ASDM-L-CFS

Smart Display Module

User's Manual 1st Ed

Last Updated: April 23, 2020

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Packing List

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

Item	Quantity
● ASDM-L-CFS	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

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

Caution:

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

Attention:

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

China RoHS Requirements (CN)

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

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

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

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

备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。

China RoHS Requirement (EN)

Poisonous or Hazardous Substances or Elements in Products

AAEON Main Board/ Daughter Board/ Backplane

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

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

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

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

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Chapter 1

Product Specifications

1.1 Specifications

System	
Form Factor	Intel SDM-L Module
CPU	8th/9th Generation Intel® Core™, Pentium®, and Celeron® processors (Coffee Lake S, Coffee Lake Refresh) TDP up to 35W
CPU Frequency	Up to 4.0 GHz
Chipset	Intel® Chipsets H310/ Q370
Memory Type	DDR4 2666 SO-DIMM x 2 (non-ECC)
Max. Memory Capacity	Up to 32GB
BIOS	AMI BIOS
Wake On LAN	Yes
Watchdog Timer	255 Levels
Power Requirement	12V DC from the Docking Board through the Edge Connector
Power Supply Type	AT/ATX
Power Consumption (Typical)	12V, 6.08A, estimate 72.96W with i7-9700TE at 100% loading
Dimension (L x W x H)	3.94" x 6.89" x 0.79" (100 mm x 175 mm x 20 mm)
Operating Temperature	32°F ~ 131°F (0°C ~ 55°C)
Storage Temperature	-40°F ~ 176°F (-40°C ~ 80°C)

System

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

Display

Controller	Intel® UHD Graphics 630/620/610
Video Output	HDMI 2.0 x 1 (through Edge connector)
	DP1.2 x 1 (through Edge connector)
Audio	Through HDMI, DP by edge connector

I/O

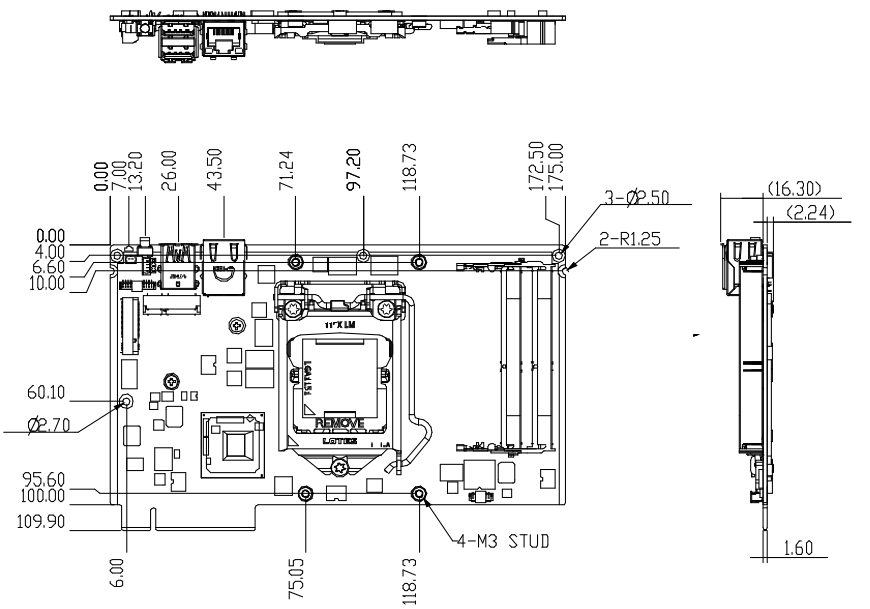
Ethernet	Intel® I219 GbE x 1
USB Port	USB 3.2 Gen 1 x 2 / USB 3.2 Gen 2 support by Q370
Storage	M.2 2242 B-Key x 1
Expansion Slot	M.2 2230 E-Key x 1
TPM	TPM 2.0 (Optional)

Chapter 2

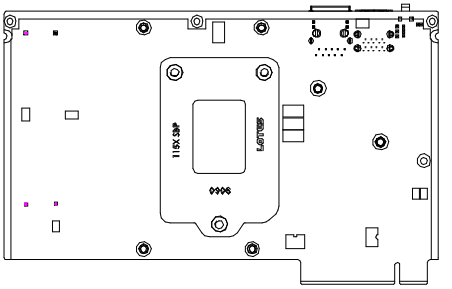
Hardware Information

2.1 Dimensions

2.1.1 Module dimensions

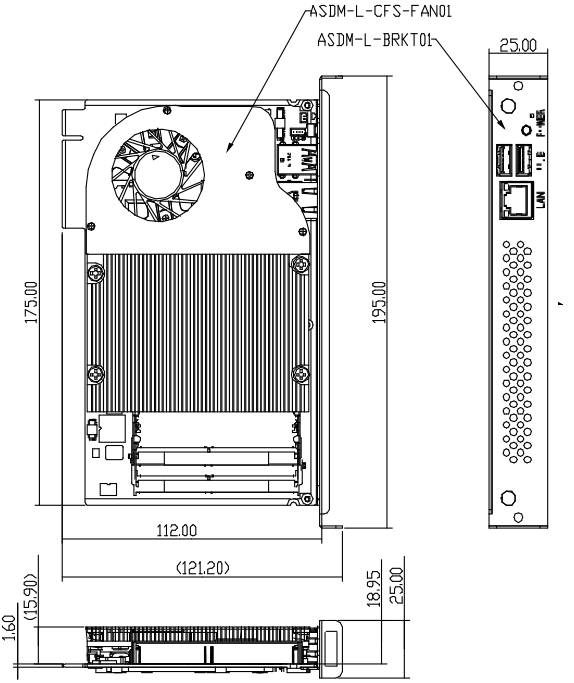


Component Side

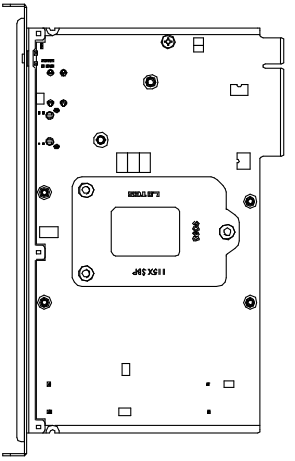


Solder Side

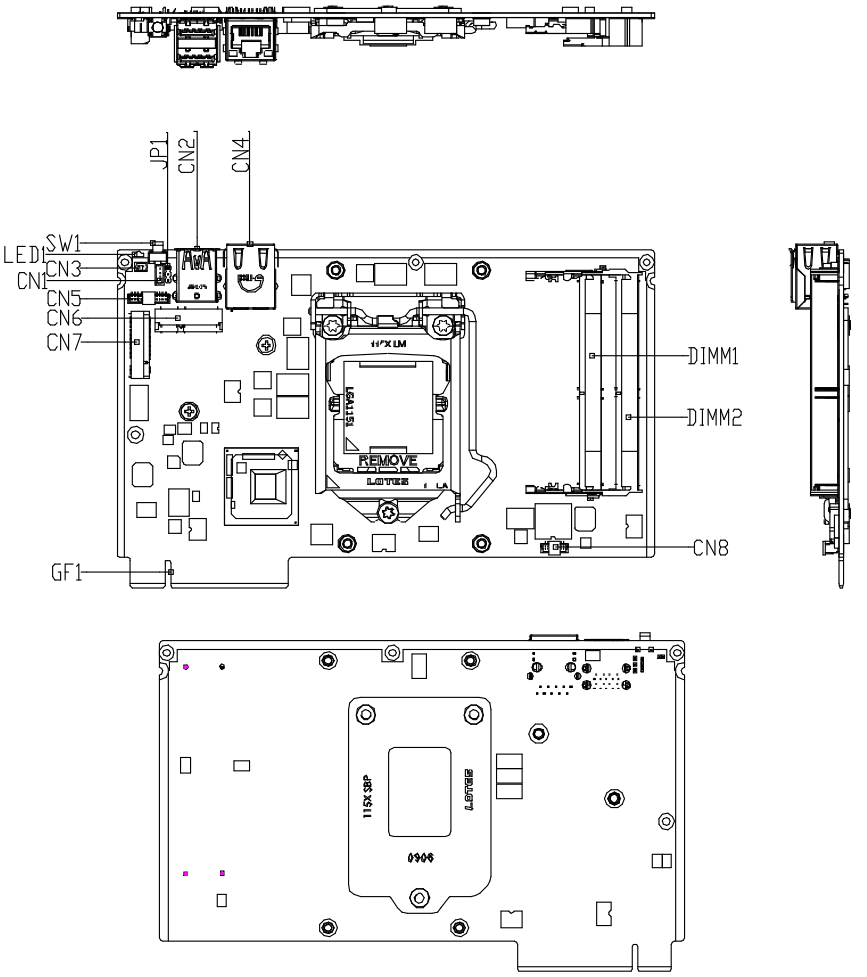
2.1.2 With Thermal Option and I/O Bracket



ASDM-L-CFS MODULAR



2.2 Jumpers and Connectors

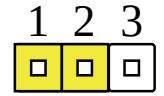


2.3 List of Jumpers

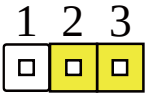
The ASDM-L-CFS features a number of jumpers allowing for manual configuration of the system to suit the needs of the user.

Label	Function
JP1	Clear CMOS Jumper

2.3.1 Clear CMOS Jumper (JP1)



Normal (Default)



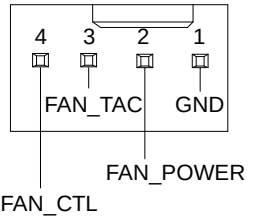
Clear CMOS

2.4 List of Connectors

The ASDM-L-CFS features a number of connectors and switches allowing for configuration and connection with external devices such as hard disk drives or a keyboard.

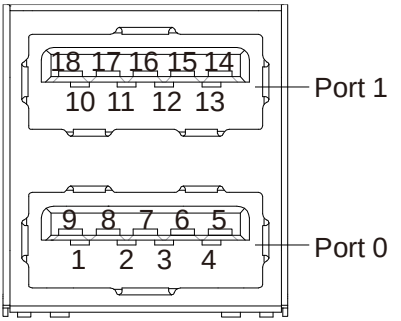
Label	Function
CN1	CPU FAN
CN2	Dual USB 3.0 Ports
CN3	Battery
CN4	LAN (RJ-45) Port
CN5	LPC/SM BUS Port
CN6	M.2 Key-E Slot (2230)
CN7	M.2 Key-B Slot (2242)
CN8	SPI Debug Port
DIMM1	DDR SO-DIMM Slot
DIMM2	DDR SO-DIMM Slot
GF1	SDM Gold Finger

2.4.1 CPU FAN (CN1)



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

2.4.2 Dual USB 3.0 Ports (CN2)



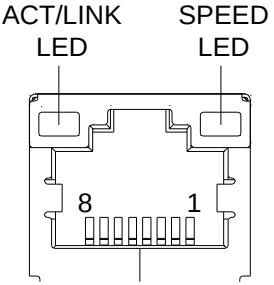
Pin	Pin Name	Signal Type	Signal Level
1	+5VSB	PWR	+5V
2	USB_D-	DIFF	

Pin	Pin Name	Signal Type	Signal Level
3	USB_D+	DIFF	
4	GND	GND	
5	USB_SSRX−	DIFF	
6	USB_SSRX+	DIFF	
7	GND	GND	
8	USB_SSTX−	DIFF	
9	USB_SSTX+	DIFF	
10	+5VSB	PWR	+5V
11	USB_D-	DIFF	
12	USB_D+	DIFF	
13	GND	GND	
14	USB_SSRX−	DIFF	
15	USB_SSRX+	DIFF	
16	GND	GND	
17	USB_SSTX−	DIFF	
18	USB_SSTX+	DIFF	

2.4.3 Battery (CN3)

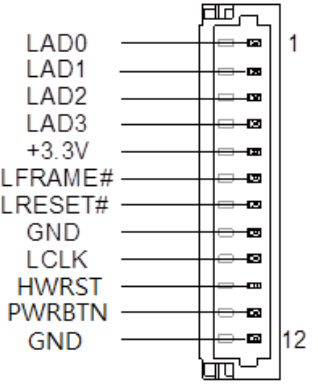
Pin	Pin Name	Signal Type	Signal Level
1	+3.3V	PWR	3.3V
2	GND	GND	

2.4.4 LAN (RJ45) Port (CN4)



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

2.4.5 LPC/SM BUS Port (CN5)



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	HWRST	OUT	
11	PWRBTN	OUT	
12	GND	GND	

2.4.6 M.2 Key-E Slot (2230) (CN6)

Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	+3.3VSB	PWR	+3.3V
3	USB_D+	DIFF	
4	+3.3VSB	PWR	+3.3V
5	USB_D-	DIFF	
6	NC		
7	GND	GND	
8	NC		
9	NC		
10	NC		
11	NC		
12	NC		
13	NC		
14	NC		
15	NC		
16	NC		
17	NC		
18	NC		
19	NC		
20	NC		
21	NC		
22	NC		
23	NC		
32	NC		
33	GND	GND	

Pin	Pin Name	Signal Type	Signal Level
34	NC		
35	PCIE_TX+	DIFF	
36	NC		
37	PCIE_TX-	DIFF	
38	NC		
39	GND	GND	
40	NC		
41	PCIE_RX+	DIFF	
42	NC		
43	PCIE_RX-	DIFF	
44	NC		
45	GND	GND	
46	NC		
47	PCIE_REF_CLK+	DIFF	
48	NC		
49	PCIE_REF_CLK-	DIFF	
50	NC		
51	GND	GND	
52	PCIE_RST#	OUT	+3.3V
53	PCIE_CLK_REQ#	IN	+3.3V
54	W_DISABLE2#	OUT	+3.3V
55	PCIE_WAKE#	IN	+3.3V
56	W_DISABLE1#	OUT	+3.3V
57	GND	GND	
58	NC		
59	NC		
60	NC		

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

2.4.7 M.2 Key-B Slot (2242) (CN7)

Pin	Pin Name	Signal Type	Signal Level
1	GND	GND	
2	+3.3V	PWR	+3.3V
3	GND	GND	
4	+3.3V	PWR	+3.3V
5	GND	GND	
6	N.C		
7	USB_D+	DIFF	
8	W_DISABLE	IN	

Pin	Pin Name	Signal Type	Signal Level
9	USB_D-	DIFF	
10	SSD_LED#	OUT	
11	GND	GND	
20	N.C		
21	GND	GND	
22	N.C		
23	N.C		
24	N.C		
25	N.C		
26	N.C		
27	GND	GND	
28	N.C		
29	PERN1/USB3.0-RX-	DIFF	
30	N.C		
31	PERN1/USB3.0-RX+	DIFF	
32	N.C		
33	GND	GND	
34	N.C		
35	PERN1/USB3.0-TX-	DIFF	
36	N.C		
37	PERN1/USB3.0-TX+	DIFF	
38	DEVSLP	IN	
39	GND	GND	
40	N.C		
41	PERN0/SATA-B+	DIFF	
42	N.C		
43	PERN0/SATA-B-	DIFF	

Pin	Pin Name	Signal Type	Signal Level
44	N.C		
45	GND	GND	
46	N.C		
47	PETN0/SATA-A-	DIFF	
48	N.C		
49	PETN0/SATA-A+	DIFF	
50	PERST#	IN	
51	GND	GND	
52	CLKREQ#	OUT	
53	REFCLKN	DIFF	
54	PEWAKE#	OUT	
55	REFCLKP	DIFF	
56	N.C		
57	GND	GND	
58	N.C		
59	N.C		
60	N.C		
61	N.C		
62	N.C		
63	N.C		
64	N.C		
65	N.C		
66	N.C		
67	N.C		
68	N.C		
69	GND	GND	
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	N.C		

2.4.8 SPI Debug Port (CN8)

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		

2.4.9 DDR SO-DIMM Slot (DIMM1/DIMM2)

DDR SO-DIMM Slots follow standard specifications.

2.3.8 SDM Gold Finger (GF1)

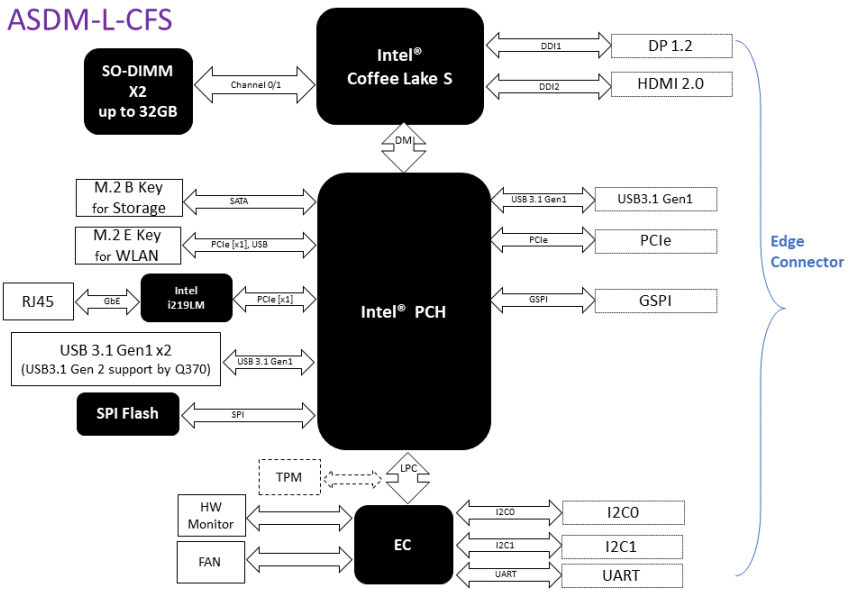
Pin	Pin Name	Signal Type	Signal Level
A1	+12V	PWR	+12V
A2	+12V	PWR	+12V
A3	+12V	PWR	+12V
A4	GND	GND	
A5	GND	GND	
A6	PWRGD#	OUT	+3.3V
A7	SLP_S4	OUT	+3.3V
A8	SDM_DET#	OUT	
A9	CEC		
A10	I2C0_SDA	I/O	+3.3V
A11	I2C0_SCL	OUT	+3.3V
A12	GSPI_CLK	OUT	+1.8V
A13	GSPI_CS0#	OUT	+1.8V
A14	GND	GND	
A15	PCIE_TX+	DIFF	
A16	PCIE_TX-	DIFF	
A17	GND	GND	
A18	PCIE_RX+	DIFF	
A19	PCIE_RX-	DIFF	
A20	GND	GND	
A21	PCIE_REF_CLK+	DIFF	
A22	PCIE_REF_CLK-	DIFF	
A23	GND	GND	
A24	PCIE_WAKE#	IN	+3.3V
A25	PCIE_CLK_REQ#	IN	+3.3V

A26	PCIE_RST#	OUT	+3.3V
A27	GND	GND	
A28	HDMI_CLK_N	DIFF	
A29	HDMI_CLK_P	DIFF	
A30	GND	GND	
A31	HDMI_D0_N	DIFF	
A32	HDMI_D0_P	DIFF	
A33	GND	GND	
A34	HDMI_D1_N	DIFF	
A35	HDMI_D1_P	DIFF	
A36	GND	GND	
A37	HDMI_D2_N	DIFF	
A38	HDMI_D2_P	DIFF	
A39	GND	GND	
A40	HDMI_SDA	I/O	+3.3V
A41	HDMI_SCL	OUT	+3.3V
A42	HDMI_HPD	IN	
A43	GND	GND	
A44	NC		
A45	NC		
A46	NC		
A47	NC		
A48	NC		
A49	NC		
B1	+12V	PWR	+12V
B2	+12V	PWR	+12V
B3	+3VSB	PWR	+3.3V
B4	GND	GND	

B5	GND	GND	
B6	PWRBTN#	IN	
B7	RESET#	IN	
B8	SYSFAN#	IN	
B9	GND	GND	
B10	I2C1_SDA	I/O	+3.3V
B11	I2C1_SCL	OUT	+3.3V
B12	GSPI_MOSI	OUT	+1.8V
B13	GSPI_MISO	IN	+1.8V
B14	GND	GND	
B15	UART_TXD	OUT	+3.3V
B16	UART_RXD	IN	+3.3V
B17	GND	GND	
B18	USB_SSTX+	DIFF	
B19	USB_SSTX–	DIFF	
B20	GND	GND	
B21	USB_SSRX+	DIFF	
B22	USB_SSRX–	DIFF	
B23	GND	GND	
B24	USB_D+	DIFF	
B25	USB_D-	DIFF	
B26	USB_OC#	IN	
B27	GND	GND	
B28	DP3-	DIFF	
B29	DP3+	DIFF	
B30	GND	GND	
B31	DP2-	DIFF	
B32	DP2+	DIFF	

B33	GND	GND
B34	DP1-	DIFF
B35	DP1+	DIFF
B36	GND	GND
B37	DP0-	DIFF
B38	DP0+	DIFF
B39	GND	GND
B40	DP_AUX-	DIFF
B41	DP_AUX+	DIFF
B42	DP_HPD	IN
B43	GND	GND
B44	NC	
B45	NC	
B46	NC	
B47	NC	
B48	NC	
B49	NC	

2.5 Function Block



2.6 Electrical Specifications for I/O Ports

I/O	Reference	Signal	Output
CPU FAN	CN1	+12V	+12V/0.5A
USB 3.0 Ports	CN2	+5VSB	+5V/1A (per channel)
LPC/SM BUS Port	CN5	+3.3V	+3.3V/0.5A
M.2 Key-E (2230)	CN6	+3.3VSB	+3.3V/2A
M.2 Key-B (2242)	CN7	+3.3VSB	+3.3V/2.5A

Chapter 3

AMI BIOS Setup

3.1 System Test and Initialization

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

The system configuration verification routines check the current system configuration against the values stored in the CMOS memory and BIOS NVRAM. If a system configuration is not found or an error is detected, the module will load the default configuration and reboot automatically.

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

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

The ASDM-L-CFS CMOS memory has an integral lithium battery backup for data retention. However, you will need to replace the battery unit when it runs down.

3.2 AMI BIOS Setup

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

To enter BIOS Setup, press <Del> or <ESC> immediately while your computer is powering up.

The following BIOS menus and their functions are listed below.

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

Advanced – Enable/ disable boot option for legacy network devices

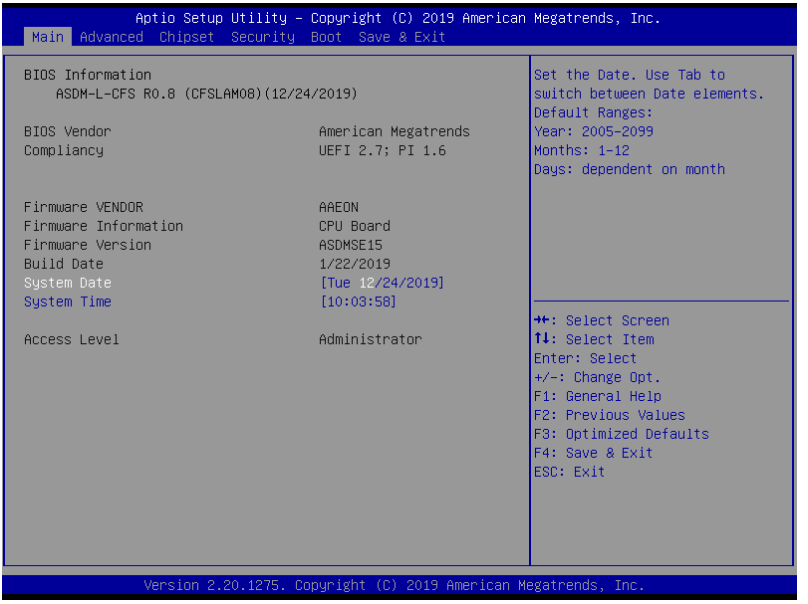
Chipset – Host bridge parameters

Security – The setup administrator password can be set here

Boot – Enable/ disable Quiet Boot option

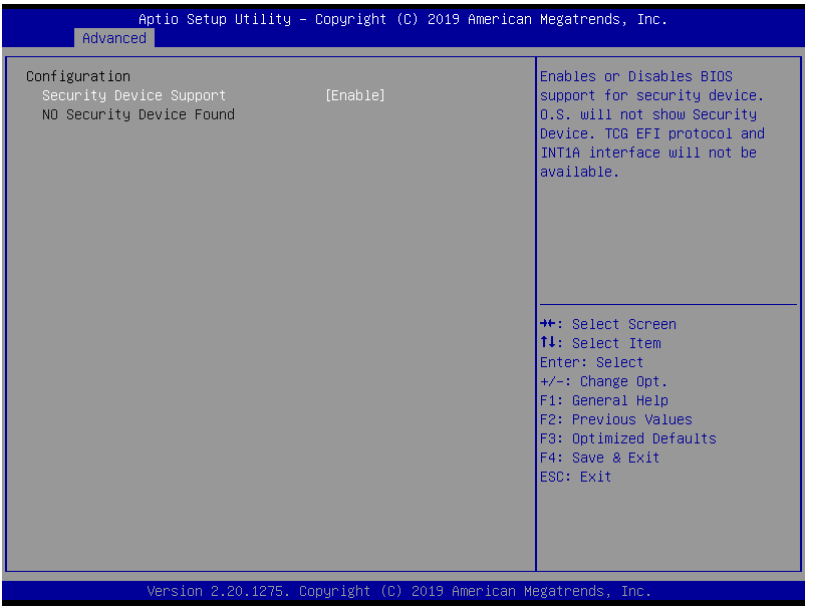
Save & Exit –Save your changes and exit the program

3.3 Setup submenu: Main



3.4 Setup submenu: Advanced

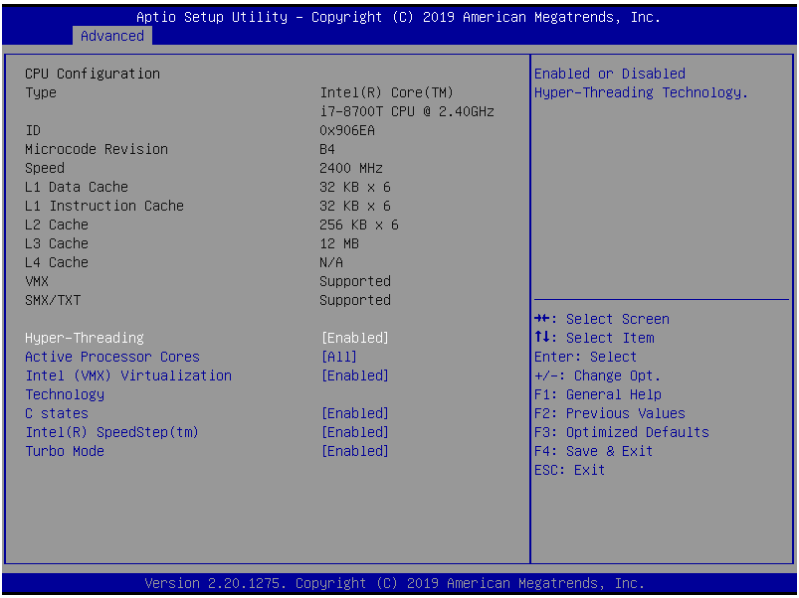
3.4.1 Trusted Computing



Options Summary		
Security Device Support	Disable	
	Enable	Optimal Default, Failsafe Default
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.		
SHA-1 PCR Bank	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable SHA-1 PCR Bank		
SHA256 PCR Bank	Disable	
	Enable	Optimal Default, Failsafe Default
Enable or Disable SHA256 PCR Bank		
Pending Operation	None	Optimal Default, Failsafe Default
	TPM Clear	
Schedule an Operation for the Security Device. NOTE: Your Computer will reboot during restart in order to change State of Security Device.		

Options Summary		
Platform Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or disable Platform Hierarchy		
Storage Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Storage Hierarchy		
Endorsement Hierarchy	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable Endorsement Hierarchy		
TPM2.0 UEFI Spec Version	TCG_1_2	
	TCG_2	Optimal Default, Failsafe Default
Select the TCG2 Spec Version Support, TCG_1_2: Compatible mode for Win8/Win10 TCG_2: Support new TCG2 protocol and event format for Win10 or later		
Physical Presence Spec Version	1.2	
	1.3	Optimal Default, Failsafe Default
Select to Tell O.S. to support PPI Spec Version 1.2 or 1.3. Note some HCK tests might not support 1.3.		

3.4.2 CPU Configuration



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.		

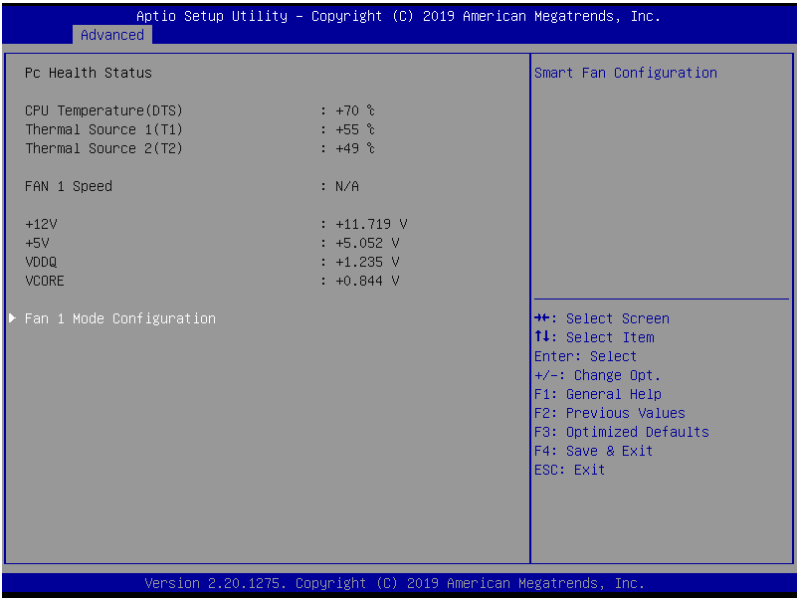
Table continues on next page...

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

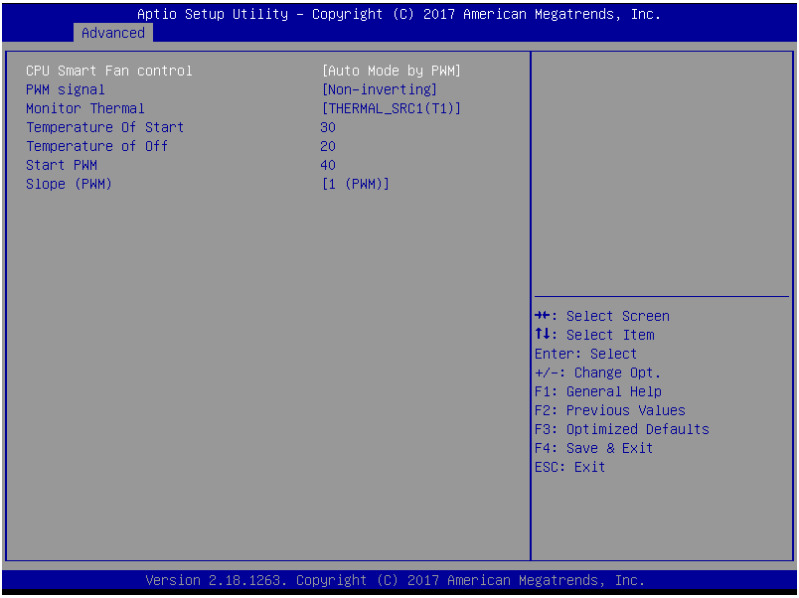
Options Summary		
SATA Controller(s)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable/Disable SATA Device.		
M.2(SATA)	Disabled	
	Enabled	Optimal Default, Failsafe Default
Enable or Disable SATA Port		

3.4.4 Hardware Monitor



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

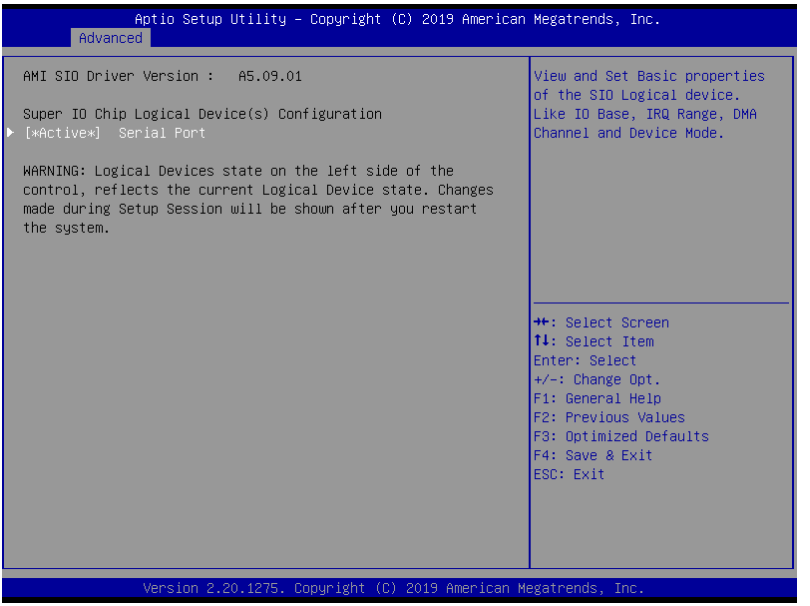
3.4.4.1 Smart Fan Mode Configuration



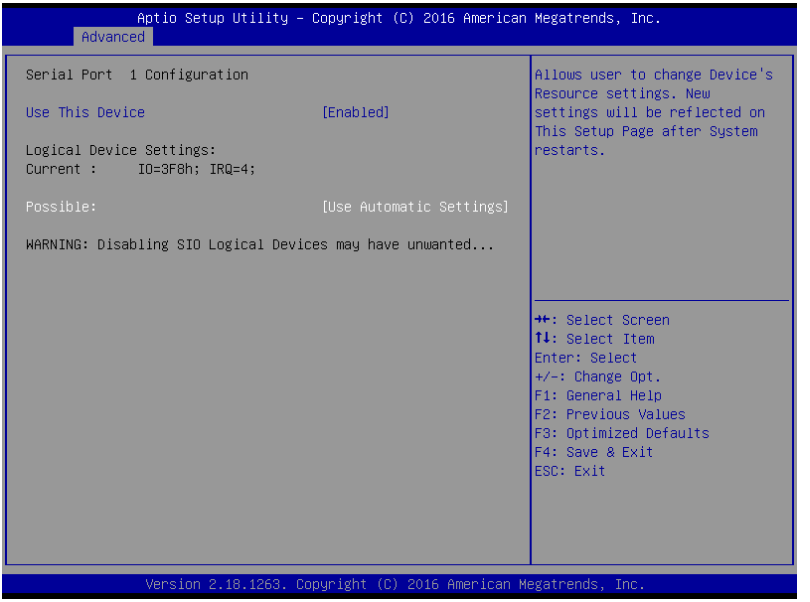
Options Summary		
CPU Smart Fan Control	Full Mode	Optimal Default, Failsafe Default
	Manual Mode by PWM	
	Auto Mode by PWM	
PWM signal	Non-inverting	
	Inverting	Optimal Default, Failsafe Default
Select output PWM of inverting or non-inverting signal		
Monitor Thermal	THERMAL_SRC1(T1)	Optimal Default, Failsafe Default
	THERMAL_SRC2(T2)	
Select monitor thermal source		
Temperature of Start	30	Optimal Default, Failsafe Default
Temperature of Start		
Temperature of Off	20	Optimal Default, Failsafe Default
Temperature of Off		

Options Summary		
Start of PWM	40	Optimal Default, Failsafe Default
Start PWM		
Slope (PWM)	1 (PWM)	Optimal Default, Failsafe Default
Slope (PWM)		

3.4.5 SIO Configuration



3.4.5.1 Serial Port 1 Configuration



Options Summary		
Use This Device	Disable	Optimal Default, Failsafe Default
	Enable	
Enable or Disable this Logical Device.		
Possible:	Use Automatic Settings	Optimal Default, Failsafe Default
	IO=3F8h; IRQ=4	
	IO=2C8h; IRQ=11	
Allows user to change Device's Resource settings. New settings will be reflected on This Setup Page after System restarts.		

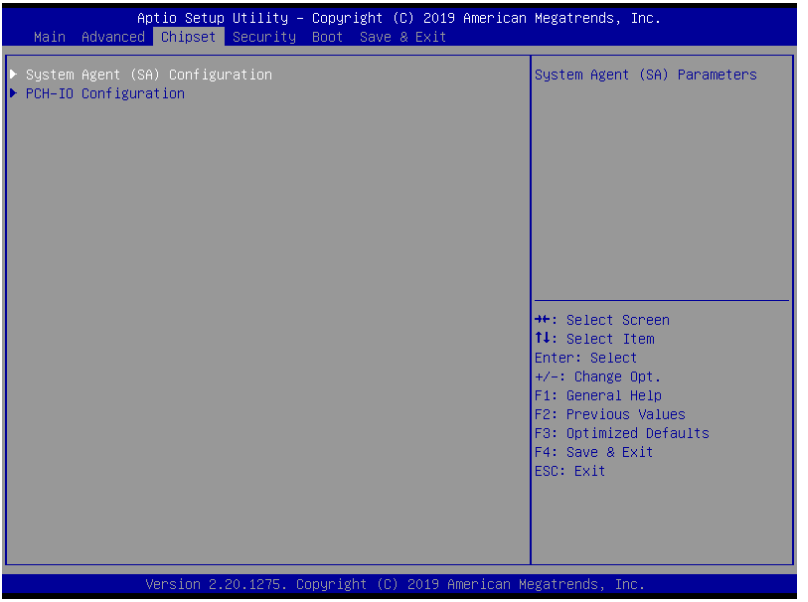
3.4.6 Seriallo Configuration

Options Summary		
SPI0 Controller	Disable	Optimal Default, Failsafe Default
	Enable	
Enables/Disables Seriallo Controller If given device is Function 0 PSF disabling is skipped. PSF default will remain and device PCI CFG Space will still be visible. This is needed to allow PCI enumerator access functions above 0 in a multifunction device.		

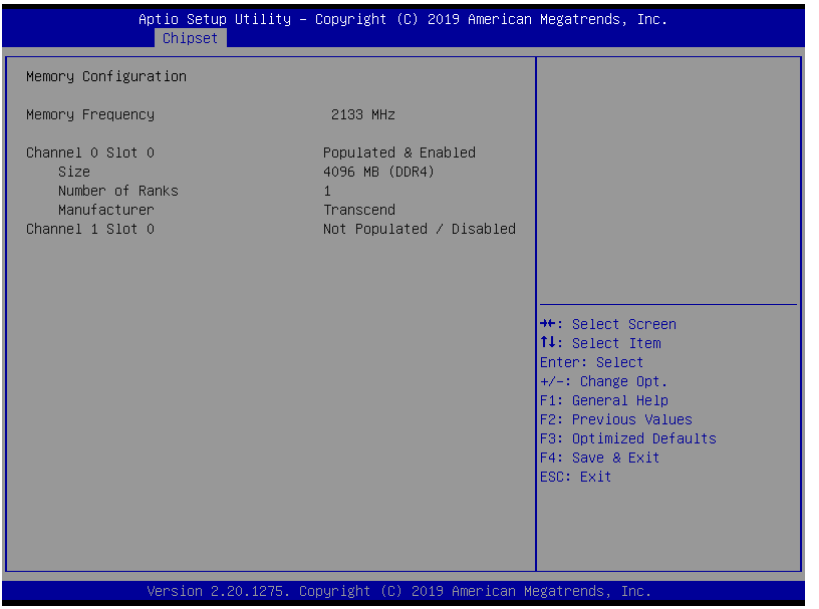
3.4.7 Power Management

Options Summary		
Power Mode	ATX Type	Optimal Default, Failsafe Default
	AT Type	
Select system power mode		
State After G3	S0 State	Optimal Default, Failsafe Default
	S5 State	
	Last State	
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	
	Dynamic 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)		
Wake on LAN Enable	Enabled	Optimal Default, Failsafe Default
	Disabled	
Enable/Disable integrated LAN to wake the system.		

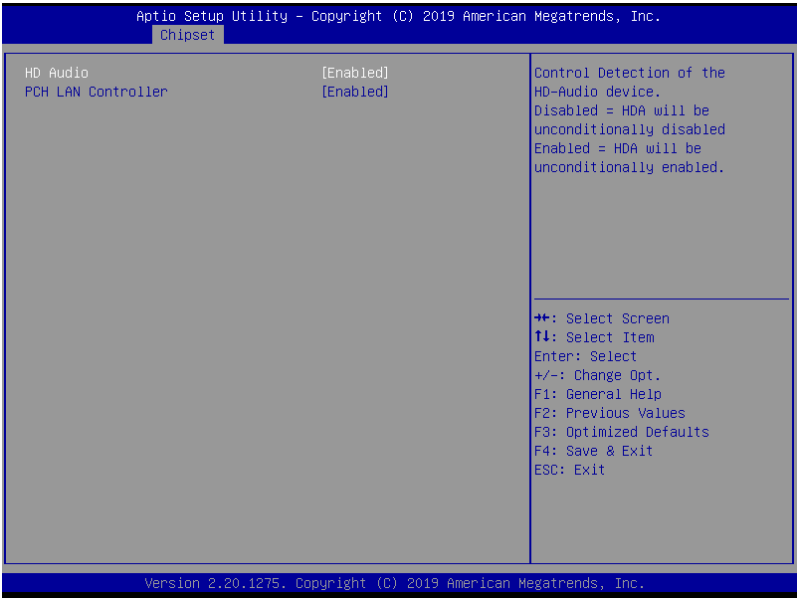
3.5 Setup submenu: Chipset



3.5.1 System Agent (SA) Configuration

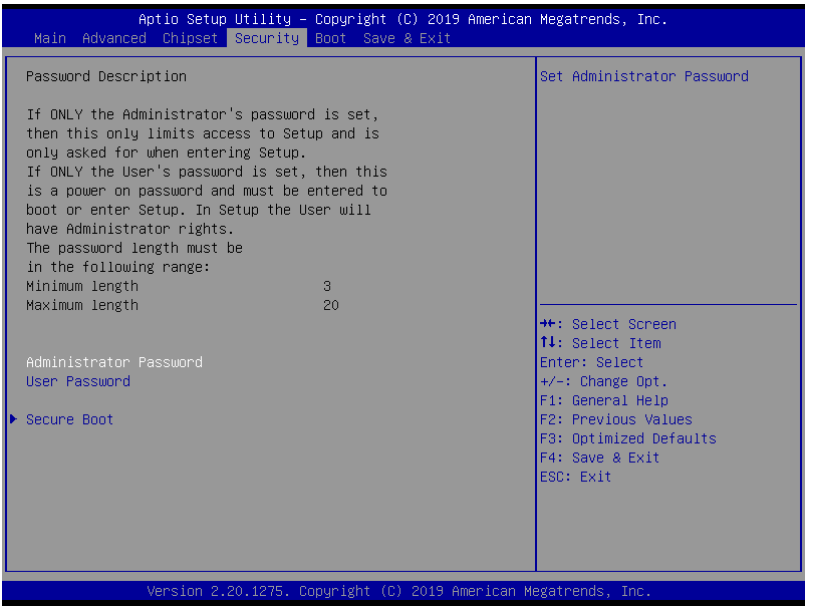


3.5.2 PCH-IO Configuration



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		

3.6 Setup submenu: Security



Change User/Administrator Password

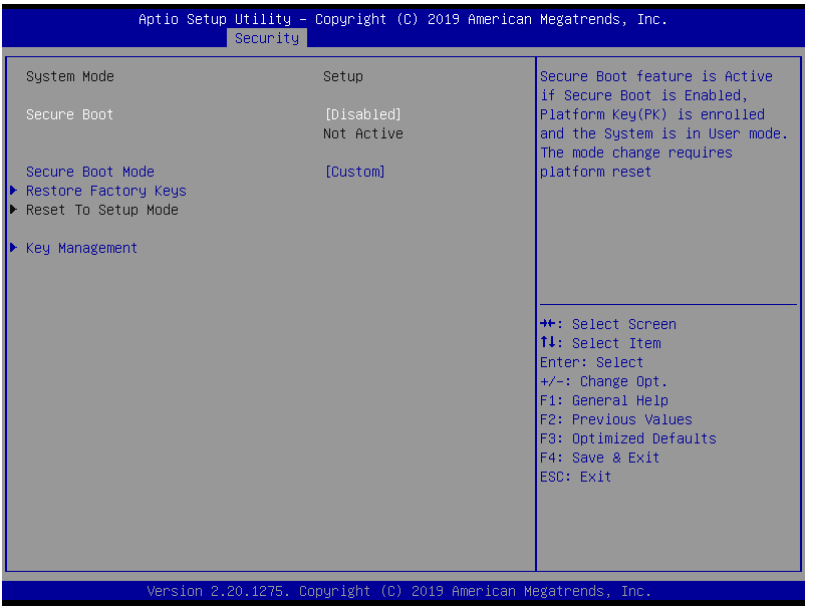
You can set an Administrator Password or User Password. An Administrator Password must be set before you can set a User Password. The password will be required during boot up, or when the user enters the Setup utility. A User Password does not provide access to many of the features in the Setup utility.

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

Removing the Password

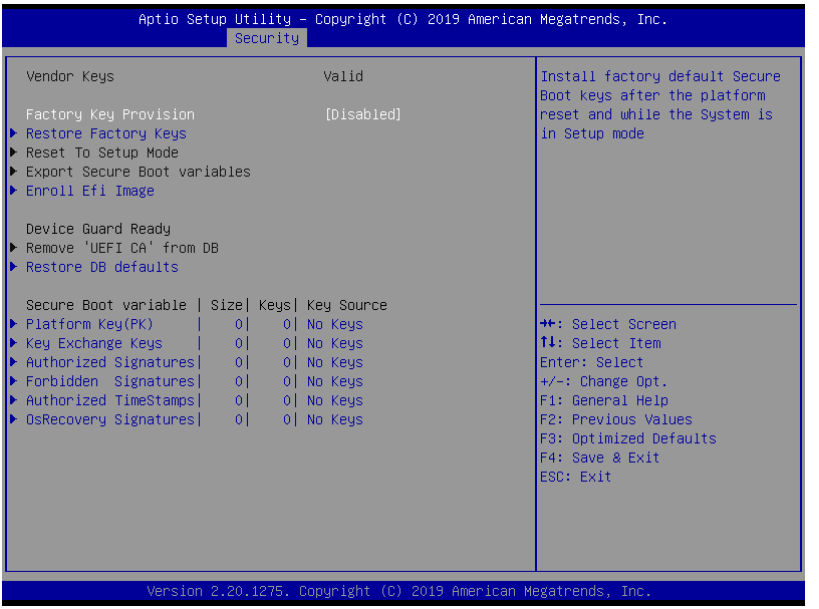
Select the password you want to remove and enter the current password. At the next dialog box press Enter to disable password protection.

3.6.1 Secure Boot



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

3.6.1.1 Key Management

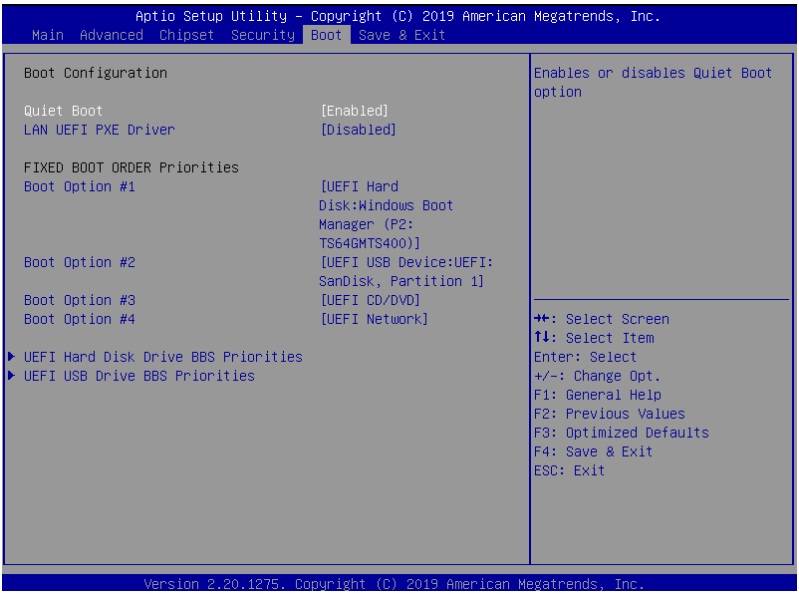


Options Summary		
Factory Key Provision	Disabled	Optimal Default, Failsafe Default
	Enabled	
Secure Boot feature is Active if Secure Boot is Enabled, Platform Key (PK) is enrolled and the System is in User mode. The mode change requires platform reset		
Restore Factory Keys		
Force System to User Mode. Install factory default Secure Boot key databases		
Reset To Setup Mode		
Delete all Secure Boot key databases from NVRAM		
Export Secure Boot variables		
Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device		
Enroll Efi Image		
Allow the image to run in Secure Boot mode. Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db)		

Table continues on next page...

Options Summary		
Remove 'UEFI CA' from DB		
Device Guard ready system must not list 'Microsoft UEFI CA' Certificate in Authorized Signature database (db)		
Restore DB defaults		
Restore DB variable to factory defaults		
Platform Key(PK)	Details	
	Export	
	Update	
	Delete	
Key Exchange Keys	Details	
	Export	
	Update	
	Append	
	Delete	
Authorized Signatures	Details	
	Export	
	Update	
	Append	
	Delete	
Forbidden Signatures	Details	
	Export	
	Update	
	Append	
	Delete	
Authorized TimeStamps	Update	
	Append	
OsRecovery Signatures	Update	
	Append	
Enroll Factory Defaults or load certificates from a file: 1.Public Key Certificate: a)EFI_SIGNATURE_LIST b)EFI_CERT_X509 (DER) c)EFI_CERT_RSA2048 (bin) d)EFI_CERT_SHAXXX 2.Authenticated UEFI Variable 3.EFI PE/COFF Image(SHA256) Key Source: Factory,External,Mixed		

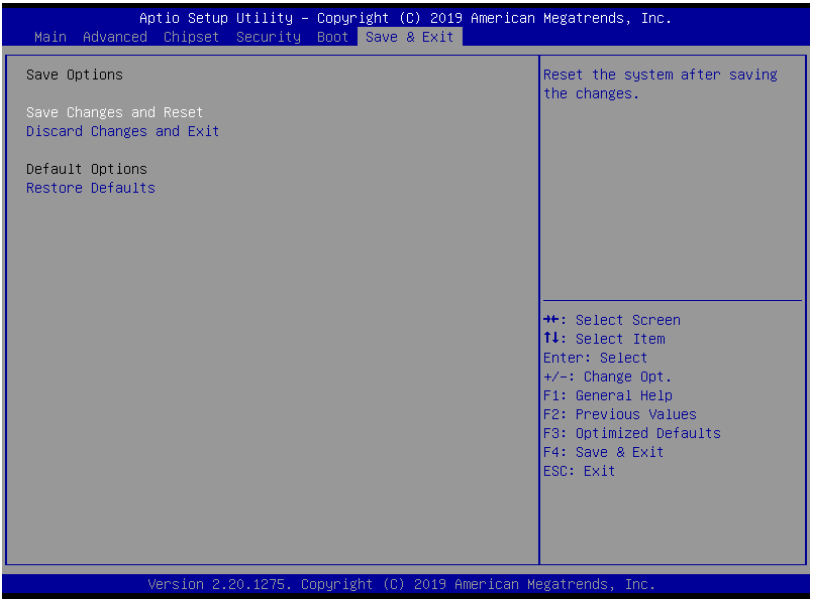
3.7 Setup submenu: Boot



Options Summary		
Quiet Boot	Disabled	Optimal Default, Failsafe Default
	Enabled	
Enable/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 Setup submenu: Save & Exit



Chapter 4

Drivers Installation

4.1 Driver Download and Installation

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

https://www.aaeon.com/en/p/smart-display-modules-asdm-l-cfs

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

Before beginning installation, use the following chart to determine if your operating system (OS) is compatible with the drivers AAEON provides for the ASDM-L-CFS. Some drivers are limited in their compatibility and will only work with certain operating systems. If you have any questions, contact your AAEON sales representative for assistance.

OS Compatibility Table		
Driver	Windows	Linux
Step 1 – Chipset	Yes	No
Step 2 – Graphics	Yes	No
Step 3 – Network	Yes	No
Step 4 – Serial IO	Yes	No
Step 5 – ME	Yes	No

Follow the steps below, in order, to install system drivers.

Step 1 – Install Chipset Drivers

1. Open the **Step 1 - 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 (Windows 10 only)

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

Step 3 – Install Network Drivers

1. Open the **Step 3 - Network** folder and select your OS
2. Run the **ProWinx64.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Step 4 – Install Serial IO Drivers

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

Step 5 – Install ME Drivers

1. Open the **Step 5 - ME** folder
2. Run the **SetupME.exe** file in the folder
3. Follow the instructions
4. Drivers will be installed automatically

Appendix A

Watchdog Timer Programming

A.1 Watchdog Timer Initial Program

Table 1 : Embedded BRAM relative register table		
	Default Value	Note
Index	0x284(Note1)	BRAM Index Register
Data	0x285(Note2)	BRAM Data Register
Logical Device Number	0xA8(Note3)	Watch dog Logical Device Number
Function and Device Number	0x00(Note4)	Watch dog Function/Device Number

Table 2 : Watchdog relative register table				
	Option Register	BitNum	Value	Note
Timer Counter	0x00(Note5)		(Note10)	Time of watchdog timer (0~255)
Counting Unit	0x01(Note6)	0(Note7)	0(Note11)	Select time unit. 0: second 1: minute
Watchdog RST pulse width	0x01(Note8)	[3:2](Note9)	0(Note12)	0: 20ms 1: 60ms 2: 100ms 3: 250ms

```
*****************************************************************************************
// Embedded BRAM relative definition (Please reference to Table 1)
#define byte EcBRAMIndex //This parameter is represented from Note1
#define byte EcBRAMData //This parameter is represented from Note2
#define byte BRAMLDNReg //This parameter is represented from Note3
#define byte BRAMFnDataReg //This parameter is represented from Note4
#define void EcBRAMWriteByte(byte Offset, byte Value);
#define byte EcBRAMReadByte(byte Offset);
#define void IOWriteByte(byte Offset, byte Value);
#define byte IOReadByte(byte Offset);
// Watch Dog relative definition (Please reference to Table 2)
#define byte TimerReg //This parameter is represented from Note5
#define byte TimerVal // This parameter is represented from Note10
#define byte UnitReg //This parameter is represented from Note6
#define byte UnitBit //This parameter is represented from Note7
#define byte UnitVal //This parameter is represented from Note11
#define byte RSTReg //This parameter is represented from Note8
#define byte RSTBit //This parameter is represented from Note9
#define byte RSTVal //This parameter is represented from Note12
*****************************************************************************************
```

```
*****************************************************************************************
VOID Main(){
        // Procedure : AaeonWDTConfig
        // (byte)Timer : Time of WDT timer.(0x00~0xFF)
        // (boolean)Unit : Select time unit(0: second, 1: minute).
        AaeonWDTConfig();

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

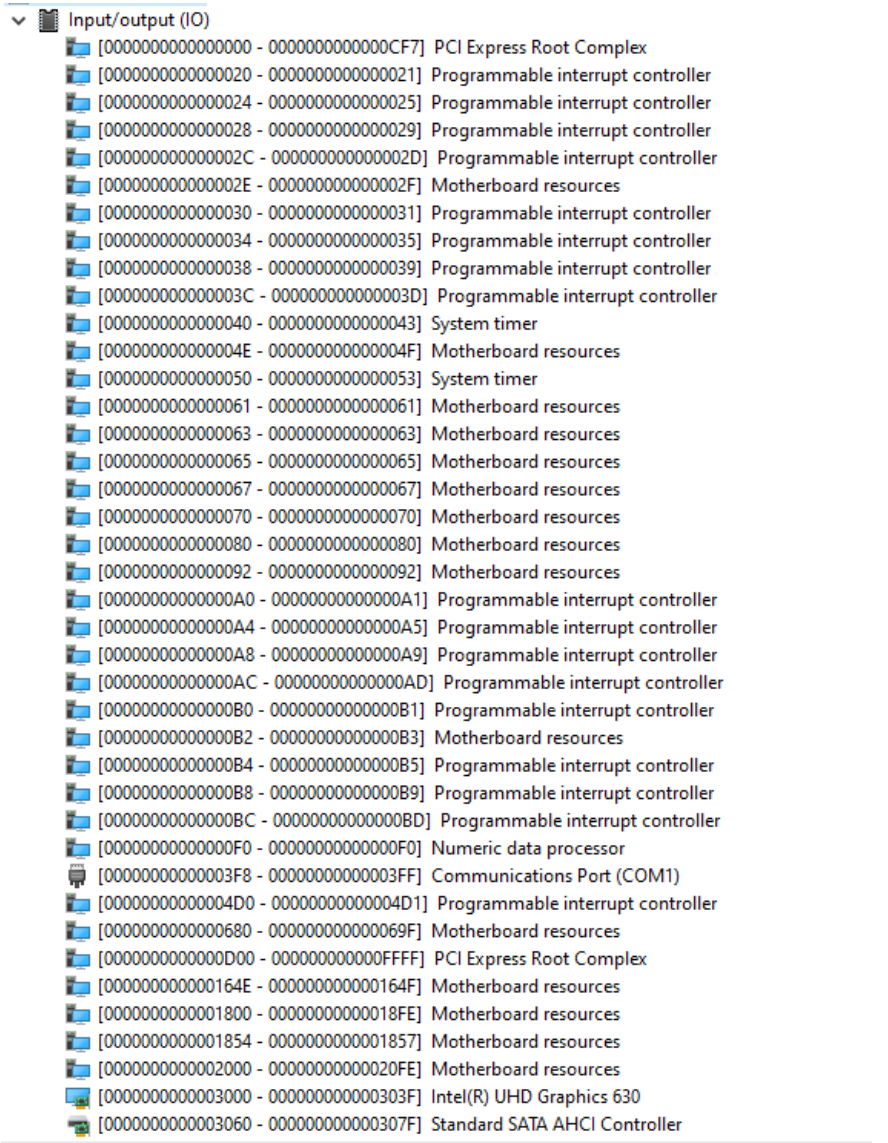
```
*****************************************************************************************
// Procedure : AaeonWDTEnable
VOID AaeonWDTEnable (){
        WDTEnableDisable(1);
}

// Procedure : AaeonWDTConfig
VOID AaeonWDTConfig (){
        // Disable WDT counting
        WDTEnableDisable(0);
        // WDT relative parameter setting
        WDTParameterSetting();
}

VOID WDTEnableDisable(byte
        Value){ ECBRAMWriteByte(TimerReg , Value);
}

VOID
        WDTParameterSetting(){ By
        te TempByte;

        // Watchdog Timer counter setting
        ECBRAMWriteByte(TimerReg , TimerVal);
        // WDT counting unit setting
        TempByte = ECBRAMReadByte(UnitReg);
        TempByte |= (UnitVal << UnitBit);
        ECBRAMWriteByte(UnitReg , TempByte);
        // WDT RST pulse width setting
        TempByte = ECBRAMReadByte(RSTReg);
        TempByte |= (RSTVal << RSTBit);
        ECBRAMWriteByte(RSTReg , TempByte);
}
*****************************************************************************************
```

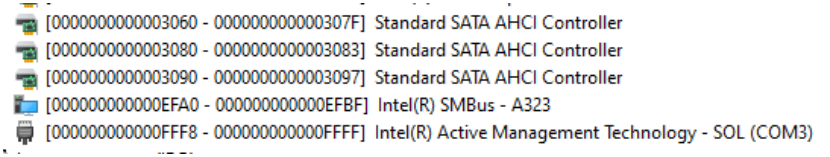
```
*****************************************************************************
VOID ECBRAMWriteByte(byte OPReg, byte OPBit, byte Value){
        IOWriteByte(EcBRAMIndex, 0x10);
        IOWriteByte(EcBRAMData, BRAMLDNReg);
        IOWriteByte(EcBRAMIndex, 0x11);
        IOWriteByte(EcBRAMData, BRAMFnDataReg);

        IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
        IOWriteByte(EcBRAMData, Value);

        IOWriteByte(EcBRAMIndex, 0x12);
        IOWriteByte(EcBRAMData, 0x30);        //Write start
}

Byte ECBRAMReadByte(byte
        OPReg){ IOWriteByte(EcBRAMIndex, 0x10);
        IOWriteByte(EcBRAMData, BRAMLDNReg);
        IOWriteByte(EcBRAMIndex, 0x11);
        IOWriteByte(EcBRAMData, BRAMFnDataReg);

        IOWriteByte(EcBRAMIndex, 0x12);
        IOWriteByte(EcBRAMData, 0x10);        //Read start

        IOWriteByte(EcBRAMIndex, 0x13 + OPReg);
        Return          IOReadByte(EcBRAMData, Value);
}
*****************************************************************************
```

Appendix B

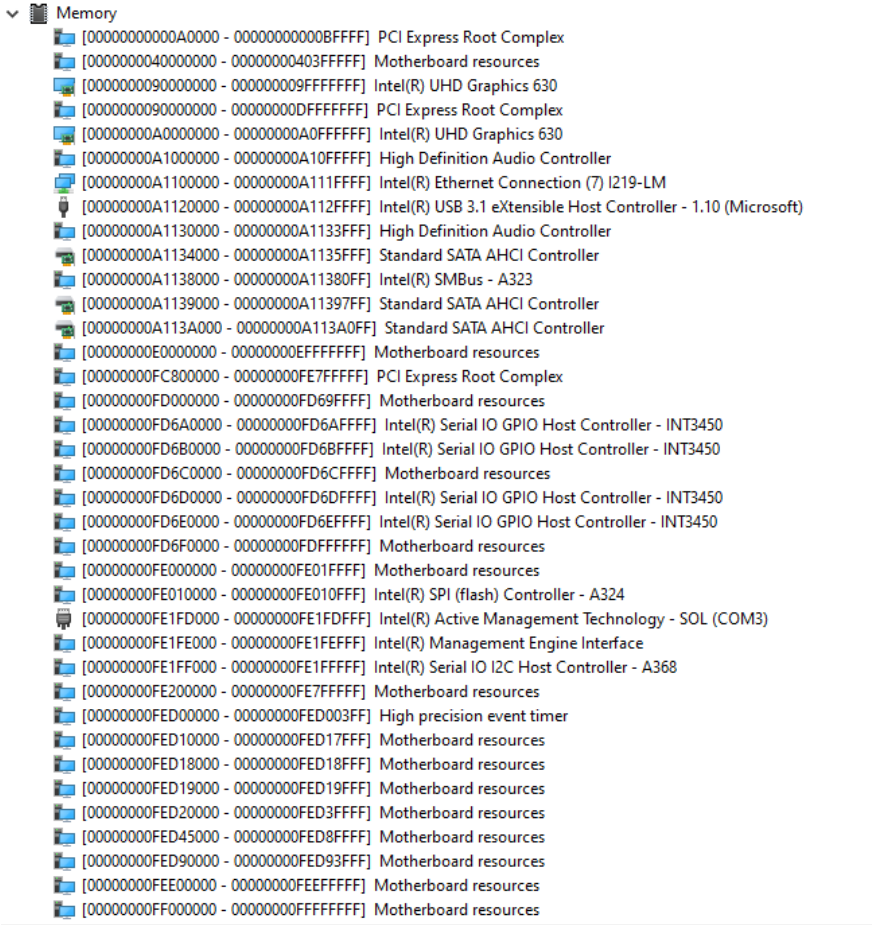
I/O Information

B.1 I/O Address Map

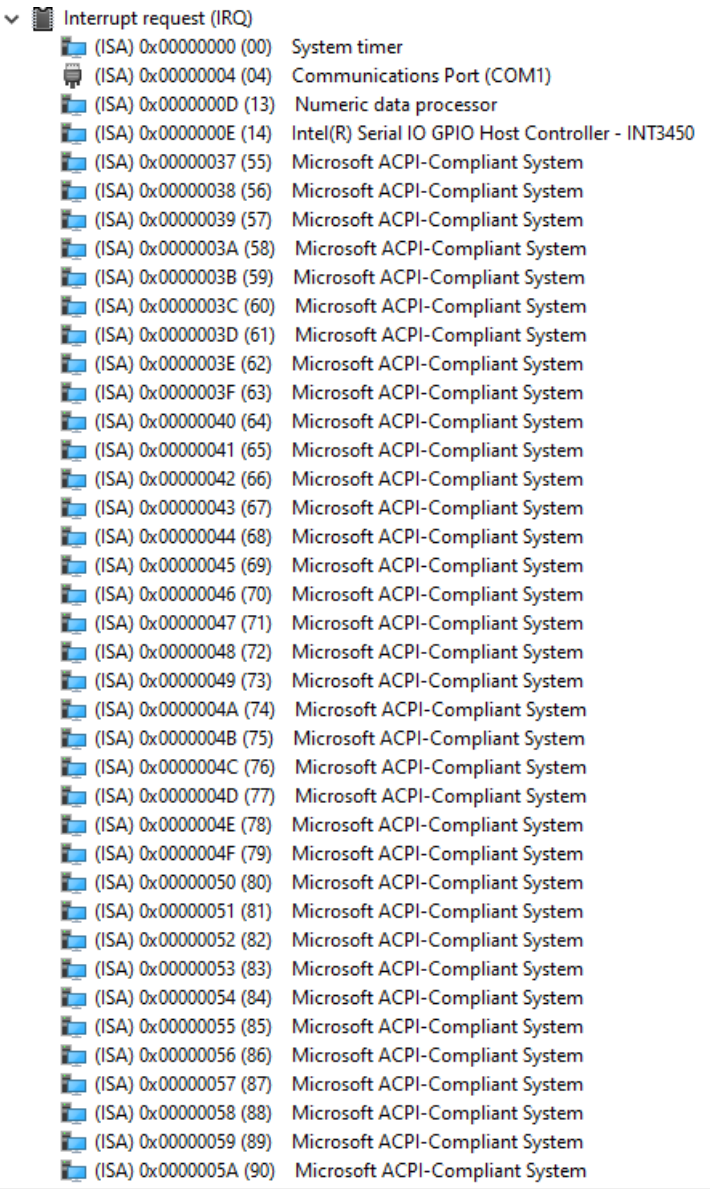


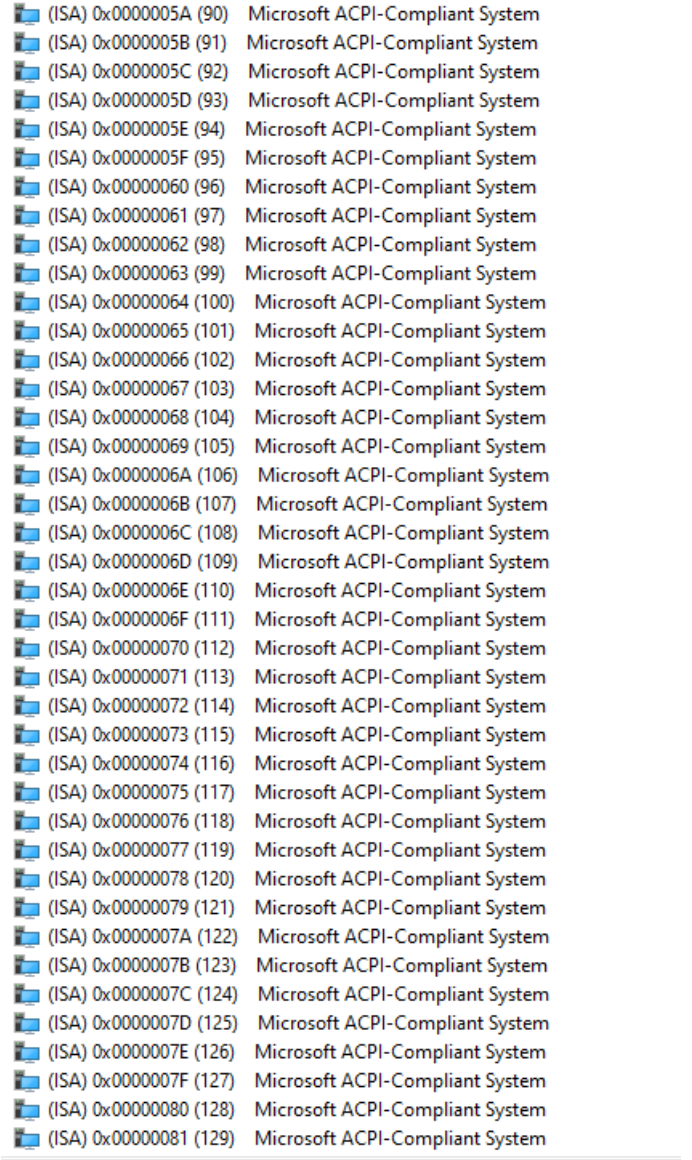

[0000000000003060 - 000000000000307F] Standard SATA AHCI Controller
[0000000000003080 - 0000000000003083] Standard SATA AHCI Controller
[0000000000003090 - 0000000000003097] Standard SATA AHCI Controller
[000000000000EFA0 - 000000000000EFBF] Intel(R) SMBus - A323
[000000000000FFF8 - 000000000000FFFF] Intel(R) Active Management Technology - SOL (COM3)

B.2 Memory Address Map



B.3 IRQ Mapping Chart




(ISA) 0x0000005A (90) Microsoft ACPI-Compliant System
(ISA) 0x0000005B (91) Microsoft ACPI-Compliant System
(ISA) 0x0000005C (92) Microsoft ACPI-Compliant System
(ISA) 0x0000005D (93) Microsoft ACPI-Compliant System
(ISA) 0x0000005E (94) Microsoft ACPI-Compliant System
(ISA) 0x0000005F (95) Microsoft ACPI-Compliant System
(ISA) 0x00000060 (96) Microsoft ACPI-Compliant System
(ISA) 0x00000061 (97) Microsoft ACPI-Compliant System
(ISA) 0x00000062 (98) Microsoft ACPI-Compliant System
(ISA) 0x00000063 (99) Microsoft ACPI-Compliant System
(ISA) 0x00000064 (100) Microsoft ACPI-Compliant System
(ISA) 0x00000065 (101) Microsoft ACPI-Compliant System
(ISA) 0x00000066 (102) Microsoft ACPI-Compliant System
(ISA) 0x00000067 (103) Microsoft ACPI-Compliant System
(ISA) 0x00000068 (104) Microsoft ACPI-Compliant System
(ISA) 0x00000069 (105) Microsoft ACPI-Compliant System
(ISA) 0x0000006A (106) Microsoft ACPI-Compliant System
(ISA) 0x0000006B (107) Microsoft ACPI-Compliant System
(ISA) 0x0000006C (108) Microsoft ACPI-Compliant System
(ISA) 0x0000006D (109) Microsoft ACPI-Compliant System
(ISA) 0x0000006E (110) Microsoft ACPI-Compliant System
(ISA) 0x0000006F (111) Microsoft ACPI-Compliant System
(ISA) 0x00000070 (112) Microsoft ACPI-Compliant System
(ISA) 0x00000071 (113) Microsoft ACPI-Compliant System
(ISA) 0x00000072 (114) Microsoft ACPI-Compliant System
(ISA) 0x00000073 (115) Microsoft ACPI-Compliant System
(ISA) 0x00000074 (116) Microsoft ACPI-Compliant System
(ISA) 0x00000075 (117) Microsoft ACPI-Compliant System
(ISA) 0x00000076 (118) Microsoft ACPI-Compliant System
(ISA) 0x00000077 (119) Microsoft ACPI-Compliant System
(ISA) 0x00000078 (120) Microsoft ACPI-Compliant System
(ISA) 0x00000079 (121) Microsoft ACPI-Compliant System
(ISA) 0x0000007A (122) Microsoft ACPI-Compliant System
(ISA) 0x0000007B (123) Microsoft ACPI-Compliant System
(ISA) 0x0000007C (124) Microsoft ACPI-Compliant System
(ISA) 0x0000007D (125) Microsoft ACPI-Compliant System
(ISA) 0x0000007E (126) Microsoft ACPI-Compliant System
(ISA) 0x0000007F (127) Microsoft ACPI-Compliant System
(ISA) 0x00000080 (128) Microsoft ACPI-Compliant System
(ISA) 0x00000081 (129) Microsoft ACPI-Compliant System

(ISA) 0x000001E3 (483) Microsoft ACPI-Compliant System
(ISA) 0x000001E4 (484) Microsoft ACPI-Compliant System
(ISA) 0x000001E5 (485) Microsoft ACPI-Compliant System
(ISA) 0x000001E6 (486) Microsoft ACPI-Compliant System
(ISA) 0x000001E7 (487) Microsoft ACPI-Compliant System
(ISA) 0x000001E8 (488) Microsoft ACPI-Compliant System
(ISA) 0x000001E9 (489) Microsoft ACPI-Compliant System
(ISA) 0x000001EA (490) Microsoft ACPI-Compliant System
(ISA) 0x000001EB (491) Microsoft ACPI-Compliant System
(ISA) 0x000001EC (492) Microsoft ACPI-Compliant System
(ISA) 0x000001ED (493) Microsoft ACPI-Compliant System
(ISA) 0x000001EE (494) Microsoft ACPI-Compliant System
(ISA) 0x000001EF (495) Microsoft ACPI-Compliant System
(ISA) 0x000001F0 (496) Microsoft ACPI-Compliant System
(ISA) 0x000001F1 (497) Microsoft ACPI-Compliant System
(ISA) 0x000001F2 (498) Microsoft ACPI-Compliant System
(ISA) 0x000001F3 (499) Microsoft ACPI-Compliant System
(ISA) 0x000001F4 (500) Microsoft ACPI-Compliant System
(ISA) 0x000001F5 (501) Microsoft ACPI-Compliant System
(ISA) 0x000001F6 (502) Microsoft ACPI-Compliant System
(ISA) 0x000001F7 (503) Microsoft ACPI-Compliant System
(ISA) 0x000001F8 (504) Microsoft ACPI-Compliant System
(ISA) 0x000001F9 (505) Microsoft ACPI-Compliant System
(ISA) 0x000001FA (506) Microsoft ACPI-Compliant System
(ISA) 0x000001FB (507) Microsoft ACPI-Compliant System
(ISA) 0x000001FC (508) Microsoft ACPI-Compliant System
(ISA) 0x000001FD (509) Microsoft ACPI-Compliant System
(ISA) 0x000001FE (510) Microsoft ACPI-Compliant System
(ISA) 0x000001FF (511) Microsoft ACPI-Compliant System
(PCI) 0x0000000B (11) Intel(R) SMBus - A323
(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 (COM3)
(PCI) 0xFFFFFFFA (-6) Intel(R) Management Engine Interface
(PCI) 0xFFFFFFFB (-5) Intel(R) UHD Graphics 630
(PCI) 0xFFFFFFFC (-4) Intel(R) USB 3.1 eXtensible Host Controller - 1.10 (Microsoft)
(PCI) 0xFFFFFFFD (-3) Intel(R) Ethernet Connection (7) I219-LM
(PCI) 0xFFFFFFFE (-2) Standard SATA AHCI Controller

Appendix C

Mating Connectors and Cables

C.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		
CN3	External RTC Connector	Molex	51021-0200	Battery Cable	1750113019