

PCM-CFS

5.25" Compact Board

User's Manual 11th Ed

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Packing List

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

Item	Quantity
PCM-CFS	1
Jumper Cap (9657666600)	1
Backplate for cooler (M09KBS9000)	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 WITH TEMPERATURES BEYOND THE DEVICE'S PERMITTED STORAGE TEMPERATURES (SEE CHAPTER 1) TO PREVENT DAMAGE.**

FCC Statement

Warning!



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

Caution:

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

Attention:

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

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON 主板/子板/背板

QQ4-381 Rev.A2

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	×	○	○	○	○	○
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。 环保使用期限(EFUP (Environmental Friendly Use Period))：10年 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)

Name and content of hazardous substances in product

AAEON Main Board/Daughter Board/Backplane

QO4-381 Rev.A2

Part Name	Hazardous Substances					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
PCB Assemblies	×	○	○	○	○	○
Connector and Cable	×	○	○	○	○	○
The table is prepared in accordance with the provisions of SJ/T 11364. ○: Indicates that said hazardous substance contained in all of the homogenous materials for this product is below the limit requirement of GB/T 26572. ×: Indicates that said hazardous substance contained in at least one of the homogenous materials used for this part is above the limit requirement of GB/T 26572. But this product still be compliance with 2011/65/EU Directive (allowed with 2011/65/EU Annex III of RoHS exemption with number 6(c),7(a),7(c)-1). EFUP (Environment Friendly Use Period) value: 10 years Notes: This product defined period of use is under normal condition.						

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Chapter 1

Product Specifications

1.1 Specifications

System	
Form Factor	5.25" Compact Board
CPU	8th/9th Generation Intel® Core™ i7/i5/i3 and Celeron® Socket Type (up to 65W)
CPU Frequency	Up to 5.0GHz
Chipset	Intel® Q370 (TDP: 6W)
Memory Type	SODIMM DDR4 Memory Slot x 2
Max. Memory Capacity	Up to 32GB
BIOS	UEFI only
Wake on LAN	Yes
Watchdog Timer	255 Levels
Power Requirement	ATX
Power Supply Type	ATX
Power Consumption (Typical)	CPU 65W TDP
Dimension (L x W)	203mm x 146mm
Operating Temperature	32°F ~ 122°F (0°C ~ 50°C)
Storage Temperature	-4°F ~ 176°F (-20°C ~ 80°C)
Operating Humidity	0 ~ 90% at 40°C, non-condensing
MTBF (Hours)	TBD
Certification	CE/FCC Class A
Display	
VGA/LCD Controller	8th Generation Intel® Core™ Processor family
Video Output	LVDS x 2
	CRT x 1
	DVI x 1

Display

Backlight inverter supply	18/24bit (2CH)
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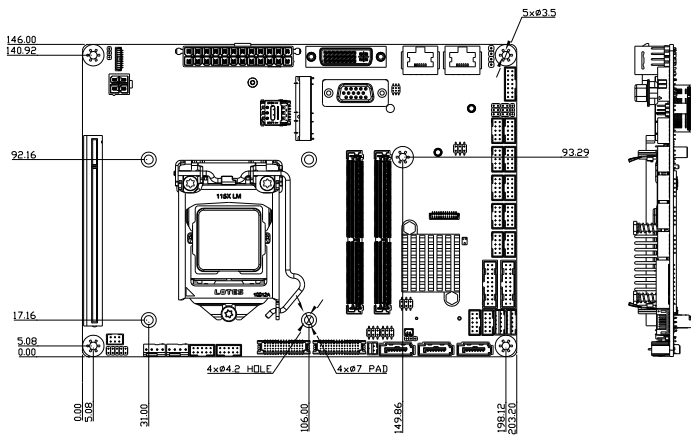
I/O

Ethernet	Intel® GbE i219 x 1 Intel® GbE i211 x 1
Audio	ALC269 (With Amplifier)
USB Port	USB 3.2 Gen 1 x 4 (headers) USB 2.0 x 4 (headers)
Serial Port	RS232 x 8 (headers) RS232/422/485 x 2 (headers)
Parallel Port	—
HDD Interface	SATA III (6.0 Gb/s) x 3
FDD Interface	—
SSD	—
Expansion Slot	M.2 3042/2280 Slot (B key) x 1 M.2 2280 Slot (M key) x 1 Half size mPCIe x 1 SMBus/I2C/LPC x 1
DIO	16-bit
SIM	—
TPM	TPM 2.0
Touch	—

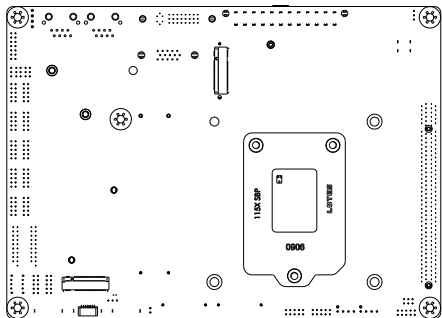
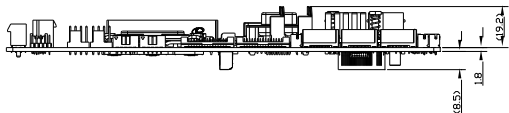
Chapter 2

Hardware Information

2.1 Dimensions

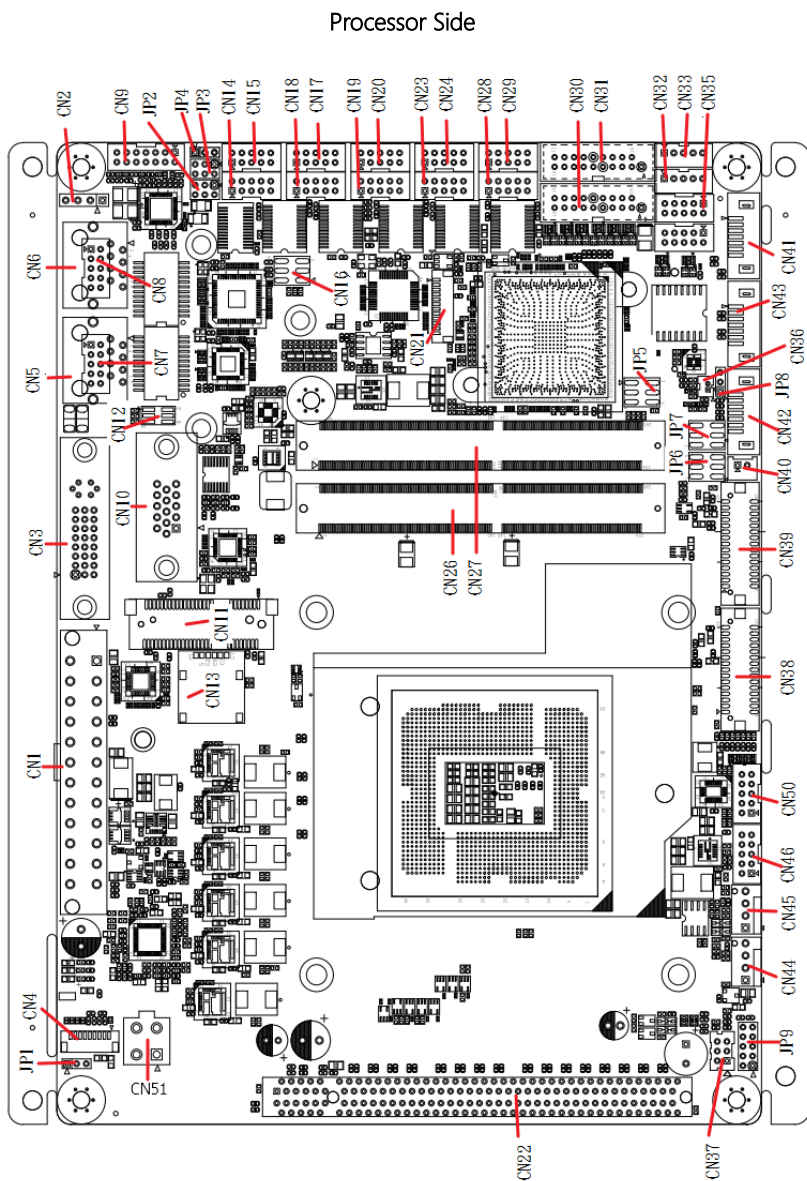


Component Side

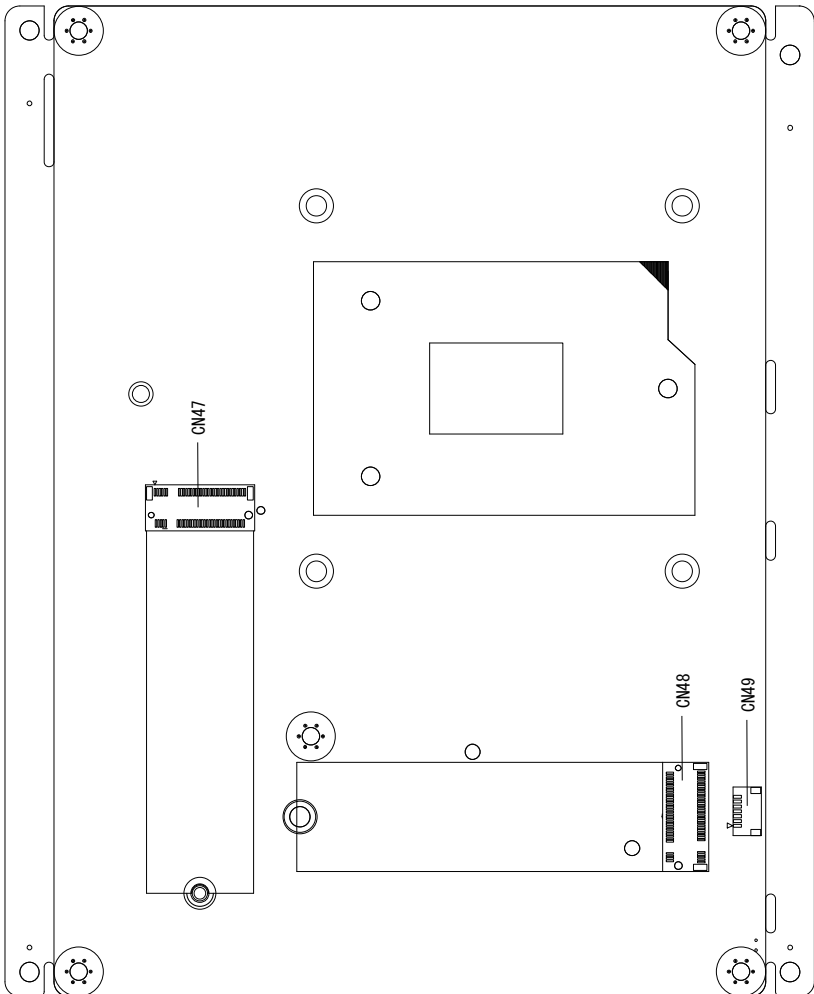


Solder Side

2.2 Jumpers and Connectors



Solder Side

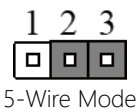
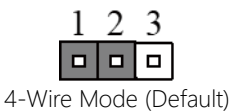


2.3 List of Jumpers

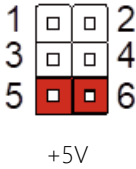
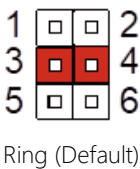
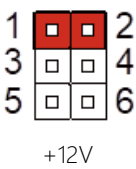
Please refer to the table below for all of the board's jumpers that you can configure for your application

Label	Function
JP1	Touch Screen 4/5-Wire Mode Selection
JP2	COM2 Pin 9 Function Selection
JP3	COM6 Pin 9 Function Selection
JP4	Auto Power Button Enable/ Disable Selection
JP5	LVDS Port 1 and Port 2 Backlight Brightness Control Mode Selection
JP6	LVDS Port 1 Operating VDD Selection, Backlight Inverter VCC Selection
JP7	LVDS Port 2 Operating VDD Selection, Backlight Inverter VCC Selection
JP8	Clear CMOS Jumper
JP9	Front Panel Connector

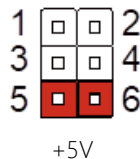
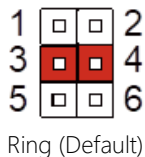
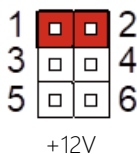
2.3.1 Touch Screen 4/5-Wire Mode Selection (JP1)



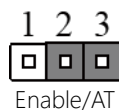
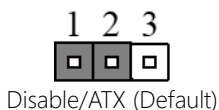
2.3.2 COM2 Pin 9 Function Selection



2.3.3 COM6 Pin 9 Function Selection (JP3)



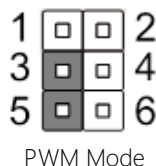
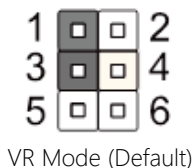
2.3.4 Auto Power Button Enable/Disable Selection (JP4)



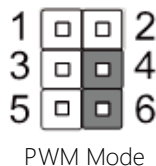
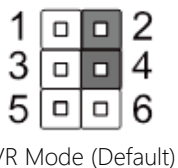
Note: When "Disable" is selected (JP4 pins 1-2), the power button is required to power on the system. Front Panel (JP9) needs to be set to pins 1-2 to use power button.

2.3.5 LVDS Port Backlight Brightness Control Mode Selection (JP5)

Port 1



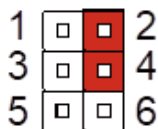
Port 2



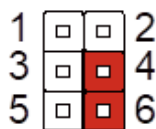
Note: To avoid damage to components, do not use any other configuration for JP5 than those shown above!

2.3.6 LVDS Operating VDD/Backlight Inverter Selection (JP6/JP7)

Operating VDD Selection

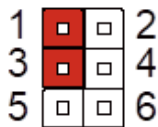


+3.3V (Default)

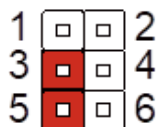


+5V

Backlight Inverter VCC Selection



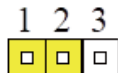
+12V



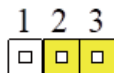
+5V (Default)

Note: To avoid damage to components, do not use any other configuration for JP6 or JP7 than those shown above!

2.3.7 Clear CMOS Jumper (JP8)

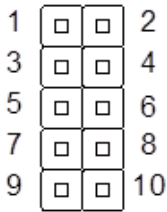


Disable/ATX (Default)



Enable/AT

2.3.8 Front Panel Connector (JP9)



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+

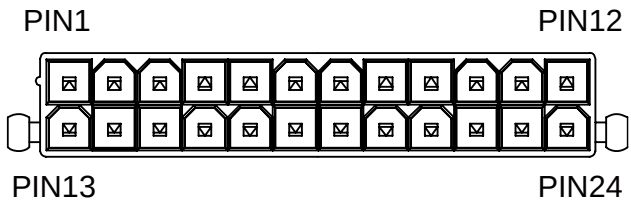
2.4 List of Connectors

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

Label	Function
CN1	ATX Power Connector
CN2	Stereo Audio Output Connector
CN3	DVI Connector
CN4	Touch Screen Connector
CN5	RJ-45 Ethernet 1 Connector
CN6	RJ-45 Ethernet 2 Connector
CN7	Ethernet 1 Connector (Optional)
CN8	Ethernet 2 Connector (Optional)
CN9	Audio In/Out and MIC Connector
CN10	CRT Connector
CN11	Mini-Card Slot (Half-Size)
CN12	Ethernet 1 LED Indicator
CN13	Nano SIM Card Connector
CN14	COM Port 1
CN15	COM Port 2
CN16	Ethernet 2 LED Indicator
CN17	COM Port 3
CN18	COM Port 4
CN19	COM Port 5
CN20	COM Port 6
CN21	LPC Port
CN22	PCI Slot
CN23	COM Port 7
CN24	COM Port 8

Label	Function
CN25	PCI Express [x16] Slot
CN26	DDR4 SO-DIMM Channel B Slot
CN27	DDR4 SO-DIMM Channel A Slot
CN28	COM Port 9
CN29	COM Port 10
CN30	USB 3.0 Ports 2 and 3
CN31	USB 3.0 Ports 0 and 1
CN32	LVDS Port 1 Inverter/ Backlight Connector
CN33	LVDS Port 2 Inverter/ Backlight Connector
CN34	USB 2.0 Ports 4 and 5
CN35	USB 2.0 Ports 6 and 7
CN36	Battery
CN37	PS/2 Keyboard/Mouse Combo Port
CN38	LVDS Port 1
CN39	LVDS Port 2
CN40	+5V Output for SATA HDD
CN41	SATA Port 1 Connector
CN42	SATA Port 0 Connector
CN43	SATA Port 2 Connector
CN44	CPU Fan Connector
CN45	System Fan Connector
CN46	Digital IO Port 1 Connector
CN47	M.2 2280 B-Key Slot
CN48	M.2 2280 M-Key Slot
CN49	SPI Flash Programming Port
CN50	Digital IO Port 2 Connector
CN51	ATX 12V Power Connector

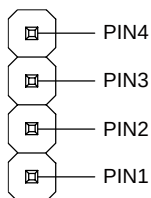
2.4.1 ATX Power Connector (CN1)



Pin	Pin Name	Signal Type	Signal level
1	+3.3V	PWR	+3.3V
2	+3.3V	PWR	+3.3V
3	GND	GND	
4	+5V	PWR	+5V
5	GND	GND	
6	+5V	PWR	+5V
7	GND	GND	
8	PWR_OK		
9	+5VSB	PWR	+5V
10	+12V	PWR	+12V
11	+12V	PWR	+12V
12	+3.3V	PWR	+3.3V
13	+3.3V	PWR	+3.3V
14	-12V	PWR	-12V
15	GND	GND	
16	PS_ON#		
17	GND	GND	
18	GND	GND	
19	GND	GND	
20	NC		

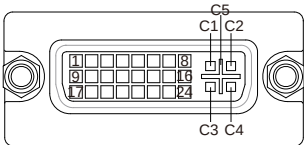
Pin	Pin Name	Signal Type	Signal level
21	+5V	PWR	+5V
22	+5V	PWR	+5V
23	+5V	PWR	+5V
24	GND	GND	

2.4.2 Stereo Audio Output Connector (CN2)



Pin	Pin Name	Signal Type	Signal level
1	SPK_OUT_R+	OUT	
2	SPK_OUT_R-	OUT	
3	SPK_OUT_L+	OUT	
4	SPK_OUT_L-	OUT	

2.4.3 DVI Connector (CN3)



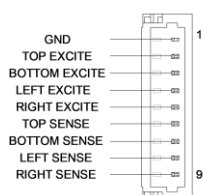
Pin	Pin Name	Signal Type	Signal level
1	TMDS_DAT2-	DIFF	
2	TMDS_DAT2+	DIFF	
3	GND	GND	
4	NC	I/O	
5	NC	I/O	
6	DVI_DDC_CLK	I/O	+5V
7	DVI_DDC_DATA	I/O	+5V
8	VSYNC	OUT	
9	TMDS_DAT1-	DIFF	
10	TMDS_DAT1+	DIFF	
11	GND	GND	
12	NC		
13	NC		
14	+5V	PWR	+5V
15	GND	GND	
16	HPLG_DETECT	IN	
17	TMDS_DAT0-	DIFF	
18	TMDS_DAT0+	DIFF	
19	GND	GND	
20	NC		
21	NC		

Pin	Pin Name	Signal Type	Signal level
22	GND	GND	
23	TMDS_CLK+	DIFF	
24	TMDS_CLK-	DIFF	
C1	RED	OUT	
C2	GREEN	OUT	
C3	BLUE	OUT	
C4	HSYNC	OUT	
C5	GND	GND	
C6	GND	GND	

2.4.4 Touch Screen Connector (CN4)

Note: Touch mode is set by Touch Screen Mode Selection JP1

8 Wires

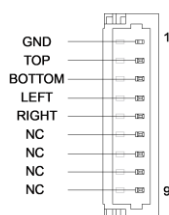


8-Wire Mode			
Pin	Pin Name	Signal Type	Signal level
1	GND	GND	
2	TOP EXCITE	IN	
3	BOTTOM EXCITE	IN	
4	LEFT EXCITE	IN	
5	RIGHT EXCITE	IN	

8-Wire Mode

Pin	Pin Name	Signal Type	Signal level
6	TOP SENSE	IN	
7	BOTTOM SENSE	IN	
8	LEFT SENSE	IN	
9	RIGHT SENSE	IN	

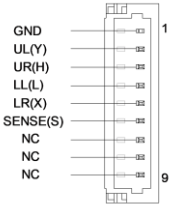
4 Wires



4-Wire Mode

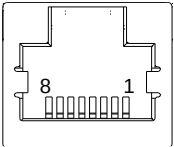
Pin	Pin Name	Signal Type	Signal level
1	GND	GND	
2	TOP	IN	
3	BOTTOM	IN	
4	LEFT	IN	
5	RIGHT	IN	
6	NC		
7	NC		
8	NC		
9	NC		

5 Wires



5-Wire Mode			
Pin	Pin Name	Signal Type	Signal level
1	GND	GND	
2	UL(Y)	IN	
3	UR(H)	IN	
4	LL(L)	IN	
5	LR(X)	IN	
6	SENSE(S)	IN	
7	NC		
8	NC		
9	NC		

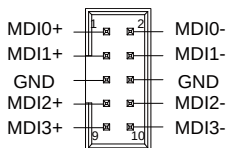
2.4.5 RJ-45 Ethernet 1/ 2 Connector (CN5/CN6)



Pin	Pin Name	Signal Type	Signal level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	

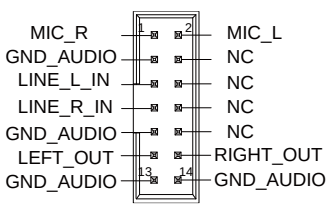
Pin	Pin Name	Signal Type	Signal level
4	MDI2+	DIFF	
5	MDI2-	DIFF	
6	MDI1-	DIFF	
7	MDI3+	DIFF	
8	MDI3-	DIFF	

2.4.6 Ethernet 1/ 2 Connector (Optional) (CN7/CN8)



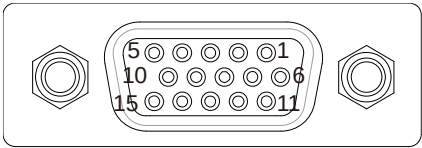
Pin	Pin Name	Signal Type	Signal level
1	MDI0+	DIFF	
2	MDI0-	DIFF	
3	MDI1+	DIFF	
4	MDI1-	DIFF	
5	GND	GND	
6	GND	GND	
7	MDI2+	DIFF	
8	MDI2-	DIFF	
9	MDI3+	DIFF	
10	MDI3-	DIFF	

2.4.7 Audio In/Out and MIC Connector



Pin	Pin Name	Signal Type	Signal level
1	MIC_R	IN	
2	MIC_L	IN	
3	GND_AUDIO	GND	
4	NC		
5	LINE_L_IN	IN	
6	NC		
7	LINE_R_IN	IN	
8	NC		
9	GND_AUDIO	GND	
10	NC		
11	LEFT_OUT	OUT	
12	RIGHT_OUT	OUT	
13	GND_AUDIO	GND	
14	GND_AUDIO	GND	

2.4.8 D-SUB CRT Connector (CN10)



Pin	Pin Name	Signal Type	Signal level
1	RED	OUT	
2	GREEN	OUT	
3	BLUE	OUT	
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	NC		
11	NC		
12	DDC_DATA	I/O	+5V
13	HSYNC	OUT	
14	VSYNC	OUT	
15	DDC_CLK	I/O	+5V

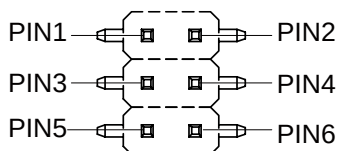
2.4.9 Mini-Card Slot (Half-Size) (CN11)

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

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

Pin	Pin Name	Signal Type	Signal level
51	NC		
52	+3.3VSB	PWR	+3.3V

2.4.10 Ethernet LED Indicator (CN12/CN16)

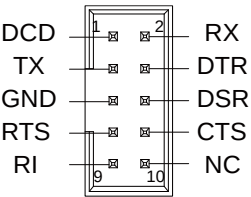


Pin	Pin Name	Signal Type	Signal level
1	ACT_LED+	PWR	+5V
2	ACT_LED-	OUT	
3	100_LED+	PWR	+5V
4	100_LED-	OUT	
5	1000_LED+	PWR	+5V
6	1000_LED-	OUT	

2.4.11 Nano-SIM Card Connector (CN13)

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	

2.4.12 COM Port 1, 3, 4, 5 (CN14/ CN17/ CN18/ CN19)

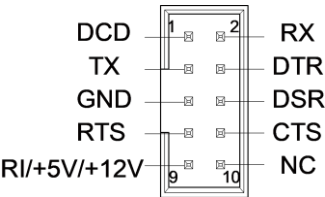


Pin	Pin Name	Signal Type	Signal level
1	DCD	IN	
2	RX	IN	
3	TX	OUT	±9V
4	DTR	OUT	±9V
5	GND	GND	
6	DSR	IN	
7	RTS	OUT	±9V
8	CTS	IN	
9	RI	IN	
10	NC		

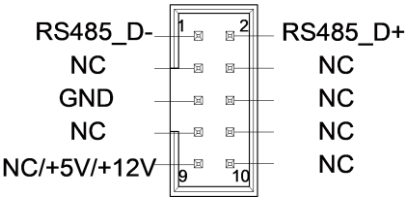
2.4.13 COM Port 2, Port 6 (CN15/CN20)

Note: COM Port 2 and Port 6 Mode (RS-232/422/485) can be set by BIOS (see Chapter 3). Default setting is RS-232.

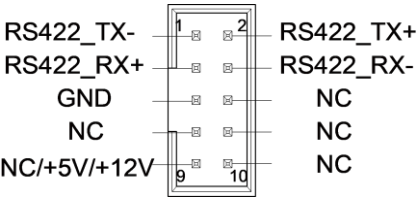
Pin 9 function can be set by COM2 Pin 9 Function Jumper (JP2) for Port 2 and COM6 Pin 9 Function Jumper (JP3) for Port 6.



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

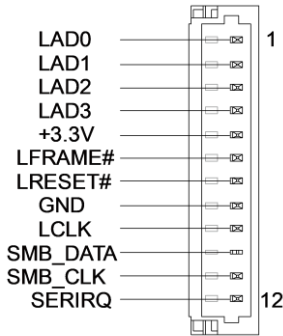


RS-485 Mode			
Pin	Pin Name	Signal Type	Signal level
1	RS485_D-	I/O	±5V
2	RS485_D+	I/O	±5V
3	NC		
4	NC		
5	GND	GND	
6	NC		
7	NC		
8	NC		
9	NC/+5V/+12V	PWR	+5V/+12V
10	NC		



RS-422 Mode			
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	NC		
7	NC		
8	NC		
9	NC/+5V/+12V	PWR	+5V/+12V
10	NC		

2.4.14 LPC Port (CN21)

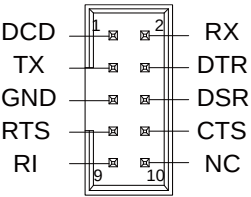


Pin	Pin Name	Signal Type	Signal level
1	LAD0	I/O	+3.3V
2	LAD1	I/O	+3.3V
3	LAD2	I/O	+3.3V
4	LAD3	I/O	+3.3V
5	+3.3V	PWR	+3.3V
6	LFRAME#	IN	
7	LRESET#	OUT	+3.3V
8	GND	GND	
9	LCLK	OUT	
10	SMB_DATA	I/O	+3.3V
11	SMB_CLK	OUT	+3.3V
12	SERIRQ	I/O	+3.3V

2.4.15 PCI Slot (CN22)

Standard specification.

2.4.16 COM Port 7, 8, 9, 10 (CN23/ CN24/ CN28/ CN29)



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	IN	
10	NC		

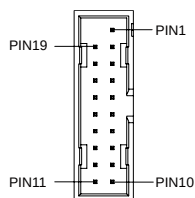
2.4.17 PCI-Express [x16] Slot (CN25)

Standard specification.

2.4.18 DDR SO-DIMM Slot (CN26/27)

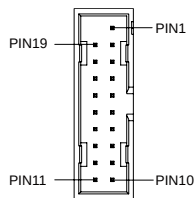
Standard specification.

2.4.19 USB 3.0 Ports 2 and 3 (CN30)



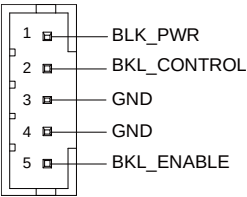
Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	USB2_SSRX-	DIFF	
3	USB2_SSRX+	DIFF	
4	GND	GND	
5	USB2_SSTX-	DIFF	
6	USB2_SSTX+	DIFF	
7	GND	GND	
8	USB2_D-	DIFF	
9	USB2_D+	DIFF	
10	NC		
11	USB3_D+	DIFF	
12	USB3_D-	DIFF	
13	GND	GND	
14	USB3_SSTX+	DIFF	
15	USB3_SSTX-	DIFF	
16	GND	GND	
17	USB3_SSRX+	DIFF	
18	USB3_SSRX-	DIFF	
19	+5VSB	PWR	+5V

2.4.20 USB 3.0 Ports 0 and 1 (CN31)



Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	USB0_SSRX-	DIFF	
3	USB0_SSRX+	DIFF	
4	GND	GND	
5	USB0_SSTX-	DIFF	
6	USB0_SSTX+	DIFF	
7	GND	GND	
8	USB0_D-	DIFF	
9	USB0_D+	DIFF	
10	NC		
11	USB1_D+	DIFF	
12	USB1_D-	DIFF	
13	GND	GND	
14	USB1_SSTX+	DIFF	
15	USB1_SSTX-	DIFF	
16	GND	GND	
17	USB1_SSRX+	DIFF	
18	USB1_SSRX-	DIFF	
19	+5VSB	PWR	+5V

2.4.21 LVDS Port Inverter/Backlight Connector (CN32/33)

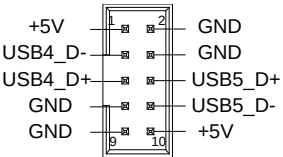


Pin	Pin Name	Signal Type	Signal level
1	BKL_PWR	PWR	+5V/+12V
2	BKL_CONTROL	OUT	
3	GND	GND	
4	GND	GND	
5	BKL_ENABLE	OUT	+5V

Note: LVDS1 BKL_PWR can be set by JP6. BKL_CTL can be set by JP5 (Pins 1/3/5).

Note: LVDS2 BKL_PWR can be set by JP7. BKL_CTL can be set by JP5 (Pins 2/4/6).

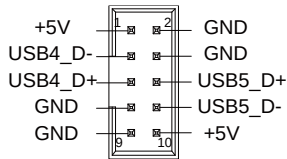
2.4.22 USB 2.0 Ports 4 and 5 (CN34)



Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	GND	GND	
3	USB4_D-	DIFF	
4	GND	GND	
5	USB4_D+	DIFF	
6	USB5_D+	DIFF	

Pin	Pin Name	Signal Type	Signal level
7	GND	GND	
8	USB5_D-	DIFF	
9	GND	GND	
10	+5VSB	PWR	+5V

2.4.23 USB 2.0 Ports 6 and 7 (CN35)

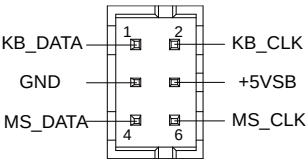


Pin	Pin Name	Signal Type	Signal level
1	+5VSB	PWR	+5V
2	GND	GND	
3	USB6_D-	DIFF	
4	GND	GND	
5	USB6_D+	DIFF	
6	USB7_D+	DIFF	
7	GND	GND	
8	USB7_D-	DIFF	
9	GND	GND	
10	+5VSB	PWR	+5V

2.4.24 Battery Connector (CN36)

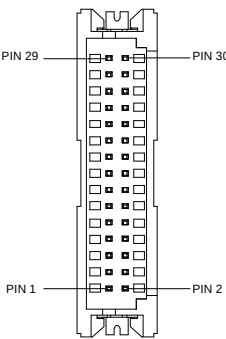
Pin	Pin Name	Signal Type	Signal level
1	+3.3V	PWR	3.3V
2	GND	GND	

2.4.25 PS/2 Keyboard/Mouse Combo Port



Pin	Pin Name	Signal Type	Signal level
1	KB_DATA	I/O	+5V
2	KB_CLK	I/O	+5V
3	GND	GND	
4	+5VSB	PWR	+5V
5	MS_DATA	I/O	+5V
6	MS_CLK	I/O	+5V

2.4.26 LVDS Port 1 (CN38)

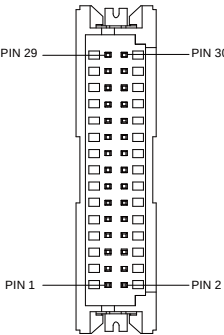


Note: LCD_PWR can be set by Jumper JP6

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	

Pin	Pin Name	Signal Type	Signal level
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	

2.4.27 LVDS Port 2 (CN39)

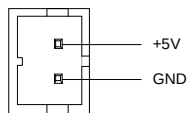


Note: LCD_PWR can be set by Jumper JP6

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	

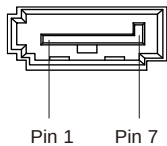
Pin	Pin Name	Signal Type	Signal level
17	DDC_DATA	I/O	+3.3V
18	DDC_CLK	I/O	+3.3V
19	LVDS_DB0-	DIFF	
20	LVDS_DB0+	DIFF	
21	LVDS_DB1-	DIFF	
22	LVDS_DB1+	DIFF	
23	LVDS_DB2-	DIFF	
24	LVDS_DB2+	DIFF	
25	LVDS_DB3-	DIFF	
26	LVDS_DB3+	DIFF	
27	LCD_PWR	PWR	+3.3V/+5V
28	GND	GND	
29	LVDS_B_CLK-	DIFF	
30	LVDS_B_CLK+	DIFF	

2.4.28 +5V Output for SATA HDD



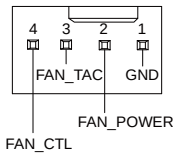
Pin	Pin Name	Signal Type	Signal level
1	+5V	PWR	+5V
2	GND	GND	

2.4.29 SATA Port Connector (CN41/ CN42/ CN43)



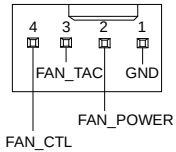
Pin	Pin Name	Signal Type	Signal level
1	GND	GND	
2	SATA_TX+	DIFF	
3	SATA_TX-	DIFF	
4	GND	GND	
5	SATA_RX-	DIFF	
6	SATA_RX+	DIFF	
7	GND	GND	

2.4.30 CPU Fan Connector (CN44)



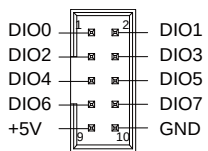
Pin	Pin Name	Signal Type	Signal level
1	GND	GND	
2	FAN_POWER	PWR	+12V
3	FAN_TAC	IN	
4	FAN_CTL	OUT	+3.3V

2.4.31 System Fan Connector (CN45)



Pin	Pin Name	Signal Type	Signal level
1	GND	GND	
2	FAN_POWER	PWR	+12V
3	FAN_TAC	IN	
4	FAN_CTL	OUT	+3.3V

2.4.32 Digital IO Port 1/Port 2 Connector (CN46/ CN50)



Pin	Pin Name	Signal Type	Signal level
1	DIO0	I/O	+5V
2	DIO1	I/O	+5V
3	DIO2	I/O	+5V
4	DIO3	I/O	+5V
5	DIO4	I/O	+5V
6	DIO5	I/O	+5V
7	DIO6	I/O	+5V
8	DIO7	I/O	+5V
9	+5V	PWR	+5V
10	GND	GND	

2.4.33 M.2 2280 B-Key Slot (CN47)

Pin	Pin Name	Signal Type	Signal level
1	CONFIG3	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	W_DISABLE#	OUT	
9	USB_D-	DIFF	
10	SATA_LED	IN	+3.3V
11	GND	GND	
20	NC		
21	CONFIG0	GND	
22	NC		
23	NC		
24	NC		
25	NC		
26	NC		
27	GND	GND	
28	NC		
29	PCIE_RX-	DIFF	
30	NC		
31	PCIE_RX+	DIFF	
32	NC		
33	GND	GND	

Pin	Pin Name	Signal Type	Signal level
34	NC		
35	PCIE_TX-	DIFF	
36	NC		
37	PCIE_TX+	DIFF	
38	NC	OUT	
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	PERST#	OUT	+3.3V
51	GND	GND	
52	PCIE_CLK_REQ#	IN	+3.3V
53	PCIE_CLK-	DIFF	
54	PCIE_WAKE	IN	+3.3V
55	PCIE_CLK+	DIFF	
56	NC		
57	GND	GND	
58	NC		
59	NC		
60	NC		

Pin	Pin Name	Signal Type	Signal level
61	NC		
62	NC		
63	NC		
64	NC		
65	NC		
66	NC		
67	NC		
68	NC		
69	CONFIG1	GND	
70	+3.3V	PWR	+3.3V
71	GND	GND	
72	+3.3V	PWR	+3.3V
73	GND	GND	
74	+3.3V	PWR	+3.3V
75	CONFIG2	GND	

2.4.34 M.2 2280 M-Key Slot (CN48)

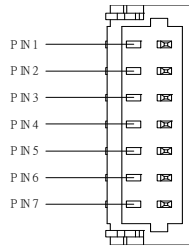
Pin	Pin Name	Signal Type	Signal level
1	GND	GND	
2	+3.3V	PWR	+3.3V
3	GND	GND	
4	+3.3V	PWR	+3.3V
5	PCIE3_RX-	DIFF	
6	NC		
7	PCIE3_RX+	DIFF	
8	NC		

Pin	Pin Name	Signal Type	Signal level
9	GND	GND	
10	SATA_LED	IN	+3.3V
11	PCIE3_TX-	GND	
12	+3.3V	PWR	+3.3V
13	PCIE3_TX+	GND	
14	+3.3V	PWR	+3.3V
15	GND	GND	
16	+3.3V	PWR	+3.3V
17	PCIE2_RX-	DIFF	
18	+3.3V	PWR	+3.3V
19	PCIE2_RX+	DIFF	
20	NC		
21	GND	GND	
22	NC		
23	PCIE2_TX-	DIFF	
24	NC		
25	PCIE2_TX+	DIFF	
26	NC		
27	GND	GND	
28	NC		
29	PCIE1_RX-	DIFF	
30	NC		
31	PCIE1_RX+	DIFF	
32	NC		
33	GND	GND	
34	NC		
35	PCIE1_TX-	DIFF	

Pin	Pin Name	Signal Type	Signal level
36	NC		
37	PCIE1_TX+	DIFF	
38	DECSLP	OUT	
39	GND	GND	
40	NC		
41	PCIE0_RX-	DIFF	
42	NC		
43	PCIE0_RX+	DIFF	
44	NC		
45	GND	GND	
46	NC		
47	PCIE0_TX-	DIFF	
48	NC		
49	PCIE0_TX+	DIFF	
50	PERST#	OUT	
51	GND	GND	
52	PCIE_CLK_REQ#	IN	
53	PCIE_CLK-	DIFF	
54	PCIE_WAKE	IN	
55	PCIE_CLK+	DIFF	
56	NC		
57	GND	GND	
58	NC		
67	NC		
68	NC		
69	NC		
70	+3.3V	PWR	+3.3V

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

2.4.35 SPI Flash Programming Port (CN49)

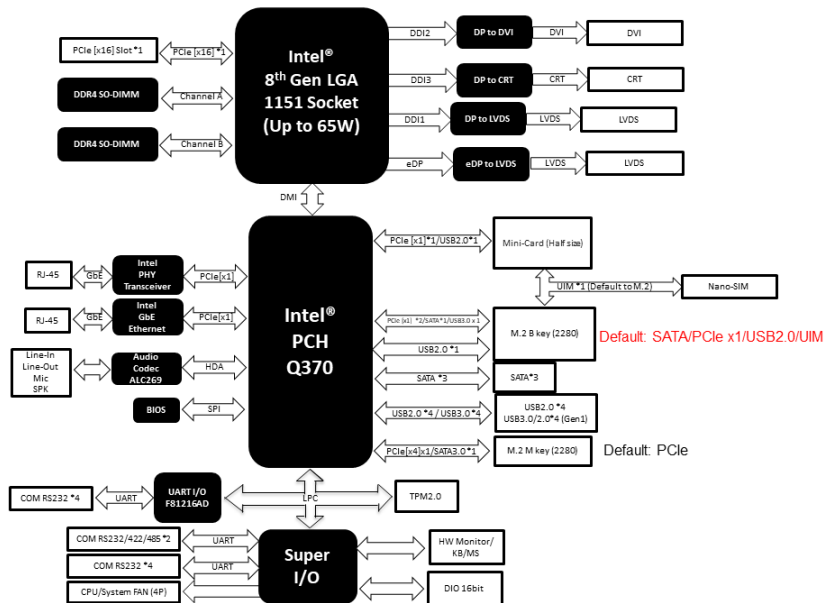


Pin	Pin Name	Signal Type	Signal level
1	SPI_MISO	OUT	
2	GND	GND	
3	SPI_CLK	IN	
4	+3.3VSB	PWR	+3.3V
5	SPI_MOSI	IN	
6	SPI_CS	IN	
7	NC		

2.4.36 ATX 12V Power Connector (CN51)

Standard Specifications

2.5 Block Diagram



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 an error message. The board 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. If they do not match, an error message will be output, and the BIOS setup program will need to be run to set the configuration information in memory.

There are three situations in which the CMOS settings will need to be set or changed:

- Starting the system for the first time
- The system hardware has been changed
- The CMOS memory has lost power and the configuration information is erased

The system's CMOS memory uses a backup battery for data retention. The battery must be replaced when it runs down.

3.2 AMI BIOS Setup

The AMI BIOS ROM has a pre-installed Setup program that allows users to modify basic system configurations, which is stored in the battery-backed CMOS RAM and BIOS NVRAM so that the information is retained when the power is turned off.

To enter BIOS Setup, press or <ESC> immediately after powering on the system.

The function for each interface can be found below.

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

Advanced – Configure settings for system hardware

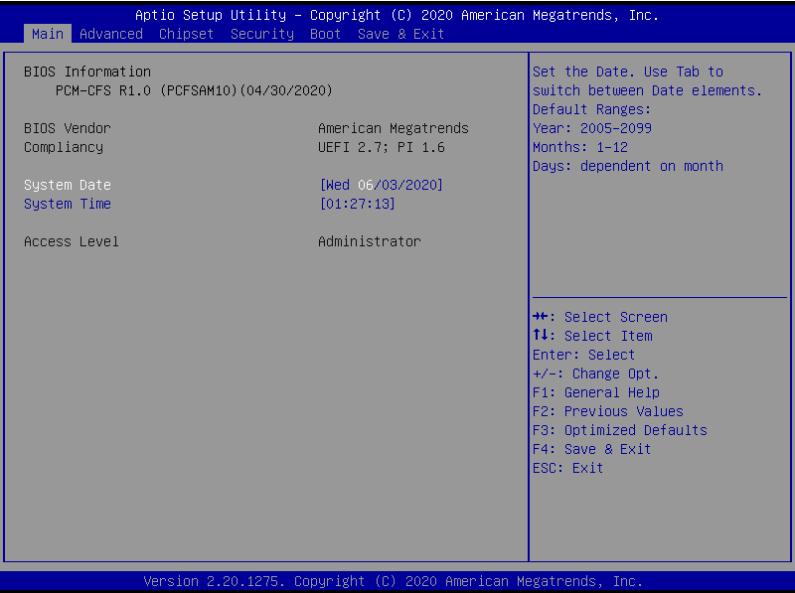
Chipset – For host bridge parameters

Boot – Enable/ Disable quiet boot option and set boot priorities

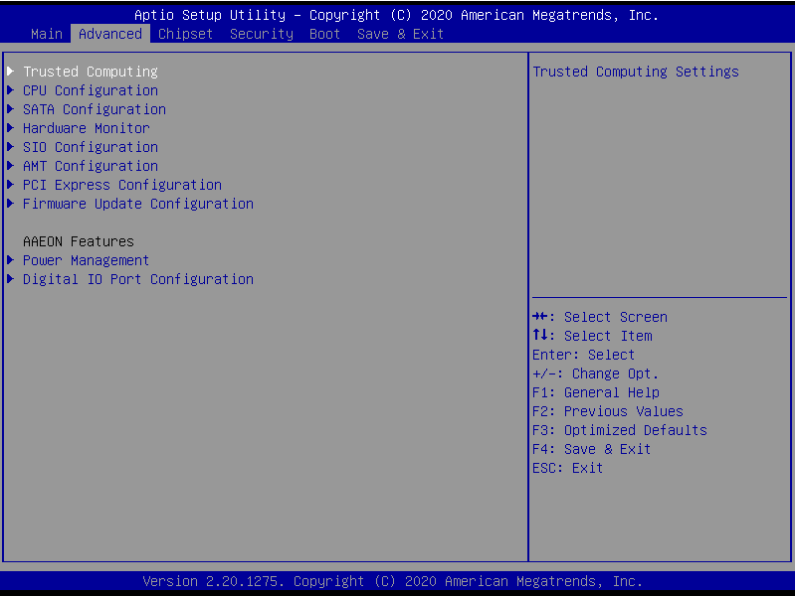
Security – The setup administrator password can be set here. Secure Boot settings can be configured here.

Save & Exit – Save changes and exit the program

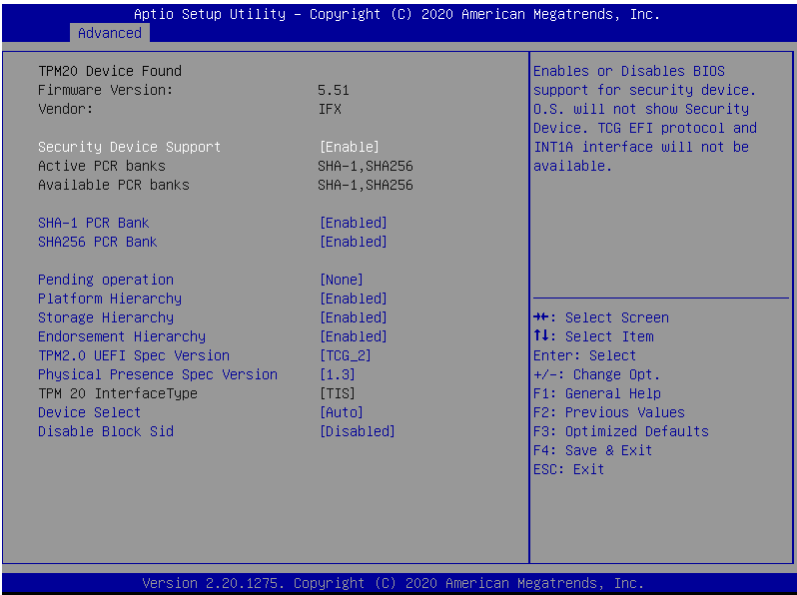
3.3 Main



3.4 Advanced



3.4.1 Trusted Computing

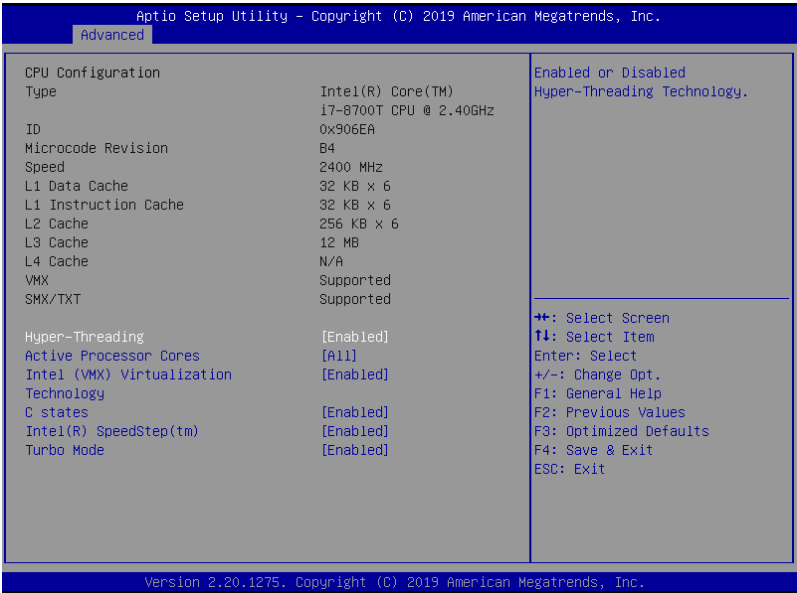


Options Summary		
Security Device Support	Disable	
	Enable	Optimal Default, Failsafe Default
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.		
SHA-1 PCR Bank	Disable	
	Enable	Optimal Default, Failsafe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

Table Continues on Next Page

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.		
Device Select	TPM 1.2	Optimal Default, Failsafe Default
	TPM 2.0	
	Auto	
TPM 1.2 will restrict support to TPM 1.2 devices, TPM 2.0 will restrict support to TPM 2.0 devices, Auto will support both with the default set to TPM 2.0 devices if not found, TPM 1.2 devices will be enumerated		
Disable Block Sid	Enabled	
	Disabled	Optimal Default, Failsafe Default
Override to allow SID authentication in TCG Storage device		

3.4.2 CPU Configuration



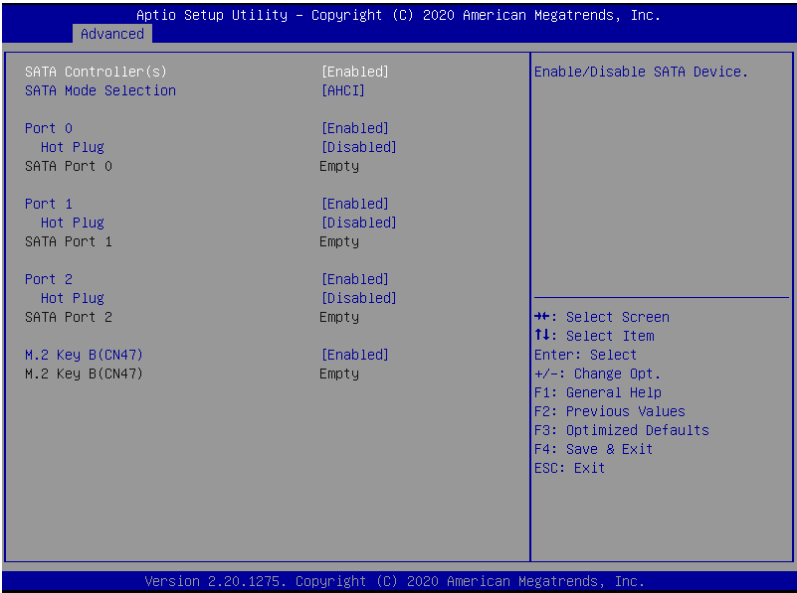
Options Summary

Hyper-Threading	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enabled or Disabled Hyper-Threading Technology		
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.		
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.		

Table Continues on Next Page

Options Summary		
Intel(R) SpeedStep(tm)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Allows more than two frequency ranges to be supported.		
Turbo Mode	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).		

3.4.3 SATA Configuration

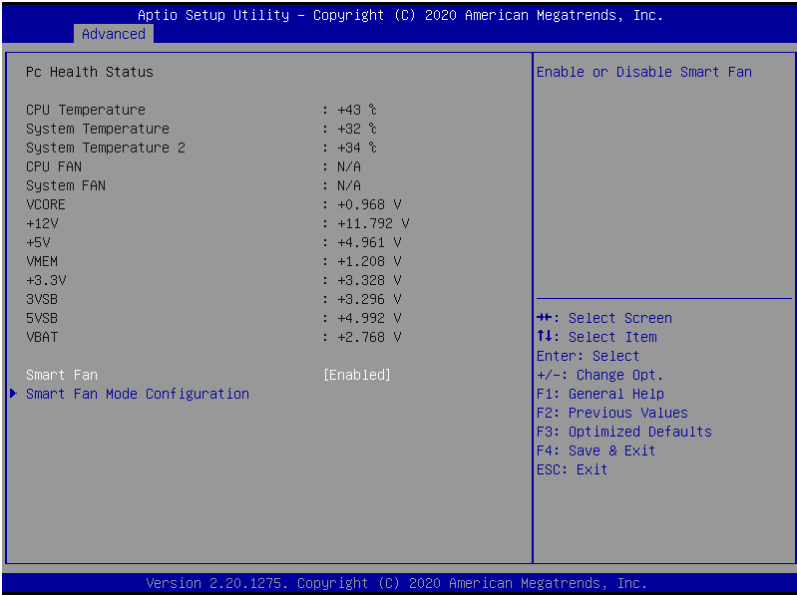


Options Summary		
SATA Controller(s)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable SATA Device.		
SATA Mode Selection	AHCI	Optimal Default, Failsafe Default
	Intel RST Premium With Intel Optane System Acceleration	
Determines how SATA controller(s) operate		
Port 0	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot Pluggable		

Table Continues on Next Page

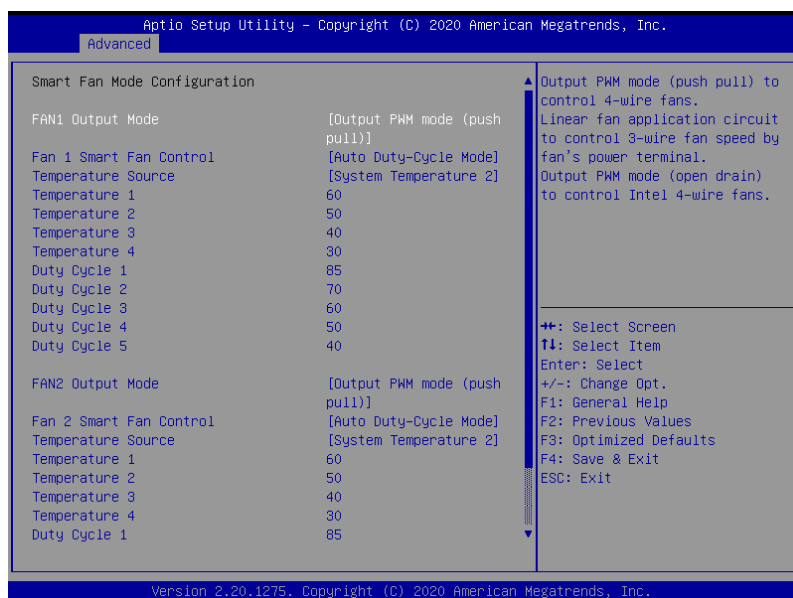
Options Summary		
Port 1	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot Pluggable		
Port 2	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port		
Hot Plug	Disabled	Optimal Default, Failsafe Default
	Enabled	
Designates this port as Hot Pluggable		
M.2 Key B(CN47)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port		

3.4.4 Hardware Monitor



Options Summary		
Smart Fan	Disable	
	Enable	Optimal Default, Failsafe Default
Enables or Disables Smart Fan		

3.4.4.1 Smart Fan Mode Configuration

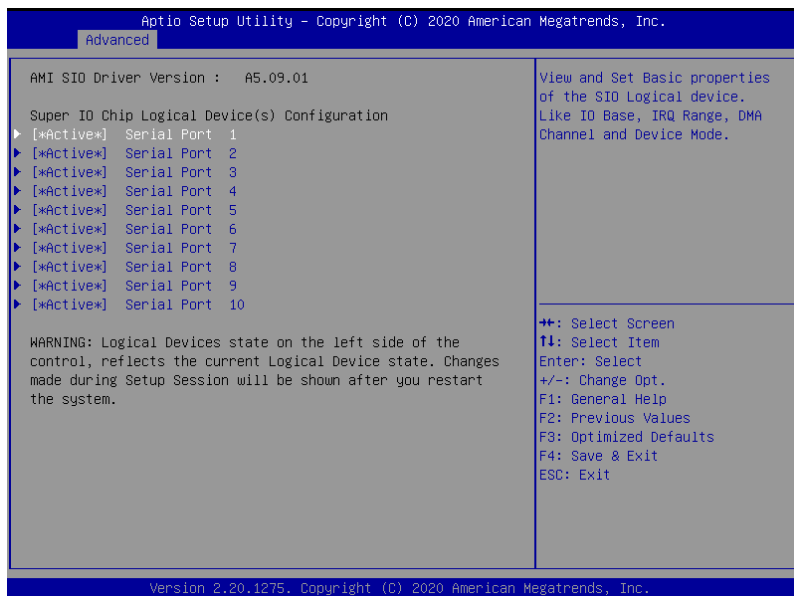


Options Summary		
FAN1 Output Mode	Output PWM mode (open drain)	
	Linear Fan Application	
	Output PWM mode (push pull)	
Fan 1 Smart Fan Control	Manual RPM Mode	
	Manual Duty Mode	
	Auto RPM Mode	
	Auto Duty-Cycle Mode	Optimal Default, Failsafe Default
Smart Fan Mode Select		
Temperature Source	CPU Temperature	
	System Temperature 2	Optimal Default, Failsafe Default
	System Temperature 1	
Select the monitored temperature source for this fan.		

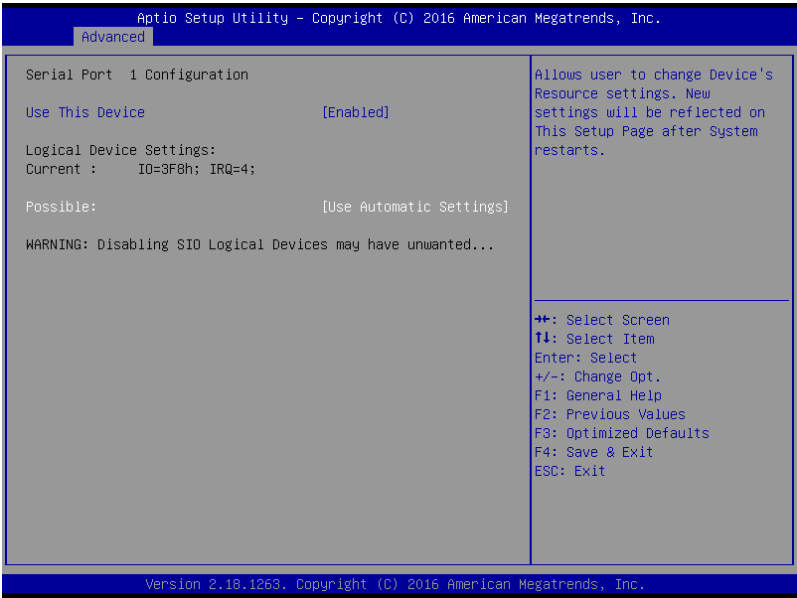
Table Continues on Next Page

Options Summary		
Duty Cycle 1	85	
Temperature 1	60	
Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100		
FAN2 Output Mode	Output PWM mode (open drain)	
	Linear Fan Application	
	Output PWM mode (push pull)	
Fan 2 Smart Fan Control	Manual RPM Mode	
	Manual Duty Mode	
	Auto RPM Mode	
	Auto Duty-Cycle Mode	Optimal Default, Failsafe Default
Smart Fan Mode Select		
Temperature Source	CPU Temperature	
	System Temperature 2	Optimal Default, Failsafe Default
	System Temperature 1	
Select the monitored temperature source for this fan.		
Duty Cycle 1	85	
Temperature 1	60	
Auto fan speed control. Fan speed will follow different temperature by different duty cycle 1-100		

3.4.5 SIO Configuration



3.4.5.1 Serial Port 1 Configuration



Options Summary

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

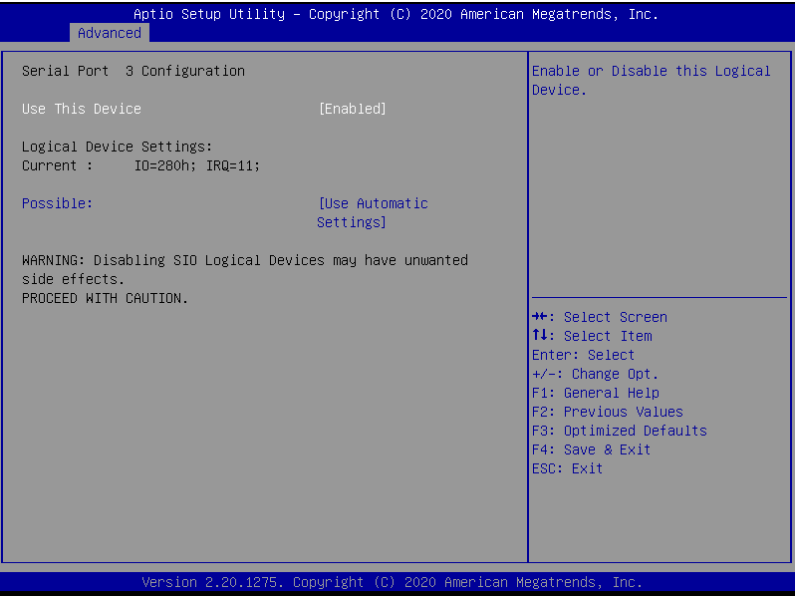
3.4.5.2 Serial Port 2 Configuration



Options Summary

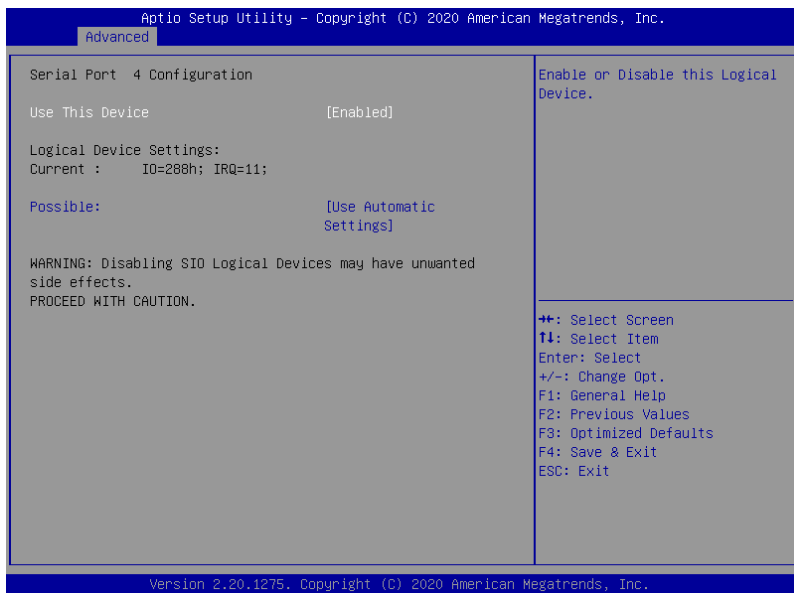
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2F8h; IRQ=3	
	IO=3F8h; IRQ=4	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup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

3.4.5.3 Serial Port 3 Configuration



Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=280h; IRQ=11	
	IO=288h; IRQ=11	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		

3.4.5.4 Serial Port 4 Configuration



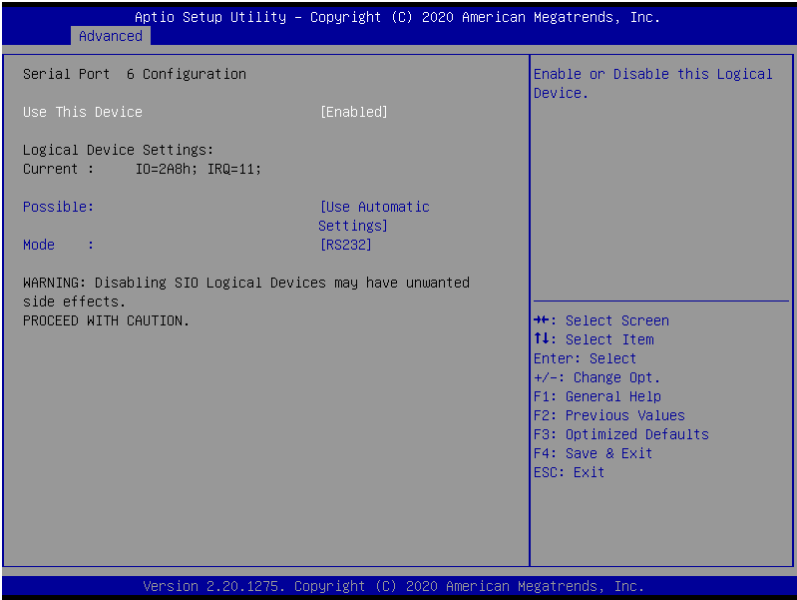
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=288h; IRQ=11	
	IO=280h; IRQ=11	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		

3.4.5.5 Serial Port 5 Configuration



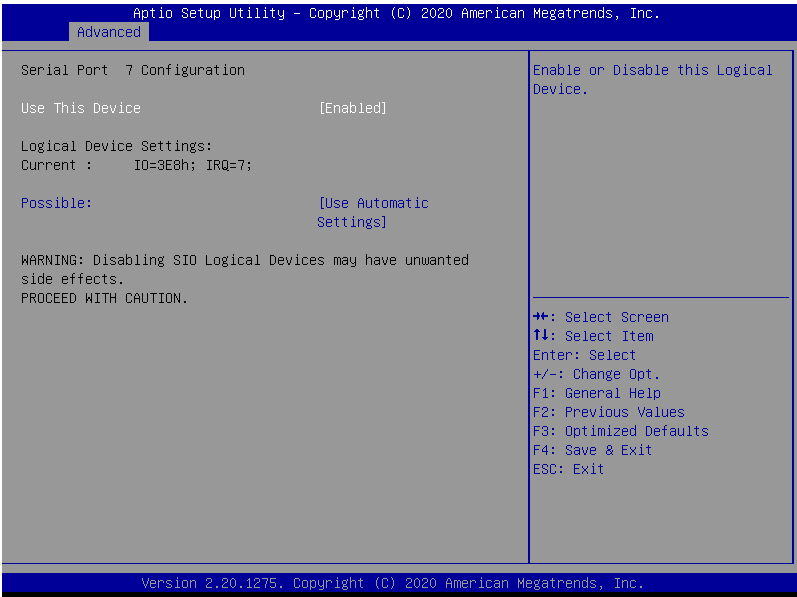
Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2A0h; IRQ=11	
	IO=2A8h; IRQ=11	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		

3.4.5.6 Serial Port 6 Configuration



Options Summary		
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2A8h; IRQ=11	
	IO=2A0h; IRQ=11	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		
Mode:	RS232	Optimal Default, Failsafe Default
	RS422	
	RS485	
UART RS232, 422, 485 selection.		

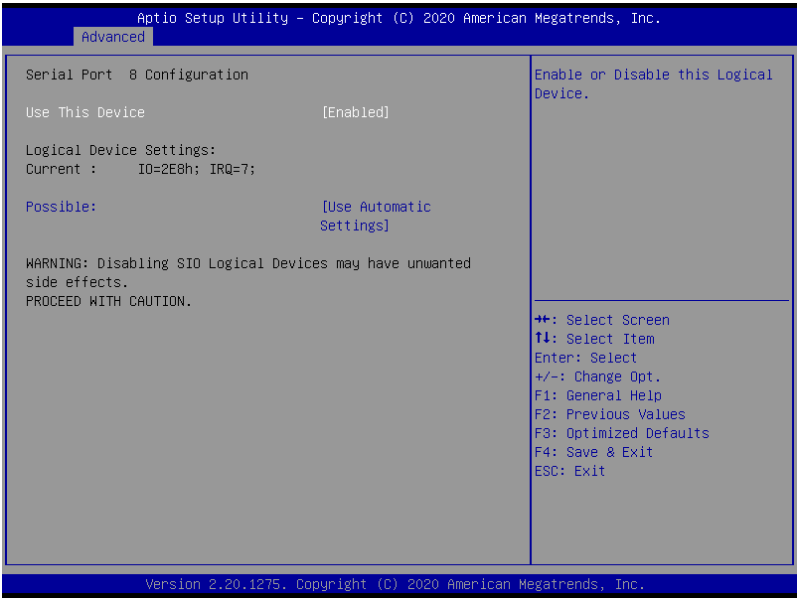
3.4.5.7 Serial Port 7 Configuration



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=3E8h; IRQ=7	
	IO=2E8h; IRQ=7	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		

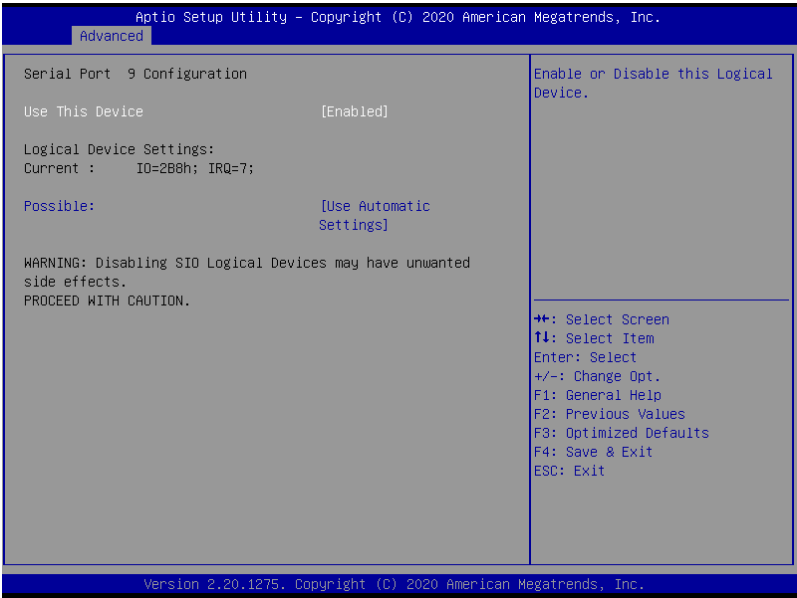
3.4.5.8 Serial Port 8 Configuration



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=2E8h; IRQ=7	
	IO=3E8h; IRQ=7	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		

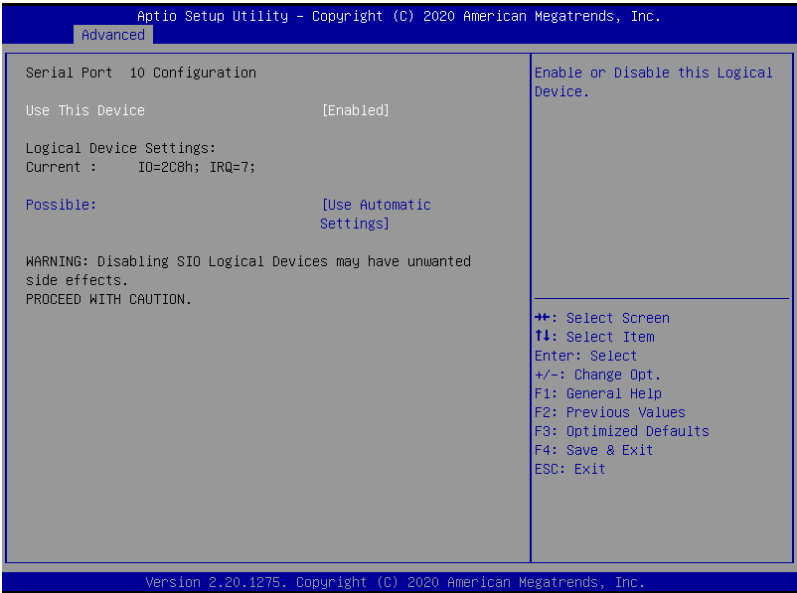
3.4.5.9 Serial Port 9 Configuration



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=2B8h; IRQ=7	
	IO=2C8h; IRQ=7	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		

3.4.5.10 Serial Port 10 Configuration



Options Summary

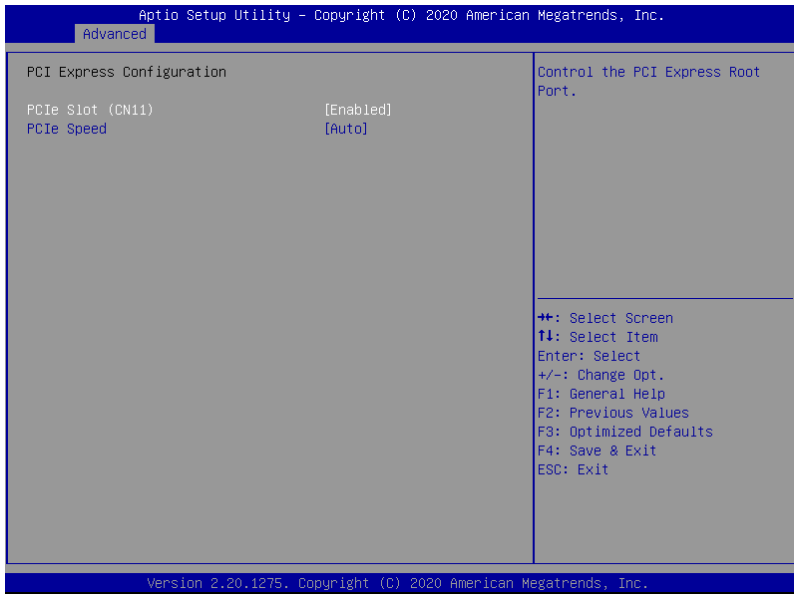
Use This Device	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=2B8h; IRQ=7	
	IO=2C8h; IRQ=7	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		

3.4.6 AMT Configuration



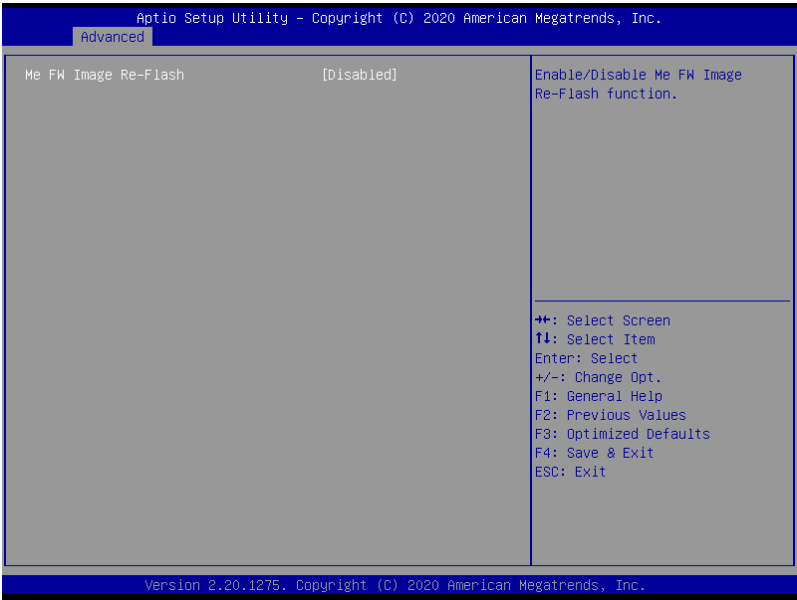
Options Summary		
AMT BIOS Features	Disable	
	Enable	Optimal Default, Failsafe Default
When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup.		
Note: This option does not disable Manageability Features in FW		

3.4.7 PCI Express Configuration



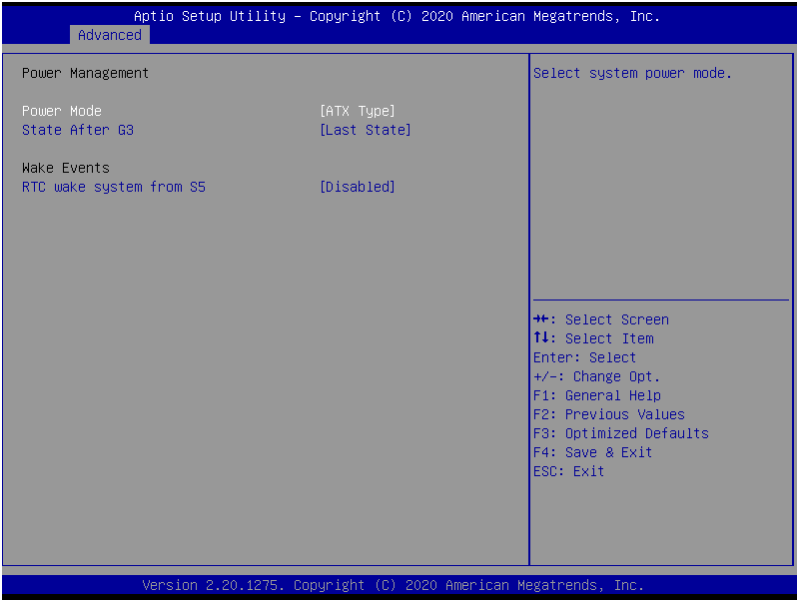
Options Summary		
PCIe Slot	Disable	
	Enable	Optimal Default, Failsafe Default
Control the PCI Express Root Port.		
PCIe Speed	Auto	Optimal Default, Failsafe Default
	Gen1	
	Gen2	
	Gen3	
Configure PCIe Speed		

3.4.8 Firmware Update Configuration



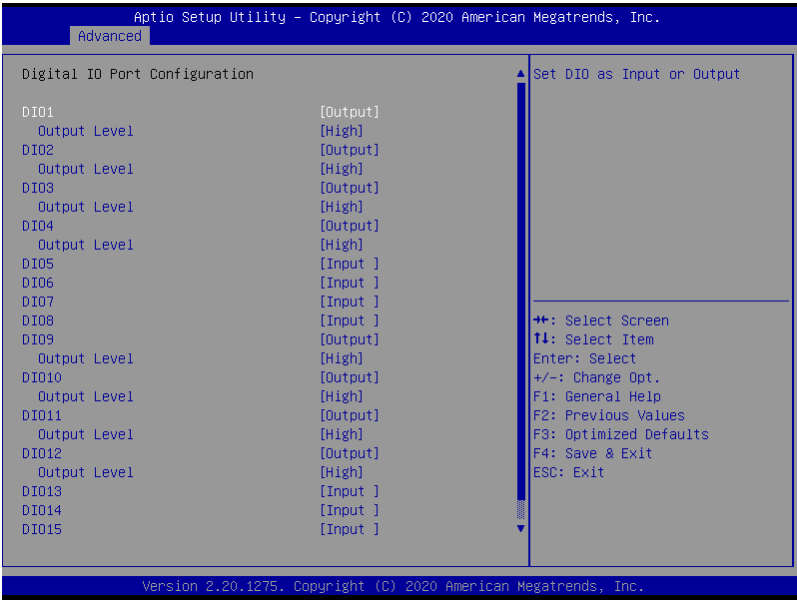
Options Summary		
Me FW Image Re-Flash	Disable	Optimal Default, Failsafe Default
	Enable	
Enable/Disable Me FW Image Re-Flash function.		

3.4.9 Power Management



Options Summary		
Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select system power mode		
State After G3	Always On	
	Always Off	
	Last State	Optimal Default, Failsafe Default
Specify what state to go to when power is re-applied after a power failure (G3 state).		
RTC wake system from S5	Disable	Optimal Default, Failsafe Default
	Fixed Time	
Fixed Time: System will wake on the hr::min::sec specified./n Dynamic Time: System will wake on the current time + Increase minute(s)		

3.4.10 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		

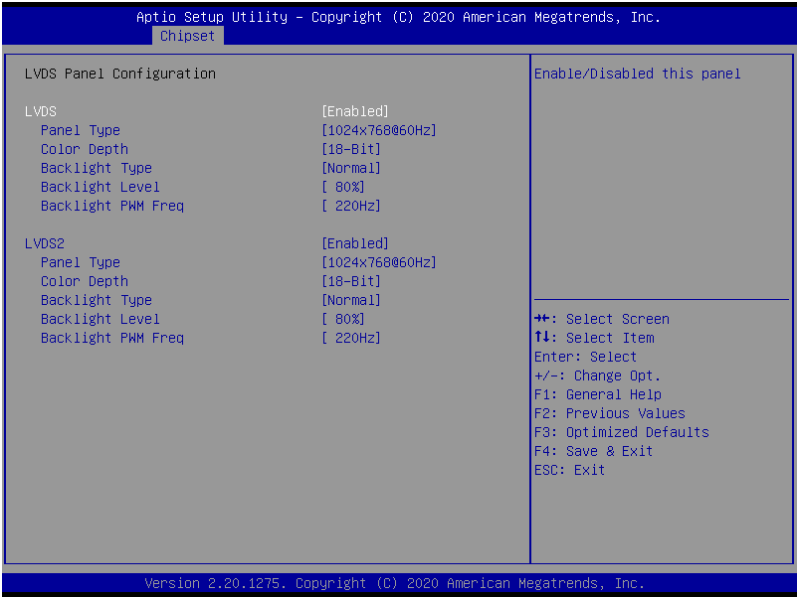
3.5 Chipset



3.5.1 North Bridge



3.5.1.1 LVDS Panel Configuration



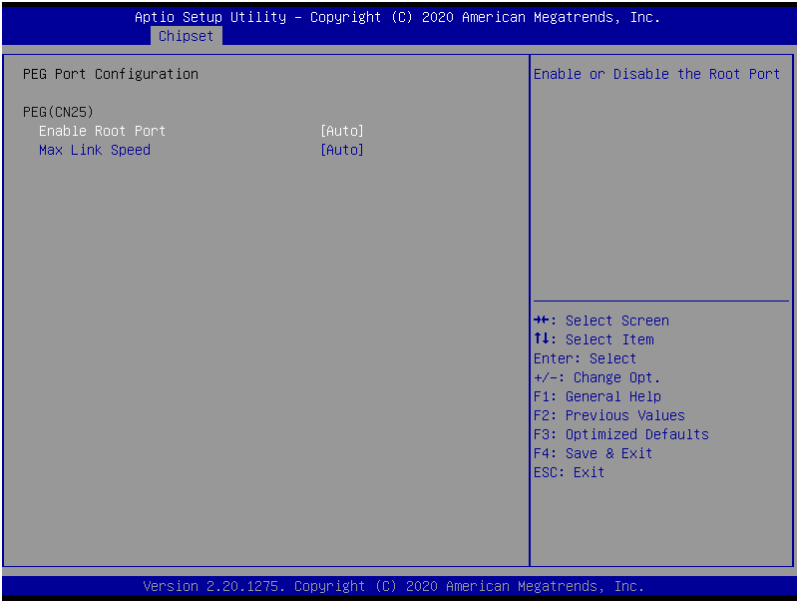
Options Summary

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	
	1024x768,24bit,60Hz	Optimal Default, Failsafe Default
	1280x768,24bit,60Hz	
	1280x1024,48bit,60Hz	
	1366x768,24bit,60Hz	
	1440x900,48bit,60Hz	
	1600x1200,48bit,60Hz	
	1920x1080,48bit,60Hz	
	1920x1200,48bit,60Hz	

Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item.

Options Summary		
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		

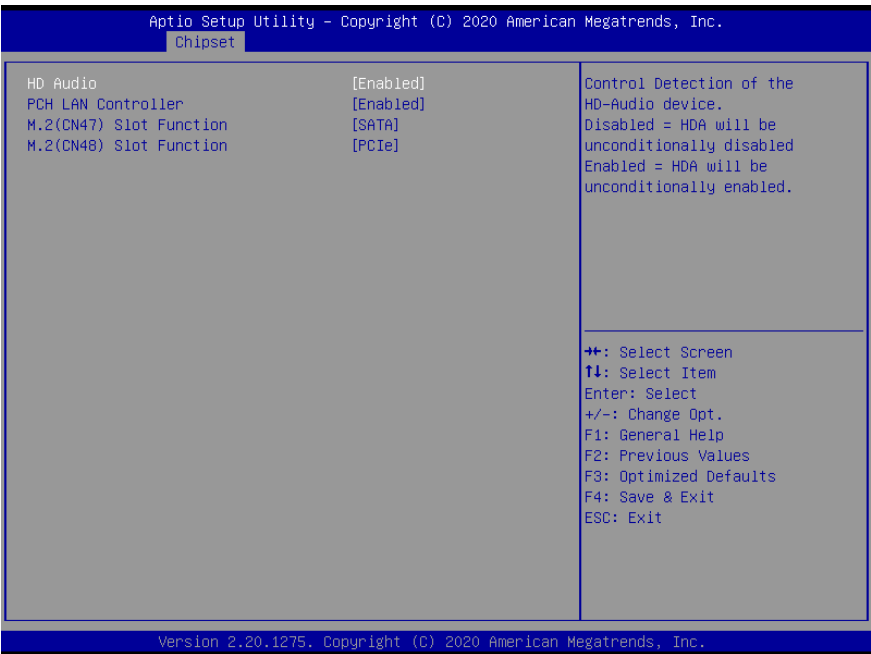
3.5.1.2 PEG Port Configuration



Options Summary

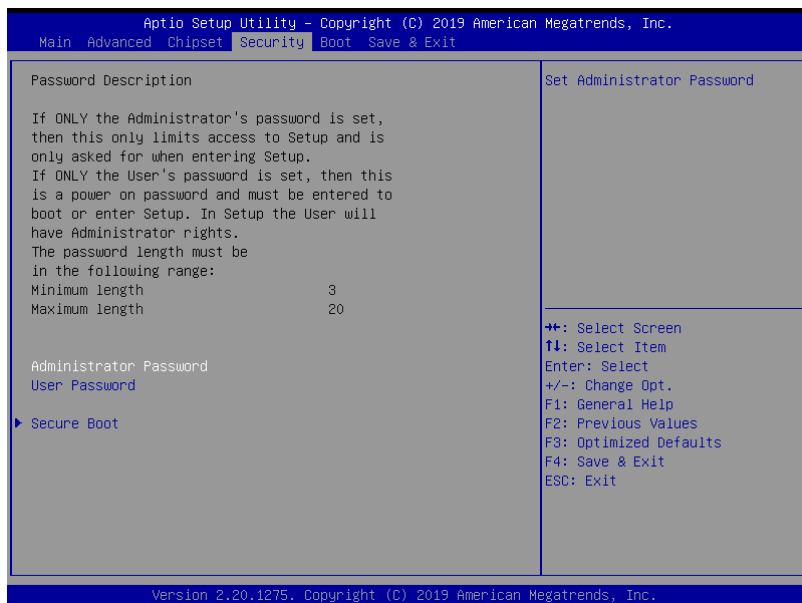
Enable Root Port	Disabled	
	Enabled	
	Auto	Optimal Default, Failsafe Default
Enable or Disable the Root Port		
Max Link Speed	Auto	
	Gen1	
	Gen2	
	Gen3	Optimal Default, Failsafe Default
Configure PEG 0:1:0 Max Speed		

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.		
PCH Lan Controller	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable onboard NIC		
M.2(CN47) Slot Function	SATA	Optimal Default, Failsafe Default
	PCIe	
Select function enabled for M.2 Slot (CN47) slot		
M.2(CN48) Slot Function	SATA	
	PCIe	Optimal Default, Failsafe Default
Select function enabled for M.2 Slot (CN48) slot		

3.6 Security



Change User/Administrator Password

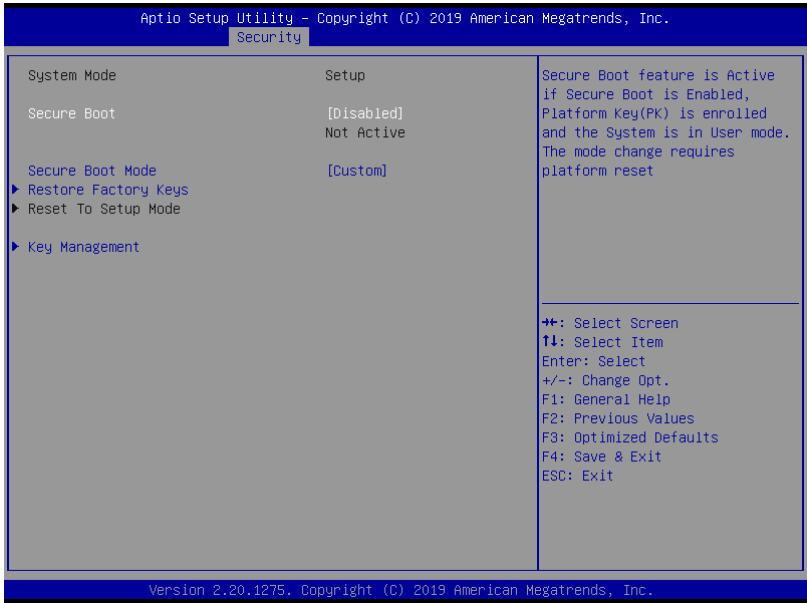
You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

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.

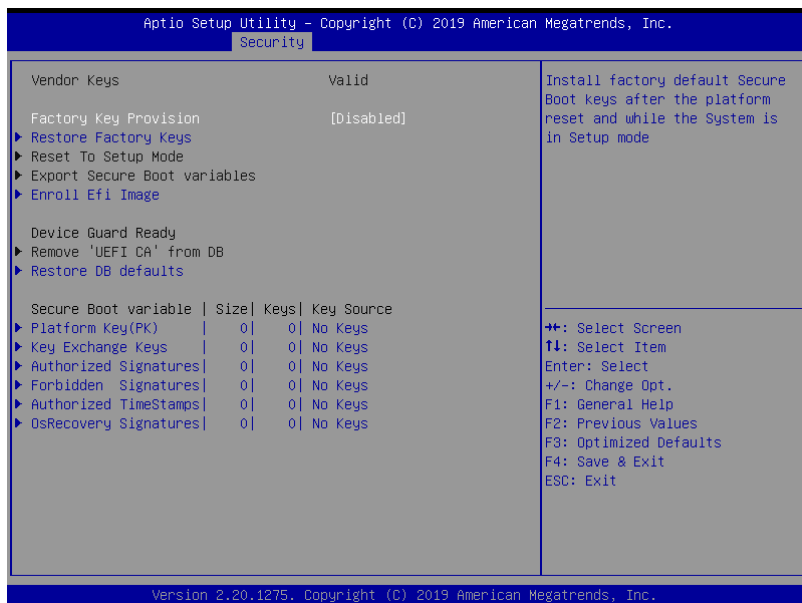
3.6.1 Secure Boot



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		

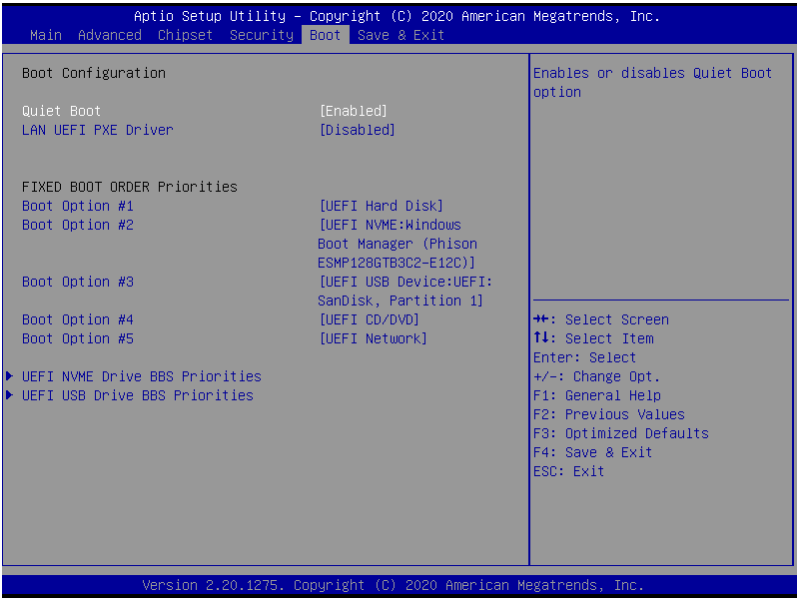
3.6.1.1 Key Management



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 Boot



Options Summary		
Quiet Boot	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable showing boot logo.		
LAN UEFI PXE Driver	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enabled/Disable LAN UEFI PXE Driver		

3.7.1 BBS Priorities



3.8 Save & Exit



Chapter 4

Drivers Installation

4.1 Driver Download/Installation

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

<https://www.aaeon.com/en/p/compact-boards-pcm-cfs>

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

Note: These drivers are only compatible for the Windows 10 64-bit operating system. If you have questions about other OS installations, please contact AAEON support.

Step 1 – Install Chipset Drivers

1. Open the **Step1 - Chipset** folder
2. Run the **SetupChipset.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 2 – Install Graphics Drivers

1. Open the **Step2 - Graphic** folder
2. Run the **igxpin.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 3 – Install LAN Drivers

1. Click on the **Step3 - Network** folder
2. Run the **PROWinx64.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 4 – Install Audio Drivers

1. Open the **Step4 - Audio** folder
2. Run the **Win10_R281.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 5 – Install Serial IO Drivers

1. Open the **Step5 - SerialIO** folder, then the OS folder
2. Run the **SetupSerialIO.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 6 – Install ME Drivers

1. Open the **Step6 – ME** folder
2. Run the **SetupME.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 7 – Install Serial Port Driver (Optional)

1. Open the **Step7 – Serial Port Driver (Optional)**
2. Run the **FintekSerial.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Appendix A

Watchdog Timer Programming

A.1 Watchdog Timer Registers

Table 1 : Watch dog relative IO address

	Default Value	Note
I/O Base Address	0xA10	I/O Base address for Watchdog operation. This address is assigned by SIO LDN7, register 0x60-0x61.

Table 2 : Watchdog relative register table

Register	Offset	BitNum	Value	Note
Watchdog WDRST# Enable	0x00	7	1	Enable/Disable time out output via WDRST# 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 Pulse width is must longer then 16ms.
Signal Polarity	0x05	2	0	0: low active 1: high active Must set this bit to 0
Counting Unit	0x05	3	0	Select time unit. 0: second 1: minute
Output Signal Type	0x05	4	1	0: Level 1: Pulse Must set this bit to 1
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 WDTRstBit 0x80 // Watchdog WDTRST# (Bit7)
    #define WDTRstVal 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).
    AaeonWDTConfig(Counter, Unit);

    // Procedure : AaeonWDTEnable
    // This procedure will enable the WDT counting.
    AaeonWDTEnable();
}
*****

```

```

*****
// 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, WDTRstBit, WDTRstVal);
}

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 (IO)	
	[0000000000000000 - 000000000000CF7] PCI Express Root Complex
	[0000000000000020 - 0000000000000021] Programmable interrupt controller
	[0000000000000024 - 0000000000000025] Programmable interrupt controller
	[0000000000000028 - 0000000000000029] Programmable interrupt controller
	[000000000000002C - 000000000000002D] Programmable interrupt controller
	[000000000000002E - 000000000000002F] Motherboard resources
	[0000000000000030 - 0000000000000031] Programmable interrupt controller
	[0000000000000034 - 0000000000000035] Programmable interrupt controller
	[0000000000000038 - 0000000000000039] Programmable interrupt controller
	[000000000000003C - 000000000000003D] Programmable interrupt controller
	[0000000000000040 - 0000000000000043] System timer
	[000000000000004E - 000000000000004F] Motherboard resources
	[0000000000000050 - 0000000000000053] System timer
	[0000000000000060 - 0000000000000060] Standard PS/2 Keyboard
	[0000000000000061 - 0000000000000061] Motherboard resources
	[0000000000000063 - 0000000000000063] Motherboard resources
	[0000000000000064 - 0000000000000064] Standard PS/2 Keyboard
	[0000000000000065 - 0000000000000065] Motherboard resources
	[0000000000000067 - 0000000000000067] Motherboard resources
	[0000000000000070 - 0000000000000070] Motherboard resources
	[0000000000000080 - 0000000000000080] Motherboard resources
	[0000000000000092 - 0000000000000092] Motherboard resources
	[00000000000000A0 - 00000000000000A1] Programmable interrupt controller
	[00000000000000A4 - 00000000000000A5] Programmable interrupt controller
	[00000000000000A8 - 00000000000000A9] Programmable interrupt controller
	[00000000000000AC - 00000000000000AD] Programmable interrupt controller
	[00000000000000B0 - 00000000000000B1] Programmable interrupt controller
	[00000000000000B2 - 00000000000000B3] Motherboard resources
	[00000000000000B4 - 00000000000000B5] Programmable interrupt controller
	[00000000000000B8 - 00000000000000B9] Programmable interrupt controller
	[00000000000000BC - 00000000000000BD] Programmable interrupt controller
	[00000000000000F0 - 00000000000000F0] Numeric data processor
	[0000000000000280 - 0000000000000287] Communications Port (COM3)
	[0000000000000288 - 000000000000028F] Communications Port (COM4)
	[00000000000002A0 - 00000000000002A7] Communications Port (COM5)
	[00000000000002A8 - 00000000000002AF] Communications Port (COM6)
	[00000000000002B8 - 00000000000002BF] Communications Port (COM9)
	[00000000000002C8 - 00000000000002CF] Communications Port (COM10)
	[00000000000002E8 - 00000000000002EF] Communications Port (COM8)

	[00000000000002F8 - 0000000000002FF] Communications Port (COM2)
	[00000000000003E8 - 0000000000003EF] Communications Port (COM7)
	[00000000000003F8 - 0000000000003FF] Communications Port (COM1)
	[00000000000004D0 - 00000000000004D1] Programmable interrupt controller
	[0000000000000680 - 000000000000069F] Motherboard resources
	[0000000000000A00 - 0000000000000A0F] Motherboard resources
	[0000000000000A10 - 0000000000000A1F] Motherboard resources
	[0000000000000A20 - 0000000000000A2F] Motherboard resources
	[0000000000000D00 - 000000000000FFFF] PCI Express Root Complex
	[000000000000164E - 000000000000164F] Motherboard resources
	[0000000000001800 - 00000000000018FE] Motherboard resources
	[0000000000001854 - 0000000000001857] Motherboard resources
	[0000000000002000 - 00000000000020FE] Motherboard resources
	[0000000000003000 - 0000000000003FFF] Intel(R) PCI Express Root Port #1 - A338
	[0000000000004000 - 000000000000403F] Intel(R) UHD Graphics 630
	[0000000000004060 - 000000000000407F] Standard SATA AHCI Controller
	[0000000000004080 - 0000000000004083] Standard SATA AHCI Controller
	[0000000000004090 - 0000000000004097] Standard SATA AHCI Controller
	[000000000000EFA0 - 000000000000EFBF] Intel(R) SMBus - A323
	[000000000000FFF8 - 000000000000FFFF] Intel(R) Active Management Technology - SOL (COM11)

B.2 Memory Address Map

Memory	
[000000000000A0000 - 00000000000BFFFF]	PCI Express Root Complex
[0000000040000000 - 00000000403FFFFF]	Motherboard resources
[0000000090000000 - 000000009FFFFFFF]	Intel(R) UHD Graphics 630
[0000000090000000 - 00000000DFFFFFFF]	PCI Express Root Complex
[00000000A0000000 - 00000000A0FFFFFF]	Intel(R) UHD Graphics 630
[00000000A1100000 - 00000000A111FFFF]	Intel(R) I211 Gigabit Network Connection
[00000000A1100000 - 00000000A11FFFFF]	Intel(R) PCI Express Root Port #1 - A338
[00000000A1120000 - 00000000A1123FFF]	Intel(R) I211 Gigabit Network Connection
[00000000A1200000 - 00000000A1203FFF]	Standard NVMe Express Controller
[00000000A1200000 - 00000000A12FFFFFFF]	Intel(R) PCI Express Root Port #17 - A340
[00000000A1320000 - 00000000A132FFFF]	Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft)
[00000000A1334000 - 00000000A1335FFF]	Standard SATA AHCI Controller
[00000000A1338000 - 00000000A13380FF]	Intel(R) SMBus - A323
[00000000A1339000 - 00000000A13397FF]	Standard SATA AHCI Controller
[00000000A133A000 - 00000000A133A0FF]	Standard SATA AHCI Controller
[00000000E0000000 - 00000000EFFFFFFF]	Motherboard resources
[00000000FC800000 - 00000000FE7FFFFF]	PCI Express Root Complex
[00000000FCF00000 - 00000000FCFFFFFF]	High Definition Audio Controller
[00000000FD000000 - 00000000FD69FFFF]	Motherboard resources
[00000000FD6A0000 - 00000000FD6AFFFF]	Intel(R) Serial IO GPIO Host Controller - INT3450
[00000000FD6B0000 - 00000000FD6BFFFF]	Intel(R) Serial IO GPIO Host Controller - INT3450
[00000000FD6C0000 - 00000000FD6CFFFF]	Motherboard resources
[00000000FD6D0000 - 00000000FD6DFFFF]	Intel(R) Serial IO GPIO Host Controller - INT3450
[00000000FD6E0000 - 00000000FD6EFFFF]	Intel(R) Serial IO GPIO Host Controller - INT3450
[00000000FD6F0000 - 00000000FD6FFFFF]	Motherboard resources
[00000000FE000000 - 00000000FE01FFFF]	Motherboard resources
[00000000FE010000 - 00000000FE010FFF]	Intel(R) SPI (flash) Controller - A324
[00000000FE1D8000 - 00000000FE1DBFFF]	High Definition Audio Controller
[00000000FE1DD000 - 00000000FE1DDFFF]	Intel(R) Management Engine Interface
[00000000FE1DE000 - 00000000FE1DEFFF]	Intel(R) Serial IO I2C Host Controller - A368
[00000000FE1DF000 - 00000000FE1DFFFF]	Intel(R) Active Management Technology - SOL (COM11)
[00000000FE1E0000 - 00000000FE1FFFFFFF]	Intel(R) Ethernet Connection (7) I219-LM
[00000000FE200000 - 00000000FE7FFFFF]	Motherboard resources
[00000000FED00000 - 00000000FED003FF]	High precision event timer
[00000000FED10000 - 00000000FED17FFF]	Motherboard resources
[00000000FED18000 - 00000000FED18FFF]	Motherboard resources
[00000000FED19000 - 00000000FED19FFF]	Motherboard resources
[00000000FED20000 - 00000000FED3FFFF]	Motherboard resources
[00000000FED40000 - 00000000FED44FFF]	Trusted Platform Module 2.0
[00000000FED45000 - 00000000FED8FFFF]	Motherboard resources
[00000000FED90000 - 00000000FED93FFF]	Motherboard resources
[00000000FEE00000 - 00000000FEEFFFFFFF]	Motherboard resources
[00000000FF000000 - 00000000FFFFFFFF]	Motherboard resources

B.3 IRQ Mapping Chart

Interrupt request (IRQ)		
	(ISA) 0x00000000 (00)	System timer
	(ISA) 0x00000001 (01)	Standard PS/2 Keyboard
	(ISA) 0x00000003 (03)	Communications Port (COM2)
	(ISA) 0x00000004 (04)	Communications Port (COM1)
	(ISA) 0x00000007 (07)	Communications Port (COM10)
	(ISA) 0x00000007 (07)	Communications Port (COM7)
	(ISA) 0x00000007 (07)	Communications Port (COM8)
	(ISA) 0x00000007 (07)	Communications Port (COM9)
	(ISA) 0x0000000B (11)	Communications Port (COM3)
	(ISA) 0x0000000B (11)	Communications Port (COM4)
	(ISA) 0x0000000B (11)	Communications Port (COM5)
	(ISA) 0x0000000B (11)	Communications Port (COM6)
	(ISA) 0x0000000C (12)	PS/2 Compatible Mouse
	(ISA) 0x0000000D (13)	Numeric data processor
	(ISA) 0x0000000E (14)	Intel(R) Serial IO GPIO Host Controller - INT3450
	(ISA) 0x0000002D (45)	Trusted Platform Module 2.0
	(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) 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) 0x00000071 (113)	Microsoft ACPI-Compliant System
 (ISA) 0x00000072 (114)	Microsoft ACPI-Compliant System
 (ISA) 0x00000073 (115)	Microsoft ACPI-Compliant System
 (ISA) 0x00000074 (116)	Microsoft ACPI-Compliant System

	(ISA) 0x000001EE (494)	Microsoft ACPI-Compliant System
	(ISA) 0x000001EF (495)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F0 (496)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F1 (497)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F2 (498)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F3 (499)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F4 (500)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F5 (501)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F6 (502)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F7 (503)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F8 (504)	Microsoft ACPI-Compliant System
	(ISA) 0x000001F9 (505)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FA (506)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FB (507)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FC (508)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FD (509)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FE (510)	Microsoft ACPI-Compliant System
	(ISA) 0x000001FF (511)	Microsoft ACPI-Compliant System
	(PCI) 0x00000010 (16)	High Definition Audio Controller
	(PCI) 0x00000010 (16)	Intel(R) Serial IO I2C Host Controller - A368
	(PCI) 0x00000013 (19)	Intel(R) Active Management Technology - SOL (COM11)
	(PCI) 0xFFFFFEB (-21)	Intel(R) Management Engine Interface
	(PCI) 0xFFFFFEC (-20)	Intel(R) Ethernet Connection (7) I219-LM
	(PCI) 0xFFFFFED (-19)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFEE (-18)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFEF (-17)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF0 (-16)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF1 (-15)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF2 (-14)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF3 (-13)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF4 (-12)	Intel(R) I211 Gigabit Network Connection
	(PCI) 0xFFFFFFF5 (-11)	Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft)
	(PCI) 0xFFFFFFF6 (-10)	Intel(R) UHD Graphics 630
	(PCI) 0xFFFFFFF7 (-9)	Standard NVM Express Controller
	(PCI) 0xFFFFFFF8 (-8)	Standard NVM Express Controller
	(PCI) 0xFFFFFFF9 (-7)	Standard NVM Express Controller
	(PCI) 0xFFFFFFFA (-6)	Standard NVM Express Controller
	(PCI) 0xFFFFFFFB (-5)	Standard NVM Express Controller
	(PCI) 0xFFFFFFFC (-4)	Standard NVM Express Controller
	(PCI) 0xFFFFFFFD (-3)	Standard NVM Express Controller
	(PCI) 0xFFFFFFFE (-2)	Standard SATA AHCI Controller

Appendix C

Digital I/O Ports

C.1 Digital I/O Register

Logic Device Number Register (LDN) – Index 07h					
Bit	Name	R/W	Reset	Default	Description
7-0	LDN	R/W	LRESET#	00h	00h: Select FDC device configuration registers
					03h: Select Parallel Port device configuration registers.
					04h: Select Hardware Monitor device configuration registers.
					05h: Select KBC device configuration registers.
					06h Select GPIO device configuration registers
					07h: Select WDT device configuration registers.
					0Ah: Select PME, ACPI and ERP device configuration registers.
					10h: Select UART1 device configuration registers.
					11h: Select UART2 device configuration registers
					12h: Select UART3 device configuration registers
					13h: Select UART4 device configuration registers
					14h: Select UART5 device configuration registers
					15h: Select UART6 device configuration registers
					Otherwise: Reserved

GPIOx Output Enable Register – Index 80h					
Bit	Name	R/W	Reset	Default	Description
7	GPIO77_OE	R/W	3VCC	0	0: GPIO77 is in input mode 1: GPIO77 is in output mode
6	GPIO76_OE	R/W	3VCC	0	0: GPIO76 is in input mode 1: GPIO76 is in output mode
5	GPIO75_OE	R/W	3VCC	0	0: GPIO75 is in input mode 1: GPIO75 is in output mode
4	GPIO74_OE	R/W	3VCC	0	0: GPIO74 is in input mode 1: GPIO74 is in output mode
3	GPIO73_OE	R/W	3VCC	0	0: GPIO73 is in input mode 1: GPIO73 is in output mode
2	GPIO72_OE	R/W	3VCC	0	0: GPIO72 is in input mode 1: GPIO72 is in output mode
1	GPIO71_OE	R/W	3VCC	0	0: GPIO71 is in input mode 1: GPIO71 is in output mode
0	GPIO70_OE	R/W	3VCC	0	0: GPIO70 is in input mode 1: GPIO70 is in output mode

GPIO7 Output Data Register – Index 81h (This byte could be also written by base address + 3)

Bit	Name	R/W	Reset	Default	Description
7	GPIO77_VAL	R/W	LRESET#	1	0: GPIO77 outputs 0 when in output mode 1: GPIO77 outputs 1 when in output mode
6	GPIO76_VAL	R/W	LRESET#	1	0: GPIO76 outputs 0 when in output mode 1: GPIO76 outputs 1 when in output mode
5	GPIO75_VAL	R/W	LRESET#	1	0: GPIO75 outputs 0 when in output mode 1: GPIO75 outputs 1 when in output mode
4	GPIO74_VAL	R/W	LRESET#	1	0: GPIO74 outputs 0 when in output mode 1: GPIO74 outputs 1 when in output mode
3	GPIO73_VAL	R/W	LRESET#	1	0: GPIO73 outputs 0 when in output mode 1: GPIO73 outputs 1 when in output mode
2	GPIO72_VAL	R/W	LRESET#	1	0: GPIO72 outputs 0 when in output mode 1: GPIO72 outputs 1 when in output mode
1	GPIO71_VAL	R/W	LRESET#	1	0: GPIO71 outputs 0 when in output mode 1: GPIO71 outputs 1 when in output mode
0	GPIO70_VAL	R/W	LRESET#	1	0: GPIO70 outputs 0 when in output mode 1: GPIO70 outputs 1 when in output mode

GPIO7 Pin Status Register – Index 82h (This byte could be also read by base address + 3)

Bit	Name	R/W	Reset	Default	Description
7	GPIO77_IN	R	-	-	The pin status of GPIO77/STB#
6	GPIO76_IN	R	-	-	The pin status of GPIO76/AFD#
5	GPIO75_IN	R	-	-	The pin status of GPIO75/ERR#
4	GPIO74_IN	R	-	-	The pin status of GPIO74/INIT#
3	GPIO73_IN	R	-	-	The pin status of GPIO73/SLIN#
2	GPIO72_IN	R	-	-	The pin status of GPIO72/ACK#
1	GPIO71_IN	R	-	-	The pin status of GPIO71/BUSY
0	GPIO70_IN	R	-	-	The pin status of GPIO70/PE/FANCTRL3/PWM_DAC3

GPIO8 Output Enable Register – Index 88h

Bit	Name	R/W	Reset	Default	Description
7	GPIO77_OE	R/W	LRESET#	0	0: GPIO87 is in input mode 1: GPIO87 is in output mode
6	GPIO76_OE	R/W	LRESET#	0	0: GPIO86 is in input mode 1: GPIO86 is in output mode
5	GPIO75_OE	R/W	LRESET#	0	0: GPIO85 is in input mode 1: GPIO85 is in output mode
4	GPIO74_OE	R/W	LRESET#	0	0: GPIO84 is in input mode 1: GPIO84 is in output mode
3	GPIO73_OE	R/W	LRESET#	0	0: GPIO83 is in input mode 1: GPIO83 is in output mode
2	GPIO72_OE	R/W	LRESET#	0	0: GPIO82 is in input mode 1: GPIO82 is in output mode
1	GPIO71_OE	R/W	LRESET#	0	0: GPIO81 is in input mode 1: GPIO81 is in output mode
0	GPIO70_OE	R/W	LRESET#	0	0: GPIO80 is in input mode 1: GPIO80 is in output mode

GPIO8 Output Data Register – Index 89h (This byte could be also written by base address + 2)

Bit	Name	R/W	Reset	Default	Description
7	GPIO87_VAL	R/W	LRESET#	1	0: GPIO87 outputs 0 when in output mode 1: GPIO87 outputs 1 when in output mode
6	GPIO86_VAL	R/W	LRESET#	1	0: GPIO86 outputs 0 when in output mode 1: GPIO86 outputs 1 when in output mode
5	GPIO85_VAL	R/W	LRESET#	1	0: GPIO85 outputs 0 when in output mode 1: GPIO85 outputs 1 when in output mode
4	GPIO84_VAL	R/W	LRESET#	1	0: GPIO84 outputs 0 when in output mode 1: GPIO84 outputs 1 when in output mode
3	GPIO83_VAL	R/W	LRESET#	1	0: GPIO83 outputs 0 when in output mode 1: GPIO83 outputs 1 when in output mode
2	GPIO82_VAL	R/W	LRESET#	1	0: GPIO82 outputs 0 when in output mode 1: GPIO82 outputs 1 when in output mode
1	GPIO81_VAL	R/W	LRESET#	1	0: GPIO81 outputs 0 when in output mode 1: GPIO81 outputs 1 when in output mode
0	GPIO80_VAL	R/W	LRESET#	1	0: GPIO80 outputs 0 when in output mode 1: GPIO80 outputs 1 when in output mode

GPIO8 Pin Status Register – Index 8Ah (This byte could be also read by base address + 2)

Bit	Name	R/W	Reset	Default	Description
7	GPIO87_IN	R	-	-	The pin status of GPIO87/PD7
6	GPIO86_IN	R	-	-	The pin status of GPIO86/PD6
5	GPIO85_IN	R	-	-	The pin status of GPIO85/PD5
4	GPIO84_IN	R	-	-	The pin status of GPIO84/PD4
3	GPIO83_IN	R	-	-	The pin status of GPIO83/PD3
2	GPIO82_IN	R	-	-	The pin status of GPIO82/PD2
1	GPIO81_IN	R	-	-	The pin status of GPIO81/PD1
0	GPIO80_IN	R	-	-	The pin status of GPIO80/PD0

C.2 Digital I/O Sample Code (4 in, 4 out; 2 low, 2 high)

```

Outportb(0x2E,0x87); //enter configuration Outportb(0x2E,0x87);
Outportb(0x2E,0x07); //set LDN
Outportb(0x2F,0x06);
Outportb(0x2E,0x88); //GPIO set 8x Output enable register
Outportb(0x2F,0xF0);
Outportb(0x2E,0x89); //GPIO 8x output data register
Outportb(0x2F,0x30);
Outportb(0x2E,0xAA); //exit configuration

```

Appendix D

Mating Connectors and Cables

D.1 Mating Connectors and Cables

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN2	Audio Speaker Connector	HO-BASE	XHP-4	N/A	N/A
CN4	Touch Screen Connector	JST	SHR-9V-S-B	N/A	N/A
CN7	Ethernet#1 Connector (Reserved)	Molex	51110-1050	LAN Cable	1700100201
CN8	Ethernet#2 Connector (Reserved)	Molex	51110-1050	LAN Cable	1700100201
CN9	Audio Connector	Molex	87831-14	Audio Cable	1700140510
CN14	COM Port 1 Connector	Molex	51110-1050	Serial Port	1701100206
CN15	COM Port 2 Connector	Molex	51110-1050	Serial Port	1701100206
CN17	COM Port 3 Connector	Molex	51110-1050	Serial Port	1701100206
CN18	COM Port 4 Connector	Molex	51110-1050	Serial Port	1701100206
CN19	COM Port 5 Connector	Molex	51110-1050	Serial Port	1701100206
CN20	COM Port 6 Connector	Molex	51110-1050	Serial Port	1701100206
CN21	LPC Port	JST	SHR-12V-S-B	AAEON LPC Cable	1703120130
CN23	COM Port 7 Connector	Molex	51110-1050	Serial Port	1701100206
CN24	COM Port 8 Connector	Molex	51110-1050	Serial Port	1701100206
CN28	COM Port 9 Connector	Molex	51110-1050	Serial Port	1701100206

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN29	COM Port 10 Connector	Molex	51110-1050	Serial Port	1701100206
CN30	USB 3.0 Port 3, 4 Connector	HO-BAS E	UB210 FB-1T1	USB 3.0 Cable	1700190450
CN31	USB 3.0 Port 1, 2 Connector	HO-BAS E	UB210 FB-1T1	USB 3.0 Cable	1700190450
CN32	LVDS#1 Inverter Connector	JST	PHR-5	N/A	N/A
CN33	LVDS#2 Inverter Connector	JST	PHR-5	N/A	N/A
CN34	USB Port 5, 6 Connector	Molex	51110-1050	USB Cable	1709100201
CN35	USB Port 7, 8 Connector	Molex	51110-1050	USB Cable	1709100201
CN36	External RTC Connector	Molex	51021-0200	Battery Cable	175011301C
CN37	P/S2 KB/MS Connector	Wafer	B6B-PHDSS	P/S2 KB/MS Cable	1700060152
CN38	LVDS#1 Connector	HIROSE	DF13-30DS-1.25C	N/A	N/A
CN39	LVDS#2 Connector	HIROSE	DF13-30DS-1.25C	N/A	N/A
CN40	+5Vout Connector	JST	PHR-2	2 Pins for HDD Power	1702150155
CN41	SATA Port1	Molex	67582-0000	SATA Cable	1709070500
CN42	SATA Port0	Molex	67582-0000	SATA Cable	1709070500
CN43	SATA Port2	Molex	67582-0000	SATA Cable	1709070500
CN44	CPU Fan Connector	Molex	22-01-2035	N/A	N/A

Connector Label	Function	Mating Connector		Available Cable	Cable P/N
		Vendor	Model no		
CN45	System Fan Connector	Molex	22-01-2035	N/A	N/A
CN46	DIO #1 Connector	Molex	51110-1050	N/A	N/A
CN50	DIO #2 Connector	Molex	51110-1050	N/A	N/A