



Network Appliance Platform

Hardware Platforms for Network Computing

NCA-1600 User Manual

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About this Document

This manual describes the overview of the various functionalities of this product, and the information you need to get it ready for operation. It is intended for those who are:

- responsible for installing, administering and troubleshooting this system or Information Technology professionals.
- assumed to be qualified in the servicing of computer equipment, such as professional system integrators, or service personnel and technicians.

The latest version of this document can be found on Lanner's official website, available either through the product page or through the [Lanner Download Center](#) page with a login account and password.

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

Icon	Usage
 Note or Information	This mark indicates that there is something you should pay special attention to while using the product.
 Warning or Important	This mark indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

To obtain additional documentation resources and software updates for your system, please visit the [Lanner Download Center](#). As certain categories of documents are only available to users who are logged in, please be registered for a Lanner Account at <http://www.lannerinc.com/> to access published documents and downloadable resources.

Technical Support

In addition to contacting your distributor or sales representative, if there are any technical queries, you could submit a support ticket to our [Lanner Technical Support](#) department.

Documentation Feedback

Your feedback is valuable to us, as it will help us continue to provide you with more accurate and relevant documentation. To provide any feedback, comments or to report an error, please email to contact@lannerinc.com. Thank you for your time.

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Federal Communication Commission Interference Statement

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

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

FCC Caution

- ▶ Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
- ▶ This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.



Note

1. An unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
2. Use only shielded cables to connect I/O devices to this equipment.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



Important

1. Operations in the 5.15-5.25GHz band are restricted to indoor usage only.
2. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.



Important

IEC 61000-4-5: As stated above, surge testing is not required for the console if it is used under the following conditions,

- (1) Short cables only (<3m, temporary connection)
- (2) Indoor use only with no outdoor cable exposure
- (3) Manufacturer specifies console is for service/maintenance only

Safety Guidelines

Follow these guidelines to ensure general safety:

- ▶ Keep the chassis area clear and dust-free during and after installation.
- ▶ Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- ▶ Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- ▶ Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- ▶ Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- ▶ Do not work alone if potentially hazardous conditions exist.
- ▶ Never assume that power is disconnected from a circuit; always check the circuit.

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- ▶ Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- ▶ Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- ▶ Portez des lunettes de sécurité pour protéger vos yeux.
- ▶ N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
- ▶ Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- ▶ Ne travaillez pas seul si des conditions dangereuses sont présentes.
- ▶ Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

Lithium Battery Caution

- ▶ There is risk of explosion if the battery is replaced by an incorrect type.
- ▶ Dispose of used batteries according to the instructions.
- ▶ Installation should be conducted only by a trained electrician or only by an electrically trained person who knows all installation procedures and device specifications which are to be applied.
- ▶ Do not carry the handle of power supplies when moving to another place.
- ▶ Please conform to your local laws and regulations regarding safe disposal of lithium battery.
- ▶ Disposal of a battery into fire or a hot oven, or mechanically crushing or cutting of a battery can result in an explosion.
- ▶ Leaving a battery in an extremely high temperature environment can result in an explosion or the leakage of flammable liquid or gas.
- ▶ A battery subjected to extremely low air pressure may result in an explosion or the leakage of flammable liquid or gas.

Avertissement concernant la pile au lithium

- ▶ Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- ▶ Jetez les piles usagées conformément aux instructions.
- ▶ L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- ▶ Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.

Operating Safety

- ▶ Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.
- ▶ Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.
- ▶ Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.
- ▶ Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.
- ▶ Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

Sécurité de fonctionnement

- ▶ L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- ▶ Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- ▶ Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.
- ▶ Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.
- ▶ Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

Mounting Installation Precautions

The following should be put into consideration for rack-mount or similar mounting installations:

- ▶ Do not install and/or operate this unit in any place that flammable objects are stored or used in.
- ▶ The installation of this product must be performed by trained specialists; otherwise, a non-specialist might create the risk of the system's falling to the ground or other damages.
- ▶ Lanner Electronics Inc. shall not be held liable for any losses resulting from insufficient strength for supporting the system or use of inappropriate installation components.
- ▶ Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.
- ▶ Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of airflow required for safe operation of the equipment is not compromised.
- ▶ Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- ▶ Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.
- ▶ Reliable Grounding - Reliable grounding of rack mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Installation & Operation

- ▶ This equipment must be grounded. The power cord for product should be connected to a socket-outlet with earthing connection.
Cet équipement doit être mis à la terre. La fiche d'alimentation doit être connectée à une prise de terre correctement câblée
- ▶ Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.
- ▶ The machine can only be used in a restricted access location and must be installed by a skilled person.
Les matériels sont destinés à être installés dans des EMPLACEMENTS À ACCÈS RESTREINT.
- ▶ Some USB devices may not be compatible with the system. If you encounter an error, please remove the USB device and restart the system.

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.
- ▶ Product shall be used with Class 1 laser device modules.

Avertissement

- ▶ Équipement de classe I. Ce matériel doit être relié à la terre. La fiche d'alimentation doit être raccordée à une prise de terre correctement câblée. Une prise de courant mal câblée pourrait induire des tensions dangereuses sur des parties métalliques accessibles.
- ▶ Le produit doit être utilisé avec des modules de dispositifs laser de classe 1.



CAUTION: TO DISCONNECT POWER, REMOVE ALL POWER CORDS FROM UNIT.

注意：要断开电源，请将所有电源线从本机上拔下。

WARNUNG: Wenn Sie das Gerät zwecks Wartungsarbeiten vom Netz trennen müssen, müssen Sie beide Netzteile abnehmen.

ATTENTION: DÉBRANCHER LES TOUT CORDONS D'ALIMENTATION POUR DÉCONNECTER L'UNITÉ DU SECTEUR.

Electrical Safety Instructions

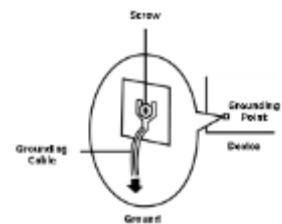
Before turning on the device, ground the grounding cable of the equipment. Proper grounding (grounding) is very important to protect the equipment against the harmful effects of external noise and to reduce the risk of electrocution in the event of a lightning strike. To uninstall the equipment, disconnect the ground wire after turning off the power. A ground wire (green-and-yellow) is required and the part connecting the conductor must be greater than 4 mm² or 10 AWG.

Consignes de sécurité électrique

- ▶ Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- ▶ Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- ▶ Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- ▶ Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm² ou 10 AWG.

Grounding Procedure for DC Power Source

- ▶ Connect the grounding cable to the ground.
- ▶ The protection device for the DC power source must provide 30 A current.
- ▶ This protection device must be connected to the power source before DC power.



Procédure de mise à la terre pour source d'alimentation CC

- ▶ Branchez le câble de mise à la terre à la terre.
- ▶ L'appareil de protection pour la source d'alimentation CC doit fournir 30 A de courant.
- ▶ Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation CC.

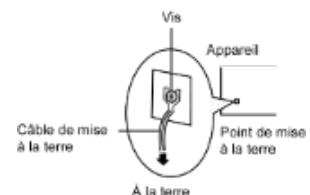


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CHAPTER 1: PRODUCT OVERVIEW

The NCA-1600, a desktop network appliance built with Intel® Core i7/i5/i3 (Raptor Lake) CPU, features up to 14 cores of computing prowess and optional support for Platform Firmware Resilience (PFR) via an optional E-SCM module.

Package Content

Your package contains the following items:

- ▶ 1x NCA-1600 Network Security Platform
- ▶ 1x Power Adaptor, 1x Power Cable, 1x Console Cable

Ordering Information

SKU No.	Main Features
NCA-1600A	Intel® i7-13800HRE 14C CPU, 2x DDR5 SODIMM, 4x GbE RJ45, 1x 2.5G RJ45, 2x 10G SFP+, 1x Micro-USB Console Port, 1x USB 3.2 Port, 2x Mini-DP, 1 M.2 M-Key for Storage, 1x M.2 B-Key for 5G/LTE, 1x M.2 E-Key for Wi-Fi Module, 1x Nano SIM card slot, 4x Smart Fans, 150W Power Adapter
NCA-1600B	Intel® i5-13600HRE 12C CPU, 2x DDR5 SODIMM, 4x GbE RJ45, 1x 2.5G RJ45, 2x 10G SFP+, 1x Micro-USB Console Port, 1x USB 3.2 Port, 2x Mini-DP, 1 M.2 M-Key for Storage, 1x M.2 B-Key for 5G/LTE, 1x M.2 E-Key for Wi-Fi Module, 1x Nano SIM card slot, 4x Smart Fans, 150W Power Adapter
NCA-1600C	Intel® i3-1320PRE 8C CPU, 2x DDR5 SODIMM, 4x GbE RJ45, 1x 2.5G RJ45, 2x 10G SFP+, 1x Micro-USB Console Port, 1x USB 3.2 Port, 2x Mini-DP, 1 M.2 M-Key for Storage, 1x M.2 B-Key for 5G/LTE, 1x M.2 E-Key for Wi-Fi Module, 1x Nano SIM card slot, 4x Smart Fans, 96W Power Adapter
NCA-1600D	Intel® i3-1315URE 6C CPU, 2x DDR5 SODIMM, 4x GbE RJ45, 1x 2.5G RJ45, 2x 10G SFP+, 1x Micro-USB Console Port, 1x USB 3.2 Port, 2x Mini-DP, 1 M.2 M-Key for Storage, 1x M.2 B-Key for 5G/LTE, 1x M.2 E-Key for Wi-Fi Module, 1x Nano SIM card slot, 4x Smart Fans, 96W Power Adapter

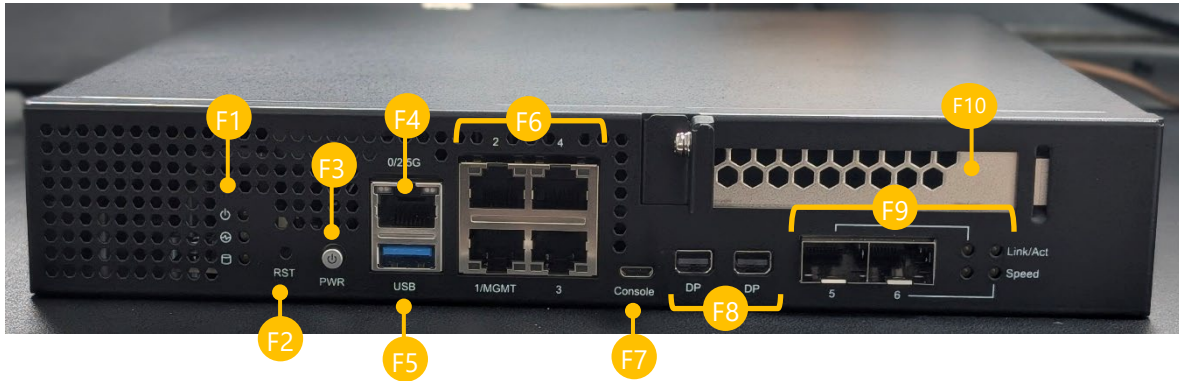
Optional Accessories

Model	Model No.	Description
Wi-Fi Antenna Kit NCA-1600	AX210	Wi-Fi 6E/BT Module with Antenna Kit
LTE Antenna Kit NCA-1600	EM7565	Sierra EM7565 LTE Module with Antenna Kit
5G Antenna Kit NCA-1600	FN990A40	Telit FN990A40 5G Module with Antenna Kit
Rackmount Kit	PSFB621-001	Rackmount Kit (Ear bracket with adapter holder)
Wallmount Kit	PSFB357-001	Wallmount Kit

System Specifications

Form Factor		Desktop
Platform	Processor	SKU A: Intel® i7-13800HRE, 45W, 14C (6P+8E) SKU B: Intel® i5-13600HRE, 45W, 12C (4P+8E) SKU C: Intel® i3-1320PRE, 28W, 8C (4P+4E) SKU D: Intel® i3-1315URE, 15W, 6C (2P+4E)
	CPU Socket	Onboard
	Chipset	SoC
	BIOS	AMI SPI Flash BIOS
System Memory	Technology	DDR5 4800MHz Non-ECC SODIMM
	Capacity	16GB/32GB/64GB
	Socket	2x 262-Pin SODIMM
Networking	Ethernet Ports	4x 1GbE RJ45; 1x 2.5G RJ45; 2x 10G SFP+
	Bypass	N/A
I/O Interface	Reset Button	1x Reset Button (Hardware Reset)
	Power Button	1x ON/OFF Power Button
	LED Indicators	Power/Status/Storage LED Indicators
	Console Port	1x Micro-USB Console Port (Default Bard Rate: 115200)
	USB Port	1x USB 3.2 Port
	Display Port	2x Mini-Display Ports
	Power Input	1x 2x3 12V Power Connector
	Antenna Holes	6x Antenna Holes
Storage	Onboard Slots	1x M.2 2280 M-Key for Storage
Expansion	PCIe	1x HHHH PCIe*16 Slot (SKU A/B Only)
	M.2	1x M.2 2230 E-Key for Wi-Fi; 1x M.2 3042//3052 B-Key for 5G/LTE
	SIM Card Slot	1x Nano-SIM for 5G/LTE
Miscellaneous	Watchdog	Yes
	Internal RTC w/ Li Battery	Yes
	TPM	Yes, Onboard
	PFR	Yes (Optional)
Cooling	Processor	Passive CPU Sink
	System	4x Smart Fans
Environmental Parameters	Temperature	Operating: 0°C~40°C Non-Operating: -40°C~70°C
	Humidity (RH)	Operating: 5%~90% Non-Operating: 5%~95%
System Dimensions	Dimensions (WxDxH)	250 x 250 x 44mm
	Weight	2.1 kg
Package Dimensions	Dimensions (WxDxH)	N/A
	Weight	N/A
Power	Type/Watts	SKU A/B: 150W Power Adapter; SKU C/D: 96W Power Adapter
	Input	AC 100~240V @50~60Hz
OS Support		Linux
Approvals and Compliance		RoHS, CE/FCC Class B (without PoE), UL, UKCA

Front Panel



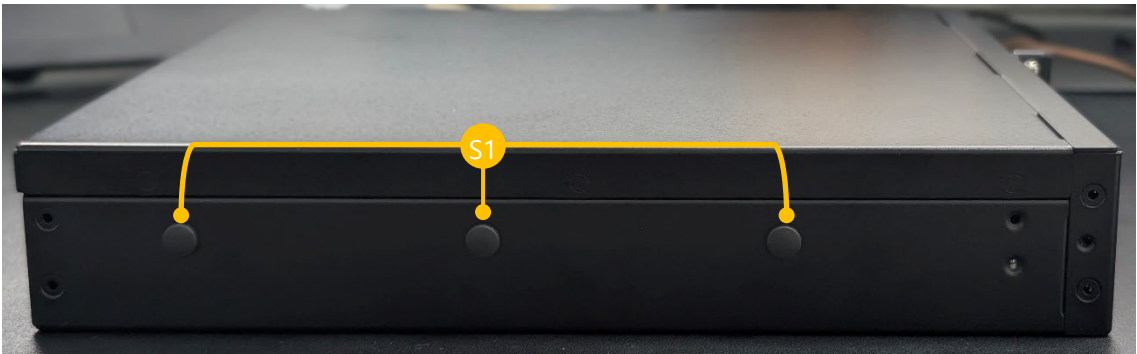
No.	Description	
F1	LED Indicators	Power/Status/Storage LED Indicators
F2	Reset Button	1x Reset Button
F3	Power Switch	1x Power ON/OFF Switch
F4	LAN Port	1x 2.5GbE RJ45 Ethernet Ports
F5	USB Port	1x USB 3.2 Port
F6	LAN Port	4x 1GbE RJ45 Ethernet Ports
F7	Console Port	1x Micro-USB Console Port
F8	Display Port	2x Mini-Display Ports
F9	SFP+ Port	2x 10G SFP+ Ports with LED Indicators
F10	PCIe Expansion Slot	1x HHHHL PCIe*16 Slot, under 75W (Optional)

Rear Panel



No.	Description	
R1	Power Input	2x3-Pin 12V Input
R2	Smart Fan	4x Smart Fan

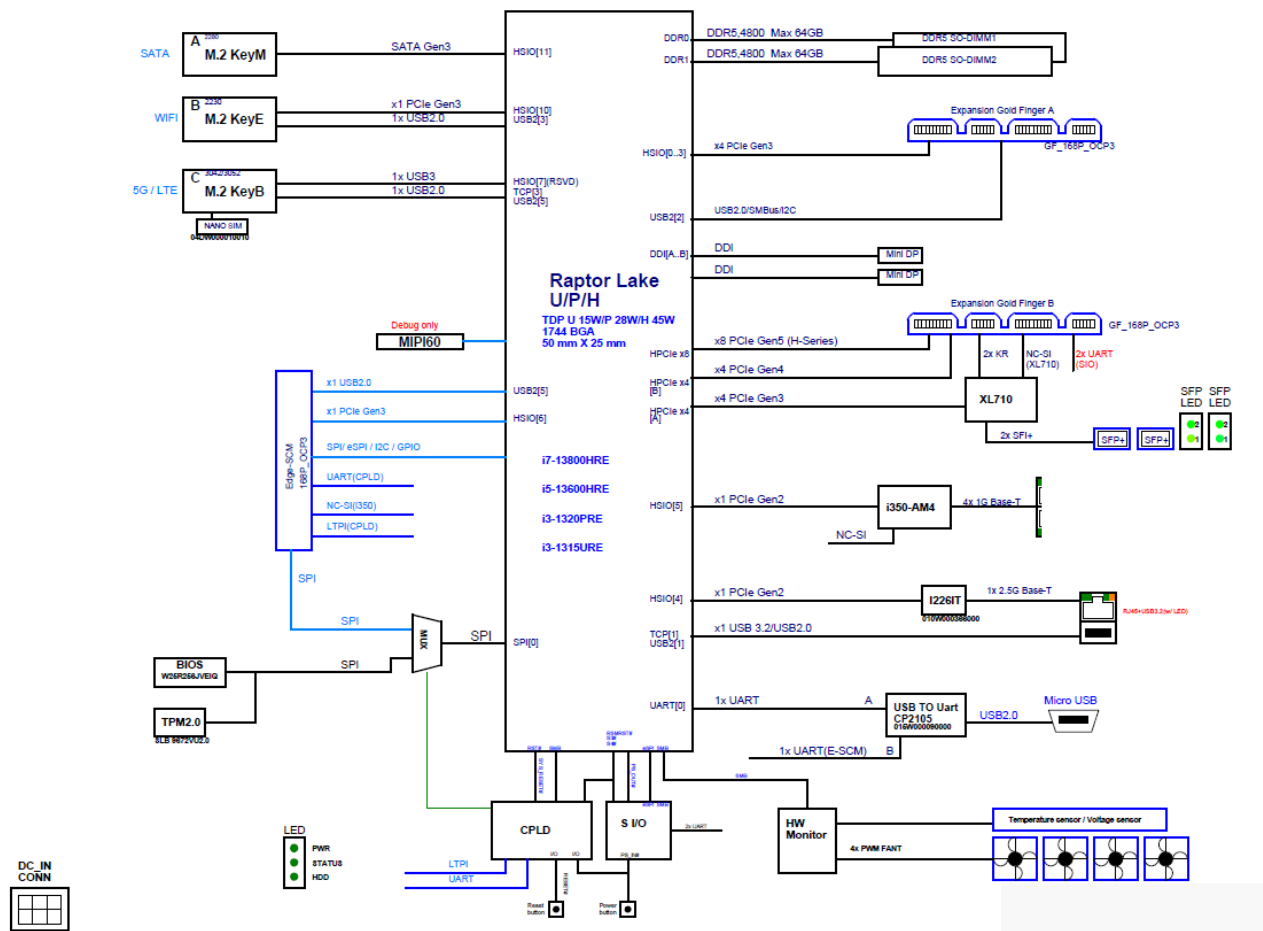
Side Panels



No.	Description	
S1	Antenna	6x SMA Antenna Holes

CHAPTER 2: MOTHERBOARD INFORMATION

Block Diagram



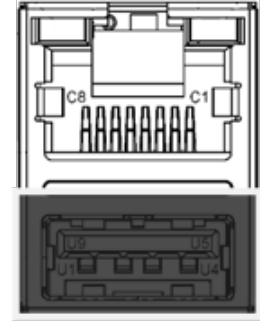
Jumper Setting and Connector Pin-out

The following references the pin assignments and internal connectors of NCA-1600.

Ethernet

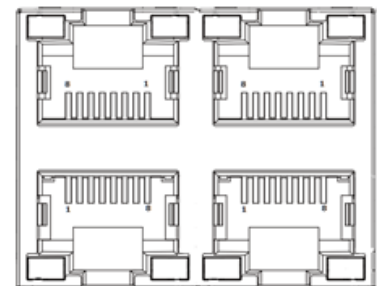
RJ1: RJ45 with LED & USB 3.0 Type-A

Pin	Description	
	Fast E-Net	Giga Net
C1	TX+	MD0+
C2	TX-	MD0-
C3	RX+	MD1+
C4	T45	MD2+
C5	T45	MD2-
C6	RX-	MD1-
C7	T78	MD3+
C8	T78	MD3-



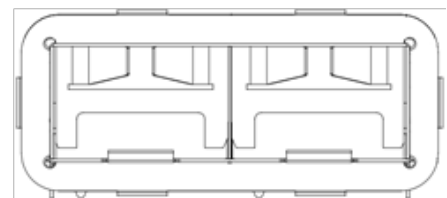
LAN2: 2x2 Port RJ45 with LED

Pin	Description	
	Fast E-Net	Giga Net
N1	TX+	MD0+
2	TX-	MD0-
3	RX+	MD1+
4	T45	MD2+
5	T45	MD2-
6	RX-	MD1-
7	T78	MD3+
8	T78	MD3-



SFP1: SFP+ 1X2 ASSY

Pin	Description	Pin	Description
1	VeeT	11	VeeR
2	TxFault	12	RD-
3	TxDis	13	RD+
4	SDA	14	VeeR
5	SCL	15	VCCR
6	MOD_ABS	16	VCCT
7	RS0	17	VeeT
8	RX_LOS	18	TD+

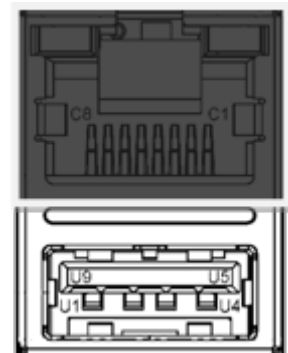


9	RS1	19	TD-
10	VeeR	20	VeeT

USB 3.0

RJ1: RJ45 with LED + USB 3.0 Type-A

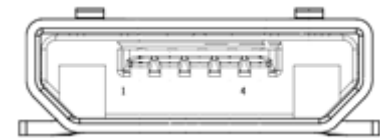
Pin	Description
U1	+P5V
U2	D1-
U3	D1+
U4	GND
U5	USB3.0_RX-
U6	USB3.0_RX+
U7	GND
U8	USB3.0_TX-
U9	USB3.0_X+



USB Console

USB1: USB to Console Port

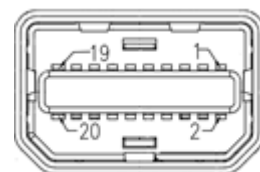
Pin	Description
1	+P5V
2	D1-
3	D1+
4	GND



Display

DP1/DP2: Mini Display Port

Pin	Description	Pin	Description
1	GND	2	HOT PLUG
3	LANE0+	4	CONFIG1
5	LANE0-	6	NC
7	GND	8	GND
9	LANE1+	10	LANE3+
11	LANE1-	12	LANE3-
13	GND	14	GND
15	LANE2+	16	AUX CH+
17	LANE2-	18	AUX CH-
19	GND	20	DP PWR



Expansion Interface A**GF_OCPA1**

Signal	Pin	Pin	Signal
PRSENT#/PESTI	OCP_B1	OCP_A1	PROCHOT#
SUS_CLK	OCP_B2	OCP_A2	PLAT_RST#
I2C0_CLK	OCP_B3	OCP_A3	WAKE#
I2C0_DAT	OCP_B4	OCP_A4	I2S_CLK/SNDW_CLK2/HDA_BCLK
I2C1_CLK	OCP_B5	OCP_A5	I2S_DIN/SNDW_DAT2/HDA_SDI
I2C1_DAT	OCP_B6	OCP_A6	I2S_DOUT/SNDW_DAT3/HDS_SDO
IPMB_CLK	OCP_B7	OCP_A7	I2S_LRCLK/SNDW_CLK3/HDA_SYNC
IPMB_DAT	OCP_B8	OCP_A8	I2S_MCLK/HDA_RST#
GND	OCP_B9	OCP_A9	GND
UART0_CTS#	OCP_B10	OCP_A10	UART0_RTS#
UART0_RX	OCP_B11	OCP_A11	UART0_TX
UART1_RX	OCP_B12	OCP_A12	POWER_MODE
UART1_TX	OCP_B13	OCP_A13	GENERAL_LED
CONN_ID_0	OCP_B14	OCP_A14	CONN_ID_1
Key			
+12V_EDGE	B1	A1	GND
+12V_EDGE	B2	A2	GND
+12V_EDGE	B3	A3	GND
+12V_EDGE	B4	A4	GND
+12V_EDGE	B5	A5	GND
+12V_EDGE	B6	A6	GND
+3.3V_EDGE	B7	A7	GND
+3.3V_EDGE	B8	A8	GND
+3.3V_EDGE	B9	A9	GND
+3.3V_AUX_EDGE	B10	A10	GND
SNDW_DMIC_CLK0	B11	A11	SMB0_CLK
SNDW_DMIC_DAT0	B12	A12	SMB0_DAT
GND	B13	A13	GND
REFCLKn0	B14	A14	SMB0_ALERT#
REFCLKp0	B15	A15	RFU
GND	B16	A16	GND
PETn0	B17	A17	PERn0
PETp0	B18	A18	PERp0
GND	B19	A19	GND
PETn1	B20	A20	PERn1

PETp1	B21	A21	PERp1
GND	B22	A22	GND
PETn2	B23	A23	PERn2
PETp2	B24	A24	PERp2
GND	B25	A25	GND
PETn3	B26	A26	PERn3
PETp3	B27	A27	PERp3
GND	B28	A28	GND
Key			
GND	B29	A29	GND
USB0_SSRX-	B30	A30	USB0_SSTX-
USB0_SSRX+	B31	A31	USB0_SSTX+
GND	B32	A32	GND
USB1_SSRX-	B33	A33	USB1_SSTX-
USB1_SSRX+	B34	A34	USB1_SSTX+
GND	B35	A35	GND
USB0-	B36	A36	USB1-
USB0+	B37	A37	USB1+
GND	B38	A38	GND
USB2_AUX-	B39	A39	USB0_PD_ALERT#
USB2_AUX+	B40	A40	USB0_PD_I2C_DAT
GND	B41	A41	USB0_PD_I2C_CLK
GND	B42	A42	USB01_OC#
Key			
GND	B43	A43	GND
DDIO_PAIR0+	B44	A44	DDIO_PAIR1+
DDIO_PAIR0-	B45	A45	DDIO_PAIR1-
GND	B46	A46	GND
DDIO_PAIR2+	B47	A47	DDIO_PAIR3+
DDIO_PAIR2-	B48	A48	DDIO_PAIR3-
GND	B49	A49	GND
DDI1_PAIR0+	B50	A50	DDI1_PAIR1+
DDI1_PAIR0-	B51	A51	DDI1_PAIR1-
GND	B52	A52	GND
DDI1_PAIR2+	B53	A53	DDI1_PAIR3+
DDI1_PAIR2-	B54	A54	DDI1_PAIR3-
GND	B55	A55	GND
DDIO_SCL_AUX	B56	A56	DDIO_HPD

DDIO_SDA_AUX	B57	A57	DDI1_HPD
GND	B58	A58	GND
DDIO_DDC_AUX_SEL	B59	A59	DDI1_DDC_AUX_SEL
DDI1_SCL_AUX	B60	A60	DDI1_SDA_AUX
GND	B61	A61	GND
NCSI_CLK_OUT	B62	A62	NCSI_TX_EN
NCSI_CRS_DV	B63	A63	NCSI_TXD0
NCSI_RXD0	B64	A64	NCSI_TXD1
NCSI_RXD1	B65	A65	NCSI_ARB_IN
GP_SPI_ALERT#	B66	A66	NCSI_ARB_OUT
GP_SPI_CS0#	B67	A67	GP_SPI_CS1#
GP_SPI_MISO	B68	A68	GP_SPI_MOSI
GP_SPI_CLK	B69	A69	RFU
GND	B70	A70	GND

GF_OCPB1

Signal	Pin	Pin	Signal
PRSENT#/PESTI	OCP_B1	OCP_A1	GND
UART2_TX	OCP_B2	OCP_A2	USB3D-
UART2_RX	OCP_B3	OCP_A3	USB3D+
GENERAL_LED	OCP_B4	OCP_A4	GND
UART3_TX	OCP_B5	OCP_A5	EXPB_GPIO0
UART3_RX	OCP_B6	OCP_A6	EXPB_GPIO1
NCSI_TX_EN	OCP_B7	OCP_A7	EXPB_GPIO2
NCSI_TXD0	OCP_B8	OCP_A8	NCSI_RXD0
GND	OCP_B9	OCP_A9	GND
NCSI_TXD1	OCP_B10	OCP_A10	NCSI_RXD1
EXPB_GPIO3	OCP_B11	OCP_A11	NCSI_CRS_DV
I2C0_CLK	OCP_B12	OCP_A12	SUS_CLK
I2C0_DAT	OCP_B13	OCP_A13	CONN_ID_1
CONN_ID_0	OCP_B14	OCP_A14	NCSI_CLK_OUT
Key			
+12V_EDGE	B1	A1	GND
+12V_EDGE	B2	A2	GND
+12V_EDGE	B3	A3	GND
+12V_EDGE	B4	A4	GND
+12V_EDGE	B5	A5	GND
+12V_EDGE	B6	A6	GND

+12V_EDGE	B1	A1	GND
+12V_EDGE	B2	A2	GND
+12V_EDGE	B3	A3	GND
+12V_EDGE	B4	A4	GND
+12V_EDGE	B5	A5	GND
+12V_EDGE	B6	A6	GND
+3.3V_EDGE	B7	A7	GND
+3.3V_EDGE	B8	A8	GND
+3.3V_EDGE	B9	A9	GND
+3.3V_AUX_EDGE	B10	A10	GND
PLAT_RST#	B11	A11	REFCLKn1
WAKE#	B12	A12	REFCLKp1
GND	B13	A13	GND
ETHERNET_TXn0	B14	A14	ETHERNET_RXn0
ETHERNET_TXp0	B15	A15	ETHERNET_RXp0
GND	B16	A16	GND
PETn0	B17	A17	PERn0
PETp0	B18	A18	PERp0
GND	B19	A19	GND
PETn1	B20	A20	PERn1
PETp1	B21	A21	PERp1
GND	B22	A22	GND
PETn2	B23	A23	PERn2
PETp2	B24	A24	PERp2
GND	B25	A25	GND
PETn3	B26	A26	PERn3
PETp3	B27	A27	PERp3
GND	B28	A28	GND
Key			
GND	B29	A29	GND
PETn4	B30	A30	PERn4
PETp4	B31	A31	PERp4
GND	B32	A32	GND
PETn5	B33	A33	PERn5
PETp5	B34	A34	PERp5
GND	B35	A35	GND
PETn6	B36	A36	PERn6
PETp6	B37	A37	PERp6

GND	B38	A38	GND
PETn7	B39	A39	PERn7
PETp7	B40	A40	PERp7
GND	B41	A41	GND
GND	B42	A42	GND
Key			
GND	B43	A43	GND
PETn8	B44	A44	PERn8
PETp8	B45	A45	PERp8
GND	B46	A46	GND
PETn9	B47	A47	PERn9
PETp9	B48	A48	PERp9
GND	B49	A49	GND
PETn10	B50	A50	PERn10
PETp10	B51	A51	PERp10
GND	B52	A52	GND
PETn11	B53	A53	PERn11
PETp11	B54	A54	PERp11
GND	B55	A55	GND
PETn12	B56	A56	PERn12
PETp12	B57	A57	PERp12
GND	B58	A58	GND
PETn13	B59	A59	PERn13
PETp13	B60	A60	PERp13
GND	B61	A61	GND
PETn14	B62	A62	PERn14
PETp14	B63	A63	PERp14
GND	B64	A64	GND
PETn15	B65	A65	PERn15
PETp15	B66	A66	PERp15
GND	B67	A67	GND
ETHERNET_TXn1	B68	A68	ETHERNET_RXn1
ETHERNET_TXp1	B69	A69	ETHERNET_RXp1
GND	B70	A70	GND

Edge-SCM**JE_SCM1 (Not Standard OCP Socket)****Other Expansion Connector****JNGFF4 M.2 Slot (M-Key)**

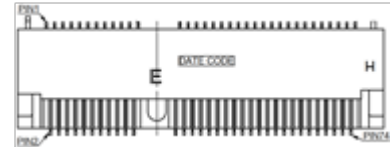
Pin	Description	Pin	Description
1	GND	2	3V3
3	GND	4	3V3
5	NC	6	NC
7	NC	8	NC
9	GND	10	M.2 LED
11	NC	12	3V3
13	NC	14	3V3
15	GND	16	3V3
17	NC	18	3V3
19	NC	20	NC
21	GND	22	NC
23	NC	24	NC
25	NC	26	NC
27	GND	28	NC
29	NC	30	NC
31	NC	32	NC
33	GND	34	NC
35	NC	36	NC
37	NC	38	NC
39	GND	40	NC
41	SATA_RX+	42	NC
43	SATA_RX-	44	NC
45	GND	46	NC
47	SATA_TX-	48	NC
49	SATA_TX+	50	NC
51	GND	52	NC
53	NC	54	NC
55	NC	56	NC
57	GND	58	NC
M-Key			
67	NC	68	NC
69	PEDET	70	3V3



71	GND	72	3V3
73	GND	74	3V3
75	GND		

M2E1 M.2 Slot (E-Key)

Pin	Description	Pin	Description
1	GND	2	3V3_AUX
3	USB D+	4	3V3_AUX
5	USB D-	6	M2_LED
7	GND	8	NC
9	NC	10	NC
11	NC	12	NC
13	M2E1_SEL1	14	NC
15	NC	16	NC
17	NC	18	GND
19	M2E1_SEL2	20	NC
21	NC	22	NC
23	NC		
E-Key			
33	GND -	32	NC
35	PETp0	34	NC
37	PETn0	36	NC
39	GND	38	NC
41	PERp0	40	NC
43	PERn0	42	NC
45	GND	44	NC
47	REFCLK+	46	NC
49	REFCLK-	48	NC
51	GND	50	SUSCLK(RSVD)
53	CLKREQ#	52	PRESET#
55	NC	54	W_DIS2
57	GND	56	W_DIS1
59	NC	58	NC
61	NC	60	NC
63	GND	62	NC
65	NC	64	NC
67	NC	66	NC
69	GND	68	NC



71	NC	70	NC
73	NC	72	3V3_AUX
75	GND	74	3V3_AUX

JNGFF3 M.2 Slot (B-Key)

Pin	Description	Pin	Description
1	NC	2	3V3_AUX
3	GND	4	3V3_AUX
5	GND	6	CARD PWROFF
7	USB D+	8	W_DIS
9	USB D-	10	DAS/DSS#(RSVD)
11	GND		
B-Key			
21	NC	20	PCIE_DIS
23	NC	22	VBUS_SENSE
25	NC	24	5G_VCC1
27	GND	26	W_DIS2
29	USB3RX-	28	NC
31	USB3RX+	30	UIM_RESET
33	GND	32	UIM_CLK
35	USB3TX-	34	UIM_DATA
37	USB3TX+	36	UIM_PWR
39	GND	38	5G_VCC2
41	PETn0	40	NC
43	PETp0	42	NC
45	GND	44	NC
47	PERn0	46	NC
49	PERp0	48	NC
51	GND	50	PRESET#
53	REFCLK-	52	CLKREQ#
55	REFCLK+	54	WALE#(RSVD)
57	GND	56	NC
59	NC	58	NC
61	NC	60	NC
63	NC	62	NC
65	NC	64	NC
67	RESET#	66	SIM_DET(RSVD)
69	PEDET	68	5G_VCC3

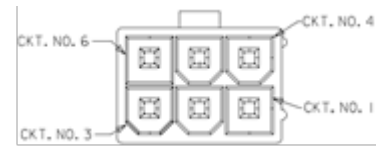


71	GND	70	3V3_AUX
73	GND	72	3V3_AUX
75	NC	74	3V3_AUX

Power

DC_IN1: 2x3 6P Mini-Fit Connector

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



FAN1/FAN2/FAN3/FAN4: System FAN Connector

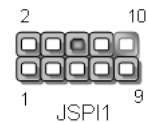
Pin	Description
1	GND
2	12V
3	FAN_TECH_IN
4	N.C
5	FAN SPEED CTRL



Other Connector

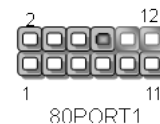
JSPI1: SPI ROM Flash Connector (Debug Only)

Pin	Description	Pin	Description
1	SPI_HOLD	2	N.C
3	SPI_CS0#	4	SPI_VCC
5	SPI_MISO	6	N.C
7	N.C	8	SPI_CLK
9	GND	10	SPI_MOSI



80PORT1: eSPI 80Port (Debug Only)

Pin	Description	Pin	Description
1	ESPI_CLK	2	ESPI_IO1
3	ESPI_RST_N	4	ESPI_IO0
5	ESPI_CS0_N	6	+P3V3
7	ESPI_IO3	8	
9	ESPI_IO2	10	GND
11	+P3V3_STBY	12	N.C

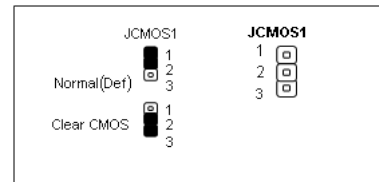


JTAG1: CPLD Flash Connector (Debug Only)

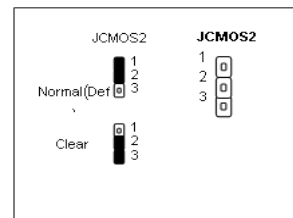
Pin	Description	Pin	Description
1	+2.5V	2	TDO
3	TDI	4	N.C
5	N.C	6	TMS
7	GND	8	TCK

**Jumper & Switch Setting****JCMOS1: Clear CMOS**

Description	CMOS1
Normal (Default)	1-2
Clear CMOS	2-3

**JCMOS2: Secured RTC Reset**

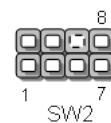
Description	JCMOS2
Normal (Default)	1-2
Clear ME RTC	2-3

**JOPEN1: Case Open Select (1x2 Pin 2.54mm Wafer)**

Pin	Description
1	GND
2	Chassis In

SW2: 5G/LTE Module Select

Pin	Description	Pin	Description
1	VBUS_SENSE	2	+P3V3
3	5G2_EM9x9x_VCC1	4	+P3V3
5	5G2_EM9x9x_VCC2	6	+P3V3
7	5G2_EM9x9x_VCC3	8	+P3V3



	SW2(1~2)	SW2(3~4)	SW2(5~6)	SW2(7~8)
EM7690	V	X	X	X
EM829X/EM9191/9190	V	V	V	V
N980/FN990	X	X	X	X

SW1: 5G/LTE Module Interface Select

Pin	Description
1	+P1V8
2	PCIE_DIS
3	GND

	J501_SEL (1-2)	J501_SEL (2-3)
FN980/FN990 USB	X	X
FN980/FN990 PCIe		V
EMB19X/7690/929X USB	V	
EMB19X/7690/929X PCIe	X	X

JM2E1_S1: WiFi Module Select

Pin	Description
1	M2E1_SEL1
2	GND

	JM2E1_S1(1-2)1	JM2E1_S2(1-2)1
AX201	V	V
AX210	X	X
BE200	V	X

JM2E1_S2: WiFi Module Select

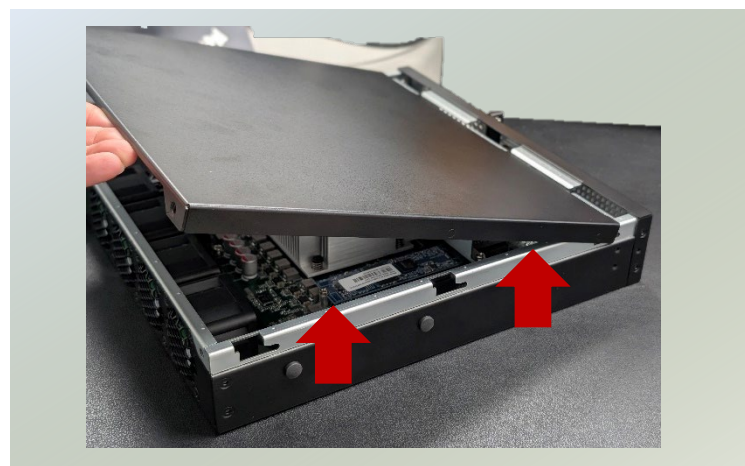
Pin	Description
1	M2E1_SEL2
2	GND

CHAPTER 3: HARDWARE SETUP

To reduce the risk of personal injury, electric shock, or damage to the system, please remove all power connections to shut down the device completely and wear ESD protection gloves when handling the installation steps.

Opening the Chassis

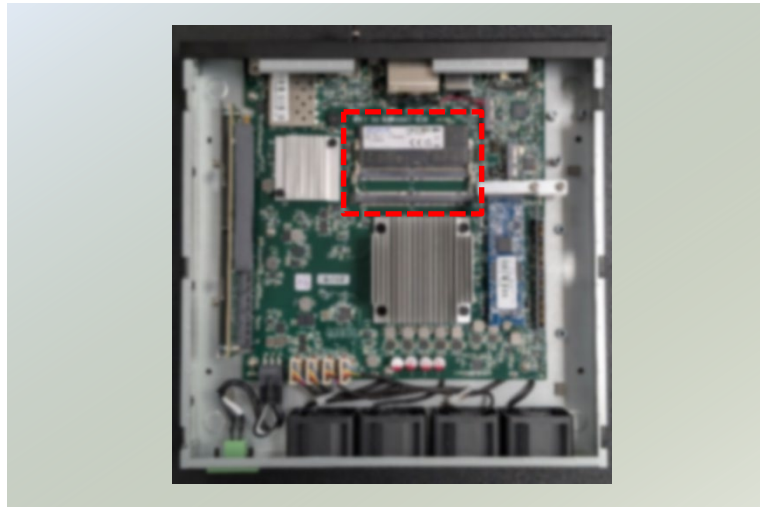
1. Power off the system and remove all power connections.
2. Locate and remove the two (2) screws on the rear chassis.
3. Gently slide the chassis cover towards the rear side.
4. Lift up to remove chassis cover.



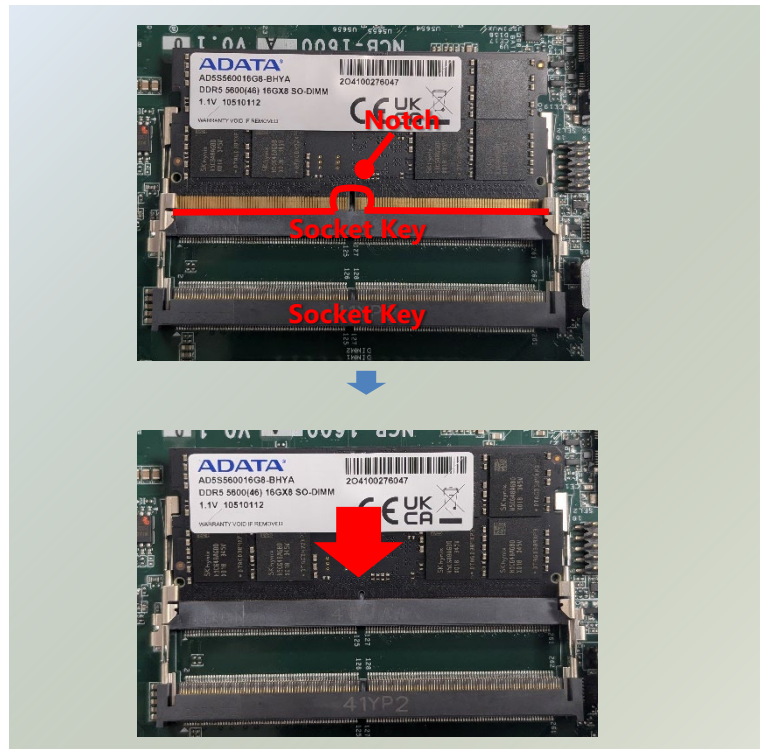
Installing the System Memory

The motherboard supports two DDR5 SO-DIMM system memory. Please follow the steps below to install the DIMM memory modules.

1. Power off the system and open the chassis cover.
2. Locate the system memory slot.



3. Align the notch of the module with the socket key in the slot. Insert the pins at 30 degrees into the socket key until it is fully seated.



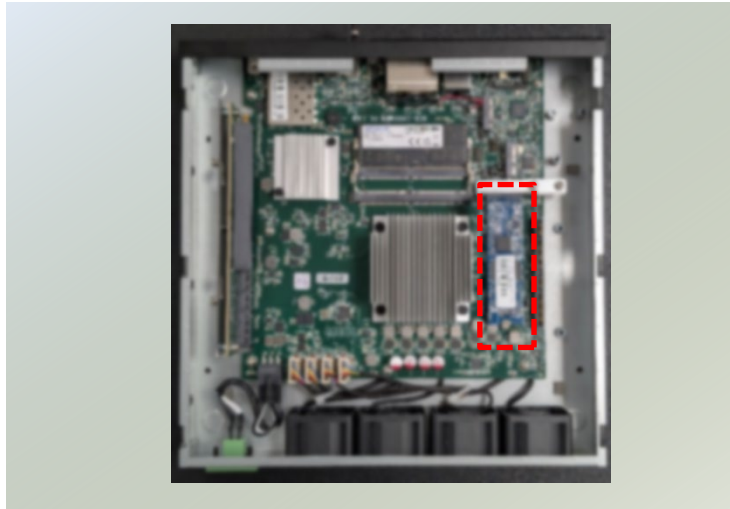
4. Push down on the module until the slot latch catches and clicks into place. Repeat if installing a second memory module.



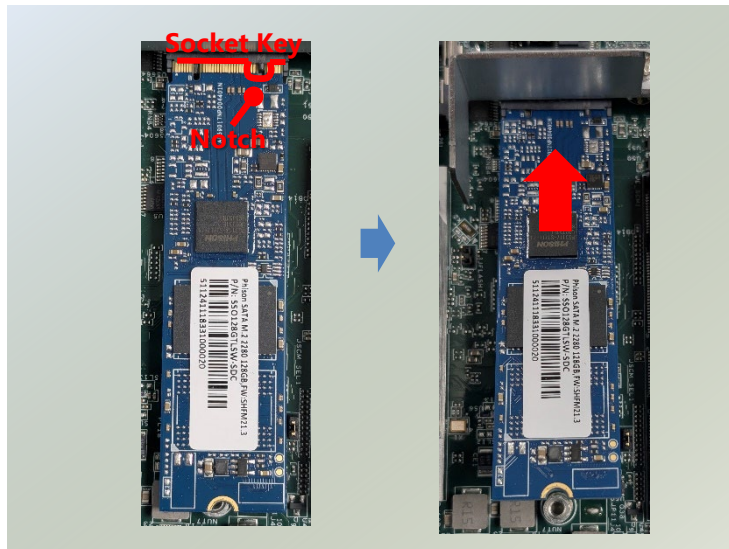
Installing M.2 Storage Module (Optional)

The system supports one M.2 2280 M-Key slot for additional data storage. Please follow the steps for installation.

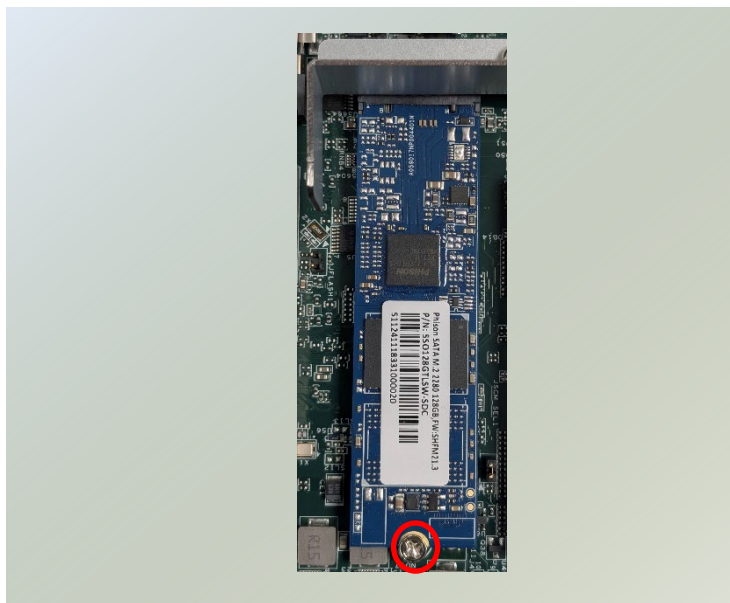
1. Power off the system and open the chassis cover.
2. Locate the M.2 slot on the motherboard.



3. Align the notch of the M.2 memory card with the socket key in the pin slot.
4. Insert the M.2 memory card pins at 30 degrees into the socket until it is fully seated.



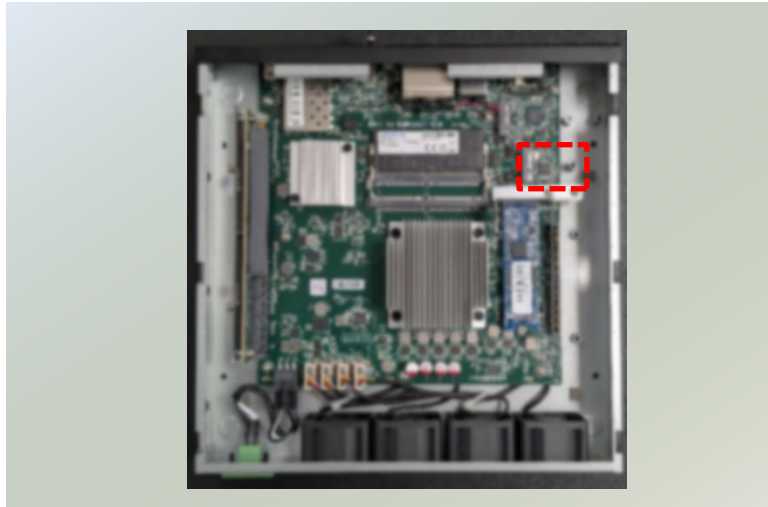
5. Push down on the module card and secure it with a screw.



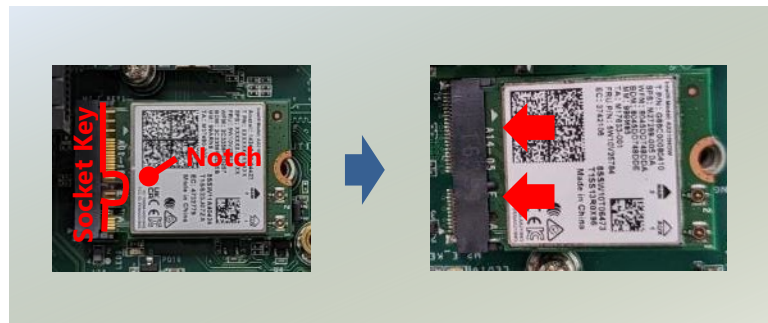
Installing Wi-Fi Module Card (Optional)

The system supports one M.2 2230 E-Key slot for a Wi-Fi or BT module card. A Wi-Fi module will require two antennas. Please follow the steps to install the Wi-Fi module card.

1. Power off the system and open the chassis cover.
2. Locate the M.2 slot on the motherboard.



3. Align the notch of the Wi-Fi module card with the socket key in the pin slot.
4. Insert the Wi-Fi module card pins at 30 degrees into socket until it is fully seated.



5. Push down on the module card and secure it with a screw.



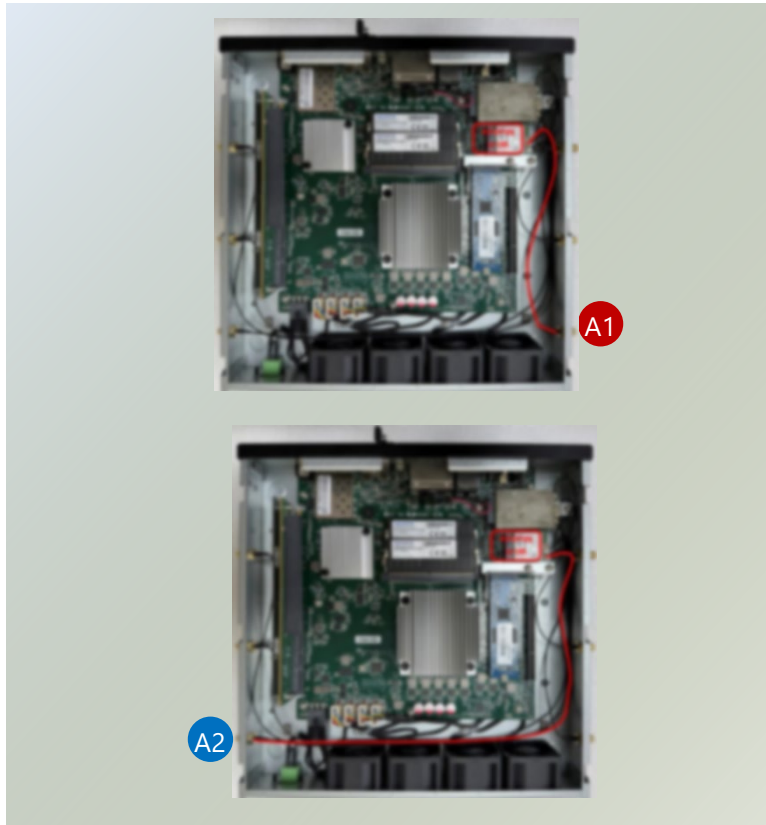
Installing Wi-Fi Antennas



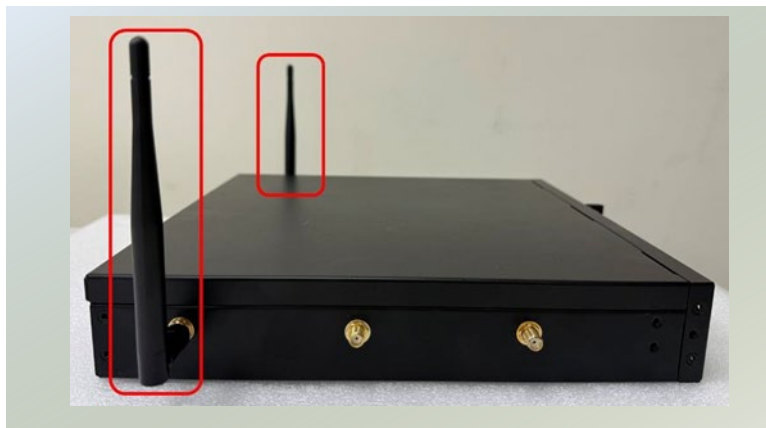
1. Locate the two (2) antenna hole placements (A1, A2). Locate the two (2) antenna IPEX connectors on the Wi-Fi module card.



2. Connect the RF cables to the IPEX connectors on the Wi-Fi module card and screw the other end of the cables in the antenna holes.



3. Then, screw on the antennas on the outside of the system.



Installing LTE/5G Module Card (Optional)

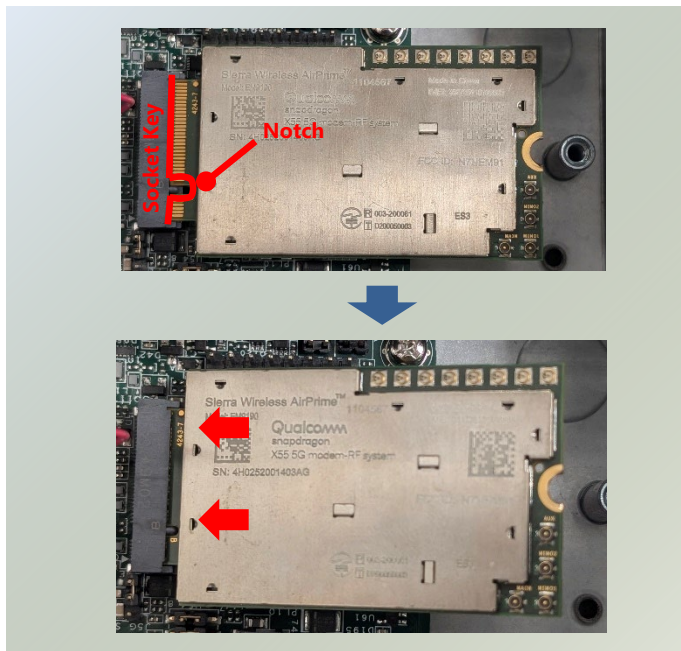
The motherboard provides one M.2 3042/3052 B-Key slot for LTE/5G module card expansion. LTE module requires two antennas, and a 5G module requires four antennas. Please follow the procedures for installation.

1. Power off the system and open the chassis cover.
2. Locate the M.2 slot on the motherboard.

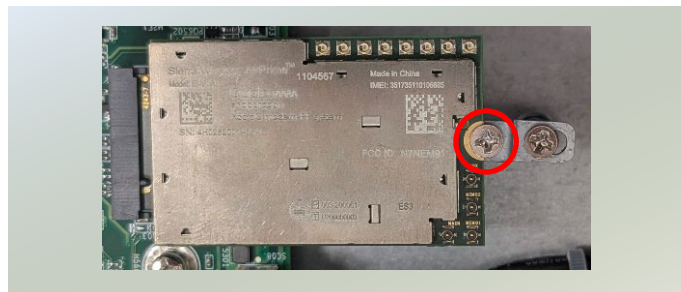


3. Align the notch of the 5G module card with the socket key in the pin slot.

4. Insert the 5G module card pins at 30 degrees into the socket until it is fully seated.



5. Push down on the module card and secure it with a screw.

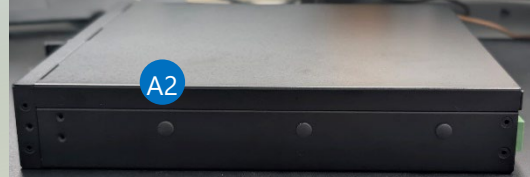


Installing LTE Module Antennas

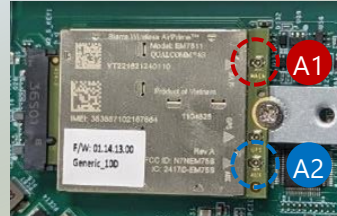
Left Side



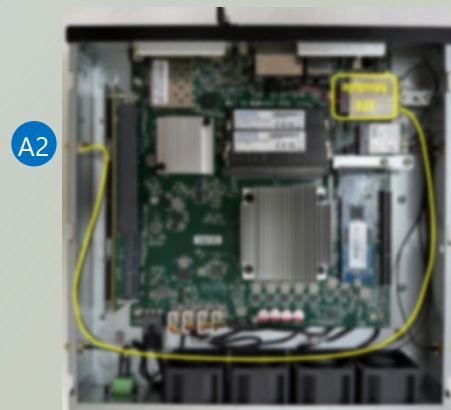
Right Side



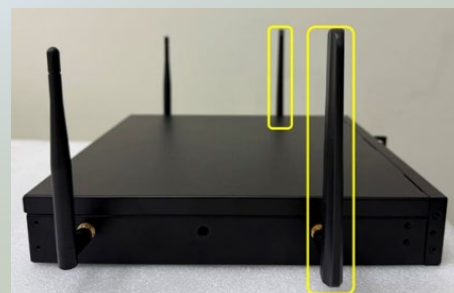
1. Locate the two (2) antenna hole placements (A1, A2). Locate the two (2) antenna IPEX connectors on the LTE module card.



2. Connect the RF cables to the IPEX connectors on the LTE module card and screw the other end of the cables in the antenna holes.



3. Then, screw on the antennas on the outside of the system.



Installing 5G Module Antennas

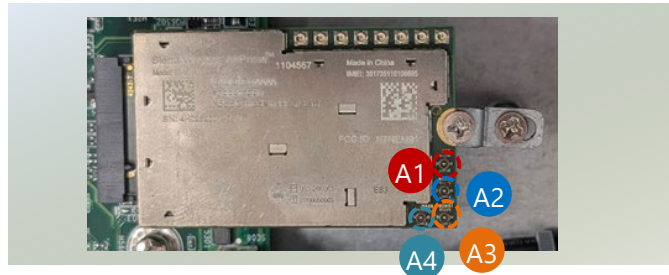
Left Side



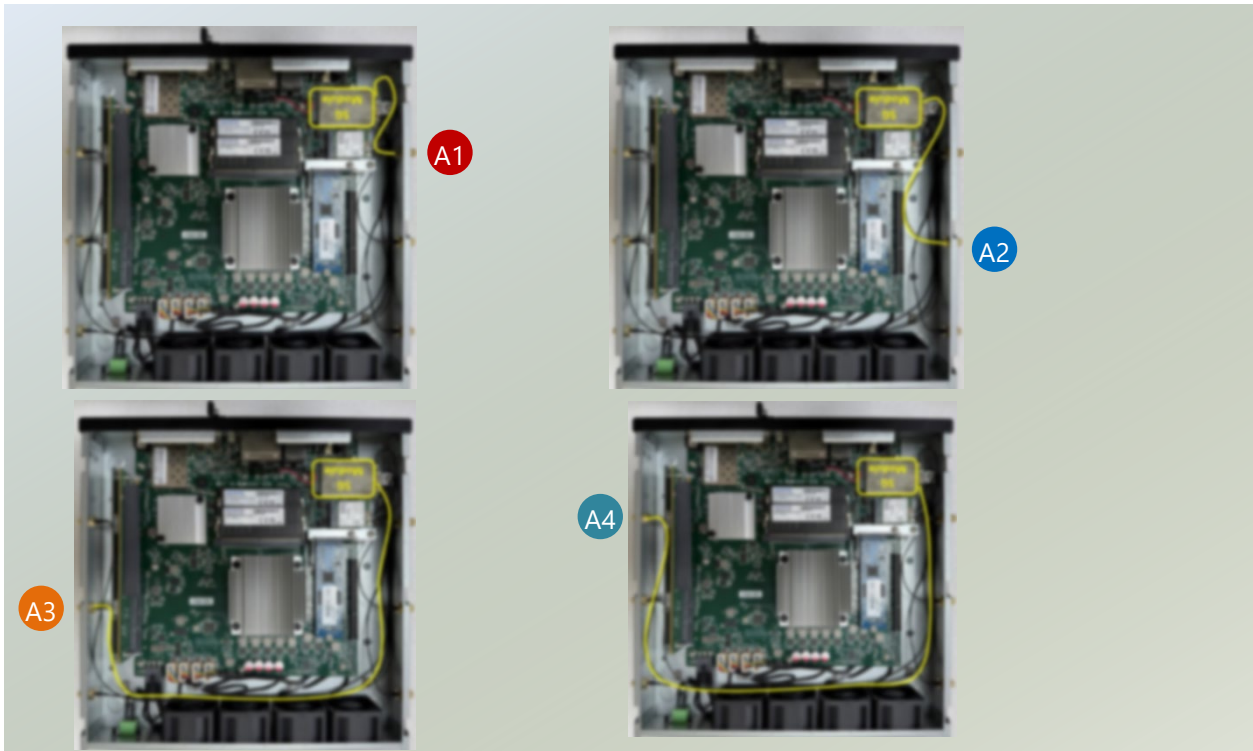
Right Side



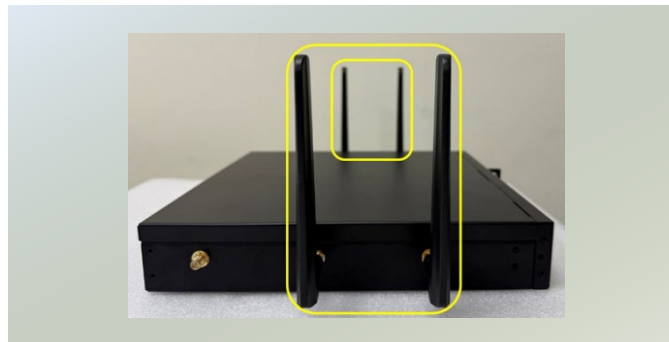
1. Locate the four (4) antenna hole placements (A1, A2, A3, A4). Locate the four (4) antenna IPEX connectors on the 5G module card.



2. Connect the RF cables to the IPEX connectors on the 5G module card and screw the other end of the cables in the antenna holes.



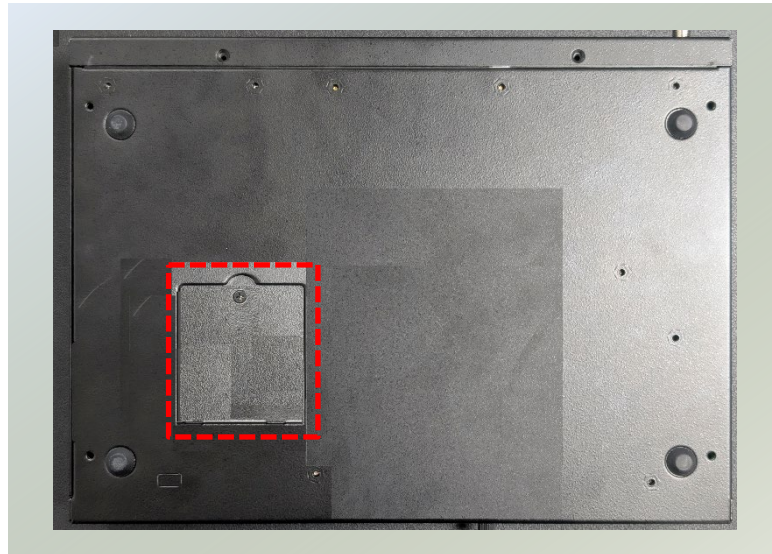
3. Then, screw on the antennas on the outside of the system.



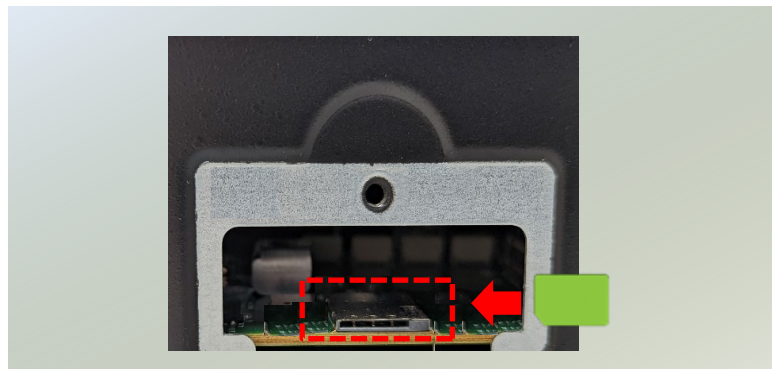
Installing SIM card (Optional)

The Nano SIM slot on the bottom side supports the LTE/5G module card (optional). Please follow the steps below for SIM card placement.

1. Power off the system.
2. Locate the Nano-SIM slot cover.
Unscrew the one (1) screw securing the cover.



3. Gently remove the SIM slot cover.
4. Insert and push the Nano-SIM card, gold contacts facing downwards, all the way in until it clicks into place.

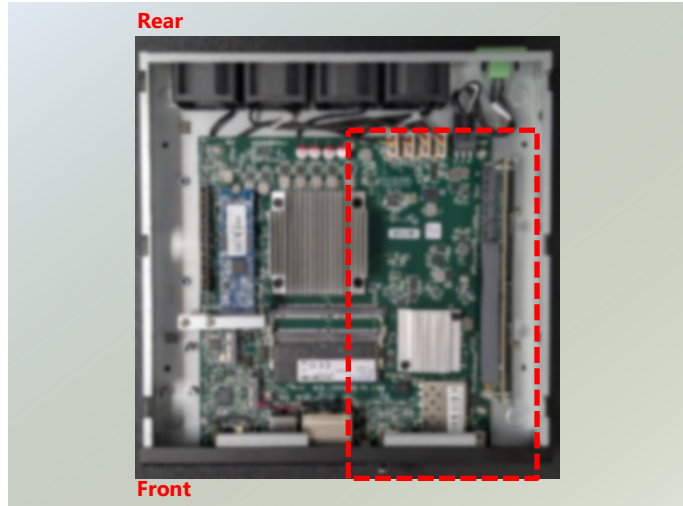


5. To remove the Nano-SIM card, use your fingertips to push it once, to have the card automatically eject.
6. Place the slot door back and tighten the one (1) screw.

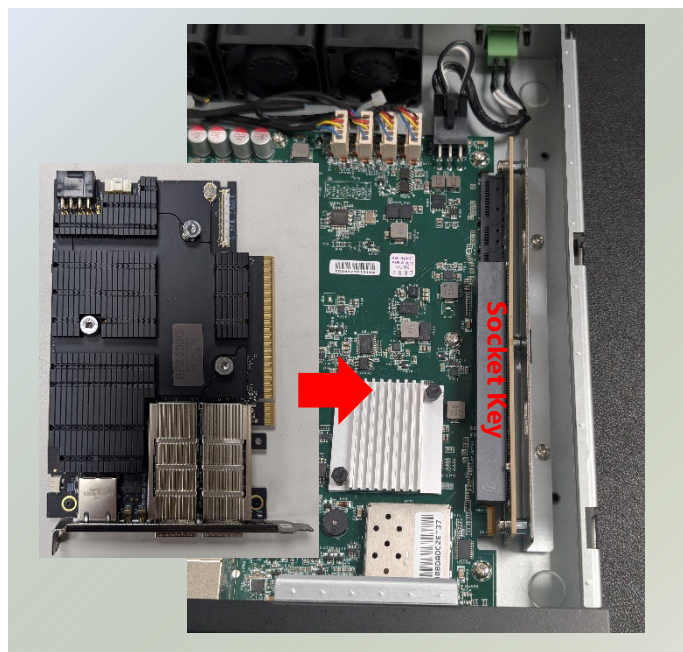
Installing the PCIe Module (SKU A/B Only, Optional)

The system supports one HHHL PCIe*16 module card slot for LAN or DPU module expansion. The PCIe card requires a rather complex installation process; therefore, the assembly must be handled with care. Please read through the instructions in this section to make sure you have acquired the necessary knowledge and comply with the requirements.

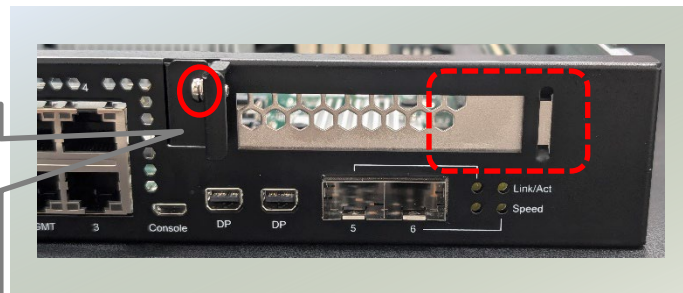
1. Power off the system and open the chassis cover.
2. Locate the PCIe*16 slot on the motherboard.



3. Align the notch of the PCIe module card pins with the socket key in the pin slot.
4. Insert the PCIe module into the socket until it is fully seated.



5. Make sure the side bar slides in properly. Then, secure it with a screw.



Wallmount the System (Optional)

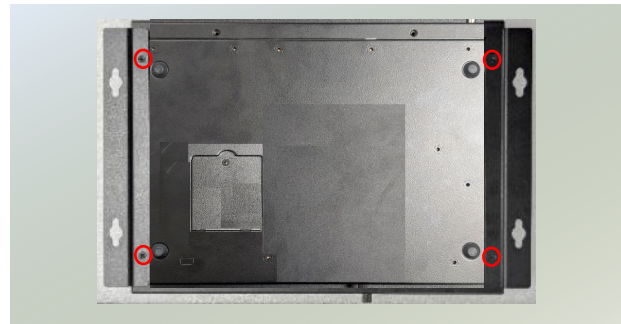
With the Wall-mount Kit, this system can be fixed on the wall surface. Please contact Lanner's sales representative for purchasing this kit.

1. The Wallmount Kit includes:

- ▶ 1x pair of Wall Brackets
- ▶ 1x Screw Pack



2. Invert the system to expose the bottom side.
Secure the two all brackets to the system using four (4) screws, two (2) per bracket.



3. Now the system can be mounted on a flat surface wall.



Note

- Installation must be performed by qualified personnel or subcontractors.
- Mounting is recommended on concrete walls.
- For all weight categories, use anti-loosening measures (spring washers, thread locker).
- In industrial environments (vibration, high temperature, outdoor), also apply anti-vibration pads and anti-corrosion screws.
- After installation, periodically inspect mounting points and screw tightness.
- Lanner assumes no liability for damage or injury resulting from mishandling or improper installation.

CHAPTER 4: BIOS SETUP

BIOS (Basic Input / Output System) is the program that controls the computer boot process. BIOS is a firmware embedded on an exclusive chip on the system's motherboard. Lanner's BIOS firmware offering including market-proven technologies such as Secure Boot and Intel Boot Guard technology deliver solid commitments for the shield protection against malware, uncertified sequences and other named cyber threats.

Entering Setup

To enter the BIOS setup utility, simply follow the steps below:

1. Boot up the system.
2. Pressing the **<Tab>** or **** key immediately allows you to enter the Setup utility, and then you will be directed to the BIOS main screen. The instructions for BIOS navigations are as below:

Control Keys	Description
→←	select a setup screen
↑↓	select an item/option on a setup screen
<Enter>	select an item/option or enter a sub-menu
+/-	adjust values for the selected setup item/option
F1	display General Help screen
F2	retrieve previous values, such as the last configured parameters during the last time you entered BIOS
F3	load optimized default values
F4	save configurations and exit BIOS
<Esc>	exit the current screen

NOTE: The images in the following section are for reference only.

Main Page

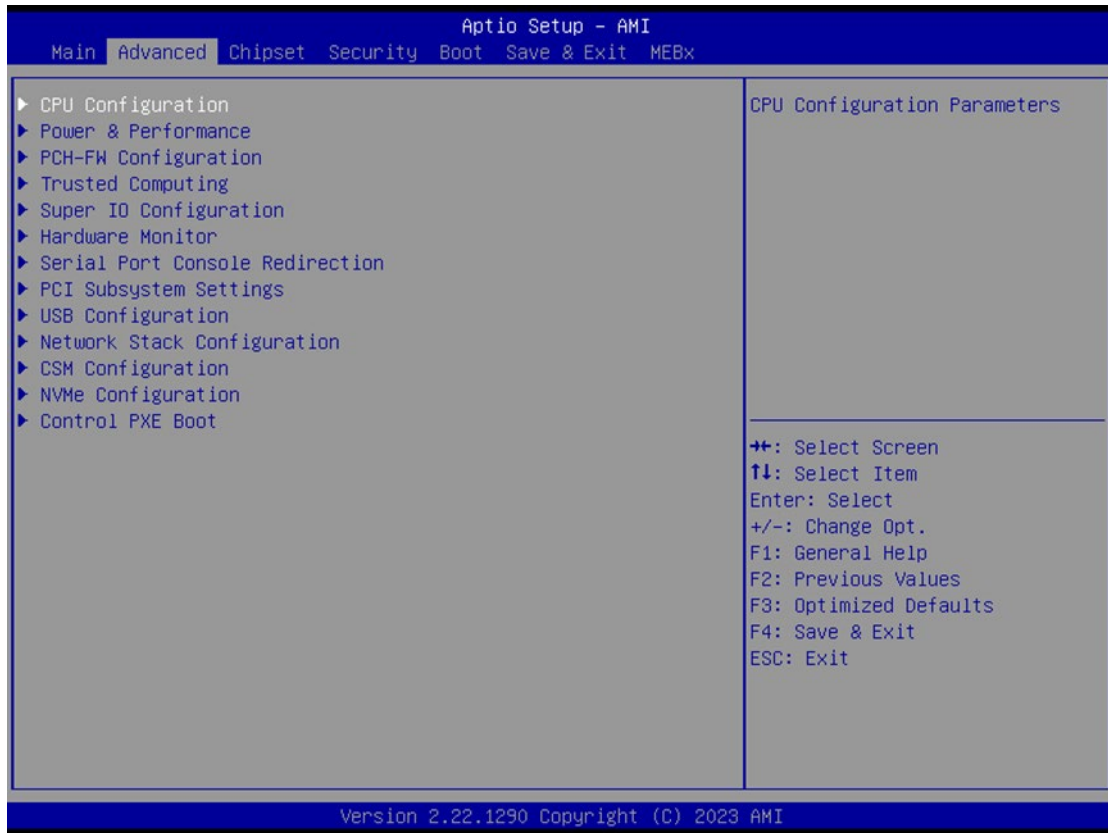
Setup main page contains BIOS information and project version information.



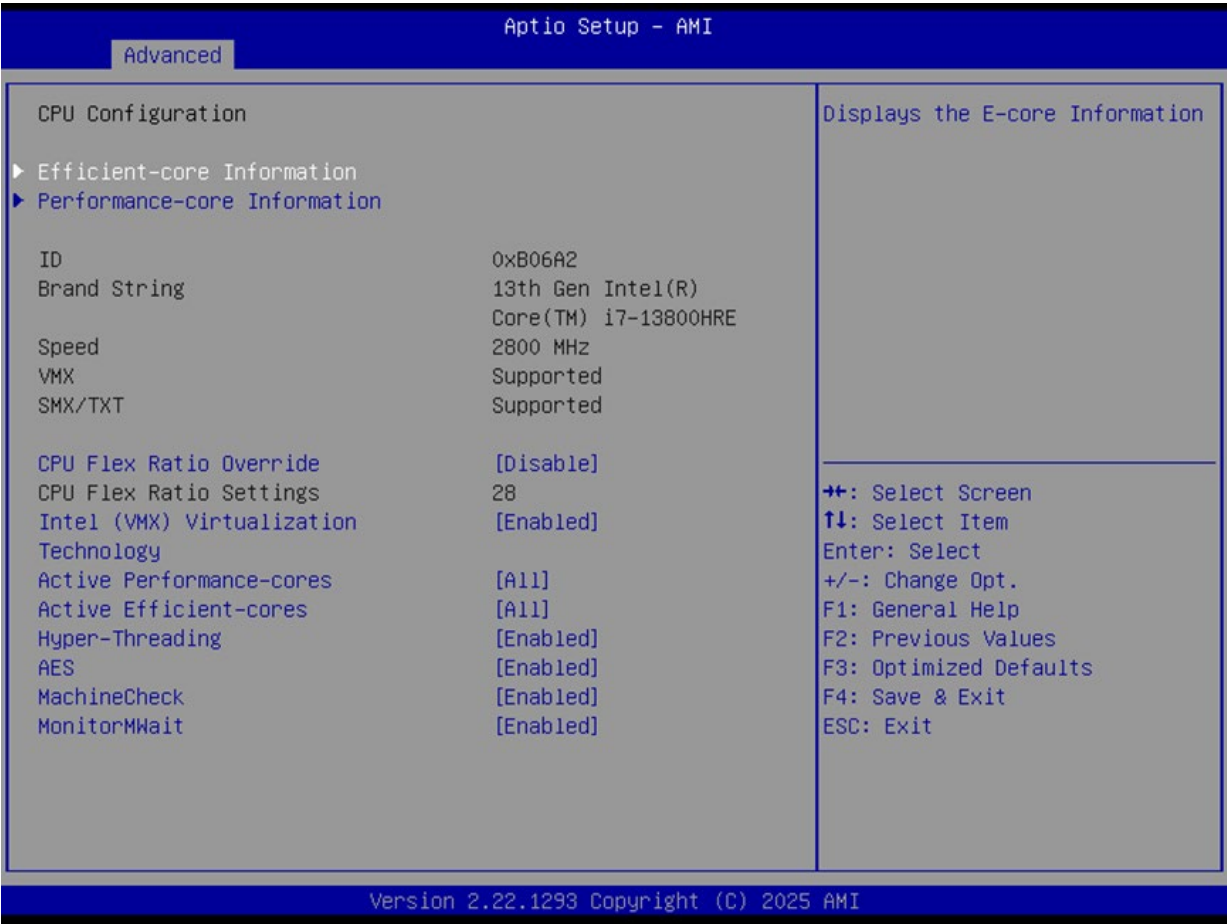
Feature	Description
BIOS Information	BIOS Vendor: American Megatrends Core Version: AMI Kernel version, CRB code base, X64 Compliancy: UEFI version, PI version Project Version: BIOS release version Build Date and Time: MM/DD/YYYY Access Level: Administrator / User
System Date	To set the Date, use <Tab> to switch between Date elements. Default Range of Year: 1998-9999 Default Range of Month: 1-12 Days: dependent on Month.
System Time	To set the Date, use <Tab> to switch between Date elements.

Advanced

Select the **Advanced** menu item from the BIOS setup screen to enter the "Advanced" setup screen. Users can select any of the items in the left frame of the screen.



CPU Configuration



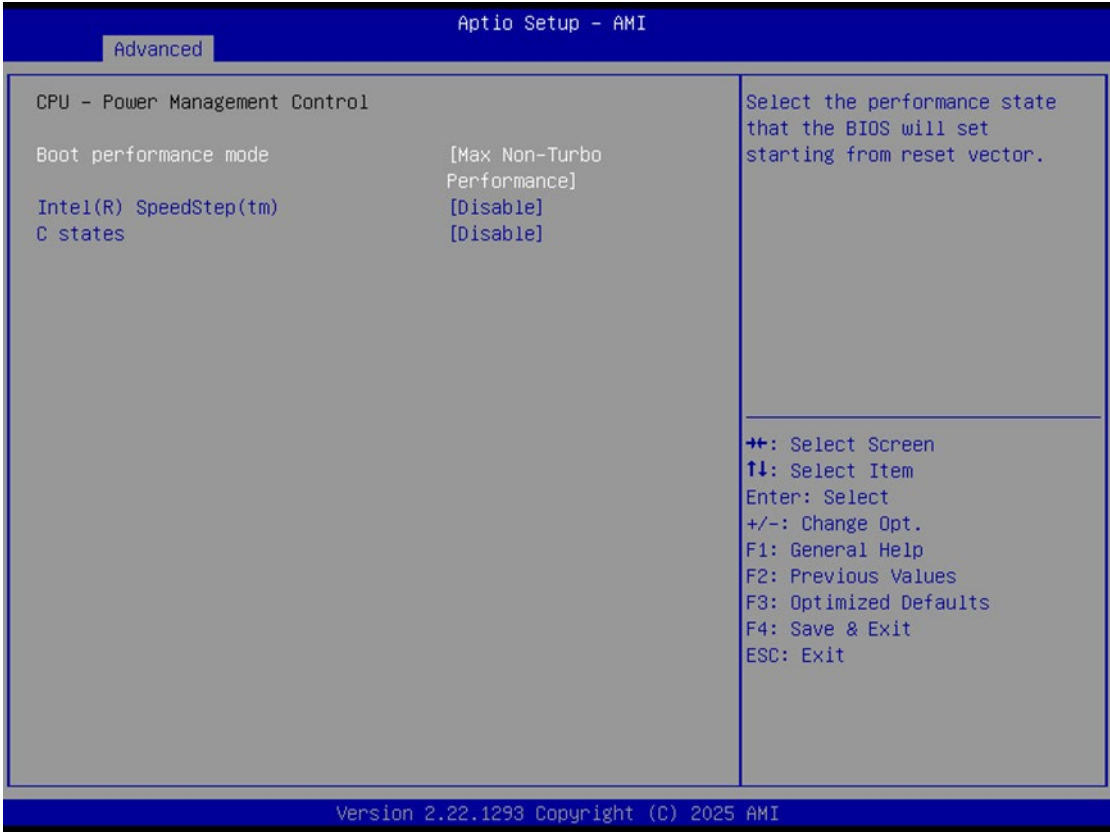
Feature	Options	Description
CPU Flex Ratio Override	Disabled Enabled	Enable/Disable CPU Flex Ratio Programming
CPU Flex Ratio Settings	28	This value must be between Max Efficiency Ratio (LFM) and Maximum non-turbo ratio set by Hardware (HFM).
Intel (VMX) Virtualization Technology	Disabled Enabled	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Performance-cores	All 1 2 3 4 5 6 7 8	Number of P-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.

Active Efficient-cores	All	Number of E-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.
	1	
	2	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	
	11	
	12	
	13	
	14	
	15	
Hyper-Threading	Disabled Enabled	Enable or Disable Hyper-Threading Technology.
AES	Disabled Enabled	Enable/Disable AES (Advanced Encryption Standard)
MachineCheck	Disabled Enabled	Enable/Disable Machine Check
MonitorMWait	Disabled Enabled	Enable/Disable MonitorMWait, if Disable MonitorMwait, the AP threads Idle Manner should not set in MWAIT Loop

Power & Performance

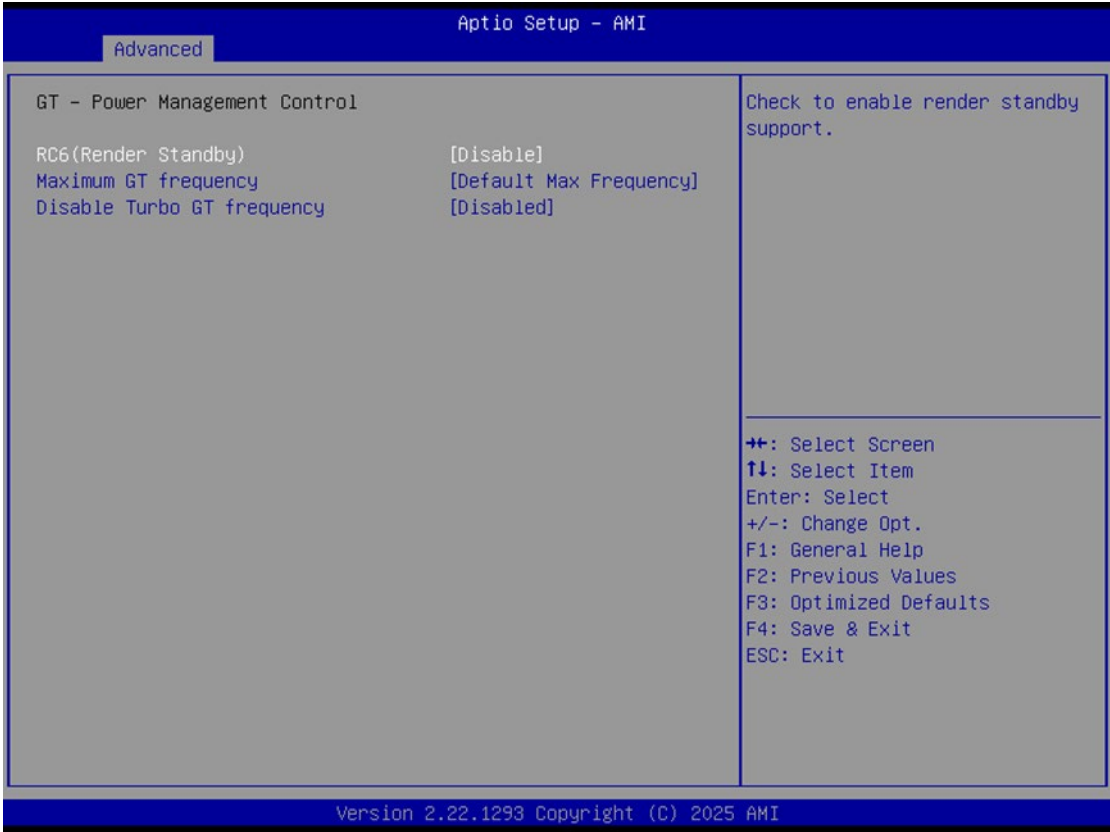


CPU – Power Management Control



Feature	Options	Description
Boot performance mode	Max Battery Max Non-Turbo Performance Turbo Performance"	Select the performance state that the BIOS will set starting from reset vector.
Intel(R) SpeedStep(tm)	Disabled Enabled	Allows more than two frequency ranges to be supported.
C states	Disabled Enabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

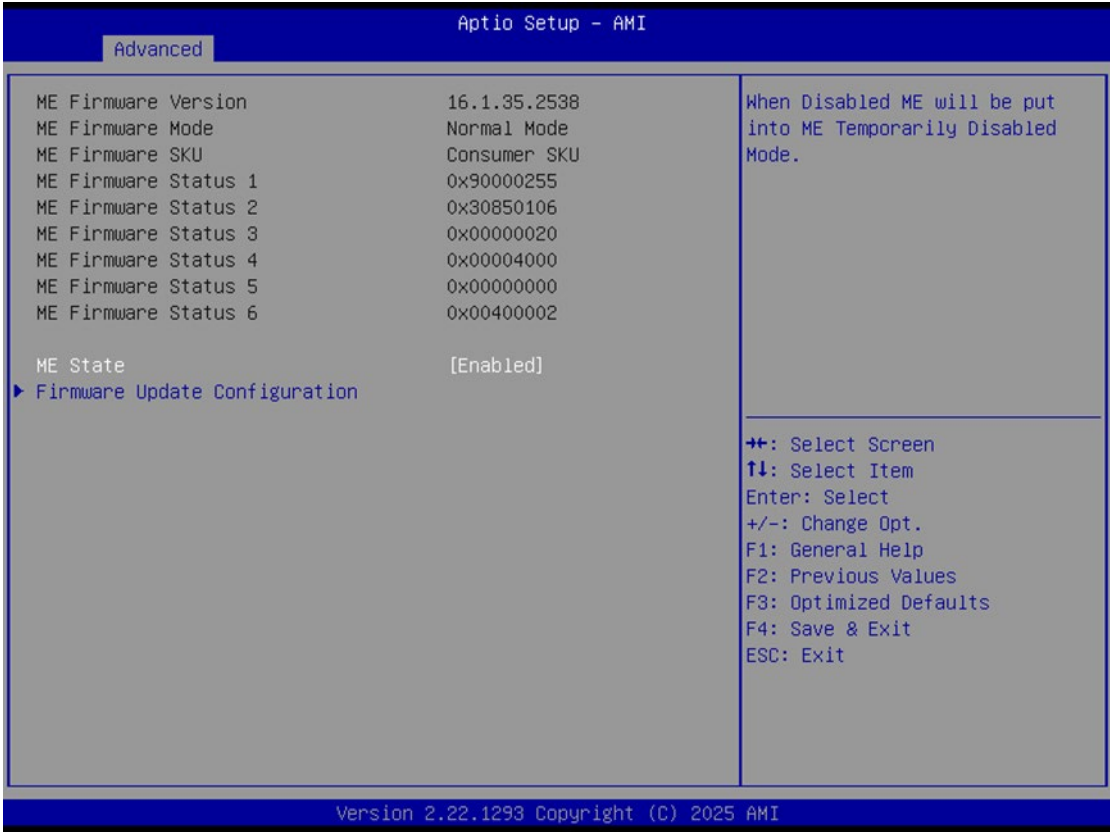
GT – Power Management Control



Feature	Options	Description
RC6 (Render Standby)	Disabled	Check to enable render standby support.
	Enabled	
Maximum GT frequency	100Mhz	Auto Updated
	150Mhz	
	200Mhz	
	250Mhz	
	300Mhz	
	350Mhz	
	400Mhz	
	450Mhz	
	500Mhz	
	550Mhz	
	600Mhz	
	650Mhz	
	700Mhz	
	750Mhz	
	800Mhz	
	850Mhz	
	900Mhz	

	950Mhz 1000Mhz 1050Mhz 1100Mhz 1150Mhz 1200Mhz Default Max- Frequency	
Disable Turbo GT frequency	Disabled Enabled	Enabled: Disables Turbo GT frequency. Disabled: GT frequency is not limited

PCH-FW Configuration



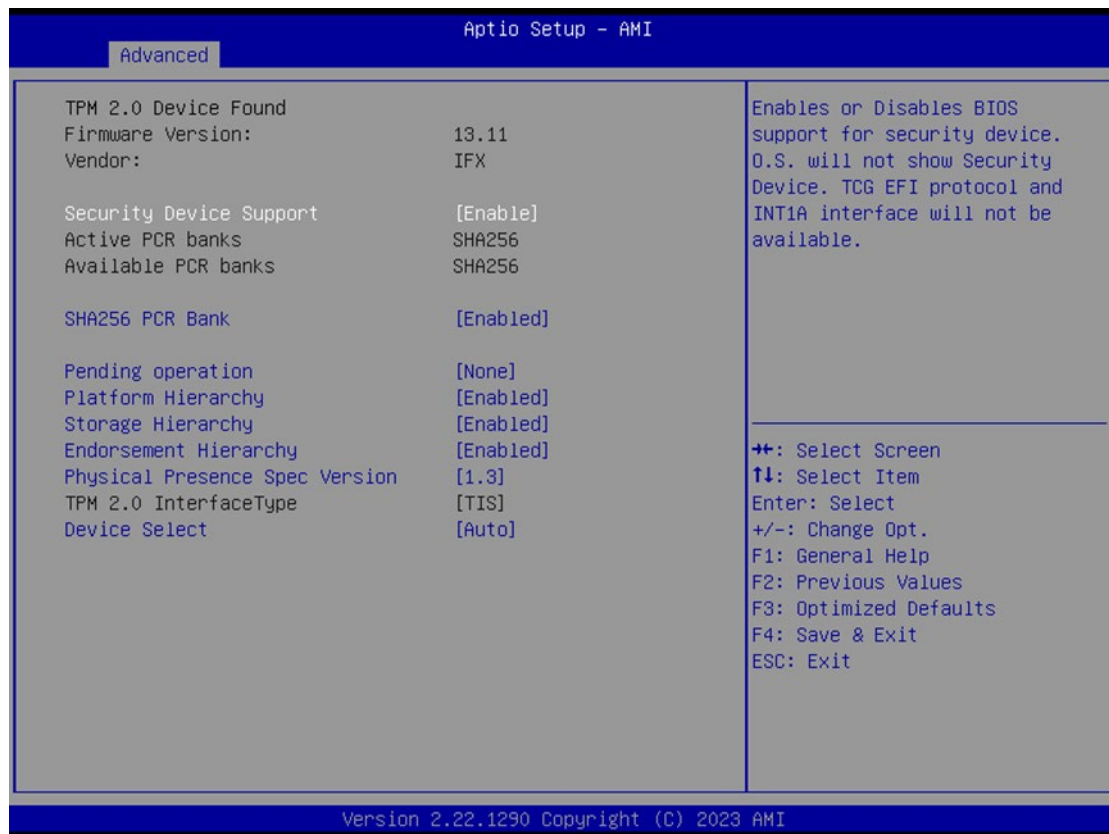
Feature	Options	Description
ME State	Disabled Enabled	When Disabled ME will be put into ME Temporarily Disabled Mode.

PCH-FW Configuration



Feature	Options	Description
Me FW Image Re-Flash	Disabled Enabled	Enable/Disable Me FW Image Re-Flash function.

Trusted Computing

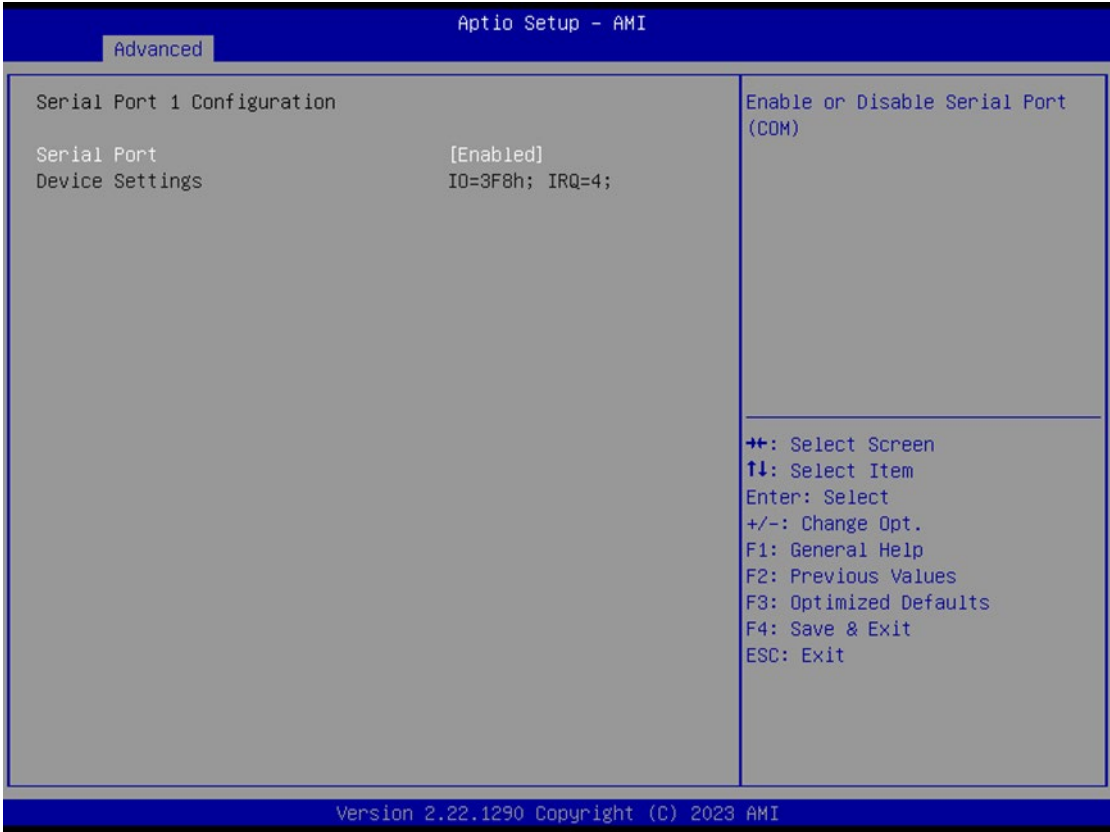


Feature	Options	Description
Security Device Support	Enabled Disabled	Enables or disables BIOS support for security device. By disabling this function, OS will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
SHA256 PCR Bank	Enabled Disabled	Enables or disables SHA256 PCR Bank.
Pending operation	None TPM Clear	Schedules an Operation for the Security Device. NOTE: Your computer will reboot during restart in order to change State of Security Device.
Platform Hierarchy	Enabled Disabled	Enables or disables Platform Hierarchy.
Storage Hierarchy	Enabled Disabled	Enables or disables Storage Hierarchy.
Endorsement Hierarchy	Enabled Disabled	Enables or disables Endorsement Hierarchy.
Physical Presence Spec Version	1.2 1.3	Select to tell OS to support PPI Spec Version 1.2 or 1.3. NOTE: Some HCK tests might not support 1.3.
TPM 20 InterfaceType	TIS	Select TPM 20 Device for the Communication Interface.
Device Select	TPM 1.2 TPM 2.0 Auto	TPM 1.2 will restrict support to TPM 1.2 devices; while TPM 2.0 will restrict support to TPM 2.0 devices; Auto will support both with the default set to TPM 2.0 devices. If not found, TPM 1.2 devices will be enumerated.

Super IO Configuration

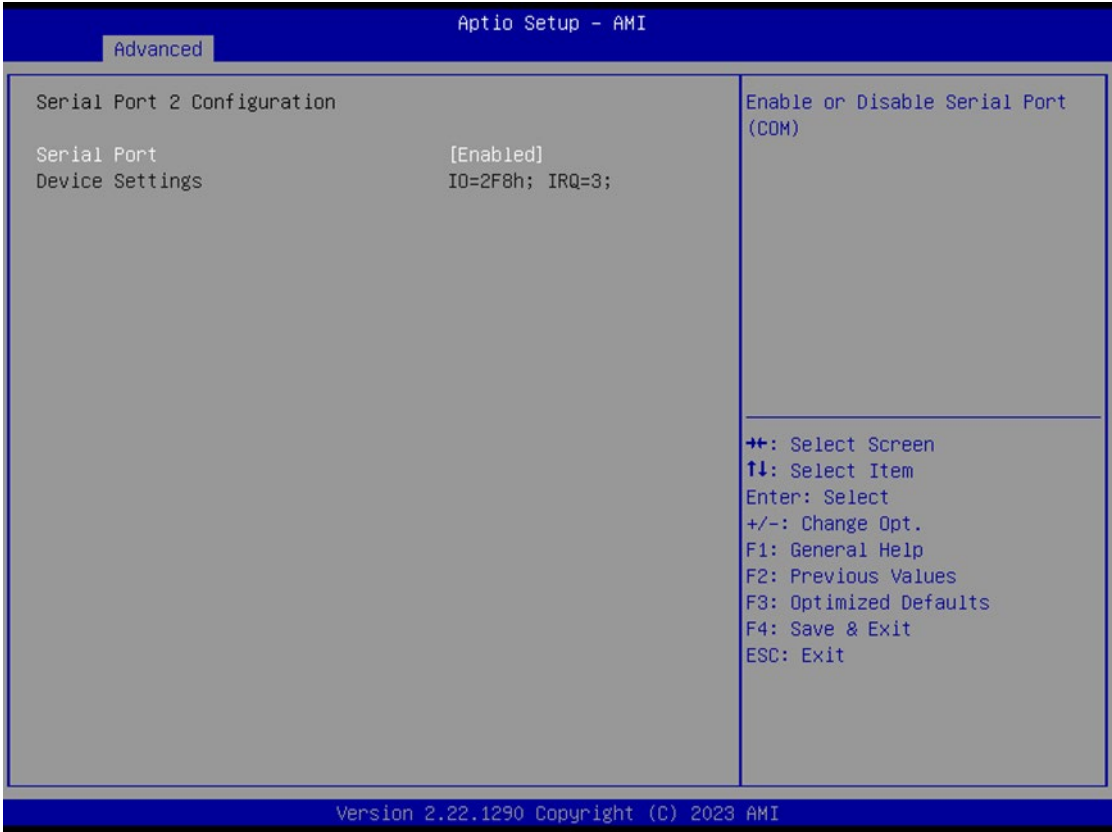


Serial Port 1 Configuration



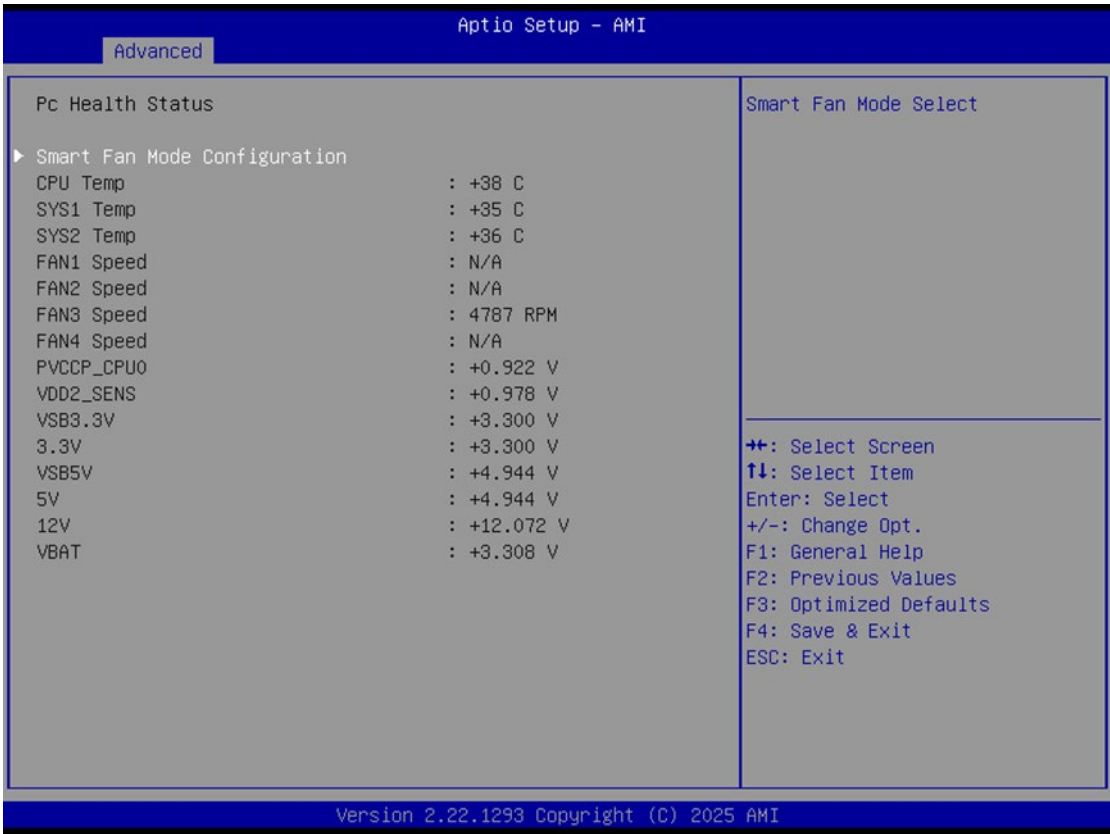
Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 1.
Device Settings	NA	IO=3F8h; IRQ = 4

Serial Port 2 Configuration

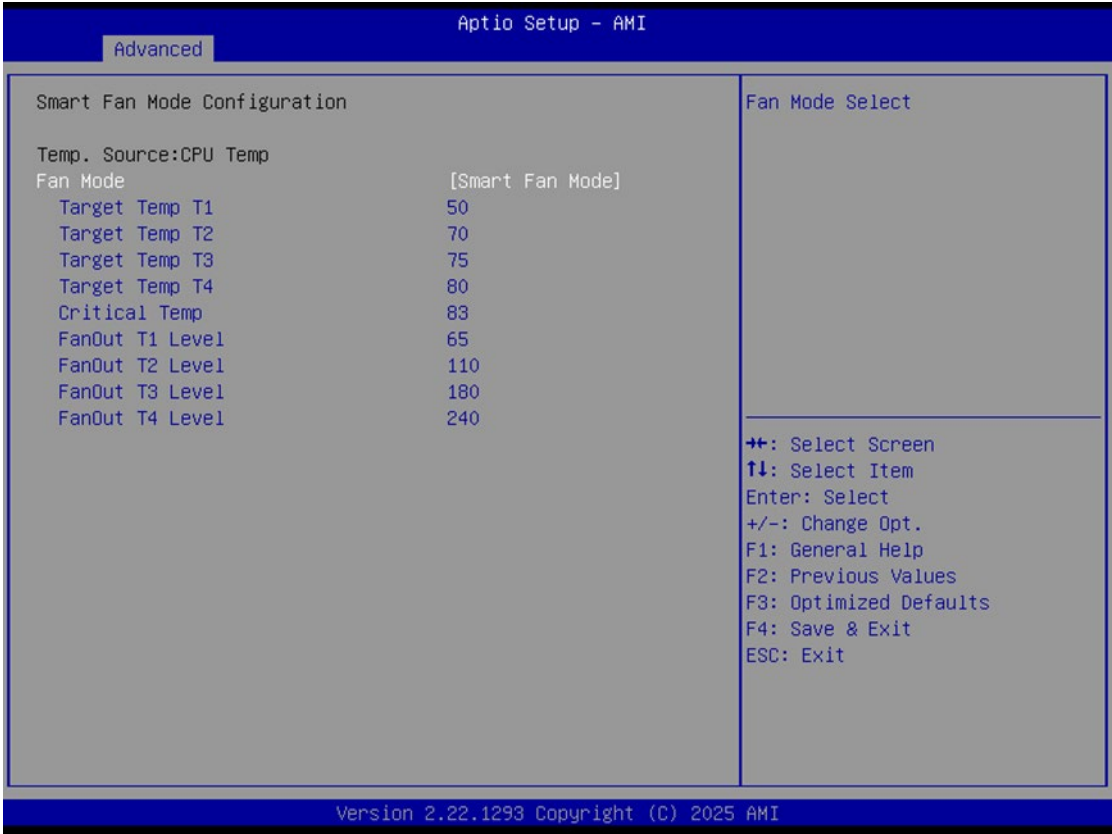


Feature	Options	Description
Serial Port	Enabled Disabled	Enables or disables Serial Port 2.
Device Settings	NA	IO=2F8h; IRQ = 3

H/W Monitor



Smart Fan Mode Configuration



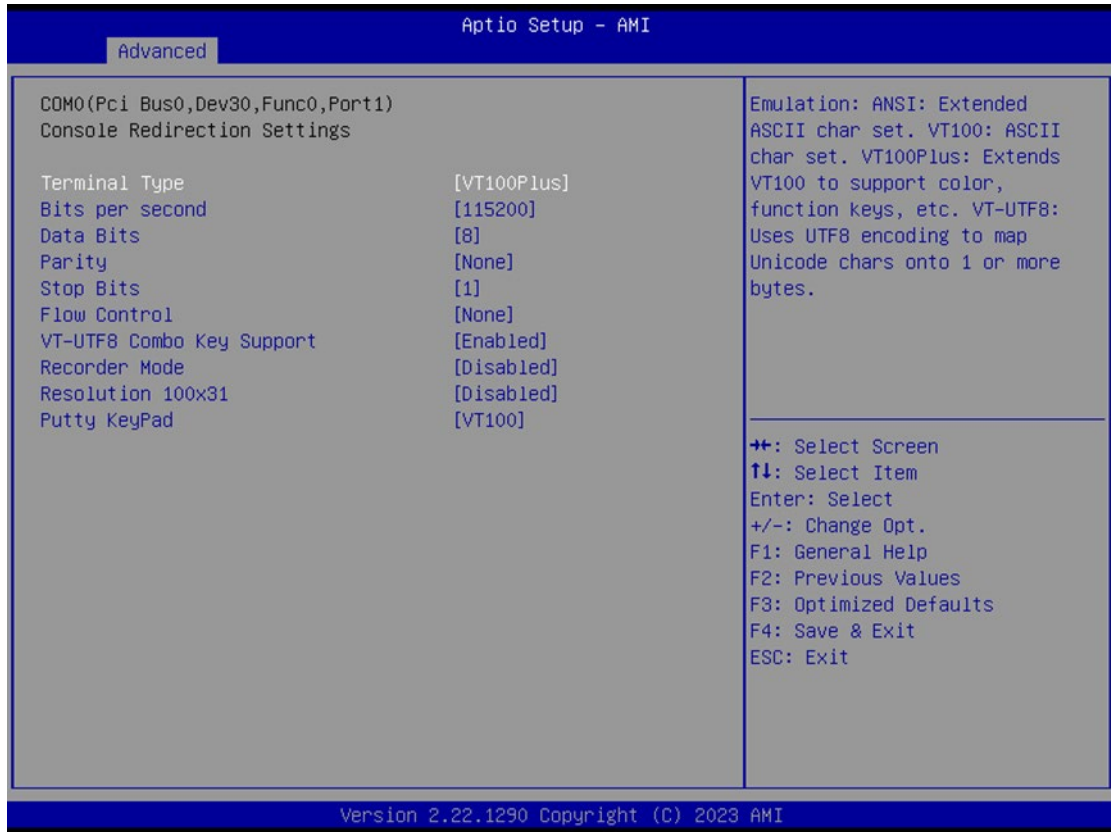
Feature	Options	Description
Fan Mode	Smart Fan Mode Disabled	Fan Mode Select

Serial Port Console Redirection



Feature	Options	Description
COM0 Console Redirection	Enabled Disabled	Enables or disables Console Redirection

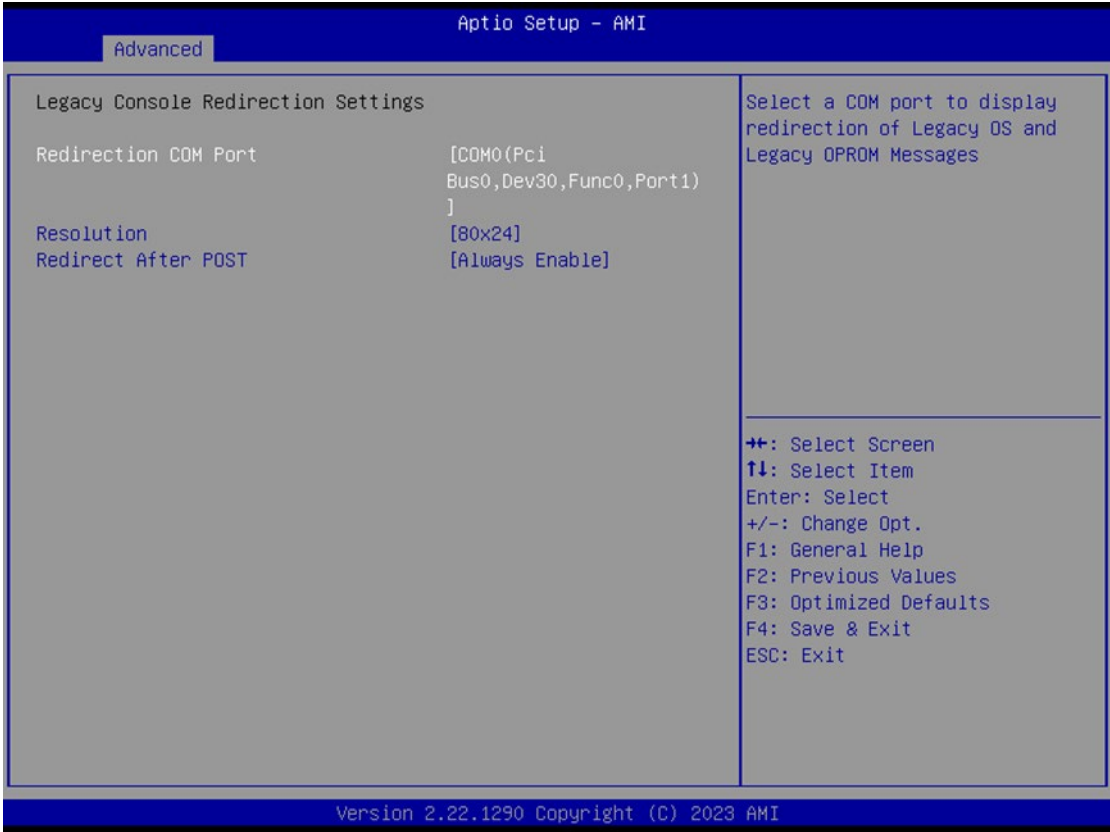
Console Redirection Settings



Feature	Options	Description
Terminal Type	VT100 VT100Plus VT-UTF8 ANSI	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100Plus: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600 19200 38400 57600 115200	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	7 8	Data Bits
Parity	None Even Odd Mark Space	A parity bit can be sent with the data bits to detect some transmission errors.
Stop Bits	1 2	Indicates the end of a serial data packet.
Flow Control	None Hardware RTS/CTS	Flow Control can prevent data loss from buffer overflow.

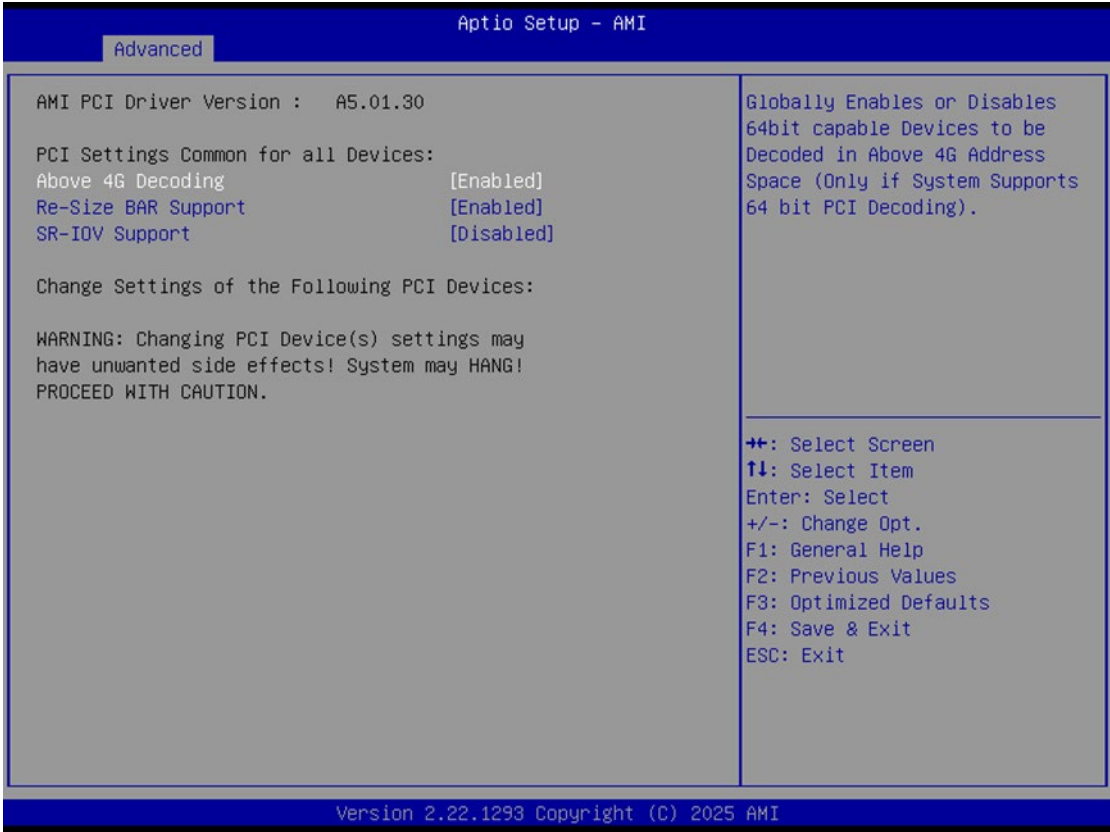
VT-UTF8 Combo Key Support	Disabled Enabled	Enables VT-UTF8 Combination Key Support for ANSI/VT100 terminals
Recorder Mode	Disabled Enabled	With this mode enabled, only text will be sent. This is to capture Terminal data.
Resolution 100x31	Disabled Enabled	Enables or disables extended terminal resolution
Putty KeyPad	VT100 LINUX XTERM86 SCO ESCN VT400	Selects Function Key and Key Pad on Putty.

Legacy Console Redirection Settings



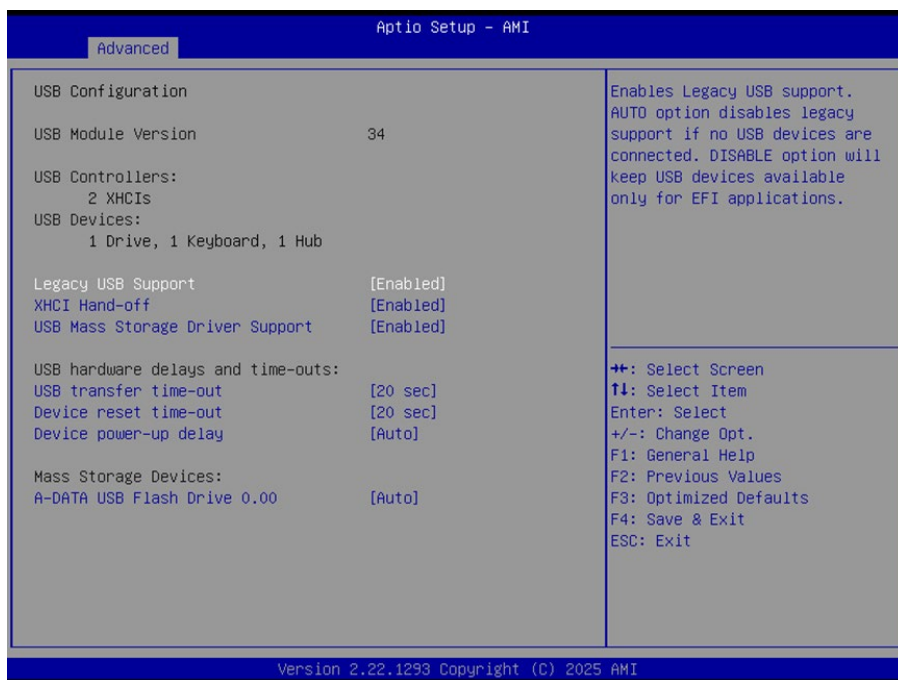
Feature	Options	Description
Redirection COM Port	COM0	Select a COM port to display redirection of Legacy OS and Legacy OPRM Messages.
Resolution	80x24 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
Redirection After BIOS POST	Always Enable BootLoader	When Bootloader is selected, Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for legacy OS. Default setting for this option is set to Always Enable .

PCI Subsystem Settings



Feature	Options	Description
Above 4G Decoding	Disabled Enabled	Globally Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports 64 bit PCI Decoding).
Re-Size BAR Support	Disabled Enabled	If system has Resizable BAR capable PCIe Devices, this option Enables or Disables Resizable BAR Support.
SR-IOV Support	Disabled Enabled	If system has SR-IOV capable PCIe Devices, this option Enables or Disables Single Root IO Virtualization Support.

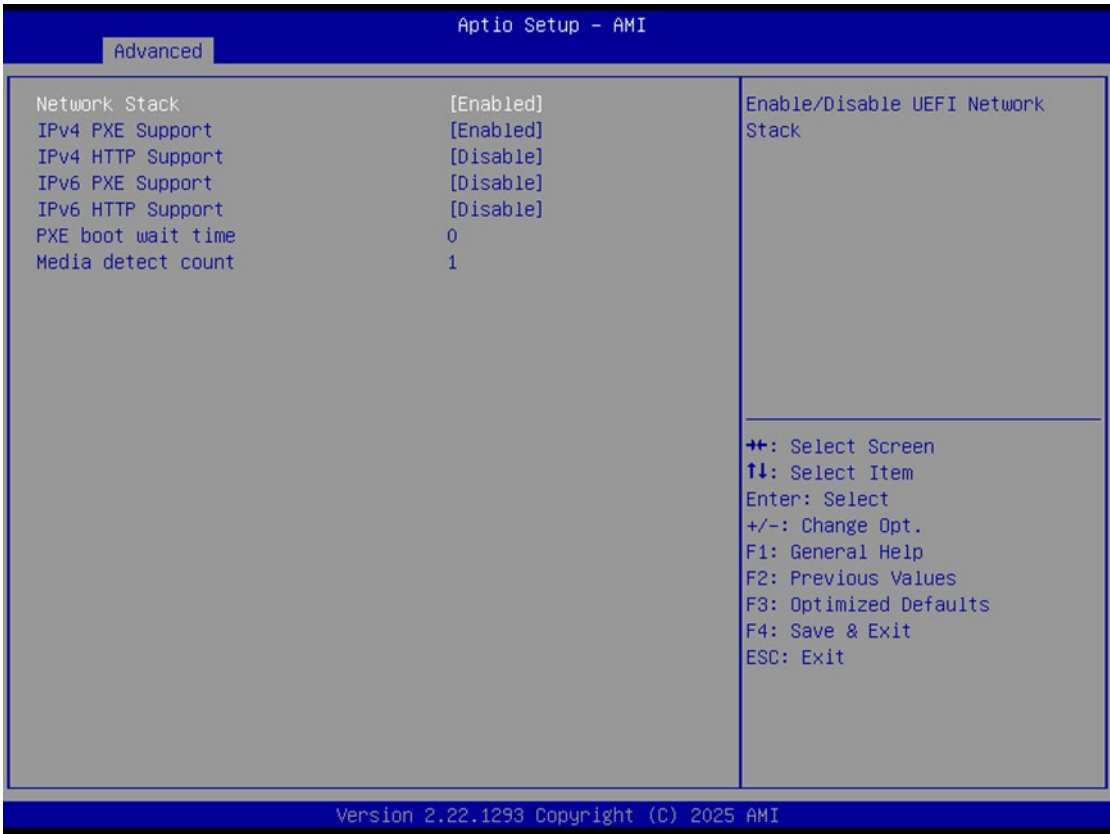
USB Configuration



Feature	Options	Description
Legacy USB Support	Enabled Disabled Auto	Enables Legacy USB support. Auto option disables legacy support if no USB devices are connected; Disabled option will keep USB devices available only for EFI applications.
XHCI Hand-off	Enabled Disabled	This is a workaround for OSES without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
USB Mass Storage Driver Support	Enabled Disabled	Enables or disables USB Mass Storage Driver Support.
USB transfer time-out	1 sec 5 sec 10 sec 20 sec	The time-out value for Control, Bulk, and Interrupt transfers
Device reset time-out	1 sec 5 sec 10 sec 20 sec	USB mass storage device Start Unit command time-out
Device power-up delay	Auto 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.

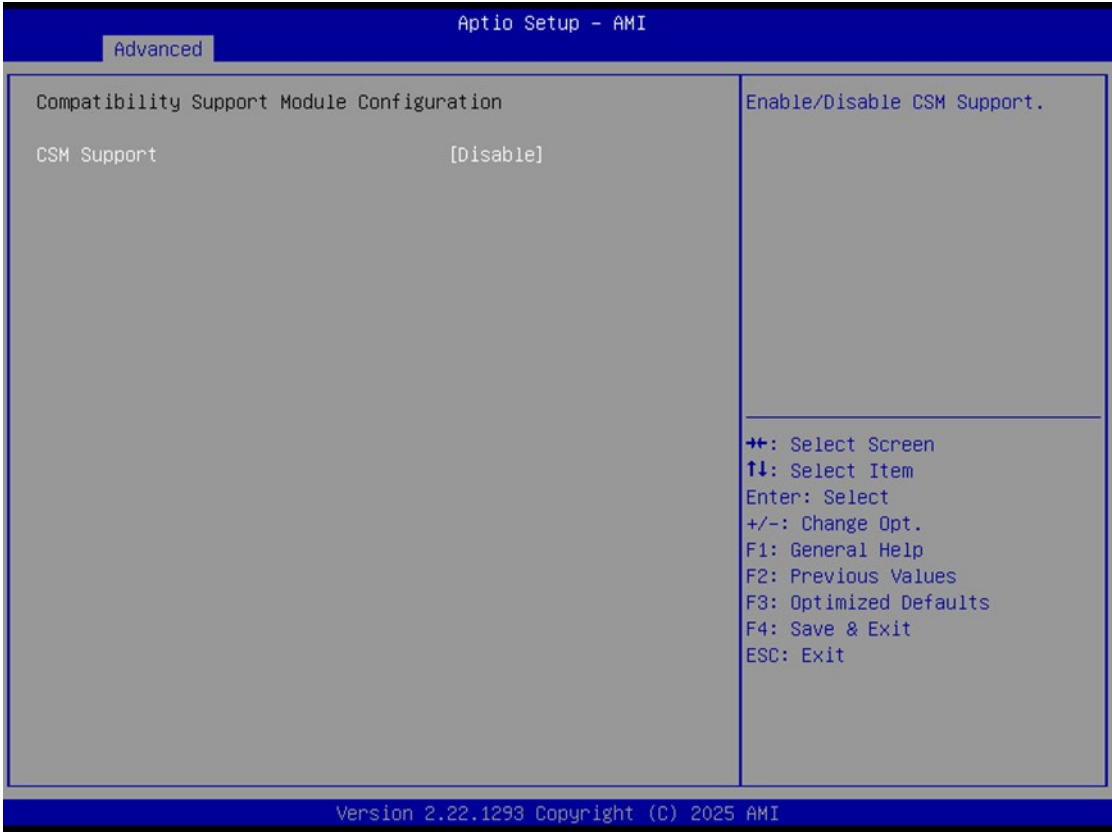
NOTE: The "Mass Storage Devices" section may bring up virtual devices from the BMC. It is built under the implement DC-SCM board.

Network Stack Configuration



Feature	Options	Description
Network Stack	Disabled Enabled	Enables or disables UEFI Network Stack
IPv4 PXE Support	Disabled Enabled	Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.
IPv4 HTTP Support	Disabled Enabled	Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.
IPv6 PXE Support	Disabled Enabled	Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.
IPv6 HTTP Support	Disabled Enabled	Enable/Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.
PXE boot wait time	0	Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.
Media detect count	1	Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

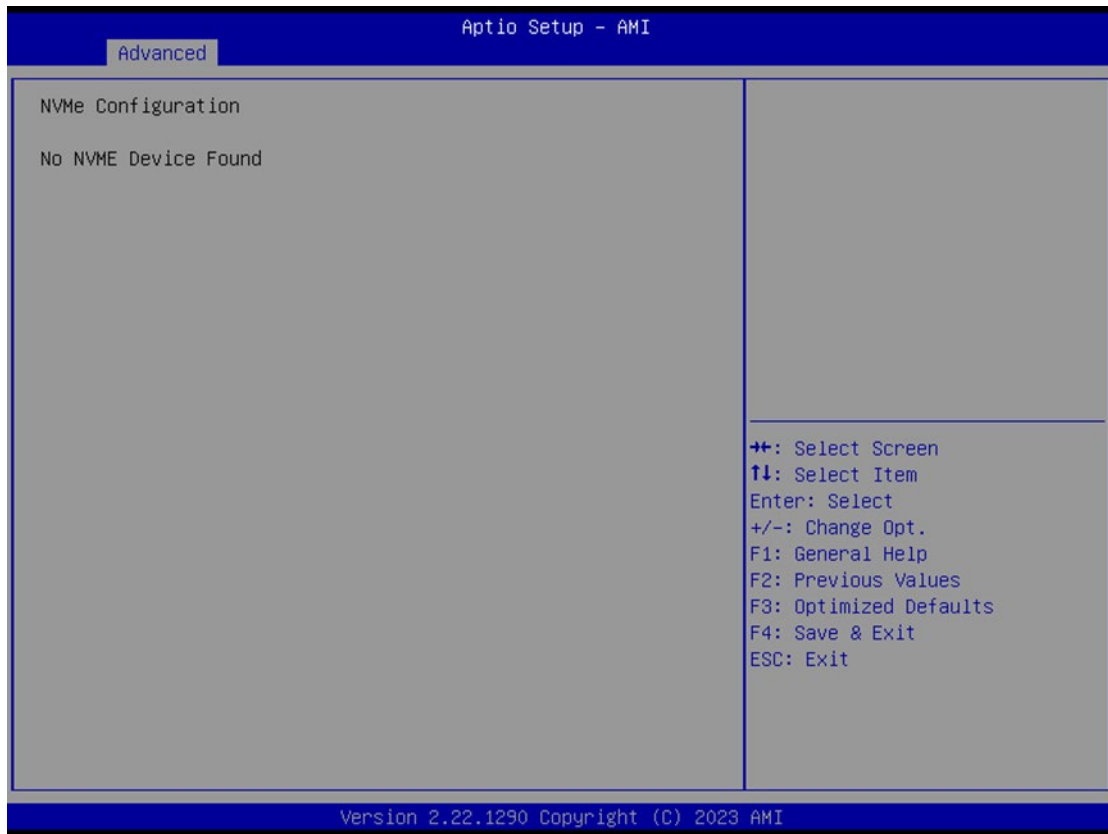
CSM Configuration



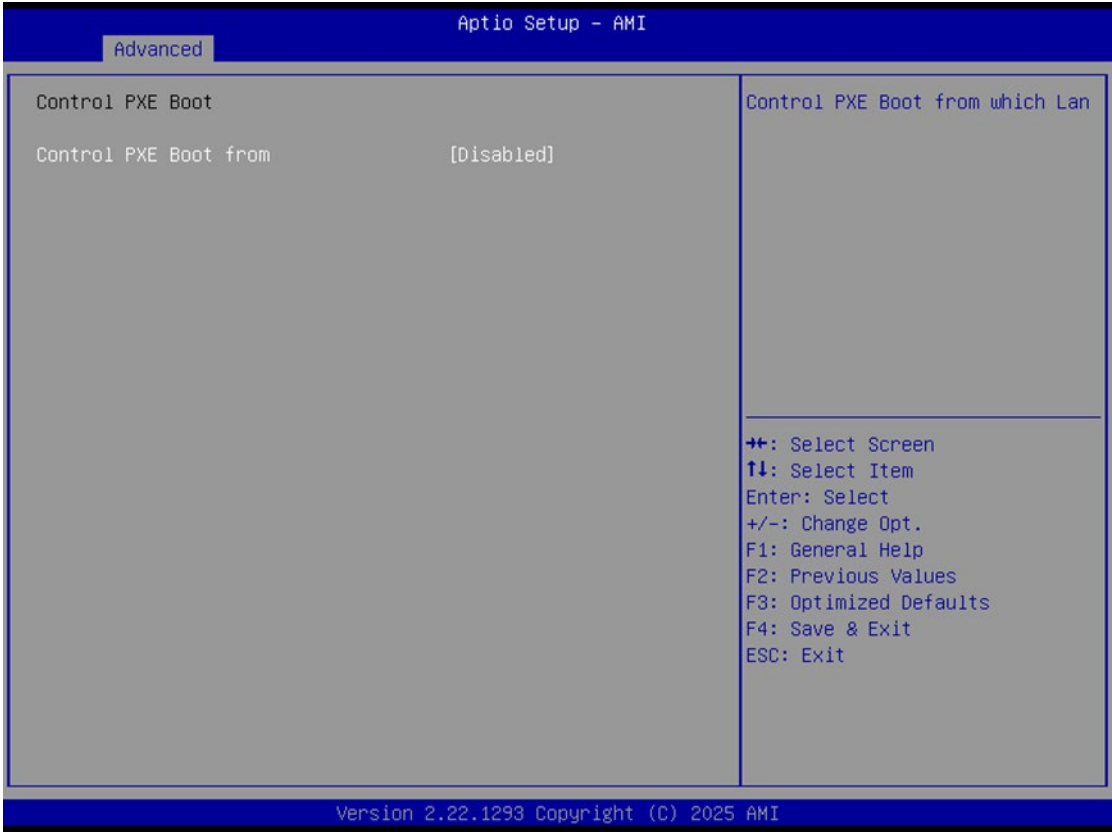
Feature	Options	Description
CSM Support	Disabled Enabled	Enables or disables CSM Support

NOTE: UEFI mode is the default value. You can choose Legacy mode, but Legacy VGA/onboard LAN will not be support.

NVMe Configuration



Control PXE Boot



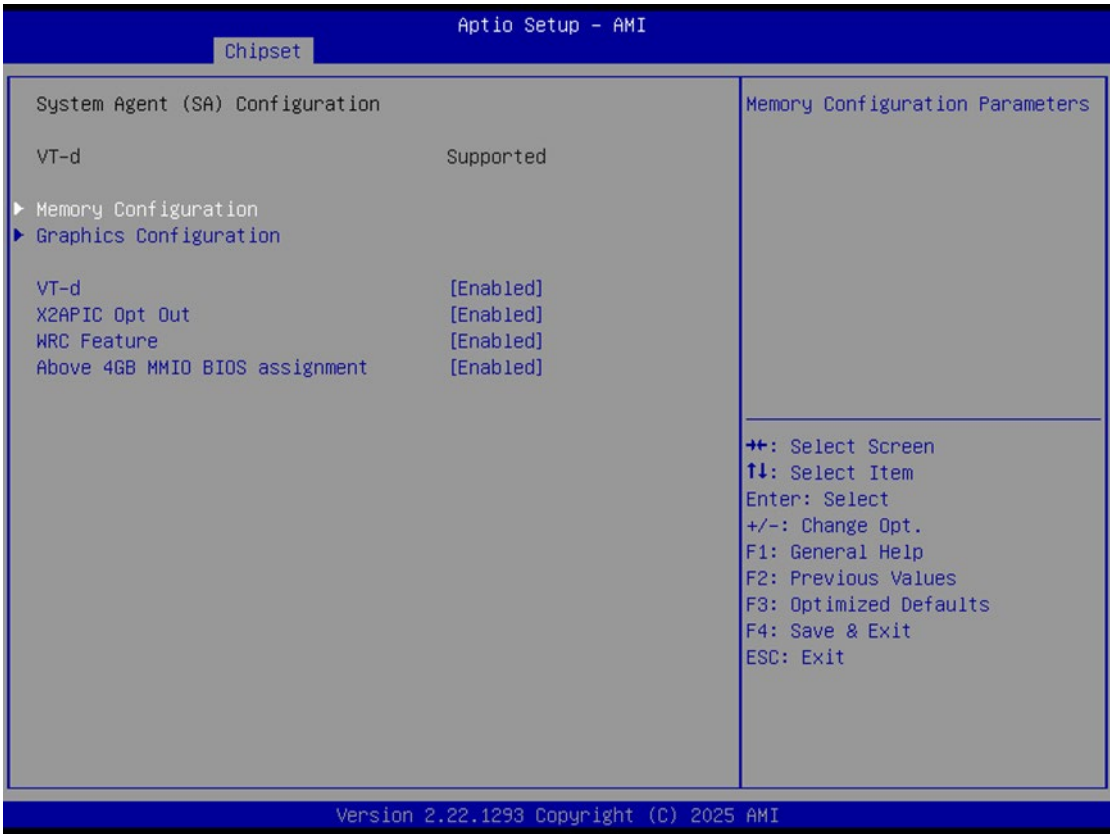
Feature	Options	Description
Control PXE Boot from	Disabled Enabled	Enable/Disable PXE function

Chipset

Select the **Chipset** menu item from the BIOS setup screen to enter the Chipset Setup screen. Users can select any of the items in the left frame of the screen.

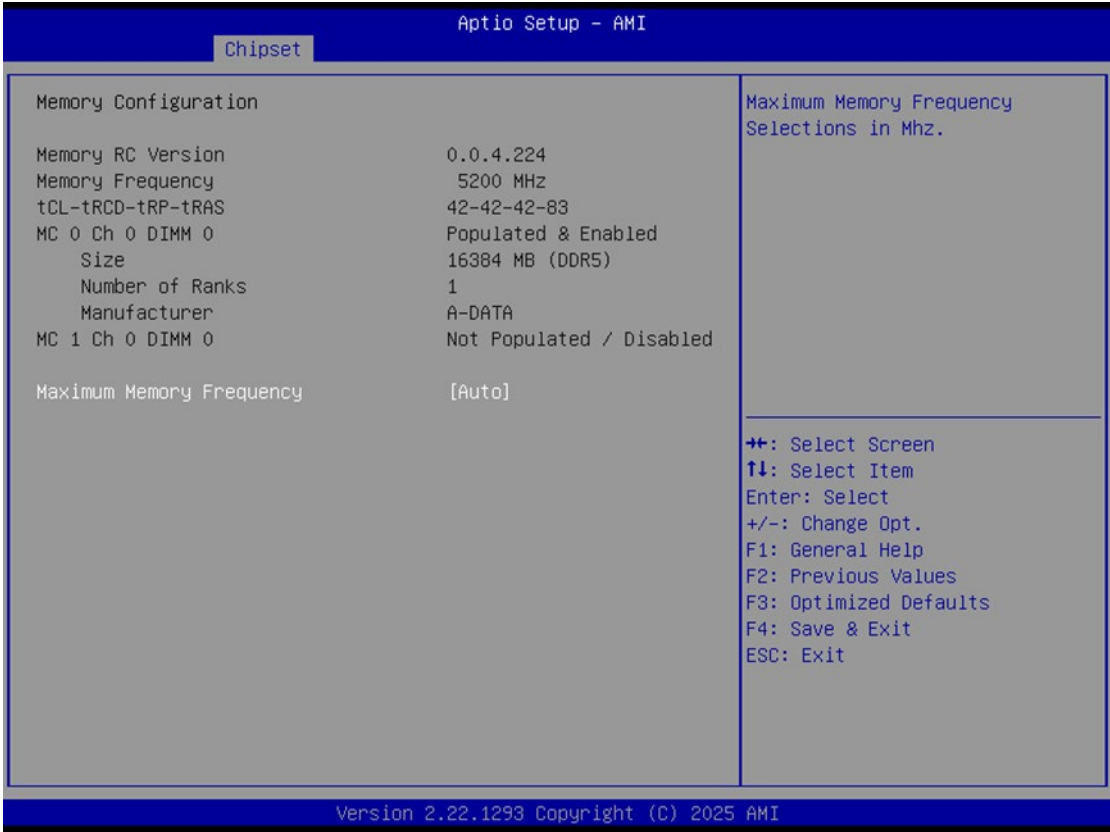


System Agent (SA) Configuration



Feature	Options	Description
VT-d	Disabled Enabled	VT-d capability
X2APIC Opt Out	Disabled Enabled	Enable/Disable X2APIC_OPT_OUT bit
WRC Feature	Disabled Enabled	Enable/Disable SA WRC (Write Cache) Feature of IOP. When enabled, supports IO devices allocating onto the ring and into LLC.
Above 4GB MMIO BIOS assignment	Disabled Enabled	Enable/Disable above 4GB MemoryMappedIO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB.

Memory Configuration



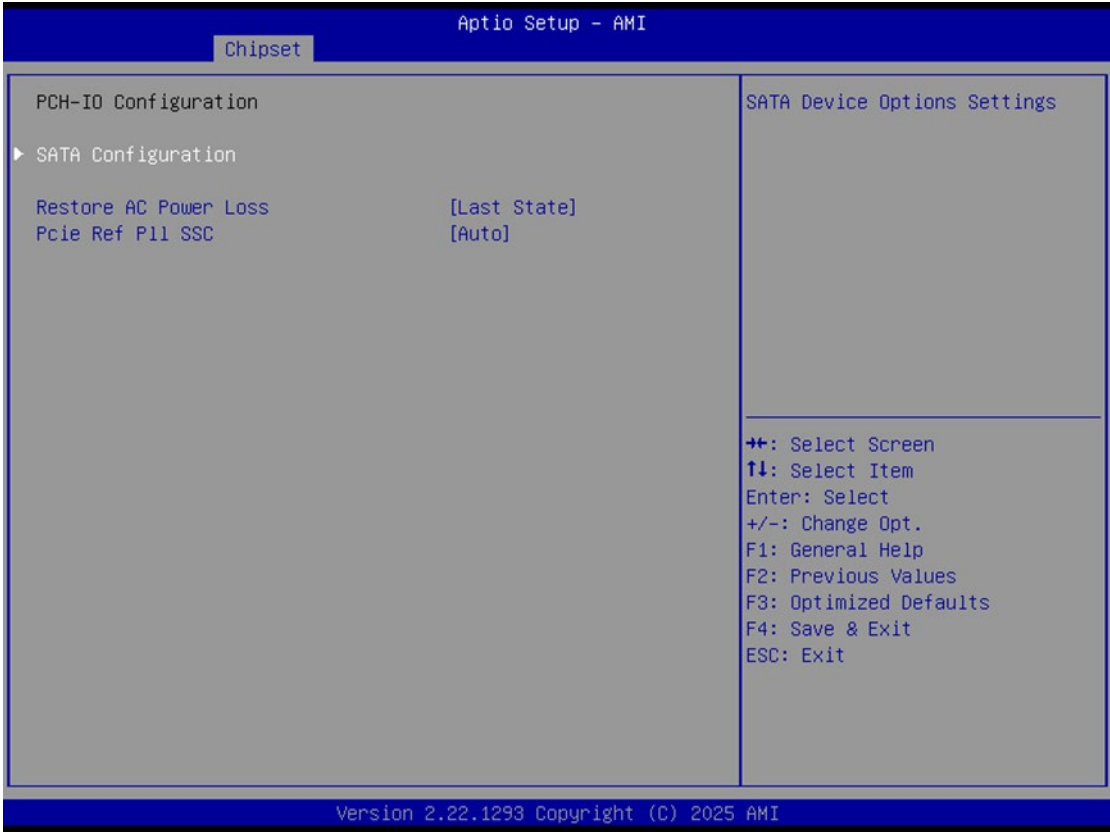
Feature	Options	Description
Maximum Memory Frequency	Auto	Maximum Memory Frequency Selections in Mhz.
	1067	
	~	
	12800	

Graphics Configuration



Feature	Options	Description
Skip Scanning of External Gfx Card	Disabled Enabled	If Enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports
Primary Display	Auto IGFX PEG Slot PCH PCI HG	Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select HG for Hybrid Gfx.

PCH-IO Configuration



Feature	Options	Description
Restore AC Power Loss	Power On Power Off Last state	Select S0/S5 for ACPI state after a G3
Pcie Ref Pll SSC	Auto 0.0% 0.1% 0.2% 0.3% 0.4% 0.5% Disabled	Pcie Ref Pll SSC Percentatge. AUTO - Keep hw default, no BIOS override. Range is 0.0%-0.5%

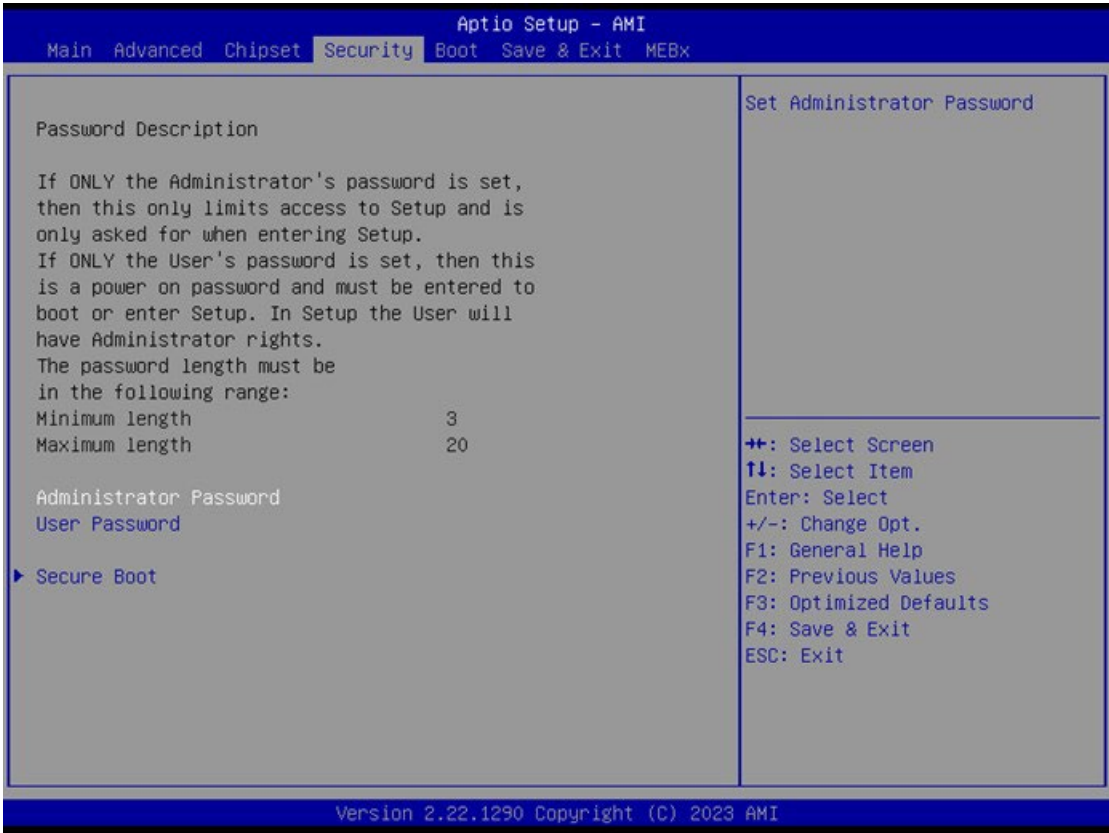
SATA Configuration



Feature	Options	Description
SATA Controller(s)	Enabled Disabled	Enable/Disable SATA Device.

Security

Select the **Security** menu item from the BIOS setup screen to enter the Security Setup screen. Users can select any of the items in the left frame of the screen.



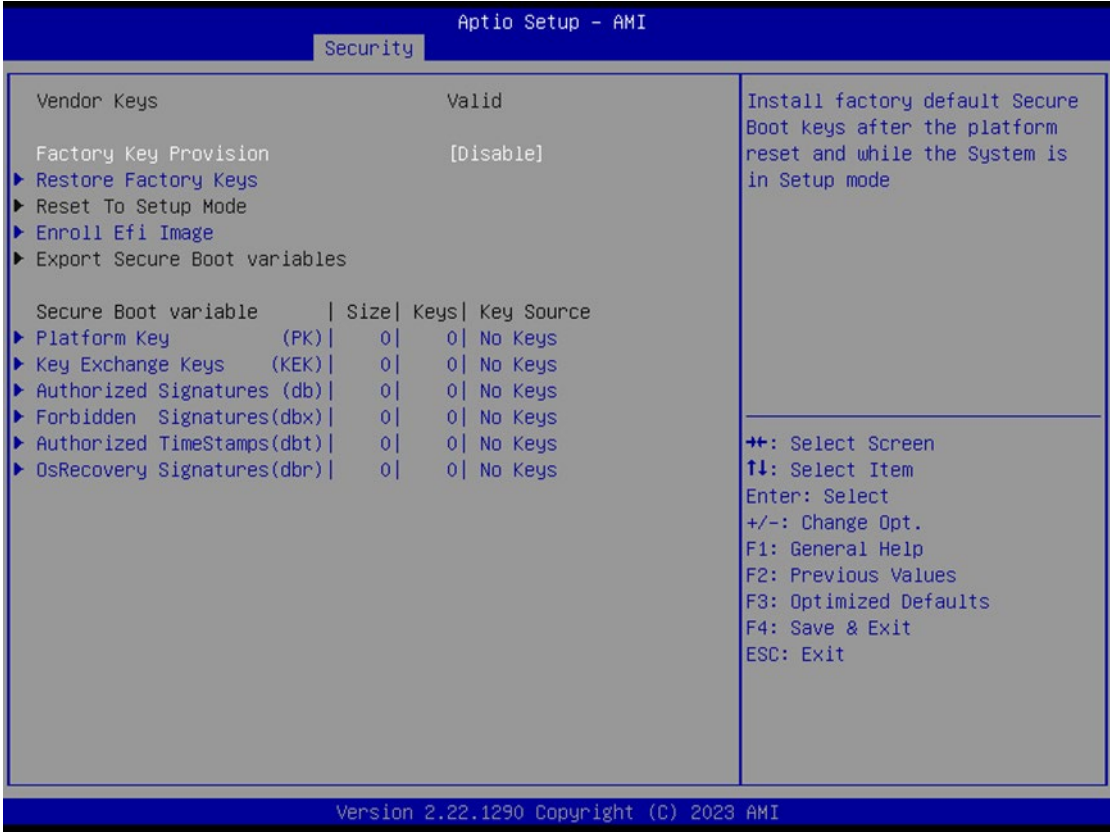
Feature	Description
Administrator Password	If ONLY the Administrator's password is set, it only limits access to Setup and is only asked for when entering Setup.
User Password	If ONLY the User's password is set, it serves as a power-on password and must be entered to boot or enter Setup. In Setup, the User will have Administrator rights.

Secure Boot



Feature	Options	Description
Secure Boot	Disabled Enabled	Secure Boot is activated when Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.
Secure Boot Mode	Standard Custom	Customizable Secure Boot mode: In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

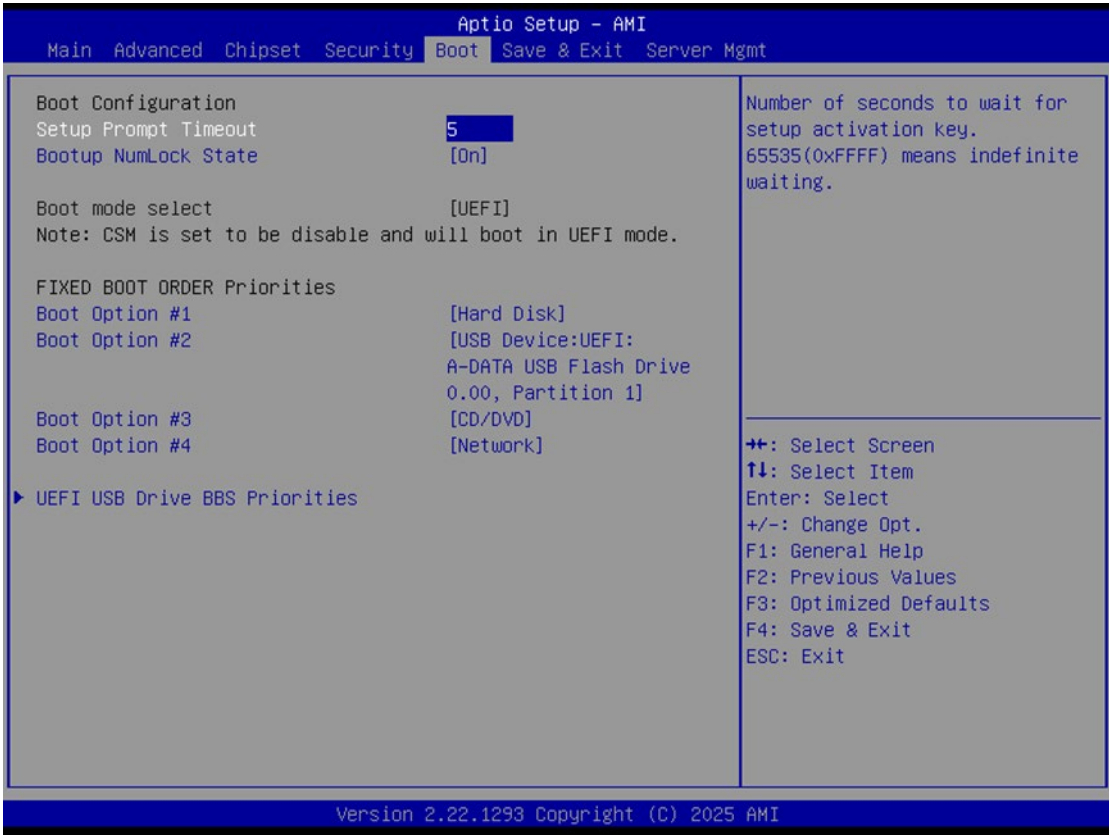
Key Management



Feature	Options	Description
Factory Key Provision	Disabled Enabled	Provision factory default keys on next re-boot only when System in Setup Mode.
Restore Factory keys	None	Force System to User Mode. Configure NVRAM to contain OEM-defined factory default Secure Boot keys.
Enroll Efi Image	None	Allows the image to run in Secure Boot mode. Enroll SHA256 hash of the binary into Authorized Signature Database (db)

Boot Menu

Select the **Boot** menu item from the BIOS setup screen to enter the Boot Setup screen. Users can select any of the items in the left frame of the screen.

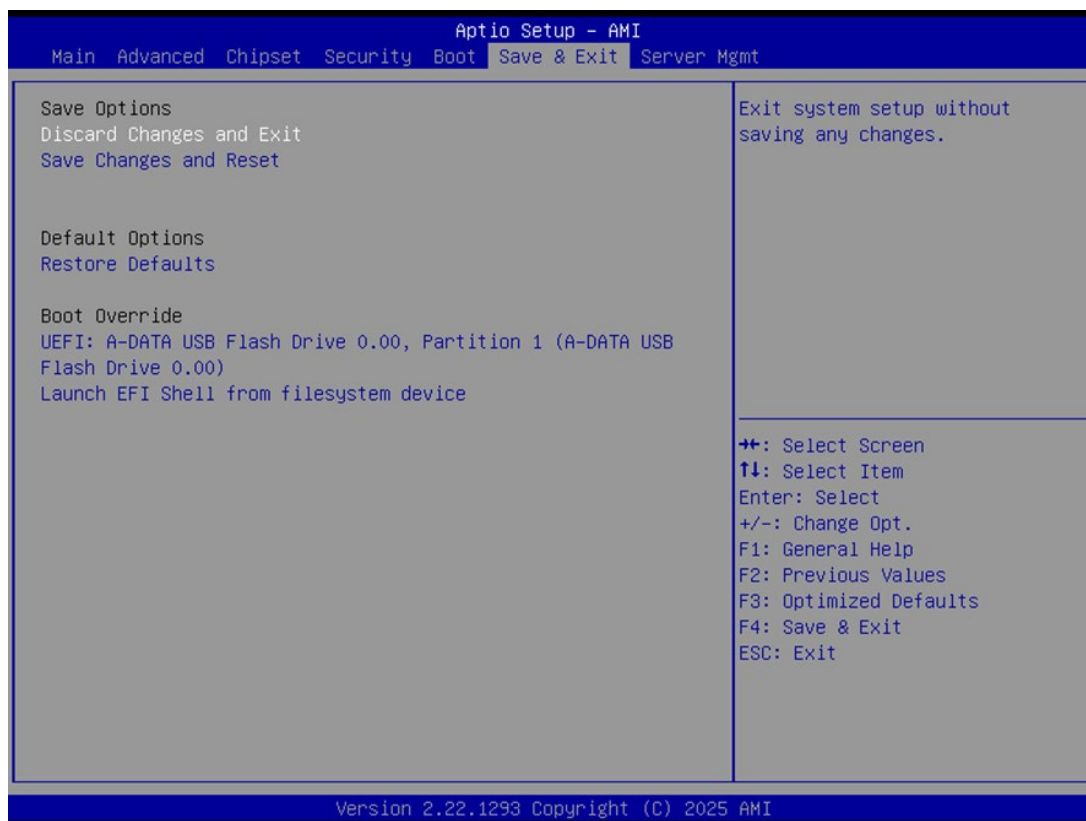


Feature	Options	Description
Setup Prompt Timeout	5	The number of seconds to wait for setup activation key. 65535 means indefinite waiting.
Bootup NumLock State	On Off	Select the keyboard NumLock state
Boot mode select	LEGACY UEFI	Select boot mode for LEGACY or UEFI.

- Choose boot priority from boot option group.
- Choose specific boot device priority sequence from available Group device.

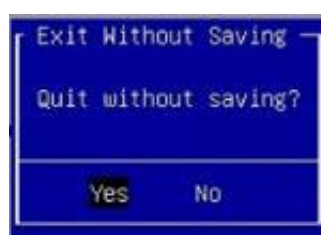
Save and Exit Menu

Select the **Save and Exit** menu item from the BIOS setup screen to enter the Save and Exit Setup screen. Users can select any of the items in the left frame of the screen.



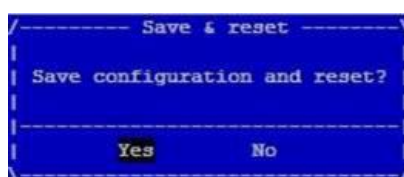
■ Discard Changes and Exit

Select this option to quit Setup without saving any modifications to the system configuration. The following window will appear after the **“Discard Changes and Exit”** option is selected. Select **“Yes”** to Discard changes and Exit Setup.



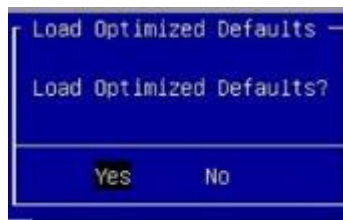
■ Save Changes and Rest

When Users have completed the system configuration changes, select this option to save the changes and exit from BIOS Setup in order for the new system configuration parameters to take effect. The following window will appear after selecting the **“Save Changes and Exit”** option is selected. Select **“Yes”** to Save Changes and Exit Setup.



■ Restore Defaults

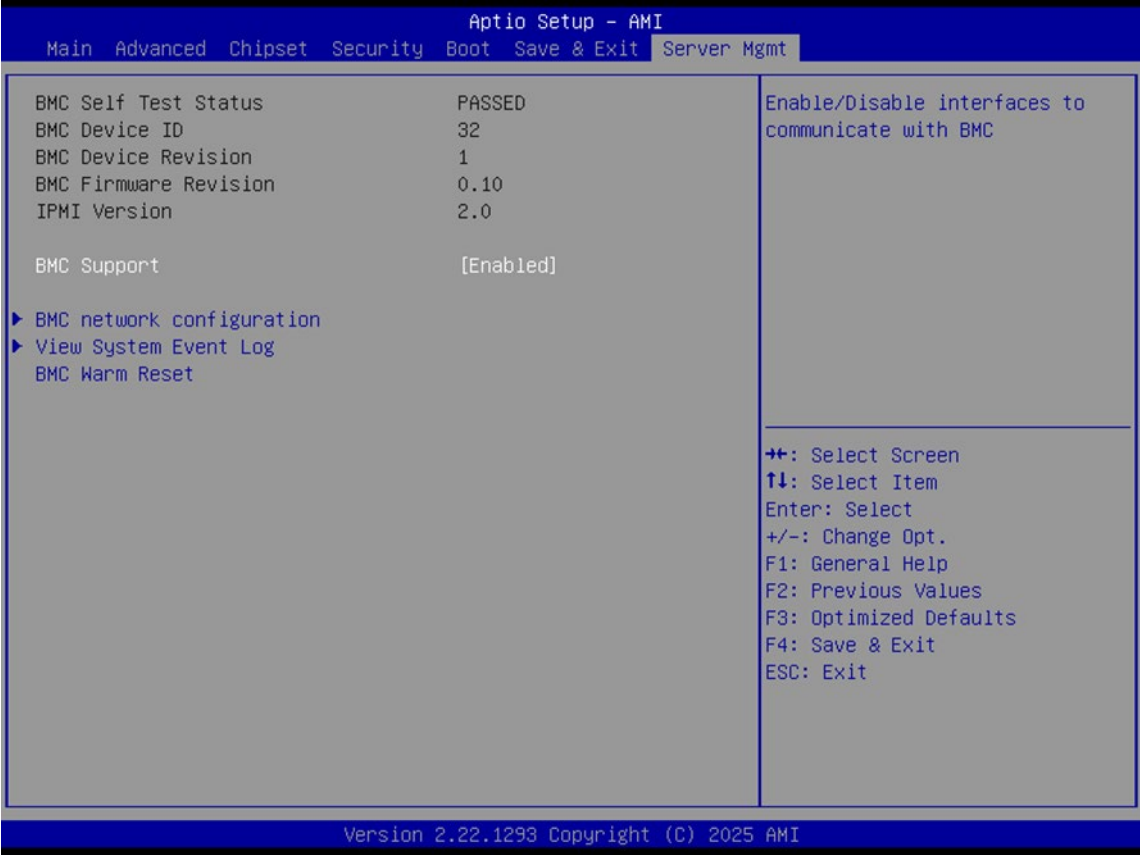
Restore default values for all setup options. Select **“Yes”** to load Optimized defaults.



NOTE: The items under Boot Override may not have the same image as above, as it would depend on the actual devices connected to the system.

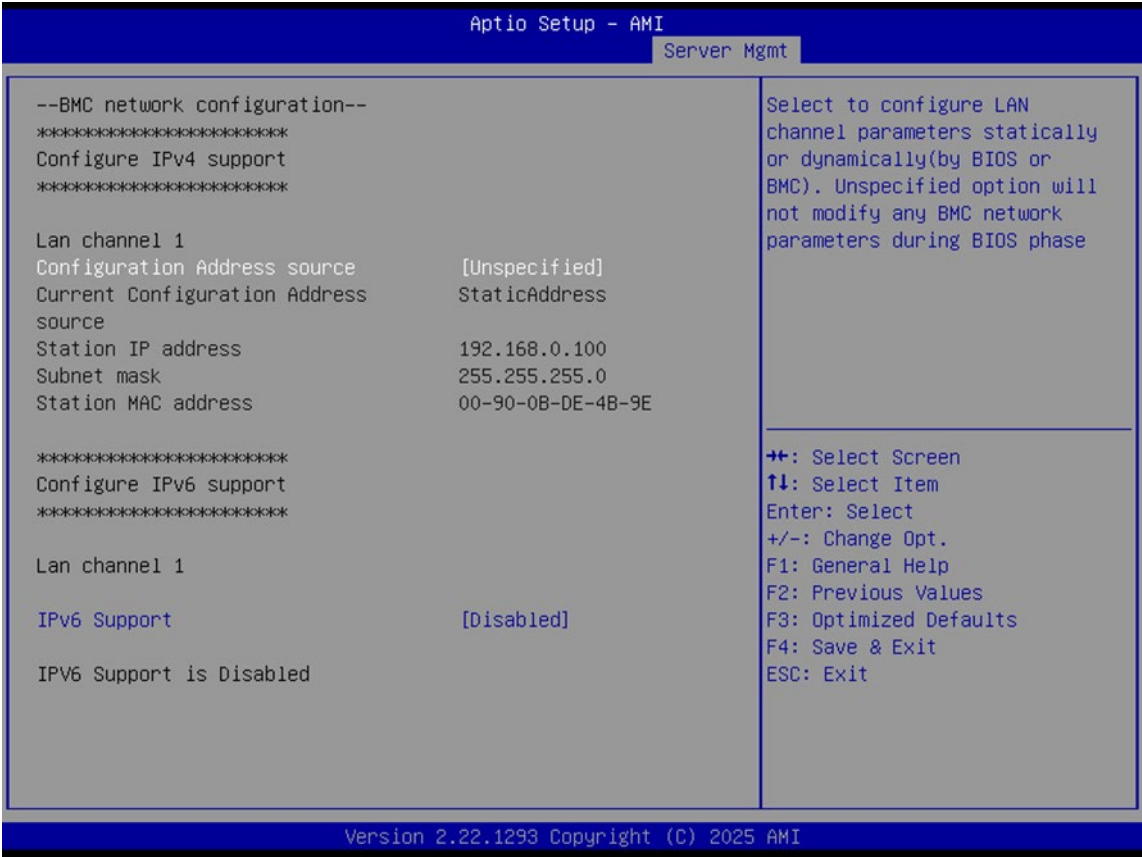
Server Mgmt

Server Mgmt page is ONLY applicable to BIOS on DC-SCM board, because it implements PFR and BMC functions to comply with DC-SCM board.



Feature	Options	Description
BMC Support	Enabled Disabled	Enable/Disable interfaces to communicate with BMC
BMC network configuration	NA	Configure BMC network parameters.
View System Event Log	NA	Press <Enter> to view the System Event Log Records.
BMC Warm Reset	NA	Press <Enter> to do Warm Reset BMC.

BMC Network Configuration



Feature	Options	Description
Configuration Address source	Unspecified 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
IPV6 Support	Enabled Disabled	Enable or Disable LAN1 IPV6 Support

APPENDIX A: TERMS AND CONDITIONS

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after-service freight charges for goods returned to the user.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:
 - ▶ Improper or inadequate maintenance by the customer
 - ▶ Unauthorized modification, misuse, or reversed engineering of the product
 - ▶ Operation outside of the environmental specifications for the product.

RMA Service

Requesting an RMA#

1. To obtain an RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
2. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
3. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
4. Mark the RMA# clearly on the box.



Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:		Reasons to Return: ☐ Repair(Please include failure details)	
		☐ Testing Purpose	
Company:		Contact Person:	
Phone No.		Purchased Date:	
Fax No.:		Applied Date:	
Return Shipping Address: _____			
Shipping by: ☐ Air Freight ☐ Sea ☐ Express _____			
☐ Others: _____			
Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

***Problem Code:**

01: D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

Request Party

Confirmed By Supplier

Authorized Signature / Date

Authorized Signature / Date