

PICO-APL4-SEMI

Pico-SEMI System

User's Manual 3rd Ed

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Packing List

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

Item	Quantity
PICO-APL4-SEMI	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 product page at AAEON.com for the latest version of this document.

Safety Precautions

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

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any 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 WHERE THE STORAGE TEMPERATURE IS BELOW -20° C (-4°F) OR ABOVE 60°C (140°F) 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.

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	○	○	○	○	○
Wires & Connectors for Ext.Connections	X	○	○	○	○	○
Chassis	○	○	○	○	○	○
CPU & RAM	X	○	○	○	○	○
HDD Drive	X	○	○	○	○	○
LCD Module	X	X	○	○	○	○
Optical Drive	X	○	○	○	○	○
Touch Control Module	X	○	○	○	○	○
PSU	X	○	○	○	○	○
Battery	X	○	○	○	○	○

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

○: 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 of 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.

Table of Contents

Chapter 1 - Product Specifications	1
1.1 Specifications	2
1.2 Block Diagram	5
Chapter 2 – Hardware Information	6
2.1 Dimensions	7
2.2 Jumpers and Connectors.....	11
2.3 List of Jumpers	14
2.3.1 Auto Power Button Enable/Disable Selection (JP1)	14
2.3.2 Clear CMOS Jumper (JP2)	14
2.4 List of Connectors.....	15
2.4.1 COM Port 2 (CN1)	16
2.4.2 COM Port 1 (CN2)	17
2.4.3 Front Panel Connector (CN3)	18
2.4.4 M.2 2230 E-Key Slot (CN4).....	18
2.4.5 M.2 2280 B-Key Slot (CN5)	21
2.4.6 SPI Flash Programming Port (CN9)	23
2.4.7 HDMI Port (CN11)	24
2.4.8 Battery (CN12).....	24
2.4.9 RJ-45 LAN Port 1 (CN13).....	25
2.4.10 RJ-45 LAN Port 2 (CN14)	25
2.4.11 USB 3.0 Ports 0 and 1 (CN15).....	26
2.4.12 +12V DC Power Jack (Optional) (CN18).....	27
2.4.13 Port 80 Debug Port (CN22)	27
2.5 Electrical Specifications for I/O Ports.....	29
Chapter 3 - AMI BIOS Setup	30
3.1 System Test and Initialization	31

3.2	AMI BIOS Setup	32
3.3	Setup Submenu: Main	33
3.4	Setup Submenu: Advanced.....	34
3.4.1	Trusted Computing	35
3.4.2	CPU Configuration	37
3.4.3	Hardware Monitor	38
3.4.4	SIO Configuration	39
3.4.4.1	Serial Port 1 Configuration.....	40
3.4.4.2	Serial Port 2 Configuration.....	41
3.4.5	GPIO Port Configuration	42
3.4.6	Power Management	43
3.5	Setup Submenu: Chipset	44
3.5.1	North Bridge	45
3.5.2	South Bridge.....	46
3.6	Setup Submenu: Security.....	47
3.7	Setup Submenu: Boot	48
3.8	Setup Submenu: Save & Exit.....	49
Chapter 4 – Drivers Installation.....		50
4.1	Driver Download/Installation	51
Appendix A - Watchdog Timer Programming.....		53
A.1	Watchdog Timer Registers	54
A.2	Watchdog Sample Program.....	55
Appendix B - I/O Information		58
B.1	I/O Address Map	59
B.2	Memory Address Map	60
B.3	IRQ Mapping Chart.....	61
Appendix C – Mating Connectors		64
C.1	List of Mating Connectors and Cables.....	65

Appendix D – Quick Installation Guide 66

D.1 Drive Installation 67

 D.1.1 M.2 2230 Card Installation 68

 D.1.2 M.2 2280 Card Installation 69

Chapter 1

Product Specifications

1.1 Specifications

System

Form Factor	PICO-SEMI
Processor	Intel® Pentium® Processor N4200 (4C/4T, 1.1 GHz, up to 2.5 GHz, TDP 6W) Intel® Celeron® Processor N3350 (2C/2T, 1.1 GHz, up to 2.4 GHz, TDP 6W)
Chipset	Intel® SoC
Memory Type	Onboard DDR3L 1866, Single Channel, Non-ECC
BIOS	UEFI
Wake on LAN	Yes
Watchdog Timer	255 Levels
Security	-
RTC Battery	Lithium Battery 3V/240mAh
Dimension (L x W x H)	4.80" x 3.18" x 1.98" (122mm x 80.8mm x 50.4mm)
Weight	0.88 lb. (0.4Kg)
OS Support	Windows® 10 (64-bit) Linux Ubuntu 16.04.2/Kernel 4.8.0-36

Power

Power Requirement	+12V
Power Supply Type	ATX
Connector	DC Jack Connector
Power Consumption	Intel® Pentium® Processor N4200, DDR3L 4GB; 1.18A @+12V

Display

Controller	Intel® HD Graphics 500/505
LVDS/eDP	-
Display Interface	HDMI 1.4b x 1 (up to 3840 x 2160 @30Hz)
Multiple Display	-

Audio

Codec	-
Audio Interface	-
Speaker	-

External I/O

Ethernet	10/100/1000Base RJ-45 x 2 (Realtek RTL8111H-CG)
USB	USB 3.2 Gen 1 x 2
Serial Port	COM 1: RS-232 x 1 (Optional) COM 2: RS-232/422/485 x 1 (Ring/+5V/+12V) (Optional)
Video	HDMI 1.4b x 1 (up to 3840 x 2160 @30Hz)

Internal I/O

USB	-
Serial Port	-
Video	-
Storage	eMMC 32GB (Optional: 16GB/64GB)
Audio	-
GPIO	-
SMBus/I2C	-
Fan	-
SIM	-

Internal I/O

Front Panel	HDD LED, PWR LED, Power Button, Buzzer, Reset
Other	-

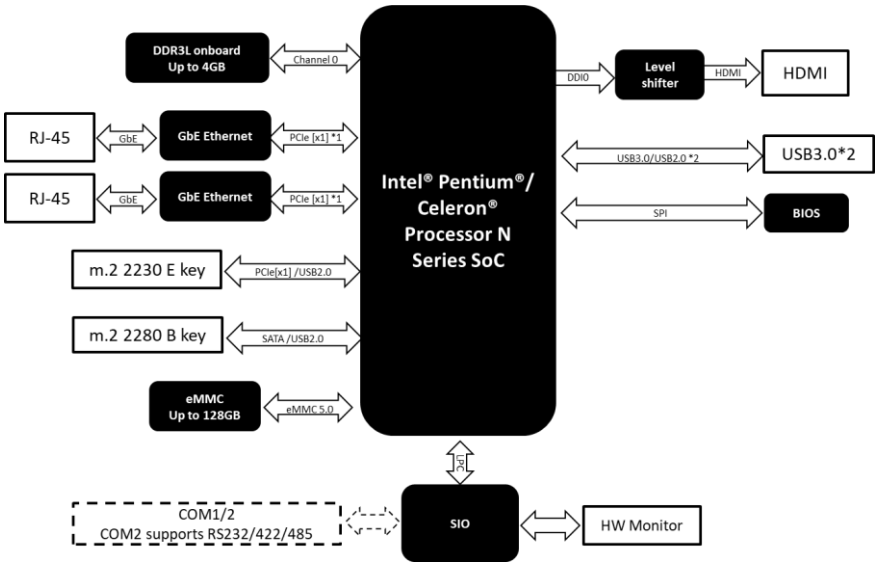
Expansion

Mini PCIe/ mSATA	-
M.2	M.2 2280 B-Key x 1 (SATA + USB 2.0) M.2 2230 E-Key x 1 (PCIe 3.0 [x1] + USB 2.0)
Other	-

Environmental & Certification

Operating Temperature	32°F ~ 122°F (0°C ~ 50°C) with 0.5 m/s airflow
Storage Temperature	-40°F ~ 185°F (-40°C ~ 85°C)
Operating Humidity	0% ~ 90% relative humidity, non-condensing
MTBF (Hours)	191,895
EMC	CE/FCC Class A

1.2 Block Diagram

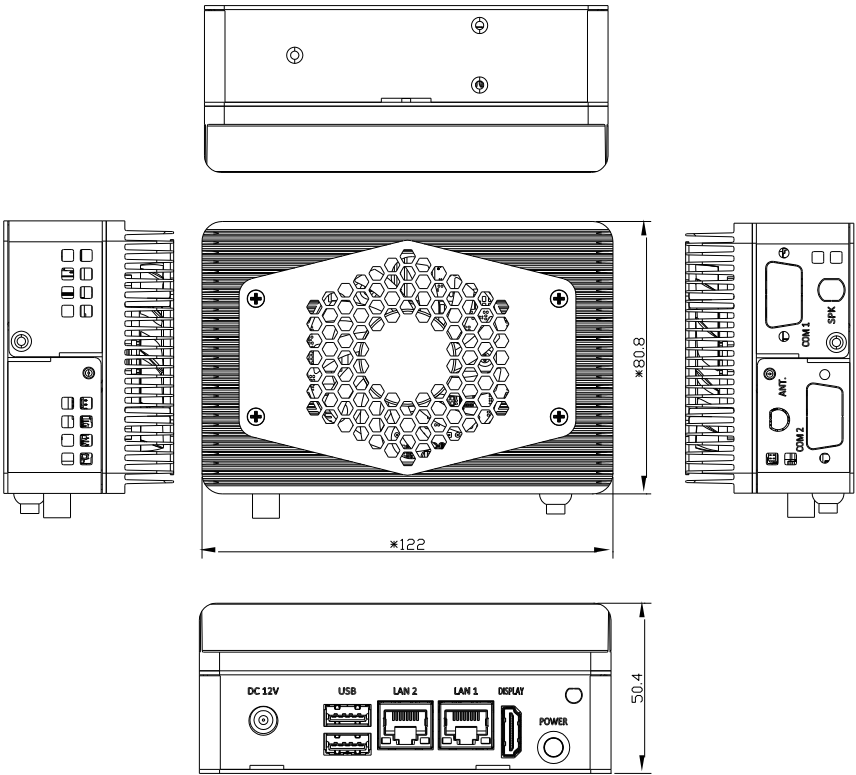


Chapter 2

Hardware Information

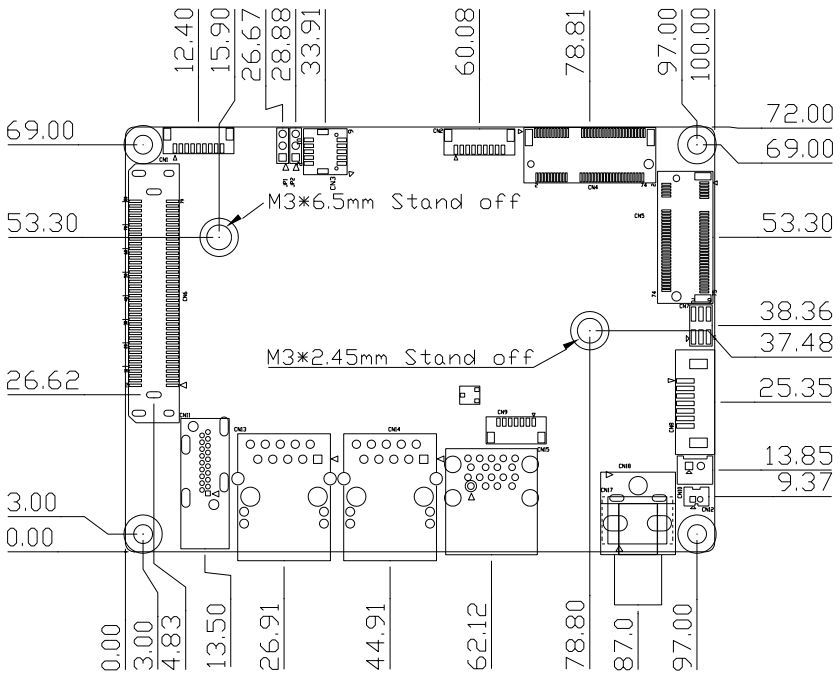
2.1 Dimensions

System

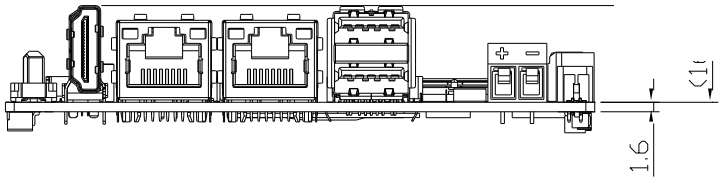


Board

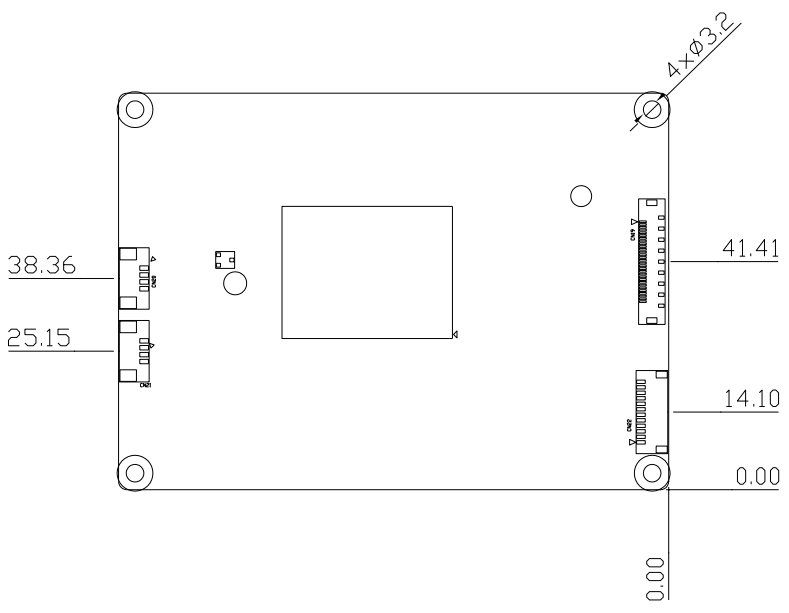
Component Side



Component Side



Solder Side



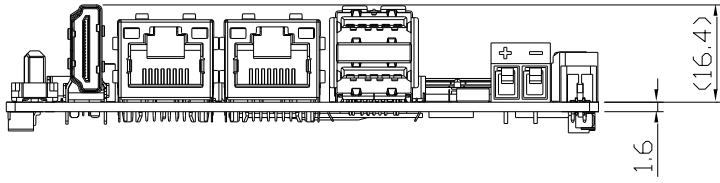
Solder Side

Rear I/O Configuration

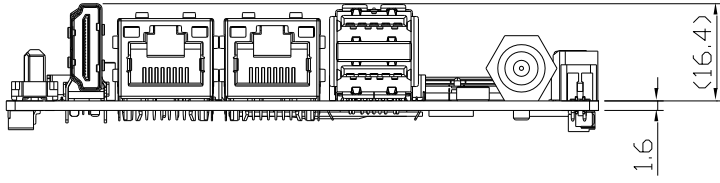
PICO-SEMI System

PICO-APL4-SEMI

Phoenix

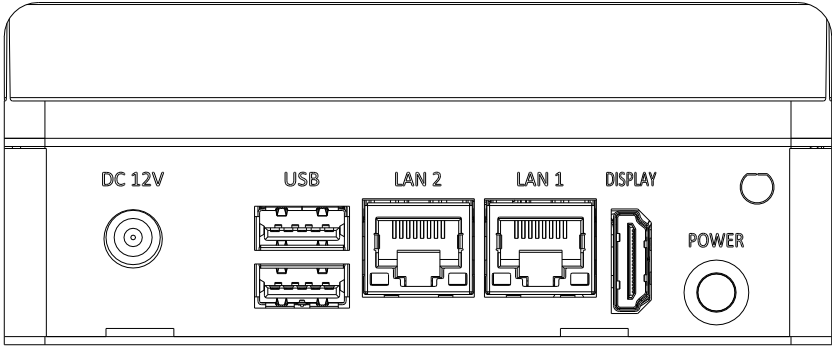


DC Jack

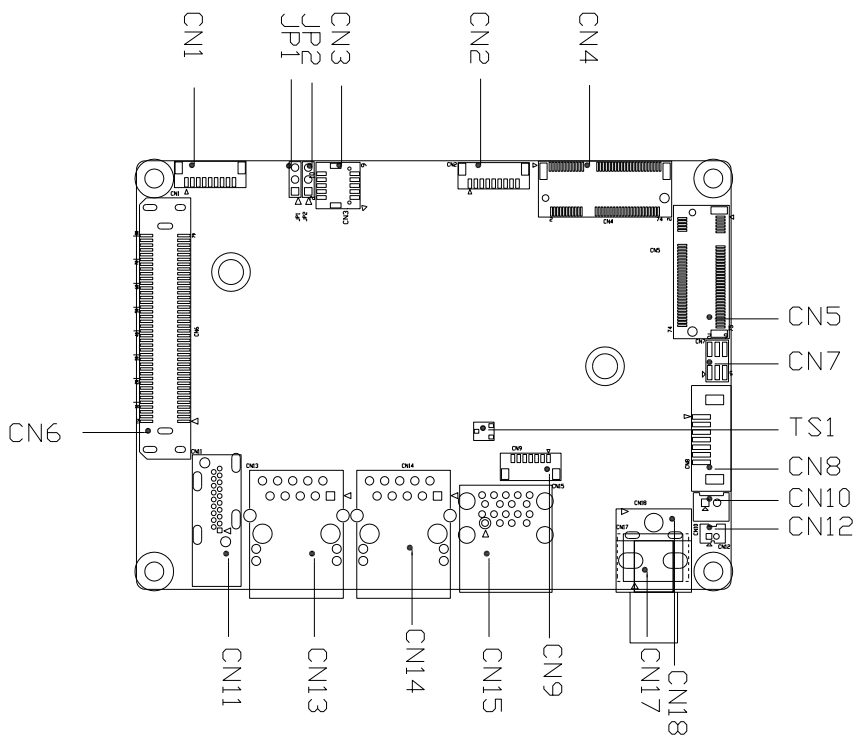


2.2 Jumpers and Connectors

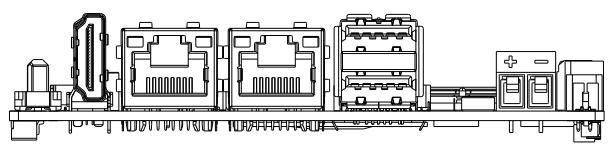
System

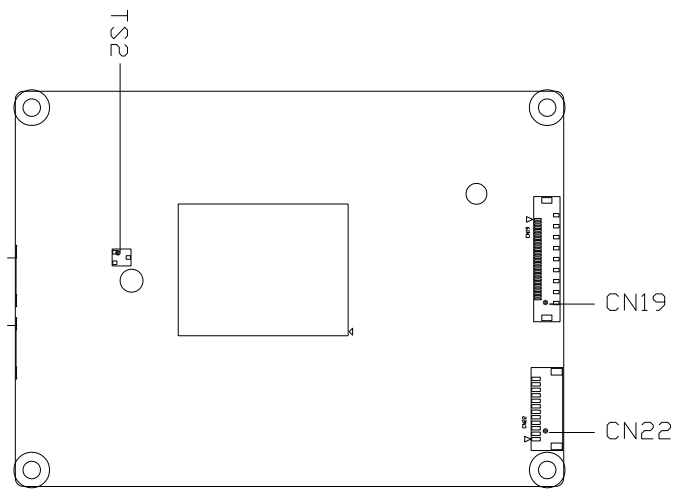


Board



Component Side





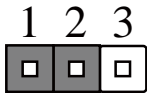
Solder Side

2.3 List of Jumpers

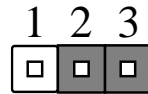
Please refer to the table below for all of the board's jumpers that you can configure for your application

Label	Function
JP1	Auto Power Button Enable/Disable Selection
JP2	Clear CMOS Jumper

2.3.1 Auto Power Button Enable/Disable Selection (JP1)



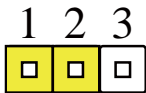
Enable/AT



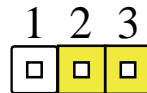
Disable/ATX (Default)

Note: When disabled, the power button of CN3 (1-2) will be used to power on the system.

2.3.2 Clear CMOS Jumper (JP2)



Normal (Default)



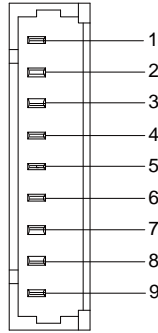
Clear CMOS

2.4 List of Connectors

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

Label	Function
CN1	COM Port 2
CN2	COM Port 1
CN3	Front Panel Connector
CN4	M.2 2230 E-Key Slot
CN5	M.2 2280 B-Key Slot
CN9	SPI Flash Programming Port
CN11	HDMI Port
CN12	Battery
CN13	RJ-45 LAN Port 1
CN14	RJ-45 LAN Port 2
CN15	USB 3.0 Ports 0 and 1
CN18	+12V DC Power Jack (Optional)
CN22	Port 80 Debug Port

2.4.1 COM Port 2 (CN1)



RS-232			
Pin	Pin Name	Signal Type	Signal Level
1	DCD2	IN	
2	DSR2	IN	
3	RX2	IN	
4	RTS2	OUT	+5V
5	TX2	OUT	+5V
6	CTS2	IN	
7	DTR2	OUT	+5V
8	RI2/+5V/+12V	IN	+5V/+12V
9	GND	GND	

RS-485			
Pin	Pin Name	Signal Type	Signal Level
1	RS485_D2-	I/O	+5V
2	NC		
3	RS485_D2+	I/O	+5V
4	NC		
5	NC		
6	NC		
7	NC		
8	NC/+5V/+12V	PWR	+5V/+12V

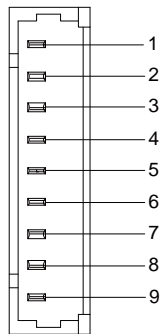
RS-485			
Pin	Pin Name	Signal Type	Signal Level
9	GND	GND	

RS-422			
Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX2-	OUT	+5V
2	NC		
3	RS422_TX2+	OUT	+5V
4	NC		
5	RS422_RX2+	IN	
6	NC		
7	RS422_RX2-	IN	
8	NC/+5V/+12V	PWR	+5V/+12V
9	GND	GND	

Note: COM 2 RS-232/422/485 can be set by BIOS setting. Default is RS-232.

Note: Pin 8 function can be changed by BOM.

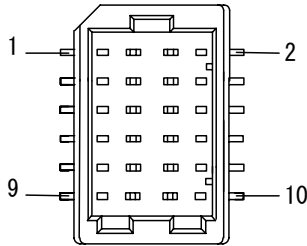
2.4.2 COM Port 1 (CN2)



RS-232			
Pin	Pin Name	Signal Type	Signal Level
1	DCD1	IN	
2	DSR1	IN	

RS-232			
Pin	Pin Name	Signal Type	Signal Level
3	RX1	IN	
4	RTS1	OUT	+9V
5	TX1	OUT	+9V
6	CTS1	IN	
7	DTR1	OUT	+9V
8	RI1	IN	
9	GND	GND	

2.4.3 Front Panel Connector (CN3)



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

2.4.4 M.2 2230 E-Key Slot (CN4)

Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	+3.3VSB	PWR	+3.3V
3	USB_D+	DIFF	

Pin	Pin Name	Signal Type	Signal Level
4	+3.3VSB	PWR	+3.3V
5	USB_D-	DIFF	
6	NC		
7	GND	GND	
8	NC		
9	NC		
10	NC		
11	NC		
12	NC		
13	NC		
14	NC		
15	NC		
16	NC		
17	NC		
18	NC		
19	NC		
20	NC		
21	NC		
22	NC		
23	NC		
32	NC		
33	GND	GND	
34	NC		
35	PCIE_TX+	DIFF	
36	NC		
37	PCIE_TX-	DIFF	
38	NC		
39	GND	GND	
40	NC		
41	PCIE_RX+	DIFF	
42	NC		
43	PCIE_RX-	DIFF	
44	NC		

Pin	Pin Name	Signal Type	Signal Level
45	GND	GND	
46	NC		
47	PCIE_REF_CLK+	DIFF	
48	NC		
49	PCIE_REF_CLK-	DIFF	
50	NC		
51	GND	GND	
52	PCIE_RST#	OUT	+3.3V
53	PCIE_CLK_REQ#	IN	+3.3V
54	W_DISABLE2#	OUT	+3.3V
55	PCIE_WAKE#	IN	+3.3V
56	W_DISABLE1#	OUT	+3.3V
57	GND	GND	
58	NC		
59	NC		
60	NC		
61	NC		
62	NC		
63	GND	GND	
64	NC		
65	NC		
66	+3.3VSB	PWR	+3.3V
67	NC		
68	NC		
69	GND	GND	
70	NC		
71	NC		
72	+3.3VSB	PWR	+3.3V
73	NC		
74	+3.3VSB	PWR	+3.3V
75	GND	GND	

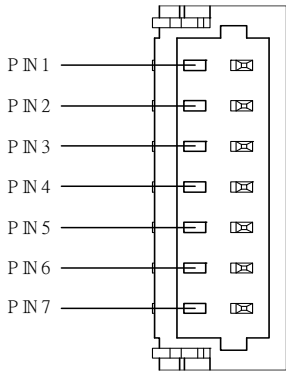
2.4.5 M.2 2280 B-Key Slot (CN5)

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	GND	GND	
6	NC		
7	USB_D+	DIFF	
8	NC		
9	USB_D-	DIFF	
10	SSD_DAS#	IN	+3.3V
11	NC		
20	NC		
21	GND	GND	
22	NC		
23	NC		
24	NC		
25	NC		
26	NC		
27	GND	GND	
28	NC		
29	NC		
30	NC		
31	NC		
32	NC		
33	GND	GND	
34	NC		
35	NC		
36	NC		
37	NC		
38	DEVSLP	OUT	+1.8V

Pin	Pin Name	Signal Type	Signal Level
39	GND	GND	
40	NC		
41	SATA_RX+	DIFF	
42	NC		
43	SATA_RX-	DIFF	
44	NC		
45	GND	GND	
46	NC		
47	SATA_TX-	DIFF	
48	NC		
49	SATA_TX+	DIFF	
50	NC		
51	GND	GND	
52	NC		
53	NC		
54	NC		
55	NC		
56	NC		
57	GND	GND	
58	NC		
59	NC		
60	NC		
61	NC		
62	NC		
63	GND	GND	
64	NC		
65	NC		
66	NC		
67	NC		
68	NC		
69	GND	GND	
70	+3.3V	PWR	+3.3V
71	GND	GND	

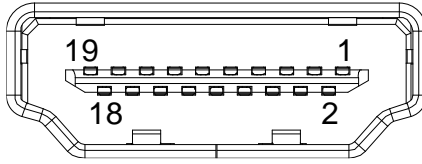
Pin	Pin Name	Signal Type	Signal Level
72	+3.3V	PWR	+3.3V
73	GND	GND	
74	+3.3V	PWR	+3.3V
75	GND	GND	

2.4.6 SPI Flash Programming Port (CN9)



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

2.4.7 HDMI Port (CN11)

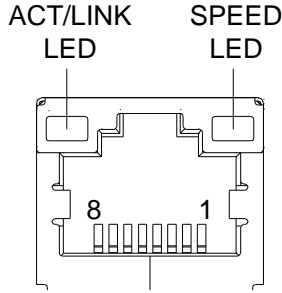


Pin	Pin Name	Signal Type	Signal Level
1	TMDS_DAT2+	DIFF	
2	GND	GND	
3	TMDS_DAT2-	DIFF	
4	TMDS_DAT1+	DIFF	
5	GND	GND	
6	TMDS_DAT1-	DIFF	
7	TMDS_DAT0+	DIFF	
8	GND	GND	
9	TMDS_DAT0-	DIFF	
10	TMDS_CLK+	DIFF	
11	GND	GND	
12	TMDS_CLK-	DIFF	
13	NC		
14	NC		
15	DDC_CLK	I/O	+5V
16	DDC_DATA	I/O	+5V
17	GND	GND	
18	+5V	I/O	+5V
19	HPLG_DETECT	IN	

2.4.8 Battery (CN12)

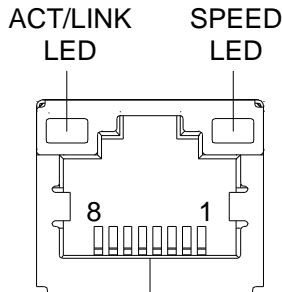
Pin	Pin Name	Signal Type	Signal Level
1	+3.3V	PWR	3.3V
2	GND	GND	

2.4.9 RJ-45 LAN Port 1 (CN13)



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

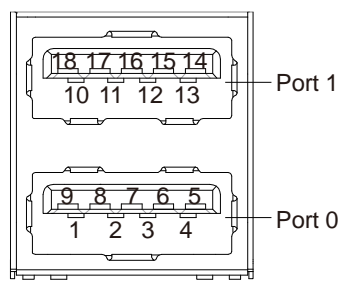
2.4.10 RJ-45 LAN Port 2 (CN14)



Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	

Pin	Pin Name	Signal Type	Signal Level
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

2.4.11 USB 3.0 Ports 0 and 1 (CN15)



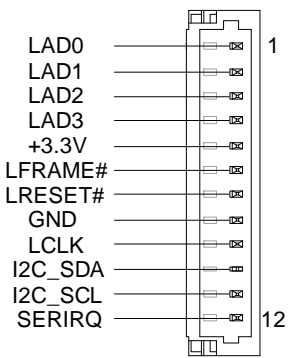
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB0_D-	DIFF	
3	USB0_D+	DIFF	
4	GND	GND	
5	USB0_SSRX-	DIFF	
6	USB0_SSRX+	DIFF	
7	GND	GND	
8	USB0_SSTX-	DIFF	
9	USB0_SSTX+	DIFF	
10	+5VSB	PWR	+5V
11	USB1_D-	DIFF	
12	USB1_D+	DIFF	
13	GND	GND	
14	USB1_SSRX-	DIFF	
15	USB1_SSRX+	DIFF	

Pin	Pin Name	Signal Type	Signal Level
16	GND	GND	
17	USB1_SSTX-	DIFF	
18	USB1_SSTX+	DIFF	

2.4.12 +12V DC Power Jack (Optional) (CN18)

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

2.4.13 Port 80 Debug Port (CN22)



Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V

Pin	Pin Name	Signal Type	Signal Level
8	GND	GND	
9	LCLK	OUT	
10	I2C0_SDA	I/O	+3.3V
11	I2C0_SCL	OUT	+3.3V
12	SERIRQ	I/O	+3.3V

2.5 Electrical Specifications for I/O Ports

I/O	Reference	Signal Name	Rate Output
COM Port 2	CN1	+5V/+12V	+5V/0.5A or +12V/0.5A
M.2 2230 E-Key Slot	CN4	+3.3VSB	+3.3V/2A
M.2 2280 B-Key Slot	CN5	+3.3V	+3.3V/2.5A
USB Ports 0 and 1	CN15	+5VSB	+5V/1A (per channel)

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 PICO-APL4 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.

Chipset

Host bridge parameters.

Security

Set setup administrator password.

Boot

Enables/disables quiet boot option.

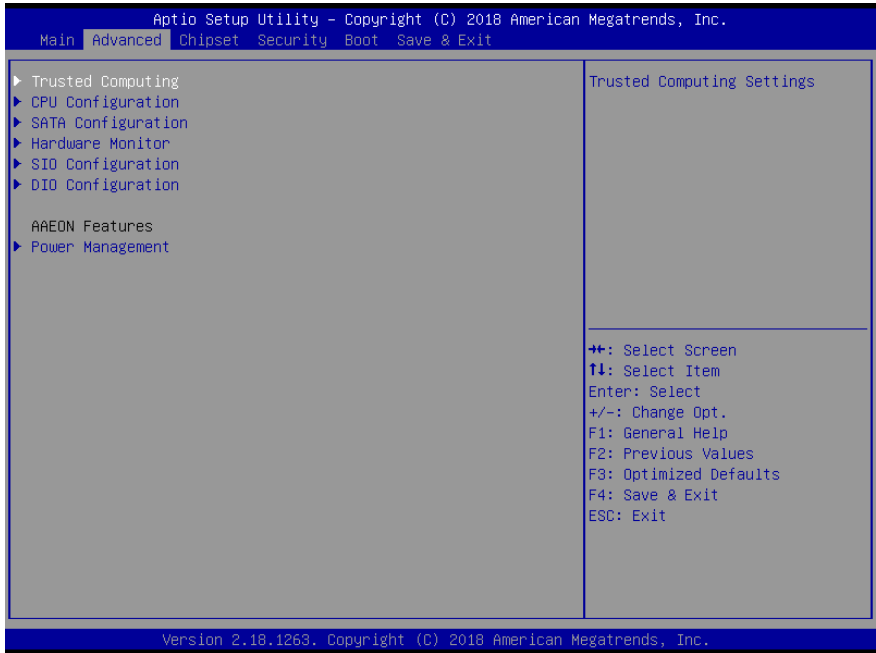
Save & Exit

Exit system setup after saving the changes.

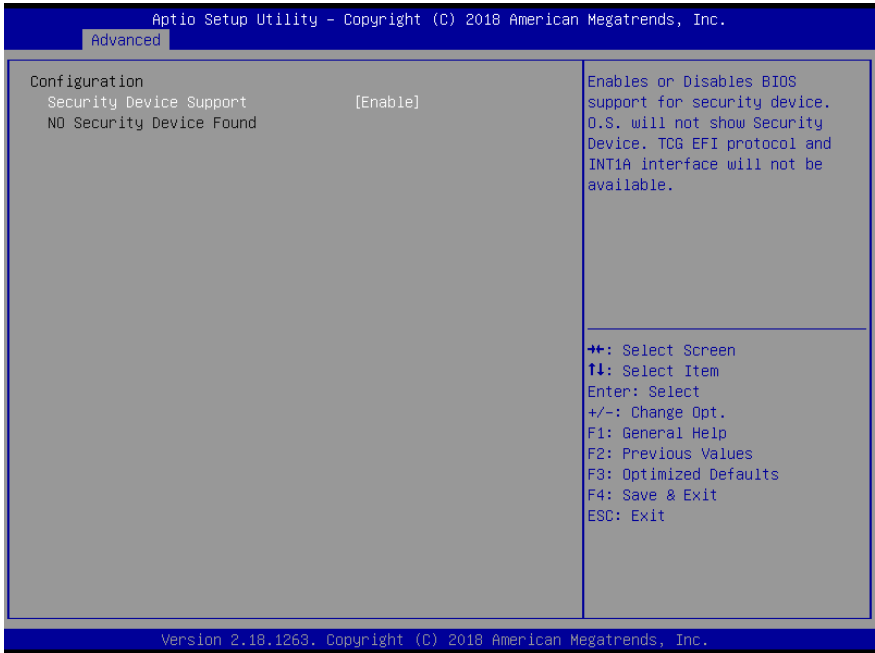
3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced



3.4.1 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.		

3.4.2 CPU Configuration

Aptio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.

Advanced

<p>CPU Configuration</p> <p>Intel(R) Pentium(R) CPU N4200 @ 1.10GHz CPU Signature: 506C9 Microcode Patch: 2E Max CPU Speed: 1100 MHz Min CPU Speed: 800 MHz Processor Cores: 4 64-bit: Supported Intel HT Technology: Not Supported Intel VT-x Technology: Supported</p> <p>L1 Data Cache: 24 kB x 4 L1 Code Cache: 32 kB x 4 L2 Cache: 1024 kB x 2 L3 Cache: Not Present</p> <p>C-States: [Enabled] EIST: [Enabled] Turbo Mode: [Enabled] Intel Virtualization Technology: [Enabled] VT-d: [Disabled] Power Limit 1 Enable: [Disabled]</p>	<p>Enable/Disable C States</p> <p>++: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F3: Optimized Defaults F4: Save & Exit ESC: Exit</p>
--	---

Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.

Options Summary		
C-States	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable C States.		
EIST™	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable Intel SpeedStep.		
Turbo Mode	Disabled	
	Enabled	Optimal Default, Failsafe Default
Turbo Mode.		
Intel Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		
VT-d	Disabled	Optimal Default, Failsafe Default
	Enabled	

Options Summary		
Enable/Disable CPU VT-d.		
Power Limit 1 Enable	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable Power Limit 1.		

3.4.3 Hardware Monitor

```

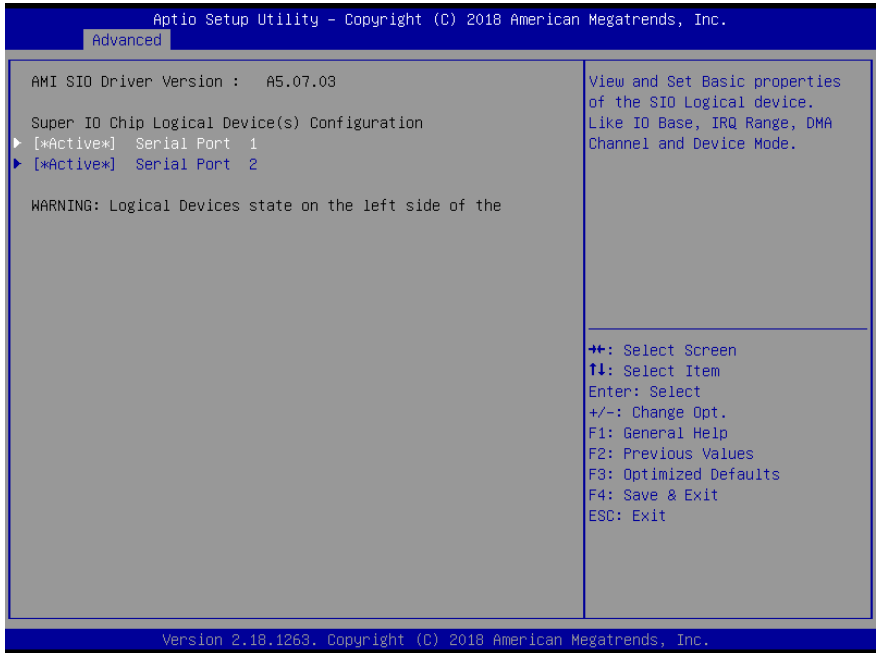
Aprio Setup Utility - Copyright (C) 2018 American Megatrends, Inc.
  Advanced
  -----
Pc Health Status

CPU Temperature(DTS)           : +40 ℃
THERMAL_SRC1(T1)               : +30 ℃
THERMAL_SRC2(T2)               : +27 ℃
VDCORE                         : +0.760 V
VMEM                           : +1.360 V
+3.3V                          : +3.280 V
VBAT                           : +3.200 V

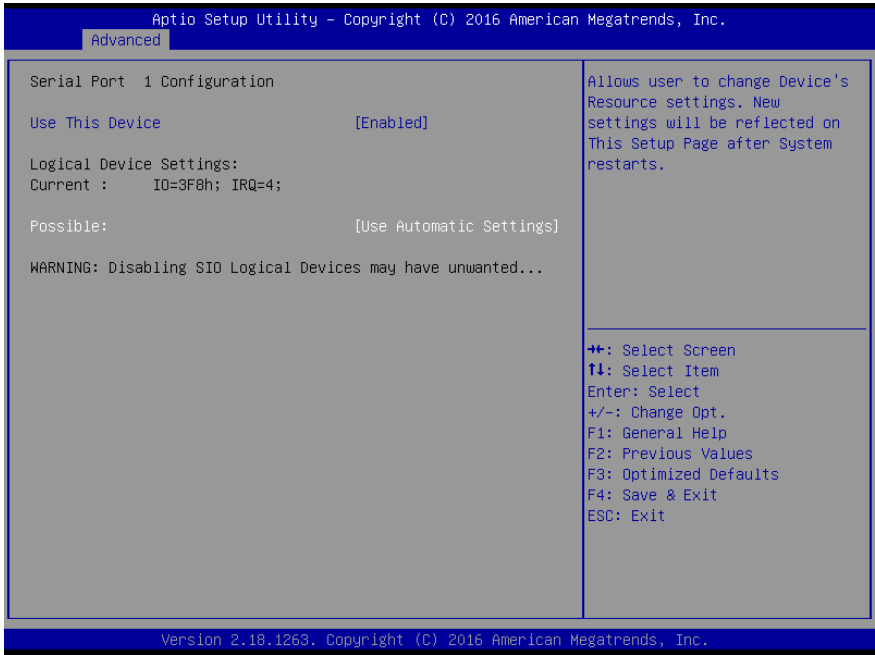
++: Select Screen
t1: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit

Version 2.18.1263. Copyright (C) 2018 American Megatrends, Inc.
  
```

3.4.4 SIO Configuration

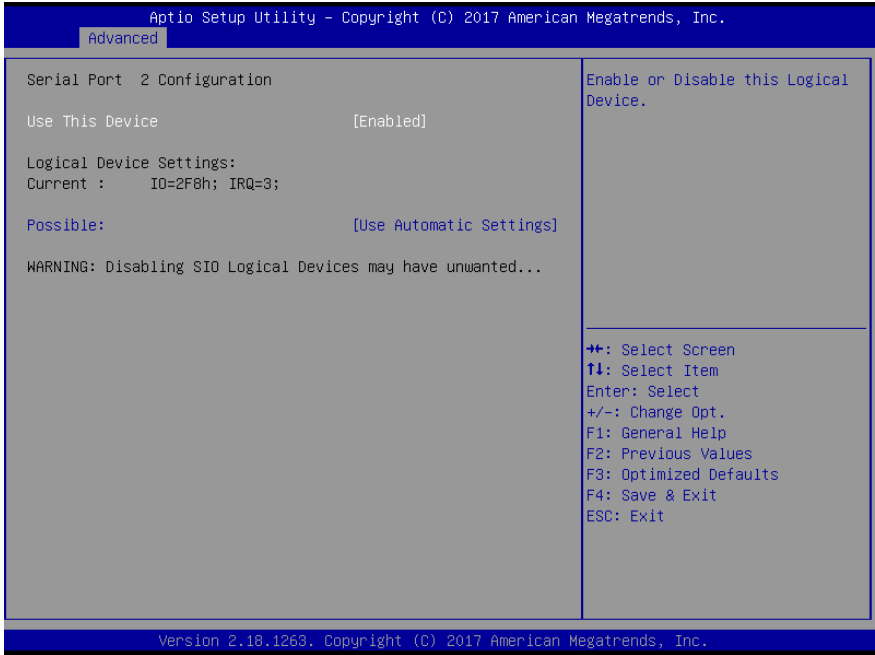


3.4.4.1 Serial Port 1 Configuration



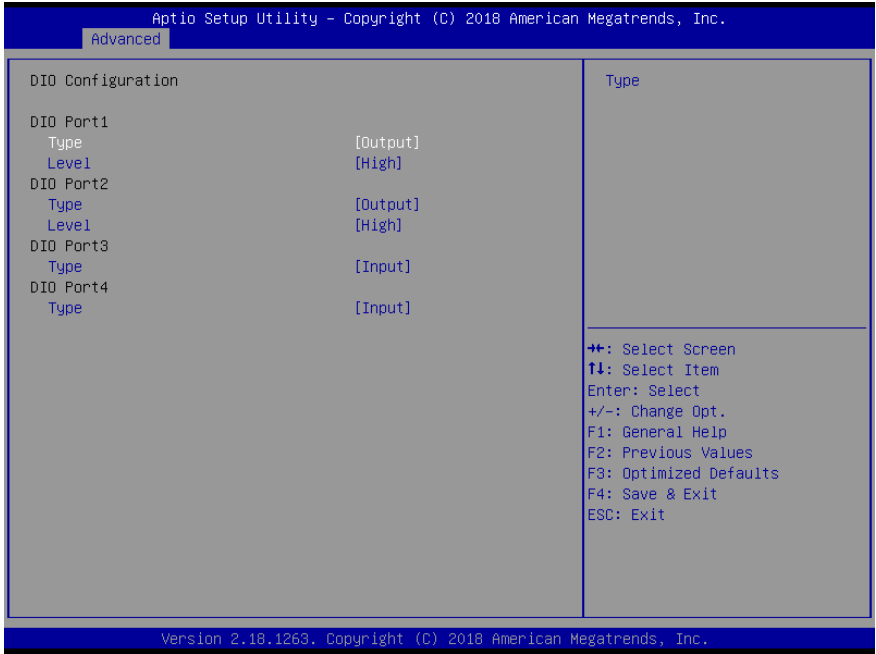
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8h; IRQ=4	
	IO=2F8h; IRQ=3	
Allows user to change Device's Resource settings. New settings will be reflected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

3.4.4.2 Serial Port 2 Configuration



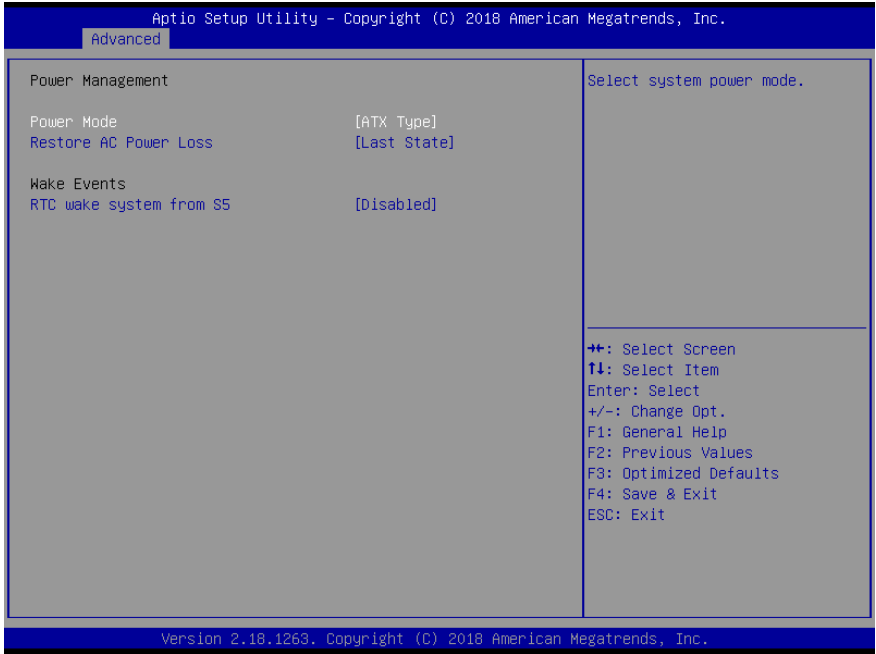
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's Resource settings. New settings will be reflected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

3.4.5 GPIO Port Configuration



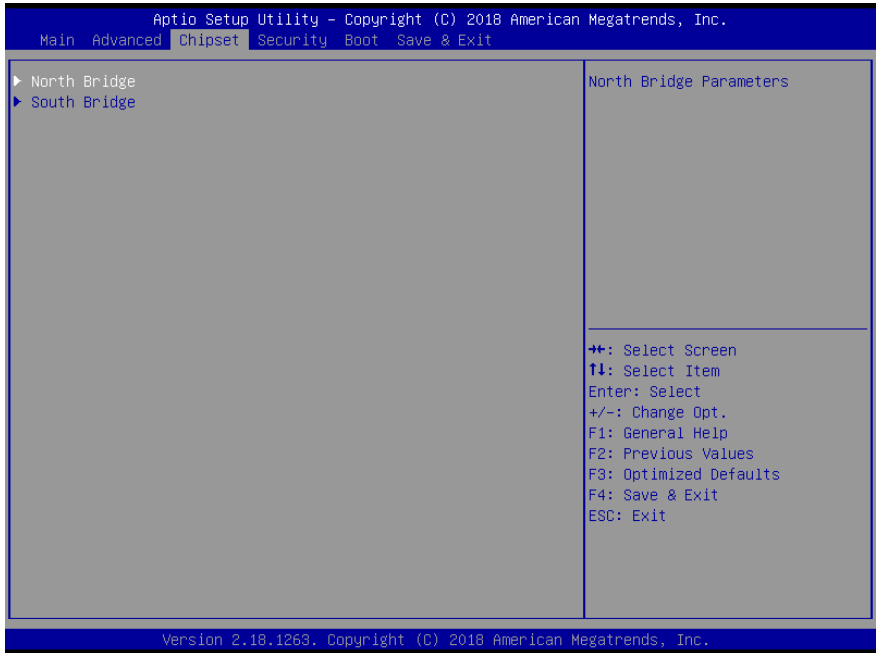
Options Summary		
GPIO Port*	Output	
	Input	
Set GPIO as Input or Output.		
Output Level	High	Optimal Default, Failsafe Default
	Low	
Set output level when GPIO pin is Output.		

3.4.6 Power Management

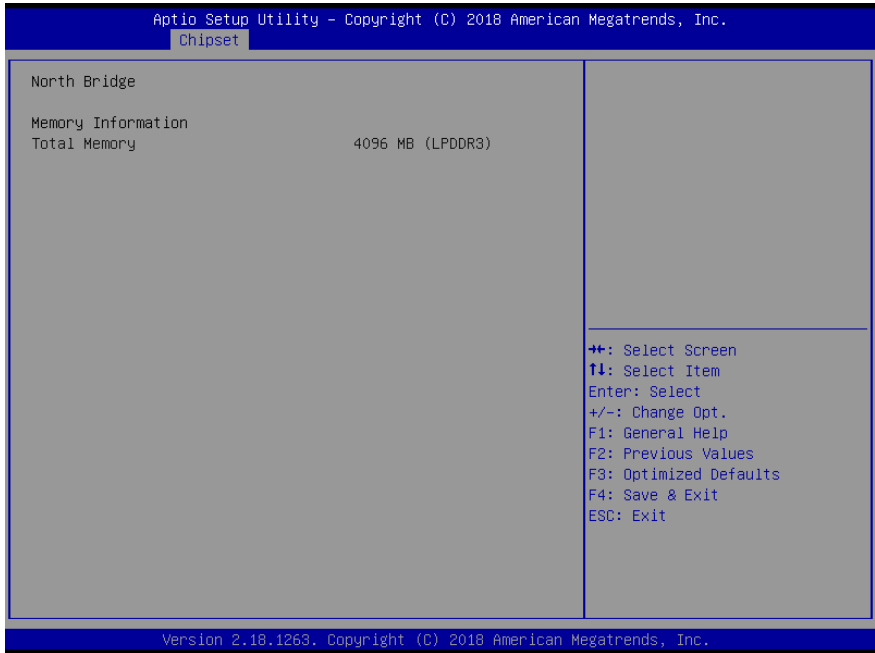


Options Summary		
Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select system power mode.		
Restore AC Power Loss	Last State	Optimal Default, Failsafe Default
	Always On	
	Always Off	
RTC wake system from S5		
RTC wake system from S5	Disable	Optimal Default, Failsafe Default
	Fixed Time	
Fixed Time: System will wake on the hr::min::sec specified.		

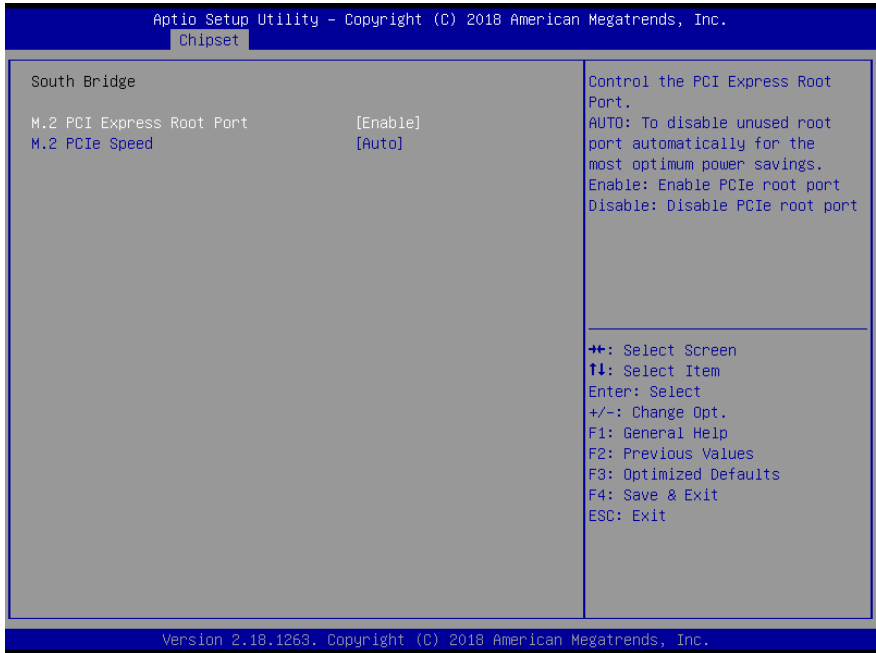
3.5 Setup Submenu: Chipset



3.5.1 North Bridge

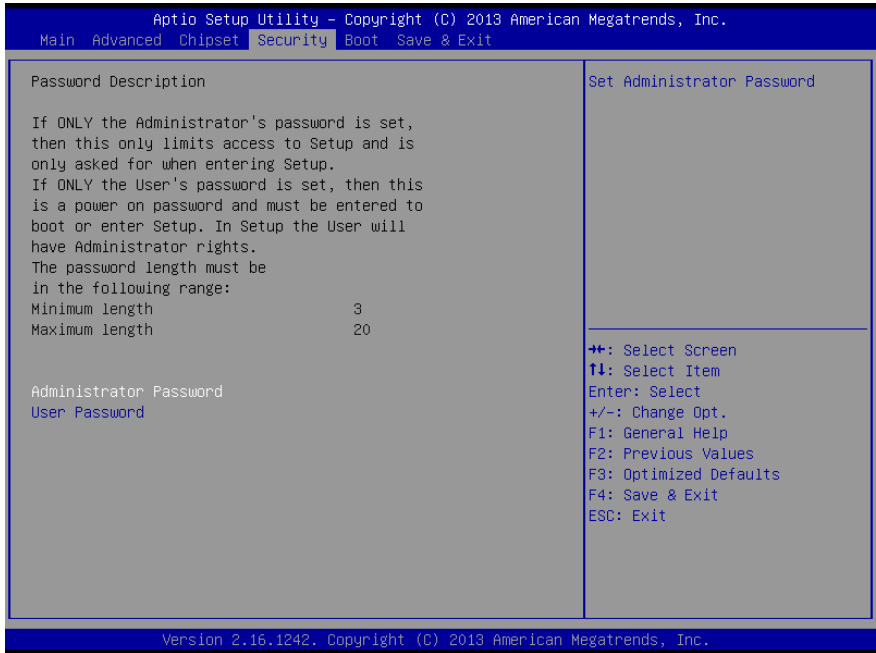


3.5.2 South Bridge



Options Summary		
M.2 PCI Express Root Port	Disable	
	Enable	Optimal Default, Failsafe Default
	Auto	
Control the PCI Express Root Port. AUTO: To disable unused root port automatically for the most optimum power savings. Enable: Enable PCIe root port. Disable: Disable PCIe root port.		
M.2 PCIe Speed	Auto	Optimal Default, Failsafe Default
	Gen1	
	Gen2	
Configure PCIe Speed.		

3.6 Setup Submenu: Security



Change User/Supervisor Password

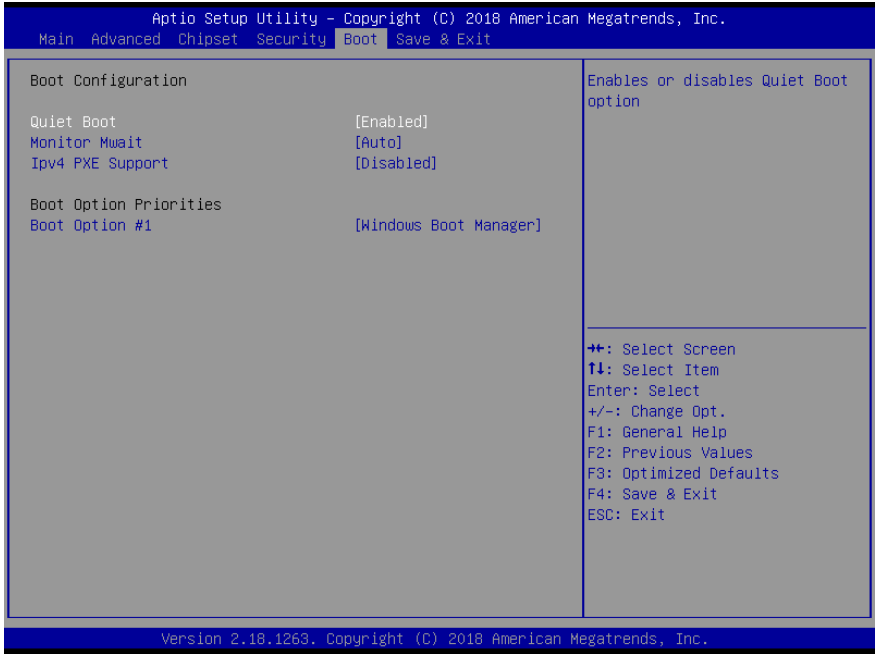
You can install a Supervisor password, and if you install a supervisor password, you can then install a user password. A user password does not provide access to many of the features in the Setup utility.

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

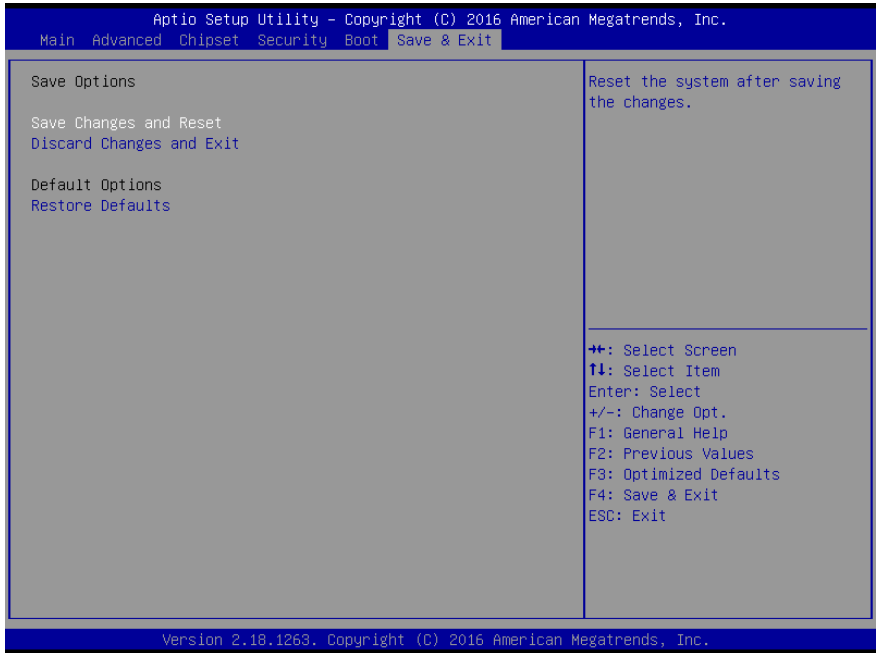
Highlight this item and type in the current password. At the next dialog box press Enter to disable password protection.

3.7 Setup Submenu: Boot



Options Summary		
Quiet Boot	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable showing boot logo.		
Monitor Mwait	Disable	
	Enabled	
	Auto	Optimal Default, Failsafe Default
Enable/Disable Monitor Mwait. To install Linux OS, please set this item to disable.		
Ipv4 PXE Support	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot option will not be created.		

3.8 Setup Submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Driver Download/Installation

Drivers for the PICO-APL4-SEMI can be downloaded from the product page on the AAEON website by following this link:

<https://www.aaeon.com/en/p/pico-itx-boards-pico-apl4-semi>

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

Install Chipset Driver

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

Install Graphics Driver

1. Open the **Graphics Driver** folder and open the **Setup.exe** file
2. Follow the instructions
3. Driver will be installed automatically

Install LAN Driver

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

Install Audio Driver

1. Open the **Audio Driver** folder and open the **0006-64bit_Win7_Win8_Win81_Win10_R279.exe** file
2. Follow the instructions
3. Driver will be installed automatically

Install TXE Driver

1. Open the **ME & TXE Driver** folder and open the **SetupTXE.exe** file
2. Follow the instructions
3. Driver will be installed automatically

Install Peripheral Driver

1. Open the **ME & TXE Driver** folder and open the **F81xxx_HWmon_Driver_User_Guide** file
2. Follow the instructions to install drivers manually

Appendix A

Watchdog Timer Programming

A.1 Watchdog Timer Registers

Table 1: Watchdog Relative IO Address

	Default Value	Note
I/O Base Address	0x2E	I/O Base address for Watchdog operation. This address is assigned by SIO LDN7

Table 2: Watchdog Relative Register Table

Register	Offset	BitNum	Value	Note
Watchdog WDTRST# Enable	0x00	7	1	Enable/Disable time out output via WDTRST# 0: Disable 1: Enable
Pulse Width	0x05	0:1	01	Width of Pulse signal 00: 1ms (do not use) 01: 25ms 10: 125ms 11: 5s <i>Pulse width is must longer then 16ms.</i>
Signal Polarity	0x05	2	0	0: low active 1: high active <i>Must set this bit to 0</i>
Counting Unit	0x05	3	0	Select time unit. 0: second 1: minute
Output Signal Type	0x05	4	1	0: Level 1: Pulse <i>Must set this bit to 1</i>
Watchdog Timer Enable	0x05	5	1	0: Disable 1: Enable
Timeout Status	0x05	6	1	1: timeout occurred. Write a 1 to clear timeout status
Timer Counter	0x06			Time of watchdog timer (0~255)

A.2 Watchdog Sample Program

```
*****
// WDT I/O operation relative definition (Please reference to Table 1)
#define WDTAddr    0x510 // WDT I/O base address
Void WDTWriteByte(byte Register, byte Value);
byte WDTReadByte(byte Register);
Void WDTSetReg(byte Register, byte Bit, byte Val);
// Watch Dog relative definition (Please reference to Table 2)
#define DevReg     0x00 // Device configuration register
    #define WDRstBit 0x80 // Watchdog WDTRST# (Bit7)
    #define WDRstVal 0x80 // Enabled WDTRST#
#define TimerReg   0x05 // Timer register
    #define PSWidthBit 0x00 // WDTRST# Pulse width (Bit0:1)
    #define PSWidthVal 0x01 // 25ms for WDTRST# pulse
    #define PolarityBit 0x02 // WDTRST# Signal polarity (Bit2)
    #define PolarityVal 0x00 // Low active for WDTRST#
    #define UnitBit    0x03 // Unit for timer (Bit3)
    #define ModeBit    0x04 // WDTRST# mode (Bit4)
    #define ModeVal    0x01 // 0:level 1: pulse
    #define EnableBit  0x05 // WDT timer enable (Bit5)
    #define EnableVal  0x01 // 1: enable
    #define StatusBit  0x06 // WDT timer status (Bit6)
#define CounterReg 0x06 // Timer counter register
*****

VOID Main() {
    // Procedure : AaeonWDTConfig
    // (byte)Timer : Counter of WDT timer.(0x00~0xFF)
    // (boolean)Unit : Select time unit(0: second, 1: minute).
    EnterSIOconfig();
    SetWDT();
    AaeonWDTConfig(Counter, Unit);
    // Procedure : AaeonWDTEnable
    // This procedure will enable the WDT counting.
    AaeonWDTEnable();
    ExitSIOconfig();
}
*****
```

```

*****
// Procedure : AaeonWDTEnable
VOID EnterSIOconfig (){
    IOWriteByte (IoConfAddr,0x87);
    IOWriteByte (IoConfAddr,0x87);
}

VOID ExitSIOconfig (){
    IOWriteByte (IoConfAddr,0xAA);
}

VOID SetWDT ()
    IOWriteByte (IoConfAddr,0x2B);
    IOWriteByte(IoConfAddr+1, (IOReadByte(IoConfAddr+1)&0xFC));
}

// Procedure : AaeonWDTEnable
VOID AaeonWDTEnable (){
    WDTEnableDisable(1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (byte Counter, BOOLEAN Unit){
    // Disable WDT counting
    WDTEnableDisable(0);
    // Clear Watchdog Timeout Status
    WDTClearTimeoutStatus();
    // WDT relative parameter setting
    WDTParameterSetting(Timer, Unit);
}

VOID WDTEnableDisable(byte Value){
    If (Value == 1)
        WDTSetBit(TimerReg, EnableBit, 1);
    else
        WDTSetBit(TimerReg, EnableBit, 0);
}

VOID WDTParameterSetting(byte Counter, BOOLEAN Unit){
    // Watchdog Timer counter setting
    WDTWriteByte(CounterReg, Counter);
    // WDT counting unit setting

```

```

    WDTSetBit(TimerReg, UnitBit, Unit);
    // WDT output mode set to pulse
    WDTSetBit(TimerReg, ModeBit, ModeVal);
    // WDT output mode set to active low
    WDTSetBit(TimerReg, PolarityBit, PolarityVal);
    // WDT output pulse width is 25ms
    WDTSetBit(TimerReg, PSWidthBit, PSWidthVal);
    // Watchdog WDTRST# Enable
    WDTSetBit(DevReg, WDRstBit, WDRstVal);
}

VOID WDTClearTimeoutStatus() {
    WDTSetBit(TimerReg, StatusBit, 1);
}

*****

*****

VOID WDTWriteByte(byte Register, byte Value){
    IOWriteByte(WDTAddr+Register, Value);
}

byte WDTReadByte(byte Register){
    return IOReadByte(WDTAddr+Register);
}

VOID WDTSetBit(byte Register, byte Bit, byte Val){
    byte TmpValue;

    TmpValue = WDTReadByte(Register);
    TmpValue &= ~(1 << Bit);
    TmpValue |= Val << Bit;
    WDTWriteByte(Register, TmpValue);
}




















































*****

```













































Appendix B

I/O Information


B.1 I/O Address Map



















































- ▼  Input/output (I/O)
 - ▼  [0000000000000000 - 000000000000006F] 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 - 0000000000000077] System CMOS/real time clock
 - ▼  [0000000000000078 - 0000000000000CF7] PCI Express Root Complex
 - >  [0000000000000080 - 000000000000008F] 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
 - >  [00000000000002E8 - 00000000000002EF] Communications Port (COM4)
 - >  [00000000000002F8 - 00000000000002FF] Communications Port (COM2)
 - >  [00000000000003E8 - 00000000000003EF] Communications Port (COM3)
 - >  [00000000000003F8 - 00000000000003FF] Communications Port (COM1)
 - >  [0000000000000400 - 000000000000047F] Motherboard resources
 - >  [00000000000004D0 - 00000000000004D1] Programmable interrupt controller
 - >  [0000000000000500 - 00000000000005FE] Motherboard resources
 - >  [0000000000000680 - 000000000000069F] Motherboard resources
 - >  [0000000000000800 - 000000000000087F] Motherboard resources
 - >  [0000000000000A00 - 0000000000000A0F] Motherboard resources
 - >  [0000000000000A10 - 0000000000000A1F] Motherboard resources
 - >  [0000000000000A20 - 0000000000000A2F] Motherboard resources
 - ▼  [0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
 - >  [0000000000001854 - 0000000000001857] Motherboard resources
 - >  [000000000000D000 - 000000000000DFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADB
 - >  [000000000000E000 - 000000000000EFFF] Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8
 - >  [000000000000F000 - 000000000000F03F] Intel(R) HD Graphics




















































B.2 Memory Address Map



















































- ▼  Memory
 -  [000000007B800001 - 000000007BFFFFFF] PCI Express Root Complex
 -  [000000007C000001 - 000000007CFFFFFF] PCI Express Root Complex
 - ▶  [0000000080000000 - 00000000CFFFFFFF] PCI Express Root Complex
 -  [00000000D0C00000 - 00000000D0C00653] Intel(R) Serial IO GPIO Host Controller - INT3452
 - ▶  [00000000D0C40000 - 00000000D0C40CEE] Unknown device
 - ▶  [00000000D0C50000 - 00000000D0C50AFE] Unknown device
 -  [00000000D0C70000 - 00000000D0C70673] Intel(R) Serial IO GPIO Host Controller - INT3452
 -  [00000000D0C80000 - 00000000D0C8082E] Unknown device
 -  [00000000D0C90000 - 00000000D0C907BE] Unknown device
 -  [00000000DE000000 - 00000000DEFFFFFF] Intel(R) HD Graphics 530
 -  [00000000DF000000 - 00000000DF0FFFFFF] PCI-to-PCI Bridge
 -  [00000000DF100000 - 00000000DF1FFFFFF] PCI-to-PCI Bridge
 -  [00000000DF220000 - 00000000DF22FFFF] High Definition Audio Controller
 -  [00000000DF230000 - 00000000DF23FFFF] Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
 -  [00000000DF240000 - 00000000DF243FFF] High Definition Audio Controller
 -  [00000000DF244000 - 00000000DF247FFF] PCI Memory Controller
 -  [00000000DF248000 - 00000000DF249FFF] Standard SATA AHCI Controller
 -  [00000000DF24A000 - 00000000DF24A0FF] SM Bus Controller
 -  [00000000DF24B000 - 00000000DF24B7FF] Standard SATA AHCI Controller
 -  [00000000DF24C000 - 00000000DF24C0FF] Standard SATA AHCI Controller
 -  [00000000DF24F000 - 00000000DF24FFFF] PCI Data Acquisition and Signal Processing Controller
 - ▶  [00000000E0000000 - 00000000EFFFFFFF] PCI Express Root Complex
 -  [00000000FD000000 - 00000000FDABFFFF] Motherboard resources
 -  [00000000FDAC0000 - 00000000FDACFFFF] Motherboard resources
 -  [00000000FDAD0000 - 00000000FDADFFFF] Motherboard resources
 -  [00000000FDAE0000 - 00000000FDAEFFFF] Motherboard resources
 -  [00000000FDAF0000 - 00000000FDAFFFFF] Motherboard resources
 -  [00000000FDB00000 - 00000000FDBFFFFF] Motherboard resources
 -  [00000000FDE00000 - 00000000FDE1FFFF] Motherboard resources
 -  [00000000FDE03600 - 00000000FDE03BFFF] Motherboard resources
 -  [00000000FDE03D00 - 00000000FDE03FFFF] Motherboard resources
 -  [00000000FDE41000 - 00000000FDE7FFFF] Motherboard resources
 -  [00000000FEA00000 - 00000000FEAFFFFF] Motherboard resources
 -  [00000000FED00000 - 00000000FED003FF] High precision event timer
 -  [00000000FED01000 - 00000000FED01FFF] Motherboard resources
 -  [00000000FED03000 - 00000000FED03FFF] Motherboard resources
 -  [00000000FED06000 - 00000000FED06FFF] Motherboard resources
 -  [00000000FED08000 - 00000000FED09FFF] Motherboard resources
 -  [00000000FED1C000 - 00000000FED1CFFF] Motherboard resources
 - ▶  [00000000FED40000 - 00000000FED44FFF] Trusted Platform Module 1.2
 -  [00000000FED80000 - 00000000FEDBFFFF] Motherboard resources
 -  [00000000FEE00000 - 00000000FEEFFFFFF] Motherboard resources
 -  [00000000FF000000 - 00000000FFFFFFFF] Legacy device

B.3 IRQ Mapping Chart

▼  Interrupt request (IRQ)

 (ISA) 0x00000000 (00)	System timer
 (ISA) 0x00000000 (00)	System timer
 (ISA) 0x00000000 (00)	System timer
 (ISA) 0x00000000 (00)	System timer
 (ISA) 0x00000001 (01)	Standard PS/2 Keyboard
 (ISA) 0x00000003 (03)	Communications Port (COM2)
 (ISA) 0x00000003 (03)	Communications Port (COM2)
 (ISA) 0x00000004 (04)	Communications Port (COM1)
 (ISA) 0x00000008 (08)	High precision event timer
 (ISA) 0x00000008 (08)	System CMOS/real time clock
 (ISA) 0x0000000A (10)	Communications Port (COM4)
 (ISA) 0x0000000A (10)	PCI-to-PCI Bridge
 (ISA) 0x0000000B (11)	Communications Port (COM3)
 (ISA) 0x0000000B (11)	High Definition Audio Controller
 (ISA) 0x0000000B (11)	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
 (ISA) 0x0000000B (11)	PCI Data Acquisition and Signal Processing Controller
 (ISA) 0x0000000B (11)	PCI-to-PCI Bridge
 (ISA) 0x0000000B (11)	SM Bus Controller
 (ISA) 0x0000000B (11)	Standard SATA AHCI Controller
 (ISA) 0x0000000C (12)	PS/2 Compatible Mouse
 (ISA) 0x0000000D (13)	Numeric data processor
 (ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INT3452
 (ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INT3452
 (ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INT3452
 (ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INT3452
 (ISA) 0x0000000E (14)	Motherboard resources
 (ISA) 0x0000000E (14)	Unknown device
 (ISA) 0x0000000E (14)	Unknown device
 (ISA) 0x0000000E (14)	Unknown device
 (ISA) 0x0000000F (15)	Unknown device
 (ISA) 0x00000011 (17)	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
 (ISA) 0x00000011 (17)	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
 (ISA) 0x00000018 (24)	PCI Data Acquisition and Signal Processing Controller
 (ISA) 0x00000019 (25)	High Definition Audio Controller
 (ISA) 0x00000019 (25)	High Definition Audio Controller
 (ISA) 0x0000001B (27)	Intel(R) Serial IO I2C Host Controller - 5AAC
 (ISA) 0x0000001B (27)	Intel(R) Serial IO I2C Host Controller - 5AAC
 (ISA) 0x0000001C (28)	Intel(R) Serial IO I2C Host Controller - 5AAE
 (ISA) 0x0000001C (28)	Intel(R) Serial IO I2C Host Controller - 5AAE
 (ISA) 0x0000001F (31)	Intel(R) Serial IO I2C Host Controller - 5AB4
 (ISA) 0x0000001F (31)	Intel(R) Serial IO I2C Host Controller - 5AB4
 (ISA) 0x00000027 (39)	Intel SD Host Controller
 (ISA) 0x00000036 (54)	Microsoft ACPI-Compliant System
 (ISA) 0x00000037 (55)	Microsoft ACPI-Compliant System
 (ISA) 0x00000038 (56)	Microsoft ACPI-Compliant System
 (ISA) 0x00000039 (57)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003A (58)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003B (59)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003C (60)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003D (61)	Microsoft ACPI-Compliant System

 (ISA) 0x0000003E (62)	Microsoft ACPI-Compliant System
 (ISA) 0x0000003F (63)	Microsoft ACPI-Compliant System
 (ISA) 0x00000040 (64)	Microsoft ACPI-Compliant System
 (ISA) 0x00000041 (65)	Microsoft ACPI-Compliant System
 (ISA) 0x00000042 (66)	Microsoft ACPI-Compliant System
 (ISA) 0x00000043 (67)	Microsoft ACPI-Compliant System
 (ISA) 0x00000044 (68)	Microsoft ACPI-Compliant System
 (ISA) 0x00000045 (69)	Microsoft ACPI-Compliant System
 (ISA) 0x00000046 (70)	Microsoft ACPI-Compliant System
 (ISA) 0x00000047 (71)	Microsoft ACPI-Compliant System
 (ISA) 0x00000048 (72)	Microsoft ACPI-Compliant System
 (ISA) 0x00000049 (73)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004A (74)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004B (75)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004C (76)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004D (77)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004E (78)	Microsoft ACPI-Compliant System
 (ISA) 0x0000004F (79)	Microsoft ACPI-Compliant System
 (ISA) 0x00000050 (80)	Microsoft ACPI-Compliant System
 (ISA) 0x00000051 (81)	Microsoft ACPI-Compliant System
 (ISA) 0x00000052 (82)	Microsoft ACPI-Compliant System
 (ISA) 0x00000053 (83)	Microsoft ACPI-Compliant System
 (ISA) 0x00000054 (84)	Microsoft ACPI-Compliant System
 (ISA) 0x00000055 (85)	Microsoft ACPI-Compliant System
 (ISA) 0x00000056 (86)	Microsoft ACPI-Compliant System
 (ISA) 0x00000057 (87)	Microsoft ACPI-Compliant System
 (ISA) 0x00000058 (88)	Microsoft ACPI-Compliant System
 (ISA) 0x00000059 (89)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005A (90)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005B (91)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005C (92)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005D (93)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005E (94)	Microsoft ACPI-Compliant System
 (ISA) 0x0000005F (95)	Microsoft ACPI-Compliant System
 (ISA) 0x00000060 (96)	Microsoft ACPI-Compliant System
 (ISA) 0x00000061 (97)	Microsoft ACPI-Compliant System
 (ISA) 0x00000062 (98)	Microsoft ACPI-Compliant System
 (ISA) 0x00000063 (99)	Microsoft ACPI-Compliant System
 (ISA) 0x00000064 (100)	Microsoft ACPI-Compliant System
 (ISA) 0x00000065 (101)	Microsoft ACPI-Compliant System
 (ISA) 0x00000066 (102)	Microsoft ACPI-Compliant System
 (ISA) 0x00000067 (103)	Microsoft ACPI-Compliant System
 (ISA) 0x00000068 (104)	Microsoft ACPI-Compliant System
 (ISA) 0x00000069 (105)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006A (106)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006B (107)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006C (108)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006D (109)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006E (110)	Microsoft ACPI-Compliant System
 (ISA) 0x0000006F (111)	Microsoft ACPI-Compliant System
 (ISA) 0x00000070 (112)	Microsoft ACPI-Compliant System

	(ISA) 0x000001DC (476)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DD (477)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DE (478)	Microsoft ACPI-Compliant System
	(ISA) 0x000001DF (479)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E0 (480)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E1 (481)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E2 (482)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E3 (483)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E4 (484)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E5 (485)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E6 (486)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E7 (487)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E8 (488)	Microsoft ACPI-Compliant System
	(ISA) 0x000001E9 (489)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EA (490)	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) 0x00000019 (25)	High Definition Audio Controller
	(PCI) 0x00000027 (39)	Intel SD Host Controller
	(PCI) 0xFFFFFFF3 (-13)	Intel(R) HD Graphics
	(PCI) 0xFFFFFFF4 (-12)	Realtek PCIe GBE Family Controller #4
	(PCI) 0xFFFFFFF5 (-11)	Intel(R) USB 3.0 eXtensible Host Controller - 1.0 (Microsoft)
	(PCI) 0xFFFFFFF6 (-10)	Realtek PCIe GBE Family Controller #2
	(PCI) 0xFFFFFFF7 (-9)	Intel(R) Trusted Execution Engine Interface
	(PCI) 0xFFFFFFF8 (-8)	Standard SATA AHCI Controller
	(PCI) 0xFFFFFFF9 (-7)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD7
	(PCI) 0xFFFFFFFA (-6)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD6
	(PCI) 0xFFFFFFFB (-5)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADA
	(PCI) 0xFFFFFFFC (-4)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD9
	(PCI) 0xFFFFFFFD (-3)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5ADB
	(PCI) 0xFFFFFFF0 (-2)	Intel(R) Celeron(R)/Pentium(R) Processor PCI Express Root Port - 5AD8

Appendix C

Mating Connectors

C.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

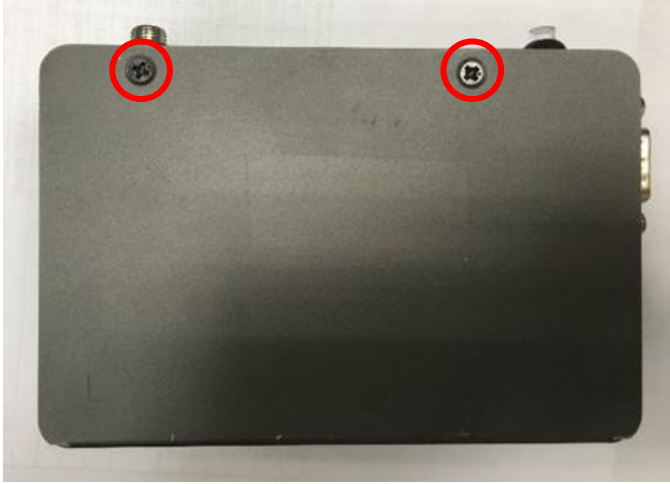
Conn Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN1	COM Port #2 Conn	JST	SHR-09V-S-B	Serial Port Cable	1701090122
CN2	COM Port #1 Conn	JST	SHR-09V-S-B	Serial Port Cable	1701090122
CN3	Front Panel Conn	ACES	50247-010H0 H0-001	Front Panel Cable	170X000347
CN12	External RTC Conn	Molex	51021-0200	Battery Cable	175011301C
CN20	USB Port #2 Conn	Molex	51021-0400	USB Cable	1700040151
CN21	USB Port #1 Conn	Molex	51021-0400	USB Cable	1700040151
CN22	Port 80 Debug Port Conn	JST	SHR-12V-S-B	AAEON Port 80 Debug Port Cable	1703120130

Appendix D

Quick Installation Guide

D.1 Drive Installation

Loosen the screws on the chassis.



D.1.1 M.2 2230 Card Installation

Loosen the screws on the MB, insert the M.2 2230 card into the socket at an angle of approximately 30 degrees.



Push down the M.2 2230 card until it is attached. Place the screw above the card to ensure the card is in position, then fasten the screw, affixing the card onto the MB.



D.1.2 M.2 2280 Card Installation

Loosen the screws on the MB, insert the M.2 2280 card into the socket at an angle of approximately 30 degrees.



Push down the M.2 2280 card until it is attached. Place the screw above the card to fix the card on the position then fasten the screw on the MB.

