

User Manual

ARK-1251

Fanless Embedded Box PC



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Please note this package contains a hard-copy user manual in Chinese for China CCC certification purposes. Please disregard the Chinese hard-copy user manual if the product is not to be sold and/or installed in China.

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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 mate-rials, 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.
- 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.

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.

Technical Support and Assistance

- Visit the Advantech website at http://support.advantech.com where you can find 1. the latest information about the product.
- Contact your distributor, sales representative, or Advantech's customer service 2. center for technical support if you need additional assistance. Please have the following information ready before you call:
 - Product name and serial number
 - Description of your peripheral attachments
 - Description of your software (operating system, version, application software, etc.)
 - A complete description of the problem
 - The exact wording of any error messages

Warnings, Cautions and Notes

Warning! Warnings indicate conditions that if not observed can cause personal injury!

Les avertissements indiquent des conditions qui, si elles ne sont pas respectées, peuvent entra?ner des blessure!



Caution! Cautions are included to help prevent hardware damage and data loss. Des précautions sont incluses pour vous aider à éviter d'endommager le matériel ou de perdre Les données.



Notes provide additional, optional information. Les remarques fournissent des informations supplémentaires facultatives.

Packing List

Before setting up the system, check that the items listed below are included and in good condition. If any item does not accord with the table, please contact your dealer immediately.

- 1 x ARK-1251 Unit
- 1 x User Manual (Simplified Chinese)
- 1 x Wrench for top cover
- 1 x 4-pin terminal block for switch
- 1 x 3-pin plug-in block for power in
- 1 x DIN-rail bracket
- 1 x WISE-PaaS/DeviceOn Quick Start Guide
- 1 x M.2 PCIe 2280 SSD thermal kit
- 1 x RAM thermal pad 59x13x1.0mm
- 1 x RAM thermal pad 59x23x1.5mm
- 1 x CPU thermal pad 25x20x0.21mm

Ordering Information

Model Number	Description
ARK-1251-S3A1	Intel Core Ultra 5-125U HDMI+DP+3*GbE+4*COM
ARK-1251-S3A1U	Intel Core Ultra 5-125U HDMI+DP+3*GbE+4*COM MIT
ARK-1251-S7A1	Intel Core Ultra 7-155U HDMI+DP+3*GbE+4*COM
ARK-1251-S7A1U	Intel Core Ultra 7-155U HDMI+DP+3*GbE+4*COM MIT

Optional Items for Default SKU

Part Number	Description
96PSA-A120W24T2-4	AC to DC adapter, 24V/120W
1702002600	Power cable 3-pin 183cm, USA type
11702002605	Power cable 3-pin 183cm, EU type
1702031801	Power cable 3-pin 183cm, UK type
1700000237	Power cable 3-pin 183cm, PSE type
1700030518-01	CANBus Cable (replacing GPIO)
1960103315N010	M.2 3052 Extend Bracket
AMK-W006	Wall mount kit
AMK-V023E	VESA mount kit

Safety Instructions

- 1. Read these safety instructions carefully.
- 2. Retain this user manual for future reference.

- 3. Disconnect the equipment from all power outlets before cleaning. Use only a damp cloth for cleaning. Do not use liquid or spray detergents.
- 4. For pluggable equipment, the power outlet socket must be located near the equipment and easily accessible.
- 5. Protect the equipment from humidity.
- 6. Place the equipment on a reliable surface during installation. Dropping or letting the equipment fall may cause damage.
- 7. Ensure that the voltage of the power source is correct before connecting the equipment to a power outlet.
- 8. Position the power cord away from high-traffic areas. Do not place anything over the power cord.
- 9. All cautions and warnings on the equipment should be noted.
- 10. If the equipment is not used for a long time, disconnect it from the power source to avoid damage from transient overvoltage.
- 11. Never pour liquid into an opening. This may cause fire or electrical shock.
- 12. Never open the equipment. For safety reasons, the equipment should be opened only by qualified service personnel.
- 13. If any of the following occurs, have the equipment checked by service personnel:
 - The power cord or plug is damaged.
 - Liquid has penetrated the equipment.
 - The equipment has been exposed to moisture.
 - The equipment is malfunctioning, or does not operate according to the user manual.
 - The equipment has been dropped and damaged.
 - The equipment shows obvious signs of breakage.
- 14. Do not leave the equipment in an environment with a storage temperature of below 40 °C (-40 °F) or above 85°C (185 °F), as this may damage the components. The equipment should be kept in a controlled environment.
- 15. CAUTION: Batteries are at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.
- 16. Any unverified component may cause unexpected damage. To ensure correct installation, always use the components (e.g., screws) provided in the accessory box.
- 17. CAUTION: The equipment is equipped with a battery-powered real-time clock circuit. There is a risk of explosion if a battery is incorrectly replaced. Replace only with the same or equivalent type as recommended by the manufacturer. Discard all used batteries according to the manufacturer's instructions.
- 18. Always disconnect the power cord from the chassis before manually handling the hardware. Do not implement connections or configuration changes while the device is powered on. Sudden power surges may damage sensitive electronic components.
- 19. In accordance with IEC 704-1:1982 specifications, the sound pressure level at the operator's position should not exceed 70 dB (A).
- 20. DISCLAIMER: These instructions are provided according to IEC 704-1 specifications. Advantech disclaims all responsibility for the accuracy of any statements con- tained herein.
- 21. Use a power cord connected to a socket-outlet with a grounded connection.
- 22. This product is intended to be supplied by a UL-Listed power supply suitable for use at minimum Tma 60°C (140°F) whose output is rated at 24V, 5A. Please contact Advantech for further information

23. **RESTRICTED ACCESS AREA**: The equipment should only be installed in a Restricted Access Area.

Consignes de Sécurité

- 1. Veuillez lire attentivement ces instructions de sécurité.
- 2. Veuillez conserver ce manuel de l'utilisateur pour référence ultérieure.
- 3. Veuillez débrancher cet équipement de la prise secteur avant le nettoyage. Utilisez un chiffon humide. Ne pas utiliser de détergent liquide ou pulvérisé pour le nettoyage. Utilisez une feuille ou un chiffon humide pour le nettoyage.
- 4. Pour les équipements enfichables, la prise de courant doit être à proximité de l'équipement et doit être facilement accessible.
- 5. S'il vous plaît garder cet équipement de l'humidité.
- 6. Posez cet équipement sur une surface fiable lors de l'installation. Une chute ou une chute pourrait causer des blessures.
- 7. Assurez-vous que la tension de la source d'alimentation est correcte avant de connecter l'équipement à la prise de courant.
- 8. Placez le cordon d'alimentation de sorte que personne ne puisse marcher dessus. Ne placez rien sur le cordon d'alimentation.
- 9. Tous les avertissements et mises en garde sur l'équipement doivent être notés.
- 10. Si l'appareil n'est pas utilisé pendant une longue période, débranchez-le du secteur pour ne pas être endommagé par une surtension transitoire.
- 11. Ne jamais verser de liquide dans les ouvertures de ventilation; Cela pourrait provoquer un incendie ou un choc électrique.
- 12. N'ouvrez jamais l'équipement. Pour des raisons de sécurité, seul le personnel de maintenance qualifié doit ouvrir l'équipement.
- 13. Si l'une des situations suivantes se présente, faites vérifier le matériel par le personnel de service:
 - Le cordon d'alimentation ou la fiche est endommagé.
 - Un liquide a pénétré dans l'appareil.
 - L'équipement a été exposé à l'humidité.
 - L'équipement ne fonctionne pas bien ou vous ne pouvez pas le faire. fonctionner conformément au manuel d'utilisation.
 - Equipment L'équipement est tombé et a été endommagé.
 - Equipment L'équipement présente des signes évidents de rupture.
- 14. Ne laissez pas cet équipement dans un environnement où la température de stockage peut être inférieure à -40°C (-40°F) ou supérieure à 85°C (185°F). Cela pourrait endommager l'équipement. L'équipement doit être dans un environnement contrôlé.
- 15. Tout composant non vérifié peut causer des dommages inattendus. Pour garantir une installation correcte, veuillez toujours utiliser les composants (ex. Vis) fournis avec la boîte d'accessoires.
- 16. ATTENTION: L'ordinateur est équipé d'un circuit d'horloge temps réel alimenté par batterie. Il y a un risque d'explosion si la batterie est remplacée de manière incorrecte. Remplacez uniquement avec le même type ou un type équivalent recommandé par le fabricant. Jetez les piles usagées conformément aux instructions du fabricant.
- 17. Débranchez toujours complètement le cordon d'alimentation de votre châssis lorsque vous utilisez du matériel. Ne faites pas de connexion quand l'appareilest sous tension. Les composants électroniques sensibles peuvent être endommagés par des surtensions soudaines.

- 18. Niveau de pression acoustique au poste de l'opérateur selon la norme CEI 704-1: 1982 n'est pas supérieur à 70 dB (A).
- 19. AVERTISSEMENT: Cet ensemble d'instructions est donné conformément à la norme CEI 704-1. Advantech décline toute responsabilité quant à l'exactitude des déclarations contenues dans ce.
- 20. Au moyen d'un cordon d'alimentation connecté à une prise de courant avec mise à la terre.
- 21. Ce produit est destiné à être alimenté par une alimentation homologuée UL adaptée à une utilisation à une température minimale de Tma de 60°C (140°F) dont la sortie est nominale de 24V, 5A. Veuillez contacter Advantech pour plus d'informations.
- 22. ZONE D'ACCÈS RESTREINT: L'équipement ne doit être installé que dans une zone d'accès restreint.

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General Information

This chapter details background information on the ARK-1251 series.

1.1 Introduction

ARK-1251 is a compact and multifunctional fanless embedded system which powers by Intel® Core[™] Ultra Processor 125U and 155U, which combine CPU, GPU, and NCU as performance hybrid SoC to offer high performance in low-power processing. ARK-1251 also offers sufficient I/O ports for different applications, targeted in market like Machine Automation, AI Inspection, Cobots/AMR and Edge Computing.

Rugged, Compact Design

ARK-1251 is equipped with dual channel memory slot, and supports up to 96GB of DDR5 5600 MHz SO-DIMM. The compact design is suitable for installation in environments with limited space, and this ruggedized system also designed for operation in harsh industrial environments for equipped with a wide operating temperature range (-20 ~ 60°C/-4 ~ 140°F), wide input power range (12 ~ 28 VDC) and multiple IO solution. It includes 4x USB 2.0, 2x USB 3.2 (Gen2), 2x full COM (RS-232/422/485), 2x COM (RS-422/485), 2 x 10/100/1000/2500 Mbps LAN ports, and 1 x 10/100/1000 Mbps LAN port, as well as 1 x Mic-In and Line-Out, 1x HDMI, and 1x DP. ARK-1251 also features 1x M.2 2280 M key, 1x M.2 2230 E-Key, and 1x M.2 2280 B-Key. ARK-1251 passes worldwide certification including CE, FCC Class B, CB, UL, CCC, BSMI, and UKCA.

Multiple Display Support

In ARK-1251, system offers 1x 8K HDMI displays, which support up to 7680 x 4320 @60Hz, and 1x 8K DP, which support up to 7680 x 4320 @60Hz. The graphic engine is Intel® Graphics.

Built-In Intelligent Management Tools — Advantech SUSI API and DeviceOn

The Advantech SUSI API is an intelligent self-management cross-platform tool that monitors the system's status for problems and take action in the event of abnormalities, and provides a valuable suite of programmable APIs such as multi-level watchdog, hardware monitoring, and other user-friendly interfaces. SUSI API makes the entire system more reliable and intelligent. ARK-1251 also supports Advantech's own WISE-DeviceOn solution either in-band or out-of-band. DeviceOn provides easy remote management so users can monitor, configure, and control a large number of terminals to ensure easy maintenance and recovery.

1.2 Product Features

1.2.1 Processor System

- CPU:
 - Core Ultra 5-125U
 - Core Ultra 7-155U
- Frequency:
 - Core Ultra 5-125U: 1.3Ghz
 - Core Ultra 7-155U: 1.7Ghz
- Core Number:
 - Core Ultra 5-125U: 12
 - Core Ultra 7-155U: 12
- BIOS: AMI EFI 256 Mbit

1.2.2 Memory

- Technology: DDR5 5600MHz
- Max capacity: Up to 96GB
- Socket: 2 x Channel DDR5 5600 MHz 262-pin SO-DIMM (no support ECC)

1.2.3 Graphic

- Chipset: Intel® Graphics
- HDMI 2.1: Up to 4096 x 2160 @ 60Hz
- **DP:** Up to 4096 x 2160 @ 60Hz
- **Dual Display:** HDMI + DP

1.2.4 Ethernet

- LAN1: 10/100/1000/2500 Mbps Intel i226-LM GbE, support Wake On LAN
- LAN2: 10/100/1000/2500 Mbps Intel i226-LM GbE, support Wake On LAN
- LAN3: 10/100/1000 Mbps Intel i210 GbE, support Wake On LAN

1.2.5 Audio

Interface: Realtek ALC888S, Mic-in and Line-out

1.2.6 I/O Interface

- Serial Ports:
 - 2 x RS-232/422/485, with auto flow control
 - 2 x RS-422/485, with auto flow control
- **USB Ports:** 2 x USB 3.2 Gen 2, 4 x USB 2.0.
- GPIO: 8-bit Programmable DIO
- Optional CAN Bus: 1 x CAN Bus 2.0 (DB9 connector, replacing GPIO)

1.2.7 Expansion

- M.2:
 - 1x M.2 2230 E key (NVMe, PCIe x2)
 - 1x M.2 2280 B key with nano SIM holder (NVMe, PCIe x2, SATA)
 - 1x M.2 2280 M key (NVMe, PCIe x4)

1.2.8 Storage

NVMe/SATA:

- 1x M.2 2280 M key (NVMe, PCIe x4) (default)
- 1x M.2 2280 B key with nano SIM holder (NVMe, PCIe x2 / SATA)

1.2.9 Other

- **TPM:** NPCT764AABYX FW7.2.3.1
- Watchdog Timer: 255 levels timer interval, setup by software

1.2.10 Software Support

- Microsoft Windows: Windows 10 Enterprise, Windows 11 Enterprise
- Linux: Ubuntu 24.04

1.2.11 Power Requirement

- Power Type: ATX/AT
- Power Input Voltage: 12 ~ 28 V_{DC}
- **Power Adapter:** AC to DC, 120W adapter

1.2.12 Power Consumption

- Core Ultra 5-125U
 - Typical: 17.83W
 - Max: 59.44W
- Core Ultra 7-155U
 - Typical: 18.19W
 - Max: 61.74W

1.2.13 Mechanical

- **Construction:** Aluminum housing
- Mounting: DIN-Rail/Wall Mount
- Dimensions (W x H x D): 173 x 60 x 141 mm (6.73 x 2.36 x 5.55 in)
- Weight: 1.5 kg

1.2.14 Environment

- Operating Temperature: With extended temp. peripherals: -20 ~ 60°C with 0.7m/s airflow (only up to 40°C when using with the adapter).
- Storage Temperature: -40 ~ 85°C (-40 ~ 185°F)
- **Relative Humidity:** 95% @ 40°C (non-condensing)
- Vibration During Operation: With SSD: 3 Grms, IEC60068-2-64, random, 5~500 Hz, and 1hr/axis (with Wall Mount)
- Shock During Operation: With SSD: 30 G, IEC-60068-2-27, half sine, 11 ms duration (with Wall Mount)
- EMC: CE/FCC Class B, CCC, UKCA, and BSMI
- **Safety:** UL, CB, CCC, and UKCA

1.3 Mechanical Diagrams

Din Rail: 173 x 60 x 141 mm (6.73 x 2.36 x 5.55 in) (W x H x D)







Figure 1.1 ARK-1251 Mechanical Dimensions Diagram

Wall Mount:





Figure 1.2 ARK-1251 Mechanical Dimensions Diagram With Wall Mount

1.4 Optional MOS Modules for iDoor Expansion

Table 1.1: Optional	MOS Modules for iDoor Expansion
Part-Number	Description
MOS-2120-Z1101E	Giga LAN Ethernet module, 1-Ch, PCle I/F,
MOS-1130Y-0202	Isolated CANBus, 2-Ch, DB9, PCIe I/F
MOS-1110Y-0101E	Isolated 16 DI/8 DO, 1-Ch, DB37, PCIe I/F
MOS-2120-Z1201	Dual Intel I210 GbE LAN iDoor, 2-Ch, PCIe I/F
MOS-1120Y-0202E	Isolated RS-232, 2-Ports, DB9, PCIe I/F
MOS-1120Y-1402E	Non-Isolated RS-232, 4-Ports, DB37, PCIe I/F
MOS-2110Z-1201E	USB module, 2-Ch, PCle I/F
AMO-1032	Expansion kit M.2 B key for mPCIe idoor

Note! 1. You need to order the AMO-I032 together with MOS modules.

2. *M.2 E Key cannot be used when adding any MOS module due to mechanical interference.*



Hardware Configuration

This chapter details instructions for installing the ARK-1251 series.

2.1 Introduction

The following sections show the internal jumper settings and the external connector pin assignments for different applications.

2.2 Jumper

2.2.1 Jumper Description

You may configure ARK-1251 to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric 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 a jumper, you connect the pins with the clip. To open a jumper, remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



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



A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

2.2.2 Jumper List/Fail Safe

Table 2.1: Jumper List					
JCMOS1	Clear CMOS				
SW4001	HW AT/ATX Mode setting				
M2_SEL1	M.2 Key B Device selection				
M2_LED_SEL	M.2 SSD LED Selection				
SW_422_485_1	RS-485/RS-422 Failsafe				
SW_422_485_2	RS-485/RS-422 Failsafe				

2.2.3 Jumper Locations

JCMOS1	
SW_422_485_2	O
	SW_422_485_1
SW4001	
M2_SEL1	
	Lange Contraction

Figure 2.1 ARK-1251 Jumper Location

2.2.4 Jumper Settings

2.2.4.1 Clear CMOS (JCMOS1)



Table 2.2: JCMOS1	Clear CMOS
Setting	Function
(1-2 Closed)	Normal operation (Default)
(2-3 Closed)	Clear CMOS

2.2.4.2 HW AT/ATX Mode DIP Switch (SW4001)



Table 2.3: SW4001 AT/ATX Mode Switch				
Setting	Function			
(1-8)	Pin 1 represents Off: ATX mode(default), Pin 8 represents On: AT mode			

Table 2.3: S	W4001 AT/ATX Mode Switch	
(2-7)	Reserved Pin 2 represents Off (default), Pin 7 represents On	
(3-6)	Reserved Pin 3 represents Off (default), Pin 6 represents On	
(4-5)	Reserved Pin 4 represents Off (default), Pin 5 represents On	

2.2.4.3 M.2 Key B Device selection (M2_SEL1)



Table 2.4: M2_SEL1 M.2 Key B Device Selection			
Setting	Function		
(1-2 Closed)	SSD with USB 2.0		
(1-2 Open)	SSD with USB 3.0 (for 4G/5G) (default)		
(3-4 Closed)	SSD – SATA type (default)		
(3-4 Open)	SSD – PCIE type		

2.2.4.4 M.2 SSD LED Selection (M2_LED_SEL)



Table 2.5: M2_LED_SEL M.2 SSD LED Mode Jumper		
Setting	Function	
(1-2 Closed)	Key B SSD LED	
(3-4 Closed)	Key M SSD LED (default)	

2.2.4.5 RS-422/RS-485 Failsafe (SW_422_485_1)



Table 2.6: SW_422_485_1 RS-485/RS-422 Failsafe		
Setting	Function	
(1-8), (2-7)	Pin 1/2 represents Off: Disable COM2 failsafe (default), Pin 7/8 represents On: Enable COM2 failsafe	
(3-6), (4-5)	Pin 3/4 represents Off: Disable COM1 failsafe (default), Pin 5/6 represents On: Enable COM1 failsafe	



Table 2.7: SW_422_485_2 RS-485/RS-422 Failsafe			
Setting	Function		
(1-8), (2-7)	Pin 1/2 represents Off: Disable COM4 failsafe (default), 7/8 represents On: Enable COM4 failsafe		
(3-6), (4-5)	Pin 3/4 represents Off: Disable COM3 failsafe (default), 5/6 represents On: Enable COM3 failsafe		

2.3 System I/O







2.4 External I/O

2.4.1 Power On/Off Button

ARK-1251 has a Power On/Off button with LED indicators that show on status (Green LED).



Figure 2.3 Power On/Off Button

2.4.2 Power Input Connector

The power input connector supports 12 \sim 28V. The 3 pins are defined as +, -, and Ground.



Figure 2.4 Power Input Connector

2.4.3 M.2 SSD LED Indicator

ARK-1251 provides one LED that indicates M.2 M Key or B key by jumper, and compact flash disk status.

0

Figure 2.5 SSD LED Indicator

Chapter 2 Hardware Configuration

2.4.4 Antenna Hole

ARK-1251 reserves 4 antenna holes for wireless antenna installation. Each of antenna hole mark "ANT" to let antenna hold easy to be recognized.



Figure 2.6 Antenna Hole

2.4.5 Audio Connector

ARK-1251 offers stereo audio ports by two phone jack connectors of Line Out and Mic In. The audio chip is controlled by Realtek ALC888S, and it's compliant with Aza-lea standard.



Figure 2.7 Audio Connector

2.4.6 DIO Connector

ARK-1251 provides 1x DIO connector.



Figure 2.8 DIO Connector

Table 2.8: DIO Connector Pin Define			
Pin	Signal Name		
1	DIO bit 0		
2	DIO bit 1		
3	DIO bit 2		
4	DIO bit 3		
5	DIO bit 4		
6	DIO bit 5		
7	DIO bit 6		
8	DIO bit 7		
9	GND		

2.4.7 COM Connector

ARK-1251 provides offer 2 x RS-232/422/485 D-sub 9 serial communication interface ports, and the default setting is RS-232, the mode RS-422/ 485 can be supported via the BIOS settings. Also provide 2 x RS-422/485 D-sub 9 serial communication interface ports, and the default setting is RS-485.



Figure 2.9 COM Connector

Table 2.9: COM Connector Pin Define			
	RS-232	RS-422	RS-485
Pin	Signal Name	Signal Name	Signal Name
1	DCD	Tx-	DATA-
2	RxD	Tx+	DATA+
3	TxD	Rx+	NC
4	DTR	Rx-	NC
5	GND	GND	GND
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

2.4.8 Ethernet Connector (1G LAN)

ARK-1251 is equipped with one Intel® i210-IT Ethernet controllers connected to LAN3. These Ethernet ports provide a standard RJ-45 jack connector with LED indicators. Right side LED shows Link status (Green LED) and Active status (flashing Green LED), and left side LED shows Speed status (Green LED for 1Gbps/Orange LED for 10 or 100 Mbps).



Figure 2.10 Ethernet Connector

Table 2.10: 1G Ethernet Connector (LAN) Pin Define			
Pin	10/100/1000 BaseT Si	gnal Name	
1	BI_DA+(GHz)		
2	BI_DA-(GHz)		
3	BI_DB+(GHz)		
4	BI_DB-(GHz)		
5	BI_DC+(GHz)		
6	BI_DC-(GHz)		
7	BI_DD+(GHz)		

Table 2.10: 1G Ethernet Connector (LAN) Pin Define			
8	BI_DD-(GHz)		
H3	GND		
H4	GND		

2.4.9 Ethernet Connector (2.5G LAN)

ARK-1251 is equipped with two Intel® i226-LM Ethernet controllers connected to LAN1 and LAN2. These Ethernet ports provide a standard RJ-45 jack connector with LED indicators. Right side LED shows Link status (Green LED) and Active status (flashing Green LED), and left side LED shows Speed status (Green LED for 2.5Gbps/Orange LED for 1Gbps/no-flashing for 10 or 100 Mbps).



Figure 2.11 Ethernet Connector

Table 2.11: 2.5G Ethernet Connector (LAN) Pin Define			
Pin	10/100/1000/2500 BaseT Signal Name		
1	BI_DA+(GHz)		
2	BI_DA-(GHz)		
3	BI_DB+(GHz)		
4	BI_DB-(GHz)		
5	BI_DC+(GHz)		
6	BI_DC-(GHz)		
7	BI_DD+(GHz)		
8	BI_DD-(GHz)		
H3	GND		
H4	GND		

2.4.10 HDMI Connector

ARK-1251 is equipped with 1 x 19-pin HDMI Type A interface. The HDMI link supports resolutions up to 7680 x 4320 @ 60 Hz.



Figure 2.12 HDMI Receptacle Connector

Table 2.12: HDMI Connector Pin Define			
Pin	Signal Name	Pin	Signal Name
1	TMDS Data 2+	2	TMDS Data 2 shield
3	TMDS Data 2-	4	TMDS Data 1+
5	TMDS Data 1 shield	6	TMDS Data 1-

Table 2.12: HDMI Connector Pin Define				
7	TMDS Data 0+	8	TMDS Data 0 shield	
9	TMDS Data 0-	10	TMDS clock+	
11	TMDS clock shield	12	TMDS clock-	
13	CEC	14	Reserved	
15	SCL	16	SDA	
17	DDC/CEC Ground	18	+5V	
19	Hot Plug Detect			

2.4.11 DP

ARK-1251 is equipped with 1 x 20-pin DP connector, supports up to 7680 x 4320 @ 60 Hz.



Figure 2.13 DP Receptacle Connector

Table 2.13: DP Connector Pin Define			
Pin	Signal Name	Pin	Signal Name
20	ML_Lane 0 (p)	21	GND
22	ML_Lane 0 (n)	23	ML_Lane 1 (p)
24	GND	25	ML_Lane 1 (n)
26	ML_Lane 2 (p)	27	GND
28	ML_Lane 2 (n)	29	ML_Lane 3 (p)
30	GND	31	ML_Lane 3 (n)
32	CONFIG1	33	CONFIG2
34	AUX CH (p)	35	GND
36	AUX CH (n)	34	Hot plug
38	Hot Plug Detect	39	DP_PWR

2.4.12 USB 3.2 - Gen2

ARK-1251 supports 2 x USB 3.2 interface. The USB interfaces comply with USB XHCI, Rev. 3.2 standards. USB 3.2 Gen2 connectors contain legacy pins to interface with USB 2.0 devices, and a new set of pins for USB 3.2 connectivity.



Figure 2.14 USB 3.2 Connector

Table 2.14: USB 3.2 Connector Pin Define					
Pin	Signal Name	Pin	Signal Name		
1	+5V	2	USB_data-		
3	USB_data+	4	GND		
5	SSRX-	6	SSRX+		
7	GND	8	SSTX-		
9	SSTX+				

2.4.13 USB 2.0

ARK-1251 supports 4 x USB 2.0.



Figure 2.15 USB 2.0 Connector

Table 2.15: USB 2.0 Connector Pin Define			
Pin	Signal Name		
1	VCC		
2	USB Data -		
3	USB Data +		
4	GND		

2.4.13.1 Remote Switch Connector

ARK-1251 provides the remote switch connector for power on/off. From the left to the right are WDT, Power Switch, GND, and Reset.



Figure 2.16 Remote Switch Connector

Table 2.16: Remote Connector Pin Define			
Pin	Signal Name		
1	WDT		
2	Power button		
3	GND		
4	Reset button		

2.5 Installation

2.5.1 Memory and CPU Thermal Pad Installation

1. Loosen the 6 screws on the front/sides and remove the bottom cover











2. Loosen the 4 spring screws on main board.



3. Loosen the 4 screws on the top cover, and remove the top cover.



4. Install CPU thermal pad on top cover





The release paper must be removed when installing thermal pad for CPU.

5. Install the memory into the slots.

6. Replace the top cover with the 6 screws.





There are two thermal pads for second RAM in the accessory box. Please do place the thermal pad for second RAM if needed.



The release paper must be removed when installing thermal pad for memory.



2.5.2 M.2 Module Installation

1. Loosen the 6 screws on the front/sides and remove the bottom cover.









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- 2. Install the M.2 module into the system.
- 3. Replace the bottom cover with the 6 screws.



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			P		

M key is default for storage, *E* key is for WiFi module, and *B* key is for 5G/AI card/ iDoor module.

4. Using 4pcs M3.5 screws in accessory box to install the M.2 SSD thermal kit and thermal pad for M.2 2280 PCIe module.







The release paper must be removed when installing thermal pad for SSD.



Figure 2.18 Placing thermal pad along with the mark



Figure 2.19 Cover up the kit with M3.5 screws
Chapter 2 Hardware Configuration

2.5.3 AMO 1032 + Idoor Installation

AMO-I032 is the expansion kit (M.2 B-Key to mPCIe) for installing iDoor modules on ARK-1251. Users need to install AMO-I032 together with the iDoor module.

1. Loosen the 6 screws on the front/sides and remove the bottom cover.









2. Loosen the 2 screws on the sides and remove the idoor cover



3. Install AMO-I032 on B key and screw it with a M3x5L screw.



- 4. The iDoor module board can then be installed on the AMO-I032.
- 5. Replace the bottom cover with the 6 screws.



Note!

- 2. M.2 E Key cannot be used when adding any MOS module due to mechanical interference.

You need to order the AMO-I032 together with MOS modules.

2.5.4 Adapter Installation

1.

1. Connect the 3-pin Phoenix connector to the DC input.



2.5.5 Wall mount Installation



- 1. Unscrew the 4 x M3x5L screws on both sides of ARK-1251.
- 2. Using the 4 screws removed in the above step to secure the wall mount brackets on both sides of ARK-1251
- 1. Dévissez les 4x vis M3x5L ou des deux côtés de l'ARK-1251.
- 2. Vissez les supports de montage mural des deux côtés de l'ARK-1251 avec les quatre vis à l'arrière.

2.5.6 Din Rail Installation



- 1. Unscrew the 3 x M3x5L screws from the back side of ARK-1251.
- 2. Using 3 screws to secure the DIN-rail bracket on the back.
- 1. Dévissez les 3 vis M3x5L à l'arrière de l'ARK-1251.
- 2. Revissez le support du rail DIN avec les trois vis

2.5.7 VESA Mount Installation



- 1. Unscrew the 4 x M3x5L screws on both sides of ARK-1251.
- 2. Using the 4 screws removed in the above step to secure the wall mount brackets on both sides of ARK-1251
- Using 4 x M4x6L in VESA mount accessory box to install VESA mount on certain object
- 4. Using 4 x M3x6L in VESA mount accessory box to install ARK-1251 on VESA mount.

Note! Wall mount kit AMK-W006 must be used along with VESA mount.



- 1. Dévissez les 4x vis M3x5L ou des deux côtés de l'ARK-1251.
- 2. Vissez les supports de montage mural des deux côtés de l'ARK-1251 avec les quatre vis à l'arrière.
- 3. Utilisation de 4 x M4x6L dans la boîte d'accessoires de montage VESA pour installer le support VESA sur certains objets
- 4. Utilisation de 4 x M3x6L dans la boîte d'accessoires de montage VESA pour installer l'ARK-1251 sur le support VESA.



Les utilisateurs ont besoin d'un support mural lorsqu'ils utilisent le support VESA.

2.5.8 Optional CAN Bus Installation

1. Loosen the 6 screws on the front/sides and remove the bottom cover.











2. Loosen 2 screws of the DIO cable



3. Remove the DIO cable.



4. Install the CAN Bus cable and bottom cover back. (Advantech Part Number 1700030518-01).



5. CAN Bus cable pin definitions are shown below.



Figure 2.20 CAN Bus Connector

Table 2.17: CAN Bus Connector Pin Define	
Pin	Signal Name
1	NC
2	CAN_L
3	GND
4	NC
5	NC
6	NC
7	CAN_H
8	NC
9	NC

ARK-1251 I/O image with optional CAN Bus port.





BIOS Setting

This chapter details instructions for Setting BIOS configuration data.

3.1 Introduction

The AMI BIOS ROM has a built-in setup program — the BIOS Setup Utility — that allows users to modify the basic system configuration. All configuration data is stored in battery-backed CMOS to ensure the setup information is retained when the power is turned off. This chapter describes the basic navigation of the ARK-1251 BIOS setup screens.

3.2 Entering BIOS Setup

Turn on the computer and then press <ESC> or to enter the BIOS Setup menu.

3.2.1 Main Setup

Upon accessing the BIOS Setup Utility, users are presented with the Main setup page. Users can always return to the Main Setup page by selecting the Main tab. The Main BIOS Setup page is shown below.

Main Advanced Chipset Security	Aptio Setup – AMI Boot Save & Exit MEBx	
BIOS Information BIOS Vendor Core Version Compliancy Project Version Build Date and Time Access Level Project Board Version Power Type	American Megatrends 5.0.3.2 1.04 x64 UEFI 2.9; PI 1.7 1251000H060X012 11/29/2024 13:34:51 Administrator ARK-1251 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	32768 MB 4800 MT/s [Fri 11/29/2024] [14:14:17]	<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 1293 Conuright (C) 2024	AMT

The Main BIOS setup page has two main frames. The left frame displays all the items accessible on the Main page. Items that are grayed out cannot be configured, whereas items presented in blue text can be configured. The right frame displays the key legend.

Located above the key legend is an area reserved for a text message. When an item is selected in the left frame, the item is presented in white text and often accompanied by a text message.

System Date / System Time

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

3.2.2 Advanced Setup

Select the Advanced tab from the BIOS Setup Utility to enter the Advanced BIOS Setup page. Select any of the items in the left frame of the screen, such as CPU Configuration, to access the sub-menu for that item. The options for any of the Advanced BIOS Setup items can be displayed by highlighting the item using the <Arrow> keys.

The Advanced BIOS Setup page is shown below:

Aptio Setup – AMI Main <mark>Advanced </mark> Chipset Security Boot Save & Exit MEBx	
WWAN Configuration CPU Configuration Power & Performance PCH-FW Configuration Trusted Computing ACPI Settings iManager Configuration SS RTC Wake Settings Serial Port Console Redirection Intel TXT Information VSB Configuration Network Stack Configuration NVMe Configuration	Configure WWAN related options ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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3.2.2.1 WWAN Configuration

Advanced	Aptio Setup – AMI	
WWAN Device	[Disabled]	Select the M.2 WWAN Device options to enable 5G – M80 (MediaTek) Modems
		<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 1293 Convright (C) 2024 AMT

WWAN Device

Enable or disable M.2 WWAN Device

3.2.2.2 CPU Configuration

Main Advanced Chipset Security		
 WWAN Configuration CPU Configuration Power & Performance PCH-FW Configuration Trusted Computing ACPI Settings iManager Configuration S5 RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration Network Stack Configuration NVMe Configuration 	BOOT SAVE & EXIT MEEX	CPU Configuration Parameters ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 2024	AMI
Advanced	Aptio Setup – AMI	
Advanced CPU Configuration	Aptio Setup – AMI	Displays the E-core Information
Advanced CPU Configuration > Efficient-core Information > Performance-core	Aptio Setup – AMI	Displays the E-core Information

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Advanced	Aptio Setup – AMI	
Boot Guard Status Boot Guard ACM Policy Status Boot Guard SACM Information	0xC0008000 0x000000000000000 0x0000000100000000	▲ Number of SOC-North Efficient-cores to enable in SOC North.
CPU Flex Ratio Override CPU Flex Ratio Settings Intel (VMX) Virtualization	[Disabled] 27 [Enabled]	
AVX Active Performance-cores Active Efficient-cores	[Enabled] [A11] [A11]	
Active SUC-North Efficient-cores Hyper-Threading BIST AP threads Idle Manner	LAII) [Enabled] [Disabled] [MWAIT Loop]	++: Select Screen f↓: Select Item
AES MachineCheck MonitorMWait Intel Invisted Evecution Technology	[Enabled] [Enabled] [Enabled] [Disabled]	Enter: Select +/-: Change Opt. F1: General Help E2: Previous Values
Alias Check Request DPR Memory Size (MB) Reset AUX Content	[Disabled] 4 [No]	F3: Optimized Defaults F4: Save & Exit ESC: Exit
Total Memory Encryption X2APIC Enable Legacy Game Compatibility Mode	[Disabled] [Enabled] [Disabled]	▼

Efficient-core Information

Displays the Efficient-core Information.

Performance-core

Displays the P-core Information.

CPU Flex Ratio Override
 Enable or Disable CPU Flex Ratio Programming.

CPU Flex Ratio Settings

This value must be between the Max Efficiency Ratio (LFM) and the Maximum non-turbo ratio set by hardware (HFM).

Intel® (VMX) Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

AVX

Enable/Disable the Avx 2 Instructions. This is applicable for Performance-core only.

Active Performance-cores

Number of P-cores to enable in each processor package. Note: Number of Cores and E-Cores are looked at together. When both are $\{0,0\}$, Pcode will enable all cores.

Active Efficient-cross

Enable/Disable Per Core Disable. When Per Core Disable Configuration is enabled, selection of Active Cores and Active Efficient-cores will be disabled.

Active SOC-North Efficient-cores

Number of SOC-North Efficient-cores to enable in SOC North

Hyper-Threading

Enable or Disable Hyper-Threading Technology.

BIST

Enable/Disable BIST (Built-in Self Test) on reset.

AP threads Idle Manner

AP threads Idle Manner for waiting signal to run.

AES

Enable/Disable AES. (Advanced Encryption Standard)

MachineCheck

Enable/Disable Machine Check.

MonitorMWait

Enable/Disable MonitorMWait. If Disabled, the AP threads Idle Manner should not be set to MWAIT Loop.

Intel Trusted Execution Technology

Intel® Trusted Execution Technology Enable utilization of additional hardware capabilities provided by Intel® Trusted Execution Technology. Changes require a full power cycle to take effect

Alias Check Request

Enable Txt Alias Checking capability. Changes require full Txt capability before it will take effect. It is a one-time only change, and on the next reboot it will be reset.

DPR Memory Size (MB)

Reserve DPR memory size (0-255) MB.

Reset AUX Content

Reset TPM Aux content. Txt may not be functional after AUX content gets reset.

Total Memory Encryption

Configure Total Memory Encryption (TME) to protect DRAM data from physical attacks. When this option is configured as 'Enabled', 'VT-d' option must be 'Enabled'. This option will be grayed out when 'VT-d' option is configured as 'Disabled'.

X2APIC Enable

Enable/Disable X2APIC Operating Mode. When this option is configured as 'Enabled', 'VT-d' option must be 'Enabled' and 'X2APIC Opt Out' option must be 'Disabled' as well. This option will be grayed out when 'VT-d' option is configured as 'Disabled'.

Legacy Game Compatibility Mode

When enabled, Pressing the scroll lock key will toggle the Efficient-cores between being parked when Scroll Lock LED is on and un-parked when LED is off.

Chapter 3 BIOS Setting

Efficient-core Information

Advanced	Aptio Setup – AMI	
CPU Configuration		▲ Displays the E-core Information
 Efficient-core Information Performance-core 		
Brand String ID Microcode Revision VMX SMX/TXT TXT Crash Code TXT SPAD Boot Guard Status Boot Guard Status Boot Guard ACM Policy Status Boot Guard ACM Information CPU Flex Ratio Override CPU Flex Ratio Override CPU Flex Ratio Settings Intel (VMX) Virtualization Technology AVX Active Performance-cores Active Efficient-cores Active SOC-North Efficient-cores	Intel(R) Core(TM) Ultra 7 165U 0xA06A4 1F Supported Supported 0x0000000 0x50008000 0x000000000000000 0x0000000000	<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	2.22.1293 Copyright (C) 202	24 AMI

Advanced	Aptio Setup – AMI	
Efficient-core Information		
L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache	320 KB 640 KB 6144 KB 12 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>
Ven	sion 2.22.1293 Copyright (C)	2024 AMI

Performance-core

Advanced	Aptio Setup – AMI	
CPU Configuration		Displays the P-core Information
 Efficient-core Information Performance-core 		
Brand String ID Microcode Revision VMX SMX/TXT TXT Crash Code TXT SPAO Boot Guard Status Boot Guard ACM Policy Status Boot Guard ACM Information CPU Flex Ratio Override CPU Flex Ratio Override CPU Flex Ratio Settings Intel (VMX) Virtualization Technology AVX	Intel(R) Core(TM) Ultra 7 165U 0xA06A4 1F Supported Supported 0x0000000 0x904000000000000 0x0000000000	<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>
Active Efficient-cores Active SOC-North Efficient-cores	[A11] [A11] [A11]	
Version	2.22.1293 Copyright (C) 200	24 AMT

Advanced	Aptio Setup - AMI	
Performance-core		
L1 Data Cache L1 Instruction Cache L2 Cache L3 Cache	96 KB 128 KB 4096 KB 12 MB	<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 2.22.1293 Convright (C) 200	24 AMT

Chapter 3 BIOS Setting

3.2.2.3 Power & Performance

Aptio Setup – AMI Main Advanced Chipset Security Boot Save & Exit MEBx	
 WWAN Configuration CPU Configuration Power & Performance PCH-FW Configuration Trusted Computing ACPI Settings iManager Configuration S5 RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration Network Stack Configuration NVMe Configuration 	Power & Performance Options ++: Select Screen 14: Select Item Enter: Select
	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1293 Copyright (C) 202	24 AMI

CPU - Power Management Control

Aptio Setup - Advanced	AMI
Power & Performance	CPU – Power Management Control
▶ CPU – Power Management Control ▶ GT/Media – Power Management Control	up (TURS
	++: Select Screen fl: Select Item Enter: Select +/-: Change Opt. Fl: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
Version 2.22.1293 Copyr:	ESC: Exit

Advanced	Aptio Setup — AMI	
CPU – Power Management Control		Enable/Disable Boot Maximum
Boot Max Frequency Boot performance mode Intel(R) SpeedStep(tm)	(Enabled) [Max Non-Turbo Performance] [Enabled]	
Intel(R) Speed Shift Technology Per Core P State OS control mode Turbo Mode > View/Configure Turbo Options	[Enabled] [Enabled] [Enabled]	
 County for contigurations CPU VR Settings Power Limit 4 Override Power Limit 4 Power Limit 4 Lock 	[Enabled] 42000 [Disabled]	++: Select Screen 11: Select Ttem
Current Power Limit 4 Boost Power Limit 4 Boost C states Thermal Monitor	0.0 0 [Disabled] [Enabled]	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
Timed MWAIT ▶ Power Limit 3 Settings ▶ CPU Lock Configuration	[Disabled]	F3: Optimized Defaults F4: Save & Exit ESC: Exit

Boot Max Frequency

Enable/Disable Boot Maximum Frequency in CPU strap.

Boot performance mode

Select the performance state that the BIOS will set before OS hand-off.

Intel® Speedstep™

Allows more than two frequency ranges to be supported.

Intel® Speed Shift Technology

Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.

Per core P state OS control mode

Enable/Disable Per Core P state OS control mode. Disabling will set Bit 31 = 1 command 0x06. When set, the highest core request is used for all other core requests.

Turbo Mode

Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).

Power Limit 4 Override

Enable/Disable Power Limit 4 override.

Power Limit 4

Power Limit 4 in Milli Watts. BIOS will round to the nearest 1/8W when programming. For 12.50W, enter 12500. If the value is 0, BIOS leaves default value.

Power Limit 4 Lock

Power Limit 4 Lock. When enabled PL4 configurations are locked during OS. When disabled PL4 configuration can be changed during OS.

Power Limit 4 Boots

Configure Power Limit 4 Boost in Watts. The value 0 means disable.

C states

Enable/Disable CPU Power Management.

Thermal Monitor

Enable/Disable Thermal Monitor.

Timed MWAIT

Enable/Disable Timed MWAIT Support.

View/Configure Turbo Options

Advanced	Aptio Setup – AMI	
CPU – Power Management Control		View/Configure Turbo Options
Boot Max Frequency Boot performance mode Intel(R) SpeedStep(tm) Intel(R) Speed Shift Technology Per Core P State OS control mode Turbo Mode View/Configure Turbo Options Config TDP Configurations CPU VR Settings	[Enabled] [Max Non-Turbo Performance] [Enabled] [Enabled] [Enabled] [Enabled]	
Power Limit 4 Override Power Limit 4 Power Limit 4 Lock Current Power Limit 4 Boost Power Limit 4 Boost C states Thermal Monitor Timed MWAIT Power Limit 3 Settings CPU Lock Configuration	[Enabled] 42000 [Disabled] 0.0 0 [Disabled] [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	2.22.1293 Copyright (C) 2024	AMI
Advanced	Aptio Setup – AMI	
Current Turbo Settings Max Turbo Power Limit Min Turbo Power Limit Package TDP Limit Power Limit 1 Power Limit 2 • Turbo Ratio Limit Options Energy Efficient P-state Package Power Limit MSR Lock Energy Efficient Turbo	4095.875 0.0 15.0 15.0 40.0 [Enabled] [Disabled] [Enabled]	View/Configure Turbo Ratio Limit Options
		<pre>++: Select Screen \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$</pre>

Energy Efficient P-state

Enable/Disable Energy Efficient P-state feature.

Package Power Limit MSR Lock

Enable/Disable locking of Package Power Limit settings.

Energy Efficient Turbo

Enable/Disable Energy Efficient Turbo Feature. This feature will opportunistically lower the turbo frequency to increase efficiency.

•	Performance-core Turbo Ratio Limit CoreO defines the core
	range, the turbo ratio is defined in Turbo Ratio Limit
	RatioO. If value is zero, this entry is ignored.
	++: Select Screen
,	†∔: Select Item Enter: Select
	+/−: Change Opt. F1: General Help
9	F2: Previous Values F3: Optimized Defaults
9	F4: Save & Exit ESC: Exit
9	
	9 9 9

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Advanced	Aptio	Setup – AMI	
P-core Turbo Ratio Limit	Ratio2 49		
P-core Turbo Ratio Limit (TRLR)	Ratio3 49		
P-core Turbo Ratio Limit (TRLR)	Ratio4 49		
P–core Turbo Ratio Limit (TRLR)	Ratio5 49		
P–core Turbo Ratio Limit (TRLR)	Ratio6 49		
P–core Turbo Ratio Limit (TRLR)	Ratio7 49		
E–core Turbo Ratio Limit CoreCount0	1		↔: Select Screen t↓: Select Item
E–core Turbo Ratio Limit CoreCount1	2		Enter: Select +/−: Change Opt.
E–core Turbo Ratio Limit CoreCount2	3		F1: General Help F2: Previous Values
E–core Turbo Ratio Limit CoreCount3	4		F3: Optimized Defaults F4: Save & Exit
E–core Turbo Ratio Limit CoreCount4	5		ESC: Exit
E-core Turbo Ratio Limit CoreCount5	6	•	
	Vencion 2 22 1299	Ropupidht (C) 2024	AMT

	Aptio Setup – AMI	
Advanced		
E-core Turbo Ratio Limit	6	Performance-core Turbo Ratio
CoreCountS	0	Limit Ratio0 (TRLR) defines
E–core Turbo Ratio Limit	7	the turbo ratio (max is 85 in
CoreCount6		normal mode and 120 in core
E–core Turbo Ratio Limit	8	extension mode).This Turbo
CoreCount7		Ratio Limit RatioO must be
E-core Turbo Ratio Limit Ratio0	38	greater than or equal all
E-core Turbo Ratio Limit Ratio?	38	value is invalid the set all
E-core Turbo Ratio Limit Ratio3	38	other active cores to minimum.
E–core Turbo Ratio Limit Ratio4	34	Otherwise, align the Ratio 🔹
E–core Turbo Ratio Limit Ratio5	34	
E–core Turbo Ratio Limit Ratio6	34	
E-core Turbo Ratio Limit Ratio7	34	↔ Select Screen
		↑↓: Select Item
P-core Turbo Ratio Limit Core0	1	Enter: Select
P-core Turbo Ratio Limit Core1	2	+/-: Change Opt.
P-core Turbo Ratio Limit Corez	3	F1: General Help
P-core Turbo Ratio Limit Core4	5	F3: Ontimized Defaults
P-core Turbo Ratio Limit Core5	6	F4: Save & Exit
P-core Turbo Ratio Limit Core6	7	ESC: Exit
P-core Turbo Ratio Limit Core7	8	
P–core Turbo Ratio Limit RatioO	49	
(TRLR)		
Version	2 22 1293 Copuridat ((P) 2024 AMT
Version	n 2.22.1293Copyright)	(C) 2024 AMI
Version	a 2.22.1293 Copyright ((C) 2024 AMI
Version Advanced	h 2.22.1293 Copyright o Aptio Setup – AMI	(C) 2024 AMI
Version	n 2.22.1293 Copyright o Aptio Setup – AMI	(C) 2024 AMI
Version Advanced P-core Turbo Ratio Limit Core7	Aptio Setup – AMI	(C) 2024 AMI ▲ Efficient-core Turbo Ratio
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0	Aptio Setup – AMI 8 49	(C) 2024 AMI
Advanced Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) B-core Turbo Ratio Limit Ratio1	Aptio Setup – AMI 8 49	(C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Retio
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR)	Aptio Setup - AMI 8 49	(C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratin3. If value is
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2	Aptio Setup – AMI 8 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored.
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR)	Aptio Setup - AMI 8 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored.
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3	Aptio Setup – AMI 8 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored.
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR)	Aptio Setup – AMI 8 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored.
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4	Aptio Setup - AMI 8 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored.
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR)	Aptio Setup - AMI 8 49 49 49 49	(C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored.
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5	Aptio Setup - AMI Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49	(C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored.
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR)	Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49 49	(C) 2024 AMI
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR)	Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49 49	(C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. ++: Select Screen
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR)	Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. ++: Select Screen 14: Select Item Exter: Select
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio7	Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. ++: Select Screen 14: Select Item Enter: Select +(-: Change Out
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR)	Aptio Setup – AMI Aptio Setup – AMI 8 49 49 49 49 49 49 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. E1: General Hein
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR)	Aptio Setup – AMI 8 49 49 49 49 49 49 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) E-core Turbo Ratio Limit Ratio7 (TRLR) E-core Turbo Ratio Limit	Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. **: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) E-core Turbo Ratio Limit CoreCount0 E-core Turbo Ratio Limit CoreCount1	Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) E-core Turbo Ratio Limit CoreCount0 E-core Turbo Ratio Limit CoreCount1 E-core Turbo Ratio Limit	Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) E-core Turbo Ratio Limit CoreCount0 E-core Turbo Ratio Limit CoreCount1 E-core Turbo Ratio Limit CoreCount2	Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Advanced P-core Turbo Ratio Limit Core7 P-core Turbo Ratio Limit Ratio0 (TRLR) P-core Turbo Ratio Limit Ratio1 (TRLR) P-core Turbo Ratio Limit Ratio2 (TRLR) P-core Turbo Ratio Limit Ratio3 (TRLR) P-core Turbo Ratio Limit Ratio4 (TRLR) P-core Turbo Ratio Limit Ratio5 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio6 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) P-core Turbo Ratio Limit Ratio7 (TRLR) E-core Turbo Ratio Limit CoreCount0 E-core Turbo Ratio Limit CoreCount1 E-core Turbo Ratio Limit CoreCount2 E-core Turbo Ratio Limit	Aptio Setup - AMI 8 49 49 49 49 49 49 49 49 49 49	 (C) 2024 AMI Efficient-core Turbo Ratio Limit CoreCount3 defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio3. If value is zero, this entry is ignored. **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Advanced	Aptio Setup – AMI	
E-core Turbo Ratio Limit	1	Efficient-core Turbo Ratio
CoreCountO E-cope Turbo Patio Limit	0	Limit CoreCount3 defines the
CoreCount1	۷.	defined in E-core Turbo Ratio
E-core Turbo Ratio Limit	3	Limit Ratio3. If value is
CoreCount2		zero, this entry is ignored.
E–core Turbo Ratio Limit	4	
CoreCount3		
E-core Turbo Ratio Limit	5	
CoreCount4 E-core Turbo Patio Limit	c	
CoreCounts	0	
E-core Turbo Ratio Limit	7	
CoreCount6		↔+: Select Screen
E-core Turbo Ratio Limit	8	†↓: Select Item
CoreCount7		Enter: Select
E–core Turbo Ratio Limit RatioO	38	+/-: Change Opt.
E-core Turbo Ratio Limit Ratio1	38	F1: General Help
E-core Turbo Ratio Limit Ratio2	38	F2: Previous Values
E-core Turbo Ratio Limit Ratio3	38	F3: Uptimized Defaults
E-COME TURBO Ratio Limit Ratios	34	F90. Evit
E-core Turbo Ratio Limit Ratio6	34	LOU. LAIC
E-core Turbo Ratio Limit Ratio7	34	

P-Core Turbo Ratio Limit Core

Performance-core Turbo Ratio Limit Core(x) defines the core range, the turbo ratio is defined in Turbo Ratio Limit Ratio(x). If value is zero, this entry is ignored.

P-Core Turbo Ratio Limit Ratio

Performance-core Turbo Ratio Limit Ratio(x) (TRLR) defines the turbo ratio (max is 85 in normal mode and 120 in core extension mode).

E-Core Turbo Ratio Limit CoreCount

Efficient-core Turbo Ratio Limit CoreCount(x) defines the core range, the turbo ratio is defined in E-core Turbo Ratio Limit Ratio(x). If value is zero, this entry is ignored.

E-Core Turbo Ratio Limit Ratio

Efficient-core Turbo Ratio Limit Ratio(x) defines the turbo ratio (max is 85 irrespective of the core extension mode), the core range is defined in E-core Turbo Ratio Limit CoreCount(x).

Config TDP Configurations

Advanced	Aptio Setup – AMI	
CPU – Power Management Control		cTDP (Assured Power)
Boot Max Frequency Boot performance mode Intel(R) SpeedStep(tm) Intel(R) Speed Shift Technology Per Core P State OS control mode Turbo Mode ▶ View/Configure Turbo Options ▶ Config TDP Configurations	[Enabled] [Max Non-Turbo Performance] [Enabled] [Enabled] [Enabled] [Enabled]	Configurations
 CPU VR Settings Power Limit 4 Override Power Limit 4 Power Limit 4 Lock Current Power Limit 4 Boost Power Limit 4 Boost C states Thermal Monitor Timed MWAIT Power Limit 3 Settings CPU Lock Configuration 	[Enabled] 42000 [Disabled] 0.0 0 [Disabled] [Enabled] [Disabled]	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 2 Aptio Setup – AMI	2024 AMI
Advanced		
Config TDP Configurations Enable Configurable TDP Configurable TDP Boot Mode Configurable TDP Lock CTDP BIOS control ConfigTDP Levels ConfigTDP Turbo Activation Ratio Power Limit 1 Power Limit 2 Custom Settings Nominal	[Applies to cTDP] [Nominal] [Disabled] [Disabled] 3 16 (Unlocked) 15.0W (MSR:15.0) 40.0W (MSR:40.0)	Applies cTDP (Assured Power) initialization settings based on non-cTDP (Assured Power) or cTDP (Assured Power). Default is 1: Applies to cTDP (Assured Power); if 0 then applies non-cTDP (Assured Power) and BIOS will bypass cTDP (Assured Power) initialzation flow
ConfigTDP Nominal Power Limit 1 Power Limit 2 Power Limit 1 Time Window ConfigTDP Turbo Activation Ratio Custom Settings Level1 ConfigTDP Level1 Power Limit 1	Ratio:17 TAR:16 PL1:15.0W 15000 40000 [0] 0 Ratio:14 TAR:13 PL1:12.0W	<pre>++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
TOWER LINER I		

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Advanced	Aptio Setup – AMI	
Power Limit 2	40.0W (MSR:40.0)	▲ Custom value for Turbo Activation Ratio. Needs to be
Custom Settings Nominal		configured with valid values
ConfigTDP Nominal	Ratio:17 TAR:16 PL1:15.0W	from LFM to Max Turbo. O means don't use custom value.
Power Limit 1	15000	
Power Limit 2	40000	
Power Limit 1 Time Window	[0]	
ConfigTDP Turbo Activation Ratio	0	
Custom Settings Level1		
ConfigTDP Level1	Ratio:14 TAR:13 PL1:12.0W	
Power Limit 1	0	↔+: Select Screen
Power Limit 2	0	↑↓: Select Item
Power Limit 1 Time Window	[0]	Enter: Select
ConfigTDP Turbo Activation Ratio	0	+/-: Change Opt.
		F1: General Help
Custom Settings Level2		F2: Previous Values
ConfigTDP Level2	Ratio:27 TAR:26 PL1:28.0W	F3: Optimized Defaults F4: Save & Exit
Power Limit 1	0	ESC: Exit
Power Limit 2	0	
Power Limit 1 Time Window	[0]	
ConfigTDP Turbo Activation Ratio	0	▼
Version	2 22 1293 Conuright (C)	2024 AMT

Enable Configurable TDP

Applies TDP initialization settings based on non-cTDP or cTDP

- Configurable TDP Boot Mode
 Configurable TDP Mode as Nominal/Up/Down/Deactivate TDP selection.
- Configurable TDP Lock
 Configurable TDP Mode Lock sets the Lock bit.

CTDP BIOS control

Enables CTDP control via runtime ACPI BIOS method.

- Power Limit 1 Power Limit 1 in Milli Watts.
- Power Limit 2
 Power Limit 2 in Milli Watts.
- Power Limit 1 Time Window
 Power Limit 1 Time Window value in seconds.
- ConfigTDP Turbo Activation Ratio
 Custom value for Turbo Activation Ratio.

CPU VR Settings

Advanced	Aptio Setup – AMI	
CPU – Power Management Control		CPU VR Settings
Boot Max Frequency Boot performance mode Intel(R) SpeedStep(tm) Intel(R) Speed Shift Technology Per Core P State OS control mode Turbo Mode View/Configure Turbo Options Config TDP Configurations CPU VR Settings	[Enabled] [Max Non-Turbo Performance] [Enabled] [Enabled] [Enabled] [Enabled]	
Power Limit 4 Override Power Limit 4 Power Limit 4 Lock Current Power Limit 4 Boost Power Limit 4 Boost C states Thermal Monitor Timed MWAIT Power Limit 3 Settings CPU Lock Configuration	[Enabled] 42000 [Disabled] 0.0 0 [Disabled] [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	2.22.1293 Copyright (C) 2024	AMI
Advanced	Aptio Setup – AMI	
CPU VR Settings PSYS Slope PSYS Offset PSYS Prefix PSYS PMax Power Vsys/Psys Critical Assertion Deglitch Mantissa Assertion Deglitch Exponent De assertion Deglitch Mantissa De assertion Deglitch Exponent SVID Stabilization Delay	0 0 [+] 0 [Disabled] 1 0 13 2 3	PSYS Slope defined in 1/100 increments. Range is 0–200. For a 1.25 slope, enter 125. 0 = AUTO.
 Acoustic Noise Settings Efficiency/Performance VR Settings GT VR Settings SA VR Settings RFI Settings 		<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>

PSYS Slope

PSYS Slope defined in 1/100 increments. Range is 0-200. For a 1.25 slope, enter 125. 0 = AUTO. Uses BIOS VR mailbox command 0x9.

PSYS Offset

PSYS Offset defined in 1/1000 increments. Range is 0-63999. For an offset of 25.348, enter 25348. PSYS Uses BIOS VR mailbox command 0x4.

PSYS Prefix

Sets the offset value as positive or negative.

PSYS PMax Power

PSYS PMax power, defined in 1/8 Watt increments. Range 0-8191. For a PMax of 125W, enter 1000. 0 = AUTO. Uses BIOS VR mailbox command 0xB.

Vsys/Psys Critical

Vsys/Psys Critical Enable or disable.

Assertion Deglitch Mantissa

Assertion Deglitch Mantissa 0x4F[7-3]. Assertion Deglitch = $2\mu s *$ Mantissa * $2^{(Exponent)}$.

Assertion Deglitch Exponent

Assertion Deglitch Exponent 0x4F[3-0]. Assertion Deglitch = $2\mu s *$ Mantissa * $2^{(Exponent)}$.

De assertion Deglitch Mantissa

De Assertion Deglitch Mantissa 0x49[7-3]. Assertion Deglitch = $2\mu s *$ Mantissa * $2^{(Exponent)}$.

De assertion Deglitch Exponent

De Assertion Deglitch Exponent 0x49[3-0]. Assertion Deglitch = $2\mu s *$ Mantissa * $2^{(Exponent)}$.

SVID Stabilization Delay

Configure SVID Stabilization Delay (in us) being used for the FVM feature when it is enabled. Note that this delay applies to all SVID domains equally (no unique values possible for IA/GT/SA).

Acoustic Noise Settings

Advanced	Aptio Setup – AMI	
CPU VR Settings PSYS Slope PSYS Offset PSYS Prefix PSYS PMax Power Vsys/Psys Critical Assertion Deglitch Mantissa Assertion Deglitch Exponent	0 0 [+] 0 [Disabled] 1 0	Configure Acoustic Noise Settings for Core, GT and SA domains
De assertion Deglitch Mantissa De assertion Deglitch Exponent SVID Stabilization Delay Acoustic Noise Settings Efficiency/Performance VR Settings GT VR Settings SA VR Settings RFI Settings	13 2 3	<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	2.22.1293 Copyright (C) 202	4 AMI

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	
Core VR Domain		
Disable Fast PKG C State Ramp for	[FALSE]	
Core Domain Clow Clow Pote for Core Demain	[Foot /2]	
SIDW SIEW RALE TOP COPE DOMAIN	[FdSt/2]	
GT VR Domain		
Disable Fast PKG C State Ramp for	[FALSE]	↔+: Select Screen
GT Domain		↑↓: Select Item
Slow Slew Rate for GT Domain	[Fast/2]	Enter: Select
		+/−: Change Opt.
SA VR Domain		F1: General Help
Disable Fast PKG C State Ramp for	[FALSE]	F2: Previous Values
SA Domain		F3: Optimized Defaults
		F4: Save & Exit
		ESU: EXIT

Acoustic Noise Mitigation

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

Pre Wake time

Set the maximum Pre Wake randomization time in micro ticks. Range is 0-255. This is for acoustic noise mitigation Dynamic Perodicity Alteration (DPA) tuning.

Ramp Up Time

Set the maximum Ramp Up randomization time in micro ticks. Range is 0-255. This is for acoustic noise mitigation Dynamic Perodicity Alteration (DPA) tuning.

Ramp Down Time

Set the maximum Ramp Down randomization time in micro ticks. Range is 0-255. This is for acoustic noise mitigation Dynamic Perodicity Alteration (DPA) tuning.

Disable Fast PKG C State Ramp for Core Domain

This option needs to be configured to reduce acoustic noise during deeper C states. False: Don't disable Fast ramp during deeper C states; True: Disable Fast ramp during deeper C state.

Slow Slew Rate for Core Domain

Set VR Core Slow Slew Rate for Deep Package C State ramp time; Slow slew rate equals to Fast divided by number, the number is 2, 4, 8, 16 to slow down the slew rate to help minimize acoustic noise.

Disable Fast PKG C State Ramp for GT Domain

This option needs to be configured to reduce acoustic noise during deeper C states. False: Don't disable Fast ramp during deeper C states; True: Disable Fast ramp during deeper C state.

Slow Slew Rate for GT Domain

Set VR GT Slow Slew Rate for Deep Package C State ramp time; Slow slew rate equals to Fast divided by number, the number is 2, 4, 8 to slow down the slew rate to help minimize acoustic noise; divide by 16 is disabled.

Disable Fast PKG C State Ramp for SA Domain

This option needs to be configured to reduce acoustic noise during deeper C states. False: Don't disable Fast ramp during deeper C states; True: Disable Fast ramp during deeper C state.

Efficiency/Performance VR Settings

Advanced	Aptio Setup – AMI	
Advanced CPU VR Settings PSYS Slope PSYS Offset PSYS Prefix PSYS PMax Power Vsys/Psys Critical Assertion Deglitch Mantissa Assertion Deglitch Exponent De assertion Deglitch Exponent SVID Stabilization Delay Acoustic Noise Settings Efficiency/Performance VR Settings Efficiency/Performance VR Settings SA VR Settings RFI Settings	Aptio Setup - AMI 0 [+] 0 [Disabled] 1 0 13 2 3	Efficiency/Performance VR Settings ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version (2.22.1293 Conuright (C) 202	4 AMT

	Aptio Setup – AMI	
Advanced		
Efficiency/Performance VR Domain		VR Config Enable
VR Config Enable	[Enabled]	
Current AC Loadline	190	
Current DC Loadline	190	
Current Psi1 Threshold	80	
Current Psi2 Threshold	20	
Current Psi3 Threshold	4	
Current Imon Slope	100	
Current Imon Offset	0	
Current VR ICC MAX	376	
Current VR ICC Limit	280	
Current Tud Current Limit	1720	Ht. Salact Scheen
AC Loadline	0	11: Select Item
DC Loadline	0	Enter: Select
PS Current Threshold1	80	+/-: Change Ont
PS Current Threshold2	20	E1: General Heln
PS Current Threshold3	4	F2: Previous Values
PS3 Enable	[Enabled]	F3: Optimized Defaults
PS4 Enable	[Enabled]	F4: Save & Exit
IMON Slope	0	ESC: Exit
IMON Offset	0	
IMON Prefix	[+]	
VR Current Limit	0	· · · · · · · · · · · · · · · · · · ·
Version	2.22.1293 Copyright (C)	2024 AMI
Advanced	Aptio Setup – AMI	
Advanced	Aptio Setup – AMI	
Advanced Advanced	Aptio Setup - AMI	Core VR Fast Vmode. Use to
Advanced AC Loadline DC Loadline	Aptio Setup - AMI 0 0	▲ Core VR Fast Vmode. Use to control Core Fast Vmode
Advanced AC Loadline DC Loadline PS Current Threshold1	Aptio Setup - AMI 0 0 80	▲ Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2	Aptio Setup - AMI 0 0 80 20	▲ Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3	Aptio Setup - AMI 0 0 80 20 4	▲ Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable	Aptio Setup - AMI 0 0 80 20 4 [Enabled]	▲ Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable	Aptio Setup - AMI 0 0 80 20 4 [Enabled] [Enabled]	▲ Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope	Aptio Setup - AMI 0 0 80 20 4 [Enabled] [Enabled] 0	Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Offset	Aptio Setup - AMI 0 0 80 20 4 [Enabled] [Enabled] 0 0	Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Offset IMON Prefix	Aptio Setup - AMI 0 0 4 [Enabled] [Enabled] 0 0 [+] 0 0	Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced 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	Aptio Setup - AMI 0 0 4 [Enabled] [Enabled] 0 0 [+] 0 [Enabled]	Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Slope IMON Offset IMON Prefix VR Current Limit Core VR Fast Vmode	Aptio Setup - AMI 0 0 80 20 4 [Enabled] [Enabled] 0 [+] 0 [Enabled] 0	Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced 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 VR Fast Vmode DCf Limit VR East Vmode DCf Limit	Aptio Setup - AMI 0 0 80 20 4 [Enabled] [Enabled] 0 1 [H] 0 [Enabled] 0 0 0 [H] 0 0 [Enabled] 0 0 0 0 [H] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced 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 VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit	Aptio Setup - AMI 0 0 80 20 4 [Enabled] [Enabled] 0 0 [+] 0 [Enabled] 0 0 [=nabled] 0 0 0 [+] 0 0 0 [0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Slope IMON Prefix VR Current Limit Core VR Fast Vmode VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable	Aptio Setup - AMI 0 0 0 80 20 4 [Enabled] [Enabled] 0 0 [+] 0 [Enabled] 0 [Enabled] 0 [Enabled] 0 0 [Enabled] 0 0 0 [Enabled] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable. ++: Select Screen 14: Select Item Enter: Select
Advanced 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 VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable IDC Current Limit	Aptio Setup - AMI 0 0 0 80 20 4 [Enabled] [Enabled] 0 0 [+] 0 [Enabled] 0 0 [Enabled] 0 0 0 [Enabled] 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable. ++: Select Screen 14: Select Item Enter: Select +/-: Change Ont
Advanced 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 VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable TDC Current Limit	Aptio Setup - AMI 0 0 0 80 20 4 [Enabled] [Enabled] 0 0 [+] 0 [Enabled] 0 0 [Enabled] 0 0 [Enabled] 0 0 [Enabled] 0 0 [Auto]	 Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable. **: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Slope IMON Prefix VR Current Limit Core VR Fast Vmode VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock	Aptio Setup - AMI 0 0 0 80 20 4 [Enabled] [Enabled] 0 0 [Enabled] 0 [Enabled] 0 0 [Enabled] 0 0 [Enabled] 0 [Enabled] 0 [Auto] [Disabled]	 Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable. **: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values
Advanced 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 VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock TRMS	Aptio Setup - AMI 0 0 4 (Enabled) (Enabled) 0 0 (Enabled] 0 (Enabled] 0 0 (Enabled] 0 0 (Enabled] 0 (Inisabled] [Disabled] [Disabled]	 Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable. **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Ontimized Defaults
Advanced AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Slope IMON Offset IMON Prefix VR Current Limit Core VR Fast Vmode VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock IRMS PS1 to PS0 Dynamic Cutoff Enable	Aptio Setup - AMI 0 0 4 [Enabled] [Enabled] 0 0 (F+] 0 [Enabled] 0 0 [Enabled] 0 0 [Enabled] 0 [Disabled] [Disabled] [Disabled]	 Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable. **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit

ARK-1251 User Manual

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PS3 Enable .

CEP Enable SIRP Enable

VCC Demotion Shutdown Threshold

VR Config Enable

VR Config Enable.

PS3 Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.

- **PS4 Enable**

[Enabled] [Disabled]

0

 $\mathsf{PS4}$ Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.

- IMON Prefix Sets the offset value as positive or negative.
- Core VR Fast Vmode
 - Core VR Fast Vmode. Use to control Core Fast Vmode Enable/Disable.
- TDC Enable TDC Enable. 0- Disable, 1 Enable
- TDC Time Window
 VR TDC Time Window, value in seconds. 1s is default. Range from 1s to 448s.
- TDC Lock Enable/Disable TDC Lock.

Enable/Disable IRMS - Current root mean square.

- PS1 to PS0 Dynamic Cutoff Enable PS1 to PS0 Dynamic Cutoff Enable/Disable.
- PS2 to PS1 Dynamic Cutoff Enable
 PS2 to PS1 Dynamic Cutoff Enable/Disable.
- CEP Enable Enable/Disable SIRP (SoC Iccmax Reactive Protection) Support.

SIRP Enable

Enable/Disable SIRP (SoC Iccmax Reactive Protection) Support

GT VR Settings

Advanced	Aptio Setup – AMI	
Advanced CPU VR Settings PSYS Slope PSYS Offset PSYS Prefix PSYS PMax Power Vsys/Psys Critical Assertion Deglitch Mantissa Assertion Deglitch Exponent De assertion Deglitch Exponent SVID Stabilization Delay Acoustic Noise Settings Efficiency/Performance VR Settings Efficiency/Performance VR Settings	Aptio Setup - AMI 0 [+] 0 [Disabled] 1 0 13 2 3	GT VR Settings ++: Select Screen 11: Select Item
▶ SA VR Settings ▶ RFI Settings		Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Advanced	Aptio Setup – AMI	
GT Domain		VR Config Enable
VR Contig Enable Current AC Loadline	[Enabled]	
Current DC Loadline	310	
Current Psi1 Threshold	80	
Current Psi2 Threshold	20	
Current Psi3 Threshold	4	
Current Imon Offset	0	
Current VR ICC MAX	160	
Current VR ICC Limit	0	
Current Tdc Current Limit	115	tt: Coloct Concon
AC Loadline	0	14: Select Item
DC Loadline	Ő	Enter: Select
PS Current Threshold1	80	+/-: Change Opt.
PS Current Threshold2	20	F1: General Help
PS Current Threshold3 PS3 Enable	4 [Enabled]	F2: Previous Values
PS4 Enable	[Enabled]	F4: Save & Exit
IMON Slope	0	ESC: Exit
IMON Offset	0	
IMON Pretix	[+]	
WY BUT CITE LINE	Ŭ.	
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Version	2.22.1293 Copyright (C) :	2024 AMI
Version	2.22.1293 Copyright (C) (Aptio Setup – AMI	2024 AMI
Version Advanced	2.22.1293 Copyright (C) 3 Aptio Setup – AMI	2024 AMI
Version Advanced Current Tdc Current Limit	2.22.1293 Copyright (C) : Aptio Setup – AMI 115	2024 AMI Voltage Regulator Current
Version Advanced Current Tdc Current Limit Current Voltage Limit	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500	2024 AMI ▲ Voltage Regulator Current Limit (Icc Max). This value
Version Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0	2024 AMI Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instructed agreed
Version Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline PS Current Threshold1	2.22.1293 Copyright (C) 2 Aptio Setup - AMI 115 1500 0 80	2024 AMI Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value
Version Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2	2.22.1293 Copyright (C) 2 Aptio Setup - AMI 115 1500 0 80 20	2024 AMI ▲ Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A
Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3	2.22.1293 Copyright (C) 2 Aptio Setup - AMI 115 1500 0 0 80 20 4	2024 AMI ✓ Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 =
Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled]	Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO.
Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable TMON Slope	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0	Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTD.
Advanced 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	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] [Enabled] 0 0	Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTD.
Advanced 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	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 0 [+]	Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTD.
Advanced 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 Prefix VR Current Limit	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 [+] 0	Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO.
Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Slope IMON Prefix VR Current Limit GT VR Fast Vmode	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 [+] 0 [Enabled] 0 0	 Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. ++: Select Screen tl: Select Item
Advanced 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 GT VR Fast Vmode ICC Limit VR Fast Vmode Offset	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 0 0 20 4 [Enabled] [Enabled] 0 1 [Enabled] 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	 Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. ++: Select Screen fl: Select Item Enter: Select
Advanced 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 GT VR Fast Vmode VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit	2.22.1293 Copyright (C) 2 Aptio Setup - AMI 115 1500 0 0 0 0 20 4 [Enabled] [Enabled] 0 0 [Filabled] 0 0 0 0 0 0 0 0 0 0 0 0 0	 Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt.
Advanced 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 GT VR Fast Vmode VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable	2.22.1293 Copyright (C) 2 Aptio Setup - AMI 115 1500 0 0 0 0 20 4 [Enabled] [Enabled] 0 0 0 [F] [Enabled] 0 0 0 1 [Enabled] 0 0 0 0 0 0 0 0 0 0 0 0 0	 Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help
Advanced 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 Slope IMON Prefix VR Current Limit GT VR Fast Vmode VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable TDC Current Limit	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 [Enabled] 0 0 [Enabled] 0 0 0 [Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 0 (Enabled] 0 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 (Enabled] 0 0 0 0 0 0 0 0 0 (Enabled] 0 0 0 0 0 0 0 0 0 0 0 0 0	 Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Ontimized Defaults
Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Offset IMON Prefix VR Current Limit GT VR Fast Vmode VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 [Enabled] 0 0 1+] 0 [Enabled] 0 0 1+] 0 [Enabled] 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	 Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. *+: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC 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 ICC Limit VR Fast Vmode ICC Limit VR Fast Vmode ICC Limit VR Voltage Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock IRMS	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 (Enabled] 0 0 1+] 0 [Enabled] 0 0 1+] 0 [Enabled] 0 0 1 [Enabled] 0 1 1 1 1 1 1 1 1 1 1 1 1 1	Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline DC Loadline PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope IMON Offset IMON Prefix VR Current Limit GT VR Fast Vmode VR Fast Vmode ICC Limit VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock IRMS PS1 to PS0 Dynamic Cutoff Enable	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 1+] 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 1 [Enabled] 0 0 1 [Enabled] 0 0 1 [Enabled] 0 0 1 [Enabled] 0 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 0 1 [Enabled] 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. **: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Advanced 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 GT VR Fast Vmode ICC Limit VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable TDC Current Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock IRMS PS1 to PS0 Dynamic Cutoff Enable PSE Fasble	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 [Linabled] 0 0 1 [Enabled] 0 0 1 [Enabled] 0 0 1 [Enabled] 0 0 1 [Enabled] 0 0 1 [Enabled] 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Advanced Current Tdc Current Limit Current Voltage Limit AC Loadline DC 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 ICC Limit VR Fast Vmode ICC Limit VR Fast Vmode Offset VR Voltage Limit TDC Enable TDC Current Limit TDC Time Window TDC Lock IRMS PS1 to PS0 Dynamic Cutoff Enable PS2 to PS1 Dynamic Cutoff Enable CEP Enable	2.22.1293 Copyright (C) : Aptio Setup - AMI 115 1500 0 0 80 20 4 [Enabled] [Enabled] 0 0 [Enabled] 0 0 [Enabled] 0 0 [Enabled] 0 0 [Enabled] 0 0 (Lisabled] 0 0 [Disabled]	Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTO. **: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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VR Config Enable

VR Config Enable.

PS3 Enable

PS3 Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.

PS4 Enable

 $\mathsf{PS4}$ Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.

- IMON Prefix Sets the offset value as positive or negative.
- GT VR Fast Vmode
 GT VR Fast Vmode. Use to control GT Fast Vmode Enable/Disable.
- TDC Enable TDC Enable. 0- Disable, 1 – Enable

TDC Time Window VR TDC Time Window, value in seconds. 1s is default. Range from 1s to 448s.

- TDC Lock
 Enable/Disable TDC Lock.
- IRMS Enable/Disable IRMS - Current root mean square.
- PS1 to PS0 Dynamic Cutoff Enable PS1 to PS0 Dynamic Cutoff Enable/Disable.
- PS2 to PS1 Dynamic Cutoff Enable
 PS2 to PS1 Dynamic Cutoff Enable/Disable.

CEP Enable Enable/Disable CEP (Current Excursion Protection) Support.

SA VR Settings

Advanced	Aptio Setup – AMI	
CPU VR Settings		SA VR Settings
<pre>PSYS Slope PSYS Offset PSYS Prefix PSYS PMax Power Vsys/Psys Critical Assertion Deglitch Mantissa Assertion Deglitch Exponent De assertion Deglitch Exponent SVID Stabilization Delay Acoustic Noise Settings Efficiency/Performance VR Settings GT VR Settings SA VR Settings RFI Settings</pre>	0 0 [+] 0 [Disabled] 1 0 13 2 3	<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>
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Advanced	Aptio Setup – AMI	
SA 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	[Enabled] 490 490 80 40 4 100	
Current VR ICC MAX Current VR ICC Limit Current Tdc Current Limit Current Voltage Limit AC Loadline DC Loadline	140 104 120 1500 0	++: Select Screen ↑↓: Select Item Enter: Select
PS Current Threshold1 PS Current Threshold2 PS Current Threshold3 PS3 Enable PS4 Enable IMON Slope	80 40 4 [Enabled] [Enabled] 0	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
IMON Offset IMON Prefix VR Current Limit	0 [+] 0	
Version	2 22 1293 Conuright	(C) 2024 AMT
Version	2.22.1293 Copyright Aptio Setup – AMI	(C) 2024 AMI
Version Advanced	2.22.1293 Copyright Aptio Setup – AMI	(C) 2024 AMI
Advanced 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	2.22.1293 Copyright Aptio Setup - AMI 120 1500 0 80 40 4 [Enabled] [Enabled] 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1	(C) 2024 AMI ▲ Voltage Regulator Current Limit (Icc Max). This value represents the Maximum instantaneous current allowed at any given time. The value is represented in 1/4 A increments. A value of 400 = 100A. 0 means AUTD.

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VR Config Enable

VR Config Enable.

PS3 Enable

PS3 Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.

PS4 Enable

 $\mathsf{PS4}$ Enable/Disable. 0 - Disabled, 1 - Enabled. Uses BIOS VR mailbox command 0x3.

- IMON Prefix Sets the offset value as positive or negative.
- SA VR Fast Vmode SA VR Fast Vmode. Use to control SA Fast Vmode Enable/Disable.
- TDC Enable TDC Enable. 0- Disable, 1 Enable

TDC Time Window VR TDC Time Window, value in seconds. 1s is default. Range from 1s to 448s.

- TDC Lock
 Enable/Disable TDC Lock.
- IRMS Enable/Disable IRMS - Current root mean square.
- PS1 to PS0 Dynamic Cutoff Enable
 PS1 to PS0 Dynamic Cutoff Enable/Disable.
- PS2 to PS1 Dynamic Cutoff Enable
 PS2 to PS1 Dynamic Cutoff Enable/Disable.

CEP Enable Enable/Disable CEP (Current Excursion Protection) Support.

RFI Settings

Advanced	Aptio Setup – AMI	
CPU VR Settings		RFI Settings
PSYS Slope PSYS Offset PSYS Prefix PSYS PMax Power Vsys/Psys Critical Assertion Deglitch Mantissa Assertion Deglitch Exponent De assertion Deglitch Exponent SVID Stabilization Delay Acoustic Noise Settings Efficiency/Performance VR Settings Sf VR Settings Sf VR Settings RFI Settings	0 0 [+] 0 [Disabled] 1 0 13 2 3	<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 :	2.22.1293 Copyright (C) 202	4 AMI

Advanced	Aptio Setup – AMI	
RFI Domain		Enable/Disable Global DLVR RFI
Global DLVR RFI Mitigation Control DLVR SSC Value DLVR RFI Frequency	[Enabled] 6 1370	Mitigation Control
		<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>

- Global DLVR RFI Mitigation Control Enable/Disable Global DLVR RFI Mitigation Control.
- DLVR SSC Value DLVR SSC in percentage with multiple of 0.25%. 0 = 0%, 31 = 7.75%.
- DLVR RFI Frequency
 DLVR RFI Frequency in MHz.

Power Limit 3 Settings

		Antio Setup - AMT	
	Advanced	nptio octup Inii	
Γ	CPU – Power Management Control		Power Limit 3 Settings
	Boot Max Frequency Boot performance mode Intel(R) SpeedStep(tm) Intel(R) Speed Shift Technology Per Core P State OS control mode Turbo Mode View/Configure Turbo Options	[Enabled] [Max Non-Turbo Performance] [Enabled] [Enabled] [Enabled] [Enabled]	
•	 Config TDP Configurations CPU VR Settings Power Limit 4 Override Power Limit 4 Power Limit 4 Lock Current Power Limit 4 Boost Power Limit 4 Boost C states Thermal Monitor Timed MMATT 	[Enabled] 42000 [Disabled] 0.0 0 [Disabled] [Enabled] [Disabled]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values E3: Ontimized Defaults
	• Power Limit 3 Settings • CPU Lock Configuration		F4: Save & Exit ESC: Exit
L			
	Version	2.22.1293 Copyright (C) 2	2024 AMI
	Version	2.22.1293 Copyright (C) 2	2024 AMI
	Version Advanced	2.22.1293 Copyright (C) 2 Aptio Setup – AMI	2024 AMI
	Version Advanced Power Limit 3 Override Power Limit 3 Time Window Power Limit 3 Duty Cycle Response Mode Power Limit 3 Lock	2.22.1293 Copyright (C) 2 Aptio Setup – AMI [Enabled] 42000 [0] 0 [Gradual Power Reduction] [Disabled]	Enable/DisablePower Limit 3 override. If this option is disabled, BIOS will leave the hardware default values for Power Limit 3 and Power Limit 3 Time Window.

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Power Limit 3 Override

Enable/Disable Power Limit 3 override.

Power Limit 3

Power Limit 3 in Milli Watts/Percent. BIOS will round to the nearest 1/8W when programming. For example, if 12.50W, enter 12500, if 12%, enter 12000, if 50%, enter 50000. If the value is 0, BIOS leaves the hardware default value.
Power Limit 3 Time Window

Power Limit 3 Time Window value in Milli seconds. The value may vary from 3 to 64(max). Indicates the time window over which Power Limit 3 value should be maintained. If the value is 0, BIOS leaves the hardware default value.

Power Limit 3 Duty Cycle

Specify the duty cycle in percentage that the CPU is required to maintain over the configured time window. Range is 0-100.

Response Mode

Use Response Mode to adjust Psys_PL3 power reduction behavior. Batteryenabled systems use Gradual Power Reduction.

Power Limit 3 Lock

Power Limit 3 Lock. When enabled PL3 configurations are locked during OS. When disabled PL3 configuration can be changed during OS.

CPU Lock Configuration

Advanced	Aptio Setup – AMI	
CPU – Power Management Control		CPU Lock Configuration
Boot Max Frequency Boot performance mode Intel(R) SpeedStep(tm) Intel(R) Speed Shift Technology Per Core P State OS control mode Turbo Mode ▶ View/Configure Turbo Options	[Enabled] [Max Non-Turbo Performance] [Enabled] [Enabled] [Enabled] [Enabled]	
 ViewConfigure in Bo options Config TDP Configurations CPU VR Settings Power Limit 4 Override Power Limit 4 Lock Current Power Limit 4 Boost Content of the Source of the Sour	[Enabled] 42000 [Disabled] 0.0 0 [Disabled] [Enabled] [Disabled]	<pre> ++: Select Screen ↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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CFG Lock

Configure MSR 0xE2[15], CFG Lock bit.

GT/Media - Power Management Control



Advanced	Aptio Setup – AMI	
GT/Media – Power Management Control RC6(Render Standby) MC6(Media Standby) Maximum GT frequency Disable Turbo GT frequency	[Enabled] [Enabled] [Default Max Frequency] [Disabled]	Check to enable render standby support.
		<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>

- RC6 (Render Standby)
 Check to enable render standby support.
- MC6 (Media Standby) Check to enable Media standby support.
- Maximum GT frequency
 Maximum GT frequency limited by the user.
- Disable Turbo GT frequency
 Enabled: Disables Turbo GT frequency. Disabled: GT frequency is not limited.

3.2.2.4 PCH-FW Configuration

Aptio Setup – AMI Main <mark>Advanced</mark> Chipset Security Boot Save & Exit MEBx	
 WWAN Configuration CPU Configuration Power & Performance PCH-FW Configuration Trusted Computing ACPI Settings iManager Configuration SS RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration Network Stack Configuration Network Stack Configuration 	Configure Management Engine Technology Parameters
	<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 2.22.1293 Copyright (C) 202	P4 AMI

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	18.0.10.2288 Normal Mode Corporate SKU 0xA0000255 0x69008300 0x00000030 0x00000000 0x02620000 0x00000000	When Disabled ME will not be unconfigured on RTC Clear
ME State Manageability Features State ME Unconfig on RTC Clear Core Bios Done Message TPM Device Selection ▶ Firmware Update Configuration	[Enabled] [Enabled] [Enabled] [Enabled] [dTPM]	<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt.</pre>
 Anti-Rollback SVN Configuration OEM Key Revocation Configuration Extend CSME Measurement to TPM-PCR 	[Disabled]	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	.22.1293 Copyright (C) 2024	AMI

ME State

When Disabled, ME will be put into ME Temporarily Disabled Mode.

- Manageability Features State
 When Disabled, ME will not be unconfigured on RTC Clear.
- ME Unconfig on RTC Clear

When Disabled, ME will not be unconfigured on RTC Clear.

- Core BIOS Done Message Enable/Disable Core BIOS Done message sent to ME.
- TPM Device Selection Selects TPM device: PTT or dTPM. PTT - Enables PTT in SkuMgr dTPM 1.2 -Disables PTT in SkuMgr Warning ! PTT/dTPM will be disabled and all data saved on it will be lost.

Extend CSME Measurement to TPM-PCR Enable/Disable Extend CSME Measurement to TPM-PCR[0] and AMT Config to TPM-PCR[1].

Firmware Update 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	18.0.10.2288 Normal Mode Corporate SKU 0xA0000255 0x69008300 0x00000030 0x00000000 0x02620000 0x00000000 [Enabled] [Enabled]	Configure Management Engine Technology Parameters
ME Unconfig on RTC Clear Core Bios Done Message TPM Device Selection Firmware Update Configuration Anti-Rollback SVN Configuration DEM Key Revocation Configuration Extend CSME Measurement to TPM-PCR	[Enabled] [Enabled] [dTPM]	++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
-Vencion -	22 1293 Conumight (C) 2024	OMT

Advanced	Aptio Setup – AMI	
Me FW Image Re-Flash FW Update	[Disabled] [Enabled]	Enable/Disable Me FW Image Re-Flash function. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Ve	ersion 2.22.1293 Copyright ((C) 2024 AMI

ME FW Image Re-Flash

Enable/Disable ME FW Image Re-Flash function.

FW Update

Enable/Disable ME FW Update function

Anti-Rollback SW 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	18.0.10.2288 Normal Mode Corporate SKU 0xA0000255 0x69008300 0x00000030 0x00000000 0x02620000	Configure Anti-Rollback SVN
ME FINHWare Status 6 ME State Manageability Features State ME Unconfig on RTC Clear Core Bios Done Message TPM Device Selection	[Enabled] [Enabled] [Enabled] [Enabled] [dTPM]	++: Select Screen 11: Select Item Enter: Select
 Firmware Update Configuration Anti-Rollback SVN Configuration OEM Key Revocation Configuration Extend CSME Measurement to TPM-PCR 	[Disabled]	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2	.22.1293 Copyright (C) 202	4 AMI

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 1 [Disabled] [Disabled]	<pre>++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	.22.1293 Copyright (C) 2024	AMI

Automatic HW-Enforced Anti-Rollback SVN

When enabled hardware-enforced Anti-Rollback mechanism is automatically activated: once ME FW was successfully run on a platform, FW with lower ARB-SVN will be blocked from execution.

Set HW-Enforced Anti-Rollback for Current SVN

Enable hardware-enforced Anti-Rollback mechanism for current ARB-SVN value. FW with lower ARB-SVN will be blocked from execution. The value will be restored to disable after the command is sent.

OEM Key Revocation 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	18.0.10.2288 Normal Mode Corporate SKU 0×A0000255 0×69008300 0×00000030 0×00000000 0×02620000 0×00000000	Configure OEM Key Revocation
ME State Manageability Features State ME Unconfig on RTC Clear Core Bios Done Message TPM Device Selection Firmware Update Configuration Anti-Rollback SVN Configuration	[Enabled] [Enabled] [Enabled] [Enabled] [dTPM]	++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help
▶ OEM Key Revocation Configuration Extend CSME Measurement to TPM-PCR	[Disabled]	F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1293 Copyright (C) 2024 AMI		

Advanced	Aptio Setup — AMI	
Automatic OEM Key Revocation Invoke OEM Key Revocation	[Disabled] [Disabled]	When enabled, BIOS will automatically send HECI command to revoke OEM keys. ++: 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	.22.1293 Copyright (C) 2024	AMI

Automatic OEM Key Revocation

When enabled, the BIOS will automatically send HECI command to revoke OEM keys.

Invoke OEM Key Revocation

A Heci command will be send to revoke the OEM key.

Chapter 3 BIOS Setting

3.2.2.5 Trusted Computing

Aptio Setup – AMI Main <mark>Advanced</mark> Chipset Security Boot Save & Exit MEBx		
 WWAN Configuration CPU Configuration Power & Performance PCH-FW Configuration Trusted Computing ACPI Settings iManager Configuration SS RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration Network Stack Configuration NVMe Configuration 	Trusted Computing Settings ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit	
Version 2.22.1293 Copyright (C) 2024	4 AMI	
Aptio Setup - AMI Advanced		

Advanced	Aptio Setup – AMI	
TPM 2.0 Device Found Firmware Version: Vendor: Security Device Support Active PCR banks Available PCR banks SHA256 PCR Bank SHA384 PCR Bank Pending operation Platform Hierarchy Storage Hierarchy Endorsement Hierarchy Physical Presence Spec Version TPM 2.0 InterfaceType Device Select	7.2 NTC [Enable] SHA256 SHA256,SHA384 [Enabled] [Disabled] [Enabled] [Enabled] [Enabled] [I.3] [TIS] [Auto]	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TGG EFI protocol and INT1A interface will not be available. ++: Select screen fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 203	24 AMI

Security Device Support

Enable or disable BIOS support for security device.

- SHA256 PCR Bank Enable or Disable SHA256 PCR Bank.
- SHA384 PCR Bank

Enable or Disable SHA384 PCR Bank.

- Pending operation Schedule an Operation for the Security Device.
- Platform Hierarchy
 Enable or Disable Platform Hierarchy.
- Storage Hierarchy
 Enable or Disable Storage Hierarchy.
- Endorsement Hierarchy
 Enable or Disable Endorsement Hierarchy.
- Physical Presence Spec Version Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3.

Device Select

TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices

3.2.2.6 ACPI Setting



Advanced	Aptio Setup – AMI	
ACPI Settings		Enables or Disables BIOS ACPI
Enable ACPI Auto Configuration	[Disabled]	Huto configuration.
Enable Hibernation	[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>
Version 2	.22.1293 Copyright (C) 2024	AMI

Enable ACPI Auto Configuration

Enables or Disables BIOS ACPI Auto Configuration.

Enable Hibernation

Enables or Disables System's ability to Hibernate (OS/S4 Sleep State).

3.2.2.7 iManager Configuration



Advanced	Aptio Setup – AMI	
iManager Configuration		Select Power Saving Mode
iManager Chipset Firmware Version OEM Group GPIO Number Available	EID-300 X00074776 8	
Power Saving Mode	[Normal]	
 Serial Port 1 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration Hardware Monitor Hatch Dog Timer Configuration GPIO Configuration EdgeBMC Network Configuration 		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt.
USB Power Enable Control 1 USB Power Enable Control 2	[Enabled] [Enabled]	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 2024	AMI

Power Saving Mode

Enable/Disable power saving mode.

Serial Port 1 Configuration

Advanced	Aptio Setup — AMI	
iManager Configuration		Set Parameters of Serial Port
iManager Chipset Firmware Version OEM Group GPIO Number Available	EIO-300 X00074776 8	(com)
Power Saving Mode	[Normal]	
 Serial Port 1 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration Hardware Monitor 		
 Watch Dog Timer Configuration GPIO Configuration EdgeBMC Network Configuration 		++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt.
USB Power Enable Control 1 USB Power Enable Control 2	[Enabled] [Enabled]	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 2024	AMI



- Serial Port Enable/Disable serial port.
- Change Settings
 Select optimal settings for Super IO device.
- COM port mode COM Port Mode Select

Serial Port 2 Configuration

Advanced	Aptio Setup – AMI	
iManager Configuration		Set Parameters of Serial Port
iManager Chipset Firmware Version OEM Group GPIO Number Available	EID-300 X00074776 8	2 (CUMB)
Power Saving Mode	[Normal]	
 Serial Port 1 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration Hardware Monitor Watch Dog Timer Configuration GPIO Configuration EdgeBMC Network Configuration 		++: Select Screen 14: Select Item Enter: Select
USB Power Enable Control 1 USB Power Enable Control 2	[Enabled] [Enabled]	<pre>#/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	2.22.1293 Copyright (C) 2024	AMI

Advanced	Aptio Setup — AMI	
Serial Port 2 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=2F8h; IRQ=3;	(con)
Change Settings COM Port Mode	[Auto] [RS-232 Mode]	
		++: Select Screen ↑↓: Select Item
		Enter: Select +/-: Change Opt.
		F1: General Help F2: Previous Values
		F3: Uptimized Defaults F4: Save & Exit
		ESU: EXIT
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Serial Port

- Enable/Disable serial port.
- Change Settings
 Select optimal settings for Super IO device.
- COM port mode

Serial Port 3 Configuration

Advanced	Aptio Setup – AMI	
iManager Configuration		Set Parameters of Serial Port
iManager Chipset Firmware Version OEM Group GPIO Number Available	EID-300 X00074776 8	3 (COMC)
Power Saving Mode	[Normal]	
 Serial Port 1 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration Hardware Monitor Watch Dog Timer Configuration GPIO Configuration EdgeBMC Network Configuration 		++: Select Screen f1: Select Item Enter: Select v : Separe Opt
USB Power Enable Control 1 USB Power Enable Control 2	[Enabled] [Enabled]	<pre>+/-: Change Upt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	.22.1293 Copyright (C) 2024	AMI
Advanced	Aptio Setup — AMI	
Serial Port 3 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=3E8h; IRQ=5;	((0))
Change Settings COM Port Mode	[Auto] [RS-485 Mode]	
		<pre>++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>

- Serial Port Enable/Disable serial port.
- Change Settings

Select optimal settings for Super IO device.

COM port mode

COM Port Mode Select

Serial Port 4 Configuration

Advanced	Aptio Setup — AMI	
iManager Configuration		Set Parameters of Serial Port
iManager Chipset Firmware Version OEM Group GPIO Number Available	EIO-300 X00074776 8	4 (COMD)
Power Saving Mode	[Normal]	
 Serial Port 1 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration Hardware Monitor Watch Dog Timer Configuration 		++: Select Screen
 GP10 Configuration EdgeBMC Network Configuration 		I↓: Select Item Enter: Select +/-: Change Ont
USB Power Enable Control 1 USB Power Enable Control 2	[Enabled] [Enabled]	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 2024	AMI

Advanced	Aptio Setup — AMI	
Serial Port 4 Configuration		Enable or Disable Serial Port
Serial Port Device Settings	[Enabled] IO=2E8h; IRQ=15;	(COM)
Change Settings COM Port Mode	[Auto] [RS-485 Mode]	
		<pre>++: Select Screen ↓: Select Item Enter: Select</pre>
		+/-: Change Opt. F1: General Help 52: Browiews Values
		F3: Optimized Defaults F4: Save & Exit
		ESC: Exit
Version 2	2.22.1293 Copyright (C) 2024	AMI

Serial Port

Enable/Disable serial port.

- Change Settings
 Select optimal settings for Super IO device.
- COM port mode COM Port Mode Select

Hardware Monitor

Advanced	Aptio Setup – AMI	
iManager Configuration		Monitor hardware status
iManager Chipset Firmware Version OEM Group GPIO Number Available	EIO-300 X00074776 8	
Power Saving Mode	[Normal]	
 Serial Port 1 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration Hardware Monitor Watch Dog Timer Configuration GPIO Configuration EdgeBMC Network Configuration USB Power Enable Control 1 USB Power Enable Control 2 	[Enabled] [Enabled]	<pre> ++: 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 1293 Convright (C) 2024	АМТ
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Advanced	Aptio Setup — AMI	
PC Health Status		
CPU Temperature System Temperature	: +50°C∕ +122°F : +35°C∕ +95°F	
+3.3V +5V VBAT	: +3.28 V : +5.04 V : +0.74 V	++: 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 1293 Conuright (C) 202	4 AMT

Hardware Monitor

Provides hardware monitoring information

Watch Dog Timer Configuration

	Aptio Setup – AMI	
Advanced		
iManager Configuration		Watch Dog Timer Configuration
iManager Chipset	EIO-300	
Firmware Version	X00074776	
OEM Group GPIO Number Available	8	
Power Saving Mode	[Normal]	
Serial Port 1 Configuration		
Serial Port 2 Configuration		
 Serial Port 3 Configuration 		
 Serial Port 4 Configuration Hardware Monitor 		
 Match Dog Timer Configuration 		++: Select Screen
GPIO Configuration		t↓: Select Item
EdgeBMC Network Configuration		Enter: Select
UCD Deven Enchie Control 4	[Enchled]	+/-: Change Opt.
USB Fower Enable Control 1 USB Power Enable Control 2	[Enabled]	F1: General Help F2: Previous Values
	[Endbied]	F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
Version	2 22 1293 Conucidat (C) 20	24 AMT
VCI 31011		



Watch Dog Timer Hidden

Enabled or Disabled Watch Dog Timer Hidden.

Watch Dog Timer

Enable or Disable the Watch Dog Timer function

GPIO Configuration

Advanced	Aptio Setup – AMI	
iManager Configuration		GPIO Configuration Settings.
iManager Chipset Firmware Version OEM Group GPIO Number Available	EID-300 X00074776 8	
Power Saving Mode	[Normal]	
 Serial Port 1 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration Hardware Monitor Watch Dog Timer Configuration GPID Configuration EdgeBMC Network Configuration 		++: Select Screen fl: Select Item Enter: Select +/-: Change Opt.
USB Power Enable Control 1 USB Power Enable Control 2	(Enabled) [Enabled]	F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 2024	AMI

Advanced	Aptio Setup – AMI	
GPIO Configuration		Choose to control GPIO by EC
GPIO Control Enable		stage.
		<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 2.22.1293 Copyright ((C) 2024 AMI

GPIO Control Enable

Select to control GPIO by EC or user override during the POST stage.

EdgeBMC Network Configuration

Advanced	Aptio Setup — AMI	
iManager Configuration		Configure EdgeBMC Network
iManager Chipset Firmware Version OEM Group GPIO Number Available	EID-300 X00074776 8	parameters
Power Saving Mode	[Normal]	
 Serial Port 1 Configuration Serial Port 2 Configuration Serial Port 3 Configuration Serial Port 4 Configuration Hardware Monitor Watch Dog Timer Configuration GPIO Configuration EdgeBMC Network Configuration 		<pre>++: Select Screen 1↓: Select Item Enter: Select</pre>
USB Power Enable Control 1 USB Power Enable Control 2	[Enabled] [Enabled]	<pre>F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
Version 2	2.22.1293 Conuright (C) 2024	AMT

Advanced	Aptio Setup — AMI	
Advanced EdgeBMC Network Configuration ************************************	Aptio Setup - AMI DHCP 00-01-02-03-04-AA 172.22.20.17 255.255.252.0 172.22.23.254	++: 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	.22.1293 Copyright (C) 2024	AMI

Chapter 3 BIOS Setting

3.2.2.8 S5 RTC Wake Settings

An Main Advanced Chipset Security Boo	ot <mark>io Setup – AMI</mark> : Save & Exit MEBx
 WWAN Configuration CPU Configuration Power & Performance PCH-FW Configuration Trusted Computing ACPI Settings iManager Configuration SS RTC Wake Settings Serial Port Console Redirection Intel TXT Information VBB Configuration Network Stack Configuration Network Stack Configuration 	Enable system to wake from S5 using RTC alarm
	++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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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) ++: Select Screen 11: Select Screen Enter: Select +(-: Change Ont
		F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1293 Copyright (C) 2024 AMI		

Wake system from S5

Enable or disable system wake on alarm event.

3.2.2.9 Serial Port Console Redirection

Aptio Setup – AMI Main <mark>Advanced</mark> Chipset Security Boot Save & Exit MEBx	
 WWAN Configuration CPU Configuration Power & Performance PCH-FW Configuration Trusted Computing ACPI Settings IManager Configuration SS RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration Network Stack Configuration NVMe Configuration 	Serial Port Console Redirection
	<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>

Advanced	Aptio Setup — AMI	
COM1 Console Redirection Console Redirection Settings	[Disabled]	Console Redirection Enable or Disable.
Console Redirection	Port Is Disabled	
Serial Port for Out-of-Band Managemer Windows Emergency Management Services Console Redirection EMS ▶ Console Redirection Settings	nt∕ ≲ (EMS) [Disabled]	
		<pre>++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults</pre>
		F4: Save & Exit ESC: Exit
Version 2.	.22.1293 Copyright (C) 2024	AMI

Console Redirection Console Redirection Enable or Disable. Console Redirection EMS

Console Redirection EMS Console Redirection Enable or Disable.

Chapter 3 BIOS Setting

3.2.2.10 Intel TXT Information

	Aptio Setup - AMI	
 Wain Advanced Chipset Security WWAN Configuration CPU Configuration Power & Performance PCH-FW Configuration Trusted Computing ACPI Settings Manager Configuration S5 RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration Network Stack Configuration NVMe Configuration 	ity boot save & exit mebx	Display Intel TXT information
		<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>
Vers	ion 2.22.1293 Copyright (C) 2	2024 AMI
Advanced	Aptio Setup – AMI	
Intel TXT Information		
Chipset BiosAcm Chipset Txt Cpu Txt Error Code Class Code Major Code Minor Code	Production Fused Production Fused Supported None None None None	
		++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

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Intel TXT Information

Display Intel TXT information

3.2.2.11 USB Configuration

Aptio Setup – AMI Main Advanced Chipset Security Boot Save & Exit MEB>	x
 WWAN Configuration CPU Configuration Power & Performance PCH-FW Configuration Trusted Computing ACPI Settings iManager Configuration SS RTC Wake Settings Serial Port Console Redirection Intel TXT Information USB Configuration Network Stack Configuration NVMe Configuration 	USB Configuration Parameters ++: Select Screen 14: Select Item Enter: Select
	+/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Advanced	Aptio Setup – AMI	
USB Configuration		This is a workaround for OSes
USB Module Version	35	The XHCI ownership change should be claimed by XHCI
USB Controllers: 2 XHCIs		driver.
USB Devices: 1 Drive, 1 Keyboard		
XHCI Hand–off	[Enabled]	
USB Mass Storage Driver Support	[Enabled]	
USB hardware delays and time-outs:		
USB transfer time-out	[20 sec]	++: Select Screen
Device reset time-out	[20 sec]	†↓: Select Item
Device power-up delay	[Auto]	Enter: Select
Mass Storage Devices:		E1: General Heln
JetFlashTranscend 1GB 8.07	[Auto]	F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit
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XHCI Hand-Off

This is a workaround for OS without XHCI hand-off support.

- USB Mass Storage Driver Support Enable/Disable USB Mass Storage Driver Support.
- USB transfer time-out

The time-out value for control, bulk, and interrupt transfers.

- Device reset time-out
 USB mass storage device Start Unit command time-out.
- Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller.

3.2.2.12 Network Stack Configuration



Advanced	Aptio Setup – AMI	
Network Stack	[Disabled]	Enable/Disable UEFI Network Stack
		<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>
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Network Stack

Enable/Disable UEFI Network Stack.

3.2.2.13 NVMe Configuration

Aptio Setup – AMI Main <mark>Advanced</mark> Chipset Security Boot Save & Exit MEBx	
 > HWAN Configuration > CPU Configuration > Power & Performance > PCH-FW Configuration > Trusted Computing > ACPI Settings > IManager Configuration > S5 RTC Wake Settings > Serial Port Console Redirection > Intel TXT Information > USB Configuration > Network Stack Configuration > NVMe Configuration 	NVMe Device Options Settings ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Aptio Setup – AMI Advanced	
NVMe Configuration	
No NVME Device Found	
	<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>
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Chapter 3 BIOS Setting

3.2.3 Chipset Configuration

Select the Chipset tab from the ARK-1125 setup screen to enter the Chipset BIOS Setup screen. You can display a Chipset BIOS Setup option by highlighting it using the <Arrow> keys. All Plug-and-Play BIOS Setup options are described in this section. The Plug-and-Play BIOS Setup screen is shown below.

3.2.3.1 System Agent (SA) Configuration

Aptio Setup – AMI Main Advanced <mark>Chipset</mark> Security Boot Save & Exit MEBx	
 System Agent (SA) Configuration PCIE Configuration PCH-IO Configuration 	System Agent (SA) Parameters
	<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 2.22.1293 Copyright (C) 2024	AMI

Chipset	Aptio Setup – AMI	
System Agent (SA) Configuration		Memory Configuration Parameters
 Memory Configuration Graphics Configuration TCSS setup menu VMD setup menu VT-d setup menu 		
GNA Device (B0:D8:F0) Above 4GB MMIO BIOS assignment IPU Device (B0:D5:F0) NPU Device (B0:D11:F0)	[Enabled] [Enabled] [Disabled] [Enabled]	
		<pre>++: Select Screen \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$</pre>
		F4: Save & Exit ESC: Exit
Version 2	.22.1293 Copyright (C) 2024	AMI

GNA Device

Enable/Disable SA GNA Device.

Above 4GB MMIO BIOS assignment

Enable/Disable above 4GB Memory Mapped I/O BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB

IPU Device

Enable/Disable SA IPU Device. This option will be grayed out when IPU is fused off from silicon.

NPU Device

Enable/Disable NPU (Neural Processing Unit) Device.

Memory Configuration

Chipset	Aptio Setup - AMI	
Chipset Memory Configuration Memory RC Version Memory Frequency tCL-tRCD-tRP-tRAS SODIMM_A1 SODIMM_B1 Size Number of Ranks Manufacturer Maximum Memory Frequency Max TOLUD SAGV	1.3.14.1 5600 MT/s 46-45-45-90 Not Populated / Disabled Populated & Enabled 8192 MB (DDR5) 1 Advantech Co Ltd [Auto] [Dynamic] [Disabled]	Maximum Memory Frequency Selections in Mhz. ++: Select Screen 11: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults
		F4: Save & Exit ESC: Exit
Maximum Memory Frequency Max TOLUD SAGV	[Auto] [Dynamic] [Disabled] Version 2.22.1293 Copyright (C) 2024	++: Select Screen †1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit

- Maximum Memory Frequency
 Maximum Memory Frequency Selections in Mhz
- Max TOLUD Maximum Value of TOLUD.
- SAGV System Agent Geysetville.

Graphics Configuration

Chipset	Aptio Setup – AMI	
System Agent (SA) Configuration		Graphics Configuration
 Memory Configuration Graphics Configuration TCSS setup menu VMD setup menu VT-d setup menu 		
GNA Device (B0:D8:F0) Above 4GB MMIO BIOS assignment IPU Device (B0:D5:F0) NPU Device (B0:D11:F0)	[Enabled] [Enabled] [Disabled] [Enabled]	
		<pre>++: 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	.22.1293 Copyright (C) 2024	AMI

Chipset	Aptio Setup — AMI	
Graphics Configuration Skip Scaning of External Gfx Card Primary Display	[Disabled] [Auto]	If Enable, it will not scan for External Gfx Card on PCIE Ports
Internal Graphics DVMT Pre-Allocated Intel Graphics Pei Display Peim VDD Enable Configure GT for use Configure Media for use GT RC1p Support Media RC1p Support	[Auto] [128M] [Disabled] [Enabled] [Enabled] [Enabled] [Disabled] [Disabled]	
PAVP Enable V-by-One(iTE6807) Enable Bypass VBT Update IUER Button Enable ▶ Intel(R) Ultrabook Event Support	[Enabled] [Disabled] [Enabled] [Disabled]	<pre>++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults E4: Souce 2 Suit</pre>
Version 2	22 1293 Conveight (C) 2024	AMT

Skip Scaning of External Gfx Card

If Enable, it will not scan for External Gfx Card on PCIE Ports.

Primary Display

Select from IGFX/PEG/PCI, which graphics device should be Primary Dis- play or select SG for Switchable Gfx.

Internal Graphics

Keep IGFX enabled based on the setup options.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

Intel Graphics Pei Display Peim Enable/Disable Pei (Early) Display.

VDD Enable

Enable/Disable forcing of VDD in the BIOS.

Configure GT for use

Enable/Disable GT configuration in BIOS.

Configure Media for use

Enable/Disable Media configuration in BIOS.

GT RC1p Support

Enable/Disable RC1p support. If GT RC1p is enabled, send a RC1p frequency request to PMA if other conditions being met.

Media RC1p Support

Enable/Disable RC1p support. If Media RC1p is enabled, send a RC1p frequency request to PMA if other conditions being met.

- PAVP Enable Enable/Disable PAVP.
- V-by-One (iTE6807) Enable
 Enable/Disable V-by-One(iTE6807)

Bypass VBT Update Enable/Disable bypass VBT update.

IUER Button Enable

Enable/Disable IUER Button Functionality.

Intel® Ultrabook Event Support

Chipset	Aptio Setup – AMI	
Graphics Configuration		Intel(R) Ultrabook Event Support
Skip Scaning of External Gfx Card	[Disabled]	
Primary Display Internal Graphics DVMT Pre-Allocated Intel Graphics Pei Display Peim VDD Enable Configure GT for use Configure Media for use GT RC1p Support Media RC1p Support PAVP Enable V-by-One(ITE6807) Enable Bypass VBT Update IUER Button Enable > Intel(R) Ultrabook Event Support	[Auto] [Auto] [128M] [Disabled] [Enabled] [Enabled] [Disabled] [Disabled] [Disabled] [Enabled] [Disabled] [Disabled]	<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 (2.22.1293 Copyright (C) 2024	AMI

Chipset	Aptio Setup - AMI	
Intel(R) Ultrabook Event S	upport	Enable/Disable IUER Slate
IUER Slate Enable IUER Dock Enable	(Disabled) (Disabled)	Functionality
		<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 2.22.1293 Copyright (C)) 2024 AMI

IUER Slate Enable

Enable/Disable IUER Slate Functionality.

IUER Dock Enable
 Enable/Disable IUER Dock Functionality.

TCSS Setup Menu

Chipset	Aptio Setup – AMI	
System Agent (SA) Configuration		TCSS Configuration settings
 Memory Configuration Graphics Configuration TCSS setup menu VMD setup menu VT-d setup menu 		
GNA Device (B0:D8:F0) Above 4GB MMIO BIOS assignment IPU Device (B0:D5:F0) NPU Device (B0:D11:F0)	[Enabled] [Enabled] [Disabled] [Enabled]	
		<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	.22.1293 Conuright (C) 2024	AMT

Chipset	Aptio Setup – AMI	
TCSS Configuration		Enable/Disable TCSS xHCI
IOM FW version: 30001A00		
PHY FW version: 1865		
TBT FW IMR Status: CO0004B5 TBT FW version: 1205 Deepest TC state: 000A		
TCSS xHCI Support ▶ TCSS USB Configuration	[Enabled]	
		<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.	22.1293 Copyright (C) 2024	AMI

TCSS xHCI Support

Enable/Disable TCSS xHCl.

TCSS USB Configuration

Chipset	Aptio Setup – AMI	
TCSS Configuration		SA TCSS USB Configuration
IOM FW version: 30001A00		Settings
PHY FW version: 1865		
TBT FW IMR Status: C00004B5 TBT FW version: 1205 Deepest TC state: 000A		
TCSS xHCI Support ▶ TCSS USB Configuration	[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>
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Chipset	Aptio Setup – AMI	
TCSS CPU USB Port Disable Override	[Disabled]	Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller.
		<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	.22.1293 Copyright (C) 2024	AMI

TCSS CPU USB Port Disable Override

Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller.

VMD Setup Menu

Chipset	Aptio Setup – AMI			
System Agent (SA) Configuration		VMD Configuration settings		
 Memory Configuration Graphics Configuration TCSS setup menu VMD setup menu VT-d setup menu 				
GNA Device (B0:D8:F0) Above 4GB MMIO BIOS assignment IPU Device (B0:D5:F0) NPU Device (B0:D11:F0)	[Enabled] [Enabled] [Disabled] [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>		
Version 2.22.1293 Copyright (C) 2024 AMI				

Chipset	Aptio Setup – AMI	
VMD Configuration		Enable/Disable to VMD
Enable VMD controller	[Disabled]	
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
	Version 2.22.1293 Copyright (C)	2024 AM1

Enable VMD Controller

Enable/Disable to VMD controller.

VT-d Setup Menu

Chipset	Aptio Setup — AMI	
System Agent (SA) Configuration		VT-d Configuration settings
 Memory Configuration Graphics Configuration TCSS setup menu VMD setup menu VT-d setup menu 		
GNA Device (B0:D8:F0) Above 4GB MMIO BIOS assignment IPU Device (B0:D5:F0) NPU Device (B0:D11:F0)	[Enabled] [Enabled] [Disabled] [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>
Version 2	.22.1293 Copyright (C) 2024	AMI

Chipset	Aptio Setup – AMI			
VT-d Configuration		Enable DMA Protection in		
VT-d	Supported	table is installed in DXE and		
VT-d Pre-boot DMA Protection X2APIC Opt Out DMA Control Guarantee	[Enabled] [Disabled] [Disabled] [Enabled]	in PEI.)		
		<pre>++: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>		
Version 2.22.1293 Copyright (C) 2024 AMI				

VT-d

Check to enable VT-d function on MCH.\nThis option will be grayed out when 'X2APIC Enable' option is configured as 'Enabled'.

Pre-boot DMA Protection

Enable DMA Protection in Pre-boot environment (If DMAR table is installed in DXE and If VTD_INFO_PPI is installed in PEI.)

X2APIC Opt Out

Enable/Disable X2APIC_OPT_OUT bit. This option will be grayed out when 'X2APIC Enable' option is configured as 'Enabled'.

DMA Control Guarantee

Enable/Disable DMA_CONTROL_GUARANTEE bit.

3.2.3.2 PCIE Configuration


PCIE Clocks

Aptio Setup – AM: <mark>Chipset</mark>	I
▶ PCIE clocks	PCIE clocks
SOC Configuration PCI Express Root Port PXPA1(M.2 Lane configured as B-Key) USB/SATA/UFS ► PCI Express Root Port PXPA3(M.2 E-Key)	s
IOE Configuration ▶ PCI Express Root Port PXPD(M.2 M-Key)	
	<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 2.22.1293 Conuright	(C) 2024 AMT

Chipset	Aptio Setup – AMI	
SOC/IOE clocks Clock0 assignment ClkReq for Clock0 Clock1 assignment ClkReq for Clock1 Clock2 assignment ClkReq for Clock2 Clock3 assignment ClkReq for Clock3 Clock4 assignment ClkReq for Clock4 Clock5 assignment	[Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR]	Platform-POR = clock is assigned to PCIe port or LAN according to board layout. Enabled = keep clock enabledeven if unused. Disabled = Disable clock.
Clock6 assignment ClkReq for Clock6 Clock7 assignment ClkReq for Clock7 Clock8 assignment ClkReq for Clock8	[Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR] [Platform-POR]	<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>

ClockX assignment

Platform-POR = clock is assigned to PCIe port or LAN according to board layout. Enabled = keep clock enabledeven if unused. Disabled = Disable clock.

C1kReq for ClockX

Platform-POR = CLKREQ signal is assigned to CLKSRC according to board layout. Disabled = CLKREQ will not be used.

PCI Express Root Port PXPA3 (M.2 M-Key)

Aptio Setup – AMI Chipset	
<pre>Chipset PCIE clocks SOC Configuration PCI Express Root Port PXPA1(M.2 Lane configured as B-Key) USB/SATA/UFS PCI Express Root Port PXPA3(M.2 E-Key) IOE Configuration PCI Express Root Port PXPD(M.2 M-Key) </pre>	PCI Express Root Port Settings. ++: Select Screen 11: Select Item
	Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.22.1293 Copyright (C) 2024	AMI

Chipset	Aptio Setup — AMI	
PCI Express Root Port PXPA ASPM L1 Substates PCIe Speed	3 [Enabled] [Disabled] [Disabled] [Auto]	Control the PCI Express Root Port.
	Version 2.22.1293 Copyright (C) :	2024 AMI

PCI Express Root Port PXPA3

Control the PCI Express Root Port.

ASPM

Set the ASPM Level: Force L0s - Force all links to L0s State. AUTO - BIOS auto configure. DISABLE - Disables ASPM

L1 Substates

PCI Express L1 Substates settings.

PCIe Speed

Configure PCIe Speed.

PCI Express Root Port PXPD(M.2 M-Key)



Chipset	Aptio Setup – AMI	
PCI Express Root Port PXPD ASPM L1 Substates PCIe Speed	[Enabled] [Disabled] [Disabled] [Auto]	Control the PCI Express Root Port.
		<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>
Versio	n 2.22.1293 Copyright (C) 203	24 AMI

PCI Express Root Port PXPD

Control the PCI Express Root Port.

ASPM

Set the ASPM Level: Force L0s - Force all links to L0s State. AUTO - BIOS auto configure. DISABLE - Disables ASPM

- L1 Substates
 PCI Express L1 Substates settings.
- PCle Speed
 Configure PCle Speed.

3.2.3.3 PCH-IO Configuration

Aptio Setup – AMI Main Advanced <mark>Chipset</mark> Security Boot Save & Exit MEBx	
 System Agent (SA) Configuration PCIE Configuration PCH-IO Configuration 	PCH Parameters ++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Chipset	Aptio Setup – AMI	
PCH-IO Configuration		SATA Device Options Settings
 SATA Configuration USB Configuration Security Configuration HD Audio Configuration 		
LAN1 Controller LAN1 PXE OpROM LAN2 Controller LAN2 PXE OpROM LAN3 Controller LAN3 PXE OpROM	[Enabled] [Disabled] [Enabled] [Disabled] [Enabled] [Disabled]	
PCIE Wake Restore AC Power Loss Legacy ID Low Latency Enable TCO Timer Lock PCH Sideband Access Flash Protection Range Registers (FPRR)	[Disabled] [Power Off] [Disabled] [Disabled] [Enabled] [Disabled]	<pre>fl: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit</pre>
SPD Write Disable	[TRUE]	ESC: Exit

LAN Controller

Enable or Disable onboard NIC.

LAN PXE OpROM

Enable or disable boot option rom for LAN1 Controller.

PCIE Wake

Enable or disable PCIE to wake the system from S5.

Restore AC Power Loss

Specify what state to go to when power is re-applied after a power failure (G3 state).

Legacy IO LOW Latency

Set to enable low latency of legacy IO. Some systems require lower IO latency irrespective of power. This is a tradeoff between power and IO latency.

Enable TCO Timer

Enable/Disable TCO timer. When disabled, it disables PCH ACPI timer, stops TCO timer, and ACPI WDAT table will not be published.

Lock PCH Sideband Access

Lock PCH Sideband access, include SideBand interface lock and SideBand PortID mask for certain end point (e.g. PSFx). The option is invalid if POST-BOOT SAI is set.

Flash Protection Range Registers (FPRR)

Enable Flash Protection Range Registers.

SPD Write Disable

Enable/Disable setting SPD Write Disable. For security recommendations, SPD write disable bit must be set.

SATA Configuration

Chipset	Aptio Setup – AMI	
SATA Configuration		Enable/Disable SATA Device.
SATA Controller(s) SATA Mode Selection SATA Controller Speed Limit Aggressive LPM Support M.2 SATA Port Software Preserve M.2 SATA Port Spin Up Device SATA Port 1 DevSlp	[Enabled] [AHCI] [Default] [Disabled] Empty Unknown [Enabled] [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>
Version :	2.22.1293 Copyright (C) 2024	AMI

SATA Controller(s)

Enable/Disable SATA Device.

SATA Mode Selection

Determines how SATA controller(s) operate.

SATA Controller Speed Limit

Indicates the maximum speed the SATA controller can support.

Aggressive LPM Support

Disable/Enable PCH to aggressively enter link power state.

M.2 SATA Port

Enable or Disable SATA/mSATA Port.

Spin Up Device

If enabled for any of ports Staggered Spin Up will be performed and only the drives which have this option enabled will spin up at boot. Otherwise all drives spin up at boot.

SATA Port 1 DevSlp

Enable/Disable SATA Port 1~2 DevSlp. For DevSlp to work, both the hard drive and SATA port need to support the DevSlp function; otherwise an unexpected behavior might happen. Please check the board design before enabling it.

USB Configuration

Chipset	Aptio Setup – AMI	
PCH-IO Configuration		USB Configuration settings
 SATA Configuration USB Configuration Security Configuration HD Audio Configuration HAN1 Controller LAN1 PXE OpROM LAN2 Controller LAN2 PXE OpROM LAN2 Controller LAN2 PXE OpROM LAN3 PXE OpROM PCIE Wake Restore AC Power Loss Legacy IO Low Latency Enable TCO Timer Lock PCH Sideband Access Flash Protection Range Registers (FPRR) SPD Write Disable 	[Enabled] [Disabled] [Enabled] [Disabled] [Disabled] [Disabled] [Power Off] [Disabled] [Disabled] [Enabled] [Disabled] [Disabled] [TRUE]	<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>
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Chipset	Aptio Setup – AMI	
USB Configuration		Select 'Disabled' for pin-based debug. If pin-based debug is enabled but USB
USB Overcurrent	[Enabled]	overcurrent is not disabled,
USB Overcurrent Lock	[Enabled]	USB DbC does not work.
USB Port Disable Override	[Disabled]	
		++: Select Screen
		†↓: Select Item
		Enter: Select
		F1: General Help
		F2: Previous Values
		F3: Optimized Detaults F4: Save & Evit
		ESC: Exit
Versi	on 2.22.1293 Copyright (C)	2024 AMI

USB Overcurrent

Select 'Disabled' for pin-based debug. If pin-based debug is enabled but USB overcurrent is not disabled, USB DbC does not work.

USB Overcurrent Lock

Select 'Enabled' if Overcurrent functionality is used. Enabling this will make xHCI controller consume the Overcurrent mapping data.

USB Port Disable Override.

Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller

Security Configuration

Chipset	Aptio Setup — AMI	
PCH-IO Configuration		Security Configuration settings
 SATA Configuration USB Configuration Security Configuration HD Audio Configuration 		
LAN1 Controller LAN1 PXE OpROM LAN2 Controller LAN2 PXE OpROM LAN3 Controller LAN3 PXE OpROM	[Enabled] [Disabled] [Enabled] [Disabled] [Enabled] [Disabled]	
PCIE Wake Restore AC Power Loss Legacy IO Low Latency Enable TCO Timer Lock PCH Sideband Access Flash Protection Range Registers (FPRR)	[Disabled] [Power Off] [Disabled] [Disabled] [Enabled] [Disabled]	<pre>++: Select Screen f↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit</pre>
SPD Write Disable	(TRUE)	ESC: Exit

Chipcot	Aptio Setup – AMI	
Security Configuration		Enable will lock bytes 38h–3Fh in the lower/upper 128–byte
RTC Memory Lock BIOS Lock Force unlock on all GPIO pads	[Enabled] [Disabled] [Disabled]	bank of RTC RAM
		 **: Select Screen f1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version	2.22.1293 Copyright (C) 203	24 AMI

RTC Memory Lock

Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM.

BIOS Lock

Enable/Disable the PCH BIOS Lock Enable feature. It is required to be enabled to ensure SMM protection of flash.

Force unlock on all GPIO pads

If Enabled, the BIOS will force all GPIO pads to be in the unlocked state.

HD Audio Configuration

Chipset	Aptio Setup – AMI	
PCH-IO Configuration		HD Audio Subsystem
 SATA Configuration USB Configuration Security Configuration HD Audio Configuration 		Configuration Settings
LANI Controller LAN1 PXE OpROM LAN2 Controller LAN2 PXE OpROM LAN3 Controller LAN3 PXE OpROM PCIE Wake Restore AC Power Loss Legacy IO Low Latency Enable TCO Timer Lock PCH Sideband Access Flash Protection Range Registers (FPRR) SPD Write Disable	[Enabled] [Disabled] [Enabled] [Disabled] [Disabled] [Disabled] [Power Off] [Disabled] [Disabled] [Enabled] [Disabled] [TRUE]	<pre> ++: Select Screen 1↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</pre>
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HD Audio

Control Detection of the HD-Audio device.

3.2.4 Security



- Administrator Password Set Administrator Password.
- User Password Set User Password.

Secure Boot

Main Advanced Chipset Security	Aptio Setup – AMI Boot Save & Exit MEBx	
Password Description		Secure Boot configuration
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range:		
Minimum length Maximum length	3 20	↔: Select Screen ↑↓: Select Item
Administrator Password User Password		Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit
▶ Secure Boot		ESC: Exit
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	Aptio Setup – AMI Security	
System Mode	Setup	Secure Boot feature is Active
Secure Boot	[Disabled] Not Active	Platform Key(PK) is enrolled and the System is in User mode. The mode change requires
Secure Boot Mode ▶ Restore Factory Keys ▶ Reset To Setup Mode	[Custom]	platform reset
▶ Expert Key Management		
		++: Select Screen 14: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Secure Boot

The Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled, and the System is in User mode. The mode change requires a platform reset.

Secure Boot Mode

Secure Boot mode options: Standard or Custom.

Expert Key Management



Aptio Setup – AMI Security		
Vendor Keys	Valid	Install factory default Secure
Factory Key Provision Restore Factory Keys Reset To Setup Mode Enroll Efi Image Export Secure Boot variable	[Disabled] s	reset and while the System is in Setup mode
Secure Boot variable > Platform Key (PK) > Key Exchange Keys (KEK) > Authorized Signatures (db) > Eschidden Signatures (db)	Size Keys Key Source 0 0 No Keys 0 0 No Keys 0 0 No Keys	
 Forbidden Signatures(dbx) Authorized TimeStamps(dbt) OsRecovery Signatures(dbr) 	0 0 No Keys 0 0 No Keys 0 0 No 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>
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Chapter 3 BIOS Setting

Factory Key Provision

Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

3.2.5 Boot



Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535 (0xFFF) means indefinite waiting.

- Bootup NumLock State
 Select the keyboard NumLock state.
- Quiet Boot

Enables or disables the Quiet Boot option.

3.2.6 Save & Exit

Aptio Setup – AMI Main Advanced Chipset Security Boot Save & Exit MEBx	
Save Options Save Changes and Exit Discard Changes and Exit Save Changes and Reset Discard Changes and Reset Save Changes Discard Changes	Exit system setup after saving the changes.
Default Options Restore Defaults Save as User Defaults Restore User Defaults Boot Override UEFI: JetFlashTranscend 16B 8.07, Partition 1 (JetFlashTranscend 16B 8.07)	<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>
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Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit Exit system setup without saving any changes.

Save Changes and Reset Reset the system after saving the changes.

Discard Changes and Reset Reset system setup without saving any changes.

Save Changes
 Save Changes done so far to any of the setup options.

Discard Changes Discard Changes done so far to any of the setup options

Restore Defaults

Restore/Load Default values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options.

3.2.7 MEBx





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