EPIC-KBS8

EPIC Board

User's Manual 1st Ed

Last Updated: May 8, 2018

Copyright Notice

Acknowledgement

Packing List

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

Item	Quantity
● EPIC-KBS8	1
● 1702150155 SATA power cable	1
● 1709070500 SATA cable	1
● 9657666600 jumper cap	1
● Product DVD with drivers	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 AAEON.com for the latest version of this document.

Safety Precautions

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

1. All cautions and warnings on the device should be noted.
2. Make sure the power source matches the power rating of the device.
3. Position the power cord so that people cannot step on it. Do not place anything over the power cord.
4. Always completely disconnect the power before working on the system's hardware.
5. No connections should be made when the system is powered as a sudden rush of power may damage sensitive electronic components.
6. If the device is not to be used for a long time, disconnect it from the power supply to avoid damage by transient over-voltage.
7. Always disconnect this device from any AC supply before cleaning.
8. While cleaning, use a damp cloth instead of liquid or spray detergents.
9. Make sure the device is installed near a power outlet and is easily accessible.
10. Keep this device away from humidity.
11. Place the device on a solid surface during installation to prevent falls
12. Do not cover the openings on the device to ensure optimal heat dissipation.
13. Watch out for high temperatures when the system is running.
14. Do not touch the heat sink or heat spreader when the system is running
15. Never pour any liquid into the openings. This could cause fire or electric shock.
16. As most electronic components are sensitive to static electrical charge, be sure to ground yourself to prevent static charge when installing the internal components. Use a grounding wrist strap and contain all electronic components in any static-shielded containers.

17. If any of the following situations arises, please the contact our service personnel:
    i. Damaged power cord or plug
    ii. Liquid intrusion to the device
    iii. Exposure to moisture
    iv. Device is not working as expected or in a manner as described in this manual
    v. The device is dropped or damaged
    vi. Any obvious signs of damage displayed on the device
18. DO NOT LEAVE THIS DEVICE IN AN UNCONTROLLED ENVIRONMENT WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.

FCC Statement

This device complies with Part 15 FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Caution:

There is a danger of explosion if the battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions and your local government's recycling or disposal directives.

Attention:

Il y a un risque d'explosion si la batterie est remplacée de façon incorrecte.
Ne la remplacer qu'avec le même modèle ou équivalent recommandé par le constructeur.
Recycler les batteries usées en accord avec les instructions du fabricant et les directives gouvernementales de recyclage.

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板及其电子组件	O	O	O	O	O	O
外部信号连接器及线材	O	O	O	O	O	O

O：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。

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

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

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

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

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

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

Table of Contents

Chapter 1

Product Specifications

1.1 Specifications

System

Form Factor	EPIC Board
Processor	6th/7th Generation Intel® Core™ i3/i5/i7/Celeron®
System Memory	Up to 16 GB DDR4 (Non-ECC) SODIMM x 1, 2133MHz
Chipset	H110/Q170 (6W)
I/O Chipset	--
Ethernet	LAN x 2 (Rear IO)
BIOS	AMI
Wake On LAN	Yes
Watchdog Timer	255 Levels
H/W Status Monitoring	--
Expansion Interface	Mini-card x 1 (Full size)
Battery	--
Power Consumption (Typical)	--
Board Size	4.53" x 6.50" (115mm x 165mm)
Gross Weight	--
Operating Temperature	32°F ~ 140°F (0°C ~ 60°C)
Storage Temperature	-40°F ~ 176°F (-40°C ~ 85°C)

- **Operation Humidity** 0 ~ 90%, relative humidity, non-condensing

Display

- **Chipset** 6th/7th Generation Intel® Core™ i3/i5/i7/Celeron®
- **Video Output** VGA/LVDS1 (Optional: LVDS2/eDP)
- **Backlight Inverter Supply** Max 12V, 2A

I/O

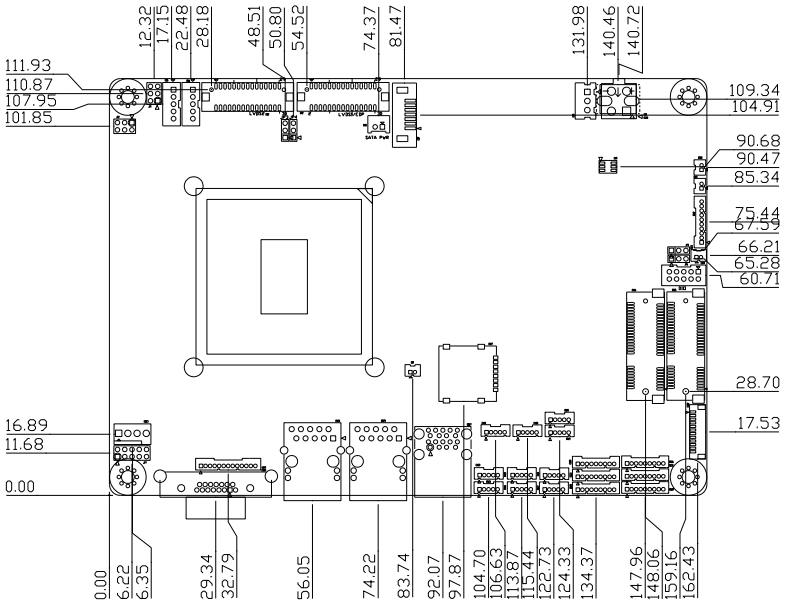
- **SATA** SATA 3.0 x 1
- **USB** Rear I/O: USB3.0 x 2
  Internal: USB2.0 x 10 (for Q170 SKU)
- **Serial Port** COM x 6 (All internal, COM2: RS-232/422/485, COM2-5 5V/12V/RI)
- **DI/O** 8-bit
- **Audio** REALTEK ALC892 (Optional: 2W Amp, I2S)

Chapter 2

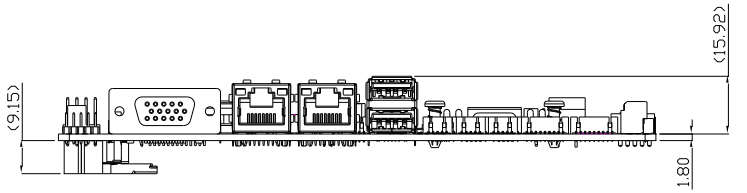
Hardware Information

2.1 Dimensions

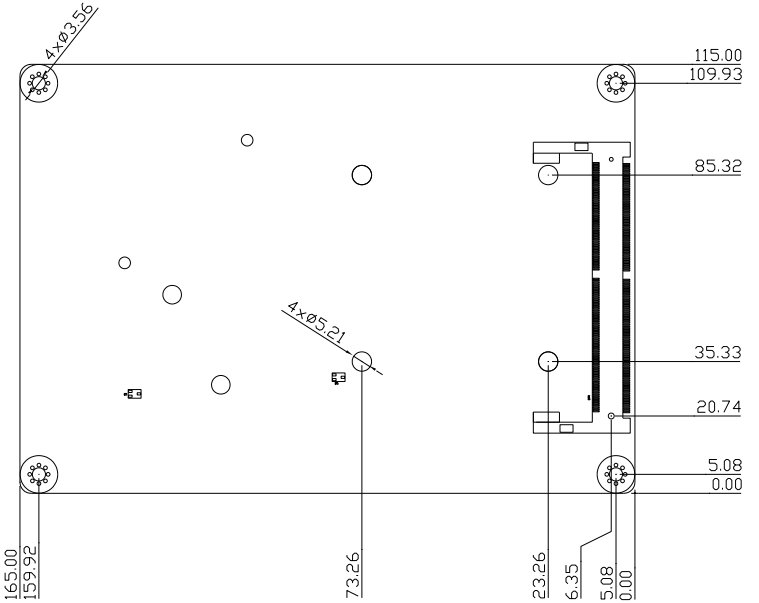
Component Side



Component Side



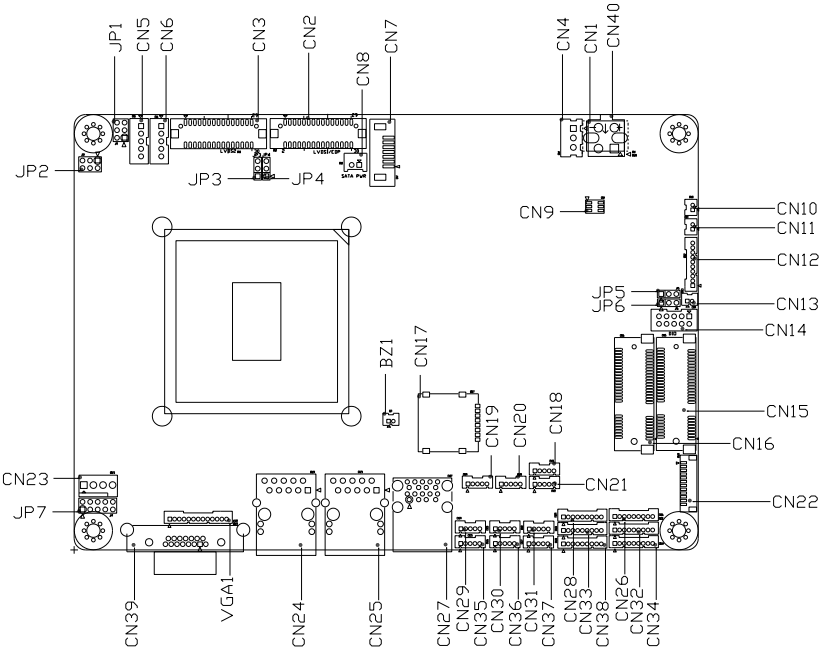
Solder Side



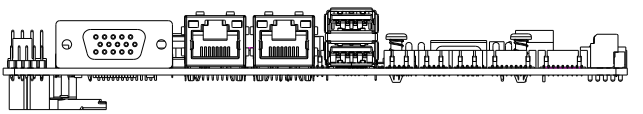
Solder Side

2.2 Jumpers and Connectors

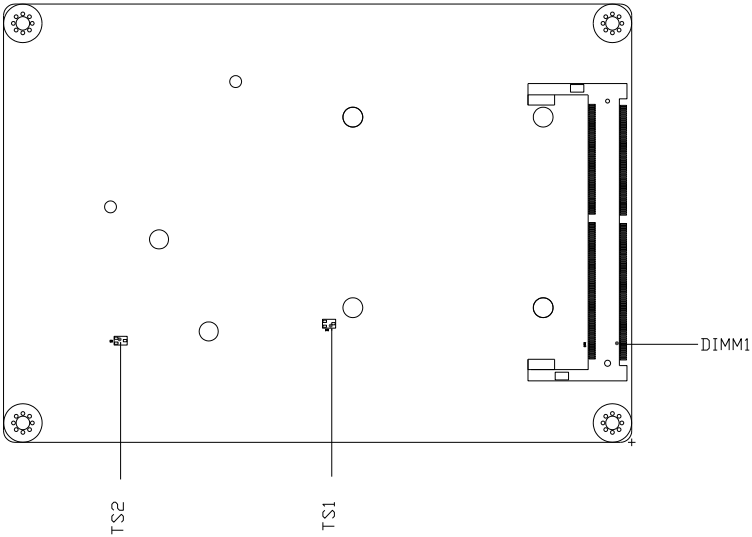
Component Side



Component Side



Solder Side



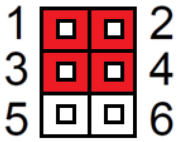
Solder Side

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

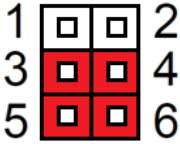
Label	Function
JP1	LVDS2 Port VDD and BLKT VCC Selection
JP2	LVDS1/eDP VDD and BLKT VCC Selection
JP3	LVDS2 Port BLKT Control Mode Selection
JP4	LVDS1 Port BLKT Control Mode Selection
JP5	Clear CMOS Jumper
JP6	Auto Power Button Enable/Disable Selection
JP7	Front Panel Connector

2.3.1 LVDS2 Operating VDD/BKLT Selection (JP1)



+12V LVDS2 BKLT (1-3)

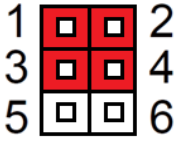
+5V LVDS2 VDD (2-4)



+5V LVDS2 BKLT (3-5) (Default)

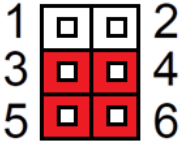
+3.3V LVDS2VDD (4-6) (Default)

2.3.2 LVDS1 and eDP Port Operating VDD/BKLT Selection (JP2)



+12V LVDS / eDP BKLT (1-3)

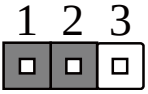
+5V LVDS / eDP VDD (2-4)



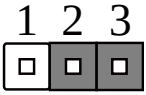
+5V LVDS / eDP BKLT (3-5) (Default)

+3.3V LVDS / eDP VDD (4-6) (Default)

2.3.3 LVDS2 BLKT Control Mode Selection (JP3)

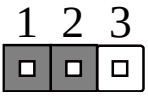


LVDS2VR Mode (1-2) (optional)

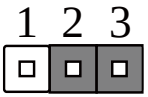


LVDS2 PWM Mode (2-3)(Default)

2.3.4 LVDS and eDP Port BLKT Control Mode Selection (JP4)

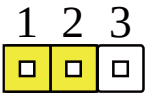


LVDS and eDP VR Mode (1-2) (optional)

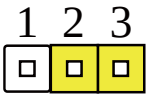


LVDS and eDP PWM Mode (2-3) (Default)

2.3.5 Clear CMOS Jumper (JP5)

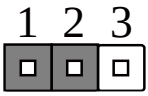


Normal (1-2) (Default)

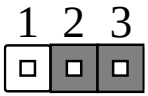


Clear CMOS (2-3)

2.3.6 Auto Power Button Enable/Disable Selection (JP6)

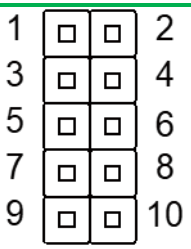


ATX Mode (1-2)



AT Mode (2-3) (Default)

2.3.7 Auto Power Button Enable/Disable Selection (JP7)



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

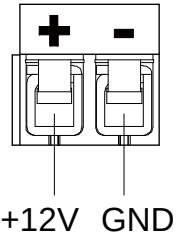
2.4 List of Connectors

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

Label	Function
CN1	External +12V Input
CN2	LVDS1/eDP Port
CN3	LVDS2 Port
CN4	+5V_SBY Input
CN5	LVDS1 Port Inverter / Backlight Connector
CN6	LVDS2 Port Inverter / Backlight Connector
CN7	SATA Port
CN8	+5V Output for SATA HDD
CN9	I2S I/O Port (optional)
CN10	Speaker (Left)
CN11	Speaker (Right)
CN12	Audio I/O Port
CN13	RTC Battery
CN14	8bit DIO Port
CN15	MiniCard Slot(Full-MiniCard)
CN16	mSATA(Default) and MiniCard Slot(Half-MiniCard)
CN17	Micro SIM Card Socket
CN18	USB Port 9 (optional)
CN19	USB Port 10 (optional)
CN20	USB Port 11 (optional)
CN21	USB Port 8 (optional)
CN22	LPC and I2C Port
CN23	CPU FAN

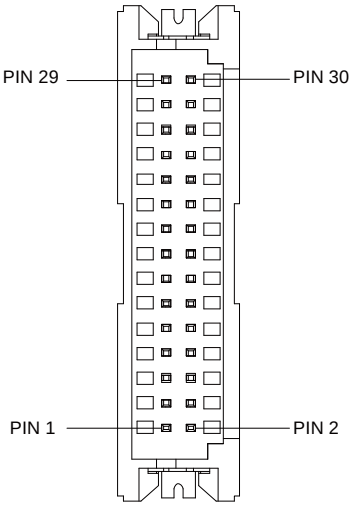
CN24	LAN (RJ-45) Port1
CN25	LAN (RJ-45) Port2
CN26	COM Port 3
CN27	USB 3.0 Ports 0 and 1
CN28	COM Port 6
CN29	USB Port 6
CN30	USB Port 4
CN31	USB Port 3
CN32	COM Port 2
CN33	COM Port 5
CN34	COM Port 4
CN35	USB Port 7
CN36	USB Port 5
CN37	USB Port 2
CN38	COM Port 1
CN39	VGA Port
VGA1	VGA Pin Header
BZ1	Buzzer Connector
DIMM1	DDR4 SO-DIMM Slot

2.4.1 External +12V Input (CN1)



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

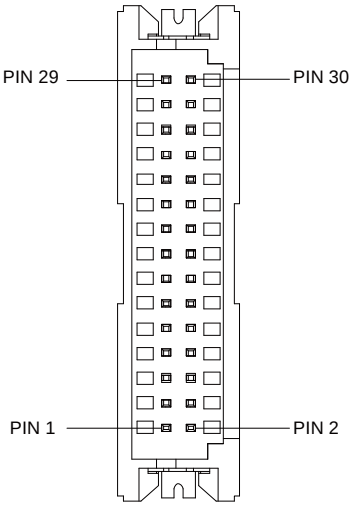
2.4.2 LVDS1/eDP Port (CN2)



Pin	Pin Name	Signal Type	Signal Level
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	
5	LVDS_A_CLK-/eDP_TXN3	DIFF	
6	LVDS_A_CLK+/eDP_TXP3	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	LVDS_DA0-/eDP_TXN2	DIFF	
10	LVDS_DA0+/eDP_TXP2	DIFF	
11	LVDS_DA1-/eDP_TXN1	DIFF	
12	LVDS_DA1+/eDP_TXP1	DIFF	

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

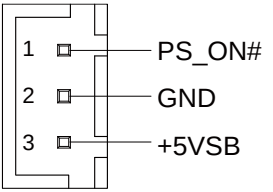
2.4.3 LVDS2N (CN3)



Pin	Pin Name	Signal Type	Signal Level
1	BKL_ENABLE	OUT	
2	BKL_CONTROL	OUT	
3	LCD_PWR	PWR	+3.3V/+5V
4	GND	GND	
5	LVDS_A_CLK-	DIFF	
6	LVDS_A_CLK+	DIFF	
7	LCD_PWR	PWR	+3.3V/+5V
8	GND	GND	
9	LVDS_DA0-	DIFF	
10	LVDS_DA0+	DIFF	
11	LVDS_DA1-	DIFF	
12	LVDS_DA1+	DIFF	

13	LVDS_DA2-	DIFF	
14	LVDS_DA2+	DIFF	
15	LVDS_DA3-	DIFF	
16	LVDS_DA3+	DIFF	
17	DDC_DATA	I/O	+3.3V
18	DDC_CLK	I/O	+3.3V
19	LVDS_DB0-	DIFF	
20	LVDS_DB0+	DIFF	
21	LVDS_DB1-	DIFF	
22	LVDS_DB1+	DIFF	
23	LVDS_DB2-	DIFF	
24	LVDS_DB2+	DIFF	
25	LVDS_DB3-	DIFF	
26	LVDS_DB3+	DIFF	
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	
29	LVDS_B_CLK-	DIFF	
30	LVDS_B_CLK+	DIFF	

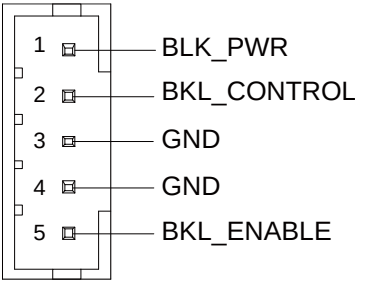
2.4.4 External +5VSB Input (CN4)



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

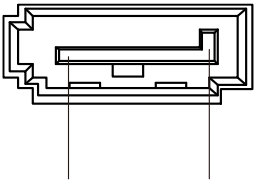
※Please make sure ATX power is full discharge when a system that use this connector(CN4) power off. Discharge time is relative to power supply and it may be 3~5s or more seconds.

2.4.5 LVDS and eDP Port Inverter / Backlight Connector (CN5, CN6)



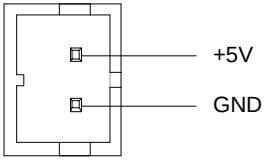
Pin	Pin Name	Signal Type	Signal Level
1	BKL_PWR	PWR	+5V / +12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+3.3V

2.4.6 3.0 SATA Port (CN7)



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

2.4.7 +5V Output for SATA HDD (CN8)

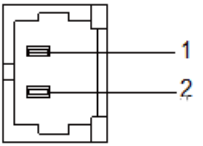


Pin	Pin Name	Signal Type	Signal Level
1	+5V	PWR	+5V
2	GND	GND	

2.4.8 I2S I/O Port(Optional) (CN9)

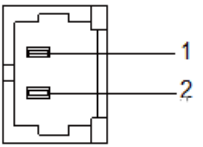
Pin	Pin Name	Signal Type	Signal Level
1	I2S_MCLK		
2	I2S_SFRM		
3	+V3.3A	PWR	+3.3V
4	I2S_TXD	OUT	
5	I2S_RXD	IN	
6	GND	GND	GND

2.4.9 Speaker (Left) (CN10)



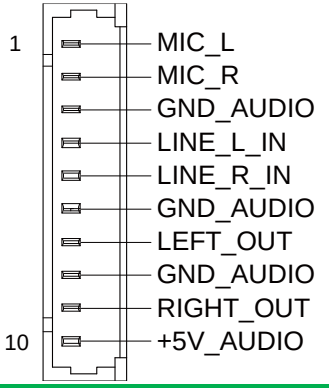
Pin	Pin Name	Signal Type	Signal Level
1	SPK_L+	OUT	
2	SPK_L-	OUT	

2.4.10 Speaker (Right) (CN11)



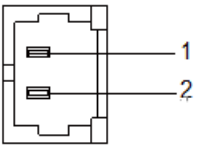
Pin	Pin Name	Signal Type	Signal Level
1	SPK_R+	OUT	
2	SPK_R-	OUT	

2.4.11 Audio I/O Port (CN12)



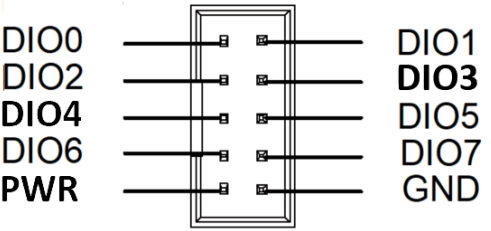
Pin	Pin Name	Signal Type	Signal Level
1	MIC_L	IN	
2	MIC_R	IN	
3	GND_AUDIO	GND	
4	LINE_L_IN	IN	
5	LINE_R_IN	IN	
6	GND_AUDIO	GND	
7	LEFT_OUT	OUT	
8	GND_AUDIO	GND	
9	RIGHT_OUT	OUT	
10	+5V_AUDIO	PWR	+5V

2.4.12 RTC Battery (CN13)



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

2.4.13 8bit DIO Port (CN14)



Pin	Pin Name	Signal Type	Signal Level
3	GPIO0	I/O	+5V
5	GPIO1	I/O	+5V
7	GPIO2	I/O	+5V
9	GPIO3	I/O	+5V
11	GPIO4	I/O	+5V
13	GPIO5	I/O	+5V
15	GPIO6	I/O	+5V
17	GPIO7	I/O	+5V

2.4.14 MiniCard Slot (Full-MiniCard) (CN15)

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

24	+3.3VSB	PWR	+3.3V
25	PCIE_RX+	DIFF	
26	GND	GND	
27	GND	GND	
28	+1.5V	PWR	+1.5V
29	GND	GND	
30	SMB_CLK	I/O	+3.3V
31	PCIE_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	PCIE_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB_D-	DIFF	
37	GND	GND	
38	USB_D+	DIFF	
39	+3.3VSB	PWR	+3.3V
40	GND	GND	
41	+3.3VSB	PWR	+3.3V
42	NC		
43	GND	GND	
44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V

49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB	PWR	+3.3V

2.4.15 mSATA(Default) and MiniCard Slot (Half-MiniCard) (CN16)

Pin	Pin Name	Signal Type	Signal Level
1	PCIE_WAKE#	IN	
2	+3.3VSB	PWR	+3.3V
3	NC		
4	GND	GND	
5	NC		
6	+1.5V	PWR	+1.5V
7	PCIE_CLK_REQ#	IN	
8	NC	PWR	
9	GND	GND	
10	NC	I/O	
11	PCIE_REF_CLK-	DIFF	
12	NC	IN	
13	PCIE_REF_CLK+	DIFF	
14	NC		
15	GND	GND	
16	NC	PWR	
17	NC		
18	GND	GND	

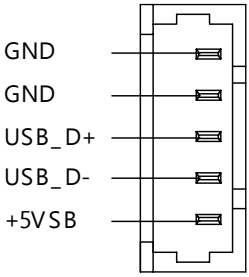
19	NC		
20	W_DISABLE#	OUT	+3.3V
21	GND	GND	
22	PCIE_RST#	OUT	+3.3V
23	SATA_RX-	DIFF	
24	+3.3VSB	PWR	+3.3V
25	SATA_RX+	DIFF	
26	GND	GND	
27	GND	GND	
28	+1.5V	PWR	+1.5V
29	GND	GND	
30	SMB_CLK	I/O	+3.3V
31	SATA_TX-	DIFF	
32	SMB_DATA	I/O	+3.3V
33	SATA_TX+	DIFF	
34	GND	GND	
35	GND	GND	
36	USB_D-	DIFF	
37	GND	GND	
38	USB_D+	DIFF	
39	+3.3VSB	PWR	+3.3V
40	GND	GND	
41	+3.3VSB	PWR	+3.3V
42	NC		
43	GND	GND	

44	NC		
45	NC		
46	NC		
47	NC		
48	+1.5V	PWR	+1.5V
49	NC		
50	GND	GND	
51	NC		
52	+3.3VSB	PWR	+3.3V

2.4.16 Micro SIM Card Socket (CN17)

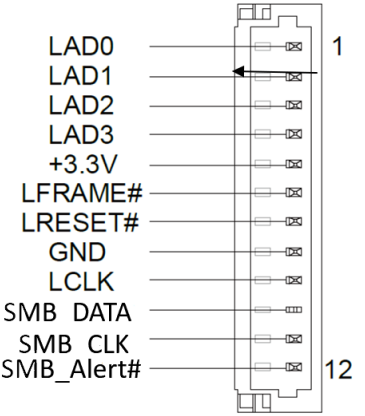
Pin	Pin Name	Signal Type	Signal Level
1	UIM_PWR	PWR	
2	UIM_RST	IN	
3	UIM_CLK	IN	
4	GND	GND	
5	UIM_VPP	PWR	
6	UIM_DATA	I/O	

2.4.17 USB 2.0 Port (CN18~CN21, CN29~CN31, CN35~CN37)



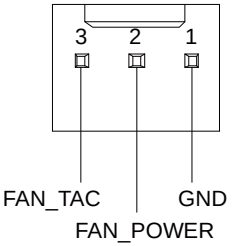
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB_D-	DIFF	
3	USB_D+	DIFF	
4	GND	GND	
5	GND	GND	

2.4.18 LPC Port (CN22)



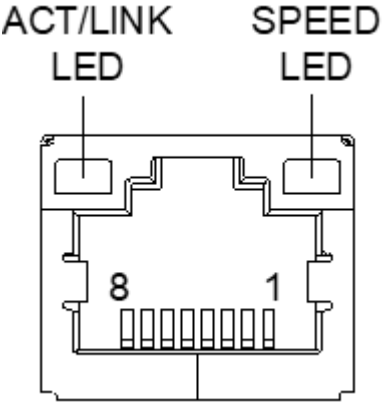
Pin	Pin Name	Signal Type	Signal Level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	
10	SMB DATA	I/O	+3.3V
11	SMB CLK	I/O	+3.3V
12	SMB_Alert#	I/O	+3.3V

2.4.19 CPU FAN (CN23)



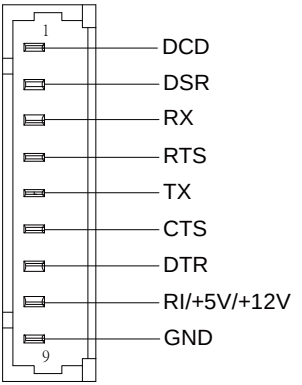
Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	FAN_POWER	PWR	+12V
3	FAN_TAC	IN	

2.4.20 LAN (RJ-45) (CN24, CN25)



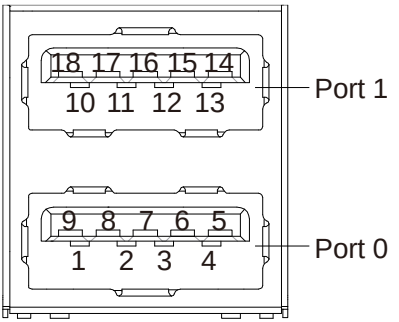
Pin	Pin Name	Signal Type	Signal Level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

2.4.21 COM Port (RS-232) (CN26, CN28, CN33, CN34, CN38)



RS-232			
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	DSR	IN	
3	RX	IN	
4	RTS	OUT	±9V
5	TX	OUT	±9V
6	CTS	IN	
7	DTR	OUT	±9V
8	RI/+5V/+12V	IN/ PWR	+5V/+12V
9	GND	GND	

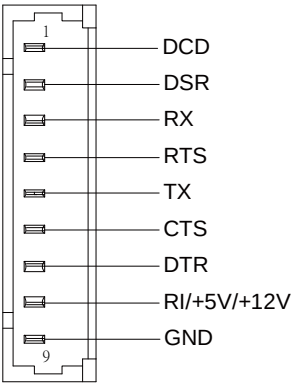
2.4.22 USB Ports 0 and 1 (CN27)



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–		
15	USB1_SSRX+		
16	GND	GND	

17	USB1_SSTX–
18	USB1_SSTX+

2.4.23 COM Port 2(RS232/422/485) (CN32)

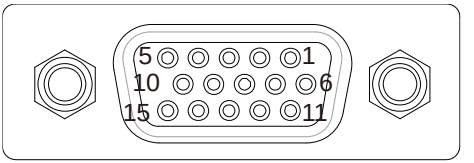


RS-232			
Pin	Pin Name	Signal Type	Signal Level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	
9	RI/+5V/+12V	IN/ PWR	RI/+5V/+12V

RS-422(only COM2)			
Pin	Pin Name	Signal Type	Signal Level
1	RS422_TX-	OUT	±5V
2	RS422_TX+	OUT	±5V
3	RS422_RX+	IN	
4	RS422_RX-	IN	
5	GND	GND	
6			
7			
8			
9	NC/+5V/+12V	PWR	+5V/+12V

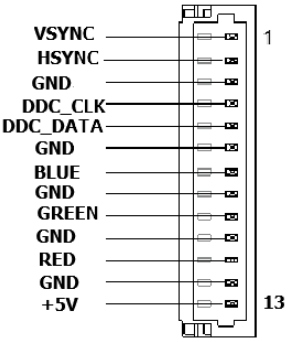
RS-485(only COM2)			
Pin	Pin Name	Signal Type	Signal Level
1	RS485_D-	I/O	±5V
2	RS485_D+	I/O	±5V
3			
4			
5	GND	GND	
6			
7			
8			
9	NC/+5V/+12V	PWR	+5V/+12V

2.4.24 VGA Port (CN39)



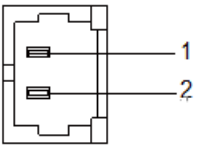
Pin	Pin Name	Signal Type	Signal Level
1	RED	OUT	Analog
2	GREEN	OUT	Analog
3	BLUE	OUT	Analog
4	NC		
5	GND	GND	
6	RED_GND_RTN	GND	
7	GREEN_GND_RTN	GND	
8	BLUE_GND_RTN	GND	
9	+5V	PWR	+5V
10	CRT_PLUG#		
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	
15	DDC_CLK	I/O	+5V

2.4.25 VGA connector (VGA1)



Pin	Pin Name	Signal Type	Signal Level
1	VSYNC	OUT	
2	HSYNC	OUT	
3	GND	GND	
4	DDC_CLK	I/O	
5	DDC_DAT	I/O	
6	GND	GND	
7	BLUE	Out	Analog
8	GND	GND	
9	GREEN	Out	Analog
10	GND	GND	
11	RED	Out	Analog
12	GND	GND	
13	+5V	PWR	

2.4.26 Buzzer Connector (BZ1)



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

2.4.27 DDR4 SO-DIMM Slot (DIMM1)

Standard Specification

2.5 CPU Installation

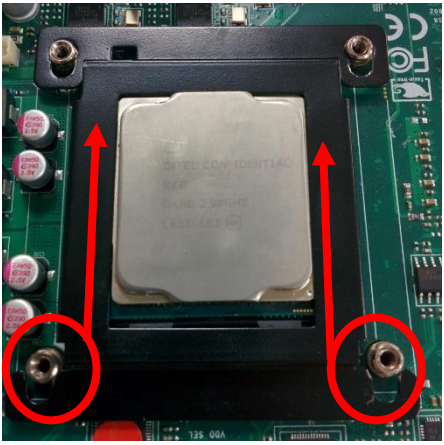
* Turn off the system, unplug the power cord and make sure the system is off.

* Have the Intel Kabylake or Intel SkyLake-S FCLGA1151 Processor (Max. TDP 35W) ready.

Step 1: Remove the plastic cover as instructed below.

Step 2: Assemble the CPU.

Step 3: Assemble the cover, and make sure the corners align.



Step 4: Slide the cover so that it fits to the stud.

Step 5: Stick the sponge on the PCB in order to fix the metal cover.

- Better fix the CPU in place

  The cover benefit is better to fix the CPU when disassembling cooler.

- Better compatibility

  It is also good for heat spreading. If the CPU is better fixed, the board will perform better and be more reliable.

Chapter 3

BIOS Setup

3.1 System Test and Initialization

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

System configuration verification

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

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

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

The EPIC-KBS8 CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the complete unit when it finally runs down.

3.2 AMI BIOS Setup

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

Entering Setup

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

Main – Date and time can be set here. Press <Tab> to switch between date elements

Advanced – Enable/ Disable boot option for legacy network devices

Chipset – For hosting bridge parameters

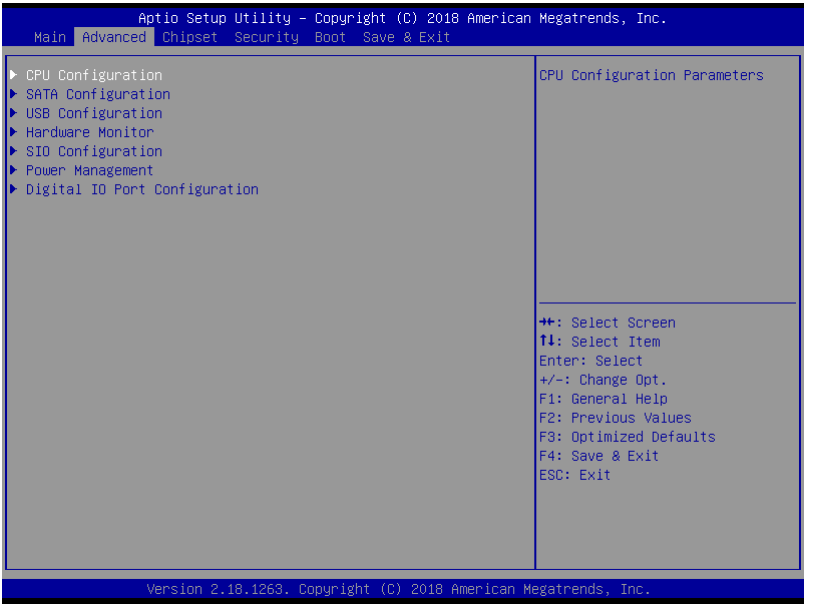
Boot – Enable/ Disable quiet Boot Option

Security – The setup administrator password can be set here

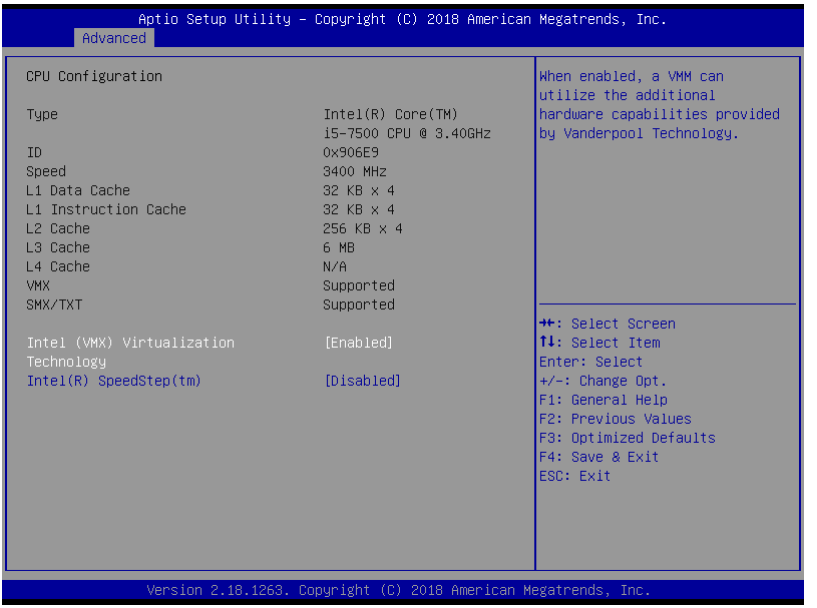
Save & Exit –Save your changes and exit the program

3.3 Setup submenu: Main

3.4 Setup submenu: Advanced



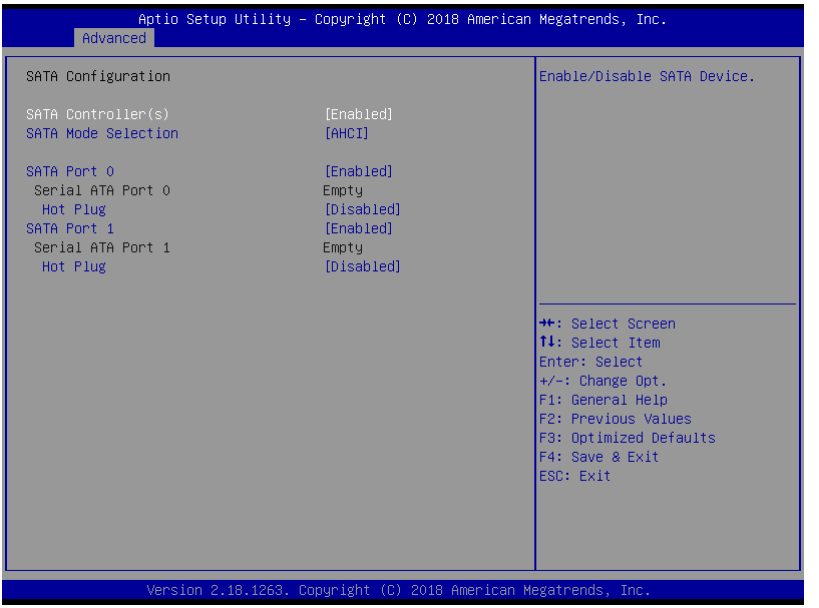
3.4.1 CPU Configuration



Options summary:

Intel (VMX) Virtualization Technology	Enabled	Optimal Default, Failsafe Default
	Disabled	
When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.		
Intel® SpeedStep™	Disabled	Optimal Default, Failsafe Default
	Enabled	
Allows more than two frequency ranges to be supported.		

3.4.2 SATA Configuration



Options summary:

SATA Controller(s)	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or disable SATA Device.		
SATA Mode selection	AHCI	Optimal Default, Failsafe Default
Port 0	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port.		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot Pluggable.		

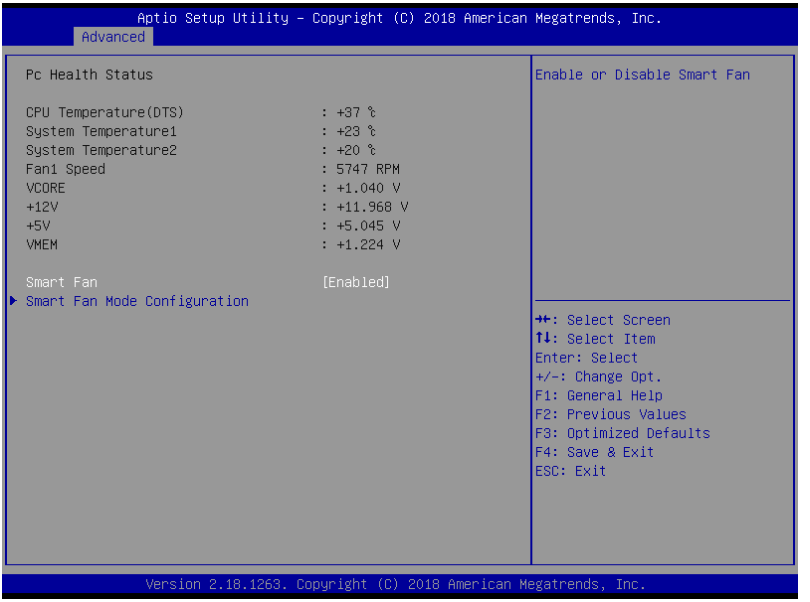
Port 1	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port.		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot Pluggable.		

3.4.3 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		

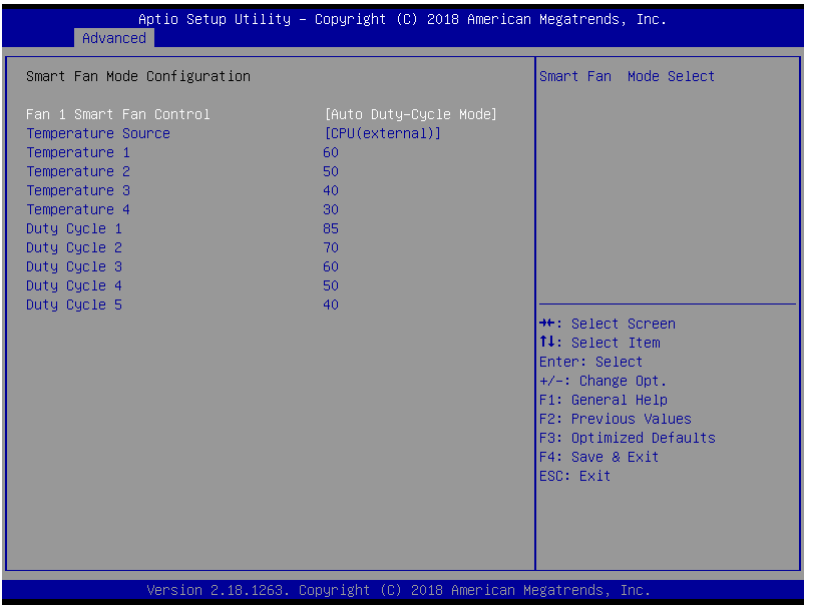
3.4.4 Hardware Monitor



Options summary:

Smart Fan	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable or Disable Smart Fan		

3.4.4.1 Smart Fan Mode Configuration

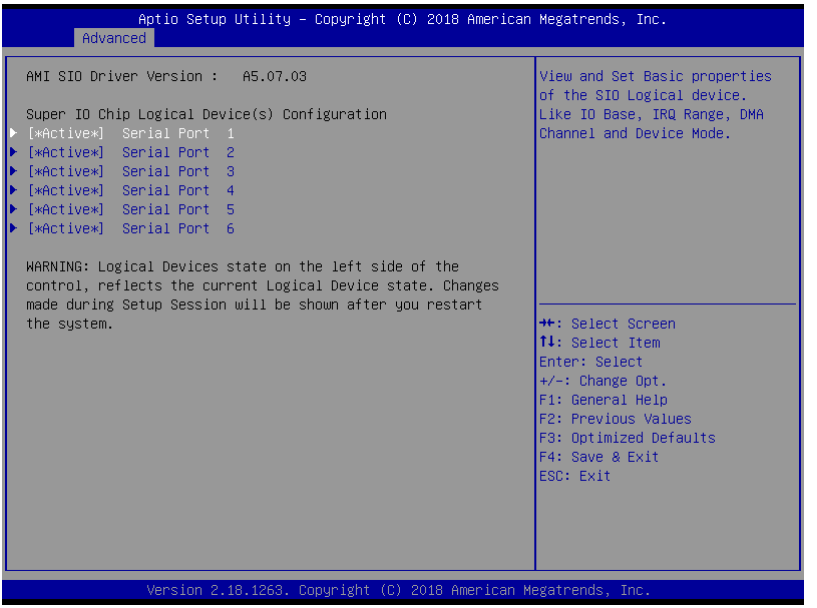


Options summary:

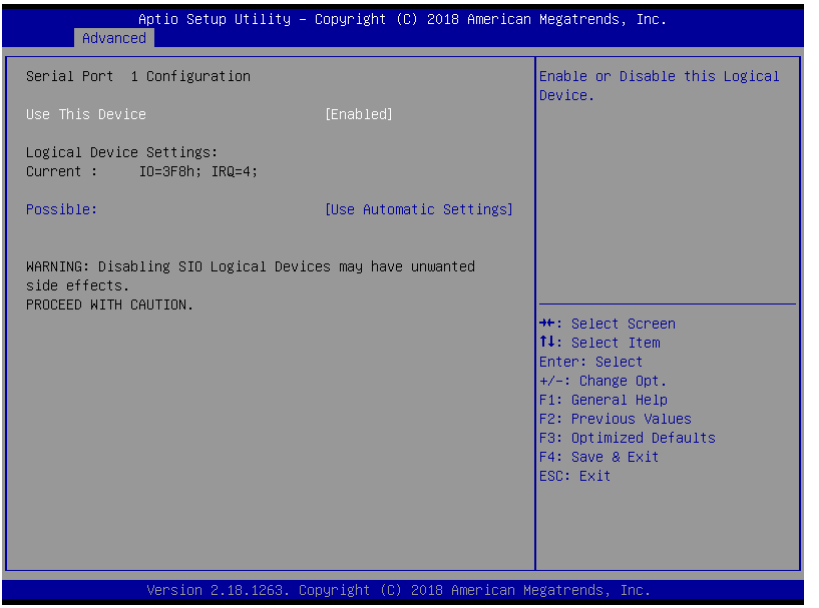
Fan 1 Smart Fan Control	Manual RPM Mode	Optimal Default, Failsafe Default
	Manual Duty Mode	
	Auto RPM Mode	
	Auto Duty-Cycle Mode	
Smart Fan Mode Select		
Temperature Source	CPU	Optimal Default, Failsafe Default
	CPU(external)	
	System	
Temperature 1	60	Optimal Default, Failsafe Default
Auto fan speed control. Fan speed will follow different temperature by different RPM 1-100.		

Temperature 2	50	Optimal Default, Failsafe Default
Auto fan speed control. Fan speed will follow different temperature by different RPM 1-100		
Temperature 3	40	Optimal Default, Failsafe Default
Auto fan speed control. Fan speed will follow different temperature by different RPM 1-100		
Temperature 4	30	Optimal Default, Failsafe Default
Auto fan speed control. Fan speed will follow different temperature by different RPM 1-100		
Duty Cucle 1	85	Optimal Default, Failsafe Default
Auto fan speed control. Fan speed will follow different temperature by different RPM 1-100		
Duty Cucle 2	70	Optimal Default, Failsafe Default
Auto fan speed control. Fan speed will follow different temperature by different RPM 1-100		
Duty Cucle 3	60	Optimal Default, Failsafe Default
Auto fan speed control. Fan speed will follow different temperature by different RPM 1-100		
Duty Cucle 4	50	Optimal Default, Failsafe Default
Auto fan speed control. Fan speed will follow different temperature by different RPM 1-100		
Duty Cucle 5	40	Optimal Default, Failsafe Default
Auto fan speed control. Fan speed will follow different temperature by different RPM 1-100		

3.4.5 SIO Configuration



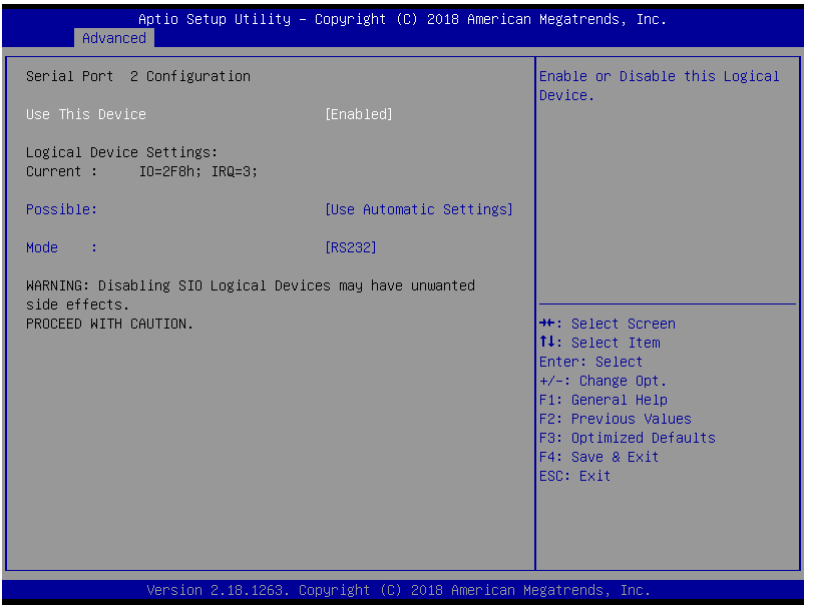
3.4.5.1 Serial Port 1 Configuration



Options summary:

Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8; IRQ=4;	
	IO=2F8; IRQ=3;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		

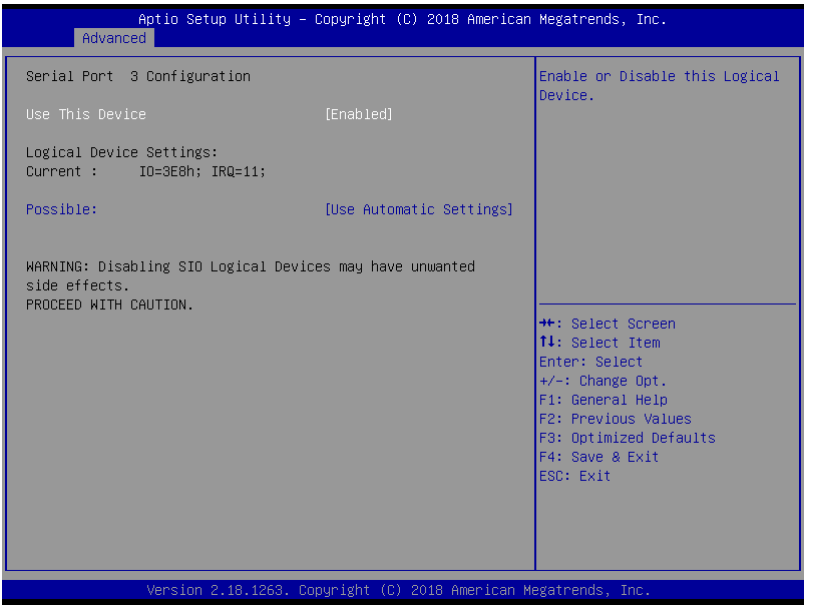
3.4.5.2 Serial Port 2 Configuration



Options summary:

Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8; IRQ=3	
	IO=3F8; IRQ=4;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		
Mode:	RS232;	Optimal Default, Failsafe Default
	RS422;	
	RS485;	
UART RS232, 422, 485 selection		

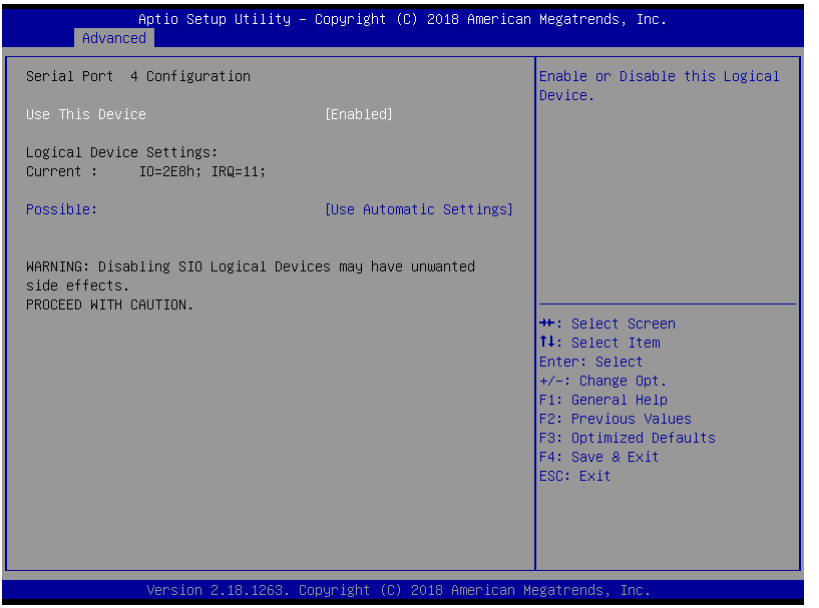
3.4.5.3 Serial Port 3 Configuration



Options summary:

Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3E8; IRQ=11;	
	IO=2E8; IRQ=11;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		

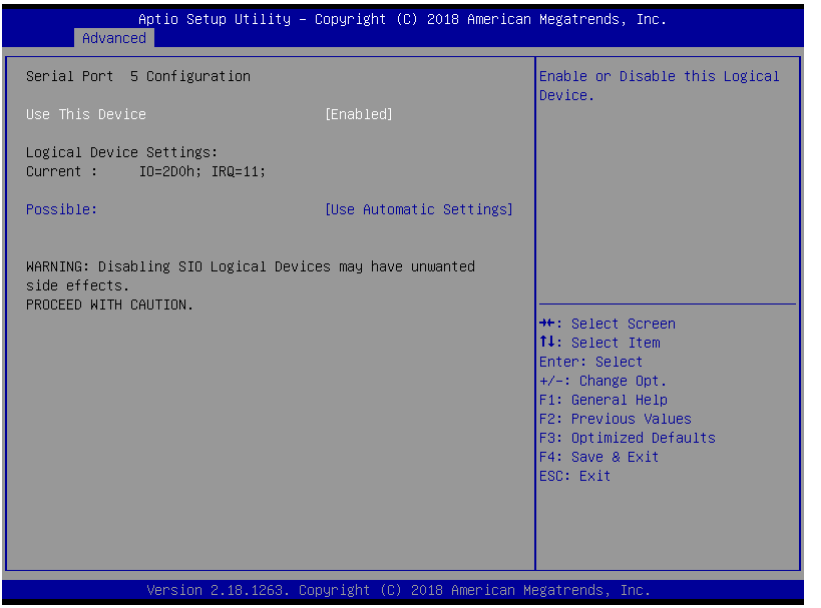
3.4.5.4 Serial Port 4 Configuration



Options summary:

Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2E8; IRQ=11;	
	IO=3E8; IRQ=11;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		

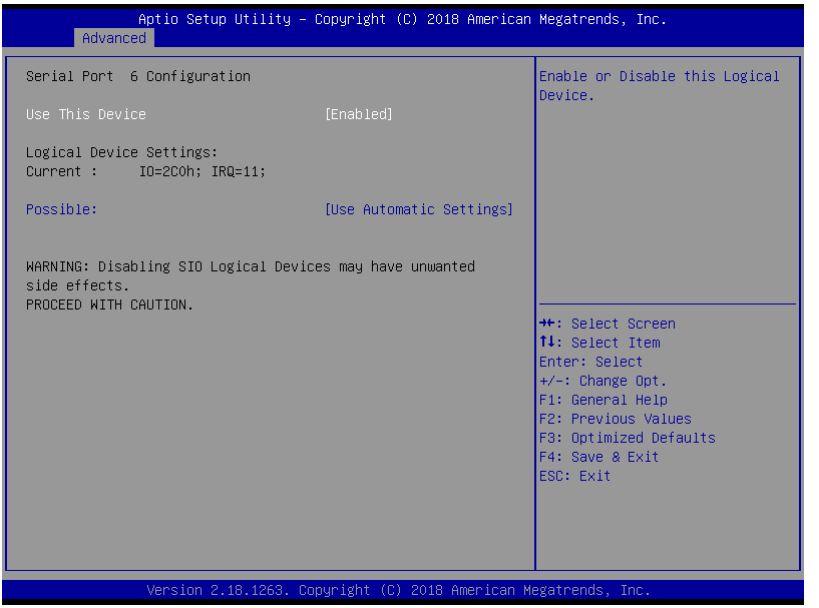
3.4.5.5 Serial Port 5 Configuration



Options summary:

Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2E8; IRQ=11;	
	IO=3E8; IRQ=11;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		

3.4.5.6 Serial Port 6 Configuration



Options summary:

Use This Device	Disabled	Optimal Default, Failsafe Default
	Enabled	
En/Disable Serial Port (COM)		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2E8; IRQ=11;	
	IO=3E8; IRQ=11;	
Allows the user to change the device resource settings. New settings will be reflected on this setup page after system restarts.		

3.4.6 Power Management

Options summary:

Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select system power mode.		
Restore on Power Loss	Last State	Optimal Default, Failsafe Default
	Power On	
	Power Off	
Select power state when power is re-applied after a power failure.		
RI Wake Event	Enabled	Optimal Default, Failsafe Default
	Disabled	
System wake up from RI# Enabled/Disabled		
RTC wake system from S5	Disabled	Optimal Default, Failsafe Default
	Fixed Time	

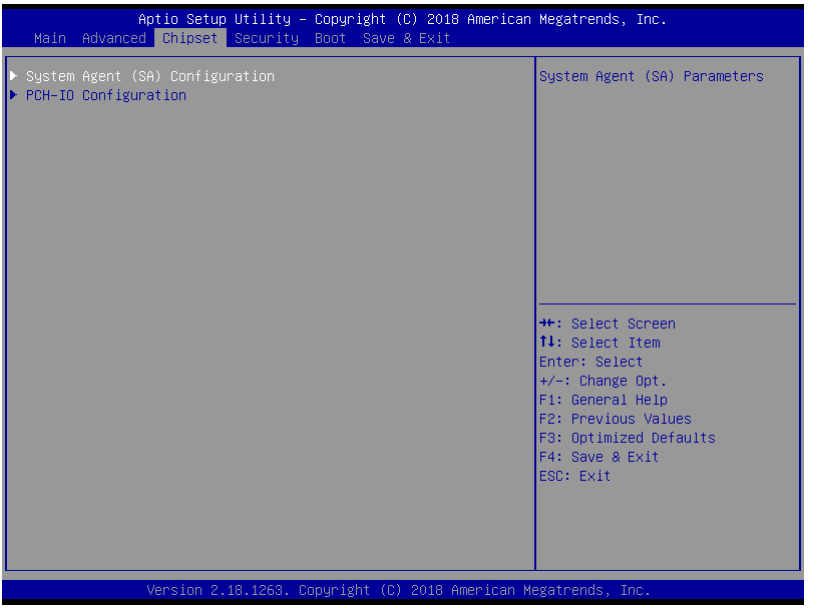
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified

3.4.7 Digital IO Port Configuration

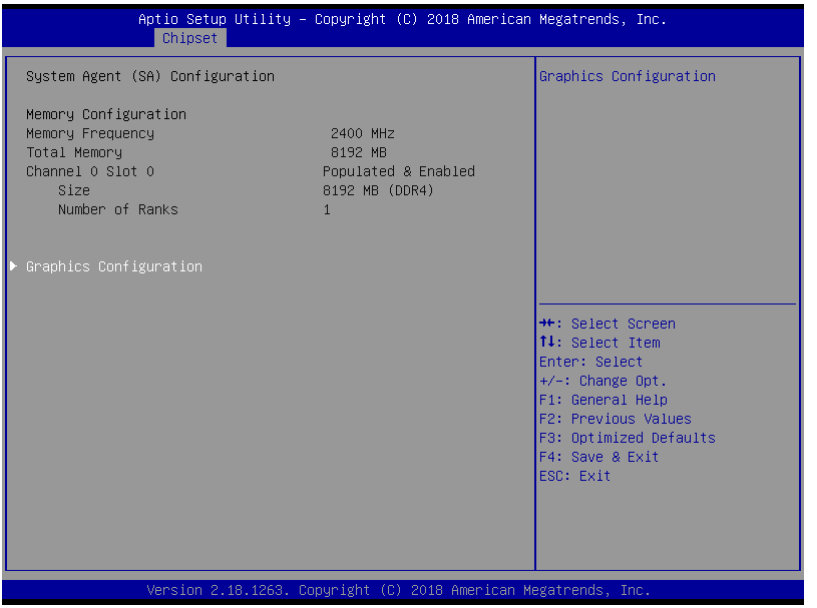
Options summary:

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

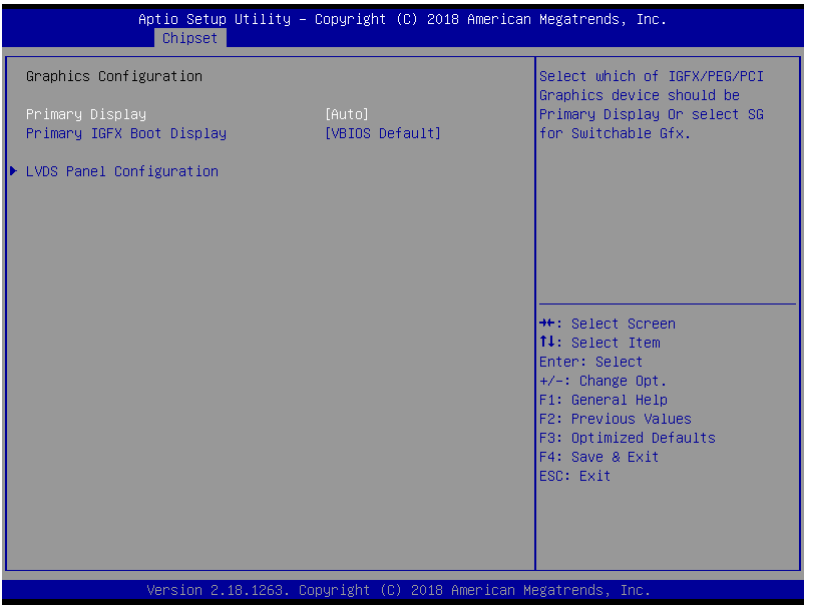
3.5 Setup submenu: Chipset



3.5.1 System Agent (SA) Configuration



3.5.1.1 Graphics Configuration



Options summary:

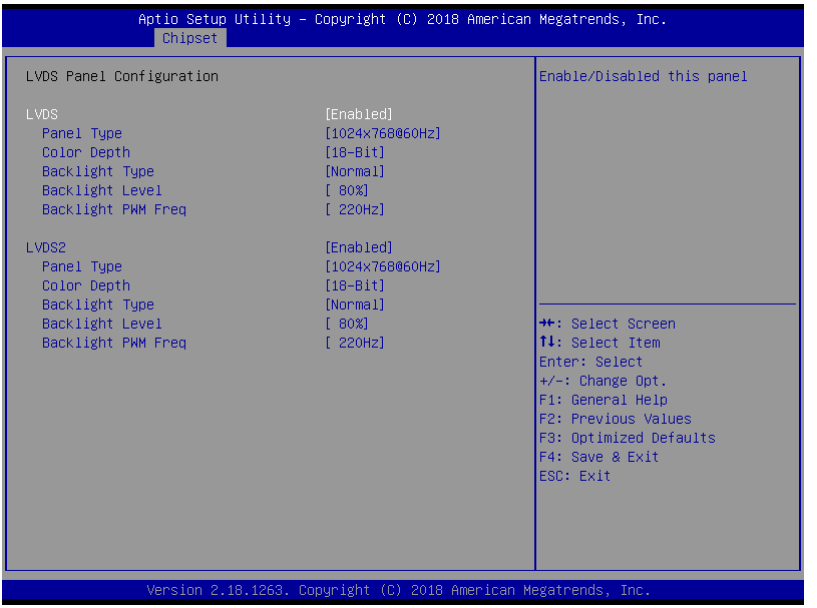
Primary IGFX Boot Display	Auto	Optimal Default, Failsafe Default
	IGFX	
	PEG	
Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.		
Primary IGFX Boot Display	VBIOS Default	Optimal Default, Failsafe Default
	eDP/LVDS1	
	LVDS2	
	CRT	
Select the Video 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.		

Secondary IGFX Boot Display	Disabled	Optimal Default, Failsafe Default
	eDP/LVDS1	
	LVDS2	
	CRT	
Select Secondary Display Device		

*The Secondary IGFX Boot Display option will different based on Primary IGFX Boot Display option.

Primary IGFX Boot Display	Secondary IGFX Boot Display
eDP/LVDS1	Disabled
	LVDS2
	CRT
LVDS2	Disabled
	CRT
CRT	Disabled

3.5.1.2 LVDS Panel Configuration



Options summary:

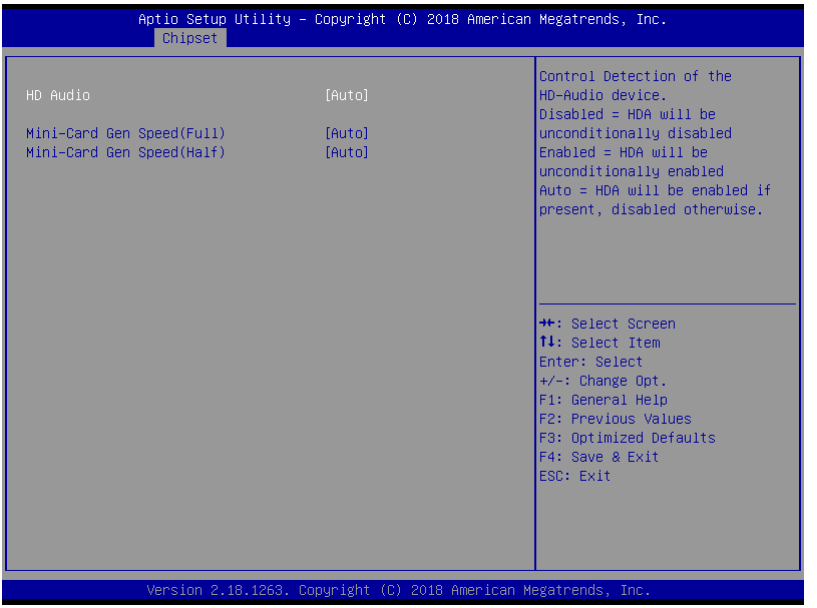
LVDS	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enabled/Disabled this panel.		
Panel Type	640x480@60Hz	
	800x480@60Hz	
	800x600@60Hz	
	1024x600@60Hz	
	1024x768@60Hz	Optimal Default, Failsafe Default
	1280x768@60Hz	
	1366x768@60Hz	
Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.		

Color Depth	18-bit	Optimal Default, Failsafe Default
	24-bit	
Select panel type		
Backlight Type	Normal	Optimal Default, Failsafe Default
	Inverted	
Select backlight control signal type		
Backlight Level	0%	Optimal Default, Failsafe Default
	10%	
	20%	
	30%	
	40%	
	50%	
	60%	
	70%	
	80%	
	90%	
	100%	
Select backlight control level		
Backlight PWM Freq	100Hz	Optimal Default, Failsafe Default
	200Hz	
	220Hz	
	500Hz	
	1KHz	
	2.2KHz	
	6.5KHz	
Select PWM frequency of backlight control signal		

LVDS2	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enabled/Disabled this panel.		
Panel Type	640x480@60Hz	
	800x480@60Hz	
	800x600@60Hz	
	1024x600@60Hz	
	1024x768@60Hz	Optimal Default, Failsafe Default
	1280x768@60Hz	
	1366x768@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	
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	Optimal Default, Failsafe Default
	200Hz	
	220Hz	
	500Hz	
	1KHz	
	2.2KHz	
	6.5KHz	
Select PWM frequency of backlight control signal		

3.5.2 PCH-IO Configuration

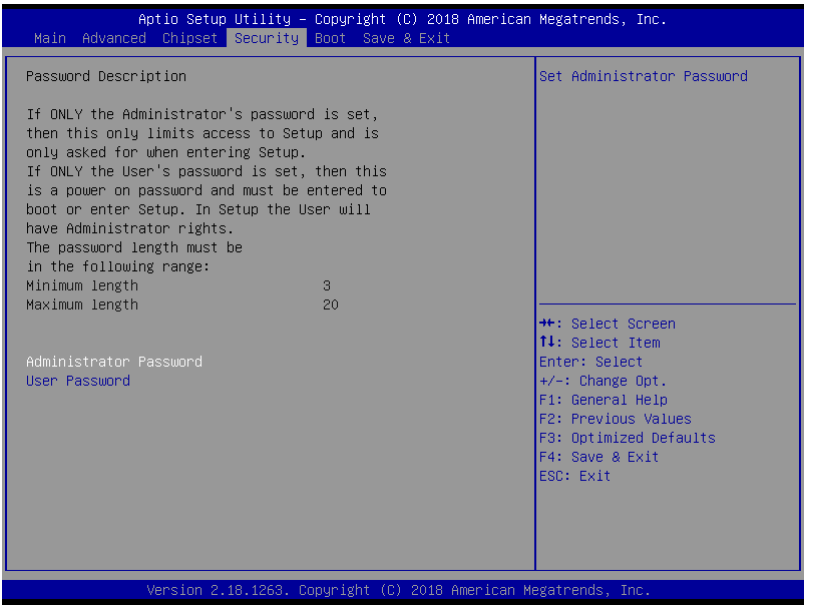


Options summary:

HD Audio	Auto	Optimal Default, Failsafe Default
	Enabled	
	Disabled	
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.		
Mini-Card Gen Speed(Full)	Auto	Optimal Default, Failsafe Default
	Gen1	
	Gen2	
	Gen3	
Configure PCIe Speed		

Mini-Card Gen Speed(Half)	Auto	Optimal Default, Failsafe Default
	Gen1	
	Gen2	
	Gen3	
Configure PCIe Speed		

3.6 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.

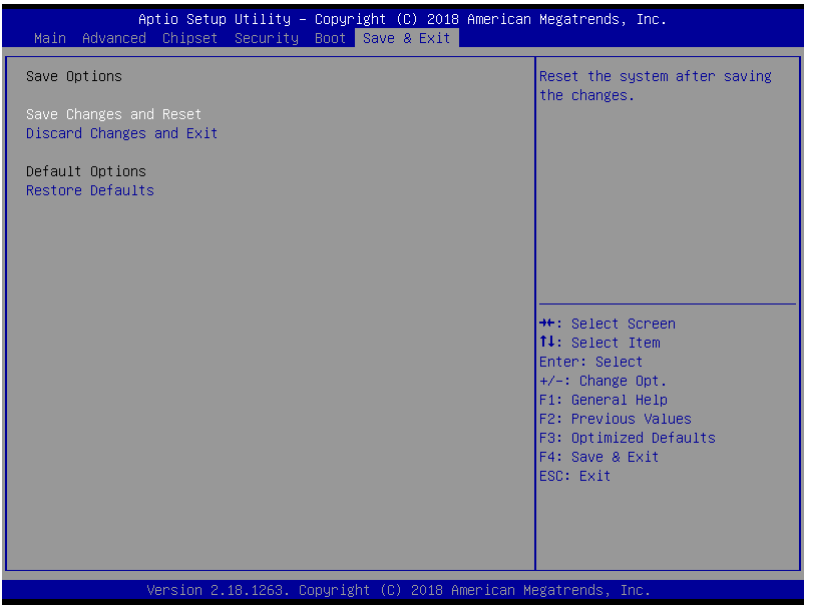
3.7 Submenu: Boot

Options summary:

Quiet Boot	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enabled or Disable showing boot logo.		
Launch PXE OpROM	Disabled	Optimal Default, Failsafe Default
	Enabled	
Controls the execution of UEFI and Legacy PXE OpROm		

3.7.1 BBS Priorities

3.8 Submenu: Exit



Chapter 4

Drivers Installation

4.1 Product CD/DVD

The EPIC-KBS8 comes with a product DVD that contains all the drivers and utilities you need to setup your product. Insert the DVD and follow the steps in the autorun program to install the drivers.

In case the program does not start, follow the sequence below to install the drivers.

Step 1 – Install Chipset Drivers

1. Open the **Step 1 – Chipset** folder followed by **infinst_autol.exe**
2. Follow the instructions
3. Drivers will be installed automatically

Step 2 – Install Graphics Driver

1. Open the **STEP2 - VGA** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Note 1:

- This motherboard supports VGA and LVDS display devices. In Single Display mode. By default, press **<Ctrl>+<Alt>+<F1>** to switch to VGA device and press **<Ctrl>+<Alt>+<F3>** to switch to LVDS device.
- Before removing the current display device, connect the display device that you want to use, and then press the hot keys to switch to that device.

Note 2: If you are using Windows® XP, you have to install the driver of dotNet Framework first (**dotnetfx35.exe** in **dotNet Framwork** folder).

Step 3 – Install LAN Driver

1. Open the **STEP3 – LAN (Intel_82579)** folder and select your OS

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

Step 4 – Install Audio Driver

1. Open the **STEP4 – Audio** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 5 – Install ME Drivers

1. Open the **STEP5 – ME SW** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 6 – Install RAID & AHCI Drivers

Please refer to Appendix E RAID & AHCI Settings

Step 7 – Install TPM Driver

1. Open the **STEP7 – TPM** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 8 – Install Touch Driver

1. Open the **STEP8 – Touch** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions

4. Drivers will be installed automatically

Step 9 – Install USB 3.0 Driver

1. Open the **STEP9 – USB 3.0** folder and select your OS
2. Open the **Setup.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Appendix A

Mating Connectors

A.1 List of Mating Connectors and Cables

The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN5, CN6	LVDS Port Inverter	JST	PHR-5	N/A	N/A
CN2, CN3	LVDS	HIROSE	DF13-30DS-1.25C	N/A	N/A
CN12	Audio	Molex	51021-1000	Audio Cable	1709100254
CN10, CN11	Speaker	Molex	51021-0200	N/A	N/A
CN26,CN28, CN32,CN33, CN34,CN38	COM	Molex	51021-0900	UART Wafer Cable	1701090150
JP7	Front Panel	Molex	51110-1050	N/A	N/A
CN14	DIO	Molex	51110-1050	N/A	N/A
CN13	RTC Battery	Molex	51021-0200	Battery Cable	175011901C
CN18~CN21, CN29~CN31 ,CN35~CN37	USB	Molex	51021-0500	USB Wafer Cable	1700050207
CN8	SATA PWR	JST	PHR-2	2 Pins For SATA Power	1702150155
CN4	External +5VSB Input and PS_ON#	JST	PHR-3	ATX Cable	170220020B
CN22	LPC Port	JST	SHR-12V-S-B	AAEON LPC Cable	1703120130
BZ1	Buzzer	Molex	51021-0200	Buzzer Cable	170302010C
CN1	External +12V Input	Molex	19211-0003	Power Cable	170204010R

VGA1	VGA Header	Molex	51021-1300	VGA Cable	1709150151