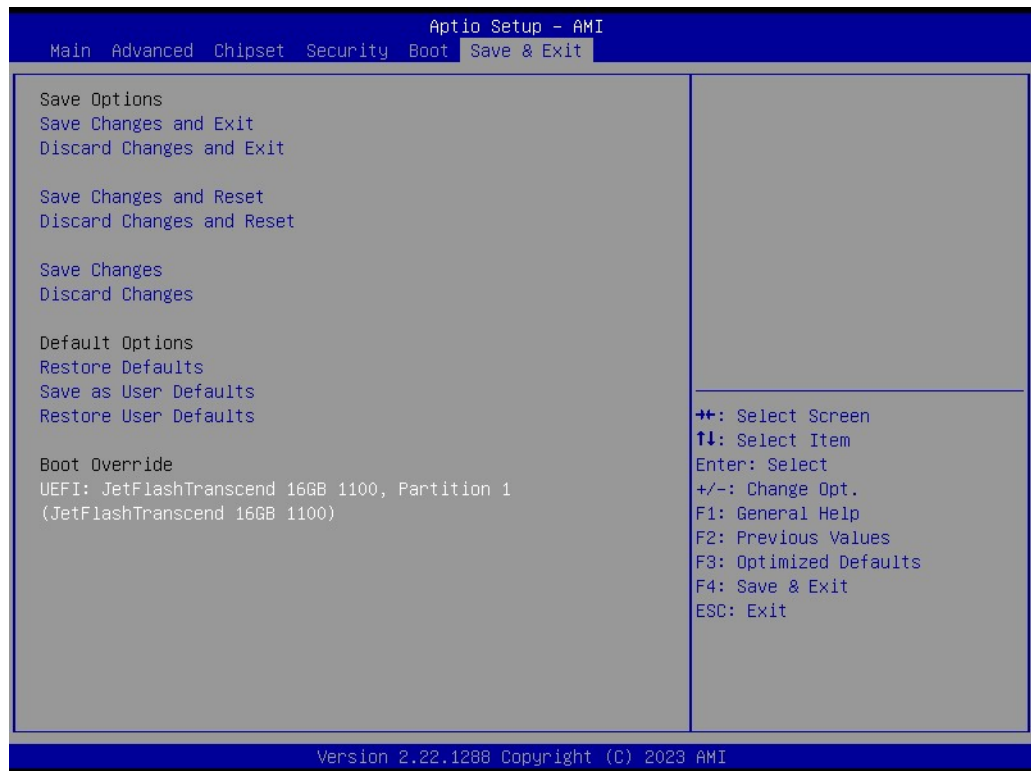
Security → Secure Boot



3.2.5 Boot Settings



3.2.6 Save and Exit Configuration



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 the device on or off. Our API also provides programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

SMBus



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

4.2.1.2 Display

Brightness Control



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

Backlight



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

4.2.1.3 Monitor

Watchdog



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

Hardware Monitor



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

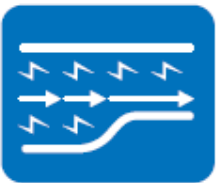
4.2.1.4 Power Saving

CPU Speed



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

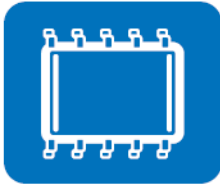
System Throttling



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.

Embedded Security ID



The embedded application is the most important property of a system integrator. It contains valuable intellectual property, design knowledge, and innovation, but it is easy to copy. The Embedded Security ID utility provides reliable security functions for customers to secure their application data within the embedded BIOS.

Monitoring



The Monitoring utility is a utility for customers to monitor system health indicators such as voltage, CPU and system temperature, and fan speed. These items are important to a device. If critical errors occur and are not resolved immediately, permanent damage may be caused.

Chapter 5

Chipset Software
Installation Utility

5.1 Before You Begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the AIMB-208 are located on the Advantech support website: <http://support.advantech.com/support/>. The driver on the support website will guide and link you to the utilities and drivers under a Windows system. Updates are provided via Service Packs from Microsoft*.

Note! *The driver files on the website are compressed. Do not attempt to install the drivers by copying the files manually. You must download the files and decompress them first. Also, please use the supplied SETUP program to install the drivers.*



Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of the user manual for your application software before performing the installation.

5.2 Introduction

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

- Core PCI PnP services
- Serial ATA interface support
- USB support
- Identification of Intel® chipset components in the Device Manager

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



- Windows 10 (64-bit)

Chapter 6

LAN Configuration

6.1 Introduction

The AIMB-208 has two Gigabit Ethernet LANs via dedicated PCI Express x1 lanes. Intel i219V and i226V offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 1000 Mbps.

6.2 Features

- Integrated 10/100/1000 Mbps transceiver
- 10/100/1000 Mbps triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCI Express x1 host interface

6.3 Installation

Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 5 for information on installing the CSI utility.*



The AIMB-208's Intel i219V and Intel i226V Gigabit integrated controllers support all major network operating systems. However, the installation procedure varies from system to system. Please find and use the section that provides the driver setup procedure for the OS you are using.

6.4 Windows® 10 Driver Setup (Intel i219V & Intel i226V)

Download the driver from the support website to your computer and decompress the file. Select "Autorun", then navigate to the directory for your OS.

Note! *Before installing the LAN drivers, make sure the CSI utility has been installed on your system. See Chapter 5 for information on installing the CSI utility.*



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