

BOXER-6645U-RPL

Fanless Embedded Box PC

User's Manual 1st Ed

Copyright Notice

This document is copyrighted, 2024. All rights are reserved. The original manufacturer reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated, or transmitted in any form or by any means without the prior written permission of the original manufacturer. Information provided in this manual is intended to be accurate and reliable. However, the original manufacturer assumes no responsibility for its use, or for any infringements upon the rights of third parties that may result from its use.

The material in this document is for product information only and is subject to change without notice. While reasonable efforts have been made in the preparation of this document to assure its accuracy, AAEON assumes no liabilities resulting from errors or omissions in this document, or from the use of the information contained herein.

AAEON reserves the right to make changes in the product design without notice to its users.

Acknowledgement

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

- Microsoft Windows® is a registered trademark of Microsoft Corp.
- Intel® is a registered trademark of Intel Corporation.
- Intel Core™ is a trademark of Intel Corporation.
- Linux® is a registered trademark of Linus Torvalds in the U.S. and other countries.
- Ubuntu and Canonical are registered trademarks of Canonical Ltd.

All other product names or trademarks are properties of their respective owners. The publisher of this document does not assume nor imply ownership of any trademarked product not listed herein.

Packing List

Before setting up your product, please make sure the following items have been shipped:

Item	Quantity
● BOXER-6645U-RPL	1
● Wallmount Bracket	2
● 3 Pin DC-In Power Connector	1
● Remote ON/OFF Cable	1
● Screw Package	1

If any of these items are missing or damaged, please contact your distributor or sales representative immediately.

About this Document

This User's Manual contains all the essential information, such as detailed descriptions and explanations on the product's hardware and software features (if any), its specifications, dimensions, jumper/connector settings/definitions, and driver installation instructions (if any), to facilitate users in setting up their product.

Users may refer to the product page at AAEON.com for the latest version of this document.

Safety Precautions

Please read the following safety instructions carefully. It is advised that you keep this manual for future references

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any power supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls.
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
 - i. Damaged power cord or plug
 - ii. Liquid intrusion to the device
 - iii. Exposure to moisture
 - iv. Device is not working as expected or in a manner as described in this manual
 - v. The device is dropped or damaged
 - vi. Any obvious signs of damage displayed on the device
18. Do not leave this device in an uncontrolled environment with temperatures beyond the device's permitted storage temperatures (see chapter 1) to prevent damage.
19. Do NOT disassemble the motherboard so as not to damage the system or void your warranty.
20. If the thermal pad had been damaged, please contact AAEON's salesperson to purchase a new one. Do NOT use those of other brands.
21. The Hex Cylinder Coppers on the front panel are not removable.
22. Repeatedly assemble and disassemble the system may cause damages to the exterior paint and surface and screw holes.
23. Use the right size screwdriver.
24. Use the screwdriver correctly to remove screws from the system.

FCC Statement

Warning!



This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte. Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur. Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON System

QO4-381 Rev.A2

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
外壳	○	○	○	○	○	○
中央处理器 与内存	×	○	○	○	○	○
硬盘	×	○	○	○	○	○
液晶模块	×	○	○	○	○	○
光驱	×	○	○	○	○	○
触控模块	×	○	○	○	○	○
电源	×	○	○	○	○	○
电池	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。
○：表示该有毒有害物质在该部件所有均质材料中的含量均在 GB/T 26572 标准规定的限量要求以下。
×：表示该有害物质的某一均质材料超出了 GB/T 26572 的限量要求，然而该部件仍符合欧盟指令 2011/65/EU 的规范。
环保使用期限(EFUP (Environmental Friendly Use Period))：10 年
备注：
一、此产品所标示之环保使用期限，系指在一般正常使用状况下。
二、上述部件物质中央处理器、内存、硬盘、光驱、电源为选购品。
三、上述部件物质液晶模块、触控模块仅一体机产品适用。

China RoHS Requirement (EN)

Name and content of hazardous substances in product

AAEON System

QO4-381 Rev.A2

Part Name	Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
PCB Assemblies	×	○	○	○	○	○
Connector and Cable	×	○	○	○	○	○
Chassis	○	○	○	○	○	○
CPU and Memory	×	○	○	○	○	○
Hard Disk	×	○	○	○	○	○
LCD Modules	×	○	○	○	○	○
CD-ROM/DVD-ROM	×	○	○	○	○	○
Touch Modules	×	○	○	○	○	○
Power	×	○	○	○	○	○
Battery	×	○	○	○	○	○
The table is prepared in accordance with the provisions of SJ/T 11364. ○ : Indicates that said hazardous substance contained in all of the homogenous materials for this product is below the limit requirement of GB/T 26572. × : Indicates that said hazardous substance contained in at least one of the homogenous materials used for this part is above the limit requirement of GB/T 26572. But this product still be compliance with 2011/65/EU Directive (allowed with 2011/65/EU Annex III of RoHS exemption with number 6(c),7(a),7(c)-1). EFUP (Environment Friendly Use Period) value: 10 years. Notes: 1. This product defined period of use is under normal condition. 2. In above part, CPU/Memory/ Hard Disk/CD-ROM/DVD-ROM/ Power are optional. 3. In above part, LCD Modules/ Touch Modules are for all-in-one product model.						

Table of Contents

Chapter 1 - Product Specifications	1
1.1 Specifications.....	2
Chapter 2 – Hardware Information	5
2.1 Dimensions	6
2.2 Jumpers and Connectors	7
2.3 List of Jumpers	8
2.3.1 Setting Jumpers	8
2.3.2 Clear CMOS Jumper (JP1)	9
2.3.3 ATX/AT Mode Selection (JP3)	9
2.4 List of Connectors	10
2.4.1 HDMI (CN2)	11
2.4.2 2.5GbE LAN + USB (CN3).....	12
2.4.3 GbE LAN + USB Port (CN4)	14
2.4.4 M.2 2230 E-Key (CN5).....	15
2.4.5 M.2 2280 M-Key (CN6)	16
2.4.6 Remote Button (CN8).....	17
2.4.7 SPI Flash Port (CN9).....	18
2.4.8 eSPI Connector (CN10).....	18
2.4.9 SATA Connector (CN12/CN13)	19
2.4.10 SATA Power Connector (CN14/CN15).....	20
2.4.11 DIO Port (CN16)	20
2.4.12 COM 1 + COM 2 (CN17)	21
2.4.13 COM Port 3 (Wafer Box, Optional) (CN18).....	22
2.4.14 COM Port 4 (Wafer Box, Optional) (CN19).....	23
2.4.15 COM Port 5 (Wafer Box, Optional) (CN20)	24
2.4.16 COM Port 6 (Wafer Box, Optional) (CN21).....	25
2.4.17 USB 2.0 Wafer (CN22, CN23).....	26

2.4.18	Dual USB 3.2 Port (CN24)	26
2.4.19	Audio Connector (CN25)	27
2.4.20	Audio Wafer (CN26)	28
2.4.21	DC Terminal Block (CN28)	29
2.4.22	SIM Slot (CN30)	29
2.4.23	Fan Connector (CN32)	30
2.5	CPU & RAM Installation	31
2.6	2.5" SATA Drive Installation	37
2.7	Expansion Module Installation	40
2.7.1	NVMe Module Installation	41
2.8	Wall Mount Installation	44
2.9	DIN Rail Installation	45
Chapter 3 - AMI BIOS Setup		46
3.1	System Test and Initialization	47
3.2	AMI BIOS Setup	48
3.3	Setup Submenu: Main	49
3.4	Setup Submenu: Advanced	50
3.4.1	CPU Configuration	51
3.4.2	Memory Configuration	52
3.4.3	PCH-FW Configuration	53
3.4.3.1	Firmware Update Configuration	54
3.4.4	Hardware Monitor	55
3.4.5	Power Management	56
3.4.6	AAEON BIOS Robot	57
3.4.6.1	Device Detecting Configuration	58
3.5	Setup Submenu: System I/O	65
3.5.1	Storage Configuration	66
3.5.2	NVMe Configuration	67

3.5.3	HD Audio Configuration	68
3.5.4	Legacy Logical Devices Configuration	69
3.5.4.1	Serial Port 1	70
3.5.4.2	Serial Port 2	71
3.5.5	Serial Port Console Redirection	72
3.5.5.1	Console Redirection Settings (COM0)	73
3.5.5.2	Console Redirection Settings (Out-of-Band Mgmt Port)	75
3.6	Setup Submenu: Security	77
3.6.1	Trusted Computing	78
3.6.2	Secure Boot	80
3.6.2.1	Key Management	81
3.7	Setup Submenu: Boot	83
3.7.1	UEFI BBS Priorities	84
3.8	Setup Submenu: Save & Exit	85
Chapter 4 – Drivers Installation		86
4.1	Drivers Download and Installation	87
Appendix A – I/O Information		88
A.1	I/O Address Map	89
A.2	Memory Address Map	91
A.3	IRQ Mapping Chart	92

Chapter 1

Product Specifications

1.1 Specifications

System

CPU	13th/14th Generation Intel® Core™ LGA 1700 Socket-Type Processor, Max TDP 65W 13th Generation Intel® Core™ Processors: Intel® Core™ i9-13900TE/Intel® Core™ i9-13900E Intel® Core™ i7-13700TE/Intel® Core™ i7-13700E Intel® Core™ i5-13500TE/Intel® Core™ i5-13500E Intel® Core™ i3-13100TE/Intel® Core™ i3-13100E 14th Generation Intel® Core™ Processors: Intel® Core™ i9 processor 14900 Intel® Core™ i9 processor 14900T Intel® Core™ i7 processor 14700 Intel® Core™ i7 processor 14700T Intel® Core™ i5 processor 14500 Intel® Core™ i5 processor 14500T Intel® Core™ i3 processor 14100 Intel® Core™ i3 processor 14100T
Chipset	Intel® H610E
System Memory	DDR5 SODIMM x 2, up to 64GB
Display Interface	HDMI 1.4a (Type-A) x 2, 4K @30Hz
Storage	2.5" SATA Drive Bay x 2 M.2 2280 M-Key x 1 (PCIe Gen 3 [x4]) for NVMe
Ethernet	Intel® Ethernet Connection I219-LM, GbE RJ-45 x 1 Intel® Ethernet Controller I226-LM, 2.5GbE RJ-45 x 1
I/O	USB 3.2 Gen 2 x 4 USB 2.0 x 2

System

I/O Cont.	DB-9 x 2 for RS-232/422/485
	Audio x 1 (Mic-in/Line-out)
	Power Button with Power LED x 1
	Remote Power On/Off x 1
Expansion	M.2 2280 M-Key x 1 (NVMe)
	M.2 2230 E-Key x 1 (Wi-Fi/Bluetooth)
	Full Size mPCIe x 1 (optional for mSATA)
Indicator	System Power LED x 1
OS Support	Windows® 10 IoT Enterprise (64-bit)
	Windows® 11 Pro (64-bit)
	Linux Ubuntu 22.04

Power Supply

Power Requirement	3-pin DC Input 10~35V
-------------------	-----------------------

Mechanical

Mounting	Wall Mount
Dimensions (W x H x D)	7.09" x 3.04" x 8.66" (180mm x 77.2mm x 220mm)
	8.43" x 3.31" x 8.66" (214mm x 84.2mm x 220mm) with brackets
Gross Weight	8.5 lb. (3.9Kg)
Net Weight	6.3 lb. (2.9Kg)

Environmental

Operating Temperature	-13°F ~ 131°F (-25°C ~ 55°C), IEC60068-2 with 0.7 m/s Airflow, with W.T memory/storage (TDP 65W CPU)
	-13°F ~ 158°F (-25°C ~ 70°C), IEC60068-2 with 0.7 m/s Airflow, with W.T memory/storage (TDP 35W CPU)
Storage Temperature	-40 °F ~ 176°F (-40°C ~ 80°C)
Storage Humidity	5 ~ 95% @ 40°C, non-condensing
Anti-Vibration	3 Grms/ 5 ~ 500Hz/ operation (with SSD)
Anti-Shock	50G, IEC68-2-27, half sine, 11ms duration (with SSD)
Certification	CE/FCC Class A/LVD

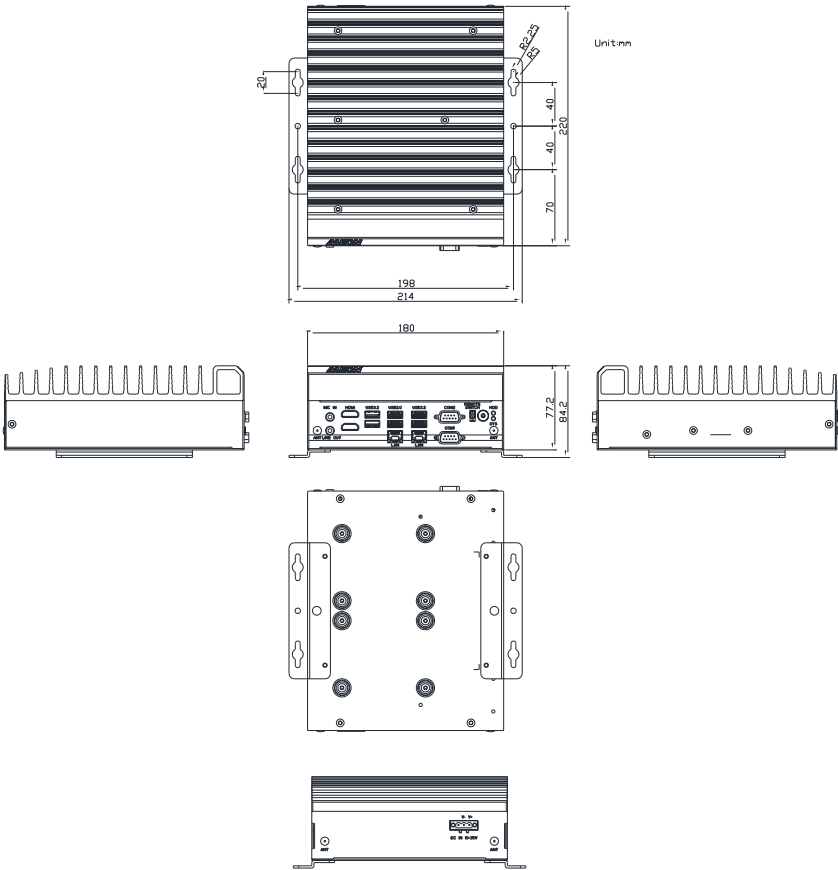
Note: Industrial grade memory modules are recommended (temperature range: -40°F ~ 185°F (-40°C ~ 85°C) or above).

Note: For Gen 4 storage module, a thermal solution is mandatory for heat-dissipation. Please check with your AAEON representative if you have any queries regarding this requirement.

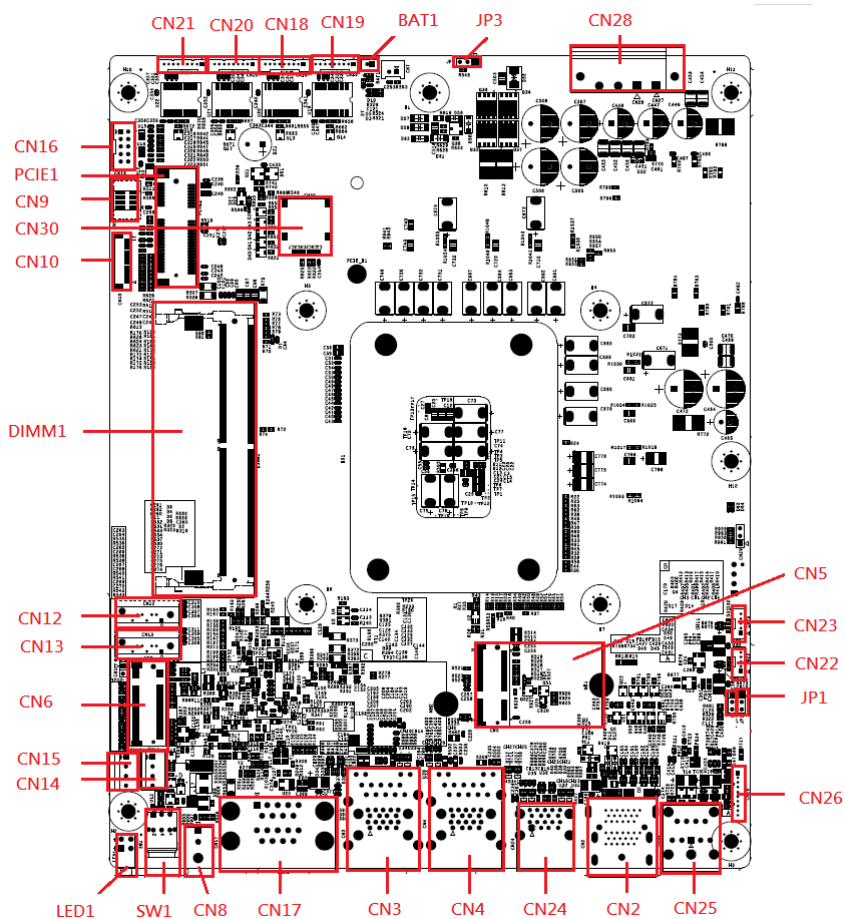
Chapter 2

Hardware Information

2.1 Dimensions



2.2 Jumpers and Connectors



2.3 List of Jumpers

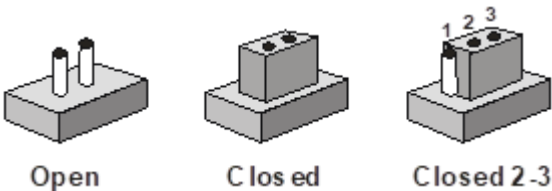
Please refer to the table below for all of the system's jumpers that you can configure for your application.

Label	Function
JP1	CMOS Control Selection
JP3	Auto-Power Button Selection

2.3.1 Setting Jumpers

The BOXER-6645U-RPL comes with several jumpers which allow you to configure the system by either setting the jumper to "open" or "closed"; or by selecting certain pins. A closed jumper has two pins connected with a jumper clip, while an open jumper has no pins connected.

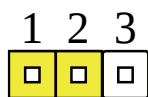
For jumpers with multiple pins, this guide uses "pins A-B" to notate which pins should be connected by a jumper clip. For example, "pins 1-2" means you should connect pins 1 and 2, while "pins 2-3" means you should connect pins 2 and 3.



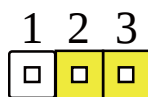
A pair of needle-nose pliers may be helpful when working with jumpers.

If you have any questions about how best to configure the system for your application, contact your AAEON representative or visit our website to talk with our support team.

2.3.2 Clear CMOS Jumper (JP1)

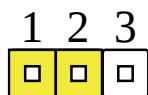


Normal (Default)

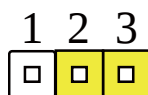


Clear CMOS

2.3.3 ATX/AT Mode Selection (JP3)



ATX (default)



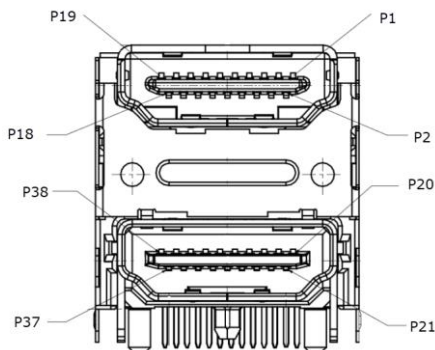
AT

2.4 List of Connectors

Please refer to the table below for all of the system’s connectors that you can configure for your application

Label	Function
CN2	HDMI
CN3	2.5GbE LAN + USB Port
CN4	GbE LAN + USB Port
CN5	M.2 2230 E-Key
CN6	M.2 2280 M-Key
CN8	Remote Button
CN9	SPI Flash Port
CN10	eSPI Connector
CN12	SATA Connector
CN13	SATA Connector
CN14	SATA Power Connector n
CN15	SATA Power Connector
CN16	DIO
CN17	COM 1 + COM 2
CN18	COM 3
CN19	COM 4
CN20	COM 5
CN21	COM 6
CN22	USB 2.0 Wafer
CN23	USB 2.0 Wafer
CN24	Dual USB 3.2 Port
CN25	Audio
CN26	Audio Wafer
CN28	DC Terminal Block
CN30	SIM Slot
PCIE1	Mini Card Slot

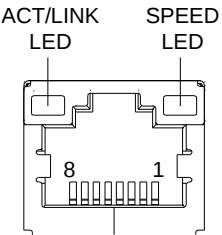
2.4.1 HDMI (CN2)



Pin	Pin Name	Signal Type	Signal level
P1	HDMI1_DATA2_P	DIFF	
P2	GND	GND	
P3	HDMI1_DATA2_N	DIFF	
P4	HDMI1_DATA1_P	DIFF	
P5	GND	GND	
P6	HDMI1_DATA1_N	DIFF	
P7	HDMI1_DATA0_P		
P8	GND	GND	
P9	HDMI1_DATA0_n		
P10	HDMI1_CLK_P	DIFF	
P11	GND	GND	
P12	HDMI1_CLK_N	DIFF	
P13	CEC		3.3V
P14	NC		
P15	HDMI1_SCL		
P16	HDMI1_SDA		
P17	GND	GND	
P18	+V5S_HDMI_CON	PWR	5V
P19	HDMI1_HPD		5V
P20	HDMI2_DATA2_P		

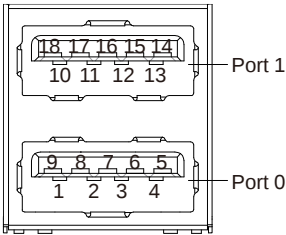
Pin	Pin Name	Signal Type	Signal level
P21	GND	GND	
P22	HDMI2_DATA2_N		
P23	HDMI2_DATA1_P		
P24	GND	GND	
P25	HDMI2_DATA1_N		
P26	HDMI2_DATA0_P		
P27	GND	GND	
P28	HDMI2_DATA0_N		
P29	HDMI2_CLK_P		
P30	GND	GND	
P31	HDMI2_CLK_N		
P32	CEC		3.3V
P33	NC		
P34	HDMI2_SCL		
P35	HDMI2_SDA		
P36	GND	GND	
P37	+V5S_HDMI_CON		5V
P38	HDMI2_HPD		5V

2.4.2 2.5GbE LAN + USB (CN3)



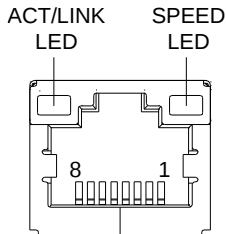
Pin	Pin Name	Signal Type	Signal level
1	MDIO+	DIFF	
2	MDIO-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	

Pin	Pin Name	Signal Type	Signal level
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

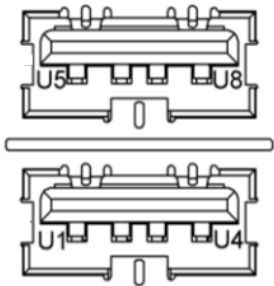


Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	USB1_D-	DIFF	
3	USB1_D+	DIFF	
4	GND	GND	
5	USB1_SSRX-	DIFF	
6	USB1_SSRX+	DIFF	
7	GND	GND	
8	USB1_SSTX-	DIFF	
9	USB1_SSTX+	DIFF	
10	+5VSB	PWR	+5V
11	USB2_D-	DIFF	
12	USB2_D+	DIFF	
13	GND	GND	
14	USB2_SSRX-	DIFF	
15	USB2_SSRX+	DIFF	
16	GND	GND	
17	USB2_SSTX-	DIFF	
18	USB2_SSTX+	DIFF	

2.4.3 GbE LAN + USB Port (CN4)



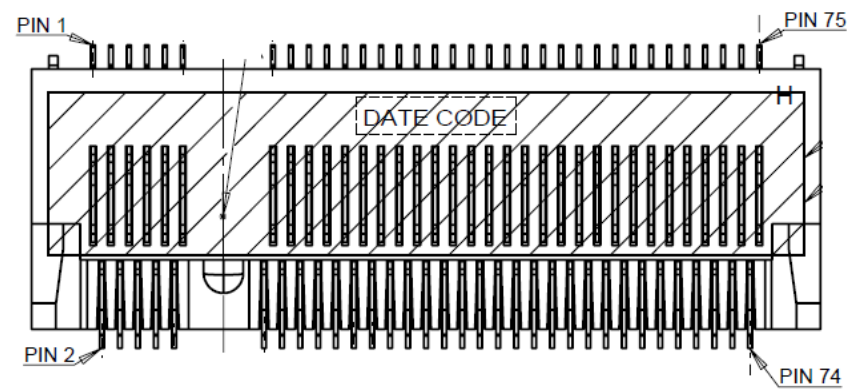
Pin	Pin Name	Signal Type	Signal level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	



Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	USB2_D-	DIFF	
3	USB2_D+	DIFF	
4	GND	GND	
5	+5VSB	PWR	+5V

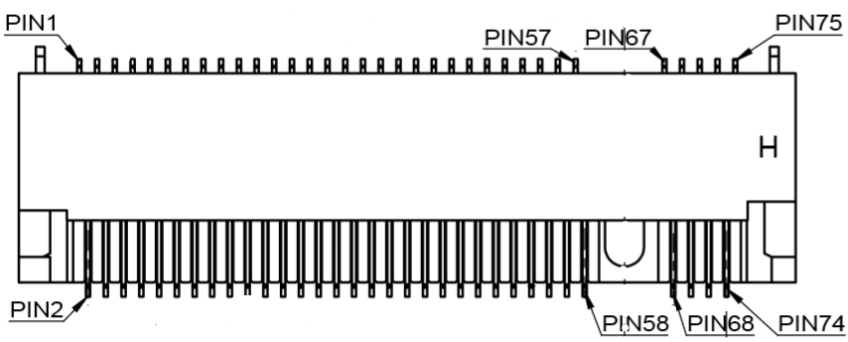
Pin	Pin Name	Signal Type	Signal level
6	USB2_D-	DIFF	
7	USB2_D+	DIFF	
8	GND	GND	

2.4.4 M.2 2230 E-Key (CN5)



Standard specification.

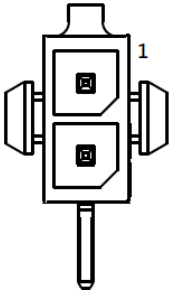
2.4.5 M.2 2280 M-Key (CN6)



Pin	Pin Name	Signal Type	Signal Level	Pin	Pin Name	Signal Type	Signal Level
1	GND	GND		2	+3.3V	PWR	+3.3V
3	GND	GND		4	+3.3V	PWR	+3.3V
5	PCIE_RXN0	IN		6	CARD_PWR_OFF_N	OUT	+3.3V
7	PCIE_RXP0	IN		8	NC		
9	GND	GND		10	NC		
11	PCIE_TXN0	OUT		12	+3.3V	PWR	+3.3V
13	PCIE_TXP0	OUT		14	+3.3V	PWR	+3.3V
15	GND	PWR		16	+3.3V	PWR	+3.3V
17	PCIE_RXN1	IN		18	+3.3V	PWR	+3.3V
19	PCIE_RXP1	IN		20	NC		
21	GND	PWR		22	NC		
23	PCIE_TXN1	OUT		24	NC		
25	PCIE_TXP1	OUT		26	NC		
27	GND	PWR		28	NC		
29	PCIE_RXN2	IN		30	NC		
31	PCIE_RXP2	IN		32	NC		
33	GND	GND		34	NC		
35	PCIE_TXN2	OUT		36	NC		
37	PCIE_TXP2	OUT		38	DEVS LP	IN	+3.3V
39	GND	GND		40	SMB_CLK_M2		+1.8V
41	PCIE_RXP3	IN		42	SMB_DATA_M2		+1.8V
43	PCIE_RXN3	IN		44	NC		
45	GND	GND		46	NC		
47	PCIE_TXN3	OUT		48	NC		

Pin	Pin Name	Signal Type	Signal Level	Pin	Pin Name	Signal Type	Signal Level
49	PCIE_TXP3	OUT		50	RESET#	IN	+3.3V
51	GND	PWR		52	CLKREQ#	OUT	+3.3V
53	PCIE_M.2_CLK#	OUT		54	WAKE#	OUT	+3.3V
55	PCIE_M.2_CLK	OUT		56	NC		
57	GND	GND		58	NC		
67	NC			68	NC		
69	NC			70	+3.3V	PWR	+3.3V
71	GND	GND		72	+3.3V	PWR	+3.3V
73	GND	GND		74	+3.3V	PWR	+3.3V
75	GND	GND					

2.4.6 Remote Button (CN8)

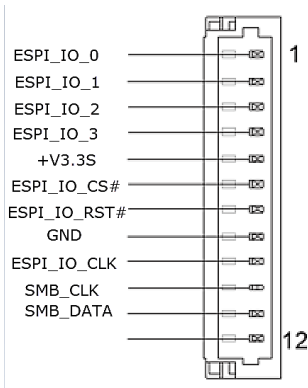


Pin	Pin Name	Signal Type	Signal level
1	PWR_BUTTON	IN	
2	GND	GND	

2.4.7 SPI Flash Port (CN9)

Pin	Pin Name	Signal Type	Signal level
1	SPI_MISO	OUT	
2	GND	GND	
3	SPI_CLK	IN	
4	+3.3VSB	PWR	+3.3V
5	SPI_MOSI	IN	
6	SPI_CS	IN	
7	NC		
8	NC		

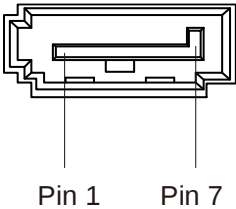
2.4.8 eSPI Connector (CN10)



Pin	Pin Name	Signal Type	Signal level
1	ESPI_IO_0	I/O	+1.8V
2	ESPI_IO_1	I/O	+1.8V
3	ESPI_IO_2	I/O	+1.8V
4	ESPI_IO_3	I/O	+1.8V
5	+3.3V	PWR	+3.3V
6	ESPI_IO_CS#	IN	
7	ESPI_IO_RST#	IN	
8	GND	GND	

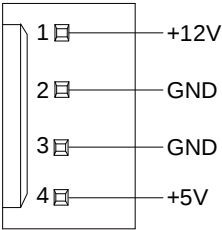
Pin	Pin Name	Signal Type	Signal level
9	EPSI_IO_LCLK	IN	
10	SMCLK	IN	
11	SMDAT	I/O	
12	NC		

2.4.9 SATA Connector (CN12/CN13)



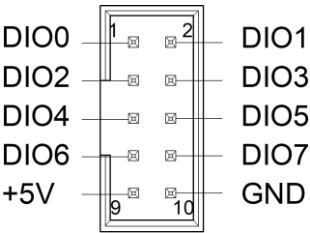
Pin	Pin Name	Signal Type	Signal level
1	GND	GND	
2	SATA_TX+	DIFF	
3	SATA_TX-	DIFF	
4	GND	GND	
5	SATA_RX-	DIFF	
6	SATA_RX+	DIFF	
7	GND	GND	

2.4.10 SATA Power Connector (CN14/CN15)



Pin	Pin Name	Signal Type	Signal level
1	+12V	PWR	+12V
2	GND	GND	
3	GND	GND	
4	+5V	PWR	+5V

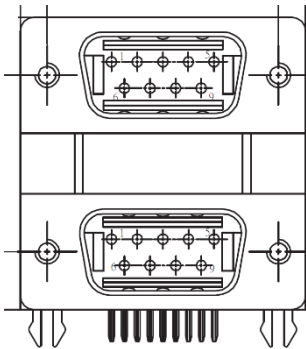
2.4.11 DIO Port (CN16)



Pin	Pin Name	Signal Type	Signal level
1	DIO0	I/O	+5V
2	DIO1	I/O	+5V
3	DIO2	I/O	+5V
4	DIO3	I/O	+5V
5	DIO4	I/O	+5V
6	DIO5	I/O	+5V
7	DIO6	I/O	+5V
8	DIO7	I/O	+5V

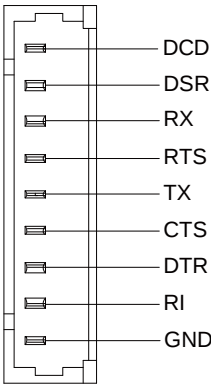
Pin	Pin Name	Signal Type	Signal level
9	+5V	PWR	+5V
10	GND	GND	

2.4.12 COM 1 + COM 2 (CN17)



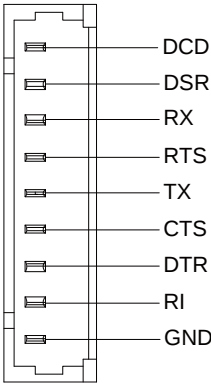
Pin	Pin Name	Signal Type	RS-422	RS-485
1	DCD	IN	RS422_TX-	RS485_D-
2	RX	IN	RS422_TX+	RS485_D+
3	TX	OUT	RS422_RX+	
4	DTR	OUT	RS422_RX-	
5	GND	GND		
6	DSR	IN		
7	RTS	OUT		
8	CTS	IN		
9	RI1	IN		

2.4.13 COM Port 3 (Wafer Box, Optional) (CN18)



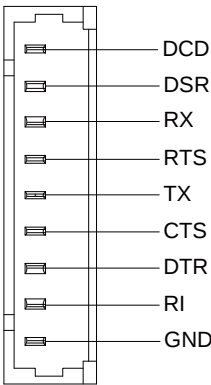
Pin	Pin Name	Signal Type	RS-422	RS-485
1	DCD	IN	RS422_TX-	RS485_D-
2	DSR	IN		
3	RX	IN	RS422_TX+	RS485_D+
4	RTS	OUT		
5	TX	OUT	RS422_RX+	
6	CTS	IN		
7	DTR	OUT	RS422_RX-	
8	RI	IN		
9	GND	GND		

2.4.14 COM Port 4 (Wafer Box, Optional) (CN19)



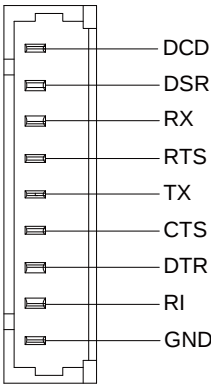
Pin	Pin Name	Signal Type	RS-422	RS-485
1	DCD	IN	RS422_TX-	RS485_D-
2	DSR	IN		
3	RX	IN	RS422_TX+	RS485_D+
4	RTS	OUT		
5	TX	OUT	RS422_RX+	
6	CTS	IN		
7	DTR	OUT	RS422_RX-	
8	RI	IN		
9	GND	GND		

2.4.15 COM Port 5 (Wafer Box, Optional) (CN20)



Pin	Pin Name	Signal Type	RS-422	RS-485
1	DCD	IN	RS422_TX-	RS485_D-
2	DSR	IN		
3	RX	IN	RS422_TX+	RS485_D+
4	RTS	OUT		
5	TX	OUT	RS422_RX+	
6	CTS	IN		
7	DTR	OUT	RS422_RX-	
8	RI	IN		
9	GND	GND		

2.4.16 COM Port 6 (Wafer Box, Optional) (CN21)

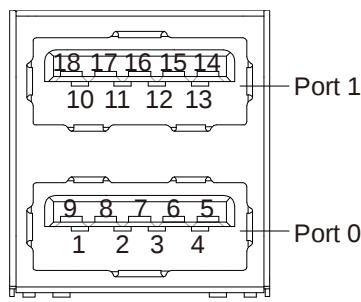


Pin	Pin Name	Signal Type	RS-422	RS-485
1	DCD	IN	RS422_TX-	RS485_D-
2	DSR	IN		
3	RX	IN	RS422_TX+	RS485_D+
4	RTS	OUT		
5	TX	OUT	RS422_RX+	
6	CTS	IN		
7	DTR	OUT	RS422_RX-	
8	RI	IN		
9	GND	GND		

2.4.17 USB 2.0 Wafer (CN22, CN23)

Pin	Pin Name	Signal Type	Signal level
1	+5V	GND	+5V
2	USBD-	DIFF	
3	USBD+	DIFF	
4	GND	GND	
5	GND	GND	

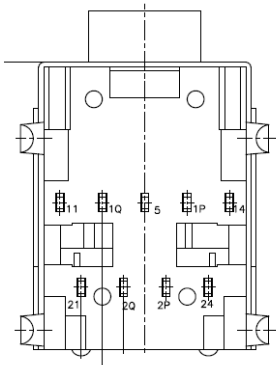
2.4.18 Dual USB 3.2 Port (CN24)



Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	USB1_D-	DIFF	
3	USB1_D+	DIFF	
4	GND	GND	
5	USB1_SSRX-	DIFF	
6	USB1_SSRX+	DIFF	
7	GND	GND	
8	USB1_SSTX-	DIFF	
9	USB1_SSTX+	DIFF	
10	+5VSB	PWR	+5V
11	USB2_D-	DIFF	
12	USB2_D+	DIFF	

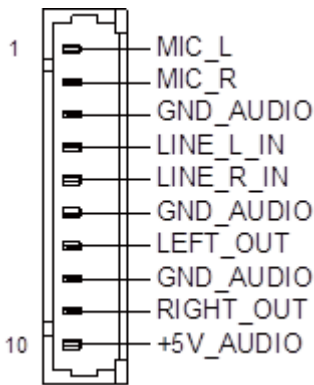
Pin	Pin Name	Signal Type	Signal level
13	GND	GND	
14	USB2_SSRX-	DIFF	
15	USB2_SSRX+	DIFF	
16	GND	GND	
17	USB2_SSTX-	DIFF	
18	USB2_SSTX+	DIFF	

2.4.19 Audio Connector (CN25)



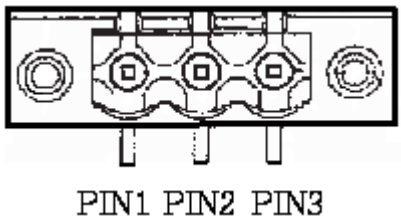
Pin	Pin Name	Signal Type	Signal level
5	AUD_GND	GND	
24	LOUT_L	OUT	
21	LOUT_R	OUT	
2P	HP_DET_3	IN	
2Q	HP_DET_4	IN	
14	MIC_L	IN	
11	MIC_R	IN	
1P	HP_DET_1	IN	
1Q	HP_DET2	IN	

2.4.20 Audio Wafer (CN26)



Pin	Pin Name	Signal Type	Signal level
1	MIC_L	IN	
2	MIC_R	IN	
3	GND_AUDIO	GND	
4	LINE_L_IN	IN	
5	LINE_R_IN	IN	
6	GND_AUDIO	GND	
7	LEFT_OUT	OUT	
8	GND_AUDIO	GND	
9	RIGHT_OUT	OUT	
10	+5V_AUDIO	PWR	+5V

2.4.21 DC Terminal Block (CN28)

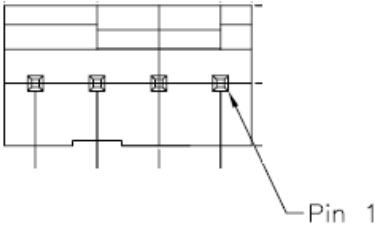


Pin	Pin Name	Signal Type	Signal level
1	VIN	PWR	+12V ~ +24V
2	GND	GND	
3	GND_EARTH		

2.4.22 SIM Slot (CN30)

Pin	Pin Name	Signal Type	Signal level
1	UIM_PWR	PWR	
2	UIM_RST	IN	
3	UIM_CLK	IN	
4	GND	GND	
5	UIM_VPP	PWR	
6	UIM_DATA	I/O	

2.4.23 Fan Connector (CN32)

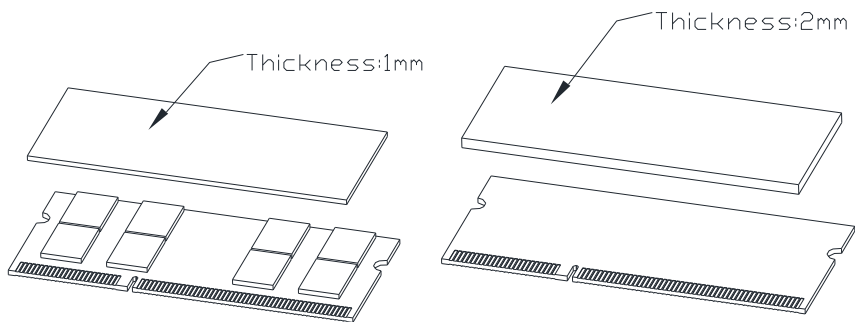


Pin	Pin Name	Signal Type	Signal level
1	GND	GND	
2	+V12S	PWR	+12V
3	FAN_PWM	OUT	
4	FAN_CTL	OUT	

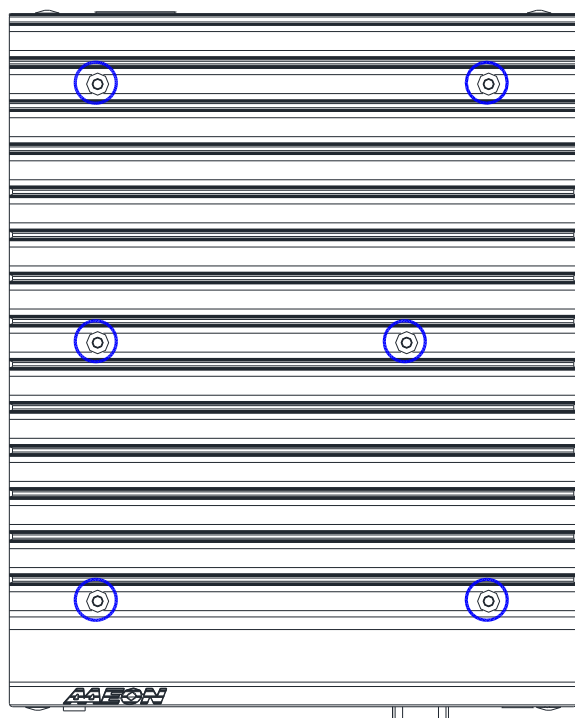
2.5 CPU & RAM Installation

Before installing the CPU, RAM, or any other components, ensure the system is powered down and disconnect the power cord from the system. See Chapter 1 Specifications for list of compatible CPU/processors.

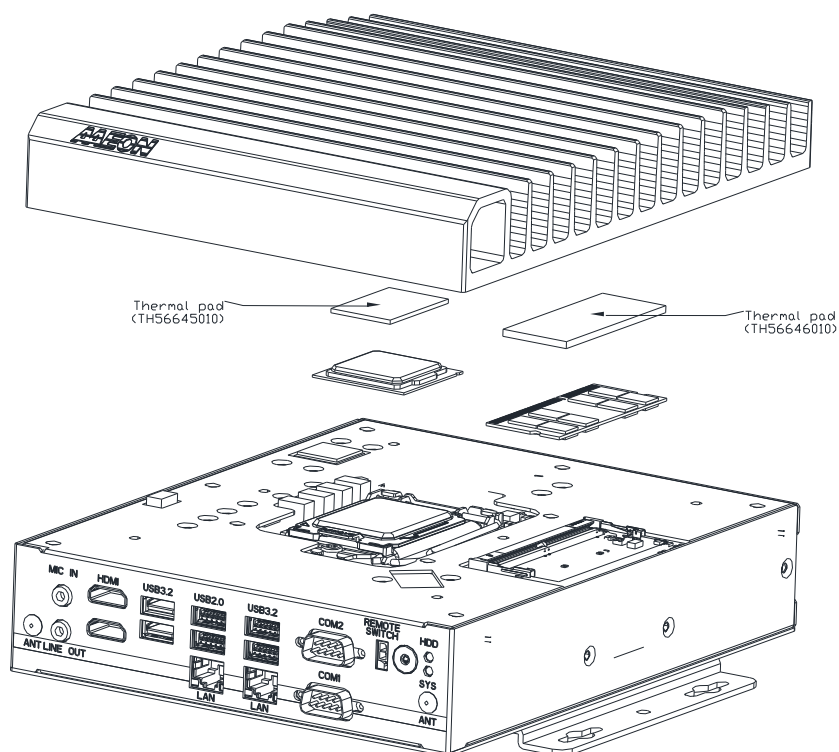
Note: When using memory modules with ICs on both sides, choose a thin thermal pad (1 mm thickness) to ensure proper contact with their heatsinks. Conversely, if the memory modules have ICs on only one side, choose a thick thermal pad (2mm thickness) to ensure effective contact with their heatsinks.



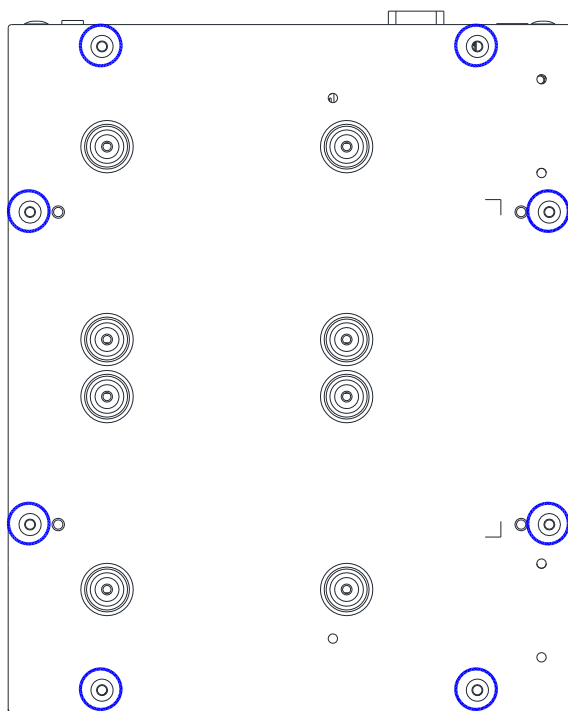
Step 1: Remove the six (6) screws on the top of the BOXER-6645U-RPL as shown in the figure below, and remove the top heatsink.



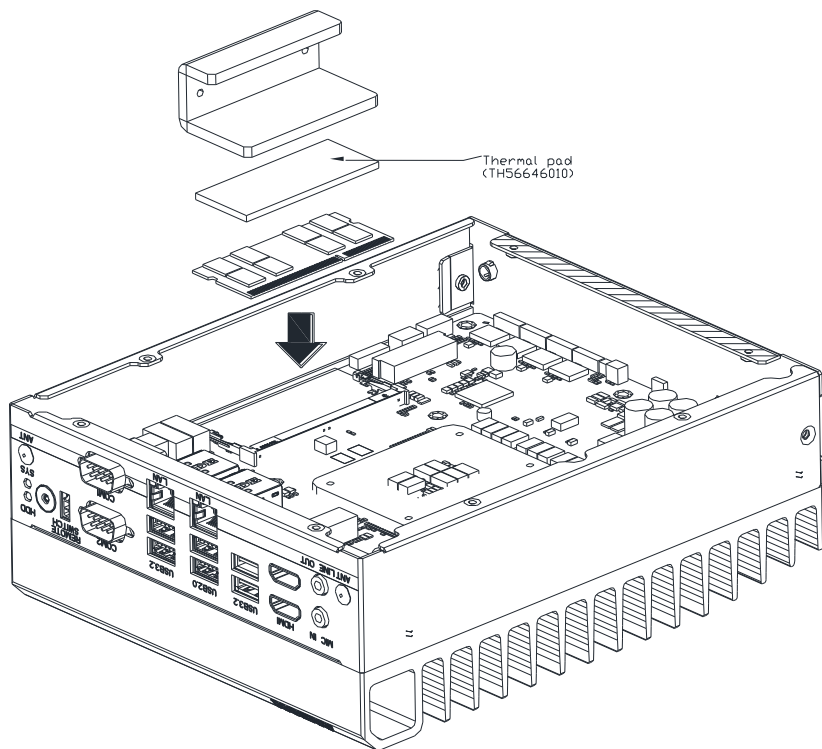
Step 2: Insert CPU and your first SODIMM into the slots on the system's motherboard. Reference section 2.2 for DIMM1 location. Ensure thermal pads are placed between the modules being installed and the motherboard.



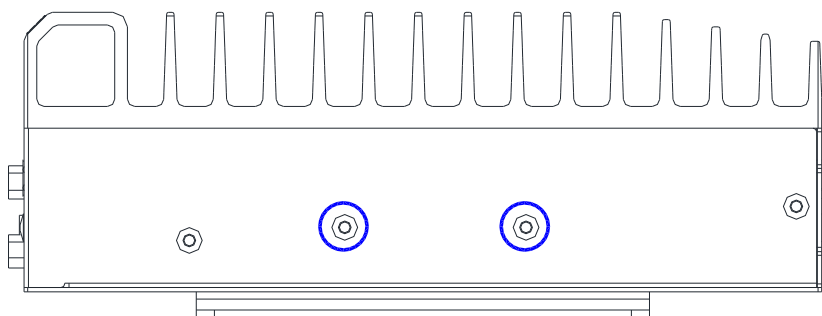
Step 3: Remove the bottom panel of the system by removing the eight (8) screws, as shown below.



Step 4: Insert second SODIMM module, noting the location of the slot as shown below. Ensure a thermal pad is placed between the module being installed and the motherboard.



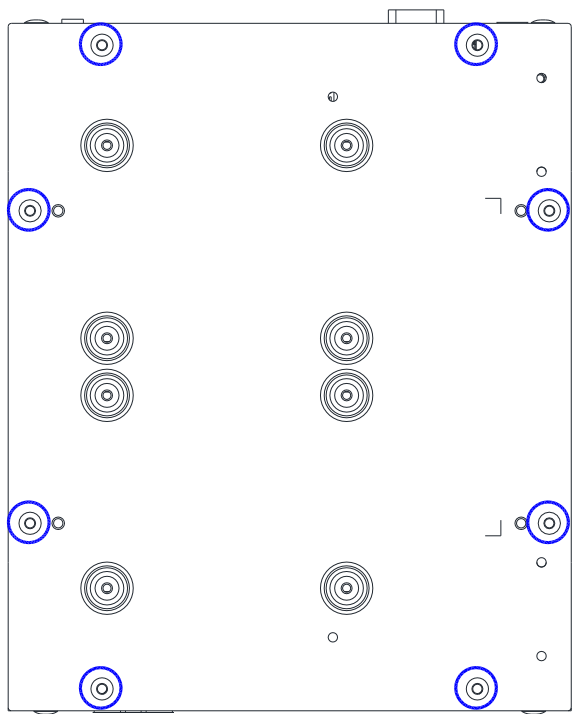
Step 5: Reassemble system, ensuring to affix the side panel with the two (2) screws as below.



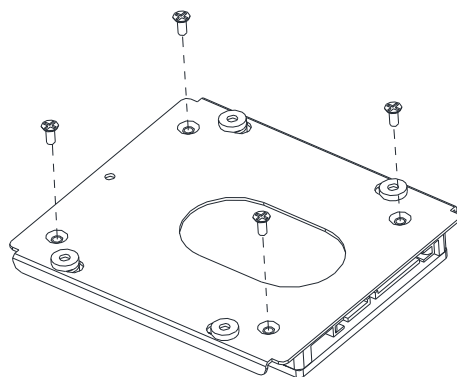
2.6 2.5" SATA Drive Installation

Before installing the SATA Drives, ensure the system is powered down and disconnect the power cord from the system. Make sure you have the SATA Drive ready to install. See Chapter 1 for SATA drive specifications for compatibility.

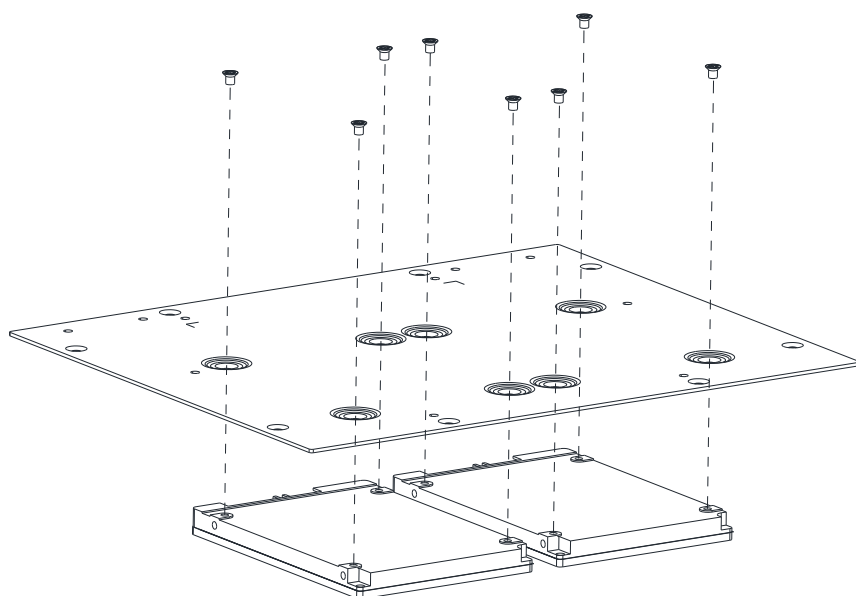
Step 1: Remove the bottom panel of the system by removing the eight (8) screws, as shown below.



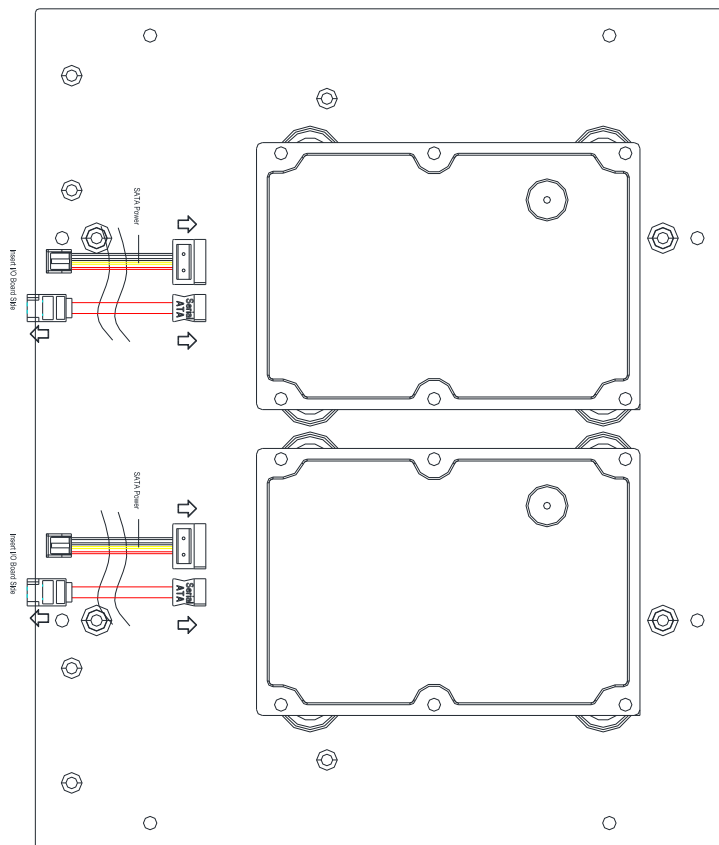
Step 2: Attach each SATA drive to the HDD Brackets using the screws provided.



Step 3: Attach the HDD Brackets for each drive to the bottom panel using four (4) screws per drive as shown in the figure below.



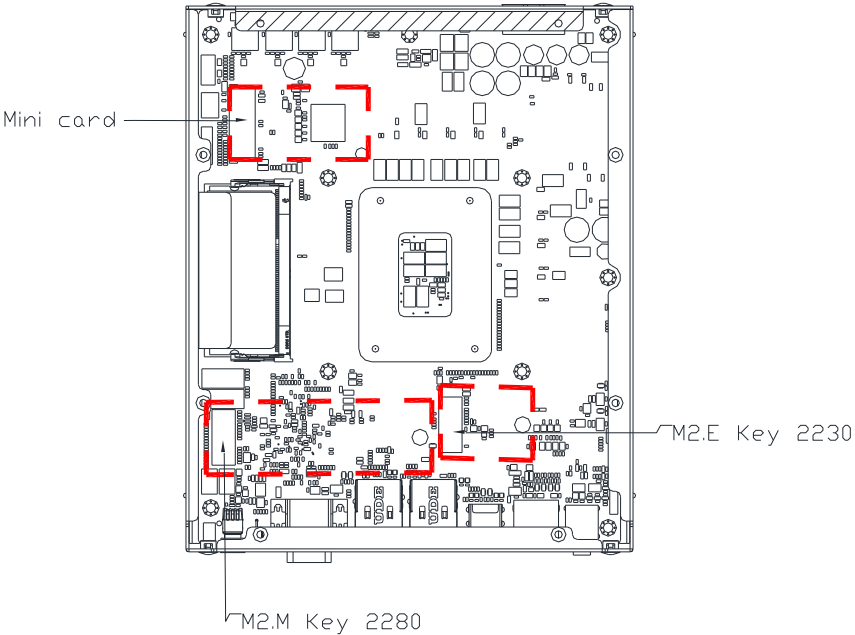
Step 4: Attach the SATA and SATA Power cables to the board and the SATA drives.



Step 5: Replace the bottom panel and secure with the eight (8) screws you removed in Step 1.

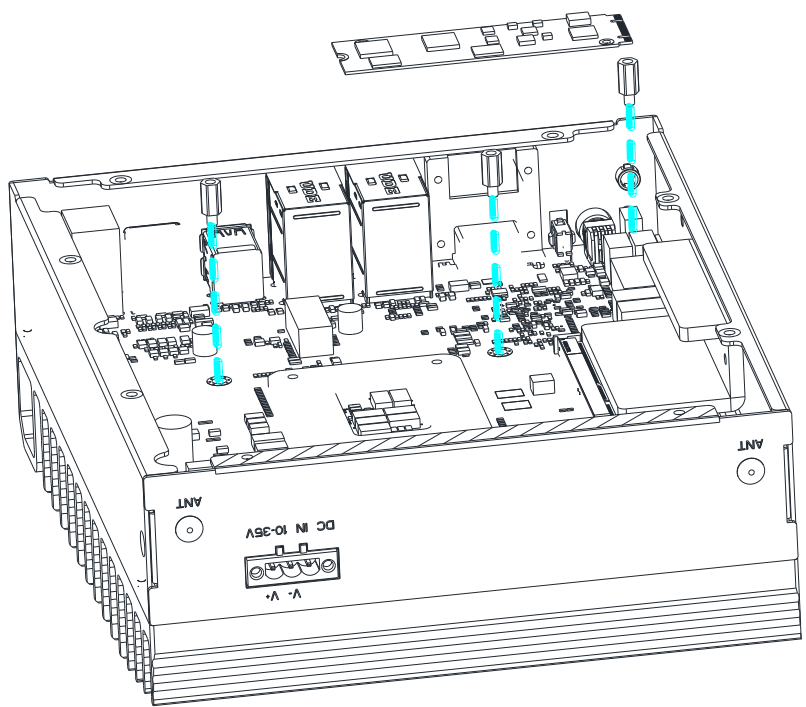
2.7 Expansion Module Installation

Step 1: Note the location of each expansion slot. Follow standard practice for module installation.

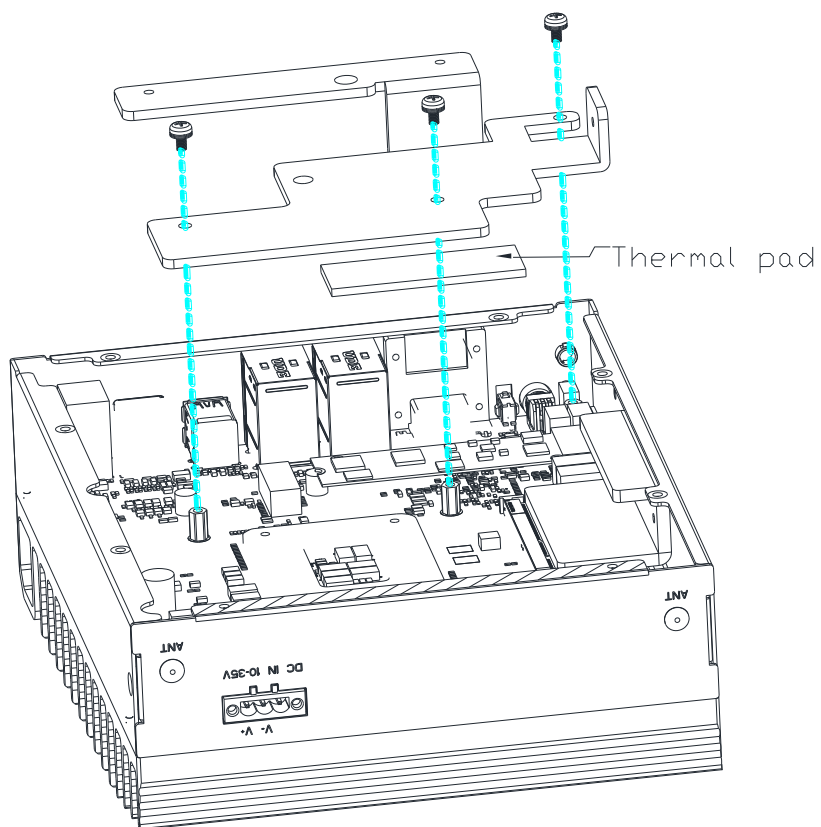


2.7.1 NVMe Module Installation

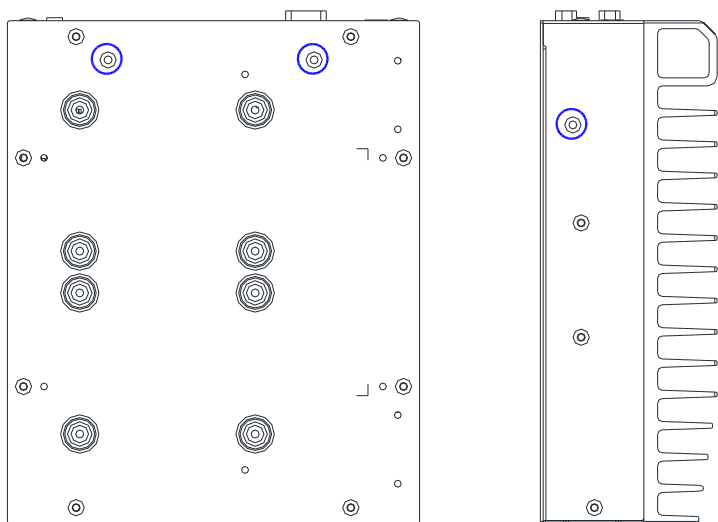
Step 1: Remove the three (3) screws as shown, then affix the NVMe module to the motherboard.



Step 2: Install the thermal pad and heatsink panel using the three (3) screws previously removed.

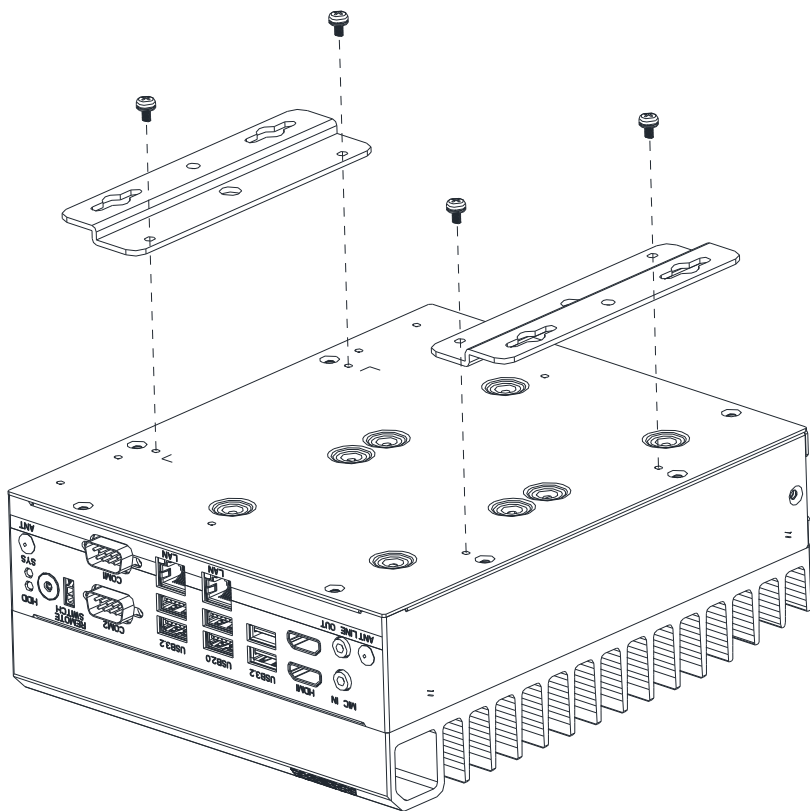


Step 3: Secure chassis panel via the screws shown in the below diagram.



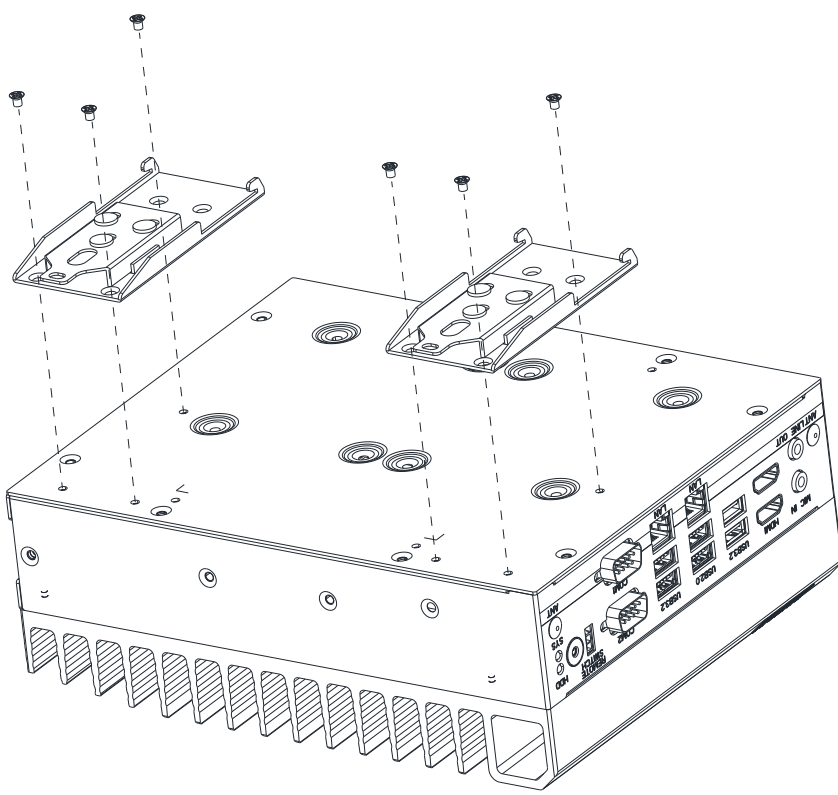
2.8 Wall Mount Installation

Affix each wall mounting bracket by securing them to the chassis using the two (2) screws per bracket provided.



2.9 DIN Rail Installation

Affix each DIN rail bracket by securing them to the chassis using the three (3) screws per bracket provided.



Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

The system uses certain routines to perform testing and initialization. If an error, fatal or non-fatal, is encountered, a few short beeps or an error message will be outputted. The board can usually continue the boot up sequence with non-fatal errors.

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory. If they do not match, an error message will be outputted, in which case you will need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

- You are starting your system for the first time
- You have changed your system's hardware
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention, which is to be replaced once emptied.

3.2 AMI BIOS Setup

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press or <F2> immediately while your computer is powering up.

The function for each interface can be found below.

Main – Date and time can be set here. Press <Tab> to switch between date elements

Advanced – Enable/ Disable boot option for legacy network devices

System I/O – Enable/ Disable system I/O device

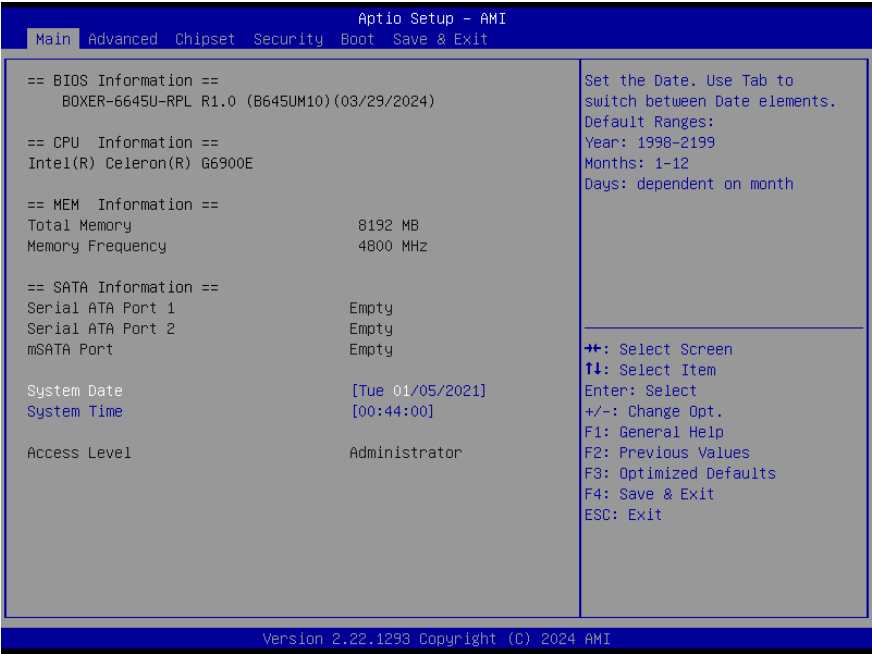
Security – The setup administrator password can be set here

Boot – Enable/ Disable quiet Boot Option

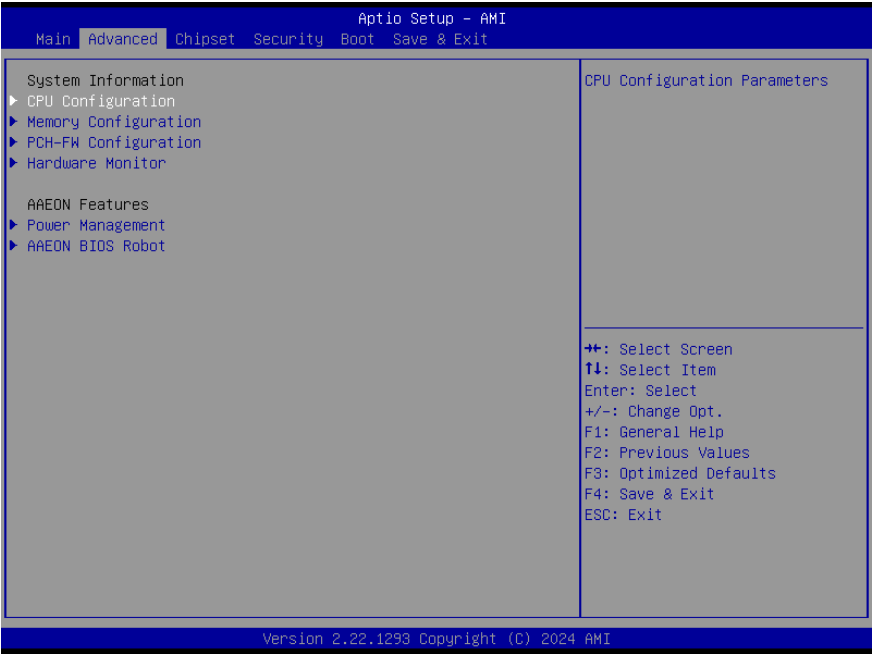
Save & Exit – Save your changes and exit the program

MEBx – Intel® Management Engine BIOS Extension

3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced



3.4.1 CPU Configuration



Options Summary		
Intel (VMX)Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		
Hyper-Threading	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Hyper-Threading Technology		
Intel® SpeedStep™	Disabled	
	Enabled	Optimal Default, Failsafe Default
Allows more than two frequency ranges to be supported		
Turbo Mode	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable processor Turbo Mode (requires EMTTM enabled too).		
AUTO means enabled.		

Options Summary		
C states	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.		

3.4.2 Memory Configuration

Aptio Setup - AMI

Advanced

Memory Configuration

Total Memory8192 MB

Memory Frequency4800 MHz

tCL-tRCD-tRP-tRAS40-39-39-77

MC 0 Ch 0 DIMM 0Populated & Enabled

Size8192 MB (DDR5)

MC 0 Ch 1 DIMM 0Not Populated / Disabled

MC 1 Ch 0 DIMM 0Not Populated / Disabled

MC 1 Ch 1 DIMM 0Not Populated / Disabled

++: Select Screen

f1: Select Item

Enter: Select

+/-: Change Opt.

F1: General Help

F2: Previous Values

F3: Optimized Defaults

F4: Save & Exit

ESC: Exit

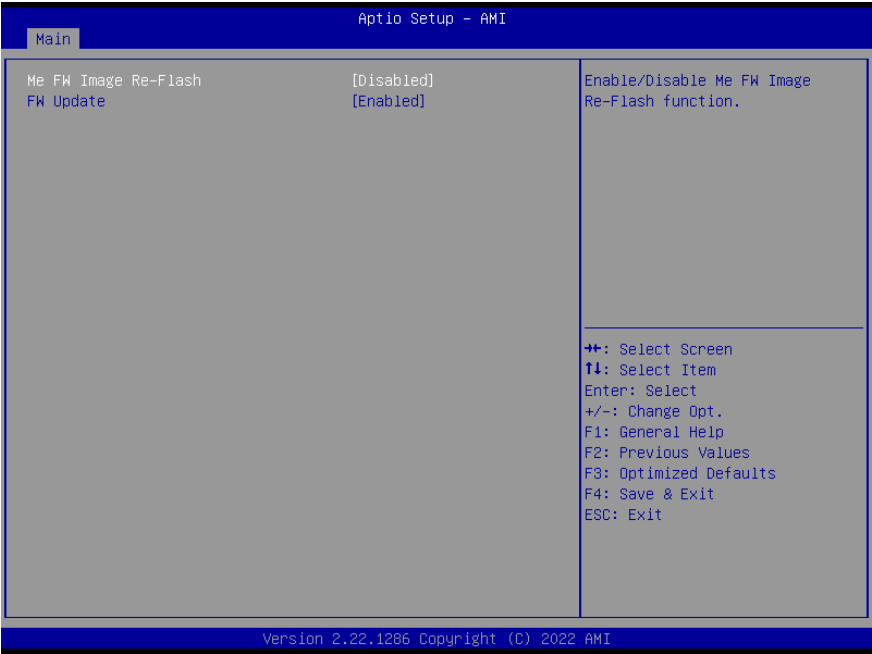
Version 2.22.1293 Copyright (C) 2024 AMI

3.4.3 PCH-FW Configuration



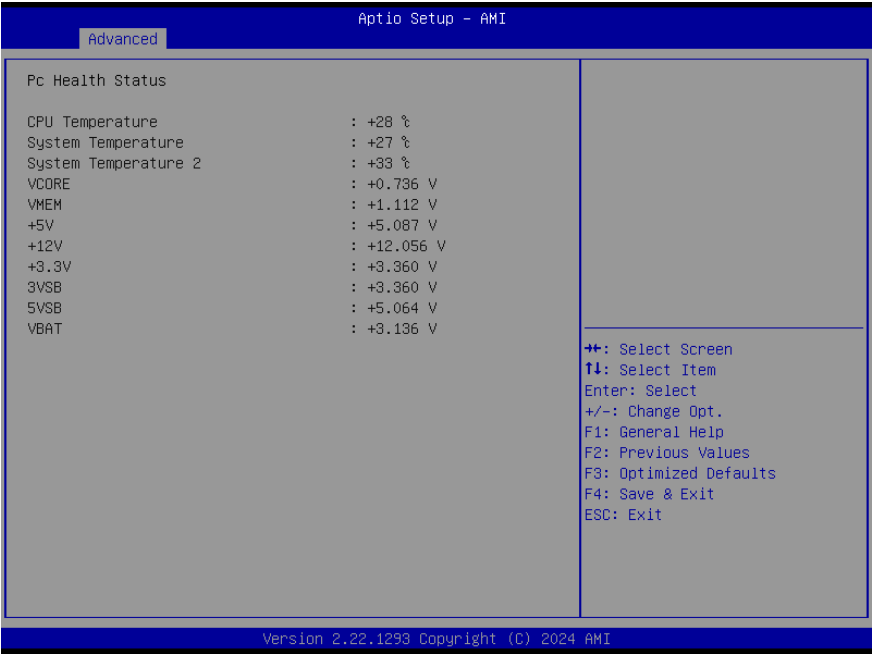
Options Summary		
AMT BIOS Features	Enabled	Optimal Default, Failsafe Default
	Disabled	
When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup.		
Note: This option does not disable Manageability Features in FW.		

3.4.3.1 Firmware Update Configuration

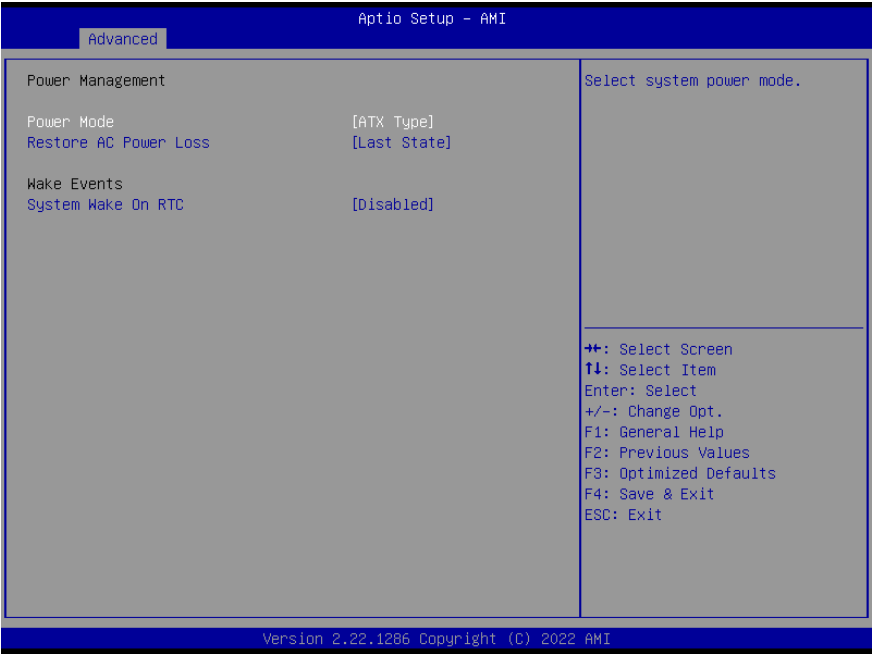


Options Summary		
Me FW Image Re-Flash	Enabled	
	Disabled	Optimal Default, Failsafe Default
Enabled/ Disable Me FW Image Re-Flash function.		
FW Update	Enabled	
	Disabled	Optimal Default, Failsafe Default
Enabled/ Disable Me FW Update function.		

3.4.4 Hardware Monitor



3.4.5 Power Management



Options Summary		
Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select system power mode		
Restore AC Power Loss	Last State	Optimal Default, Failsafe Default
	Always On	
	Always Off	
Set GPI [3:0] Output as Hi or Low		
System Wake On RTC	Disabled	Optimal Default, Failsafe Default
	By Date	
	By Weekday	
	Bypass	
By Date: System will wake on the day with hr::min::sec specified./n By Weekday: System will wake on the enabled weekday with hr::min::sec specified./n Bypass: BIOS will not control RTC wake function		

3.4.6 AAEON BIOS Robot



Options Summary		
Sends watch dog before BIOS POST	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – Robot set Watch Dog Timer (WDT) right after power on, before BIOS start POST process. And then Robot will clear WDT on completion of POST. WDT on completion of POST. WDT will reset system automatically if it is not cleared before its timer counts down to zero.		
Sends watch dog before booting OS	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – Robot set Watch Dog Timer (WDT) after POST completion, before BIOS transfer control to OS. WARNING: Before enabling this function, a program in OS must be in responsible for clearing WDT. Also, this function should be disabled if OS I going to update itself.		
Delayed POST (PEI phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	

Options Summary		
Enabled -Robot holds BIOS from starting POST, right after power on. This allows BIOS POST to start with stable power or start after system is physically warmed-up. Note: Robot does this before 'Sends watch dog'.		
Delayed POST (DXE phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled -Robot holds BIOS before POST completion. This allows BIOS POST to start with stable power or start after system is physically warmed-up. Note: Robot does this after 'Sends watch dog before BIOS POST'.		

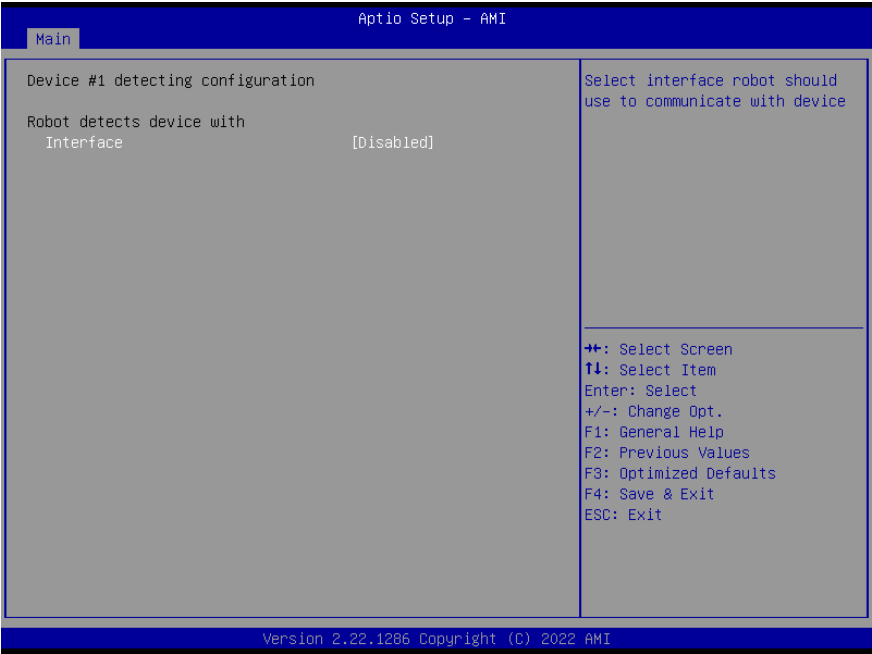
3.4.6.1 Device Detecting Configuration



Options Summary		
Action	Reset System	Optimal Default, Failsafe Default
	Hold System	
Select action that robot should do.		

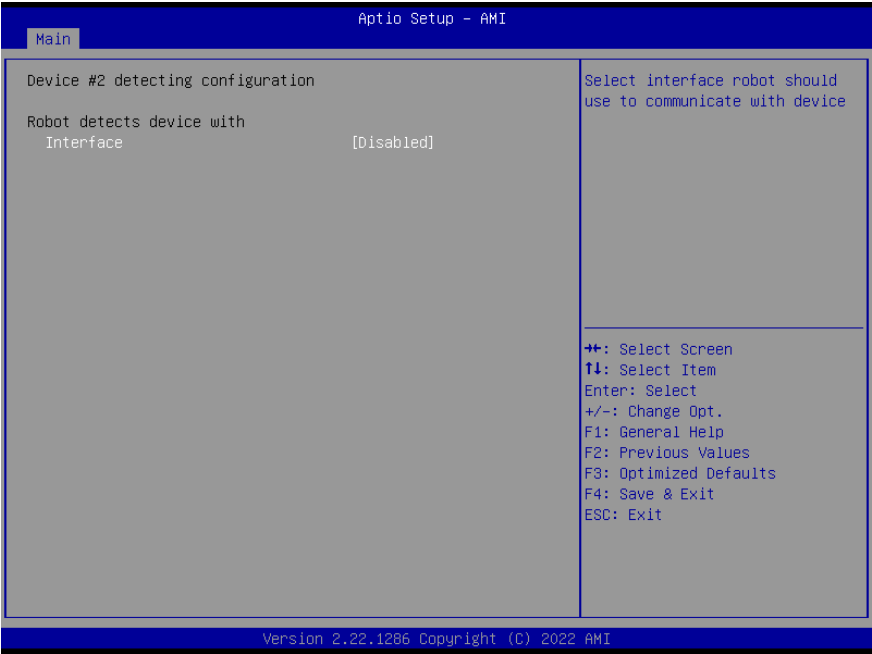
Options Summary		
Soft or hard reset	Soft	Optimal Default, Failsafe Default
	Hard	
Select reset type robot should send on each boot.		
Retry-Count	3	Optimal Default, Failsafe Default
Fill retry counter here. Robot will reset system at most counter times, and then let system continue its POST.		
At time	After show logo	Optimal Default, Failsafe Default
	Before show logo	
Select robot action time: After show logo -Robot will do action after logo is displayed. System devices are almost ready. Before show logo - Robot will do action earlier before logo, but some devices may not be ready.		

3.4.6.1.1 Device #1 Detecting Configuration



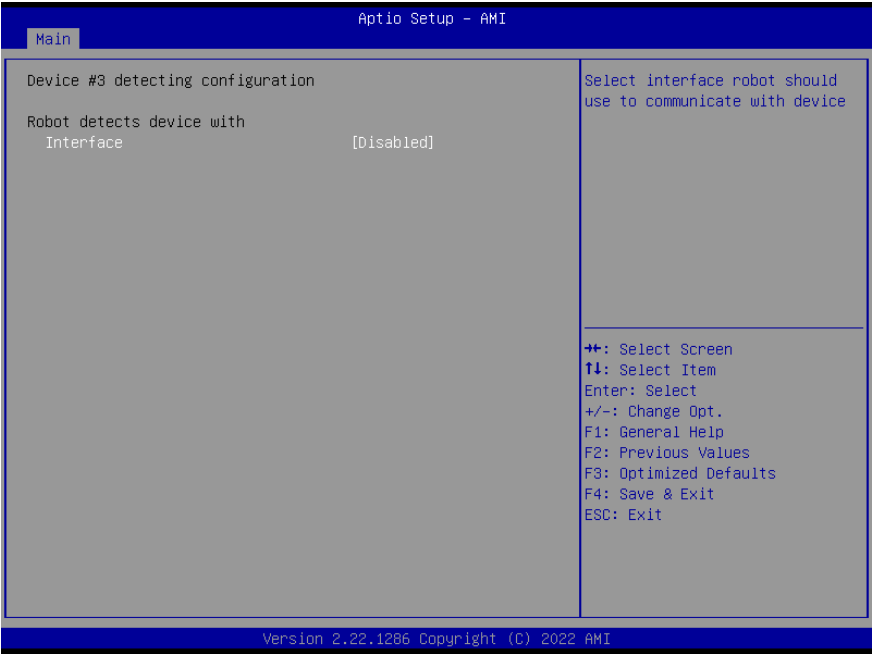
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device		

3.4.6.1.2 Device #2 Detecting Configuration



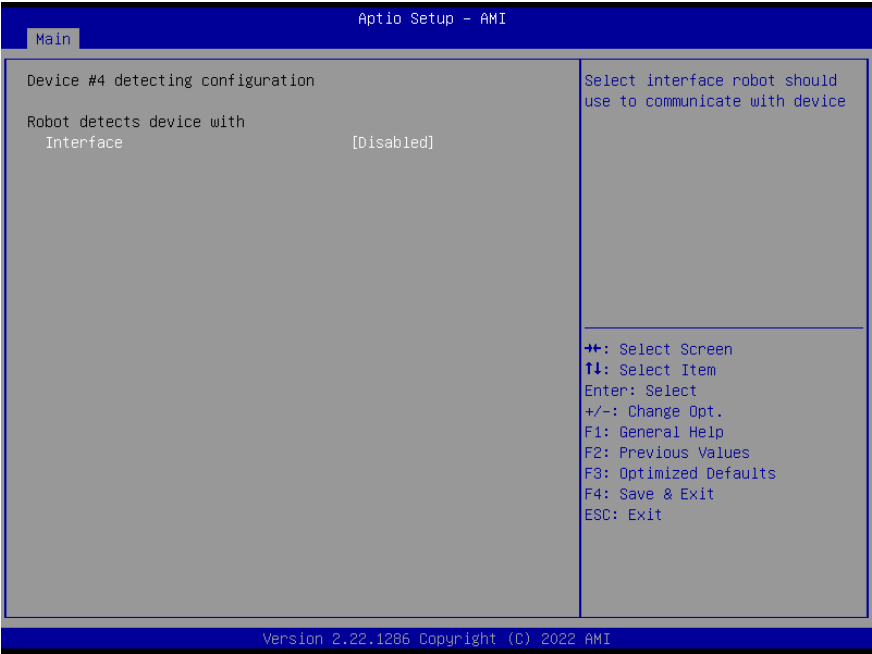
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device		

3.4.6.1.3 Device #3 Detecting Configuration



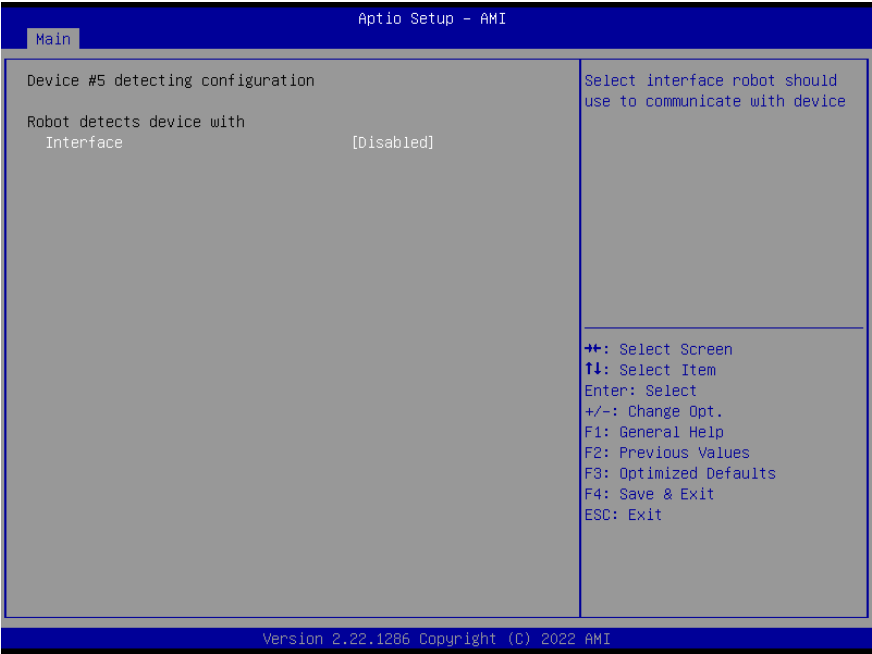
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device		

3.4.6.1.4 Device #4 Detecting Configuration



Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device		

3.4.6.1.5 Device #5 Detecting Configuration



Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device		

3.5 Setup Submenu: System I/O

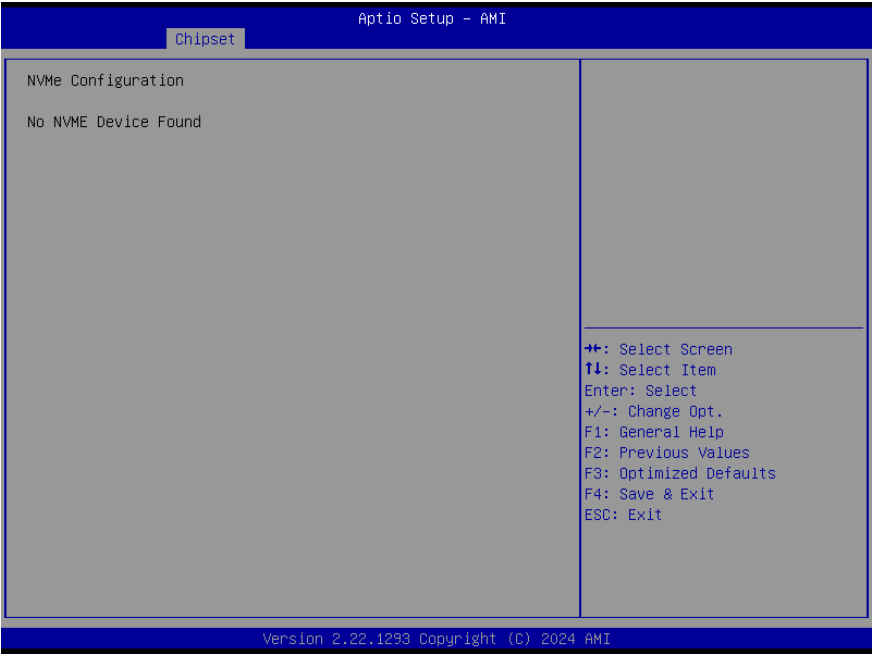


3.5.1 Storage Configuration

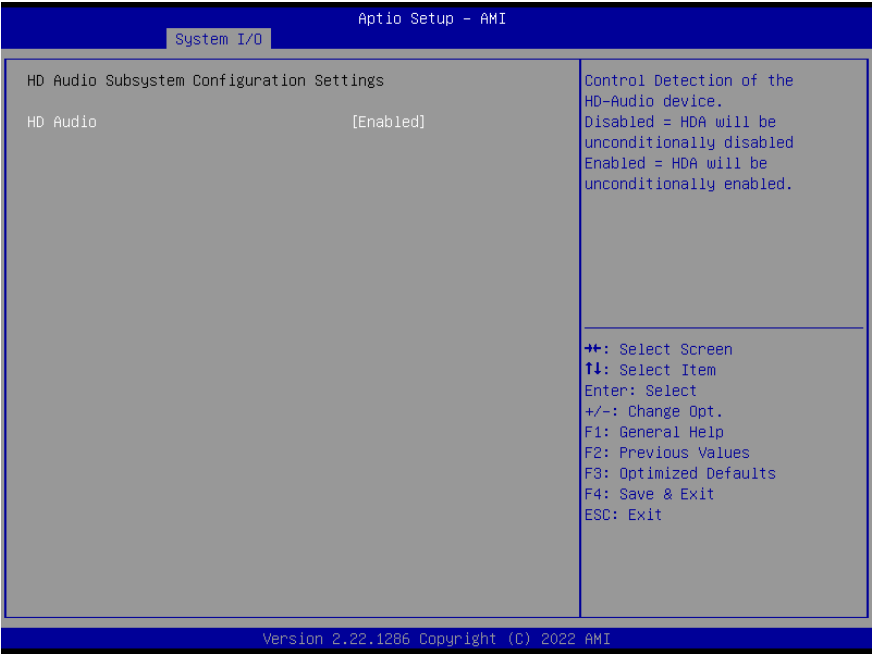


Options Summary		
SATA Controller(s)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable/Disable to SATA Device		
Port 1	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable SATA Port		
Port 2	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable SATA Port		
mSATA	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable SATA Port		

3.5.2 NVMe Configuration



3.5.3 HD Audio Configuration

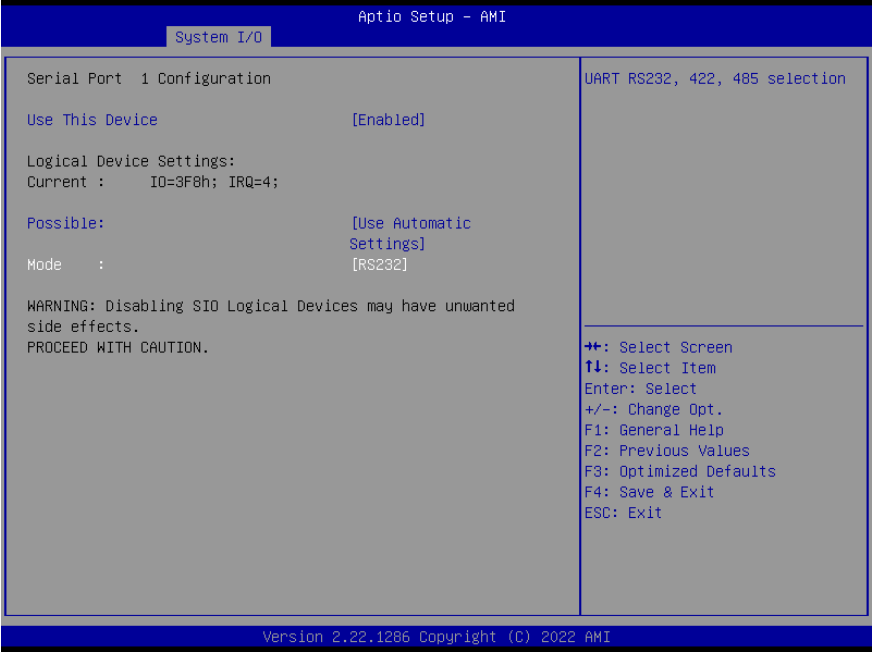


Options Summary		
HD Audio	Disabled	
	Enabled	Optimal Default, Failsafe Default
Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled.		

3.5.4 Legacy Logical Devices Configuration

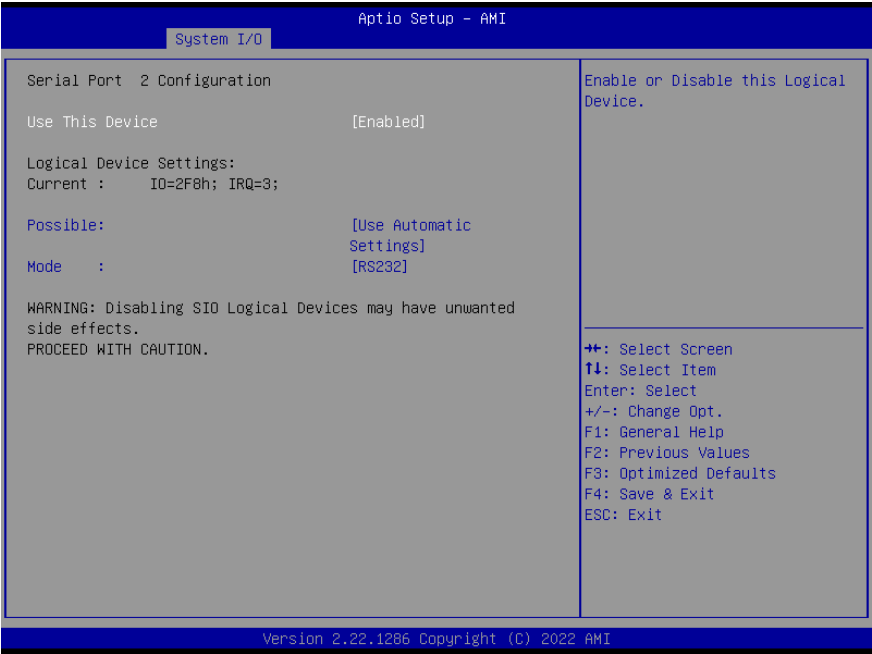


3.5.4.1 Serial Port 1



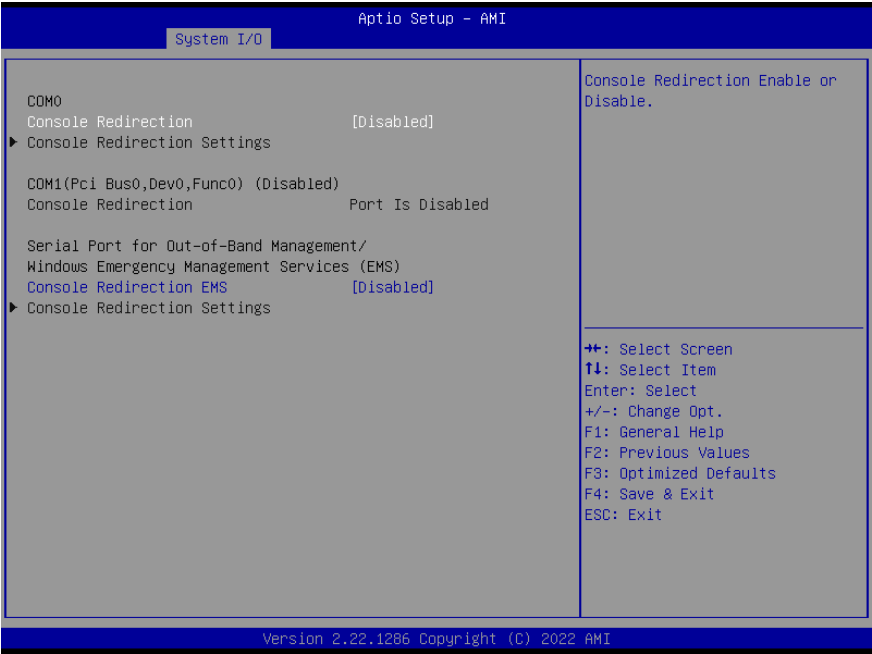
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8; IRQ=4;	
	IO=2F8; IRQ=3;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485, selection		

3.5.4.2 Serial Port 2



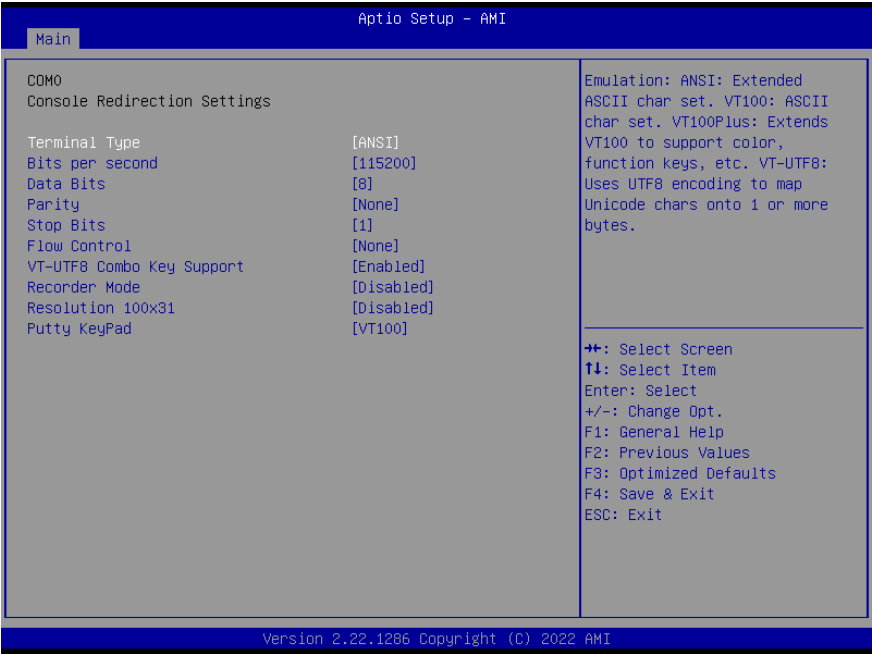
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8; IRQ=3;	
	IO=3F8; IRQ=4;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485, selection		

3.5.5 Serial Port Console Redirection



Options Summary		
Console Redirection	Disabled	Optimal Default, Failsafe Default
	Enabled	
Console Redirection Enable or Disable		
Console Redirection EMS	Disabled	Optimal Default, Failsafe Default
	Enabled	
Console Redirection Enable or Disable		

3.5.5.1 Console Redirection Settings (COM0)



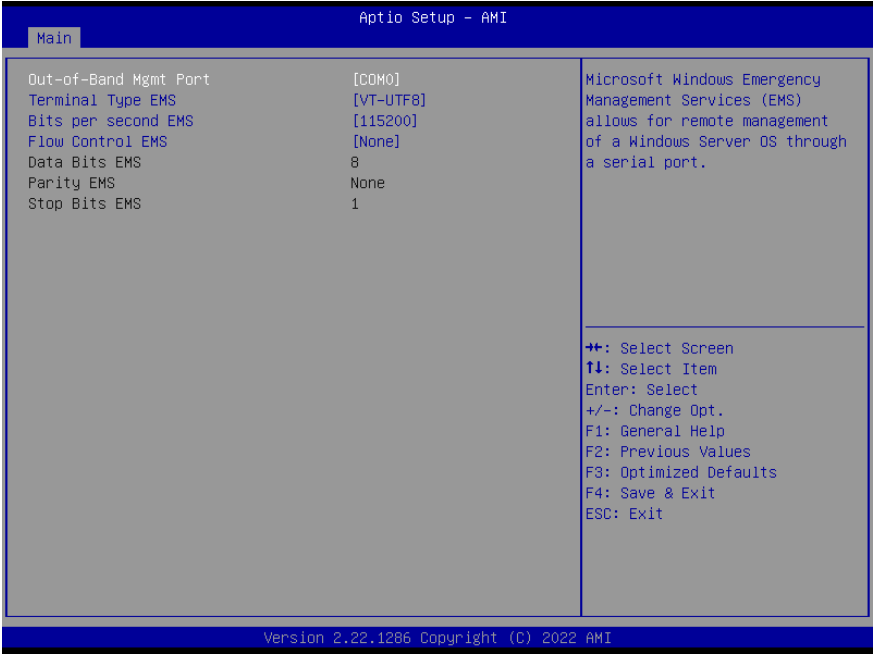
Options Summary		
Terminal Type	VT100	
	VT100Plus	
	VT-UTF8	
	ANSI	Optimal Default, Failsafe Default
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100Plus: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.		
Bits per second	9600	
	19200	
	38400	
	57600	
	115200	Optimal Default, Failsafe Default
Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.		

Options Summary		
Data Bits	7	
	8	Optimal Default, Failsafe Default
Data Bits		
Parity	None	Optimal Default, Failsafe Default
	Even	
	Odd	
	Mark	
	Space	
A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.		
Stop Bits	1	Optimal Default, Failsafe Default
	2	
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.		
Flow Control	None	Optimal Default, Failsafe Default
	Hardware RTS/CTS	
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.		
VT-UTF8 Combo Key Support	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals		
Recorder Mode	Disabled	Optimal Default, Failsafe Default
	Enabled	
With this mode enabled only text will be sent. This is to capture Terminal data.		
Resolution 100x31	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enables or disables extended terminal resolution		
Putty KeyPad	VT100	Optimal Default, Failsafe Default
	LINUX	
	XTERMR6	
	SCO	
	ESCN	
	VT400	

Options Summary

Select FunctionKey and KeyPad on Putty.

3.5.5.2 Console Redirection Settings (Out-of-Band Mgmt Port)



Options Summary

Out-of-Band Mgmt Port	COM0	Optimal Default, Failsafe Default
	COM1 (Pci Bus0, Dev0, Func0) (Disabled)	
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.		
Terminal Type EMS	VT100	
	VT100Plus	
	VT-UTF8	Optimal Default, Failsafe Default
	ANSI	
VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.		

Options Summary		
Bits per second EMS	9600	
	19200	
	57600	
	115200	Optimal Default, Failsafe Default
Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.		
Flow Control EMS	None	Optimal Default, Failsafe Default
	Hardware RTS/CTS	
	Software Xon/Xoff	
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.		

3.6 Setup Submenu: Security



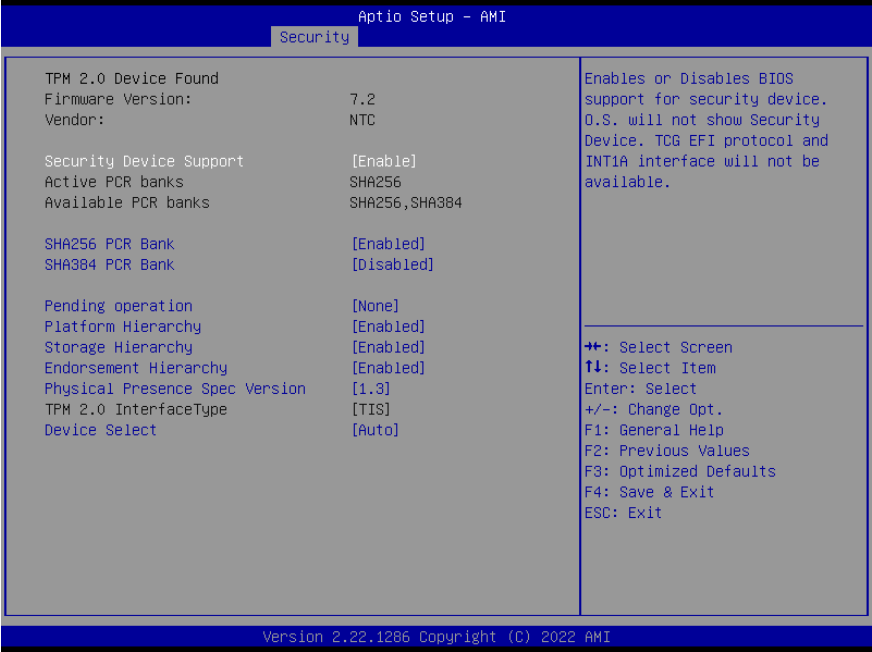
Change User/Administrator Password

You can set a User Password once an Administrator Password. The password will be required during boot up, or when the user enters the Setup utility. Please Note that a User Password does not provide access to many of the features in the Setup utility. Select the password you wish to set, press Enter to open a dialog box to enter your password (you can enter no more than six letters or numbers). Press Enter to confirm your entry, after which you will be prompted to retype your password for a final confirmation. Press Enter again after you have retyped it correctly.

Removing the Password

Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

3.6.1 Trusted Computing



Options Summary		
Security Device Support	Enable	Optimal Default, Failsafe Default
	Disable	
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.		
SHA256 PCR Bank	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SHA256 PCR Bank		
SHA384 PCR Bank	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable or Disable SHA384 PCR Bank		
Pending operation	None	Optimal Default, Failsafe Default
	TPM Clear	
Schedule an Operation for the Security Device.		
NOTE: Your Computer will reboot during restart in order to change State of Security Device.		

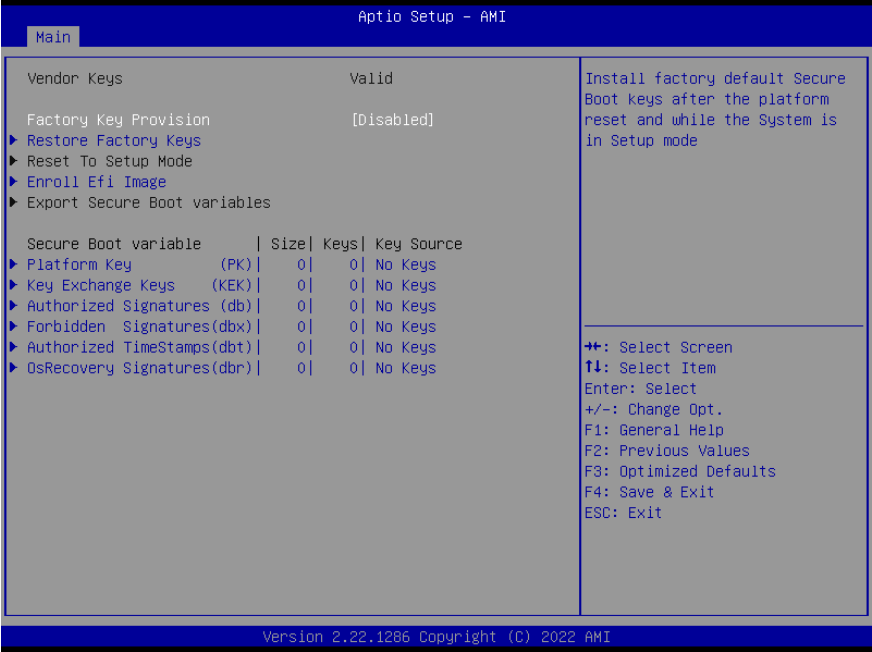
Options Summary		
Platform Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Platform Hierarchy		
Storage Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Storage Hierarchy		
Endorsement Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Endorsement Hierarchy		
Physical Presence Spec Version	1.2	
	1.3	Optimal Default, Failsafe Default
Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.		
Device Select	TPM 1.2	
	TPM 2.0	
	Auto	Optimal Default, Failsafe Default
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 the default set to TPM 2.0 devices if not found. TPM 1.2 devices will be enumerated.		

3.6.2 Secure Boot



Options Summary		
Secure Boot	Disabled	Optimal Default, Failsafe Default
	Enabled	
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	
	Custom	Optimal Default, Failsafe Default
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		
Restore Factory Keys	Yes	
	No	
Force System to User Mode. Install factory default Secure Boot key databases		

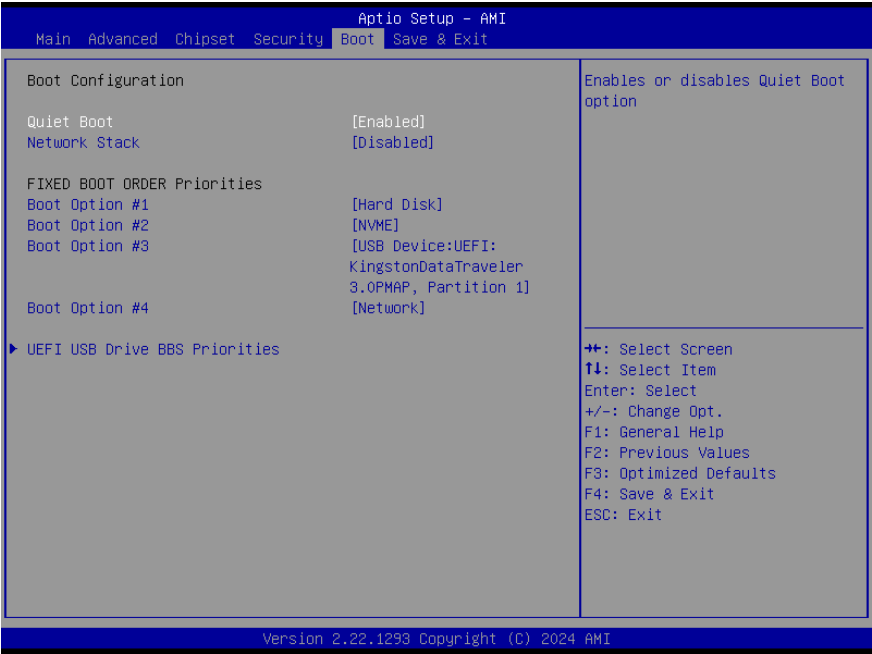
3.6.2.1 Key Management



Options Summary		
Factory Key Provision	Disabled	Optimal Default, Failsafe Default
	Enabled	
Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode		
Restore Factory Keys	Yes	
	No	
Force System to User Mode. Install factory default Secure Boot key databases		
Enroll Efi Image		
Allow Efi image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)		
Platform Key (PK)	Update	
Key Exchange Keys (KEK)	Update	
	Append	
Authorized Signatures (db)	Update	
	Append	

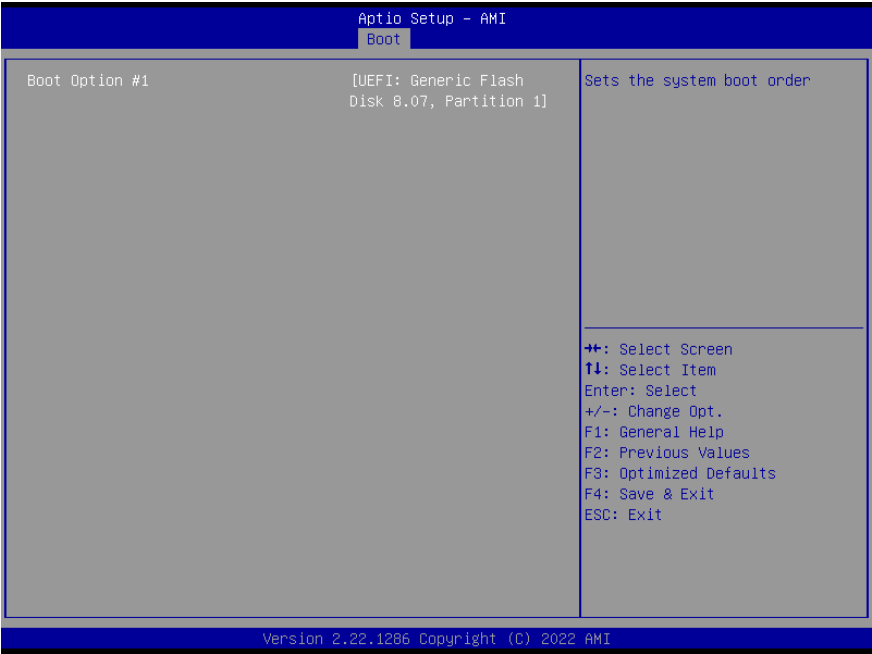
Options Summary		
Forbidden Signatures (dbx)	Update	
	Append	
Authorized TimeStamps (dbt)	Update	
	Append	
OsRecovery Signatures (dbr)	Update	
	Append	
Enroll Factory Defaults or load certificates from a file: 1. Public Key Certificate: a) EFI_SIGNATURE_LIST b) EFI_CERT_X509 (DER) c) EFI_CERT_RSA2048 (bin) d) EFI_CERT_SHAXXX 2. Authenticated UEFI Variable 3.EFI PE/COFF Image (SHA256) Key Source: Factory, External, Mixed		

3.7 Setup Submenu: Boot



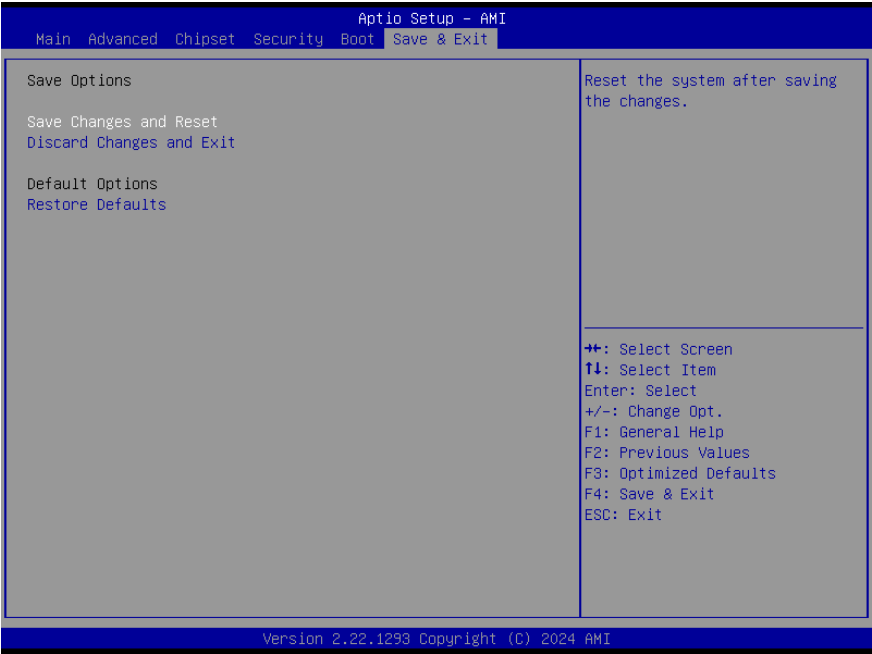
Options Summary		
Quiet Boot	Disabled	
	Enabled	Default
Enables/disables Quiet Boot option.		
Network Stack	Disabled	Default
	Enabled	
Enable/Disable UEFI Network Stack.		
Boot Option #1	Hard Disk	
Boot Option #2	NVME	
Boot Option #3	USB Device	
Boot Option #4	Network	
Sets the system boot order		

3.7.1 UEFI BBS Priorities



Options Summary		
Quiet Boot	Disabled	
	Enabled	Default
Enables/disables Quiet Boot option.		
Network Stack	Disabled	Default
	Enabled	
Enable/Disable UEFI Network Stack.		
Boot Option #1	Hard Disk	
Boot Option #2	NVME	
Boot Option #3	USB Device	
Boot Option #4	Network	
Sets the system boot order		

3.8 Setup Submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Drivers Download and Installation

Drivers for the BOXER-6645U-RPL can be downloaded from the product page on the AAEON website:

<https://www.aaeon.com/en/>

Appendix A

I/O Information

A.1 I/O Address Map

▼	DESKTOP-QBP7RPH
▼	Input/output (IO)
	[0000000000000000 - 000000000000CF7] PCI Express Root Complex
	[0000000000000020 - 0000000000000021] Programmable interrupt controller
	[0000000000000024 - 0000000000000025] Programmable interrupt controller
	[0000000000000028 - 0000000000000029] Programmable interrupt controller
	[000000000000002C - 000000000000002D] Programmable interrupt controller
	[000000000000002E - 000000000000002F] Motherboard resources
	[0000000000000030 - 0000000000000031] Programmable interrupt controller
	[0000000000000034 - 0000000000000035] Programmable interrupt controller
	[0000000000000038 - 0000000000000039] Programmable interrupt controller
	[000000000000003C - 000000000000003D] Programmable interrupt controller
	[0000000000000040 - 0000000000000043] System timer
	[000000000000004E - 000000000000004F] Motherboard resources
	[0000000000000050 - 0000000000000053] System timer
	[0000000000000061 - 0000000000000061] Motherboard resources
	[0000000000000063 - 0000000000000063] Motherboard resources
	[0000000000000065 - 0000000000000065] Motherboard resources
	[0000000000000067 - 0000000000000067] Motherboard resources
	[0000000000000070 - 0000000000000070] Motherboard resources
	[0000000000000080 - 0000000000000080] Motherboard resources
	[0000000000000092 - 0000000000000092] Motherboard resources
	[00000000000000A0 - 00000000000000A1] Programmable interrupt controller
	[00000000000000A4 - 00000000000000A5] Programmable interrupt controller
	[00000000000000A8 - 00000000000000A9] Programmable interrupt controller
	[00000000000000AC - 00000000000000AD] Programmable interrupt controller
	[00000000000000B0 - 00000000000000B1] Programmable interrupt controller
	[00000000000000B2 - 00000000000000B3] Motherboard resources
	[00000000000000B4 - 00000000000000B5] Programmable interrupt controller
	[00000000000000B8 - 00000000000000B9] Programmable interrupt controller
	[00000000000000BC - 00000000000000BD] Programmable interrupt controller
	[00000000000002F8 - 00000000000002FF] Communications Port (COM2)
	[00000000000003F8 - 00000000000003FF] Communications Port (COM1)
	[00000000000004D0 - 00000000000004D1] Programmable interrupt controller

	[00000000000004D0 - 00000000000004D1]	Programmable interrupt controller
	[0000000000000680 - 000000000000069F]	Motherboard resources
	[0000000000000A00 - 0000000000000A0F]	Motherboard resources
	[0000000000000A10 - 0000000000000A1F]	Motherboard resources
	[0000000000000A20 - 0000000000000A2F]	Motherboard resources
	[0000000000000D00 - 000000000000FFFF]	PCI Express Root Complex
	[000000000000164E - 000000000000164F]	Motherboard resources
	[0000000000001854 - 0000000000001857]	Motherboard resources
	[0000000000002000 - 00000000000020FE]	Motherboard resources
	[0000000000003000 - 000000000000303F]	Intel(R) UHD Graphics 710
	[0000000000003060 - 000000000000307F]	Standard SATA AHCI Controller
	[0000000000003080 - 0000000000003083]	Standard SATA AHCI Controller
	[0000000000003090 - 0000000000003097]	Standard SATA AHCI Controller
	[000000000000EFA0 - 000000000000EFBF]	Intel(R) SMBus - 7AA3

A.2 Memory Address Map

- ▼  DESKTOP-QBP7RPH
 - >  Input/output (IO)
 - >  Interrupt request (IRQ)
 - ▼  Large Memory
 -  [0000004000000000 - 0000007FFFFFFFFF] PCI Express Root Complex
 - ▼  Memory
 -  [0000000000A0000 - 0000000000BFFFFFFF] PCI Express Root Complex
 -  [0000000080400000 - 00000000804FFFFFFF] Intel(R) Ethernet Controller I226-LM
 -  [0000000080400000 - 00000000805FFFFFFF] Intel(R) PCI Express Root Port #4 - 7ABB
 -  [0000000080400000 - 00000000BFFFFFFF] PCI Express Root Complex
 -  [0000000080500000 - 0000000080503FFF] Intel(R) Ethernet Controller I226-LM
 -  [0000000080620000 - 0000000080621FFF] Standard SATA AHCI Controller
 -  [0000000080622000 - 00000000806227FF] Standard SATA AHCI Controller
 -  [0000000080623000 - 00000000806230FF] Standard SATA AHCI Controller
 -  [00000000BFFE0000 - 00000000BFFFFFFF] Intel(R) Ethernet Connection (17) I219-LM
 -  [00000000C0000000 - 00000000CFFFFFFF] Motherboard resources
 -  [00000000FE010000 - 00000000FE010FFF] Intel(R) SPI (flash) Controller - 7AA4
 -  [00000000FED00000 - 00000000FED003FF] High precision event timer
 -  [00000000FED20000 - 00000000FED7FFFF] Motherboard resources
 -  [00000000FED40000 - 00000000FED44FFF] Trusted Platform Module 2.0
 -  [00000000FED45000 - 00000000FED8FFFF] Motherboard resources
 -  [00000000FED90000 - 00000000FED93FFF] Motherboard resources
 -  [00000000FEDA0000 - 00000000FEDA0FFF] Motherboard resources
 -  [00000000FEDA1000 - 00000000FEDA1FFF] Motherboard resources
 -  [00000000FEDC0000 - 00000000FEDC7FFF] Motherboard resources
 -  [00000000FEE00000 - 00000000FEEFFFFFFF] Motherboard resources
 -  [0000004000000000 - 000000400FFFFFFF] Intel(R) UHD Graphics 710
 -  [0000006000000000 - 0000006000FFFFFFF] Intel(R) UHD Graphics 710
 -  [0000006001100000 - 000000600110FFFF] Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
 -  [0000006001118000 - 00000060011180FF] Intel(R) SMBus - 7AA3
 -  [0000007FFFEFB000 - 0000007FFFEFBFFF] Intel(R) Management Engine Interface #1
 -  [0000007FFFEFC000 - 0000007FFFEFFFFF] Intel® Smart Sound Technology BUS
 -  [0000007FFFF00000 - 0000007FFFFFFFFFFF] Intel® Smart Sound Technology BUS

A.3 IRQ Mapping Chart

