

EPIC-TGH7-PUC

EPIC System

User's Manual 2nd Ed

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Packing List

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

Item	Quantity
● EPIC-TGH7-PUC	1
● Screw, Thermal Pads and Accessories Kit	1
● SATA Cable	2
● Dual SATA Power Cable	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 on 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 AC 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.**

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.A0

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。 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。						

Hazardous and Toxic Materials List

AAEON System

QO4-381 Rev.A0

Component Name	Hazardous or Toxic Materials or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated biphenyls (PBBS)	Polybrominated diphenyl ethers (PBDES)
PCB and Components	X	O	O	O	O	O
Wires & Connectors for Ext.Connections	X	O	O	O	O	O
Chassis	O	O	O	O	O	O
CPU & RAM	X	O	O	O	O	O
HDD Drive	X	O	O	O	O	O
LCD Module	X	O	O	O	O	O
Optical Drive	X	O	O	O	O	O
Touch Control Module	X	O	O	O	O	O
PSU	X	O	O	O	O	O
Battery	X	O	O	O	O	O

This form is prepared in compliance with the provisions of SJ/T 11364.

O: The level of toxic or hazardous materials present in this component and its parts is below the limit specified by GB/T 26572.

X: The level of toxic or hazardous materials present in the component exceed the limits specified by GB/T 26572, but is still in compliance with EU Directive 2011/65/EU (RoHS 2).

Notes:

1. The Environment Friendly Use Period indicated by labelling on this product is applicable only to use under normal conditions.
2. Individual components including the CPU, RAM/memory, HDD, optical drive, and PSU are optional.
3. LCD Module and Touch Control Module only applies to certain products which feature these components.

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Chapter 1

Product Specifications

1.1 Specifications

System	
Form Factor	EPIC System
CPU	11th Generation Intel® Xeon/Core™ Processor: Intel® Core™ i7-11850HE (8C/16T, 2.60 GHz, 45W) Intel® Xeon® W-11865MRE (8C/16T, 2.60 GHz, 45W)
Chipset	Intel® 500 Series Mobile Chipsets (RM590E/HM570E)
Memory Type	DDR4 3200, Dual-Channel SODIMM x 2, Max 64GB (ECC supported by Intel® Xeon® SKU only)
BIOS	UEFI
Wake on LAN	Yes
Watchdog Timer	255 Levels
Security	TPM 2.0 (Optional)
RTC Battery	Lithium Battery 3V/240mAh
Dimension	10.2" x 6.3" x 1.9" (260mm x 160mm x 50mm)
OS Support	Windows® 10 (64-bit) Ubuntu 20.04.5/Kernel 5.15.0-46-generic x86_64

Power	
Power Requirement	+9V to +24V
Power Supply Type	AT/ATX
Connector	DC Jack Connector
Power Consumption	Intel® Xeon® W-11865MRE, DDR4 32GB x 2, 8.32A @12V, 99.84W (Typical) Intel® Xeon® W-11865MRE, DDR4 32GB x 2, 12.52A @12V, 150.24W (Max)

Display

Controller	Intel® UHD Graphics for 11th Gen Intel® Processors
LVDS/eDP	—
Display Interface	VGA x 1, up to 1920 x 1080 DP++ 1.2 x 2, up to 3840 x 2160 @60Hz HDMI 2.0 x 1, up to 3840 x 2160 @60Hz
Multiple Display	Up to 4 Simultaneous Displays

Audio

CODEC	—
Audio Interface	—
Speaker	—

External I/O

Ethernet	Intel® I226, 2.5GbE RJ-45 x 2 Intel® I225, 2.5GbE RJ-45 x 1 Intel® I219, GbE RJ-45 x 1 (Wake on LAN supported for Intel® I219 + Intel® I225)
USB	USB 3.2 Gen 2 x 4 USB 2.0 x 2
Serial Port	COM 1 ~ COM 2 (RS-232/422/485, RI as default, 5V/12V selected by BOM change)
Video	VGA x 1, up to 1920 x 1080 DP++ 1.2a x 2, up to 3840 x 2160 @60Hz HDMI 2.0b x 1, up to 3840 x 2160 @60Hz

Internal I/O

USB	—
Serial Port	—
Video	—
SATA	SATA 6Gb/s x 2 +5V SATA Power Connector x 1 (Total up to 5V @2A, up to 5V @1A, shared with 2.5" SSD x 2 as limitation with 170X000592)
Audio	—
DIO/GPIO	GPIO 16-bit
SMBus/I2C	—
Touch	—
Fan	4 Pin Smart Fan
SIM	Nano SIM x 1
Front Panel	Power Button, Power LED
Others	—

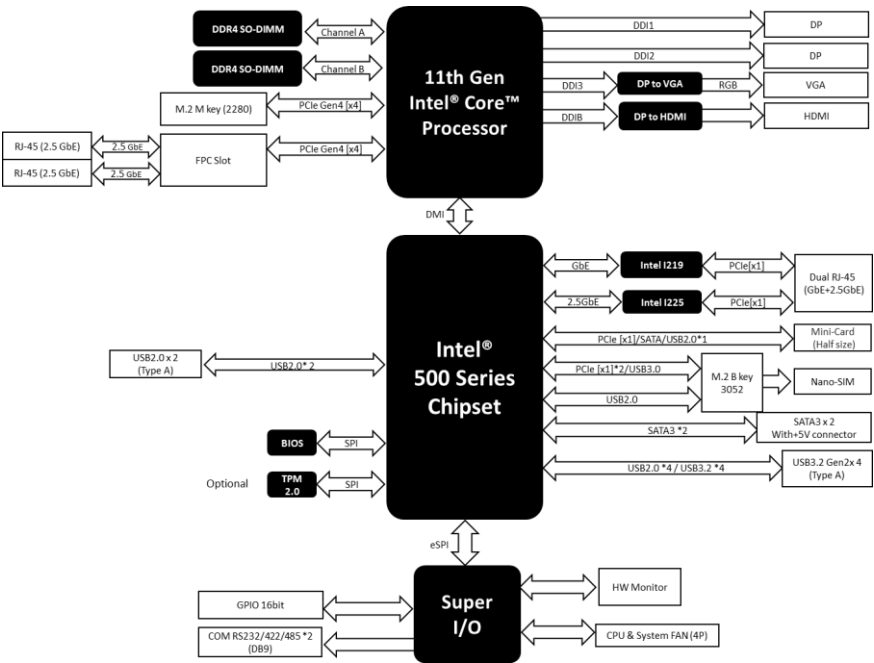
Expansion

Mini PCI-E/mSATA	Half Size mSATA/mPCIe x 1 (Default: mPCIe, mSATA selected by BIOS)
M.2	M.2 2280 M-Key x 1 (PCIe 4.0 [x4] x 1) M.2 3052 B-Key x 1 (PCIe 3.0 [x2] + USB 3.2 + USB 2.0)
Others	—

Environmental

Operating Temperature	32°F ~ 122°F (0°C ~ 50°C) with 0.5m/sec air flow
Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)
Operating Humidity	0% ~ 90% relative humidity, non-condensing
MTBF (Hours)	250,817
EMC	CE/FCC Class A

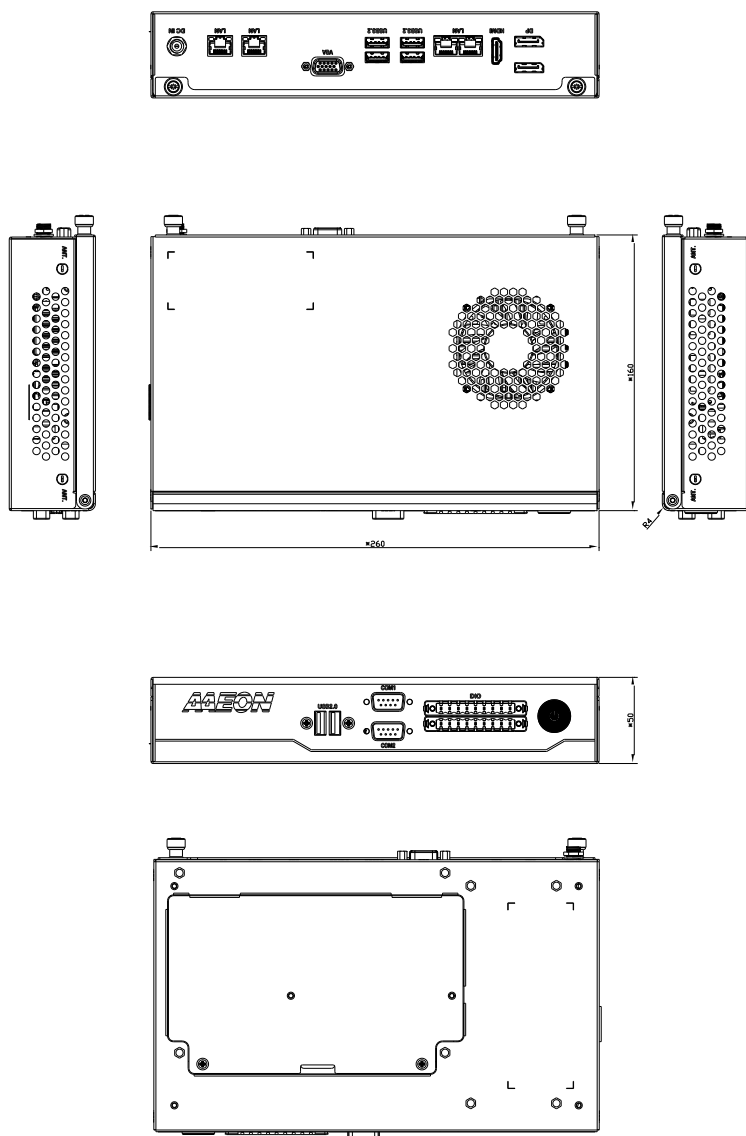
1.2 Block Diagram



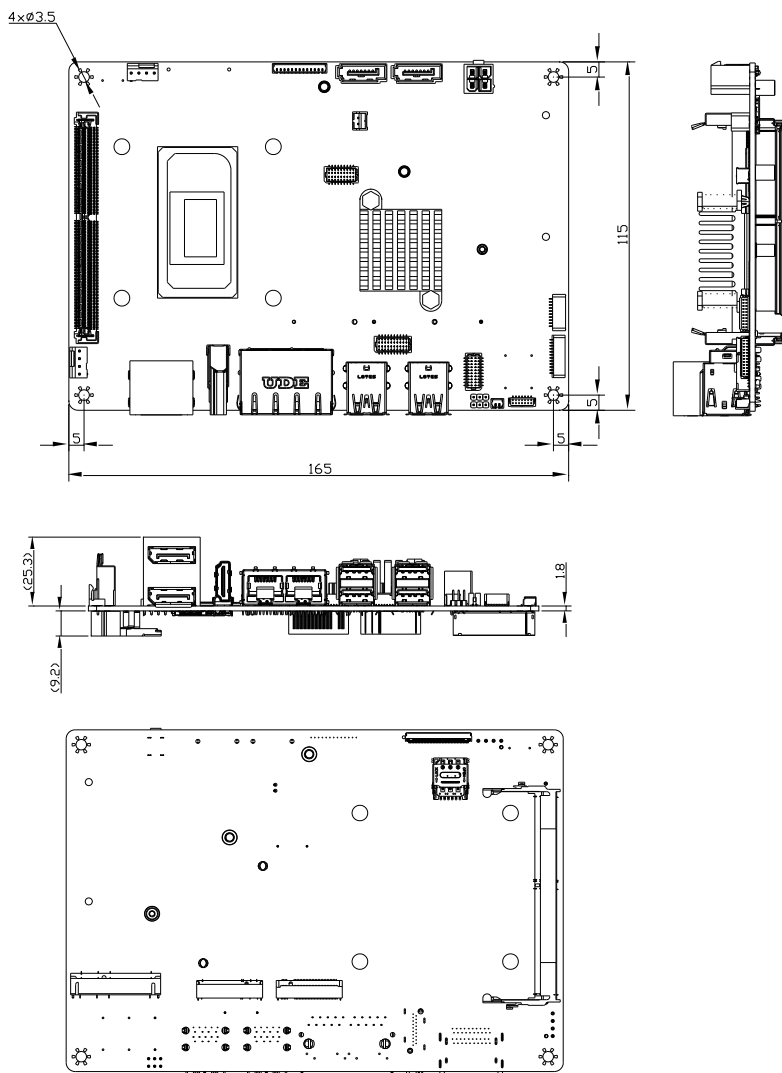
Chapter 2

Hardware Information

System

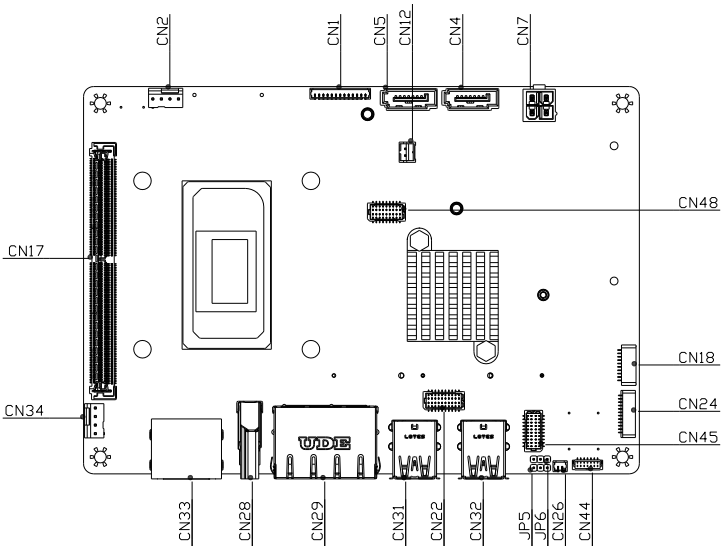


Board

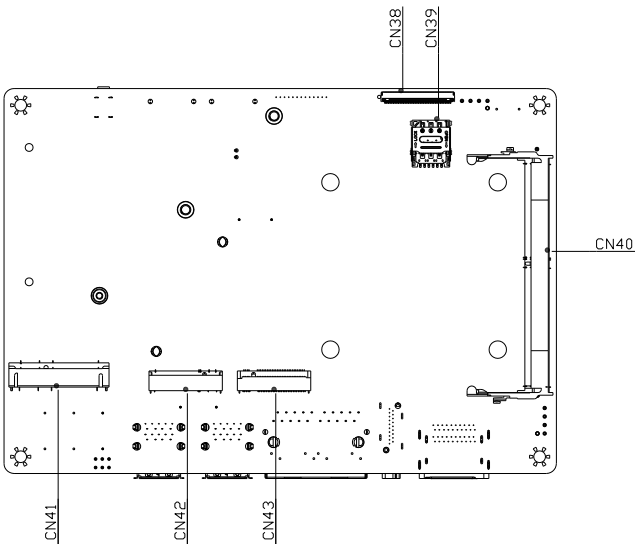


2.2 Jumpers and Connectors

Component Side



Solder Side

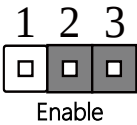
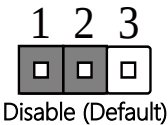


2.3 List of Jumpers

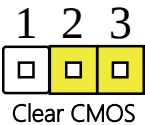
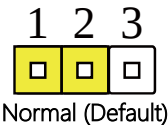
The board features a number of jumpers which can be configured for your application. Please refer to the table below and following sections for all jumpers which can be configured.

Label	Function
JP5	Auto Power Button Enable/Disable Selection
JP6	Clear CMOS Jumper

2.3.1 Auto Power Button Enable/Disable Selection (JP5)



2.3.2 Clear CMOS Jumper (JP6)



2.4 List of Connectors

This section details the connectors featured on the board, which can be configured for your application. For a list of mating connectors and cables, please see Appendix C. For Electrical Specifications of I/O Ports, please see Appendix D.

Please refer to the table below for a list of all connectors on this board which can be configured.

Label	Function
CN1	VGA Connector
CN2	Fan Connector
CN4	SATA Connector
CN5	SATA Connector
CN7	External +12V Input
CN12	SATA 5V Power
CN17	DDR4 SODIMM 0
CN18	Front panel
CN22	USB 2.0 Port 1 & 2
CN24	ESPI Debug Card
CN26	Battery Connector
CN28	HDMI Connector
CN29-L	I225 2.5GbE LAN
CN29-R	I219 GbE LAN
CN31	USB 3.2/USB 2.0 Port 1 & 2
CN32	USB 3.2/USB 2.0 Port 3 & 4
CN33	Dual DP Connector
CN34	FAN Connector
CN38	PCIe FPC Connector
CN39	Nano SIM

Label	Function
CN40	DDR4 SODIMM1
CN41	Half Size Mini Card/mSATA
CN42	M.2 3052 B-Key
CN43	M.2 2280 M-Key
CN44	SPI Flash Programming Port
CN45	COM Port 1 & 2 (RS232/422/485)
CN48	DIO (16-bit)
CN51	External Power Input

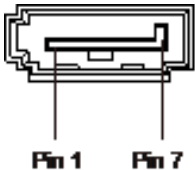
2.4.1 VGA Connector (CN1)

Pin	Pin Name	Signal Type	Signal Level
1	VSYNC	OUT	-
2	HSYNC	OUT	-
3	GND	GND	-
4	DDC_CLK	OUT	-
5	DDC_DATA	OUT	-
6	GND	GND	-
7	BLUE	OUT	-
8	GND	GND	-
9	GREEN	OUT	-
10	GND	GND	-
11	RED	OUT	-
12	GND	GND	-
13	+5V	OUT	-

2.4.2 FAN Connector (CN2 & CN34)

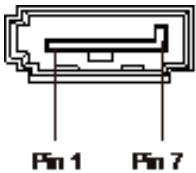
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	+V12S	PWR	+12V
3	TACH	IN	-
4	PWM	OUT	-

2.4.3 SATA Port (CN4)



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	-

2.4.4 SATA Port (CN5)

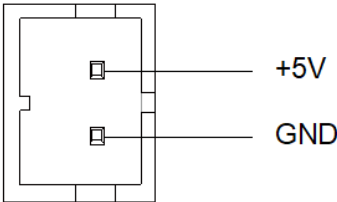


Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	-
2	SATA_TX+	DIFF	-
3	SATA_TX-	DIFF	-
4	GND	GND	-
5	SATA_RX-	DIFF	-
6	SATA_RX+	DIFF	-
7	GND	GND	-

2.4.5 External +12V Input (CN7)

Standard ATX 12V Power Connector.

2.4.6 +5V Output for SATA HDD (CN12)



Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	-

2.4.7 DDR4 SODIMM Slot (CN17 & CN40)

Standard specification.

2.4.8 Front Panel (CN18)



Pin	Pin Name	Pin	Pin Name
Pin 1	PWR_BTN-	Pin 2	PWR_BTN+
Pin 3	HDD_LED-	Pin 4	HDD_LED+
Pin 5	SPEAKER-	Pin 6	SPEAKER+
Pin 7	PWR_LED-	Pin 8	PWR_LED+
Pin 9	H/W RESET-	Pin 10	H/W RESET+

2.4.9 USB 2.0 Port 1 & 2 (CN22)

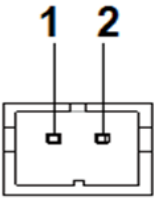
Pin	Pin Name	Pin	Pin Name
Pin 1	5V_USB	Pin 2	5V_USB
Pin 3	USB2_5_DN	Pin 4	USB2_6_DN
Pin 5	USB2_5_DP	Pin 6	USB2_6_DP
Pin 7	GND	Pin 8	GND
Pin 9	GND	Pin 10	GND
Pin 11	5V_USB	Pin 12	5V_USB
Pin 13	USB2_7_DN	Pin 14	USB2_8_DN
Pin 15	USB2_7_DP	Pin 16	USB2_8_DP
Pin 17	GND	Pin 18	GND
Pin 19	GND	Pin 20	GND

2.4.10 eSPI Debug Port (CN24)

Pin	Pin Name	Signal Type	Signal Level
1	ESPI_IO0_EC_R	I/O	+3.3V
2	ESPI_IO1_EC_R	I/O	+3.3V
3	ESPI_IO2_EC_R	I/O	+3.3V
4	ESPI_IO3_EC_R	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	ESPI_CS_EC_R_N	IN	+3.3V
7	ESPI_RST_EC_R_N	OUT	+3.3V
8	GND	GND	-
9	ESPI_CLK_EC_R	OUT	+3.3V

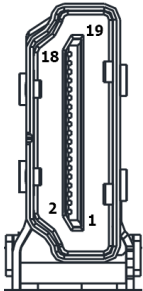
Pin	Pin Name	Signal Type	Signal Level
10	SMB_DATA/I2C_SDA/3.3V	I/O	+3.3V
11	SMB_CLK/I2C_CLK	OUT	+3.3V
12	SMB_ALERT/SERIRQ	IN	+3.3V

2.4.11 RTC Battery Connector (CN26)



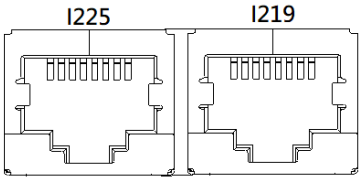
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	+3.3V	PWR	+3.3V

2.4.12 HDMI (CN28)



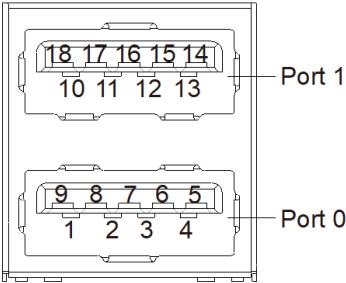
Pin	Pin Name	Signal Type	Signal Level
1	HDMI_TX2+	DIFF	-
2	GND	GND	GND
3	HDMI_TX2-	DIFF	-
4	HDMI_TX1+	DIFF	-
5	GND	GND	GND
6	HDMI_TX1-	DIFF	-
7	HDMI_TX0+	DIFF	-
8	GND	GND	GND
9	HDMI_TX0-	DIFF	-
10	HDMI_CLK+	DIFF	-
11	GND	GND	GND
12	HDMI_CLK-	DIFF	-
13	NC	-	-
14	NC	-	-
15	DDC_CLK	I/O	+5V
16	DDC_DATA	I/O	+5V
17	GND	GND	GND
18	+5V	PWR	+5V
19	HDMI_HPD	-	-

2.4.13 RJ-45 LAN I225 (Left), I219 (Right) (CN29)



Pin	Pin Name	Pin	Pin Name
1P1	LAN2_MDI0_P	2P1	LAN1_MDI0_P
1P2	LAN2_MDI0_N	2P2	LAN1_MDI0_N
1P3	LAN2_MDI1_P	2P3	LAN1_MDI1_P
1P4	LAN2_MDI1_N	2P4	LAN1_MDI1_N
1P5	1CT5	2P5	2CT5
1P6	1CT6	2P6	2CT6
1P7	LAN2_MDI2_P	2P7	LAN1_MDI2_P
1P8	LAN2_MDI2_N	2P8	LAN1_MDI2_N
1P9	LAN2_MDI3_P	2P9	LAN1_MDI3_P
1P10	LAN2_MDI3_N	2P10	LAN1_MDI3_N
1L1	LAN2_LED_LINK#	2L1	LAN1_LED_LINK#
1L2	LAN2_LED_3P3A	2L2	LAN1_LED_3P3A
1L3	LAN2_LED_2500#	2L3	LAN1_LED_100#
1L4	LAN2_LED_1000#	2L4	LAN1_LED_1000#

2.4.14 USB 3.2/USB 2.0 Port 1 & 2 (CN31 & CN32)



Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB0_D-	DIFF	-
3	USB0_D+	DIFF	-
4	GND	GND	-
5	USB0_SSRX-	DIFF	-
6	USB0_SSRX+	DIFF	-
7	GND	GND	-
8	USB0_SSTX-	DIFF	-
9	USB0_SSTX+	DIFF	-
10	+5VSB	PWR	+5V
11	USB1_D-	DIFF	-
12	USB1_D+	DIFF	-
13	GND	GND	-
14	USB1_SSRX-	DIFF	-
15	USB1_SSRX+	DIFF	-
16	GND	GND	-
17	USB1_SSTX-	DIFF	-
18	USB1_SSTX+	DIFF	-

2.4.15 Dual DP Port (CN33)

Pin	Pin Name	Signal Type	Signal Level
1	DP1_TX0_DP	DIFF	-
2	GND	GND	-
3	DP1_TX0_DN	DIFF	-
4	DP1_TX1_DP	DIFF	-
5	GND	GND	-
6	DP1_TX1_DN	DIFF	-
7	DP1_TX2_DP	DIFF	-
8	GND	GND	-
9	DP1_TX2_DN	DIFF	-
10	DP1_TX3_DP	DIFF	-
11	GND	GND	-
12	DP1_TX3_DN	DIFF	-
13	DP1_OB_AUX_EN	GND	-
14	GND	GND	-
15	DP1_AUX_DP	I/O	-
16	GND	GND	-
17	DP1_AUX_DN	I/O	-
18	HDMI_HPD1	I/O	-
19	GND	GND	-
20	+V3P3S	PWR	+3.3V
21	DP2_TX0_DP	DIFF	-
22	GND	GND	-
23	DP2_TX0_DN	DIFF	-
24	DP2_TX1_DP	DIFF	-
25	GND	GND	-

Pin	Pin Name	Signal Type	Signal Level
26	DP2_TX1_DN	DIFF	-
27	DP2_TX2_DP	DIFF	-
28	GND	GND	-
29	DP2_TX2_DN	DIFF	-
30	DP2_TX3_DP	DIFF	-
31	GND	GND	-
32	DP2_TX3_DN	DIFF	-
33	DP2_OB_AUX_EN	GND	-
34	GND	GND	-
35	DP2_AUX_DP	I/O	-
36	GND	GND	-
37	DP2_AUX_DN	I/O	-
38	HDMI_HPD2	I/O	-
39	GND	GND	-
40	+V3P3S	PWR	+3.3V

2.4.16 PCIe FPC Connector (CN38)

Pin	Pin Name	Signal Type	Signal Level
1	+V3P3S	PWR	+3.3V
2	+V3P3S	PWR	+3.3V
3	+V3P3S	PWR	+3.3V
4	SMB_DATA	I/O	-
5	SMB_CLK	I/O	-
6	BUF_PLT_RST#	I/O	-
7	+V3P3A	PWR	+3.3V

Pin	Pin Name	Signal Type	Signal Level
8	GND	GND	-
9	PCIE_18_RXP	DIFF	-
10	PCIE_18_RXN	DIFF	-
11	GND	GND	-
12	PCIE_20_RXP	DIFF	-
13	PCIE_20_RXN	DIFF	-
14	GND	GND	-
15	PCIE_19_RXP	DIFF	-
16	PCIE_19_RXN	DIFF	-
17	GND	GND	-
18	PCIE_17_RXP	DIFF	-
19	PCIE_17_RXN	DIFF	-
20	GND	GND	-
21	PCIE_20_TXN	DIFF	-
22	PCIE_20_TXP	DIFF	-
23	GND	GND	-
24	PCIE_19_TXN	DIFF	-
25	PCIE_19_TXP	DIFF	-
26	GND	GND	-
27	PCIE_18_TXN	DIFF	-
28	PCIE_18_TXP	DIFF	-
29	GND	GND	-
30	CLK_PCIE_FPC_N	DIFF	-
31	CLK_PCIE_FPC_P	DIFF	-
32	GND	GND	-
33	PCIE_17_TXN	DIFF	-
34	PCIE_17_TXP	DIFF	-

Pin	Pin Name	Signal Type	Signal Level
35	GND	GND	-
36	+V12S	PWR	-
37	+V12S	PWR	-
38	+V12S	PWR	-
39	+V12S	PWR	-
40	+V12S	PWR	-

2.4.17 Nano SIM Card Socket (CN39)

Pin	Pin Name	Signal Type	Signal Level
1	UIM_PWR	PWR	-
2	UIM_RST	IN	-
3	UIM_CLK	IN	-
4	NC	-	-
5	GND	GND	-
6	UIM_VPP	PWR	-
7	UIM_DATA	I/O	-
8	NC	-	-

2.4.18 Half Size Mini Card Slot (CN41)

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	-
2	+3.3VSB	PWR	+3.3V
3	NC	-	-
4	GND	GND	-
5	NC	-	-
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	-
8	UIM_PWR	PWR	-
9	GND	GND	-
10	UIM_DATA	I/O	-
11	PCIE_REF_CLK-	DIFF	-
12	UIM_CLK	IN	-
13	PCIE_REF_CLK+	DIFF	-
14	UIM_RST	IN	-
15	GND	GND	-
16	UIM_VPP	PWR	-
17	NC	-	-
18	GND	GND	-
19	NC	-	-
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	-
22	PCIE_RST#	OUT	+3.3V
23	PCIE_RX-	DIFF	-
24	+3.3VSB	PWR	+3.3V

Pin	Pin Name	Signal Type	Signal Level
25	PCIE_RX+	DIFF	-
26	GND	GND	-
27	GND	GND	-
28	+1.5V	PWR	+1.5V
29	GND	GND	-
30	SMB_CLK	I/O	+3.3V
31	PCIE_TX-	DIFF	-
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+	DIFF	-
34	GND	GND	-
35	GND	GND	-
36	USB_D-	DIFF	-
37	GND	GND	-
38	USB_D+	DIFF	-
39	+3.3VSB	PWR	+3.3V
40	GND	GND	-
41	+3.3VSB	PWR	+3.3V
42	NC	-	-
43	GND	GND	-
44	NC	-	-
45	NC	-	-
46	NC	-	-
47	NC	-	-
48	+1.5V	PWR	+1.5V
49	NC	-	-
50	GND	GND	-
51	NC	-	-

Pin	Pin Name	Signal Type	Signal Level
52	+3.3VSB	PWR	+3.3V

2.4.19 M.2 3052 B-Key Slot (CN42)

Standard specification.

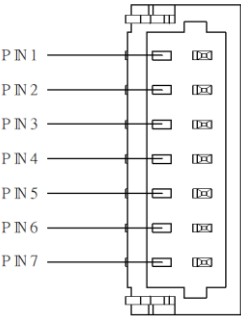
2.4.20 M.2 2280 M-Key Slot (CN43)

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	PCIE3_RX-	DIFF	-
6	NC	-	-
7	PCIE3_RX+	DIFF	-
8	NC	-	-
9	GND	GND	-
10	SATA_LED	IN	+3.3V
11	PCIE3_TX-	GND	-
12	+3.3V	PWR	+3.3V
13	PCIE3_TX+	GND	-
14	+3.3V	PWR	+3.3V
15	GND	GND	-
16	+3.3V	PWR	+3.3V
17	PCIE2_RX-	DIFF	-
18	+3.3V	PWR	+3.3V

Pin	Pin Name	Signal Type	Signal Level
19	PCIE2_RX+	DIFF	-
20	NC	-	-
21	GND	GND	-
22	NC	-	-
23	PCIE2_TX-	DIFF	-
24	NC	-	-
25	PCIE2_TX+	DIFF	-
26	NC	-	-
27	GND	GND	-
28	NC	-	-
29	PCIE1_RX-	DIFF	-
30	NC	-	-
31	PCIE1_RX+	DIFF	-
32	NC	-	-
33	GND	GND	-
34	NC	-	-
35	PCIE1_TX-	DIFF	-
36	NC	-	-
37	PCIE1_TX+	DIFF	-
38	DECSLP	OUT	-
39	GND	GND	-
40	NC	-	-
41	PCIE0_RX-	DIFF	-
42	NC	-	-
43	PCIE0_RX+	DIFF	-
44	NC	-	-
45	GND	GND	-

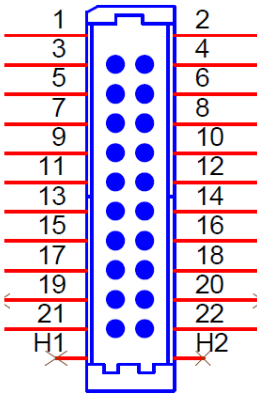
Pin	Pin Name	Signal Type	Signal Level
46	NC	-	-
47	PCIE0_TX-	DIFF	-
48	NC	-	-
49	PCIE0_TX+	DIFF	-
50	PERST#	OUT	-
51	GND	GND	-
52	PCIE_CLK_REQ#	IN	-
53	PCIE_CLK-	DIFF	-
54	PCIE_WAKE	IN	-
55	PCIE_CLK+	DIFF	-
56	NC	-	-
57	GND	GND	-
58	NC	-	-
67	NC	-	-
68	NC	-	-
69	NC	-	-
70	+3.3V	PWR	+3.3V
71	GND	GND	-
72	+3.3V	PWR	+3.3V
73	GND	GND	-
74	+3.3V	PWR	+3.3V
75	GND	GND	-

2.4.20 SPI Flash Programming Port (CN44)



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	-	-

2.4.21 COM Port 1/2 (CN45)



RS-232				
Pin Port 1	Pin Port 2	Pin Name	Signal Type	Signal Level
1	2	DCD	IN	-
3	4	RX	IN	-
5	6	TX	OUT	±5V
7	8	DTR	OUT	±5V
9	10	GND	GND	-
11	12	DSR	IN	-
13	14	RTS	OUT	±5V
15	16	CTS	IN	-
17	18	RI	IN	-
19	20	NC	-	-

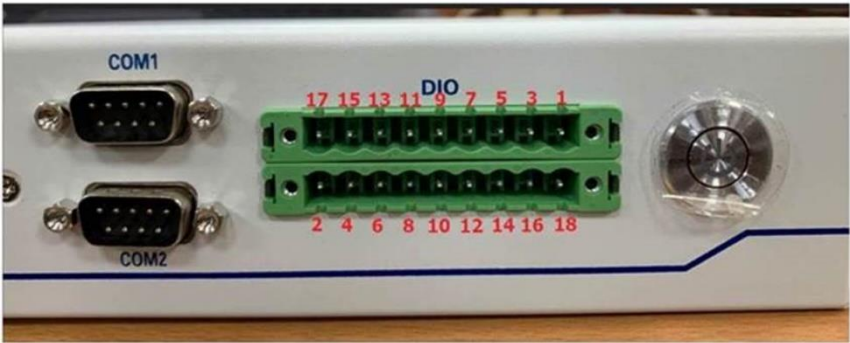
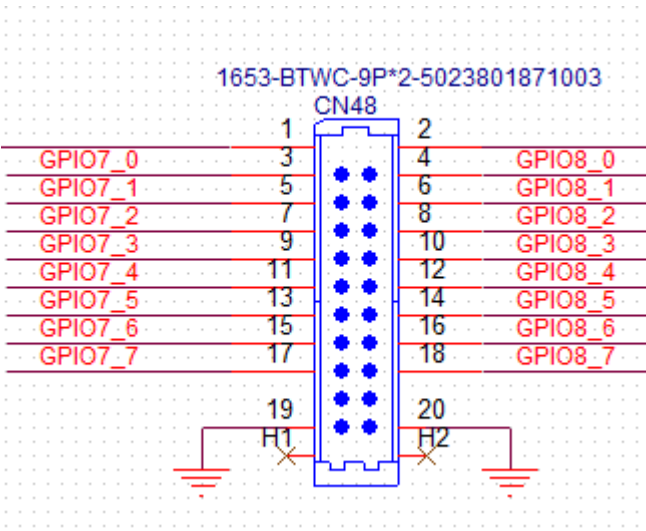
RS-422				
Pin Port 1	Pin Port 2	Pin Name	Signal Type	Signal Level
1	2	RS422_TX-	OUT	±5V
3	4	RS422_TX+	OUT	±5V
5	6	RS422_RX+	IN	-
7	8	RS422_RX-	IN	-
9	10	GND	GND	-
11	12	NC	-	-
13	14	NC	-	-
15	16	NC	-	-
17	18	+5V/+12V(0.5A)	PWR	+5V/+12V
19	20	NC	-	-

RS-485				
Pin Port 1	Pin Port 2	Pin Name	Signal Type	Signal Level
1	2	RS485_D-	I/O	±5V
3	4	RS485_D+	I/O	±5V
5	6	NC	-	-
7	8	NC	-	-
9	10	GND	GND	-
11	12	NC	-	-
13	14	NC	-	-
15	16	NC	-	-
17	18	+5V/+12V(0.5A)	PWR	+5V/+12V
19	20	NC	-	-

Note: COM2 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

Note: Pin 8 function can be set by BOM.

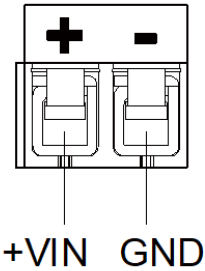
2.4.22 DIO Port (CN48)



Pin	Pin Name	Pin	Pin Name
Pin 1	5V	Pin 2	GND
Pin 3	DIO7_0	Pin 4	DIO8_0
Pin 5	DIO7_1	Pin 6	DIO8_1
Pin 7	DIO7_2	Pin 8	DIO8_2
Pin 9	DIO7_3	Pin 10	DIO8_3

Pin	Pin Name	Pin	Pin Name
Pin 11	DIO7_4	Pin 12	DIO8_4
Pin 13	DIO7_5	Pin 14	DIO8_5
Pin 15	DIO7_6	Pin 16	DIO8_6
Pin 17	DIO7_7	Pin 18	DIO8_7

2.4.23 External Power Input (CN51)



Pin	Pin Name	Signal Type	Signal Level
1	+VIN	PWR	+12V
2	GND	GND	-

Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors.

System configuration verification

These routines check the current system configuration stored in the CMOS memory and BIOS NVRAM. If system configuration is not found or system configuration data error is detected, system will load optimized default and re-boot with this default system configuration automatically.

There are four situations in which you will need to setup system configuration:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The system configuration is reset by Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The EPIC-TGH7-PUC CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

AMI BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM and BIOS NVRAM so that it retains the Setup information when the power is turned off.

Entering Setup

Power on the computer and press or <ESC> immediately. This will allow you to enter Setup.

Main

Set the date, use tab to switch between date elements.

Advanced

Enable/disable boot option for legacy network devices.

System I/O

Host bridge parameters.

Security

Set setup administrator password.

Boot

Enables/disables quiet boot option.

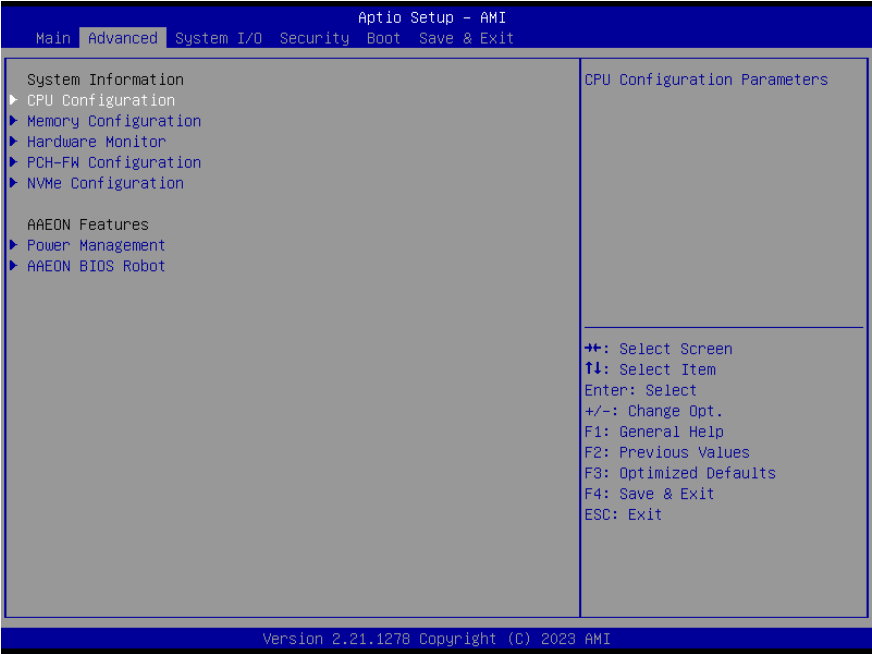
Save & Exit

Exit system setup after saving the changes.

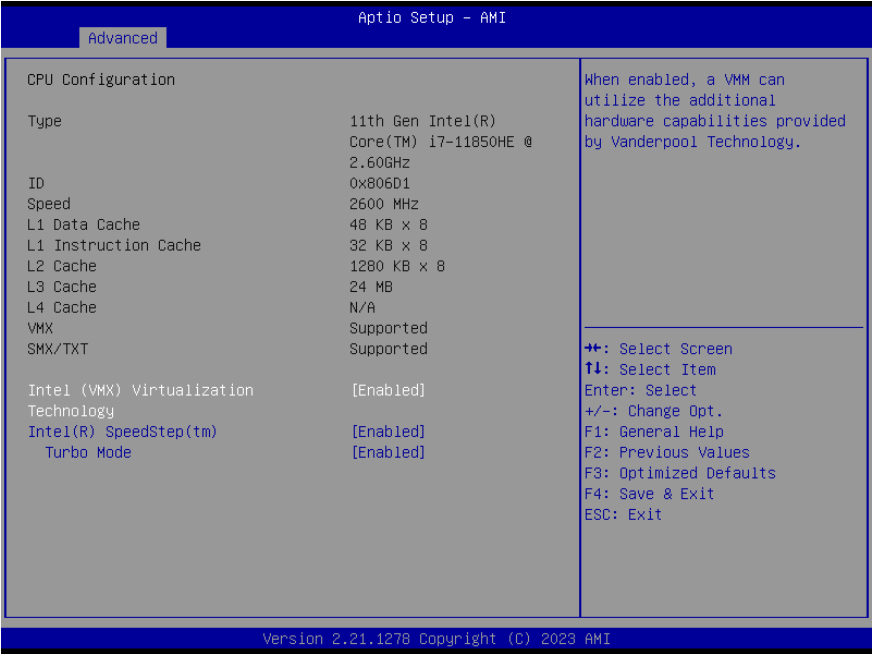
3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced

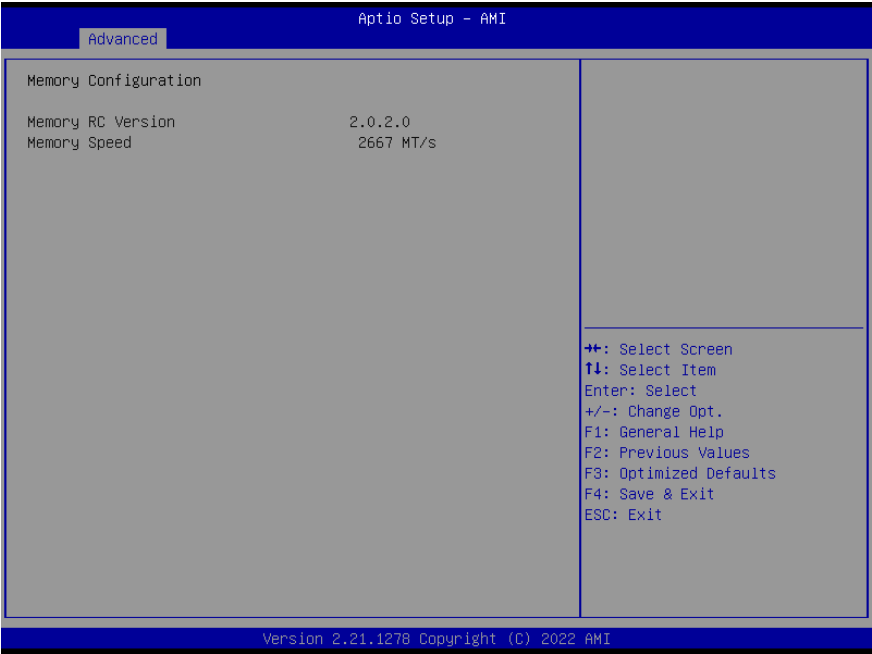


3.4.1 CPU Configuration

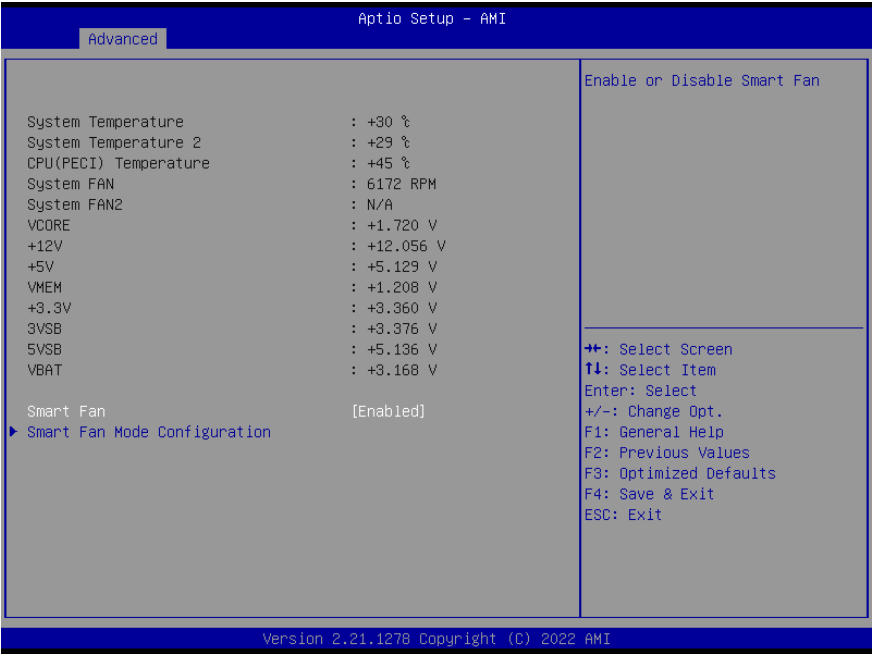


Options Summary		
Intel (VMX) Virtualization Technology	Disabled	-
	Enabled	Optimal Default, Failsafe Default
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		
Intel(R) SpeedStep(tm)	Disabled	-
	Enabled	Optimal Default, Failsafe Default
Allows more 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.		

3.4.2 Memory Configuration

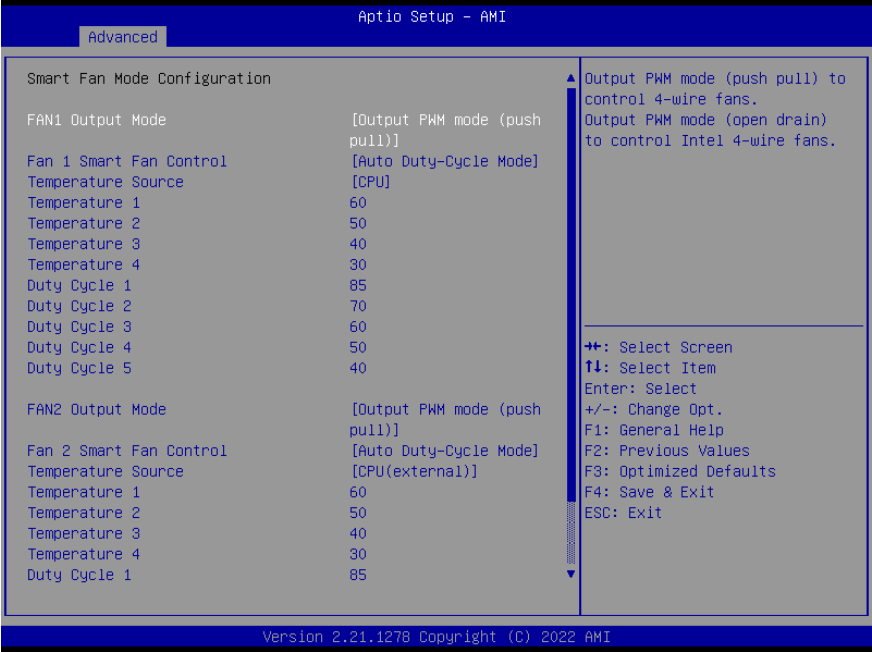


3.4.3 Hardware Monitor



Options Summary		
Smart Fan	Disabled	-
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Smart Fan.		

3.4.4 Smart Fan Mode Configuration



Options Summary		
FAN1 Output Mode	Output PWM mode (push pull)	-
	Linear Fan Application	-
	Output PWM mode (open drain)	Optimal Default, Failsafe Default
Output PWM mode (push pull) to control 4-wire fans. Linear fan application circuit to control 3-wire fan speed by fan's power terminal. Output PWM mode (open drain) to control Intel 4-wire fans.		
Fan 1 Smart Fan Control	Manual Duty Mode	-
	Auto Duty-Cycle Mode	Optimal Default, Failsafe Default
Smart Fan Mode Select		
Temperature Source	CPU(PECI) Temperature	Optimal Default, Failsafe Default
	System Temperature 2	-
	System Temperature	-
Select the monitored temperature source for this fan.		

Options Summary		
Duty Cycle	Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100	
Temperature		

Aptio Setup - AMI		
Advanced		
Fan 1 Smart Fan Control	[Auto Duty-Cycle Mode]	▲ Output PWM mode (push pull) to control 4-wire fans. Output PWM mode (open drain) to control Intel 4-wire fans. ✚: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Temperature Source	[CPU]	
Temperature 1	60	
Temperature 2	50	
Temperature 3	40	
Temperature 4	30	
Duty Cycle 1	85	
Duty Cycle 2	70	
Duty Cycle 3	60	
Duty Cycle 4	50	
Duty Cycle 5	40	
FAN2 Output Mode	[Output PWM mode (push pull)]	
Fan 2 Smart Fan Control	[Auto Duty-Cycle Mode]	
Temperature Source	[CPU(external)]	
Temperature 1	60	
Temperature 2	50	
Temperature 3	40	
Temperature 4	30	
Duty Cycle 1	85	
Duty Cycle 2	70	
Duty Cycle 3	60	
Duty Cycle 4	50	
Duty Cycle 5	40	
Version 2.21.1278 Copyright (C) 2022 AMI		

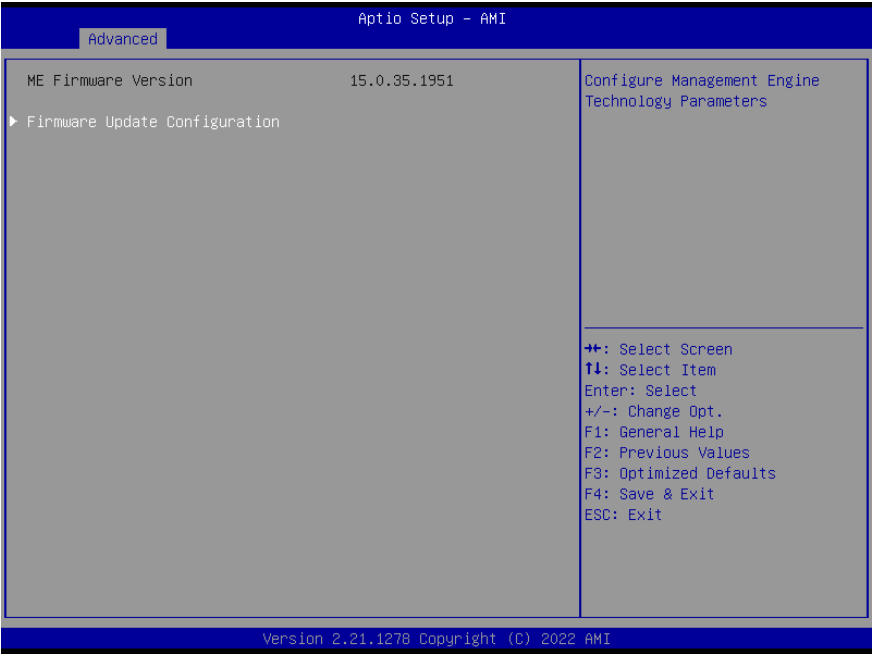
Options Summary		
FAN2 Output Mode	Output PWM mode (push pull)	-
	Linear Fan Application	-
	Output PWM mode (open drain)	Optimal Default, Failsafe Default
Output PWM mode (push pull) to control 4-wire fans. Linear fan application circuit to control 3-wire fan speed by fan's power terminal. Output PWM mode (open drain) to control Intel 4-wire fans.		
Fan 2 Smart Fan Control	Manual Duty Mode	-
	Auto Duty-Cycle Mode	Optimal Default, Failsafe Default
Smart Fan Mode Select.		

Options Summary		
Temperature Source	CPU(PECI) Temperature	Optimal Default, Failsafe Default
	System Temperature 2	-
	System Temperature	-
Select the monitored temperature source for this fan.		
Duty Cycle	Auto fan speed control. Fan speed will follow different	
Temperature	temperature by different duty cycle 1-100	

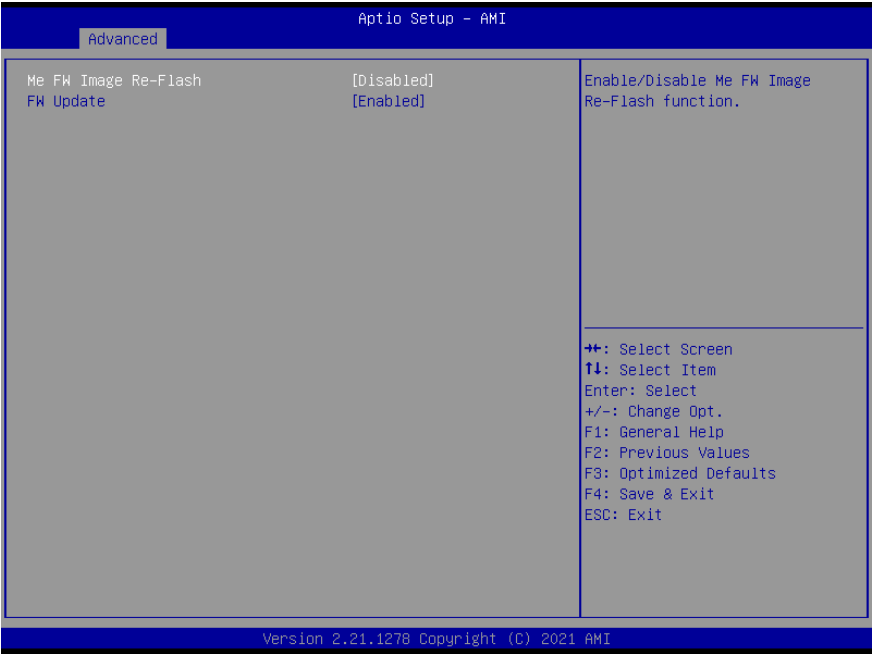
Aptio Setup - AMI		
Advanced		
Smart Fan Mode Configuration		Output PWM mode (push pull) to control 4-wire fans. Output PWM mode (open drain) to control Intel 4-wire fans.
FAN1 Output Mode	[Output PWM mode (push pull)]	
Fan 1 Smart Fan Control	[Manual Duty Mode]	
Manual Duty Mode	60	
FAN2 Output Mode	[Output PWM mode (push pull)]	
Fan 2 Smart Fan Control	[Manual Duty Mode]	
Manual Duty Mode	60	
		++: Select Screen T↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
Version 2.21.1278 Copyright (C) 2022 AMI		

Options Summary		
Manual Duty Mode	60	Optimal Default, Failsafe Default
Manual mode fan control, user can write expected duty cycle (PWM fan type) 1-100.		

3.4.5 PCH-FW Configuration

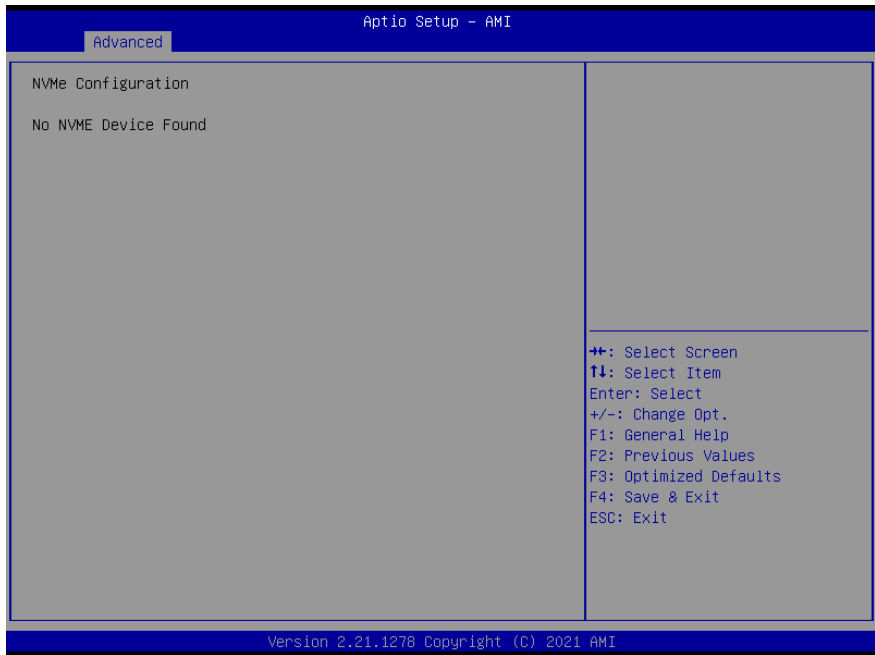


3.4.6 Firmware Update Configuration



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

3.4.7 NVMe Configuration



3.4.8 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	-
IO Restore AC power Loss.		
RTC wake system from S5	Disable	Optimal Default, Failsafe Default
	Fixed Time	-
	Dynamic Time	-
	Bypass	-
Fixed Time: System will wake on the hr::min::sec specified. Dynamic Time: System will wake on the current time + Increase minute(s). Bypass: BIOS will not control RTC wake function during system shutdown.		

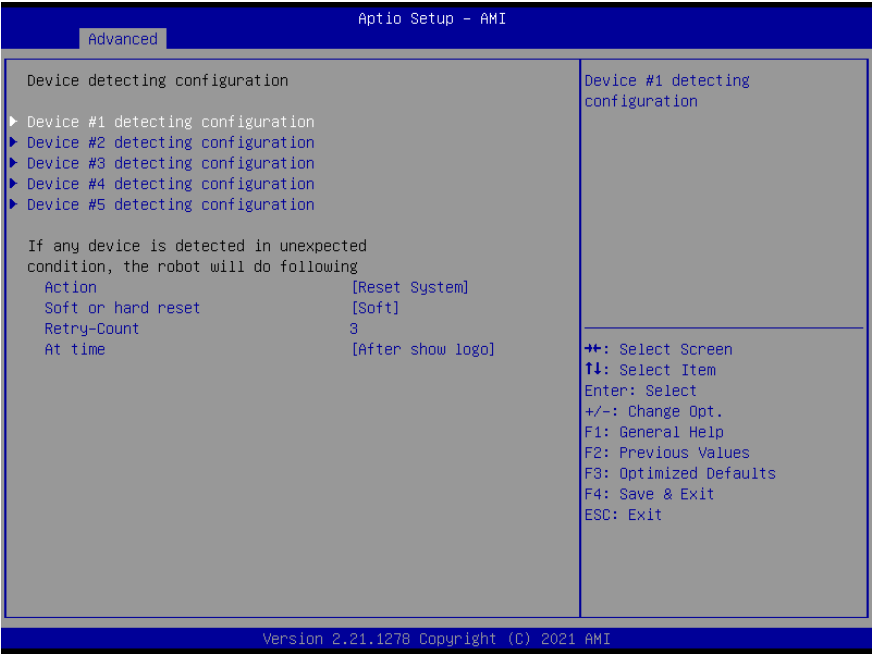
3.4.9 AAEON BIOS Robot



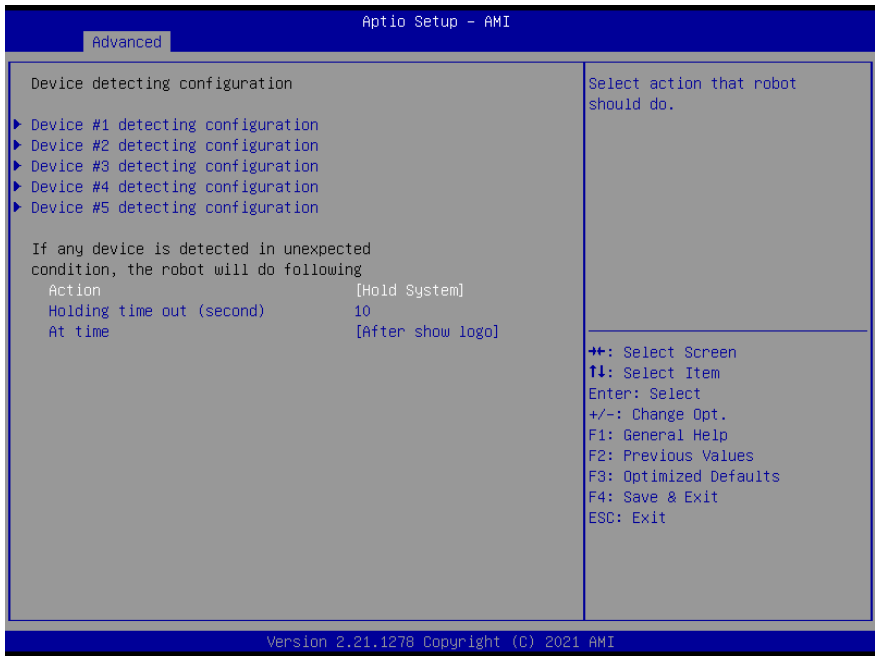
Options Summary		
Sends watch dog before BIOS POST	Disabled	Optimal Default, Failsafe Default
	Enabled	-
Enabled - Robot set Watch Dog Timer (WDT) right after power on, before BIOS start POST process. And then Robot will clear WDT on completion of POST. WDT will reset system automatically if it is not cleared before its timer counts down to zero.		
POST Timer (second)	30	Optimal Default, Failsafe Default
Timer count set to Watch Dog Timer for POST. WARNING: Do not set to a value equal or shorter than normal POST time, otherwise system may never complete POST unless clearing BIOS settings. More than 2 x normal POST time is suggested.		
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 is going to update itself.		

Options Summary		
OS Timer (minute)	3	Optimal Default, Failsafe Default
Timer count set to Watch Dog Timer for OS loading.		
Delayed POST (PEI phase)	Disabled	Optimal Default, Failsafe Default
	Enabled	-
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 time (second)	10	Optimal Default, Failsafe Default
Period of time for Robot to hold BIOS from POST.		
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'.		
Delayed time (second)	10	Optimal Default, Failsafe Default
Period of time for Robot to hold BIOS from POST.		
Reset system once	Disabled	Optimal Default, Failsafe Default
	Enabled	-
Enabled - Robot resets system for one time on each boot. This will send a soft or hard reset to onboard devices, thus puts devices to more stable state.		
Soft or hard reset	Soft reset	Optimal Default, Failsafe Default
	Hard reset"	-
Select reset type robot should send on each boot.		

3.4.10 Device Detecting Configuration

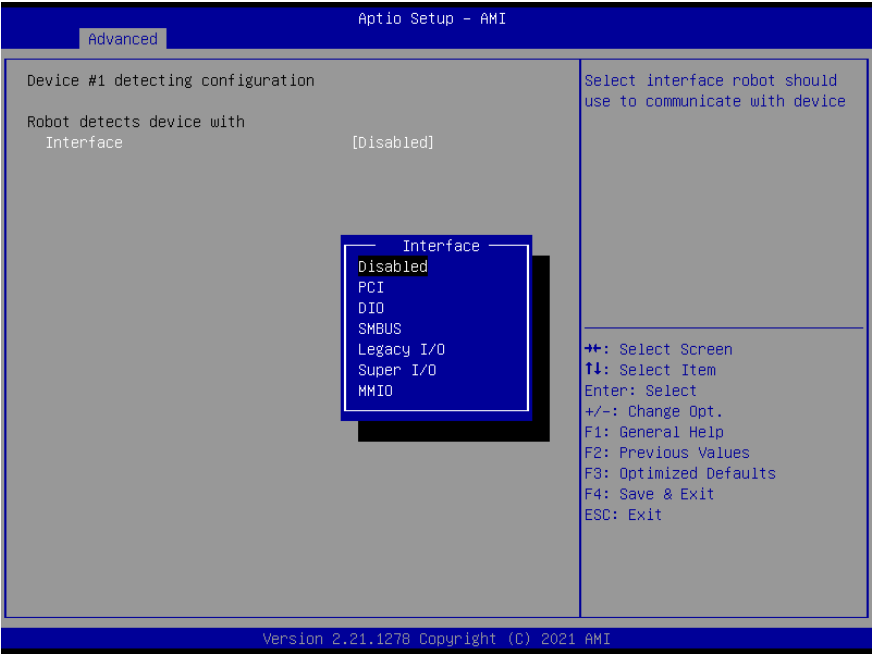


Options Summary		
Action	Reset System	Optimal Default, Failsafe Default
	Hold System	
Select action that robot should do.		
Soft or hard reset	Soft	Optimal Default, Failsafe Default
	Hard	
Select reset type robot should send on each boot.		
Retry-Count	3	Optimal Default, Failsafe Default
Fill retry counter 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.		



Options Summary		
Action	Reset System	Optimal Default, Failsafe Default
	Hold System	
Select action that robot should do.		
Holding time out (second)	10	Optimal Default, Failsafe Default
Fill hold time out here. Robot will hold system no longer then time-out value, 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.		

3.4.10.1 Device #* Detecting Configuration – Interface



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.		

3.4.10.2 Device #* Detecting Configuration – PCI

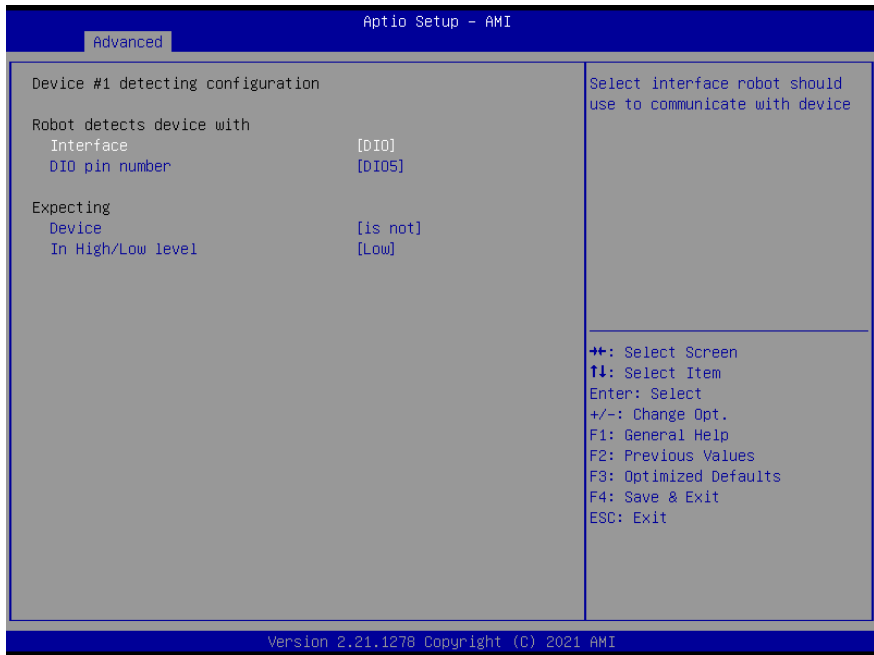
Aptio Setup - AMI		
Advanced		
Device #1 detecting configuration		Select the condition that robot should check for device. Present - device is detected According to register - Robot read register according to configuration. Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF.
Robot detects device with		
Interface	[PCI]	++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
BUS	0	
Device	0	
Function	0	
Expecting		
Device	[is not]	
In condition	[Specified register data]	
Register data is	[bitwise equal to]	
Register offset	0	
Bit offset	0	
Bit value	[Low]	

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Options Summary		
When interface item set to "PCI" it will show below items		
BUS	0	Optimal Default, Failsafe Default
Fill BUS number to a PCI device, in hexadecimal. Range: 0 – FF.		
Device	0	Optimal Default, Failsafe Default
Fill DEVICE number to a PCI device, in hexadecimal. Range: 0 – FF.		
Function	0	Optimal Default, Failsafe Default
Fill FUNCTION number to a PCI device, in hexadecimal. Range: 0 – FF.		
Device	is	
	Is not	Optimal Default, Failsafe Default
Select that robot should or should not do action if condition met.		
In condition	Present	Optimal Default, Failsafe Default
	Specified register data	
Select the condition that robot should check for device. Present - device is detected. According to register - Robot read register according to configuration. Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF.		

Options Summary		
Register data is	bitwise equal to	Optimal Default, Failsafe Default
	bytewise equal to	
	bytewise lesser than	
	bytewise larger than	
Select how robot should compare data read from register, to a value configured below.		
Register offset	0	Optimal Default, Failsafe Default
Fill register offset (or index) for robot to read, in hexadecimal. Range: 0 – FF.		
Bit offset	0	Optimal Default, Failsafe Default
Fill bit offset for register, for robot to compare with bit value.		
Bit value	Low	Optimal Default, Failsafe Default
	High	
Fill bit value for robot to compare register-bit with specified offset.		
Byte value	0	Optimal Default, Failsafe Default
Fill a byte value for robot to compare register data with, in hexadecimal: Range: 0 - FF.		

3.4.10.3 Device #* Detecting Configuration – DIO



Options Summary		
When interface item set to "DIO" will show below items		
Device	is	
	Is not	Optimal Default, Failsafe Default
Select that robot should or should not do action if condition met.		
DIO pin number	DIO1	Optimal Default, Failsafe Default
	DIO*	
Fill DIO pin number, DIO, DIO1, and so on. For COM express product: 0-3 - PI0-3\n4-7 - GPO0-3.		
Device	is	
	Is not	Optimal Default, Failsafe Default
Select that robot should or should not do action if condition met.		
In High/Low level	Low	Optimal Default, Failsafe Default
	High	
Select High/Low level of the DIO pin that robot should do action.		

3.4.10.4 Device #* Detecting Configuration – SMBUS

Aptio Setup - AMI		
Advanced		
Device #1 detecting configuration		Select interface robot should use to communicate with device
Robot detects device with		
Interface	[SMBUS]	
SMBUS Slave Address	0	
Expecting		
Device	[is not]	
In condition	[Specified register data]	
Register data is	[bitwise equal to]	
Register offset	0	
Bit offset	0	
Bit value	[Low]	
		++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Options Summary		
When interface item set to "SMBUS" will show below items		
SMBUS Slave Address	0	Optimal Default, Failsafe Default
Fill slave address to a SMBUS device, in hexadecimal. Range: 0 – FF.		
Device	is	
	Is not	Optimal Default, Failsafe Default
Select that robot should or should not do action if condition met.		
In condition	Present	Optimal Default, Failsafe Default
	Specified register data	
Select the condition that robot should check for device. Present - device is detected According to register - Robot read register according to configuration. Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF.		
Register data is	bitwise equal to	Optimal Default, Failsafe Default
	bytewise equal to	
	bytewise lesser than	
	bytewise larger than	

Options Summary		
Select how robot should compare data read from register, to a value configured below.		
Register offset	0	Optimal Default, Failsafe Default
Fill register offset (or index) for robot to read, in hexadecimal. Range: 0 – FF.		
Bit offset	0	Optimal Default, Failsafe Default
Fill bit offset for register, for robot to compare with bit value.		
Bit value	Low	Optimal Default, Failsafe Default
	High	
Fill bit value for robot to compare register-bit with specified offset.		
Byte value	0	Optimal Default, Failsafe Default
Fill a byte value for robot to compare register data with, in hexadecimal. Range: 0 – FF.		

3.4.10.5 Device #* Detecting Configuration – Legacy I/O

Aptio Setup - AMI		
Advanced		
Device #1 detecting configuration		Select interface robot should use to communicate with device
Robot detects device with		
Interface	[Legacy I/O]	
I/O Address	0	
Expecting		
Device	[is not]	
In condition	[Specified register data]	
Register data is	[bitwise equal to]	
Bit offset	0	
Bit value	[Low]	
		++: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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Options Summary		
When interface item set to "Legacy I/O" will show below items		
I/O Address	0	Optimal Default, Failsafe Default
Fill I/O address device is responding to. Range: 0~FFFF.		
Device	is	
	Is not	Optimal Default, Failsafe Default
Select that robot should or should not do action if condition met.		
In condition	Present	Optimal Default, Failsafe Default
	Specified register data	
Select the condition that robot should check for device. Present - device is detected. According to register - Robot read register according to configuration. Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF.		
Register data is	bitwise equal to	Optimal Default, Failsafe Default
	byte-wise equal to	
	byte-wise lesser than	
	byte-wise larger than	

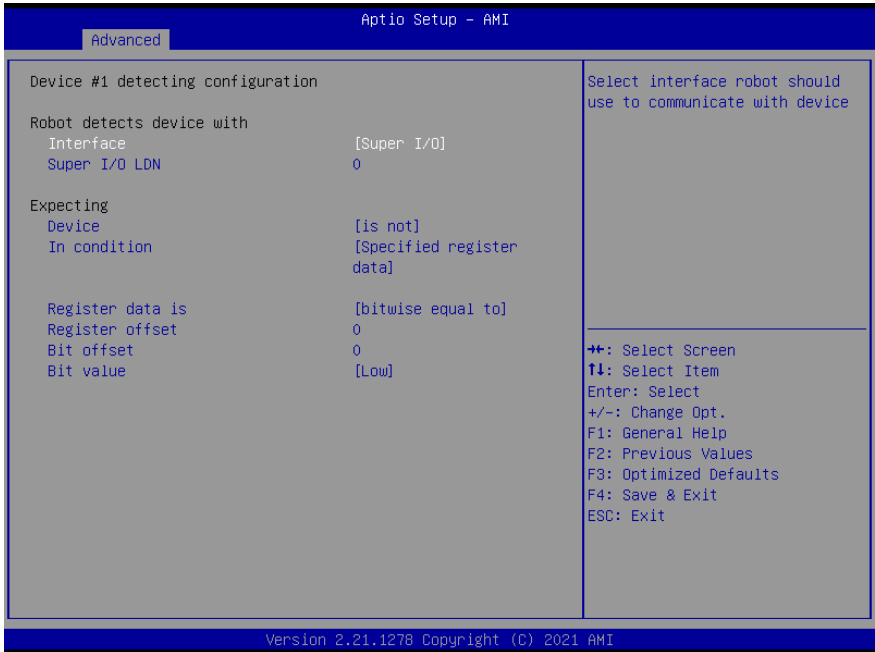
Options Summary

Select how robot should compare data read from register, to a value configured below.

Bit offset	0	Optimal Default, Failsafe Default
------------	---	-----------------------------------

Fill bit offset for register, for robot to compare with bit value.

3.4.10.6 Device #* Detecting Configuration – Super I/O



Options Summary

When interface item set to "Super I/O" will show below items

Super I/O LDN	0	Optimal Default, Failsafe Default
---------------	---	-----------------------------------

Fill LDN number to a Super I/O device. Range: 0~FF.

Device	Is	
	Is not	Optimal Default, Failsafe Default

Select that robot should or should not do action if condition met.

In condition	Present	Optimal Default, Failsafe Default
	Specified register data	

Options Summary		
Select the condition that robot should check for device. Present - device is detected.		
According to register - Robot read register according to configuration. Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF.		
Register data is	bitwise equal to	Optimal Default, Failsafe Default
	byte-wise equal to	
	byte-wise lesser than	
	byte-wise larger than	
Select how robot should compare data read from register, to a value configured below.		
Register offset	0	Optimal Default, Failsafe Default
Fill register offset (or index) for robot to read, in hexadecimal. Range: 0 – FF.		
Bit offset	0	Optimal Default, Failsafe Default
Fill bit offset for register, for robot to compare with bit value.		
Bit value	Low	Optimal Default, Failsafe Default
	High	
Fill bit value for robot to compare register-bit with specified offset.		
Byte value	0	Optimal Default, Failsafe Default
Fill a byte value for robot to compare register data with, in hexadecimal. Range: 0 – FF.		

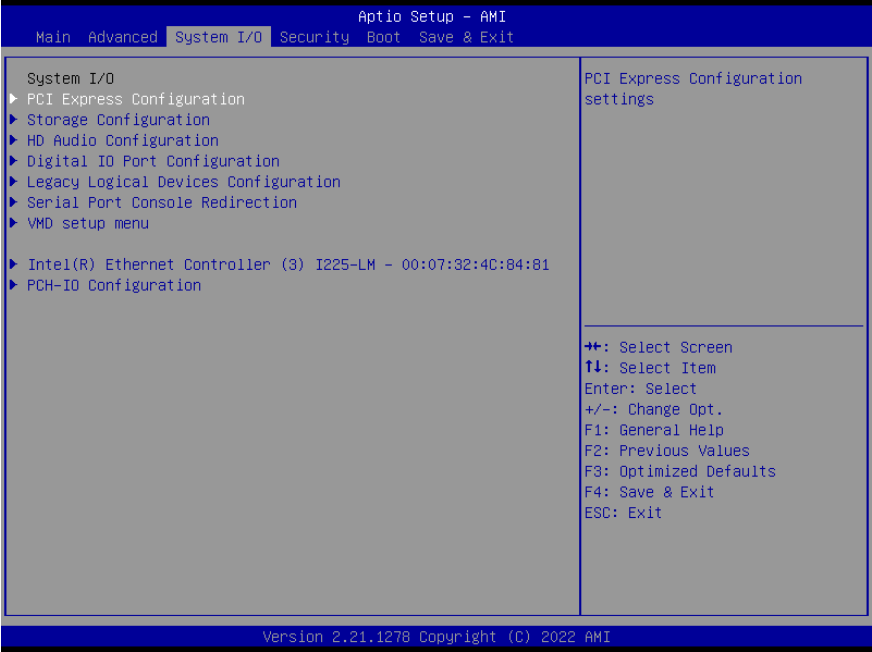
3.4.10.7 Device #* Detecting Configuration – MMIO

Aptio Setup - AMI		
Advanced		
Device #1 detecting configuration		Select interface robot should use to communicate with device
Robot detects device with		
Interface	[MMIO]	
MMIO Address	0	
Expecting		
Device	[is not]	
In condition	[Specified register data]	
Register data is	[bitwise equal to]	
Bit offset	0	
Bit value	[Low]	
		+-: Select Screen T1: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit
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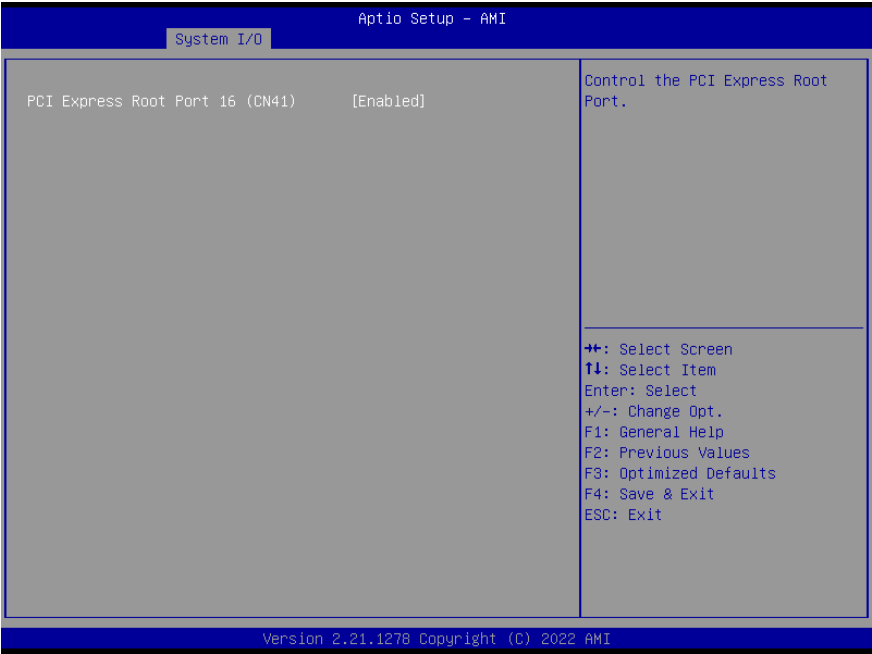
Options Summary		
When interface item set to "MMIO" will show below items		
MMIO Address	0	Optimal Default, Failsafe Default
Fill Memory Mapped I/O address device is responding to. Range: 0~FFFFFFFF.		
Device	is	
	Is not	Optimal Default, Failsafe Default
Select that robot should or should not do action if condition met.		
In condition	Present	Optimal Default, Failsafe Default
	Specified register data	
Select the condition that robot should check for device. Present - device is detected. According to register - Robot read register according to configuration. Note: Device will be considered 'Present' by Robot, when data read from device is not 0xFF.		
Register data is	bitwise equal to	Optimal Default, Failsafe Default
	bytewise equal to	
	bytewise lesser than	
	bytewise larger than	

Options Summary		
Select how robot should compare data read from register, to a value configured below.		
Bit offset	0	Optimal Default, Failsafe Default
Fill bit offset for register, for robot to compare with bit value.		
Bit value	Low	Optimal Default, Failsafe Default
	High	
Fill bit value for robot to compare register-bit with specified offset.		
Byte value	0	Optimal Default, Failsafe Default
Fill a byte value for robot to compare register data with, in hexadecimal. Range: 0 – FF.		

3.5 Setup Submenu: System I/O

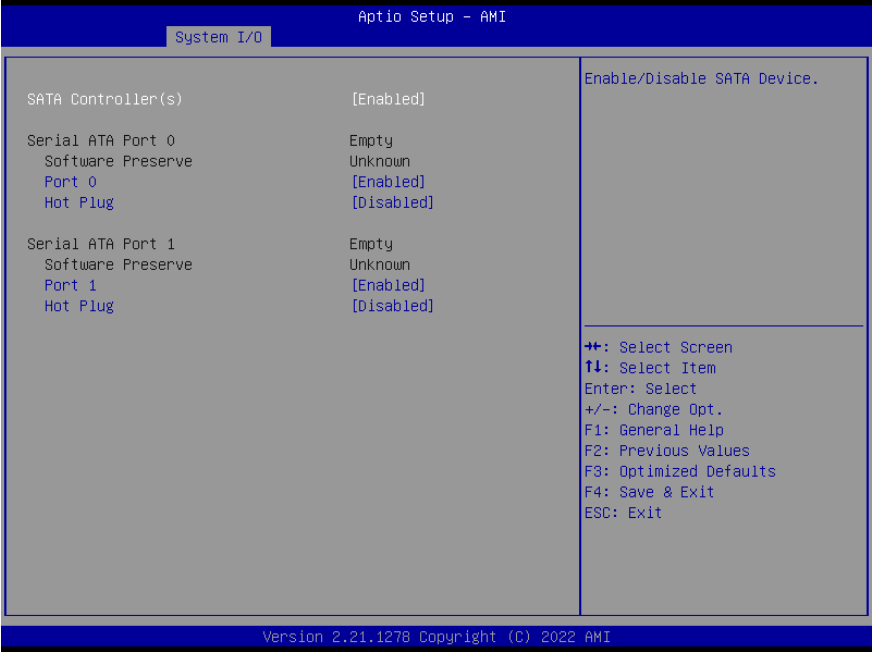


3.5.1 PCI Express Configuration



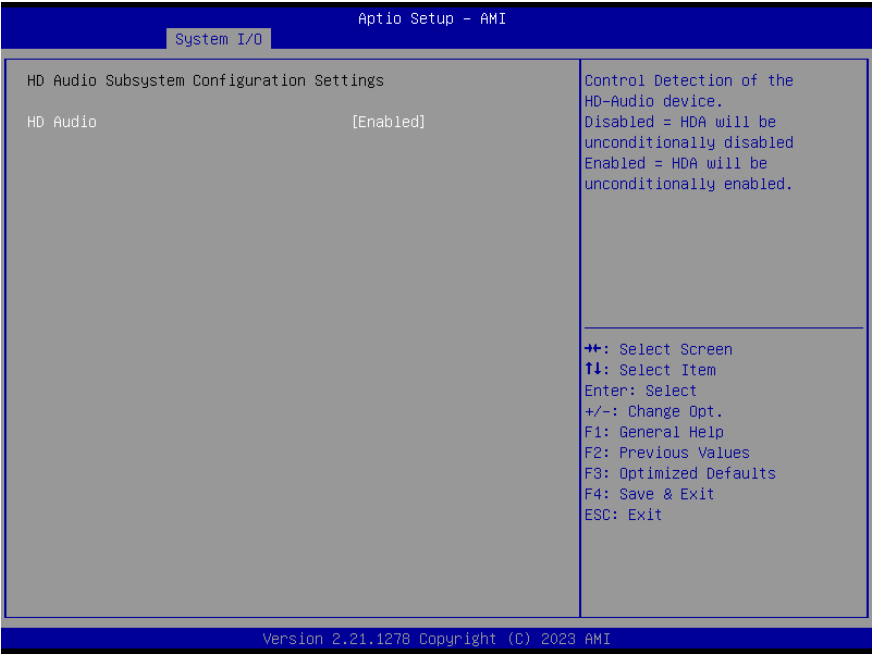
Options Summary		
PCI Express Root Port 16 (CN41)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Control the PCI Express Root Port.		

3.5.2 Storage Configuration



Options Summary		
SATA Controller(s)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable SATA Device.		
Port 0	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port.		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot Pluggable.		
Port 1	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port.		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot Pluggable.		

3.5.3 HD Audio Configuration



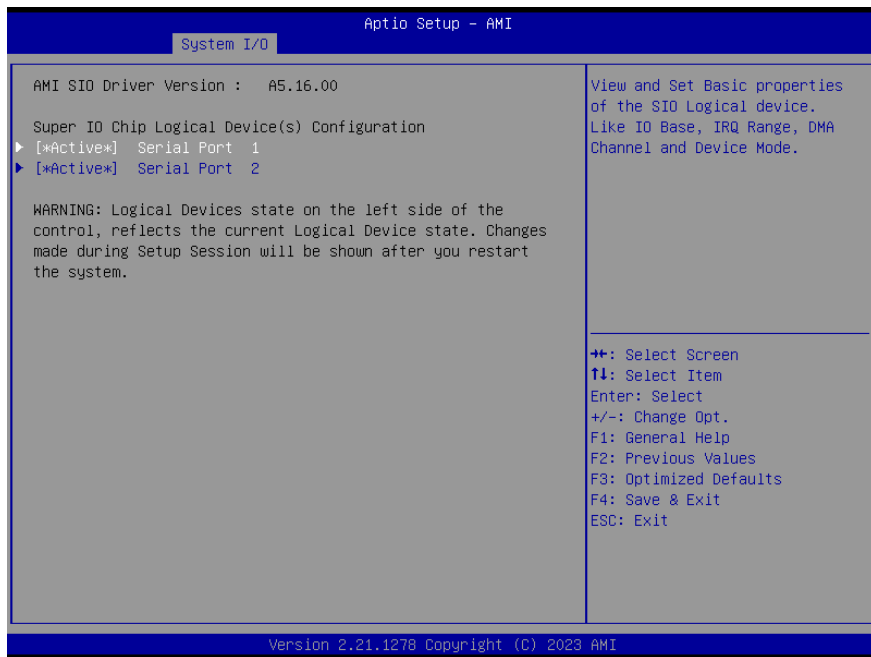
Options Summary		
HD Audio	Disabled	
	Enabled	Optimal Default, Failsafe Default
Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled. Enabled = HDA will be unconditionally enabled.		

3.5.4 Digital IO Port Configuration



Options Summary		
DIO Port*	Output	
	Input	
Set DIO as Input or Output.		
Output Level	High	Optimal Default, Failsafe Default
	Low	
Set output level when DIO pin is output.		

3.5.5 Legacy Logical Devices Configuration



3.5.5.1 Serial Port 1 Configuration

Aptio Setup - AMI

System I/O

Serial Port 1 Configuration

Use This Device [Enabled]

Logical Device Settings:
Current : IO=3F8h; IRQ=4;

Possible: [Use Automatic Settings]

Mode : [RS232]

WARNING: Disabling SIO Logical Devices may have unwanted side effects.
PROCEED WITH CAUTION.

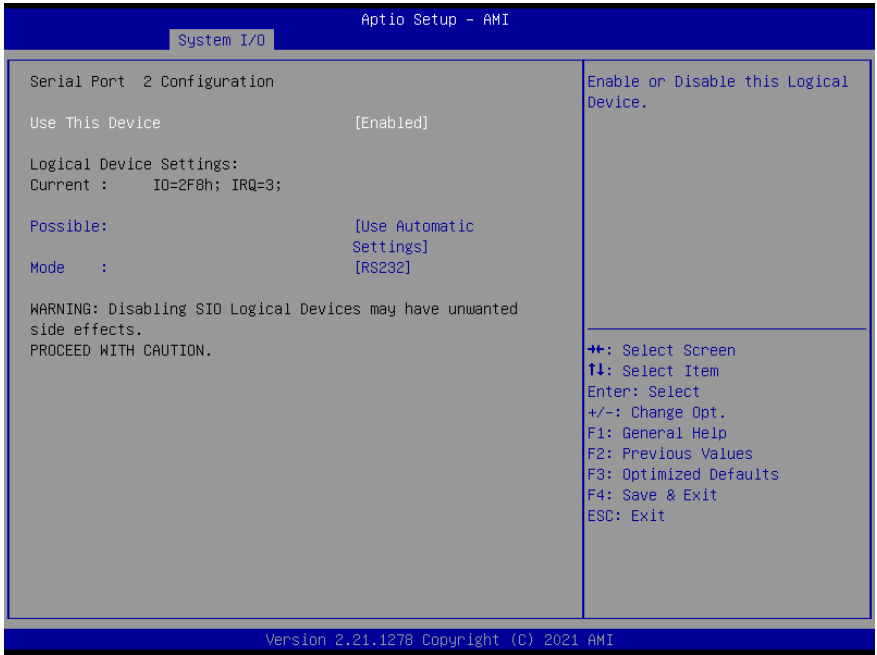
Enable or Disable this Logical Device.

⇧⇩: Select Screen
 T1: Select Item
 Enter: Select
 +/-: Change Opt.
 F1: General Help
 F2: Previous Values
 F3: Optimized Defaults
 F4: Save & Exit
 ESC: Exit

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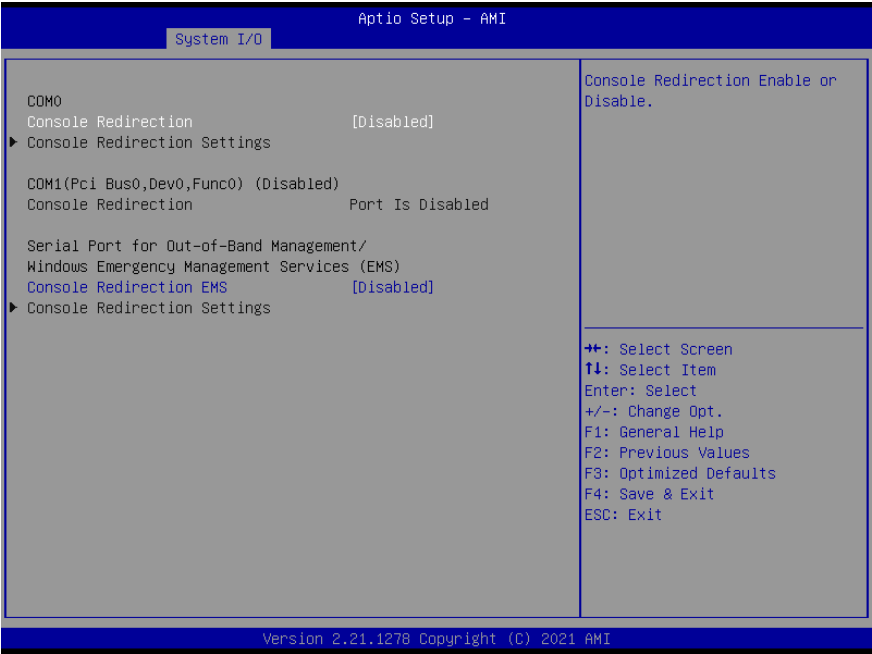
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8h; IRQ=4	
	IO=2F8h; IRQ=3	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		
Mode	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485 selection.		

3.5.5.2 Serial Port 2 Configuration



Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's 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.		

3.5.6 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.		

3.5.7 Console Redirection Settings

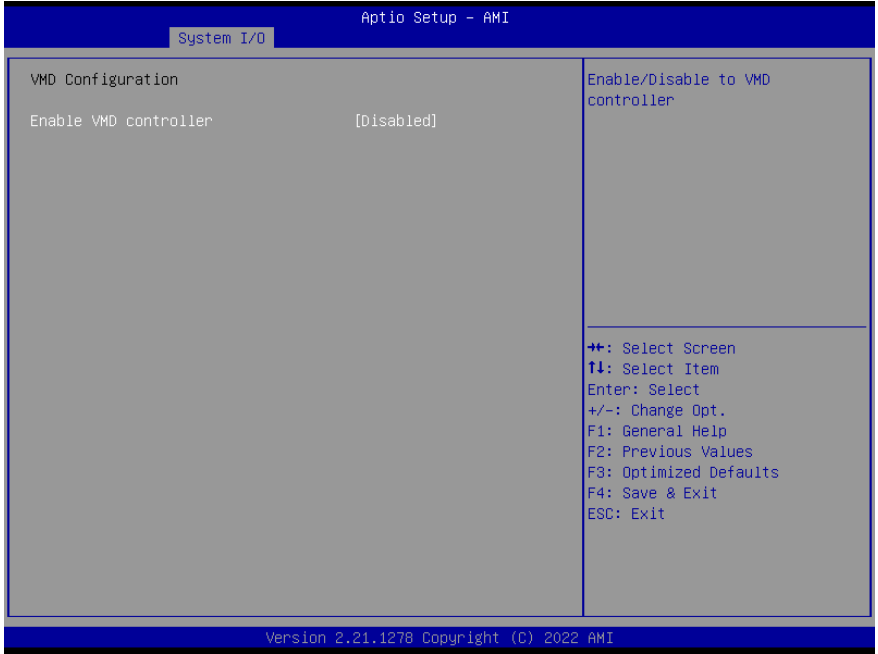


Options Summary		
Terminal Type	VT100	
	VT100+	
	VT-UTF8	
	ANSI	Optimal Default, Failsafe Default
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.		
Bits 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.		

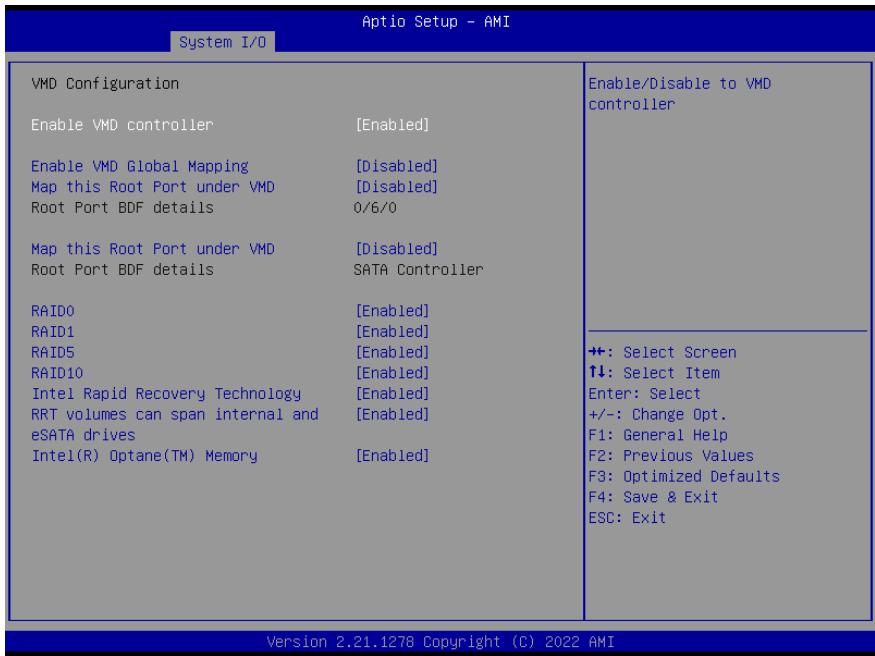
Options Summary		
Data Bits	7	
	8	Optimal Default, Failsafe Default
Parity	None	Optimal Default, Failsafe Default
	Even	
	Odd	
	Mark	
	Space	
A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit 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.		

Options Summary		
Putty KeyPad	VT100	Optimal Default, Failsafe Default
	LINUX	
	XTERMR6	
	SCO	
	ESCN	
	VT400	
Select FunctionKey and KeyPad on Putty.		

3.5.8 VMD Setup Menu



Options Summary		
Enable VMD controller	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable to VMD controller.		

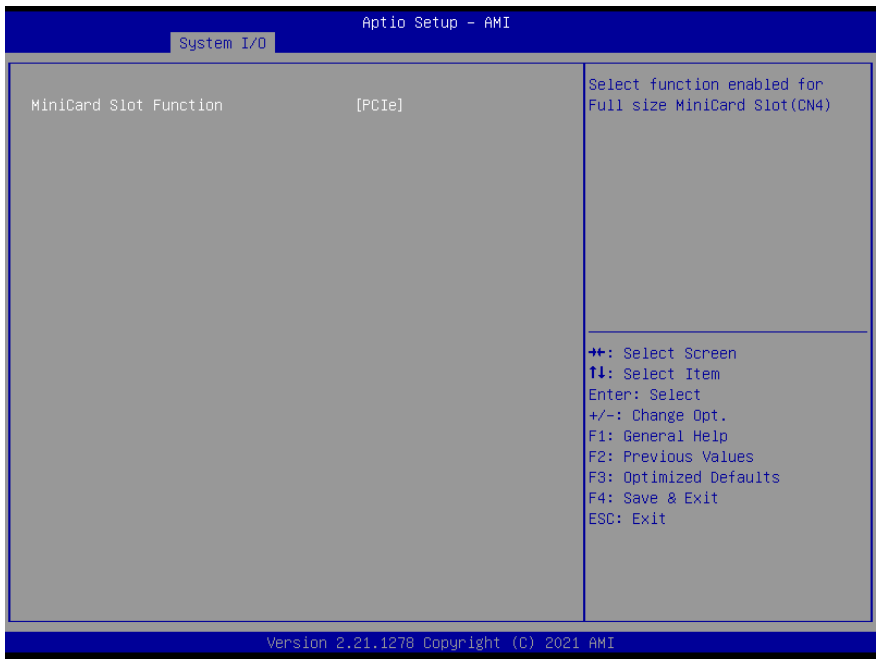


Options Summary

Enable VMD Global Mapping	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable to VMD Global Mapping.		
Map this Root Port under VMD	Disabled	
	Enabled	Optimal Default, Failsafe Default
Map/UnMap this Root Port to VMD.		
RAID0	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable RAID0 support".		
RAID1	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable RAID1 support".		
RAID5	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable RAID5 support".		
RAID10	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable RAID10 support".		

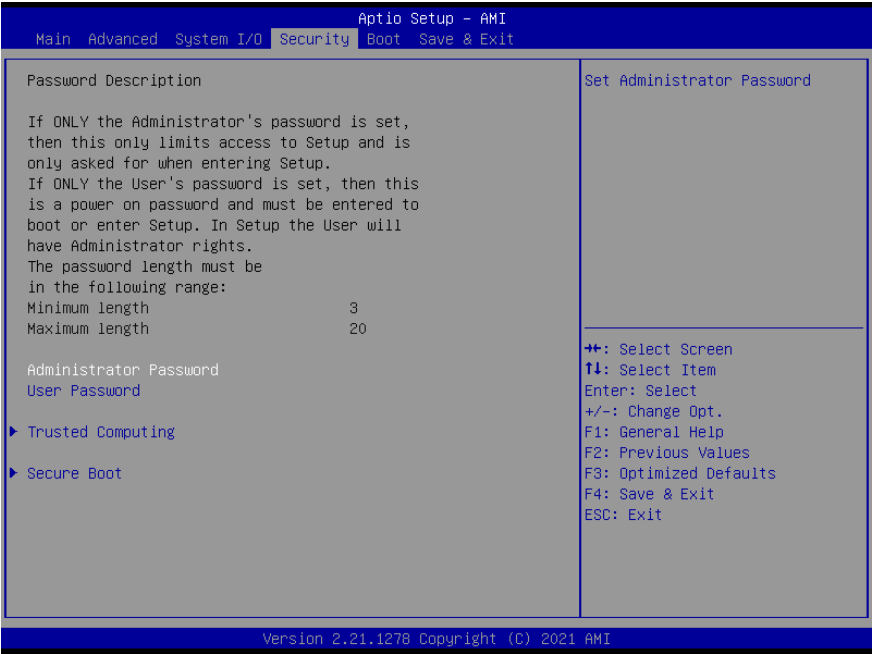
Options Summary		
Intel Rapid Recovery Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable Intel Rapid Recovery Technology.		
RRT volumes can span internal and eSATA drives	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable RRT volumes can span internal and eSATA drives.		
Intel(R) Optane(TM) Memory	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable System Acceleration with Intel(R) Optane(TM) Memory feature.		

3.5.9 PCH-IO Configuration



Options Summary		
MiniCard Slot Function	SATA	Optimal Default, Failsafe Default
	PCIe	
Select function enabled for Full size MiniCard Slot (CN6).		

3.6 Setup Submenu: Security



Change User/Supervisor Password

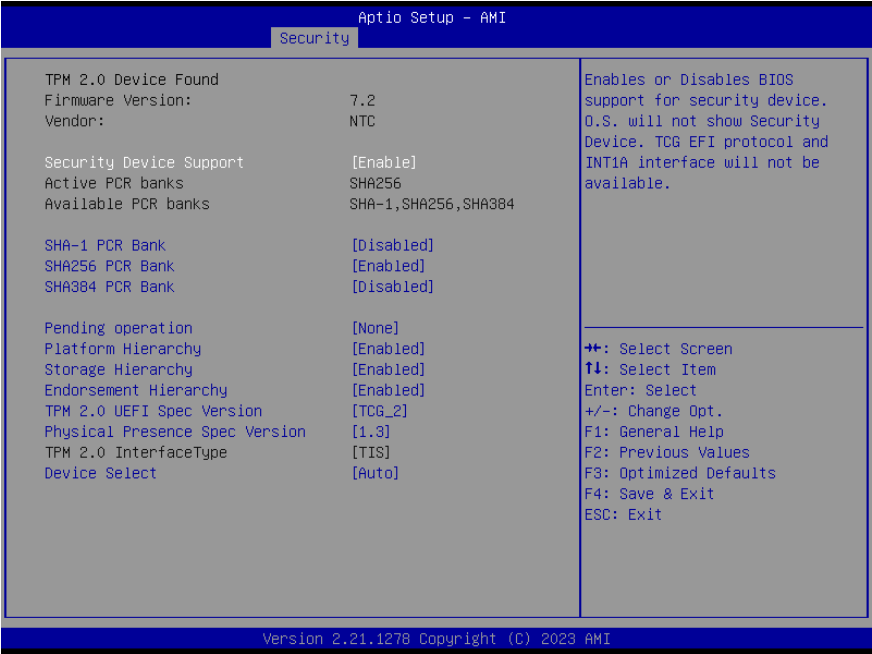
You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

If you highlight these items and press Enter, a dialog box appears which lets you enter a password. You can enter no more than six letters or numbers. Press Enter after you have typed in the password. A second dialog box asks you to retype the password for confirmation. Press Enter after you have retyped it correctly. The password is required at boot time, or when the user enters the Setup utility.

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	Disable	
	Enable	Optimal Default, Failsafe Default
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.		
SHA-1 PCR Bank	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable SHA-1 PCR Bank.		
SHA256 PCR Bank	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable SHA256 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.		

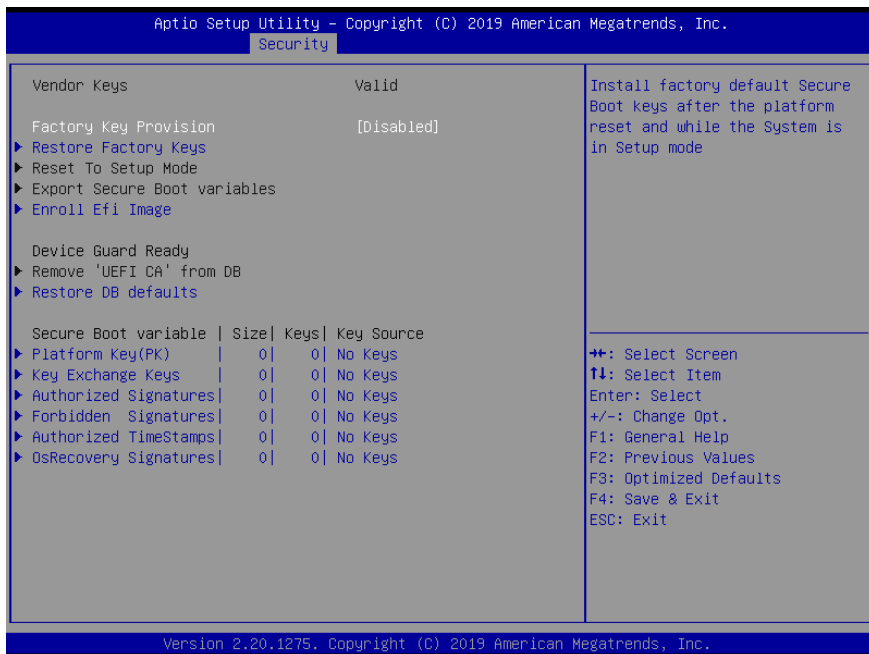
Options Summary		
Platform Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or disable Platform Hierarchy.		
Storage Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Storage Hierarchy.		
Endorsement Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Endorsement Hierarchy.		
TPM2.0 UEFI Spec Version	TCG_1_2	
	TCG_2	Optimal Default, Failsafe Default
Select the TCG2 Spec Version Support, TCG_1_2: The Compatible mode for Win8/Win10 TCG_2: Support new TCG2 protocol and event format for Win10 or later.		
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.		

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	Custom	Optimal Default, Failsafe Default
	Standard	
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		
Force System to User Mode. Install factory default Secure Boot key databases.		
Reset to Setup Mode		
Delete all Secure Boot key databases from NVRAM.		

3.6.3 Key Management



Options Summary		
Factory Key Provision	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.		
Restore Factory Keys		
Force System to User Mode. Install factory default Secure Boot key databases.		
Reset to Setup Mode		
Delete all Secure Boot key databases from NVRAM.		
Export Secure Boot variables		
Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.		
Enroll Efi Image		
Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).		
Remove 'UEFI CA' from DB		

Options Summary

Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db).

Restore DB defaults

Restore DB variable to factory defaults.

Platform Key (PK)

Details

Export

Update

Delete

Key Exchange Keys

Details

Export

Update

Append

Delete

Authorized Signatures

Details

Export

Update

Append

Delete

Forbidden Signatures

Details

Export

Update

Append

Delete

Authorized TimeStamps

Update

Append

OsRecovery Signatures

Update

Append

Enroll Factory Defaults or load certificates from a file:

1.Public Key Certificate:

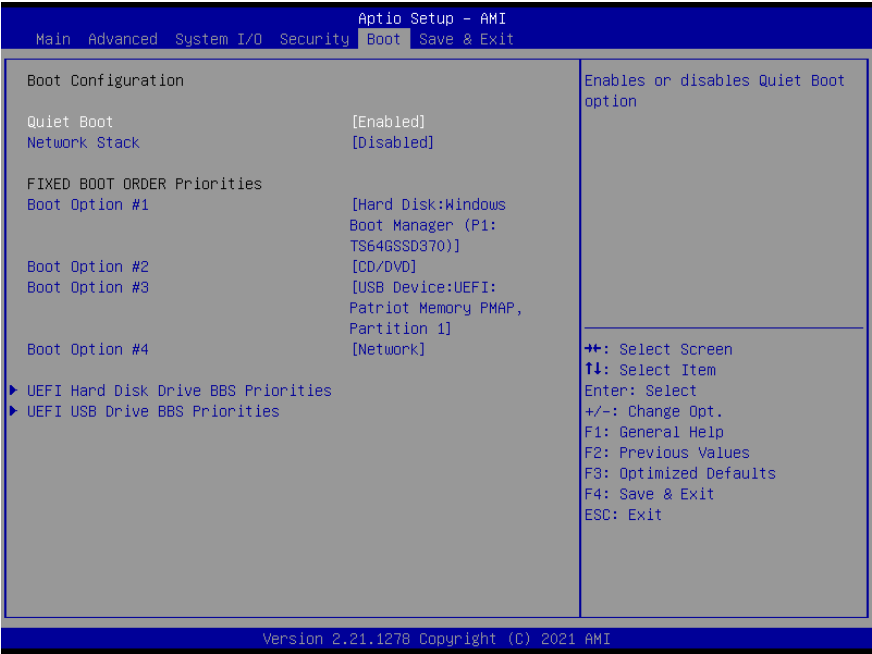
- a) EFI_SIGNATURE_LIST
- b) EFI_CERT_X509 (DER)
- c) EFI_CERT_RSA2048 (bin)
- d) EFI_CERT_SHAXXX

2.Authenticated UEFI Variable

3.EFI PE/COFF Image (SHA256)

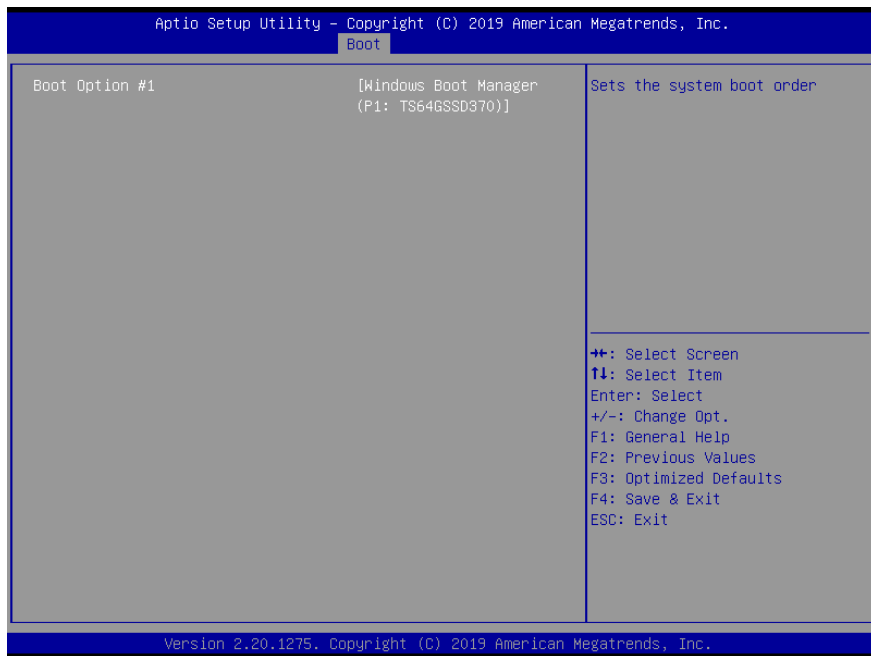
Key Source: Factory, External, Mixed.

3.7 Setup Submenu: Boot

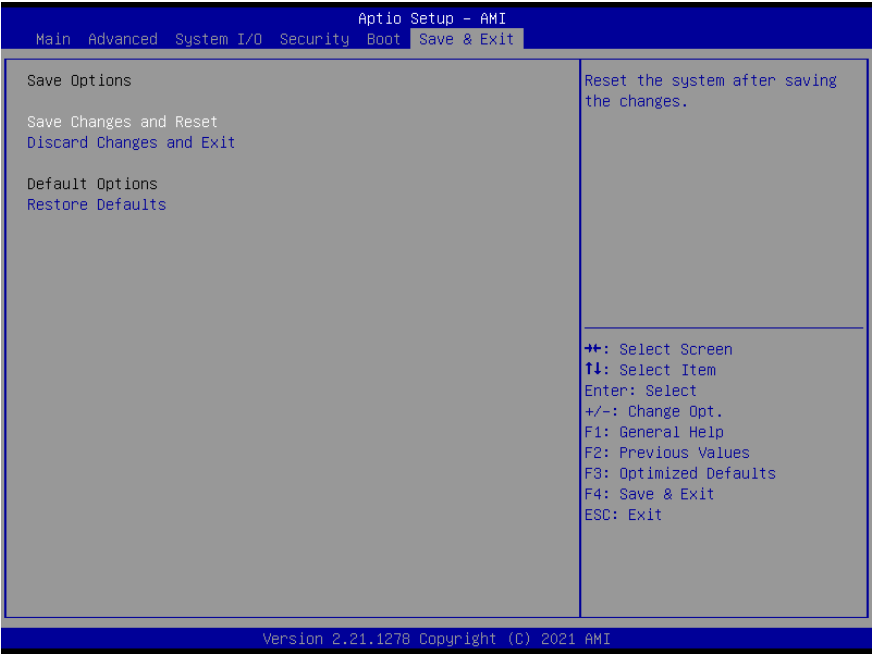


Options Summary		
Quiet Boot	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable showing boot logo.		
Lunch PXE ROM	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable UEFI Network Stack.		

3.7.1 BBS Priorities



3.8 Setup Submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Drivers Download and Installation

Drivers for the EPIC-TGH7-PUC can be downloaded from the product page on the AAEON website by following this link:

<https://www.aaeon.com/en/p/epic-boards-11gen-intel-epic-tgh7-puc>

Download the driver(s) you need and follow the steps below to install them.

Install Chipset Drivers

1. Open the **Chipset Driver** folder
2. Open the **SetupChipset.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

Install Graphics Driver

1. Open the **Graphics Driver** folder
2. Open the **Installer.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Install LAN Driver

1. Open the **LAN Driver** folder
2. Open the **.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Install Peripheral Driver

1. Open the **Peripheral Driver** folder
2. Open the **SetupSerialIO.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

Install ME & TXE Drivers

1. Open the **ME & TXE Driver** folder
2. Open the **SetupME.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

Install VMD Driver

1. Open the **VMD Driver** folder
2. Open the **RstMwService.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

Appendix A

I/O Information

A.1 I/O Address Map

DESKTOP-5CEQQ2J	
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	
[0000000000000060 - 0000000000000060] Standard PS/2 Keyboard	
[0000000000000061 - 0000000000000061] Motherboard resources	
[0000000000000063 - 0000000000000063] Motherboard resources	
[0000000000000064 - 0000000000000064] Standard PS/2 Keyboard	
[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	
[00000000000000F0 - 00000000000000F0] Numeric data processor	
[00000000000002C0 - 00000000000002C7] Communications Port (COM6)	
[00000000000002D0 - 00000000000002D7] Communications Port (COM5)	
[00000000000002E8 - 00000000000002EF] Communications Port (COM4)	
[00000000000002F8 - 00000000000002FF] Communications Port (COM2)	
[00000000000003E8 - 00000000000003EF] Communications Port (COM3)	
[00000000000003F8 - 00000000000003FF] Communications Port (COM1)	
[00000000000004D0 - 00000000000004D1] Programmable interrupt controller	
[0000000000000680 - 000000000000069F] Motherboard resources	
[0000000000000A00 - 0000000000000A0F] Motherboard resources	
[0000000000000A10 - 0000000000000A1F] Motherboard resources	
[0000000000000A20 - 0000000000000A2F] Motherboard resources	
[0000000000000D00 - 0000000000000FFF] PCI Express Root Complex	
Interrupt request (IRQ)	
(ISA) 0x00000000 (00) System timer	
(ISA) 0x00000000 (00) System timer	
(ISA) 0x00000000 (00) System timer	
(ISA) 0x00000000 (00) System timer	
(ISA) 0x00000000 (00) System timer	

A.2 Memory Address Map

	(PCI) 0xFFFFFFFF (-2)	Intel(R) PCI Express Root Port #9 - 43B0
✓	Large Memory	
	[0000000400000000 - 0000007FFFFFFF]	PCI Express Root Complex
✓	Memory	
	[00000000000A0000 - 0000000000BFFFFF]	PCI Express Root Complex
	[0000000040000000 - 00000000403FFFFFFF]	Motherboard resources
	[000000004F400000 - 000000004F5FFFFFFF]	PCI Express Root Port
	[000000004F620000 - 000000004F621FFF]	Standard SATA AHCI Controller
	[000000004F622000 - 000000004F6227FF]	Standard SATA AHCI Controller
	[000000004F623000 - 000000004F6230FF]	Standard SATA AHCI Controller
>	[0000000050400000 - 00000000BFFFFFFF]	PCI Express Root Complex
	[00000000C0000000 - 00000000CFFFFFFF]	Motherboard resources
	[00000000FD000000 - 00000000FD68FFFF]	Motherboard resources
>	[00000000FD690000 - 00000000FD69FFFF]	Intel(R) Serial IO GPIO Host Controller - INT34C6
	[00000000FD6A0000 - 00000000FD6AFFFF]	Intel(R) Serial IO GPIO Host Controller - INT3450
>	[00000000FD6B0000 - 00000000FD6BFFFF]	Intel(R) Serial IO GPIO Host Controller - INT3450
	[00000000FD6C0000 - 00000000FD6CFFFF]	Motherboard resources
>	[00000000FD6D0000 - 00000000FD6DFFFF]	Intel(R) Serial IO GPIO Host Controller - INT3450
>	[00000000FD6E0000 - 00000000FD6EFFFF]	Intel(R) Serial IO GPIO Host Controller - INT3450
	[00000000FD6F0000 - 00000000FD6FFFFF]	Motherboard resources
>	[00000000FE000000 - 00000000FE01FFFF]	Motherboard resources
	[00000000FE04C000 - 00000000FE04FFFF]	Motherboard resources
	[00000000FE050000 - 00000000FE0AFFFF]	Motherboard resources
	[00000000FE0D0000 - 00000000FE0FFFFF]	Motherboard resources
	[00000000FE200000 - 00000000FE7FFFFFFF]	Motherboard resources
	[00000000FED00000 - 00000000FED003FF]	High precision event timer
>	[00000000FED20000 - 00000000FED7FFFF]	Motherboard resources
	[00000000FED45000 - 00000000FED8FFFF]	Motherboard resources
	[00000000FED90000 - 00000000FED93FFF]	Motherboard resources
	[00000000FEDA0000 - 00000000FEDA0FFF]	Motherboard resources
	[00000000FEDA1000 - 00000000FEDA1FFF]	Motherboard resources
	[00000000FEDC0000 - 00000000FEDC7FFF]	Motherboard resources
	[00000000FEE00000 - 00000000FEEFFFFF]	Motherboard resources
	[00000000FF000000 - 00000000FFFFFFFF]	Motherboard resources
>	[0000000400000000 - 0000000400FFFFFFF]	Intel(R) UHD Graphics
>	[0000000600000000 - 0000000600FFFFFFF]	Intel(R) UHD Graphics
>	[0000000600110000 - 0000000600110FFFFF]	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
>	[00000006001110000 - 0000000600111FFFFF]	Intel(R) USB 3.10 eXtensible Host Controller - 1.20 (Microsoft)
>	[00000006001128000 - 000000060011280FFF]	SM Bus Controller
	[00000006001440000 - 00000006001447FFF]	Intel(R) Tigerlake Telemetry Aggregator Driver
	[0000007FFFEF2000 - 0000007FFFEF2FFF]	Intel(R) Serial IO UART Host Controller - 43A8
	[0000007FFFEF3000 - 0000007FFFEF3FFF]	Intel(R) Serial IO I2C Host Controller - 43AE
	[0000007FFFEF4000 - 0000007FFFEF4FFF]	Intel(R) Serial IO I2C Host Controller - 43AD
	[0000007FFFEF5000 - 0000007FFFEF5FFF]	Intel(R) Management Engine Interface #1
	[0000007FFFEF6000 - 0000007FFFEF6FFF]	Intel(R) Serial IO I2C Host Controller - 43EB
	[0000007FFFEF7000 - 0000007FFFEF7FFF]	Intel(R) Serial IO I2C Host Controller - 43EA
	[0000007FFFEF8000 - 0000007FFFEF8FFF]	Intel(R) Serial IO I2C Host Controller - 43E9
	[0000007FFFEF9000 - 0000007FFFEF9FFF]	Intel(R) Serial IO I2C Host Controller - 43E8
	[0000007FFFEFA000 - 0000007FFFEFAFFF]	Intel(R) Serial IO SPI Host Controller - 43AB
	[0000007FFFEFB000 - 0000007FFFEFBFFF]	Intel(R) Serial IO I2C Host Controller - 43D8
	[0000007FFFEFC000 - 0000007FFFEFFFFF]	High Definition Audio Controller
	[0000007FFFF00000 - 0000007FFFFFFFFFFF]	High Definition Audio Controller

A.3 IRQ Mapping Chart

	(ISA) 0x000001EB (491)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EC (492)	Microsoft ACPI-Compliant System
	(ISA) 0x000001ED (493)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F1 (497)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F3 (499)	Microsoft ACPI-Compliant System
	(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) 0x00000010 (16)	High Definition Audio Controller
	(PCI) 0x00000010 (16)	Intel(R) Serial IO UART Host Controller - 43A8
	(PCI) 0x00000012 (18)	Intel(R) Serial IO I2C Host Controller - 43D8
	(PCI) 0x00000013 (19)	Intel(R) Active Management Technology - SOL (COM7)
	(PCI) 0x0000001B (27)	Intel(R) Serial IO I2C Host Controller - 43E8
	(PCI) 0x0000001D (29)	Intel(R) Serial IO I2C Host Controller - 43EA
	(PCI) 0x0000001E (30)	Intel(R) Serial IO I2C Host Controller - 43EB
	(PCI) 0x0000001F (31)	Intel(R) Serial IO I2C Host Controller - 43AD
	(PCI) 0x00000020 (32)	Intel(R) Serial IO I2C Host Controller - 43AE
	(PCI) 0x00000025 (37)	Intel(R) Serial IO SPI Host Controller - 43AB
	(PCI) 0x00000028 (40)	Intel(R) Serial IO I2C Host Controller - 43E9
	(PCI) 0xFFFFFEEC (-20)	Intel(R) Management Engine Interface #1
	(PCI) 0xFFFFFEEB (-19)	Intel(R) Ethernet Connection (14) I219-V
	(PCI) 0xFFFFFEEA (-18)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFEFF (-17)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF0 (-16)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF1 (-15)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF2 (-14)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF3 (-13)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF4 (-12)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF5 (-11)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF6 (-10)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF7 (-9)	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
	(PCI) 0xFFFFFFF8 (-8)	Intel(R) UHD Graphics
	(PCI) 0xFFFFFFF9 (-7)	Standard SATA AHCI Controller
	(PCI) 0xFFFFFFFA (-6)	Intel(R) PEG60 - 9A0F
	(PCI) 0xFFFFFFFB (-5)	Intel(R) PEG12 - 9A07
	(PCI) 0xFFFFFFFC (-4)	Intel(R) PEG11 - 9A05
	(PCI) 0xFFFFFFFD (-3)	Intel(R) PEG10 - 9A01
	(PCI) 0xFFFFFFF0 (-2)	Intel(R) PCI Express Root Port #9 - 43B0

Large Memory

	(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) 0x000001EB (491)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EC (492)	Microsoft ACPI-Compliant System
	(ISA) 0x000001ED (493)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F1 (497)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F3 (499)	Microsoft ACPI-Compliant System
	(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) 0x00000010 (16)	High Definition Audio Controller
	(PCI) 0x00000010 (16)	Intel(R) Serial IO UART Host Controller - 43A8
	(PCI) 0x00000012 (18)	Intel(R) Serial IO I2C Host Controller - 43D8
	(PCI) 0x00000013 (19)	Intel(R) Active Management Technology - SOL (COM7)
	(PCI) 0x00000018 (27)	Intel(R) Serial IO I2C Host Controller - 43E8
	(PCI) 0x0000001D (29)	Intel(R) Serial IO I2C Host Controller - 43EA
	(PCI) 0x0000001E (30)	Intel(R) Serial IO I2C Host Controller - 43EB
	(PCI) 0x0000001F (31)	Intel(R) Serial IO I2C Host Controller - 43AD
	(PCI) 0x00000020 (32)	Intel(R) Serial IO I2C Host Controller - 43AE
	(PCI) 0x00000025 (37)	Intel(R) Serial IO SPI Host Controller - 43AB
	(PCI) 0x00000028 (40)	Intel(R) Serial IO I2C Host Controller - 43E9
	(PCI) 0xFFFFFEC (-20)	Intel(R) Management Engine Interface #1
	(PCI) 0xFFFFFED (-19)	Intel(R) Ethernet Connection (14) I219-V
	(PCI) 0xFFFFFEE (-18)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFEF (-17)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF0 (-16)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF1 (-15)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF2 (-14)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF3 (-13)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF4 (-12)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF5 (-11)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF6 (-10)	Intel(R) Ethernet Controller (3) I225-LM
	(PCI) 0xFFFFFFF7 (-9)	Intel(R) USB 3.20 eXtensible Host Controller - 1.20 (Microsoft)
	(PCI) 0xFFFFFFF8 (-8)	Intel(R) UHD Graphics
	(PCI) 0xFFFFFFF9 (-7)	Standard SATA AHCI Controller
	(PCI) 0xFFFFFFFA (-6)	Intel(R) PEG60 - 9A0F
	(PCI) 0xFFFFFFF8 (-5)	Intel(R) PEG12 - 9A07
	(PCI) 0xFFFFFFF8 (-4)	Intel(R) PEG11 - 9A05
	(PCI) 0xFFFFFFF8 (-3)	Intel(R) PEG10 - 9A01
	(PCI) 0xFFFFFFF8 (-2)	Intel(R) PCI Express Root Port #9 - 43B0

▼ Large Memory

Appendix B

Mating Connectors

B.1 List of Mating Connectors and Cables

Conn. Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	VGA Connector	Molex	510211300	VGA cable 15cm	170X000715
CN2	FAN	Molex	22-01-2045	-	-
CN4	SATA Connector	Molex	887505318	SATA Cable 15cm	170X000593
CN5	SATA Connector	Molex	887505318	SATA Cable 15cm	170X000593
CN12	SATA 5V Power	JST	JST PHR-2	SATA power cable 15cm	170X000592
CN18	Front Panel Connector	JST	SHR-10V-S-B	Front panel cable 10cm	170X000287
CN22	USB2.0 x 2 Connector	Aces	50247-020H 0 H0-001	USB2.0 x 2 cable	170X000588
CN24	eSPI Debug Card	JST	SHR-12V-S-B	Debug Card cable	1703120130
CN26	CMOS Battery Connector	Molex	51021-0200	Battery with cable	175011901C
CN45	COM Port 1&2 (RS232/422/485)	Aces	50247-020H 0 H0-001	Dual COM cable 30cm	170X000508
CN48	DIO 16 bit	Aces	50247-018H0 H0-001	-	170X000589
CN51	External Power Input	Molex	19211-0003	Double 4P power cable 10cm	170204010R
CN29-L	LAN	Molex	44915-0001	-	-
CN29-R	LAN	Molex	44915-0001	-	-
CN34	FAN	Molex	22-01-2045	-	-

Appendix C

Assembly Guide

C.1 Introduction

This section details the steps needed to install various hardware components for the EPIC-TGH7-PUC. It is recommended that you read through each step before beginning installation and to make sure you have all necessary tools and components.

C.2 DDR4 Module Installation (CN17/DDR4 SODIMM 0)

Step 1: Loosen the two (2) screws located on the rear I/O side of the chassis, as shown.

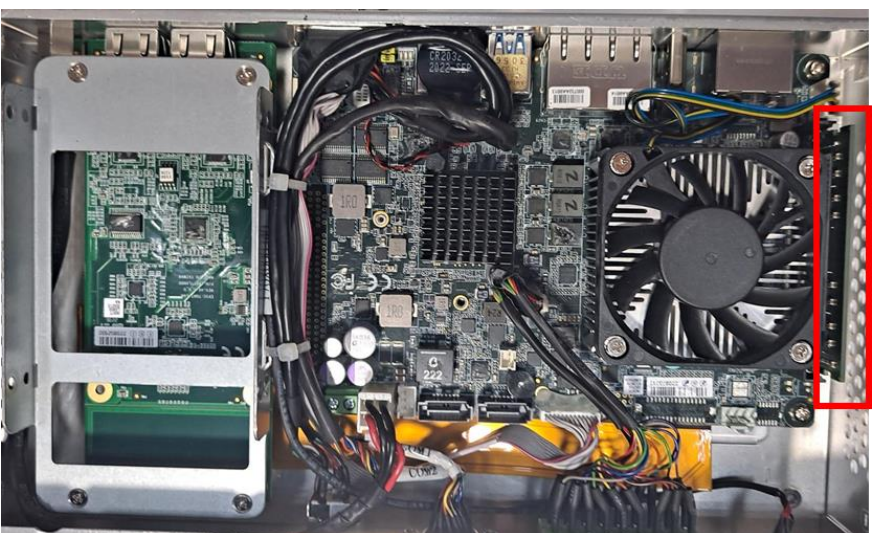


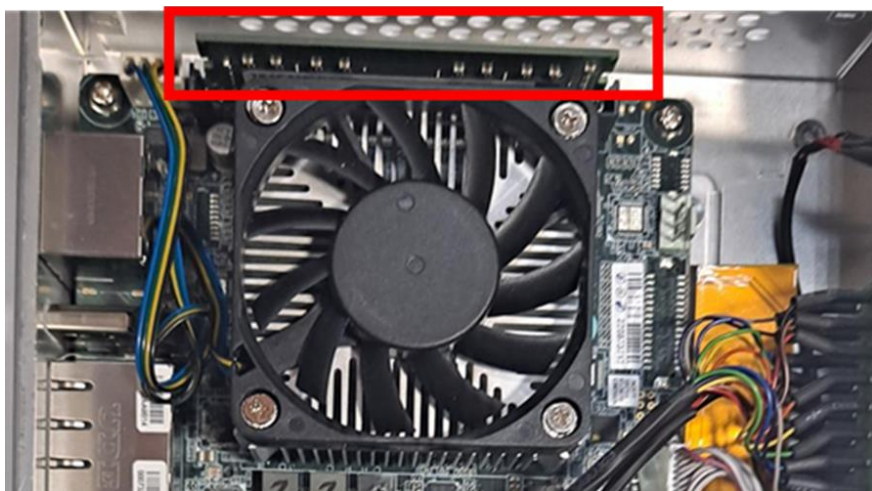
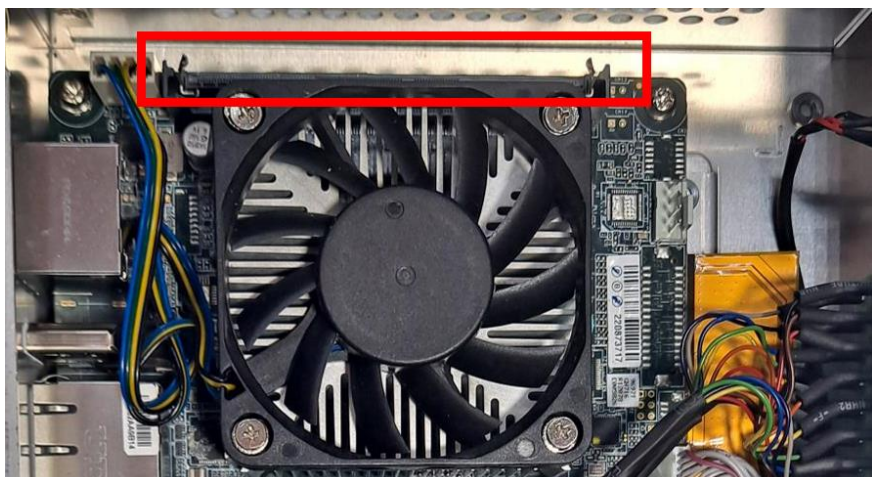
Step 2: Remove the top cover of the chassis by pulling it upwards and away from the rear I/O side.



Following top cover removal, you will have access to the system's motherboard.

Step 3: Vertically insert the DDR4 module to the SODIMM slot until you hear a sharp click.



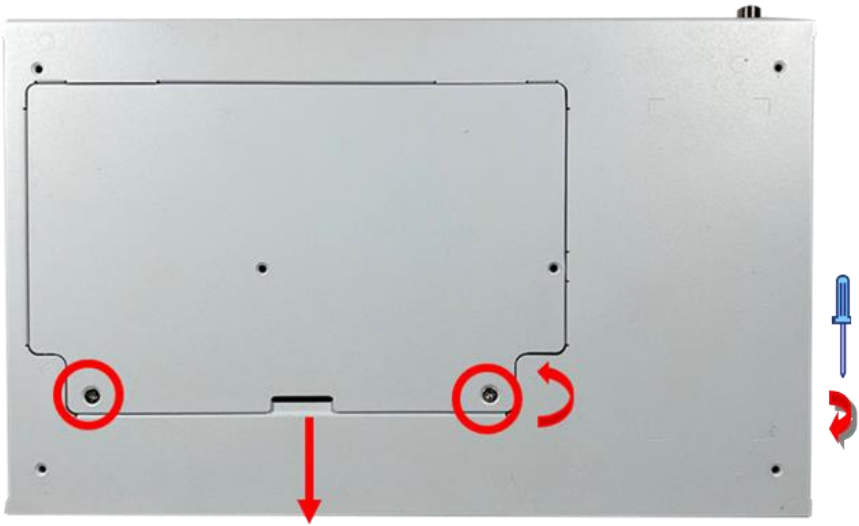


Step 4: Replace the chassis top and tighten the two (2) screws that you loosened during step 1.

C.3 DDR4 Module Installation (CN40/DDR4 SODIMM 1)

Note: The system's second SODIMM slot is accessible via the bottom side of the chassis.

Step 1: Remove the two (2) screws located on the bottom chassis cover, as shown.

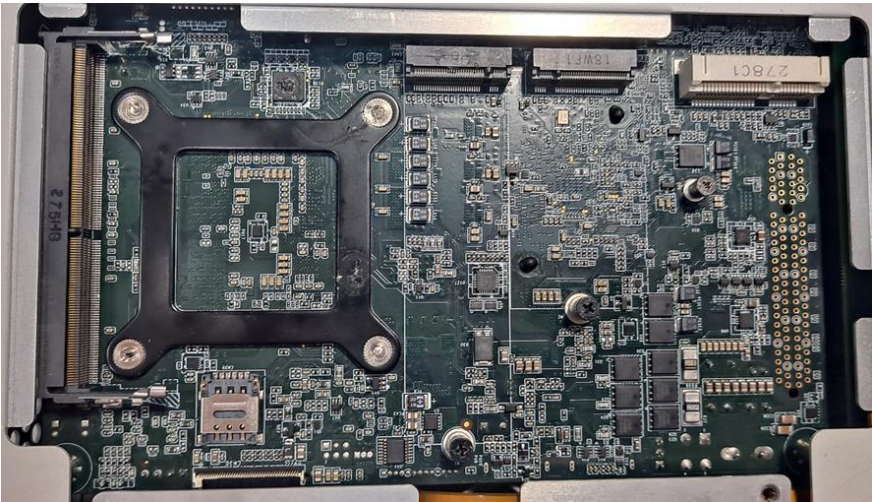


Step 2: Remove the bottom chassis cover by lifting slightly, then sliding it in the direction shown, keeping the cover flat throughout to avoid damage to the cover's hinges.

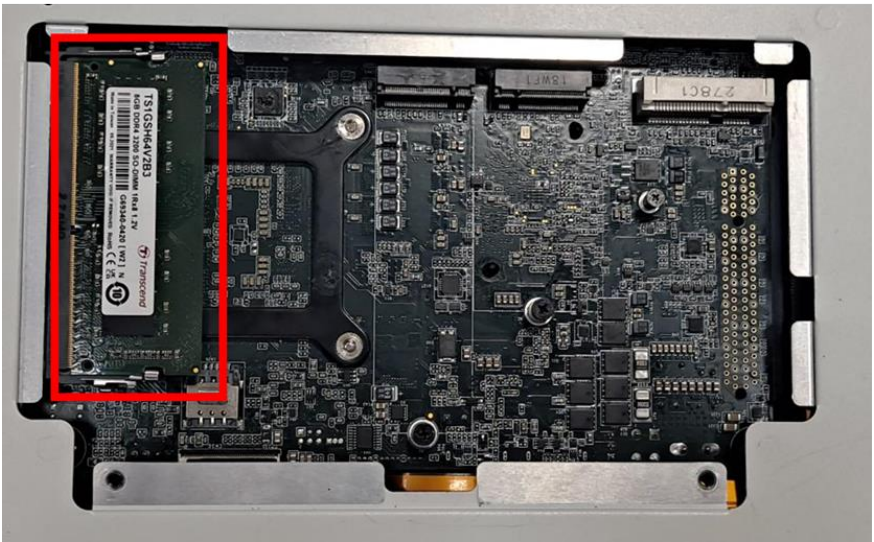
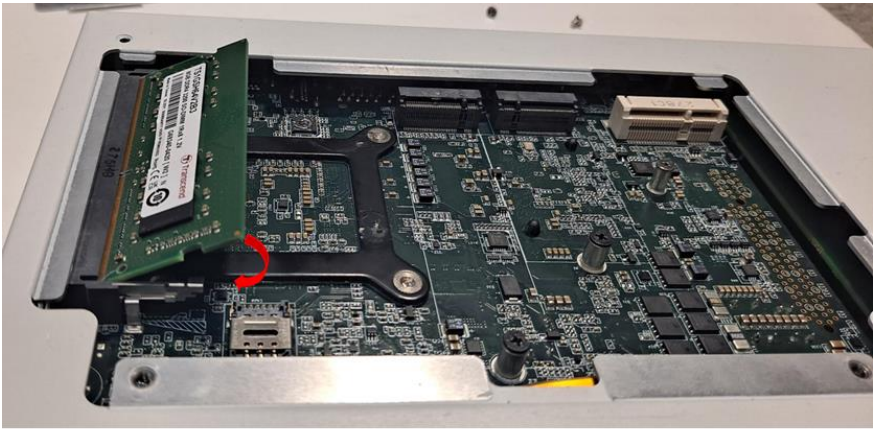
Step 3: Remove the plastic from the thermal pads and affix to the backplate, as shown.



Following bottom cover removal, you will have access to the component side of the motherboard.

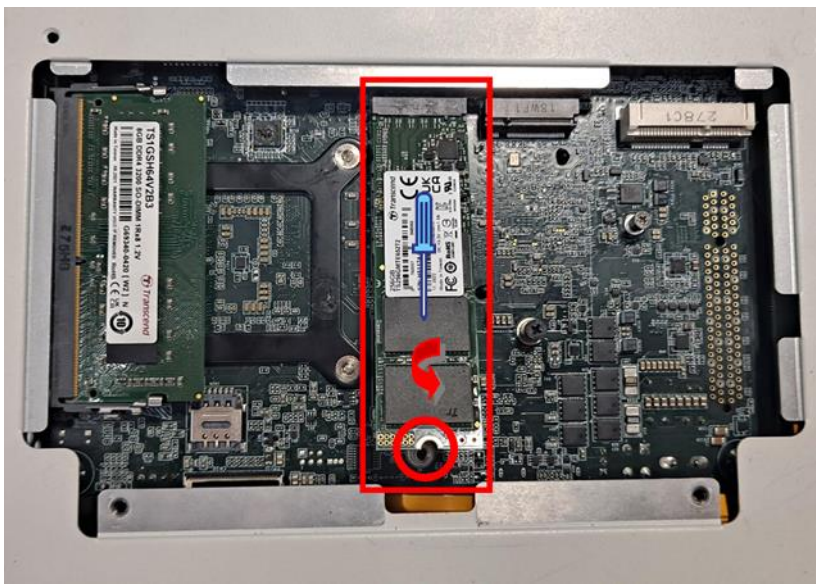


Step 4: Horizontally insert your DDR4 module at a 30° angle, and then gently push down to affix to SODIMM hinges, at which point you will hear a sharp click.



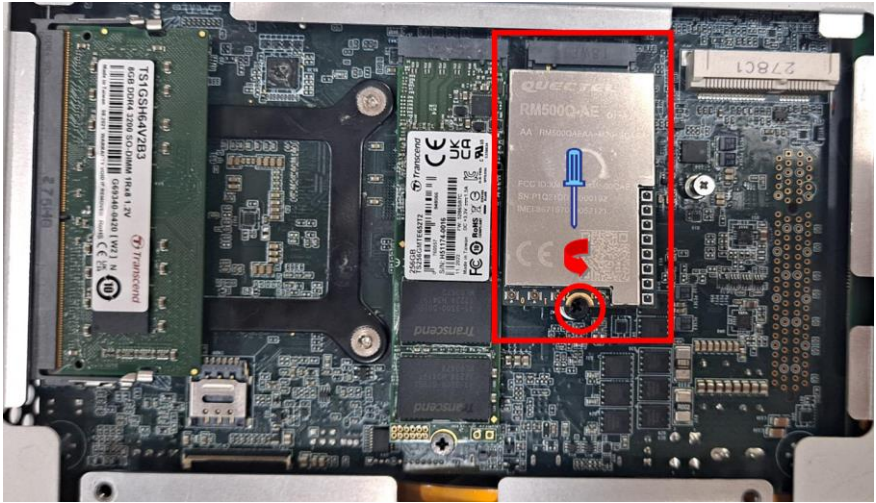
C.4 M.2 3052 B-Key Installation

Follow standard procedures for expansion card installation, aligning the notch on the M.2 3052 module with the M.2 B-Key slot. Note the location of the mounting screws.



C.5 M.2 2280 M-Key Installation

Follow standard procedures for expansion card installation, aligning the notch on the M.2 2280 module with the M.2 M-Key slot. Note the location of the mounting screws.



Once all expansion modules have been installed, reattach backplate to chassis and affix with the two (2) screws removed during B.4 Step 1.