

User Manual

AIMB-292

Thin Al Motherboard with 12th/13th/14th Gen Intel® Core™ Processor and MXM GPU Integration (Codename: Raptor Lake-S Refresh)



Copyright

The documentation and the software included with this product are copyrighted 2024 by Advantech Co., Ltd. All rights are reserved. Advantech Co., Ltd. reserves the right to make improvements in the products described in this manual at any time without notice. No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of Advantech Co., Ltd. The information provided in this manual is intended to be accurate and reliable. However, Advantech Co., Ltd. assumes no responsibility for its use, nor for any infringements of the rights of third parties that may result from its use.

Acknowledgments

IBM and PC are trademarks of International Business Machines Corporation.

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

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

Product Warranty (2 Years)

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

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

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

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

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

Part No. 2006029200 Printed in China Edition 1 October 2024

A Message to the Customer

Advantech Customer Services

Each and every Advantech product is built to the most exacting specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether your new Advantech equipment is destined for the laboratory or the factory floor, you can be assured that your product will provide the reliability and ease of operation for which the name Advantech has come to be known. Your satisfaction is our primary concern. Here is a guide to Advantech's customer services. To ensure you get the full benefit of our services, please follow the instructions below carefully.

Technical Support

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

Please consult this manual first. If you still cannot find the answer, gather all the information or questions that apply to your problem, and with the product close at hand, call your dealer. Our dealers are well trained and ready to give you the support you need to get the most from your Advantech products. In fact, most problems reported are minor and are able to be easily solved over the phone.

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

Declaration of Conformity

FCC Class B

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

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

CPU Compatibility

Processor Number	Max TDP	Code Name	Cores/Threads
i9-14900	65W	Raptor Lake-S Refresh	8P+16E/32T
i9-14900T	35W	Raptor Lake-S Refresh	8P+16E/32T
i7-14700	65W	Raptor Lake-S Refresh	8P+12E/28T
i7-14700T	35W	Raptor Lake-S Refresh	8P+12E/28T
i5-14500	65W	Raptor Lake-S Refresh	6P+8E/20T
i5-14500T	35W	Raptor Lake-S Refresh	6P+8E/20T
i5-14400	65W	Raptor Lake-S Refresh	6P+4E/16T
i5-14400T	35W	Raptor Lake-S Refresh	6P+4E/16T
i3-14100	60W	Raptor Lake-S Refresh	4P+0E/8T
i3-14100T	35W	Raptor Lake-S Refresh	4P+0E/8T
Intel® Processor 300	46W	Raptor Lake-S Refresh	2P+0E/4T
Intel® Processor 300T	35W	Raptor Lake-S Refresh	2P+0E/4T
i9-13900	65W	Raptor Lake-S	8P+16E/32T
i9-13900E	65W	Raptor Lake-S	8P+16E/32T
i9-13900TE	35W	Raptor Lake-S	8P+16E/32T
i7-13700	65W	Raptor Lake-S	8P+8E/24T
i7-13700E	65W	Raptor Lake-S	8P+8E/24T
i7-13700TE	35W	Raptor Lake-S	8P+8E/24T
i5-13500	65W	Raptor Lake-S	6P+8E/20T
i5-13500E	65W	Raptor Lake-S	6P+8E/20T
i5-13500TE	35W	Raptor Lake-S	6P+8E/20T
i5-13400	65W	Raptor Lake-S	6P+4E/16T
i5-13400E	65W	Raptor Lake-S	6P+4E/16T
i3-13100	60W	Raptor Lake-S	4P+0E/8T
i3-13100E	60W	Raptor Lake-S	4P+0E/8T
i3-13100TE	35W	Raptor Lake-S	4P+0E/8T
i9-12900	65W	Alder Lake-S	8P+8E/24T
i9-12900E	65W	Alder Lake-S	8P+8E/24T
i9-12900TE	35W	Alder Lake-S	8P+8E/24T
i7-12700	65W	Alder Lake-S	4P+8E/20T
i7-12700E	65W	Alder Lake-S	8P+8E/24T
i7-12700TE	35W	Alder Lake-S	8P+8E/24T
i5-12500	65W	Alder Lake-S	6P+6E/12T
i5-12500E	65W	Alder Lake-S	6P+6E/12T
i5-12500TE	35W	Alder Lake-S	6P+6E/12T
i5-12400	65W	Alder Lake-S	6P+6E/12T
i3-12100	60W	Alder Lake-S	4P+4E/8T
i3-12100E	60W	Alder Lake-S	4P+4E/8T
i3-12100TE	35W	Alder Lake-S	4P+4E/8T
G7400E	46W	Alder Lake-S	2P+2E/4T
G7400TE	35W	Alder Lake-S	2P+2E/4T
G6900E	46W	Alder Lake-S	2P+2E/4T
G6900TE	35W	Alder Lake-S	2P+2E/2T

Memory Compatibility

Category	Speed	Capacity	Vendor	ADVANTECH P/N	ECC
DDR5	5600	48GB	ADVANTECH	SQR-SD5N48G5K6M	N
DDR5	5600	32GB	ADVANTECH	SQR-SD5N32G5K6SNPB	N

Ordering Information

P/N	GPU	DP	LVDS/ eDP	2.5 GbE	GbE	сом	SATA III	USB 3.2	USB 2.0	M.2 M-key	M.2 E-key	TPM 2.0	AMP	Cooler type	Temperature
AIMB- 2920- 00A1	Quadro® A4500	3	1	2	1	2	1	4	2	1	1 (B-Key optional)	1	1	Standard	0~55°C

"0 Supports by B0IM options

AIMB-292 Kit

P/N	GPU	CPU	Memory	Storage	DP	LVDS /eDP	2.5 GbE	GbE	сом	SATA III	USB 3.2	USB 2.0	M.2 M-key	M.2 E-key	ТРМ 2.0	AMP	Cooler type	Temperature
AIMB- 2920- K1A1	Quadro® A4500	I7- 13700E	32GB	512G NVMe	3	1	2	1	2	1	4	2	1	1 (B-Key optional)	1	1	Standard	0~55°C

Initial Inspection

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

- 1 x AIMB-292 Thin AI Motherboard
- 1 x SATA HDD cable
- 1 x SATA power cable
- 1 x Serial port cable
- 1 x I/O port bracket
- 1 x Startup Manual
- 1 x Warranty Card
- 2 x screws (M3x4.5L)

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-292 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-292, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

Contents

Chapter	1	General Introduction	1
	1.1	Introduction	2
	1.2	Features	2
	1.3	Specifications	2
		1.3.1 Svstem	2
		132 Memory	2
		1 3 3 Input/Output	2
		1.3.4 Graphics	2
		135 Ethernet I AN	0
		136 Industrial Features	3
		1.3.7 Mechanical and Environmental Specifications	3
	14	Jumpers and Connectors	0 4
	1.4	Table 1 1: I/O Connector	
		Table 1.1: NO Connector	-
		Table 1.2. Dox Header	···· 4
		Table 1.5. Fill Header	4
	15	Board Layout: Jumper and Connector Locations	5
	1.5	Eigure 1.1 Jumper and Connector Locations (Top Side)	5
		Figure 1.2 Jumper and Connector Locations (Top Side)	5
	1.6	AIMP 202 Roard Diagram	0
	1.0	AIMD-292 DOBID DIAVIAII	0
	4 7	Figure 1.3 AIMB-292 Board Diagram	0
	1./	Salety Precautions	/
	1.8	Jumper Settings	/
		1.8.1 How to Set Jumpers	/
		1.8.2 Front Panel Header (JFP1)	8
			8
		1.8.3 CMOS Reset Header (JCMOS1)	8
		Table 1.6: JCMOS1	8
		1.8.4 AT/ATX Mode Selection (PSON1)	8
		Table 1.7: PSON1	8
		1.8.5 EDP Panel/LVDS Panel Voltage Selection (JLVDS1)	9
		Table 1.8: PSON1+JCMOS	9
	1.9	System Memory	9
	1.10	Memory Installation Procedures	9
	1.11	Cache Memory	10
	1.12	Processor Installation	10
Chapter	2	Connecting Peripherals	11
	21	Introduction	12
	2.1	I/O Connector	12
		2 2 1 DC-In Connector (DCIN1)	12
		Table 2 1: DC-In Connector (DCIN1)	12
		2 2 2 R.I-45 Dual I AN Ports (I AN1 AN2)	13
		Table 2.2 [°] R.I-45 Dual I AN Ports (I AN1 I AN2)	13
		2.2.3 RI-45 Signal I AN Port (I AN3)	10
		Table 2.3 R_{1} -45 Signal I AN Port (I AN3)	
		2.2.4 SATA (SATA1)	
		Table 2 4° SATA (SATA1)	
		2 2 5 SIM CARD (SIM1)	
		Table 2.5 SIM CARD (SIM1)	15

2.2.6

	2.3	2.2.8 2.2.9 2.2.10 2.2.11 2.2.12 Box He 2.3.1	Table 2.7:M.2 E-Key (M2_M1)MXM (MXM16-1)Audio (AUDIO1)Table 2.8:Audio (AUDIO1)DisplayPort (DP1)Table 2.9:DisplayPort (DP2_DP3)Table 2.10:Dual DisplayPort (DP2_DP3)USB Port 1234 (USB1234)Table 2.11:USB Port 1234 (USB1234)Table 2.12:COM1 Connector (COM1)Table 2.12:COM1 Connector (COM1)	. 17 . 18 . 18 . 19 . 19 . 20 . 20 . 21 . 21 . 22 . 22 . 22
		2.3.2 2.3.3 2.3.4	Table 2.13: COM2 Connector (COM2) EDP/LVDS Connector (EDP1_LVDS1) Table 2.14: LVDS Pin Definitions Table 2.15: eDP Pin Definitions ATX 5V/PSON Connector (ATX 5VSB1)	. 22 . 22 . 23 . 23 . 23 . 24 . 25
		2.3.5	Table 2.16:ATX 5V/PSON Connector (ATX_5VSB1) EDP/LVDS Backlight Inverter Power Connector (INV1) Table 2.17:EDP/LVDS Backlight Inverter Power Connector (INV 25	. 25 . 25 V1)
		2.3.6 2.3.7	USB 56 (USB56) Table 2.18: USB 56 (USB56) SATA Power (SATA_PWR1) Table 2.19: SATA Power (SATA_PM(P1))	. 26 . 26 . 26
	2.4	Pin He 2.4.1	ader Power LED Pin Header (JFP2) Table 2.20: Power LED Pin Header (JFP2)	. 20 . 27 . 27 . 27 . 27
		2.4.2 2.4.3	General Purpose I/O Pin Header (GPIO1) Table 2.21: General Purpose I/O Pin Header (GPIO1) CPUFAN (CPUFAN1) Table 2.22: CPUFAN (CPUFAN1)	. 27 . 27 . 27 . 27 . 27
		2.4.4 2.4.5	SYSFAN (SYSFAN1) Table 2.23: SYSFAN (SYSFAN1) SYSFAN (SYSFAN2)	. 28 . 28 . 28 . 28
		2.4.6	Table 2.24: SYSFAN (SYSFAN2) AMP (AMP 1) Table 2.25: AMP (AMP 1) Description	. 28 . 28 . 28
		2.4.7 2.4.8	Table 2.26:Program VCORE Header (VR_PMB1) MXM FAN (MXMFAN1) Table 2.27:MXM FAN (MXMFAN1)	. 29 . 29 . 29 . 29 . 29
	2.5	Jumpe 2.5.1	r Settings Front Panel Header (JFP1) Table 2.28: Front Panel Header (JFP1)	. 29 . 29 . 29 . 29
		2.5.2 2.5.3	CMOS Reset Header (JCMOS1) Table 2.29: CMOS Reset Header (JCMOS1) AT/ATX Mode Selection (PSON1) Table 2.30: AT/ATX Mode Selection (PSON1)	. 30 . 30 . 30 . 30
		2.5.4	EDP Panel / LVDS Panel Voltage Selection (JEDP1_LVDS1) Table 2.31: EDP Panel / LVDS Panel Voltage Selection (JEDP1_ VDS1)	. 30 _L- . 30
Chanter	3	2.5.5	Program EC Header (JEC1)	. 30 31
Sundrei	31	Introdu		20
	J.I	muouu		. JZ

	3.2	BIOS Setup	32
		I able 3.1: Control Keys 2.2.1 Main Manu	32
		3.2.1 Main Menu	33
		3.2.3 Chipset Configuration Setting	72
		3.2.4 Security	90
		3.2.5 Boot Settings	91
		3.2.6 Save & Exit Configuration	92
		3.2.7 MEBx	93
Chantor	Λ	Software Introduction & Services	92
onapter	- T	Soltware introduction & Services	55
	4.1	Introduction	96
	4.2	Value-Added Software Services	96
		4.2.1 Software API	96
		4.2.2 Software Utility	98
Chanter	5	Chipset Software Installation Utility	99
onaptor	Ŭ	empoor contrare metanation eting	
	5.1	Before You Begin	100
	5.2	Introduction	100
Chantor	C	LAN Configuration	^ 4
Chapter	O	LAN Configuration	UI
	6.1	Introduction	102
	6.2	Features	102
	63	Installation	102

х



General Introduction

1.1 Introduction

The AIMB-292 is engineered with the Intel® Q670E chipset, providing high performance and power efficiency for industrial applications. This motherboard supports Intel® Core™ i9/i7/i5/i3 LGA1700 CPUs up to 65W and dual-channel DDR5 5600MT/ s SDRAM, with a maximum capacity of 96GB. It features a diverse range of I/O connectivity, including 2 serial ports, 4 USB 3.2 Gen2x1, 2 USB 2.0, 1 SATA III, and dual 2.5 GbE LAN ports along with 1 GbE LAN port. The AIMB-292 also offers flexible storage options with support for SATA HDDs, M.2 NVMe SSDs, and additional M.2 slots for Wi-Fi, Bluetooth, or LTE by option. This industrial motherboard is designed to accommodate NVIDIA RTX/Quadro GPUs, leveraging an ultra-slender design to deliver exceptional computing power and advanced graphics performance for visual computing and edge intelligence. It features both native Intel® UHD Graphics 770 and discrete NVIDIA Quadro® A4500 GPUs, with support for multiple display outputs including LVDS or eDP, and DP, offering maximum resolutions up to 4K.

1.2 Features

- I/O expansion: 2 serial ports, 4 USB 3.2 Gen2x1 and 2 USB 2.0, 1 SATA III, 1 M.2 M-Key & 1 M.2 E-Key (or 1 M.2 B-key by option), 2.5 GbE LAN and 1 GbE LAN.
- Industrial motherboard featuring NVIDIA RTX/Quadro MXM GPU: The AIMB-292 leverages an ultra-slender design to deliver outstanding computing power and superior graphics performance for visual computing and edge intelligence.
- Wide selection of storage devices: SATA HDD, M.2 (M-Key and E-Key or B-Key by option). Customers benefit from the flexibility of using the most suitable storage device for the capacity needed.

1.3 Specifications

1.3.1 System

- **CPU:** Intel[®] Core[™] i9/i7/i5/i3 LGA1700 CPU (up to 65W)
- BIOS: AMI EFI 256 Mbit SPI BIOS.
- System chipset: Intel® Q670E.
- SATA hard disk drive interface:
 - One on-board SATA connector with a data transmission rate up to 6 GB/s
 - One M.2 M-Key slot (2280), supporting NVMe SSD
 - One M.2 E-Key slot (2230), supporting Wi-Fi/BT or One B-Key slot (3042), supporting LTE and storage by option

1.3.2 Memory

 RAM: 2 x 262-pin SODIMM sockets support dual-channel DDR5 5600MT/s SDRAM, up to 96GB Max.

1.3.3 Input/Output

- Serial ports: 2 serial ports support RS-232/422/485 with auto flow control.
- **USB port:** Supports up to 4 USB 3.2 Gen2x1 and 2 USB 2.0
- **GPIO connector:** 8-bit general purpose Input/Output.

1.3.4 Graphics

- **Native GPU:** Intel® UHD Graphics 770
- Discrete GPU: NVIDIA Quadro® A4500
- LVDS or eDP: 1 LVDS with maximum resolution up to 1920x1200 @60Hz or 1 eDP with maximum resolution up to 1920x1080 @60Hz by pass mode.
- DP: 2 DP 1.4a from MXM Type-A/B/B+ module, maximum resolution up to 4K at 120Hz and 1 x DP ++ from CPU maximum resolution up to 4096 x 2160 @60 Hz

1.3.5 Ethernet LAN

- Supports three 10/100/1000/2500 Mbps Ethernet port (s)
- Controller:
 - GbE LAN1: Intel i226-V
 - GbE LAN2: Intel i226-V
 - GbE LAN3: Intel i210-AT

1.3.6 Industrial Features

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

1.3.7 Mechanical and Environmental Specifications

- Operating temperature: 0 ~ 55°C (32 ~ 131°F), depends on CPU speed and cooler solution
- **Storage temperature:** -40 ~ 85°C (-40 ~ 185°F).
- **Humidity:** 5 ~ 95% non-condensing.
- Power supply voltage: 24V
- **Power consumption:** Boost 100.2W; Typical 62.5W (configuration: Intel® Core[™] i9-14900 5.4 GHz, 2pcs 48 GB DDR5 5600MHz SODIMM)
- Board size: 170 x 230 mm (6.69" x 9.06").
- Board weight: 1.5 kg

1.4 Jumpers and Connectors

Connectors on the AIMB-292 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: I/O Connector							
	Description	Part Reference					
1	DC IN Connector	DCIN1					
2	RJ-45 Dual LAN ports	LAN1_LAN2					
3	RJ-45 Signal LAN port	LAN3					
4	SATA	SATA1					
5	SIM CARD	SIM1					
6	M.2 E-Key	M2_E1					
7	М.2 М-Кеу	M2_M1					
8	MXM	MXM16-1					
9	Audio	AUDIO1					
10	DisplayPort	DP1					
11	Dual DisplayPort	DP2_DP3					
12	USB Port 1234	USB1234					

Table 1.2: Box Header							
	Description	Part Reference					
1	COM1 Connector	COM1					
2	COM2 Connector	COM2					
3	EDP/LVDS Connector	EDP1_LVDS1					
4	ATX 5V/PSON Connector	ATX_5VSB1					
5	EDP/LVDS Backlight Inverter Power Connector	INV1					
6	USB 56	USB56					
7	SATA Power	SATA_PWR1					

Table 1.3: Pin Header						
	Description	Part Reference				
1	Power LED Pin Header	JFP2				
2	General Purpose I/O Pin Header	GPIO1				
3	CPUFAN	CPUFAN1				
4	SYSFAN	SYSFAN1				
5	SYSFAN	SYSFAN2				
6	AMP	AMP1				
7	Program VCORE Header	VR_PMB1				
8	MXM FAN	MXMFAN1				

Table 1.4: Jumper Settings							
	Description	Part Reference					
1	Front Panel Header	JFP1					
2	CMOS Reset Header	JCMOS1					
3	AT/ATX Mode Selection	PSON1					
4	EDP Panel/LVDS Panel Voltage Selection	JLVDS1					
5	Program EC Header	JEC1					

1.5 Board Layout: Jumper and Connector Locations





Figure 1.2 Jumper and Connector Locations (Bottom Side)

1.6 AIMB-292 Board Diagram



Figure 1.3 AIMB-292 Board Diagram

1.7 Safety Precautions



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



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



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



Caution! There is 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 Front Panel Header (JFP1)

Table '	I.5: JFP1			
		$ \begin{array}{ccc} 2 & 8 \\ \hline \circ \circ \circ \circ \circ \\ 1 & 7 \end{array} $		
Pin	Signal	Pin	Signal	
	U		•	
1	3.3V	2	FP_PANSWIN#	
1 3	3.3V FP_HDD_LED#	2 4	FP_PANSWIN# GND	
1 3 5	3.3V FP_HDD_LED# SMB_DAT_RESUME	2 4 6	FP_PANSWIN# GND FP_SYS_RESET#	

1.8.3 CMOS Reset Header (JCMOS1)

Table 1.6: JCMOS1	
Function	Jumper Settings
1-2 (Default) Keep CMOS data*	
2~3 Clear CMOS data	

1.8.4 AT/ATX Mode Selection (PSON1)

Table 1.7: PSON1	
Function	Jumper Settings
1-2 AT Mode	
2-3 (Default) ATX Mode	

1.8.5 EDP Panel/LVDS Panel Voltage Selection (JLVDS1)

Table 1.8: PSON1+JCMOS	
Function	Jumper Setting
Jumper position for 3.3V (Default)	2 4 6 0 0 0 1 3 5
Jumper position for 5V	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
Jumper position for 12V	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$

1.9 System Memory

AIMB-292 has two sockets for a 262-pin DDR5 SODIMM. 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, 64GB, up to max 96GB. AIMB-292 does NOT support error checking and correction (ECC).

1.10 Memory Installation Procedures

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

1.11 Cache Memory

The AIMB-292 supports a CPU with one of the following built-in full-speed last-level caches: 36MB for Intel® Core $^{\text{IM}}$ -i9-14900/i9-14900T/i9-13900E/i9-13900TE 33MB for Intel® Core $^{\text{IM}}$ -i7-14700/i7-14700T 30MB for Intel® Core $^{\text{IM}}$ i9-12900E/i9-12900TE 25MB for Intel® Core $^{\text{IM}}$ i7-12700E/i7-12700TE 24MB for Intel® Core $^{\text{IM}}$ i5-14500/ i5-14500T 20MB for Intel® Core $^{\text{IM}}$ i5-14400/ i5-14400T 18MB for Intel® Core $^{\text{IM}}$ i5-12500E/i7-12500TE 12MB for Intel® Core $^{\text{IM}}$ i3-14100/ i3-14100T/i3-12100E/i7-12100TE 6MB Intel® Pentium® Processor 300/ Intel® Processor 300T/G7400E/G7400TE 4MB Intel® Pentium® G6900E/G6900TE

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

1.12 Processor Installation

The AIMB-292 is designed to support 14th Gen Intel® Core™ i9/i7/i5/i3, Pentium®, and Celeron® LGA 1700 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 I/O Connector

2.2.1 DC-In Connector (DCIN1)



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

2.2.2 RJ-45 Dual LAN Ports (LAN1_LAN2)



|--|

Pin	Signal	Pin	Signal
AL1	LAN1_LED2_ACT#	BL1	LAN2_LED2_ACT#
AL2	+V3.3LAN1	BL2	+V3.3LAN1
AL3	LAN1_LED1_2.5G#	BL3	LAN2_LED1_2.5G#
AL4	LAN1_LED1_1G#	BL4	LAN2_LED1_1G#
RA9	GND	RB9	GND
RA1	LAN1_MDI0+	RB1	LAN2_MDI0+
RA2	LAN1_MDI0-	RB2	LAN2_MDI0-
RA3	LAN1_MDI1+	RB3	LAN2_MDI1+
RA4	LAN1_MDI1-	RB4	LAN2_MDI1-
RA5	LAN1_MDI2+	RB5	LAN2_MDI2+
RA6	LAN1_MDI2-	RB6	LAN2_MDI2-
RA7	LAN1_MDI3+	RB7	LAN2_MDI3+
RA8	LAN1_MDI3-	RB8	LAN2_MDI3-
RA10	GND	RB10	GND

2.2.3 RJ-45 Signal LAN Port (LAN3)



Table 2.3: RJ-45 Signal LAN Port (LAN3)			
Pin	Signal	Pin	Signal
L1	LAN3_LED1	L2	+V3.3_LAN3
L3	LAN3_LED2	L4	LAN3_LED0
R5	GND	R4	LAN3_MDI1-
R1	LAN3_MDI0+	R7	LAN3_MDI2+
R2	LAN3_MDI0-	R8	LAN3_MDI2-
R3	LAN3_MDI1+	R9	LAN3_MDI3+
R10	LAN3_MDI3-	R6	GND

2.2.4 SATA (SATA1)



Table 2.4: SATA (S	ATA1)
Pin	Signal
1	GND
2	TX+
3	TX-
4	GND
5	RX-
6	RX+
7	GND

2.2.5 SIM CARD (SIM1)



Table 2	.5: SIM CARD (SIM1)		
Pin	Signal	Pin	Signal
C1	VCC	C5	GND
C2	RST	C6	VPP
C3	CLK	C7	IO

2.2.6 M.2 E-Key (M2_E1)



Table 2	.6: M.2 E-Key (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#
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

\bigcirc
S C
pter
N
Cor
nne
cting
er.
Ч
era

Table 2.6: M.2 E-Key (M2_E1)				
69	GND	70	NC	
71	CNV_WT_CLK-	72	+3.3V	
73	CNV_WT_CLK+	74	+3.3V	
75	GND			

2.2.7 M.2 M-Key (M2_M1)



Table 2.7: M.2 E-Key (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

Table 2.7: M.2 E-Key (M2_M1)			
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
71	GND	72	3.3V
73	GND	74	3.3V
75	GND		

2.2.8 MXM (MXM16-1)



2.2.9 Audio (AUDIO1)



Table 2.8: Audio (AUDIO1)		
Pin	Signal	
1	MIC IN	
2	LINE OUT	

2.2.10 DisplayPort (DP1)



Table 2.9: DisplayPort (DP1)			
Pin	Signal	Pin	Signal
1	DP1_0+	2	GND
3	DP1_0-	4	DP1_1+
5	GND	6	DP1_1-
7	DP1_2+	8	GND
9	DP1_2-	10	DP1_3+
11	GND	12	DP1_3-
13	DP1_HDMI_DNG_DET	14	GND
15	DP1_AUX+	16	GND
17	DP1_AUX-	18	HPD
19	GND	20	POWER

2.2.11 Dual DisplayPort (DP2_DP3)



Table 2.10: Dual DisplayPort (DP2_DP3)				
Pin	Signal	Pin	Signal	
P1	DP3_0+	P21	DP2_0+	
P2	GND	P22	GND	
P3	DP3_0-	P23	DP2_0-	
P4	DP3_1+	P24	DP2_1+	
P5	GND	P25	GND	
P6	DP3_1-	P26	DP2_1-	
P7	DP3_2+	P27	DP2_2+	
P8	GND	P28	GND	
P9	DP3_2-	P29	DP2_2-	
P10	DP3_3+	P30	DP2_3+	
P11	GND	P31	GND	
P12	DP3_3-	P32	DP2_3-	
P13	DP3_HDMI_DNG_DET	P33	DP2_HDMI_DNG_DET	
P14	GND	P34	GND	
P15	DP3_AUX+	P35	DP2_AUX+	
P16	GND	P36	GND	
P17	DP3_AUX-	P37	DP2_AUX-	
P18	DP3_HPD	P38	DP2_HPD	
P19	GND	P39	GND	
P20	+3.3V_DP3	P40	+3.3V_DP	

2.2.12 USB Port 1234 (USB1234)



Table 2.11: USB Port 1234 (USB1234)			
Pin	Signal	Pin	Signal
11	+USBV1	12	D1-
13	D1+	14	GND
15	USB31_P1_z_RX-	16	USB31_P1_z_RX+
17	GND	18	USB31_P1_z_TX-
19	USB31_P1_z_TX+		
21	USBV2	22	D2-
23	D2+	24	GND
25	USB31_P2_z_RX-	26	USB31_P2_z_RX+
27	GND	28	USB31_P2_z_TX-
29	USB31_P2_z_TX+		
31	USBV3	32	D3-
33	D3+	34	GND
35	USB31_P3_z_RX-	36	USB31_P3_z_RX+
37	GND	38	USB31_P3_z_TX-
39	USB31_P3_z_TX+	40	
41	USBV4	42	D4-
43	D4+	44	GND
45	USB31_P4_z_RX-	46	USB31_P4_z_RX+
47	GND	48	USB31_P4_z_TX-
49	USB31_P4_z_TX+		

2.3 Box Header

2.3.1 COM1 Connector (COM1)



Table 2.12: COM1 Connector (COM1)			
Pin	Signal	Pin	Signal
1	COM1_422_485_TX-	2	COM1_422_485_TX+
3	COM1_422_RX+	4	COM1_422_RX-
5	GND	6	COM1_DSR#
7	COM1_RTS#	8	COM1_CTS#
9	COM1_RI#	10	NC

2.3.2 COM2 Connector (COM2)



Table 2.13: 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

2.3.3 EDP/LVDS Connector (EDP1_LVDS1)



Table 2.14: LVDS P	in Definitions
Pin	Signal
1	LVDS1_CTRL
2	GND
3	CH7511_CLK1N
4	CH7511_CLK1P
5	GND
6	CH7511_A0N_C
7	CH7511_A0P_C
8	GND
9	CH7511_A1N_C
10	CH7511_A1P_C
11	GND
12	CH7511_A2N_C
13	CH7511_A2P_C
14	GND
15	NC
16	NC
17	GND
18	LVDS1_A3N_C
19	LVDS1_A3P_C
20	GND
21	LVDS1_CLK2N
22	LVDS1_CLK2P
23	GND
24	LVDS1_A7N_C
25	LVDS1_A7P_C
26	GND
27	LVDS1_A6N_C
28	LVDS1_A6P_C
29	GND
30	LVDS1_A5N_C
31	LVDS1_A5P_C
32	GND
33	LVDS1 A4N C

Table 2.14: LVDS P	in Definitions
34	LVDS1_A4P_C
35	NC
36	GND
37	VDD_LVDS1
38	VDD_LVDS1
39	VDD_LVDS1
40	VDD_LVDS1

Table 2.15: eDP Pin Definitions		
Pin	Signal	
1	LVDS1_CTRL	
2	GND	
3	AUX_CH_N	
4	AUX_CH_P	
5	GND	
6	NC	
7	HPD	
8	GND	
9	Lane1_N	
10	Lane1_P	
11	GND	
12	Lane0_N	
13	Lane0_P	
14	GND	
17	GND	
20	GND	
23	GND	
26	GND	
29	GND	
32	GND	
35	NC	
36	NC	
37	VDD_LVDS1	
38	VDD_LVDS1	
39	VDD_LVDS1	
40	VDD_LVDS1	

2.3.4 ATX 5V/PSON Connector (ATX_5VSB1)



Table 2.16: ATX 5V/PSON Connector (ATX_5VSB1)		
Pin	Signal	
1	+5V_A_ATX	
2	GND	
3	SPS_PS_ON#	

2.3.5 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	BKL CTRL	
5	+5V	

2.3.6 USB 56 (USB56)

- r		1.1
9		_10
Ζ_		8
5_		_6
3_		-4
*		_2
: L		

Table 2.18: USB 56 (USB56)				
Pin	Signal	Pin	Signal	
1	N.C	2	GND	
3	GND	4	GND	
5	D+	6	D+	
7	D-	8	D-	
9	VBUS	10	VBUS	

2.3.7 SATA Power (SATA_PWR1)



Table 2.19: SATA Power (SATA_PWR1)		
Pin	Signal	
1	+V5	
2	GND	
3	GND	
4	+V12	
2.4 Pin Header

2.4.1 Power LED Pin Header (JFP2)



Table 2.20: Power LED Pin Header (JFP2)		
Pin	Signal	
1	Power LED+	
2	NC	
3	Power LED-	

2.4.2 General Purpose I/O Pin Header (GPIO1)

10		9
8	1 1	
6	12 4	5
4		3
2		
		_

Table 2.21: General Purpose I/O Pin Header (GPIO1)			
Pin	Signal	Pin	Signal
1	GPIO0	2	GPIO4
3	GPIO1	4	GPIO5
5	GPIO2	6	GPIO6
7	GPIO3	8	GPIO7
9	VCC_GPIO	10	GND

2.4.3 CPUFAN (CPUFAN1)



Table 2.22: CPUFAN (CPUFAN1)		
Pin	Signal	
1	GND	
2	CPU FAN VCC	
3	CPU FAN SPEED	
4	CPU FAN PWM	

2.4.4 SYSFAN (SYSFAN1)



Table 2.23: SYSFAN (SYSFAN1)	
Pin	Signal
1	GND
2	SYSTEM FAN VCC
3	SYSTEM FAN SPEED
4	SYSTEM FAN PWM

2.4.5 SYSFAN (SYSFAN2)



Table 2.24: SYSFAN (SYSFAN2)		
Pin	Signal	
1	GND	
2	SYSTEM FAN VCC	
3	SYSTEM FAN SPEED	
4	SYSTEM FAN PWM	

2.4.6 AMP (AMP 1)



Table 2.25: AMP (AMP 1)	
Pin	Signal
1	AMP OUT – R+
2	AMP OUT – R-
3	AMP OUT – L-
4	AMP OUT – L+

2.4.7 Program VCORE Header (VR_PMB1)



Table 2.26: Program VCORE Header (VR_PMB1)		
Pin	Signal	
1	DATA	
2	GND	
3	CLK	

2.4.8 MXM FAN (MXMFAN1)



Table 2.27: MXM FAN (MXMFAN1)		
Pin	Signal	
1	GND	
2	MXM FAN VCC	
3	MXM FAN SPEED	
4	MXM FAN PWM	

2.5 Jumper Settings

2.5.1 Front Panel Header (JFP1)



Table 2.28: Front Panel Header (JFP1)			
Pin	Signal	Pin	Signal
1	3.3V	2	FP_PANSWIN#
3	FP_HDD_LED#	4	GND
5	SMB_DAT_RESUME	6	FP_SYS_RESET#
7	SMB_CLK_RESUME	8	GND

2.5.2 CMOS Reset Header (JCMOS1)



Table 2.29: CMOS Reset Header (JCMOS1)		
Pin	Signal	
1	NC	
2	RTCRST#	
3	RTCRST#_PD	

2.5.3 AT/ATX Mode Selection (PSON1)



Table 2.30: AT/ATX Mode Selection (PSON1)	
Pin	Signal
1	VCCAT
2	+V3_Pull High
3	VCCATX

2.5.4 EDP Panel / LVDS Panel Voltage Selection (JEDP1_LVDS1)



Table 2.31: 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

2.5.5 Program EC Header (JEC1)





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-292 setup screens.

3.2 BIOS Setup

The AIMB-292 Series 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 button during the BIOS POST (Power-On Self-Test) to access the CMOS SETUP screen.

Table 3.1: Control I	Keys
$<\uparrow><\downarrow><\leftarrow><\rightarrow>$	Move to select item
<enter></enter>	Select Item
<esc></esc>	Main Menu - Quit and not save changes into CMOS Sub-menu - Exit current page and return to 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>	Load Previous Values
<f7></f7>	Load Setup Defaults
<f10></f10>	Save all CMOS changes

3.2.1 Main Menu

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

Main Advanced Chipset Secur:	Aptio Setup – AMI Ity 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 0.19 x64 UEFI 2.8; PI 1.7 A292000Q060X018 09/06/2024 10:33:31 Administrator AIMB-292 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	8192 MB 5600 MT/s [Mon 09/09/2024] [07:00:38]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Versi	ion 2.22.1290 Copyright (C) 20	24 AMI

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 legend. Above the 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-292 setup menu to enter the Advanced BIOS setup page. Users can select any item in the left frame of the screen, such as CPU configuration. Select an Advanced BIOS setup option by highlighting the text using the <Arrow> keys. All Advanced BIOS setup options are described in this section. The Advanced BIOS setup menu screen is shown below. The sub-menus are described in the following pages.

3.2.2.1 CPU Configuration

Advanced \rightarrow CPU Configuration



Efficient-core Information

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

	Advanced	Aptio Setup — AMI	
CP	U Configuration		Displays the E-core Information
CP Feff Pee Br Mi WM SM SM TX TX Bo Bo Bo Bo C6 CP CP Had Ad In Te PE	U Configuration ficient-core Information rformance-core Information and String crocode Revision X X/TXT T Crash Code T SPAD ot Guard Status ot Guard Status ot Guard ACM Policy Status ot Guard SACM Information DRAM U Flex Ratio Override U Flex Ratio Override U Flex Ratio Settings rdware Prefetcher Jacent Cache Line Prefetch tel (VMX) Virtualization chnology CI	0xB0671 Intel(R) Core(TM) i7-14700T 11E Supported Supported 0x00000000 0x904000000000000 0x0000000000	<pre>> Displays the E-core Information ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

ersion 2.22.1290 Copyright (C) 2024 AMI

Advanced	Aptio Setup – AMI	
Efficient-core Information		
L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache	32 KB x 12 64 KB x 12 4096 KB x 3 33 MB	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Versi	on 2.22.1290 Copyright (C) 202	24 AMI

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 33 MB	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	.22.1290 Copyright (C) 2024	AMI

CPU SMM Enhancement

Advanced	Aptio Setup – AMI	
		When enabled Pressing the
C6DRAM	[Enabled]	scroll lock key will toggle
CPU Flex Ratio Override	[Disabled]	the Efficient-cores between
CPU Flex Ratio Settings	13	being parked when Scroll Lock
Hardware Prefetcher	[Enabled]	LED is on and un-parked when
Adjacent Cache Line Prefetch	[Enabled]	LED is off.
Intel (VMX) Virtualization	[Enabled]	
Technology		
PECI	[Enabled]	
AVX	[Enabled]	
Active Performance-cores	[A11]	
Active Efficient-cores	[A11]	
Hyper-Threading	[Enabled]	
BIST	[Disabled]	→+: Select Screen
AP threads Idle Manner	[MWAIT Loop]	↑↓: Select Item
AES	[Enabled]	Enter: Select
MachineCheck	[Enabled]	+/-: Change Opt.
MonitorMWait	[Enabled]	F1: General Help
Intel Trusted Execution Technology	[Disabled]	F2: Previous Values
Alias Check Request	[Disabled]	F3: Optimized Defaults
DPR Memory Size (MB)	4	F4: Save & Exit
Reset AUX Content	[no]	ESC: Exit
CPU SMM Enhancement		
Total Memory Encryption	[Disabled]	
Legacy Game Compatibility Mode	[Disabled]	
- Vancian - 9	22 1290 Conunight (C) 202	4 AMT
Version 2	22.12 30 COpg right (C) 202	4 ANI



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

3.2.2.2 Power & Performance

Advanced \rightarrow Power & Performance



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

CPU – Power Management Control

Advanced \rightarrow Power & Performance \rightarrow CPU – Power Management Control

Advanced	Aptio Setup - AMI	
CPU - Power Management Control 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	50 50 50 50 52	Select the performance state that the BIOS will set starting from reset vector.
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(D) Speed Shift Technology	52 50 50 [Turbo Performance] [Enabled] [Enabled]	++- Select Screen
Inter(R) Jurbo Boost Max Technology 3.0 Per Core P State OS control mode HwP Autonomous Per Core P State HwP Autonomous EPP Grouping EPB override over PECI HwP Lock	[Enabled] [Enabled] [Enabled] [Enabled] [Disabled] [Enabled]	fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
HDC Control Turbo Mode ▶ View/Configure Turbo Options ▶ CPU VR Settings Version	[Enabled] [Enabled] 2.22.1290 Copyright (C) 2024	ESC: Exit

Boot performance mode [Turbo Performance]

Select the performance state that the BIOS will set starting from the reset vector.

Current Turbo Settings

Advanced \rightarrow Power & Performance \rightarrow CPU – Power Management Control \rightarrow View/ Configure Turbo Ratio

Advanced	Aptio Setup – AMI	
C states Enhanced C-states C-State Auto Demotion C-State Un-demotion Package C-State Demotion Package C-State Un-demotion CState Pre-Wake IO MWAIT Redirection Package C State Limit C6/C7 Short Latency Control(MSR 0x Time Unit Latency	[Enabled] [Enabled] [C1] [C1] [Enabled] [Enabled] [Disabled] [Auto] 60B) [1024 ns] 0	Enable Dual Tau Boost feature. This is only applicable for Desktop 35W/65W/125W sku. When DPTF is enabled this feature is ignored.
Time Unit Latency Thermal Monitor Interrupt Redirection Mode Selection Timed MWAIT Custom P-state Table Energy Performance Gain EPG DIMM Idd3N EPG DIMM Idd3P CPU Lock Configuration Dual Tau Boost	<pre>[1024 ns] 0 [Enabled] [Fixed Priority] [Disabled] 26 11 [Disabled]</pre>	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Chapter 3 BIOS Operation

Turbo Ratio Limit Options

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

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 35.0 35.0 100.0	Limit options
▶ Turbo Ratio Limit Options Energy Efficient P–state Package Power Limit MSR Lock Energy Efficient Turbo	[Enabled] [Disabled] [Enabled]	
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version (2.22.1290 Copyright (C) 2024	AMI

Turbo Ratio Limit Options View/Configure Turbo Ratio Limit Options.

- Energy Efficient P-state [Enable]
- Package Power Limit MSR Lock [Disabled]
- Power Limit 1 Override [Disabled]
- Power Limit 2 Override [Enabled]
- Power Limit 2 0
- Energy Efficient P-state [Disable]

Advanced	Aptio Setup — AMI	
Current Turbo Ratio Limit Settings	i	Performance–core Turbo Ratio Limit Numcore0 defines the
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	52	
P–core Turbo Ratio Limit Ratio1	52	
P–core Turbo Ratio Limit Ratio2	50	
P–core Turbo Ratio Limit Ratio3	50	++: Select Screen
P–core Turbo Ratio Limit Ratio4	50	†↓: Select Item
P–core Turbo Ratio Limit Ratio5	50	Enter: Select
P–core Turbo Ratio Limit Ratio6	44	+/−: Change Opt.
P–core Turbo Ratio Limit Ratio7	44	F1: General Help
E–core Turbo Ratio Limit NumcoreO	12	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	
Version 2	.22.1290 Copyright (C) 2024	AMI

Advanced	Aptio Setup – AMI	
E-core Turbo Ratio Limit Numcore7 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	0 37 0 0 0 0 0 0 0	 Performance-core Turbo Ratio Limit Ratio6 defines the turb ratio (max is 85 in normal mode and 120 in core extensio mode), the core range is defined in Turbo Ratio Limit Numcore6.
P-core Turbo Ratio Limit Numcore0 P-core Turbo Ratio Limit Numcore1 P-core Turbo Ratio Limit Numcore2 P-core Turbo Ratio Limit Numcore3 P-core Turbo Ratio Limit Numcore4 P-core Turbo Ratio Limit Numcore5 P-core Turbo Ratio Limit Numcore6 P-core Turbo Ratio Limit Numcore7 P-core Turbo Ratio Limit Ratio0 P-core Turbo Ratio Limit Ratio1 P-core Turbo Ratio Limit Ratio1 P-core Turbo Ratio Limit Ratio3 P-core Turbo Ratio Limit Ratio3 P-core Turbo Ratio Limit Ratio4 P-core Turbo Ratio Limit Ratio5 P-core Turbo Ratio Limit Ratio6	1 2 3 4 5 6 7 8 52 52 52 50 50 50 50 50 50 50	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

		Aptio Setup – AMI	
Advanced			
P-core Turbo Ratio Limit	Numcore7	8	▲ Efficient-core Turbo Ratio
P-core Turbo Ratio Limit	Ratio0	52	Limit Ratio7 defines the turbo
P-core Turbo Ratio Limit	Ratio1	52	ratio (max is 85 irrespective
P-core Turbo Ratio Limit	Ratio2	50	of the core extension mode),
P-core Turbo Ratio Limit	Ratio3	50	the core range is defined in
P-core Turbo Ratio Limit	Ratio4	50	E-core Turbo Ratio Limit
P-core Turbo Ratio Limit	Ratio5	50	Numcore7.
P-core Turbo Ratio Limit	Ratio6	44	
P-core Turbo Ratio Limit	Ratio7	44	
E-core Turbo Ratio Limit	Numcore0	12	
E-core Turbo Ratio Limit	Numcore1	0	
E-core Turbo Ratio Limit	Numcone2	0	
E-core Turbo Ratio Limit	Numcore3	0	
E-core Turbo Ratio Limit	Numcore4	0	→+: Select Screen
E-core Turbo Ratio Limit	Numcore5	0	↑↓: Select Item
E-core Turbo Ratio Limit	Numcore6	0	Enter: Select
E-core Turbo Ratio Limit	Numcore7	0	+/-: Change Opt.
E-core Turbo Ratio Limit	Ratio0	37	F1: General Help
E-core Turbo Ratio Limit	Ratio1	0	F2: Previous Values
E-core Turbo Ratio Limit	Ratio2	0	F3: Optimized Defaults
E-core Turbo Ratio Limit	Ratio3	0	F4: Save & Exit
E-core Turbo Ratio Limit	Ratio4	0	ESC: Exit
E-core Turbo Ratio Limit	Ratio5	0	
E-core Turbo Ratio Limit	Ratio6	0	
E-core Turbo Ratio Limit		0	▼
		a aa taan ahuun kubit (a) a	
	version	2.22.1290 COPYRIght (C) 2	1024 HM1

CPU VR Settings

Advanced \rightarrow Power & Performance \rightarrow CPU – Power Management Control \rightarrow CPU VR Settings

Advanced	Aptio Setup — AMI	
CPU VR Settings		PSYS Slope defined in 1/100
Current VccIn Aux Icc Max PSYS Slope PSYS Offset PSYS Prefix PSYS PMax Power Min Voltage Override VccIn Aux Icc Max VccIn Aux ICC Max VccIn Aux IMON Slope VccIN Aux IMON Offset VccIN Aux IMON Prefix Vsgs/Psys Critical Assertion Deglitch Mantissa Assertion Deglitch Mantissa De assertion Deglitch Mantissa	144 0 (+) 0 [Disabled] 0 100 0 [+] [Disabled] 1 0 13 2	<pre>http://www.secondedication.com/ for a 1.25 slope, enter 125. 0 = AUTO. Uses BIOS VR mailbox command 0x9. ++: Select Screen fl: Select Screen fl: Select Item Enter: Select +/-: Change Dot</pre>
VR Power Delivery Design Acoustic Noise Settings Core/IA VR Settings GT VR Settings RFI Settings	[AUTO]	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1290 Copyright (C) 2024	AMI

PSYS Slope

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

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 TA Domain	[FALSE]	
Slow Slew Rate for IA Domain	[Fast/2]	
GT VR Domain		
Disable Fast PKG C State Ramp for	[FALSE]	++: Select Screen
GT Domain		t↓: 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
		Loos Entr
Vancian	2 22 1290 Copunidht (C) 20	24 ANT
Version	2.22.1230 COP9Pigne (C) 20	

Acoustic Noise Mitigation [Disabled]

Enabling this option will help mitigate acoustic noise on certain SKUs when the CPU is in a deeper C state.

Chapter 3 BIOS Operation

Core/IA VR Settings

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

Core/IA VR Domain VR Config Enable VR Config Enable [Enabled] Current AC Loadline 170 Current DC Loadline 170 Current Psi1 Threshold 80 Current Psi2 Threshold 20 Current Psi3 Threshold 4 Current Imon Slope 0 Current VR Current Limit 660 Current VR Current Limit 832 Current Voltage Limit 1720 AC Loadline 0	Advanced	Aptio Setup – AM	Ι
VR Config Enable[Enabled]Current AC Loadline170Current DC Loadline170Current Psi1 Threshold80Current Psi2 Threshold20Current Psi3 Threshold4Current Imon Slope0Current VR Current Limit660Current VR Current Limit832Current Voltage Limit1720AC Loadline0**: Select Screen	Core∕IA VR Domain		▲ VR Config Enable
DC Loadline011: Select ItemPS Current Threshold180Enter: SelectPS Current Threshold220+/-: Change Opt.PS Current Threshold34F1: General HelpPS3 Enable[Enabled]F2: Previous ValuesPS4 Enable[Enabled]F3: Optimized DefaultsIMON Slope0F4: Save & ExitIMON Offset0ESC: ExitVR Current Limit0Core VR Fast Vmode	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 VR Current Limit Current Tdc 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] 170 170 80 20 4 0 1 660 832 1720 0 0 80 20 4 [Enabled] [Enabled] 0 0 [+] 0 [Enabled]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

VR Config Enable [Enabled] VR Config Enable.

Current Psi3 Threshold 4 Enable/Disable IRMS - Current Current Imon Slope 0 root mean square Current Imon Offset 1 root mean square Current VR Current Limit 660 root mean square Current Tdc Current Limit 832 root mean square Current Voltage Limit 1720 root mean square AC Loadline 0 root mean square DC Loadline 0 root mean square PS Current Threshold1 80 root mean square PS Current Threshold2 20 root mean square PS Current Threshold3 4 root mean square PS3 Enable [Enabled] root mean square PS4 Enable [Enabled] root mean square	Advanced	Aptio Setup – AMI	
	Current Psi3 Threshold Current Imon Slope Current Imon Offset Current VR Current Limit Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable	4 0 1 660 832 1720 0 0 80 20 4 [Enabled] [Enabled]	▲ Enable/Disable IRMS – Current root mean square
IMON Stope 0 IMON Stope IMON Offset 0 11: Select scheen IMON Prefix [+] Enter: Select VR Current Limit 0 +/-: Change Opt. Core VR Fast Vmode [Enabled] F1: General Help Fast Vmode Itrip ICC Limit 600 F2: Previous Values VR Voltage Limit 0 F3: Optimized Defaults TDC Enable [Enabled] F4: Save & Exit TDC Current Limit 0 ESC: Exit TDC Time Window [1 sec] TDC Lock TRMS [Disabled] Image: Select Scheen	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	0 0 [+] 0 [Enabled] 600 0 [Enabled] 0 [1 sec] [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</pre>

IRMS [Disabled]

Enable/Disable IRMS – Current root mean square.

GT Domain

Advanced \rightarrow Power & Performance \rightarrow CPU – Power Management Control \rightarrow CPU VR Settings \rightarrow GT Domain

Advanced	Aptio Setup – AMJ	I
GT Domain		▲ VR Config Enable
VR Config Enable Current AC Loadline Current DC Loadline Current PSi1 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 0 1 120 176 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 0 [Linabled] 0 0 0 [Linabled] 0 0 0 [Linabled] 0 0 0 0 0 0 0 0 0 0 0 0 0	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Ven	sion 2.22.1290 Copyright	(C) 2024 AMI

Advanced	Aptio Setup – AMI			
Current Psil Threshold	80	TDC Lock		
Current Psi2 Threshold	20			
Current Psi3 Threshold	4			
Current Imon Slope	0			
Current Imon Ottset	1			
Current VR Current Limit	120			
Current Tdc Current Limit	176			
Current Voltage Limit	1500			
AC Loadline	0			
DC Loadline	0			
PS Current Threshold1	80			
PS Current Threshold2	20			
PS Current Threshold3	4			
PS3 Enable	[Enabled]	↔: Select Screen		
PS4 Enable	[Enabled]	↑↓: Select Item		
IMON Slope	0	Enter: Select		
IMON Offset	0	+/-: Change Opt.		
IMON Prefix	[+]	F1: General Help		
VR Current Limit	0	F2: Previous Values		
GT VR Fast Vmode	[Disabled]	F3: Optimized Defaults		
VR Voltage Limit	0	F4: Save & Exit		
TDC Enable	[Enabled]	ESC: Exit		
TDC Current Limit	0			
TDC Time Window	[1 sec]			
TDC Lock	[Disabled]	▼		
Version 2.22.1290 Copyright (C) 2024 AMI				

RFI Domain

Advanced \rightarrow Power & Performance \rightarrow CPU – Power Management Control \rightarrow CPU VR Settings \rightarrow RFI Domain

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 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Vers	ion 2.22.1290 Copyright (C	:) 2024 AMĪ

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 Number of P states		Sets the number of custom P-states. At least 2 states must be present.
		++: 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 1290 Conveight (0	2) 2024 AMT
	teroten eteettebo copgi ight (c	

Number of P states 0

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

Chapter 3 BIOS Operation

CFG Lock

Advanced \rightarrow Power & Performance \rightarrow CPU – Power Management Control \rightarrow CFG Lock

Advanced	Aptio Setup – AMI	
CFG Lock Overclocking Lock	[Enabled] [Enabled]	Configure MSR 0xE2[15], CFG Lock bit
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	Version 2.22.1290 Copyright (C)	2024 AMI

GT – Power Management Control

Advanced \rightarrow Power & Performance \rightarrow GT – Power Management Control

Advanced	Aptio Setup – AMI	
GT – Power Management Control		Check to enable render standby
RC6(Render Standby) Maximum GT frequency Disable Turbo GT frequency	[Enabled] [Default Max Frequency] [Disabled]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit</pre>
		ESC: Exit
Version 2	.22.1290 Copyright (C) 2024	AMI

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

3.2.2.3 PCH-FW Configuration

Advanced \rightarrow PCH-FW Configuration

Advanced	Aptio Setup — AMI	
ME Firmware Version ME Firmware Mode ME Firmware SKU ME Firmware Status 1 ME Firmware Status 2 ME Firmware Status 3 ME Firmware Status 4 ME Firmware Status 5 ME Firmware Status 6 ME State Manageability Features State AMT BIOS Features AMT Configuration Local Platform Erase Configuration	16.1.30.2269 Normal Mode Corporate SKU 0x90000255 0x38858106 0x0000030 0x00000103 0x80400002 [Enabled] [Enabled] [Enabled]	Configure Intel(R) Active Management Technology Parameters ++: Select Screen 14: Select Item
ME Unconfig on RTC Clear Comms Hub Support JHI Support Core Bios Done Message CSE Data Resilience Support Firmware Update Configuration PTT Configuration FIPS Configuration Unique Platform Id Configuration	[Enabled] [Disabled] [Disabled] [Enabled] [Enabled]	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Version 2.22.1290 Copyright (C) 2024 AMI

	Aptio Setup – AMI	
Advanced		
ME Firmware Status 2 ME Firmware Status 3 ME Firmware Status 4 ME Firmware Status 5 ME Firmware Status 6	0×3B858106 0×00000030 0×00004000 0×00000103 0×80400002	Enable/Disable Extend CSME Measurement to TPM-PCR[0] and AMT Config to TPM-PCR[1]
ME State Manageability Features State AMT BIOS Features ▶ AMT Configuration ▶ Local Platform Erase Configuration	[Enabled] [Enabled] [Enabled]	
ME Unconfig on RTC Clear Comms Hub Support JHI Support Core Bios Done Message CSE Data Resilience Support	[Enabled] [Disabled] [Disabled] [Enabled] [Enabled]	++: Select Screen 14: Select Item Enter: Select +/-: Change Ont.
 Firmware Update Configuration PTT Configuration 		F1: General Help F2: Previous Values
 FIPS Configuration Unique Platform Id Configuration ME Debug Configuration Anti-Rollback SVN Configuration 		F3: Optimized Defaults F4: Save & Exit ESC: Exit
 DEM Key Revocation Configuration Extend CSME Measurement to TPM-PCR 	[Disabled]	
Version :	2 22 1290 Conucidat (C) 2020	1 AMT

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 Due Click Recovery(OCR) Configuration Remote Platform Erase Configuration	[Disabled] [Disabled] [As defined in FIT] [Disabled] [Disabled]	Enable/Disable of AMT USB Provisioning.
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.	.22.1290 Copyright (C) 2024	AMI

AMT Configuration

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

Advanced	Aptio Setup – AMI	
PET Progress WatchDog OS Timer BIOS Timer ASF Sensors Table	[Enabled] [Disabled] 0 0 [Disabled]	Enable/Disable PET Events Progress to receive PET Events. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.22.1290 Copyright (C	:) 2024 AMI

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. *** **: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.22.1290 Copyright (C)	2024 AMI

One Click Recovery (OCR) Configuration

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

OCR Https Boot [Enabled] OCR PBA Boot [Enabled] OCR Windows Recovery Boot [Enabled] OCR Disable Secure Boot [Enabled]	Enable/Disable One Click Recovery Https Boot
	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Enable Remote Platform Erase Feature

Advanced \rightarrow PCH-FW Configuration \rightarrow AMT Configuration \rightarrow Enable Remote Platform Erase Feature

Advanced	Aptio Setup – AMI	
Enable Remote Platform Erase Feature SSD Erase Mode	[Enabled] [Simulated]	Enable/Disable Remote Platform Erase Feature
		++: Select Screen 1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Versio	n 2.22.1290 Copyright (C) 2024 AMI

Performance Platform Erase Operations

Advanced \rightarrow PCH-FW Configuration \rightarrow AMT Configuration \rightarrow Performance Platform Erase Operations



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.
Ver	sion 2.22.1290 Copyright (C)	2024 AMI

PTT Configuration

 $\mathsf{Advanced} \to \mathsf{PCH}\text{-}\mathsf{FW} \ \mathsf{Configuration} \to \mathsf{PTT} \ \mathsf{Configuration}$

Advanced	Aptio Setup — AMI	
PTT Capability / State	1 / 0	
TPM Device Selection	[dtpm]	
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	2.22.1290 Copyright (C) 2024	AMI

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 16.1.30.2269	FIPS Mode configuration
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	.22.1290 Copyright (C) 2024	AMI

Unique Platform Id Configuration

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

Advanced	Aptio Setup — AMI	
OEM Platform Id CSME Platform Id	N/A N/A	
Upid State Upid OS Control State	[Disabled] [Enabled]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	2.22.1290 Copyright (C) 2024	AMI

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]	
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults E4: Save & Evit</pre>
Version 2	.22.1290 Copyright (C) 2024	ESC: Exit AMI

SMBIOS Type 130 OEM Capabilities

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

[Enabled] [Enabled] [Disabled]	Change BIOS Reflash Capability State
[Enabled] [Enabled]	
	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	[Enabled] 22.1290 Copyright (C) 2024

Anti-Rollback SVN Configuration

Advanced \rightarrow PCH-FW Configuration \rightarrow Anti-Rollback SVN Configuration

Advanced	Aptio Setup – AMI		
Minimal Allowed Anti-Rollback SVN Executing Anti-Rollback SVN Automatic HW-Enforced Anti-Rollback SVN Set HW-Enforced Anti-Rollback for Current SVN	0 4 [Disabled] [Disabled]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>	
Version 2.22.1290 Copyright (C) 2024 AMI			

OEM Key Revocation Configuration

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

Advanced	Aptio Setup – AMI	
Automatic OEM Key Revocation Invoke DEM Key Revocation	(Disabled) (Disabled)	When enabled, BIOS will automatically send HECI command to revoke OEM keys.
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version	2.22.1290 Copyright (C) 2024	4 AMI

3.2.2.4 Trusted Computing Settings

Advanced \rightarrow Trusted Computing

Advanced	Aptio Setup – AMI	
TPM 2.0 Device Found Firmware Version: Vendor:	15.23 IFX	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and
Security Device Support Active PCR banks Available PCR banks	[Enable] SHA256 SHA256,SHA384	INT1A interface will not be available.
SHA256 PCR Bank SHA384 PCR Bank	[Enabled] [Disabled]	
Pending operation Platform Hierarchy Storage Hierarchy Endorsement Hierarchy Physical Presence Spec Version TPM 2.0 InterfaceType Device Select	[None] [Enabled] [Enabled] [1.3] [TIS] [Auto]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version	2.22.1290 Copyright (C) 202	24 AMI

3.2.2.5 ACPI Settings



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

ACPI Shutdown Temperature

Advanced \rightarrow iManager Configuration \rightarrow ACPI Shutdown Temperature

Advanced	Aptio Setup – AMI	
iManager Configuration		▲ Select the Critical
iManager Chipset Firmware Version OEM Group GPIO Number Available	EIO-300 T01034583 8	must shutdown the system.
ACPI Shutdown Temperature CPU Warning Temperature CPU FAN1 Mode SYS FAN1 Mode SYS FAN2 Mode MXM FAN1 Mode	[Auto] [Auto] [Auto] [Auto] [Auto] [Auto]	
Backlight Enable Polarity Backlight Control Mode Brightness PWM Polarity Backlight Turn On Timing Backlight Turn Off Timing Brightness Control Enable	[Auto] [Auto] [Auto] 10 [Auto]	<pre> ++: Select Screen ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help E2: Previous Values</pre>
 Serial Port 1 Configuration Serial Port 2 Configuration Wake On Ring Hardware Monitor Watch Dog Timer Configuration GPIO Configuration 	[Disabled]	F3: Optimized Defaults F4: Save & Exit ESC: Exit
Vencion	2 22 1280 Copupidat (C)	ANT NOO

3.2.2.6 EdgeBMC Network Configuration

Advanced \rightarrow iManager Configuration \rightarrow EdgeBMC Network Configuration

Advanced	Aptio Setup – AMI	
Firmware Version	T01034583	Configure EdgeBMC Network
OEM Group GPIO Number Available	8	parameters
ACPI Shutdown Temperature	[Auto]	
CPU Warning Temperature	[Auto]	
CPU FAN1 Mode	[Auto]	
SYS FAN1 Mode	[Auto]	
SYS FAN2 Mode	[Auto]	
MXM FAN1 Mode	[Auto]	
Backlight Enable Polarity	[Auto]	
Backlight Control Mode	[Auto]	
Brightness PWM Polarity	[Auto]	
Backlight Turn On Timing	10	
Backlight lurn off liming	10	**: Select Screen
Brightness Control Enable	[AUTO]	I+: Select Item
Sonial Post 1 Configuration		Enter: Select
 Serial Fort 1 Configuration Serial Port 2 Configuration 		F1: Ceneral Heln
Wake On Ring	[Disabled]	F2: Previous Values
 Hardware Monitor 	[DISUDICU]	F3: Ontimized Defaults
▶ Watch Dog Timer Configuration		F4: Save & Exit
▶ GPIO Configuration		ESC: Exit
▶ EdgeBMC Network Configuration		
		•
Version 2	2.22.1290 Copyright (C) 202	4 AMI



Serial Port 1 Configuration

Advanced \rightarrow iManager Configuration \rightarrow Serial Port 1 Configuration


Serial Port 2 Configuration

Advanced \rightarrow iManager Configuration \rightarrow Serial Port 2 Configuration

Advanced	Aptio Setup – AMI	
Serial Port 2 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=2F8h; IRQ=3;	(CUM)
Change Settings COM Port Mode	[Auto] [RS-232 Mode]	
		++: Select Screen
		Enter: Select
		F1: General Help
		F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
Version	2.22.1290 Copyright (C) 20	D24 AMI

3.2.2.7 HW Monitor

 $\mathsf{Advanced} \to \mathsf{iManager}\ \mathsf{Configuration} \to \mathsf{HW}\ \mathsf{Monitor}$

Advanced	Aptio Setup – AMI	
Advanced PC Health Status CPU temperature System temperature MXM temperature CPU FAN1 Speed SYS FAN1 Speed SYS FAN2 Speed MXM FAN1 Speed +3.3V +3.3V +3.4VSB +5VSB VCORE VBAT	Aptio Setup - AMI : +39°C/ +102°F : +32°C/ +90°F : +0°C/ +32°F : 2160 RPM : 0 RPM : 0 RPM : 0 RPM : 0 RPM : +3.31 V : +3.30 V : +5.09 V : +1.22 V : +2.98 V	<pre>**: Select Screen **: Select Screen *1: Select Item Enter: Select */-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	Version 2.22.1290 Copyright (C) 20	24 AMI

3.2.2.8 Watch Dog Timer Configuration

Advanced \rightarrow iManager Configuration \rightarrow Watch Dog Timer Configuration



3.2.2.9 GPIO Configuration

Advanced \rightarrow iManager Configuration \rightarrow GPIO Configuration



3.2.2.10 S5 RTC Wake Settings

Advanced \rightarrow S5 RTC Wake Settings

Advanced	Aptio Setup – AMI	
Wake system from S5	[Disabled]	Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime , System will wake on the current time + Increase minute(s)
		<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Ver	sion 2.22.1290 Copyright ((C) 2024 AMI

Wake system from S5 [Disabled]

This item allows you to enable or disable a system wake-on-alarm event.

3.2.2.11 Serial Port Console Redirection

Advanced → Serial Port Console Redirection



Console Redirection [Disabled]

Enable/Disable the console redirection feature.

3.2.2.12 Legacy Console Redirection Settings

 $\mathsf{Advanced} \to \mathsf{Serial}$ Port Console Redirection $\to \mathsf{Legacy}$ Console Redirection Settings

Advanced	Aptio Setup – AMI	
Legacy Console Redirection Settings		Select a COM port to display
Redirection COM Port Resolution Redirect After POST	[COM1] [80x24] [Always Enable]	 redirection of Legacy OS and Legacy OPROM Messages **: Select Screen *1: Select Item Enter: Select */-: Change Opt. F1: General Help F2: Beneral Help F2: Provider Veluce
		F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	.22.1290 Copyright (C) 2024	AMI

Redirection COM Port [COM1]

3.2.2.13 Intel TXT Information

Advanced \rightarrow Intel TXT Information

Advanced	Aptio Setup — AMI	
Intel TXT Information	Production Fused	
BiosAcm Chipset Txt Cpu Txt Error Code Class Code Major Code Minor Code	Production Fused Supported None None None None None	
		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	2.22.1290 Copyright (<u>C) 202</u> 4	AMI

3.2.2.14 USB Configuration

Advanced \rightarrow USB Configuration

USB ConfigurationAUSB Configuration31USB Module Version31USB Controllers: 1 XHCI31USB Devices: 1 Drive, 1 Keyboard1 Drive, 1 KeyboardLegacy USB Support[Enabled] USB Mass Storage Driver SupportUSB hardware delays and time-outs: USB transfer time-out[20 sec] [20 sec] [20 sec]Device power-up delay Generic-Multi-Card 1.00[Auto]Wass Storage Devices: Generic-Multi-Card 1.00[Auto]USB PWR OFF Configuration 1 USB PWR OFF Configuration 2 USB PWR OFF Configuration 3 (USB PWR OFF Configuration 4[Disabled] (Disabled]	Advanced	Aptio Setup – AMI	
USB Module Version31AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.USB Devices: 1 Drive, 1 KeyboardEnabled] USB Mass Storage Driver SupportEnabled] USB hardware delays and time-outs: USB transfer time-out Device reset time-out Device power-up delay Generic-Multi-Card 1.00++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: ExitUSB PWR OFF Configuration 1 USB PWR OFF Configuration 3 USB PWR OFF Configuration 4Disabled USB babled	USB Configuration	-	Enables Legacy USB support.
USB Controllers: 1 XHCI USB Devices: 1 Drive, 1 Keyboard Legacy USB Support Keep USB devices available only for EFI applications. Legacy USB Support Legacy USB Support Keep USB devices available only for EFI applications. Herein Select USB hardware delays and time-outs: USB hardware delays and time-outs: USB transfer time-out Device reset time-out Device reset time-out Device power-up delay Mass Storage Devices: Generic-Multi-Card 1.00 USB PWR OFF Configuration 1 USB PWR OFF Configuration 3 USB PWR OFF Configuration 4 USB PWR OFF CONFIGUR	USB Module Version	31	AUTO option disables legacy support if no USB devices are connected. DISABLE option will
USB Devices: 1 Drive, 1 Keyboard Legacy USB Support [Enabled] XHCI Hand-off [Enabled] USB Mass Storage Driver Support [Enabled] USB hardware delays and time-outs: USB transfer time-out [20 sec] Device reset time-out [20 sec] Device power-up delay [Auto] Mass Storage Devices: Generic-Multi-Card 1.00 [Auto] USB PWR OFF Configuration 1 [Disabled] USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled]	USB Controllers: 1 XHCI		keep USB devices available
Legacy USB Support [Enabled] XHCI Hand-off [Enabled] USB Mass Storage Driver Support [Enabled] USB hardware delays and time-outs: ++: Select Screen USB transfer time-out [20 sec] Device reset time-out [20 sec] Device power-up delay [Auto] Mass Storage Devices: [Auto] Generic-Multi-Card 1.00 [Auto] USB PWR OFF Configuration 1 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled]	USB Devices:		
Legacy USB Support [Enabled] XHCI Hand-off [Enabled] USB Mass Storage Driver Support [Enabled] USB hardware delays and time-outs: USB transfer time-out [20 sec] Device reset time-out [20 sec] Device power-up delay [Auto] Mass Storage Devices: Generic-Multi-Card 1.00 [Auto] USB PWR OFF Configuration 1 [Disabled] USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 4 [Disabled] USB PWR OFF Configuration 4 [Disabled]	i bi ive, i keyboulu		
XHC1 Hand-off [Enabled] USB Mass Storage Driver Support [Enabled] USB hardware delays and time-outs: ++: Select Screen USB transfer time-out [20 sec] Device reset time-out [20 sec] Device power-up delay [Auto] Mass Storage Devices: Enter: Select Generic-Multi-Card 1.00 [Auto] VSB PWR OFF Configuration 1 [Disabled] USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled]	Legacy USB Support	[Enabled]	
USB hadware delays and time-outs: USB transfer time-out [20 sec] Device reset time-out [20 sec] Device power-up delay [Auto] Mass Storage Devices: Generic-Multi-Card 1.00 [Auto] USB PWR OFF Configuration 1 [Disabled] USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled]	XHUI Hand-off USB Maga Stapada Daiwaa Support	[Enabled]	
USB hardware delays and time-outs:++: Select ScreenUSB transfer time-out[20 sec]11: Select ItemDevice reset time-out[20 sec]Enter: SelectDevice power-up delay[Auto]+/-: Change Opt.Mass Storage Devices:F1: General HelpGeneric-Multi-Card 1.00[Auto]USB PWR OFF Configuration 1[Disabled]USB PWR OFF Configuration 2[Disabled]USB PWR OFF Configuration 3[Disabled]USB PWR OFF Configuration 4[Disabled]	USB Mass sturage priver support	[Eughied]	
USB transfer time-out [20 sec] 11: Select Item Device reset time-out [20 sec] Enter: Select Device power-up delay [Auto] +/-: Change Opt. F1: General Help F2: Previous Values Generic-Multi-Card 1.00 [Auto] F3: Optimized Defaults F4: Save & Exit USB PWR OFF Configuration 1 [Disabled] USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled] USB PWR OFF Configuration 4 [Disabled] VER PWR OFF CONFIGURATION 4 [Disab	USB hardware delays and time-outs:		++: Select Screen
Device reset time-out[20 sec]Enter: SelectDevice power-up delay[Auto]+/-: Change Opt.Mass Storage Devices:F1: General HelpGeneric-Multi-Card 1.00[Auto]USB PWR OFF Configuration 1[Disabled]USB PWR OFF Configuration 2[Disabled]USB PWR OFF Configuration 3[Disabled]USB PWR OFF Configuration 4[Disabled]	USB transfer time-out	[20 sec]	†↓: Select Item
Device power-up delay[Auto]+/-: Change Opt.Mass Storage Devices:F1: General HelpGeneric-Multi-Card 1.00[Auto]USB PWR OFF Configuration 1[Disabled]USB PWR OFF Configuration 2[Disabled]USB PWR OFF Configuration 3[Disabled]USB PWR OFF Configuration 4[Disabled]	Device reset time-out	[20 sec]	Enter: Select
Mass Storage Devices: F1: General Help Generic-Multi-Card 1.00 [Auto] VSB PWR OFF Configuration 1 [Disabled] USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled]	Device power-up delay	[Auto]	+/-: Change Opt.
Mass Storage Devices: F2: Previous Values Generic-Multi-Card 1.00 [Auto] F3: Optimized Defaults F4: Save & Exit USB PWR OFF Configuration 1 [Disabled] USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled]			F1: General Help
Generic-Multi-Card 1.00[Auto]F3: Optimized DefaultsUSB PWR OFF Configuration 1[Disabled]F4: Save & ExitUSB PWR OFF Configuration 2[Disabled]ESC: ExitUSB PWR OFF Configuration 3[Disabled]Image: Configuration 3USB PWR OFF Configuration 4[Disabled]Image: Configuration 4	Mass Storage Devices:		F2: Previous Values
USB PWR OFF Configuration 1 [Disabled] ESC: Exit USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled] •	Generic-Multi-Card 1.00	[Auto]	F3: Optimized Defaults
USB PWR OFF Configuration 1 [Disabled] ESC: Exit USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled] V			F4: Save & Exit
USB PWR OFF Configuration 2 [Disabled] USB PWR OFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled]	USB PWR OFF Configuration 1	[Disabled]	ESC: Exit
USB PWR UFF Configuration 3 [Disabled] USB PWR OFF Configuration 4 [Disabled]	USB PWR OFF Configuration 2	[Disabled]	
USB PWR UFF Configuration 4 [Disabled]	USB PWR OFF Configuration 3	[Disabled]	
	USB PWR OFF Configuration 4	[Disabled]	
Version 2 22 1290 ConucidAt (C) 2024 AMT	Version 2	22 1290 Conucidat (C) 2024	1 AMT

- Legacy USB Support [Enabled]
- XHCI Hand-off [Enabled]
- USB Mass Storage Driver Support [Enabled]
- USB hardware delays and time-outs
 USB Device transfer & reset time-out and delay setting.
- Mass Storage Devices [Auto] Shows USB mass storage device information.
- USB PWR OFF Configuration 1-6 [Disabled] Power off USB Port 1-6 via BIOS setting.

3.2.2.15 Network Stack Configuration

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

able UEFI Network
Screen Item ect e Opt. 1 Help us Values zed Defaults Exit

3.2.2.16 CSM Configuration

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

Advanced	Aptio Setup – AMI	
Compatibility Support Mod	dule Configuration	Enable/Disable CSM Support.
CSM Support	[Disabled]	++: Select Screen ++: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1290 Copyright (C) 2024 AMI		

3.2.2.17 NVMe Configuration

Advanced \rightarrow NVMe Configuration



3.2.2.18 TIs Auth Configuration

Advanced \rightarrow TIs Auth Configuration



3.2.2.19 Driver Health

Advanced \rightarrow Driver Health

Aptio Setup – AMI Advanced	
Advanced • Intel(R) PRO/1000 6.3.27 PCI-E Healthy • Intel(R) 2.56 Ethernet Controller 0.10.06 Healthy • Intel(R) 2.56 Ethernet Controller 0.10.06 Healthy	Provides Health Status for the Drivers/Controllers ++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1290 Copyright (C) 2024	AMI

3.2.3 Chipset Configuration Setting

Select the chipset tab from the BIOS setup screen to enter the Chipset Setup screen. Users can select any item in the left frame of the screen, such as PCI Express Configuration, to go to the sub-menu for that item. Users can display a Chipset Setup option by highlighting it using the <Arrow> keys. All Chipset Setup options are described in this section. The Chipset Setup screens are shown below. The sub-menus are described on the following pages.



3.2.3.1 System Agent (SA) Configuration

 $Chipset \rightarrow System Agent (SA) Configuration$

Chipset	Aptio Setup – AMI	
System Agent (SA) Configuration		Memory Configuration Parameters
VT-d	Supported	
 Memory Configuration Graphics Configuration DMI/OPI Configuration VMD setup menu PCI Express Configuration 		
VT-d Control Iommu Pre-boot Behavior Above 4GB MMIO BIOS assignment Program Grant Count	[Enabled] [Disable IOMMU] [Enabled] [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</pre>
Version 2	2.22.1290 Copyright (C) 2024	AMI

Memory Configuration

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



Graphics Configuration

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

Chipset	Aptio Setup – AMI	
Chipset Graphics Configuration Graphics Turbo IMON Current Skip Scaning of External Gfx Card Primary Display External Gfx Card Primary Display Co Internal Graphics GTT Size	31 [Disabled] [IGFX] nfiguration [Enabled] [0MB]	Graphics turbo IMON current values supported (14–31)
Aperture Size DVMT Pre-Allocated DVMT Total Gfx Mem Intel Graphics Pei Display Peim VDD Enable Configure GT for use RC1p Support PAVP Enable Cdynmax Clamping Enable Cd Clock Frequency LCD Control	[256MB] [60M] [256M] [Disabled] [Enabled] [Disabled] [Disabled] [Disabled] [Max CdClock freq based on Reference Clk]	<pre>++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2.22.1290 Copyright (C) 2024 AMI		

Chapter 3 BIOS Operation

LCD Control

Chipset	Aptio Setup – AMI	
LCD Control		
Panel Type	[Disabled]	
		++: Select Screen 14: Select Item
		Enter: Select +/−: Change Opt. F1: General Help
		F2: Previous Values F3: Optimized Defaults F4: Save & Evit
		ESC: Exit
Version 2	.22.1290 Copyright (C) 2024	AMI

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 fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Ver	rsion 2.22.1290 Copyright ((C) 2024 AMI

DMI Advanced Menu

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

Chipset	Aptio Setup – AM	I
DMI Advanced Menu		DMI Gen4 EQ Mode
DMI Gen4 EQ Mode DMI Gen4 RTCO Cpre Lane0 DMI Gen4 RTCO Cpost Lane0 DMI Gen4 RTCO Cpost Lane1 DMI Gen4 RTCO Cpost Lane1 DMI Gen4 RTCO Cpre Lane2 DMI Gen4 RTCO Cpre Lane2 DMI Gen4 RTCO Cpost Lane3 DMI Gen4 RTCO Cpost Lane3 DMI Gen4 RTCO Cpost Lane4 DMI Gen4 RTCO Cpost Lane5 DMI Gen4 RTCO Cpost Lane5 DMI Gen4 RTCO Cpost Lane5 DMI Gen4 RTCO Cpost Lane6 DMI Gen4 RTCO Cpost Lane7 DMI Gen3 RTCO Cpost Lane7 DMI Gen3 RTCO Cpre Lane0 DMI Gen3 RTCO Cpost Lane0 DMI Gen3 RTCO Cpost Lane1 DMI Gen3 RTCO Cpost Lane1	[Fixed EQ] 10 6 10 6 10 6 10 6 10 6 10 6 10 6 10	<pre>+*: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit </pre>

10101011 212212200 00p3, 18/10 (0) 2021 1/112

Chipset	Aptio Setup – AMI	
DMI Gen4 RTCO Cpost Lane3 DMI Gen4 RTCO Cpre Lane4 DMI Gen4 RTCO Cpost Lane4 DMI Gen4 RTCO Cpost Lane5 DMI Gen4 RTCO Cpost Lane5 DMI Gen4 RTCO Cpre Lane6 DMI Gen4 RTCO Cpost Lane6 DMI Gen4 RTCO Cpost Lane7 DMI Gen4 RTCO Cpre Lane7 DMI Gen3 RTCO Cpre Lane0 DMI Gen3 RTCO Cpost Lane0 DMI Gen3 RTCO Cpre Lane1	6 10 6 10 6 10 6 10 6 3 3 3 5	 DMI Gen3 Lane Transmitter Pre/Post-Cursor Coefficient values.
DMI Gen3 RTC0 Cpost Lane1 DMI Gen3 RTC0 Cpre Lane2 DMI Gen3 RTC0 Cpre Lane2 DMI Gen3 RTC0 Cpost Lane3 DMI Gen3 RTC0 Cpost Lane3 DMI Gen3 RTC0 Cpre Lane4 DMI Gen3 RTC0 Cpost Lane4 DMI Gen3 RTC0 Cpre Lane5 DMI Gen3 RTC0 Cpost Lane5 DMI Gen3 RTC0 Cpre Lane6 DMI Gen3 RTC0 Cpre Lane6 DMI Gen3 RTC0 Cpre Lane7 DMI Gen3 RTC0 Cpost Lane7	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
	Version 2.22.1290 Copyright (C	:) 2024 AMI

VMD Configuration

Chipset \rightarrow System Agent (SA) Configuration \rightarrow VMD Configuration

Chipset	Aptio Setup – AMI	
VMD Configuration		Enable/Disable to VMD
Enable VMD controller	[Disabled]	
		<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values</pre>
		F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	2.22.1290 Copyright (C) 2024	AMI

PCI Express Configuration

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

Aptio Setup - AMI Chipset	
PCI Express Configuration	PCI Express Root Port Settings.
▶ M.2 M Key ▶ MXM CONNECTOR	
	t∔: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
	F3: Optímized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1290 Copyright (C) 2024	AMI

M.2 M-Key

Chipset \rightarrow System Agent (SA) Configuration \rightarrow PCI Express Configuration \rightarrow M.2 M-Key

Chipset	Aptio Setup – AMI	
M.2 M Key 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	<pre>[Enabled] [Slot] [Enabled] [Enabled] [Disabled] [Disabled] [Hardware] [Hardware] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Enabled]</pre>	 Control the PCI Express Root Port. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

Version 2.22.1290 Copyright (C) 2024 AMI

Chipset	Aptio Setup – AMI	
SECE PME SCI Advanced Error Reporting PCIe Speed Enable ClockReq Messaging Transmitter Half Swing Detect Timeout P2P Support	[Disabled] [Enabled] [Enabled] [Auto] [Disabled] [Disabled] 0 [Disabled]	▲ Downstream Port Transmitter Preset
SA PCIe LTR Configuration LTR Snoop Latency Override Non Snoop Latency Override Force LTR Override LTR Lock	[Enabled] [Auto] [Auto] [Disabled] [Disabled]	++: Select Screen fl: Select Item Enter: Select the Set Set
CPU PCIe Gen3 HWEQ Config UPTP DPTP	5 7	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
CPU PCIE Gen4 HWEQ Config UPTP DPTP	8 9	ESC: Exit
Versi	on 2.22.1290 Copyright	(C) 2024 AMI

Chapter 3 BIOS Operation

MXM Connector

Chipset \rightarrow System Agent (SA) Configuration \rightarrow PCI Express Configuration \rightarrow MXM Connector

Chipset	Aptio Setup – AMI	
MXM CONNECTOR 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	[Enabled] [Slot] [Enabled] [Disabled] [Disabled] [Hardware] [Hardware] [Enabled] [Enabled] [Disabled] [Gusabled]	Control the PCI Express Root Port.
EDPC URR FER NFER CER CTO SEFE SENFE SECE PME SCI Advanced Error Reporting PCIe Speed	[Enabled] [Enabled] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Enabled] [Enabled] [Enabled] [Auto]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

Version 2.22.1290 Copyright (C) 2024 AMI

Chipset	Aptio Setup – AMI	I
Enable ClockReq Messaging Transmitter Half Swing Detect Timeout P2P Support CPU PCIE FuncO 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 ↑↓: Select Item Enter: Select +/-: Change Opt. E1: General Help
CPU PCIE Gen4 HWEQ Config UPTP DPTP	7 5	F2: Previous Values F3: Optimized Defaults F4: Save & Exit
CPU PCIe Gen5 HWEQ Config UPTP DPTP	5 5	v
Versi	on 2 22 1290 Conuright	(C) 2024 AMT

3.2.3.2 PCH-I/O Configuration

$Chipset \rightarrow PCH-IO \ Configuration$

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 LAN3 Controller LAN3 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] [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Power Off] 0 [Disabled] [Disabled] [Disabled] [TRUE]	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version	2.22.1290 Copyright (C) 2024	AMI

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

PCI Express Configuration

 $Chipset \rightarrow PCH\text{-IO Configuration} \rightarrow PCI \text{ Express Configuration}$

Chipset	Aptio Setup — AMI	
PCI Express Configuration		The control of Active State
DMI Link ASPM Control PCIe function swap PCH PCIE Clock Gating PCH PCIE Power Gating ▶ PCIe EQ settings	(L 1) [Enab led] [Enab led] [Enab led]	Fower Management of the DMI Link.
▶ M.2 E Key ▶ LAN1 ▶ LAN2 ▶ LAN3		
		<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	.22.1290 Copyright (C) 2024	AMI

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

PCIe EQ Settings

Chipset \rightarrow PCH-IO Configuration \rightarrow PCI Express Configuration \rightarrow PCIe EQ Settings



M.2 E-Key

Chipset \rightarrow PCH-IO Configuration \rightarrow PCI Express Configuration \rightarrow M.2 E-Key

Chipset	Aptio Setup – AMI	
DPC	[Disabled]	A Peer Memory Write
EDPC	[Fnahled]	Enable/Disable
LIRR	[Disabled]	
FER	[Disabled]	
NEER	[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]	v
Versio	n 2.22.1290 Copyright	(C) 2024 AMI
10/020		

Chipset	Aptio Setup – AMJ	
M.2 E 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/0	[Enabled] [Slot] [Disabled] [Disabled] [Enabled] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Enabled] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Auto] [Disabled] [Dis	 ▲ Control the PCI Express Root Port. ★+: Select Screen ★1: Select Item Enter: Select ★/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Ve	ersion 2.22.1290 Copyright	(C) 2024 AMI

LAN 1



Chipset	Aptio Setup – AM	1
LAN1 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] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Enabled] [Enabled] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Auto] [Disabled] 0 0	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
1	/ersion 2.22.1290 Copyright	: (C) 2024 AMI

Chipset	Aptio Setup – AMI	
Chipset LAN2 Connection Type ASPM L1 Substates L1 Low ACS PTM DPC EDPC URR FER NFER CER SEFE SEFE SEFE 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] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Enabled] [Enabled] [Enabled] [Enabled] [Enabled] [Disabled] [Enabled] [Disabled] [Disabled] [Disabled] [Enabled] [Disa	 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
	Version 2.22.1290 Copyright (C) 20	D24 AMI

LAN 2



Chipset	Aptio Setup – AMI	
DPC EDPC URR FER NFER CER SERE SENFE SECE PME SCI Advanced Econor Report ing	[Disabled] [Enabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Disabled] [Enabled] [Enabled]	Peer Memory Write Enable/Disable
PCIe Speed Transmitter Half Swing Detect Timeout Extra Bus Reserved Reserved Memory Reserved I/O PCH PCIe LTR Configuration LTR Snoop Latency Override Non Snoop Latency Override	[Enabled] [Disabled] 0 10 4 [Enabled] [Auto] [Auto]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
LTR Lock Peer Memory Write Enable Versio	[Disabled] [Disabled] n 2.22.1290 Copyright (C) 2024 AMI

	Aptio Setup – AMI	
Chipset		
DPC	[Disabled]	▲ Peer Memory Write
EDPC	[Enabled]	Enable/Disable
URR	[Disabled]	
FER	[Disabled]	
NFER	[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]	▼

LAN 3

 $\label{eq:chipset} \text{Chipset} \rightarrow \text{PCH-IO Configuration} \rightarrow \text{PCI Express Configuration} \rightarrow \text{LAN3}$

Chipset	Aptio Setup – AMI	
LAN3 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] [Enabled] [Disabled	 Control the PCI Express Root Port. **: Select Screen 1!: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.22.1290 Copyright (C)	2024 AMI

Chipset	Aptio Setup – AMI	
DPC	[Disabled]	A Peer Memory Write
EDPC	[Enabled]	Enable/Disable
URR	[Disabled]	
FER	[Disabled]	
NFER	[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]	▼
Version	1 2.22.1290 Copyright (C)	2024 AMI

M.2 M-Key

Chipset \rightarrow PCH-IO Configuration \rightarrow PCI Express Configuration \rightarrow M.2 M-Key

Chipset	Aptio Setup – AMI	
SATA Mode Selection Aggressive LPM Support SATA Controller Speed	[AHCI] [Enabled] [Default]	▲ Enable/Disable DITO Configuration
Serial ATA Port 1 Software Preserve Port 1 External Spin Up Device SATA Device Type Topology DITO Configuration DITO Value	Empty Unknown [Enabled] [Disabled] [Disabled] [Hard Disk Drive] [Unknown] [Disabled] 625	
DM Value M.2 M Key Software Preserve Port 2 External Spin Up Device SATA Device Type Topology SATA Port 2 DevSlp DITO Configuration DITO Value	15 Empty Unknown [Enabled] [Disabled] [Disabled] [Hard Disk Drive] [Unknown] [Disabled] [Disabled] [Disabled] 625	<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
DM Value	15 Version 2.22.1290 Copyright (C) 20	024 AMI

SATA Configuration

 $\label{eq:chipset} \text{Chipset} \rightarrow \text{PCH-IO} \ \text{Configuration} \rightarrow \text{SATA} \ \text{Configuration}$

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 DITO Configuration DITO Value DM Value M.2 M Key Software Preserve Port 2 External Spin Up Device SATA Device Type Topology SATA Port 2 DevSlp	[Enabled] [AHCI] [Enabled] [Default] Empty Unknown [Enabled] [Disabled] [Disabled] [Disabled] [Unknown] [Disabled] 625 15 Empty Unknown [Enabled] [Disabled] [Disabled] [Disabled] [Hard Disk Drive] [Unknown] [Disabled]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

sion 2.22.1290 Copyright (C)

2024 AMI

Security Configuration

 $Chipset \rightarrow PCH-IO\ Configuration \rightarrow Security\ Configuration$

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
Versio	n 2.22.1290 Copyright (C) 202	4 AMI

- RTC Memory Lock [Enabled]
- BIOS Lock [Enabled]
- Force unlock on all GPIO pads [Disabled]

Chapter 3 BIOS Operation

HD Audio Subsystem Configuration Settings

 $Chipset \rightarrow PCH-IO\ Configuration \rightarrow HD\ Audio\ Subsystem\ Configuration\ Settings$

Chipset	Aptio Setup – AMI	
HD Audio Subsystem Configuration Set HD Audio HDA Codec ALC245 Configuration	tings [Enabled] [No Dmic to codec]	Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.
		<pre>++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Vanaian 2	- 22 4280 Conuniabt (C) 2024	AWT

3.2.4 Security

Secure Boot

Security \rightarrow Secure Boot

Aptio Setup – AMI Main Advanced Chipset <mark>Security</mark> Boot Save & Exit MEBx		
Password Description		Set Administrator Password
If ONLY the Administrator's then this only limits acces only asked for when enterin If ONLY the User's password is a power on password and boot or enter Setup. In Set have Administrator rights. The password length must be in the following range:	password is set, is to Setup and is ig Setup. I is set, then this must be entered to sup the User will	
Minimum length Mavimum langth	3	the Salact Separa
Haximum iength	20	14: Select Item
Administrator Password		Enter: Select
User Password		+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
▶ Secure Boot		ESC: Exit
	Version 2.22.1290 Copyright (C)	2024 AM1

Administrator Password

Select this option and press to access the sub-menu, and then type in the password.

Set the Administrator password.

User Password

Select this option and press to access the sub-menu, and then type in the password.

Set the User Password.

Chapter 3 BIOS Operation

3.2.5 Boot Settings



Setup Prompt Timeout

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

- Bootup NumLock State [Off] On or Off power on state for the NumLock.
- Quiet Boot [Disabled] If this option is set to disabled, the BIOS displays normal POST messages. If enabled, an OEM logo is shown instead of POST messages.

Boot Option #1

Choose boot priority from the boot devices.

3.2.6 Save & Exit Configuration

Aptio Setup – AMI Main Advanced Chipset Security Boot <mark>Save & Exit MEB</mark> x	
Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset	Exit system setup after saving the changes.
Save Changes Discard Changes	
Default Options Restore Defaults Save as User Defaults	
Restore User Defaults	++: Select Screen ↑↓: Select Item
UEFI: Generic-Multi-Card 1.00, Partition 1 (Generic-Multi-Card 1.00)	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1290 Copyright (C) 2024 AMI	

Save Changes and Exit

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

1.Select Exit Saving Changes from the Exit menu and press <Enter>. The following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel] 2. Select Ok or Cancel.

Discard Changes and Exit

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

1.Select Exit Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]

2. Select Ok to discard changes and exit. Select Discard Changes from the Exit menu and press <Enter>.

Save Changes and Reset

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

1.Select Exit Saving Changes from the Exit menu and press <Enter>. The Following message appears: Save Configuration Changes and Exit Now? [Ok] [Cancel]

2. Select Ok or Cancel.

Discard Changes and Reset

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

1.Select Reset Discarding Changes from the Exit menu and press <Enter>. The following message appears: Discard Changes and Exit Setup Now? [Ok] [Cancel]

2.Select Ok to discard changes and reset. Discard Changes Select Discard Changes from the Exit menu and press <Enter>.

Restore Defaults

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

Save as User Default Save the all current settings as a user default.

Restore User Default Restore all settings to user default values.

3.2.7 MEBx





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



SMBus



General Purpose Input/Output is a flexible parallel interface that allows a variety of custom connections. It allows users to monitor the level of signal input or set the output status to switch the device on/off. Our API also provides Programmable GPIO, which allows developers to dynamically set the GPIO input or output status.

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

4.2.1.2 Display

Brightness Control



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

Backlight



4.2.1.3 Monitor

Watchdog



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.

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.

The Backlight API allows a developer to control the backlight

(screen) on/off in embedded devices.

4.2.1.4 Power Saving

CPU Speed



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

System Throttling



This refers to a series of methods for reducing power consumption in computers by lowering the clock frequency. This API allows the user to adjust the clock from 87.5% to 12.5%.

4.2.2 Software Utility

BIOS Flash



Embedded Security ID



The BIOS Flash utility allows customers to update the flash ROM BIOS version, or use it to back up the current BIOS by copying it from the flash chip to a file on a customer's disk. The BIOS Flash utility also provides a command line version and an API for fast implementation into customized applications.

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

Monitoring



Monitoring is a utility for a customer to monitor the system health, like voltage, CPU and system temperature and fan speed. These items are important to a device; if critical errors occur and are not solved immediately, permanent damage may be caused.


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-292 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)



LAN Configuration

6.1 Introduction

The AIMB-292 system features three Gigabit Ethernet LANs via dedicated PCI Express x1 lanes (Intel® I226-V (LAN1 and LAN2) and Intel® I210-AT (LAN3)) that offer bandwidth of up to 500 MB/sec, eliminating bottlenecks in the flow of network data by incorporating Gigabit Ethernet at 2500 Mbps.

6.2 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

6.3 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 Intel® I226-V (LAN1 and LAN2) and Intel® I210-AT (LAN3) Gigabit integrated controllers support all major network operating systems. However, the installation procedure varies between systems. Please follow the driver setup procedure instructions specific to the operating system installed.

6.4 Windows® 10 Driver Setup (Intel® I226-V and Intel® I210-AT)

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

Ν	ote!
ſ	
J.	

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

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

All product specifications are subject to change without notice.

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

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

© Advantech Co., Ltd. 2024