



BOXER-6649-RAP

Fanless Compact Embedded Computer

User's Manual 1st Ed

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Packing List

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

Item	Quantity
● BOXER-6649-RAP	1
● Wall Mount Kit	2
● 3-Pin Terminal Block Connector (for DC Input)	1
● Screw Pack	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.

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.						

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Chapter 1

Product Specifications

1.1 Specifications

System	
CPU	13th Generation Intel® Core™ Processors (28W TDP): Intel® Core™ i3-1320PE Processor Intel® Core™ i5-1340PE Processor Intel® Core™ i7-1370PE Processor
Chipset	Intel® SoC
System Memory	DDR5 SODIMM x 2, up to 96GB
Display Interface	HDMI x 2
Storage Device	Internal 2.5" SATA Drive Bay x 1 M.2 2280 M-Key x 1 (PCIe Gen 4 [x4]) for NVMe
Ethernet	Intel® Ethernet Controller I226-LM, 2.5GbE, RJ-45 x 5 (IEEE 802.3 at PoE PSE x 4) Note: PoE Power Budget: 20W (≥12V DC Input) 60W (≥19V DC Input)
I/O	USB 3.2 Gen 2 (Type-A) x 2 (10Gbps) USB 2.0 x 4 DB-9 for RS-232/422/485 x 2 Audio Jack x 1 for Mic-in/Line-out DB-15 for DIO 8-bit Power Button with LED Indicator x 1
Expansion	M.2 2230 E-Key x 1 (PCIe) M.2 3052 B-Key x 1 (USB 3.2/USB 2.0) SIM Slot x 1
Indicator	System Power

System

OS Support	Windows® 10 IoT Enterprise LTSC 2021
	Windows® 11 Pro
	Windows® 11 IoT Enterprise LTSC 2024
	Ubuntu 24.04 or later

Power Supply

Power Requirement	9V – 36V DC input via 3-pin Terminal Block Connector with protection circuit
-------------------	--

Mechanical

Mounting	Wall Mount
	DIN Rail (optional)
Dimensions (W x H x D)	9.5" x 6.6" x 2.2" (242mm x 167mm x 56mm) w/o Brackets
Gross Weight	7.1 lb (3.2 kg)
Net Weight	5.3 lb (2.4 kg)

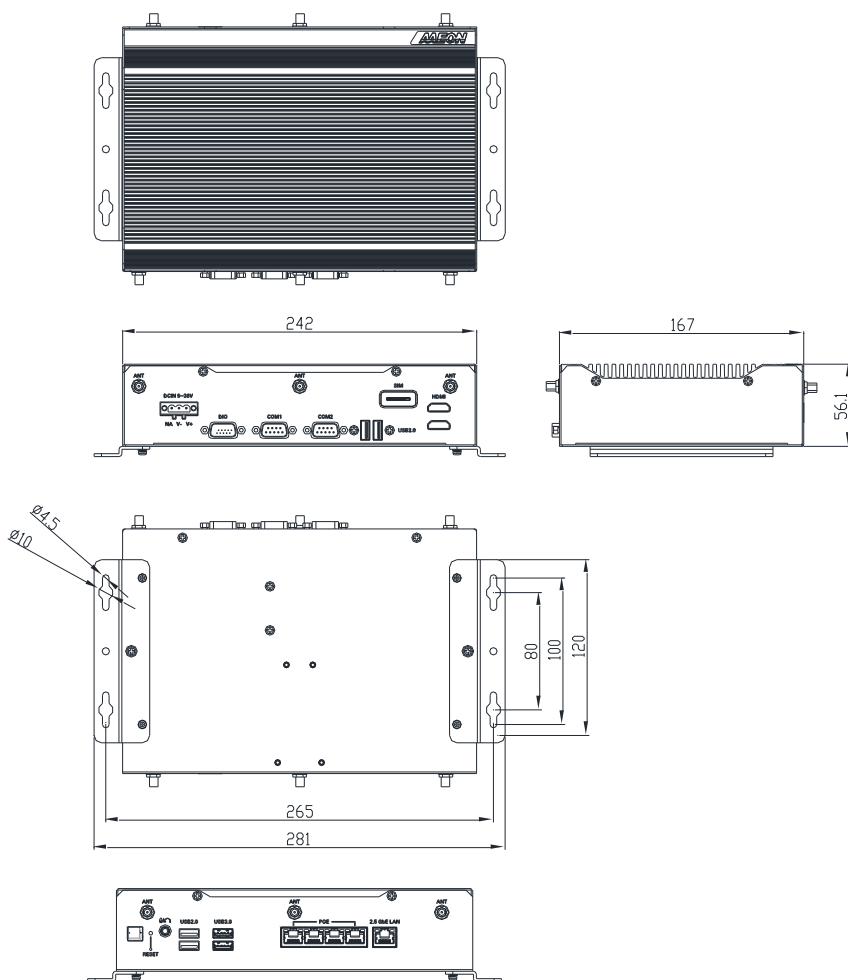
Environmental

Operating Temperature	-13°F ~ 140°F (-25°C ~ 60°C), IEC60068-2 with 0.7 m/s
	AirFlow, with wide temp. memory/storage
Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)
Storage Humidity	5 ~ 95% @ 40°C, non-condensing
Anti-Vibration	SSD: Random, 3Grms, 5~500Hz
Anti-Shock	SSD: 50G @ Wall Mount, Half-sine, 11ms
Certification	CE/FCC Class A

Chapter 2

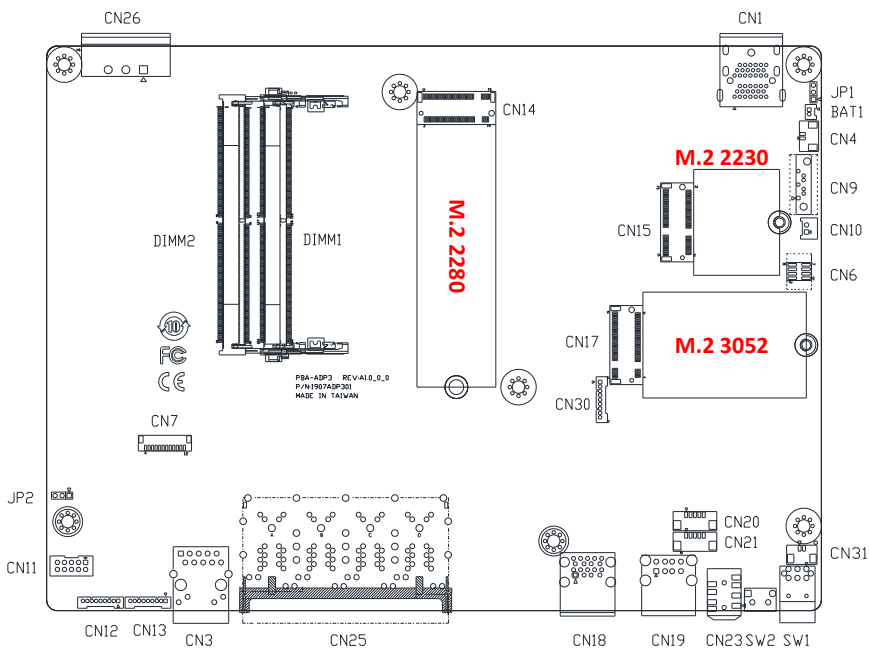
Hardware Information

2.1 Dimensions

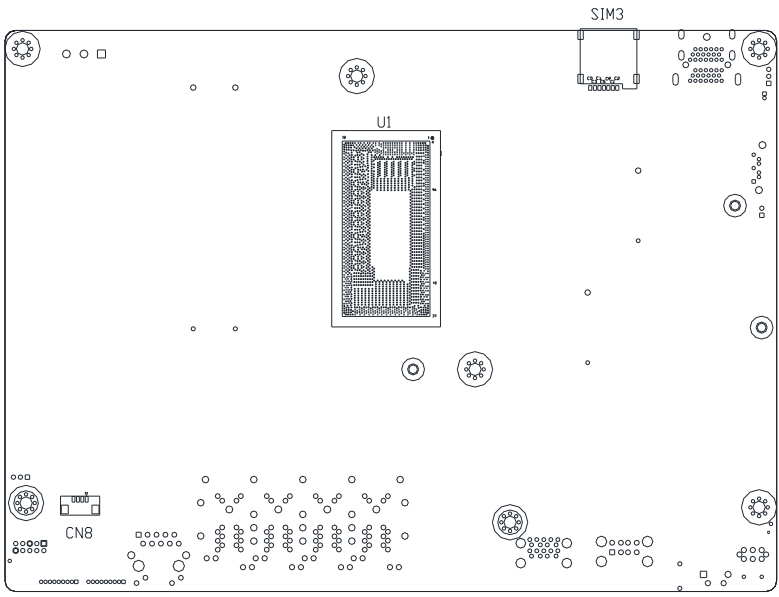


2.2 Jumpers and Connectors

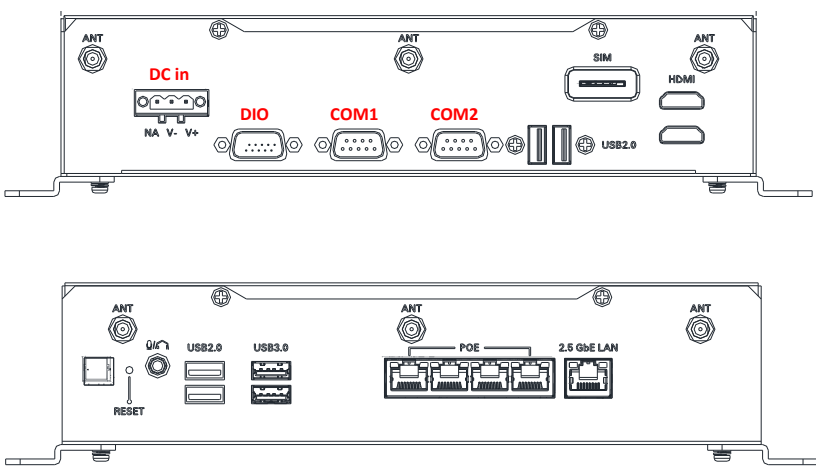
Top View



Bottom View



I/O Ports



2.3 List of Jumpers

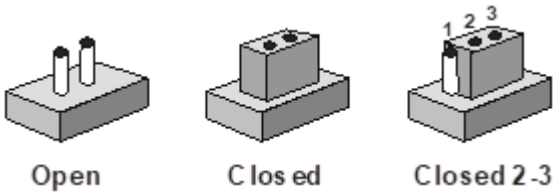
Please refer to the table below for all of the system's jumpers that you can configure for your application.

Label	Function
JP1	CMOS Control Selection
JP2	ATX/AT Mode Selection

2.3.1 Setting Jumpers

The BOXER-6649-RAP 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.

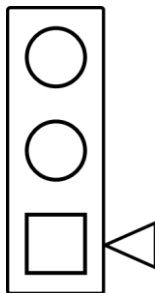
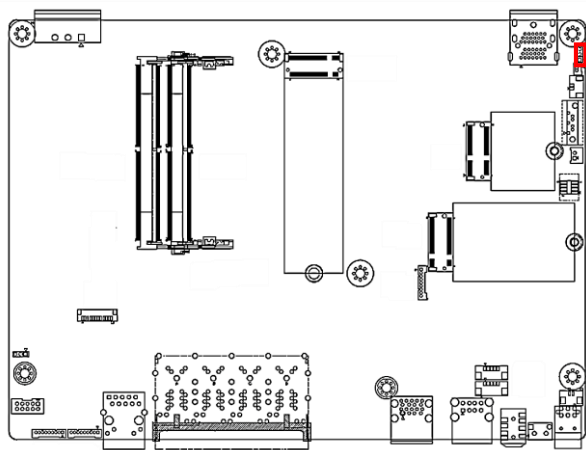
For jumpers with multiple pins, this guide uses "pins A-B" to notate which pins should be connected by a jumper clip. For example, "pins 1-2" means you should connect pins 1 and 2, while "pins 2-3" means you should connect pins 2 and 3.



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

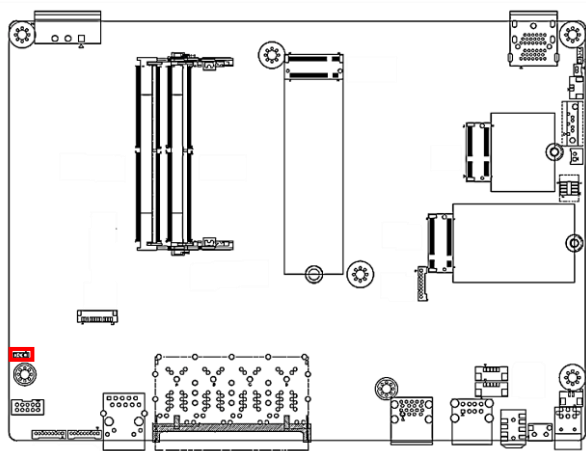
If you have any questions about how best to configure the system for your application, contact your AAEON representative or visit our website to talk with our support team.

2.3.2 Clear CMOS Jumper (JP1)



Function	Pin Configuration
Normal (Default)	1-2
Clear CMOS	2-3

2.3.3 ATX/AT Mode Selection (JP2)



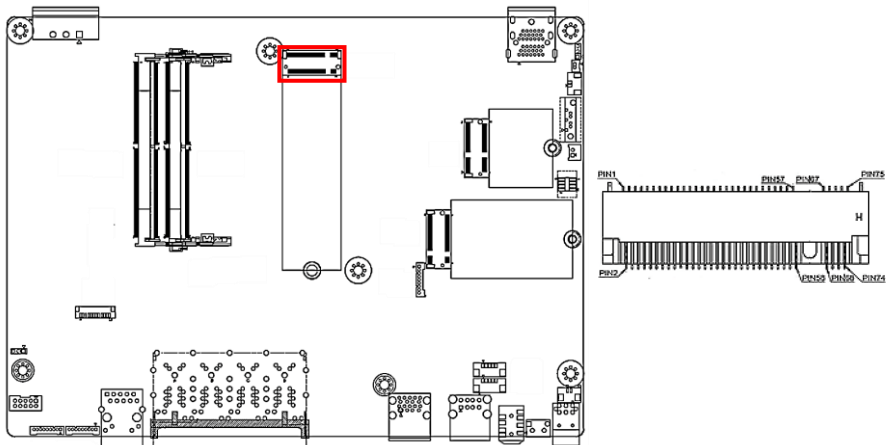
Function	Pin Configuration
ATX (Default)	1-2
AT	2-3

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
M.2 2280	M.2 2280 M-Key
DC in	Phoenix Connector Power Input
DIO	8-bit DIO
COM1	COM 1 DB-9 for RS232/422/485
COM2	COM 2 DB-9 for RS232/422/485
M.2 3052	M.2 3052 B-Key
M.2 2230	M.2 2230 E-Key
BAT1	RTC Battery

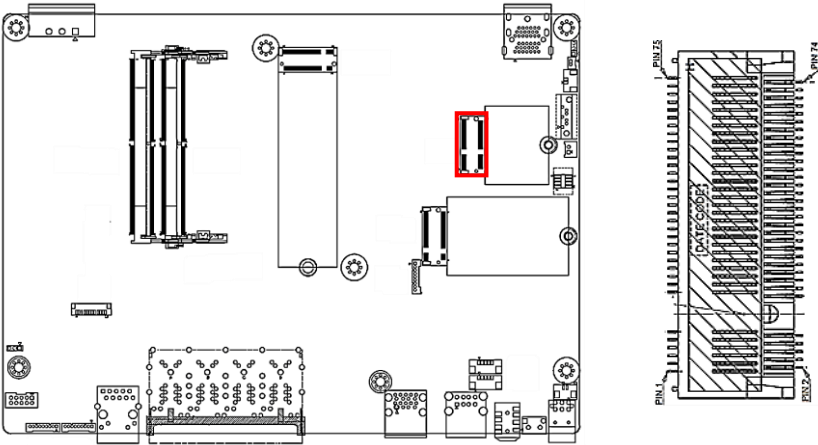
2.4.1 M.2 2280 M-Key (M.2 2280)



Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	2	+V3P3_NGFF	PWR	+3.3V
3	GND	GND	4	+V3P3_NGFF	PWR	+3.3V
5	PCIE4_3_RXN	IN	6	CARD_PWR_OFF_N	OUT	+3.3V
7	PCIE4_3_RXP	IN	8	NC		
9	GND	GND	10	NC		
11	PCIE4_3_TXN	OUT	12	+V3P3_NGFF	PWR	+3.3V
13	PCIE4_3_TXP	OUT	14	+V3P3_NGFF	PWR	+3.3V
15	GND	PWR	16	+V3P3_NGFF	PWR	+3.3V
17	PCIE4_2_RXN	IN	18	+V3P3_NGFF	PWR	+3.3V
19	PCIE4_2_RXP	IN	20	NC		
21	GND	PWR	22	NC		
23	PCIE4_2_TXN	OUT	24	NC		
25	PCIE4_2_TXP	OUT	26	NC		
27	GND	PWR	28	NC		
29	PCIE4_1_RXN	IN	30	NC		
31	PCIE4_1_RXP	IN	32	NC		
33	GND	GND	34	NC		
35	PCIE4_1_TXN	OUT	36	NC		
37	PCIE4_1_TXP	OUT	38	DEV_SLP	IN	+3.3V
39	GND	GND	40	SMB_CLK_M2		+1.8V
41	PCIE4_0_RXP	IN	42	SMB_DATA_M2		+1.8V

Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
43	PCIE4_0_RXN	IN	44	NC		
45	GND	GND	46	NC		
47	PCIE4_0_TXN	OUT	48	NC		
49	PCIE4_0_TXP	OUT	50	BUF_PLT_RST_R	IN	+3.3V
51	GND	PWR	52	PCIE_CLKREQ#0	OUT	+3.3V
53	CLKOUT_PCIE_N0	OUT	54	M2_WAKE#	OUT	+3.3V
55	CLKOUT_PCIE_P0	OUT	56	NC		
57	GND	GND	58	NC		
67	NC		68	NC		
69	NC		70	+V3P3_NGFF	PWR	+3.3V
71	GND	GND	72	+V3P3_NGFF	PWR	+3.3V
73	GND	GND	74	+V3P3_NGFF	PWR	+3.3V
75	GND	GND				

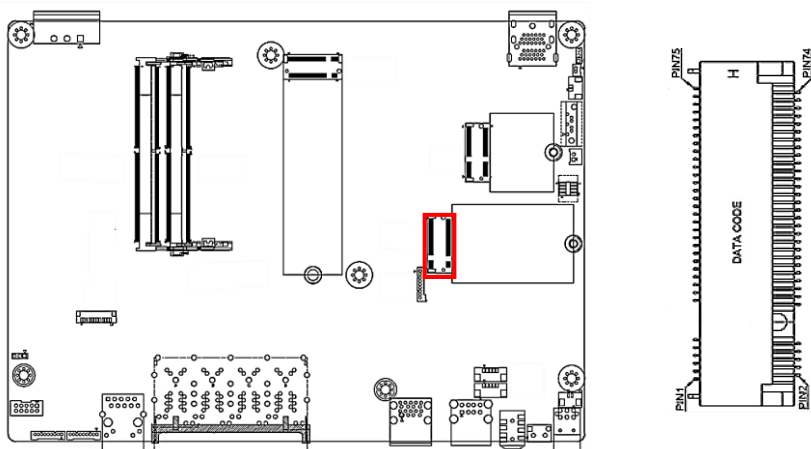
2.4.2 M.2 2230 E-Key (M.2 2230)



Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	2	+V3P3_NGFF_E	PWR	+3.3V
3	USB_PP9	DIFF	4	+V3P3_NGFF_E	PWR	+3.3V
5	USB_PN9	DIFF	6	NC		
7	GND	GND	8	M.2_BT_PCMCLK_C	IN	+3.3V
9	NC		10	M.2_BT_PCMFRM_C	IN	+3.3V
11	NC		12	M.2_BT_PCMIN_C	OUT	+3.3V
13	NC		14	M.2_BT_PCMOUT_C	IN	+3.3V
15	NC		16	NC		
17	NC		18	GND	GND	
19	NC		20	KEYE_UART_WAKE_N	OUT	+3.3V
21	NC		22	NC		
23	NC					
			32	NC		
33	GND	GND	34	NC		
35	PCIE5_TXP	DIFF	36	NC		
37	PCIE5_TXN	DIFF	38	CL_RST#	IN	+3.3V
39	GND	GND	40	CL_DATA		+3.3V
41	PCIE5_RXP	DIFF	42	CL_CLK	IN	+3.3V

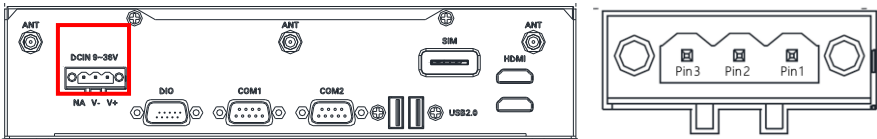
Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
43	PCIE5_RXN	DIFF	44	GPPC_F6_CNV_PA_BLANKING	OUT	+3.3V
45	GND	GND	46	CNV_MFUART2_TXD	IN	+3.3V
47	CLKOUT_PCIE_P4	DIFF	48	CNV_MFUART2_RXD	OUT	+3.3V
49	CLKOUT_PCIE_N4	DIFF	50	SUSCLK	IN	+3.3V
51	GND	GND	52	BUF_PLT_RST#	IN	+3.3V
53	PCIE_CLKREQ#4	OUT	54	GPP_A13_PMC_I2C_SCL	IN	+3.3V
55	KEYE_WAKE_N	OUT	56	GPPC_E3_CPU_GP_0	IN	+3.3V
57	GND	GND	58	SMB_DATA		
59	NC		60	SMB_CLK	IN	
61	NC		62	SMB_ALERT	IN	
63	GND	GND	64	NC		
65	NC		66	NC		
67	NC		68	NC		
69	GND	GND	70	NC		
71	NC		72	+V3P3_NGFF_E	PWR	+3.3V
73	NC		74	+V3P3_NGFF_E	PWR	+3.3V
75	GND	GND				

2.4.3 M.2 3052 B-Key (M.2 3052)



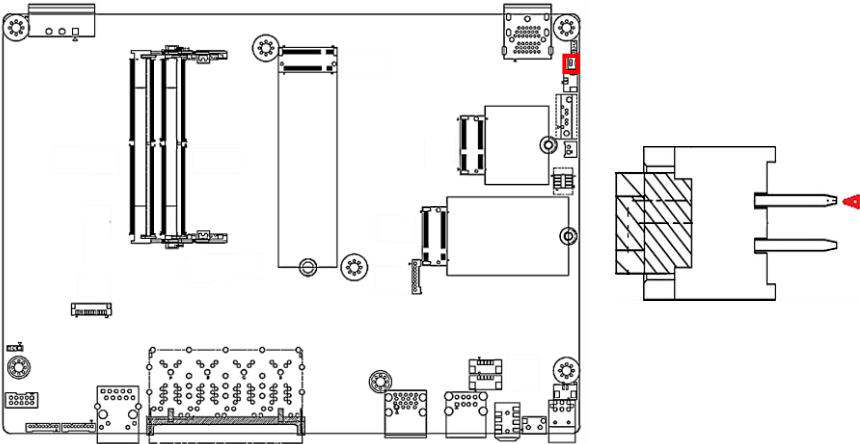
Pin	Pin Name	Signal Type	Pin	Pin Name	Signal Type	Signal Level
1	NC		2	+3P3V_NGFF_3052	PWR	+3.3V
3	GND	GND	4	+3P3V_NGFF_3052	PWR	+3.3V
5	GND	GND	6	FULL_CARD_POWER_B	OUT	+3.3V
7	USB_PP4	DIFF	8	3GPW_EN_B	IN	+3.3V
9	USB_PN4	DIFF	10	NC		
11	GND	GND				
			20	NC		
21	NC		22	NC		
23	NC		24	NC		
25	NC		26	NC		
27	GND	GND	28	NC		
29	USB3_RX4_N	DIFF	30	UIM3_RESET	OUT	
31	USB3_RX4_P	DIFF	32	UIM3_CLK	OUT	
33	GND	GND	34	UIM3_DATA	I/O	
35	USB3_TX3_N	DIFF	36	UIM1_PWR1	PWR	+3.3V
37	USB3_TX3_P	DIFF	38	NC		
39	GND	GND	40	UIM2_DET	IN	
41	NC		42	UIM2_DATA	OUT	
43	NC		44	UIM2_CLK	OUT	
45	GND	GND	46	UIM2_RESET	OUT	
47	NC		48	UIM2_PWR2	PWR	+3.3V
49	NC		50	BUF_PLT_3052A_RST#	IN	+3.3V
51	GND	GND	52	M3052A_PCIE_CLKREQ#		
53	NC	OUT	54	M2_3052A_WAKE#	OUT	+3.3V
55	NC	OUT	56	NC		
57	GND	GND	58	NC		
59	NC		60	NC		
61	NC		62	NC		
63	NC		64	NC		
65	NC		66	UIM1_DET	IN	
67	BUF_PLT_3052A_RST#		68	SUSCLK_3052A		
69	NC		70	+3P3V_NGFF_3052	PWR	+3.3V
71	GND	GND	72	+3P3V_NGFF_3052	PWR	+3.3V
73	GND	GND	74	+3P3V_NGFF_3052	PWR	+3.3V
75	GND	GND				

2.4.4 Phoenix Connector Power Input (DC in)



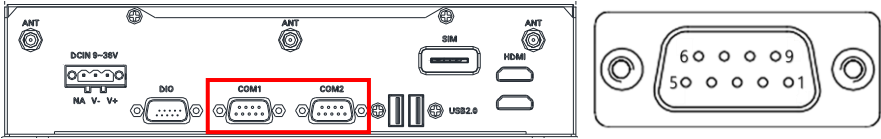
Pin	Pin Name	Signal Type	Signal level
1	VIN	PWR	+9V ~ +36V
2	GND	GND	
3	NA	NA	

2.4.5 RTC Battery (BAT1)



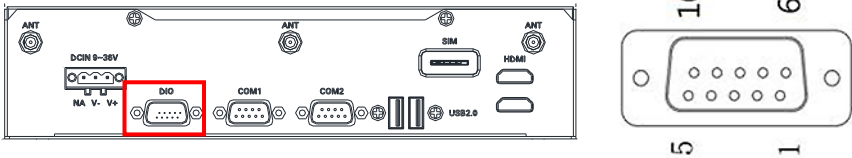
Pin	Pin Name	Signal Type	Signal level
1	+V3P3A_RTC	PWR	+3.3V
2	GND	GND	

2.4.6 DB-9 for RS-232/422/485 (COM1/COM2)



Pin	RS-232	RS-422	RS-485
1	DCD	TX-	D-
2	RX	TX+	D+
3	TX	RX+	NC
4	DTR	RX-	NC
5	GND	NC	NC
6	DSR	NC	NC
7	RTS	NC	NC
8	CTS	NC	NC
9	RI	NC	NC

2.4.7 Digital I/O Port (DIO)

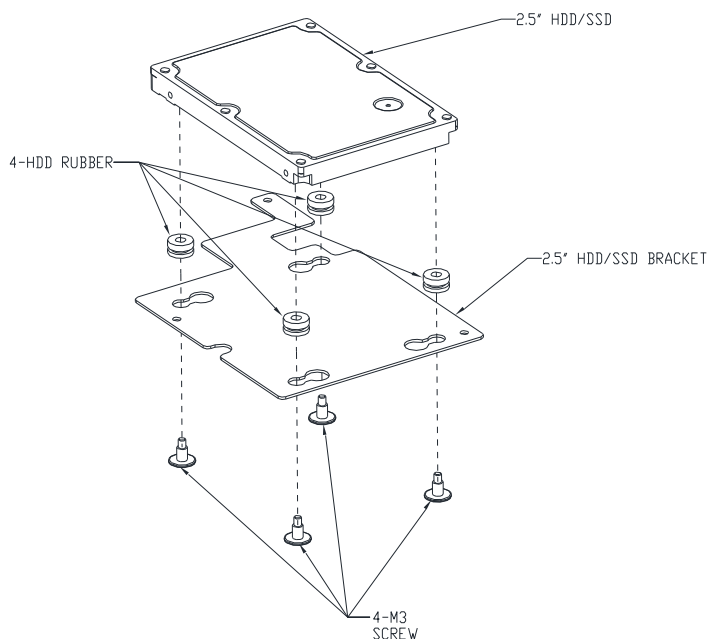


Pin	Pin Name	Signal Type	Signal level
1	DIO0	I/O	+ 5V
2	DIO1	I/O	+ 5V
3	DIO2	I/O	+ 5V
4	DIO3	I/O	+ 5V
5	DIO4	I/O	+ 5V
6	DIO5	I/O	+ 5V
7	DIO6	I/O	+ 5V
8	DIO7	I/O	+ 5V
9	+5V	PWR (Output)	+ 5V / 600mA
10	GND	GND	

2.5 Hardware Installation

2.5.1 2.5" HDD Installation

Prepare the Bracket Assembly

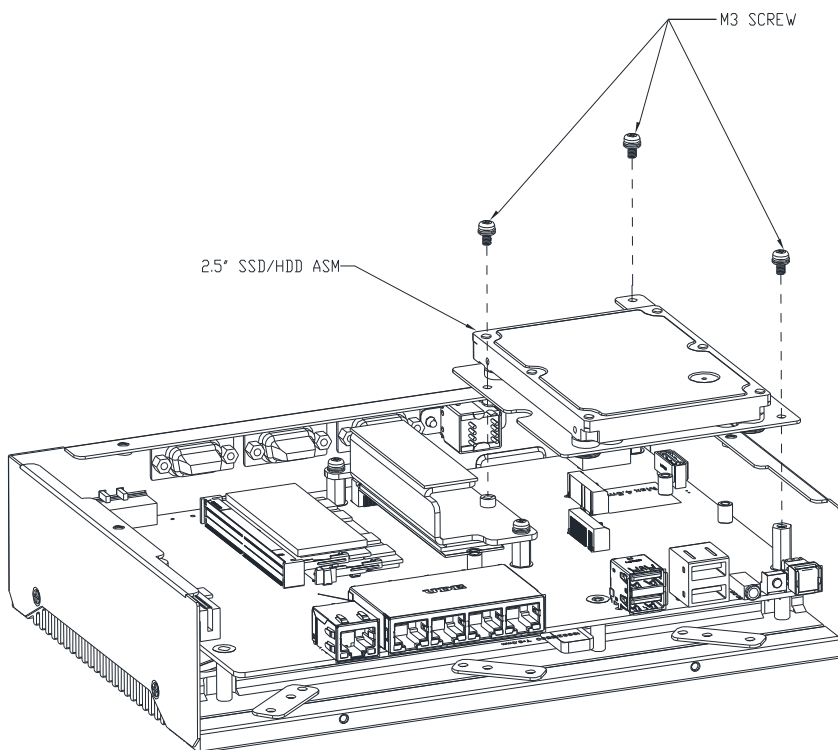


1. Insert four (4) HDD rubber grommets into the corresponding holes on the 2.5" HDD/SSD bracket.
2. Align the 2.5" HDD/SSD with the holes on the bracket, ensuring that the screw holes on the drive line up with the rubber grommets.

Secure the HDD to the Bracket

1. Insert the 4 rubber grommets into the holes on the HDD/SSD bracket.
2. Align the screw holes of the HDD with the rubber grommets on the bracket.
3. Use 4 × M3 screws to secure the HDD onto the bracket through the grommets (this provides vibration damping).

Install the Bracket Assembly into the Chassis



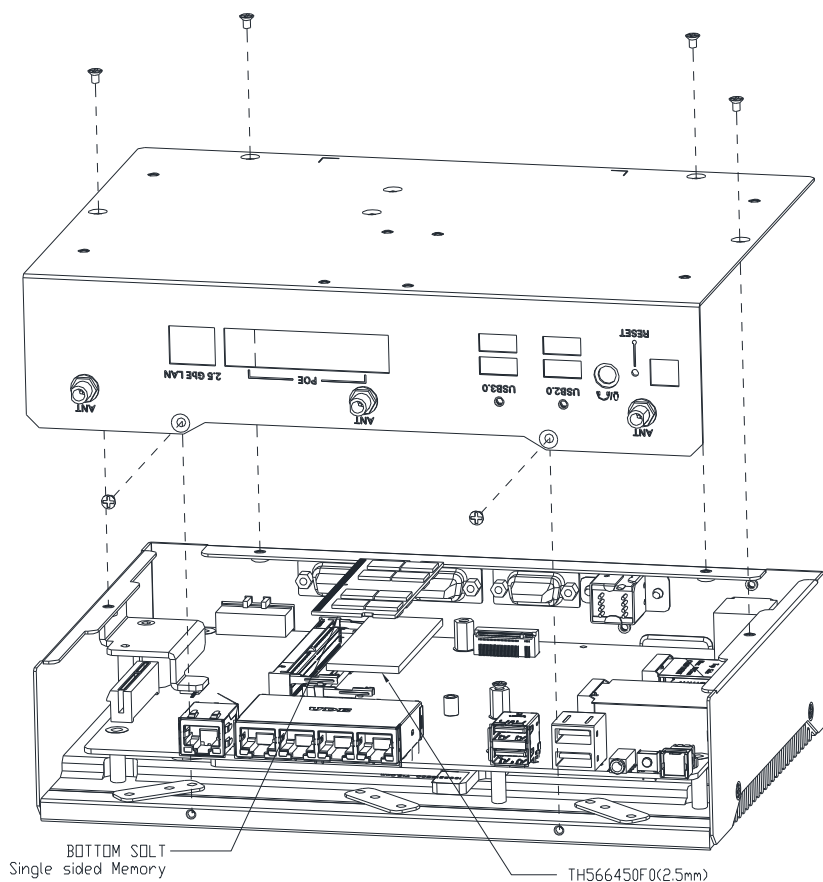
1. Place the assembled HDD + bracket into the designated mounting area inside the chassis.
2. Align the mounting holes on the bracket with the chassis standoffs.
3. Secure the bracket to the chassis using four (4) M3 screws.

Connect Cables

1. Attach the SATA data cable to the HDD and connect the other end to an available SATA port on the motherboard.
2. Attach the SATA power cable from the power supply to the HDD.

2.5.2 DDR5 SODIMM Installation

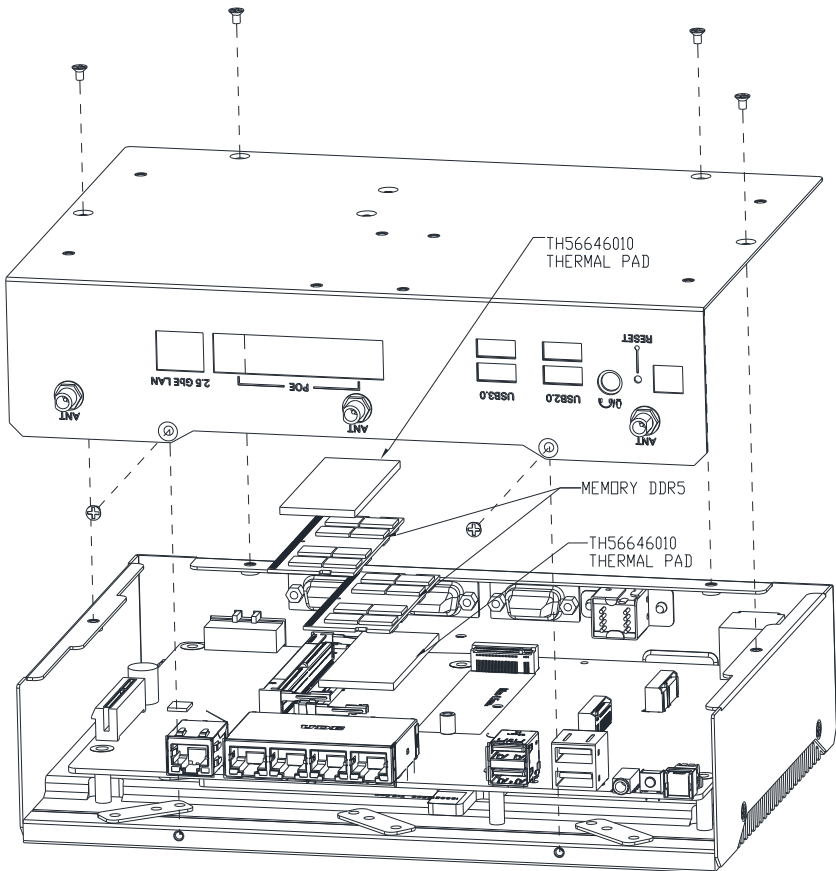
Step 1: Top SODIMM Installation



1. Locate the top memory slot under the system cover.
2. Prepare the two thermal pads:
 - o One is placed on top of the SODIMM chips (to touch the chassis lid).
 - o The other is placed underneath/alongside the slot area (to ensure even contact and thermal transfer).

3. Peel the protective films off both pads.
4. Insert the SODIMM at a 30°–45° angle into the slot.
5. Press the module down until the side clips snap into place.
6. Ensure both thermal pads are properly seated against the chassis lid and bottom cover when reassembling the system.

Step 2: Install Bottom SODIMM (Optional – Single-Sided Memory)

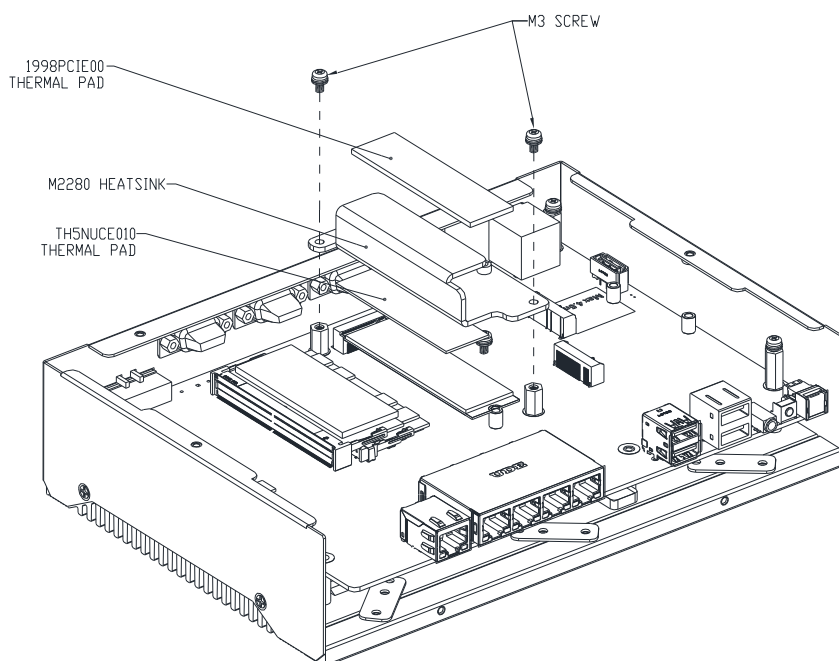


1. Locate the bottom memory slot (labeled *BOTTOM SLOT | Single sided Memory*).

2. Align the SODIMM module with the slot notch.
3. Insert the module at a 30°–45° angle until the contacts are fully seated.
4. Press the module down gently until the retention clips snap into place.

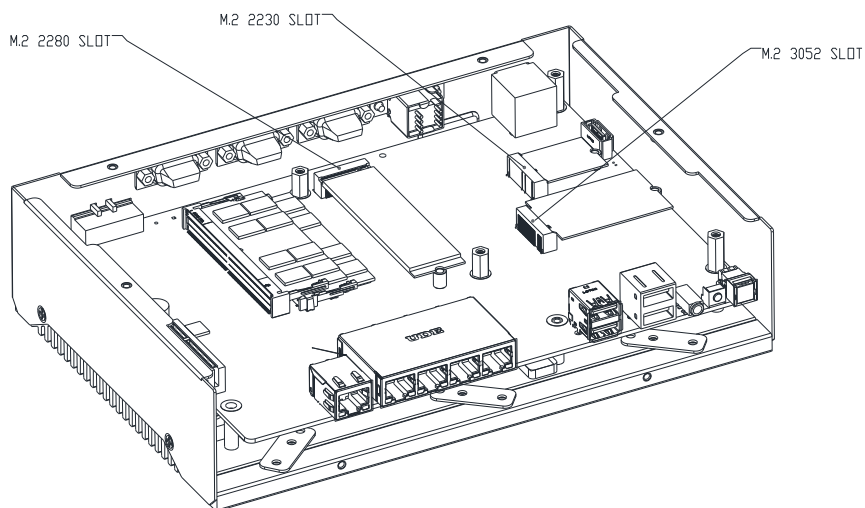
Note: When installing memory, if a single-sided module is used in the bottom slot, a 2.5 mm thermal pad must be applied; for all other configurations, use the standard TH56646010 2.0 mm thermal pad. Ensure the thermal pad is properly seated to maintain optimal heat transfer.

2.5.3 M.2 2280 Card Installation



- Locate the M.2 2230 connector (short slot, 30mm mounting point).
- Insert the module at a 30° angle into the slot.
- Press down flat and secure with the screw provided.
- Place one thermal pad on top of the module, followed by the M2280 Heatsink, followed by a second thermal pad aligned as in the below diagram. Secure the heatsink using the two (2) M3 screws provided.

2.5.4 M.2 2230/3052 Card Installation



- Access the M.2 Key slots by removing the four (4) screws on the bottom-side of the chassis.
- Insert modules as required.
- Reaffix the screws removed during step 1.

S

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

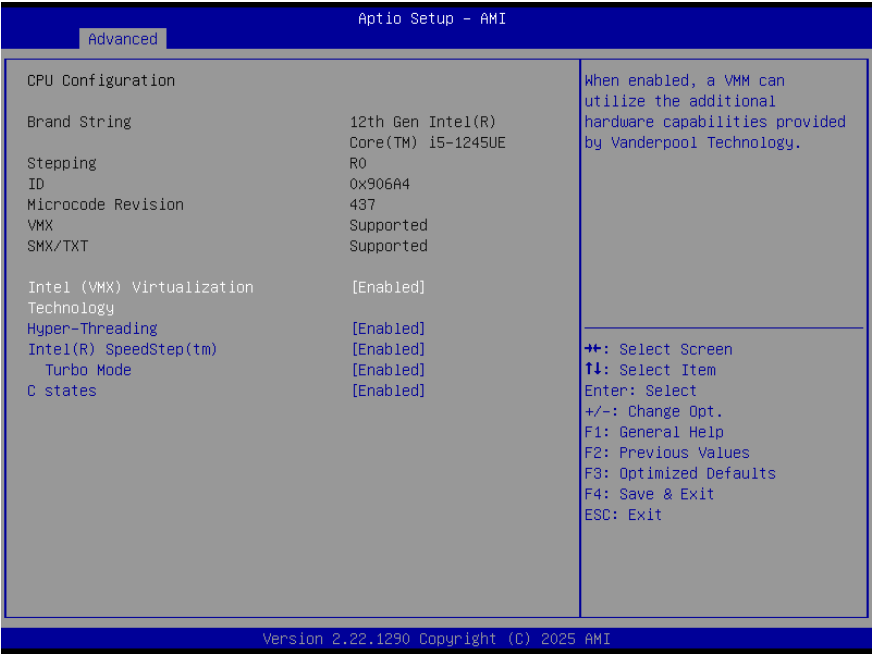
3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced



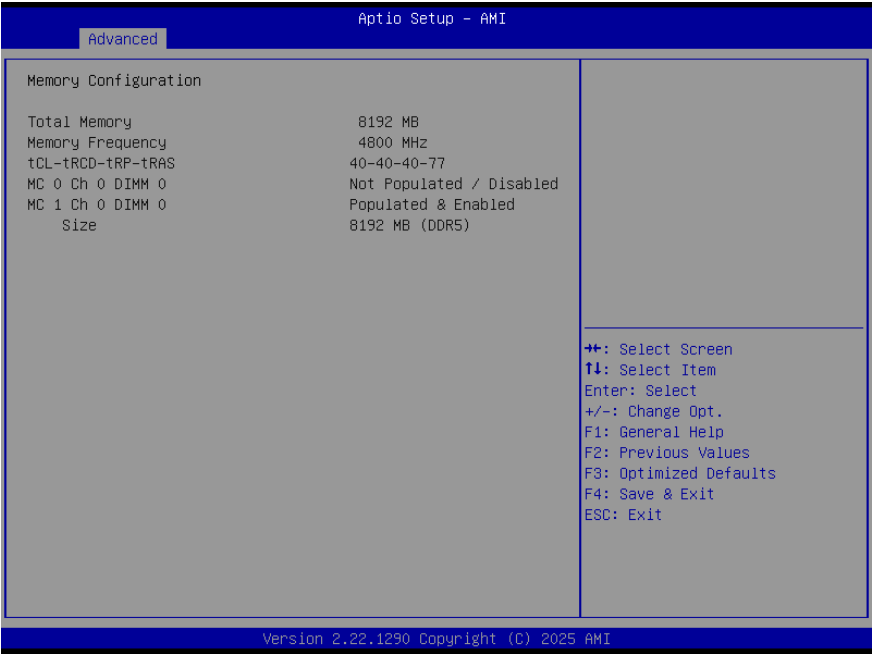
3.4.1 CPU Configuration



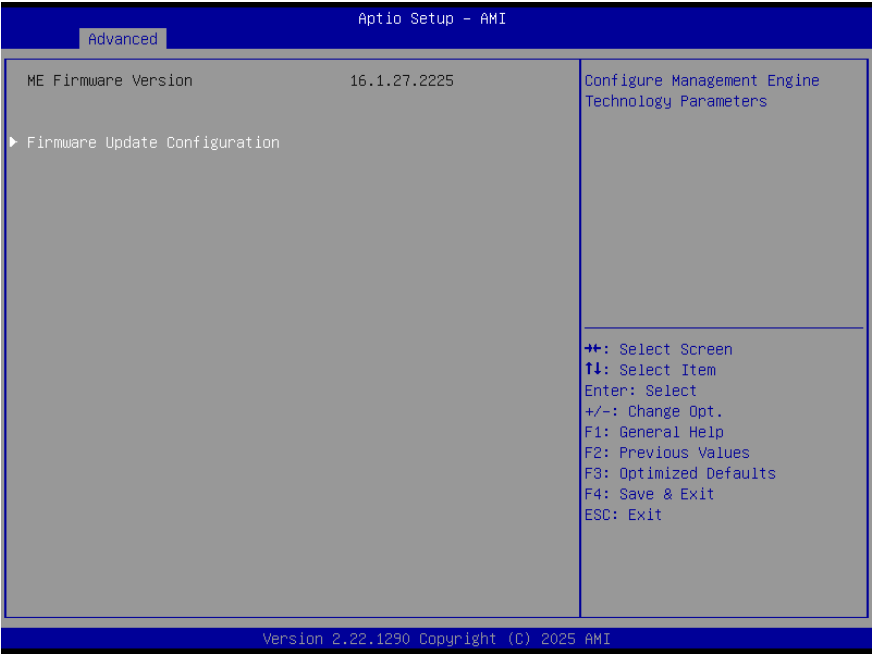
Options Summary		
Intel (VMX)Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
When enabled, a Virtual Machine Monitor (VMM) can use the additional hardware virtualization features provided by Intel® VT-x (Vanderpool Technology).		
Hyper-Threading	Disabled	
	Enabled	Optimal 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

Options Summary		
Enable or disable processor Turbo Mode.		
When enabled (or set to AUTO), the processor can run above its base frequency if Intel® Enhanced Memory and Thread Management (EMTTM) is also enabled.		
Enabled/AUTO: Turbo Mode is active, allowing higher performance under thermal and power limits.		
Disabled: Turbo Mode is turned off, and the CPU will run at its base frequency only.		
C states	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or disable CPU Power Management. When enabled, the processor can enter C-states (low-power idle states) when it is not fully utilized, reducing power consumption and heat.		
Enabled: CPU dynamically enters lower power states when idle.		
Disabled: CPU remains in active state, consuming more power but providing consistent performance.		

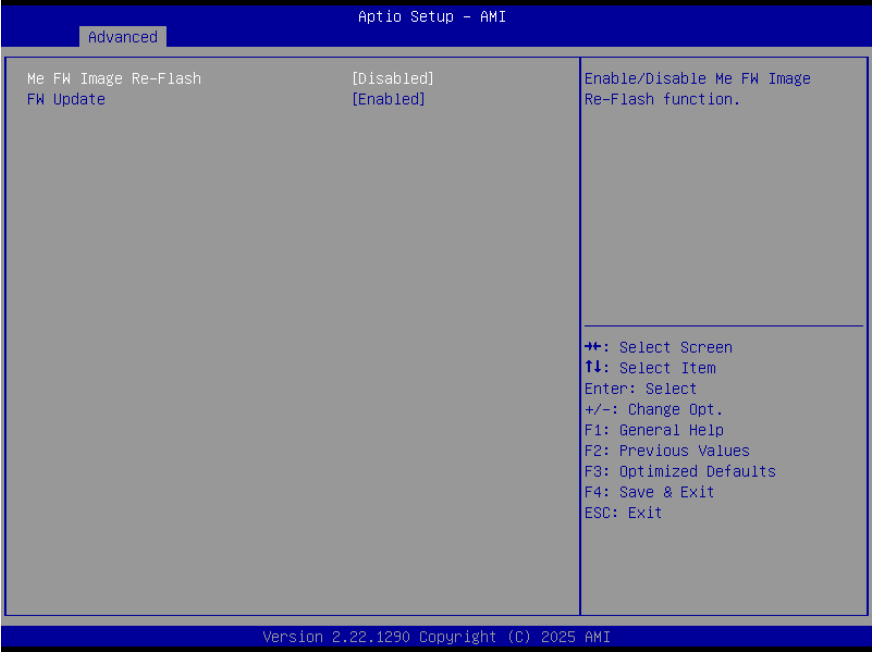
3.4.2 Memory Configuration



3.4.3 PCH-FW Configuration

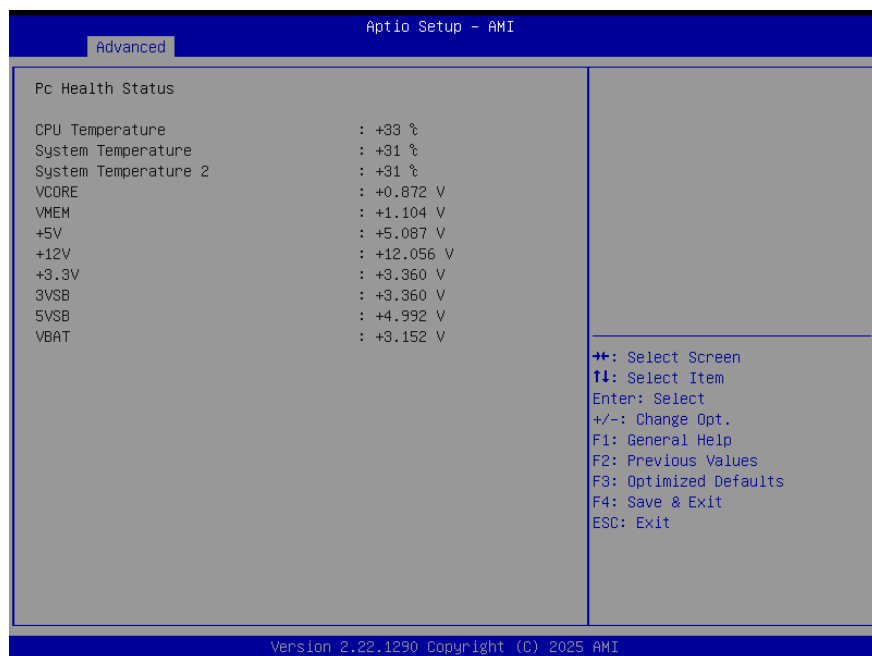


3.4.3.1 Firmware Update Configuration

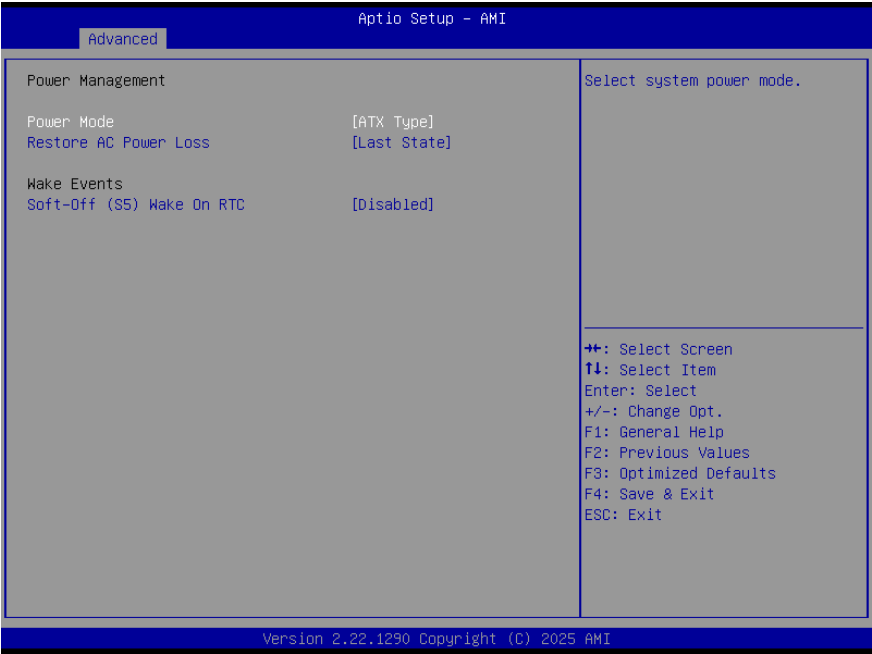


Options Summary		
Me FW Image Re-Flash	Enabled	
	Disabled	Optimal Default, Failsafe Default
Enable or disable the ME FW Image Re-Flash function.		
Enabled: Allows the Management Engine firmware image to be re-flashed.		
Disabled: Prevents re-flashing of the Management Engine firmware image.		
FW Update	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or disable the ME FW Update function.		
Enabled: Allows updating of the Management Engine firmware.		
Disabled: Prevents any Management Engine firmware updates..		

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	
Determines the system behavior when AC power is restored after an unexpected power loss. Power Off: System remains off when power is restored. Power On: System automatically powers on when power is restored. Last State: System returns to the state it was in before the power loss (on or off). Note: The CMOS battery must be present for this setting to function properly.		
System Wake On RTC	Disabled	Optimal Default, Failsafe Default
	By Date	
	By Weekday	
	Bypass	

Options Summary

By Date: System wakes on a specific date at the specified time (hour::minute::second).
By Weekday: System wakes on selected weekday(s) at the specified time (hour::minute::second).
Bypass: Disables BIOS control of the RTC wake function (OS or other controllers may manage it).

3.4.6 AAEON BIOS Robot



Options Summary

Sends watch dog before BIOS POST	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The robot sets the Watchdog Timer (WDT) immediately after power-on, before the BIOS starts the POST process. Once POST completes, the robot clears the WDT. If the WDT is not cleared before the countdown reaches zero, the system will automatically reset.		
Sends watch dog before booting OS	Disabled	Optimal Default, Failsafe Default
	Enabled	

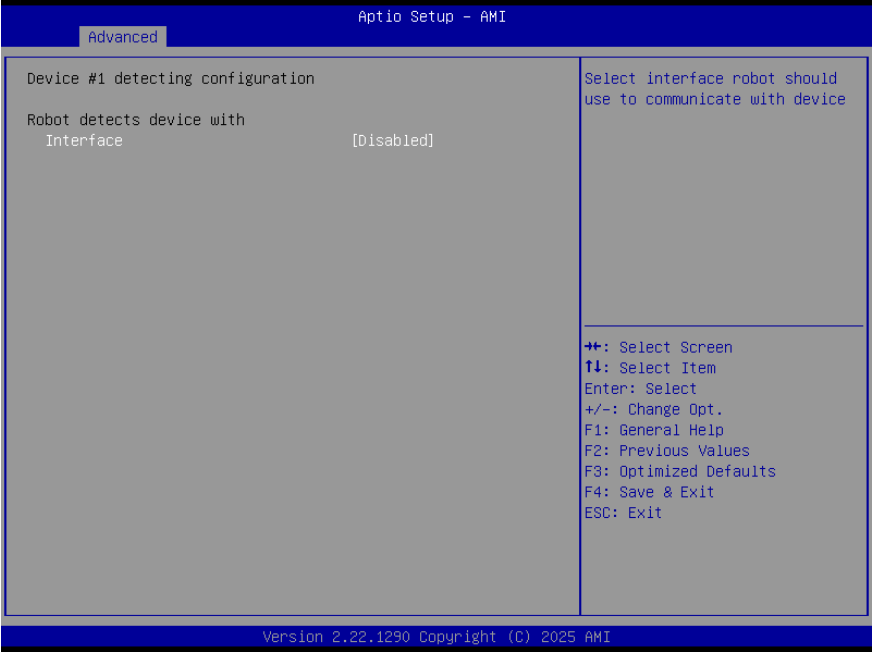
Options Summary		
Enabled – The robot sets the Watch Dog Timer (WDT) after POST completes, before the BIOS transfers control to the OS.		
Warning: Before enabling this function, an OS program must be responsible for clearing the WDT. Disable this function if the OS will perform updates.		
Delayed POST (PEI phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The robot holds the BIOS from starting POST immediately after power-on. This ensures POST begins with stable power or after the system is physically warmed up.		
Note: The robot performs this action before sending the Watch Dog signal.		
Delayed POST (DXE phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The robot holds the BIOS before POST completion. This allows POST to start with stable power or after the system is physically warmed up.		
Reset system once	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled – The robot performs a single system reset on each boot. This sends a soft or hard reset to onboard devices, helping to place them in a more stable state.		

3.4.6.1 Device Detecting Configuration



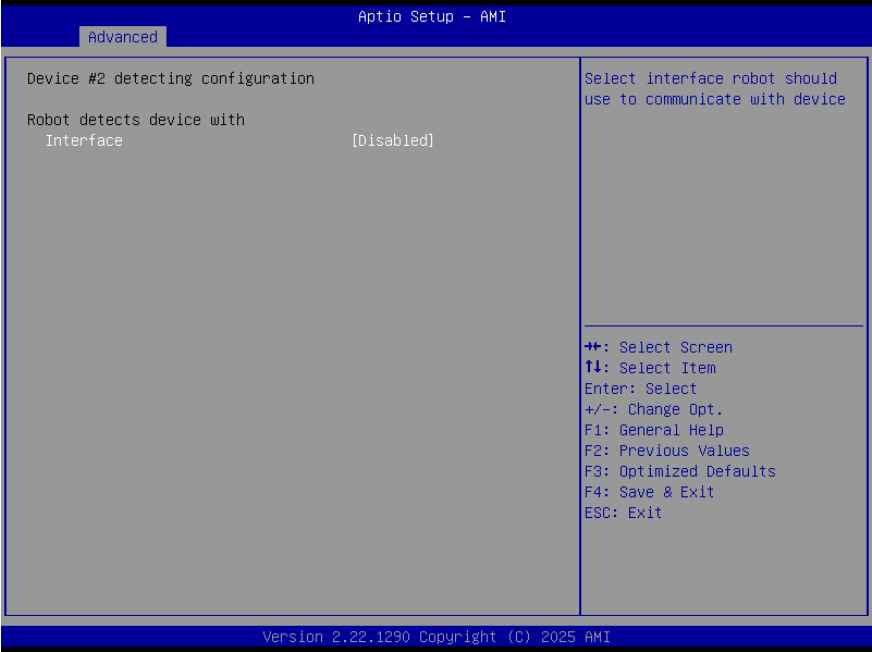
Options Summary		
Action	Reset System	Optimal Default, Failsafe Default
	Hold System	
Select action that robot should do.		
Soft or hard reset	Soft	Optimal Default, Failsafe Default
	Hard	
Select reset type robot should send on each boot.		
Retry-Count	3	Optimal Default, Failsafe Default
Enter the retry counter value. The robot will reset the system up to the specified number of times, then allow POST to continue.		
At time	After show logo	Optimal Default, Failsafe Default
	Before show logo	
Select the robot action timing:		
After Show Logo – The robot performs the action after the logo is displayed; system devices are nearly ready.		
Before Show Logo – The robot performs the action before the logo is displayed; some devices may not be ready.		

3.4.6.1.1 Device #1 Detecting Configuration



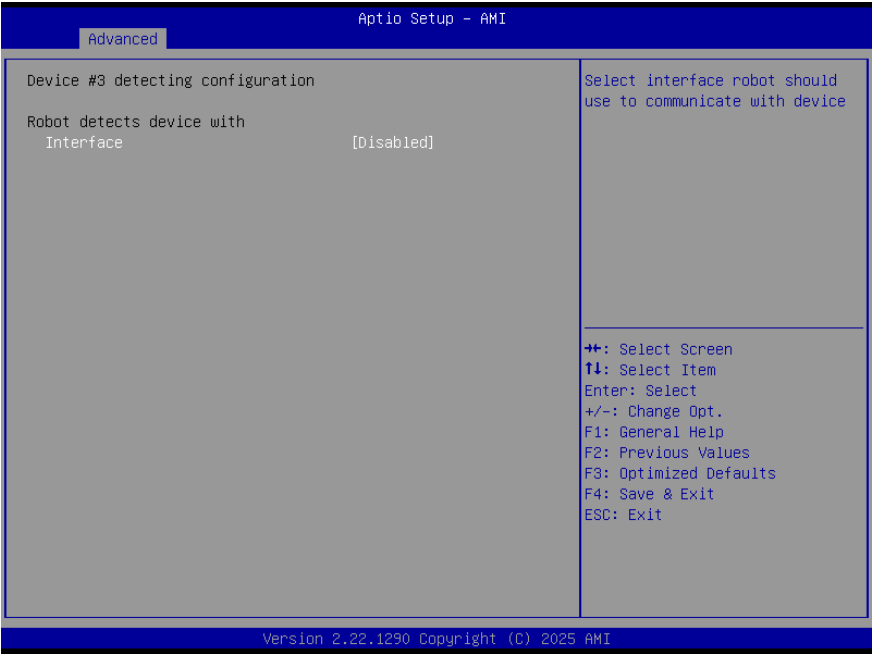
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device		

3.4.6.1.2 Device #2 Detecting Configuration



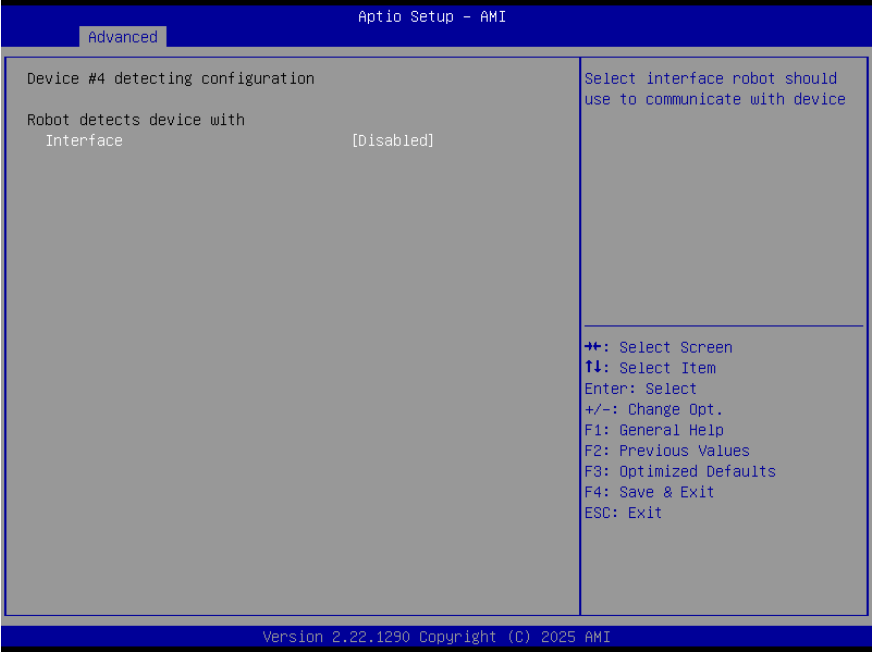
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device		

3.4.6.1.3 Device #3 Detecting Configuration



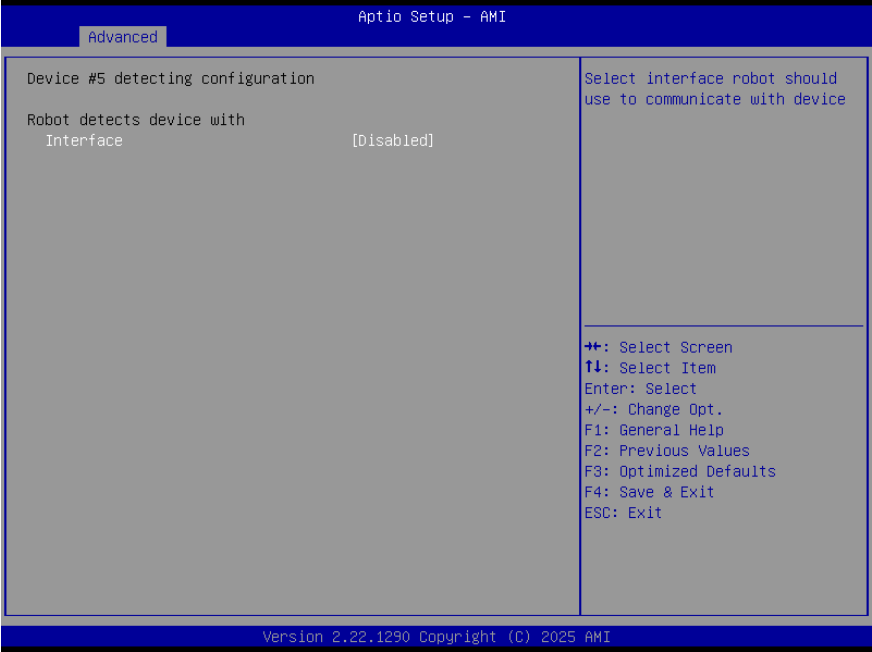
Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device		

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

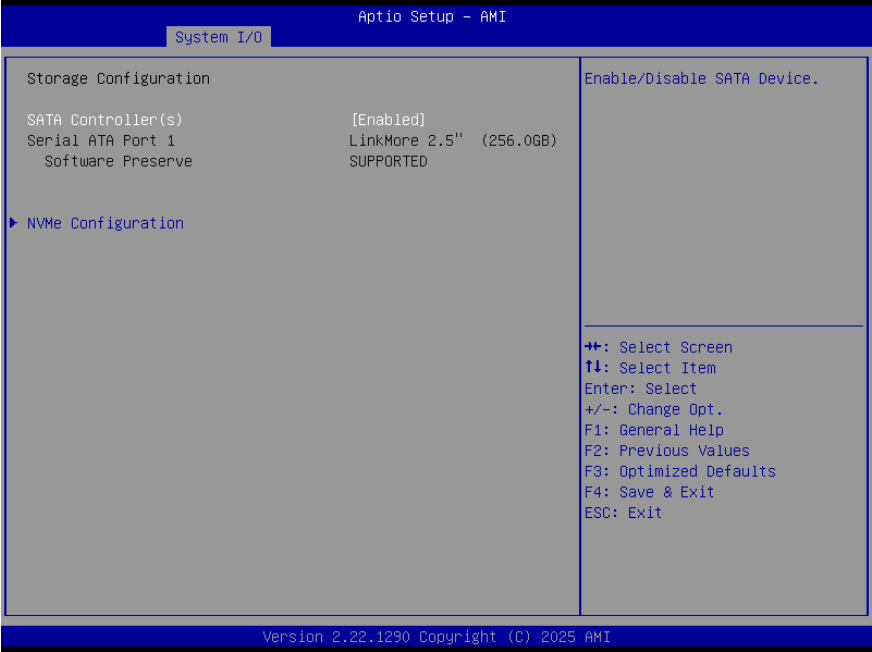


Options Summary		
Interface	Disabled	Optimal Default, Failsafe Default
	PCI	
	DIO	
	SMBUS	
	Legacy I/O	
	Super I/O	
	MMIO	
Select interface robot should use to communicate with device		

3.5 Setup Submenu: System I/O



3.5.1 Storage Configuration

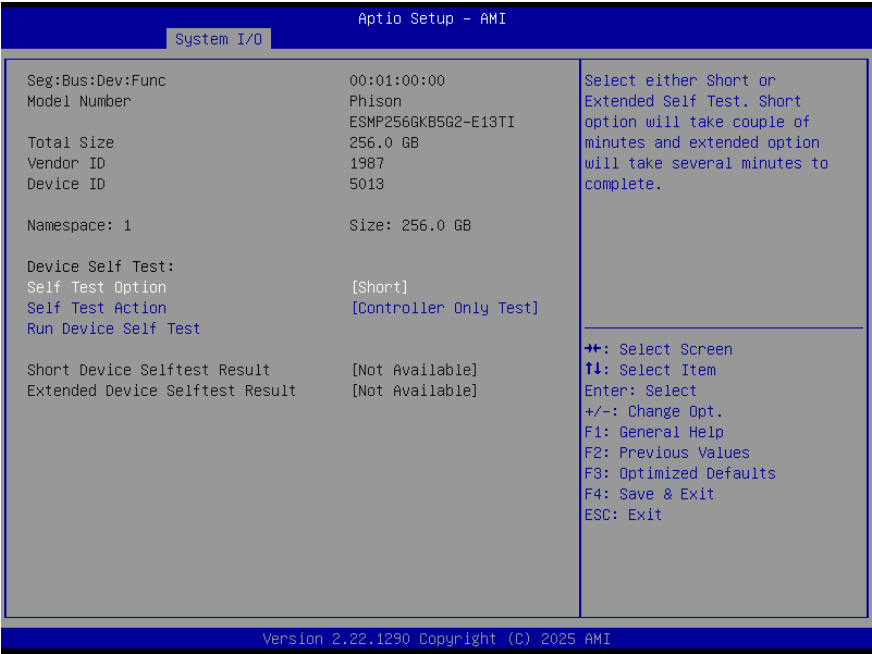


Options Summary		
SATA Controller(s)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable/Disable to SATA Device		

3.5.1.1 NVMe Configuration

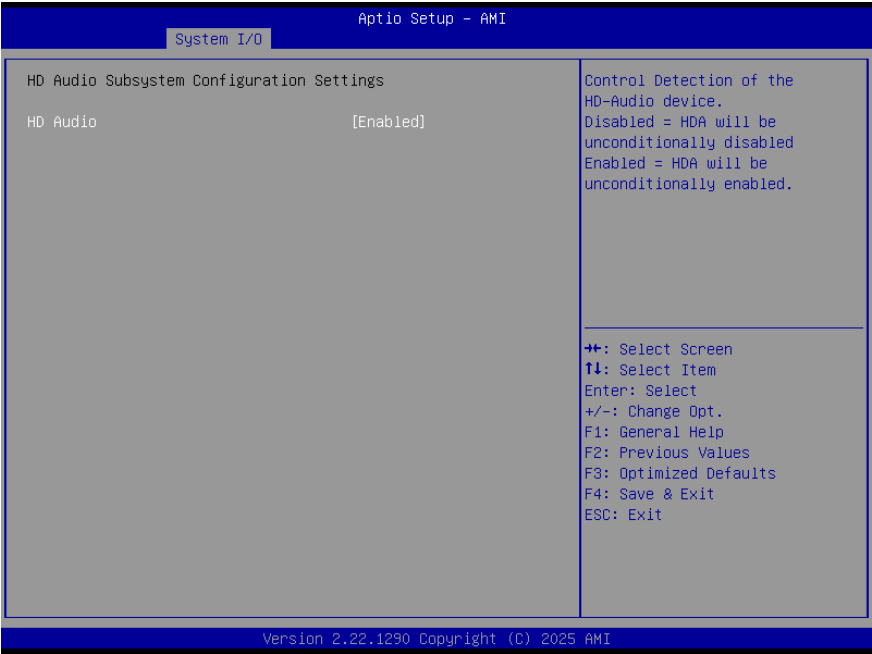


3.5.1.1 NVMe Configuration (Cont.)



Options Summary		
Self Test Option	Short	Optimal Default, Failsafe Default
	Extended	
The Short option takes a few minutes, while the Extended option takes several minutes to complete.		
Self Test Action	Controller Only Test	Optimal Default, Failsafe Default
	Controller and Namespace Test	
Controller Only – Tests only the NVMe controller. Controller and Namespace – Tests both the controller and its namespace(s), which significantly increases test duration.		
Run Device Self Test		
Perform a device self-test according to the user's selection. Press Esc to abort. The displayed result shows the most recent test logged by the device.		

3.5.2 HD Audio Configuration



Options Summary		
HD Audio	Disabled	
	Enabled	Optimal Default, Failsafe Default
Control the detection of the HD-Audio (HDA) device:		
Disabled – HDA is unconditionally disabled.		
Enabled – HDA is unconditionally enabled.		

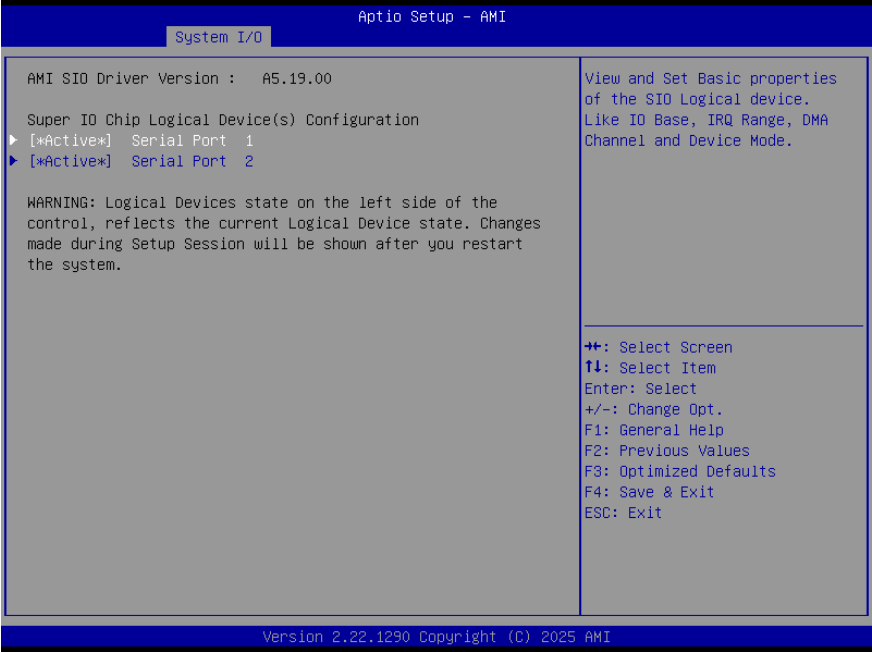
3.5.3 Digital IO Port Configuration



Options Summary		
DIO1	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output		
Output Level	Low	
	High	Optimal Default, Failsafe Default
Set output level when DIO pin is output		
DIO2	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output		
Output Level	Low	
	High	Optimal Default, Failsafe Default
Set output level when DIO pin is output		
DIO3	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output		

Options Summary		
Output Level	Low	
	High	Optimal Default, Failsafe Default
Set output level when DIO pin is output		
DIO4	Input	
	Output	Optimal Default, Failsafe Default
Set DIO as Input or Output		
Output Level	Low	
	High	Optimal Default, Failsafe Default
Set output level when DIO pin is output		
DIO5	Input	Optimal Default, Failsafe Default
	Output	
Set DIO as Input or Output		
DIO6	Input	Optimal Default, Failsafe Default
	Output	
Set DIO as Input or Output		
DIO7	Input	Optimal Default, Failsafe Default
	Output	
Set DIO as Input or Output		
DIO8	Input	Optimal Default, Failsafe Default
	Output	
Set DIO as Input or Output		

3.5.4 Legacy Logical Devices Configuration

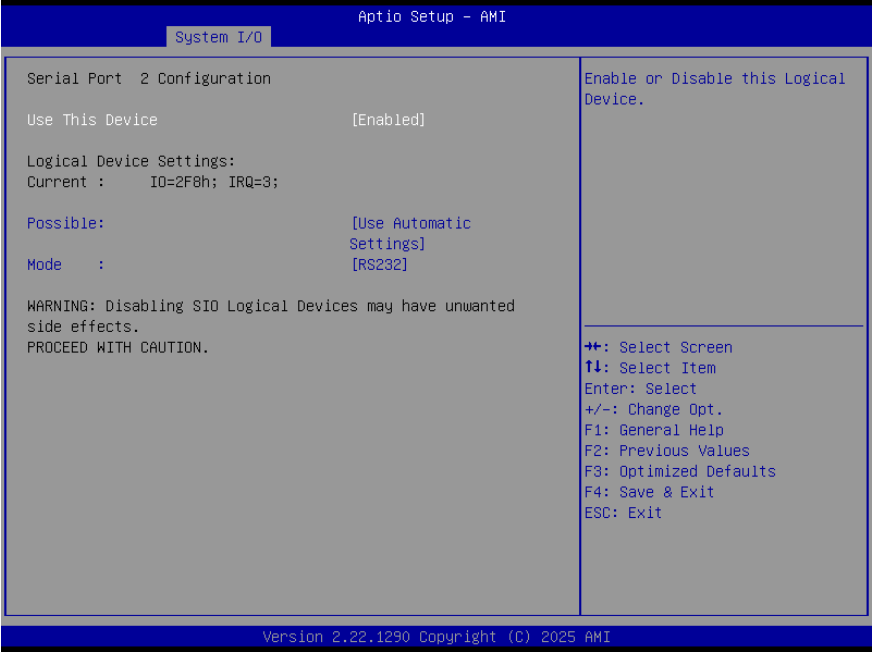


3.5.4.1 Serial Port 1



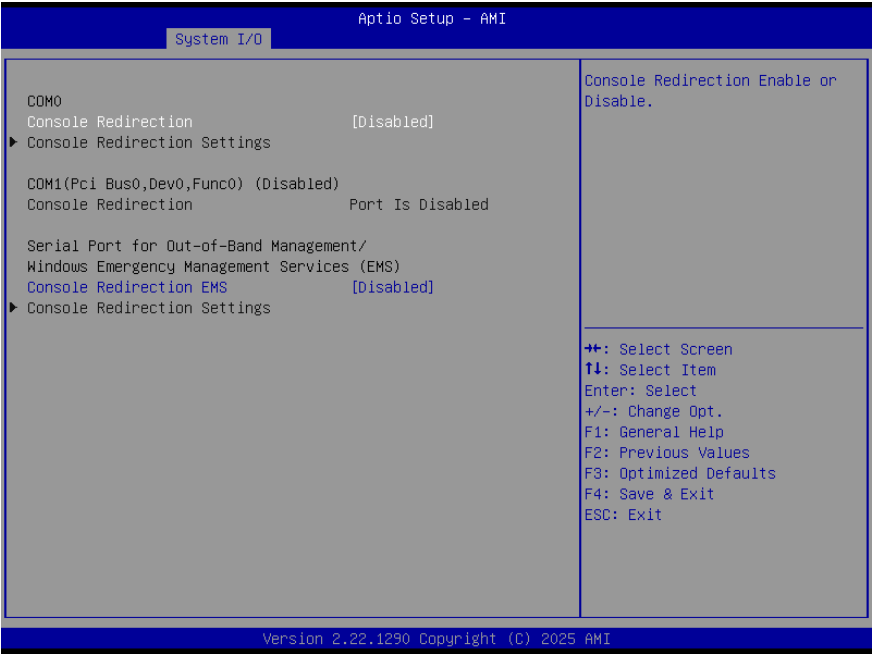
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8; IRQ=4;	
	IO=2F8; IRQ=3;	
Allows the user to change the device resource settings. New settings will 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



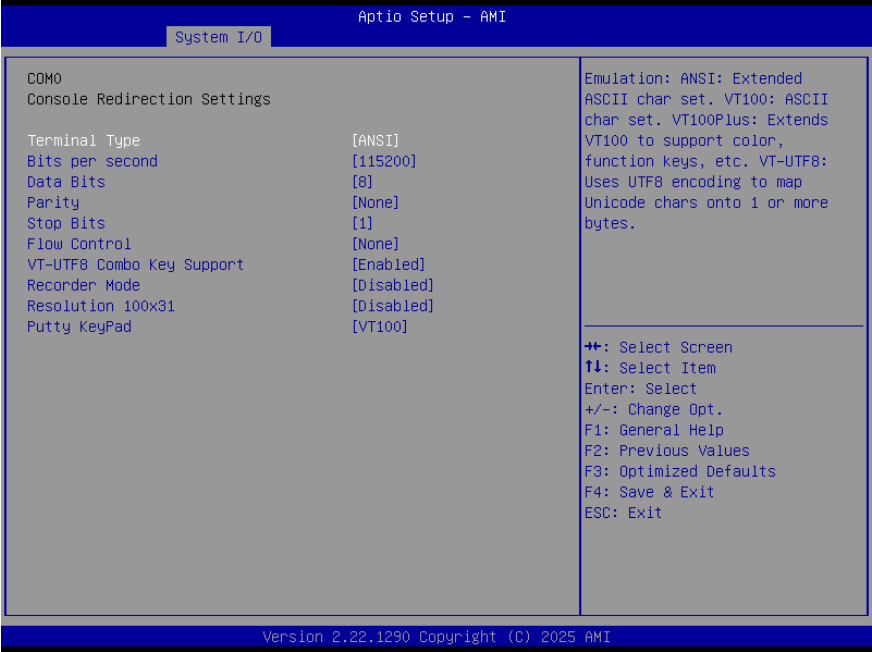
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable this Logical Device		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8; IRQ=3;	
	IO=3F8; IRQ=4;	
Allows the user to change the device resource settings. New settings will 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)

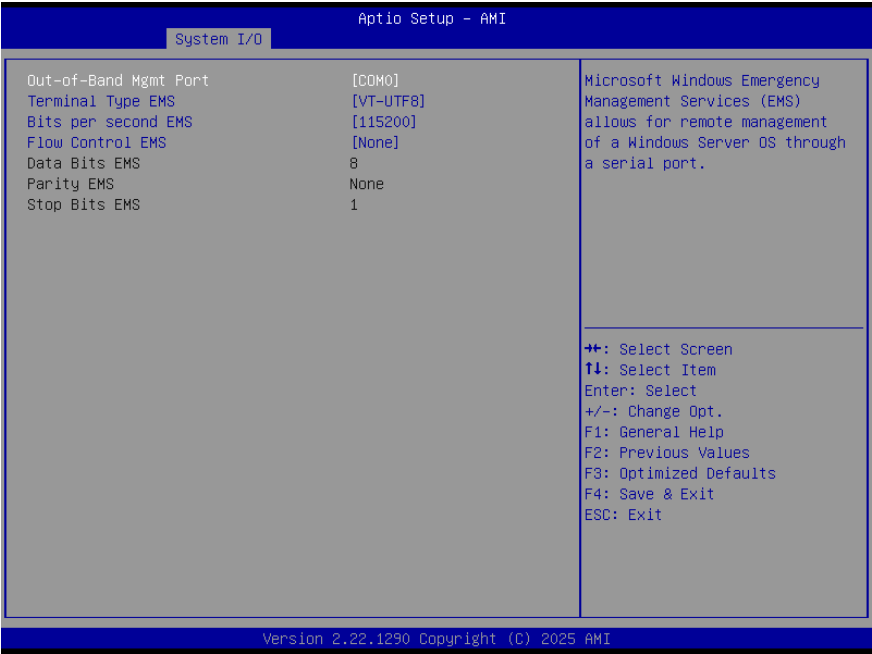


Options Summary		
Terminal Type	VT100	
	VT100Plus	
	VT-UTF8	
	ANSI	Optimal Default, Failsafe Default
Terminal Emulation – Select the emulation type: ANSI – Uses the extended ASCII character set. VT100 – Uses the standard ASCII character set. VT100+ – Extends VT100 to support colors, function keys, and additional features. VT-UTF8 – Uses UTF-8 encoding to map Unicode characters onto one 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	
Serial Port Parity – A parity bit can be added to data bits to help detect transmission errors: Even – Parity bit is 0 if the number of 1's in the data bits is even. Odd – Parity bit is 0 if the number of 1's in the data bits is odd. Mark – Parity bit is always 1. Space – Parity bit is always 0. Note: Mark and Space parity do not provide error detection and can be used as an additional data bit.		
Stop Bits	1	Optimal Default, Failsafe Default
	2	
Serial Port Stop Bits – Stop bits mark the end of a serial data packet (a start bit marks the beginning). Standard: 1 stop bit. Extended: More than 1 stop bit may be required for communication with slower devices.		
Flow Control	None	Optimal Default, Failsafe Default
	Hardware RTS/CTS	
Flow control prevents data loss due to buffer overflow. When sending data, if the receiver's buffers are full, a stop signal halts data transmission. Once the buffers are available, a start signal resumes the flow. Hardware flow control uses two dedicated wires to send these start/stop signals.		
VT-UTF8 Combo Key Support	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or disable VT-UTF8 combination key support for ANSI and VT100 terminals.		
Recorder Mode	Disabled	Optimal Default, Failsafe Default
	Enabled	

Options Summary		
Recorder Mode – Controls terminal data capture: Disabled – Normal terminal operation. Enabled – Only text data is sent, allowing terminal output to be captured.		
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	
Select FunctionKey and KeyPad on Putty.		

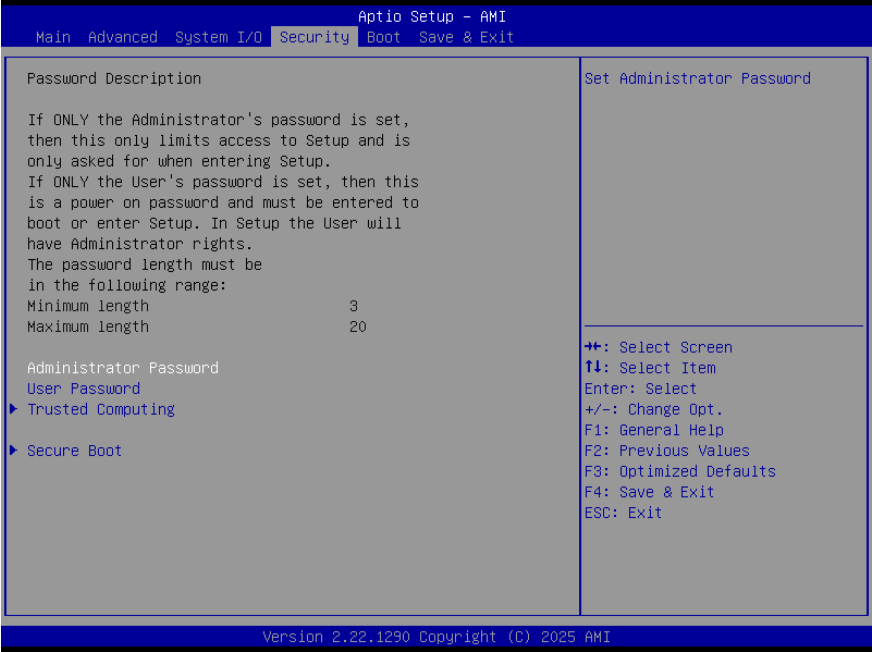
3.5.5.2 Console Redirection Settings (Out-of-Band Mgmt Port)



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 options are VT100+ followed by VT100. For additional guidance on terminal type and emulation, refer to the Console Redirection Settings page.		
Bits per second EMS	9600	
	19200	
	57600	
	115200	Optimal Default, Failsafe Default

Options Summary		
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 – Prevents data loss from buffer overflow during serial communication. If the receiving buffer is full, a stop signal halts data transmission. Once the buffer has space, a start signal resumes the flow. Hardware flow control uses two dedicated wires to transmit these 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	
Enable or disable BIOS support for the security device.		
Enabled: BIOS supports the security device.		
Disabled: The operating system will not display the security device, and the TCG EFI protocol and INT1A interface will be unavailable.		
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	

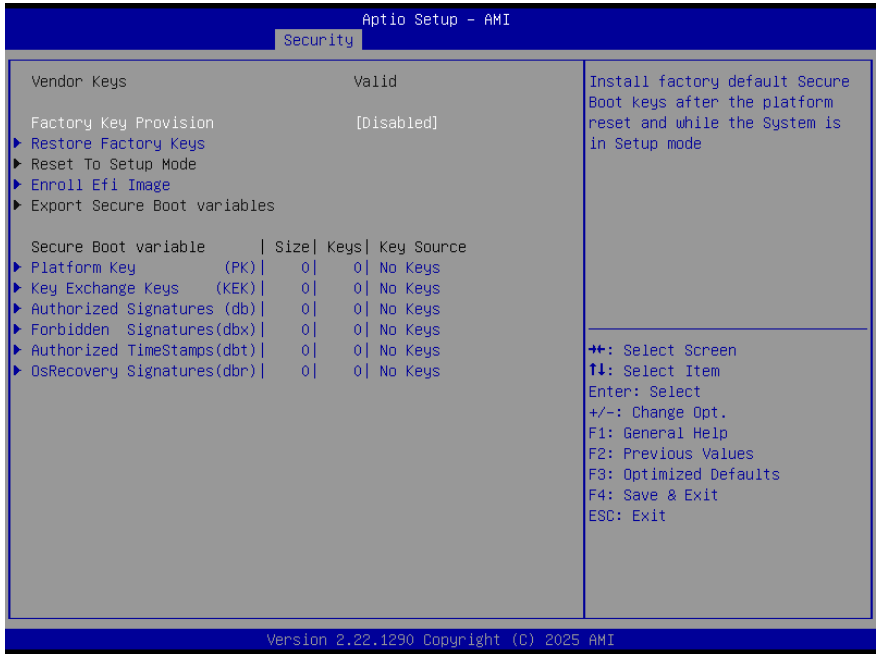
Options Summary		
Schedule an Operation for the Security Device.		
Note: Your Computer will reboot during restart in order to change State of Security Device.		
Platform Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Platform Hierarchy		
Storage Hierarchy	Disabled	
	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 the PPI specification version to be supported by the operating system: 1.2 or 1.3.		
Note: Some HCK tests may not support version 1.3.		
Device Select	TPM 1.2	
	TPM 2.0	
	Auto	Optimal Default, Failsafe Default
TPM Device Support		
TPM 1.2 – Restricts support to TPM 1.2 devices only.		
TPM 2.0 – Restricts support to TPM 2.0 devices only.		
Auto – Supports both TPM 1.2 and TPM 2.0 devices. By default, TPM 2.0 devices are enumerated first; TPM 1.2 devices are enumerated if TPM 2.0 is not found.		

3.6.2 Secure Boot



Options Summary		
Secure Boot	Disabled	Optimal Default, Failsafe Default
	Enabled	
The Secure Boot feature is active when Secure Boot is enabled, the Platform Key (PK) is enrolled, and the system is in User mode. Changing the mode requires a 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		

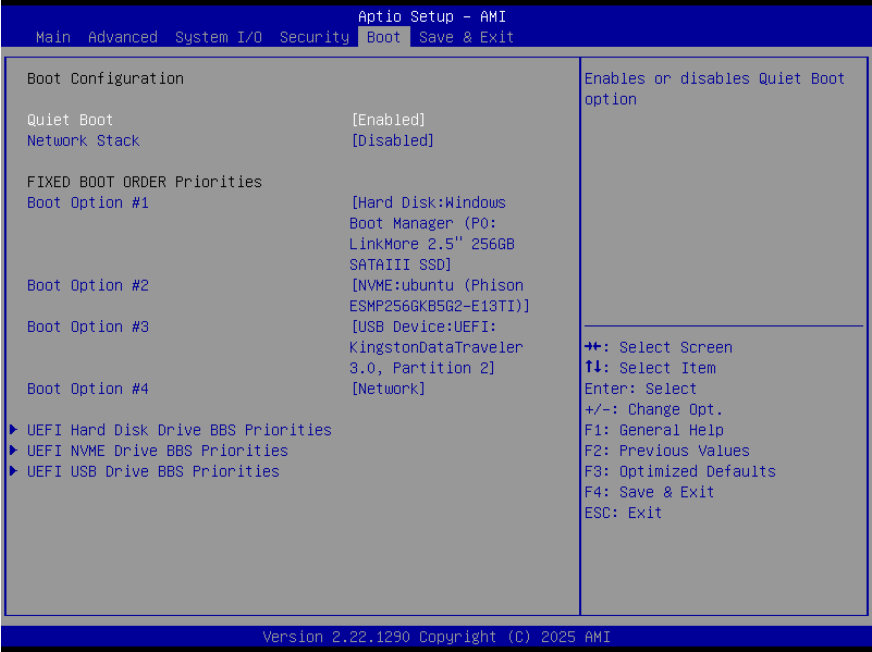
3.6.2.1 Key Management



Options Summary		
Factory Key Provision	Disabled	Optimal Default, Failsafe Default
	Enabled	
Install the factory default Secure Boot keys after a platform reset 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 the EFI image to run in Secure Boot mode by enrolling its SHA256 hash certificate into the Authorized Signature Database (db).		
Platform Key (PK)	Update	
Key Exchange Keys (KEK)	Update	
	Append	
Authorized Signatures (db)	Update	
	Append	

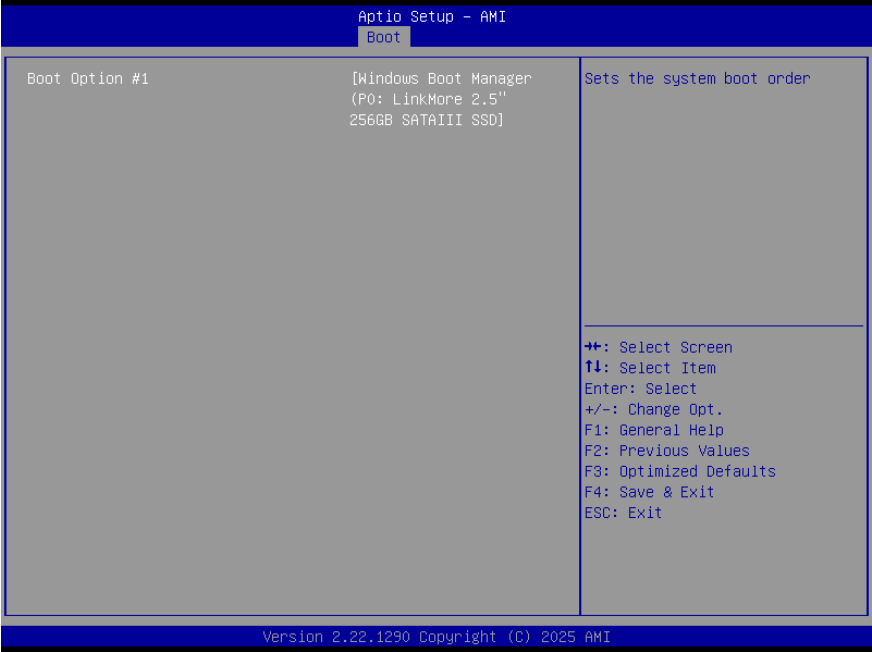
Options Summary		
Forbidden Signatures (dbx)	Update	
	Append	
Authorized TimeStamps (dbt)	Update	
	Append	
OsRecovery Signatures (dbr)	Update	
	Append	
Enroll Factory Defaults or load certificates from a file:		
1. Public Key Certificate:		
a) EFI_SIGNATURE_LIST		
b) EFI_CERT_X509 (DER)		
c) EFI_CERT_RSA2048 (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	Optimal Default, Failsafe Default
Enables/disables Quiet Boot option.		
Network Stack	Disabled	Optimal Default, Failsafe 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



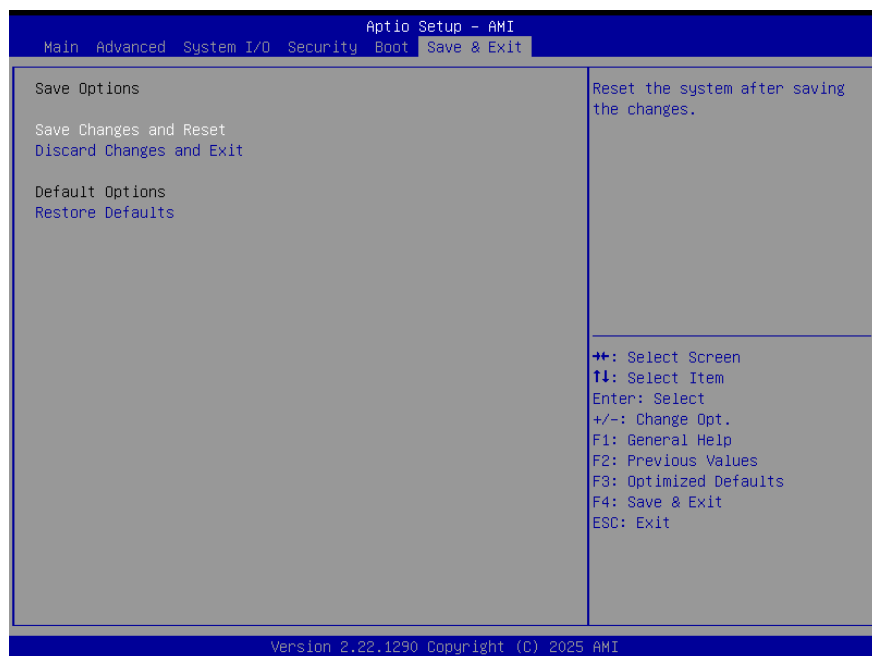
3.7.2 UEFI NVME Drive BBS Priorities



3.7.2 UEFI USB Drive BBS Priorities



3.8 Setup Submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Drivers Download and Installation

Drivers for the BOXER-6649-RAP can be downloaded from the product page on the AAEON website by following this link:

<https://www.aaeon.com/en/product/detail/compact-fanless-box-pc-solutions-boxer-6649-rap/download>

Appendix A

I/O Information

A.1 I/O Address Map

▼	Input/output (I/O)
	[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
	[000000000000002F8 - 000000000000002FF] Fintek Communications Port (COM2)
	[000000000000003F8 - 000000000000003FF] Fintek Communications Port (COM1)
	[000000000000004D0 - 000000000000004D1] Programmable interrupt controller
	[00000000000000680 - 0000000000000069F] Motherboard resources
	[00000000000000A00 - 00000000000000A0F] Motherboard resources
	[00000000000000A10 - 00000000000000A1F] Motherboard resources
	[00000000000000A20 - 00000000000000A2F] Motherboard resources
	[00000000000000D00 - 00000000000000FFFF] PCI Express Root Complex
	[0000000000000164E - 0000000000000164F] Motherboard resources
	[00000000000001854 - 00000000000001857] Motherboard resources
	[00000000000002000 - 000000000000020FE] Motherboard resources
	[00000000000003000 - 00000000000003FFF] Intel(R) PCI Express Root Port #9 - 51B0
	[00000000000004000 - 0000000000000403F] Intel(R) UHD Graphics
	[00000000000004060 - 0000000000000407F] Standard SATA AHCI Controller
	[00000000000004080 - 00000000000004083] Standard SATA AHCI Controller
	[00000000000004090 - 00000000000004097] Standard SATA AHCI Controller
	[0000000000000EFA0 - 0000000000000EFBF] Intel(R) SMBus - 51A3

A.2 Memory Address Map

▼	Large Memory
▼	Memory
	[0000004000000000 - 0000007FFFFFFF] PCI Express Root Complex
	[0000000000A0000 - 0000000000BFFFF] PCI Express Root Complex
	[0000000080400000 - 0000000080DFFFF] Intel(R) PCI Express Root Port #9 - 51B0
	[0000000080400000 - 00000000BFFFFFF] PCI Express Root Complex
	[0000000080E00000 - 0000000080FFFFFF] PCI-to-PCI Bridge
	[0000000080E00000 - 00000000811FFFF] Intel(R) PCI Express Root Port #12 - 51B3
	[0000000080E00000 - 00000000811FFFF] PCI-to-PCI Bridge
	[0000000080EFC000 - 0000000080EFFFF] Intel(R) Ethernet Controller I226-LM #4
	[0000000080F00000 - 0000000080FFFFFF] Intel(R) Ethernet Controller I226-LM #4
	[0000000081000000 - 00000000811FFFF] PCI-to-PCI Bridge
	[00000000810FC000 - 00000000810FFFF] Intel(R) Ethernet Controller I226-LM #5
	[0000000081100000 - 00000000811FFFF] Intel(R) Ethernet Controller I226-LM #5
	[0000000081200000 - 00000000813FFFF] Intel(R) PCI Express Root Port #8 - 51BF
	[00000000812FC000 - 00000000812FFFF] Intel(R) Ethernet Controller I226-LM #2
	[0000000081300000 - 00000000813FFFF] Intel(R) Ethernet Controller I226-LM #2
	[0000000081400000 - 00000000814FFFF] Intel(R) Ethernet Controller I226-LM #3
	[0000000081400000 - 00000000815FFFF] Intel(R) PCI Express Root Port #7 - 51BE
	[0000000081500000 - 0000000081503FFF] Intel(R) Ethernet Controller I226-LM #3
	[0000000081600000 - 00000000816FFFF] Intel(R) Ethernet Controller I226-LM
	[0000000081600000 - 00000000817FFFF] Intel(R) PCI Express Root Port #6 - 51BD
	[0000000081700000 - 0000000081703FFF] Intel(R) Ethernet Controller I226-LM
	[0000000081800000 - 0000000081801FFF] Standard SATA AHCI Controller
	[0000000081802000 - 00000000818027FF] Standard SATA AHCI Controller
	[0000000081803000 - 00000000818030FF] Standard SATA AHCI Controller
	[00000000C0000000 - 00000000CFFFFFFF] Motherboard resources
	[00000000FE010000 - 00000000FE010FFF] Intel(R) SPI (flash) Controller - 51A4
	[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 - 00000000FEEFFFFF] Motherboard resources
	[0000004000000000 - 000000400FFFFFFF] Intel(R) UHD Graphics
	[0000006000000000 - 00000060009FFFFF] Intel(R) PCI Express Root Port #9 - 51B0
	[0000006001000000 - 00000060011FFFFF] Intel(R) UHD Graphics
	[0000006002100000 - 000000600210FFFF] Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
	[0000006002118000 - 00000060021180FF] Intel(R) SMBus - 51A3
	[00000077FFEFB000 - 00000077FFEFBFFF] Intel(R) Management Engine Interface #1
	[00000077FFEFEC000 - 00000077FFEFFFFF] Intel® Smart Sound Technology BUS
	[00000077FFFF00000 - 00000077FFFFFFFFFF] Intel® Smart Sound Technology BUS

A.3 IRQ Mapping Chart

▼	Interrupt request (IRQ)	
	(ISA) 0x00000000 (00)	System timer
	(ISA) 0x00000003 (03)	Fintek Communications Port (COM2)
	(ISA) 0x00000004 (04)	Fintek Communications Port (COM1)
	(ISA) 0x00000029 (41)	Trusted Platform Module 2.0
	(ISA) 0x00000037 (55)	Microsoft ACPI-Compliant System
	(ISA) 0x00000038 (56)	Microsoft ACPI-Compliant System
	(ISA) 0x00000039 (57)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003A (58)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003B (59)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003C (60)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003D (61)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003E (62)	Microsoft ACPI-Compliant System
	(ISA) 0x0000003F (63)	Microsoft ACPI-Compliant System
	(ISA) 0x00000040 (64)	Microsoft ACPI-Compliant System
	(ISA) 0x00000041 (65)	Microsoft ACPI-Compliant System
	(ISA) 0x00000042 (66)	Microsoft ACPI-Compliant System
	(ISA) 0x00000043 (67)	Microsoft ACPI-Compliant System
	(ISA) 0x00000044 (68)	Microsoft ACPI-Compliant System
	(ISA) 0x00000045 (69)	Microsoft ACPI-Compliant System
	(ISA) 0x00000046 (70)	Microsoft ACPI-Compliant System
	(ISA) 0x00000047 (71)	Microsoft ACPI-Compliant System
	(ISA) 0x00000048 (72)	Microsoft ACPI-Compliant System
	(ISA) 0x00000049 (73)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004A (74)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004B (75)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004C (76)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004D (77)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004E (78)	Microsoft ACPI-Compliant System
	(ISA) 0x0000004F (79)	Microsoft ACPI-Compliant System
	(ISA) 0x00000050 (80)	Microsoft ACPI-Compliant System
	(ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
	(ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
	(ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
	(ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
	(ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
	(ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
	(ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
	(ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
	(ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
	(ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
	(ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
	(ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
	(ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
	(ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
	(ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System

 (ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
 (ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
 (ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
 (ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
 (ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
 (ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System
 (ISA) 0x00000071 (113)	Microsoft ACPI-Compliant System
 (ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
 (ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
 (ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System
 (ISA) 0x00000075 (117)	Microsoft ACPI-Compliant System
 (ISA) 0x00000076 (118)	Microsoft ACPI-Compliant System
 (ISA) 0x00000077 (119)	Microsoft ACPI-Compliant System
 (ISA) 0x00000078 (120)	Microsoft ACPI-Compliant System
 (ISA) 0x00000079 (121)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007A (122)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007B (123)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007C (124)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007D (125)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007E (126)	Microsoft ACPI-Compliant System
 (ISA) 0x0000007F (127)	Microsoft ACPI-Compliant System
 (ISA) 0x00000080 (128)	Microsoft ACPI-Compliant System
 (ISA) 0x00000081 (129)	Microsoft ACPI-Compliant System
 (ISA) 0x00000082 (130)	Microsoft ACPI-Compliant System
 (ISA) 0x00000083 (131)	Microsoft ACPI-Compliant System
 (ISA) 0x00000084 (132)	Microsoft ACPI-Compliant System
 (ISA) 0x00000085 (133)	Microsoft ACPI-Compliant System
 (ISA) 0x00000086 (134)	Microsoft ACPI-Compliant System
 (ISA) 0x00000087 (135)	Microsoft ACPI-Compliant System
 (ISA) 0x00000088 (136)	Microsoft ACPI-Compliant System
 (ISA) 0x00000089 (137)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008A (138)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008B (139)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008C (140)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008D (141)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008E (142)	Microsoft ACPI-Compliant System
 (ISA) 0x0000008F (143)	Microsoft ACPI-Compliant System
 (ISA) 0x00000090 (144)	Microsoft ACPI-Compliant System
 (ISA) 0x00000091 (145)	Microsoft ACPI-Compliant System
 (ISA) 0x00000092 (146)	Microsoft ACPI-Compliant System
 (ISA) 0x00000093 (147)	Microsoft ACPI-Compliant System
 (ISA) 0x00000094 (148)	Microsoft ACPI-Compliant System
 (ISA) 0x00000095 (149)	Microsoft ACPI-Compliant System

 (ISA) 0x00000096 (150)	Microsoft ACPI-Compliant System
 (ISA) 0x00000097 (151)	Microsoft ACPI-Compliant System
 (ISA) 0x00000098 (152)	Microsoft ACPI-Compliant System
 (ISA) 0x00000099 (153)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009A (154)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009B (155)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009C (156)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009D (157)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009E (158)	Microsoft ACPI-Compliant System
 (ISA) 0x0000009F (159)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A0 (160)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A1 (161)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A2 (162)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A3 (163)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A4 (164)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A5 (165)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A6 (166)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A7 (167)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A8 (168)	Microsoft ACPI-Compliant System
 (ISA) 0x000000A9 (169)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AA (170)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AB (171)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AC (172)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AD (173)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AE (174)	Microsoft ACPI-Compliant System
 (ISA) 0x000000AF (175)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B0 (176)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B1 (177)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B2 (178)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B3 (179)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B4 (180)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B5 (181)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B6 (182)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B7 (183)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B8 (184)	Microsoft ACPI-Compliant System
 (ISA) 0x000000B9 (185)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BA (186)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BB (187)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BC (188)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BD (189)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BE (190)	Microsoft ACPI-Compliant System
 (ISA) 0x000000BF (191)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C0 (192)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C1 (193)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C2 (194)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C3 (195)	Microsoft ACPI-Compliant System
 (ISA) 0x000000C4 (196)	Microsoft ACPI-Compliant System
(ISA) 0x000000C5 (197)	Microsoft ACPI-Compliant System
(ISA) 0x000000C6 (198)	Microsoft ACPI-Compliant System
(ISA) 0x000000C7 (199)	Microsoft ACPI-Compliant System
(ISA) 0x000000C8 (200)	Microsoft ACPI-Compliant System

 (ISA) 0x000000C9 (201)	Microsoft ACPI-Compliant System
 (ISA) 0x000000CA (202)	Microsoft ACPI-Compliant System
 (ISA) 0x000000CB (203)	Microsoft ACPI-Compliant System
 (ISA) 0x000000CC (204)	Microsoft ACPI-Compliant System
 (ISA) 0x00000100 (256)	Microsoft ACPI-Compliant System
 (ISA) 0x00000101 (257)	Microsoft ACPI-Compliant System
 (ISA) 0x00000102 (258)	Microsoft ACPI-Compliant System
 (ISA) 0x00000103 (259)	Microsoft ACPI-Compliant System
 (ISA) 0x00000104 (260)	Microsoft ACPI-Compliant System
 (ISA) 0x00000105 (261)	Microsoft ACPI-Compliant System
 (ISA) 0x00000106 (262)	Microsoft ACPI-Compliant System
 (ISA) 0x00000107 (263)	Microsoft ACPI-Compliant System
 (ISA) 0x00000108 (264)	Microsoft ACPI-Compliant System
 (ISA) 0x00000109 (265)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010A (266)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010B (267)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010C (268)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010D (269)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010E (270)	Microsoft ACPI-Compliant System
 (ISA) 0x0000010F (271)	Microsoft ACPI-Compliant System
 (ISA) 0x00000110 (272)	Microsoft ACPI-Compliant System
 (ISA) 0x00000111 (273)	Microsoft ACPI-Compliant System
 (ISA) 0x00000112 (274)	Microsoft ACPI-Compliant System
 (ISA) 0x00000113 (275)	Microsoft ACPI-Compliant System
 (ISA) 0x00000114 (276)	Microsoft ACPI-Compliant System
 (ISA) 0x00000115 (277)	Microsoft ACPI-Compliant System
 (ISA) 0x00000116 (278)	Microsoft ACPI-Compliant System
 (ISA) 0x00000117 (279)	Microsoft ACPI-Compliant System
 (ISA) 0x00000118 (280)	Microsoft ACPI-Compliant System
 (ISA) 0x00000119 (281)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011A (282)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011B (283)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011C (284)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011D (285)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011E (286)	Microsoft ACPI-Compliant System
 (ISA) 0x0000011F (287)	Microsoft ACPI-Compliant System
 (ISA) 0x00000120 (288)	Microsoft ACPI-Compliant System
 (ISA) 0x00000121 (289)	Microsoft ACPI-Compliant System
 (ISA) 0x00000122 (290)	Microsoft ACPI-Compliant System
 (ISA) 0x00000123 (291)	Microsoft ACPI-Compliant System
 (ISA) 0x00000124 (292)	Microsoft ACPI-Compliant System
 (ISA) 0x00000125 (293)	Microsoft ACPI-Compliant System
 (ISA) 0x00000126 (294)	Microsoft ACPI-Compliant System
 (ISA) 0x00000127 (295)	Microsoft ACPI-Compliant System
 (ISA) 0x00000128 (296)	Microsoft ACPI-Compliant System
 (ISA) 0x00000129 (297)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012A (298)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012B (299)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012C (300)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012D (301)	Microsoft ACPI-Compliant System
 (ISA) 0x0000012E (302)	Microsoft ACPI-Compliant System

 (ISA) 0x0000012F (303)	Microsoft ACPI-Compliant System
 (ISA) 0x00000130 (304)	Microsoft ACPI-Compliant System
 (ISA) 0x00000131 (305)	Microsoft ACPI-Compliant System
 (ISA) 0x00000132 (306)	Microsoft ACPI-Compliant System
 (ISA) 0x00000133 (307)	Microsoft ACPI-Compliant System
 (ISA) 0x00000134 (308)	Microsoft ACPI-Compliant System
 (ISA) 0x00000135 (309)	Microsoft ACPI-Compliant System
 (ISA) 0x00000136 (310)	Microsoft ACPI-Compliant System
 (ISA) 0x00000137 (311)	Microsoft ACPI-Compliant System
 (ISA) 0x00000138 (312)	Microsoft ACPI-Compliant System
 (ISA) 0x00000139 (313)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013A (314)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013B (315)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013C (316)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013D (317)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013E (318)	Microsoft ACPI-Compliant System
 (ISA) 0x0000013F (319)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000014E (334)	Microsoft ACPI-Compliant System
 (ISA) 0x0000014F (335)	Microsoft ACPI-Compliant System
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(ISA) 0x0000015D (349)	Microsoft ACPI-Compliant System
(ISA) 0x0000015E (350)	Microsoft ACPI-Compliant System
(ISA) 0x0000015F (351)	Microsoft ACPI-Compliant System
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 (ISA) 0x00000168 (360)	Microsoft ACPI-Compliant System
 (ISA) 0x00000169 (361)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000016E (366)	Microsoft ACPI-Compliant System
 (ISA) 0x0000016F (367)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000017D (381)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017E (382)	Microsoft ACPI-Compliant System
 (ISA) 0x0000017F (383)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000018E (398)	Microsoft ACPI-Compliant System
 (ISA) 0x0000018F (399)	Microsoft ACPI-Compliant System
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 (ISA) 0x0000019E (414)	Microsoft ACPI-Compliant System
 (ISA) 0x0000019F (415)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001A6 (422)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001B9 (441)	Microsoft ACPI-Compliant System
 (ISA) 0x000001BA (442)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001BE (446)	Microsoft ACPI-Compliant System
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 (ISA) 0x000001D8 (472)	Microsoft ACPI-Compliant System
 (ISA) 0x000001D9 (473)	Microsoft ACPI-Compliant System
 (ISA) 0x000001DA (474)	Microsoft ACPI-Compliant System
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(ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
(ISA) 0x000001EA (490)	Microsoft ACPI-Compliant System
(ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System
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(ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
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(ISA) 0x000001F4 (500)	Microsoft ACPI-Compliant System
(ISA) 0x000001F5 (501)	Microsoft ACPI-Compliant System
(ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
(ISA) 0x000001F8 (504)	Microsoft ACPI-Compliant System
(ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
(ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System

	(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
	(PCI) 0xFFFFFE1 (-31)	Intel(R) Management Engine Interface #1
	(PCI) 0xFFFFFE2 (-30)	Intel® Smart Sound Technology BUS
	(PCI) 0xFFFFFE3 (-29)	Intel(R) Ethernet Controller I226-LM #5
	(PCI) 0xFFFFFE4 (-28)	Intel(R) Ethernet Controller I226-LM #5
	(PCI) 0xFFFFFE5 (-27)	Intel(R) Ethernet Controller I226-LM #5
	(PCI) 0xFFFFFE6 (-26)	Intel(R) Ethernet Controller I226-LM #5
	(PCI) 0xFFFFFE7 (-25)	Intel(R) Ethernet Controller I226-LM #5
	(PCI) 0xFFFFFE8 (-24)	Intel(R) Ethernet Controller I226-LM #2
	(PCI) 0xFFFFFE9 (-23)	Intel(R) Ethernet Controller I226-LM #2
	(PCI) 0xFFFFFEA (-22)	Intel(R) Ethernet Controller I226-LM #2
	(PCI) 0xFFFFFEB (-21)	Intel(R) Ethernet Controller I226-LM #2
	(PCI) 0xFFFFFEC (-20)	Intel(R) Ethernet Controller I226-LM #2
	(PCI) 0xFFFFFED (-19)	Intel(R) Ethernet Controller I226-LM #4
	(PCI) 0xFFFFFEE (-18)	Intel(R) Ethernet Controller I226-LM #4
	(PCI) 0xFFFFFEF (-17)	Intel(R) Ethernet Controller I226-LM #4
	(PCI) 0xFFFFFFF0 (-16)	Intel(R) Ethernet Controller I226-LM #4
	(PCI) 0xFFFFFFF1 (-15)	Intel(R) Ethernet Controller I226-LM #4
	(PCI) 0xFFFFFFF2 (-14)	Intel(R) UHD Graphics
	(PCI) 0xFFFFFFF3 (-13)	Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
	(PCI) 0xFFFFFFF4 (-12)	Intel(R) Ethernet Controller I226-LM
	(PCI) 0xFFFFFFF5 (-11)	Intel(R) Ethernet Controller I226-LM
	(PCI) 0xFFFFFFF6 (-10)	Intel(R) Ethernet Controller I226-LM
	(PCI) 0xFFFFFFF7 (-9)	Intel(R) Ethernet Controller I226-LM
	(PCI) 0xFFFFFFF8 (-8)	Intel(R) Ethernet Controller I226-LM
	(PCI) 0xFFFFFFF9 (-7)	Intel(R) Ethernet Controller I226-LM #3
	(PCI) 0xFFFFFFFA (-6)	Intel(R) Ethernet Controller I226-LM #3
	(PCI) 0xFFFFFFFB (-5)	Intel(R) Ethernet Controller I226-LM #3
	(PCI) 0xFFFFFFFC (-4)	Intel(R) Ethernet Controller I226-LM #3
	(PCI) 0xFFFFFFFD (-3)	Intel(R) Ethernet Controller I226-LM #3
	(PCI) 0xFFFFFFE (-2)	Standard SATA AHCI Controller