

# **User Manual**

# AIMB-279 B1

12th/13th/14th Gen Intel® Core™ Processor (Alder Lake / Raptor Lake / Raptor Lake-S Refresh), Mini-ITX with Q670E/H610E, PCIe x16 Gen4, 2.5GbE



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

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# **Declaration of Conformity**

#### FCC Class B

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

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

# **CPU Compatibility**

Processor Number	Max_TDP	Code Name	Cores/Threads	S-Spec	Lithography
i9-14900	65W	Raptor Lake-R	8P+16E/32T	Q37Q	Intel 7
i9-14900T	35W	Raptor Lake-R	8P+16E/32T	Q37P	Intel 7
17-14700	65W	Raptor Lake-R	8P+12E/32T	Q3RX	Intel 7
i7-14700T	35W	Raptor Lake-R	8P+12E/28T	Q3J8	Intel 7
i5-14500	65W	Raptor Lake-R	6P+8E/20T	Q37Y	Intel 7
i5-14500T	35W	Raptor Lake-R	6P+8E/20T	Q37X	Intel 7
i5-14400	65W	Raptor Lake-R	6P+4E/16T	Q3XZ	Intel 7
i5-14400T	35W	Raptor Lake-R	6P+4E/16T	Q381	Intel 7
i3-14100	60W	Raptor Lake-R	4P+0E/8T	Q3E4	Intel 7
i3-14100T	35W	Raptor Lake-R	4P+0E/8T	Q3DE	Intel 7
Intel Processor 300	46W	Raptor Lake-R	2P+0E/4T	Q3E6	Intel 7
Intel Processor 300T	35W	Raptor Lake-R	2P+0E/4T	Q3E7	Intel 7
i9-13900TE	35W	Raptor Lake	8P+16E/32T	SRMG1	Intel 7
i9-13900E	65W	Raptor Lake	8P+16E/32T	SRMG2	Intel 7
i9-13900	65W	Raptor Lake	8P+16E/32T	SRMB6	Intel 7
i7-13700TE	35W	Raptor Lake	8P+8E/24T	SRMG4	Intel 7
i7-13700E	65W	Raptor Lake	8P+8E/24T	SRMG3	Intel 7
i7-13700	65W	Raptor Lake	8P+4E/24T	SRMBA	Intel 7
i5-13500TE	35W	Raptor Lake	6P+8E/20T	SRMFZ	Intel 7
i5-13500E	65W	Raptor Lake	6P+8E/20T	SRMFW	Intel 7
i5-13500	65W	Raptor Lake	6P+8E/20T	SRMBM	Intel 7
i5-13400	65W	Raptor Lake	6P+4E/16T	SRMBP	Intel 7
i3-13100TE	35W	Raptor Lake	4P+0E/8T	SRMFT	Intel 7
i3-13100E	60W	Raptor Lake	4P+0E/8T	SRMFR	Intel 7
i3-13100	60W	Raptor Lake	4P+0E/8T	SRMBU	Intel 7
i9-12900TE	35W	Alder Lake	8P+8E/24T	SRL6C	Intel 7
i9-12900E	65W	Alder Lake	8P+8E/24T	SRL6B	Intel 7
i9-12900	65W	Alder Lake	8P+8E/24T	SRL4K	Intel 7
i7-12700TE	35W	Alder Lake	8P+4E/20T	SRL6E	Intel 7
i7-12700E	65W	Alder Lake	8P+4E/20T	SRL6D	Intel 7
i7-12700	65W	Alder Lake	8P+4E/20T	SRL4Q	Intel 7
i5-12500TE	35W	Alder Lake	6P/12T	SRL6V	Intel 7
i5-12500E	65W	Alder Lake	6P/12T	SRL6W	Intel 7
i5-12500	65W	Alder Lake	6P/12T	SRL5V	Intel 7
i5-12400	65W	Alder Lake	6P/12T	SRL5Y	Intel 7
i3-12100TE	35W	Alder Lake	4P/8T	SRL6T	Intel 7
i3-12100E	60W	Alder Lake	4P/8T	SRL6U	Intel 7
i3-12100	60W	Alder Lake	4P/8T	SRL62	Intel 7
G7400TE	35W	Alder Lake	2P/4T	SRL6S	Intel 7
G7400E	46W	Alder Lake	2P/4T	SRL6R	Intel 7
G6900TE	35W	Alder Lake	2P/2T	SRL6P	Intel 7
G6900E	46W	Alder Lake	2P/2T	SRL6Q	Intel 7

Category	Speed	Capacity	Vendor	Chip P/N	ADVANTECH P/N	ECC
DDR5	5600	8GB	Advantech	SEC337 K4RAH16 5VPB- CWM	SQR- SD5N8G5K6SNGPB	N
DDR5	5600	16GB	Advantech	SEC337 K4RAH08 6VPB- CWM	SQR- SD5N16G5K6SNPB	N
DDR5	3200	32GB	Advantech	SEC337 K4RAH08 6VPB- CWM	SQR- SD5N32G5K6SNPB	N
DDR5	4800	16GB	Advantech	SEC 149 K7RAH08 6VB BCQK	SQR- SD5N16G4K8SNBB	N
DDR5	4800	32GB	Advantech	SEC 149 K7RAH08 6VB BCQK	SQR- SD5N32G4K8SNBB	N
DDR5	4800	32GB	Advantech	SEC 210 K4RAH08 6VB BCQK	AQD-SD5V32GN48- SB	N
DDR5	4800	16GB	Advantech	SEC 210 K4RAH08 6VB BCQK	AQD-SD5V16GN48- SB	N
DDR5	5600	16GB	Advantech	SEC346 K4RAH08 6VPB- CWM	AQD-SD5V16GN56- SB	N
DDR5	5600	32GB	Advantech	SEC337 K4RAH08 6VPB- CWM	AQD-SD5V32GN56- SB	N
DDR5	5600	48GB	Apacer	H5CGD8MGBD X021 352A	N/A	N

# **Memory Compatibility**

# **M.2 SSD Compatibility**

Dimension	Interface	Bandwidth Performance	Category	Vendor	Model	Advantech P/N	Result
2242	M.2 Key M	PCle v3.1	NVMe PCIe SSD	Advant- ech	SQF-C4MV4- 2TDEDC	SQF-C4MV4-2TD- EDC	PASS
2242	M.2 Key B+M	SATA3	SSD	Advant- ech	SQF-S4BZ2- 128GDSDC	SQF-S4BZ2- 128GDSDC	PASS
2242	M.2 Key M	PCle v3.0	NVMe PCIe SSD	Advant- ech	SQF-C4MV2- 128GDEDC	SQF-C4MV2- 128GDEDC	PASS
2230	M.2 Key A+E	PCle v3.1	NVMe PCIe SSD	Advant- ech	SQF-C3AV1- 512GDEDC	SQF-C3AV1- 512GDEDC	PASS

# M.2 Wi-Fi Compatibility

Dimension	Interface	Bandwidth Performance	Category	Vendor	Model	Advantech P/N	Result
2230	M.2 E- Key	PCI-E / USB	Wireless LAN + Bluetooth	Advant- ech	AIW-170BQ	AIW-170BQ	Limita- tion
2230	M.2 Key A+E	PCI-E / USB	Wireless LAN + Bluetooth	Advant- ech	EWM- W179M201E	EWM- W179M201E	PASS

2230	M.2 Key A+E	PCIe v3.1	NVMe PCle SSD	Advant- ech	SQF-C3AV1- 512GDEDC	SQF-C3AV1- 512GDEDC	PASS
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Note: [M.2 Compatibility] M.2 E-Key WLAN+BT card does not detect a BT device under device manager. (Bug ID: 3795059)

# **Initial Inspection**

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

- 1 x AIMB-279 B1 Intel® Core™ i9/i7/i5/i3 LGA1700 Mini-ITX motherboard
- 1 x SATA HDD cable
- 1 x SATA power cable
- 1 x 1-to-1 serial port cable, 50 cm
- 1 x I/O port bracket
- 2 x M.2 screws (M3, L=4 mm)
- 1 x ATX cable 3P-2.0, 15 cm
- 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-279 B1 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-279 B1, 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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**General Information** 

# 1.1 Introduction

The AIMB-279 B1 is designed with the Intel® Q670E/H610E PCH for industrial applications that require both performance computing and enhanced power management capabilities. The motherboard supports Intel® Core<sup>TM</sup> i9/i7/i5/i3/Pentium®/Celeron® desktop processors, up to 36 MB SmartCache, and 2 x DDR5 5600MHz SODIMM, up to 96 GB. Multiple I/O connectivity of 2 x serial ports, 2 x USB 3.2 Gen2, 2 x USB 3.2 Gen1, 1 x GbE LAN, 1 x 2.5 GbE LAN, 2 x SATA III, 1 x NGFF (M.2 E-Key), 1 x NGFF (M.2 M-Key) connector, and 1 x PCIe x16 slot are also supported.

# **1.2 Features**

- I/O connectivity: 2 x serial ports, 2 x USB 3.2 Gen 2, 2 x USB 3.2 Gen 1, 2 x SATAIII, 1 x M.2 M-Key & 1 x M.2 E-Key, 1 x GbE LAN, 1 x 2.5GbE LAN, 1 x PCIe x16 Gen4
- Standard Mini-ITX form factor with industrial features: The AIMB-279 B1 is a full-featured Mini-ITX motherboard with balanced expandability and performance.
- Wide selection of storage devices: SATA HDD, M.2 (M-Key), customers benefit from the flexibility of using the most suitable storage device for larger capacity.
- **Optimized integrated graphics solution:** With Intel® Graphics flexible, it supports versatile display options and a 32-/64-bit 3D graphics engine.

# **1.3 Specifications**

#### 1.3.1 System

- **CPU:** LGA1700 Intel® Core<sup>™</sup> i9/i7/i5/i3/Pentium®/Celeron® desktop processors are compliant.
- BIOS: AMI EFI 256 Mbit SPI BIOS.
- System chipset: Intel® Q670E/H610E.
- SATA hard disk drive interface:
  - Two on-board SATA connectors with data transmission rates up to 600 MB/s
  - One M.2 M-Key to support PCIe/NVMe x4 M.2 2242.

#### 1.3.2 Memory

RAM: 2 x 260-pin SODIMM sockets support dual-channel DDR5 5600MHz SODIMMs, up to 96GB Max.

#### 1.3.3 Input/Output

- Serial ports: 2 x serial ports; COM1 supports RS-232, COM2 supports RS-232/ 422/485.
- **USB port:** Supports 4 x USB 3.2 with a transmission rates of up to 10 Gbps.
- **GPIO connector:** 8-bit general purpose Input/Output.

#### 1.3.4 Graphics

- **Controller:** Intel® UHD graphics driven by Xe Architecture
- eDP: Supports max. resolution 4096 x 2304 @ 60Hz, colay LVDS
- DP1.4: Supports max. resolution 4096 x 2304 @ 60 Hz
- **HDMI 2.0b:** Supports max. resolution 4096 x 2160 @ 60 Hz
- LVDS: Supports single/dual channel 18-/24-bit with maximum resolution up to 1920 x 1200 @ 60 Hz (LVDS colay with eDP)

#### 1.3.5 Ethernet LAN

- Supports dual 10/100/2500 Mbps Ethernet port (s) via PCI Express x1 bus which provides 500 MB/s data transmission rates.
- Controller:
  - GbE LAN1: Intel I219LM (Clarkville)
  - GbE LAN2: Intel I226 (Q670E/H610E: I226-V)

#### **1.3.6 Industrial Features**

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

#### **1.3.7 Mechanical and Environmental Specifications**

- **Operating temperature:** 0 ~ 60°C (32 ~ 140°F, depending on CPU).
- **Storage temperature:** -40 ~ 85°C (-40 ~ 185°F).
- **Humidity:** 5 ~ 95% non-condensing.
- Power supply voltage: +3.3V, +5V, +12V, -12V, +5VSB
- **Power consumption:** Intel® Core™ i9-14900 5.8GHz, 2pcs 48GB DDR5 5600MHz, 24V @4.45A with 24V DC input adapter
- Board size: 170 x 170 mm (6.69" x 6.69").
- Board weight: 0.365 kg

# **1.4 Jumpers and Connectors**

Connectors on the AIMB-279 B1 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 the 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: Connector and Header List	
ltem	Description	Part Reference
1	DC-IN CONNECTOR	ATX12V1
2	RJ-45 + USB 3.2 stack connector (GEN2)	Lan1_USB12
3	RJ-45 + USB 3.2 stack connector (GEN1)	Lan2_USB34
4	ATX 5VSB CONN	ATX_5VSB1
5	DUAL DisplayPort stack up Connector	DP12
6	HDMI vertical Conn port	HDMI1
7	HD Audio Interface (Analog)	AUDIO1
8	Audio amplifier output pin header	AMP1
9	PCI Express x16 slot	PCIEX16_1
10	IMVP9.1 Programming Header	VR_PMB1
11	System Fan #1 Connector	SYSFAN1
12	CPU FAN Connector	CPUFAN1
13	EDP Connector / LVDS Connector	EDP1_LVDS1
14	LVDS VESA, JEIDA format selection pin header	JLVDS_VCON1
15	EDP Panel / LVDS Panel Voltage Selection	JEDP1_LVDS1
16	EDP / LVDS Backlight Inverter Power Connector	INV1
17	AT / ATX Mode selection	PSON1
18	8-bit General Purpose I/O pin header	GPIO1
19	LED port 80 connector	LED_P80
20	COM1 CONNECTOR (RS232)	COM1
21	SATA POWER	SATA_PWR2
22	COM2 CONNECTOR (RS232/RS422/RS485)	COM2
23	SATA POWER	SATA_PWR1
24	PWRBTN#/ RESET#/HDD LED/SMBUS	JFP1
25	Power LED pin header	JFP2
26	Serial ATA interface Connector	SATA2
27	Serial ATA interface Connector	SATA1
28	Universal Serial Bus 2.0 WAFER	USB56
29	RTC / CMOS clear	JCMOS1
30	Flash Descriptor Security Override Pin Header	JME1
31	M.2 M-Key Connector	M2_M1
32	SPI BIOS flash PIN HEADER	SPI_CN1
33	M.2 E-Key Connector	M2_E1
34	CMOS battery Connector	BAT1
35	Case Open Connector	JCASE1
36	COM1 RI# selection pin header	JSETCOM1_V1
37	PCI Express x16 Bifurcation	SW_PEGSEL1

# 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-279 B1 Board Diagram



Figure 1.3 AIMB-279 B1 Block Diagram

#### 1.7 **Safety Precautions**



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



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

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



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

## **1.8 Jumper Settings**

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

#### 1.8.1 How to Set Jumpers

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 CMOS Clear (JCMOS1)

The AIMB-279 B1 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 1.2: JCMOS1				
Function	Jumper Setting			
Keep CMOS data (Default)	1 2 3 1-2			
Clear CMOS data	1 2 3 2-3			

#### **1.8.3 ATX/AT Mode Selection (PSON1)**

Table 1.3: ATX/AT Mode Selection (PSON1)			
Function	Jumper Setting		
ATX Mode (Default)	$\circ$		
	1 2 3		
AT Mode	$\bullet \bullet \circ$		
	1 2 3		

### 1.8.4 eDP/LVDS Panel Voltage Selection (JEDP1\_LVDS1)

Table 1.4: eDP/LVDS Panel Voltage Selection (JEDP1_LVDS1)			
Function	Jumper Setting		
Jumper position for +3.3V (Default)			
Jumper position for 5V	2 4 6 0 0 0 1 3 5		
Jumper position for 12V	2 4 6 0 0 0 1 3 5		

## **1.8.5 PCI Express x16 Bifurcation (SW\_PEGSEL1)**

Table 1.5: PCI Express x16 Bifurcation (SW_PEGSEL1)			
Function	Jumper Setting		
1 X16 (Default)			
2 X8			

# 1.8.6 COM1\_RI# Pin RI# / 5V / 12V Selection (JSETCOM1\_V1)

Table 1.6: COM1_RI# Pin RI# / 5V / 12V Selection (JSETCOM1_V1)			
Function	Jumper Setting		
	2 4 6		
Jumper position for RI# (Default)			
	1 3 5		
	2 4 6		
Jumper position for 5V			
	1 3 5		

Table 1.6: COM1_RI# Pin RI# / 5V / 12V Selection (JSETCOM1_V1)			
	2 4 6		
Jumper position for 12V			
	1 3 5		

# **1.9 System Memory**

The AIMB-279 B1 has two sockets for 260-pin DDR5 SODIMMs. These sockets use a 1.2 V unbuffered double data rate synchronous DRAM (DDR SDRAM). DRAM is available in capacities of 8GB, 16GB, 32GB and 48GB. The sockets can take any combination with SODIMMs of any size, giving a total memory size between 8GB, 16GB, 32GB, 48GB, and up to max 96GB.

# **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-279 B1 supports a CPU with one of the following built-in full speed last level caches:

36MB for Intel® Core<sup>™</sup> i9-14900E/i9-14900T 33MB for Intel® Core<sup>™</sup> i7-14700E/i7-14700T 24MB for Intel® Core<sup>™</sup> i5-14500E/i7-14500T 20MB for Intel® Core<sup>™</sup> i5-14400/i514400T 12MB for Intel® Core<sup>™</sup> i3-14100/i7-14100T 6MB Pentium® G7400E/G7400TE

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

# **1.12 Processor Installation**

The AIMB-279 B1 is designed with the LGA 1700 socket to support 12th/13th/14th Gen Intel® Core™ i9 /i7/i5/i3, Pentium®, and Celeron® processors.



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 DC-In Power Connector (ATX12V1)



Table 2.1: DC-In Power Connector (DCIN1)				
Pin	Signal	Pin	Signal	
1	GND	1	POWER	
2	GND	2	POWER	
3	GND	3	POWER	
4	GND	4	POWER	

# 2.3 RJ-45 + USB 3.2 Stack Connector (LAN1\_USB12)



Table 2.2: RJ45 + USB3.2 Stack Connector (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+	

Table 2.2	: RJ45 + USB3.2 Stacl	k Connector	(LAN1_USB12)
R2	LAN1_MDI_P0	R6	LAN1_MDI_P2
R3	LAN1_MDI_N0	R7	LAN1_MDI_N2
R4	LAN1_MDI_P1	R8	LAN1_MDI_P3
R5	LAN1_MDI_N1	R9	LAN1_MDI_N3

# 2.4 RJ-45 Connector (LAN2\_USB34)



Table 2.3: F	RJ45 Connector (LAN2)		
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	LAN2_MDI_P0	R6	LAN2_MDI_P2
R3	LAN2_MDI_N0	R7	LAN2_MDI_N2
R4	LAN2_MDI_P1	R8	LAN2_MDI_P3
R5	LAN2_MDI_N1	R9	LAN2_MDI_N3

# 2.5 ATX 5VSB CONN (ATX\_5VSB1)



Table 2.4: ATX 5VSB CONN (ATX_5VSB1)		
Pin	Signal	
1	+5_A_ATX	
2	GND	
3	SPS_PS_ON#	

# 2.6 Dual DisplayPort Stack Up Connector (DP12)



Table 2.5: Dis	splayPort Stack Up Cor	nnector (DP2)	
Pin	Signal	Pin	Signal
1	DPD_0+	21	DP3_C_DP0+
2	GND	22	GND
3	DPD_0-	23	DP3_C_DN0
4	DPD_1+	24	DP3_C_DP1
5	GND	25	GND
6	DPD_1-	26	DP3_C_DN1
7	DPD_2+	27	DP3_C_DP2
8	GND	28	GND
9	DPD_2-	29	DP3_C_DN2
10	DPD_3+	30	DP3_C_DP3
11	GND	31	GND

Table 2.5: [	DisplayPort Stack Up Co	onnecto	r (DP2)
12	DPD_3-	32	DP3_C_DN3
13	DP2_HDMI_DNG_DET	33	DP3_HDMI_DNG_DET
14	DPD_P14	34	DP3_CFG2
15	DPD_AUX+	35	DP3_CON_AUXP
16	GND	36	GND
17	DPD_AUX-	37	DP3_CON_AUXN
18	DPD_HPD	38	DP3_HDP_CON
19	GND	39	GND
20	+3.3V_DPD	40	+3.3V_DP

# 2.7 HDMI Vertical Conn Port (HDMI1)



Table 2.6: HDMI Vertical Conn Port (HDMI1)				
Pin	Signal	Pin	Signal	
1	HDMI1_z_D2+	2	GND	
3	HDMI1_z_D2-	4	HDMI1_z_D1+	
5	GND	6	HDMI1_z_D1-	
7	HDMI1_z_D0+	8	GND	
9	HDMI1_z_D0-	10	HDMI1_z_CLK+	
11	GND	12	HDMI1_z_CLK-	
13	NC	14	NC	
15	HDMI1_SCL	16	HDMI1_SDA	
17	GND	18	+V5_HDMI1	
19	HDMI1_HPD			

# 2.8 HD Audio Interface (Analog) (AUDIO1)



Table 2.7: HD Audio Interface (Analog) (AUDIO1)			
Pin	Signal		
1	MIC IN		
2	LINE OUT		
3	LINE IN		

# 2.9 Audio Amplifier Output Pin Header (AMP1)



Table 2.8: Audio Amplifier Output Pin Header (AMP1)			
Pin	Signal		
1	AMP OUT – R+		
2	AMP OUT – R-		
3	AMP OUT – L-		
4	AMP OUT – L+		

# 2.10 PCI-Express x16 Slot (PCIEX16\_1)

Table	A1 A11 A12 BBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB		
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

Table 2.9: PCI	-Express x16 Slot (P	CIEX16 1)	
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+
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	IX10+	A58	GND
B59	IX10-	A59	GND

Table 2.9:	PCI-Express x16	Slot (PCIEX16_1)		
B60	GND	A60	RX10+	
B61	GND	A61	RX10-	
B62	TX11+	A62	GND	
B63	TX11-	A63	GND	
B64	GND	A64	RX11+	
B65	GND	A65	RX11-	
B66	TX12+	A66	GND	
B67	TX12-	A67	GND	
B68	GND	A68	RX12+	
B69	GND	A69	RX12-	
B70	TX13+	A70	GND	
B71	TX13-	A71	GND	
B72	GND	A72	RX13+	
B73	GND	A73	RX13-	
B74	TX14+	A74	GND	
B75	TX14-	A75	GND	
B76	GND	A76	RX14+	
B77	GND	A77	RX14-	
B78	TX15+	A78	GND	
B79	TX15-	A79	GND	
B80	GND	A80	RX15+	
B81	Reserved	A81	RX15-	
B82	Reserved	A82	GND	

# 2.11 IMVP9.1 Programming Header (VR\_PMB1)

Table 2.10: IMVP9.1	Programming Header (JSMB1)
Pin	Signal
1	DATA
2	GND
3	CLK

# 2.12 System Fan #1 Connector (SYSFAN1)

	8 8	
Table 2.11: 3	4 System Fan #1 Connect	1 or (SY
Pin	Signal	
	- J -	
1	GND	
1 2	GND SYSTEM FAN VCC	
1 2 3	GND SYSTEM FAN VCC SYSTEM FAN SPE	ED

# 2.13 CPU FAN Connector (CPUFAN1)



Table 2.12: CPU FAN Connector (CPUFAN1)			
Pin	Signal		
1	GND		
2	CPU FAN VCC		
3	CPU FAN SPEED		
4	CPU FAN PWM		

# 2.14 EDP Connector / LVDS Connector (EDP1\_LVDS1)



Table 2.13: LVDS Connector (LVDS1)				
Pin	Signal	Pin	Signal	
1	VDD	2	VDD	
3	LVDS DETECT#	4	GND	
5	VDD	6	VDD	
7	LVDS_OD0-	8	LVDS_ED0-	
9	LVDS_OD0+	10	LVDS_ED0+	
11	GND	12	GND	
13	LVDS_OD1-	14	LVDS_ED1-	
15	LVDS_OD1+	16	LVDS_ED1+	
17	GND	18	GND	
19	LVDS_OD2-	20	LVDS_ED2-	
21	LVDS_OD2+	22	LVDS_ED2+	
23	GND	24	GND	
25	LVDS_OCK-	26	LVDS_ECK-	
27	LVDS_OCK+	28	LVDS_ECK+	
29	GND	30	GND	
31	N.C.	32	N.C.	
33	GND	34	GND	
35	LVDS_OD3-	36	LVDS_ED3-	
37	LVDS_OD3+	38	LVDS_ED3+	
39	LVDS ENBKL	40	LVDS VCON	

Table 2.14: EDP Connector (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_HPD	
35	N.C.	36	N.C.	
37	N.C.	38	N.C.	
39	N.C.	40	GND	

# 2.15 LVDS VESA, JEIDA Format Selection Pin Header (JLVDS\_VCON1)



Table 2.15: LVDS VESA, JEIDA Format Selection Pin Header (JLVDS_VCON1)			
Pin	Signal		
1	+3.3V		
2	Advantech defined		
3	GND		

# 2.16 EDP Panel / LVDS Panel Voltage Selection (JEDP1\_LVDS1)

2	4	6
0	0	0
0	0	0
1	3	5

Table 2.16: EDP Panel / LVDS Panel Voltage Selection (JEDP1_LVDS1)				
Pin	Signal	Pin	Signal	
1	NC	2	+5V	
3	+12V	4	VDD	
5	NC	6	+3.3V	

# 2.17 EDP / LVDS Backlight Inverter Power Connector (INV1)



Table 2.17: EDP / LVDS Backlight Inverter Power Connector (INV1)			
Pin	Signal		
1	+12V		
2	GND		
3	BKL EN		
4	BKLCTRL		
5	+5V		

# 2.18 AT / ATX Mode Selection (PSON1)



Table 2.18: AT / ATX Mode Selection (PSON1)			
Pin	Signal		
1	VCCAT		
2	+3.3V		
3	VCCATX		

# 2.19 8-Bit General Purpose I/O Pin Header (GPIO1)



Table 2.4	19: 8-Bit General Purp	ose I/O Pin Hea	der (GPIO1)	
Pin	Signal	Pin	Signal	
1	SIO_GPIO0	2	SIO_GPIO4	
3	SIO_GPIO1	4	SIO_GPIO5	
5	SIO_GPIO2	6	SIO_GPIO6	
7	SIO_GPIO3	8	SIO_GPIO7	
9	+V5A_GPIO	10	GND	

# 2.20 LED Port 80 Connector (LED\_P80)



Table 2.20: LED Port 80 Connector (LED_P80)				
Pin	Signal	Pin	Signal	
1	GND	2	SIO_LED_A	
3	SIO_LED_B	4	SIO_LED_C	
5	SIO_LED_D	6	SIO_LED_E	
7	SIO_LED_F	8	SIO_LED_G	
9	SIO_DGH0#	10	SIO_DGL0#	

### LED Port 80

# 2.21 COM1 Connector (COM1)



Table 2.21: COM1 Connector (COM1)				
Pin	Signal	Pin	Signal	
1	COM1_DCD#	2	COM1_SIN	
3	COM1_SOUT	4	COM1_DTR#	
5	GND	6	COM1_DSR#	
7	COM1_RTS#	8	COM1_CTS#	
9	COM1_RI_V#	10	NC	

# 2.22 SATA POWER (SATA\_PWR2)



Table 2.22: SATA POWER (SATA_PWR2)			
Pin	Signal		
1	+V5		
2	GND		
3	GND		
4	+V12		

# 2.23 COM2 Connector (COM2)



Table 2.23: COM2 Connector (COM2)				
Pin	Signal	Pin	Signal	
1	COM2_422_485_TX-	2	COM2_422_485_TX+	
3	COM2_422_RX+	4	COM2_422_RX-	
5	GND	6	COM2_DSR#	
7	COM2_RTS#	8	COM2_CTS#	
9	COM2_RI#	10	NC	

# 2.24 SATA POWER (SATA\_PWR1)



Table 2.24: SATA POWER (SATA_PWR1)			
Pin	Signal		
1	+V5		
2	GND		
3	GND		
4	+V12		

# 2.25 PWRBTN#/ RESET#/HDD LED/SMBUS (JFP1)



Table 2.25: PWRBTN#/ RESET#/HDD LED/SMBUS (JFP1)				
Pin	Signal	Pin	Signal	
1	HDD LED+	2	Power Button	
3	HDD LED-	4	GND	
5	SMB_DATA	6	RESET Button-	
7	SMB_CLK	8	GND	

# 2.26 Power LED Pin Header (JFP2)



Table 2.26: Power LED Pin Header (JFP2)	
Pin	Signal
1	Power LED+
2	NC
3	Power LED-
# 2.27 Serial ATA Interface Connector (SATA2)



Table 2.27: Serial ATA Interface Connector (SATA2)			
Pin	Signal		
1	GND		
2	TX+		
3	TX-		
4	GND		
5	RX-		
6	RX+		
7	GND		

# 2.28 Serial ATA Interface Connector (SATA1)



Table 2.28: Serial ATA Interface Connector (SATA1)			
Pin	Signal		
1	GND		
2	TX+		
3	TX-		
4	GND		
5	RX-		
6	RX+		
7	GND		

# 2.29 USB 2.0 Front Panel Header (USB56)



Table 2.29: USB 2.0 Front Panel Header (USB56)				
Pin	Signal	Pin	Signal	
1	+5V_B_USBV4	2	+5V_B_USBV4	
3	USB_CM_N5	4	USB_CM_N6	
5	USB_CM_P5	6	USB_CM_P6	
7	GND	8	GND	
9	GND	10	Х	

# 2.30 COMS Mode Selection (JCMOS1)



Table 2.30: COMS Mode Selection (JCMOS1)		
Pin	Signal	
1	NC	
2	RTC_RESET#	
3	GND	

## 2.31 Flash Descriptor Security Override Pin Header (JME1)



Table 2.31: Flash Descriptor Security Override Pin Header (JME1)PinSignal

1	Advantech Defined
2	Advantech Defined
3	NC

# 2.32 M.2 M-Key Connector (M2\_M1)



Table 2.32:	M.2 M-Key Connector	· (M2_M1)	
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)(0/ 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
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-PCle/GND- SATA)	70	3.3V

Table	2.32: M.2 M-Key Co	onnector (M2_M1)		
71	GND	72	3.3V	
73	GND	74	3.3V	
75	GND			

# 2.33 SPI BIOS Flash Pin Header (SPI\_CN1)



Table 2.33: SPI BIOS Flash Pin Header (SPI_CN1)				
Pin	Signal	Pin	Signal	
1	SPISKT_CS0#	2	+3.3V_SPI	
3	SPISKT_MISO	4	NC	
5	NC	6	SPISKT_CLK	
7	GND	8	SPISKT_MOSI	

# 2.34 M.2 E-Key Connector (M2\_E1)



Table 2.34: M.2 E-Key Connector (M2_E1)				
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#	

Table 2.3	4: M.2 E-Key Connect	tor (M2_E1)	
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#
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		

# 2.35 CMOS Battery Connector (BAT1)



Table 2.35: CMOS Battery Connector (BAT1)		
Pin	Signal	
1	+VBAT	
2	GND	

# 2.36 Case Open connector (JCASE1)



Table 2.36: Case Open Connector (JCASE1)			
Pin	Signal		
1	Case Open		
2	GND		

## 2.37 COM1 RI# Selection Pin Header (JSETCOM1\_V1)



Table 2.37: COM1 RI# Selection Pin Header (JSETCOM1_V1)			
Pin	Signal	Pin	Signal
1	RI# [1]	2	Advantech defined
3	Advantech defined	4	+5V
5	+12V	6	Advantech defined

# 2.38 PCI Express x16 Bifurcation (SW\_PEGSEL1)



Table 2.38: PCI Express x16 Bifurcation (SW_PEGSEL1)		
Pin	Signal	
1	+VCC_CFG_PU_OUT	
2	CPU_CFG5	
3	GND	



**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-279 B1 setup screens.

## 3.2 BIOS Setup

The AIMB-279 B1 system has AMI BIOS built in, with a CMOS SETUP utility that allows users to configure required settings or to activate certain system features. The CMOS SETUP saves the configuration in the CMOS RAM of the motherboard. When the 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 <Del> button during the BIOS POST (Power-On Self Test) to access the CMOS SETUP screen.

Control Keys	
$<\uparrow><\downarrow><\leftarrow><\rightarrow>$	Move to select item
<enter></enter>	Select item
<esc></esc>	Main Menu - Quit without saving changes to the CMOS Sub-Menu - Exit thecurrent page and return to the Main Menu
<page +="" up=""></page>	Increase the numeric value or make changes
<page -="" down=""></page>	Decrease the numeric value or make changes
<f1></f1>	General help, for Setup Sub Menu
<f2></f2>	Item help
<f5></f5>	Loads previous values
<f7></f7>	Loads setup defaults
<f10></f10>	Saves all CMOS changes

### 3.2.1 Main Menu

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

Main Advanced Chipset Security	Aptio Setup – AMI Boot Save & Exit MEBx	
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time Access Level Project Board Version Power Type	American Megatrends 5.0.2.7 0.07 x64 UEFI 2.8; PI 1.7 A279000Q060X008 10/17/2023 15:31:16 Administrator AIMB-279QF ATX	Set the Date. Use Tab to switch between Date elements. Default Ranges: Year: 2000–2099 Months: 1–12 Days: Dependent on month Range of Years may vary.
Memory Information Total Memory Memory Frequency System Date System Time	4096 MB 2400 MT/s [Sun 01/10/2021] [17:11:28]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
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Figure 3.1

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-279 B1 setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as CPU Configuration, to go to the sub menu for that item. You can display an Advanced BIOS Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown below. The sub menus are described on the following pages.



Figure 3.2

# Chapter 3 BIOS Operation

### 3.2.2.1 CPU Configuration

Advanced  $\rightarrow$  CPU Configuration

Advanced	Aptio Setup – AMI	
CPU Configuration		▲ Displays the E-core Information
▶ Efficient-core Information		
Performance-core information		
ID	0×B0671	
Brand String	13th Gen Intel(R)	
	Core(TM) i9–13900	
Microcode Revision	112	
VMX	Supported	
SMX/TXT	Supported	
TXT CPASH LODE	0x0000000	
Boot Guard Status	0×0008000	++: Select Screen
Boot Guard ACM Policy Status	0×00000000000000000	↑↓: Select Item
Boot Guard SACM Information	0x0000001100000000	Enter: Select
		+/-: Change Opt.
C6DRAM	[Enabled]	F1: General Help
CPU Flex Ratio Override	[Disabled]	F2: Previous Values
CPU Flex Ratio Settings	20	F3: Optimized Defaults
Hardware Prefetcher	[Enabled]	F4: Save & Exit
Adjacent Cache Line Pretetch	[Enabled]	ESC: Exit
Intel (VMX) Virtualization	[Enabled]	
PECT	[Enabled]	
	[Endbied]	
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Figure 3.3

### **Efficient-Core Information**

 $\mathsf{Advanced} \to \mathsf{CPU} \ \mathsf{Configuration} \to \mathsf{Efficient}\text{-}\mathsf{Core} \ \mathsf{Information}$ 

Advanced	Aptio Setup – AMI	
Efficient-core Information		
L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache	32 KB × 16 64 KB × 16 4096 KB × 4 36 MB	<pre>+*: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Ver	rsion 2.22.1288 Copyright (C) 2023	AMI

Figure 3.4

### **Performance-Core Information**

Advanced  $\rightarrow$  CPU Configuration  $\rightarrow$  Performance-Core Information

Advanced	Aptio Setup – AMI	
Performance-core Information		
L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache	48 KB x 8 32 KB x 8 2048 KB x 8 36 MB	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version (	2.22.1288 Copyright (C) 2023	AMI
10102011		

Figure 3.5

### **CPU SMM Enhancement**

Advanced  $\rightarrow$  CPU SMM Enhancement

Advanced	Aptio Setup – AMI	
CPU SMM Enhancement		Enable/Disable usage of SMM DELAYED MSR for MP sunc in
SMM Use Delay Indication SMM Use Block Indication SMM Use SMM en-US Indication	[Enabled] [Enabled] [Enabled]	SMI
		↔: Select Screen ↑↓: Select Item Enter: Select
		+/−: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version :	2.22.1288 Copyright (C) 2023	AMI

Figure 3.6

### 3.2.2.2 Power & Performance

Advanced  $\rightarrow$  Power & Performance

Aptio Setup – AMI Advanced	
Power & Performance ▶ CPU – Power Management Control ▶ GT – Power Management Control	CPU – Power Management Control Options
	<pre> ++: Select Screen  14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2.22.1288 Copyright (C) 200	23 AMI

Figure 3.7

### **CPU - Power Management Control**

 $\mathsf{Advanced} \to \mathsf{Power} \And \mathsf{Performance} \to \mathsf{CPU} \text{ -} \mathsf{Power} \texttt{Management} \texttt{Control}$ 

Advanced	Aptio Setup – AMI	
CPU – Power Management Control		Select the performance state that the BIOS will set
PO Fused Max Core Ratio P1 Fused Max Core Ratio P2 Fused Max Core Ratio P3 Fused Max Core Ratio P4 Fused Max Core Ratio P5 Fused Max Core Ratio P6 Fused Max Core Ratio P7 Fused Max Core Ratio Boot performance mode Intel(R) SpeedStep(tm) Race To Halt (RTH) Intel(R) Speed Shift Technology Intel(R) Turbo Boost Max Technology 3.0 Per Core P State OS control mode HwP Autonomous Per Core P State HwP Lock HDC Control Turbo Mode View/Configure Turbo Options	53 53 53 55 56 56 53 53 [Max Non-Turbo Performance] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled]	<pre>that the BIOS will set starting from reset vector. **: Select Screen fl: Select Item Enter: Select +/-: Change Opt. fl: General Help f2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version	2.22.1288 Copyright (C) 20	D23 AMI

Figure 3.8

Aptio Setup - AMI Advanced			
Turbo Mode	[Enabled]	▲ Enable/Disable Timed MWAIT	
View/Configure Turbo Options		Support	
CPU VR Settings			
ATX Telemetry Unit	[Watts]		
Power Limit 4	149000		
Power Limit 4 Lock	[Disabled]		
C states	[Enabled]		
Enhanced C-states	[Enabled]		
C-State Auto Demotion	[C1]		
C-State Un-demotion	[01]		
Package C—State Demotion	[Enabled]		
Package C—State Un—demotion	[Enabled]		
CState Pre-Wake	[Enabled]		
IO MWAIT Redirection	[Disabled]	++: Select Screen	
Package C State Limit	[Auto]	↑↓: Select Item	
C6/C7 Short Latency Control(MSR 0	x60B)	Enter: Select	
Time Unit	[1024 ns]	+/-: Change Opt.	
Latency	0	F1: General Help	
C6/C7 Long Latency Control(MSR Ox	60C)	F2: Previous Values	
Time Unit	[1024 ns]	F3: Optimized Defaults	
Latency	0	F4: Save & Exit	
Thermal Monitor	[Enabled]	ESC: Exit	
Interrupt Redirection Mode	[Fixed Priority]		
Selection			
Timed MWAIT	[Disabled]	▼	
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Eiguro 3.0			
	i iyure J.a		

### **Current Turbo Settings**

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  CPU - Power Management Control  $\rightarrow$  View/ Configure Turbo Option

Advanced	Aptio Setup – AMI	
Current Turbo Settings		View/Configure Turbo Ratio
Max Turbo Power Limit Min Turbo Power Limit Package TDP Limit Power Limit 1 Power Limit 2	4095.875 0.0 65.0 65.0 93.0	
Turbo Ratio Limit Options Energy Efficient P-state Package Power Limit MSR Lock Power Limit 1 Override Power Limit 1 Power Limit 2 Time Window Power Limit 2 Override Power Limit 2 Energy Efficient Turbo	[Enabled] [Disabled] [Enabled] 65000 [0] [Enabled] 93000 [Enabled]	++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults E4: Scup 2 Evit
Version	2,22.1288 Copyright (C) 202:	ESC: Exit

Figure 3.10

# Chapter 3 BIOS Operation

### **Turbo Ratio Limit Options**

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  CPU – Power Management Control  $\rightarrow$  View/ Configure Turbo Option  $\rightarrow$  Turbo Ratio Limit Options

Advanced	Aptio Setup – AMI	
Current Turbo Ratio Limit Settings		Performance-core Turbo Ratio
P-core Turbo Ratio Limit NumcoreO	1	core range, the turbo ratio is
P–core Turbo Ratio Limit Numcore1	2	defined in Turbo Ratio Limit
P–core Turbo Ratio Limit Numcore2	3	RatioO. If value is zero, this
P–core Turbo Ratio Limit Numcore3	4	entry is ignored.
P–core Turbo Ratio Limit Numcore4	5	
P–core Turbo Ratio Limit Numcore5	6	
P–core Turbo Ratio Limit Numcore6	7	
P–core Turbo Ratio Limit Numcore7	8	
P–core Turbo Ratio Limit RatioO	56	
P–core Turbo Ratio Limit Ratio1	56	
P–core Turbo Ratio Limit Ratio2	53	
P–core Turbo Ratio Limit Ratio3	53	↔: Select Screen
P–core Turbo Ratio Limit Ratio4	53	†↓: Select Item
P–core Turbo Ratio Limit Ratio5	53	Enter: Select
P–core Turbo Ratio Limit Ratio6	53	+/−: Change Opt.
P–core Turbo Ratio Limit Ratio7	53	F1: General Help
E–core Turbo Ratio Limit NumcoreO	16	F2: Previous Values
E–core Turbo Ratio Limit Numcore1	0	F3: Optimized Defaults
E–core Turbo Ratio Limit Numcore2	0	F4: Save & Exit
E-core Turbo Ratio Limit Numcore3	0	ESC: Exit
E-core Turbo Ratio Limit Numcore4	0	
E-core Turbo Ratio Limit Numcore5	0	
E-core Turbo Ratio Limit Numcore6	0	

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Figure 3.11

Advanced	Aptio Setup — AMI	
E-core Turbo Ratio Limit Numcored E-core Turbo Ratio Limit Numcored E-core Turbo Ratio Limit Ratio0 E-core Turbo Ratio Limit Ratio1 E-core Turbo Ratio Limit Ratio2 E-core Turbo Ratio Limit Ratio3 E-core Turbo Ratio Limit Ratio4 E-core Turbo Ratio Limit Ratio5 E-core Turbo Ratio Limit Ratio6 E-core Turbo Ratio Limit Ratio7 P-core Turbo Ratio Limit Numcored	0 42 0 42 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performance-core Turbo Ratio Limit Ratio5 defines the turbo ratio (max is 85 in normal mode and 120 in core extension mode), the core range is defined in Turbo Ratio Limit Numcore5.
P-core Turbo Ratio Limit Numcored P-core Turbo Ratio Limit Ratio0 P-core Turbo Ratio Limit Ratio1 P-core Turbo Ratio Limit Ratio2 P-core Turbo Ratio Limit Ratio3 P-core Turbo Ratio Limit Ratio3 P-core Turbo Ratio Limit Ratio4 P-core Turbo Ratio Limit Ratio5	2 3 4 5 6 7 7 8 56 56 56 56 53 53 53 53 53	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Versio	n 2.22.1288 Copyright (C) 2023	3 AMI

Figure 3.12

Advanced		Aptio Setup – AMI	
Advanced P-core Turbo Ratio Limit P-core Turbo Ratio Limit E-core Turbo Ratio Limit	Numcore7 Ratio0 Ratio1 Ratio2 Ratio3 Ratio4 Ratio5 Ratio6 Ratio7 Numcore0 Numcore0 Numcore1 Numcore3 Numcore4 Numcore5 Numcore6 Numcore7 Ratio0 Ratio1 Ratio1 Ratio2 Ratio3 Ratio4 Ratio5 Ratio6 Ratio5 Ratio6 Ratio6 Ratio6 Ratio6 Ratio7	Aptio Setup - AMI  8 56 56 53 53 53 53 53 53 16 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Efficient-core Turbo Ratio Limit Ratio7 defines the turbo ratio (max is 85 irrespective of the core extension mode), the core range is defined in E-core Turbo Ratio Limit Numcore7. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.	22.1288 Copyright (C) 2023	AMI

Figure 3.13

### **CPU VR Settings**

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  CPU - Power Management Control  $\rightarrow$  CPU VR Settings

Advanced	Aptio Setup – AMI	
CPU VR Settings Current VccIn Aux Icc Max PSYS Slope PSYS Offset PSYS Prefix PSYS PMax Power Min Voltage Override VccIn Aux Icc Max VccIn Aux IMON Slope VccIN Aux IMON Slope VccIN Aux IMON Prefix	144 0 [+] 0 [Disabled] 0 100 0 [+]	PSYS Slope defined in 1/100 increments. Range is 0–200. For a 1.25 slope, enter 125. 0 = AUTO. Uses BIOS VR mailbox command 0x9.
Vsys/Psys Critical Assertion Deglitch Mantissa Assertion Deglitch Exponent De assertion Deglitch Exponent VR Power Delivery Design Acoustic Noise Settings Core/IA VR Settings GT VR Settings RFI Settings	[Disabled] 1 0 13 2 [AUTO]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Figure 3.14

# Chapter 3 BIOS Operation

### Acoustic Noise Settings

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  CPU - Power Management Control  $\rightarrow$  CPU VR Settings  $\rightarrow$  Acoustic Noise Settings

Advanced	Aptio Setup – AMI	
Acoustic Noise Settings		Enabling this option will help
Acoustic Noise Mitigation	[Disabled]	certain SKUs when the CPU is
Pre Wake Time	0	in deeper C state
Ramp Up Time	0	
Ramp Down Time	0	
IA VR Domain		
Disable Fast PKG C State Ramp for	[FALSE]	
IH DUMAIN Slow Slew Rate for IA Domain	[Fact/2]	
SIGM SIGM NATE FOR IN DOMAIN	[[ d3(72]	
GT VR Domain		
Disable Fast PKG C State Ramp for	[FALSE]	↔: Select Screen
GT Domain		†↓: Select Item
Slow Slew Rate for GT Domain	[Fast/2]	Enter: Select
		+/−: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Uptimized Defaults
		ESC: Exit
		Loor Latt
-Vencion-2	22 1288 Copuridht (C) 2022	AMT

Figure 3.15

### Core/IA VR Settings

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  CPU - Power Management Control  $\rightarrow$  CPU VR Settings  $\rightarrow$  Core/IA Settings

Advanced	Aptio Setup – AM	I
Core∕IA VR Domain		▲ VR Config Enable
VR Config Enable Current AC Loadline Current DC Loadline Current PSil Threshold Current PSil Threshold Current PSil Threshold Current Imon Slope Current Imon Offset Current VR Current Limit Current VC Current Limit Current Voltage Limit AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Offset IMON Prefix VR Current Limit Core VR Fast Vmode	[Enabled] 110 110 80 20 4 0 1 1116 1408 1720 0 0 80 20 4 [Enabled] [Enabled] 0 1 [Enabled]	<pre>**: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Vens	ion 2.22.1288 Copyright	(C) 2023 AMI

Figure 3.16

Advanced	Aptio Setup – AM	I
Current Psi3 Threshold Current Imon Slope Current Imon Offset Current VR Current Limit Current VC Current Limit Current Voltage Limit AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Offset IMON Prefix VR Current Limit Core VR Fast Vmode Fast Vmode Itrip ICC Limit VR Voltage Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock IRMS	4 0 1 1116 1408 1720 0 0 80 20 4 [Enabled] [Enabled] 0 0 [Enabled] 988 0 [Enabled] 988 0 [Enabled] 0 [Enabled] 988 0 [Enabled] 0 1 sec] [Disabled] [Disabled]	<ul> <li>Enable/Disable IRMS - Current root mean square</li> <li>**: Select Screen</li> <li>11: Select Item Enter: Select</li> <li>*/-: Change Opt.</li> <li>F1: General Help</li> <li>F2: Previous Values</li> <li>F3: Optimized Defaults</li> <li>F4: Save &amp; Exit</li> <li>ESC: Exit</li> </ul>
l leves l		(a) 0000 ANT

Figure 3.17

### **GT VR Settings**

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  CPU - Power Management Control  $\rightarrow$  CPU VR Settings  $\rightarrow$  GT VR Settings

Advanced	Aptio Setup – AMI	
GT Domain		▲ VR Config Enable
VR Config Enable Current AC Loadline Current DC Loadline Current Psil Threshold Current Psi2 Threshold Current Psi3 Threshold Current Imon Slope Current Imon Offset Current VR Current Limit Current VR Current Limit Current VOltage Limit AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Offset IMON Prefix VR Current Limit GT VR Fast Vmode	[Enabled] 400 400 80 20 4 1 120 176 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 0 [H] 0 0 [Jisabled]	<pre>+*: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

Figure 3.18

Advanced	Aptio Setup – AMI	
Advanced Current Psi1 Threshold Current Psi2 Threshold Current Psi3 Threshold Current Imon Slope Current Imon Offset Current VR Current Limit Current VC Current Limit Current Voltage Limit AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Offset IMON Prefix VR Current Limit GT VR Fast Vmode VR Voltage Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock	80 20 4 0 1 120 176 1500 0 80 20 4 [Enabled] [Enabled] 0 0 [Inabled] [Inabled]	<ul> <li>TDC Lock</li> <li>**: Select Screen</li> <li>11: Select Item</li> <li>Enter: Select</li> <li>+/-: Change Opt.</li> <li>F1: General Help</li> <li>F2: Previous Values</li> <li>F3: Optimized Defaults</li> <li>F4: Save &amp; Exit</li> <li>ESC: Exit</li> </ul>
	Version 2.22.1288 Copyright (C)	2023 AMI

Figure 3.19

### **RFI Settings**

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  CPU - Power Management Control  $\rightarrow$  CPU VR Settings  $\rightarrow$  RFI Settings

Advanced	Aptio Setup - AMI	
RFI Domain RFI Current Frequency RFI Frequency FIVR Spread Spectrum RFI Spread Spectrum	139.200MHz 0 [Enabled] [1.5%]	Set desired RFI frequency, in increments of 100KHz. (For a frequency of 100.6MHz, enter 1006.)
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Figure 3.20

# Chapter 3 BIOS Operation

### **Custom P-State Table**

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  CPU - Power Management Control  $\rightarrow$  Custom P-State Table

Advanced	Aptio Setup – AMI	
Custom P-state Table		Sets the number of custom
Number of P states	0	must be present.
		↔: Select Screen ↑↓: Select Item
		Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Ontimized Defaults
		F4: Save & Exit ESC: Exit
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Figure 3.21

### **CPU Lock Configuration**

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  CPU - Power Management Control  $\rightarrow$  CPU Lock Configuration

Advanced	Aptio Setup – AMI	
CFG Lock Overclocking Lock	[Enabled] [Enabled]	Configure MSR 0xE2[15], CFG Lock bit ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1288 Copyright (C) 2023 AMI		
Figure 3.22		

### GT - Power Management Control

Advanced  $\rightarrow$  Power & Performance  $\rightarrow$  GT - Power Management Control



Figure 3.23

### 3.2.2.3 PCH-FW Configuration

Advanced → PCH-FW Configuration

	Aptio Setup - AMI Advanced					
ME ME ME ME ME ME ME ME	Firmware Version Firmware Mode Firmware SKU Firmware Status 1 Firmware Status 2 Firmware Status 3 Firmware Status 4 Firmware Status 5 Firmware Status 6 State anageability Features State	16.1.25.2101 ▲ Normal Mode Corporate SKU 0×90000255 0×39858106 0×00000030 0×00004000 0×0000103 0×80400002 [Enabled] [Enabled]	Configure Intel(R) Active Management Technology Parameters			
AN AN AN AN AN AN AN AN AN AN	AT BIOS Features AT Configuration ocal Platform Erase Configuration E Unconfig on RTC Clear omms Hub Support AI Support ore Bios Done Message GE Data Resilience Support immware Update Configuration TT Configuration IPS Configuration hique Platform Id Configuration	[Enabled] [Disabled] [Disabled] [Enabled] [Enabled]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>			







### 3.2.2.4 AMT Configuration

Advanced  $\rightarrow$  PCH-FW Configuration  $\rightarrow$  AMT Configuration

Advanced	Aptio Setup – AMI	
USB Provisioning of AMT MAC Pass Through Dynamic Lan Switch Activate Remote Assistance Process Unconfigure ME ASF Configuration Secure Erase Configuration One Click Recovery(OCR) Configuration Remote Platform Erase Configuration	[Disabled] [Disabled] [As defined in FIT] [Disabled] [Disabled]	Enable/Disable of AMT USB Provisioning. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.	22.1288 Copyright (C) 2023	AMI

Figure 3.26

### **AMT Configuration**

Advanced  $\rightarrow$  PCH-FW Configuration  $\rightarrow$  AMT Configuration  $\rightarrow$  ASF Configuration

Advanced	Aptio Setup – AMI	
PET Progress WatchDog OS Timer BIOS Timer ASF Sensors Table	[Enabled] [Disabled] 0 [Disabled]	Enable/Disable PET Events Progress to receive PET Events.
	/ersion 2.22.1288 Copyright (	C) 2023 AMI

Figure 3.27

### Secure Erase Configuration

 $\mathsf{Advanced} \to \mathsf{PCH}\text{-}\mathsf{FW}$  Configuration  $\to \mathsf{AMT}$  Configuration  $\to \mathsf{Secure}$  Erase Configuration

Advanced	Aptio Setup – AMI	
Secure Erase mode Force Secure Erase	[Simulated] [Disabled]	Change Secure Erase module behavior: Simulated: Performs SE flow without erasing SSD Real: Erase SSD. **** If SATA device is used, OEM could use SECURE_ERASE_HOOK_PROTOCOL to remove SATA power to skip G3 cycle. ***
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
	Version 2.22.1288 Copyright (C)	2023 AMI

Figure 3.28

### One Click Recovery(ORC) Configuration

Advanced  $\rightarrow$  PCH-FW Configuration  $\rightarrow$  AMT Configuration  $\rightarrow$  One Click Recovery(ORC) Configuration

Advanced	Aptio Setup – AMI		
Advanced OCR Https Boot OCR PBA Boot OCR Windows Recovery Boot OCR Disable Secure Boot	[Enabled] [Enabled] [Enabled] [Enabled]	Enable/Disable One Click Recovery Https Boot ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit	
		ESC: Exit	
Vers	ion 2.22.1288 Copyright	(C) 2023 AMI	
Figure 3.29			

### Firmware Update Configuration

Advanced  $\rightarrow$  PCH-FW Configuration  $\rightarrow$  Firmware Update Configuration

Advanced	Aptio Setup – AMI	
Me FW Image Re-Flash FW Update	[Disabled] [Enabled]	Enable/Disable Me FW Image Re-Flash function.
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Vers	ion 2.22.1288 Copyright (0	2023 AMT

Figure 3.30

### **PTT Configuration** Advanced $\rightarrow$ PCH-FW Configuration $\rightarrow$ PTT Configuration

Advanced	Aptio Setup – AMI	
PTT Capability / State	1 / 0	
TPM Device Selection	[dTPM]	
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2	.22.1288 Copyright (C) 2023	AMI

Figure 3.31

### **FIPS Configuration**

Advanced  $\rightarrow$  PCH-FW Configuration  $\rightarrow$  FIPS Configuration

Advanced	Aptio Setup – AMI	
FIPS Mode Select Current FIPS mode Crypto driver FIPS version	[Disabled] Disabled 16.1.2101.25	FIPS Mode configuration ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	22.1288 Copyright (C) 2023.	AMI

Figure 3.32

### **Unique Platform Id Configuration**

Advanced  $\rightarrow$  PCH-FW Configuration  $\rightarrow$  Unique Platform Id Configuration



Figure 3.33

### **ME Debug Configuration**

Advanced  $\rightarrow$  PCH-FW Configuration  $\rightarrow$  ME Debug Configuration

Advanced	Aptio Setup — AMI	
HECI Timeouts Force ME DID Init Status CPU Replaced Polling Disable HECI Message check Disable MBP HOB Skip	[Enabled] [Disabled] [Disabled] [Disabled] [Disabled]	Enable/Disable HECI Send/Receive Timeouts.
HECI2 Interface Communication KT Device End Of Post Message DOI3 Setting for HECI Disable MCTP Broadcast Cycle SMBIOS type 130 OEM capabilities	[Disabled] [Enabled] [Send in DXE] [Disabled] [Disabled]	
		++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1288 Copyright (C) 2023	3 AMI

Figure 3.34

### SMBIOS Type 130 OEM Capabilities

Advanced  $\rightarrow$  PCH-FW Configuration  $\rightarrow$  ME debug Configuration  $\rightarrow$  SMBIOS Type 130 OEM Capabilities

Advanced	Aptio Setup – AMI	
BIOS Reflash Capability State BIOS Boot to Setup Capability State BIOS Pause Before Booting Capability State BIOS Secure Boot Capability Exposure to FW State vPro TBT Dock Support	[Enabled] [Enabled] [Disabled] [Enabled] [Enabled]	Change BIOS Reflash Capability State
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2	.22.1288 Copyright (C) 2023	AMI

Figure 3.35

### Anti-Rollback SVN Configuration

 $\mathsf{Advanced} \to \mathsf{PCH}\text{-}\mathsf{FW}\ \mathsf{Configuration} \to \mathsf{Anti-Rollback}\ \mathsf{SVN}\ \mathsf{Configuration}$ 

Advanced	Aptio	Setup – AMI	
Minimal Allowed Anti-Rollback Executing Anti-Rollback SVN Automatic HW-Enforced Anti-Rollback SVN Set HW-Enforced Anti-Rollback Current SVN	SVN 0 4 [Disab.	Led] Led]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Ver	sion 2.22.1288	3 Copyright (C) 2023	AMI

Figure 3.36

### **OEM Key Revocation Configuration**

Advanced  $\rightarrow$  PCH-FW Configuration  $\rightarrow$  OEM Key Revocation Configuration

Advanced	Aptio Setup — AMI	
Automatic OEM Key Revocation Invoke OEM Key Revocation	[Disabled] [Disabled]	When enabled, BIOS will automatically send HECI command to revoke OEM keys.
		<pre> ++: Select Screen  1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
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Figure 3.37

### 3.2.2.5 Trusted Computing Settings

Advanced → Trusted Computing

Advanced	Aptio Setup – AMI	
TPM 2.0 Device Found Firmware Version: Vendor: Security Device Support Active PCR banks Available PCR banks	15.22 IFX [Enable] SHA256 SHA256,SHA384	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.
SHA256 PCR Bank SHA384 PCR Bank Pending operation Platform Hierarchy Storage Hierarchy Endorsement Hierarchy Physical Presence Spec Version TPM 2.0 InterfaceType Device Select	[Enabled] [Disabled] [Enabled] [Enabled] [Inabled] [1.3] [TIS] [Auto]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1288 Copyright (C) 2023 AMI		

Figure 3.38

# Chapter 3 BIOS Operation

### 3.2.2.6 ACPI Settings

 $\mathsf{Advanced} \to \mathsf{ACPI} \ \mathsf{Settings}$ 

Advanced	Aptio Setup – AMI	
ACPI Settings		Enables or Disables BIOS ACPI
Enable ACPI Auto Configuration	[Disabled]	Huto configuration.
Enable Hibernation ACPI Sleep State	[Enabled] [S3 (Suspend to RAM)]	
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
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Figure 3.39

### 3.2.2.7 NCT6126D Super IO Configuration

Advanced  $\rightarrow$  NCT6126D Super IO Configuration



Figure 3.40

### **Serial Port 1 Configuration**

Advanced  $\rightarrow$  NCT6126D Super IO Configuration  $\rightarrow$  Serial Port 1 Configuration



Figure 3.41

### **Serial Port 2 Configuration**

Advanced 

— NCT6126D Super IO Configuration 

— Serial Port 2 Configuration

Serial Port 2 Configuration       Enable or Disable Serial Port (COM)         Serial Port       [Enabled]         Device Settings       IO=2F8h; IRQ=3;         Change Settings       [Auto]         Device Mode       [RS232]
Serial Port [Enabled] Device Settings IO=2F8h; IRQ=3; Change Settings [Auto] Device Mode [RS232]
Change Settings [Auto] Device Mode [RS232]
++: Select Screen 14: Select Item Enter: Select
+/-: Change Opt. F1: General Help
F2: Previous Values F3: Optimized Defaults
F4: Save & Exit ESC: Exit
Version 2 22 1288 Conunight (C) 2023 AMT

Figure 3.42

### 3.2.2.8 NCT6126D HW Monitor

Advanced  $\rightarrow$  NCT6126D HW Monitor

Advanced	Aptio Setup – AMI	
PC Health Status		Enable or Disable Smart Fan
System temperature Cpu Temperature CPU FAN Speed SYS FAN1 Speed VCORE +5V +12V +3.3V VBAT	: +34°C/ +93°F : +40°C/ +104°F : 2795 RPM : 0 RPM : +0.728 V : +5.200 V : +12.096 V : +3.328 V : +3.024 V	
Smart Fan Function ▶ Smart Fan Function ▶ Digital I/O Configuration	[Enabled]	++: Select Screen ↑↓: Select Item Enter: Select
CPU Warning Temperature ACPI Shutdown Temperature Case Open Warning Wake On Ring Watch Dog Timer	[Disabled] [Disabled] [Disabled] [Disabled] [Disabled]	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
1	/ersion 2.22.1288 Copyright (C) 203	23 AMI

Figure 3.43

### **Smart Fan Function**

Advanced  $\rightarrow$  NCT6126D HW Monitor  $\rightarrow$  Smart Fan Function

	Aptio Setup – AMI	
Advanced		
Smart Fan Mode Configuration		CPU Fan Mode Select
CPU Fan Mode	[SMART FAN IV Mode]	
CPUFAN Temperature 1	40	
CPUFAN DC/PWM 1	127	
CPUFAN Temperature 2	57	
CPUFAN DC/PWM 2	170	
CPUFAN Temperature 3	74	
CPUFAN DC/PWM 3	214	
CPUFAN Temperature 4	90	
CPUFAN DC/PWM 4	255	
CPUFAN Critical Temperature	90	
CPUFAN Critical Temp Tolerance	1	
		↔: Select Screen
System Fan1 Mode	[SMART FAN IV Mode]	↑↓: Select Item
SYSFAN1 Temperature 1	30	Enter: Select
SYSFAN1 DC/PWM 1	0	+/−: Change Opt.
SYSFAN1 Temperature 2	40	F1: General Help
SYSFAN1 DC/PWM 2	84	F2: Previous Values
SYSFAN1 Temperature 3	50	F3: Optimized Defaults
SYSFAN1 DC/PWM 3	168	F4: Save & Exit
SYSFAN1 Temperature 4	60	ESC: Exit
SYSFAN1 DC/PWM 4	255	
SYSFAN1 Critical Temperature	90	
SYSFAN1 Critical Temp Tolerance	1	
Version	2.22.1288 Copyright (C) 2	023 AMI

Figure 3.44

### **Digital I/O Configuration**

Advanced  $\rightarrow$  NCT6126D HW Monitor  $\rightarrow$  Digital I/O Configuration

Advanced	Aptio Setup — AMI	
Digital I/O Configuration		Configure Digital I/O Pin.
Digital I/O Pin 1 Digital I/O Pin 2 Digital I/O Pin 3 Digital I/O Pin 4 Digital I/O Pin 5 Digital I/O Pin 6 Digital I/O Pin 7 Digital I/O Pin 8	[Input] [Input] [Input] [Input] [Input] [Input] [Input]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Versi	on 2.22.1288 Copyright (C) 202	3 AMI

Figure 3.45

### 3.2.2.9 S5 RTC Wake Settings

Advanced  $\rightarrow$  S5 RTC Wake Settings



Figure 3.46

# Chapter 3 **BIOS** Operation

### 3.2.2.10 Serial Port Console Redirection

Advanced → Serial Port Console Redirection

Advanced	Aptio Setup – AMI	
COM1 Console Redirection ▶ Console Redirection Settings COM1(Pci Bus0,Dev0,Func0) (Disabled) Console Redirection	[Disabled] Port Is Disabled	Console Redirection Enable or Disable.
Legacy Console Redirection Legacy Console Redirection Settings Serial Port for Out-of-Band Manageme Windows Emergency Management Service Console Redirection EMS Console Redirection Settings	nt/ s (EMS) [Disabled]	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help</pre>
Version 2	.22.1288 Convright (C) 2023	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

### rigure 3.47

### Legacy Console Redirection Settings

Advanced  $\rightarrow$  Serial Port Console Redirection  $\rightarrow$  Legacy Console Redirection Settings



Figure 3.48

### 3.2.2.11 Intel TXT Information

### Advanced $\rightarrow$ Intel TXT Information

Advanced	Aptio Setup — AMI	
Advanced Intel TXT Information Chipset BiosAcm Chipset Txt Cpu Txt Error Code Class Code Major Code Minor Code	Aptio Setup - AMI Production Fused Production Fused Supported None None None None None	++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Vers	ion 2.22.1288 Copyright (C) 202	3 AMI

Figure 3.49

### 3.2.2.12 USB Configuration

Advanced  $\rightarrow$  USB Configuration

Huvanceu		
USB Configuration		Enables Legacy USB support.
USB Module Version	31	support if no USB devices are connected. DISABLE option will
USB Controllers: 1 XHCI		keep USB devices available only for EFI applications.
USB Devices: 1 Drive, 1 Keyboard		
Legacy USB Support	[Enabled]	
USB Mass Storage Driver Support	[Enabled]	
USB hardware delays and time-outs:		↔+: Select Screen
USB transfer time-out	[20 sec]	†↓: Select Item
Device reset time-out	[20 sec]	Enter: Select
Device power-up delay	[Auto]	+/−: Change Opt.
		F1: General Help
Mass Storage Devices:		F2: Previous Values
Generic Flash Disk 8.07	[Auto]	F3: Optimized Defaults F4: Save & Exit
USB PWR OFF Configuration 1	[Disabled]	ESC: Exit
USB PWR OFF Configuration 2	[Disabled]	
USB PWR OFF Configuration 3	[Disabled]	
Version 2.	.22.1288 Copyright (C) 2023	AMI

Figure 3.50
# 3.2.2.13 Network Stack Configuration

 $\mathsf{Advanced} \to \mathsf{Network} \; \mathsf{Stack} \; \mathsf{Configuration}$ 

Advanced	Aptio Setup – AMI	
Network Stack	[Disabled]	Enable/Disable UEFI Network Stack ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.22.1288 Copyright (C	) 2023 AMI

Figure 3.51

#### 3.2.2.14 CSM Configuration

 $\mathsf{Advanced} \to \mathsf{CSM}\ \mathsf{Configuration}$ 



Figure 3.52

### 3.2.2.15 NVMe Configuration

Advanced  $\rightarrow$  NVMe Configuration



Figure 3.53

#### 3.2.2.16 TIs Auth Configuration

Advanced  $\rightarrow$  TIs Auth Configuration



Figure 3.54

# 3.2.2.17 Driver Health

 $\mathsf{Advanced} \to \mathsf{Driver} \; \mathsf{Health}$ 

Aptio Setup – AMI Advanced	
<ul> <li>Intel(R) Ethernet Connection I219 0.2.03 Healthy</li> <li>Intel(R) 2.56 Ethernet Controller 0.10.06 Healthy</li> </ul>	Provides Health Status for the Drivers/Controllers ++: Select Screen 11: Select Item Enter: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Figure 3.55

# 3.2.3 Chipset Configuration Settings

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



Figure 3.56

# Chapter 3 BIOS Operation

# 3.2.3.1 System Agent (SA) Configuration

 $Chipset \rightarrow System \, Agent \, (SA) \, Configuration$ 

Chipset	Aptio Setup – AMI	
System Agent (SA) Configuration		Memory Configuration Parameters
VT-d	Supported	
<ul> <li>Memory Configuration</li> <li>Graphics Configuration</li> <li>DMI/OPI Configuration</li> <li>VMD setup menu</li> <li>PCI Express Configuration</li> </ul>		
VT-d Control Iommu Pre-boot Behavior Above 4GB MMIO BIOS assignment Program Grant Count	[Enabled] [Disable IOMMU] [Enabled] [Disabled]	<pre> ++: Select Screen  11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version 2	2.22.1288 Copyright (C) 2023	AMI

Figure 3.57

# **Memory Configuration**

 $Chipset \rightarrow System Agent (SA) \ Configuration \rightarrow Memory \ Configuration$ 

Chipset	Aptio Setup – AMI	
Memory Configuration Memory RC Version Memory Frequency DIMMA1 Size Number of Ranks Manufacturer DIMMB1 SAM Overlaoding	0.0.4.112 2400 MT/s Not Populated / Disabled 4096 MB (DDR4) 1 Apacer Technology Not Populated / Disabled [Disabled]	Enable: copy the sagv frequency point. Disable: not copy.
		<pre>++: Select Screen f4: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Version (	2.22.1288 Copyright (C) 2023	AMI

Figure 3.58

### **Graphics Configuration**

Chipset  $\rightarrow$  System Agent (SA) Configuration  $\rightarrow$  Graphics Configuration

Chipset	Aptio Setup – AMI	
Graphics Configuration Graphics Turbo IMON Current	31	Graphics turbo IMON current values supported (14–31)
<ul> <li>Skip Scaning of External Gfx Card</li> <li>Primary Display</li> <li>External Gfx Card Primary Display Conternal Graphics</li> <li>GTT Size</li> <li>Aperture Size</li> <li>DVMT Pre-Allocated</li> <li>DVMT Total Gfx Mem</li> </ul>	[Disabled] [Auto] onfiguration [Auto] [8MB] [256MB] [60M] [256M]	
Intel Graphics Pei Display Peim VDD Enable Configure GT for use RC1p Support PAVP Enable Cdynmax Clamping Enable Cd Clock Frequency	[Disabled] [Enabled] [Enabled] [Disabled] [Enabled] [Disabled] [Max CdClock freq based on Reference Cikl	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values E3: Ontimized Defaults
▶ LCD Control		F4: Save & Exit ESC: Exit
Version 2.22.1288 Copyright (C) 2023 AMI		

Figure 3.59

#### External Gfx Card Primary Display Configuration

Chipset  $\rightarrow$  System Agent (SA) Configuration  $\rightarrow$  Graphics Configuration  $\rightarrow$  External Gfx Card Primary Display Configuration



Figure 3.60

# Chapter 3 BIOS Operation

# LCD Control

LCD Control Panel Type [Disabled] Backlight Signal Control [PWM] Backlight Control PWM 100 Backlight PWM Frequency Control [23.3 KHz] ++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	Chipset	Aptio Setup – AMI	
Panel Type       [Disabled]         Backlight Signal Control       [PNM]         Backlight Control PNM       100         Backlight PNM Frequency Control       [23.3 KHz]         **: Select Screen         1: Select Item         Enter: Select         */-: Change Opt.         F2: Previous Values         F3: Optimized Defaults         F4: Save & Exit         ESC: Exit	LCD Control		
Version 2.22.1288 Copyright (C) 2023 AMI	Panel Type Backlight Signal Control Backlight Control PWM Backlight PWM Frequency Control	[Disabled] [PWM] 100 [23.3 KHz]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
	Version 2.22.1288 Copyright (C) 2023 AMI		

Figure 3.61

# **DMI/OPI Configuration**

 $Chipset \rightarrow System \ Agent \ (SA) \ Configuration \rightarrow DMI/OPI \ Configuration$ 

Chipset	Aptio Setup – AMI	
DMI/OPI Configuration		Set DMI Speed Gen1/Gen2/Gen3
DMI	X8 Gen4	
DMI Max Link Speed CDR Relock for CPU DMI DMI ASPM DMI Gen3 L1 Exit Latency New FOM for CPU DMI ▶ DMI Advanced Menu	[Gen4] [Disabled] [ASPM L1] 4 [Disabled]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
Versi	ion 2.22.1288 Copyright (C)	2023 AMI

Figure 3.62

#### DMI Advanced Menu

Chipset  $\rightarrow$  System Agent (SA) Configuration  $\rightarrow$  DMI/OPI Configuration  $\rightarrow$  DMI Advanced Menu

Chipset	Aptio Setup – AMI	
DMI Advanced Menu		▲ DMI Gen4 EQ Mode
DMI Gen4 EQ Mode DMI Gen4 RTCO Cpre Lane0 DMI Gen4 RTCO Cpre Lane0 DMI Gen4 RTCO Cpre Lane1 DMI Gen4 RTCO Cpre Lane1 DMI Gen4 RTCO Cpre Lane2 DMI Gen4 RTCO Cpre Lane2 DMI Gen4 RTCO Cpre Lane3 DMI Gen4 RTCO Cpre Lane3 DMI Gen4 RTCO Cpre Lane4 DMI Gen4 RTCO Cpre Lane5 DMI Gen4 RTCO Cpre Lane5 DMI Gen4 RTCO Cpre Lane6 DMI Gen4 RTCO Cpre Lane6 DMI Gen4 RTCO Cpre Lane7 DMI Gen4 RTCO Cpre Lane7 DMI Gen3 RTCO Cpre Lane0 DMI Gen3 RTCO Cpre Lane0 DMI Gen3 RTCO Cpre Lane1 DMI Gen3 RTCO Cpre Lane1	[Fixed EQ] 10 6 10 6 10 6 10 6 10 6 10 6 10 6 10	<pre>**: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit */*</pre>
	Version 2 22 1288 Conuright (	C) 2023 AMT

Figure 3.63

Chipset	Aptio Setup – A	IME
Chipset DMI Gen4 RTC0 Cpost Lane3 DMI Gen4 RTC0 Cpre Lane4 DMI Gen4 RTC0 Cpre Lane4 DMI Gen4 RTC0 Cpost Lane5 DMI Gen4 RTC0 Cpre Lane5 DMI Gen4 RTC0 Cpre Lane5 DMI Gen4 RTC0 Cpre Lane6 DMI Gen4 RTC0 Cpre Lane7 DMI Gen4 RTC0 Cpre Lane7 DMI Gen3 RTC0 Cpre Lane0 DMI Gen3 RTC0 Cpre Lane0 DMI Gen3 RTC0 Cpre Lane1 DMI Gen3 RTC0 Cpre Lane1 DMI Gen3 RTC0 Cpre Lane2 DMI Gen3 RTC0 Cpre Lane2 DMI Gen3 RTC0 Cpre Lane2 DMI Gen3 RTC0 Cpre Lane3 DMI Gen3 RTC0 Cpre Lane3 DMI Gen3 RTC0 Cpre Lane3 DMI Gen3 RTC0 Cpre Lane4 DMI Gen3 RTC0 Cpre Lane4 DMI Gen3 RTC0 Cpre Lane5 DMI Gen3 RTC0 Cpre Lane5 DMI Gen3 RTC0 Cpre Lane5 DMI Gen3 RTC0 Cpre Lane6 DMI Gen3 RTC0 Cpre Lane6 DMI Gen3 RTC0 Cpre Lane6 DMI Gen3 RTC0 Cpre Lane6 DMI Gen3 RTC0 Cpre Lane6	Aptio Setup - 6 10 6 10 6 10 6 10 6 3 3 3 5 5 5 3 3 3 3 5 5 5 3 3 3 5 5 5 3 3 3 5 5 5 3 3 3 5 5 5 3 3 3 5 5 5 5 3 3 3 5 5 5 5 3 3 3 3 5 5 5 5 5 5 3 3 3 3 5 5 5 5 5 5 3 3 3 3 5 5 5 5 5 5 5 5 5 5 5 5 5	AMI         DMI Gen3 Lane Transmitter         Pre/Post-Cursor Coefficient         values.         ++: Select Screen         11: Select Item         Enter: Select         +/-: Change Opt.         F1: General Help         F2: Previous Values         F3: Optimized Defaults         F4: Save & Exit         ESC: Exit
UMI Gena Kicu upust Laner	Version 2.22.1288 Copyrigh	nt (C) 2023 AMI

Figure 3.64

# VMD Setup Menu

 $Chipset \rightarrow System Agent (SA) Configuration \rightarrow VMD Setup Menu$ 

Chipset	Aptio Setup – AMI	
VMD Configuration		Enable/Disable to VMD
Enable VMD controller	[Disabled]	
		≁+: Select Screen ↑↓: Select Item
		Enter: Select +/−: Change Opt.
		F1: General Help F2: Previous Values
		F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Versic	on 2.22.1288 Convright (C) 20	D23 AMI
10/010	p3, 18,10 (0) 20	

Figure 3.65

# **PCI Express Configuration**

 $Chipset \rightarrow System Agent (SA) Configuration \rightarrow PCI Express Configuration$ 



Figure 3.66

# **PCI Express Configuration**

Chipset  $\rightarrow$  System Agent (SA) Configuration  $\rightarrow$  PCI Express Configuration  $\rightarrow$  PCI EXPRESS SLOT

Chipset	Aptio Setup – AMI	
Connection Type PCI Express Clock Gating PCI Express Power Gating ASPM L1 Substates Gen3 Eq Phase3 Method Gen4 Eq Phase3 Method ACS PTM DPC FOM Scoreboard Control Policy Multi-VC EDPC URR FER NFER CER CTO SEFE SENFE SECE PME SCI Advanced Error Reporting PCIe Speed Enable ClockReq Messaging	<pre>[Slot] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Hardware] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Enabled] [Disabled] [Disabled] [Enabled] [Disabled] [Disabled] [Enabled] [Disabled] [Disabled] [Enabled] [Disabled] [Disabled] [Enabled] [Disabled] [Disabled] [Enabled] [Enabled] [Disabled] [Enabled] [Enabled] [Enabled] [Disabled]</pre>	<ul> <li>Built-In: a built-in device is connected to this rootport. SlotImplemented bit will be clear. Slot: this rootport connects to user-accessible slot. SlotImplemented bit will be set.</li> <li>**: Select Screen         11: Select Item Enter: Select             +/-: Change Opt.             F1: General Help             F2: Previous Values             F3: Optimized Defaults             F4: Save &amp; Exit             ESC: Exit         </li> </ul>

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Chipset	Aptio Setup – AMI	[
Enable ClockReq Messaging Transmitter Half Swing Detect Timeout P2P Support CPU PCIE Func0 Link Disable	[Disabled] [Disabled] 0 [Disabled] [Disabled]	▲ Downstream Port Transmitter Preset
SA PCIE LTR Configuration LTR Snoop Latency Override Non Snoop Latency Override Force LTR Override	[Enabled] [Auto] [Auto] [Disabled]	
LTR Lock	[Disabled]	· · · · · · · · · · · · · · · · · · ·
CPU PCIe Gen3 HWEQ Config UPTP DPTP	7 7	++: Select Screen fl: Select Item Enter: Select +/-: Change Opt.
CPU PCIE Gen4 HWEQ Config UPTP DPTP	7 5	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
CPU PCIE Gen5 HWEQ Config UPTP DPTP	5 7	ESC: Exit
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Figure 3.68

# 3.2.3.2 PCH-I/O Configuration

 $Chipset \rightarrow PCH\text{-I/O Configuration}$ 

Chipset	Aptio Setup – AMI	
PCH-IO Configuration > PCI Express Configuration > SATA Configuration > Security Configuration > HD Audio Configuration		PCI Express Configuration settings
LAN1 Controller LAN1 PXE OpROM LAN2 Controller LAN2 PXE OpROM PCIE Wake ErP Support Restore AC Power Loss PCIE Device Initial Delay Legacy IO Low Latency Flash Protection Range Registers (FPRR) SPD Write Disable	[Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Power Off] 0 [Disabled] [Disabled] [Disabled] [TRUE]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
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Figure 3.69

# ErP Support Note

 $Chipset \rightarrow PCH\text{-I/O Configuration} \rightarrow ErP \text{ Support}$ 

Chipset	Aptio Setup – AMI	
PCH-IO Configuration > PCI Express Configuration > SATA Configuration > Security Configuration > HD Audio Configuration		When Erp enables, wake up event not supported. Please refer to user manual for more details.
LANI Controller LANI PXE OpROM LAN2 Controller LAN2 PXE OpROM PCIE Wake ErP Support Restore AC Power Loss PCIE Device Initial Delay Legacy IO Low Latency Flash Protection Range Registers (FPRR) SYD Write Disaule	<pre>[Enabled] [Disabled] [Disabled] [Disabled] [Power Off] 0 [Disabled] [Disabled] [Disabled] [Disabled]</pre>	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Figure 3.70

When ErP enables, restore AC power loss & below features are not supported. [USB : S3/S4] [PCIE Wake] Connect to PCIe slots and depends on add-on card driver behavior. [RT: S5] [WOR: S5] [WOL: depends on LAN chip and driver behavior(GBE)]

Support S3/S4/S5 (with I219 & I226)

### **PCI Express Configuration**

Chipset  $\rightarrow$  PCH-I/O Configuration  $\rightarrow$  PCI Express Configuration

Chipset	Aptio Setup – AMI	
PCI Express Configuration		The control of Active State
DMI Link ASPM Control PCIe function swap PCIE EQ settings M.2 E-Key LAN2 M.2 M-Key	[L1] [Enabled]	Link.
		++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Versi		) 2023 HMI

Figure 3.71

# **PCIe EQ Settings**

Chipset  $\rightarrow$  PCH-I/O Configuration  $\rightarrow$  PCI Express Configuration  $\rightarrow$  PCIe EQ Settings

Chipset	Aptio Setup – AMI	
PCIe EQ override	[Disabled]	Choose your own PCIe EQ settings, only for users who have a thorough understanding of equalization process ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Figure 3.72

## LAN2

 $Chipset \rightarrow PCH\text{-I/O Configuration} \rightarrow PCI \text{ Express Configuration} \rightarrow LAN2$ 

Chipset	Aptio Setup – AMI	
Chipset LAN2 Connection Type ASPM L1 Substates L1 Low ACS PTM DPC EDPC URR FER NFER CER SEFE SENFE SECE PME SCI Advanced Error Reporting PCIe Speed Transmitter Half Swing Detect Timeout Extra Bus Reserved Reserved Memory Reserved I/0	[Enabled] [Slot] [Disabled] [Disabled] [Enabled] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Enabled] [Enabled] [Enabled] [Enabled] [Auto] [Disabled] 0 0 10	Control the PCI Express Root Port. **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
V	ersion 2.22.1288 Copyright (	(C) 2023 AMI

Figure 3.73

Chipset	Aptio Setup – AMI	
	[Disels]ed]	A Doorn Manager United
	[DISabled]	■ Peer Memory Write
	[Enabled]	Enable/Disable
	[Disabled]	
FER	[DISabled]	
NFER	[Disabled]	
	[DISabled]	
SEFE	[Disabled]	
SENFE	[Disabled]	
SECE	[D1sabled]	
PME SUI	[Enabled]	
Advanced Error Reporting	[Enabled]	
Pule Speed	[Auto]	
Iransmitter Half Swing	[Disabled]	
Detect limeout	0	++: Select Screen
Extra Bus Reserved	0	I↓: Select Item
Reserved Memory	10	Enter: Select
Reserved I/O	4	+/-: Change Opt.
		F1: General Help
PCH PCIe LTR Configuration		F2: Previous Values
LTR	[Enabled]	F3: Optimized Defaults
Snoop Latency Override	[Auto]	F4: Save & Exit
Non Snoop Latency Override	[Auto]	ESC: Exit
LTR Lock	[Disabled]	
Peer Memory Write Enable	[Disabled]	T
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Figure 3.74

# M.2 E-Key

 $Chipset \rightarrow PCH\text{-I/O Configuration} \rightarrow PCI \text{ Express Configuration} \rightarrow M.2 \text{ E-Key}$ 

Chipset	Aptio Setup — AMI	
Chipset M.2 E-Key Connection Type ASPM L1 Substates L1 Low ACS PTM DPC EDPC URR FER NFER CER SEFE SENFE SEFE SENFE SECE PME SCI Advanced Error Reporting PCIe Speed Transmitter Half Swing Detect Timeout Extra Bus Reserved Reserved Memory Reserved I/O	Aptio Setup - AMI [Enabled] [Slot] [Disabled] [Disabled] [Enabled] [Enabled] [Enabled] [Disabl	<ul> <li>Control the PCI Express Root Port.</li> <li>++: Select Screen</li> <li>++: Select Item Enter: Select</li> <li>+/-: Change Opt.</li> <li>F1: General Help</li> <li>F2: Previous Values</li> <li>F3: Optimized Defaults</li> <li>F4: Save &amp; Exit</li> <li>ESC: Exit</li> </ul>
Reserved I/0	4 Version 2.22.1288 Copyright (C)	▼ 2023 AMI

Figure 3.75



Figure 3.76

# M.2 M-key

Chipset  $\rightarrow$  PCH-I/O Configuration  $\rightarrow$  PCI Express Configuration  $\rightarrow$  M.2 M-Key

Chipset	Aptio Setup – AMI	
M.2 M-Key Connection Type ASPM L1 Substates L1 Low ACS PTM DPC EDPC URR FER NFER CER SEFE SENFE SECE PME SCI Advanced Error Reporting PCIe Speed Transmitter Half Swing Detect Timeout Extra Bus Reserved Reserved Memory Reserved I/O	[Enabled] [Slot] [Disabled] [Disabled] [Enabled] [Enabled] [Enabled] [Enabled] [Disabled	<ul> <li>Control the PCI Express Root Port.</li> <li>++: Select Screen</li> <li>+1: Select Item Enter: Select</li> <li>+/-: Change Opt.</li> <li>F1: General Help</li> <li>F2: Previous Values</li> <li>F3: Optimized Defaults</li> <li>F4: Save &amp; Exit</li> <li>ESC: Exit</li> </ul>
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Figure 3.77

Chipset	Aptio Setup – AMI	
DPC	[Disabled]	A Peer Memory Write
EDEC	[Enabled]	Enable/Disable
LIRR	[Disabled]	
FFR	[Disabled]	
NER	[Disabled]	
CER	[Disabled]	
SEFE	[Disabled]	
SENFE	[Disabled]	
SECE	[Disabled]	
PME SCI	[Enabled]	
Advanced Error Reporting	[Enabled]	
PCIe Speed	[Auto]	
Transmitter Half Swing	[Disabled]	
Detect Timeout	0	++: Select Screen
Extra Bus Reserved	0	↑↓: Select Item
Reserved Memory	10	Enter: Select
Reserved I/O	4	+/-: Change Opt.
		F1: General Help
PCH PCIe LTR Configuration		F2: Previous Values
LTR	[Enabled]	F3: Optimized Defaults
Snoop Latency Override	[Auto]	F4: Save & Exit
Non Snoop Latency Override	[Auto]	ESC: Exit
LTR Lock	[Disabled]	
Peer Memory Write Enable	[Disabled]	<b>T</b>
	[01000100]	
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Figure 3.78

# SATA Configuration

 $Chipset \rightarrow PCH\text{-I/O Configuration} \rightarrow SATA \ Configuration$ 

Chipset	Aptio Setup – AMI	
SATA Configuration		▲ Enable/Disable SATA Device.
SATA Controller(s) SATA Mode Selection Aggressive LPM Support SATA Controller Speed Serial ATA Port 1 Software Preserve Port 1 External Spin Up Device SATA Device Type Topology SATA Port 1 DevSlp DITO Configuration DITO Value DM Value Serial ATA Port 2 Software Preserve Port 2 External Spin Up Device SATA Device Type Topology	[Enabled] [AHCI] [Enabled] [Default] Empty Unknown [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] 625 15 Empty Unknown [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
	Version 2.22.1288 Copyright (C)	2023 AMI

Figure 3.79

Chipset	Aptio Setup – AMI	
DITO Configuration DITO Value DM Value Serial ATA Port 2 Software Preserve Port 2 External Spin Up Device SATA Device Type Topology SATA Port 2 DevSlp DITO Configuration DITO Value DM Value M.2 M-Key Software Preserve Port 3 External Spin Up Device SATA Device Type Topology SATA Port 3 DevSlp DITO Configuration DITO Value DM Value M.2 M-Key	[Disabled] 625 15 Empty Unknown [Enabled] [Disabled] [Disabled] [Hard Disk Drive] [Unknown] [Disabled]	<ul> <li>Enable/Disable DITO Configuration</li> <li>**: Select Screen</li> <li>**: Select Item</li> <li>Enter: Select</li> <li>*/-: Change Opt.</li> <li>F1: General Help</li> <li>F2: Previous Values</li> <li>F3: Optimized Defaults</li> <li>F4: Save &amp; Exit</li> <li>ESC: Exit</li> </ul>
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Figure 3.80

# Security Configuration

 $Chipset \rightarrow PCH\text{-I/O Configuration} \rightarrow Security \ Configuration$ 

Chipset	Aptio Setup – AMI	
Security Configuration		Enable will lock bytes 38h–3Fh
RTC Memory Lock BIOS Lock Force unlock on all GPIO pads	[Enabled] [Enabled] [Disabled]	In the lower∕upper 128–byte bank of RTC RAM
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
Version	2.22.1288 Copyright (C) 202	3 AMI

Figure 3.81

# HD Audio Subsystem Configuration Settings

 $\label{eq:chipset} Chipset \rightarrow PCH\text{-I/O Configuration} \rightarrow HD \ Audio \ Subsystem \ Configuration \ Settings$ 

Chipset	Aptio Setup – AMI	
HD Audio Subsystem Configuration Se	ettings	Control Detection of the HD-Audio device.
HD Audio HDA Codec ALC245 Configuration	[Enabled] [No Dmic to codec]	Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
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Figure 3.82

# 3.2.4 Security

Aptio Setup – AMI Main Advanced Chipset <mark>Security</mark> Boot Save & Exit MEBx		
Password Description		Set Administrator Password
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range:		
Maximum length	20	↔+: Select Screen
Administraton Descurred		14: Select Item
Haministrator Password		+/-: Change Opt.
▶ Secure Boot		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Vaccian 2 22 4290 Comunickt /D) 00	22.047
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Figure 3.83

# Administrator Password

Select this option and press <ENTER> to access the sub-menu, and then type in the password to set the Administrator password.

#### User Password

Select this option and press <ENTER> to access the sub-menu, and then type in the password to set the User Password.

#### Secure Boot

Security  $\rightarrow$  Secure Boot

Security	Aptio Setup – AMI	
System Mode	Setup	
Secure Boot	[Enabled] Inactive	
Secure Boot Mode ▶ Restore Factory Keys ▶ Reset To Setup Mode	[Standard]	
▶ Key Management		
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>
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Figure 3.84

# 3.2.5 Boot Settings



Figure 3.85

#### Setup Prompt Timeout

User the <+> and <-> keys to adjust the number of seconds to wait for setup activation key.

Bootup NumLock State [Off]
 On or off power on state for the NumLock.

# 3.2.6 Save & Exit Configuration

Save Options Save Changes and Exit Discard Changes and ExitExit system setup after savin the changes.Save Changes and Reset Discard Changes Discard ChangesExit system setup after savin the changes.Default Options Restore Defaults Save as User Defaults Restore User Defaults Boot Override UEFI: Generic Flash Disk 8.07, Partition 1 (Generic Flash Disk 8.07)#*: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit	Aptio Setup – AMI Main Advanced Chipset Security Boot Save & Exit MEBx	
Save as User Defaults Restore User Defaults Boot Override UEFI: Generic Flash Disk 8.07, Partition 1 (Generic Flash Disk 8.07) F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit	Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes Default Options Restore Defaults	Exit system setup after saving the changes.
ESC: Exit	Save as User Defaults Restore User Defaults Boot Override UEFI: Generic Flash Disk 8.07, Partition 1 (Generic Flash Disk 8.07)	<pre> ++: Select Screen  14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save &amp; Exit ESC: Exit</pre>

Figure 3.86

#### Save Changes and Exit

When users have completed system configuration, select this option to save changes, exit the BIOS setup menu and reboot the computer to take effect of all system configuration parameters.

1. Select **Save Changes and Exit** from the Save & Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now?

2. Select [Ok] or [Cancel]

#### Discard Changes and Exit

Select this option to quit setup without making any permanent changes to the system configuration.

1.Select **Discard Changes and Exit** from the Save & Exit menu and press <Enter>. The following message appears: Discard Changes and Exit setup now? [Ok] or [Cancel]

2. Select Ok to discard changes and exit.

#### Save Changes and Reset

When users have completed system configuration, select this option to save changes, exit the BIOS setup menu and reboot the computer to take effect. 1. Select **Save Changes and Reset** from the Save & Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Ok] or [Cancel]

2. Select [Ok] or [Cancel]

#### Discard Changes and Reset

Select this option to quit Setup without making any permanent changes to the system configuration.

1. Select **Discard Changes and Reset** from the Save & Exit menu and press <Enter>. The following message appears: Discard Changes and exit setup

Now? [Ok] or [Cancel]

2. Select Ok to discard changes and reset.

#### Restore Default

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

# Save as User Default

Save the all current settings as a user default.

#### Restore User Default

Restore all settings to user default values.

#### Boot Override

Shows the boot device types on the system.



Software Introduction & Services

# 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

GP I/O	General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch on/off the device. Our API also provides Programma- ble GPIO, which allows developers to dynamically set the GPIO input or output status
SMBus	SMBus is the System Management Bus defined by Intel Cor- poration in 1995. It is used in personal computers and serv- ers for low-speed system management communications. The SMBus API allows a developer to interface with an embed- ded system environment and transfer serial messages using the SMBus protocols, allowing multiple simultaneous device control.

# 4.2.1.2 Display

#### **Brightness Control**



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

#### 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.



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-279 B1 are located on the Advantech support website: http://support.advantech.com/Support/. The drivers 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\*.



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 your application software's user manual 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



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)



**Display Driver Setup** 

# 6.1 Introduction

The 12th/13th/14th Gen Intel® Core™ i processors are embedded with an integrated graphics controller. You need to install the driver to enable the function.

Optimized integrated graphics solution: Intel® Graphics Flexible supports versatile display options and a 3D graphics engine. Dual independent displays include enhanced display modes for widescreen flat panels for, extended, twin, clone and dual display modes, and optimized 3D support delivers an intensive and realistic visual experience.

# 6.2 Windows 10 Display Driver Installation



Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 5 for information on installing the CSI utility.

Download the driver the from website to your computer. Navigate to the "AIMB-279 Technical Downloads" folder and complete the installation of the drivers for Windows 10.



LAN Configuration

# 7.1 Introduction

The AIMB-279 B1 has two Gigabit Ethernet LANs via dedicated PCI Express x1 lanes, Intel i226 and I219LM (Phy) that offer bandwidth of up to 500 MB/sec, eliminating the bottleneck of network data flow and incorporating Gigabit Ethernet at 2500 Mbps.

# 7.2 Features

- Integrated 10/100/1000/2500 Mbps transceiver
- 10/100/1000/2500 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

# 7.3 Installation

# Note!

Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 5 for information on installing the CSI utility.

The AIMB-279 B1 Intel i226 and Intel i219LM 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.

# 7.4 Windows® 10 Driver Setup (Intel i219LM & Intel i226)

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



Before installing this driver, make sure the CSI utility has been installed in your system. See Chapter 5 for information on installing the CSI utility.



# www.advantech.com

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