

# HPM-ERSDE

Dual 4th/5th Generation Intel®Xeon® Scalable Processor  
Proprietary Server Board with Intel®C741 Chipset and  
IPMI2.0. Processor supports up to 270W TDP

## User's Manual

1<sup>st</sup> Ed – 11 March 2024

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## Document Amendment History

Revision	Date	By	Comment
1 <sup>st</sup>	March 2024	Avalue	Initial Release

## Declaration of Conformity



This device complies with part 15 fcc rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference.

(2) This device must accept any interference received including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class "a" digital device, pursuant to part 15 of the fcc rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

### CE statement

The product(s) described in this manual complies with all application European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

## Notice

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

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## Disclaimer

This manual is intended to be used as a practical and informative guide only and is subject to change without notice. It does not represent a commitment on the part of Avalue. This

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product might include unintentional technical or typographical errors. Changes are periodically made to the information herein to correct such errors, and these changes are incorporated into new editions of the publication.

## A Message to the Customer

### *Avalue Customer Services*

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

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

### *Technical Support and Assistance*

1. Visit the Avalue website at <https://www.avalue.com/> where you can find the latest information about the product.
2. Contact your distributor or our technical support team or sales representative for technical support if you need additional assistance. Please have 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

To receive the latest version of the user's manual; please visit our Web site at:

[www.avalue.com](http://www.avalue.com)

## ***Product Warranty (Returns & Warranties policy)***

### **1. Purpose**

Avalue establishes the following maintenance specifications and operation procedures for providing the best quality of service and shortened repair time to our customers.

### **2. Warranty**

#### **2.1 Warranty Period**

Avalue endeavors to offer customers the most comprehensive post-sales services and protection; besides offering a 2-year warranty for standard Avalue products, an extended warranty service can also be provided based on additional request from the customer. Within the warranty period, customers are entitled to receive comprehensive and prompt repair and warranty.

Standard products manufactured by Avalue are offered a 2-year warranty, from the date of delivery from Avalue. For ODM/OEM products manufactured by Avalue or PCBA with conformal coating, will follow up the define warranty of the agreement, otherwise will be offered 1-year warranty for ODM/OEM products but non-warranty for PCBA with conformal coating. For outsourcing parts kit by Avalue (ex: Motherboard, LCD touch panel, CPU, RAM, HDD) are offered a 6-month warranty, and Mobile/Tablet PC battery are offered a warranty of the half year, from the date of delivery by Avalue. Products before the mass production stage, i.e. engineering samples are not applied in this warranty or service policy. For extended warranty and cross-territory services, product defects resulting from design, production process or material are covered by the pre-set warranty period after the date of delivery from Avalue. For non-Avalue products, the product warranty and repair time shall be based on the service standards provided by the original manufacturer; in principle Avalue will provide these products a warranty service for no more than one year.

#### **2.2 Maintenance services within the warranty period**

In the case of Avalue product DOA (Defect-on-Arrival) when the customer finds any defect within 1 month after the delivery, Avalue will replace it with a new product in a soonest way. Except for custom products, once the customer is approved of a Cross-Shipment Agreement, which allows for delivery a new product to the customer before receiving the defective one, Avalue will immediately proceed with new product replacement for the said DOA case. On validation of the confirmed defect, Avalue is entitled to reserve the right whether to provide a new product for replacement. For the returned defective new product, it is necessary to verify that there shall be no bruise, alteration, scratch or marking to the appearance, and that none of the delivered accessories missing; otherwise, the customer will be requested to pay a processing fee. On the other hand, if the new product defect is resulting from incorrect configuration or erroneous use by the user instead of any problem of the hardware itself, the customer will also be requested to pay for relevant handling fees.

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As for other conditions, Avalue will handle defects by way of repair. The customer will be requested to send the defective product to an Avalue authorized service center, and Avalue will return the repaired product back to the customer as soon as possible.

### 2.3 Ruling of an out-of-warranty defect

The following situations are not included in the warranty:

- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident or other causes. Avalue reserves the right for the ruling of the aforementioned situations.
- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules of non-Avalue products and accessories shall be in accordance with standards set up by the original manufacturer. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiration of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number.
- Products before the mass production stage, i.e. engineering samples.

## 3. Procedure for sending for repair

### 3.1 Attain a RMA number

A customer's rejected product returned for repair shall have a RMA (Return Merchandise Authorization) number. Without a RMA number, Avalue will not provide any repair service for the rejected product, and the product will be returned to the customer at customer's cost. Avalue will not issue any notice for the return of the product.

Each returned product for repair shall have a RMA number, which is simply the authorization of the return for repair; it is not a guarantee that the returned goods can be repaired or replaced. For applying for a RMA number, the customer may enter the eRMA webpage of Avalue <https://www.avalue.com/en/member> and log-in with an account number and a password authorized by Avalue. The system will then automatically issue a RMA number.

When applying for the RMA number, it is essential to fill in basic information of the customer and the product, together with detailed description of the problem encountered. If possible, avoid using ambiguous words such as "does not work" or "problematic". Without a substantial description of the problem, it is hard to start the repair and will cause prolonged repair time. Lacking detailed statement of fault steps also makes the problem hard to be identified, sometimes resulting in second-time repairs.

In case the customer can't define the cause of problem, please contact Avalue application engineers. Sometimes when the problem can be resolved even before the customer sends back the product.

On the other hand, if the customer only returns the key parts to Avalue for repair, it is necessary that the serial number of the entire unit is given in the "Problem Description" field, so that warranty period can be ruled accordingly; or Avalue will handle the case as an Out-of- warranty case.

### 3.2 Return of faulty product for repair

It is recommended that the customer not to return the accessories (manual, connection cables, etc.) with the products for repair, devices such as CPU, DRAM, CF memory card, etc., shall also be removed from the faulty goods before return for repair. If these devices are relevant to described repair problems and necessary to be returned with the goods; please clearly indicate the items included in the eRMA application form. Avalue shall not be responsible for any item that is not itemized. Moreover, make sure the problem(s) are detailed in the "Problem Description" field.

In the list of delivery, the customer may fill-in a value which is lower than the actual value, to prevent customs levying a higher tax over the excessive value of the return goods. The customer shall be held responsible for extra fees caused by this. We strongly recommend that "Invoice for customs purpose only with no commercial value" be indicated on the delivery note. Also for the purpose of expedited handling, please printout the RMA number and put it in the carton, also indicate the number outside of the carton, with the recipient addressing to Avalue RMA Department.

When returning the defective product, please use an anti-static bag or ESD material to pack it properly. In case of improper packing resulting in damages in the transportation process, Avalue reserves the right to reject the un-repaired faulty good at the customer's costs. Furthermore, it is suggested that the faulty goods shall be sent via a door-to-door courier service. The customer shall be held responsible for any customs clearance fee or extra expenses if Air-Cargo is used for the delivery.

In case of a DOA situation of a new product, Avalue will be responsible for the product and the freight. If the faulty goods are within the warranty period, the sender will take responsibility for the freight. For an out-of-warranty case, the customer shall be responsible for the freight of both trips.

### 3.3 Maintenance Charge

Avalue will charge a moderate repair fee for the following conditions:

- The warranty period has expired.
- Product has been altered or its label of the serial number has been torn off.
- Product functionality issues resulting from improper use by the user, unauthorized dismantle or alteration, unfit operation environment, improper maintenance, accident

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or other causes. Avalue reserves the right for the ruling of the aforementioned situations.

- Product damage resulting from lightning, flood, earthquake or other calamities.
- The warranty rules for non-Avalue products and accessories shall be in accordance with standards set up by the original supplier. These products and accessories include RAM, HDD, FDD, CD-ROM, CPU, FAN, etc.
- Product upgrade request or test request submitted by the customer after expiry of the warranty.
- PCBA with conformal coating.
- Avalue semi-product and outsourced products without Avalue serial number
- Products before the mass production stage, i.e. engineering samples.
- In case the products received are examined as NPF (No Problem Found) within the warranty period, the customer shall be responsible for the freight of both trips.
- Please contact your local distributor to examine in advance to prevent unnecessary freight cost.

For system failure of out-of-warranty products, Avalue will provide a quotation prior to repair service. When the customer applies for the cost, please refer to the Quotation number. In case the customer does not return the DOA product that has already been replaced by a new one, or the customer does not sign back the quotation of the out-of-warranty maintenance, Avalue reserves the right of whether or not to provide the repair service. In case the customer does not reply in 3 months, Avalue shall directly scrap or return the product back to customer at customer's cost without further notice to the customer.

### 3.4 Maintenance service of phased-out products

For servicing phased-out products, Avalue provides an extended period, starting the date of phase-out, as a guaranteed maintenance period of such products, for continuance of the maintenance service to meet customer's requirements. In case of unexpected factors causing Avalue to be unable to repair/replace a warranted but phased-out product, Avalue will, depending on the availability, upgrade the product (free of charge with continued warranty period as of the original product), or, give partial refund (based on the length of the remaining warranty period) to solve this kind of problem.

### 3.5 Maintenance Report

On completion of repair of a defective product, a Maintenance Report indicating the maintenance result and part(s) replaced (if any) will be sent to the customer together with the product. If the customer demands an additional maintenance analysis report, a service fee of various level will be charged depending on the warranty status. In case the analysis result shows that the defect attributes to Avalue's faulty design or process, the analysis fee will be exempted.



#### **4. Service Products**

Avalue provides service products to manage with different customer needs. Should you have any need, please consult to Avalue Sales Department.












##### **Defect Analysis Report (DAR)**






Avalue provides DAR (Defect Analysis Report) services aiming to elevating customer satisfaction. A DAR includes defect cause identification/verification/suggestion and improvement precautions, with instructions on correct usage for the avoidance of any reoccurrence.

##### **Upgrade Service**

Avalue is capable to provide system upgrade service for customization requirements. This upgrade service is applicable for main parts, such as CPU, memory, HDD, SSD, storage devices; also replacements motherboards of systems. Please contact Avalue sales for details to evaluate the possibility of system upgrade service and obtain information of lead time and price.

## Explanation of Graphical Symbols

	Warning	A WARNING statement provides important information about a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	Caution	A CAUTION statement provides important information about a potentially hazardous situation which, if not avoided, may result in minor or moderate injury to the user or patient or in damage to the equipment or other property.
	Note	A NOTE provides additional information intended to avoid inconveniences during operation.
		Direct current.
		Alternating current
		Stand-by, Power on
		FCC Certification
		CE Certification
		Follow the national requirements for disposal of equipment.
		Stacking layer limit
		This side up

		Fragile Packaging
		Beware of water damage, moisture-proof
		Carton recyclable
		Handle with care
		Follow operating instructions of consult instructions for use.

### Disposing of your old product

#### **WARNING:**

There is danger of explosion if the battery is mishandled or incorrectly replaced. Replace only with the same type of battery. Do not disassemble it or attempt to recharge it outside the system. Do not crush, puncture, dispose of in fire, short the external contacts, or expose to water or other liquids. Dispose of the battery in accordance with local regulations and instructions from your service provider.

#### **CAUTION:**

- Lithium Battery Caution: Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type. Dispose batteries according to manufacturer's instructions.
- Disposal of a BATTERY into fire or a hot oven, or mechanically crushing or cutting of a BATTERY, that can result in an EXPLOSION
- Leaving a BATTERY in an extremely high temperature surrounding environment that can result in an EXPLOSION or the leakage of flammable liquid or gas.
- A BATTERY subjected to extremely low air pressure that may result in an EXPLOSION or the leakage of flammable liquid or gas.

#### **Mise en garde!**

AVERTISSEMENT : Il existe un risque d'explosion si la batterie est mal manipulée ou remplacée de manière incorrecte. Remplacez uniquement par le même type de batterie. Ne le démontez pas et ne tentez pas de le recharger en dehors du système. Ne pas écraser, percer, jeter au feu, court-circuiter les contacts externes ou exposer à l'eau ou à d'autres liquides. Jetez la batterie conformément aux réglementations locales et aux instructions de votre fournisseur de services.

#### **MISE EN GARDE:**

- Pile au lithium Attention : Danger d'explosion si la pile n'est pas remplacée correctement. Remplacer uniquement par un type identique ou équivalent. Jetez les piles conformément aux instructions du fabricant.
- L'élimination d'une BATTERIE dans le feu ou dans un four chaud, ou l'écrasement ou le découpage mécanique d'une BATTERIE, pouvant entraîner une EXPLOSION
- Laisser une BATTERIE dans un environnement à température extrêmement élevée pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.
- UNE BATTERIE soumise à une pression d'air extrêmement basse pouvant entraîner une EXPLOSION ou une fuite de liquide ou de gaz inflammable.

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# 1. Getting Started

## 1.1 Safety Precautions

### Warning!



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

### Caution!



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

Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.

### Français:

### Attention!



Débranchez le câble d'alimentation de votre châssis chaque fois que vous travaillez avec le matériel. Ne faites pas de connexion lorsque le système est allumé. Les composants électroniques sensibles peuvent être endommagés par les surtensions soudaines. Seule les personnels expérimentés de l'électronique peuvent ouvrir le châssis du PC.

### Précaution!



Il faut toujours mettre à la masse pour éliminer l'électricité statique avant de toucher la carte CPU. Les appareils électroniques modernes sont très sensibles aux électricité statique. Pour des raisons de sécurité, utilisez un bracelet électrostatique. Placez tous les composants électroniques sur une surface antistatique ou dans un sac antistatique quand ils ne sont pas dans le châssis.

Risque d'explosion si la batterie est remplacée par un type incorrect. Jetez les piles usagées selon les instructions

**Warning!**



Class I Equipment. This equipment must be earthed. The power plug must be connected to a properly wired earth ground socket outlet. An improperly wired socket outlet could place hazardous voltages on accessible metal parts.

**Warning!**



**IT Room**

Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.

**Warning!**



**RAL**

The device can only be used in a fixed location such as a lab or a machine room. When you install the device, ensure that the protective earthing connection of the socket-outlet is verified by a skilled person.

**Warning!**



**For RTC battery, current statement in the manual is acceptable.**

There is danger of explosion if the battery is mishandled or incorrectly replaced. Replace only with the same type of battery. Do not disassemble it or attempt to recharge it outside the system. Do not crush, puncture, dispose of in fire, short the external contacts, or expose to water or other liquids. Dispose of the battery in accordance with local regulations and instructions from your service provider.

**1.2 Packing List**

Before installation, please ensure all the items listed in the following table are included in the package.

Item	Description	Q'ty
1	HPM-ERSDE motherboard	1
2	I/O Shield	1
3	LGA4677 CPU carrier-E1B	2



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

## 1.3 Manual Objectives

This manual describes in details Avalue Technology HPM-ERSDE Single Board.

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

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

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

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

1.4 System Specifications

<b>System</b>	
<b>CPU</b>	Dual Intel LGA4677 Socket supports 5th Gen. Intel Xeon Scalable Processor (Max. TDP at 270W)
<b>BIOS</b>	AMI UEFI BIOS
<b>System Chipset</b>	Intel C741 Chipset (DMI x8)
<b>System Memory</b>	12 x DDR5 5600MT/s RDIMM Up to 3TB
<b>Watchdog Timer</b>	System reset event 0~6553 second.
<b>H/W Status Monitor</b>	Temperature. Fan. Voltage. Case open. (1 x 2.5mm pitch Box Wafer, Pinrex 753-71-02TW07 or equivalent)
<b>RAID</b>	Intel VMD and Virtual RAID on CPU(VROC) 1 x Intel VROC header
<b>TPM</b>	TPM 2.0 NuvoTon NPCT750AADYX or equivalent TCM Nationz Z32H330TC or equivalent (Optional)
<b>Other</b>	IPMI 2.0 with AST 2600 BMC controller onboard.
<b>Expansion Slot</b>	
<b>PCIe</b>	7 x PCIe Gen5 x16 slots Slot 1, PCIe Gen5 x16 from 2nd CPU Slot 2, PCIe Gen5 x16 from 1st CPU Slot 3, PCIe Gen5 x16 from 2nd CPU Slot 4, PCIe Gen5 x16 from 1st CPU Slot 5, PCIe Gen5 x16 from 2nd CPU Slot 6, PCIe Gen5 x16 from 1st CPU Slot 7, PCIe Gen5 x16 from 2nd CPU (This slot is closest to CPU socket)
<b>Storage</b>	
<b>M.2</b>	1 x M.2 M-Key Slot to support 1 x PCIe 5.0 x4 NVMe SSD from 1st CPU 2242/2260/2280/22110 form factor
<b>SATA</b>	5 x SATA III Supports up to 6.0 Gb/s -1 x Mini-SAS HD 4i (from PCH for 4 xSATA or 1 x4 NVMe interface) -1 x 7pin SATA connector
<b>Other</b>	3 x Slim SAS 8i (SFF-8654) connector (from 1st CPU)
<b>Edge I/O</b>	
<b>COM</b>	1 x DB-9 male connector (Connector: DB-9(male) and DB-15(female) dual port right angle)
<b>LAN</b>	5 x RJ45 (Including MGMT, LAN1, 2, 3, and 4)

	<p>MGMT port: Dedicated IPMI function access</p> <p>LAN 1: 1GbE Ethernet port, LAN1 shared with IPMI function access (Connector: 1 x 1G Base-T RJ45 module jack over 2 x USB 3.1 Gen1 stacked receptacle)</p> <p>LAN 2: 2.5GbE Ethernet port (Connector: 1 x 2.5G Base-T RJ45 module jack over 2 x USB 3.1 Gen1 stacked receptacle)</p> <p>LAN 3 and 4: 2 x 10GbE Ethernet ports (Optional) (Connector: 1 x 2X1 10G Base-T RJ45 module jack)</p>																				
<b>USB</b>	<p>4 x USB 3.1 type A ports +5VSB/0.9A (Connector: 1 x 1G Base-T RJ45 module jack over 2 x USB 3.1 Gen1 stacked receptacle)</p> <p>(Connector: 1 x 2.5G Base-T RJ45 module jack over 2 x USB 3.1 Gen1 stacked receptacle)</p> <p>2 x USB 3.1 type A ports +5VSB/0.9A (Connector: USB 3.0 type A double stacked USB receptacle).</p>																				
<b>VGA</b>	<p>1 x DB-15 female connector (Connector: DB-9(male) and DB-15(female) dual port right angle)</p>																				
<b>Onboard I/O</b>																					
<b>COM</b>	<p>1 x RS232 ports (1 x 2.0mm pitch Box Header)</p> <p>Pin definition: Follow Avalue standard.</p>																				
<b>USB</b>	<p>2 x USB 2.0 type A receptacle,+5VSB/0.5A</p> <p>2 x USB 2.0 ports (1 x USB 2.0 2.54mm pitch Box Header) +5VSB/0.5A</p> <p>Pin definition:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>VCC</td> <td>Pin 1</td> <td>Pin 2</td> <td>VCC</td> </tr> <tr> <td>USB0-</td> <td>Pin 3</td> <td>Pin 4</td> <td>USB1-</td> </tr> <tr> <td>USB0+</td> <td>Pin 5</td> <td>Pin 6</td> <td>USB1+</td> </tr> <tr> <td>GND</td> <td>Pin 7</td> <td>Pin 8</td> <td>GND</td> </tr> <tr> <td>Key</td> <td>Pin 9</td> <td>Pin 10</td> <td>No Connection</td> </tr> </table> <p>2 x USB 3.1 Gen1 ports (1 x USB 3.1 Gen1 2.0mm pitch Box Header (Pinrex 52X-8020GB52 or equivalent) +5VSB/0.9A</p> <p>Pin definition :</p>	VCC	Pin 1	Pin 2	VCC	USB0-	Pin 3	Pin 4	USB1-	USB0+	Pin 5	Pin 6	USB1+	GND	Pin 7	Pin 8	GND	Key	Pin 9	Pin 10	No Connection
VCC	Pin 1	Pin 2	VCC																		
USB0-	Pin 3	Pin 4	USB1-																		
USB0+	Pin 5	Pin 6	USB1+																		
GND	Pin 7	Pin 8	GND																		
Key	Pin 9	Pin 10	No Connection																		

## HPM-ERSDE User's Manual

	Pin No.   Signal   Description			
	1	Vbus	Power	
	2	IntA_P1_SSRX-	USB3 ICC Port1 SuperSpeed Rx-	
	3	IntA_P1_SSRX+	USB3 ICC Port1 SuperSpeed Rx+	
	4	GND	GND	
	5	IntA_P1_SSTX-	USB3 ICC Port1 SuperSpeed Tx-	
	6	IntA_P1_SSTX+	USB3 ICC Port1 SuperSpeed Tx+	
	7	GND	GND	
	8	IntA_P1_D-	USB3 ICC Port1 D- (USB2 Signal D-)	
	9	IntA_P1_D+	USB3 ICC Port1 D+ (USB2 Signal D+)	
	10	ID	Over Current Protection	
	11	IntA_P2_D+	USB3 ICC Port2 D+ (USB2 Signal D+)	
	12	IntA_P2_D-	USB3 ICC Port2 D- (USB2 Signal D-)	
	13	GND	GND	
	14	IntA_P2_SSTX+	USB3 ICC Port2 SuperSpeed Tx+	
	15	IntA_P2_SSTX-	USB3 ICC Port2 Super Speed Tx-	
	16	GND	GND	
	17	IntA_P2_SSRX+	USB3 ICC Port2 SuperSpeed Rx+	
	18	IntA_P2_SSRX-	USB3 ICC Port2 SuperSpeed Rx-	
	19	Vbus	Power	
<b>CPU/System FAN</b>	2 x 4 Pin, pitch 2.54mm CPU Fan Header (4 Pin PWM) 6 x 4 Pin, pitch 2.54mm Chassis Fan Header (4 Pin PWM, 2 for front fans and 4 for rear fans)			
<b>Buzzer</b>	1 x onboard buzzer			
<b>Front Panel</b>	1 x front panel connector (2.54 mm Pitch)			
	Pin	Function	Pin	Function
	1-3	HDD LED	2-4	POWER LED
	5-7	RESET BUTTON	6-8	POWER BUTTON
	9-11	STATUS LED	10-12	LAN1 ACT LED
	13-15	UID LED	14-16	STBY POWER LED
	17-19	UID BUTTON	18-20	LAN2-X ACT LED
	Notes: LAN2-X ACT LED, "X" means the max number of Ethernet ports.			
<b>RTC Battery</b>	1 x Horizontal Socket Type CMOS Battery Holder with CR2450 (15 years)			
<b>Clear CMOS</b>	1 x Clear CMOS header (1 x 2.0 mm pitch Header)			
<b>Audio</b>	1 x Avalue HD audio interface (1 x 6x2 2.0mm pitch wafer connector)			
	Signal	Pin	Pin	Signal
	ACZ_VCC3	1	2	GND
	ACZ_SYNC	3	4	ACZ_BITCLK
	ACZ_SDOUT	5	6	ACZ_SDIN0
	ACZ_SDIN1	7	8	ACZ_RST#
	ACZ_5VSB	9	10	GND-Chassis
GND	11	12	NC	
<b>Display</b>				
<b>Graphic Chipset</b>	1 x VGA port (DB15 on edge I/O) AST2600 BMC controller			
<b>Spec. &amp; Resolution</b>	VGA:1920x1200@60Hz 32bpp			

<b>Audio</b>																																																	
<b>Audio Codec</b>	ALC888S through Avalue HD Audio daughter board.																																																
<b>Ethernet</b>																																																	
<b>LAN Chipset</b>	1 x Intel I210AT 1 x Intel I226-LM 1 x Intel X550-AT2																																																
<b>LAN Spec.</b>	1 x 1G Base-T Ethernet Controller 1 x 2.5G Base-T Ethernet controller 1 x Dual 10G Base-T Ethernet controller																																																
<b>LED Indicator</b>	1G LAN:																																																
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<b>Mechanical &amp; Environmental</b>																																																	
<b>Power Requirement</b>	1 x Std. 24 pin ATX Connector 3 x 8 Pin SSI 12V Connectors																																																

# HPM-ERSDE User's Manual

	Connector current rating information.									
	<b>MAXIMUM CURRENT RATING(Amperes)</b> Wire-to-Wire and Wire-to- Board									
	<b>Brass</b>					<b>Phosphor Bronze</b>				
	Ckt.Size Wire	2 & 3	4 - 6	7 - 10	12 - 24	Ckt.Size Wire	2 & 3	4 - 6	7 - 10	12 - 24
	AWG #16	9	8	7	6	AWG #16	8	7	6	5
	AWG #18	9	8	7	6	AWG #18	8	7	6	5
	AWG #20	7	6	5	5	AWG #20	6	5	4	4
	AWG #22	5	4	4	4	AWG #22	4	3	3	3
AWG #24	4	3	3	3	AWG #24	3	2	2	2	
AWG #26	3	2	2	2	AWG #26	2	1	1	1	
AWG #28	2	1	1	1	AWG #28	1	1	1	1	
<b>ACPI</b>	Yes, S0 and S5									
<b>Power Mode</b>	H/W: ATX power well design only BMC: AT (Default)									
<b>Operating Temp.</b>	0 °C to 50 °C (32°F ~ 122°F )to support up to 250W TDP CPU 0 °C to 40 °C (32°F ~ 104°F )to support up to 270W TDP CPU									
<b>Storage Temp.</b>	-40 °C to 85 °C (-40°F~ 185°F)									
<b>Operating Humidity</b>	40°C 95% Relative Humidity, Non-condensing									
<b>Size (L x W)</b> (Please consult product engineers for the production feasibility if the size is larger than 410x360mm or smaller than 80x70mm)	Proprietary form factor 12" x 16.452" (304.8mm x 417.88mm) PCB thickness is 2.86mm									
<b>Weight</b>	2.2KG									
<b>Vibration Test</b>	Follow Avalue standard test. <u>Random Vibration Operation</u> Reference IEC60068-2-64 Testing procedures 1. Test PSD : 0.00454G <sup>2</sup> /Hz , 1.5 Grms 2. System condition : operation mode 3. Test frequency : 5~500 Hz 4. Test axis : X,Y and Z axis 5. Test time : 30 minutes per each axis 6. System condition : Operation mode 7. IEC60068-2-64 Test Fh Storage : mSATA <u>Random vibration test (Non-operation)</u> Reference IEC60068-2-64 Testing procedures 1. PSD: 0.00808G <sup>2</sup> /Hz , 2.0 Grms 2. Non-Operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis									



	<ol style="list-style-type: none"> <li>5. 30 min. per each axis</li> <li>6. System condition : Non-Operation mode</li> <li>7. IEC 60068-2-64 Test:Fh</li> </ol> <p><u>Package Vibration Test:</u></p> <p>Reference IEC60068-2-64 Testing procedures</p> <ol style="list-style-type: none"> <li>1. Test PSD : 0.026G<sup>2</sup>/Hz , 2.16 Grms</li> <li>2. Non-operation mode</li> <li>3. Test frequency : 5~500 Hz</li> <li>4. Test axis : X,Y and Z axis</li> <li>5. Test time : 30 minutes per each axis</li> <li>6. IEC 60068-2-64 Test Fh</li> </ol>
<p style="text-align: center;"><b>Drop Test</b></p>	<p>Follow Avalue standard test.</p> <p>Reference ISTA 2A, Method : IEC-60068-2-32 Test:Ed</p> <p>Test Ea : Drop Test</p> <ol style="list-style-type: none"> <li>1 Test phase : One corner, three edges, six faces</li> <li>2 Test high : 96.5cm</li> <li>3 Package weight : 5Kg</li> <li>4 Test drawing</li> </ol>
<p style="text-align: center;"><b>OS Information</b></p>	<p>Windows :</p> <p>Windows 10 IoT Enterprise LTSC 2021.</p> <p>Windows 11.</p> <p>Windows Server IoT 2019 with VT-d disabled.</p> <p>Windows Server IoT 2022.</p> <p>Linux :</p> <p>Ubuntu 21.10, 22.04 LTS or later</p> <p>Red Hat Enterprise Linux (RHEL) 8.4 LTS/8.5 or later</p>



**Note:** Specifications are subject to change without notice.

# HPM-ERSDE User's Manual

## \*Only Install CPU1

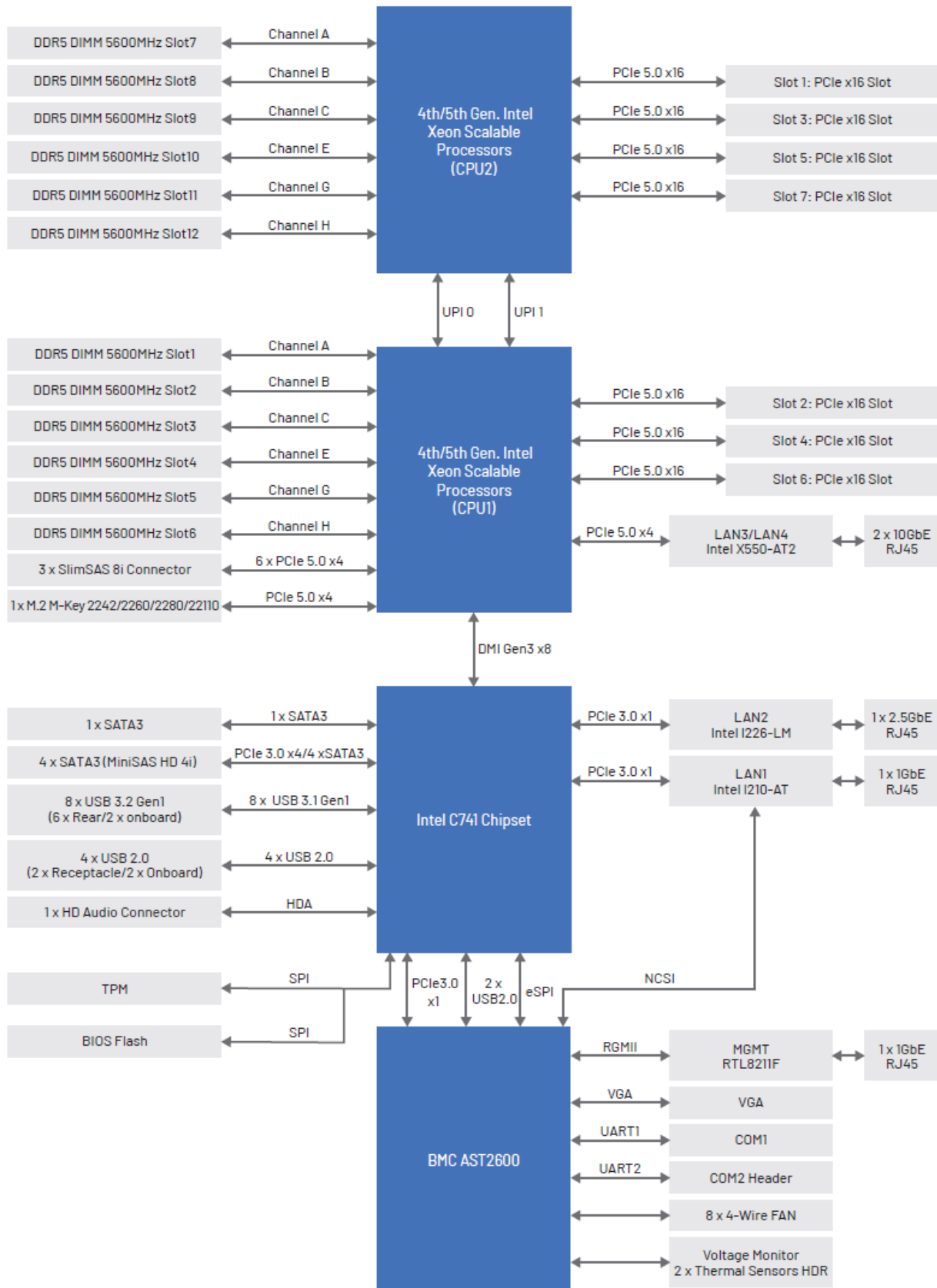
DIMM Qty	DIMM No.					
	DIMM1	DIMM2	DIMM3	DIMM4	DIMM5	DIMM6
1	V					
		V				
				V		
2	V				V	
			V	V		
4	V		V	V	V	
6	V	V	V	V	V	V

## \*Install CPU1 and CPU2

DIMM Qty	DIMM No.											
	DIMM1	DIMM2	DIMM3	DIMM4	DIMM5	DIMM6	DIMM7	DIMM8	DIMM9	DIMM10	DIMM11	DIMM12
1	V											
		V										
				V								
2	V						V					
	V							V				
	V									V		
		V						V				
		V							V			
		V									V	
				V				V				
4	V				V		V				V	
	V				V				V	V		
			V	V			V				V	
			V	V					V	V		
6	V		V	V	V		V				V	
	V		V	V	V				V	V		
	V				V		V		V	V	V	
			V	V			V		V	V	V	
8	V		V	V	V		V		V	V	V	
	V	V	V	V	V	V	V				V	
	V	V	V	V	V	V			V	V		
	V				V		V	V	V	V	V	V
			V	V			V	V	V	V	V	V
10	V	V	V	V	V	V	V		V	V	V	
	V		V	V	V		V	V	V	V	V	V
12	V	V	V	V	V	V	V	V	V	V	V	V

## 1.5 Architecture Overview—Block Diagram

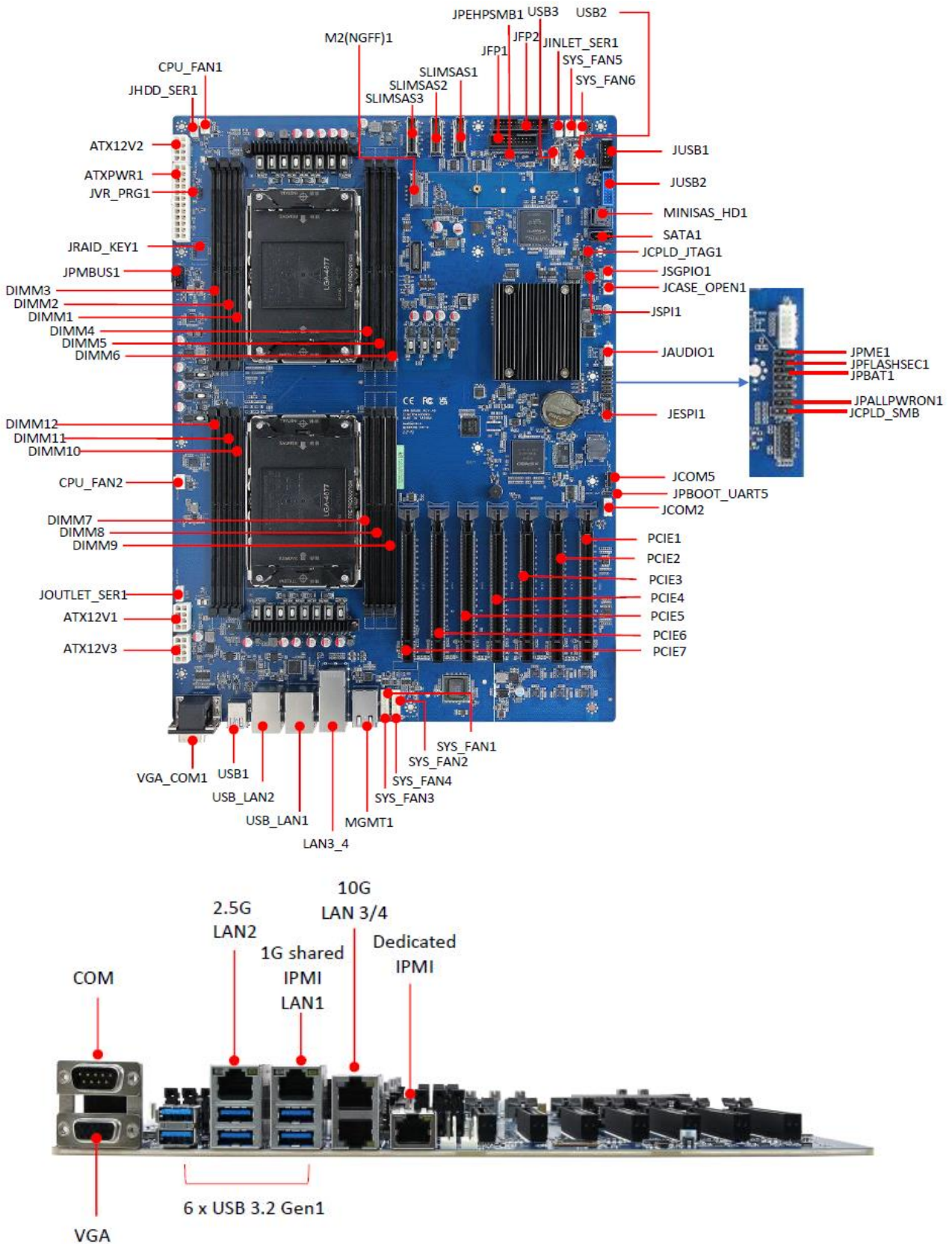
The following block diagram shows the architecture and main components of HPM-ERSDE.



# 2. Hardware Configuration

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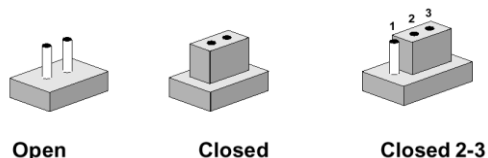
## 2.1 Product Overview



## 2.2 Jumper and Connector List

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

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



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



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

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

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

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

### Jumpers

Label	Function	Note
JPFLASHSEC1	Flash Security Override	3 x 1 header, pitch 2.00mm
JPME1	ME FW update	3 x 1 header, pitch 2.00mm
JPALLPWRON1	Force PWRON setting	3 x 1 header, pitch 2.00mm
JPBAT1	Clear CMOS	3 x 1 header, pitch 2.00mm
JPBOOT_UART5	Boot UART5 setting	3 x 1 header, pitch 2.00mm
JPSATASEL	SATA or PCIE select	3 x 1 header, pitch 2.00mm

### Connectors

Label	Function	Note
SYS_FAN1-6	System fan connector 1-6	4 x 1 wafer, pitch 2.54mm
CPU_FAN1-2	CPU fan connector 1-2	4 x 1 wafer, pitch 2.54mm
VGA_COM1	Serial port 1 connector	

	VGA connector	
<b>JCOM2</b>	Serial port 2 connector	5 x 2 wafer, pitch 2.00mm
<b>JCOM5</b>	BMC_UART5 debug connector	4 x 1 header, pitch 2.54mm
<b>MGMT1</b>	MGMT port	
<b>JSGPIO1</b>	Serial General Purpose I/O connector	3 x 2 wafer, pitch 2.00mm
<b>PCIE1</b>	PCIe Gen5 x16	
<b>PCIE2</b>	PCIe Gen5 x16	
<b>PCIE3</b>	PCIe Gen5 x16	
<b>PCIE4</b>	PCIe Gen5 x16	
<b>PCIE5</b>	PCIe Gen5 x16	
<b>PCIE6</b>	PCIe Gen5 x16	
<b>PCIE7</b>	PCIe Gen5 x16 (The slot closest to CPU)	
<b>JFP1</b>	Front Panel connector 1	10 x 2 wafer, pitch 2.54mm
<b>JFP2</b>	Front Panel connector 2	12 x 2 wafer, pitch 2.54mm
<b>USB_LAN1</b>	2 x USB3.1 Gen1 connector 1 x RJ-45 Ethernet (LAN1 Share IPMI Port)	
<b>USB_LAN2</b>	2 x USB3.1 Gen1 connector 1 x RJ-45 Ethernet	
<b>LAN3_4</b>	2 x RJ-45 Ethernet	
<b>USB1</b>	2 x USB3.1 Gen1 connector	
<b>USB2/3</b>	2 x USB2.0 connector	
<b>JUSB1</b>	2 x USB2.0 connector	5 x 2 wafer, pitch 2.54mm
<b>JUSB2</b>	2 x USB3.1 Gen1 connector	10 x 2 wafer, pitch 2.00mm
<b>JSPI1</b>	SPI connector	4 x 2 header, pitch 2.00mm
<b>JESPI1</b>	ESPI connector	6 x 2 header, pitch 2.00mm
<b>SATA1</b>	Serial ATA connector	
<b>MINISAS-HD1</b>	Mini-SAS HD 4i (from PCH for 4 xSATA or 1 x4 NVMe interface)	
<b>SLIMSAS1-3</b>	3 x SlimSAS 8i connector for 6 x4 NVMe	
<b>JRAID_KEY1</b>	VROC Header	4 x 1 header, pitch 2.00mm
<b>DIMM1-12</b>	12 x DDR5 RDIMM socket	
<b>JVR_PRG1</b>	SMBUS VR connector	3 x 1 header, pitch 2.54mm
<b>JCASE_OPEN1</b>	CASE OPEN connector	2 x 1 wafer, pitch 2.50mm

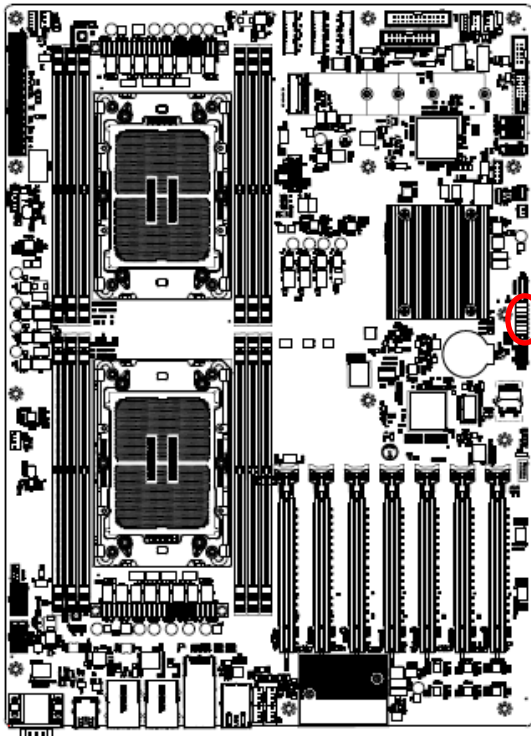
## HPM-ERSDE User's Manual

<b>ATX12V1</b>	ATX 12V power connector 1	4 x 2 wafer, pitch 4.20mm
<b>ATX12V2</b>	ATX 12V power connector 2	4 x 2 wafer, pitch 4.20mm
<b>ATX12V3</b>	ATX 12V power connector 3	4 x 2 wafer, pitch 4.20mm
<b>ATXPWR1</b>	ATX power connector	12 x 2 wafer, pitch 4.20mm
<b>JPMBUS1</b>	Power supply PMBus connector	5 x 1 wafer, pitch 2.54mm
<b>JINLET_SER1</b>	Inlet Thermal Sensor	4 x 1 wafer, pitch 2.00mm
<b>JOUTLET_SER1</b>	Outlet Thermal Sensor	4 x 1 wafer, pitch 2.00mm
<b>JHDD_SER1</b>	HDD Backplane thermal Sensor	5 x 1 wafer, pitch 2.00mm
<b>JPEHPSMB1</b>	CPU PCIE HP SMB connector	5 x 1 header, pitch 2.00mm
<b>JAUDIO1</b>	AZALIA connector	6 x 2 header, pitch 2.00mm
<b>M2(NGFF)1</b>	M.2 M-Key PCIe 5.0 x4 NVMe SSD	
<b>JCPLD_JTAG1</b>	CPLD JTAG header	5 x 2 header, pitch 2.54mm
<b>JCPLD_SMB</b>	CPLD SMBUS connector	3 x 1 header, pitch 2.54mm

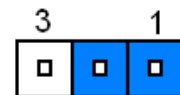


## 2.3 Setting Jumpers & Connectors

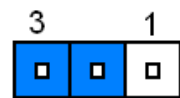
### 2.3.1 Flash Security Override (JPFLASHSEC)



Disable\*

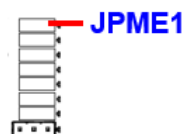
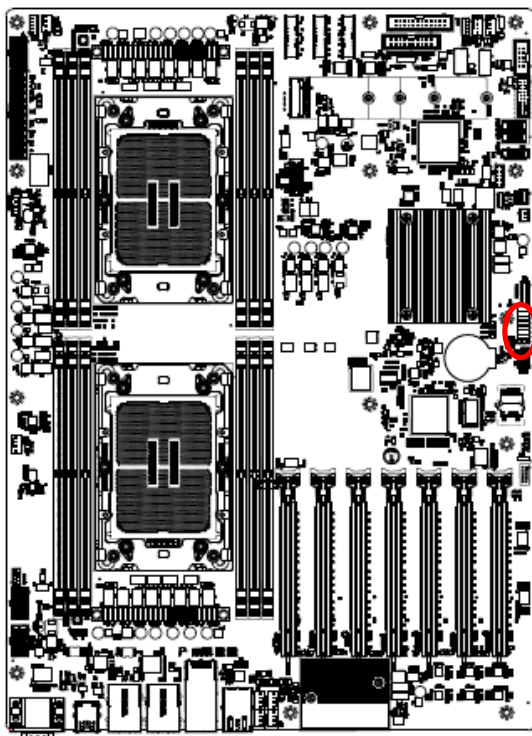


Enable

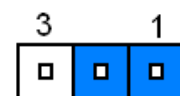


\* Default

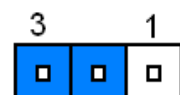
### 2.3.2 ME FW update (JPME1)



Normal\*

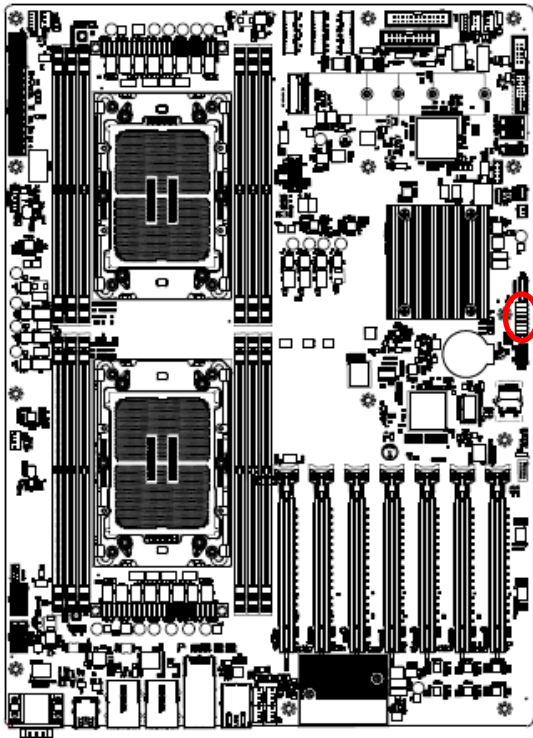


ME Force Update

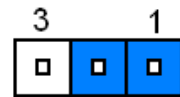


\* Default

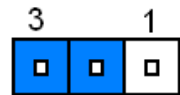
### 2.3.3 Force PWRON setting (JPALLPWRON1)



Normal Operation\*

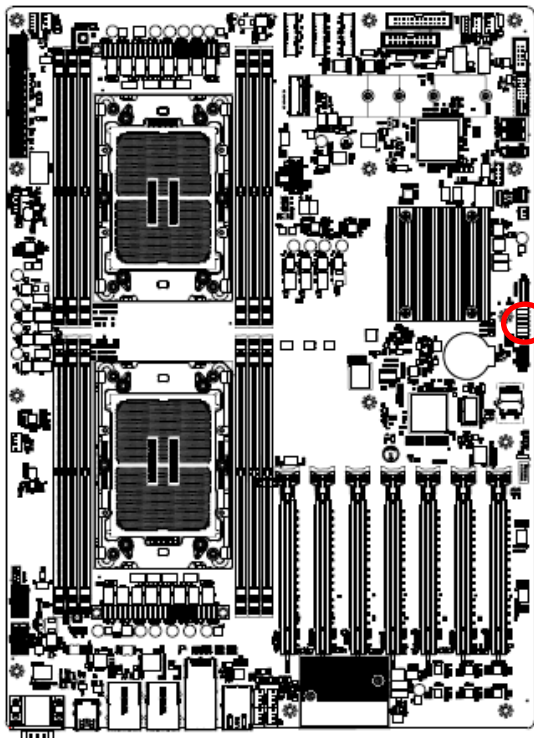


Enable Force PWR-ON

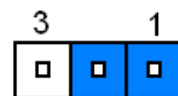


\* Default

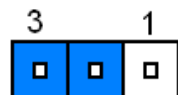
### 2.3.4 Clear CMOS (JPBAT1)



Normal RTC Reset\*

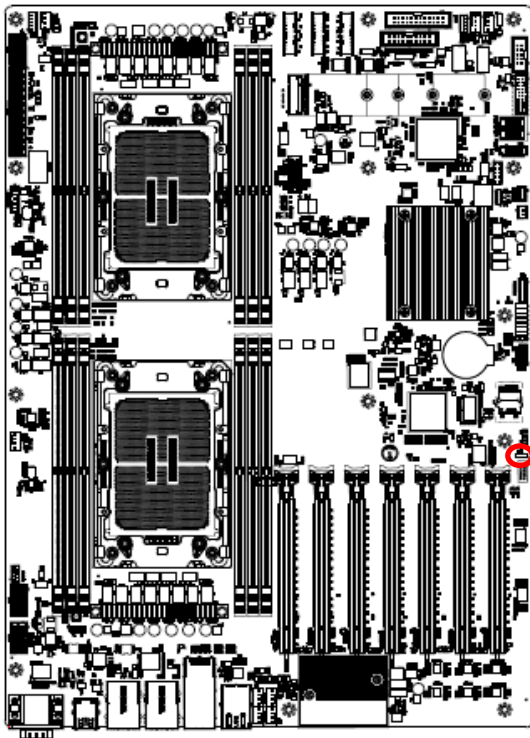


Clear RTC REGISTERS

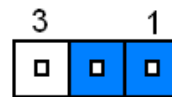


\* Default

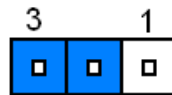
### 2.3.5 Boot UART5 setting (JPBOOT\_UART5)



Disable\*

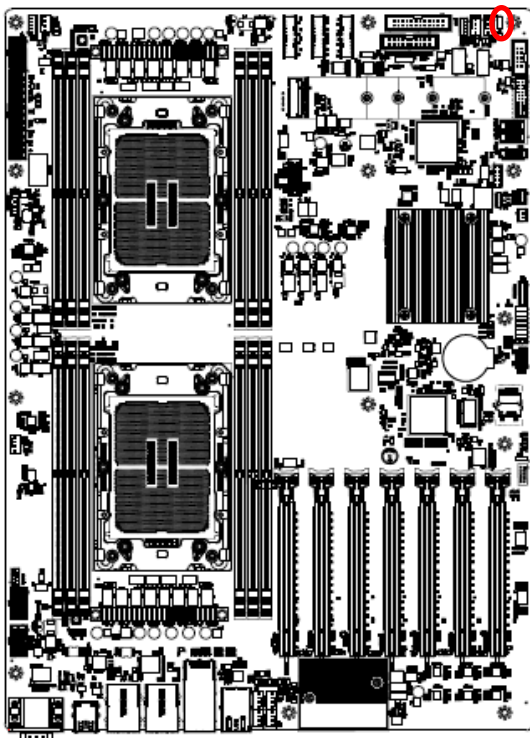


Enable BOOT FROM UART5

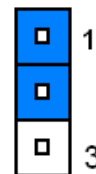


\* Default

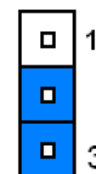
### 2.3.6 SATA or PCIE select (JPSATASEL)



PCIE\*

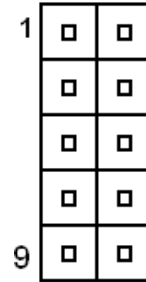
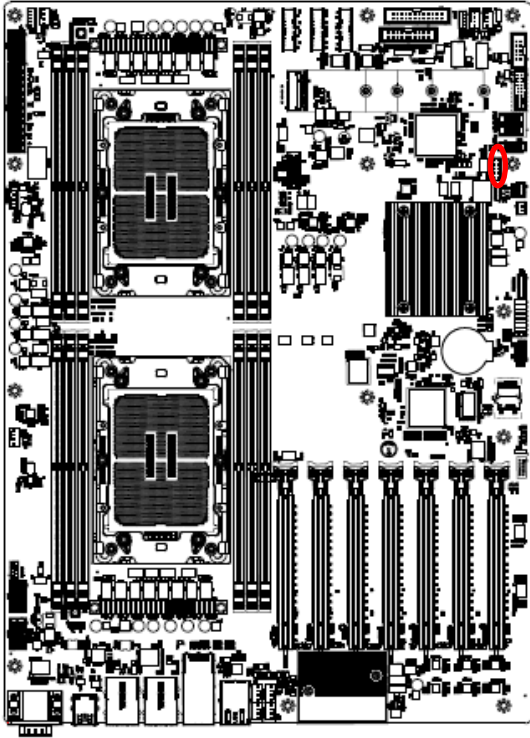


SATA



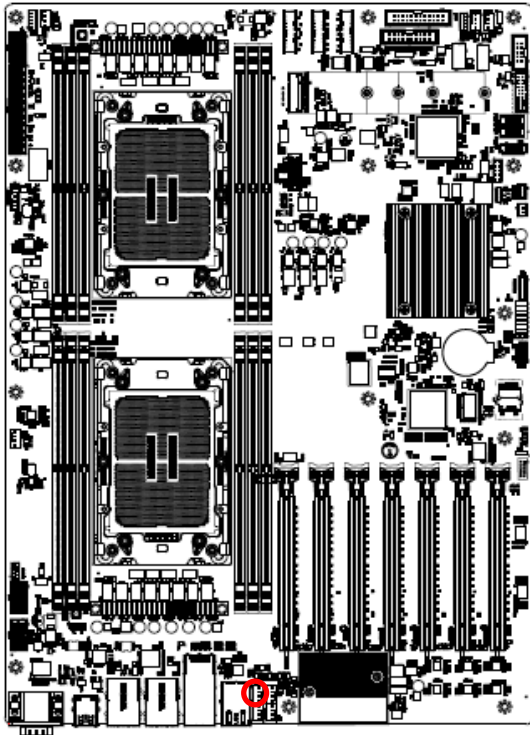
\* Default

2.3.7 CPLD JTAG header (JCPLD\_JTAG1)



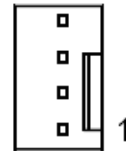
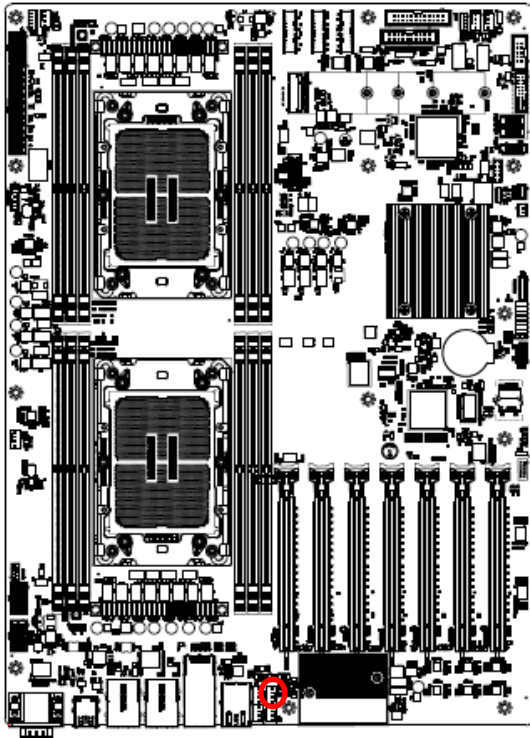
Signal	PIN	PIN	Signal
JTAG_TCK	1	2	GND
JTAG_TDO	3	4	+3.3VSB
JTAG_TMS	5	6	NC
NC	7	8	NC
JTAG_TDI	9	10	GND

2.3.8 System fan connector 1 (SYS\_FAN1)



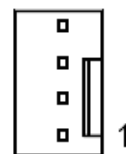
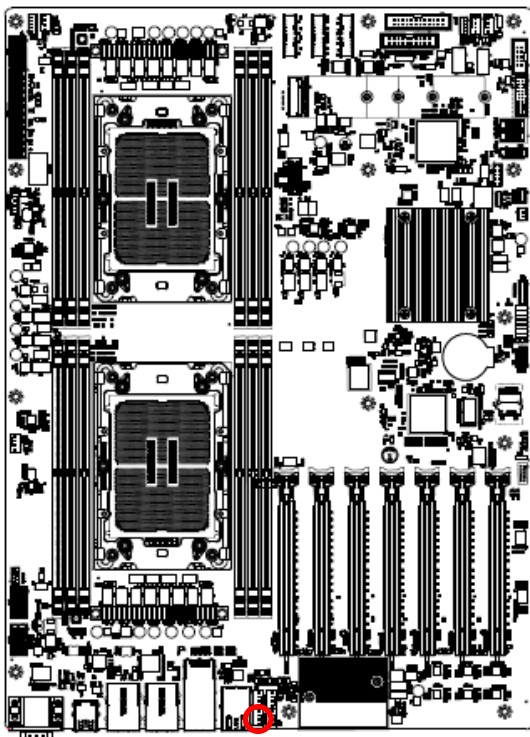
Signal	PIN
SYS_PWM1	4
FAN_TACH1	3
+12V	2
GND	1

### 2.3.9 System fan connector 2 (SYS\_FAN2)



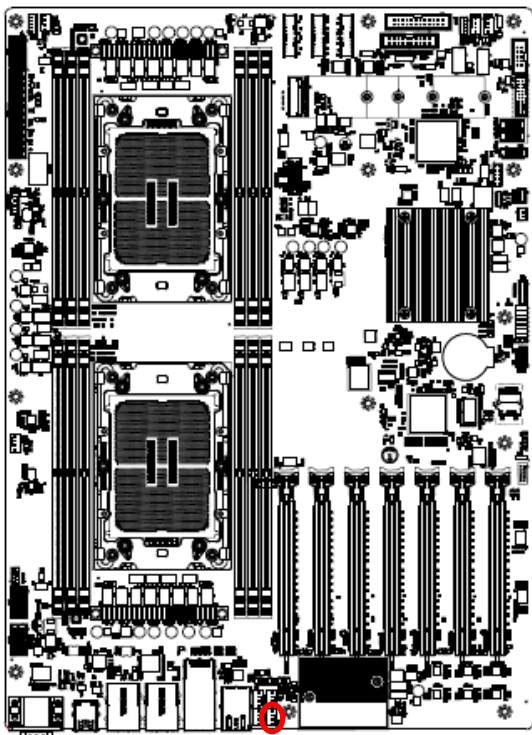
Signal	PIN
SYS_PWM2	4
FAN_TACH2	3
+12V	2
GND	1

### 2.3.10 System fan connector 3 (SYS\_FAN3)



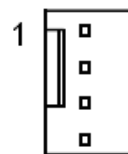
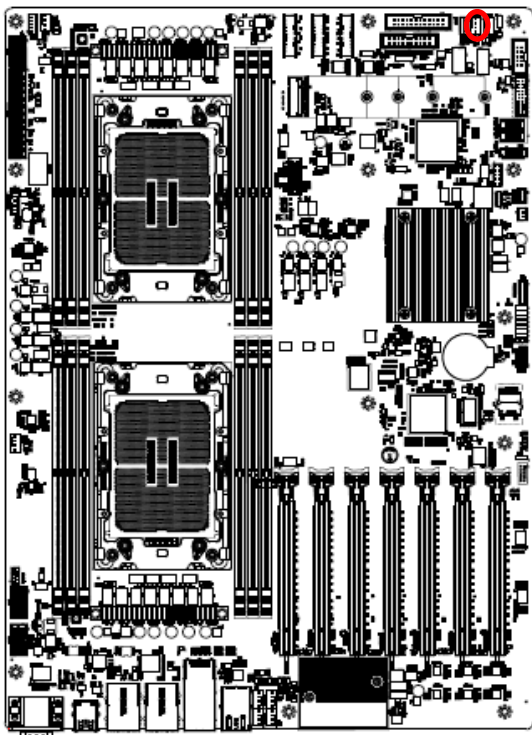
Signal	PIN
SYS_PWM3	4
FAN_TACH3	3
+12V	2
GND	1

2.3.11 System fan connector 4 (SYS\_FAN4)



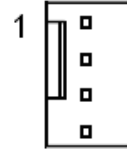
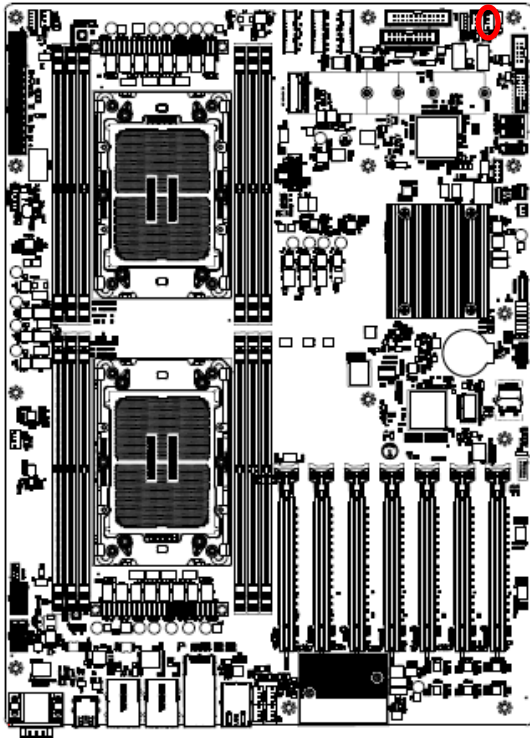
Signal	PIN
SYS_PWM4	4
FAN_TACH4	3
+12V	2
GND	1

2.3.12 System fan connector 5 (SYS\_FAN5)



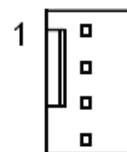
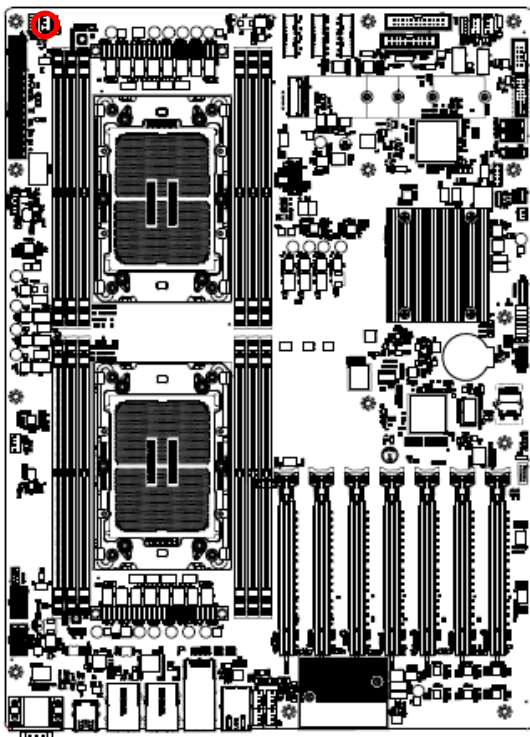
Signal	PIN
GND	1
+12V	2
FAN_TACH5	3
SYS_PWM5	4

### 2.3.13 System fan connector 6 (SYS\_FAN6)



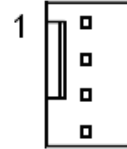
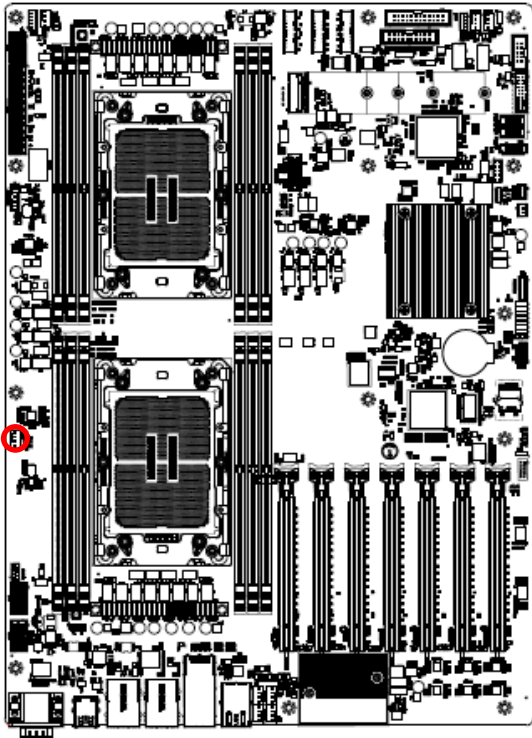
Signal	PIN
GND	1
+12V	2
FAN_TACH6	3
SYS_PWM6	4

### 2.3.14 CPU fan connector 1 (CPU\_FAN1)



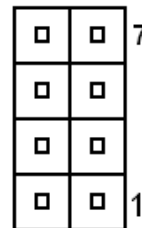
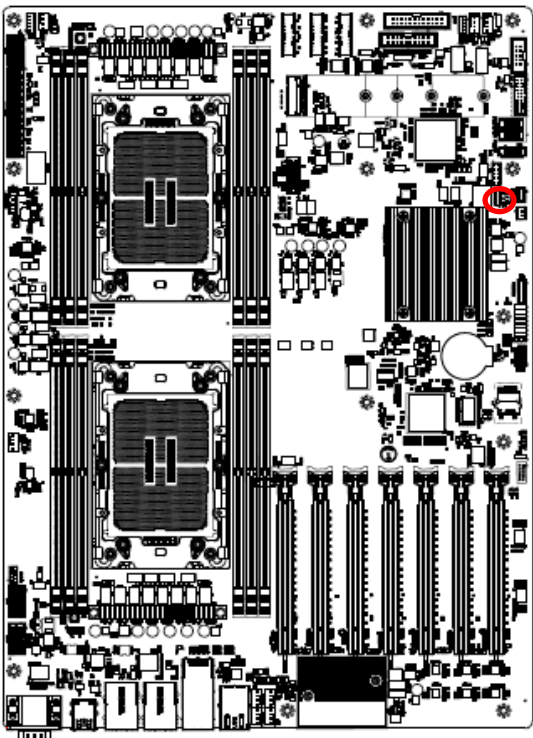
Signal	PIN
GND	1
+12V	2
FAN_TACH0	3
CPU0_PWM	4

2.3.15 CPU fan connector 2 (CPU\_FAN2)



Signal	PIN
GND	1
+12V	2
FAN_TACH7	3
CPU1_PWM	4

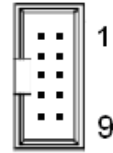
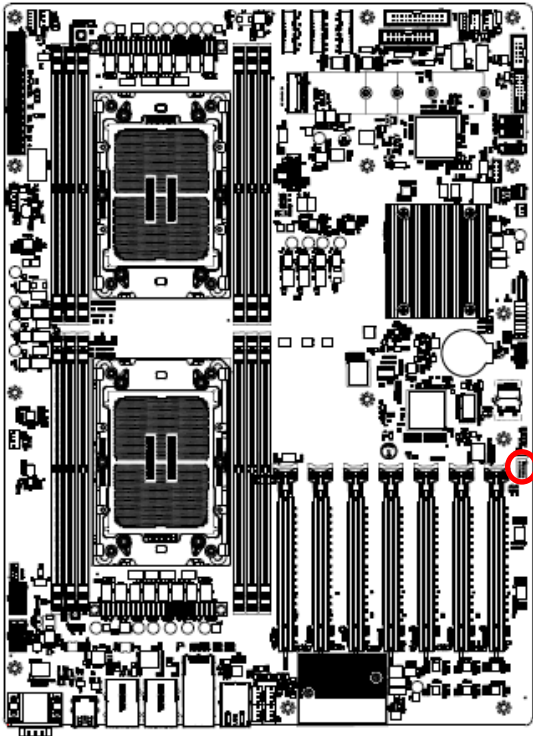
2.3.16 SPI connector (JSPI1)



Signal	PIN	PIN	Signal
SPI_IO2	8	7	SPI_IO3
SPI_MOSI	6	5	SPI_MISO
SPI_CLK	4	3	SPI_CS#
GND	2	1	+3.3VSB

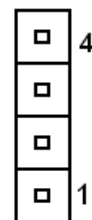
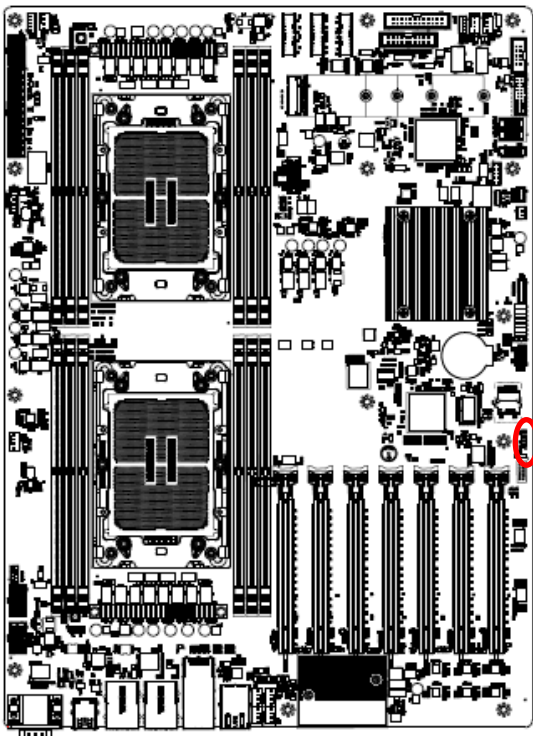


### 2.3.17 Serial port 2 connector (JCOM2)



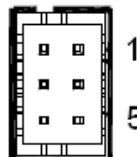
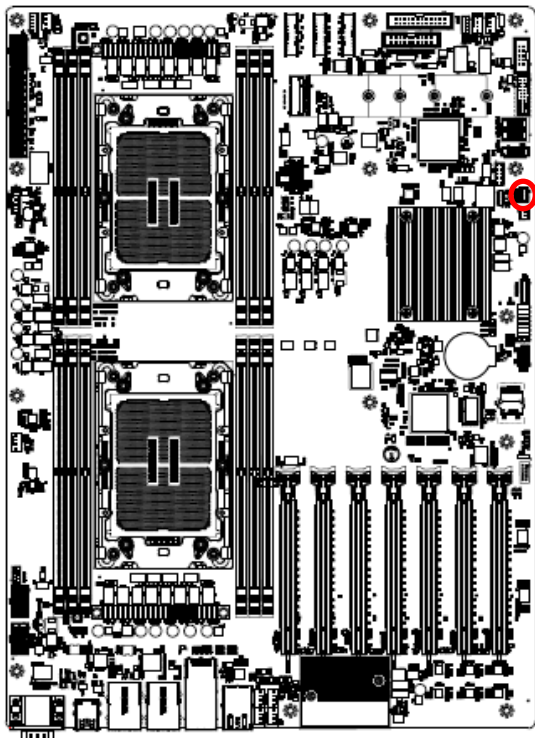
Signal	PIN	PIN	Signal
COM_RXD2	2	1	COM_DCD#2
COM_DTR#2	4	3	COM_TXD2
COM_DSR#2	6	5	GND
COM_CTS#2	8	7	COM_RTS#2
NC	10	9	COM_RI#2

### 2.3.18 BMC\_UART5 debug connector (JCOM5)



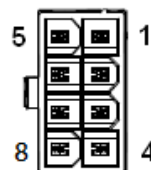
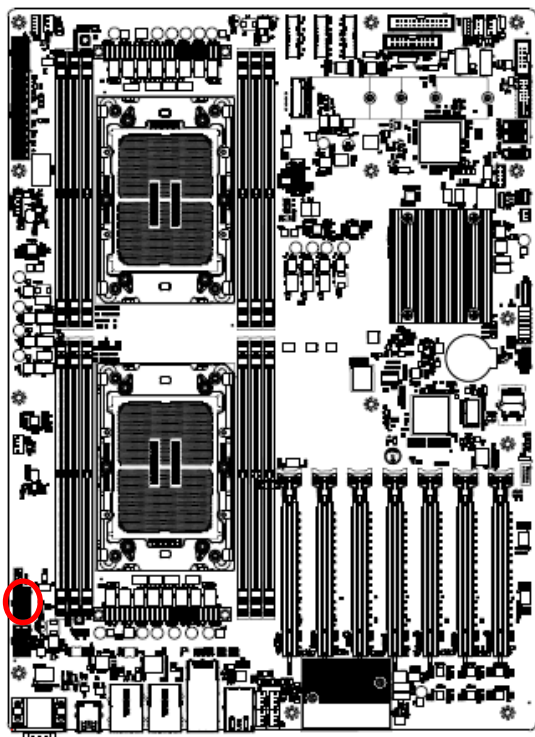
Signal	PIN
+3.3VSB	4
GND	3
UART5_RX	2
UART5_TX	1

2.3.19 Serial General Purpose I/O connector (JSGPIO1)



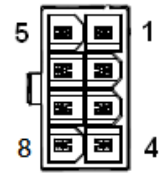
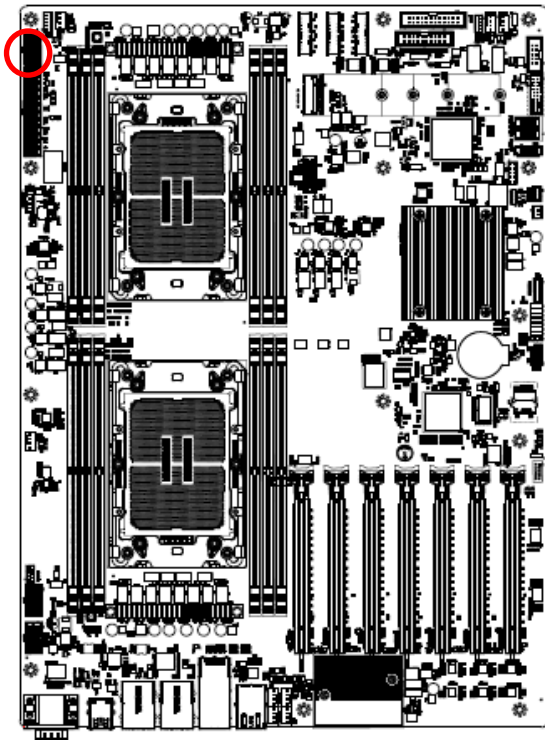
Signal	PIN	PIN	Signal
GND	2	1	GND
SGPIO_DATAOUT	4	3	SGPIO_LOAD
NC	6	5	SGPIO_CLOCK

2.3.20 ATX 12V power connector 1 (ATX12V1)



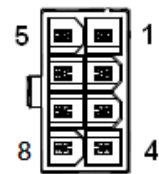
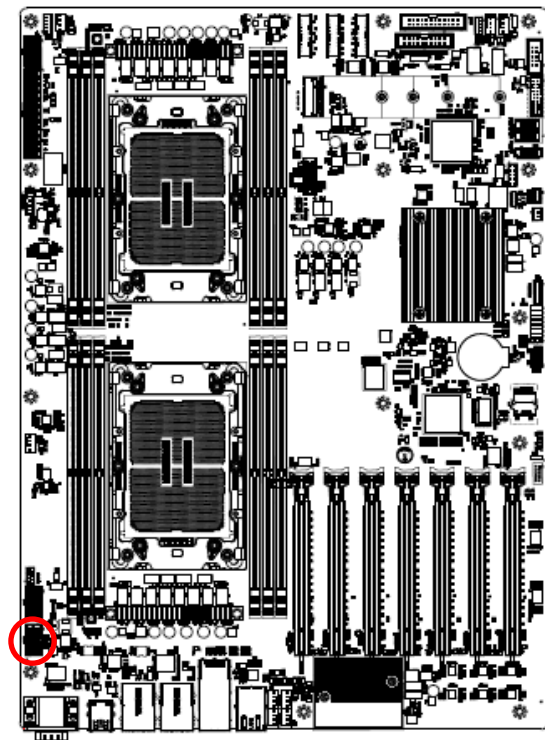
Signal	PIN	PIN	Signal
+12V	5	1	GND
+12V	6	2	GND
+12V	7	3	GND
+12V	8	4	GND

2.3.21 ATX 12V power connector 2 (ATX12V2)



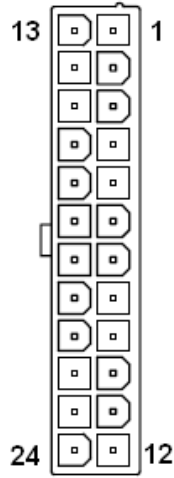
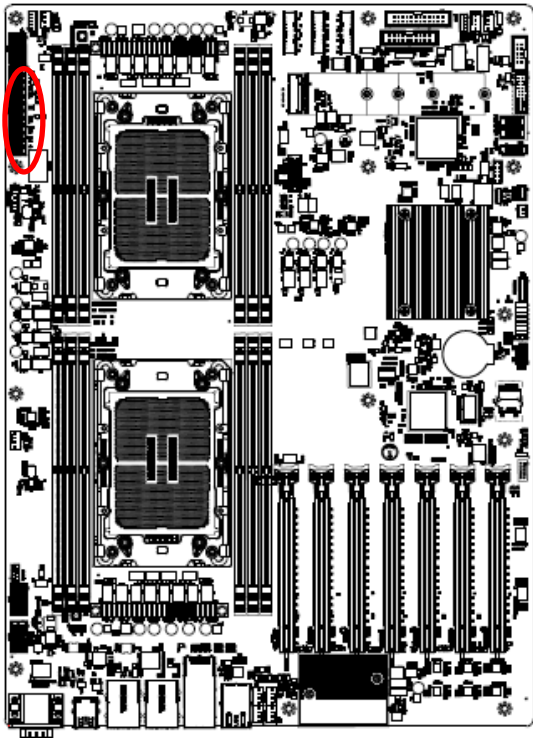
Signal	PIN	PIN	Signal
+12V	5	1	GND
+12V	6	2	GND
+12V	7	3	GND
+12V	8	4	GND

2.3.22 ATX 12V power connector 3 (ATX12V3)



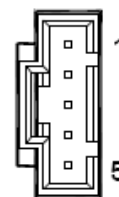
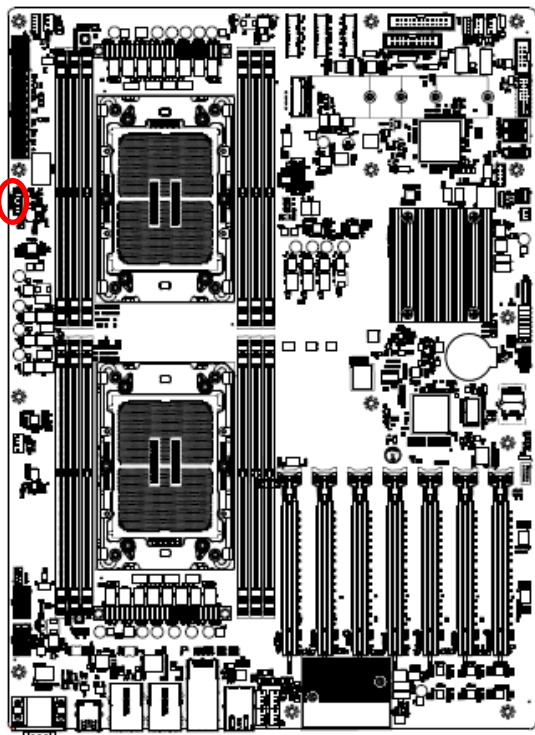
Signal	PIN	PIN	Signal
+12V	5	1	GND
+12V	6	2	GND
+12V	7	3	GND
+12V	8	4	GND

2.3.23 ATX power connector (ATXPWR1)



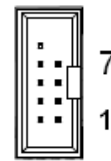
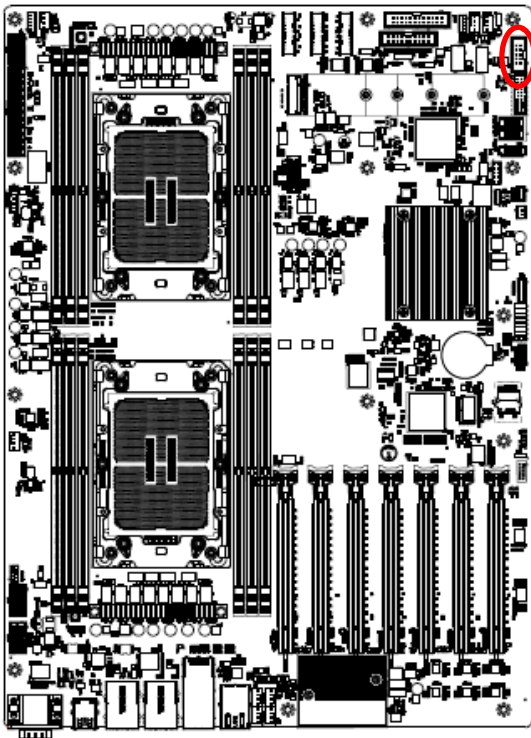
Signal	PIN	PIN	Signal
+3.3V	13	1	+3.3V
-12V	14	2	+3.3V
GND	15	3	GND
PSON#	16	4	+5V
GND	17	5	GND
GND	18	6	+5V
GND	19	7	GND
NC	20	8	PSU_PWRGD
+5V	21	9	+V5SB
+5V	22	10	+12V
+5V	23	11	+12V
GND	24	12	+3.3V

2.3.24 Power supply PMBus connector (JPMBUS1)



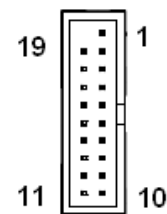
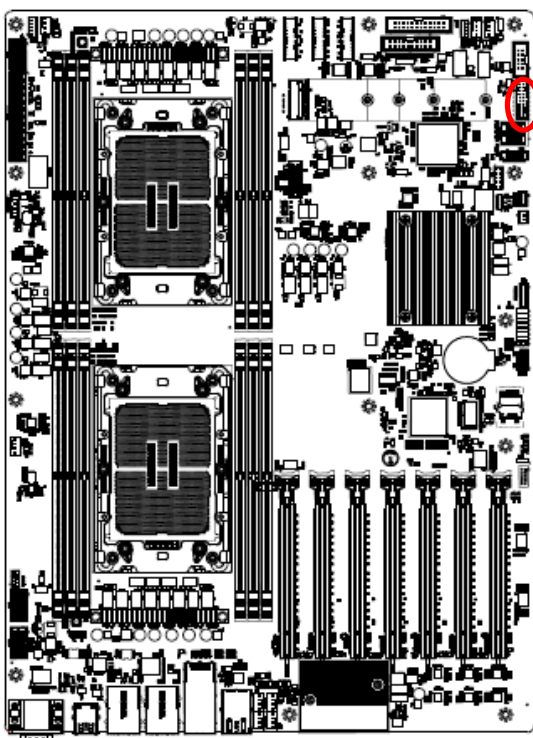
Signal	PIN
SMB_PSU_SCL	1
SMB_PSU_SDA	2
SMB_PSU_ALERT#	3
GND	4
NC	5

2.3.25 Front Panel USB2.0 connector (JUSB1)



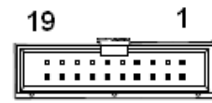
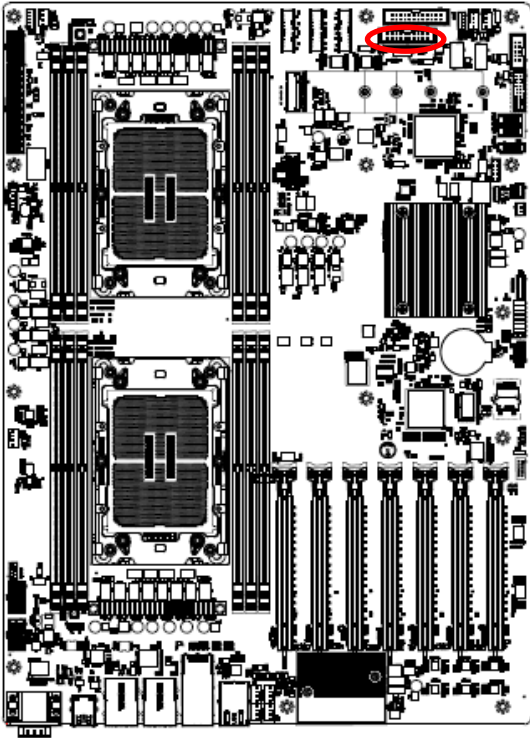
Signal	PIN	PIN	Signal
NC	10		
GND	8	7	GND
USB_PP8	6	5	USB_PP9
USB_PN8	4	3	USB_PN9
+5V	2	1	+5V

2.3.26 Front Panel USB3.1 connector (JUSB2)



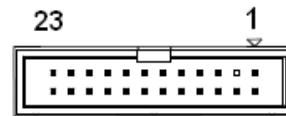
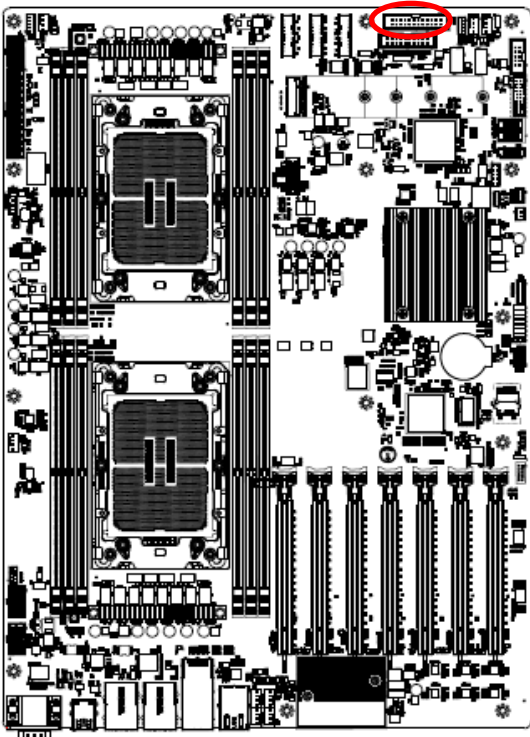
Signal	PIN	PIN	Signal
		1	+5V
+5V	19	2	USB3_RN6
USB3_RN7	18	3	USB3_RP6
USB3_RP7	17	4	GND
GND	16	5	USB3_TN6
USB_TN7	15	6	USB3_TP6
USB_TP7	14	7	GND
GND	13	8	USB3_PN11
USB_PN13	12	9	USB3_PP11
USB_PP13	11	10	USB_OC2#

2.3.27 Front Panel connector 1 (JFP1)



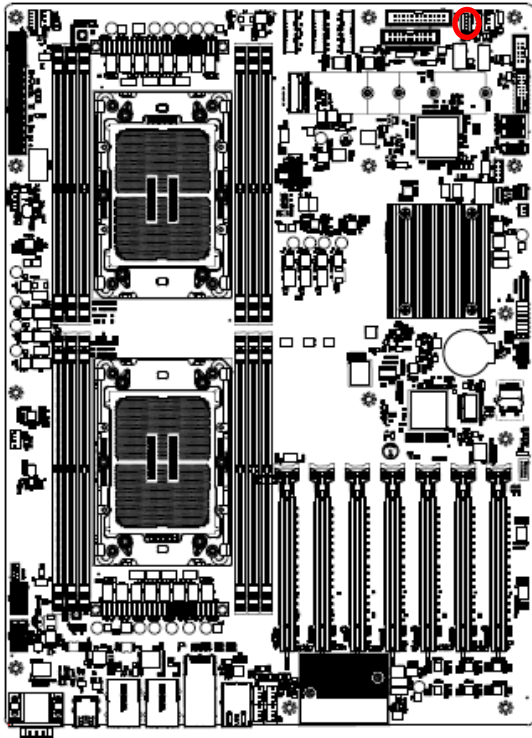
Signal	PIN	PIN	Signal
+3.3VSB	2	1	HDD_LED_P
PWR_LED#	4	3	HDD_LED#
PWRON_BUTTON#	6	5	RESET_BUTTON#
GND	8	7	GND
LAN1_LED_P	10	9	STATUS_LED_P
LAN1_LED#	12	11	STATUS_LED#
SBPWRLED_P	14	13	UID_LED#
GND	16	15	UID_LED_P
LAN2-X_LED_P	18	17	UID_BUTTON#
LAN2-X_LED#	20	19	GND

2.3.28 Front Panel connector 2 (JFP2)



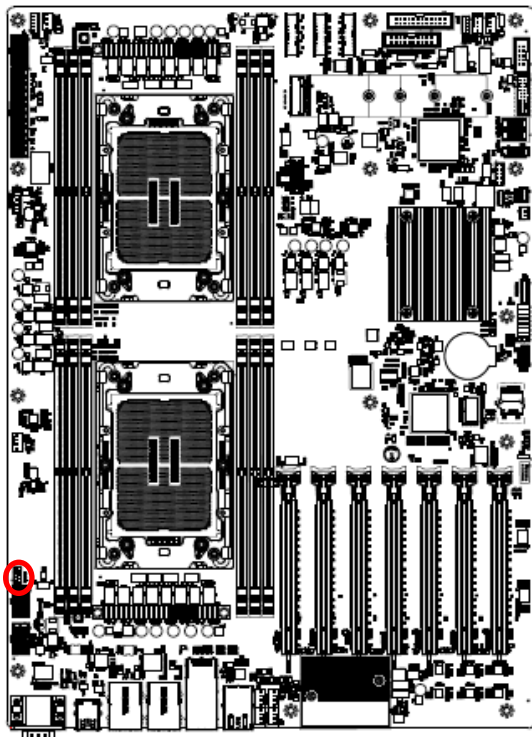
Signal	PIN	PIN	Signal
+3.3VSB	2	1	+3.3VSB
UID_LED_P	4		
UID_LED#	6	5	PWR_LED#
STATUS_LED#	8	7	HDD_LED_P
STATUS_LED_P	10	9	HDD_LED#
LAN1_LED_P	12	11	PWRON_BUTTON#
LAN1_LED#	14	13	GND
SMBus_SDA	16	15	RESET_BUTTON#
SMBus_SCL	18	17	GND
INTRUSION#	20	19	UID_BUTTON#
LAN2-X_LED_P	22	21	NC
LAN2-X_LED#	24	23	NMI_BUTTON#

### 2.3.29 Inlet Thermal Sensor (JINLET\_SER1)



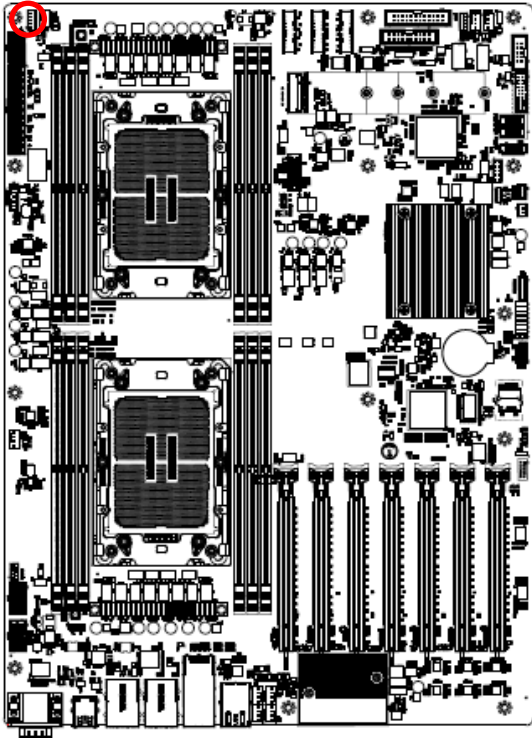
Signal	PIN
+3.3VSB	1
SMB_INLET_TEMPSENSOR_SDA	2
SMB_INLET_TEMPSENSOR_SCL	3
GND	4

### 2.3.30 Outlet Thermal Sensor (JOUTLET\_SER1)



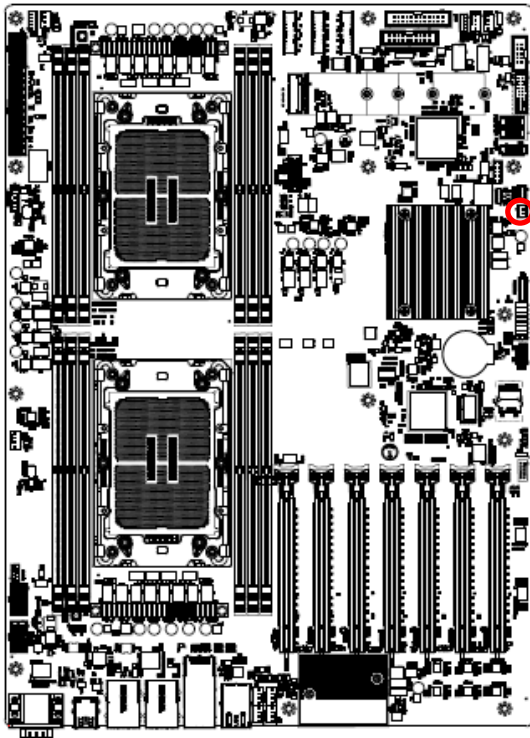
Signal	PIN
GND	4
SMB_OUTLET_TEMPSENSOR_SCL	3
SMB_OUTLET_TEMPSENSOR_SDA	2
+3.3VSB	1

2.3.31 HDD Backplane thermal Sensor (JHDD\_SER1)



Signal	PIN
SSD_LED_N	5
GND	4
SMB_HDBP_TEMPESENSOR_SCL	3
SMB_HDBP_TEMPESENSOR_SDA	2
+3.3VSB	1

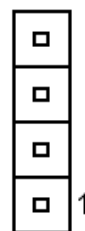
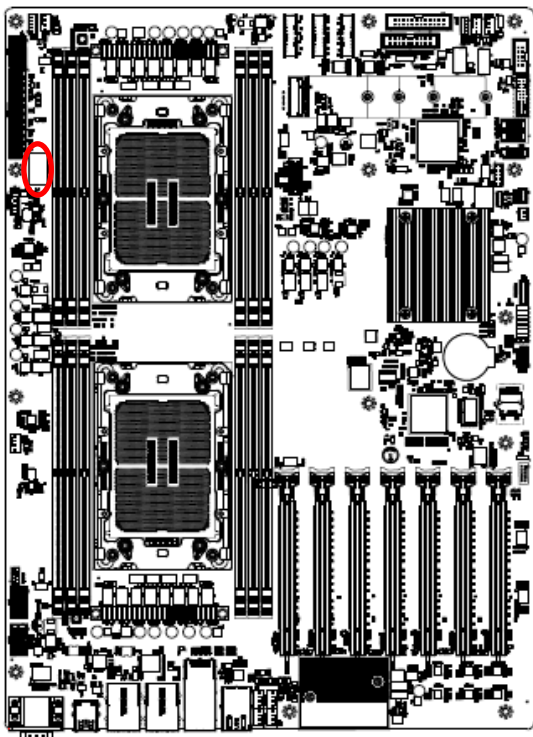
2.3.32 CASE OPEN connector (JCASE\_OPEN1)



Signal	PIN
CHASSIS_INTRUSION	1
GND	2

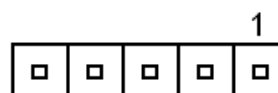
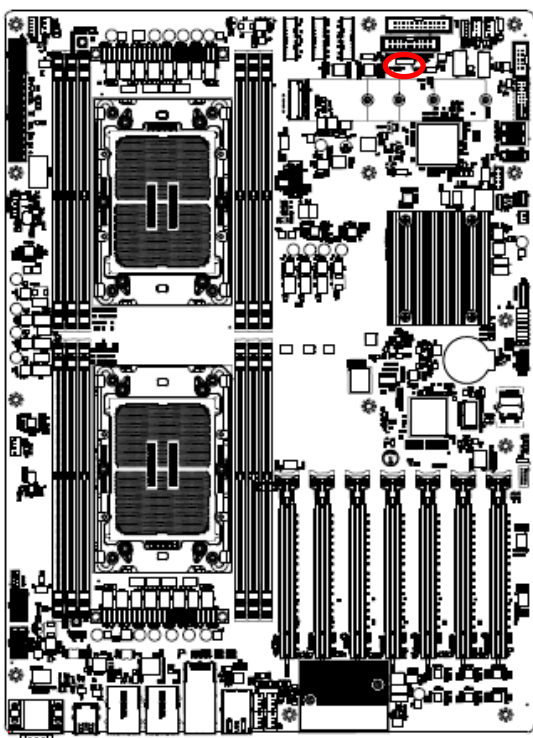


### 2.3.33 VROC Header (JRAID\_KEY1)



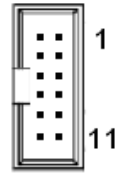
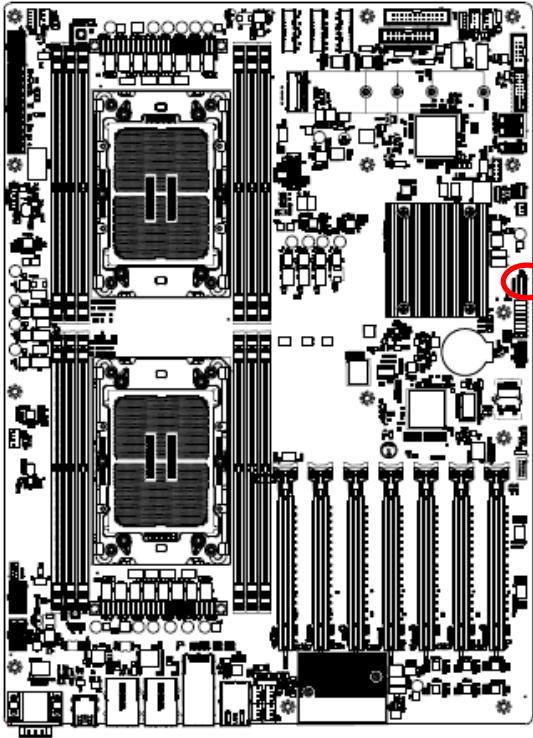
Signal	PIN
PCH_SATA_RAIDKEY	4
GND	3
PU_LEY_CONN	2
GND	1

### 2.3.34 CPU PCIE HP SMB connector (JPEHPMB1)



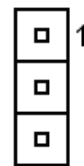
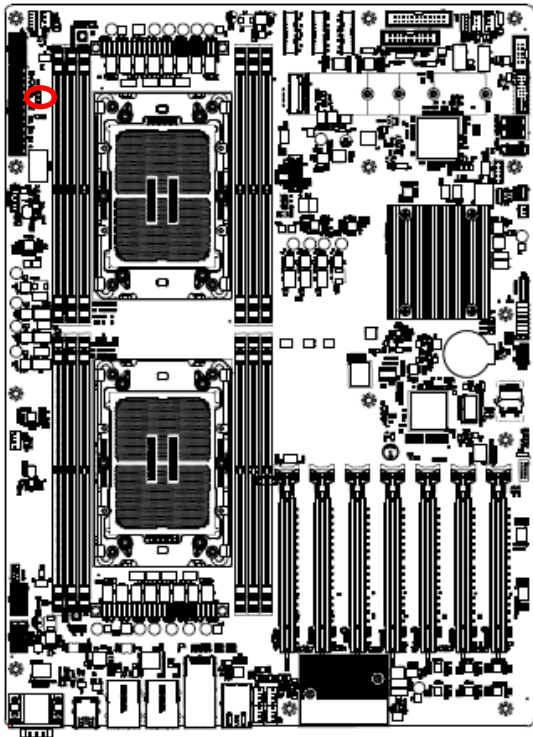
Signal	PIN
SMB_CPUHP_SCL	1
GND	2
SMB_CPUHP_SDA	3
GND	4
SMB_CPUHP_ALERT#	5

2.3.35 AZALIA connector (JAUDIO1)



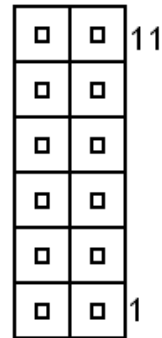
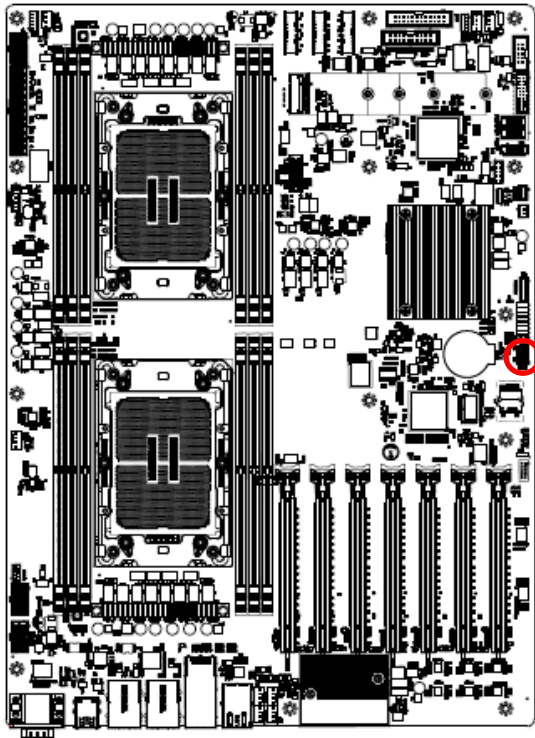
Signal	PIN	PIN	Signal
GND	2	1	+3.3V
AUD_AZA_BCLK	4	3	AUD_AZA_SYNC
AUD_AZA_SDI0	6	5	AUD_AZA_SDO
AUD_AZA_RST#	8	7	AUD_AZA_SDI1
GND	10	9	+5VSB
NC	12	11	GND

2.3.36 SMBUS VR connector (JVR\_PRG1)



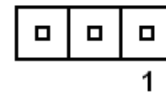
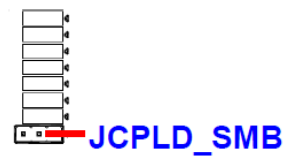
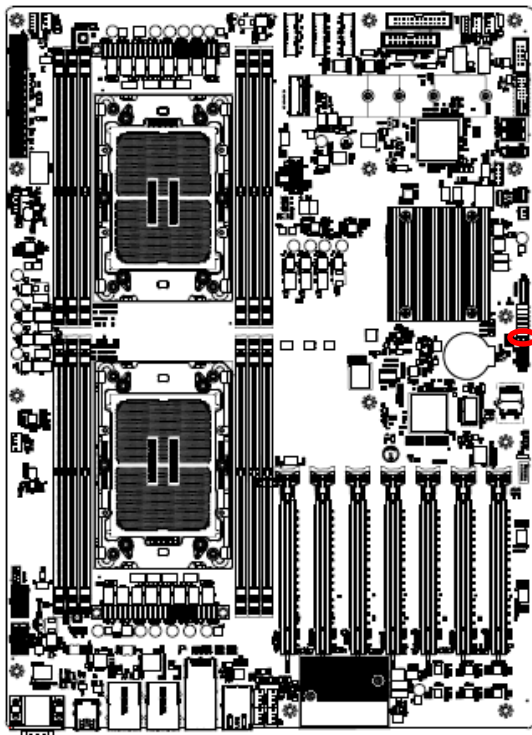
Signal	PIN
SMB_VR_SDA	1
GND	2
SMB_VR_SCL	3

2.3.37 ESPI connector (JESPI1)



Signal	PIN	PIN	Signal
ESPI_ALERT#	12	11	ESPI_RESET#
GND	10	9	NC
ESPI_CLK	8	7	ESPI_D3
ESPI_CS#	6	5	ESPI_D2
PLTRST#	4	3	ESPI_D1
+3.3VSB	2	1	ESPI_D0

2.3.38 CPLD SMBUS connector (JCPLD\_SMB)



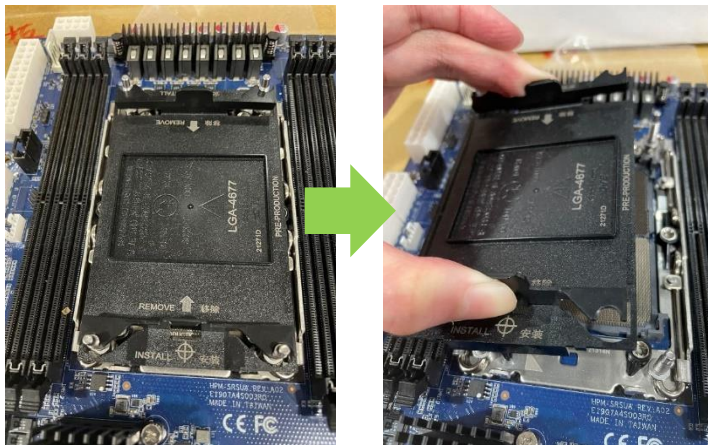
Signal	PIN
SMB_DEBUG_PLD_R_SDA	1
GND	2
SMB_DEBUG_PLD_R_SCL	3

## 2.4 Processor Installation SOP

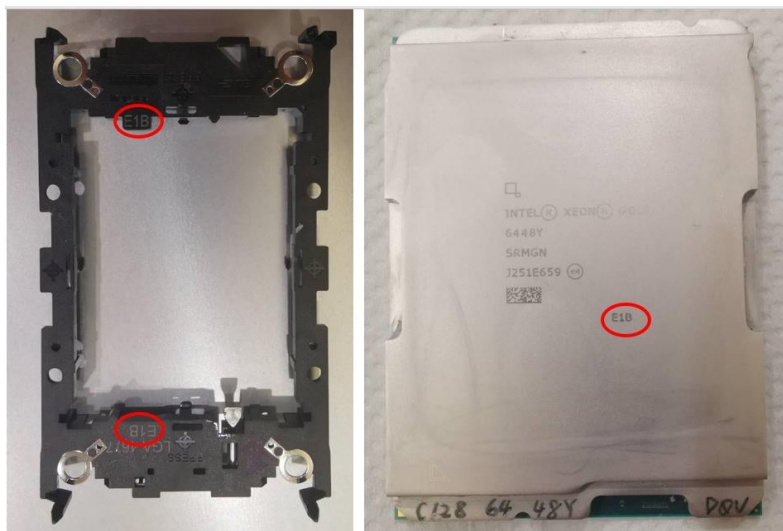
### Overview of the Processor Assembly installation procedure

**Note:** Suggest installing the memory first, then installing the CPU cooler module to lower the memory installation difficulty.

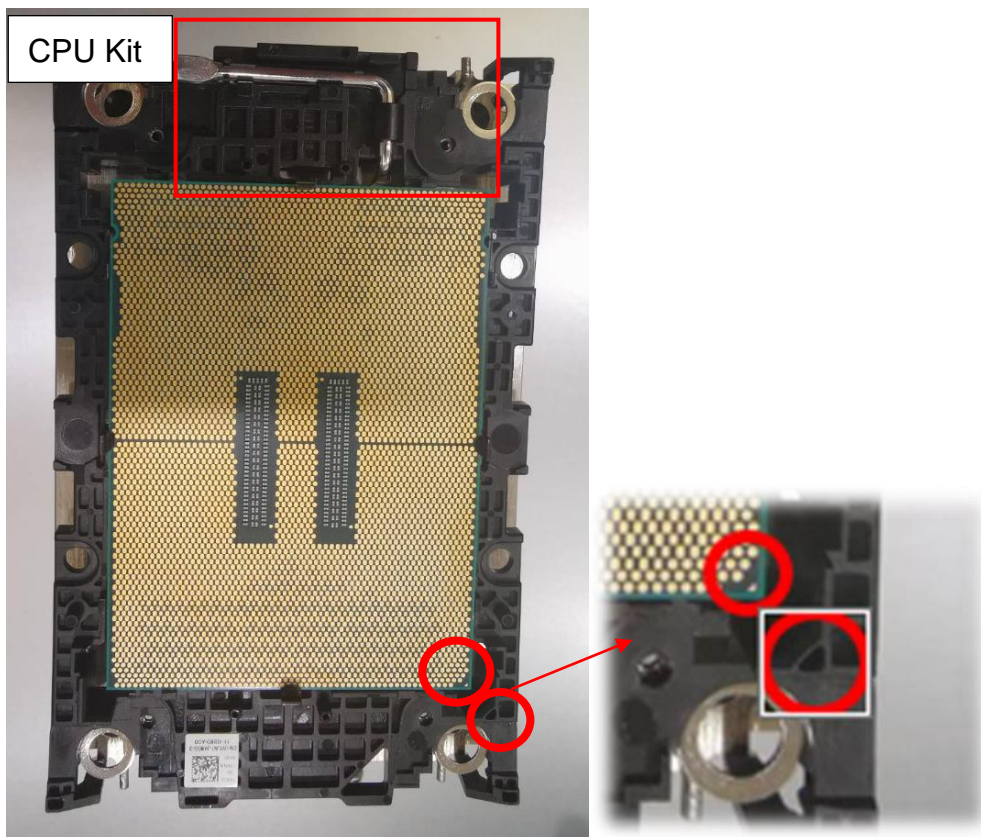
1. The CPU socket is protected by a plastic protective cover.
  - a. Hold finger grips on socket cover and squeeze in on the grip tabs.
  - b. Then pull the cover up and off vertically to remove.



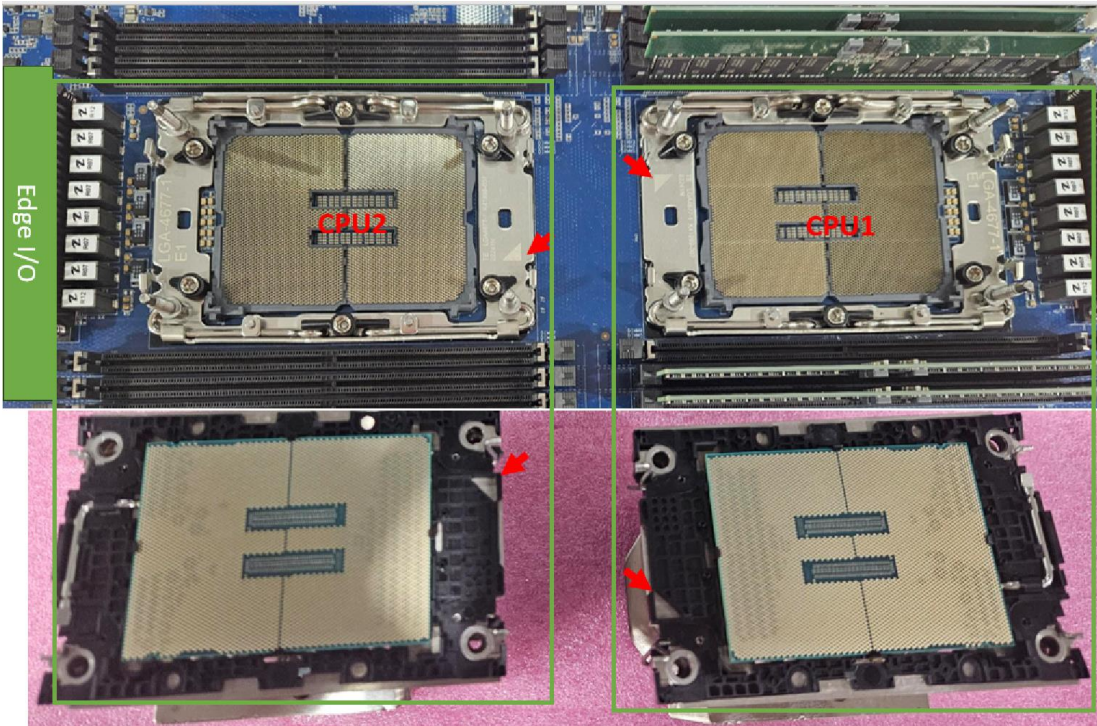
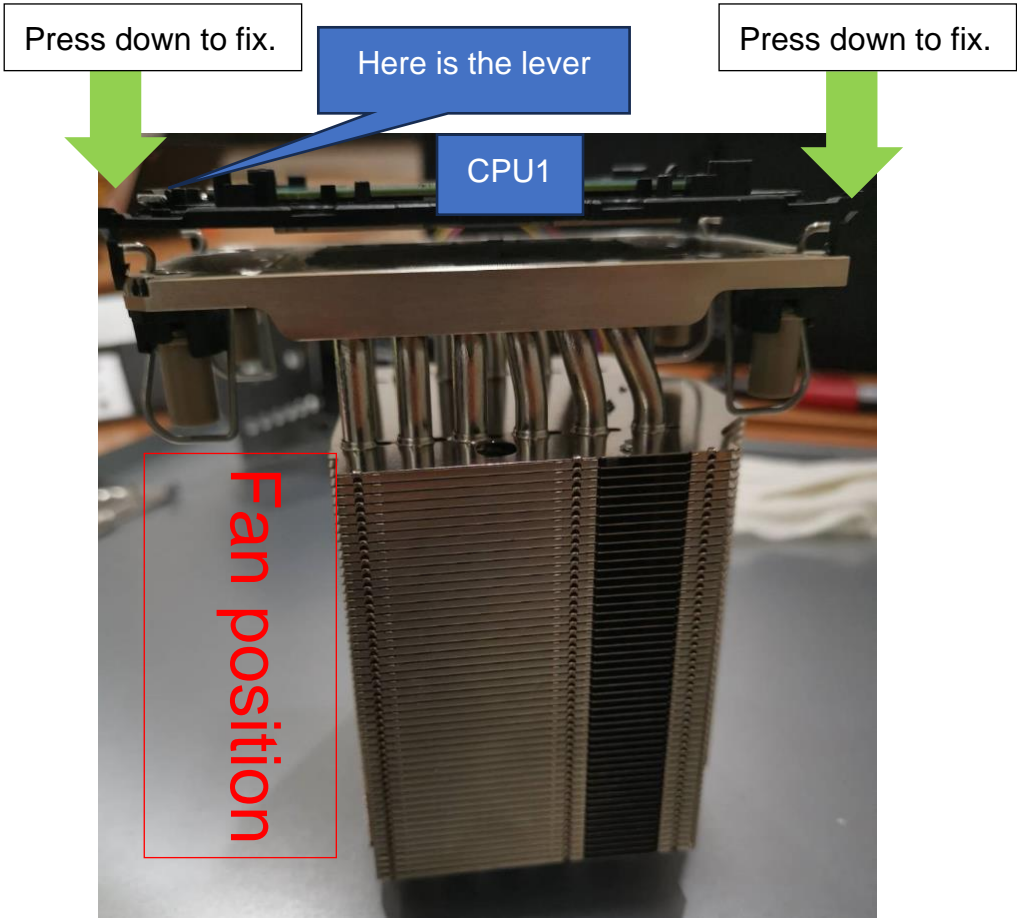
2. The processor assembly contains the Intel Xeon SP with carrier and CPU cooler.
  - 1x Intel 4th /5th Xeon SP(MCC & LCC SKU)
  - 1x E1B CPU Carrier (In the HPM-ERSDE package)
  - 1x Cooler module (Avalue P/N:BCC-FAN-467-01R)Please ensure the carrier model on the CPU is consistent with the carrier silkscreen.



3. Install the CPU on the carrier and align the triangle marks (Pin 1).  
Look at the below red frame, please make sure the lever is pressed down.



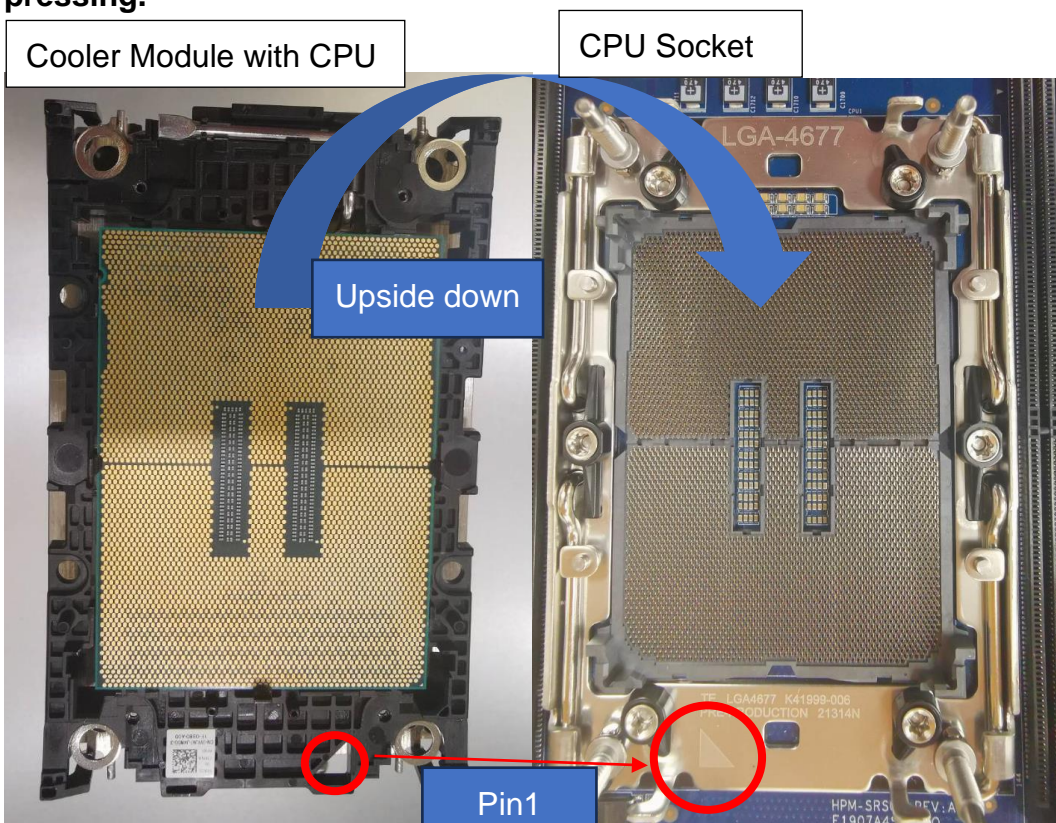
4. Install the CPU kit assembly on the cooler module, please press down the CPU kit to fixate it.  
CPU1: Make sure the lever on the carrier is on the same side as the fan.  
CPU2: Make sure the lever on the carrier is on a different side than the fan.  
(Only applicable to HPM-ERSDE and Avalue Cooler BCC-FAN-467-01R.)  
Note: The Thermal grease must be pre-applied on the heatsink before installation.  
Note: Please ensure the direction of the fan before installing the CPU kit on the Cooler module.



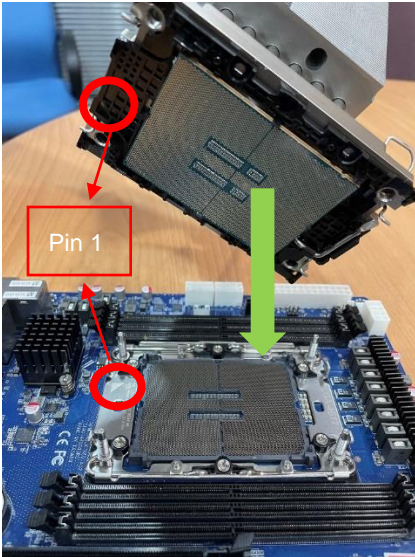
**5. Cooler module with CPU kit installed on the motherboard.**

- a. Please align the triangle mark between the Cooler module and CPU socket and install it. (Figure A)
- b. Hold the Cooler module with the CPU and align the holes with the CPU socket. Press the Cooler module down to the CPU socket until it snaps into place.
- c. Press down the fixing tenons on the four sides to fixate. (Figure B)
- d. With a T30 screwdriver, gradually tighten the four screws to ensure even pressure. (Figure C)

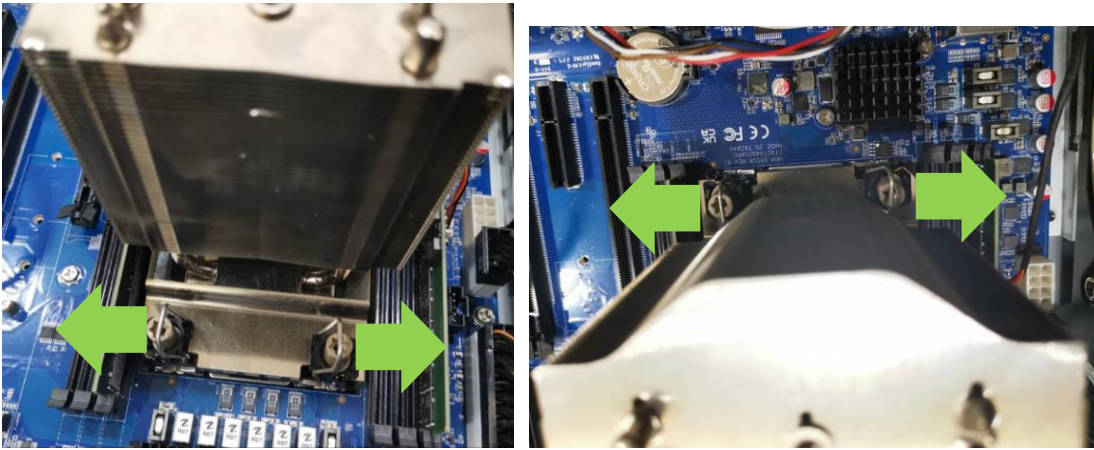
★ The cooler module with CPU pin1 must be aligned with the CPU socket pin1 mark, and the direction cannot be changed at will, or it may cause the CPU to damage after pressing.



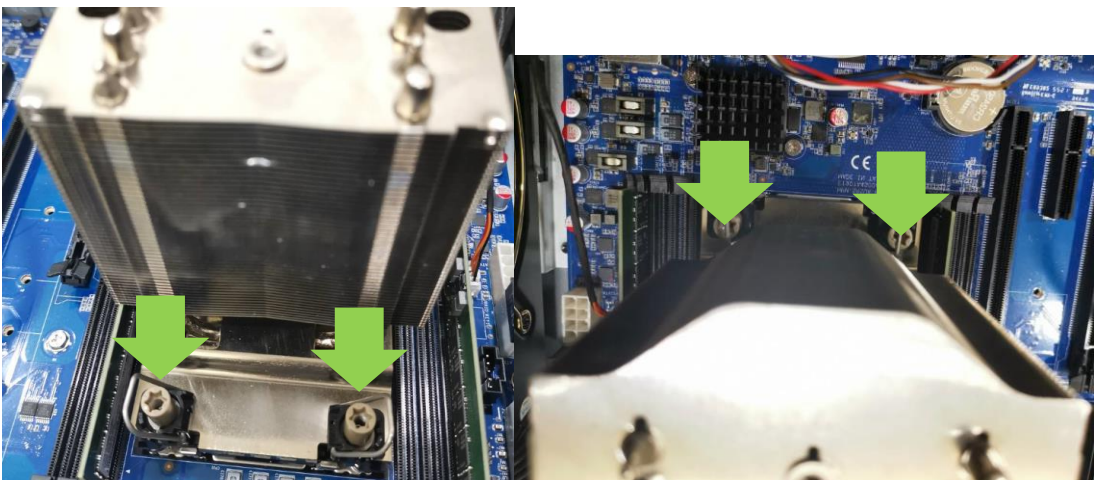
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▲ Figure A



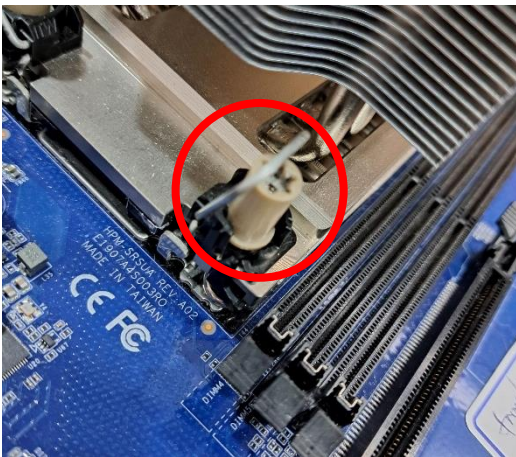
▲ Figure B



▲ Figure C



▼ Before locking the tenons

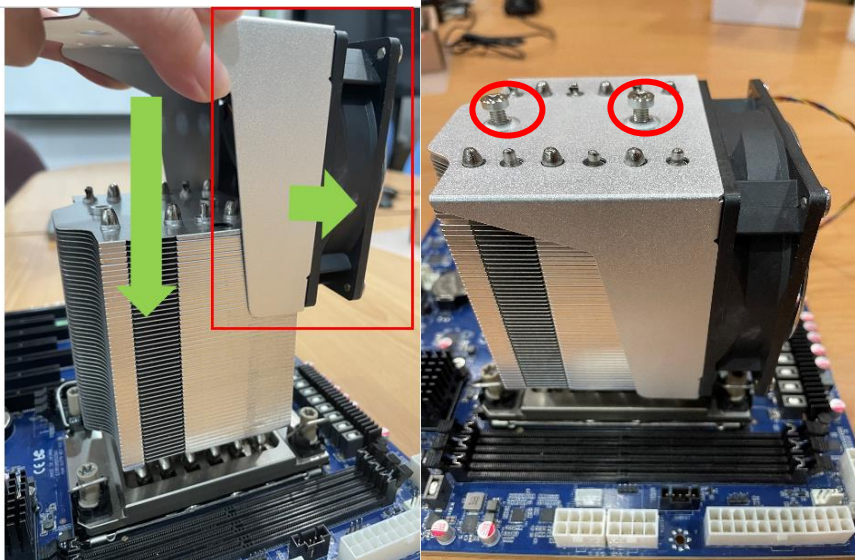


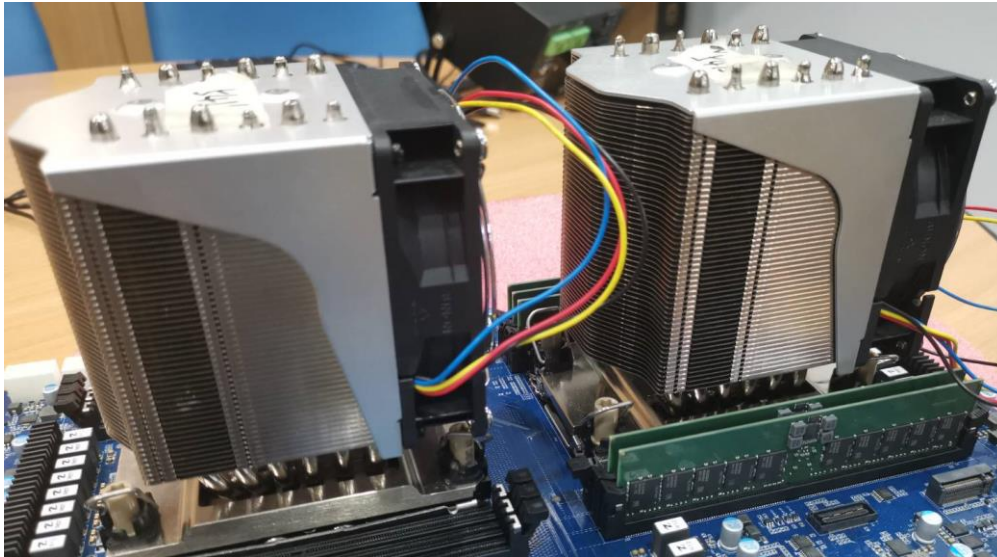
▼ After locking the tenons



6. Install the cooling fan and holder on the cooler module and tighten two locking screws (T30) on the top of the fan holder.

Note: The 4U cooler's fan for Xeon SP dual sockets is facing the opposite side of Edge I/O.





7. Connect the cooling fan connector to the fan header labeled for the CPU on the motherboard.


# 3. Drivers Installation

All the drivers are available on Avalue Downloads Area (<https://www.avaluetech.com/en/support/download>). Type the model name and press Enter to find all the relevant software, utilities, and documentation.

Chipset 1 Audio 1 Graphics 1 LAN 1 Other 1


## Chipset

Total **1** Files

No.	Release Date	Title	Description	Download
01	2023-09-20	Intel Chipset Driver for Win10 x64	Windows 10 64bit	

## Audio

Total **1** Files

No.	Release Date	Title	Description	Download
01	2023-09-20	Realtek Audio Driver for Win10 x64	Windows 10 64bit	



**Note:** Installation procedures and screen shots in this section are for your reference and may not be exactly the same as shown on your screen.

### 3.1 Install Chipset Driver

All drivers can be found on the Avalue Official Website:

[www.avalue.com](http://www.avalue.com).



**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system. If the warning message appears while the installation process, click Continue to go on.



**Step 3. Click Install.**



**Step1. Click Next.**



**Step 4. Setup completed.**



**Step 2. Click Accept.**

## 3.2 Install VGA Driver

All drivers can be found on the Avalue Official Website:

[www.avalue.com](http://www.avalue.com).



**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



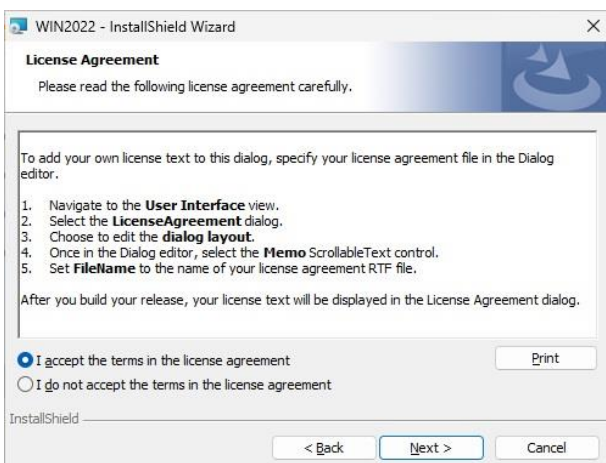
**Step 3. Click Next.**



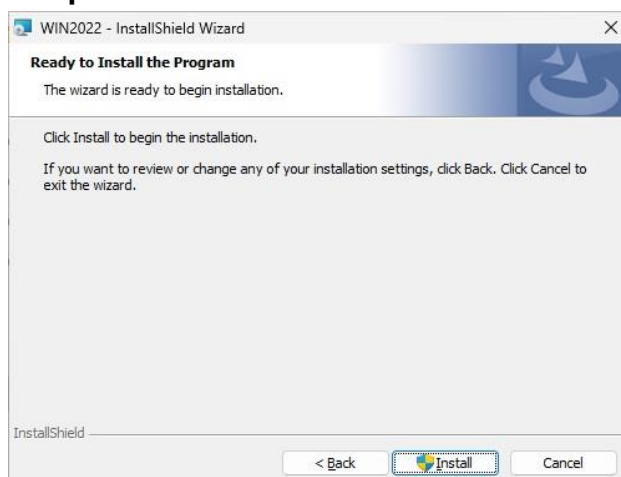
**Step 1. Click Next** to continue installation.



**Step 4. Click Next.**



**Step 2. Click Next.**



**Step 5. Click Install.**

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**Step 6.** Click **Finish** to complete setup.

### 3.3 Install Audio Driver

All drivers can be found on the Avalue Official Website:

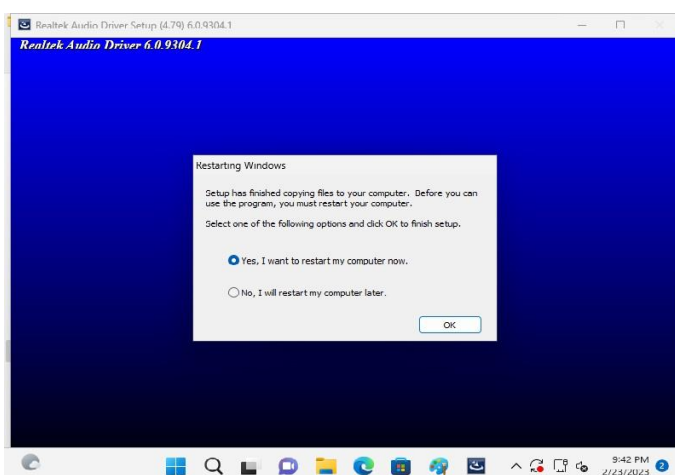
[www.avalue.com](http://www.avalue.com).



**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



**Step 1.** Click **Yes** to continue installation.



**Step 2.** Setup completed.

### 3.4 Install Ethernet Driver

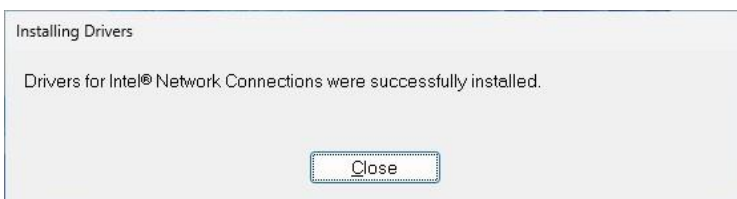
All drivers can be found on the Avalue Official Website:  
[www.avalue.com](http://www.avalue.com).



**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



**Step 1.** Click **OK** to continue installation.



**Step 2.** Setup completed.

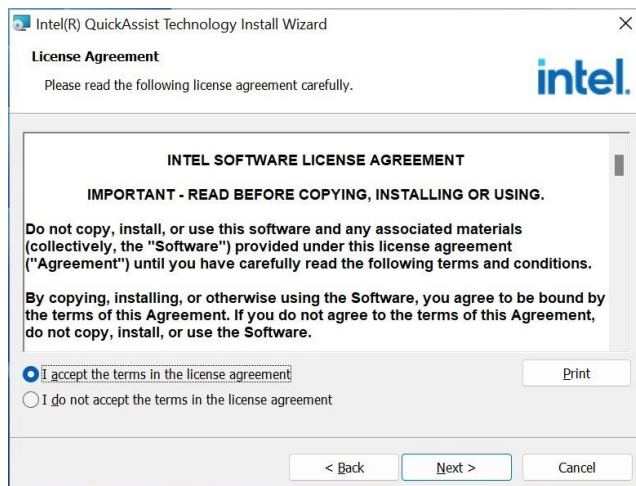


## 3.5 Install QuickAssist Technology Driver

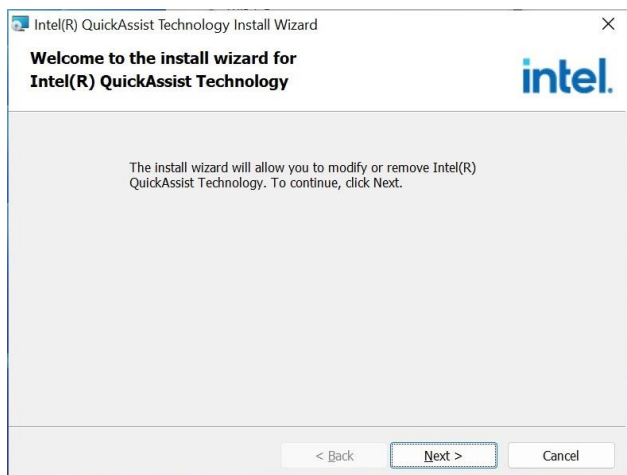
All drivers can be found on the Avalue Official Website:  
[www.avalue.com](http://www.avalue.com).



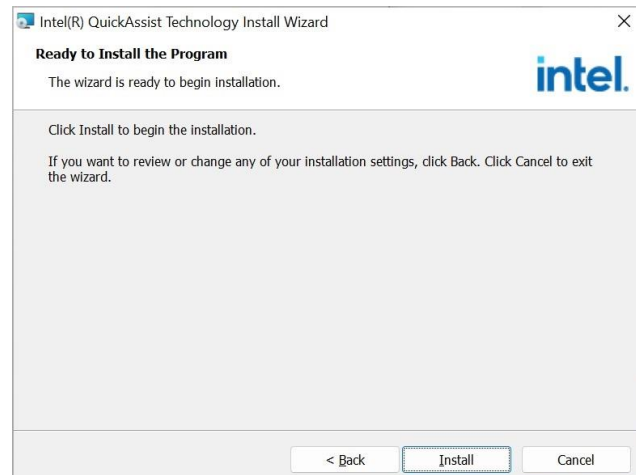
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



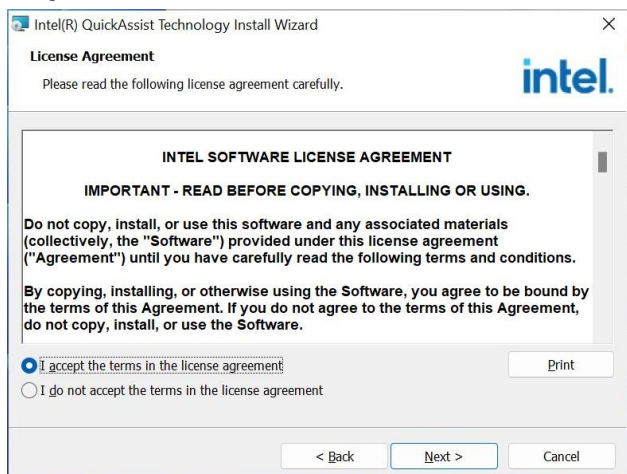
**Step 3. Click Next.**



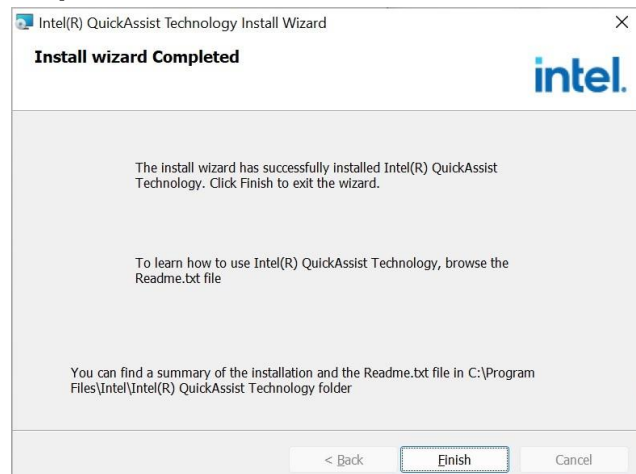
**Step 1. Click Next** to continue installation.



**Step 4. Click Install.**



**Step 2. Click Next.**



**Step 5. Click Finish** to complete setup.

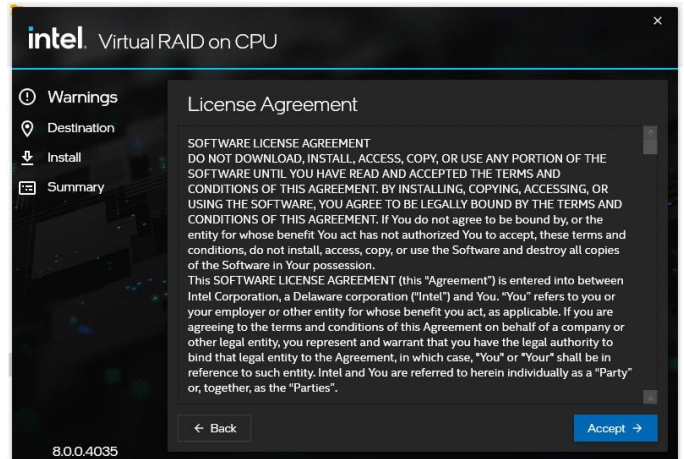
### 3.6 Install VROC Driver

All drivers can be found on the Avalue Official Website:

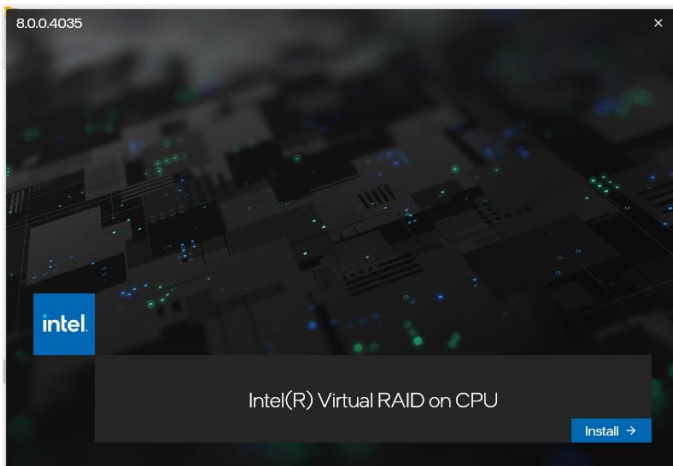
[www.avalue.com](http://www.avalue.com).



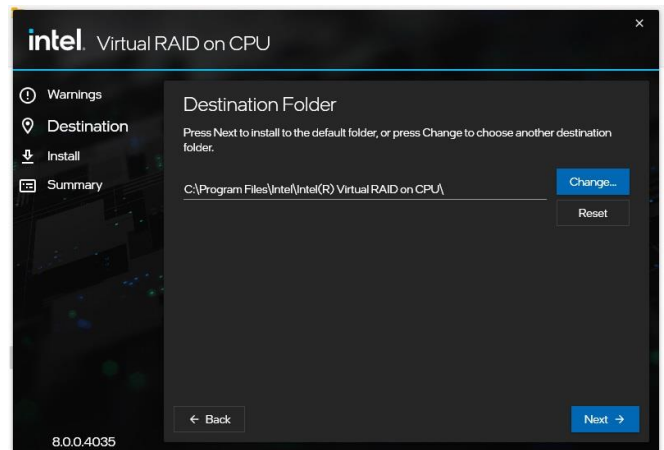
**Note:** The installation procedures and screen shots in this section are based on Windows 10 operation system.



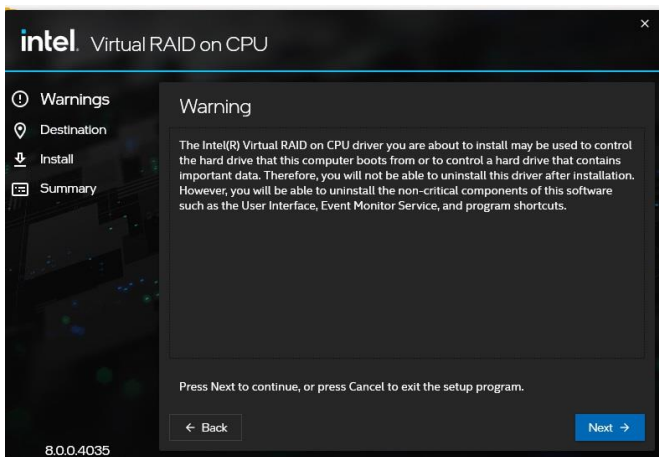
**Step 3.** Click **Accept**.



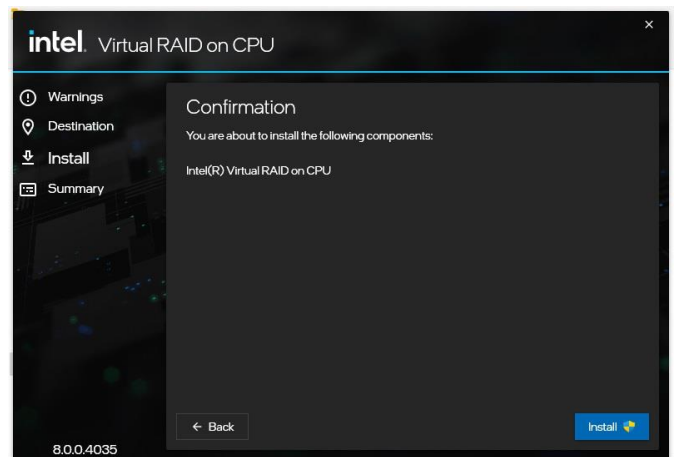
**Step 1.** Click **Install** to continue installation.



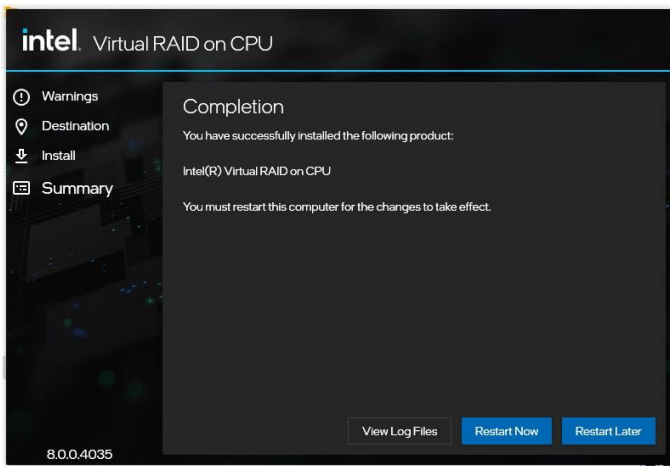
**Step 4.** Click **Next**.



**Step 2.** Click **Next**.



**Step 5.** Click **Install**.



**Step 6.** Setup completed.

# 4. BIOS Setup

---

## 4.1 Introduction

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

## 4.2 Starting Setup

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

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing <ESC> or <Del> immediately after switching the system on, or

By pressing the <ESC> or <Del> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

**Press <ESC> or <Del> to enter SETUP**

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

## 4.3 Using Setup

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

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

- **Navigating Through The Menu Bar**

Use the left and right arrow keys to choose the menu you want to be in.



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

- **To Display a Sub Menu**

Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A “➤” pointer marks all sub menus.

## 4.4 Getting Help

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

## 4.5 In Case of Problems

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

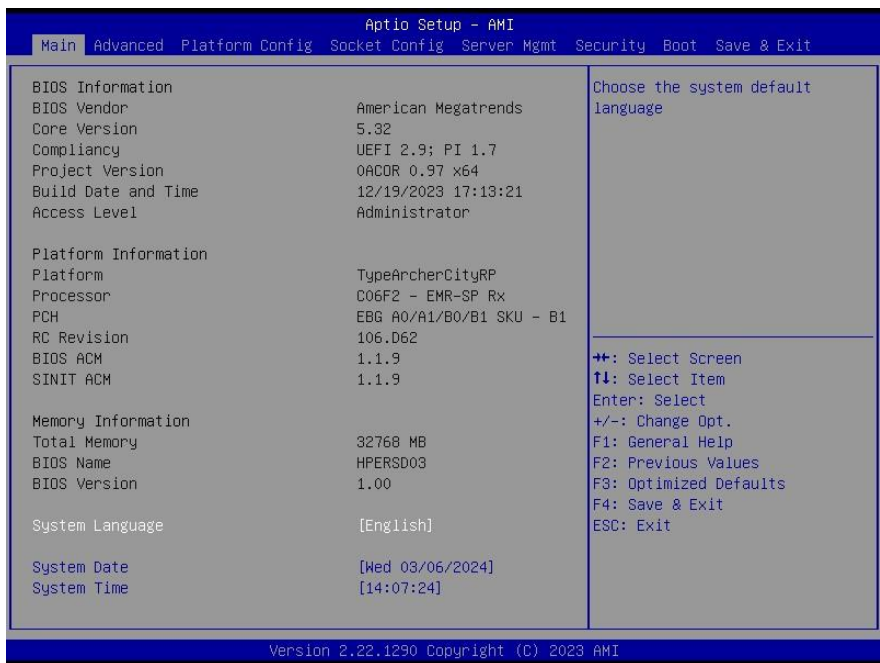
The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both BIOS Vendor and your systems manufacturer to provide the absolute maximum performance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

## 4.6 BIOS setup

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

### 4.6.1 Main Menu

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



#### 4.6.1.1 System Language

This option allows choosing the system default language.

#### 4.6.1.2 System Date

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

#### 4.6.1.3 System Time

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



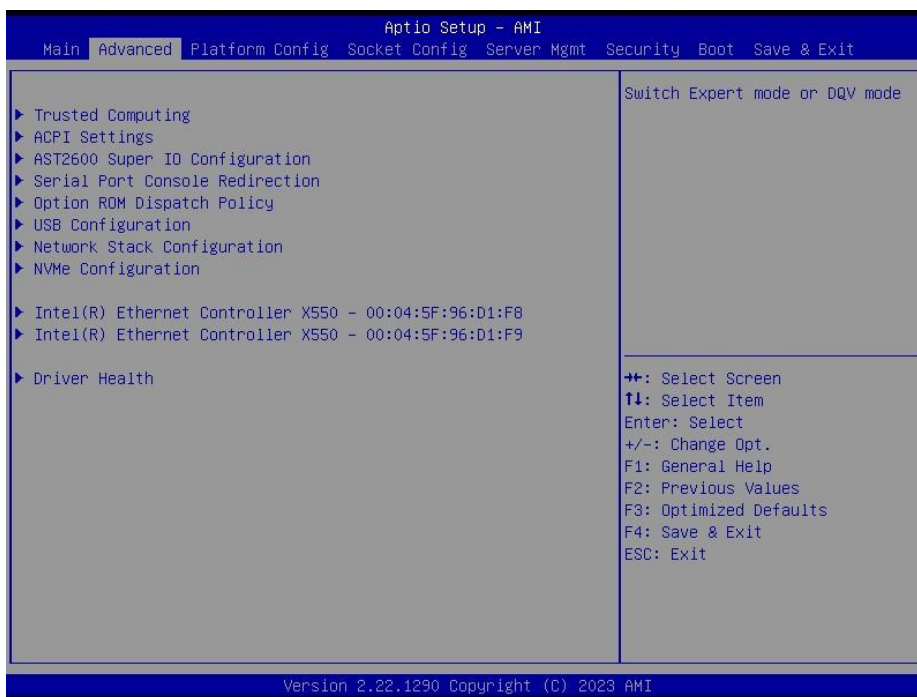
**Note:** The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen.

Visit the Avalue website ([www.avalue.com](http://www.avalue.com)) to download the latest product and BIOS information.



### 4.6.2 Advanced Menu

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



#### 4.6.2.1 Trusted Computing



Item	Options	Description
Security Device Support	Disable, Enable[Default]	Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.

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<b>SHA256 PCR Bank</b>	Disabled, Enabled[ <b>Default</b> ]	Enables or Disables SHA256 PCR Bank.
<b>SHA384 PCR Bank</b>	Disabled[ <b>Default</b> ], Enabled	Enables or Disables SHA384 PCR Bank.
<b>Pending operation</b>	None[ <b>Default</b> ] TPM Clear	Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.
<b>Physical Presence Spec Version</b>	1.2 1.3[ <b>Default</b> ]	Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3 Note some HCK tests might not support 1.3.
<b>Device Select</b>	TPM 2.0 Auto[ <b>Default</b> ]	TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated.

### 4.6.2.2 ACPI Settings



Item	Options	Description
<b>Enable ACPI Auto Configuration</b>	Disabled[ <b>Default</b> ] Enabled	Enables or Disables BIOS ACPI Auto Configuration.
<b>Enable Hibernation</b>	Disabled Enabled[ <b>Default</b> ]	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.

### 4.6.2.3 AST2600 Super IO Configuration



Item	Description
<b>Serial Port 1 Configuration</b>	Set Parameters of Serial Port 1 (COMA).
<b>Serial Port 2 Configuration</b>	Set Parameters of Serial Port 2 (COMB).

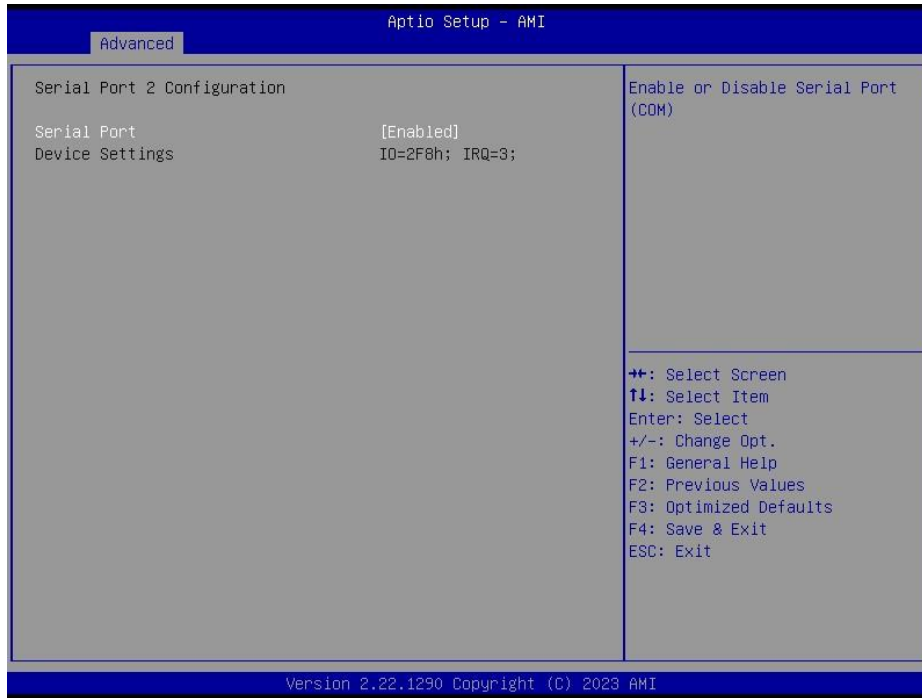
#### 4.6.2.3.1 Serial Port 1 Configuration



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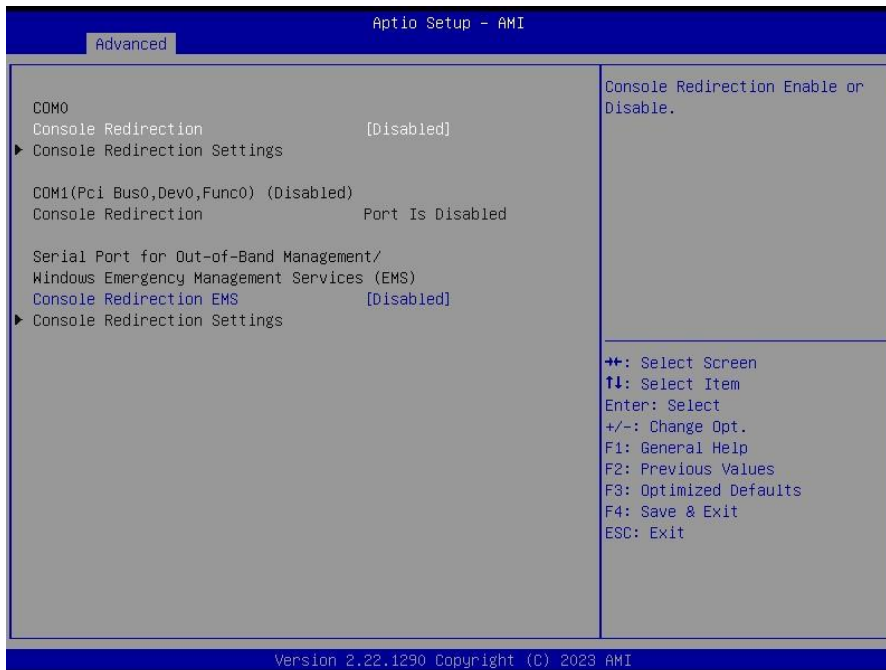
Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM).

### 4.6.2.3.2 Serial Port 2 Configuration



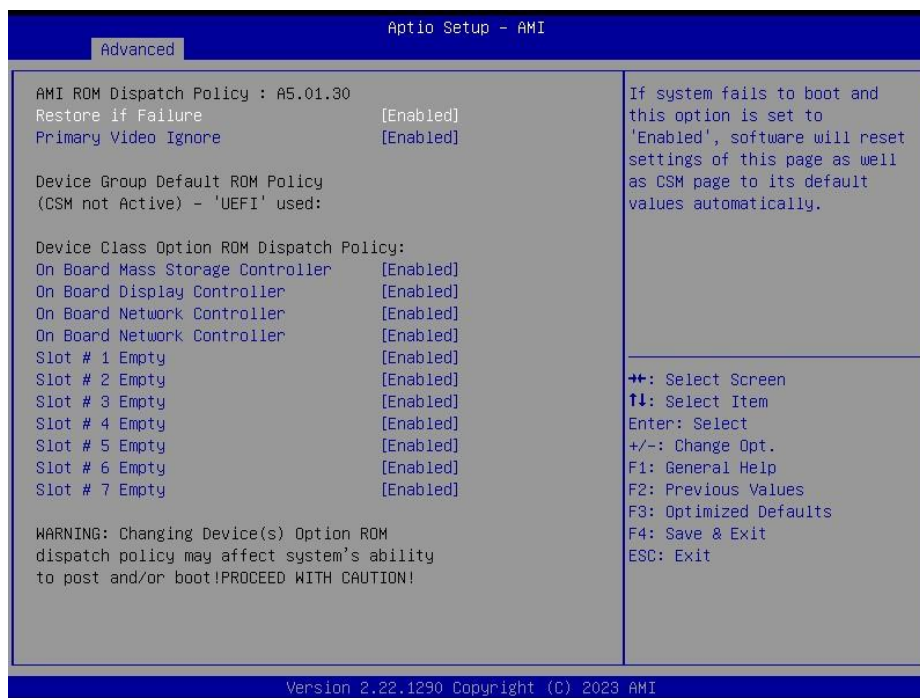
Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM).

### 4.6.2.4 Serial Port Console Redirection



Item	Options	Description
Console Redirection	Disabled[Default], Enabled	Console Redirection Enable or Disable.
Console Redirection EMS	Disabled[Default], Enabled	Console Redirection Enable or Disable.

#### 4.6.2.5 Option ROM Dispatch Policy



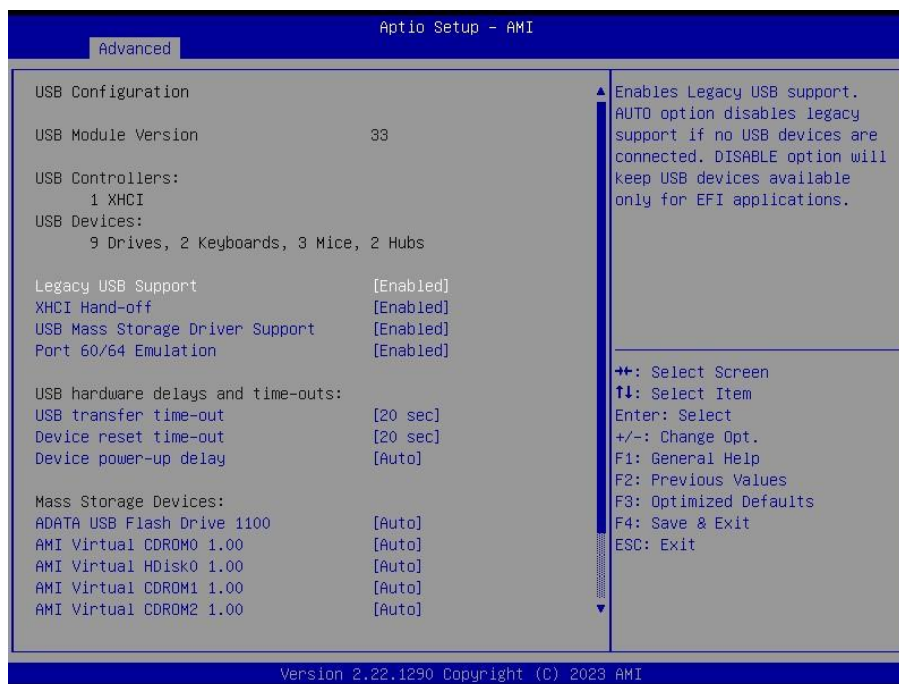
Item	Options	Description
Restore if Failure	Disabled Enabled[Default],	If system fails to boot and this option is set to 'Enabled', software will reset settings of this page as well as CSM page to its default values automatically.
Primary Video Ignore	Disabled Enabled[Default],	If software will detect that due to the Policy settings. Option ROM of Primary Video Device will not dispatch, it will ignore this device policy settings, and restore it to 'Enable' automatically.
Onboard Mass Storage Controller	Enabled[Default], Disabled	Onboard Device has: UEFI [X] Legacy [X] Embedded ROM(s). VIDx8086; DIDxA1D2 @ s0 Bx0  Dx11  Fx5
Onboard Display Controller	Enabled[Default], Disabled	Onboard Device has: UEFI [X] Legacy [X] Embedded ROM(s). VIDx1A03; DIDx2000 @ s0 BxA  Dx0  Fx0

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<b>Onboard Network Controller</b>	Enabled[Default], Disabled	Onboard Device has: UEFI [X] Legacy [X] Embedded ROM(s). VIDx8086; DIDx1533 @ s0 Bx6  Dx0  Fx0
<b>Slot#1 Empty</b>	Enabled[Default], Disabled	Enable or Disable Option ROM execution for selected Slot.
<b>Slot#2 Empty</b>	Enabled[Default], Disabled	Enable or Disable Option ROM execution for selected Slot.
<b>Slot#3 Empty</b>	Enabled[Default], Disabled	Enable or Disable Option ROM execution for selected Slot.
<b>Slot#4 Empty</b>	Enabled[Default], Disabled	Enable or Disable Option ROM execution for selected Slot.
<b>Slot#5 Empty</b>	Enabled[Default], Disabled	Enable or Disable Option ROM execution for selected Slot.
<b>Slot#6 Empty</b>	Enabled[Default], Disabled	Enable or Disable Option ROM execution for selected Slot.
<b>Slot#7 Empty</b>	Enabled[Default], Disabled	Enable or Disable Option ROM execution for selected Slot.

### 4.6.2.6 USB Configuration

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



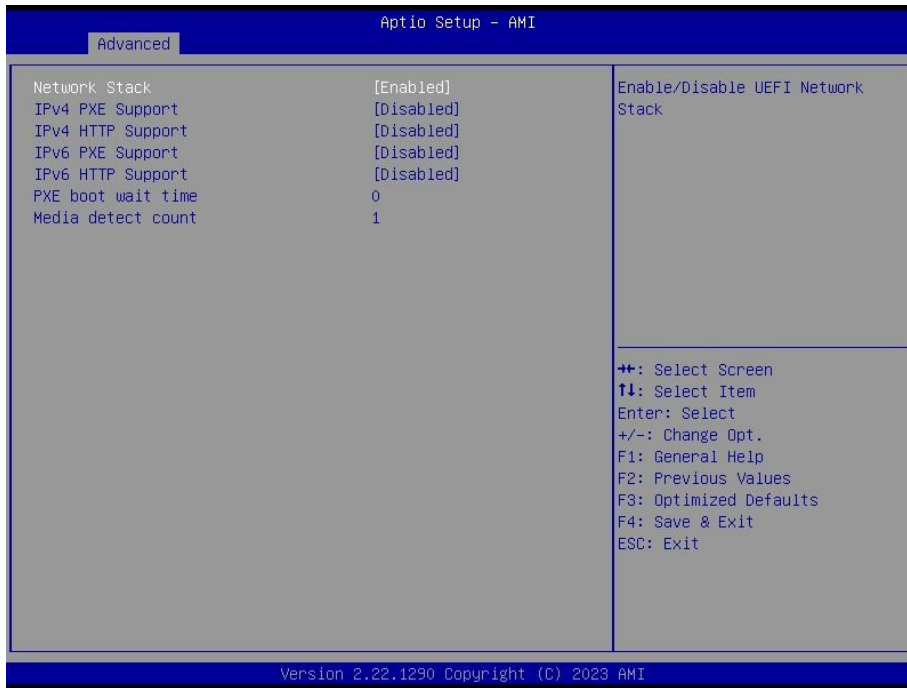
Item	Options	Description
<b>Legacy USB Support</b>	Enabled[Default], Disabled Auto	Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
<b>XHCI Hand-off</b>	Enabled[Default],	This is a workaround for OSeS without XHCI

	Disabled	hand-off support. The XHCI ownership change should be claimed by XHCI driver.
<b>USB Mass Storage Driver Support</b>	Disabled Enabled[Default],	Enable/Disable USB Mass Storage Driver Support.
<b>Port 60/64 Emulation</b>	Disabled Enabled[Default],	Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.
<b>USB transfer time-out</b>	1 sec 5 sec 10 sec 20 sec[Default]	The time-out value for Control, Bulk, and Interrupt transfers.
<b>Device reset time-out</b>	10 sec 20 sec[Default] 30 sec 40 sec	USB mass storage device Start Unit command time-out.
<b>Device power-up delay</b>	Auto[Default] Manual	Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value: for a Root port it is 100 ms, for a Hub port the delay is taken from Hub descriptor.
<b>Mass Storage Devices</b>	Auto[Default] Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

#### 4.6.2.7 Network Stack Configuration



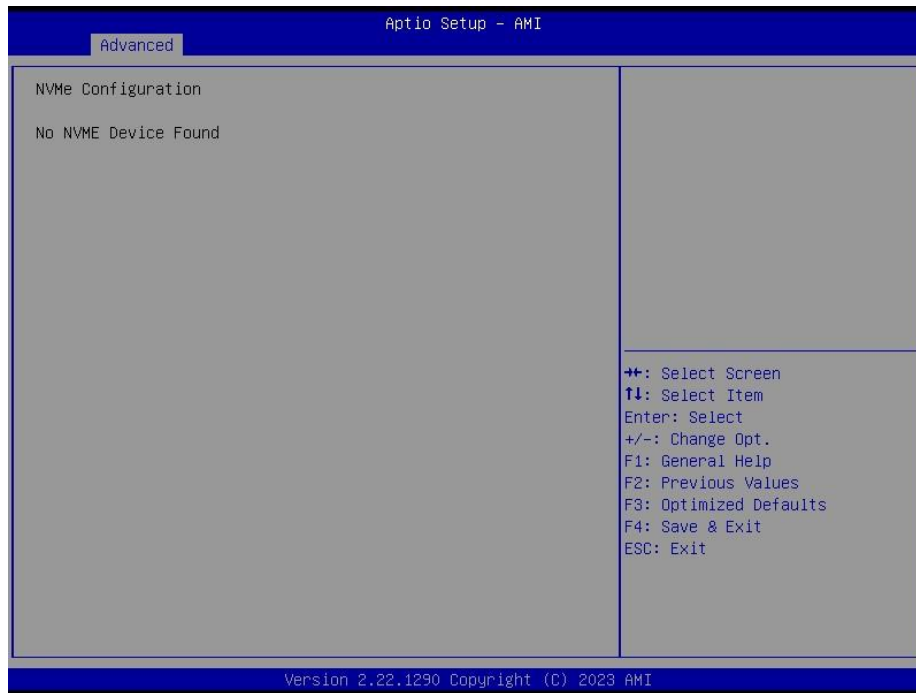
# HPM-ERSDE User's Manual



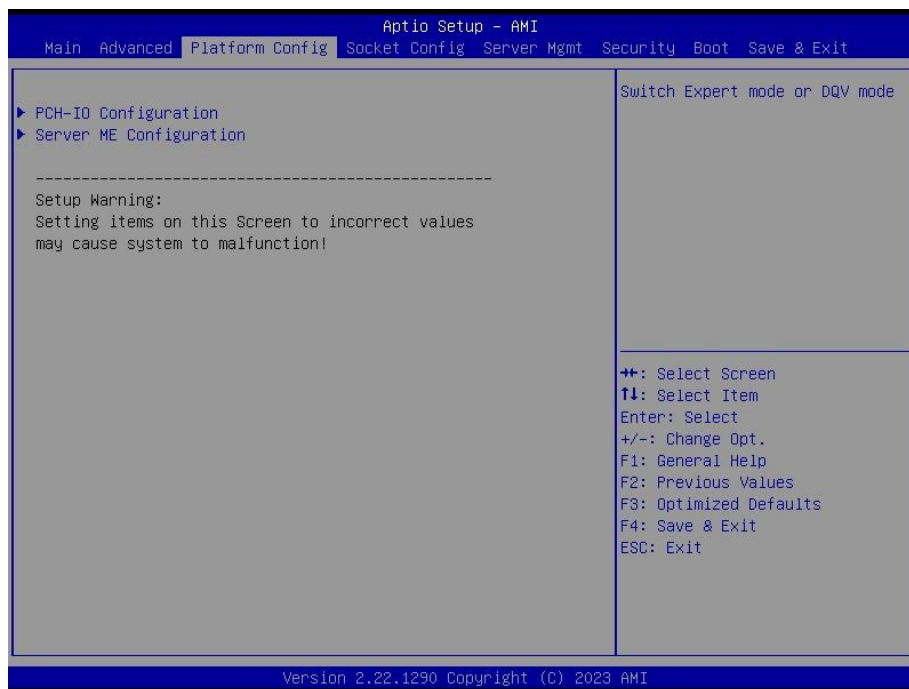
Item	Option	Description
<b>Network stack</b>	Enabled Disabled[ <b>Default</b> ]	Enable/Disable UEFI Network Stack.
<b>Ipv4/6 PXE Support</b>	Enabled Disabled[ <b>Default</b> ]	Enable/Disable Ipv4/6 PXE boot support. If disabled IPv4/6 PXE boot support will not be available.
<b>Ipv4/6 HTTP Support</b>	Enabled Disabled[ <b>Default</b> ]	Enable/Disable Ipv4/6 HTTP boot support. If disabled, IPv4/6 HTTP boot support will not be available.
<b>PXE boot wait time</b>	0	Wait time to press ESC key to abort the PXE boot.
<b>Media detect count</b>	1	Number of times presence of media will be checked.



### 4.6.2.8 NVMe Configuration

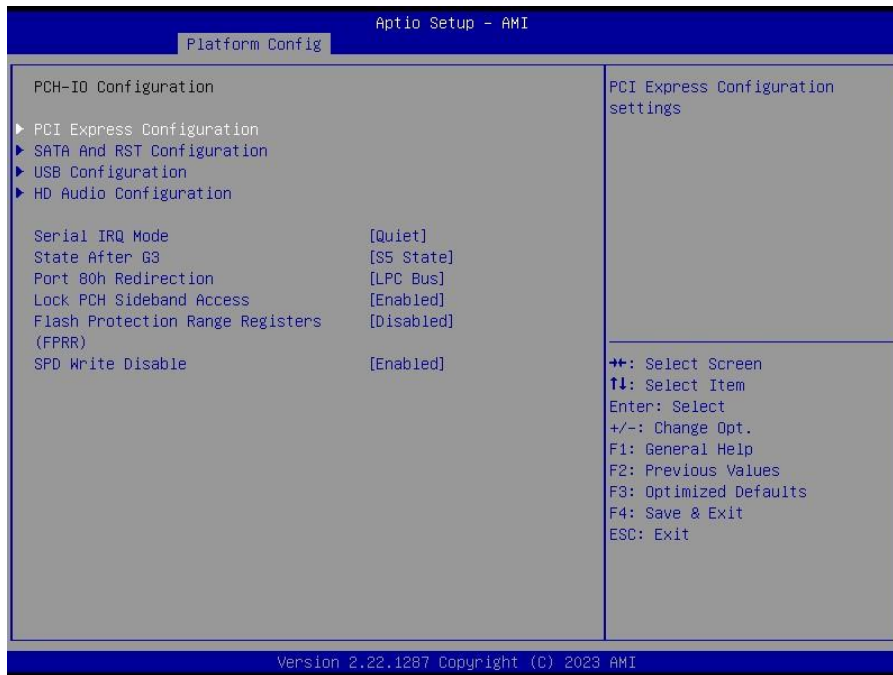


### 4.6.3 Platform Config



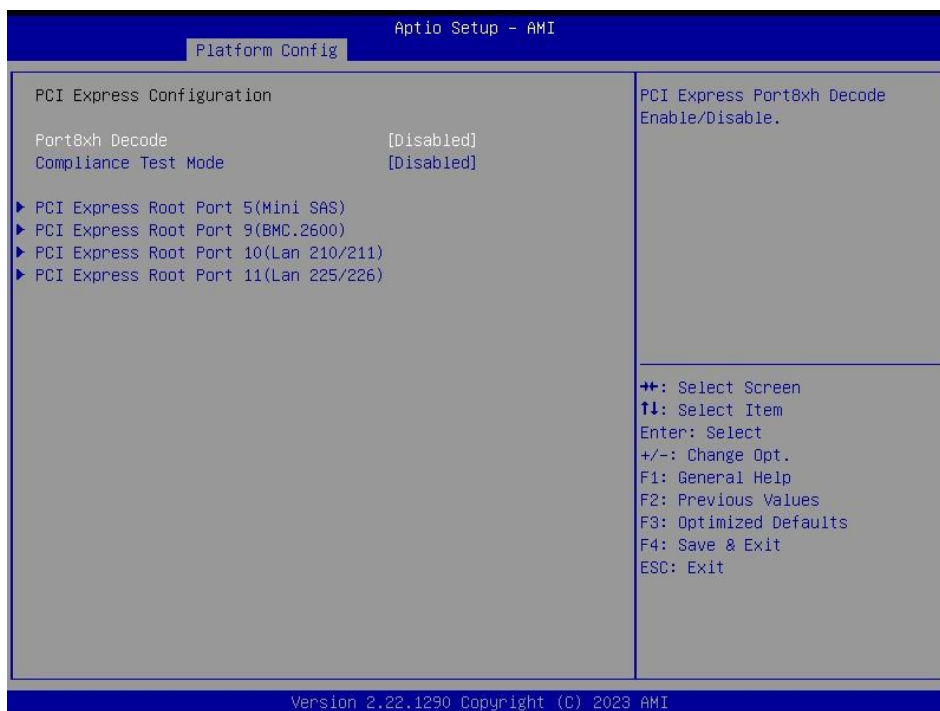
# HPM-ERSDE User's Manual

## 4.6.3.1 PCH-IO Configuration



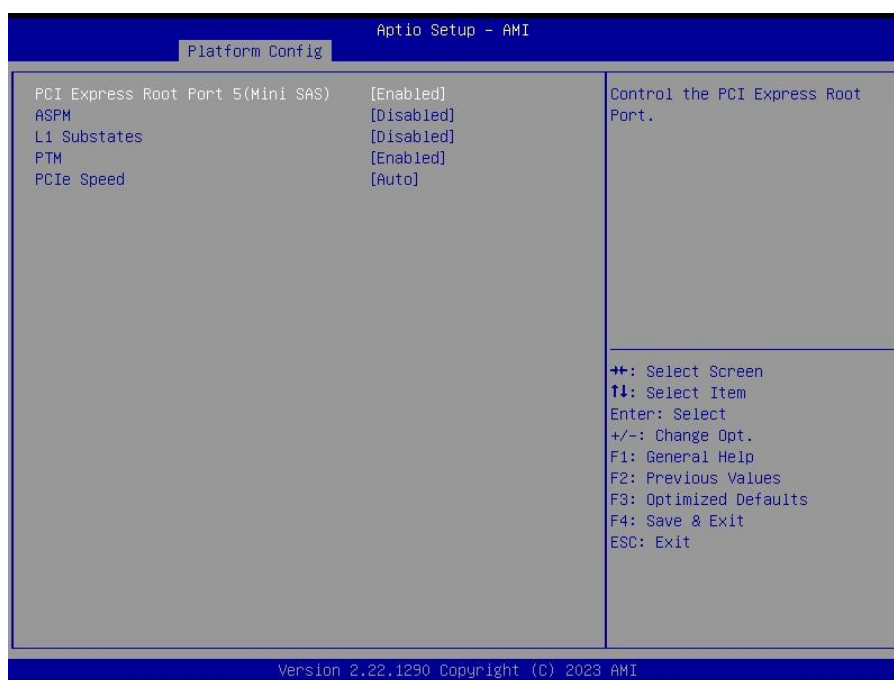
Item	Option	Description
<b>Serial IRQ Mode</b>	Quiet[Default] Continuous	Configure Serial IRQ Mode.
<b>State After G3</b>	S0 State S5 State[Default]	Specify what state to go to when power is re-applied after a power failure (G3 state).
<b>Port 80h Redirection</b>	LPC Bus[Default] PCIe Bus	Control where the Port 80h cycles are sent.
<b>Lock PCH Sideband Access</b>	Disabled Enabled[Default]	Lock PCH Sideband access, include SideBand interface lock and SideBand PortID mask for certain end point (e.g. PSFx). The option is invalid if POSTBOOT SAI is set.
<b>Flash Protection Range Registers(FRRR)</b>	Disabled[Default] Enabled	Enable Flash Protection Range Registers.
<b>SPD Write Disable</b>	Disabled Enabled[Default]	Enable/Disable setting SPD Write Disable bit. For security recommendations, SPD write disable bit must be set.

### 4.6.3.1.1 PCI Express Configuration



Item	Option	Description
<b>Port8xh Decode</b>	Disabled[Default] Enabled	PCI Express Port8xh Decode Enable/Disable.
<b>Compliance Test Mode</b>	Disabled[Default] Enabled	Enable when using Compliance Load Board.

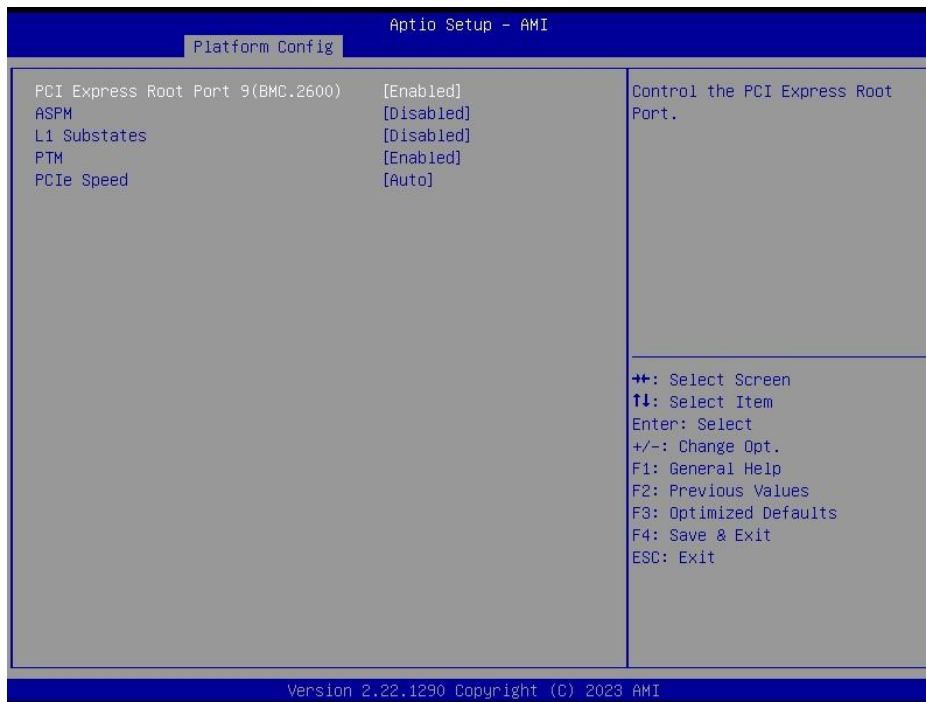
#### 4.6.3.1.1.1 PCI Express Root Port 5(Mini SAS)



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Item	Option	Description
PCI Express Root Port 5(Mini SAS)	Enabled[Default], Disabled	Control the PCI Express Root Port.
ASPM	Disabled[Default], L1	PCI Express Active State Power Management settings.
L1 Substates	Disabled[Default] L1.1 L1.2 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Enabled[Default], Disabled	Enable/Disable Precision Time Measurement.
PCIe Speed	Auto[Default] Gen1 Gen2 Gen3	Configure PCIe Speed.

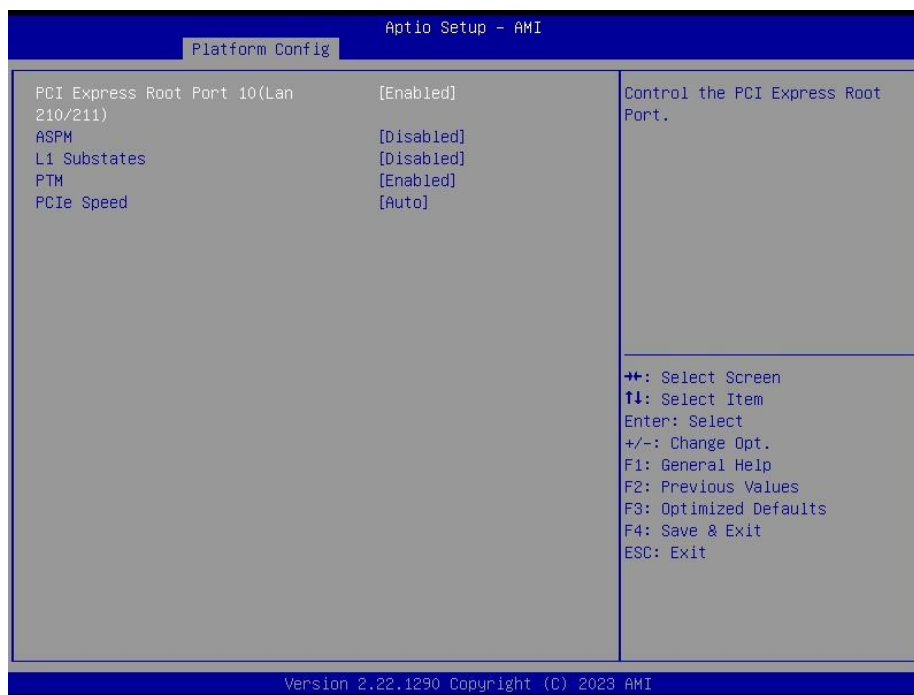
### 4.6.3.1.1.2 PCI Express Root Port 9(BMC.2600)



Item	Option	Description
PCI Express Root Port 9(BMC. 2600)	Enabled[Default], Disabled	Control the PCI Express Root Port.
ASPM	Disabled[Default], L1	PCI Express Active State Power Management settings.
L1 Substates	Disabled[Default] L1.1 L1.2 L1.1 & L1.2	PCI Express L1 Substates settings.
PTM	Enabled[Default], Disabled	Enable/Disable Precision Time Measurement.

<b>PCIe Speed</b>	Auto <b>[Default]</b> Gen1 Gen2 Gen3	Configure PCIe Speed.
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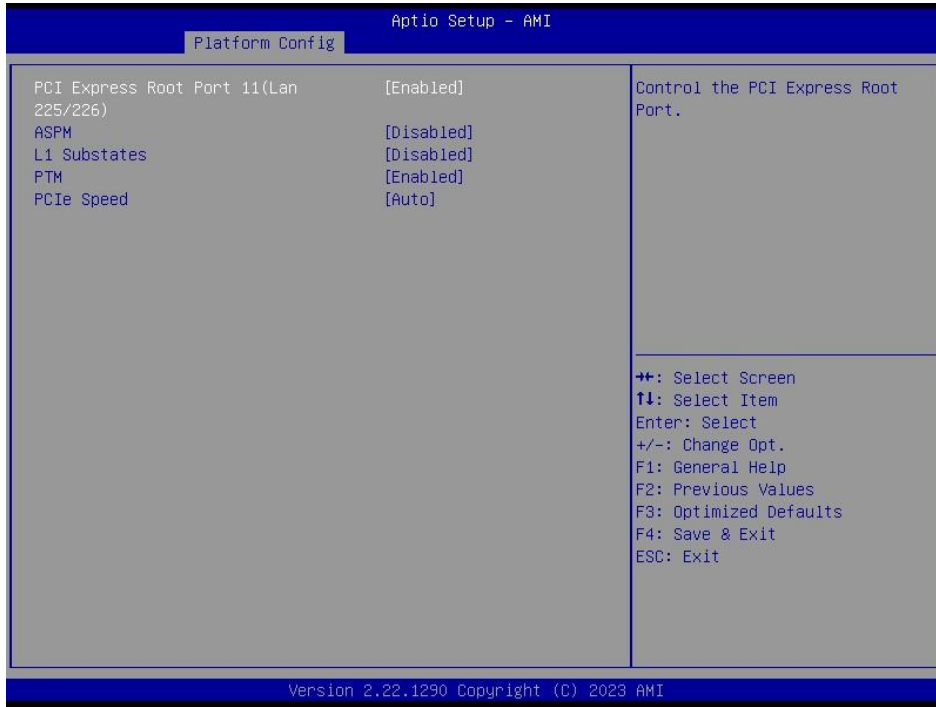
#### 4.6.3.1.1.3 PCI Express Root Port 10(Lan 210/211)



Item	Option	Description
<b>PCI Express Root Port 10(Lan 210/211)</b>	Enabled <b>[Default]</b> , Disabled	Control the PCI Express Root Port.
<b>ASPM</b>	Disabled <b>[Default]</b> , L1	PCI Express Active State Power Management settings.
<b>L1 Substates</b>	Disabled <b>[Default]</b> L1.1 L1.2 L1.1 & L1.2	PCI Express L1 Substates settings.
<b>PTM</b>	Enabled <b>[Default]</b> , Disabled	Enable/Disable Precision Time Measurement.
<b>PCIe Speed</b>	Auto <b>[Default]</b> Gen1 Gen2 Gen3	Configure PCIe Speed.

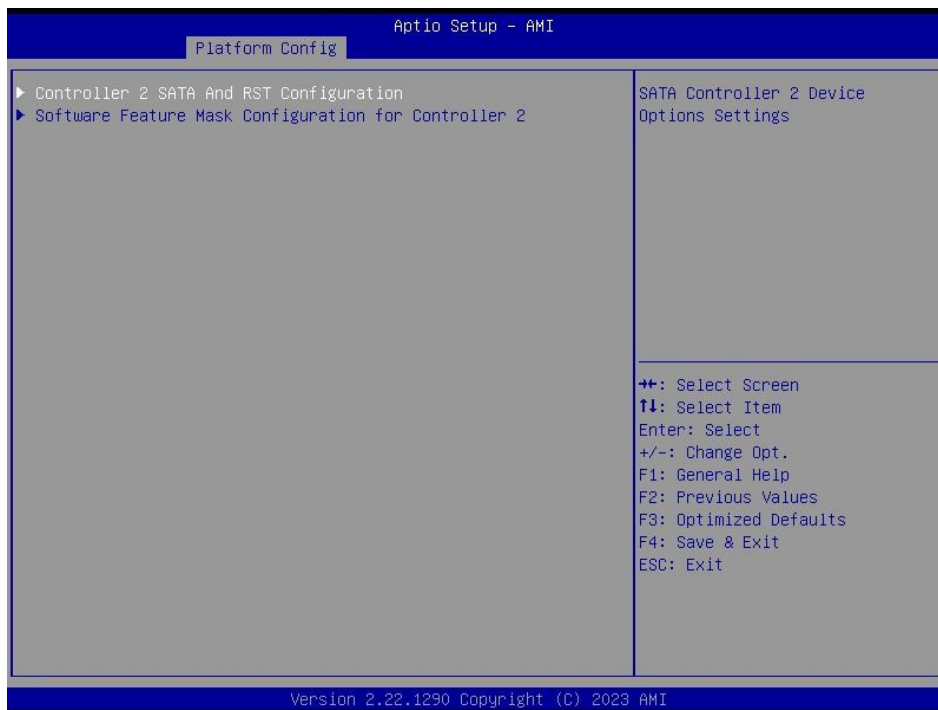
# HPM-ERSDE User's Manual

## 3.6.3.1.1.4 PCI Express Root Port 11(LAN 225/226)

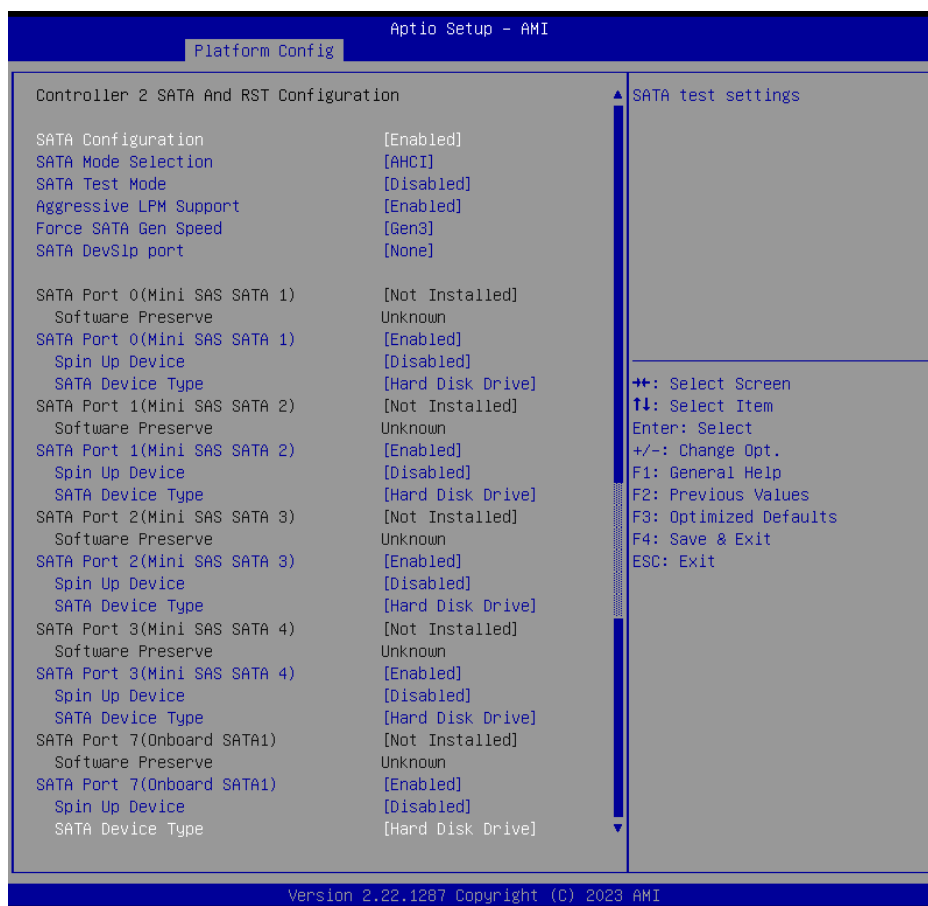


Item	Option	Description
<b>PCI Express Root Port 11(LAN 225/226)</b>	Enabled[Default], Disabled	Control the PCI Express Root Port.
<b>ASPM</b>	Disabled[Default], L1	PCI Express Active State Power Management settings.
<b>L1 Substates</b>	Disabled[Default] L1.1 L1.2 L1.1 & L1.2	PCI Express L1 Substates settings.
<b>PTM</b>	Enabled[Default], Disabled	Enable/Disable Precision Time Measurement.
<b>PCIe Speed</b>	Auto[Default] Gen1 Gen2 Gen3	Configure PCIe Speed.

### 4.6.3.1.2 SATA And RST Configuration



#### 4.6.3.1.2.1 Controller 2 SATA And RST Configuration



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Item	Options	Description
<b>SATA Configuration</b>	Enabled[ <b>Default</b> ] Disabled,	SATA test settings.
<b>SATA Mode Selection</b>	AHCI[ <b>Default</b> ], RAID	Determines how SATA controller(s) operate.
<b>SATA Test Mode</b>	Enabled Disabled[ <b>Default</b> ]	Test Mode Enable/Disable (Loop Back).
<b>Aggressive LPM Support</b>	Enabled[ <b>Default</b> ] Disabled	Enable PCH to aggressively enter link power state.
<b>Force SATA Gen Speed</b>	Gen1 Gen2 Gen3[ <b>Default</b> ]	Changes SATA Gen Speed for port.
<b>SATA DevSlp port</b>	None[ <b>Default</b> ] Port0 Port1 Port2 Port3 Port4 Port5 Port6 Port7	Enable SATA DevSlp feature for port. It is possible to enable DevSlp for only one port or none.
<b>SATA Port 0(Mini SAS SATA 1)</b>	Disabled Enabled[ <b>Default</b> ]	Enable or Disable SATA Port.
<b>Spin Up Device</b>	Disabled[ <b>Default</b> ] Enabled	If enabled for any of ports Staggerred 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.
<b>SATA Device Type</b>	Hard Disk Drive[ <b>Default</b> ] Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
<b>SATA Port 1(Mini SAS SATA 2)</b>	Disabled Enabled[ <b>Default</b> ]	Enable or Disable SATA Port.
<b>Spin Up Device</b>	Disabled[ <b>Default</b> ] Enabled	If enabled for any of ports Staggerred 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.
<b>SATA Device Type</b>	Hard Disk Drive[ <b>Default</b> ] Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
<b>SATA Port 2(Mini SAS SATA 3)</b>	Disabled Enabled[ <b>Default</b> ]	Enable or Disable SATA Port.
<b>Spin Up Device</b>	Disabled[ <b>Default</b> ] Enabled	If enabled for any of ports Staggerred 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.
<b>SATA Device Type</b>	Hard Disk Drive[Default] Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
<b>SATA Port 3(Mini SAS SATA 4)</b>	Disabled Enabled[Default]	Enable or Disable SATA Port.
<b>Spin Up Device</b>	Disabled[Default] Enabled	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.
<b>SATA Device Type</b>	Hard Disk Drive[Default] Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
<b>SATA Port 7(Onboard SATA 1)</b>	Disabled Enabled[Default]	Enable or Disable SATA Port.
<b>Spin Up Device</b>	Disabled[Default] Enabled	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.
<b>SATA Device Type</b>	Hard Disk Drive[Default] Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.

#### 4.6.3.1.2.2 Software Feature Mask Configuration for Controller 2



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Item	Options	Description
<b>HDD Unlock</b>	Disabled, Enabled[ <b>Default</b> ]	If enabled, indicates that the HDD password unlock in the OS is enabled.
<b>LED Locate</b>	Disabled, Enabled[ <b>Default</b> ]	If enabled, indicates that the LED/SGPIO hardware is attached and ping to locate feature is enabled on the OS.

### 4.6.3.1.3 USB Configuration



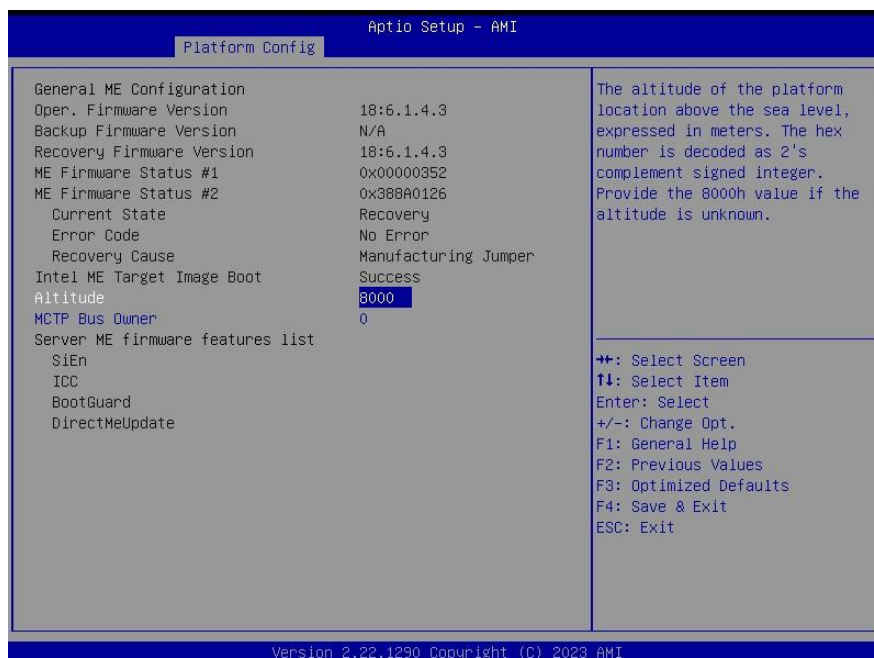
Item	Options	Description
<b>USB Overcurrent</b>	Disabled, Enabled[ <b>Default</b> ]	Select 'Disabled' for pin-based debug. If pin-based debug is enabled but USB overcurrent is not disabled, USB DbC does not work.
<b>USB Port Disable Override</b>	Disable[ <b>Default</b> ] Select Per-Pin	Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller.

### 4.6.3.1.4 HD Audio Configuration



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

### 4.6.3.2 Server ME Configuration



Item	Option	Description
Altitude	8000	The altitude of the platform location above the sea level, expressed in meters. The hex number is decoded as 2's complement signed integer. Provide the 8000h value if the

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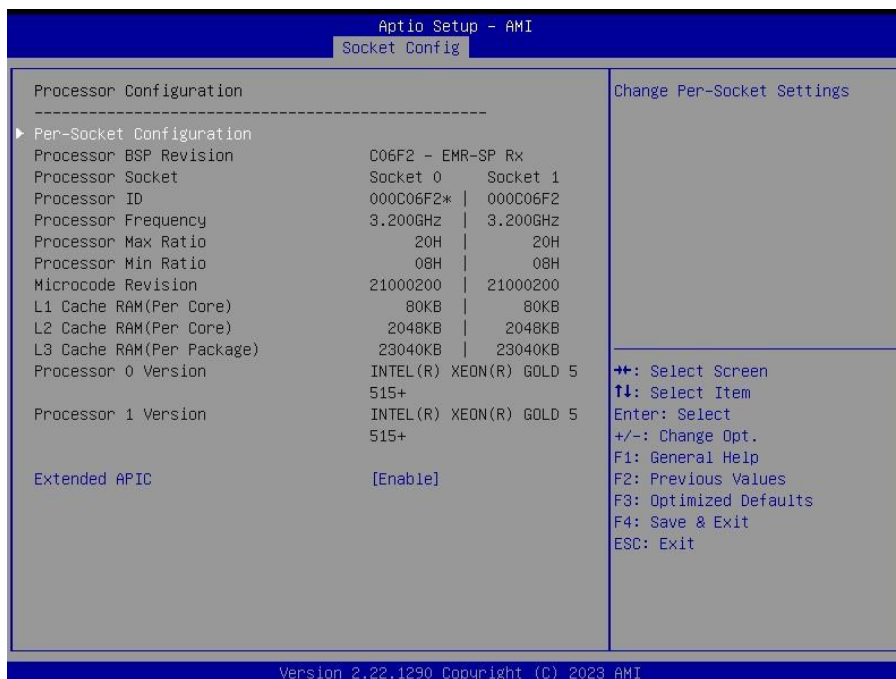
		altitude is unknown.
<b>MCTP Bus Owner</b>	0	MCTP bus owner location on PCIe: [15:8] bus, [7:3] device, [2:0] function. If all zeros sending bus owner is disabled.

### 4.6.4 Socket Config



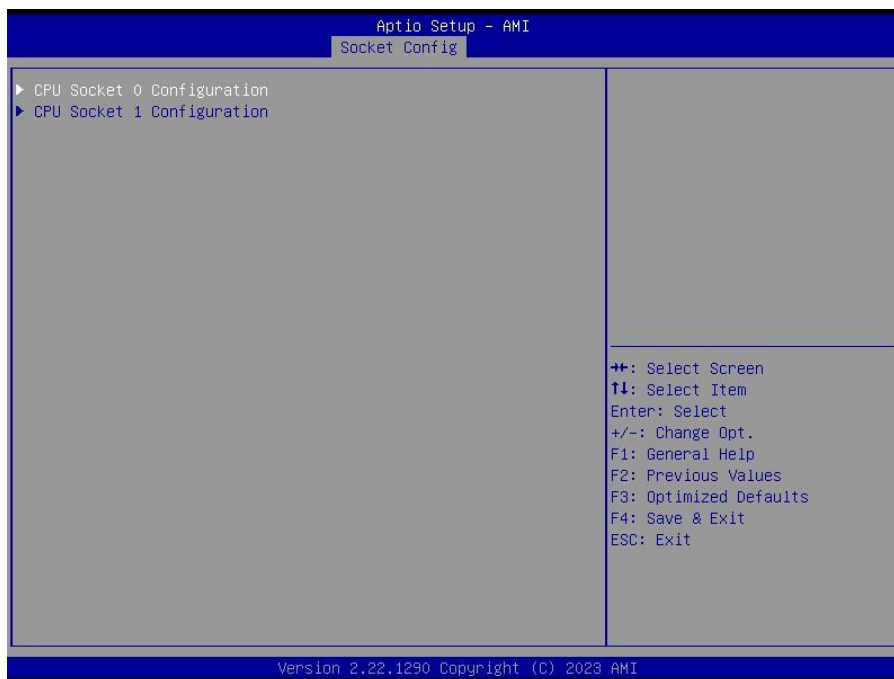
Item	Options	Description
<b>Expert Mode (Socket config)</b>	DQV mode[Default] Expert mode	Switch Expert mode or DQV mode.

#### 4.6.4.1 Processor Configuration

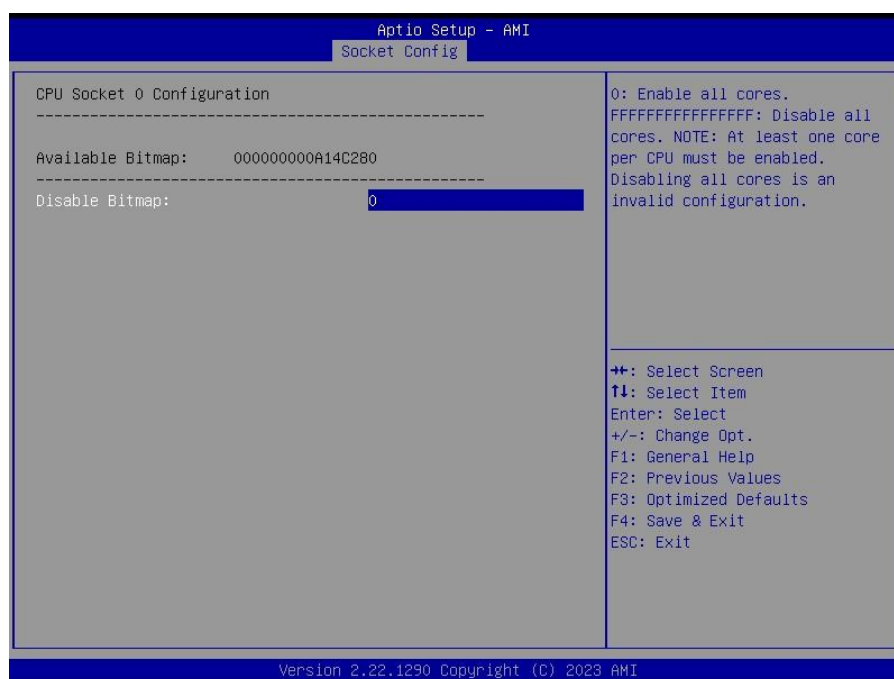


Item	Option	Description
Extended APIC	Disable Enable[Default]	Enable/disable extended APIC support. Note: When enabled, VT-d_Interrupt Remapping will be automatically enabled.

#### 4.6.4.1.1 Per-Socket Configuration



##### 4.6.4.1.1.1 CPU Socket 0 Configuration



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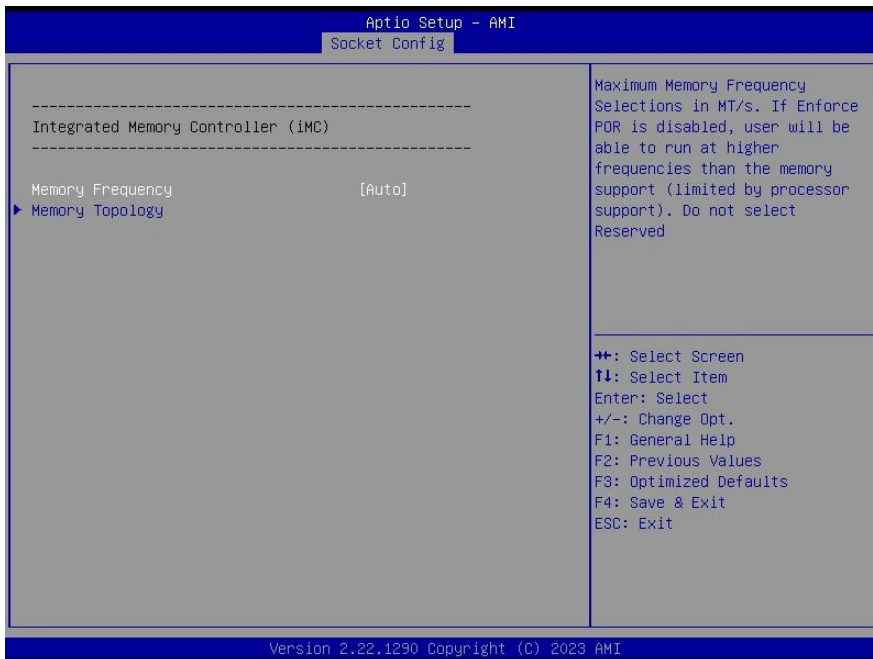
Item	Option	Description
Disable Bitmap:	0	0: Enable all cores. FFFFFFFFFFFFFFFFFF: Disable all cores. NOTE: AT least one core per CPU must be enabled. Disabling all cores is an invalid configuration.

### 4.6.4.1.1.2 CPU Socket 1 Configuration



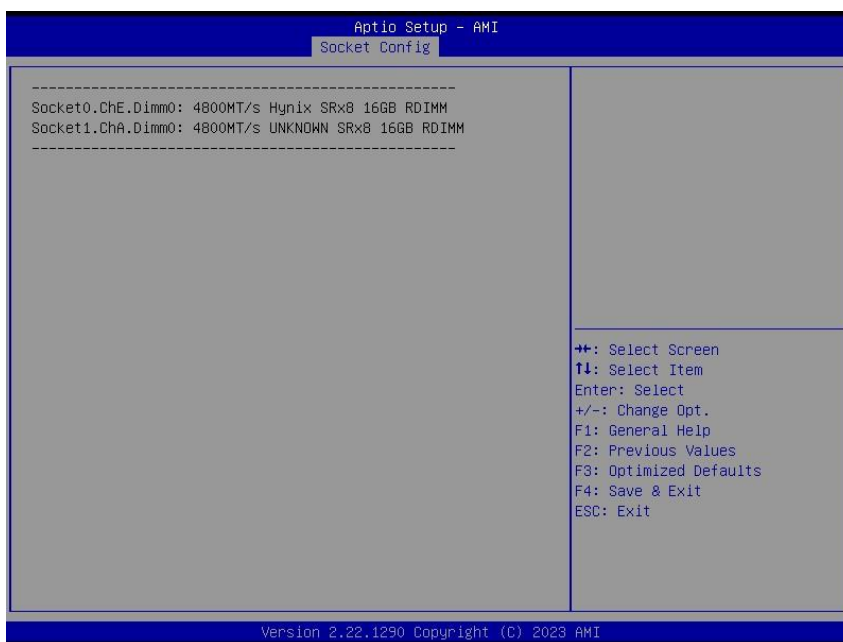
Item	Option	Description
Disable Bitmap:	0	0: Enable all cores. FFFFFFFFFFFFFFFFFF: Disable all cores. NOTE: AT least one core per CPU must be enabled. Disabling all cores is an invalid configuration.

### 4.6.4.2 Memory Configuration



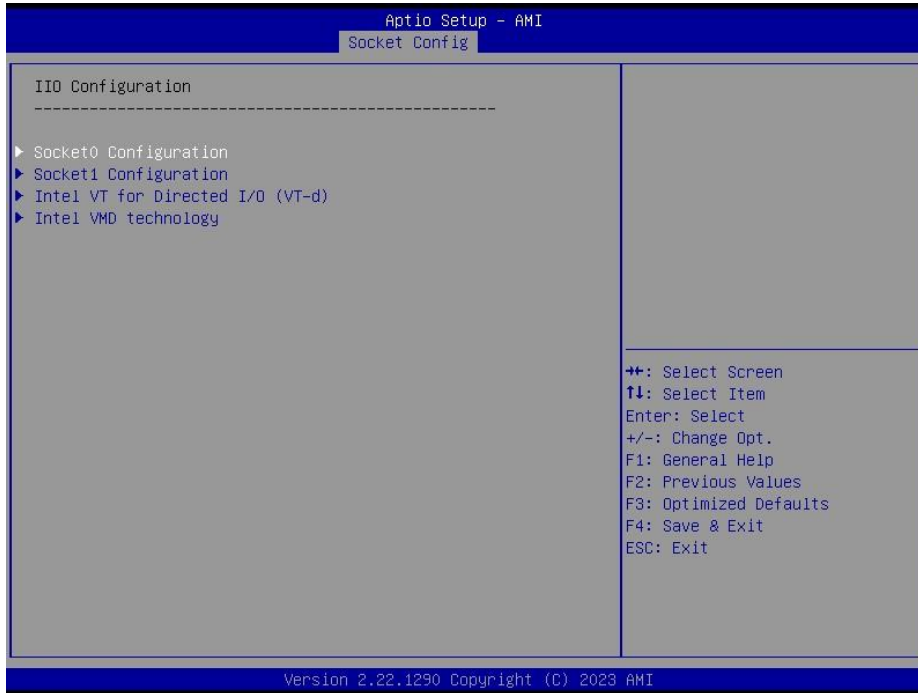
Item	Option	Description
Memory Frequency	Auto[Default]	Maximum Memory Frequency Selections in MT/s. If Enforce POR is disabled, user will be able to run at higher frequencies than the memory support (limited by processor support). Do not select Reserved.
	3200	
	3600	
	4000	
	4400	
	4800	
	5200	
5600		

#### 4.6.4.2.1 Memory Topology

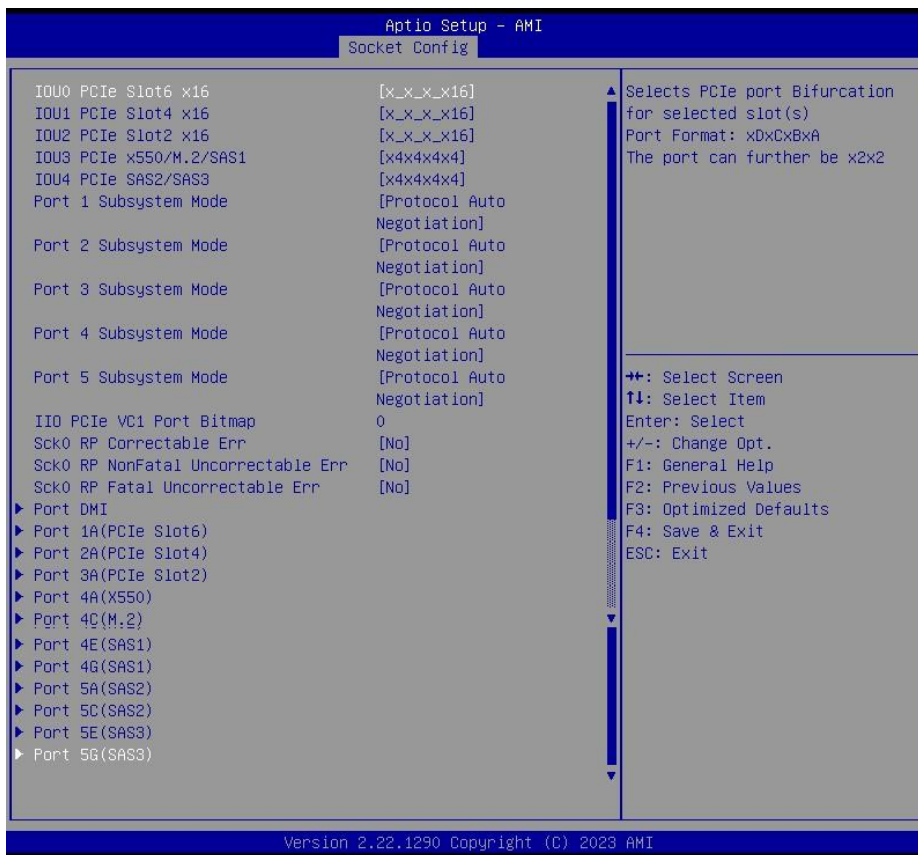


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## 4.6.4.3 IIO Configuration



### 4.6.4.3.1 Socket0 Configuration



Item	Options	Description
IOU0 PCIe Slot6 x16	Auto x4x4x4x4 x4x4x_x8	Selects PCIe port Bifurcation for selected slot(s) Port Format: xDxCxBxA The port



	<p>x_8x4x4  x_8x_x8  <b>x_x_x_x16[Default]</b>  x2x2x4x_x8  x4x2x2x_x8  x_x8x2x2x4  x2x2x4x4x4  x4x2x2x4x4  x4x4x2x2x4  x2x2x2x2x_x8  x2x2x2x2x4x4  x2x2x4x2x2x4  x4x2x2x2x2x4  x2x2x2x2x2x2x4  x_x8x4x2x2  x4x4x4x2x2  x_x8x2x2x2x2  x2x2x4x4x2x2  x4x2x2x4x2x2  x4x4x2x2x2x2  x2x2x2x2x4x2x2  x2x2x4x2x2x2x2  x4x2x2x2x2x2x2  x2x2x2x2x2x2x2x2</p>	<p>can further be x2x2.</p>
<p><b>IOU1 PCIe Slot4 x16</b></p>	<p>Auto  x4x4x4x4  x4x4x_x8  x_x8x4x4  x_x8x_x8  <b>x_x_x_x16[Default]</b>  x2x2x4x_x8  x4x2x2x_x8  x_x8x2x2x4  x2x2x4x4x4  x4x2x2x4x4  x4x4x2x2x4  x2x2x2x2x_x8  x2x2x2x2x4x4  x2x2x4x2x2x4  x4x2x2x2x2x4  x2x2x2x2x2x2x4  x_x8x4x2x2  x4x4x4x2x2  x_x8x2x2x2x2  x2x2x4x4x2x2  x4x2x2x4x2x2  x4x4x2x2x2x2  x2x2x2x2x4x2x2  x2x2x4x2x2x2x2  x4x2x2x2x2x2x2  x2x2x2x2x2x2x2x2</p>	<p>Selects PCIe port Bifurcation for selected slot(s) Port Format: xDxCxBxA The port can further be x2x2.</p>
<p><b>IOU2 PCIe Slot2 x16</b></p>	<p>Auto  x4x4x4x4  x4x4x_x8  x_x8x4x4  x_x8x_x8  <b>x_x_x_x16[Default]</b>  x2x2x4x_x8  x4x2x2x_x8  x_x8x2x2x4</p>	<p>Selects PCIe port Bifurcation for selected slot(s) Port Format: xDxCxBxA The port can further be x2x2.</p>

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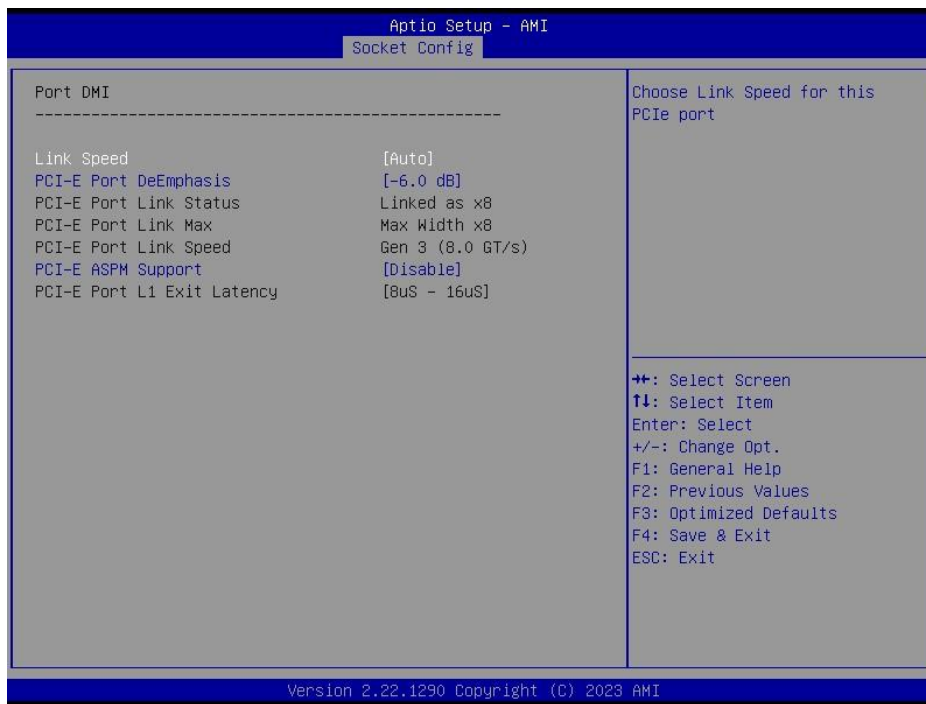
	<p>x2x2x4x4x4  x4x2x2x4x4  x4x4x2x2x4  x2x2x2x2x_x8  x2x2x2x2x4x4  x2x2x4x2x2x4  x4x2x2x2x2x4  x2x2x2x2x2x2x4  x_x8x4x2x2  x4x4x4x2x2  x_x8x2x2x2x2  x2x2x4x4x2x2  x4x2x2x4x2x2  x4x4x2x2x2x2  x2x2x2x2x4x2x2  x2x2x4x2x2x2x2  x4x2x2x2x2x2x2  x2x2x2x2x2x2x2x2</p>	
<p><b>IOU3 PCIe  x550/M.2/SAS1</b></p>	<p>Auto  <b>x4x4x4x4[Default]</b>  x4x4x_x8  x_x8x4x4  x_x8x_x8  x_x_x_x16  x2x2x4x_x8  x4x2x2x_x8  x_x8x2x2x4  x2x2x4x4x4  x4x2x2x4x4  x4x4x2x2x4  x2x2x2x2x_x8  x2x2x2x2x4x4  x2x2x4x2x2x4  x4x2x2x2x2x4  x2x2x2x2x2x2x4  x_x8x4x2x2  x4x4x4x2x2  x_x8x2x2x2x2  x2x2x4x4x2x2  x4x2x2x4x2x2  x4x4x2x2x2x2  x2x2x2x2x4x2x2  x2x2x4x2x2x2x2  x4x2x2x2x2x2x2  x2x2x2x2x2x2x2x2</p>	<p>Selects PCIe port Bifurcation for selected slot(s) Port Format: xDxCxBxA The port can further be x2x2.</p>
<p><b>IOU4 PCIe SAS2/SAS3</b></p>	<p>Auto  <b>x4x4x4x4[Default]</b>  x4x4x_x8  x_x8x4x4  x_x8x_x8  x_x_x_x16  x2x2x4x_x8  x4x2x2x_x8  x_x8x2x2x4  x2x2x4x4x4  x4x2x2x4x4  x4x4x2x2x4  x2x2x2x2x_x8  x2x2x2x2x4x4  x2x2x4x2x2x4</p>	<p>Selects PCIe port Bifurcation for selected slot(s) Port Format: xDxCxBxA The port can further be x2x2.</p>

	<p>x4x2x2x2x2x4  x2x2x2x2x2x2x4  x_x8x4x2x2  x4x4x4x2x2  x_x8x2x2x2x2  x2x2x4x4x2x2  x4x2x2x4x2x2  x4x4x2x2x2x2  x2x2x2x2x4x2x2  x2x2x4x2x2x2x2  x4x2x2x2x2x2x2  x2x2x2x2x2x2x2x2</p>	
<b>Port 1 Subsystem Mode</b>	<p>Gen5  Protocol Auto Negotiation[Default]</p>	<p>Select PCIe Subsystem Mode for selected slot(s) Gen4: Gen4 controller only Gen5: Gen5 with or without mix mode Auto: Auto select Force CXL: There is no training discovery, the attached device must also supports this mode.</p>
<b>Port 2 Subsystem Mode</b>	<p>Gen5  Protocol Auto Negotiation[Default]</p>	<p>Select PCIe Subsystem Mode for selected slot(s) Gen4: Gen4 controller only Gen5: Gen5 with or without mix mode Auto: Auto select Force CXL: There is no training discovery, the attached device must also supports this mode.</p>
<b>Port 3 Subsystem Mode</b>	<p>Gen5  Protocol Auto Negotiation[Default]</p>	<p>Select PCIe Subsystem Mode for selected slot(s) Gen4: Gen4 controller only Gen5: Gen5 with or without mix mode Auto: Auto select Force CXL: There is no training discovery, the attached device must also supports this mode.</p>
<b>Port 4 Subsystem Mode</b>	<p>Gen5  Protocol Auto Negotiation[Default]</p>	<p>Select PCIe Subsystem Mode for selected slot(s) Gen4: Gen4 controller only Gen5: Gen5 with or without mix mode Auto: Auto select Force CXL: There is no training discovery, the attached device must also supports this mode.</p>
<b>Port 5 Subsystem Mode</b>	<p>Gen5  Protocol Auto Negotiation[Default]</p>	<p>Select PCIe Subsystem Mode for selected slot(s) Gen4: Gen4 controller only Gen5: Gen5 with or without mix mode Auto: Auto select Force CXL: There is no training discovery, the attached device must also supports this mode.</p>
<b>IIO PCIe VC1 Port Bitmap</b>	<p>0</p>	<p>Enable/Disable PCIe Port VC1 support. Port 0 is allocated to DMI or DMI as PCIe.</p>

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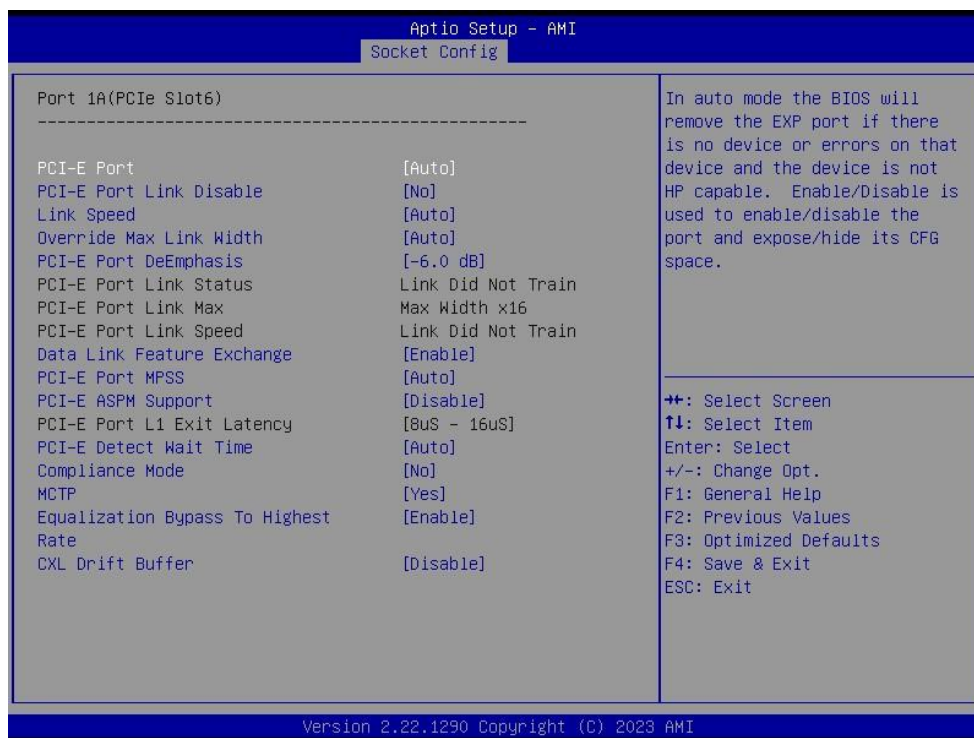
		Port 0 bit will have no effect in DMI mode. 0-VC1 support disabled. 1-VC1 support enabled. Example: bit 0= IIO PCIe Port 0...bit n = IIO PCIe Portn.
<b>Sck0 RP Correctable Err</b>	No[Default] Yes	Applies to root ports only. Enabled interrupt on correctable errors.
<b>Sck0 RP NonFatal Uncorrectable Err</b>	No[Default] Yes	Applies to root ports only. Enabled interrupt on a non-fatal error.
<b>Sck0 RP Fatal Uncorrectable Err</b>	No[Default] Yes	Applies to root ports only. Enabled MSI/INTx interrupt on fatal errors.

### 4.6.4.3.1.1 Port DMI



Item	Option	Description
<b>Link Speed</b>	Auto[Default] Gen 1 (2.5 GT/s) Gen 2 (5 GT/s) Gen 3 (8 GT/s) Gen 4 (16 GT/s) Gen 5 (32 GT/s)	Choose Link Speed for this PCIe port.
<b>PCI-E Port DeEmphasis</b>	-6.0 dB[Default] -3.5 dB	De-Emphasis control (LNKCON2[6]) for this PCIe port.
<b>PCI-E ASPM Support</b>	Disabled[Default] Auto	This option can disable ASPM support in a PCIe root port. 'Auto' keeps hardware default.

4.6.4.3.1.2 Port 1A(PCIe Slot6), Port 2A(PCIe Slot4), Port 3A(PCIe Slot2), Port 4A(X550), Port 4C(M.2), Port 4E(SAS1), Port 4G(SAS1), Port 5A(SAS2), Port 5C(SAS2), Port 5E(SAS3), Port 5G(SAS3)

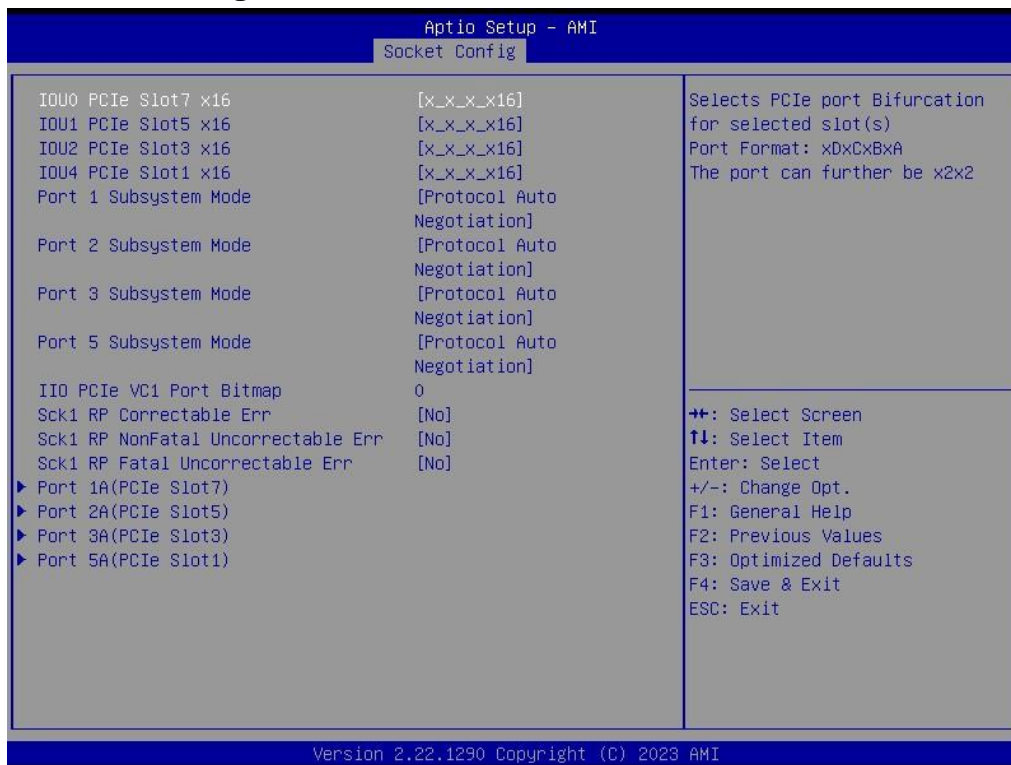


Item	Option	Description
<b>PCI-E Port</b>	Auto[Default] No Yes	In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Enable/Disable is used to enable/disable the port and expose/hide its CFG space.
<b>PCI-E Port Link Disable</b>	No[Default] Yes	This option disables the link so that the no training occurs but the CFG space is still active.
<b>Link Speed</b>	Auto[Default] Gen 1 (2.5 GT/s) Gen 2 (5 GT/s) Gen 3 (8 GT/s) Gen 4 (16 GT/s) Gen 5 (32 GT/s)	Choose Link Speed for this PCIe port.
<b>Override Max Link Width</b>	Auto[Default] x1 x2 x4 x8 x16	Override the max link width that was set by bifurcation.
<b>PCI-E Port DeEmphasis</b>	-6.0 dB[Default] -3.5 dB	De-Emphasis control (LNKCON2[6]) for this PCIe port.
<b>Data Link Feature Exchange</b>	Disable Enable[Default]	Enable/Disable data link feature negotiation in the Data Link Feature Capabilities (DLFCAP) register.
<b>PCI-E Port MPSS</b>	128B 256B	Configure Max Payload Size Supported in PCIe Device Capabilities register. 'Auto' keeps hardware

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	512B Auto[Default]	default.
<b>PCI-E ASPM Support</b>	Disabled[Default] Auto	This option can disable ASPM support in a PCIe root port. 'Auto' keeps hardware default.
<b>PCI-E Detect Wait Time</b>	Disable 500ms Auto[Default]	Set PCIe port TxRx detect polling.
<b>Compliance Mode</b>	No[Default] Yes	Enable/Disable Compliance Mode for this PCIe port.
<b>MCTP</b>	No Yes[Default]	Enable/Disable MCTP.
<b>Equalization Bypass To Highest Rate</b>	Disable Enable[Default]	Equalization Bypass To Highest Rate Support Enable/Disable.
<b>CXL Drift Buffer</b>	Disable[Default] Enable	Enable/Disable CXL Drift Buffer if there is a common reference clock.

### 4.6.4.3.2 Socket1 Configuration



Item	Options	Description
<b>IOU0 PCIe Slot7 x16</b>	Auto x4x4x4x4 x4x4x_x8 x_x8x4x4 x_x8x_x8 x_x_x_x16[Default] x2x2x4x_x8 x4x2x2x_x8 x_x8x2x2x4 x2x2x4x4x4 x4x2x2x4x4 x4x4x2x2x4 x2x2x2x2x_x8	Selects PCIe port Bifurcation for selected slot(s) Port Format: xDxCxBxA The port can further be x2x2.

	<p>x2x2x2x2x4x4  x2x2x4x2x2x4  x4x2x2x2x2x4  x2x2x2x2x2x2x4  x_x8x4x2x2  x4x4x4x2x2  x_x8x2x2x2x2  x2x2x4x4x2x2  x4x2x2x4x2x2  x4x4x2x2x2x2  x2x2x2x2x4x2x2  x2x2x4x2x2x2x2  x4x2x2x2x2x2x2  x2x2x2x2x2x2x2x2</p>	
<p><b>IOU1 PCIe Slot5 x16</b></p>	<p>Auto  x4x4x4x4  x4x4x_x8  x_x8x4x4  x_x8x_x8  <b>x_x_x_x16[Default]</b>  x2x2x4x_x8  x4x2x2x_x8  x_x8x2x2x4  x2x2x4x4x4  x4x2x2x4x4  x4x4x2x2x4  x2x2x2x2x_x8  x2x2x2x2x4x4  x2x2x4x2x2x4  x4x2x2x2x2x4  x2x2x2x2x2x2x4  x_x8x4x2x2  x4x4x4x2x2  x_x8x2x2x2x2  x2x2x4x4x2x2  x4x2x2x4x2x2  x4x4x2x2x2x2  x2x2x2x2x4x2x2  x2x2x4x2x2x2x2  x4x2x2x2x2x2x2  x2x2x2x2x2x2x2x2</p>	<p>Selects PCIe port Bifurcation for selected slot(s) Port Format: xDxCxBxA The port can further be x2x2.</p>
<p><b>IOU2 PCIe Slot3 x16</b></p>	<p>Auto  x4x4x4x4  x4x4x_x8  x_x8x4x4  x_x8x_x8  <b>x_x_x_x16[Default]</b>  x2x2x4x_x8  x4x2x2x_x8  x_x8x2x2x4  x2x2x4x4x4  x4x2x2x4x4  x4x4x2x2x4  x2x2x2x2x_x8  x2x2x2x2x4x4  x2x2x4x2x2x4  x4x2x2x2x2x4  x2x2x2x2x2x2x4  x_x8x4x2x2  x4x4x4x2x2</p>	<p>Selects PCIe port Bifurcation for selected slot(s) Port Format: xDxCxBxA The port can further be x2x2.</p>

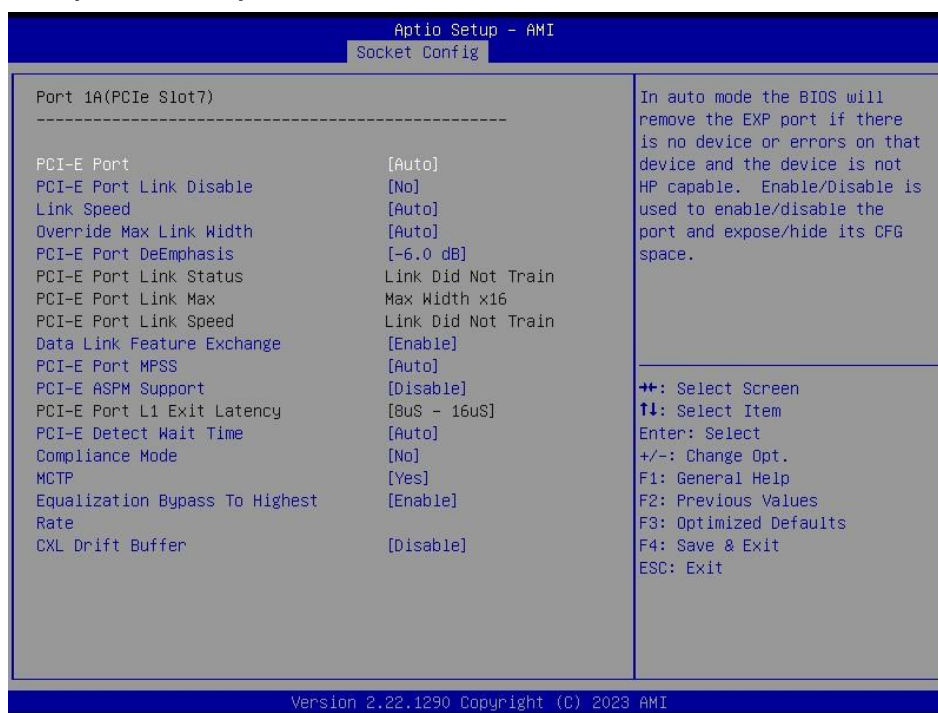
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	<p>x<sub>8</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>4</sub>x<sub>2</sub>  x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>2</sub>  x<sub>4</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>2</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub></p>	
<b>IOU4 PCIe Slot1 x16</b>	<p>Auto  x<sub>4</sub>x<sub>4</sub>x<sub>4</sub>x<sub>4</sub>  x<sub>4</sub>x<sub>4</sub>x<sub>8</sub>  x<sub>8</sub>x<sub>4</sub>x<sub>4</sub>  x<sub>8</sub>x<sub>8</sub>x<sub>8</sub>  <b>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>16</sub>[Default]</b>  x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>8</sub>  x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>8</sub>  x<sub>8</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>4</sub>x<sub>4</sub>  x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>4</sub>  x<sub>4</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>8</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>4</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>  x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>  x<sub>8</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>4</sub>x<sub>4</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>8</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>4</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>4</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>  x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub>x<sub>2</sub></p>	<p>Selects PCIe port Bifurcation for selected slot(s) Port Format: xDxCxBxA The port can further be x2x2.</p>
<b>Port 1 Subsystem Mode</b>	<p>Gen5  Protocol Auto Negotiation[Default]</p>	<p>Select PCIe Subsystem Mode for selected slot(s) Gen4: Gen4 controller only Gen5: Gen5 with or without mix mode Auto: Auto select Force CXL: There is no training discovery, the attached device must also supports this mode.</p>
<b>Port 2 Subsystem Mode</b>	<p>Gen5  Protocol Auto Negotiation[Default]</p>	<p>Select PCIe Subsystem Mode for selected slot(s) Gen4: Gen4 controller only Gen5: Gen5 with or without mix mode Auto: Auto select Force CXL: There is no training discovery, the attached device must also supports this mode.</p>
<b>Port 3 Subsystem Mode</b>	<p>Gen5  Protocol Auto Negotiation[Default]</p>	<p>Select PCIe Subsystem Mode for selected slot(s) Gen4: Gen4 controller only Gen5: Gen5 with or without mix mode Auto: Auto select Force CXL: There</p>



		is no training discovery, the attached device must also supports this mode.
<b>Port 5 Subsystem Mode</b>	Gen5 Protocol Auto Negotiation[Default]	Select PCIe Subsystem Mode for selected slot(s) Gen4: Gen4 controller only Gen5: Gen5 with or without mix mode Auto: Auto select Force CXL: There is no training discovery, the attached device must also supports this mode.
<b>IIO PCIe VC1 Port Bitmap</b>	0	Enable/Disable PCIe Port VC1 support. Port 0 is allocated to DMI or DMI as PCIe. Port 0 bit will have no effect in DMI mode. 0-VC1 support disabled. 1-VC1 support enabled. Example: bit 0= IIO PCIe Port 0...bit n = IIO PCIe Portn.
<b>Sck1 RP Correctable Err</b>	No[Default] Yes	Applies to root ports only. Enabled interrupt on correctable errors.
<b>Sck1 RP NonFatal Uncorrectable Err</b>	No[Default] Yes	Applies to root ports only. Enabled interrupt on a non-fatal error.
<b>Sck1 RP Fatal Uncorrectable Err</b>	No[Default] Yes	Applies to root ports only. Enabled MSI/INTx interrupt on fatal errors.

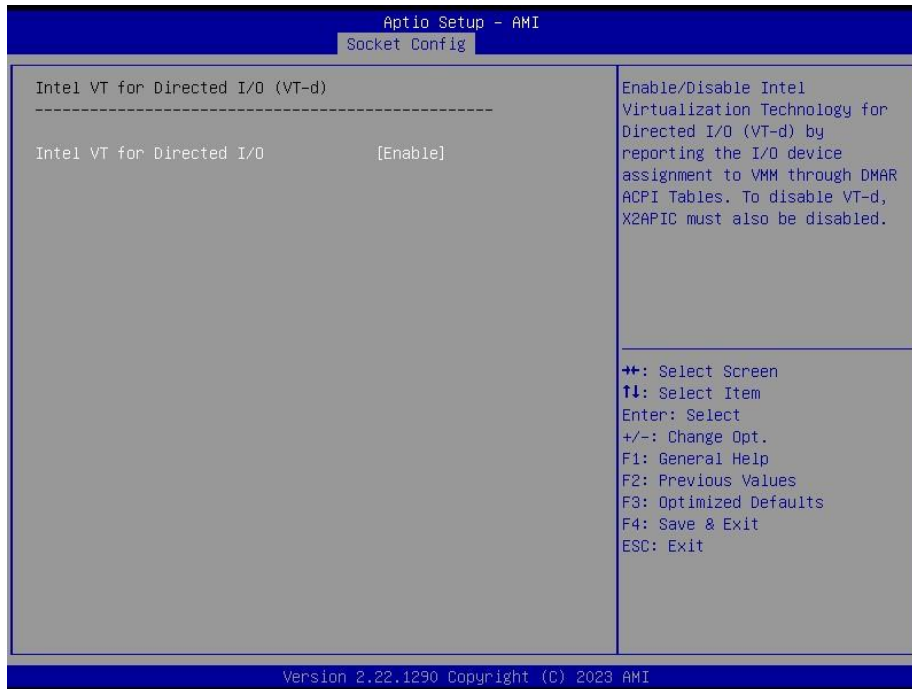
#### 4.6.4.3.2.1 Port 1A(Pcie Slot7), Port 2A(Pcie Slot5), Port 3A(Pcie Slot3), Port 5A(Pcie Slot1)



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Item	Option	Description
<b>PCI-E Port</b>	Auto[Default] No Yes	In auto mode the BIOS will remove the EXP port if there is no device or errors on that device and the device is not HP capable. Enable/Disable is used to enable/disable the port and expose/hide its CFG space.
<b>PCI-E Port Link Disable</b>	No[Default] Yes	This option disables the link so that the no training occurs but the CFG space is still active.
<b>Link Speed</b>	Auto[Default] Gen 1 (2.5 GT/s) Gen 2 (5 GT/s) Gen 3 (8 GT/s) Gen 4 (16 GT/s) Gen 5 (32 GT/s)	Choose Link Speed for this PCIe port.
<b>Override Max Link Width</b>	Auto[Default] x1 x2 x4 x8 x16	Override the max link width that was set by bifurcation.
<b>PCI-E Port DeEmphasis</b>	-6.0 dB[Default] -3.5 dB	De-Emphasis control (LNKCON2[6]) for this PCIe port.
<b>Data Link Feature Exchange</b>	Disable Enable[Default]	Enable/Disable data link feature negotiation in the Data Link Feature Capabilities (DLFCAP) register.
<b>PCI-E Port MPSS</b>	128B 256B 512B Auto[Default]	Configure Max Payload Size Supported in PCIe Device Capabilities register. 'Auto' keeps hardware default.
<b>PCI-E ASPM Support</b>	Disabled[Default] Auto	This option can disable ASPM support in a PCIe root port. 'Auto' keeps hardware default.
<b>PCI-E Detect Wait Time</b>	Disable 500ms Auto[Default]	Set PCIe port TxRx detect polling.
<b>Compliance Mode</b>	No[Default] Yes	Enable/Disable Compiancer Mode for this PCIe port.
<b>MCTP</b>	No Yes[Default]	Enable/Disable MCTP.
<b>Equalization Bypass To Highest Rate</b>	Disable Enable[Default]	Equalization Bypass To Highest Rate Support Enable/Disable.
<b>CXL Drift Buffer</b>	Disable[Default] Enable	Enable/Disable CXL Drift Buffer if there is a common reference clock.

### 4.6.4.3.3 Intel VT for Directed I/O (VT-d)



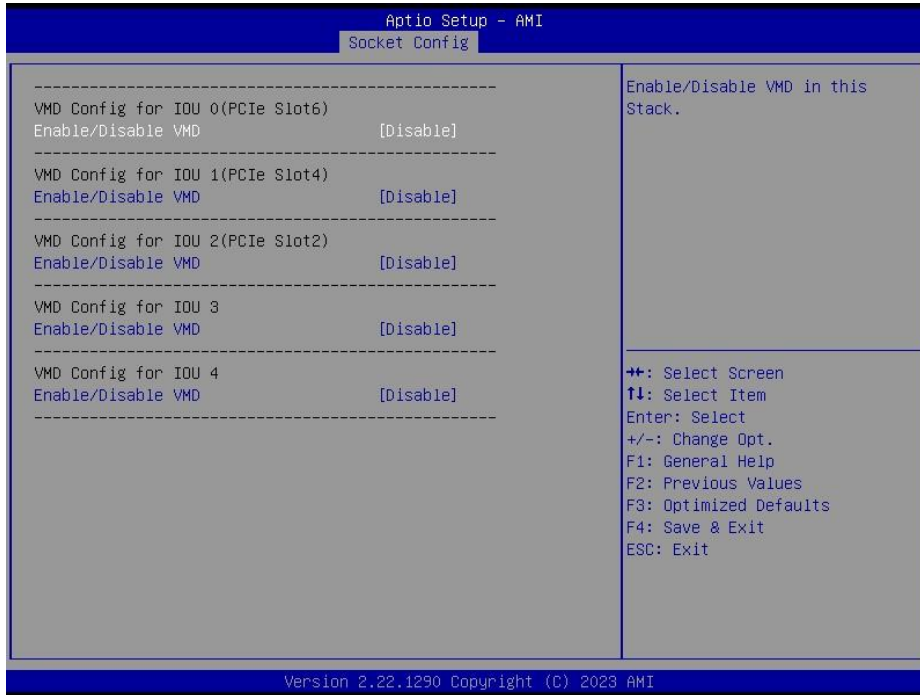
Item	Options	Description
Intel VT for Directed I/O	Enable[Default] Disable	Enable/Disable Intel Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI Tables. To disable VT-d, X2APIC must also be disabled.

### 4.6.4.3.4 Intel VMD technology



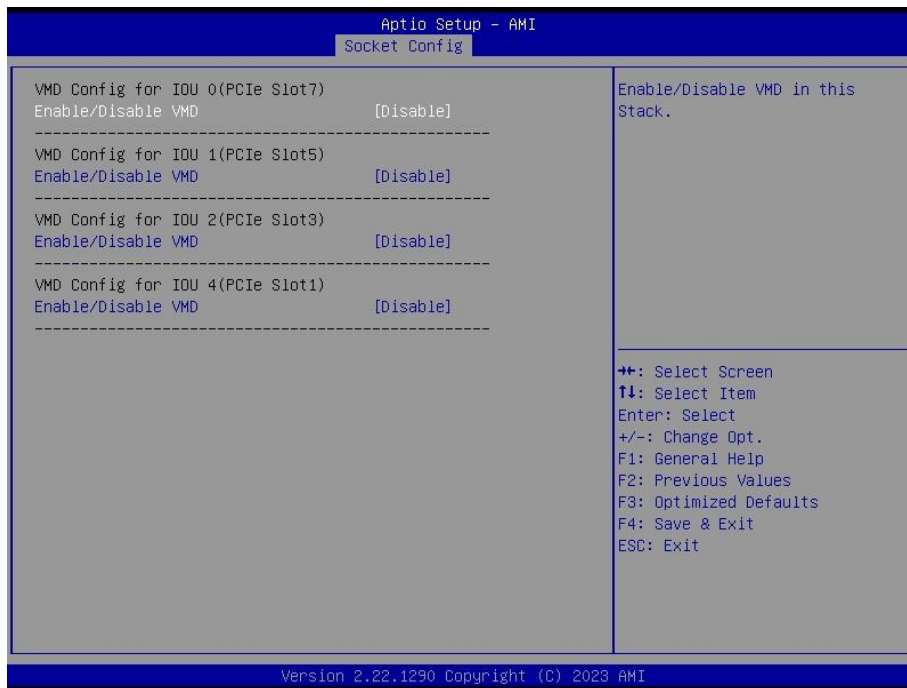
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## 4.6.4.3.4.1 Intel VMD for Volume Management Device on Socket 0



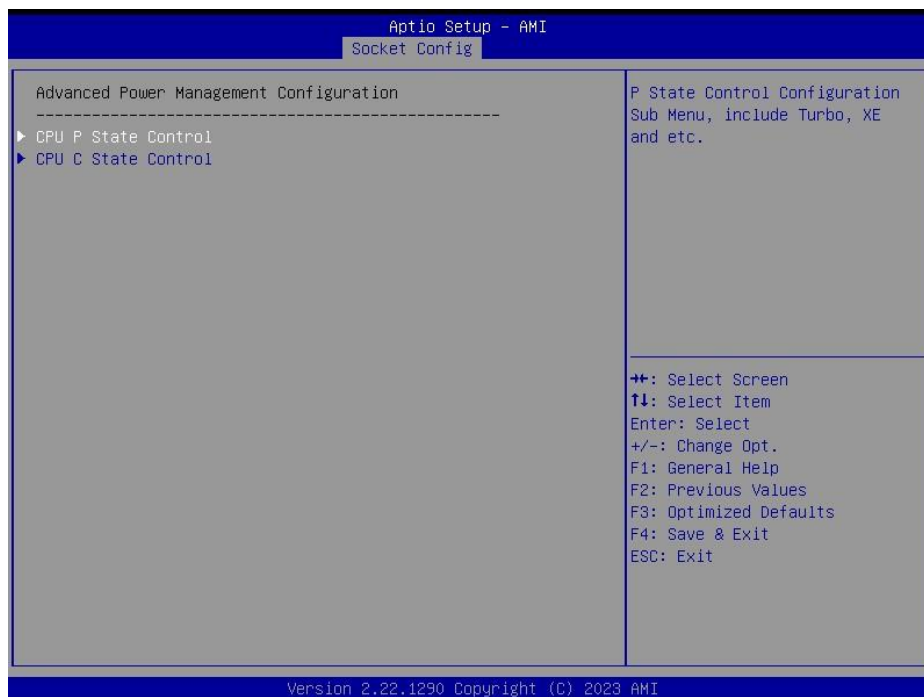
Item	Option	Description
Enable/Disable VMD	Disable[Default] Enable	Enable/Disable VMD in this Stack.

## 4.6.4.3.4.2 Intel VMD for Volume Management Device on Socket 1



Item	Option	Description
Enable/Disable VMD	Disable[Default] Enable	Enable/Disable VMD in this Stack.

### 4.6.4.4 Advanced Power Management Configuration



#### 4.6.4.4.1 CPU P State Control

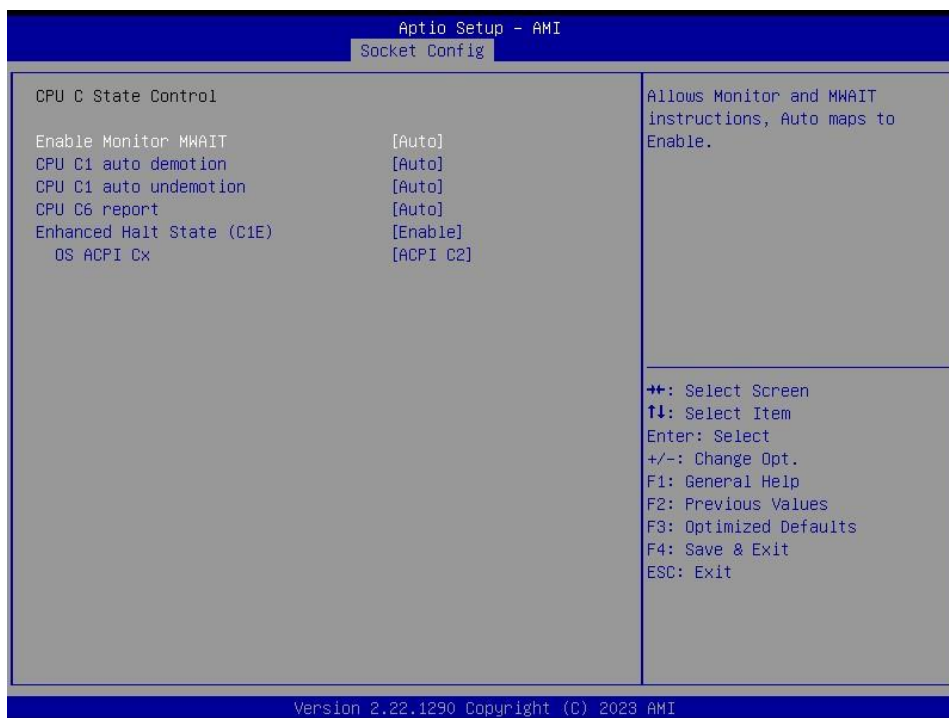


Item	Option	Description
Activate SST-BF	Disable[Default] Enable	This Option allows SST-BF to be enabled. NOTE: HWP Native Mode is a pre-requisite for enabling SST-BF; HWP Native Mode with No Legacy is a pre-requisite for configuring SST-BF.
SpeedStep (Pstates)	Disable	Enable/Disable EIST (P-States).

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	Enable[Default]	
<b>EIST PSD Function</b>	HW_ALL[Default] SW_ALL	Choose HW_ALL/SW_ALL in _PSD return.
<b>Boot performance mode</b>	Max Performance[Default] Max Efficient Set by Intel Node Manager	Select the performance state that the BIOS will set before OS hand off.
<b>Energy Efficient Turbo</b>	Enable[Default] Disable	Energy Efficient Turbo Disable, MSR 0x1FC[19].
<b>Turbo Mode</b>	Disable Enable[Default]	Enable/Disable processor Turbo Mode (requires EMTTM enabled too).
<b>CPU Flex Ratio Override</b>	Disable[Default] Enable	Enable/Disable CPU Flex Ratio Programming.

### 4.6.4.4.2 CPU C State Control



Item	Option	Description
<b>Enable Monitor MWAIT</b>	Disable Enable Auto[Default]	Allows Monitor and MWAIT instructions, Auto maps to Enable.
<b>CPU C1 auto demotion</b>	Disable Enable[Default]	Allows CPU to automatically demote to C1. Takes effect after reboot.
<b>CPU C1 auto undemotion</b>	Disable Enable[Default]	Allows CPU to automatically undemote from C1. Takes effect after reboot.
<b>CPU C6 report</b>	Disable Enable Auto[Default]	Enable/Disable CPU C6(ACPI C3) report to OS, Auto maps to enable.
<b>Enhanced Halt State (C1E)</b>	Disable Enable[Default]	Core C1E auto promotion Control. Takes effect after reboot. Will be enforced to enable when Optimized Power Mode is enabled.
<b>OS ACPI Cx</b>	ACPI C2[Default] ACPI C3	Report CC3/CC6 to OS ACPI C2 or ACPI C3.

### 4.6.5 Server Mgmt

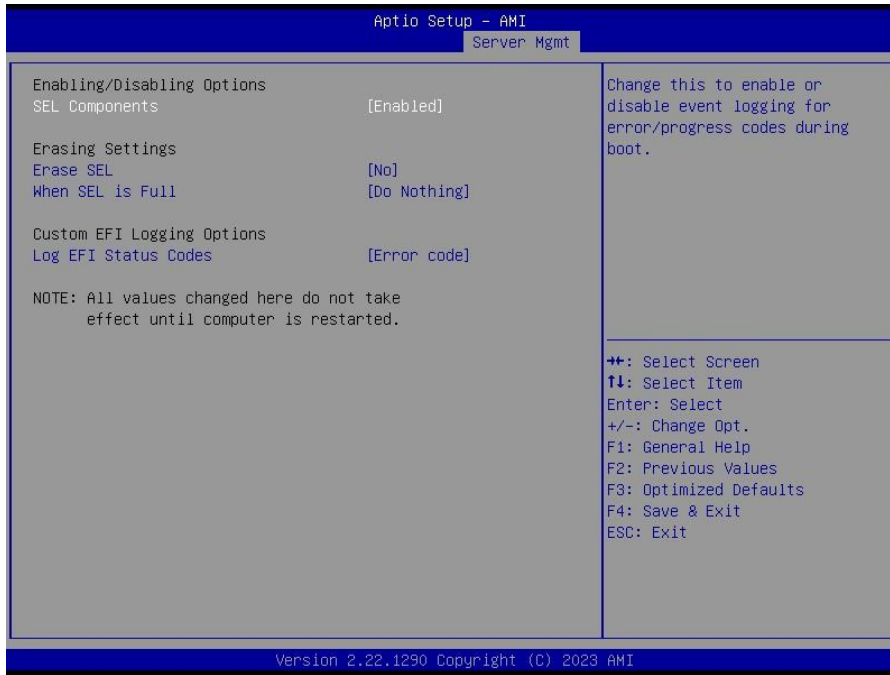


Item	Options	Description
<b>BMC Support</b>	Enabled[Default] Disabled	Enable/Disable interfaces to communicate with BMC.
<b>IPMI Interface Type</b>	Kcs Interface[Default] Ssif Interface Ipmi Interface Usb Interface Oem1 Interface Oem2 Interface	Type of Interface to communicate BMC from HOST.
<b>Wait For BMC</b>	Enabled Disabled[Default]	Wait For BMC response for specified time out. BMC starts at the same time when BIOS starts during AC power ON. It takes around 30 seconds to initialize Host to BMC interfaces.
<b>FRB-2 Timer</b>	Enabled[Default] Disabled	Enable or Disable FRB-2 time (POST timer).
<b>FRB-2 Timer timeout</b>	6	Enter value Between 3 to 6 min for FRB-2 Timer Expiration value.
<b>FRB-2 Timer Policy</b>	Do Nothing[Default] Reset Power Down Power Cycle	Configure how the system should respond if the FRB-2 Timer expires. Not available if FRB-2 Timer is disabled.
<b>OS Watchdog Timer</b>	Enabled Disabled[Default]	If enabled, starts a BIOS timer which can only be shut off by Management Software after the OS loads. Helps determine that the OS successfully loaded or follows the OS Boot Watchdog Timer policy.

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<b>Power Control Policy</b>	Do Not PowerUp Last Power State Power Restore Unspecified <b>[Default]</b>	Configure how the system should respond if AC Power is lost, Reset not required as selected Power policy will be set in BMC when policy is saved.
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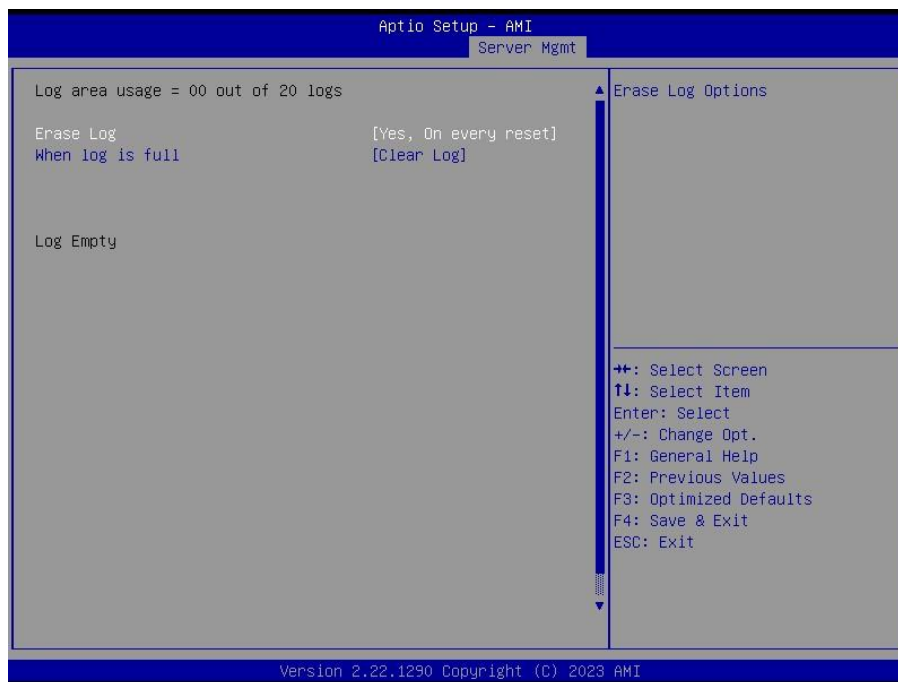
### 4.6.5.1 System Event Log



Item	Option	Description
<b>SEL Components</b>	Enabled <b>[Default]</b> Disabled	Change this to enable or disable event logging for error/progress codes during boot.
<b>Erase SEL</b>	<b>No[Default]</b> Yes, On next reset Yes, On every reset	Choose options for erasing SEL.
<b>When SEL is Full</b>	Do Nothing <b>[Default]</b> Erase Immediately Delete Oldest Record	Choose options for reactions to a full SEL.
<b>Log EFI Status Codes</b>	Disabled Both Error code <b>[Default]</b> Progress code	Disable the logging of EFI Status Codes or log only error code or only progress code or both.



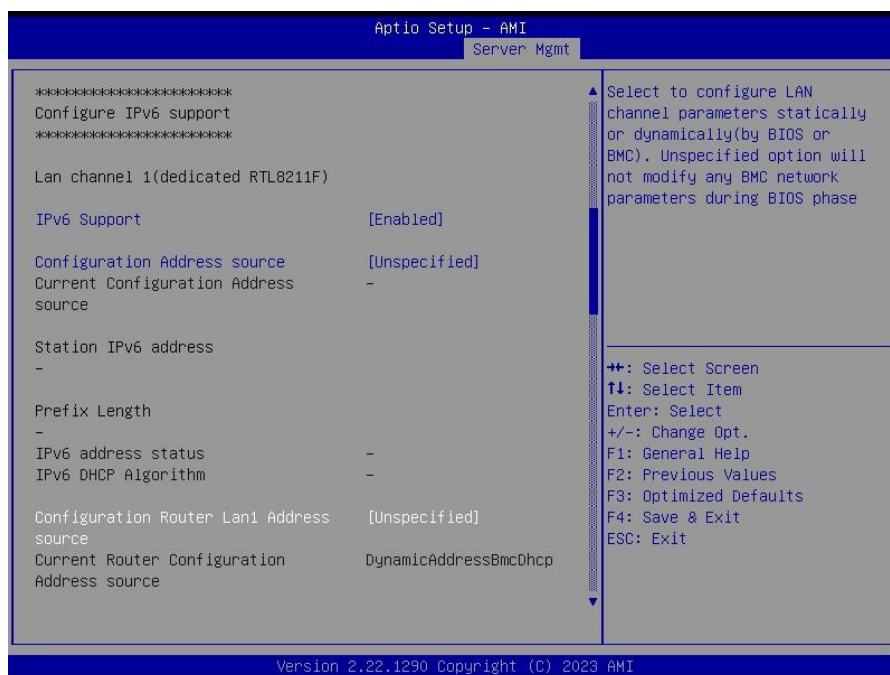
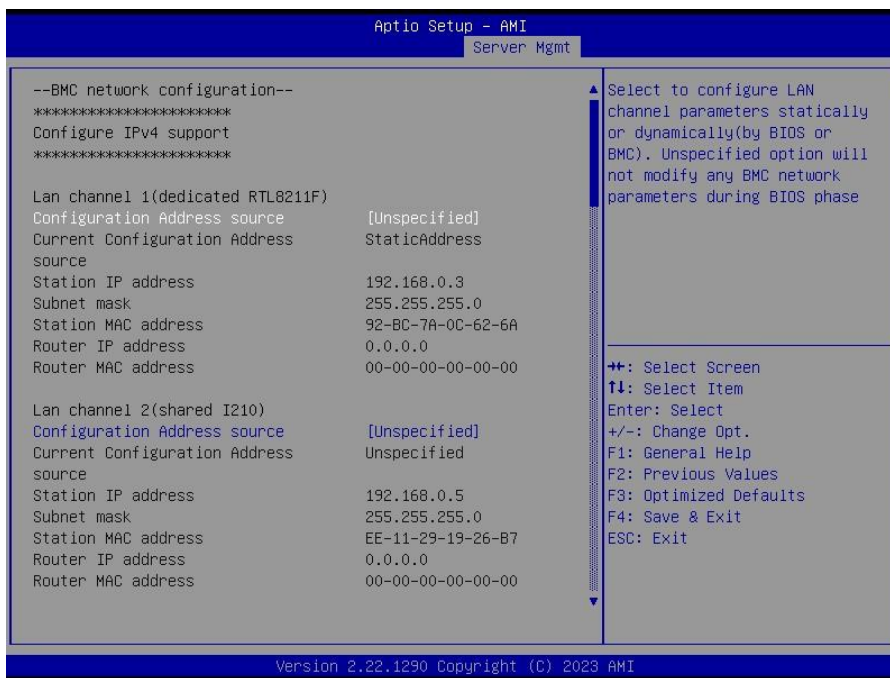
### 4.6.5.2 Bmc self test log

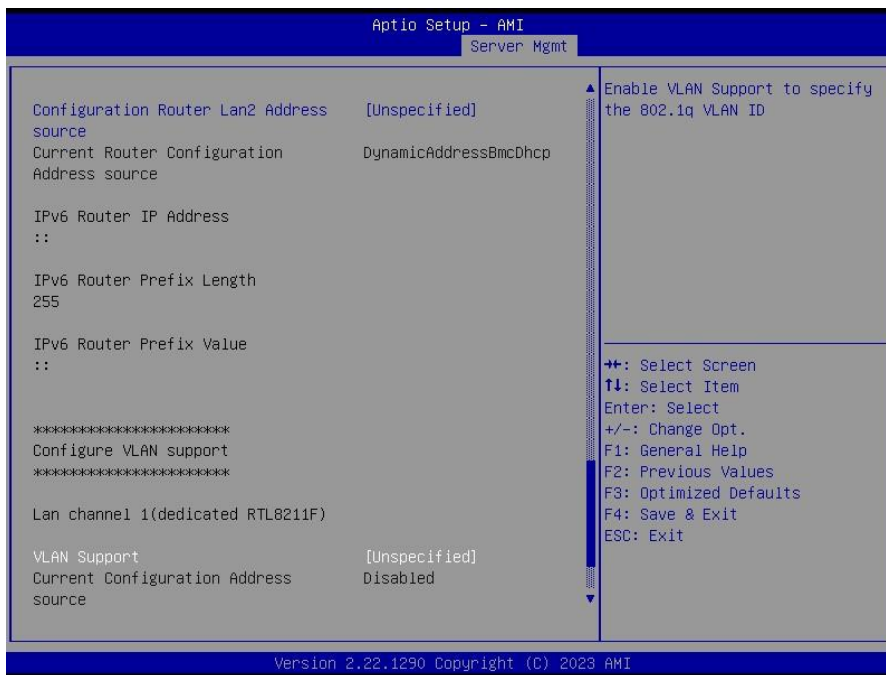
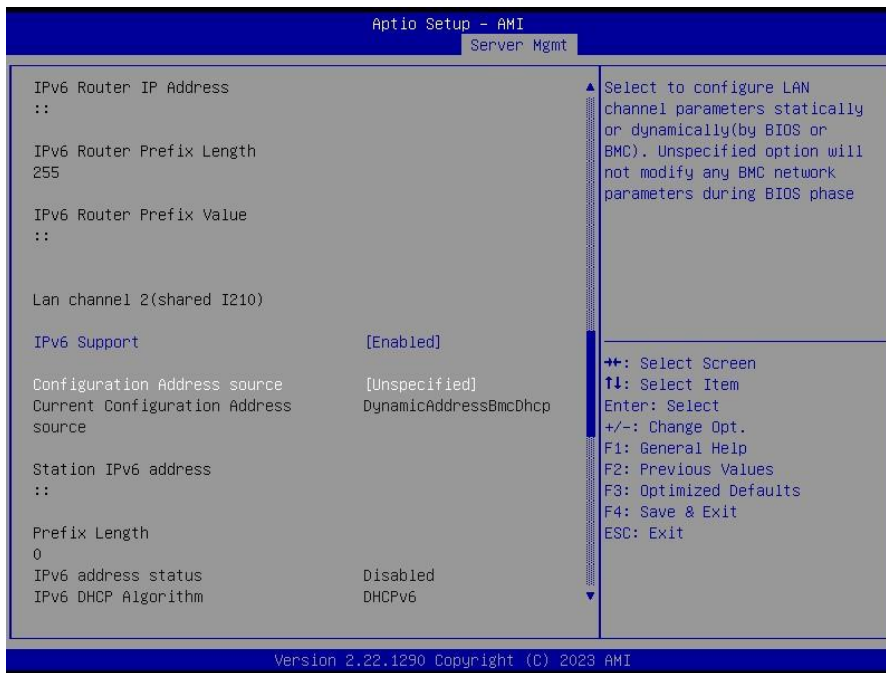


Item	Option	Description
<b>Erase Log</b>	Yes, On every reset[ <b>Default</b> ] No	Erase Log Options.
<b>When log is full</b>	Clear Log[ <b>Default</b> ] Do not log any more	Select the action to be taken when log is full.

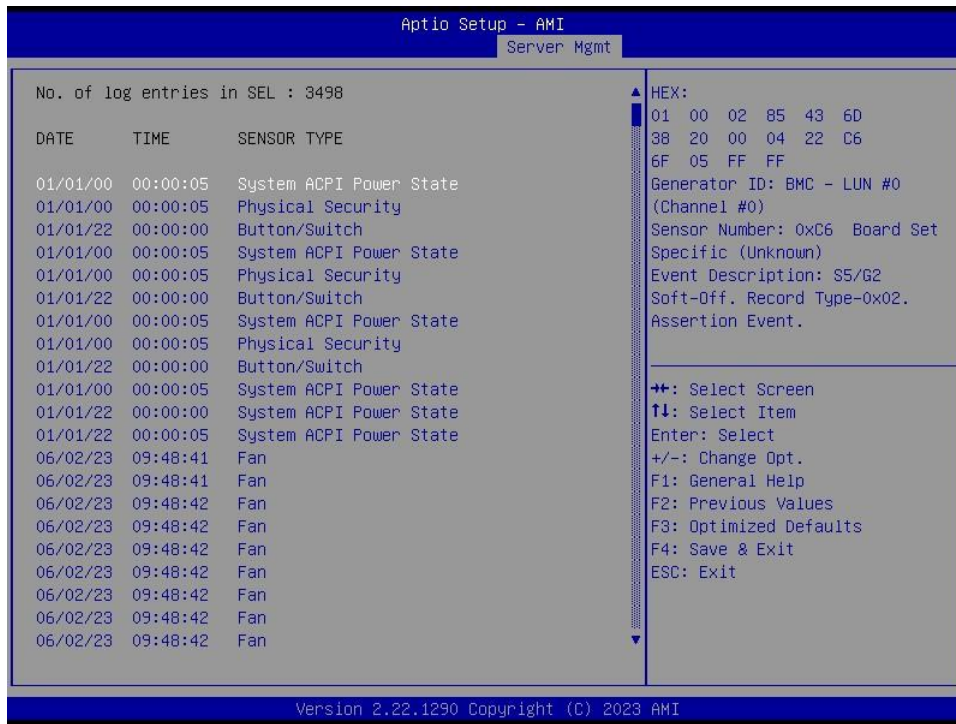
# HPM-ERSDE User's Manual

## 4.6.5.3 BMC network configuration



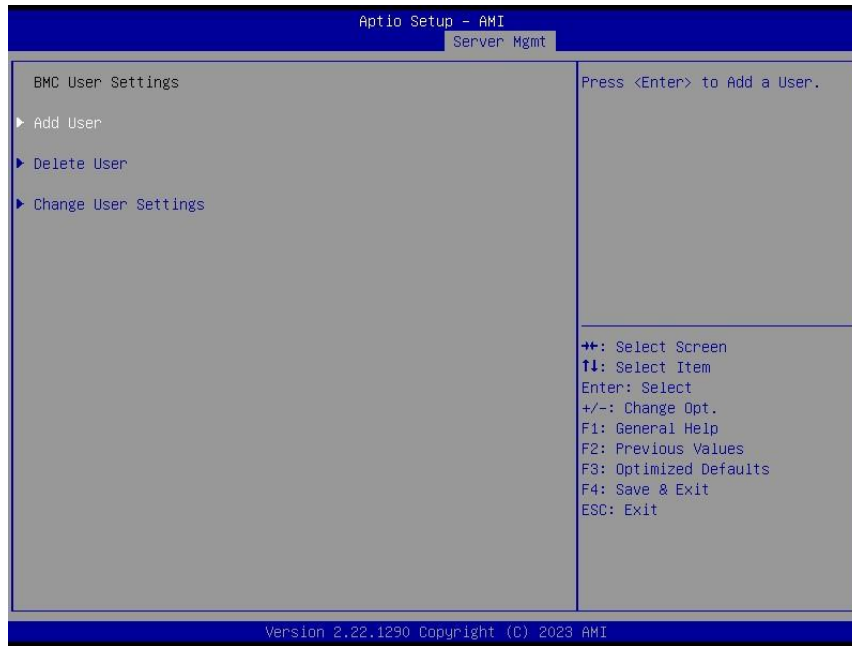


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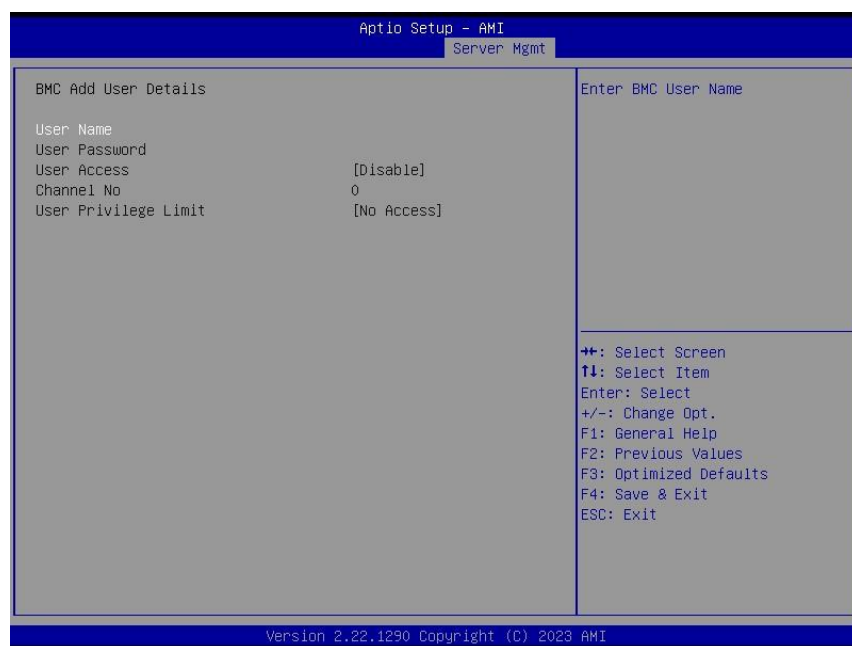


Item	Option	Description
<b>Configuration Address source</b>	Unspecified[Default] Static DynamicBmcDhcp DynamicBmcNonDhcp	Select configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.
<b>IPv6 Support</b>	Enabled[Default] Disabled DynamicBmcDhcp	Enable or Disable LAN1 IPv6 Support.
<b>Configuration Address source</b>	Unspecified[Default] Static DynamicBmcDhcp	Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.
<b>Configuration Router Lan1/2 Address source</b>	Unspecified[Default] Static DynamicBmcDhcp	Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.
<b>VLAN Support</b>	Enabled Disabled Unspecified[Default]	Enable VLAN Support to specify the 802. 1q VLAN ID.

### 4.6.5.4 BMC User Settings



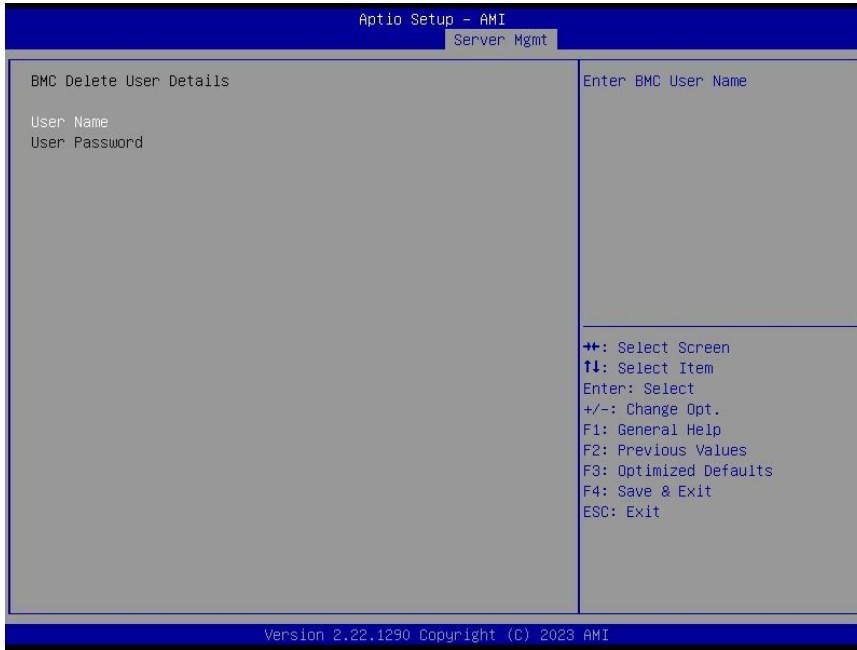
#### 4.6.5.4.1 BMC Add User Details



Item	Description
User Name	Enter BMC User Name.

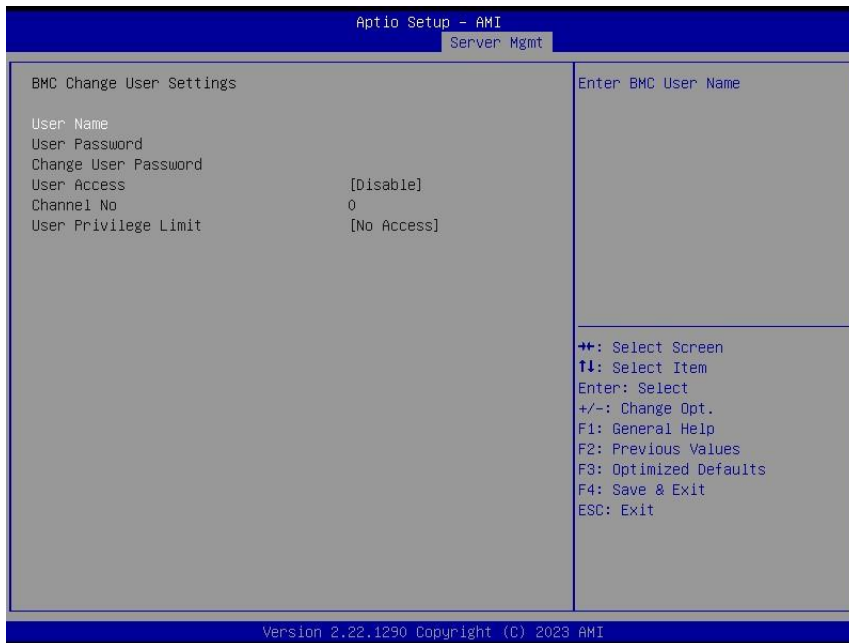
# HPM-ERSDE User's Manual

## 4.6.5.4.2 BMC Delete User Details



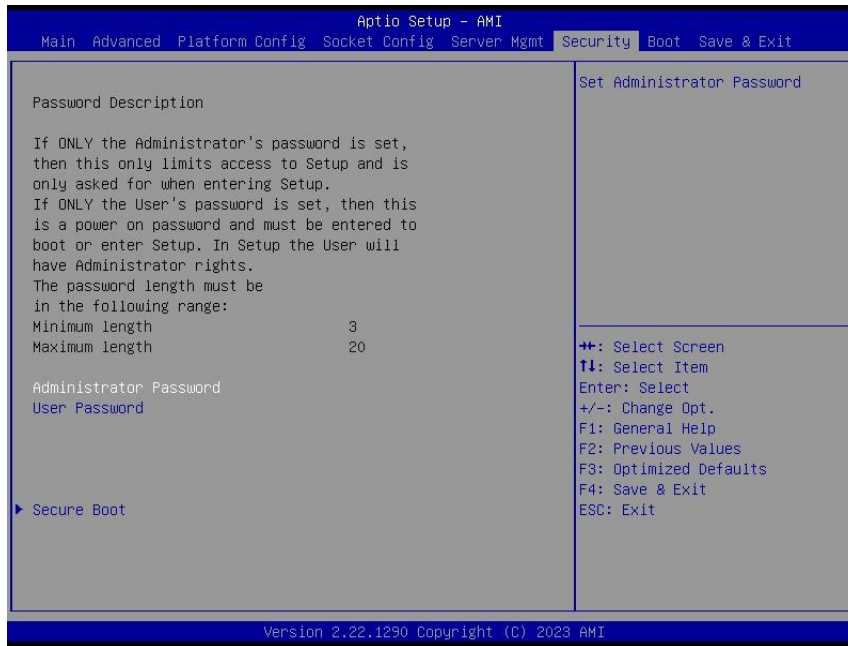
Item	Description
User Name	Enter BMC User Name.

## 4.6.5.4.3 BMC Change User Settings



Item	Description
User Name	Enter BMC User Name.

## 4.6.6 Security



- **Administrator Password**

Set setup Administrator Password

- **User Password**

Set User Password

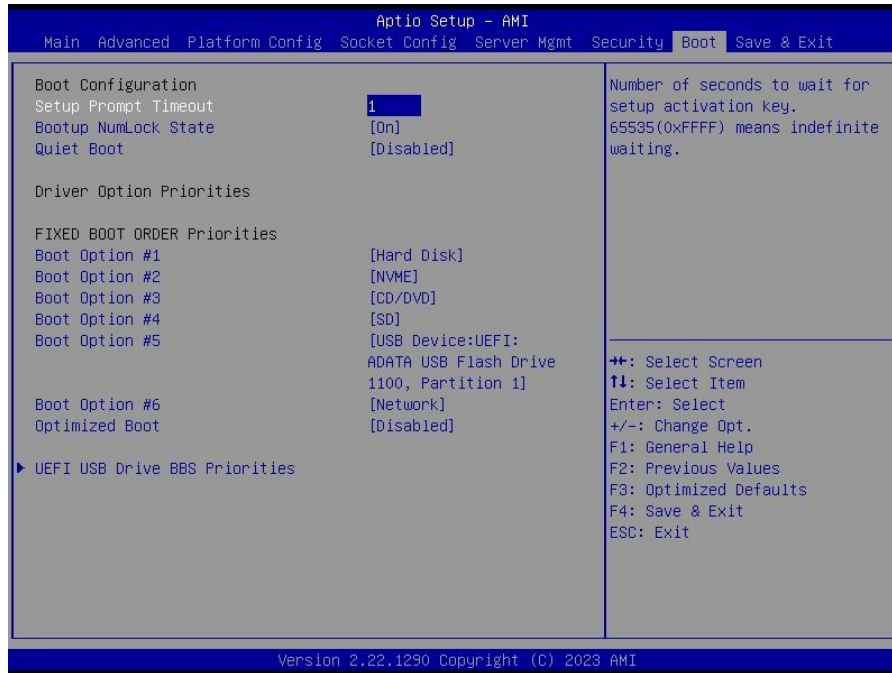
### 4.6.6.1 Secure Boot



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Item	Option	Description
Secure Boot	Disabled Enabled[Default]	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 platform reset.
Secure Boot Mode	Standard[Default] Custom	Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

### 4.6.7 Boot

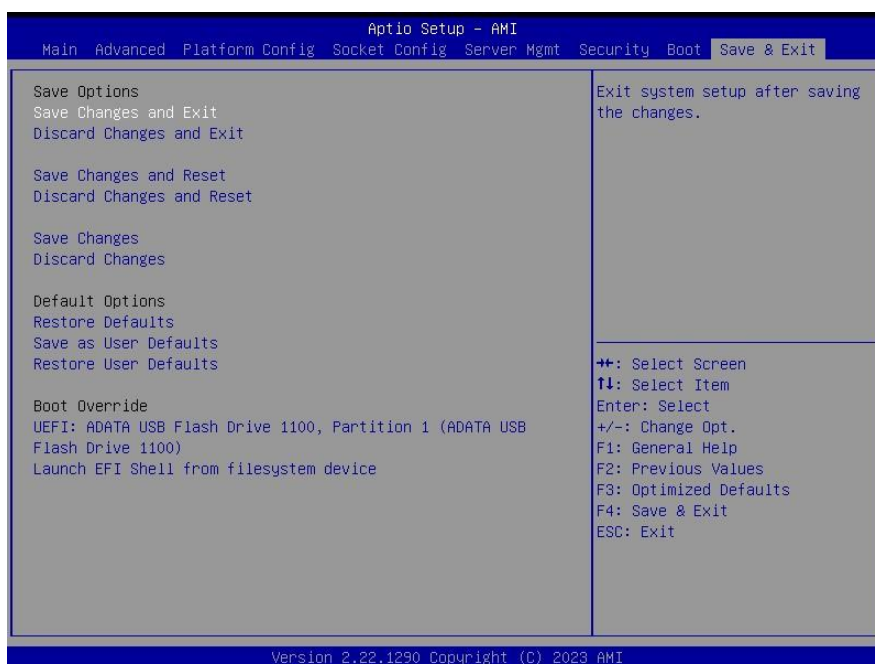


Item	Option	Description
Setup Prompt Timeout	1~ 65535	Set the default timeout before system boot. A value of 65535 will disable the timeout completely.
Bootup NumLock State	On[Default] Off	Select the keyboard NumLock state
Quiet Boot	Disabled[Default] Enabled	Enables or disables Quiet Boot option
Boot Option #1	Hard Disk[Default] NVME CD/DVD SD USB Device Network	Set the system boot order.
Boot Option #2	Hard Disk NVME[Default] CD/DVD SD USB Device Network	Set the system boot order.



<b>Boot Option #3</b>	Hard Disk NVME CD/DVD[Default] SD USB Device Network	Set the system boot order.
<b>Boot Option #4</b>	Hard Disk NVME CD/DVD SD[Default] USB Device Network	Set the system boot order.
<b>Boot Option #5</b>	Hard Disk NVME CD/DVD SD USB Device[Default] Network	Set the system boot order.
<b>Boot Option #6</b>	Hard Disk NVME CD/DVD SD USB Device Network[Default]	Set the system boot order.
<b>Optimized Boot</b>	Disabled[Default] Enabled	Enables or disables Optimized Boot. Enabling Optimized Boot will disable Csm support and disable connecting Network devices to decrease boot time. While disabling Optimized Boot, make sure to restore Csm Support option to previous value before enabling Optimized Boot.

#### 4.6.8 Save and exit



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### **4.6.8.1 Save Changes and Exit**

Use the save changes and reset option to save the changes made to the BIOS options and to exit the BIOS configuration setup program.

### **4.6.8.2 Discard Changes and Exit**

Use the Discard changes and Exit option to exit the system without saving the changes made to the BIOS configuration setup program.

### **4.6.8.3 Save Changes and Reset**

Reset the system after saving the changes.

### **4.6.8.4 Discard Changes and Reset**

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

### **4.6.8.5 Save Changes**

Changes made to BIOS settings during this session are committed to NVRAM. The setup program remains active, allowing further changes.

### **4.6.8.6 Discard Changes**

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The BIOS setup continues to be active.

### **4.6.8.7 Restore Defaults**

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

### **4.6.8.8 Save as User Defaults**

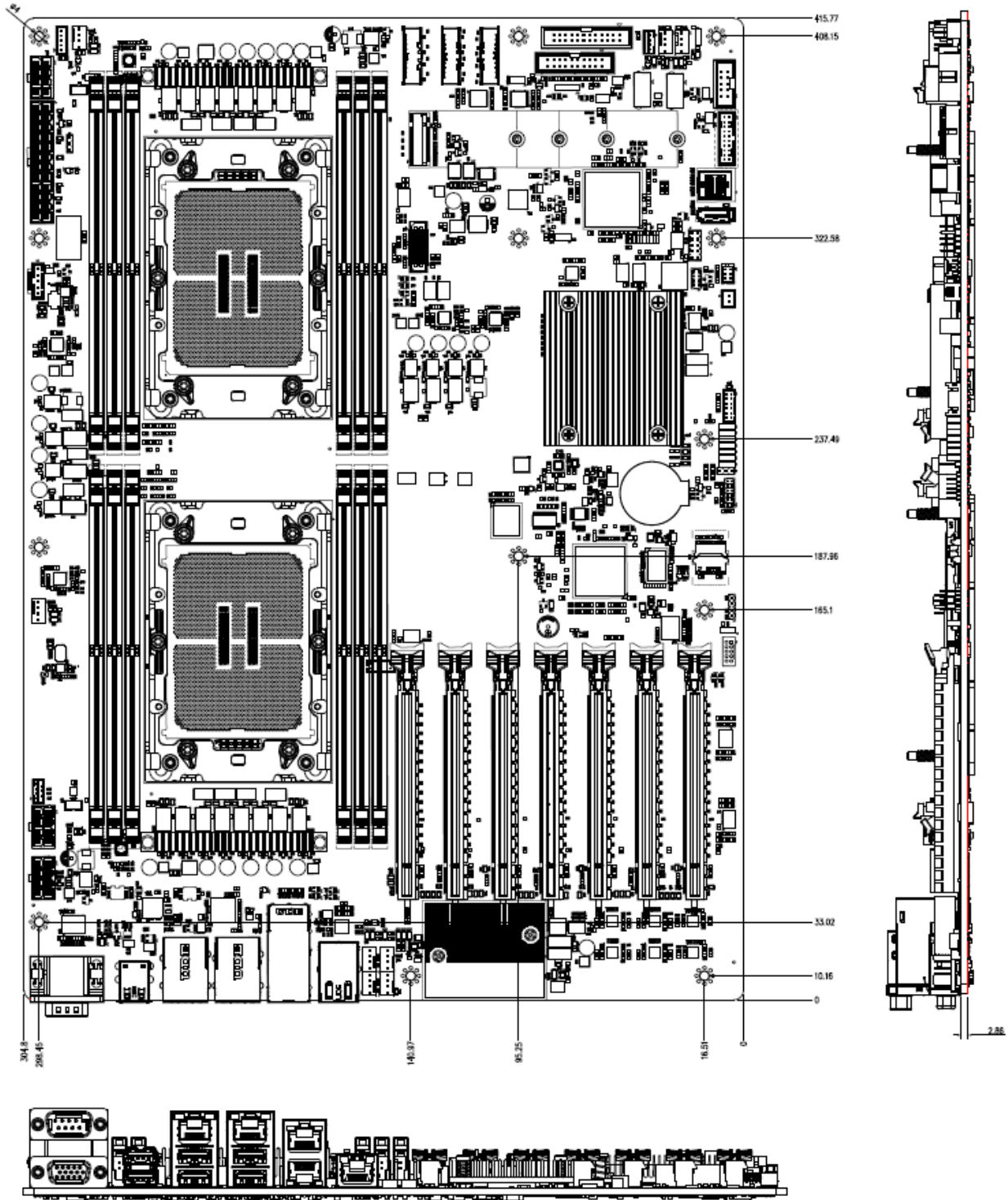
This option saves a copy of the current BIOS settings as the User Defaults. This option is useful for preserving custom BIOS setup configurations.

### **4.6.8.9 Restore User Defaults**

This option restores all BIOS settings to the user defaults. This option is useful for restoring previously preserved custom BIOS setup configurations.

# 5. Mechanical Drawing

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Unit: mm

# 6. Maintenance & Troubleshooting

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## System Maintenance Introduction

If the components of the product fail they must be replaced.

Please contact the system reseller or vendor to purchase the replacement parts. Please follow the safety precautions outlined in the sections that follow

### General Safety Precautions

Please ensure the following safety precautions are adhered to at all times.

1. Follow the electrostatic precautions outlined below whenever the device is opened.
2. Make sure the power is turned off and the power cord is disconnected whenever the product is being installed, moved or modified.
3. To prevent the risk of electric shock, make sure power cord is unplugged from wall socket. To fully disengage the power to the unit, please disconnect the power cord from the AC outlet. Refer servicing to qualified service personnel. The AC outlet shall be readily available and accessible.
4. Do not apply voltage levels that exceed the specified voltage range. Doing so may cause fire and/or an electrical shock. Use a power cord that matches the voltage of the power outlet, which has been approved and complies with the safety standard of your particular country.
5. Electric shocks can occur if the product chassis is opened when it is running. To avoid risk of electric shock, this device must only be connected to a supply mains with protective earth.
6. Do not drop or insert any objects into the ventilation openings of the product.
7. If considerable amounts of dust, water, or fluids enter the device, turn off the power supply immediately, unplug the power cord, and contact your dealer or the nearest service center.
8. This equipment is not suitable for use in locations where children are likely to be present.
9. DO NOT:
  - Drop the device.
  - In a site where the ambient temperature exceeds the rated temperature.

## Anti-Static Precautions

**WARNING:**

Failure to take ESD precautions during the installation of the product may result in permanent damage to the product and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the product. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the product is opened and any of the electrical components are handled, the following anti-static precautions are strictly adhered to.

- Wear an anti-static wristband: Wearing a simple anti-static wristband can help to prevent ESD from damaging any electrical component.
- Self-grounding: Before handling any electrical component, touch any grounded conducting material. During the time the electrical component is handled, frequently touch any conducting materials that are connected to the ground.
- Use an anti-static pad: When configuring or working with an electrical component, place it on an anti-static pad. This reduces the possibility of ESD damage.
- Only handle the edges of the electrical component. When handling the electrical component, hold the electrical component by its edges. Please ensure the following safety precautions are adhered to at all times.

### Maintenance and Cleaning

When maintaining or cleaning the product, please follow the guidelines below.

#### **WARNING:**

- For safety reasons, turn-off the power and unplug the PC before cleaning.
- If you dropped any material or liquid such as water onto the PC when cleaning, unplug the power cable immediately and contact your dealer or the nearest service center. Always make sure your hands are dry when unplugging the power cable.

#### Maintenance and Cleaning

Prior to cleaning any part or component of the product, please read the details below.

- Never spray or squirt liquids directly onto any other components.
- The interior of the device does not require cleaning. Keep fluids away from the device interior.
- Be cautious of all small removable components when vacuuming the device.
- Never drop any objects or liquids through the openings of the device.
- Be cautious of any possible allergic reactions to solvents or chemicals used when cleaning the device.
- Avoid eating, drinking and smoking within vicinity of the device.



## Basic Troubleshooting

### PEI Beep Codes

# of Beeps	Description
1	Memory not Installed
2	Recovery started
3	Typically for development use. The beep code is generated when DXE IPL PPI or DXE Core is not found.
4	Recovery failed
4	S3 Resume failed
7	Typically for development use. The beep code is generated when platform cannot be reset because reset PPI is not available.

### DXE Beep Codes

# of Beeps	Description
1	Invalid password
4	Typically for development use. The beep code is generated when some of the Architectural Protocols are not available.
5	No Console Input or Output Devices are found
5	No Console Input Devices are found
6	Flash update is failed
7	Typically for development use. The beep code is generated when platform cannot be reset because reset protocol is not available.
8	Platform PCI resource requirements cannot be met

