EPIC-TGH7

EPIC Board

User's Manual 1st Ed

Last Updated: August 8, 2022

Copyright Notice

Acknowledgement

Packing List

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

Item	Quantity
● EPIC-TGH7	1
● Screw Kit	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.

FCC Statement

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 Main Board/ Daughter Board/ Backplane

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	×	O	O	O	O	O
外部信号连接器及线材	×	O	O	O	O	O

O：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 SJ/T 11363-2006 标准规定的限量要求以下。

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。

备注：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。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

Component	Poisonous or Hazardous Substances or Elements					
	Lead (Pb)	Mercury (Hg)	Cadmium (Cd)	Hexavalent Chromium (Cr(VI))	Polybrominated Biphenyls (PBB)	Polybrominated Diphenyl Ethers (PBDE)
PCB & Other Components	X	O	O	O	O	O
Wires & Connectors for External Connections	X	O	O	O	O	O

O：The quantity of poisonous or hazardous substances or elements found in each of the component's parts is below the SJ/T 11363-2006-stipulated requirement.

X: The quantity of poisonous or hazardous substances or elements found in at least one of the component's parts is beyond the SJ/T 11363-2006-stipulated requirement.

Note: The Environment Friendly Use Period as labeled on this product is applicable under normal usage only

Table of Contents

Chapter 1

Product Specifications

1.1 Specifications

System	
Form Factor	4" EPIC Board
CPU	11th Generation Intel® Xeon™ / Core™ Processor
CPU Frequency	Xeon W-11865MRE (8C/16T, 2.60GHz, up to 4.70GHz) i7-11850HE (8C/16T, 2.60GHz, up to 4.70GHz) i5-11500HE (6C/12T, 2.60GHz, up to 4.50GHz) i3-11100HE (4C/8T, 2.40GHz, up to 4.40GHz) Celeron 6600HE (2C/2T, 2.60GHz)
Chipset	Intel® 500 Series Mobile Chipset (RM590E / HM570E)
Memory Type	DDR4 3200 SODIMM x 2 (ECC supported by Xeon W-11865MRE only)
Max. Memory Capacity	Up to 64GB
BIOS	AMI
Wake on LAN	Yes
Watchdog Timer	255 Levels
Power Requirement	+9-24V
Power Supply Type	AT/ATX
Power Consumption (Typical)	12V@8.32A with Xeon W-11865MRE, with 100% full loading in steady status
Dimension (L x W)	4.53" x 6.50" (115mm x 165mm)
Operating Temperature	32°F ~ 140°F (0°C ~ 60°C)
Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)

System

Operating Humidity	0% ~ 90% relative humidity, non-condensing
MTBF (Hours)	-
Certification	CE/FCC Class A

Display

VGA/LCD Controller	Intel® UHD Graphics for 11th Gen Intel® Processors
Video Output	Dual Channel 24/48bit LVDS (Default) or eDP x 1
	HDMI2.0b x 1
	DP 1.2a (DP++) x 2
	VGA x 1
Backlight Inverter Supply	12V/5V (Default: 5V)

I/O

Ethernet	Intel® i225, 10/100/1000/2500Base, RJ-45 x 1
	Intel® i219, 10/100/1000Base, RJ-45 x 1
Audio	Realtek ALC269 (2W Amplifier)
USB Port	USB 3.2 Gen 2 x 4
	USB 2.0 x 4
Serial Port	RS-232 x 4
	RS-232/422/485 x 2
Parallel Port	-
HDD Interface	SATA 3 x 2
	+5V SATA Power Connector x 1
SSD	Half size mSATA/mPCIe x 1
	(Default mPCIe, selected by BIOS)

I/O

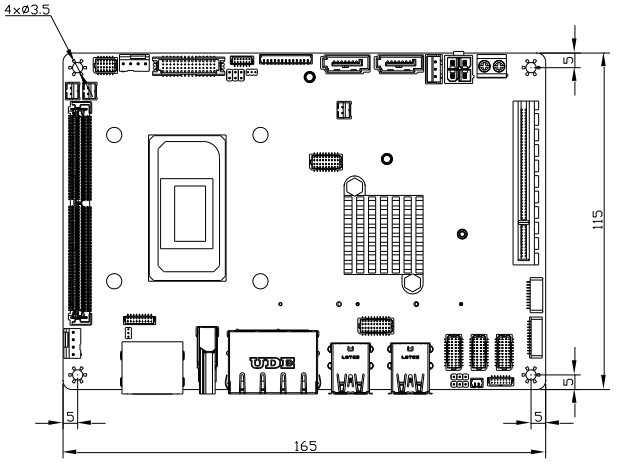
Expansion Slot	M.2 B-Key (3052) x 1 (Default PCIe [x1]+ USB 3.0+USB 2.0 , PCIe [x2]+ USB 2.0 by BOM) M.2 M-Key (2280) x 1 (PCIe 4.0 [x4]) PCIe 4.0 [x8] slot x 1 (Supply maximum 25W to the PCIe peripheral) Board to board FPC connector (PCIe [x4] x 1)
DIO	16-Bit
TPM	TPM 2.0 (Optional)
Touch	Optional
SIM	Nano SIM (Optional)

Chapter 2

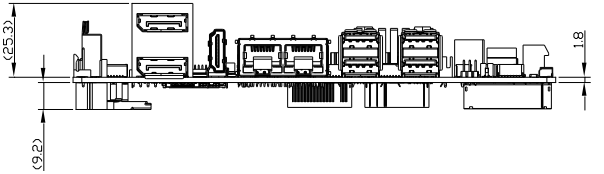
Hardware Information

2.1 Dimensions

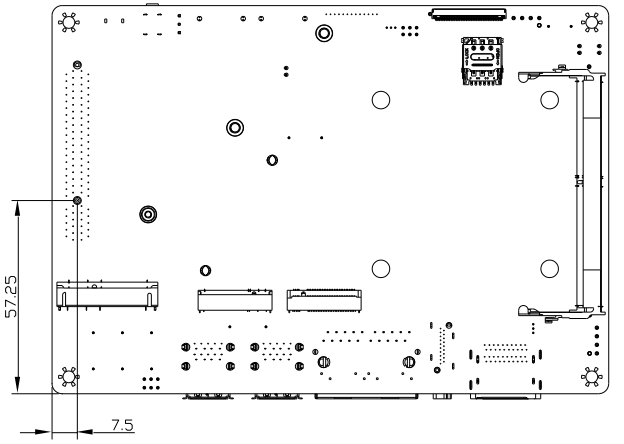
Component Side



Component Side



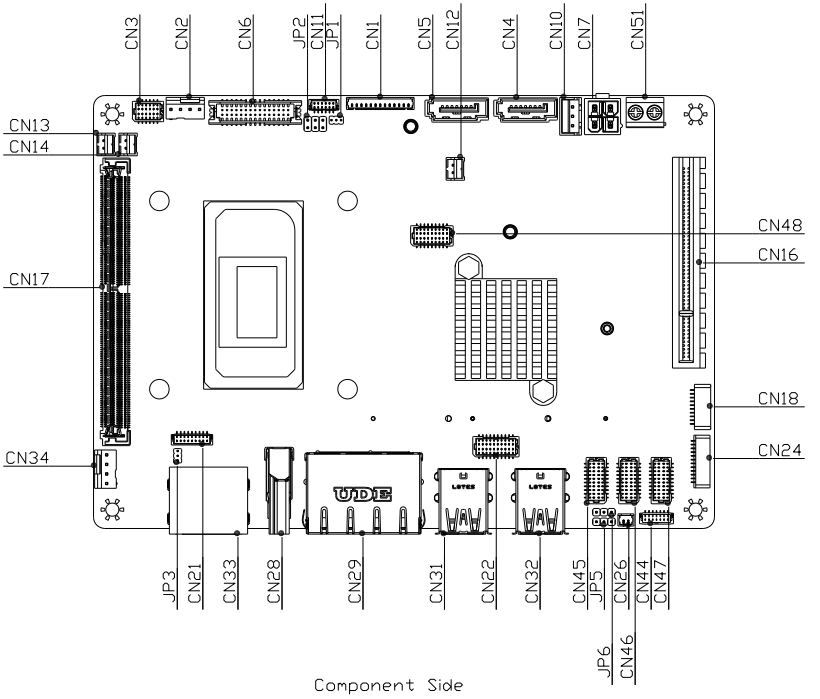
Solder Side



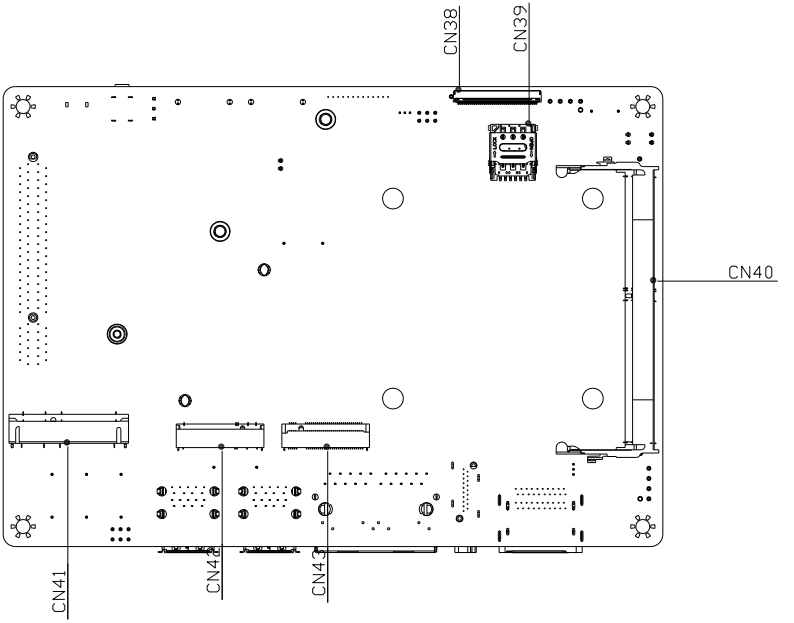
Solder Side

2.2 Jumpers and Connectors

Component Side

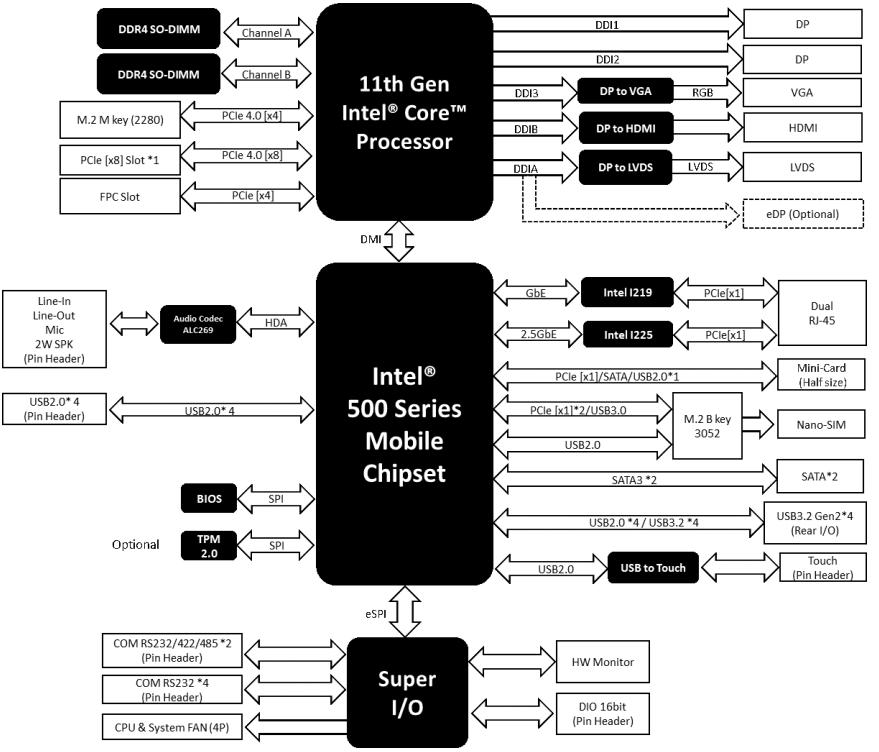


Solder Side



Solder Side

2.3 Block Diagram

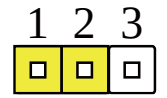


2.4 List of Jumpers

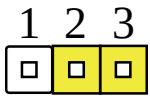
The board features a number of jumpers which can be configured for your application. Please refer to the table below and following sections for all jumpers which can be configured.

Label	Function
JP1	LVDS/eDP Backlight Lightness Control Mode Selection
JP2 (1-2-3)	LVDS/eDP Backlight Inverter VCC Selection
JP2 (3-4-5)	LVDS/eDP Operating VDD Selection
JP3	Touch Screen 4/5/8-wire Mode Selection
JP5	Auto Power Button Enable/Disable Selection
JP6	Clear CMOS Jumper

2.4.1 Clear CMOS Jumper (JP6)

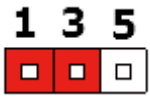


Normal (Default)

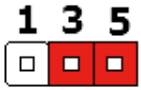


Clear CMOS

2.4.2 LVDS/eDP Port Backlight Inverter VCC Selection (JP2)



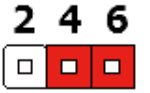
+12V



+5V (Default)

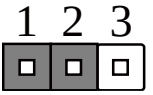
2.4.3 LVDS/eDP Operating VDD Selection (JP2)

+3.3V(Default)

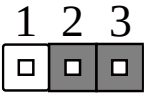


+5V

2.4.4 LVDS/eDP Port Backlight Lightness Control Mode Selection (JP1)

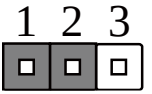


VR Mode (Default)

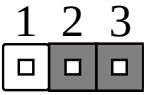


PWM Mode

2.4.5 Touch Screen 4,5,8 Wire Selection (JP3)

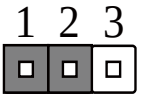


4/8 Wires Mode (Default)

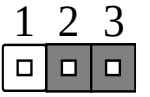


5 Wires Mode

2.4.6 Auto Power Button Enable/Disable Selection (JP5)



Disable



Enable (Default)

2.5 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.

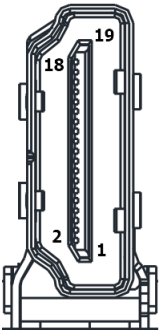
Label	Function
CN1	VGA Connector
CN2	FAN Connector
CN3	Audio Connector
CN4	SATA Connector
CN5	SATA Connector
CN6	LVDS/eDP Connector
CN7	9-24V Input (VIN)
CN10	External +5VSB Input
CN11	LVDS/eDP Port Inverter / Backlight Connector
CN12	SATA 5V Power
CN13	Speaker Right
CN14	Speaker Left
CN16	PCIE x8 Slot
CN17	DDR4 SODIMM0
CN18	Front panel
CN21	Touch Screen Connector
CN22	USB 2.0 x 4 Connector
CN24	ESPI Debug card
CN26	Battery Connector
CN28	HDMI Connector

Label	Function
CN29-L	I225 2.5G LAN
CN29-R	I219 Giga LAN
CN31	USB 3.0 x 2 Connector (GEN2)
CN32	USB 3.0 x 2 Connector (GEN2)
CN33	Dual DP Connector
CN34	FAN Connector
CN38	PCIE FPC Connector
CN39	Nano SIM
CN40	DDR4 SODIMM1
CN41	Half Mini-Card/mSATA
CN42	M.2 B-Key (3052)
CN43	M.2 M-Key Slot (2280) (CPU PCIE Gen 4)
CN44	SPI Flash Programming Port
CN45	COM Port 1 & 2 (RS232/422/485)
CN46	COM Port 3 & 4 (RS232 Only)
CN47	COM Port 5 & 6 (RS232 Only)
CN48	DIO (16bit)
CN51	9-24V Input (VIN)

2.5.1 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	-

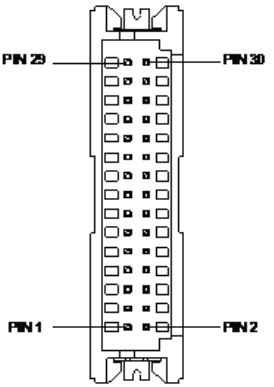
2.5.2 HDMI (CN28)



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	-	-

2.5.3 LVDS/eDP (CN6)



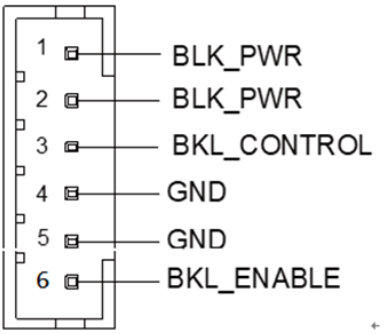
	LVDS	eDP		
Pin	Pin Name		Signal Type	Signal level
1	BKL_ENABLE	BKL_ENABLE	OUT	-
2	BKL_CONTROL	BKL_CONTROL	OUT	-
3	LCD_PWR	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	GND	-
5	LVDS_A_CLK-	eDP_TXN3	DIFF	-
6	LVDS_A_CLK+	eDP_TXP3	DIFF	-
7	LCD_PWR	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	GND	-
9	LVDS_DA0-	eDP_TXN2	DIFF	-
10	LVDS_DA0+	eDP_TXP2	DIFF	-

11	LVDS_DA1-	eDP_TXN1	DIFF	-
12	LVDS_DA1+	eDP_TXP1	DIFF	-
13	LVDS_DA2-	eDP_TXN0	DIFF	-
14	LVDS_DA2+	eDP_TXP0	DIFF	-
15	LVDS_DA3-	NC	DIFF	-
16	LVDS_DA3+	eDP_HPD	DIFF	-
17	DDC_DATA	eDP_AUX_N	I/O	+3.3V
18	DDC_CLK	eDP_AUX_P	I/O	+3.3V
19	LVDS_DB0-	NC	DIFF	-
20	LVDS_DB0+	NC	DIFF	-
21	LVDS_DB1-	NC	DIFF	-
22	LVDS_DB1+	NC	DIFF	-
23	LVDS_DB2-	NC	DIFF	-
24	LVDS_DB2+	NC	DIFF	-
25	LVDS_DB3-	NC	DIFF	-
26	LVDS_DB3+	NC	DIFF	-
27	LCD_PWR	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	GND	-
29	LVDS_B_CLK-	NC	DIFF	-
30	LVDS_B_CLK+	NC	DIFF	-

Note: LVDS LCD_PWR current support => 2A.

Note: LVDS LCD_PWR can be set to +3.3V or +5V by JP2 (2-4-6).

2.5.4 LVDS Port Inverter / Backlight Connector (CN11)



Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_PWR	PWR	+5V / +12V
3	BKL_CONTROL	OUT	+3.3V
4	GND	GND	-
5	GND	GND	-
6	BKL_ENABLE	OUT	+3.3V

Note: LVDS BKL_PWR can be set to +5V or +12V by JP2 (1-3-5).

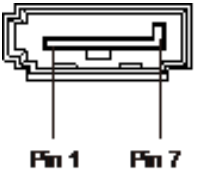
Note: LVDS BKL_CONTROL can be set by JP1.

2.5.5 Mini-Card Slot (Half-Size) (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

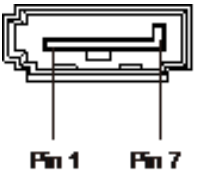
25	PCIE_RX+	DIFF	-
26	GND	GND	-
27	GND	GND	-
28	+1.5V	PWR	+1.5V
29	GND	GND	-
30	SMB_CLK	I/O	+3.3V
31	PCIE_TX-	DIFF	-
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+	DIFF	-
34	GND	GND	-
35	GND	GND	-
36	USB_D-	DIFF	-
37	GND	GND	-
38	USB_D+	DIFF	-
39	+3.3VSB	PWR	+3.3V
40	GND	GND	-
41	+3.3VSB	PWR	+3.3V
42	NC	-	-
43	GND	GND	-
44	NC	-	-
45	NC	-	-
46	NC	-	-
47	NC	-	-
48	+1.5V	PWR	+1.5V
49	NC	-	-
50	GND	GND	-
51	NC	-	-
52	+3.3VSB	PWR	+3.3V

2.5.6 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	-

2.5.7 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	-

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

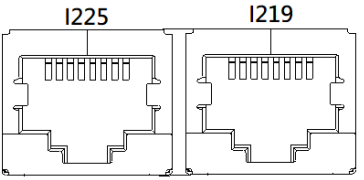
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	-
2	+3.3V	PWR	+3.3V
3	GND	GND	-
4	+3.3V	PWR	+3.3V
5	PCIE3_RX-	DIFF	-
6	NC	-	-
7	PCIE3_RX+	DIFF	-
8	NC	-	-

Pin	Pin Name	Signal Type	Signal Level
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
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	-	-

Pin	Pin Name	Signal Type	Signal Level
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	-
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	-	-

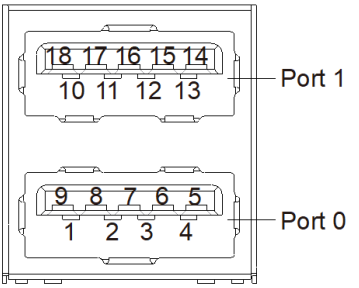
Pin	Pin Name	Signal Type	Signal Level
69	NC	-	-
70	+3.3V	PWR	+3.3V
71	GND	GND	-
72	+3.3V	PWR	+3.3V
73	GND	GND	-
74	+3.3V	PWR	+3.3V
75	GND	GND	-

2.5.9 LAN (RJ-45) I225 (Left) ; I219 (Right) (CN29)



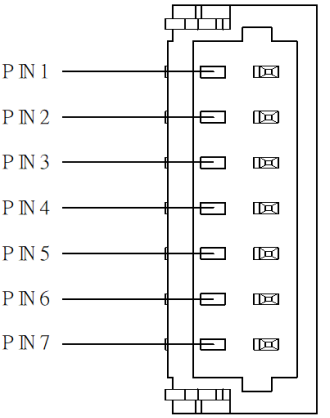
Pin	Pin Name	Pin	Pin Name
1P1	LAN2_MDI0_P	2P1	LAN1_MDI0_P
1P2	LAN2_MDI0_N	2P2	LAN1_MDI0_N
1P3	LAN2_MDI1_P	2P3	LAN1_MDI1_P
1P4	LAN2_MDI1_N	2P4	LAN1_MDI1_N
1P5	1CT5	2P5	2CT5
1P6	1CT6	2P6	2CT6
1P7	LAN2_MDI2_P	2P7	LAN1_MDI2_P
1P8	LAN2_MDI2_N	2P8	LAN1_MDI2_N
1P9	LAN2_MDI3_P	2P9	LAN1_MDI3_P
1P10	LAN2_MDI3_N	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#

2.5.10 USB Ports 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	-

2.5.11 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	-	-

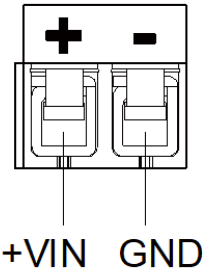
2.5.12 FAN Connector (CN2 & 34)

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

2.5.13 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
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

2.5.14 External Power Input (CN51)



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

2.5.15 ATX 12V Power Connector (CN7)

Standard ATX 12V Power Connector.

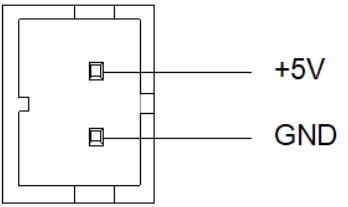
2.5.16 USB 2.0 4 Port (On Board) (CN22)

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

2.5.17 Front Panel (CN18)

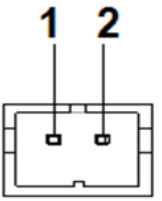
Pin	Pin Name	Pin	Pin Name
Pin 1	PWR_BTN-	Pin 2	PWR_BTN+
Pin 3	HDD_LED-	Pin 4	HDD_LED+
Pin 5	SPEAKER-	Pin 6	SPEAKER+
Pin 7	PWR_LED-	Pin 8	PWR_LED+
Pin 9	H/W RESET-	Pin 10	H/W RESET+

2.5.18 +5V Output for SATA HDD (CN12)



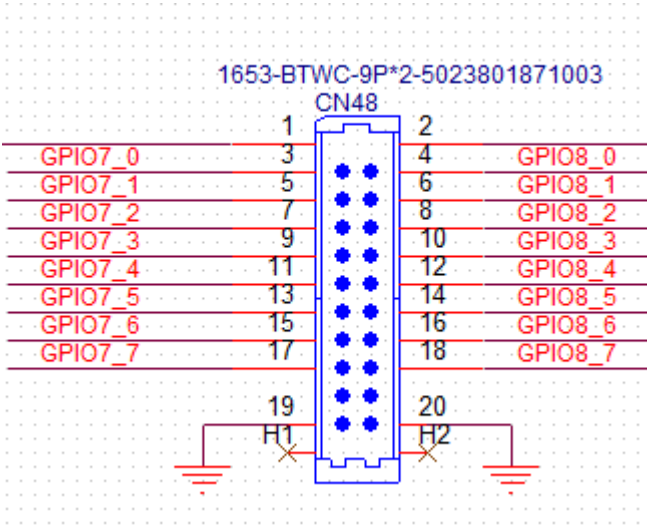
Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	-

2.5.19 RTC Battery Connector (CN26)



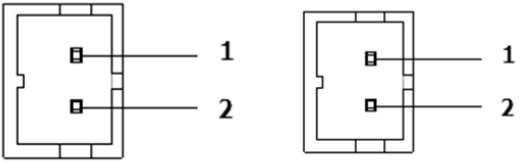
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	+3.3V	PWR	+3.3V

2.5.20 DIO Port (CN48)



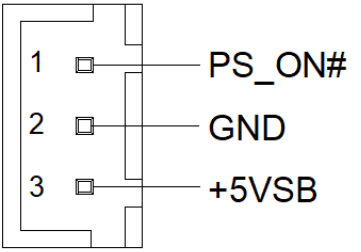
Pin	Pin Name	Pin	Pin Name
Pin 1	5V	Pin 2	GND
Pin 3	DIO7_0	Pin 4	DIO8_0
Pin 5	DIO7_1	Pin 6	DIO8_1
Pin 7	DIO7_2	Pin 8	DIO8_2
Pin 9	DIO7_3	Pin 10	DIO8_3
Pin 11	DIO7_4	Pin 12	DIO8_4
Pin 13	DIO7_5	Pin 14	DIO8_5
Pin 15	DIO7_6	Pin 16	DIO8_6
Pin 17	DIO7_7	Pin 18	DIO8_7

2.5.21 Speaker Left (CN13) / Speaker Right (CN14)



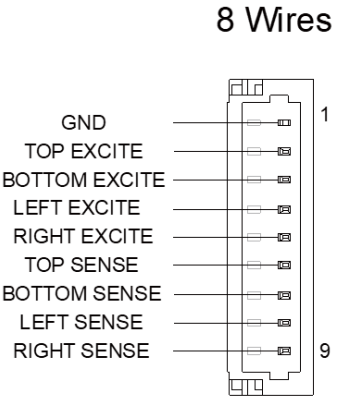
Pin	Pin Name	Signal Type	Signal Level
1	AMP_OUT_L+	IO	-
2	AMP_OUT_L-	IO	-

2.5.22 External +5VSB Input (CN10)



Pin	Pin Name	Signal Type	Signal Level
1	PS_ON#	OUT	+3.3V
2	GND	GND	-
3	+5VSB	PWR	+5V

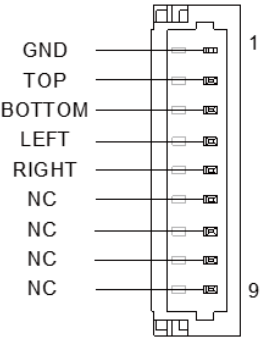
2.5.23 Touch Screen Connector (CN21)



8 Wire			
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	-
2	TOP EXCITE	IN	-
3	BOTTOM EXCITE	IN	-
4	LEFT EXCITE	IN	-
5	RIGHT EXCITE	IN	-
6	TOP SENSE	IN	-
7	BOTTOM SENSE	IN	-
8	LEFT SENSE	IN	-
9	RIGHT SENSE	IN	-

Note: 4/8 Wire and 5 Wire can be set by JP3.

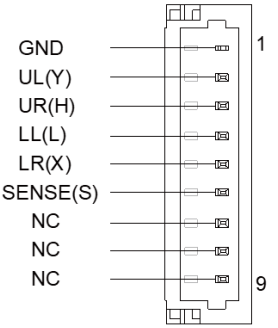
4 Wires



4 Wire			
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	-
2	TOP	IN	-
3	BOTTOM	IN	-
4	LEFT	IN	-
5	RIGHT	IN	-
6	NC	-	-
7	NC	-	-
8	NC	-	-
9	NC	-	-

Note: 4/8 Wire and 5 Wire can be set by JP3.

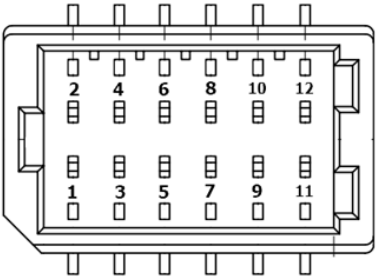
5 Wires



5 Wire			
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	-
2	TOP	IN	-
3	BOTTOM	IN	-
4	LEFT	IN	-
5	RIGHT	IN	-
6	Sense(S)	IN	-
7	NC	-	-
8	NC	-	-
9	NC	-	-

Note: 4/8 Wire and 5 Wire can be set by JP3.

2.5.24 Audio I/O Port (CN3)

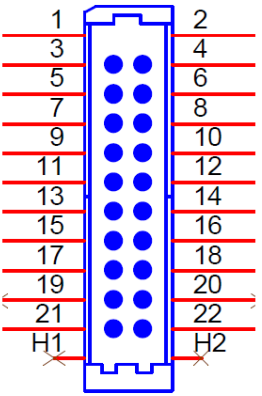


Pin	Pin Name	Signal Type	Signal Level
1	RIGHT_OUT	OUT	-
2	MIC_R	IN	-
3	LEFT_OUT	OUT	-
4	MIC_L	IN	-
5	JD_LOUT	IN	-
6	JD_MIC	IN	-
7	GND_AUDIO	GND	-
8	GND_AUDIO	GND	-
9	JD_LIN	IN	-
10	LINE_R_IN	IN	-
11	+5V_AUDIO	PWR	+5V
12	LINE_L_IN	IN	-

2.5.25 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	-	-

2.5.26 COM Port 1/2 (CN45)



			RS232	
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	-	-

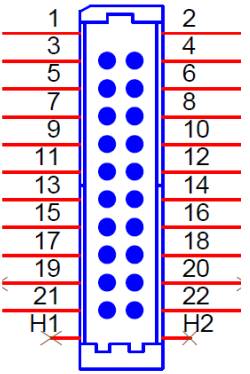
RS422				
Pin	Pin	Pin Name	Signal Type	Signal Level
1	2	RS422_TX-	OUT	±5V
3	4	RS422_TX+	OUT	±5V
5	6	RS422_RX+	IN	-
7	8	RS422_RX-	IN	-
9	10	GND	GND	-
11	12	NC	-	-
13	14	NC	-	-
15	16	NC	-	-
17	18	+5V/+12V(0.5A)	PWR	+5V/+12V
19	20	NC	-	-

RS485				
Pin	Pin	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.

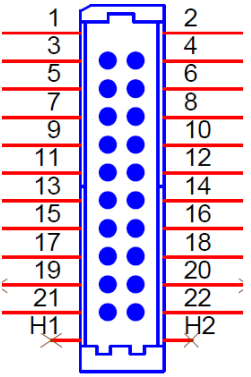
Note: Pin 8 function can be set by BOM.

2.5.27 COM Port 3/4 (CN46)



			RS232	
Pin Port 4	Pin Port 3	Pin Name	Signal Type	Signal Level
1	2	DCD	IN	-
3	4	RX	IN	-
5	6	TX	OUT	±9V
7	8	DTR	OUT	±9V
9	10	GND	GND	-
11	12	DSR	IN	-
13	14	RTS	OUT	±9V
15	16	CTS	IN	-
17	18	RI	IN	-
19	20	NC	-	-

2.5.28 COM Port 5/6 (CN47)



			RS232	
Pin Port 6	Pin Port 5	Pin Name	Signal Type	Signal Level
1	2	DCD	IN	-
3	4	RX	IN	-
5	6	TX	OUT	±9V
7	8	DTR	OUT	±9V
9	10	GND	GND	-
11	12	DSR	IN	-
13	14	RTS	OUT	±9V
15	16	CTS	IN	-
17	18	RI	IN	-
19	20	NC	-	-

2.5.29 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	-

Pin	Pin Name	Signal Type	Signal Level
25	GND	GND	-
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

2.5.30 DDR4 SO-DIMM Slot (CN40 & CN17)

Standard specification.

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

Standard specification.

2.5.32 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
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	-

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

2.5.33 PCIE x8 Slot (CN16)

Standard specification.

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 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 <Del>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.

Boot

Enables/disable quiet boot option.

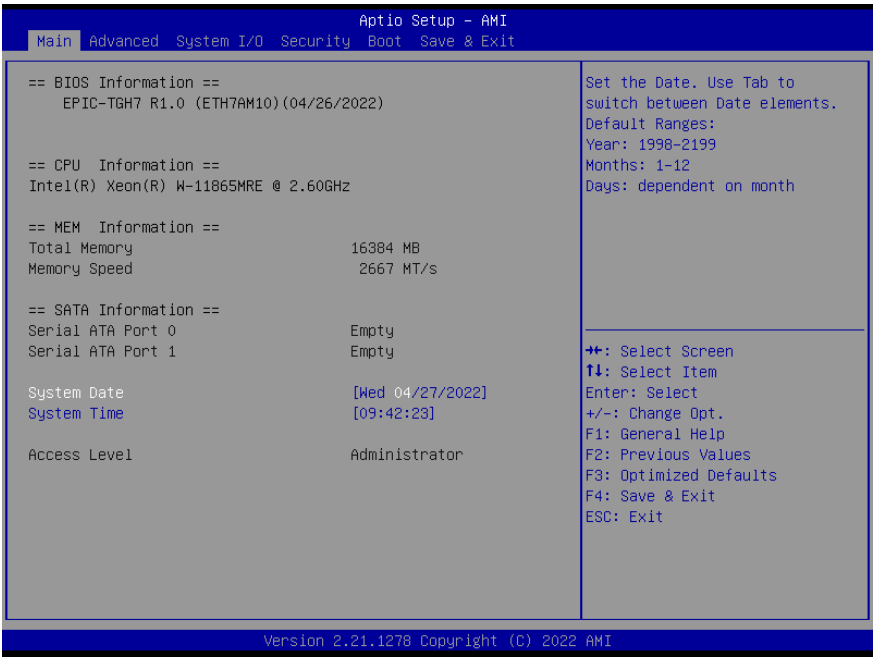
Security

Set setup administrator password.

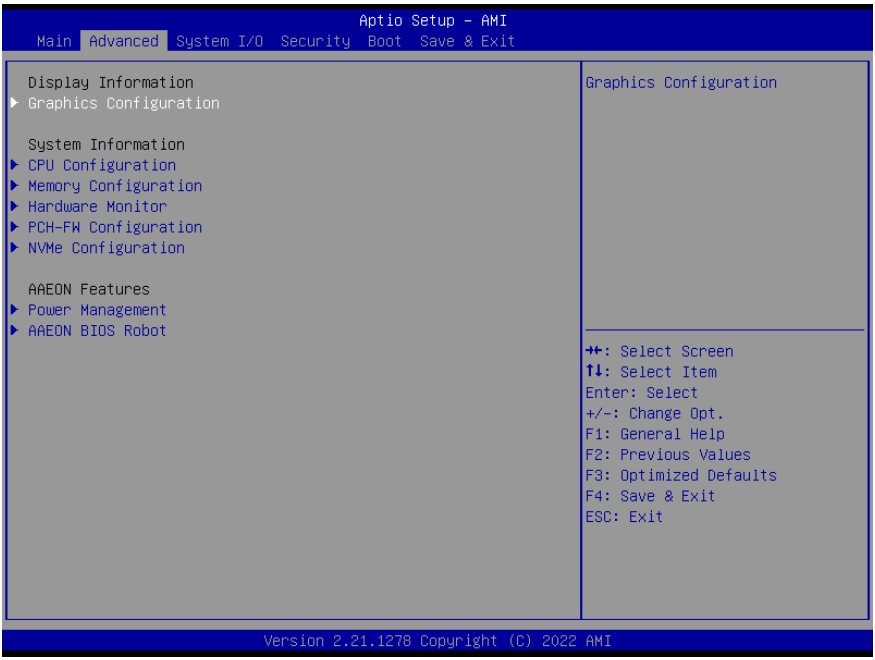
Save & Exit

Exit system setup after saving the changes.

3.3 Setup Submenu: Main



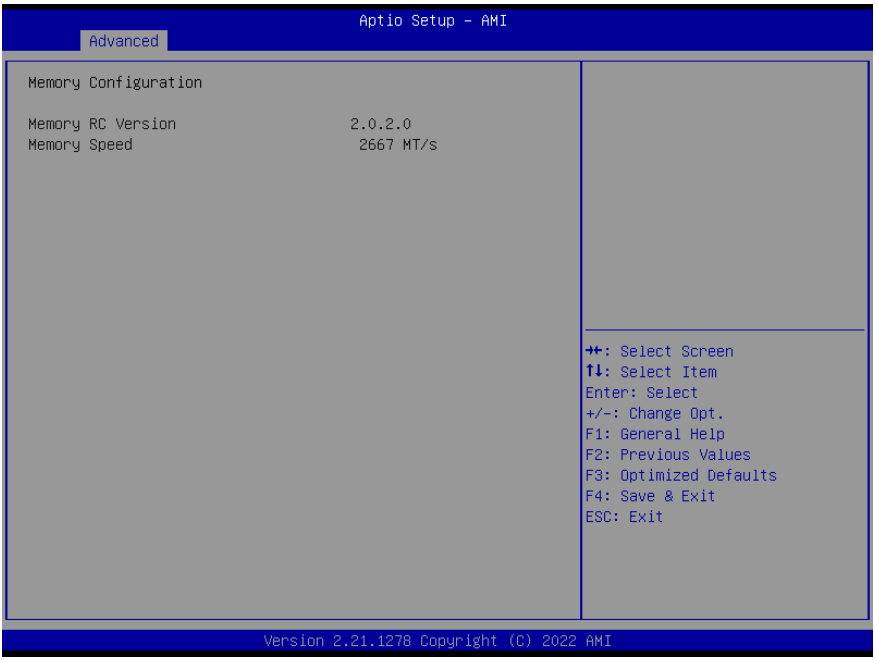
3.4 Setup Submenu: Advanced



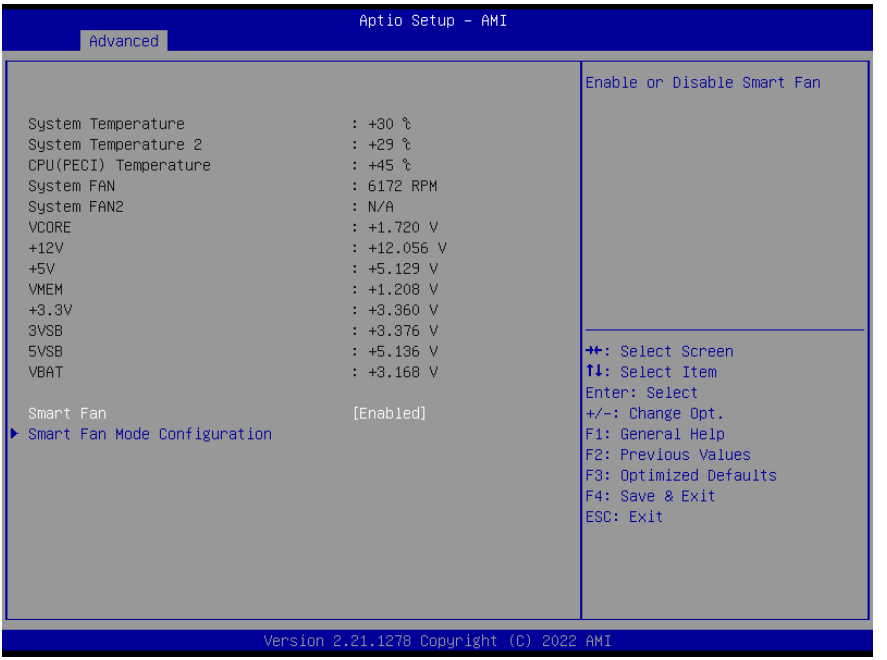
3.4.1 CPU Configuration

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

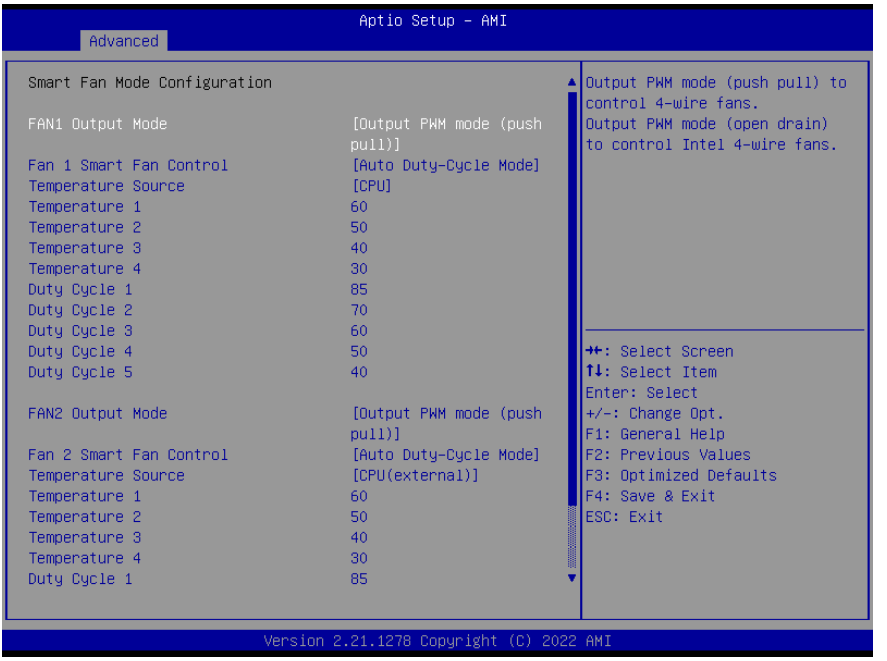


3.4.3 Hardware Monitor



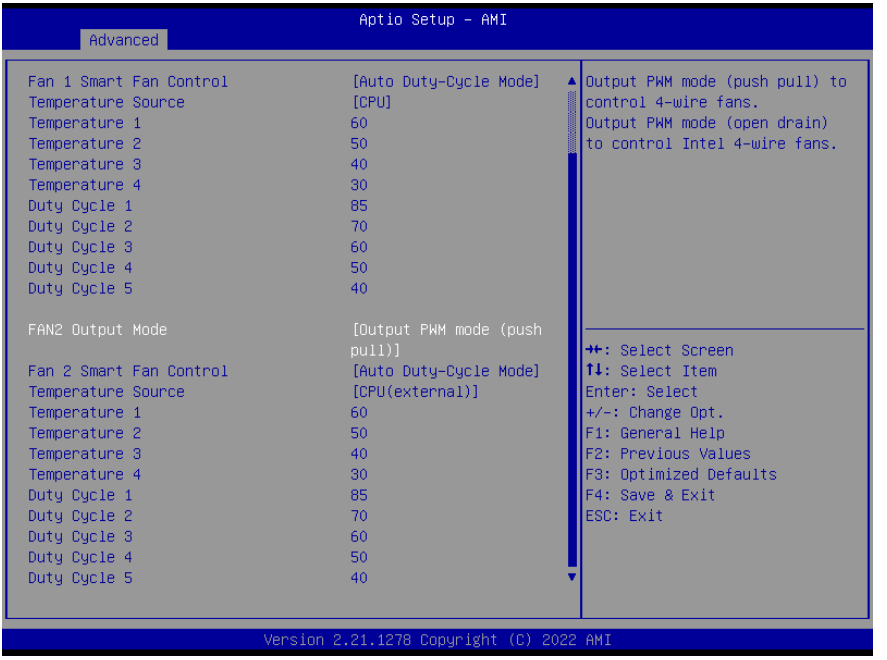
Options Summary		
Smart Fan	Disabled	-
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Smart Fan.		

3.4.4 Smart Fan Mode Configuration



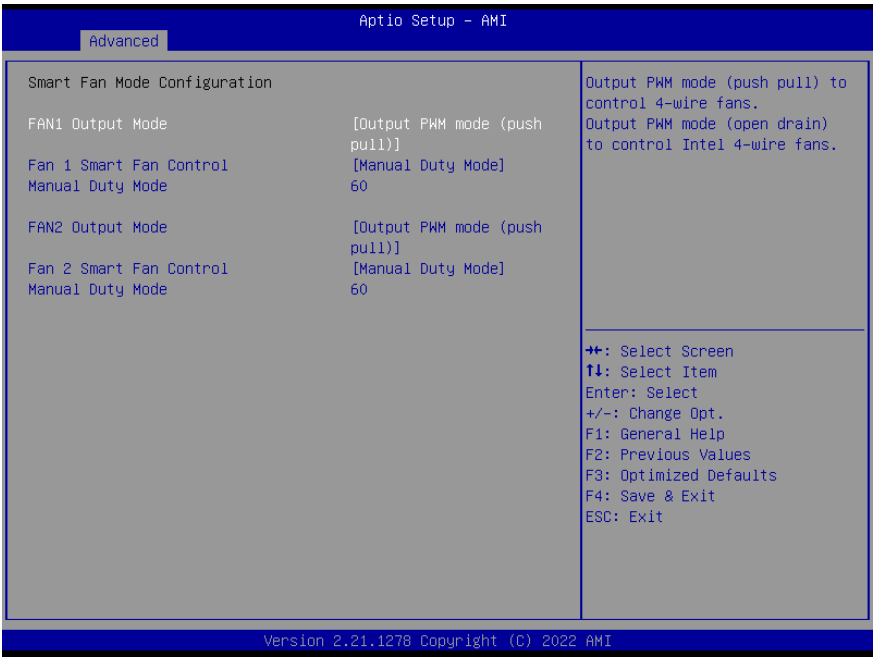
Options Summary		
FAN1 Output Mode	Output PWM mode (push pull)	-
	Linear Fan Application	-
	Output PWM mode (open drain)	Optimal Default, Failsafe Default
Output PWM mode (push pull) to control 4-wire fans. Linear fan application circuit to control 3-wire fan speed by fan's power terminal. Output PWM 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	



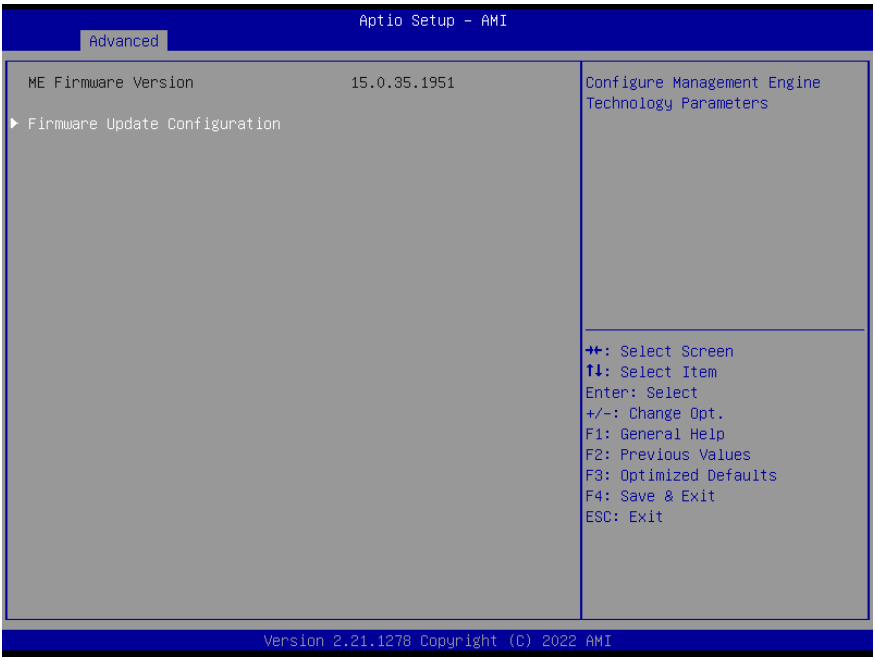
Options Summary		
FAN2 Output Mode	Output PWM mode (push pull)	-
	Linear Fan Application	-
	Output PWM mode (open drain)	Optimal Default, Failsafe Default
Output PWM mode (push pull) to control 4-wire fans. Linear fan application circuit to control 3-wire fan speed by fan's power terminal. Output PWM 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 by different duty cycle 1-100
Temperature		



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		

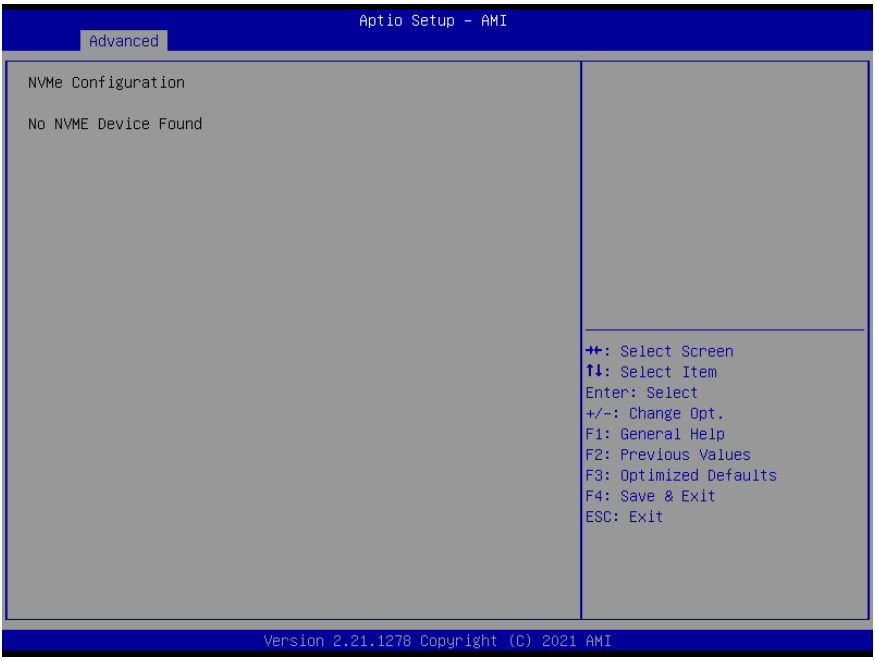
3.4.5 PCH-FW Configuration



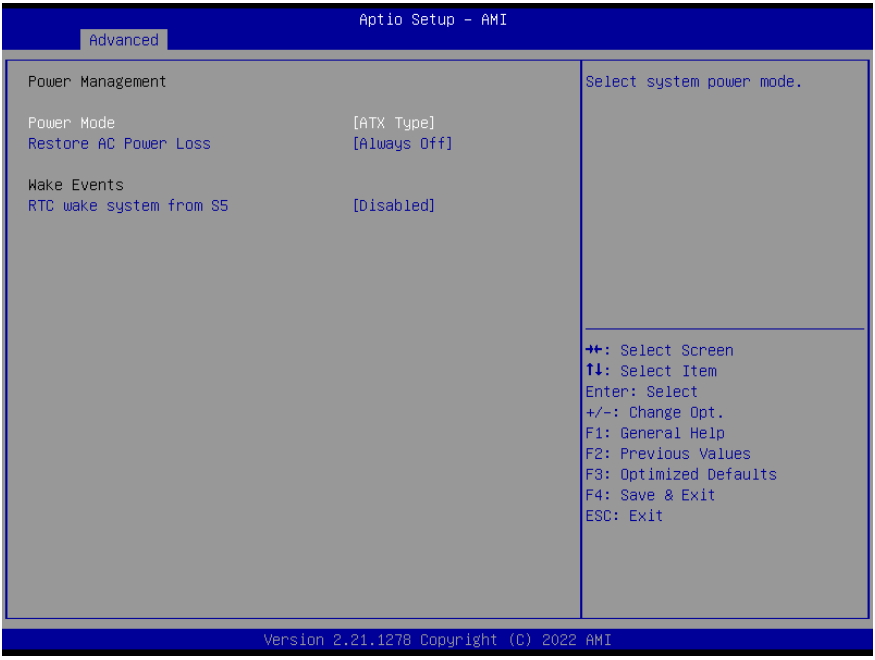
3.4.6 Firmware Update Configuration

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

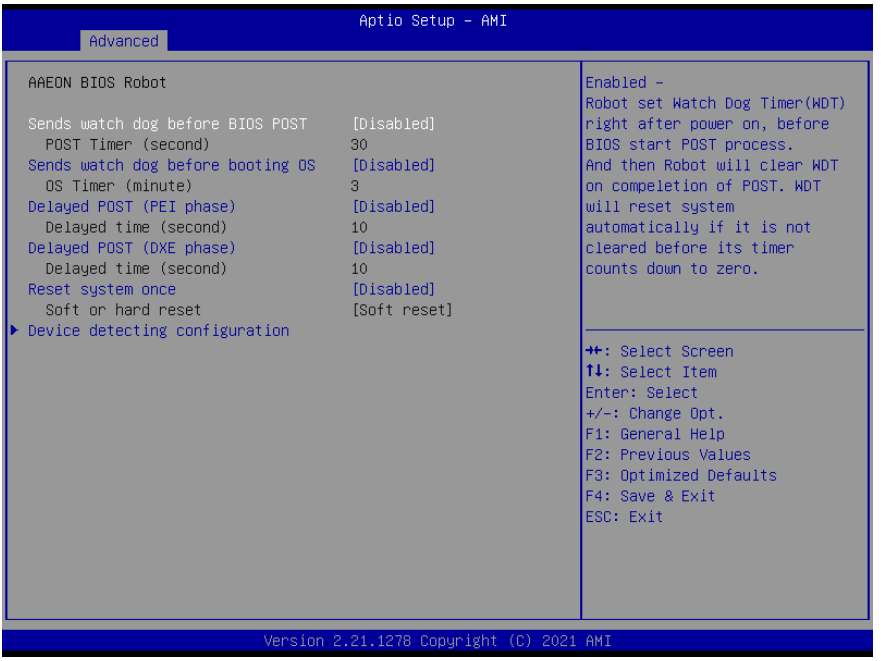


3.4.8 Power Management



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.		

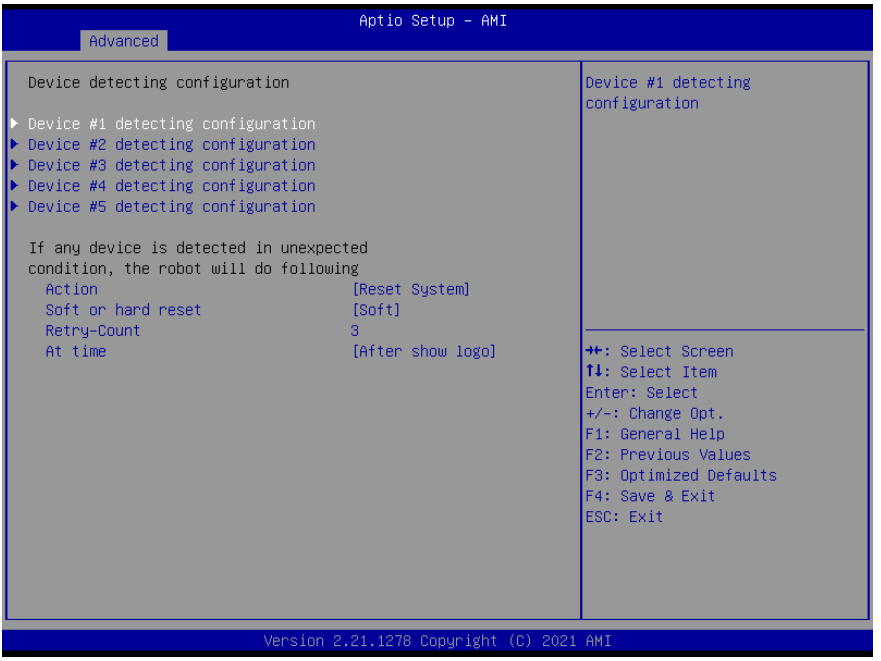
3.4.9 AAEON BIOS Robot



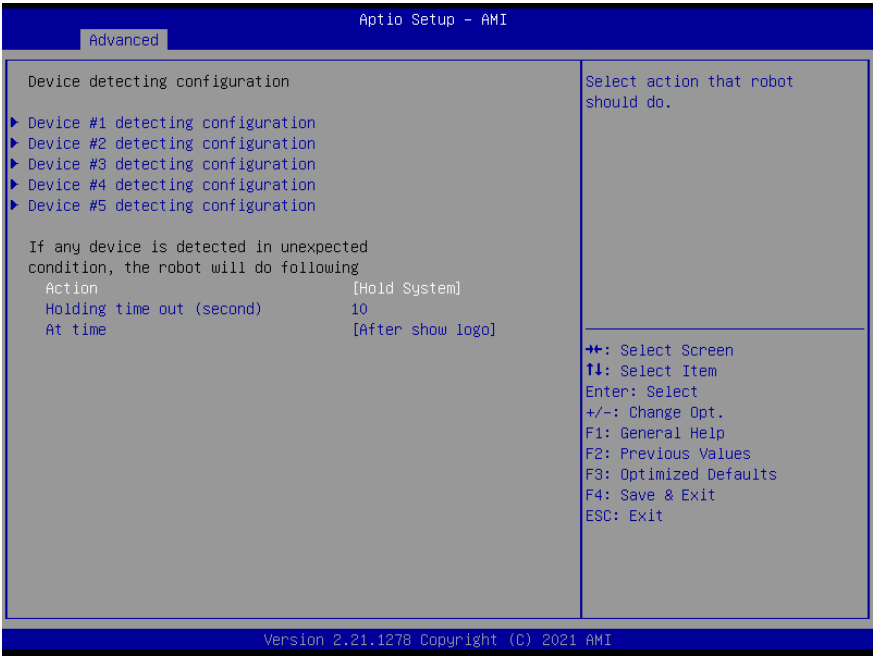
Options Summary		
Sends watch dog before BIOS POST	Disabled	Optimal Default, Failsafe Default
	Enabled	-
Enabled - Robot set Watch Dog Timer (WDT) right after power on, before BIOS start POST process. And then Robot will clear WDT on completion of POST. WDT will reset system automatically if it is not 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.		
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- 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

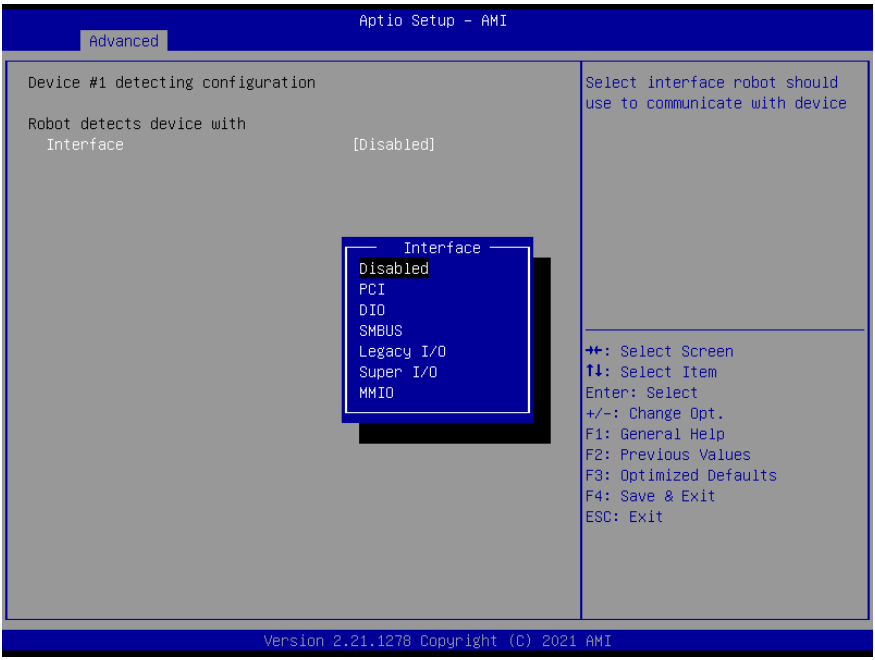


Options Summary		
Action	Reset System	Optimal Default, Failsafe Default
	Hold System	
Select action that robot should do.		
Soft or hard reset	Soft	Optimal Default, Failsafe Default
	Hard	
Select reset type robot should send on each boot.		
Retry-Count	3	Optimal Default, Failsafe Default
Fill retry counter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



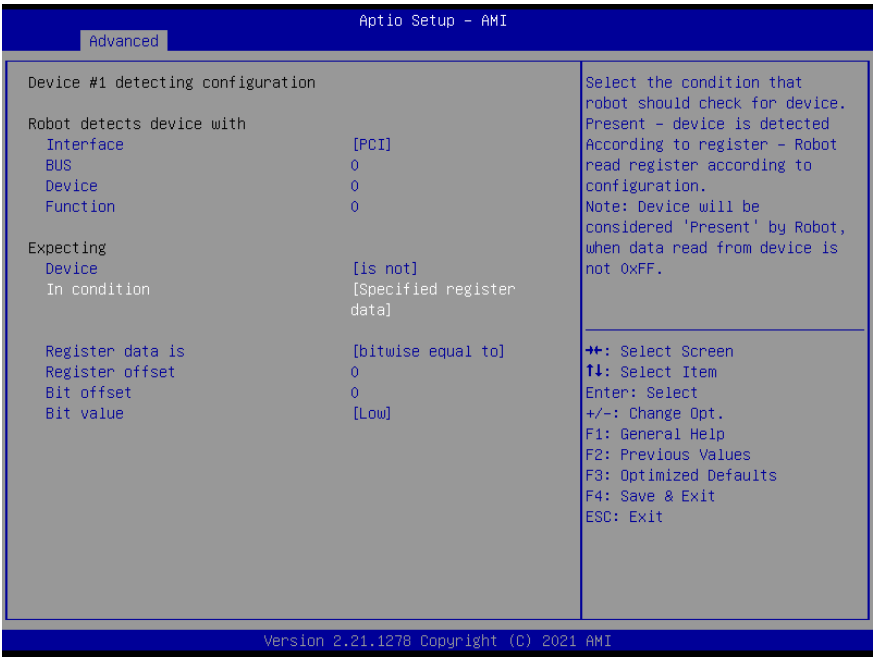
Options Summary		
Action	Reset System	Optimal Default, Failsafe Default
	Hold System	
Select action that robot should do.		
Holding time out (second)	10	Optimal Default, Failsafe Default
Fill hold time out here. Robot will hold system no longer then time-out value, and then let system continue its POST.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

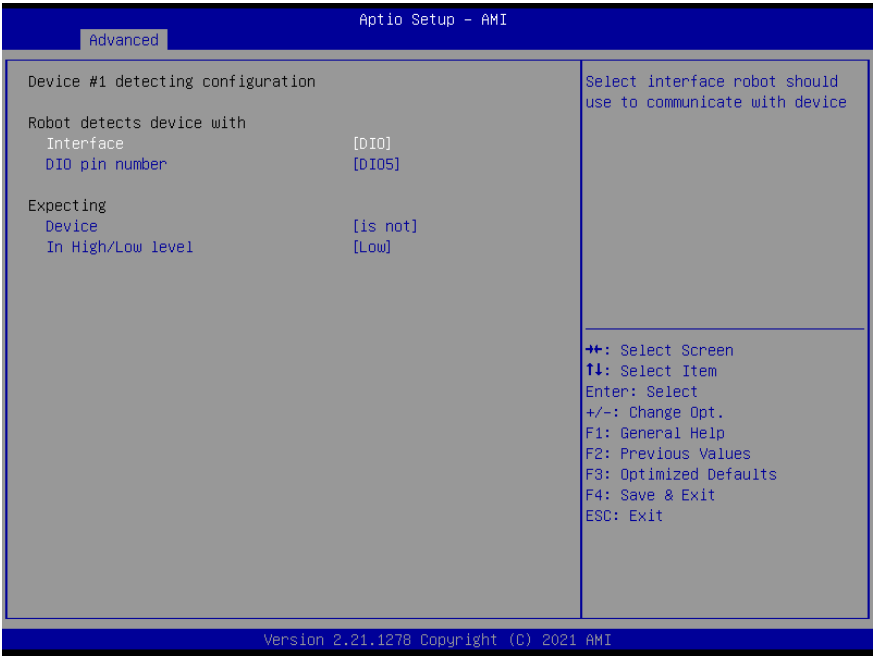
3.4.10.2 Device #* Detecting Configuration – PCI



Options Summary		
When interface item set to "PCI" 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.		

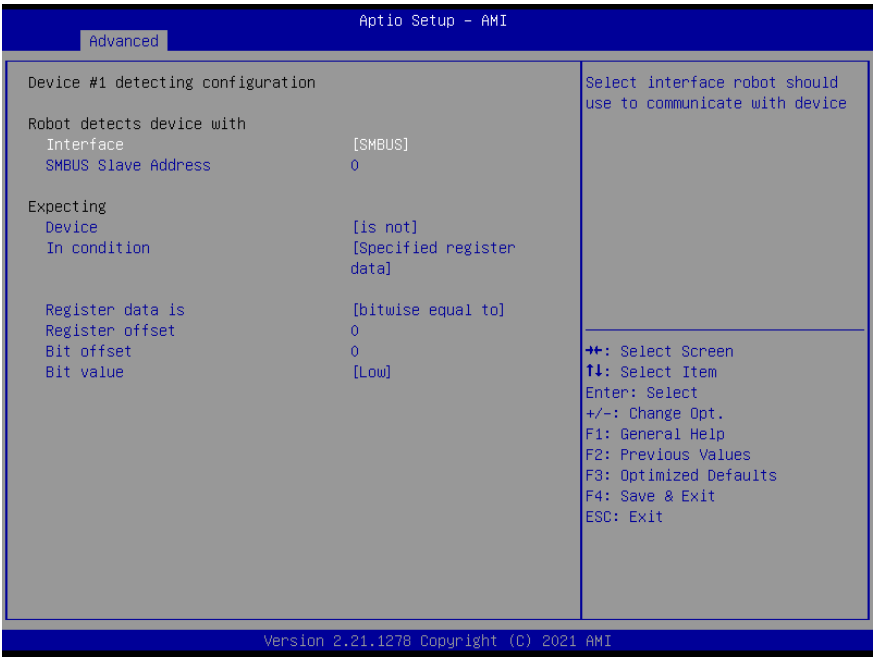
Register data is	bitwise equal to	Optimal Default, Failsafe Default
	bytewise equal to	
	bytewise lesser than	
	bytewise larger than	
Select how robot should compare data read from register, to a value configured below.		
Register offset	0	Optimal Default, Failsafe Default
Fill register offset (or index) 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 - GPI0-3\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.		

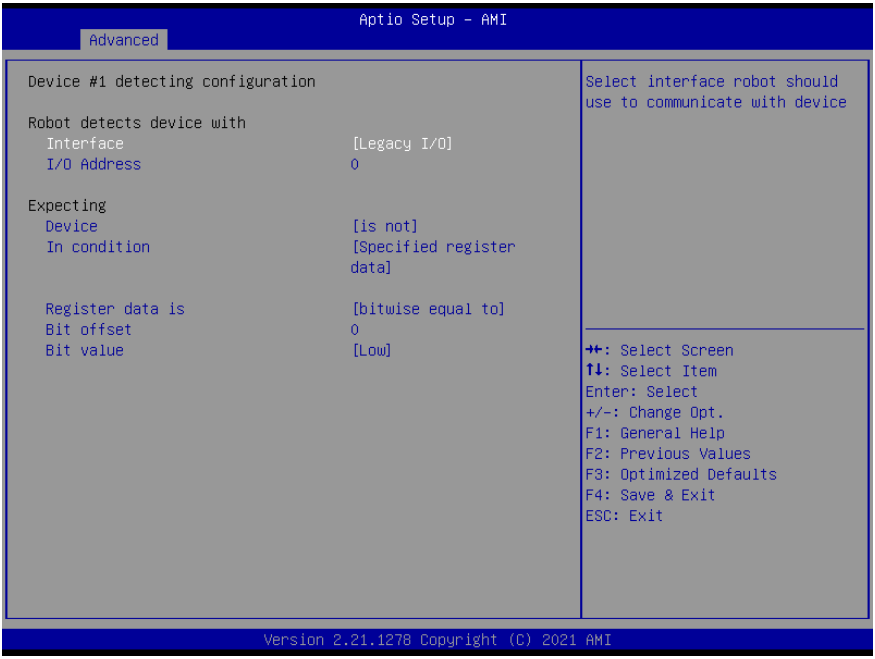
3.4.10.4 Device #* Detecting Configuration – SMBUS



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.		

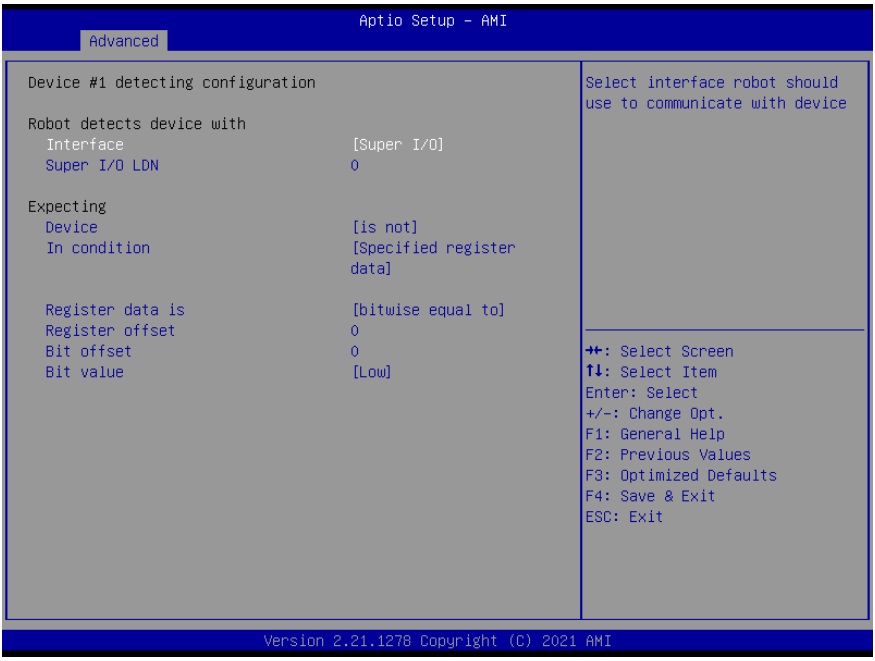
Register data is	bitwise equal to	Optimal Default, Failsafe Default
	bytewise equal to	
	bytewise lesser than	
	bytewise larger than	
Select how robot should compare data read from register, to a value configured below.		
Register offset	0	Optimal Default, Failsafe Default
Fill register offset (or index) 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



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
	bytewise equal to	
	bytewise lesser than	
	bytewise larger than	
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.		

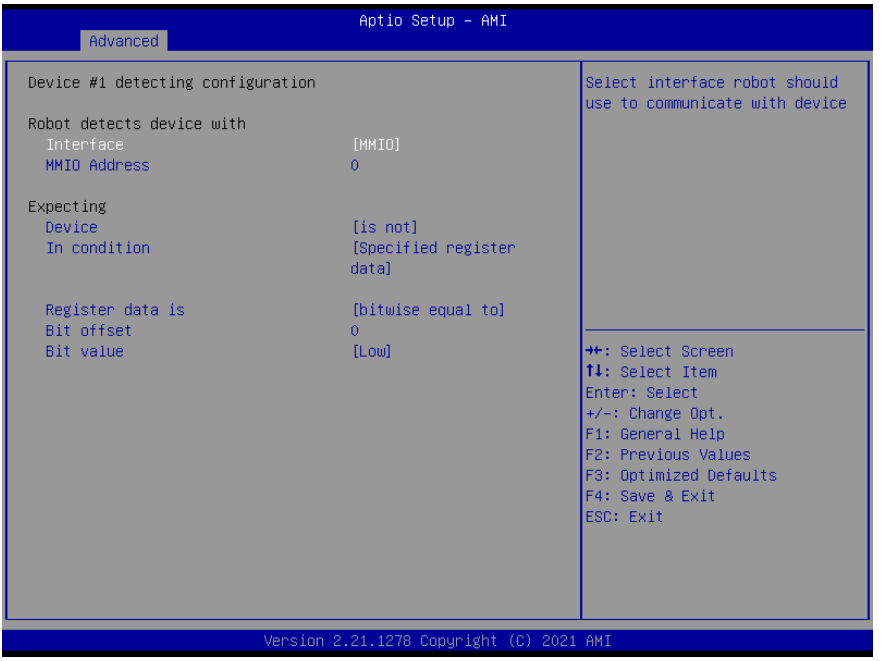
3.4.10.6 Device #* Detecting Configuration – Super I/O



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	
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	

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.		

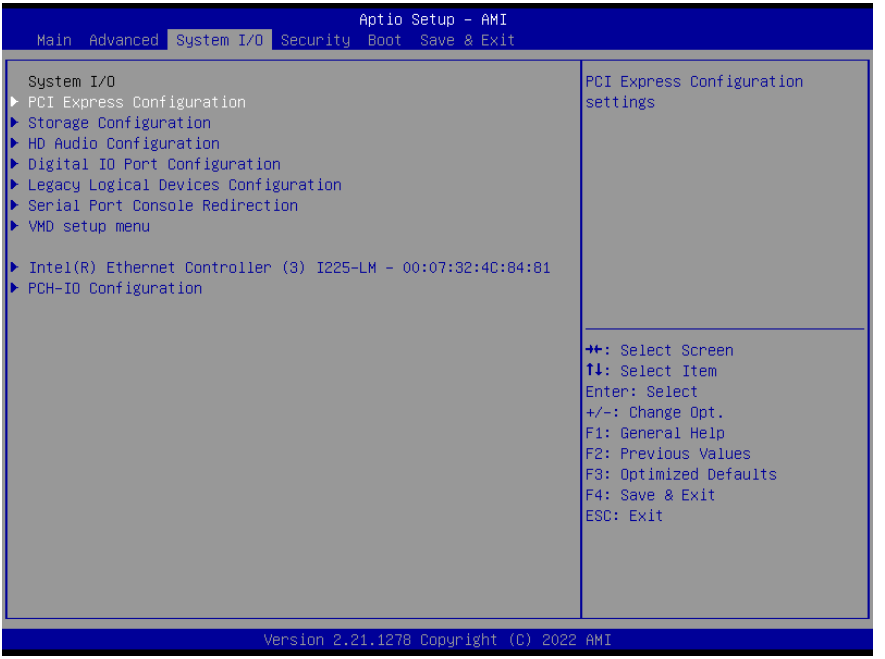
3.4.10.7 Device #* Detecting Configuration – MMIO



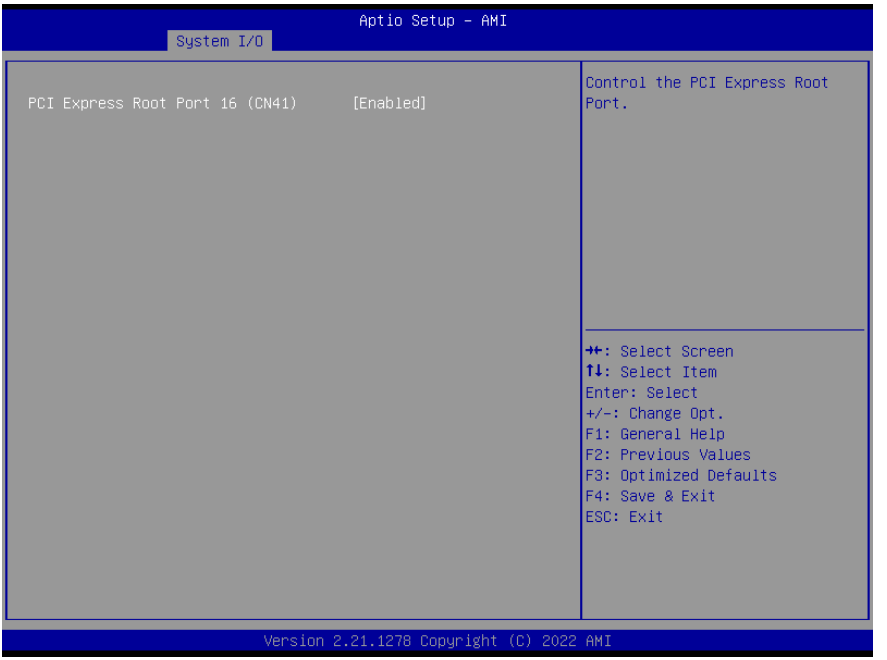
Options Summary		
When interface item set to "MMIO" will show below items		
MMIO Address	0	Optimal Default, Failsafe Default
Fill Memory Mapped I/O address device is responding to. Range: 0~FFFFFFFF.		
Device	is	
	Is not	Optimal Default, Failsafe Default
Select that robot should or should not do action 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	

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.		

3.6 Setup Submenu: System I/O

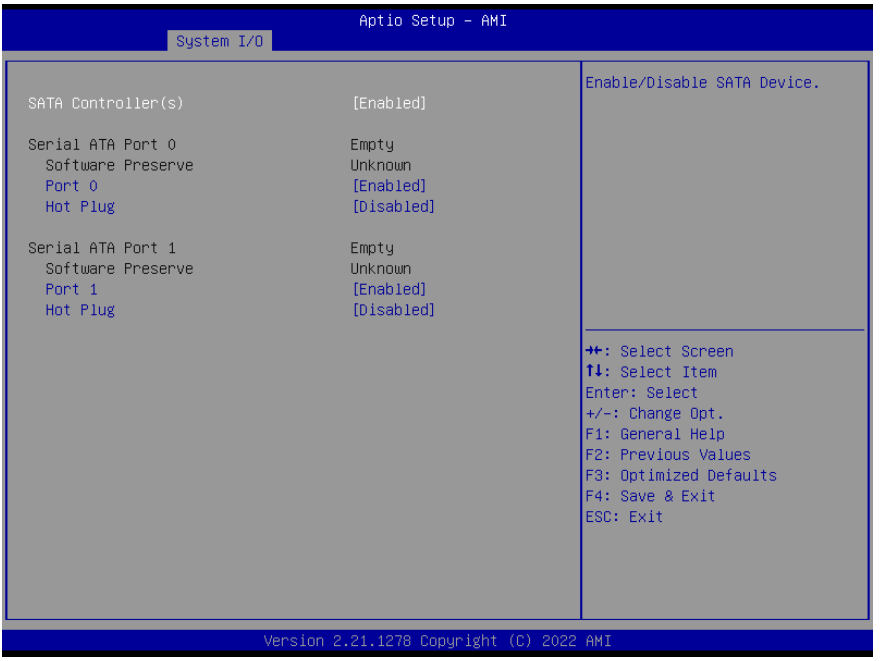


3.6.1 PCI Express Configuration



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

3.6.2 Storage Configuration

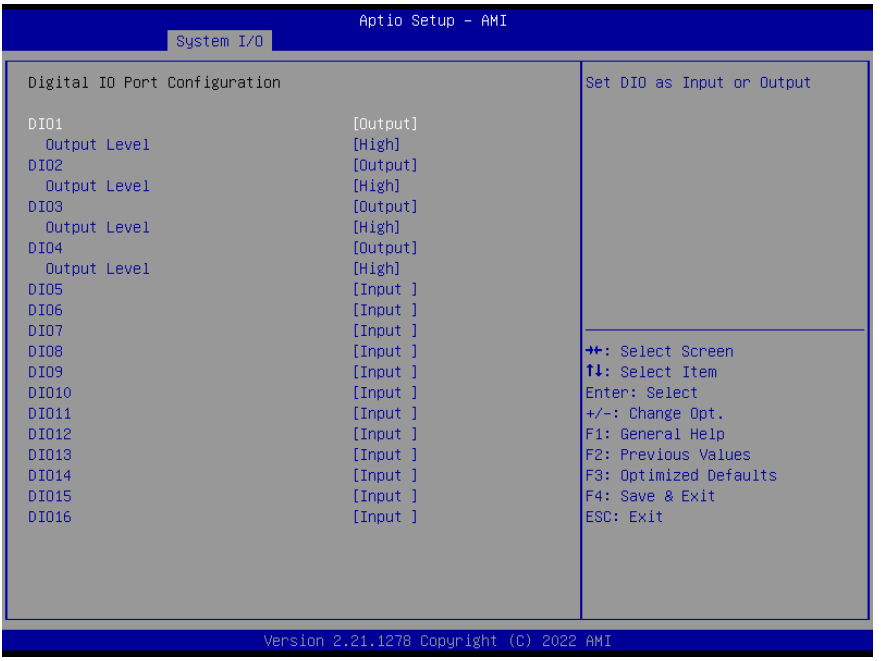


Options Summary		
SATA Controller(s)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable SATA Device.		
Port 0	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port.		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot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

3.6.3 HD Audio Subsystem Configuration Settings

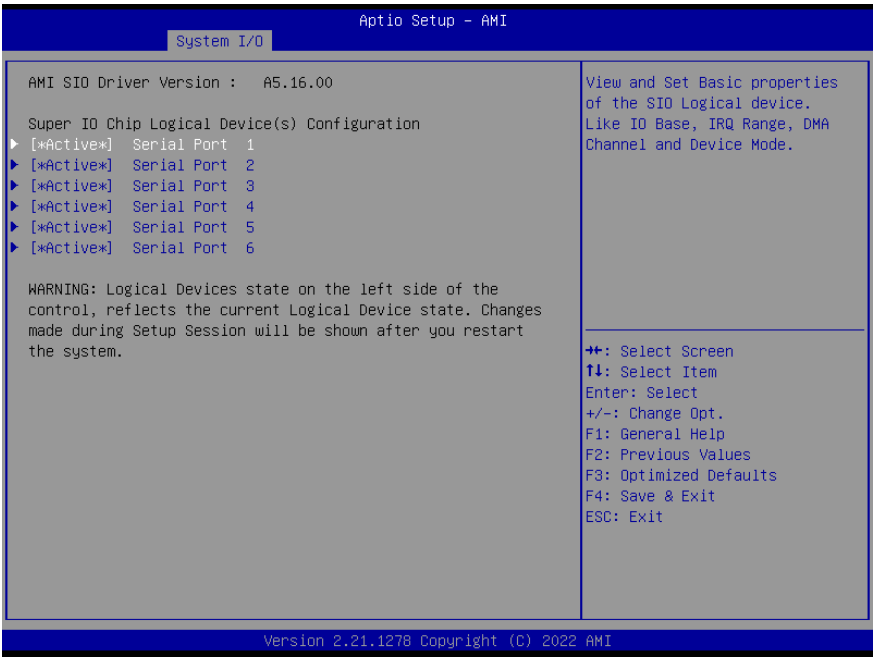
Options Summary		
HD Audio	Disabled	
	Enabled	Optimal Default, Failsafe Default
Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled. Enabled = HDA will be unconditionally enabled.		

3.6.4 HD Audio Subsystem Configuration Settings

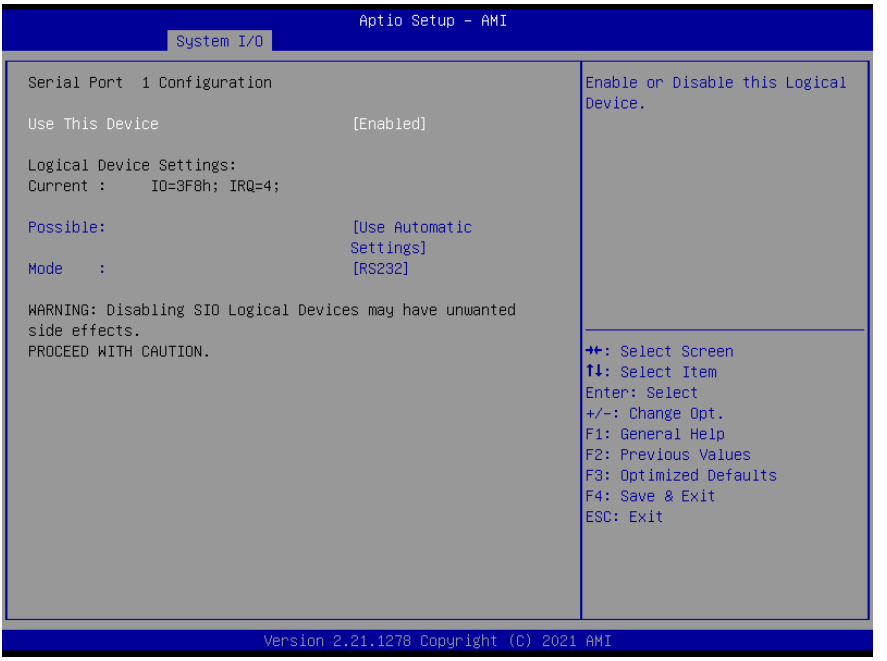


Options Summary		
DIO Port*	Output	
	Input	
Set DIO as Input or Output.		
Output Level	High	Optimal Default, Failsafe Default
	Low	
Set output level when DIO pin is output.		

3.6.5 Legacy Logical Devices Configuration

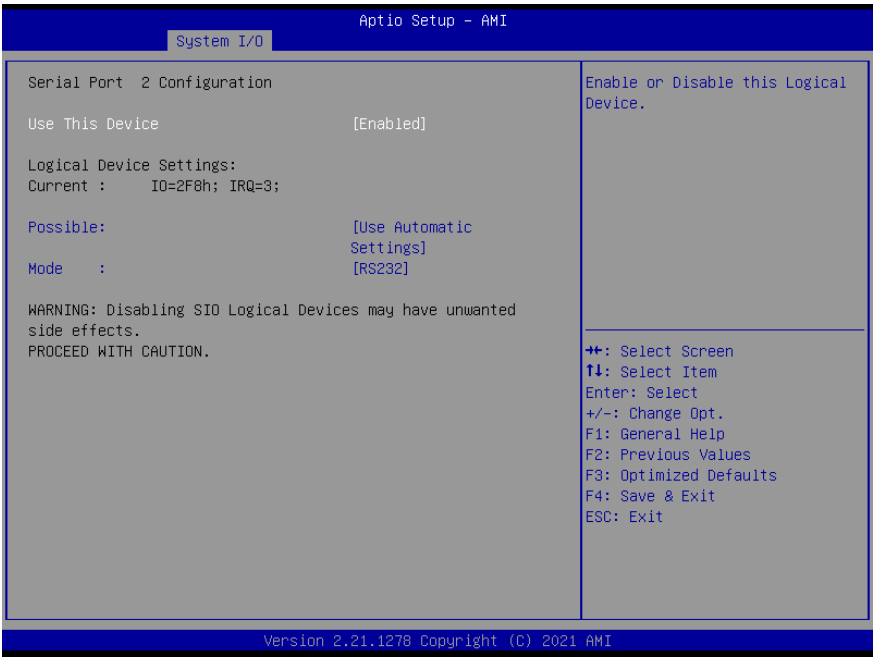


3.6.5.1 Serial Port 1 Configuration



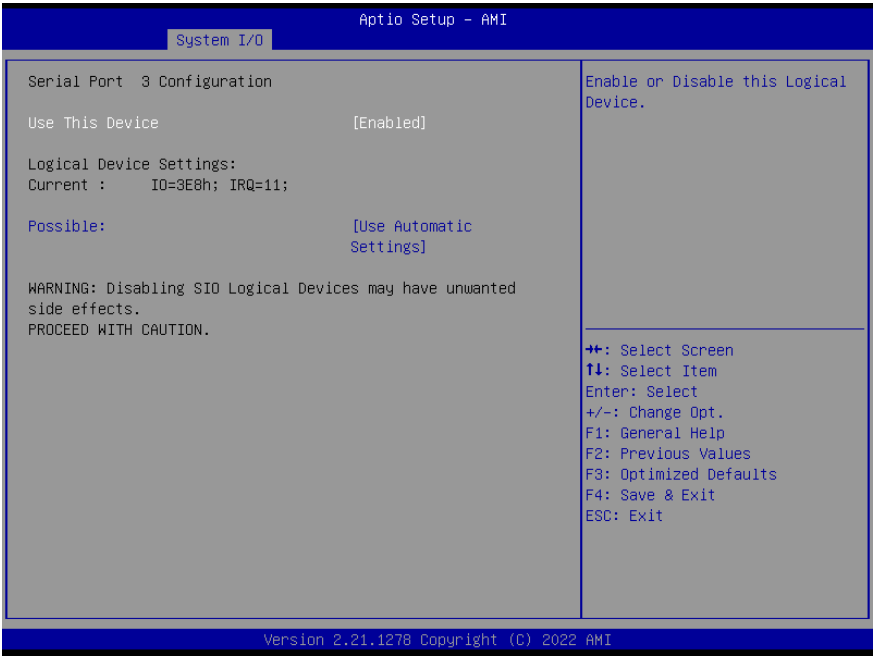
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8h; IRQ=4	
	IO=2F8h; IRQ=3	
Allows user to change Device's Resource settings. New settings will be reflected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

3.6.5.2 Serial Port 2 Configuration



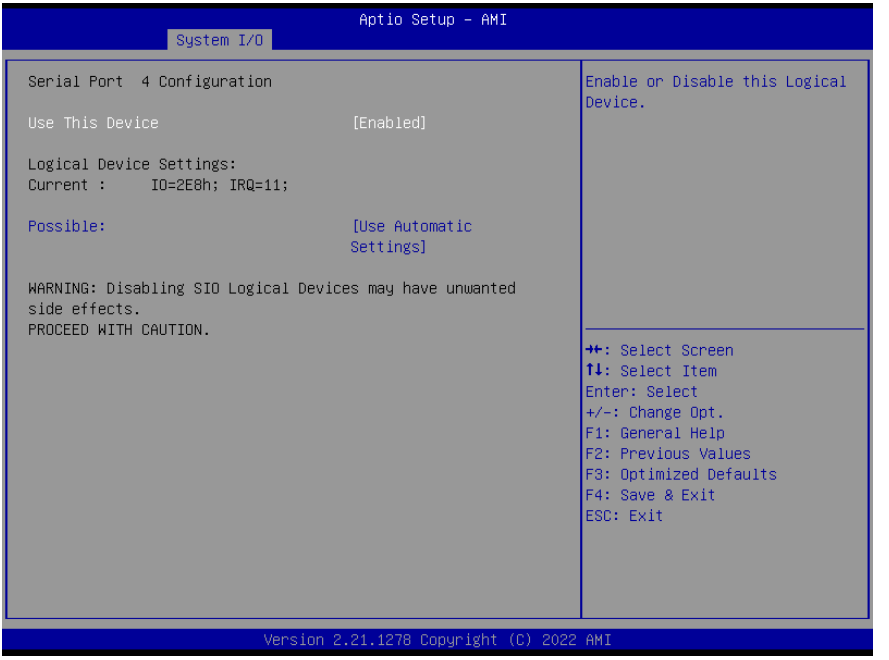
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's Resource settings. New settings will be reflected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

3.6.5.3 Serial Port 3 Configuration



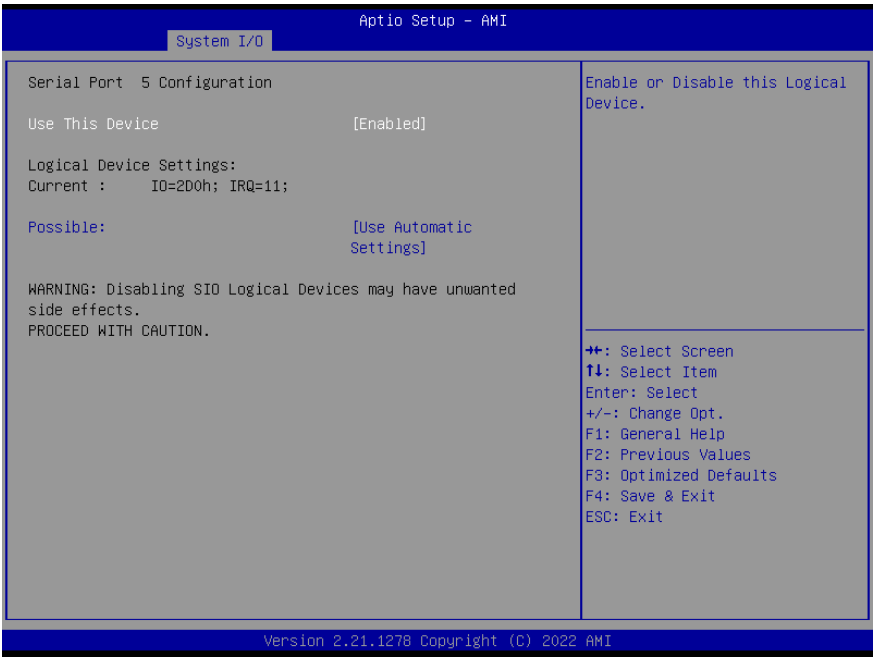
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's Resource settings. New settings will be reflected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

3.6.5.4 Serial Port 4 Configuration



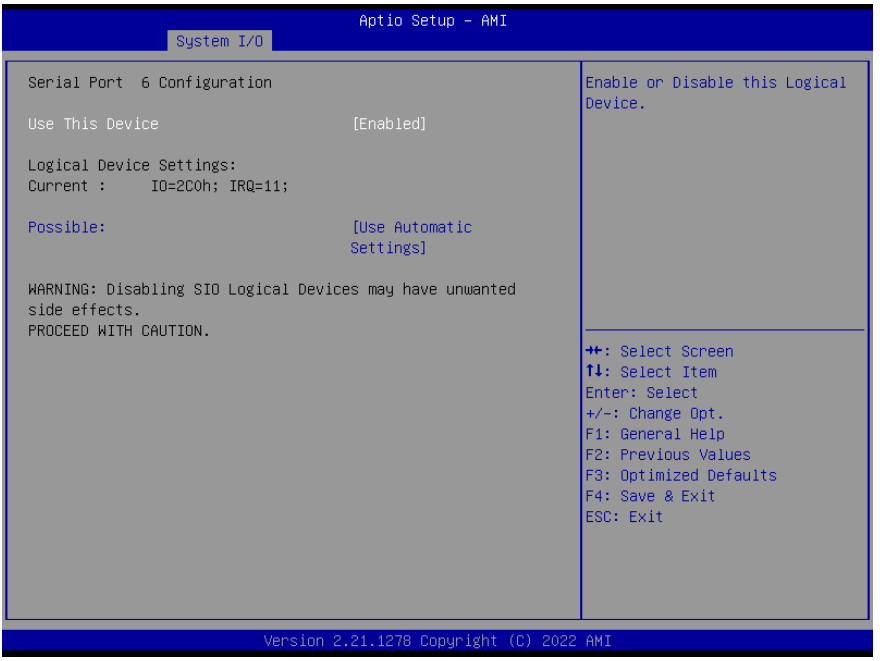
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's Resource settings. New settings will be reflected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

3.6.5.5 Serial Port 5 Configuration



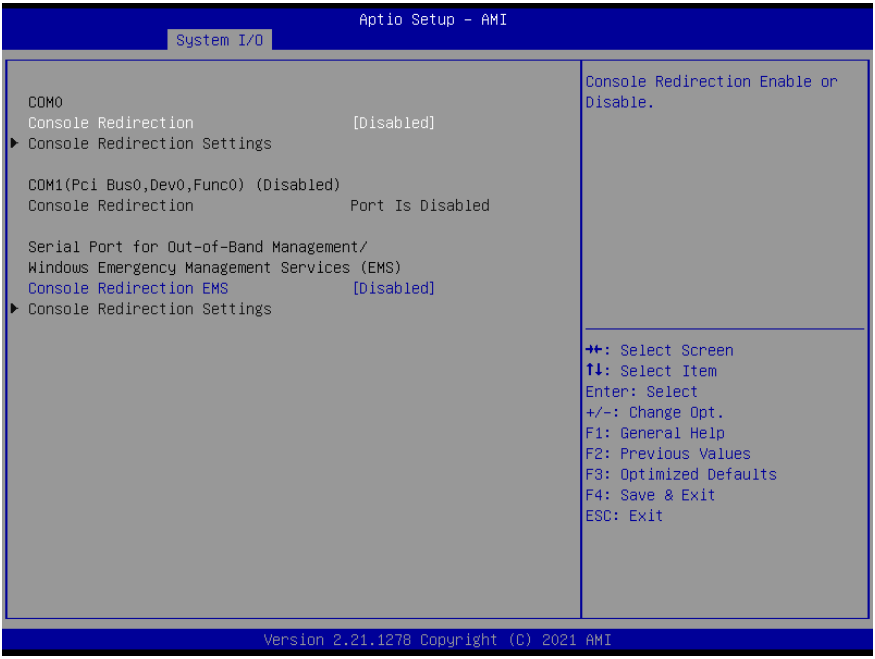
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's Resource settings. New settings will be reflected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

3.6.5.6 Serial Port 6 Configuration



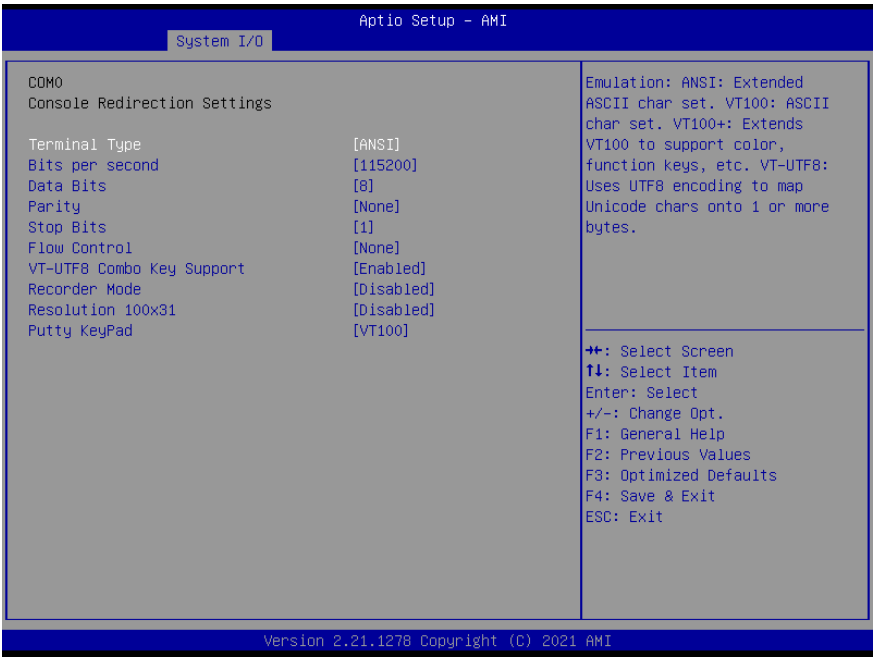
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's Resource settings. New settings will be reflected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

3.6.6 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.		

3.6.7 Console Redirection Settings

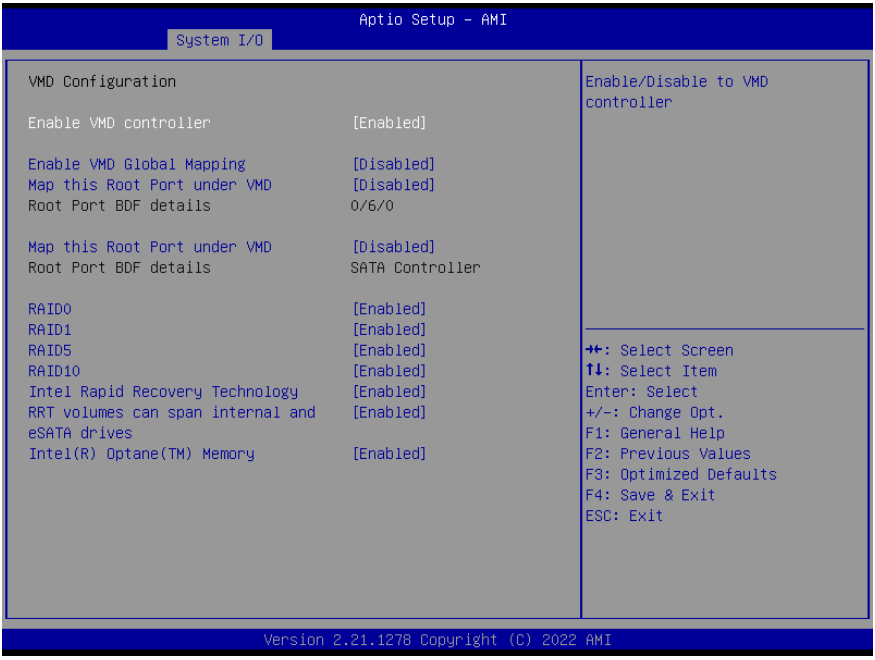


Options Summary		
Terminal Type	VT100	
	VT100+	
	VT-UTF8	
	ANSI	Optimal Default, Failsafe Default
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.		
Bits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

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

3.6.8 VMD Setup Menu

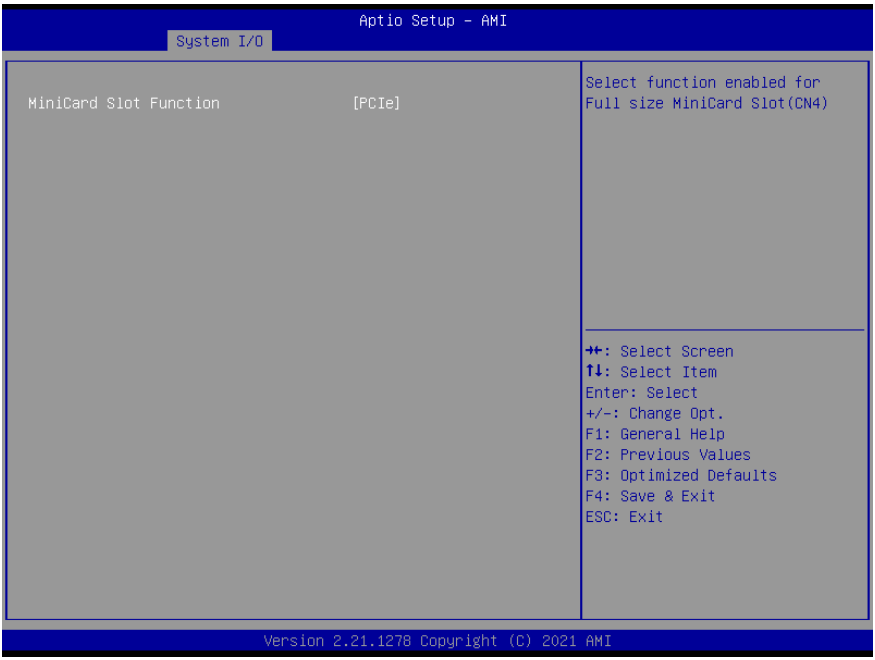
Options Summary		
Enable VMD controller	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable to VMD controller.		



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".		

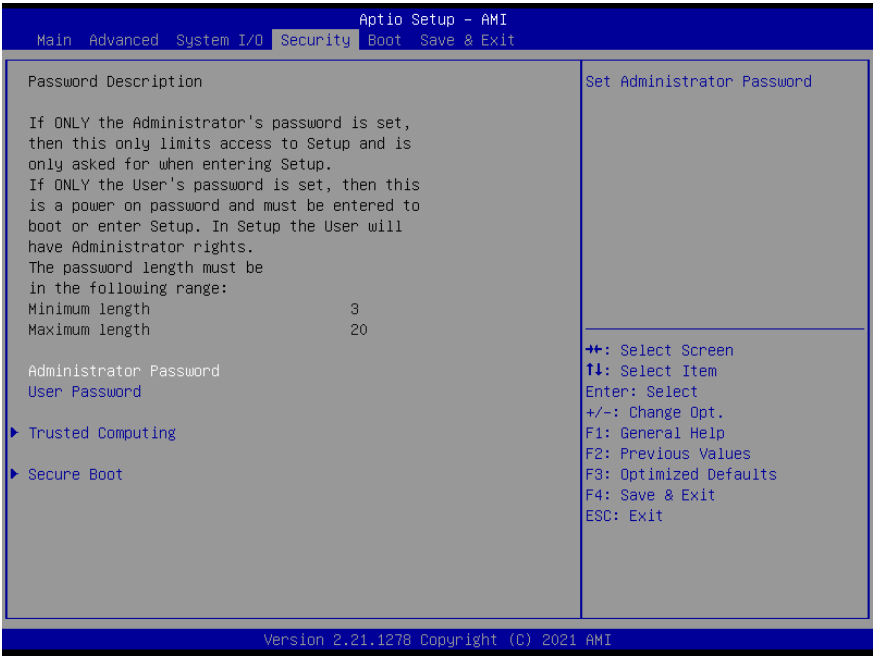
Intel Rapid Recovery Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable Intel Rapid Recovery Technology.		
RRT volumes can span internal and eSATA drives	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable RRT volumes can span internal and eSATA drives.		
Intel(R)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

3.6.9 PCH-IO Configuration



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

3.7 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.

3.7.1 Trusted Computing

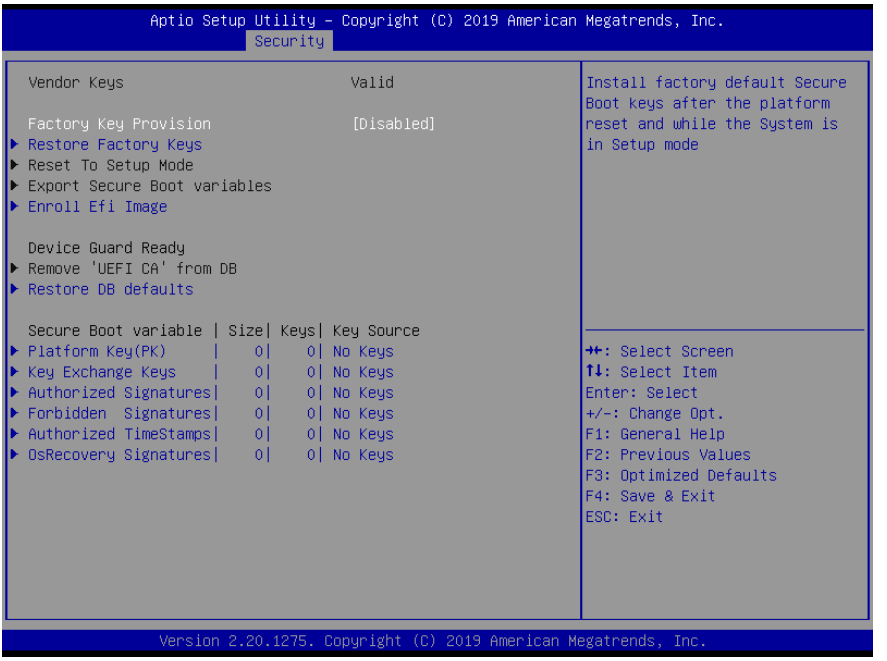
Options Summary		
Security Device Support	Disable	
	Enable	Optimal Default, Failsafe Default
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.		
SHA-1 PCR Bank	Disable	
	Enable	Optimal Default, Failsafe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

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.		

3.7.2 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.		

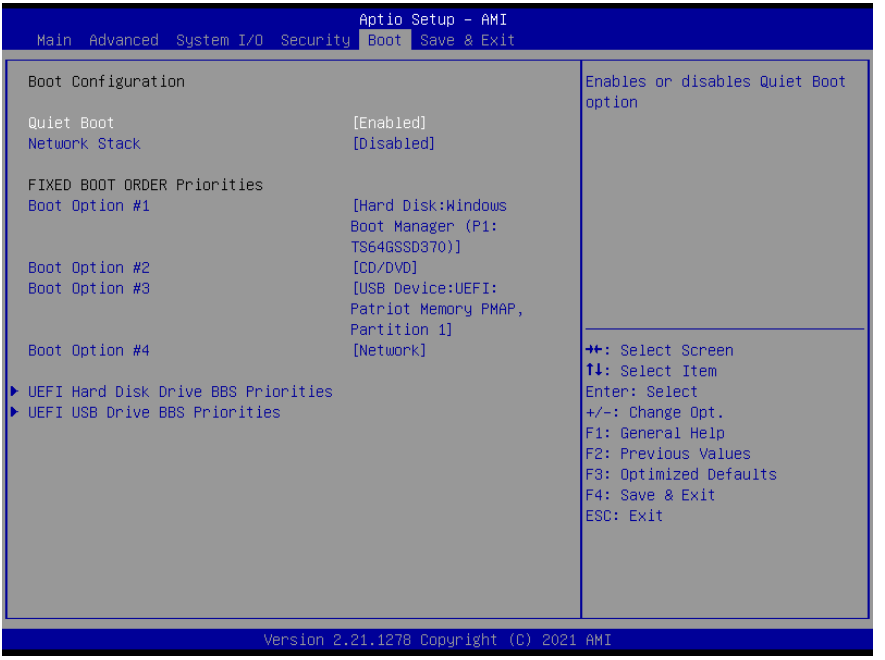
3.7.3 Key Management



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).		

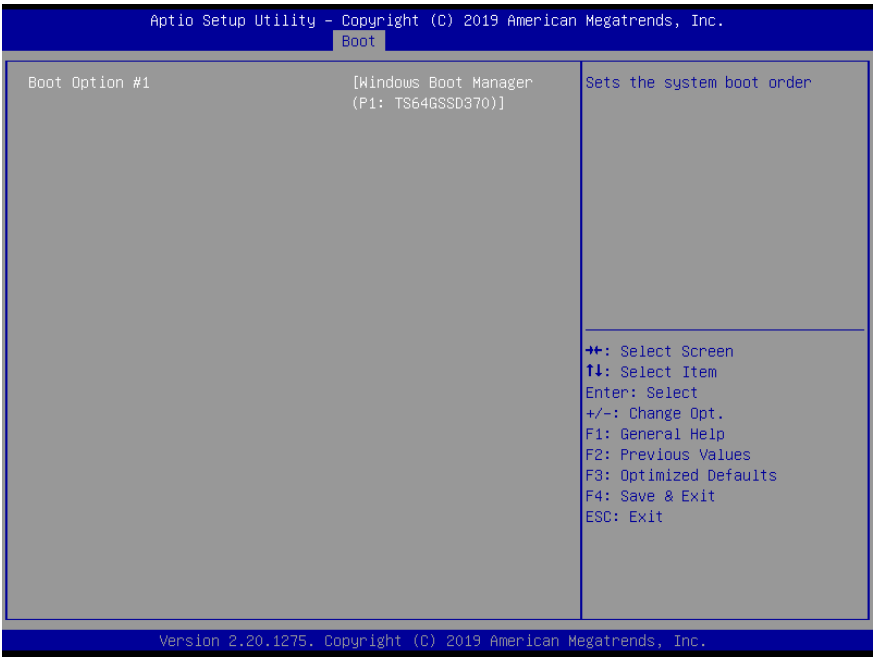
Remove 'UEFI CA' from DB	
Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db).	
Restore DB defaults	
Restore DB variable to factory defaults.	
Platform Key (PK)	Details
	Export
	Update
	Delete
Key Exchange Keys	Details
	Export
	Update
	Append
	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	

3.8 Setup Submenu: Boot

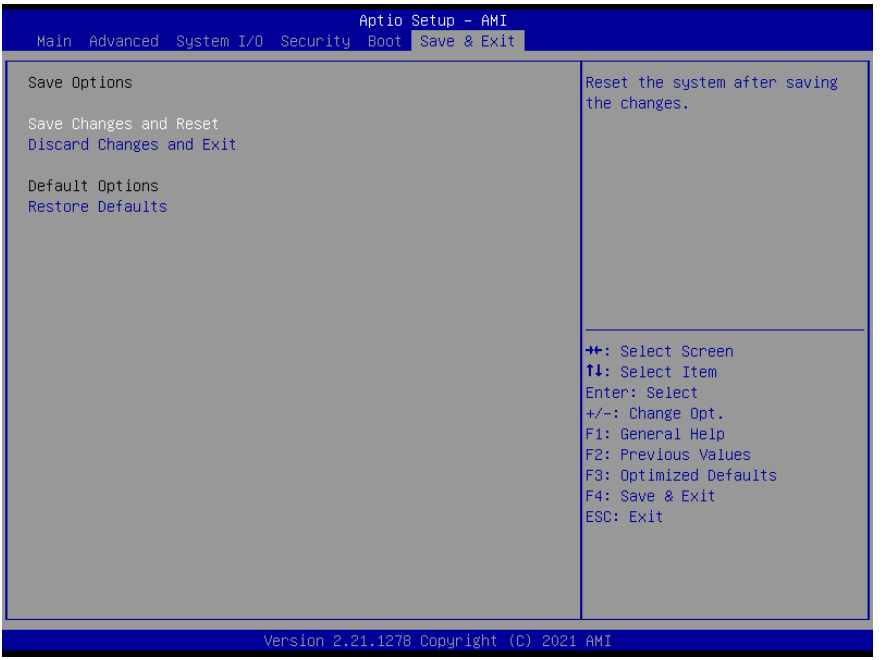


Options Summary		
Quiet Boot	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable showing boot logo.		
Lunch PXE ROM	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable UEFI Network Stack.		

3.8.1 BBS Priorities



3.9 Setup Submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Drivers Download and Installation

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

https://www.aaeon.com/en/p/epic-boards-epic-tgh7

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

Step 1 – Install Chipset Drivers

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

Step 2 – Install Graphics Driver

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

Step 3 – Install LAN Driver

1. Open the **Step 3 – Network** folder
2. Open the **.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 4 – Install Audio Driver

1. Open the **Step 4 – Audio** folder
2. Open the **Setup.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

Step 5 – Install Peripheral Driver

1. Open the **Step 5 – Peripheral Driver** folder
2. Open the **SetupSerialIO.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

Step 6 – Install ME & TXE Drivers

1. Open the **Step 6 – ME & TXE Driver** folder
2. Open the **SetupME.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

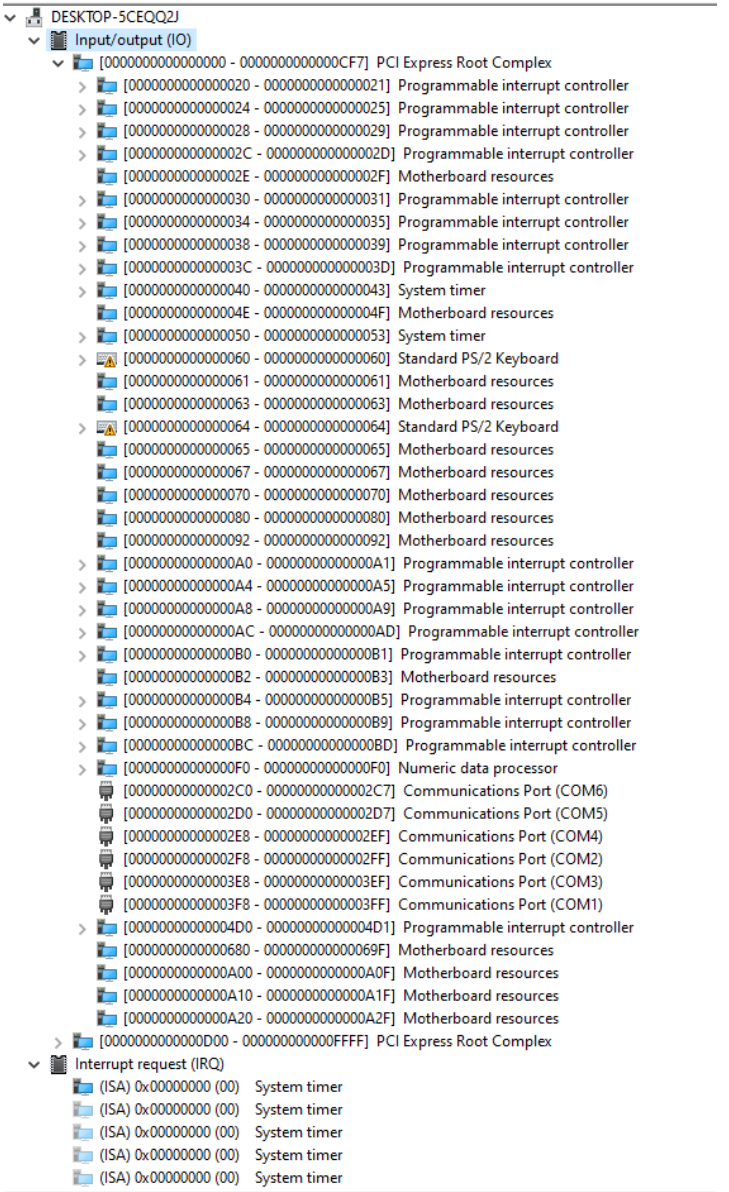
Step 7 – Install Touch Controller Driver

1. Open the **Step 7 – Touch Controller Driver** folder
2. Open the **Setup.exe** file
3. Follow the instructions
4. Drivers will be installed automatically

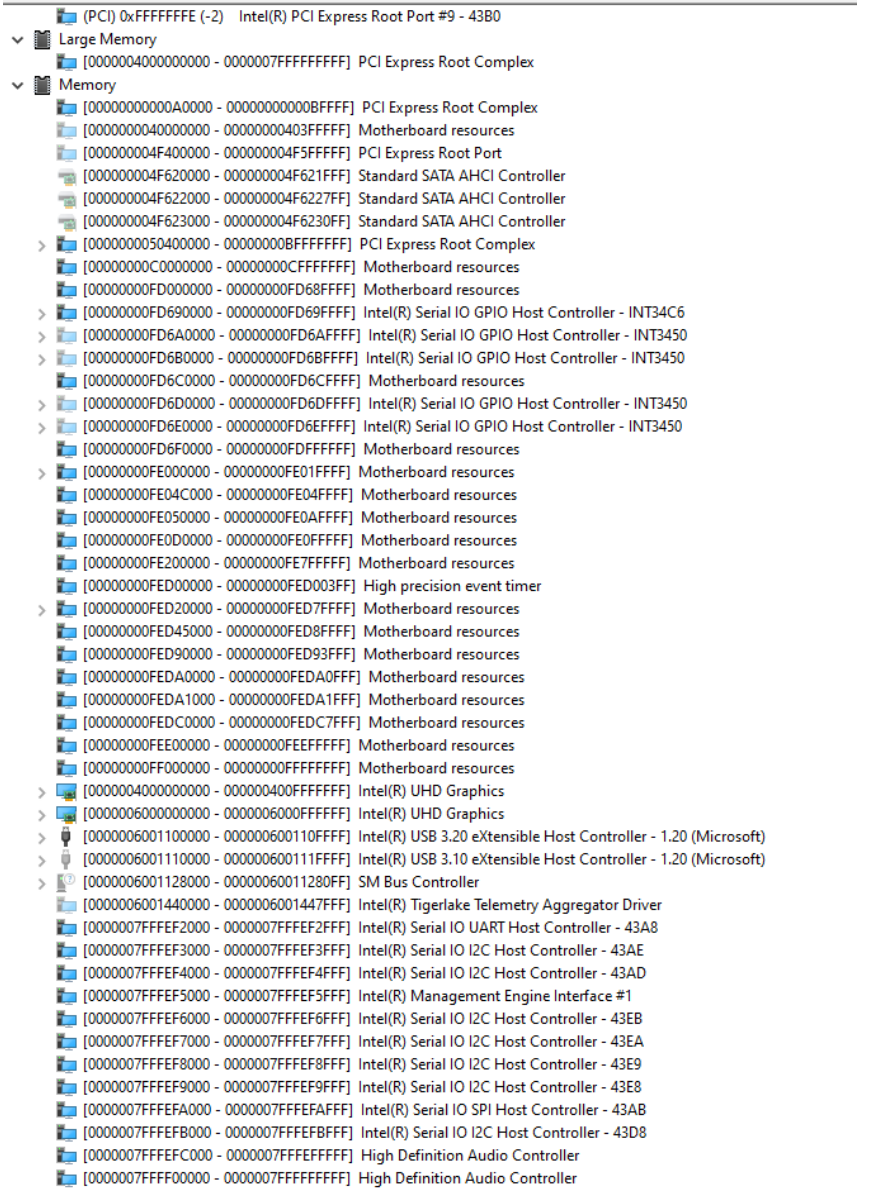
Appendix A

I/O Information

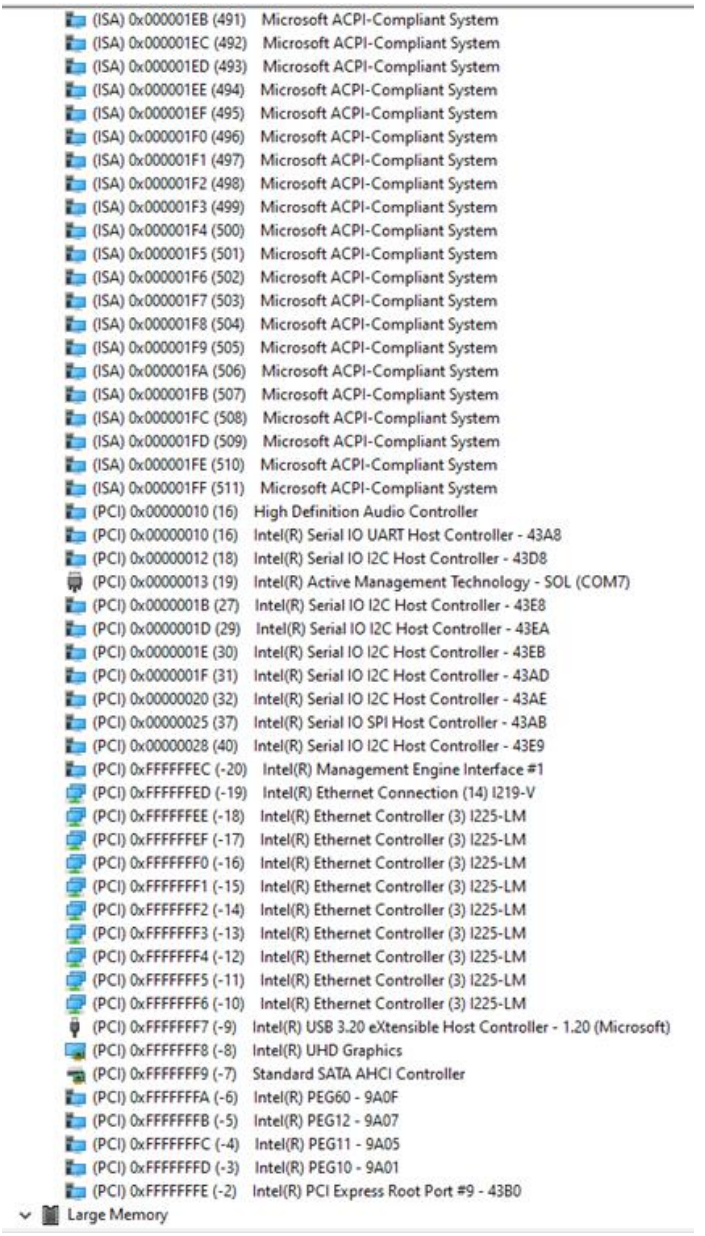
A.1 I/O Address Map

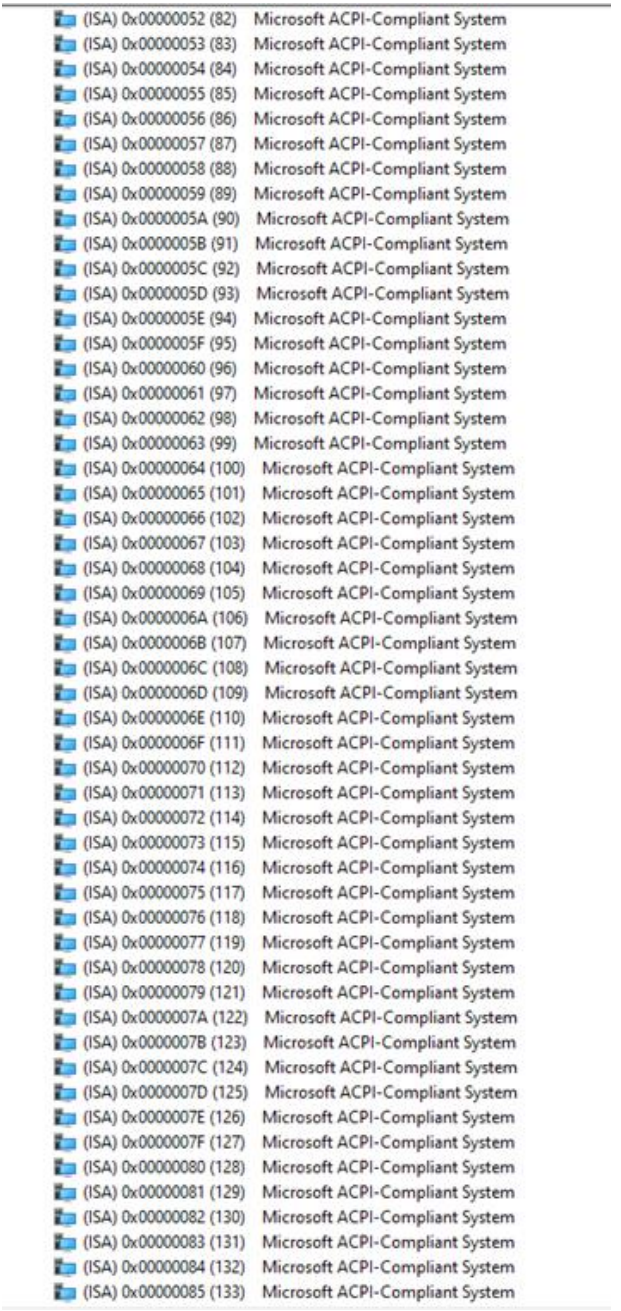


A.2 Memory Address Map



A.3 IRQ Mapping Chart




(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) 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) 0xFFFFFFEC (-20) Intel(R) Management Engine Interface #1
(PCI) 0xFFFFFFED (-19) Intel(R) Ethernet Connection (14) I219-V
(PCI) 0xFFFFFFEE (-18) Intel(R) Ethernet Controller (3) I225-LM
(PCI) 0xFFFFFFEF (-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) 0xFFFFFFFE (-2) Intel(R) PCI Express Root Port #9 - 43B0
Large Memory

Appendix B

Mating Connectors

B.1 List of Mating Connectors and Cables

Con. Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	VGA Connector	Molex	510211300	VGA cable 15cm	1709150151
CN2	FAN	Molex	22-01-2045	-	-
CN3	Audio Connector	ACES	50247-012H0H0-001	Audio Cable 25cm	170X000156 170X000517
CN4	SATA Connector	Molex	887505318	SATA Cable 15cm	1709070150
CN5	SATA Connector	Molex	887505318	SATA Cable 15cm	1709070150
CN6	LVDS / eDP Connector	HIROSE	DF13-30DS-1.25C	-	-
CN10	External +5VSB Power Input and PS_ON#	JST	PHR-3	ATX Cable	170220020B
CN11	LVDS/eDP port inverter Backlight Connector	Aces	50233-006h	-	-
CN12	SATA 5V Power	JST	JST PHR-2	SATA power cable 15cm	1702150155
CN13	Speaker (Right)	JST	JST PHR-2	-	-
CN14	Speaker (Left)	JST	JST PHR-2	-	-
CN18	Front Panel Connector	JST	SHR-10V-S-B	Front panel cable 10cm	170X000287
CN21	Touch Screen Connector	JST	SHR-9V-S-B	-	-
CN22	USB2.0 x 4 Connector	Aces	50247-020H0H0-001	USB2.0 x 4 cable	170X000390
CN24	eSPI Debug Card	JST	SHR-12V-S-B	Debug Card CABLE	1703120130
CN26	CMOS Battery Connector	Molex	51021-0200	Battery with CABLE	175011901C

Con. Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN45	COM Port 1&2 (RS232/422/485)	Aces	50247-020H0H0-001	Dual COM cable 30cm	170X000231
CN46	COM Port 3&4 (RS232 Only)	Aces	50247-020H0H0-001	Dual COM cable 30cm	170X000231
CN47	COM Port 5&6 (RS 232 Only)	Aces	50247-020H0H0-001	Dual COM cable 30cm	170X000231
CN48	DIO 16 bit	Aces	50247-018H0H0-001	-	-
CN51	9-24V input	Molex	19211-0003	Double 4P power cable 10cm	170204010R
CN29-L	LAN Connector	Molex	44915-0001	-	-
CN29-R	LAN Connector	Molex	44915-0001	-	-
CN34	FAN	Molex	22-01-2045	-	-

Appendix C

3-Pin ATX Behavior Description

C.1 3-Pin ATX Behavior Description

For board level power design, the EPIC-TGH7 supports the 3-Pin ATX Power Scheme, and there are 3 scenarios.

Single Input Power Source – AT mode

Operate as "AT" mode, which the HW design supports "Auto Power Button: Enable"

Case 1:

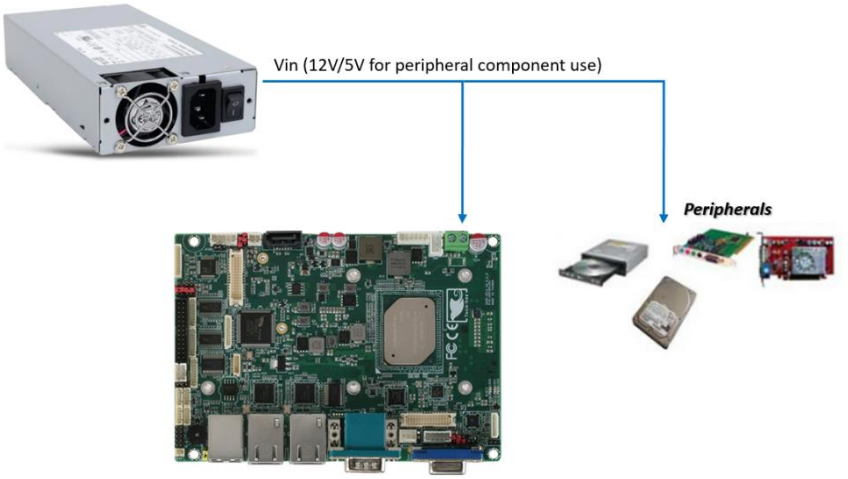
When power supply or power adapter is "powered", the system will boot up. Manually trigger PWRBTN# to turn off the computer. However, this only turns off the system, while the power source continues to supply power to the peripherals, such as cooler, SATA drive, USB ports, etc.

Case 2:

When power supply or power adapter is "powered", the system will boot up. Manually turn off the power source directly to perform computer shut down. In this case, the system is turned off, and the power source will NOT supply power to the peripherals, meaning the whole system is shut down.

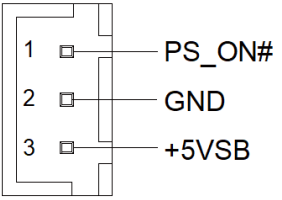
Single Input Power Source – ATX mode

Operating in "ATX mode", wherein the H/W auto power button sets: disable, you must manually trigger the power button signal in order to power up or turn off the system. In this mode, when the power supply or power source is "powered", manually trigger the PWRBTN# signal to turn on or shut down the system. However, this only turns off the system, while the power source continues to supply power to the peripherals, such as cooler, SATA drive, USB ports, etc.



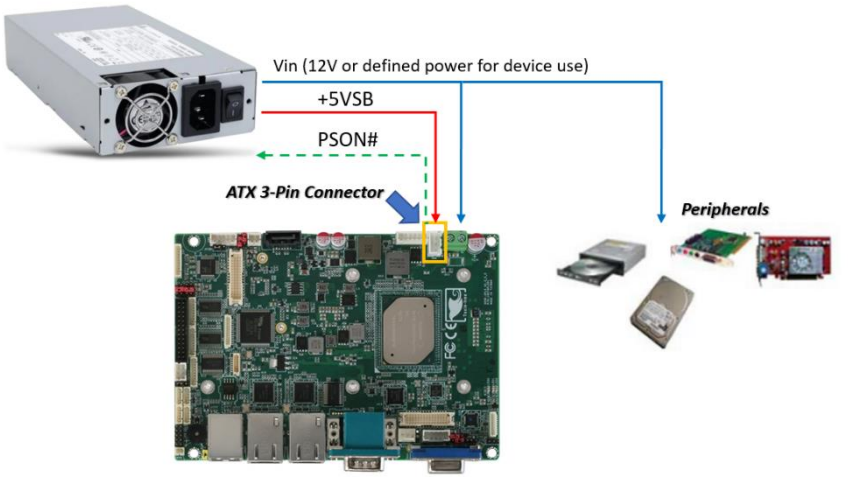
12V Input Power with 3-pin ATX External Connector

Operating in "ATX mode", manually triggering PWRBTN# is necessary to power up or shut down the system. All peripherals are powered by the S-rail powers, and S-rail powers (such as +12V and +5V), so they will power on or off with the power source.



Pin	Pin Name	Signal Type	Signal Level
1	PS_ON#	OUT	+3.3V
2	GND	GND	-
3	+5VSB	PWR	+5V

The 3-pin ATX External Connector



C.2 ATX Power Table

Type		Power Supply Unit / Turn On	Power Supply Unit / Turn Off
Single Input Power Source - AT Mode	SBC Mainboard	Powered	No Power
	External Peripherals	Powered	Powered
Single Input Power Source - ATX Mode	SBC Mainboard	Powered	No Power
	External Peripherals	Powered	Powered
12V Input Power with 3-pin ATX External Connector	SBC Mainboard	Powered	No Power
	External Peripherals	Powered	No Power