PICO-KBU4-SEMI

PICO-SEMI System

User's Manual 5th Ed

Last Updated: March 5, 2024

Copyright Notice

Acknowledgement

Packing List

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

Item	Quantity
PICO-KBU4-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 the product page at AAEON.com for the latest version of this document.

Safety Precautions

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

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

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.

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。

China RoHS Requirement (EN)

Hazardous and Toxic Materials List

AAEON System QO4-381 Rev.A0

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

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

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

X: The level of toxic 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 Specifications

System	
Form Factor	Pico-ITX
Processor	7th Generation Intel® Core™ i7/i5/i3/Celeron® Processor 3000 Series Processors Intel® Core™ i7-7600U Intel® Core™ i5-7300U Intel® Core™ i3-7100U Intel® Celeron® Processor 3965U (Optional)
Chipset	7th Generation Intel® Core™ SoC
Memory Type	DDR4 2133MHz SODIMM x 1, up to 16GB, Non-ECC
BIOS	AMI BIOS
Wake on LAN	Yes
Watchdog Timer	255 Levels
Security	-
RTC Battery	Lithium Battery 3V/240mAh
Dimension (L X W)	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)

Power

Power Requirement	+12V
Power Supply Type	AT/ATX (Default)
Connector	Lockable DC Jack Connector
Power Consumption	Intel® Core™ i7-7600U with DDR4 16GB, 2.3A @+12V

Display

Controller	Intel® HD Graphics 510/620
LVDS/eDP	-
Display Interface	HDMI 1.4b x 1 (up to 4096 x 2304)
Multiple Display	-

Audio

Codec	Realtek ALC269 (Optional)
Audio Interface	Line-out x 1 (Optional)
Speaker	-

External I/O

Ethernet	RJ-45 10/100/1000Base-TX x 2 (Realtek 8111G)
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 4096 x 2304)

Internal I/O

USB	-
Serial Port	-
Video	-
SATA	SATA 6Gb/s x 1
	+5V SATA Power Connector x 1
Audio	Audio Header x 1 (Optional)
GPIO	4-bit (Optional)
SMBus/ I2C	I2C/SMBus x 1 (Optional, SMBus as Default)
Touch	-
Fan	4-pin Smart Fan x 1
SIM	-
Front Panel	HDD LED, PWR LED, Power Button, Buzzer, Reset

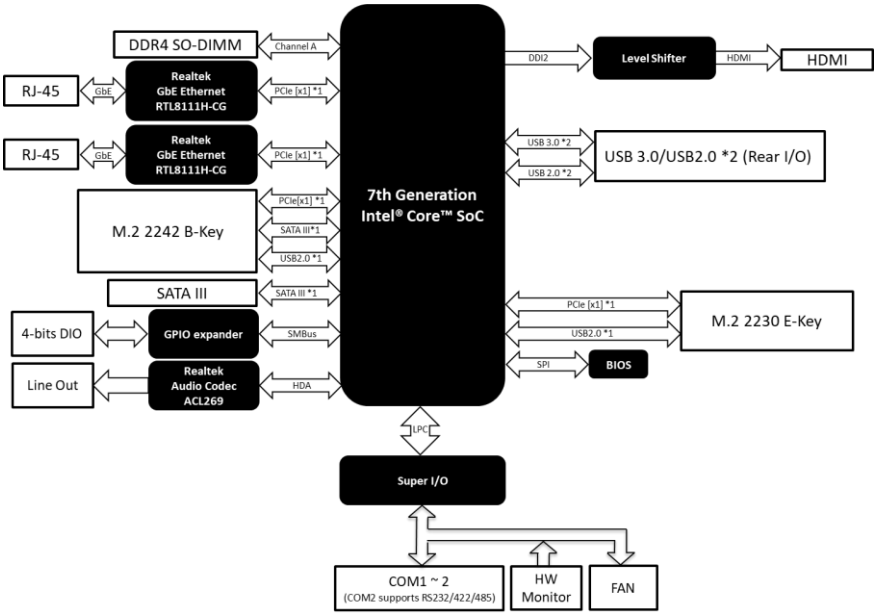
Expansion

Mini PCIe/mSATA	-
M.2	M.2 2242 B-Key x 1 (PCIe [x1]/SATA Select by BIOS)
	M.2 2230 E-Key x 1 (PCIe/USB)
Other	-

Environmental & Certification

Operating Temperature	32°F~ 122°F (0°C ~ 50°C)
Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)
Operating Humidity	0% ~ 90% relative humidity, non-condensing
MTBF (Hours)	163,000
Certification	CE, FCC Class A

1.2 Block Diagram

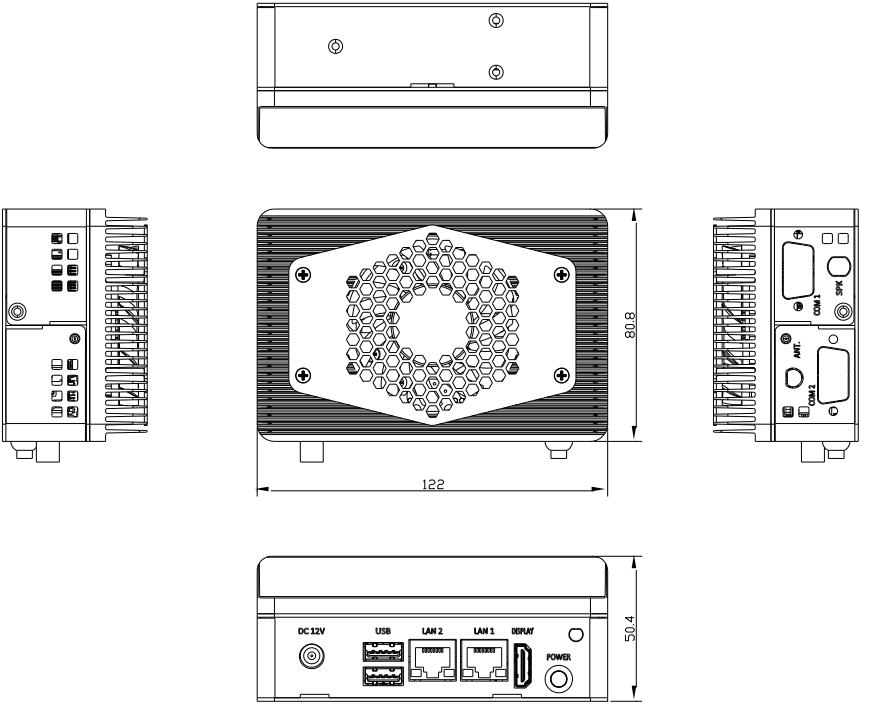


Chapter 2

Hardware Information

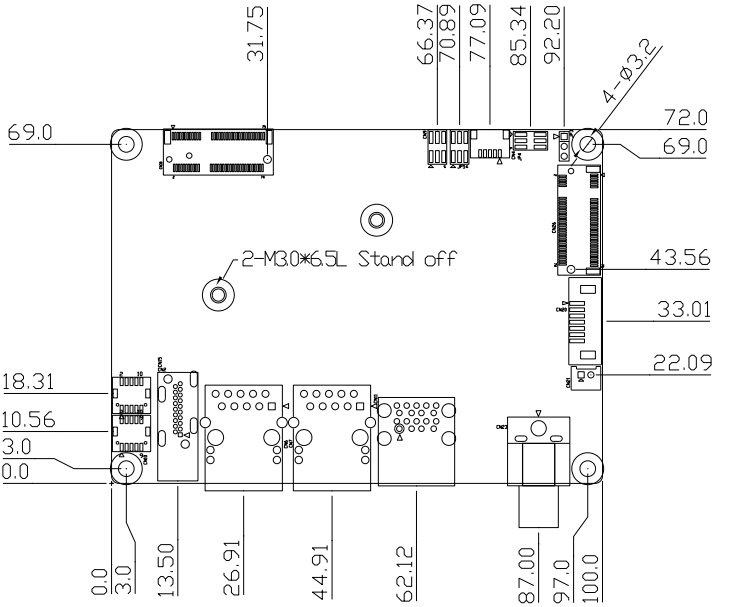
2.1 Dimensions

System

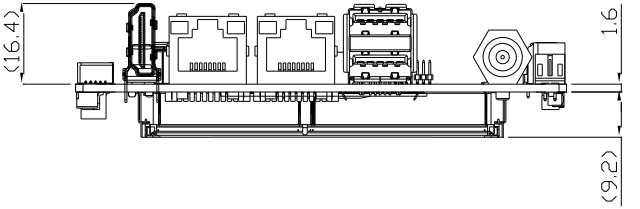


Board

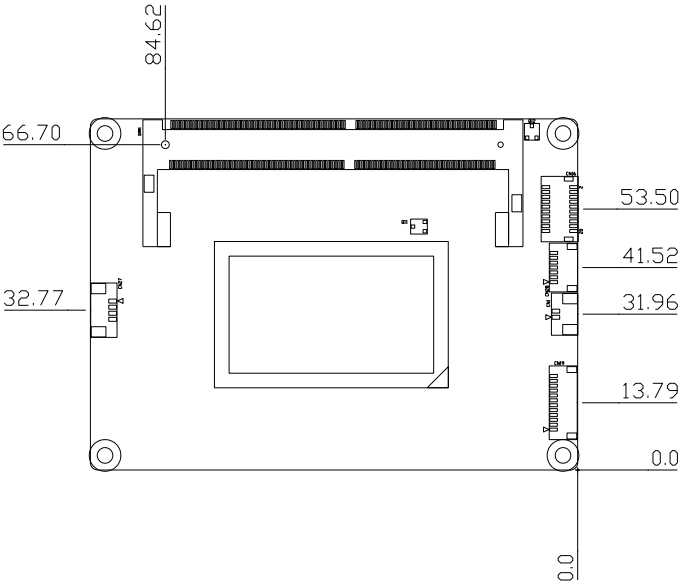
Component Side



Component Side



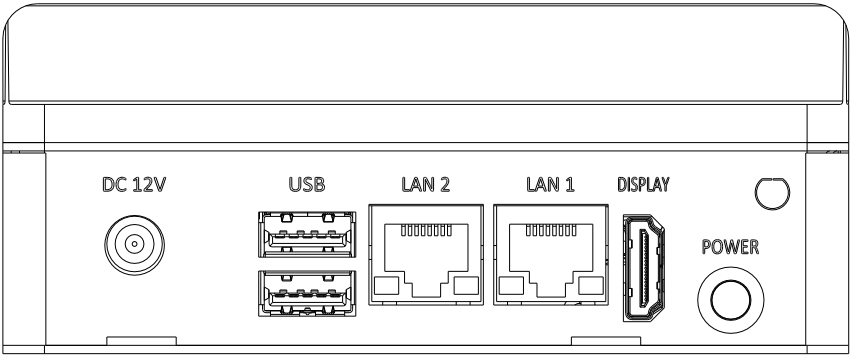
Solder Side



Solder Side

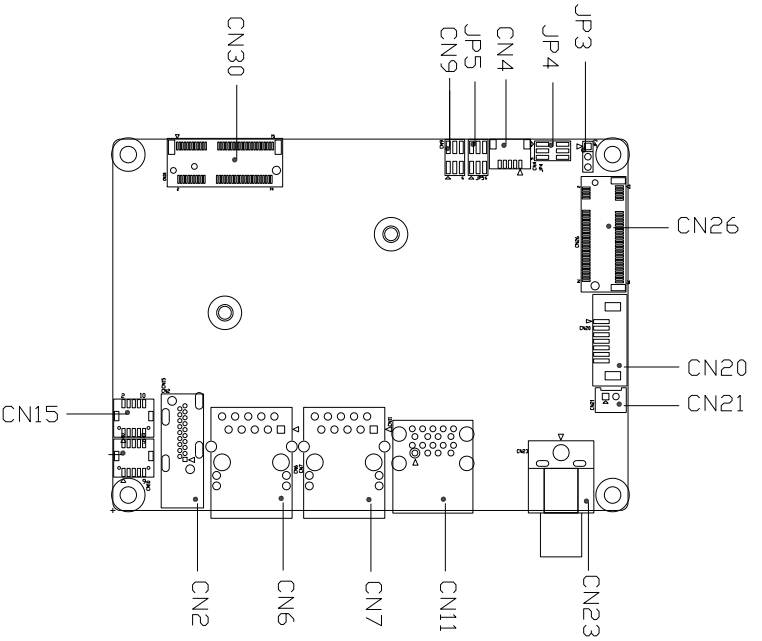
2.2 Jumpers and Connectors

System

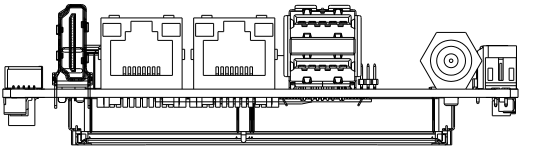


Board

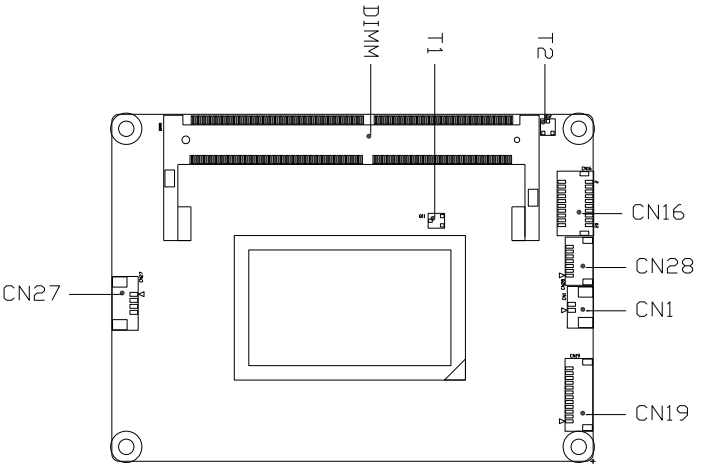
Component Side



Component Side



Solder Side



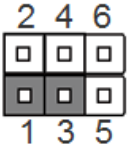
Solder Side

2.3 List of Jumpers

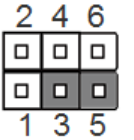
Please refer to the table below for all of the board's jumpers that you can configure for your application

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

2.3.1 Clear CMOS Jumper (JP5)

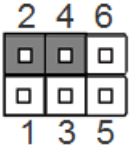


Normal (Default)

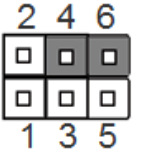


Clear CMOS

2.3.2 Auto Power Button Enable/Disable Selection (JP5)



Enable Auto Power Button



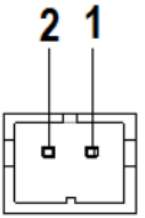
Disable Auto Power Button (Default)

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

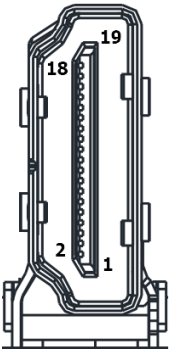
Label	Function
CN1	RTC Battery Connector
CN2	HDMI
CN6	RJ-45 LAN Port 1
CN7	RJ-45 LAN Port 2
CN11	USB 2.0/3.0 Port 3 Port 0/1
CN15	Front Panel
CN16	COM Port 1/COM Port 2 (Optional)
CN19	Port 80 Debug Port
CN23	+12V DC Jack
CN26	M.2 2242 B-Key
CN27	Smart Fan Connector
CN30	M.2 2230 E-Key
DIMM1	DDR4 SODIMM Slot

2.4.1 RTC Battery Connector (CN1)



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

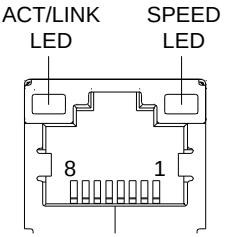
2.4.2 HDMI (CN2)



Pin	Pin Name	Signal Type	Pin Name
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

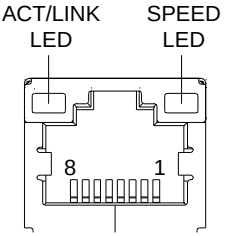
Pin	Pin Name	Signal Type	Pin Name
9	HDMI_TX0-	DIFF	
10	HDMI_CLK+	DIFF	
11	GND	GND	GND
12	HDMI_CLK-	DIFF	
13	NC		
14	NC		
15	DDC_CLK	I/O	+5V
16	DDC_DATA	I/O	+5V
17	GND	GND	GND
18	+5V	PWR	+5V
19	HDMI_HPD		

2.4.3 RJ-45 LAN Port 1 (CN6)



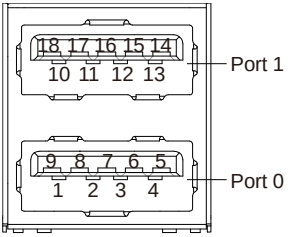
Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

2.4.4 RJ-45 LAN Port 2 (CN7)



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	

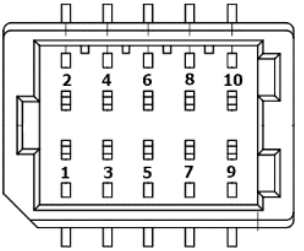
2.4.5 USB 2.0/3.0 Port 3 Port 3/4 (CN11)



Pin	Pin Name	Signal Type	Signal Level
1	+V5SB	PWR	+5V
2	USB3_D-	DIFF	
3	USB3_D+	DIFF	
4	GND	GND	GND
5	USB3_SSRX–	DIFF	

Pin	Pin Name	Signal Type	Signal Level
6	USB3_SSRX+	DIFF	
7	GND	GND	GND
8	USB3_SSTX−	DIFF	
9	USB3_SSTX+	DIFF	
10	+V5SB	PWR	+5V
11	USB4_D-	DIFF	
12	USB4_D+	DIFF	
13	GND	GND	GND
14	USB4_SSRX−	DIFF	
15	USB4_SSRX+	DIFF	
16	GND	GND	GND
17	USB4_SSTX−	DIFF	
18	USB4_SSTX+	DIFF	

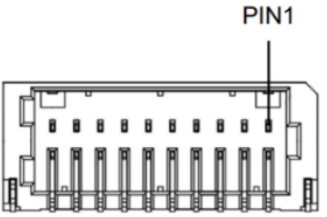
2.4.6 Front Panel Port (CN15)



Pin	Pin Name	Signal Type	Pin Name
1	GND	GND	GND
2	EXT_PWRBTN#	IN	
3	SATA_LED-	OUT	
4	SATA_LED+	OUT	
5	BUZZER-	OUT	
6	BUZZER+	OUT	
7	GND	GND	GND

Pin	Pin Name	Signal Type	Pin Name
8	PWR_LED+	OUT	
9	GND	GND	GND
10	HWRST#	IN	

2.4.7 COM Port 1/COM Port 2 (CN16)



Pin	Pin Name	Signal Type	Signal Level
1	LOUT_L	OUT	
2	LOUT_R	OUT	
3	GND	GND	GND
4	AGND	GND	GND
5	DCDA	IN	
6	DCDB	IN	
7	RXA	IN	
8	RXB	IN	
9	TXA	OUT	±9V
10	TXB	OUT	±9V
11	DTRA	OUT	±9V
12	DTRB	OUT	±9V
13	DSRA	IN	
14	DSRB	IN	
15	RTSA	OUT	±9V
16	RTSB	OUT	±9V
17	CTSA	IN	
18	CTSB	IN	
19	RIA/+5V/+12V	IN/ PWR	+5V/+12V
20	RIB/+5V/+12V	IN/ PWR	+5V/+12V

COM Port 2 RS-422			
Pin	Pin Name	Signal Type	Signal Level
3	GND	GND	GND
6	RS422_TX-	OUT	±5V
8	RS422_TX+	OUT	±5V
10	RS422_RX+	IN	
12	RS422_RX-	IN	

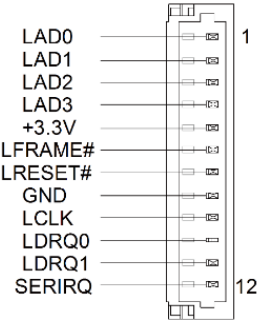
COM Port 2 RS-485			
Pin	Pin Name	Signal Type	Signal Level
3	GND	GND	GND
6	RS485_D-	I/O	±5V
8	RS485_D+	I/O	±5V

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

Note: COM 2 RI/+5V/+12V function can be set by BOM

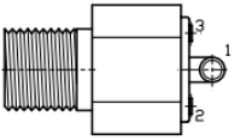
(R317-RI/R316-+12V/R318-+5V).

2.4.8 Port 80 Debug Port (CN19)



Pin	Pin Name	Signal Type	Signal Level
1	LAD0	IN/OUT	+3.3V
2	LAD1	IN/OUT	+3.3V
3	LAD2	IN/OUT	+3.3V
4	LAD3	IN/OUT	+3.3V
5	+V3.3S	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	GND
9	LCLK	OUT	
10	SMB_DATA/ I2C_SDA	IN/OUT	
11	SMB_CLK/ I2C_CLK	OUT	
12	SMB_ALERT/INT_SERIRQ	IN	+3.3V

2.4.9 +12V DC Jack (CN23)



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

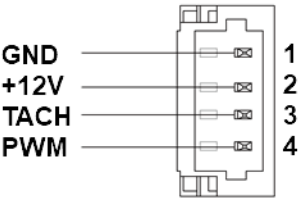
2.4.10 M.2 2242 B-Key (CN26)

Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	+V3.3S	PWR	+3.3V
3	GND	GND	GND
4	+V3.3S	PWR	+3.3V
5	GND	GND	GND
6	NC	NC	
7	USB2P_10	IN/OUT	
8	W_DISABLE0#	OUT	
9	USB2N_10	IN/OUT	
10	SSD_LED#	IN	
11	GND	GND	GND
20	NC	NC	
21	GND	GND	GND
22	NC	NC	
23	NC	NC	
24	NC	NC	
25	NC	NC	
26	NC	NC	
27	GND	GND	GND

Pin	Pin Name	Signal Type	Signal Level
28	NC	NC	
29	PCIE11_RXN	DIFF	
30	NC	NC	
31	PCIE11_RXP	DIFF	
32	NC	NC	
33	GND	GND	GND
34	NC	NC	
35	PCIE11_TXN	DIFF	
36	NC	NC	
37	PCIE11_TXP	DIFF	
38	NC	NC	
39	GND	GND	GND
40	NC	NC	
41	SATA2_RXP	DIFF	
42	NC	NC	
43	SATA2_RXN	DIFF	
44	NC	NC	
45	GND	GND	GND
46	NC	NC	
47	SATA2_TXN	DIFF	
48	NC	NC	
49	SATA2_TXP	DIFF	
50	BUF_PLT_RST#	OUT	
51	GND	GND	GND
52	PCIE_CLK_REQ3#	IN	
53	PCIE3_CLKN	DIFF	
54	PCIE_WAKE#	IN	
55	PCIE3_CLKP	DIFF	
56	NC	NC	
57	GND	GND	GND
58	NC	NC	
59	NC	NC	
60	NC	NC	

Pin	Pin Name	Signal Type	Signal Level
61	NC	NC	
62	NC	NC	
63	NC	NC	
64	NC	NC	
65	NC	NC	
66	NC	NC	
67	NC	NC	
68	NC	NC	
69	GND	GND	GND
70	+V3.3S	PWR	+3.3V
71	GND	GND	GND
72	+V3.3S	PWR	+3.3V
73	GND	GND	GND
74	+V3.3S	PWR	+3.3V
75	NC	NC	

2.4.11 Smart Fan Connector (CN27)



Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	+V3.3S	PWR	+12V
3	TACH	IN	
4	PWM	OUT	

2.4.12 M.2 2230 E-Key (CN30)

Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	GND
2	+V3.3A	PWR	+3.3V
3	USB2P_5	IN/OUT	
4	+V3.3A	PWR	+3.3V
5	USB2N_5	IN/OUT	
6	NC	NC	
7	GND	GND	GND
8	NC	NC	
9	NC	NC	
10	NC	NC	
11	NC	NC	
12	NC	NC	
13	NC	NC	
14	NC	NC	
15	NC	NC	
16	NC	NC	
17	NC	NC	
18	NC	NC	
19	NC	NC	
20	NC	NC	
21	NC	NC	
22	NC	NC	
23	NC	NC	
32	NC	NC	
33	GND	GND	GND
34	NC	NC	
35	PCIE1_TXP	DIFF	
36	NC	NC	
37	PCIE1_TXN	DIFF	
38	NC	NC	

Pin	Pin Name	Signal Type	Signal Level
39	GND	GND	GND
40	NC	NC	
41	PCIE1_RXP	DIFF	
42	NC	NC	
43	PCIE1_RXN	DIFF	
44	NC	NC	
45	GND	GND	GND
46	NC	NC	
47	PCIE1_CLKP	DIFF	
48	NC	NC	
49	PCIE1_CLKN	DIFF	
50	NC	NC	
51	GND	GND	GND
52	BUF_PLT_RST#	OUT	
53	PCIE_CLK_REQ1#	IN	
54	W_DISABLE1#	OUT	
55	PCIE_WAKE#	IN	
56	W_DISABLE2#	OUT	
57	GND	GND	GND
58	NC	NC	
59	NC	NC	
60	NC	NC	
61	NC	NC	
62	NC	NC	
63	GND	GND	GND
64	NC	NC	
65	NC	NC	
66	NC	NC	
67	NC	NC	
68	NC	NC	
69	GND	GND	GND
70	NC	NC	
71	NC	NC	

Pin	Pin Name	Signal Type	Signal Level
72	+V3.3S	PWR	+3.3V
73	NC	NC	
74	+V3.3S	PWR	+3.3V
75	GND	GND	GND

2.4.13 DDR4 SODIMM Slot (DIMM1)

Standard specification.

Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

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

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory and BIOS NVRAM. If a system configuration is not found or an error is detected, the system will load the default configuration and reboot 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 was reset by the Clear-CMOS jumper
4. The CMOS memory has lost power and the configuration information has been erased.

The system CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the battery unit when it 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.

Chipset

Host bridge parameters.

Security

Set setup administrator password.

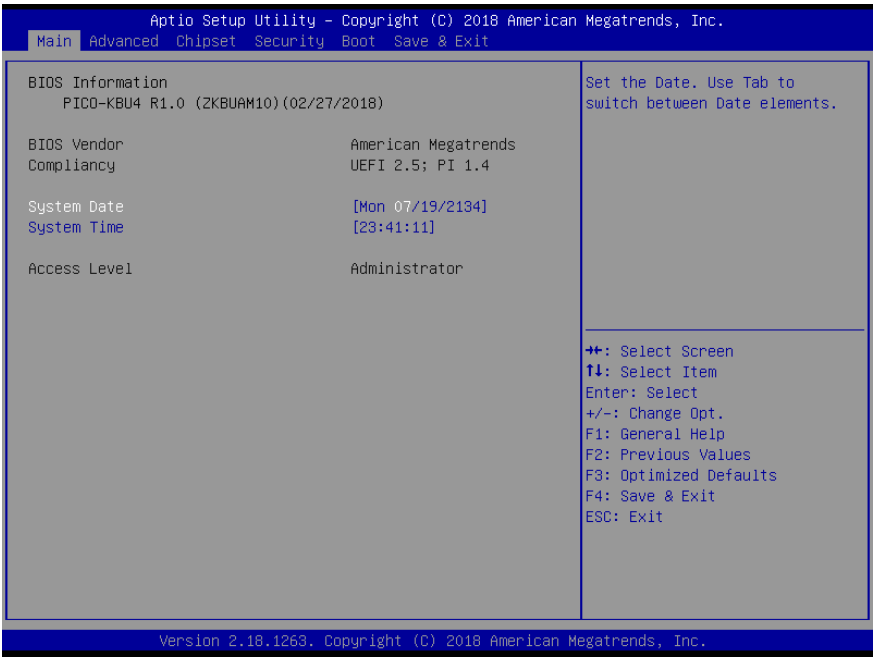
Boot

Enables/disable quiet boot option.

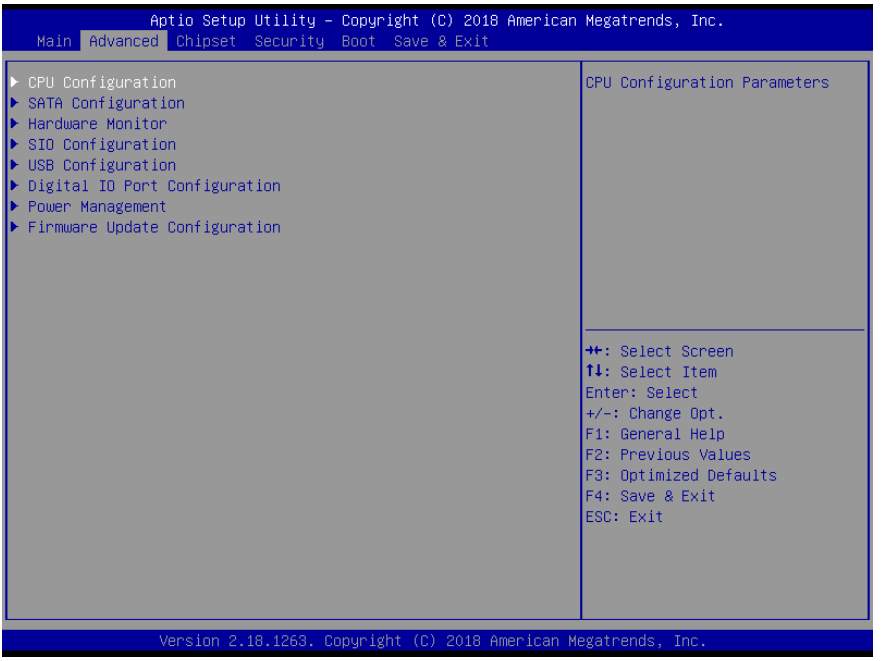
Save & Exit

Exit system setup after saving the changes.

3.3 Setup Submenu: Main



3.4 Setup Submenu: Advanced

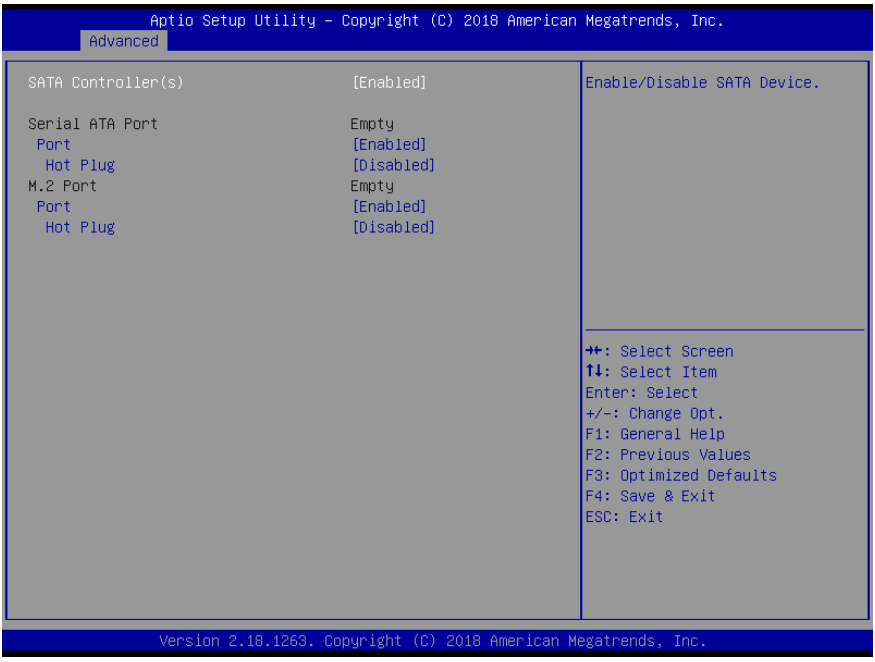


3.4.1 CPU Configuration

Options Summary		
Hyper-Threading	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable for Linux and Disabled for other OS.		
Active Processor Cores	All	Optimal Default, Failsafe Default
	1	
Number of cores to enable in each processor package.		
Intel (VMX) Virtualization Technology	Disabled	
	Enabled	Optimal Default, Failsafe Default
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		
CPU C states	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable CPU power Management. Allows CPU to go to C states when it's not 100% utilized.		

Options Summary		
Intel® SpeedStep™	Disabled	
	Enabled	Optimal Default, Failsafe Default
Allows more than two frequency ranges to be supported.		
Turbo Mode	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable processor turbo mode.		

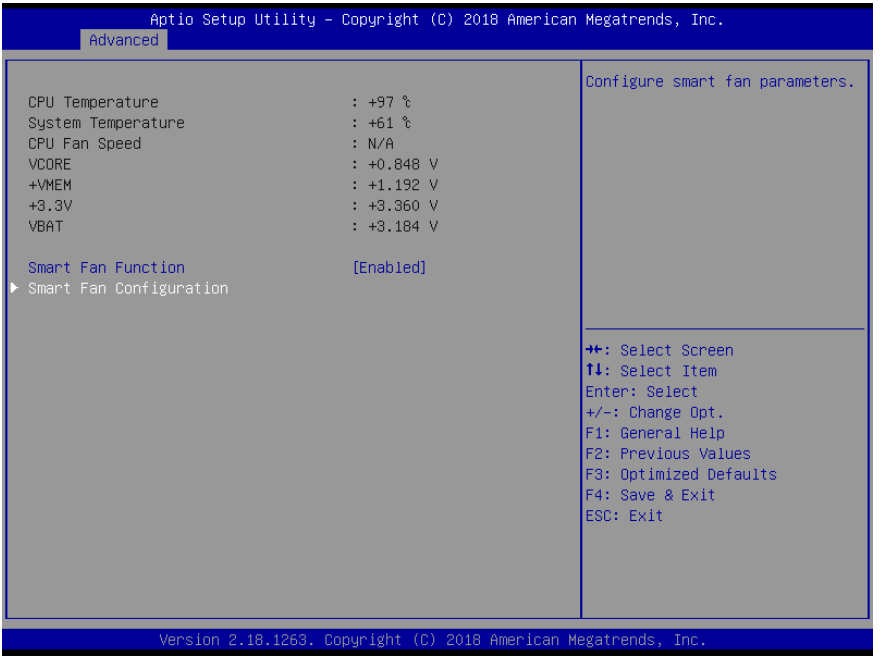
3.4.2 SATA Configuration



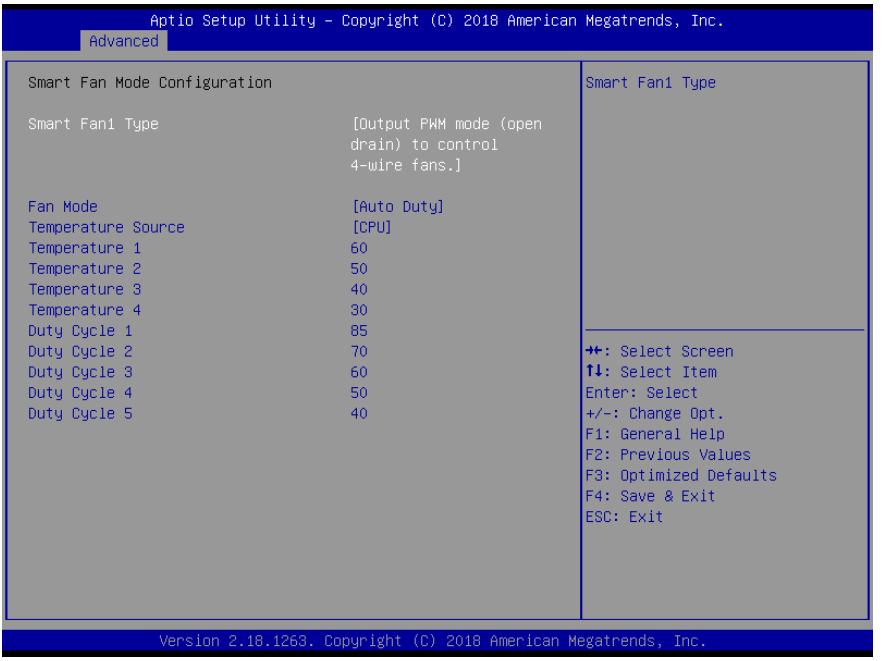
Options Summary		
SATA Controller(s)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or disable SATA Device.		
Port X	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port.		

Options Summary		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot Pluggable.		

3.4.3 Hardware Monitor

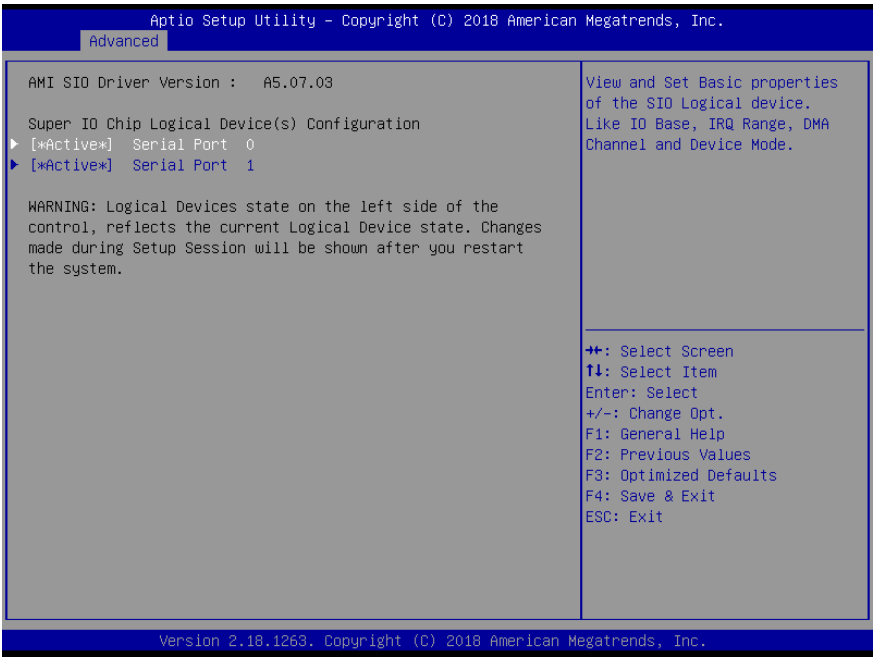


3.4.3.1 CPU Smart Fan Mode Configuration

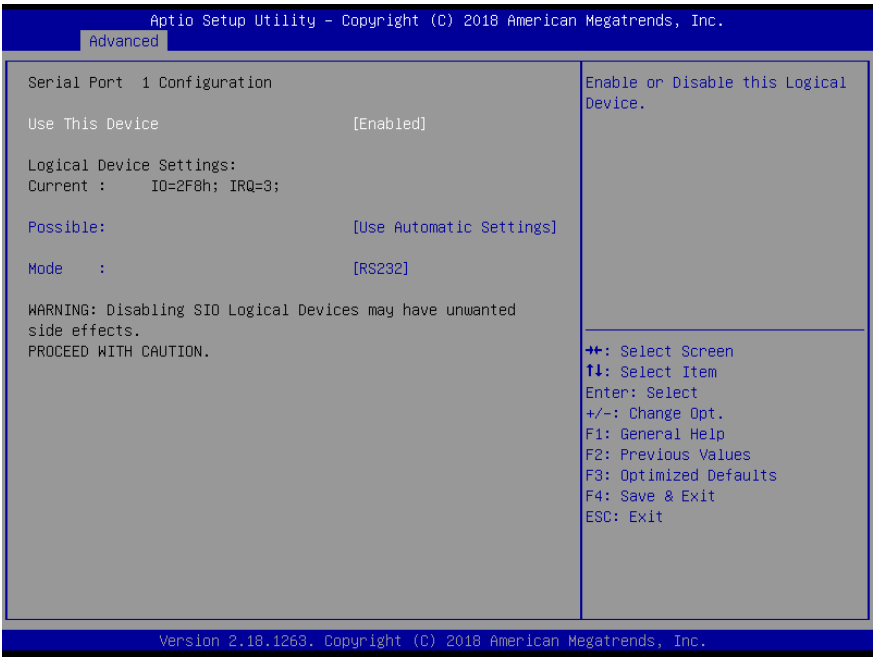


Options Summary		
Smart Fan1 Type	Use linear fan application circuit.	
	Output PWM mode (open drain) to control 4-wire fans.	Optimal Default, Failsafe Default
Smart fan type.		
Fan Mode	Manual Duty	
	Auto Duty	Optimal Default, Failsafe Default
Smart fan mode.		
Temperature Source	CPU	Optimal Default, Failsafe Default
Select the monitored temperature source for this fan.		

3.4.4 SIO Configuration



3.4.4.1 Serial Port Configuration



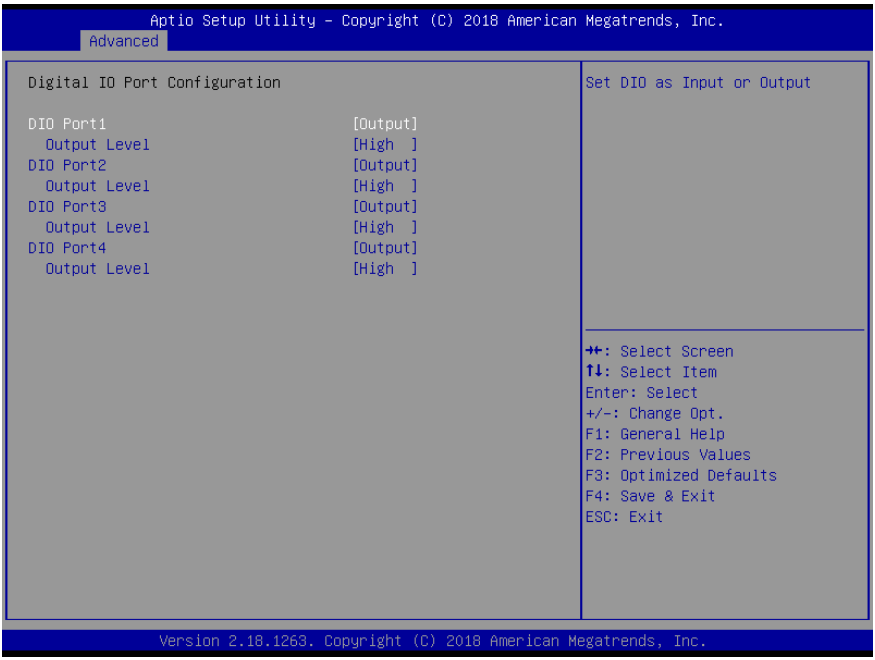
Options Summary		
Use This Device	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Serial Port (COM).		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8; IRQ=3;	
	IO=3F8; IRQ=4;	
Select an optimal setting for IO device.		
Mode:	RS232	Optimal Default, Failsafe Default
	RS422;	
	RS485	
UART 232/422/485 selection.		

3.4.5 USB Configuration

Options Summary		
Legacy USB Support	Enabled	Optimal Default, Failsafe Default
	Disabled	
	Auto	
Enables BIOS Support for Legacy USB Support. When enabled, USB can be functional in legacy environment like DOS. AUTO option disables legacy support if no USB devices are connected		
Device Name (Emulation Type)	Auto	Optimal Default, Failsafe Default
	Floppy	
	Forced FDD	
	Hard Disk	
	CDROM	
If Auto. USB devices less than 530MB will be emulated as Floppy and remaining as Floppy and remaining as hard drive. Forced FDD option can be used to force a HDD formatted drive to boot as FDD (Ex. ZIP drive).		

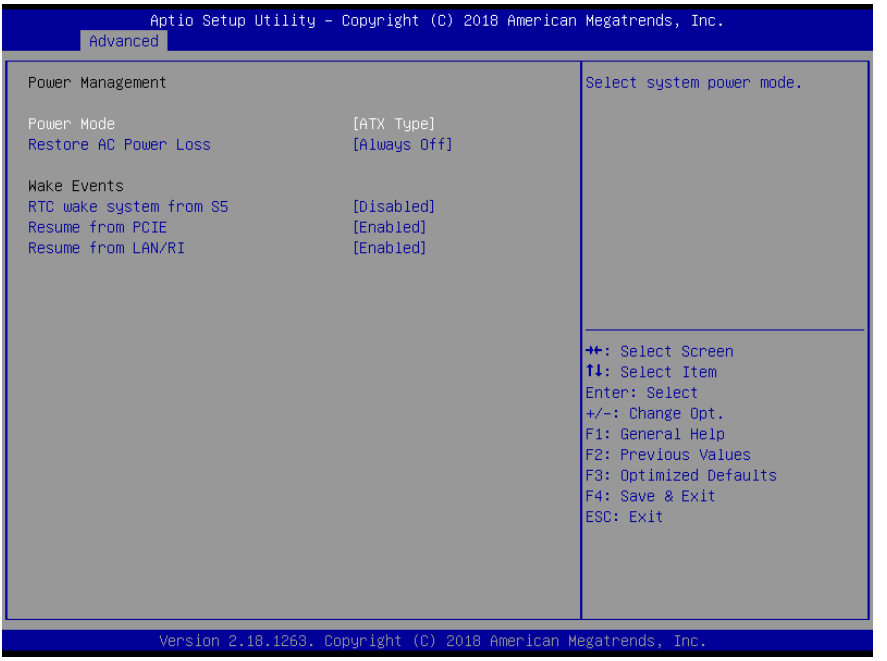
Options Summary		
USB Port 0/1 function routing	FCH USB port 8/9	Optimal Default, Failsafe Default
	FCH USB port 0/1	

3.4.6 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.		

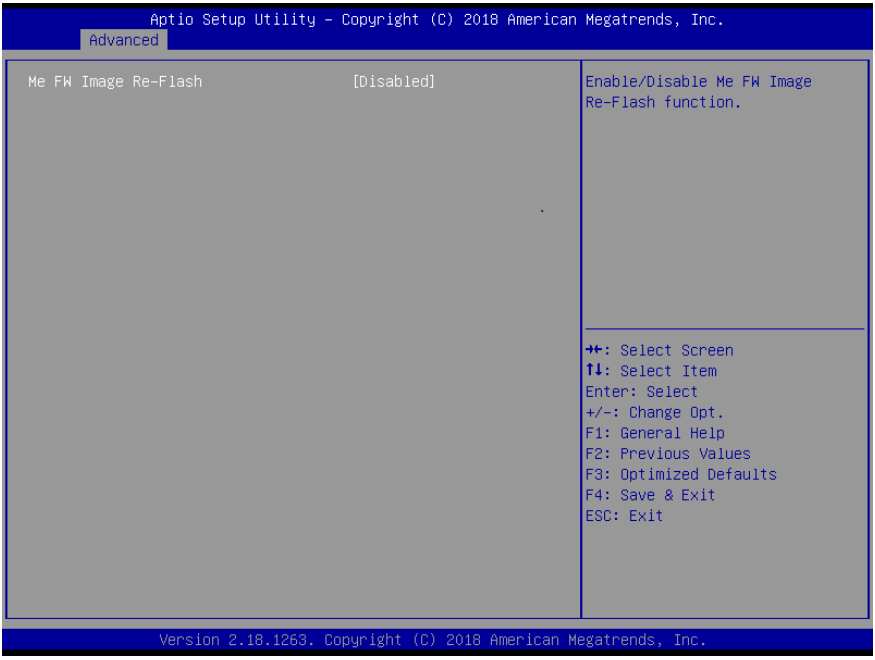
3.4.7 Power Management



Options Summary		
Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select power supply mode.		
Restore on Power Loss	Last State	
	Always On	
	Always Off	Optimal Default, Failsafe Default
Select power state when power is re-applied after a power failure.		
RTC wake system from S5	Disabled	Optimal Default, Failsafe Default
	Fixed Time	
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified.		
Resume from PCIE	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable resume from PCIE.		

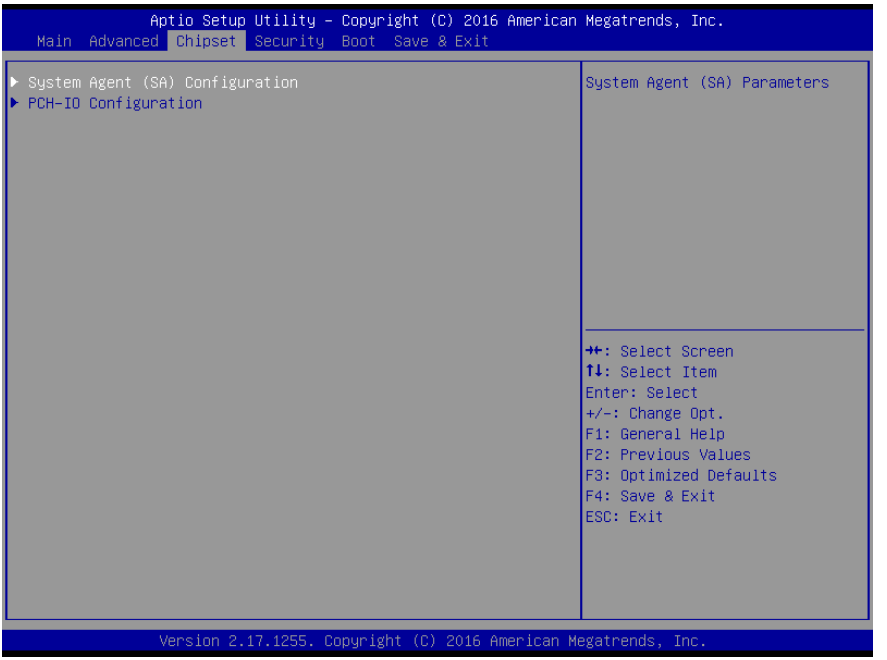
Options Summary		
Resume form LAN/RI	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable resume from PCIE		

3.4.8 Firmware Update Configuration

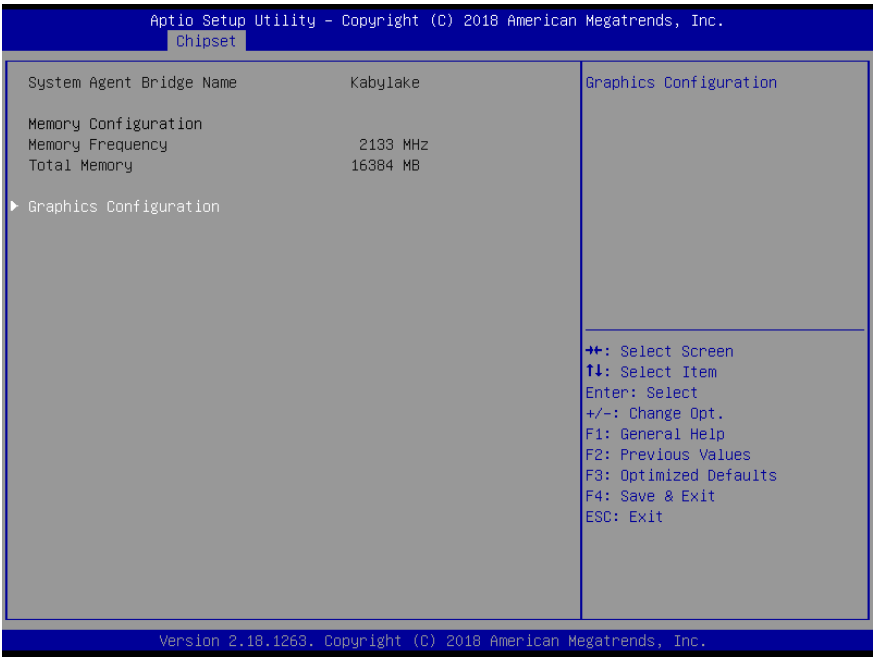


Options Summary		
Me FW Image Re-Flash	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/Disable Me FW Image Re-Flash function.		

3.5 Setup Submenu: Chipset



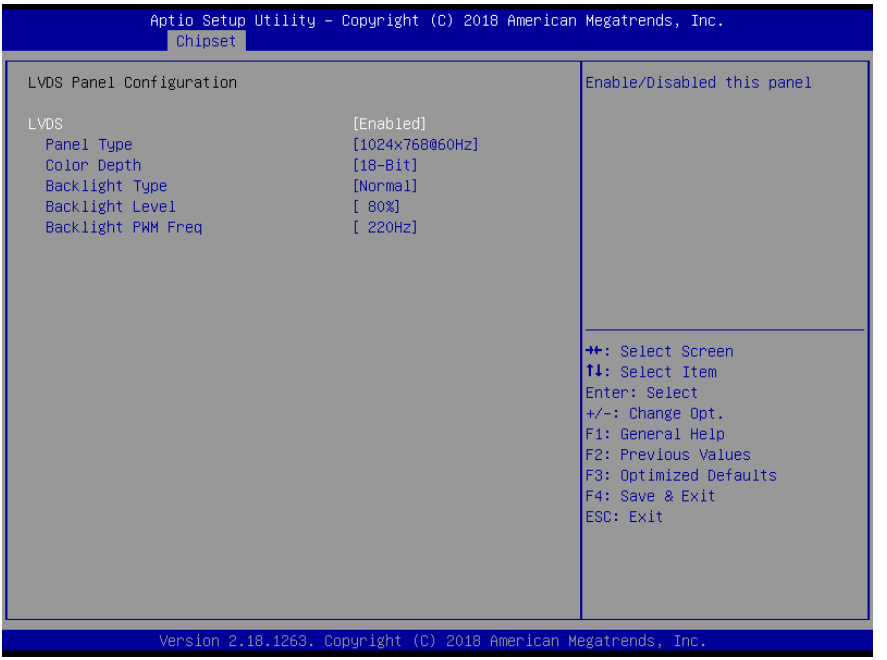
3.5.1 System Agent (SA) Configuration



3.5.1.1 Graphics Configuration

Options Summary		
Primary IGFX Boot Display	VBIOS Default	Optimal Default, Failsafe Default
	HDMI	
	LVDS	
Select the Video Device which will be activated during POST. This has no effect if external graphic present. Secondary boot display selection will appear based on your selection.		

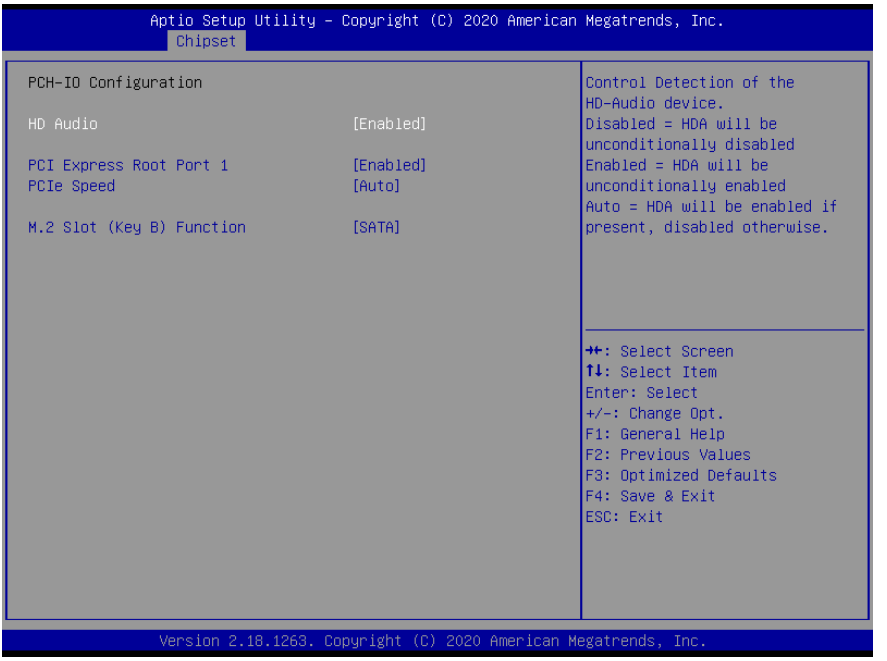
3.5.1.1.1 LVDS Panel Configuration



Options Summary		
LVDS	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disabled this panel.		
LVDS Panel Type	640x480,18bit,60Hz	
	800x480,18bit,60Hz	
	800x600,18bit,60Hz	
	1024x600,18bit,60Hz	
	1024x768,18bit,60Hz	Optimal Default, Failsafe Default
	1024x768,24bit,60Hz	
	1280x768,24bit,60Hz	
	1280x1024,48bit,60Hz	
	1366x768,24bit,60Hz	
	1440x900,48bit,60Hz	
	1600x1200,48bit,60Hz	
	1920x1080,48bit,60Hz	

Options Summary		
LVDS Panel Type	1920x1200,48bit,60Hz	
Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.		
Color Depth	18-bit	Optimal Default, Failsafe Default
	24-bit	
	36-bit	
	48-bit	
Select panel type.		
Backlight Type	Normal	Optimal Default, Failsafe Default
	Inverted	
Select backlight control signal type.		
Backlight Level	0%	
	10%	
	20%	
	30%	
	40%	
	50%	
	60%	
	70%	
	80%	Optimal Default, Failsafe Default
	90%	
	100%	
Select backlight control level.		
Backlight PWM Freq	100Hz	
	200Hz	
	220Hz	Optimal Default, Failsafe Default
	500Hz	
	1KHz	
	2.2KHz	
	6.5KHz	
Select PWM frequency of backlight control signal.		

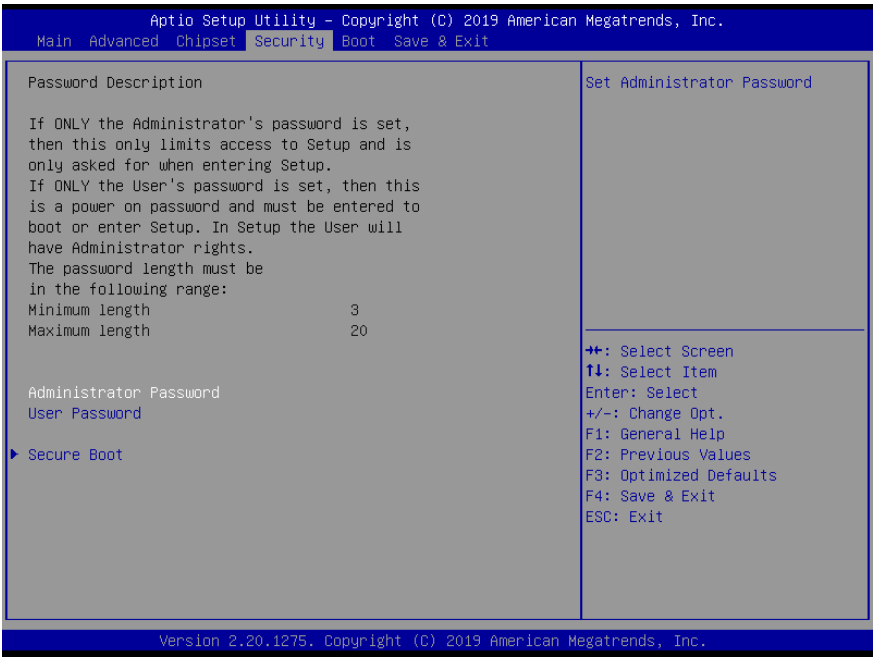
3.5.2 PCH-IO Configuration



Options Summary		
HD Audio	Disabled	
	Enabled	Optimal Default, Failsafe Default
Control Detection of the HD-Audio device. Disabled = HDA will be unconditionally disabled. Enabled = HDA will be unconditionally enabled. Auto = HDA will be enabled if present, disabled otherwise.		
PCI Express Root Port 1	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or disable PCI Express Root Port 1		
PCIe Lane Gen Speed	Auto	Optimal Default, Failsafe Default
	Gen1	
	Gen2	
	Gen3	
Select PCI Express port speed.		

Options Summary		
M.2 Slot (Key B) Function	SATA	Optimal Default, Failsafe Default
	PCIe	
Switch M.2 slot function.		
PCI Express Root 12	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/ Disable M.2 Slot PCIE.		
PCIE Speed	Auto	Optimal Default, Failsafe Default
	Gen1	
	Gen1	
	Gen1	
Config PCIe speed.		

3.6 Setup Submenu: Security



Change User/Administrator Password

You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

Select the password you wish to set, and press Enter. In the dialog box, enter your password (must be between 3 and 20 letters or numbers). Press Enter and retype your password to confirm. Press Enter again to set the password.

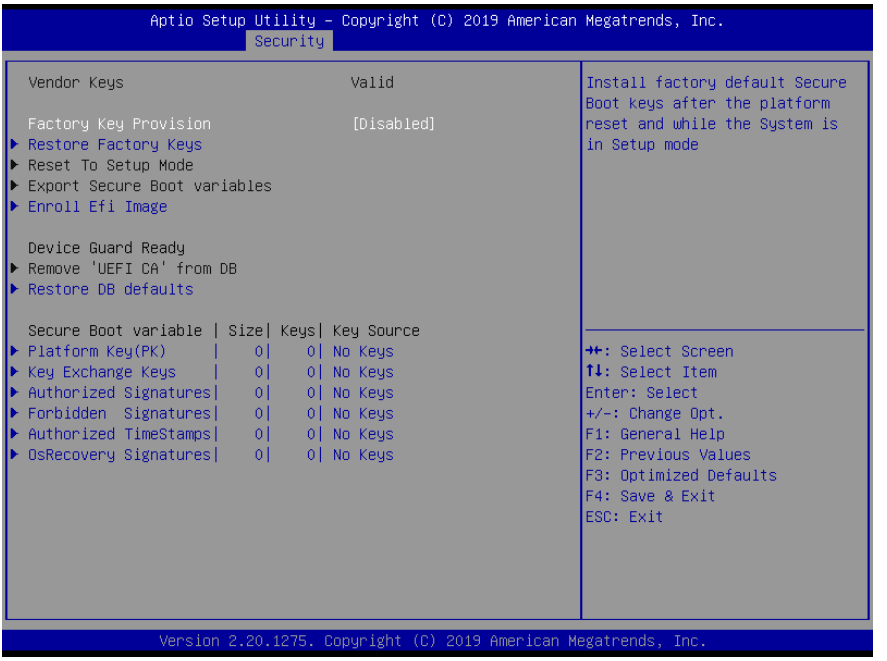
Removing the Password

Select the password you want to remove and enter the current password. At the next dialog box press Enter to disable password protection.

3.6.1 Secure Boot

Options Summary		
Secure Boot	Disabled	Optimal Default, Failsafe Default
	Enabled	
Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset.		
Secure Boot Mode	Custom	Optimal Default, Failsafe Default
	Standard	
Secure Boot mode options: Standard or Custom. In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.		
Restore Factory Keys		
Force System to User Mode. Install factory default Secure Boot key databases.		
Reset To Setup Mode		
Delete all Secure Boot key databases from NVRAM.		

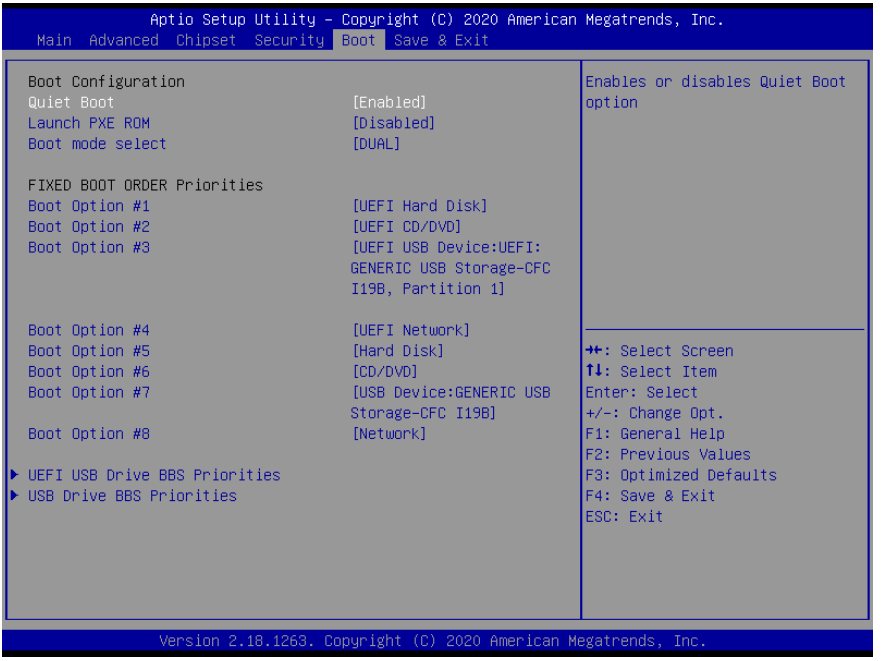
3.6.1.1 Key Management



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).		

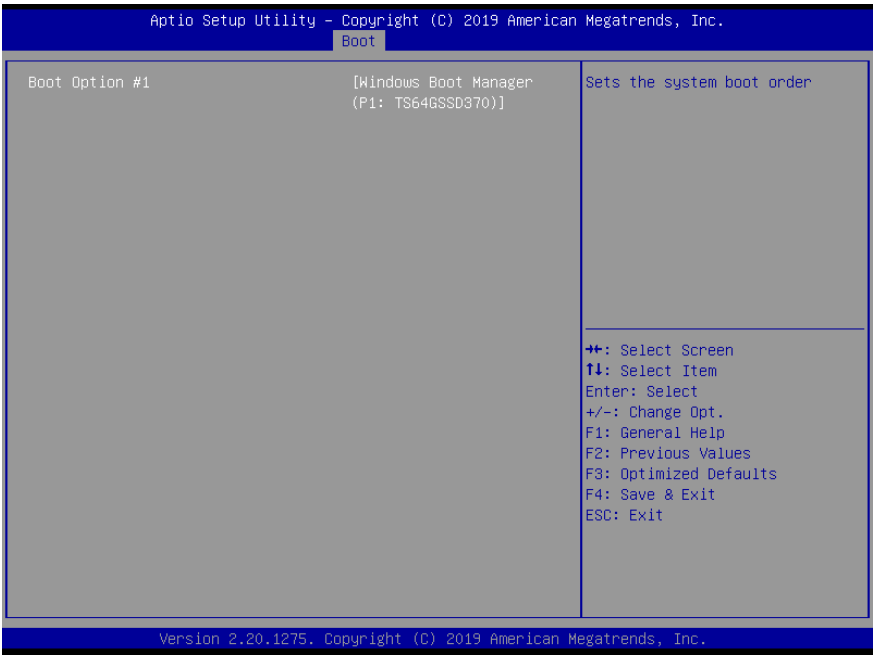
Options Summary		
Remove 'UEFI CA' from DB		
Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db).		
Restore DB defaults		
Restore DB variable to factory defaults.		
Platform Key (PK)	Details	
	Export	
	Update	
	Delete	
Key Exchange Keys	Details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

3.7 Setup Submenu: Boot

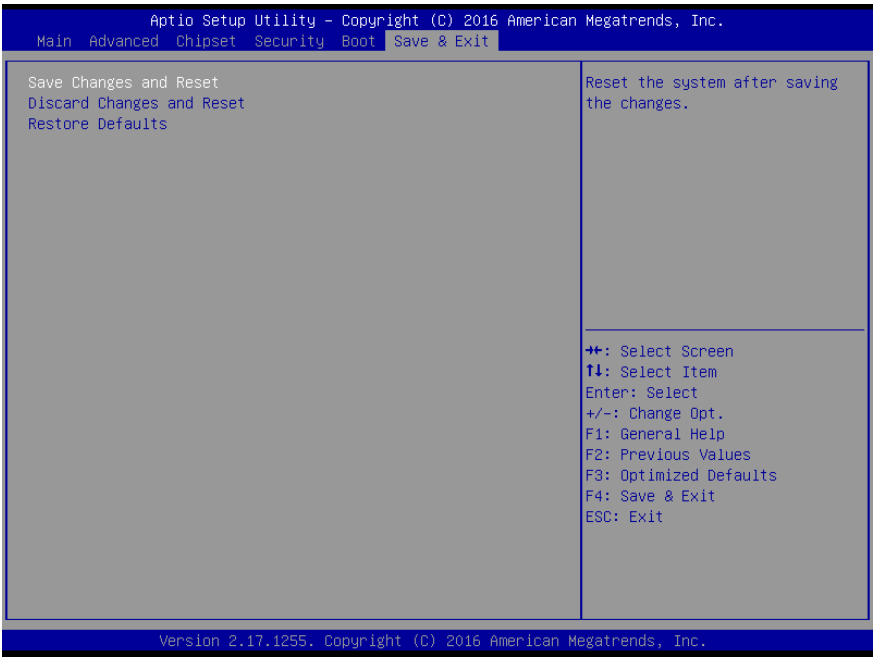


Options Summary		
Quiet Boot	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/ Disable showing boot logo.		
Lunch PXE ROM	Disabled	Optimal Default, Failsafe Default
	Enabled	
Controls the execution of Legacy Network OpROM.		
Boot mode select	LEGACY	
	UEFI	
	DUAL	Optimal Default, Failsafe Default
Select boot mode.		

3.7.1 BBS Priorities



3.8 Setup Submenu: Exit



Chapter 4

Drivers Installation

4.1 Driver Download/Installation

Drivers for the PICO-KBU4-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-kbu4-semi

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

Step 1 – Install Chipset Driver

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

Step 2 – Install Graphic Driver

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

Step 3 – Install LAN Driver

1. Open the **Step 2 - Graphic Driver a**nd open the **.exe** file
2. Follow the instructions
3. Driver will be installed automatically

Step 4 – Install Audio Driver

1. Open the **Step 4 - Audio Driver** folder and select your OS
2. Open the Setup.exe file
3. Follow the instructions
4. Driver will be installed automatically

Step 5 – Install Serial Port Driver (Optional)

1. Open the **Step 5 - Serial Port Driver (Optional)** folder and select your OS
2. Open the .exe file
3. Follow the instructions
4. Driver will be installed automatically

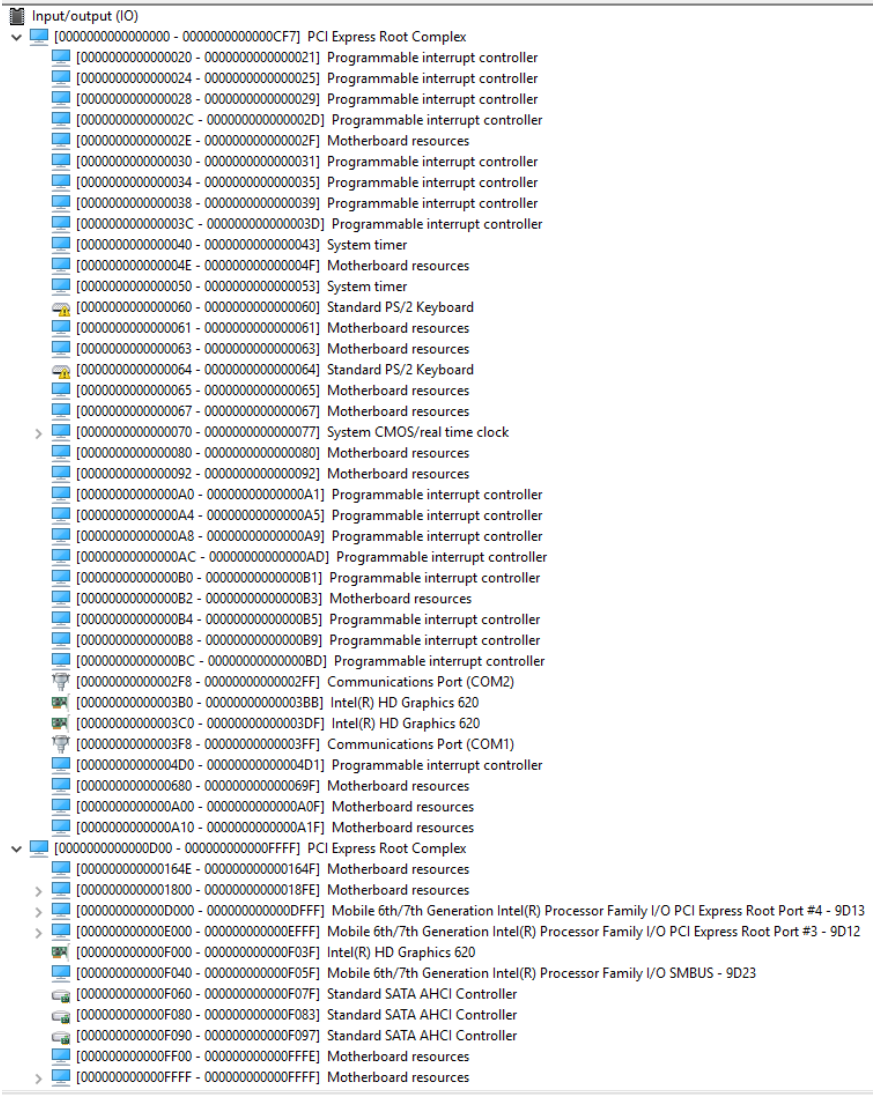
Step 6 – Install USB3.0 Driver

1. Open the **Step 6 - USB3.0 Driver** folder and select your OS
2. Open the .exe file
3. Follow the instructions
4. Driver will be installed automatically

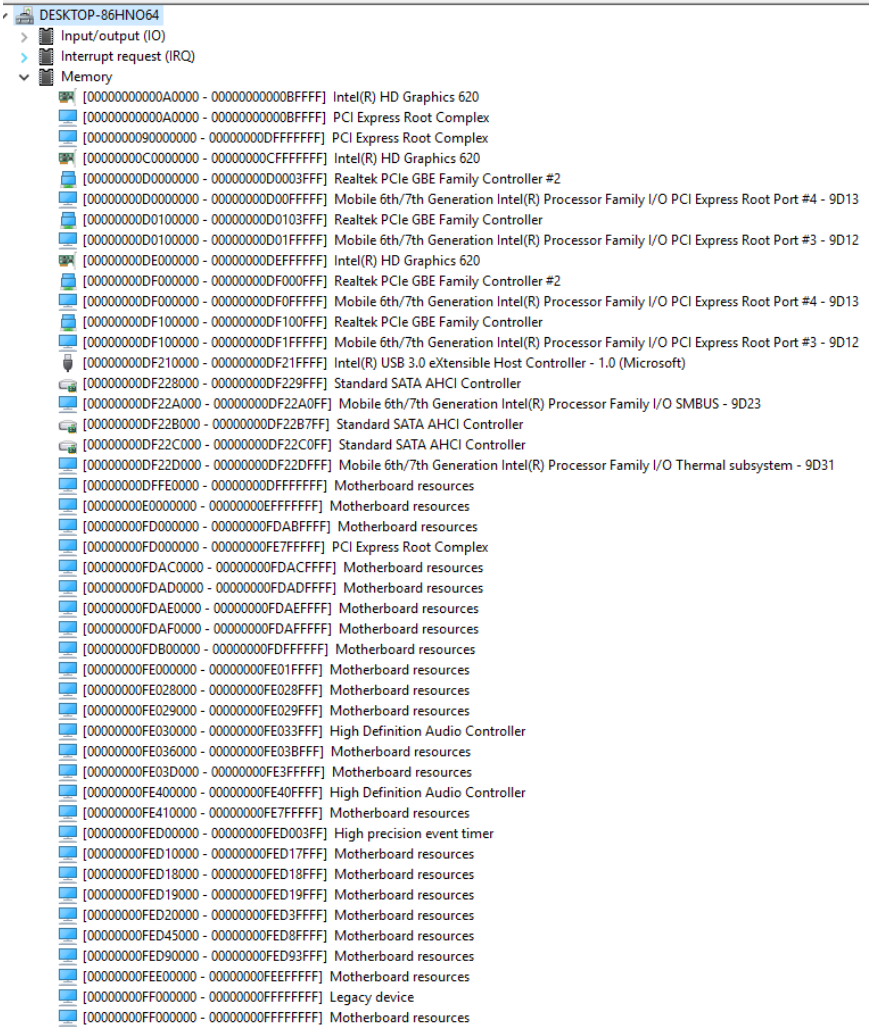
Appendix A

I/O Information

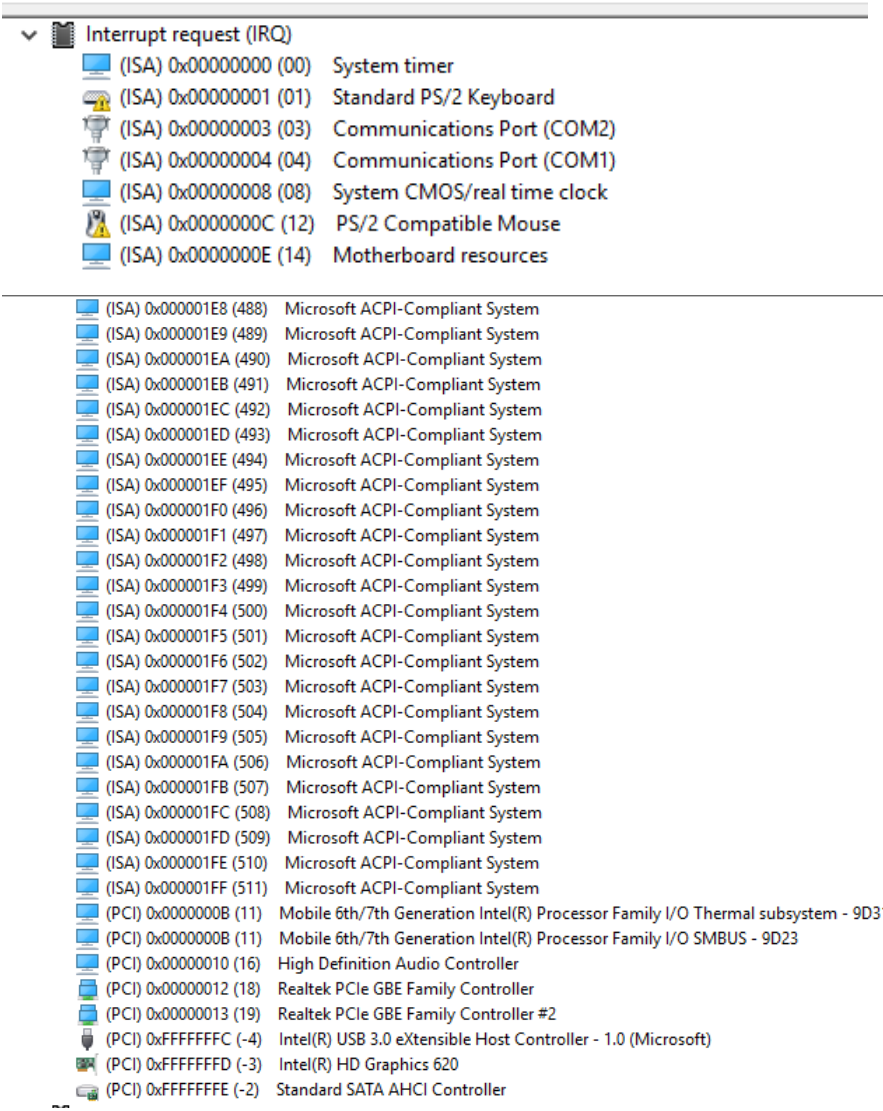
A.1 I/O Address Map



A.2 Memory Address Map



A.3 IRQ Mapping Chart



Appendix B

Mating Connectors

B.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	Battery	Molex	51021-0200	Battery Cable	175011301C
CN2	HDMI	Molex	88768-9900	NA	NA
CN6	LAN Conn	Molex	44915-0001	NA	NA
CN7	LAN Conn	Molex	44915-0001	NA	NA
CN10	USB 2.0 Conn	ACES	50247-010H0H0-001	USB Cable	170010010D
CN11	USB 3.0 Conn	Wurth	710-692112030100	NA	NA
CN15	Front Panel Conn	ACES	50247-010H0H0-001	Front Panel Cable	170X000347
CN16	COM Port 1/2 & line out Conn	JST	SHDR-20V-S-B	COM Port Cable	1701200101
CN19	LPC Port	JST	SHR-12V-S-B	AAEON LPC Cable	1703120130
CN23	DC Jack	HUANG JI	5525C257-3T00-R1-7.5	Power Cable	1702041004
CN27	FAN Conn	Molex	51021-0400	NA	NA