

UMBC-1100 USER

Intel® Xeon®/Core™ i7/i5/i3 Processor MicroATX Motherboard

Workstation-grade Intel® C246 PCH, 4 GigE LAN, 6 USB 3.1, 5 COM, M.2, 3 PCIe

Manual

Record of Revision

Version	Date	Page	Description	Remark
0.10	2019/12/11	All	Preliminary Release	
1.00	2019/12/16		Official Release	
1.10	2021/03/23	3, 8	Update	
1.20	2023/06/13	7, 28, 72-74	Update	
1.30	2024/02/22	16	Update	

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Order Information

Part Number	Description
UMBC-1100	UMBC-1100 MicroATX Motherboard, Intel® C246 with Intel® Xeon®/ Core™ i7/i5/i3 Processor (CFL-R S/CFL-S), 4 GigE LAN, 6 USB 3.1, 4 COM, 8 SATA III, 1 M.2, 1 PCIe x16, 2 PCIe x4, 16 GPIO

CPU List

Series	CPU	Cores	GHz	TDP (W)	CPU	Cores	GHz	TDP (W)
Intel® Xeon®	E-2278GE	8	4.7	80	E-2176G	6	4.6	80
	E-2278GEL	8	3.9	35	E-2124G	4	4.5	71
	E-2226GE	6	4.6	80				
Intel® Core™	i7-9700E	8	4.4	65	i7-8700	6	4.6	65
	i7-9700TE		3.8	35	i7-8700T	6	4	35
	i5-9500E	6	4.2	65	i5-8500	6	4.1	65
	i5-9500TE		3.6	35	i5-8500T	6	3.5	35
	i3-9100E	4	3.7	65	i3-8100	4	3.6	65
	i3-9100TE		3.2	35	i3-8100T	4	3.1	35

Optional Accessories

Part Number	Description
DDR4 32G	Certified DDR4 32GB 2666MHz U-DIMM
DDR4 16G	Certified DDR4 16GB 2666MHz U-DIMM
DDR4 8G	Certified DDR4 8GB 2666MHz U-DIMM
DDR4 4G	Certified DDR4 4GB 2666MHz U-DIMM
COM Port Cable	COM Cable with DB9 Connector
SATA Data Cable	SATA Cable with 7P SATA Vertical SATA Connector
USB 3.1 Cable	USB Cable with Dual USB 3.1 Type A Connector
USB 2.0 Cable	USB Cable with Dual USB 2.0 Type A Connector
1U CPU Cooler	CPU Cooler for 1U Chassis
2U CPU Cooler	CPU Cooler for 2U Chassis

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1

GENERAL INTRODUCTION

1.1 Overview

Vecow UMBC-1100 is a high performance industrial MicroATX Motherboard. Workstation-grade Intel® C246 chipset flexible supports 8-core 9th Generation Intel® Xeon®/Core™ i7/i5/i3 processor (CFL-R S/CFL-S), 4 DDR4 U-DIMM sockets support 2666MHz up to 128GB ECC memory, advanced Intel® UHD Graphics 630 supporting DirectX 12 and OpenGL 4.5 API, and up to Ultra HD 4K resolution, Vecow UMBC-1100 MicroATX Motherboard delivers leading system productivity; Multiple PCIe 3.0 (8GT/s), SATA III (6Gbps), USB 3.1 (5Gbps), and GigE LAN (1Gbps) connections make high-speed data transfer possible.

Fanless design supporting 0°C to 60°C operating temperature, onboard DisplayPort, VGA and HDMI display interfaces support triple independent displays and up to 4K resolution; 4 GigE LAN, 5 COM RS-232/422/485, 8 SATA III, 6 USB 3.1, 4 USB 2.0, 16 GPIO; 1 PCIe x16, 2 PCIe x4, and 1 M.2 expansion; iAMT 12.0, TPM 2.0, Wake on LAN and PXE smart manageability, Vecow ECX-1000 Series 5,25" SBC serves compact & flexible solutions to meet your project requirements.

Workstation-grade Intel® Xeon®/Core™ i7/i5/i3 processor (Coffee Lake), running with Intel® C246 chipset, leading performance and system productivity, flexible expansion, industrial-grade reliability and integrated features, Vecow UMBC-1100 MicroATX Motherboard is your powerful solution for Smart Manufacturing, Public Surveillance, Gaming, Self-service System, Traffic Control and any performance-driven Industrial 4.0/AIoT applications.

1.2 Features

- Workstation-grade Platform : LGA 1151 Socket supports 8 cores 9th Generation Intel® Xeon®/Core™ i7/i5/i3 Processor (Coffee Lake-Refresh s) running with Intel® C246 Chipset
- Supports DDR4 2666/2400MHz U-DIMM memory, up to 128GB (ECC/Non-ECC)
- Display : VGA, DisplayPort and HDMI display interfaces, up to 4K resolution
- 4 Independent GigE LAN, iAMT 12.0 supported
- Storage : 8 SATA III support RAID 0, 1, 5, 10 data protection
- 6 USB 3.1, 4 USB 2.0
- 5 COM RS-232/422/485, 16 GPIO
- Expansion : 1 PCIe x16, 2 PCIe x4, 1 M.2
- Supports case open detection
- Optional supports TPM 2.0/1.2

1.3 Product Specification

System	
Processor	8 cores Intel® Xeon®/Core™ i7/i5/i3 Processor (CFL-R S/CFL-S)
Chipset	Intel® C246 Chipset
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> • DDR4 2666MHz (ECC/Non-ECC) • Up to 128GB • 4 288-pin U-DIMM Socket
Graphics	
Graphics Processor	Intel® UHD Graphics 630
Interface	3 display interfaces : <ul style="list-style-type: none"> • 1 VGA : Up to 1920 x 1200 @60Hz • 1 DisplayPort : Up to 4096 x 2160 @60Hz • 1 HDMI : Up to 4096 x 2160 @24Hz
Ethernet	
LAN 1	Intel® I219LM GigE LAN supports iAMT 12.0
LAN 2	Intel® I211 GigE LAN
LAN 3	Intel® I211 GigE LAN
LAN 4	Intel® I211 GigE LAN
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
Storage	
SATA	8 SATA III (6Gbps) support S/W RAID 0, 1, 5, 10
I/O Interface	
Rear I/O	<ul style="list-style-type: none"> • 1 HDMI Connector • 1 DisplayPort Connector • 1 VGA Connector • 4 RJ45 Connector • 4 USB 3.1 Type A Connector
Internal I/O	<ul style="list-style-type: none"> • 5 COM RS-232/422/485 Header • 8 SATA Connector • 4 USB 2.0 Header • 2 USB 3.1 Header • 1 GPIO Header • 1 CPU Fan Header • 4 System Fan Header

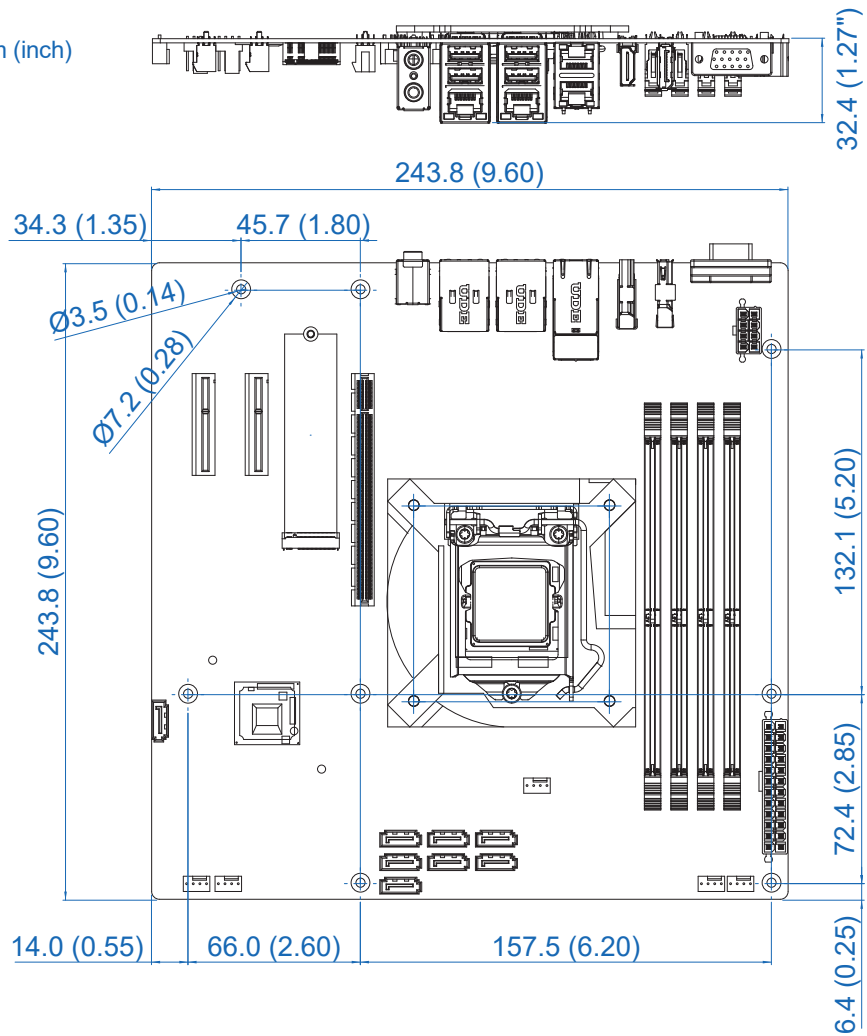
Expansion	
PCIe x16	1 PCIe x16 Slot (Gen 3)
PCIe x4	2 PCIe x4 Slot (Gen 3)
M.2	1 M.2 Key M Socket
Power	
Input Voltage	+12V +5V +3.3V 5VSB 7.25A 0.58A 0.27A 0.07A
Power Type	ATX Input
Power Interface	<ul style="list-style-type: none"> • 1 24-pin ATX Power Connector • 1 8-pin 12V ATX Power Connector
Others	
TPM	Optional Infineon SLB9665 supports TPM 2.0, LPC interface
Watchdog Timer	Reset : 1 to 255 sec./min. per step
Smart Management	Wake on LAN, PXE supported
HW Monitor	Monitoring temperature, voltages. Auto throttling control when CPU overheats.
Software Support	
OS	Windows 10, Linux
Mechanical	
Dimension (W x L)	244.0mm x 244.0mm (9.60" x 9.60")
Weight	1450 g (3.2 lb)
Environment	
Operating Temperature	0°C to 60°C (-32°F to 140°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 60°C
EMC	CE, FCC

1.4 Supported CPU List

Processor No.	Cores	TDP	Cache	Max. Frequency	ECC Memory
Intel® Xeon® E-2278GE	8	80W	16M	Up to 4.7GHz	Y
Intel® Xeon® E-2278GEL	8	35W	16M	Up to 3.9GHz	Y
Intel® Xeon® E-2226GE	6	80W	12M	Up to 4.6GHz	Y
Intel® Xeon® E-2176G	6	80W	12M	Up to 4.6GHz	Y
Intel® Xeon® E-2124G	4	71W	8M	Up to 4.6GHz	Y
Intel® Core™ i7-9700E	8	65W	12M	Up to 4.4GHz	N
Intel® Core™ i7-9700TE	8	35W	12M	Up to 3.8GHz	N
Intel® Core™ i7-8700	6	65W	12M	Up to 4.6GHz	N
Intel® Core™ i7-8700T	6	35W	12M	Up to 4.0GHz	N
Intel® Core™ i5-9500E	6	65W	9M	Up to 4.2GHz	N
Intel® Core™ i5-9500TE	6	35W	9M	Up to 3.6GHz	N
Intel® Core™ i5-8500	6	65W	9M	Up to 4.1GHz	N
Intel® Core™ i5-8500T	6	35W	9M	Up to 3.5GHz	N
Intel® Core™ i3-9100E	4	65W	6M	Up to 3.7GHz	Y
Intel® Core™ i3-9100TE	4	35W	6M	Up to 3.2GHz	Y
Intel® Core™ i3-8100	4	65W	6M	Up to 3.6GHz	Y
Intel® Core™ i3-8100T	4	35W	6M	Up to 3.1GHz	Y

1.5 Mechanical Dimension

Unit : mm (inch)



2

GETTING TO KNOW YOUR UMBC-1100

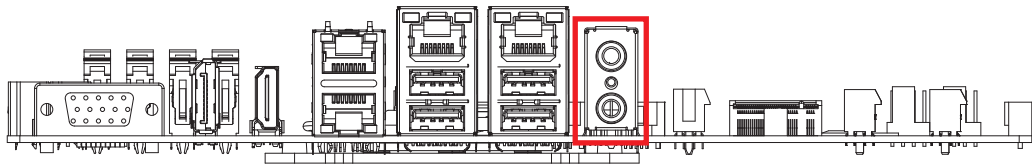
2.1 Packing List

Item	Description	Qty
1	UMBC-1100 MicroATX Motherboard	1
2	IO Shield	1

2.2 Front Panel I/O Functions

In Vecow's UMBC-1100 series family, all I/O connectors are located on the front panel. Most of the general connections to the computer device, such as audio, USB, RJ45, HDMI, Display Port, and any VGA, are placed on the front panel.

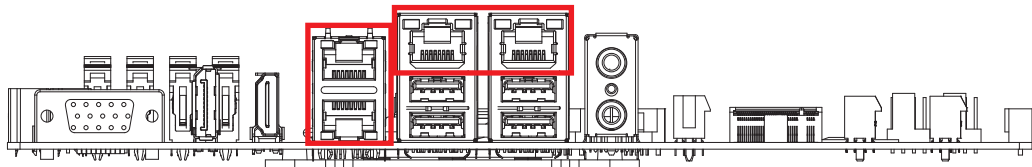
2.2.1 Audio Connector



There are two audio connectors, mic-in and line-out, on the front side of UMBC-1100. Onboard Realtek ALC888S-VD audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications.

To utilize the audio function on the Windows platform, you need to install corresponding drivers for both Intel® C246 chipset and Realtek ALC888S-VD codec. Please refer to chapter four for more details on driver installation.

2.2.2 10/100/1000 Mbps Ethernet Port



There are two 8-pin RJ-45 jacks supporting 10/100/1000 Mbps Ethernet connections in the front side of UMBC-1100. LAN1 is powered by Intel® I219-LM Ethernet engine; LAN2, LAN3 and LAN4 are powered by Intel® I211-AT Ethernet engine. When both LAN1, LAN2, LAN3 and LAN4 work in normal status, basic iAMT function is enabled.

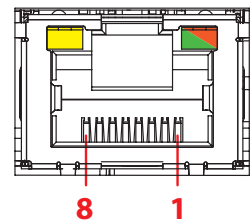
Using suitable RJ-45 cable, you can connect UMBC-1100 system to a computer or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, LAN1, LAN2, LAN3 and LAN4 supports Wake on LAN and Pre-boot functions. The pinouts of LAN1, LAN2, LAN3 and LAN4 are listed as follow :

Pin No.	10/100 Mbps	1000Mbps
1	E_TX+	MDI0_P
2	E_TX-	MDI0_N
3	E_RX+	MDI1_P
4	-----	MDI2_P
5	-----	MDI2_N
6	E_RX-	MDI1_N
7	-----	MDI3_P
8	-----	MDI3_N

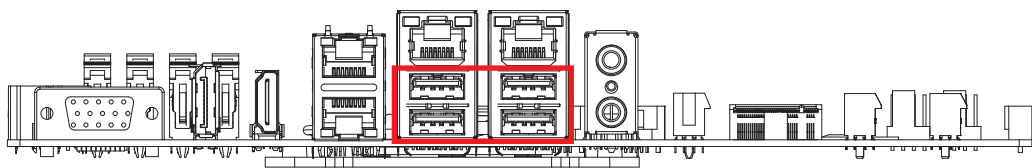
Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/Link/Speed status of the connection.

The LED indicator on the right bottom corner lightens solid green when the cable is properly connected to a 100Mbps Ethernet network and solid orange when the cable is properly connected to a 1000Mbps Ethernet network. The left LED will keep blinking off when Ethernet data packets are being transmitted/received.

LED Location	LED Color	10Mbps	100Mbps	1000Mbps
Right	Green/ Orange	Off	Solid Green	Solid Orange
Left	Yellow	Blinking Yellow	Blinking Yellow	Blinking Yellow

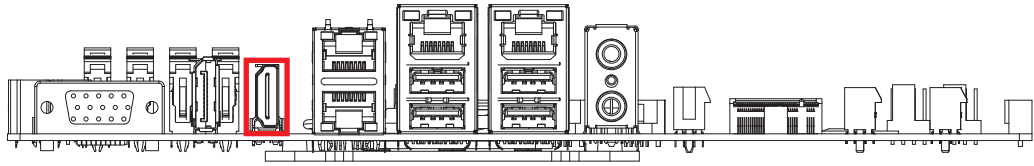


2.2.3 USB 3.1



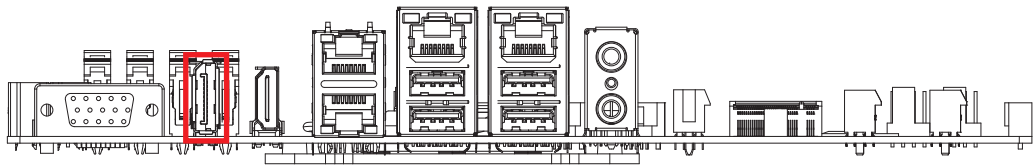
There are 4 USB 3.1 Gen1 connections available supporting up to 5GB per second data rate in the top side of UMBC-1100. They are also compliant with the requirements of SuperSpeed (SS), high speed (HS), full speed (FS) and low speed (LS).

2.2.4 HDMI



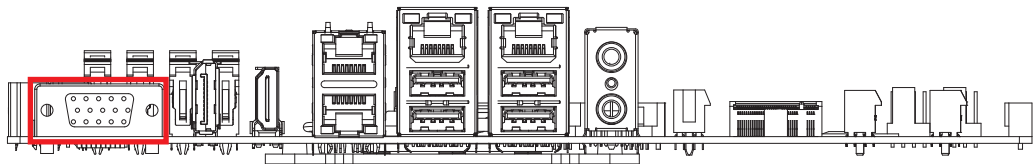
Onboard HDMI Port supports DDC channel mode. The connection supports up to 4096x2160 @24Hz.

2.2.5 DISPLAY PORT



UMBC-1100 supports single Display Port and up to 4096 x 2304 pixels resolution.

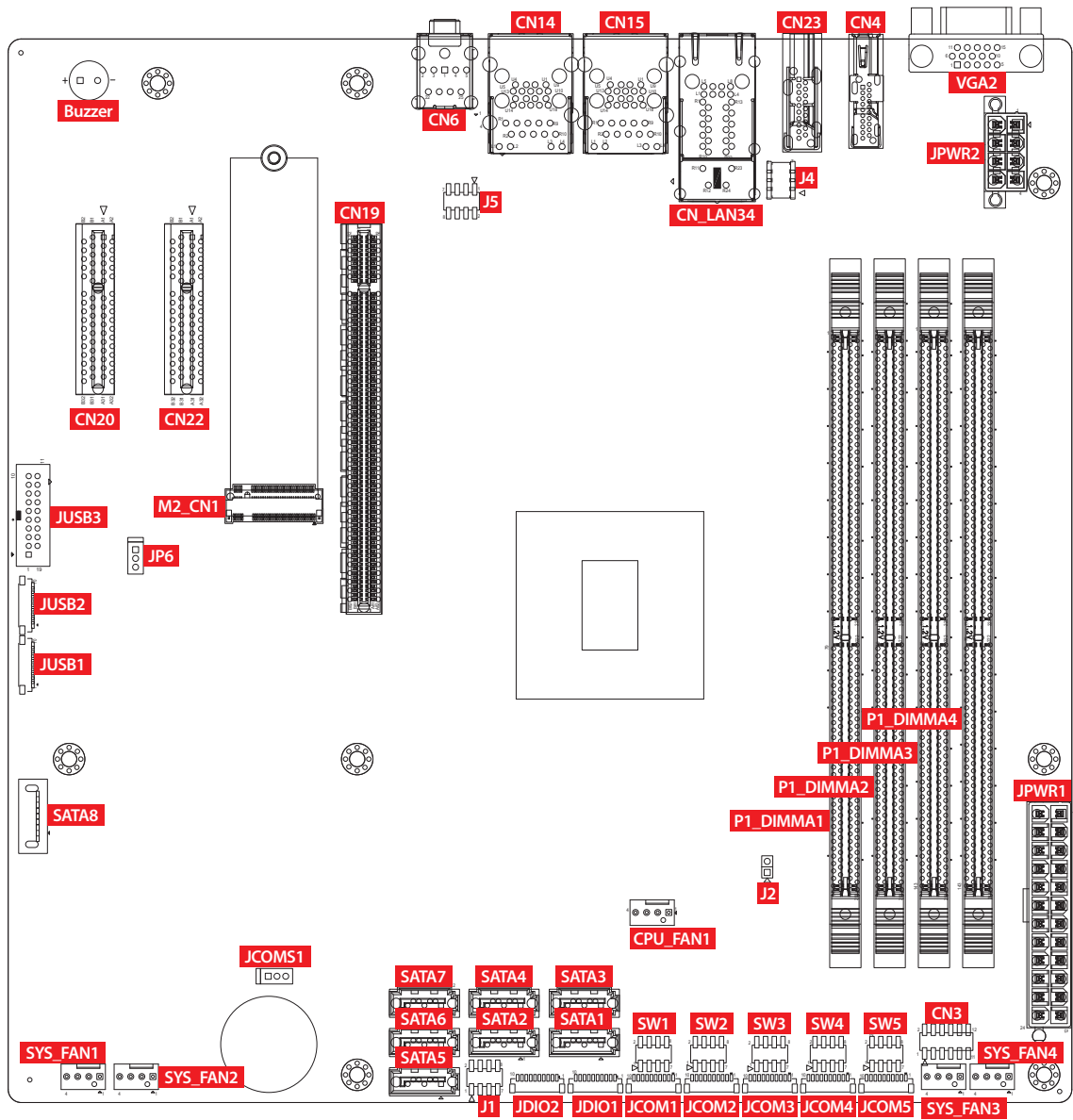
2.2.6 VGA



UMBC-1100 supports single VGA and up to 1920 x 1200 pixels resolution.

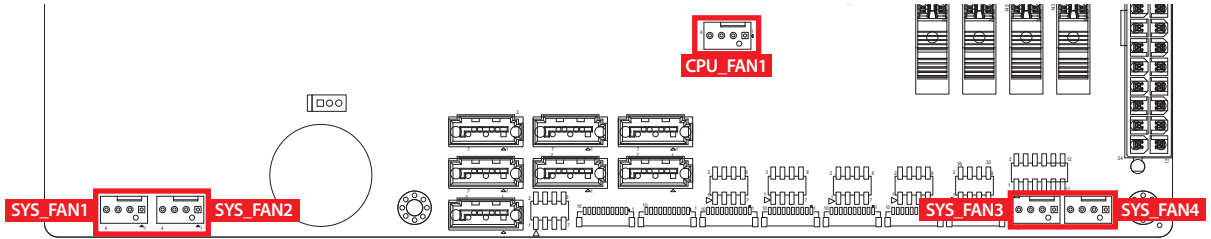
2.2 Connector/Jumper Locations

2.2.1 Top Side



2.2.2 CPU and SYS FAN Connector

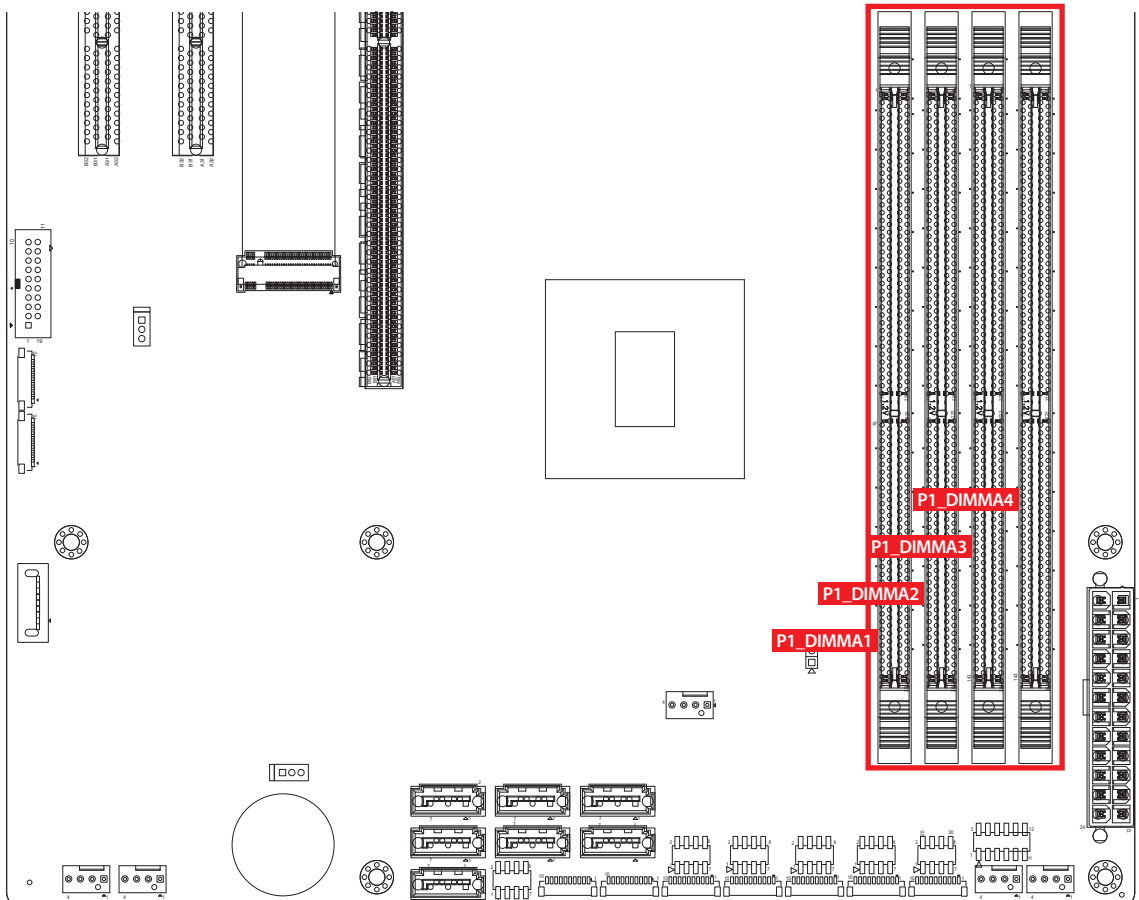
The fan power connector is for additional thermal requirements. The pin assignments of SYS_FAN1, SYS_FAN2, SYS_FAN3, SYS_FAN4 and CPU_FAN1 are listed in the following table.



Pin No.	Definition	Pin No.	Definition
1	GND	2	+12V (1.5A max)
3	Fan speed sensor	4	Fan PWM

2.2.3 P1_DIMMA1, P1_DIMMA2, P1_DIMMA3, P1_DIMM_A4 : DDR4 Slot

There are 4 DDR4 channel onboard, support DDR4 2666/2400/2133, max 64GB Each channel 16GB.

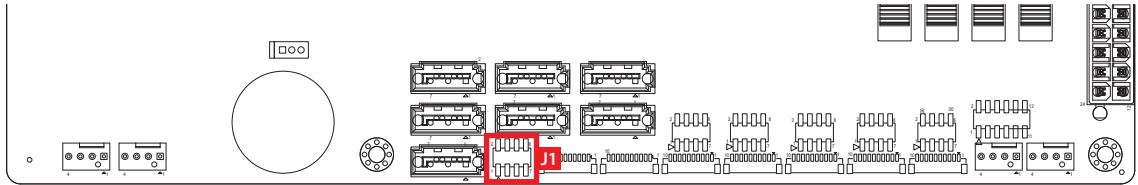


Pin No.	Definition	Pin No.	Definition
P1_DIMM_A1	DDR4 Channel A	P1_DIMM_A2	DDR4 Channel A
P1_DIMM_A3	DDR4 Channel B	P1_DIMM_A4	DDR4 Channel B

2.2.4 J1 : Miscellaneous Pin Header

2.0mm 2x4p header

This pin header can be used as a backup for following functions, hard drive LED indicator, reset button, power LED indicator, and power-on/off button, which already can be accessed by front panel and top panel. The pin-outs of Miscellaneous port are listed in following table :

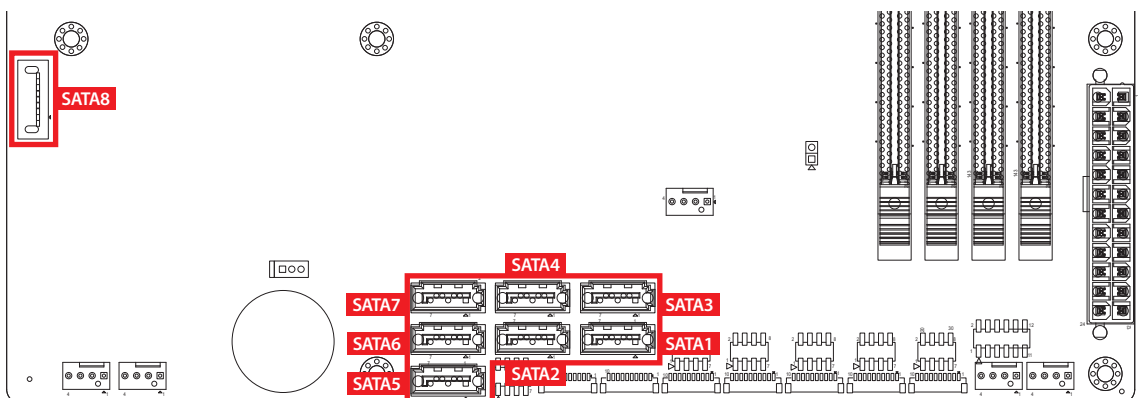


	Group	Pin No.	Description
	HDD LED	1	HDD_LED_P
		3	HDD_LED_N
	Reset button	5	FP_RST_BTN_N
		7	Ground
	Power and standby LED	2	PWR_LED_P
		4	PWR_LED_N
	Power on button	6	FP_PWR_BTN_N
		8	Ground

2.2.5 SATA 1 ~ SATA8 : SATA III Connector

Standard 7 PIN SATA Connector

There are 8 onboard high performance Serial ATA III. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA 1 to 8 are listed in the following table :

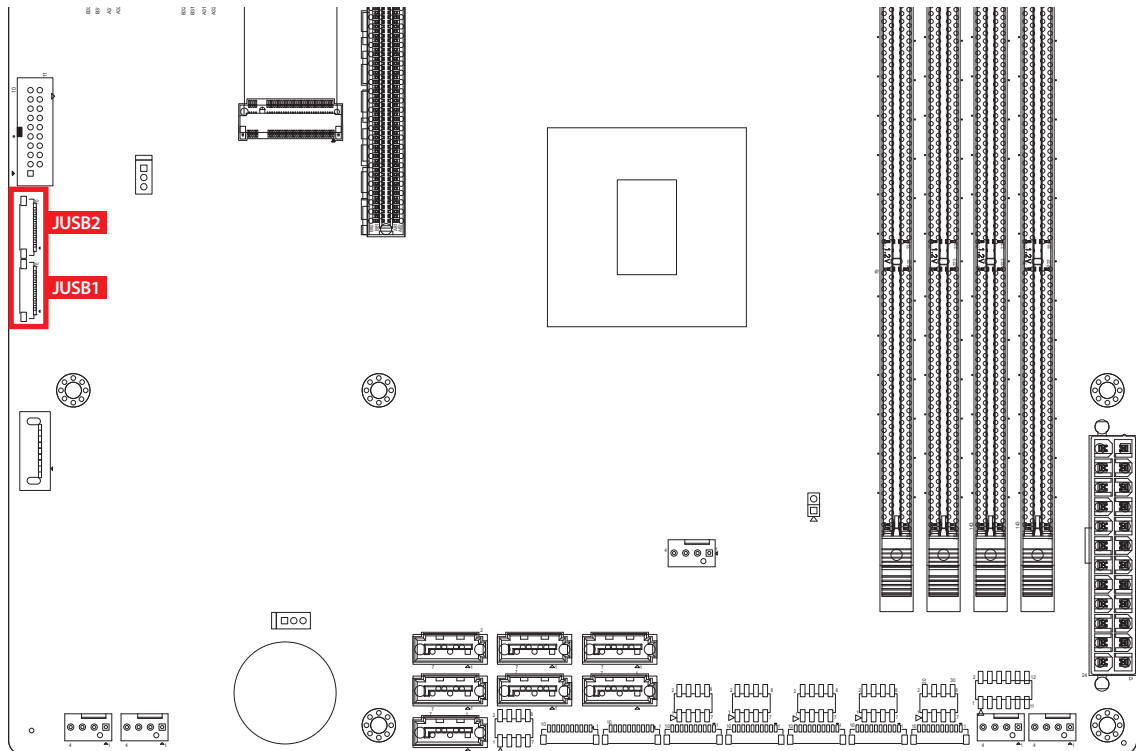


	Pin No.	Definition	Pin No.	Definition
	1	GND	2	TXP
	3	TXN	4	GND
	5	RXN	6	RXP
	7	GND		

2.2.6 JUSB1, JUSB2 : Internal USB 2.0

The UMBC-1100 main board provides maxima eight expansion USB ports. The USB interface supports 480Mbps transfer rate which comply with high speed USB specification Rev. 2.0.

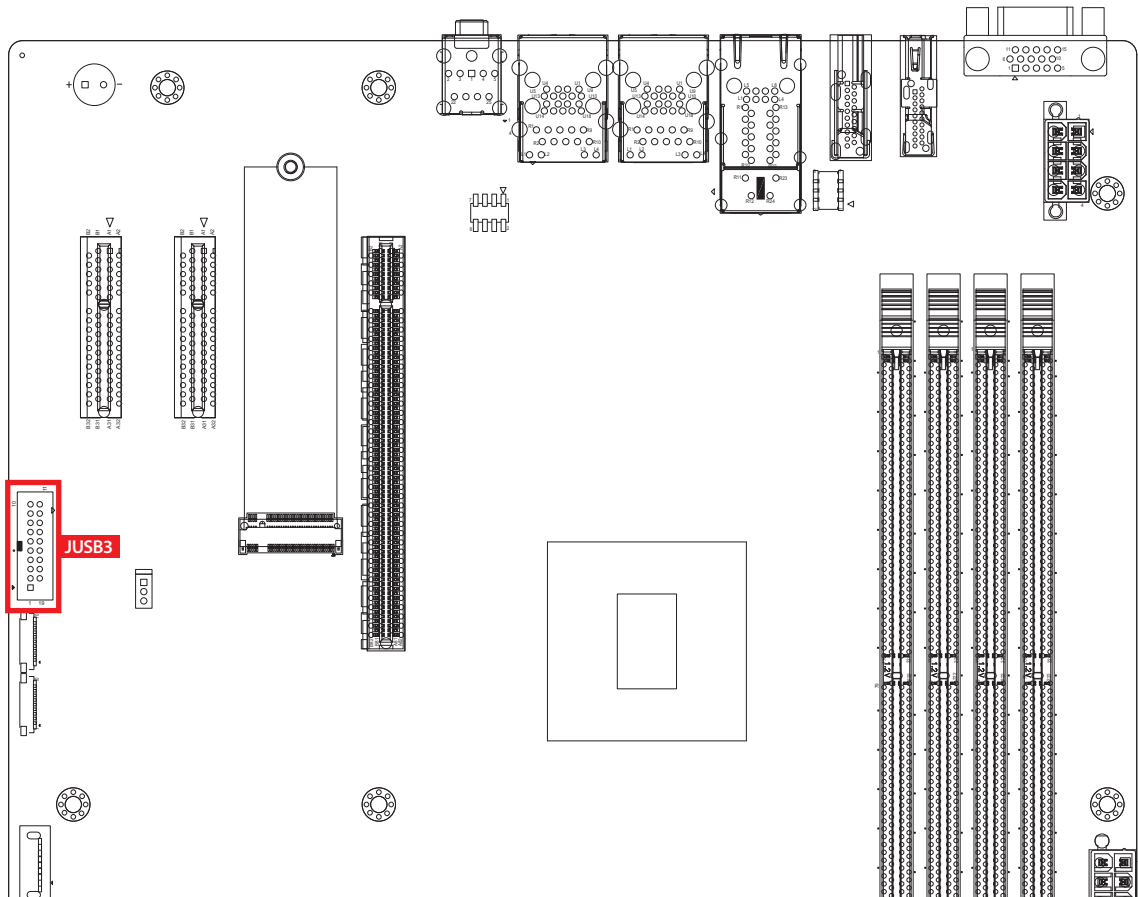
The USB interface is accessed through one 10-pin JST 1.0mm connector. You will need an adapter cable if you use a standard USB connector. The adapter cable has a 10-pin connector on one end and a USB connector on the other. The pin assignments of JUSB1 and JUSB2 are listed in the following table :



	Pin No.	Defnition
	1	USB +VCC(+V5/Max. 0.5A)
	2	USB +VCC(+V5/Max. 0.5A)
	3	USB +VCC(+V5/Max. 0.5A)
	4	DATA0-
	5	DATA0+
	6	DATA1-
	7	DATA1+
	8	Ground
	9	Ground
	10	Ground

2.2.7 JUSB3 : Internal USB 3.1

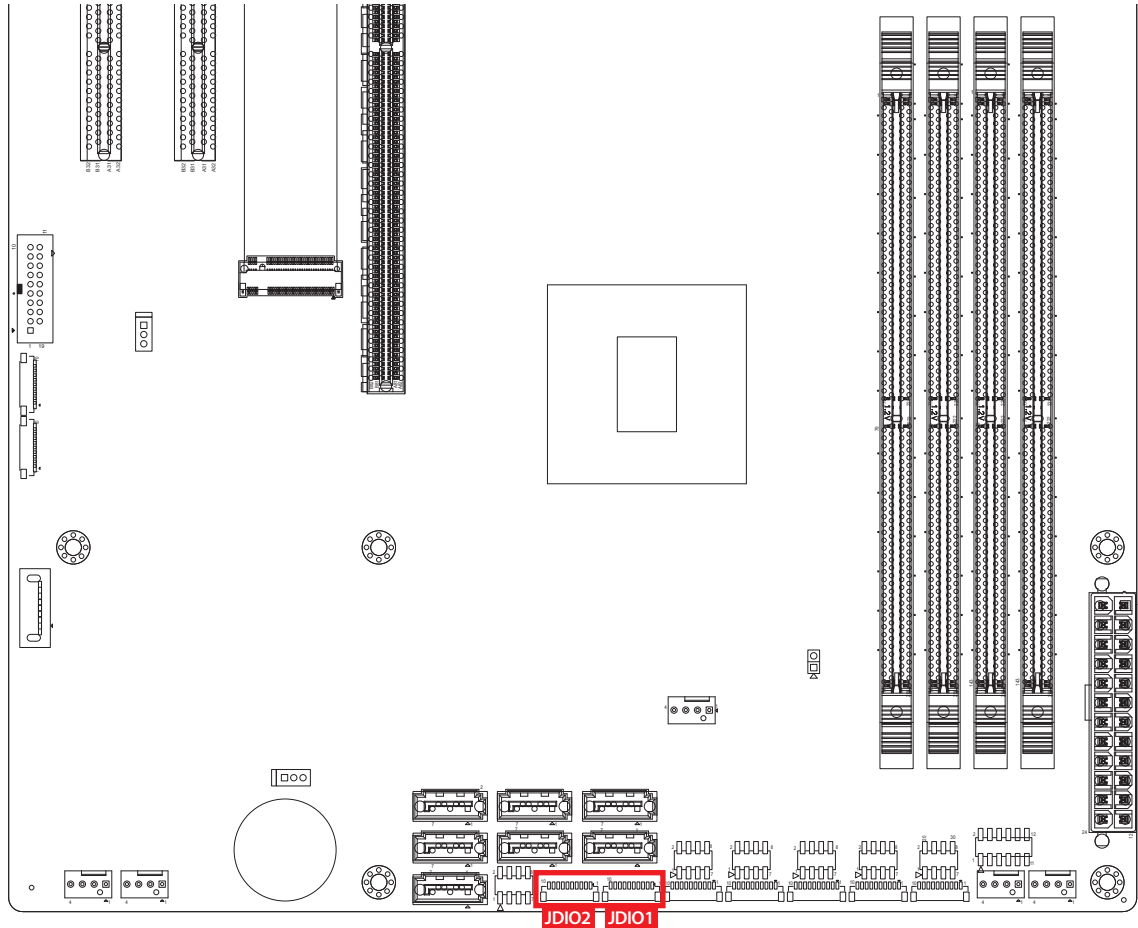
There are 2 USB 3.1 connections available supporting up to 5GB per second data rate in the top side of UMBC-1100. They are also compliant with the requirements of SuperSpeed (SS), high speed (HS), full speed (FS) and low speed (LS).



	Pin No.	Definition	Pin No.	Definition
	1	+V5/Max. 1.5A	2	RX1-
	3	RX1+	4	Ground
	5	TX1-	6	TX1+
	7	Ground	8	DATA1-
	9	DATA1+	10	NC
	11	DATA2+	12	DATA2-
	13	Ground	14	TX2+
	15	TX2-	16	Ground
	17	RX2+	18	RX2-
	19	+V5/Max. 1.5A		

2.2.8 JDIO1, JDIO2 : GPIO Header

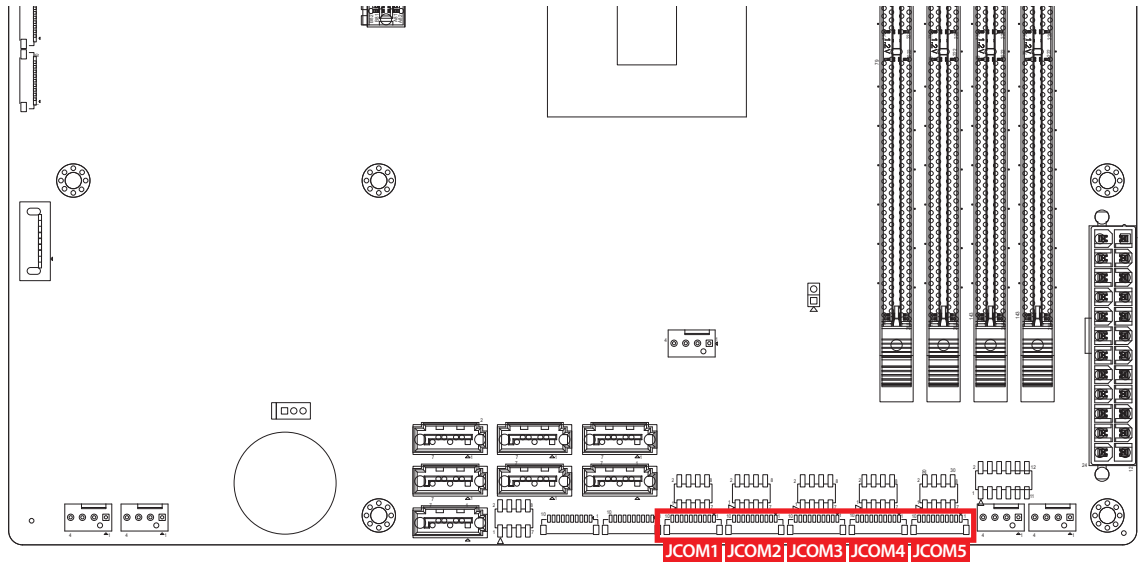
There is a 16-bit GPIO connector on the top side. Each GPIO channel can be configuration GPI or GPO. Please refer to below table to see the pin definition in details. JDIO1 and JDIO2 Pin define are as below :

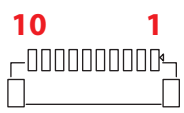


	Pin No.	JDIO1 Definition	JDIO2 Definition
	1	SIO_GPI80	SIO_GPI84
	2	SIO_GPI81	SIO_GPI85
	3	SIO_GPI82	SIO_GPI86
	4	SIO_GPI83	SIO_GPI87
	5	SIO_GPO70	SIO_GPO74
	6	SIO_GPO71	SIO_GPO75
	7	SIO_GPO72	SIO_GPO76
	8	SIO_GPO73	SIO_GPO77
	9	+VDIO	+VDIO
	10	GND	GND

2.2.9 JCOM1 ~ JCOM5 : COM Port Header

Serial port 1 to 5 (JCOM 1 to 5) can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 1 to 5 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.



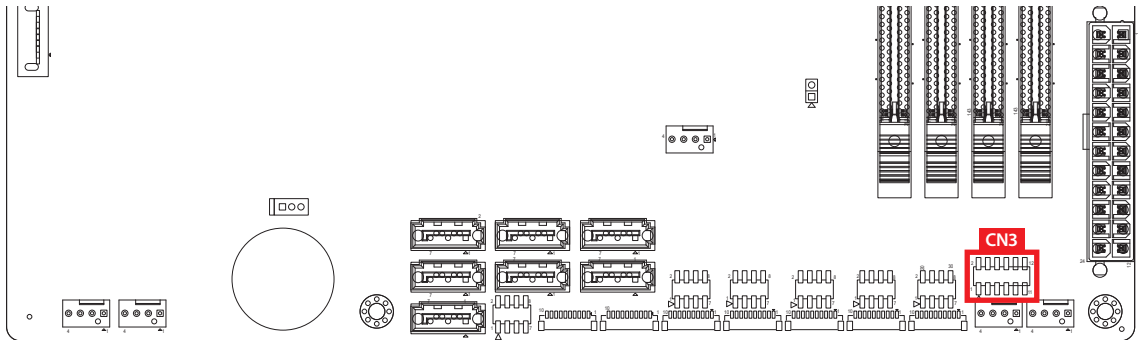
	BIOS Setting	Function
	COM1 (JCOM1) COM2 (JCOM2) COM3 (JCOM3) COM4 (JCOM4) COM5 (JCOM5)	
		RS-422 (5-wire)
		RS-422 (9-wire)
		RS-485
		RS-485 w/z auto-flow control

The pin assignments are listed in the following table :

Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
1, 2 3, 4, 5	1	GND_EARTH	GND_EARTH	GND_EARTH	GND_EARTH
	2	GND	GND	GND	GND
	3	RI	-----	CTS-	RI
	4	DTR	RXD-	RXD-	-----
	5	CTS	-----	CTS+	-----
	6	TXD	RXD+	RXD+	-----
	7	RTS	-----	RTS+	-----
	8	RXD	TXD+	TXD+	DATA+
	9	DSR	-----	RTS-	-----
	10	DCD	TXD-	TXD-	DATA-

2.2.10 CN3 : LPC Header

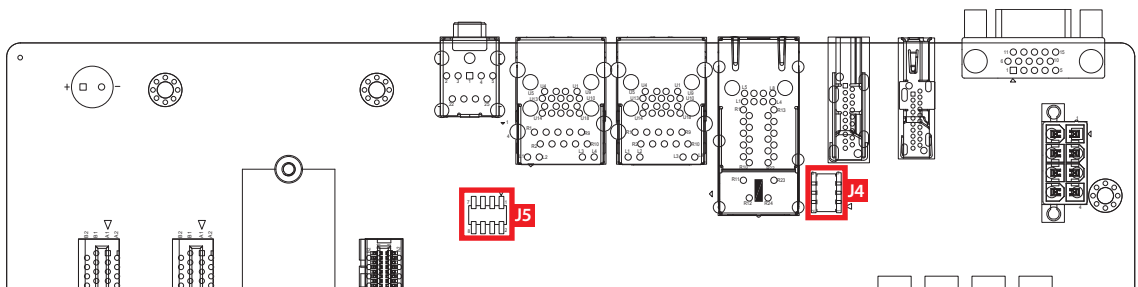
The systems provide a LPC Port 80 Header for debug card.



	Pin No.	Definition	Pin No.	Definition
	1	SERIRQ	2	+3.3V
	3	LPC_AD3	4	RESET#
	5	LPC_AD1	6	LPC_AD2
	7	LPC_FRAME#	8	LPC_AD0
	9	N/C	10	Ground
	11	CLOCK	12	Ground

2.2.11 J4, J5 : LAN LED Header

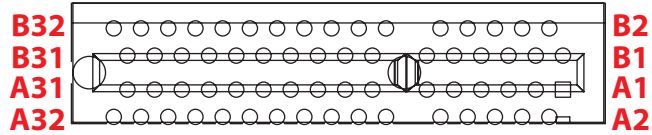
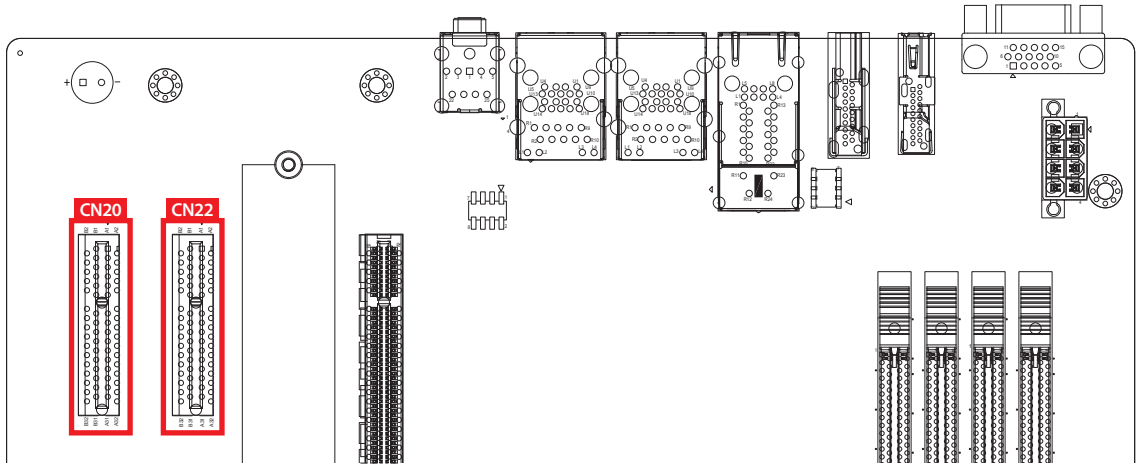
LAN LED Header for present Active/Link/Speed status of the connection.



	Pin No.	J4 Definition	Pin No.	J5 Definition
	1	LAN3_LINK100#	1	LAN1_LINK100#
	2	LAN4_LINK100#	2	LAN2_LINK100#
	3	LAN3_LINK1000#	3	LAN1_LINK1000#
	4	LAN4_LINK1000#	4	LAN2_LINK1000#
	5	LAN3_ACT#	5	LAN1_ACT#
	6	LAN4_ACT#	6	LAN2_ACT#
	7	+V3.3A	7	+V3.3A
	8	+V3.3A	8	+V3.3A

2.2.12 CN20, CN22 : two PCIe x4 Slot (PCH)

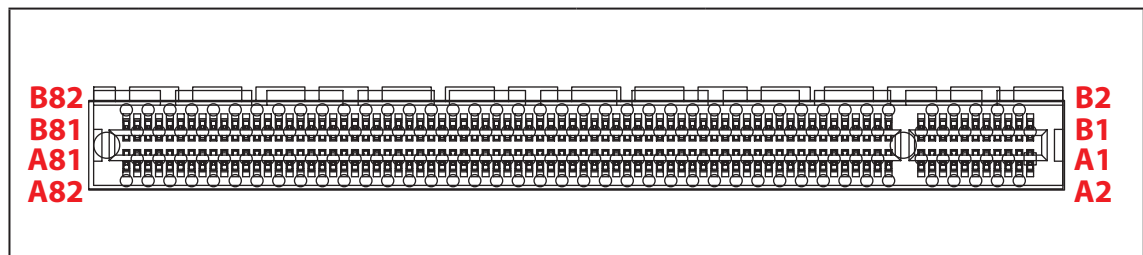
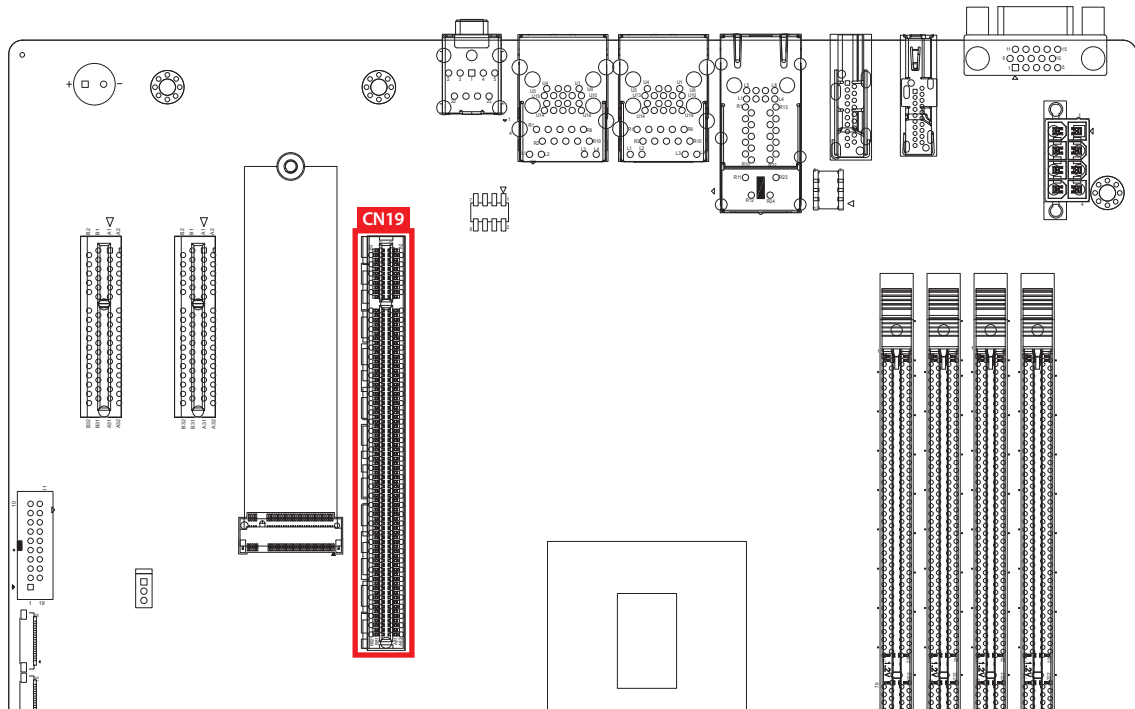
The pin assignments of CN20, CN22 are listed in the following table :



Pin No.	Definition	Pin No.	Definition
A1	Reserved	B1	+V12S
A2	+V12S	B2	+V12S
A3	+V12S	B3	+V12S
A4	GND	B4	GND
A5	CLKOUT_100M_X4_P2	B5	SM_SLOT_CLK
A6	CLKOUT_100M_X4_N2	B6	SM_SLOT_DAT
A7	CLKOUT_100M_X4_P3	B7	GND
A8	CLKOUT_100M_X4_N3	B8	+V3.3S
A9	+V3.3S	B9	Reserved
A10	+V3.3S	B10	+V3.3A
A11	PLTRST_PCIE#	B11	WAKE#
A12	GND	B12	Reserved
A13	CLKOUT_100M_X4_P0	B13	GND
A14	CLKOUT_100M_X4_N0	B14	PCIE_TXP21
A15	GND	B15	PCIE_TXN21

Pin No.	Definition	Pin No.	Definition
A16	PCIE_RXP21	B16	GND
A17	PCIE_RXN21	B17	Reserved
A18	GND	B18	GND
A19	Reserved	B19	PCIE_TXP22
A20	GND	B20	PCIE_TXN22
A21	PCIE_RXP22	B21	GND
A22	PCIE_RXN22	B22	GND
A23	GND	B23	PCIE_TXP23
A24	GND	B24	PCIE_TXN23
A25	PCIE_RXP23	B25	GND
A26	PCIE_RXN23	B26	GND
A27	GND	B27	PCIE_TXP24
A28	GND	B28	PCIE_TXN24
A29	PCIE_RXP24	B29	GND
A30	PCIE_RXn24	B30	CLKOUT_100M_X4_P1
A31	GND	B31	CLKOUT_100M_X4_N1
A32	Reserved	B32	GND

2.2.13 CN19 : One PCIe x16 Slot (CPU)



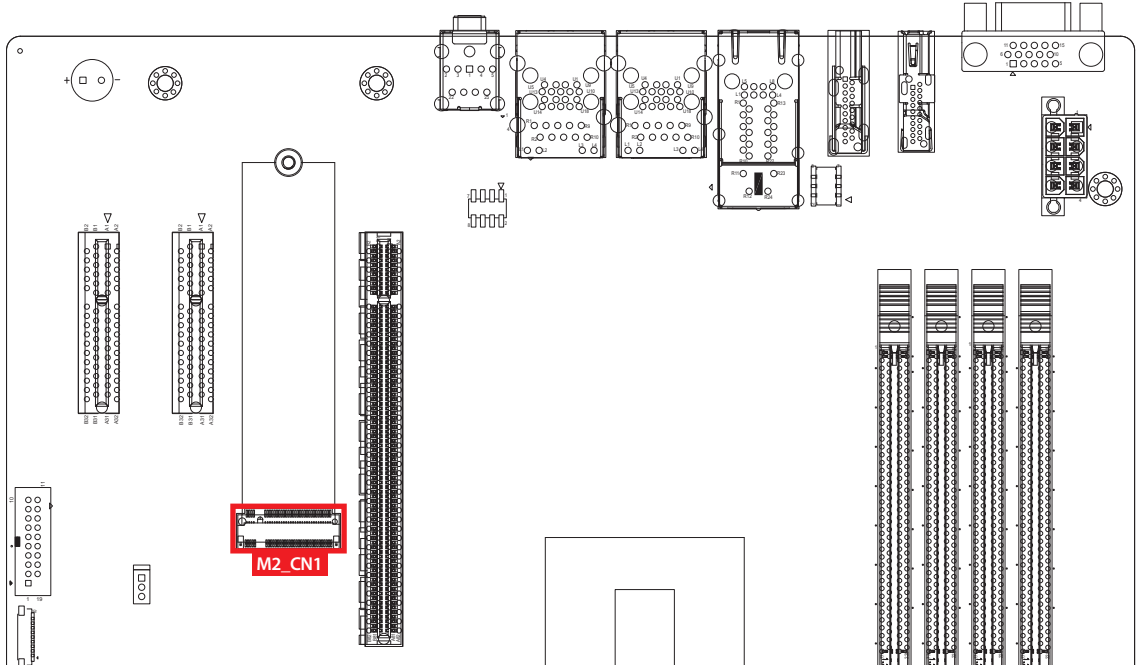
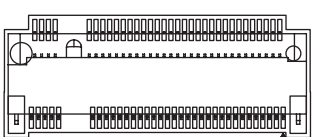
Pin No.	Definition	Pin No.	Definition
A1	Reserved	B1	+V12S
A2	+V12S	B2	+V12S
A3	+V12S	B3	+V12S
A4	GND	B4	GND
A5	CLKOUT_100M_X16_P2	B5	SM_SLOT_CLK
A6	CLKOUT_100M_X16_N2	B6	SM_SLOT_DAT
A7	USB_P8_DP	B7	GND
A8	USB_P8_DN	B8	+V3.3S
A9	+V3.3S	B9	GND
A10	+V3.3S	B10	+V3.3A
A11	PLTRST_PCIE#	B11	WAKE#
A12	GND	B12	Reserved
A13	CLKOUT_100M_X16_P0	B13	GND
A14	CLKOUT_100M_X16_N0	B14	PEG_TXP_0
A15	GND	B15	PEG_TXN_0

Pin No.	Definition	Pin No.	Definition
A16	PEG_RXP_0	B16	GND
A17	PEG_RXN_0	B17	Reserved
A18	GND	B18	GND
A19	Reserved	B19	PEG_TXP_1
A20	GND	B20	PEG_TXN_1
A21	PEG_RXP_1	B21	GND
A22	PEG_RXN_1	B22	GND
A23	GND	B23	PEG_TXP_2
A24	GND	B24	PEG_TXN_2
A25	PEG_RXP_2	B25	GND
A26	PEG_RXN_2	B26	GND
A27	GND	B27	PEG_TXP_3
A28	GND	B28	PEG_TXN_3
A29	PEG_RXP_3	B29	GND
A30	PEG_RXN_3	B30	PEG_TXP_7
A31	GND	B31	PEG_TXN_7
A32	CLKOUT_100M_X16_P1	B32	GND
A33	CLKOUT_100M_X16_N1	B33	PEG_TXP_4
A34	GND	B34	PEG_TXN_4
A35	PEG_RXP_4	B35	GND
A36	PEG_RXN_4	B36	GND
A37	GND	B37	PEG_TXP_5
A38	GND	B38	PEG_TXN_5
A39	PEG_RXP_5	B39	GND
A40	PEG_RXN_5	B40	GND
A41	GND	B41	PEG_TXP_6
A42	GND	B42	PEG_TXN_6
A43	PEG_RXP_6	B43	GND
A44	PEG_RXN_6	B44	GND
A45	GND	B45	PEG_TXP_7
A46	GND	B46	PEG_TXN_7
A47	PEG_RXP_7	B47	GND
A48	PEG_RXN_7	B48	Reserved
A49	GND	B49	GND
A50	Reserved	B50	PEG_TXP_8

Pin No.	Definition	Pin No.	Definition
A51	GND	B51	PEG_TXN_8
A52	PEG_RXP_8	B52	GND
A53	PEG_RXN_8	B53	GND
A54	GND	B54	PEG_TXP_9
A55	GND	B55	PEG_TXN_9
A56	PEG_RXP_9	B56	GND
A57	PEG_RXN_9	B57	GND
A58	GND	B58	PEG_TXP_10
A59	GND	B59	PEG_TXN_10
A60	PEG_RXP_10	B60	GND
A61	PEG_RXN_10	B61	GND
A62	GND	B62	PEG_TXP_11
A63	GND	B63	PEG_TXN_11
A64	PEG_RXP_11	B64	GND
A65	PEG_RXN_11	B65	GND
A66	GND	B66	PEG_TXP_12
A67	GND	B67	PEG_TXN_12
A68	PEG_RXP_12	B68	GND
A69	PEG_RXN_12	B69	GND
A70	GND	B70	PEG_TXP_13
A71	GND	B71	PEG_TXN_13
A72	PEG_RXP_13	B72	GND
A73	PEG_RXN_13	B73	GND
A74	GND	B74	PEG_TXP_14
A75	GND	B75	PEG_TXN_14
A76	PEG_RXP_14	B76	GND
A77	PEG_RXN_14	B77	GND
A78	GND	B78	PEG_TXP_15
A79	GND	B79	PEG_TXN_15
A80	PEG_RXP_15	B80	GND
A81	PEG_RXN_15	B81	PEG_TXP_7
A82	GND	B82	PEG_TXN_7

2.2.14 M2_CN1 : PCIe4 support

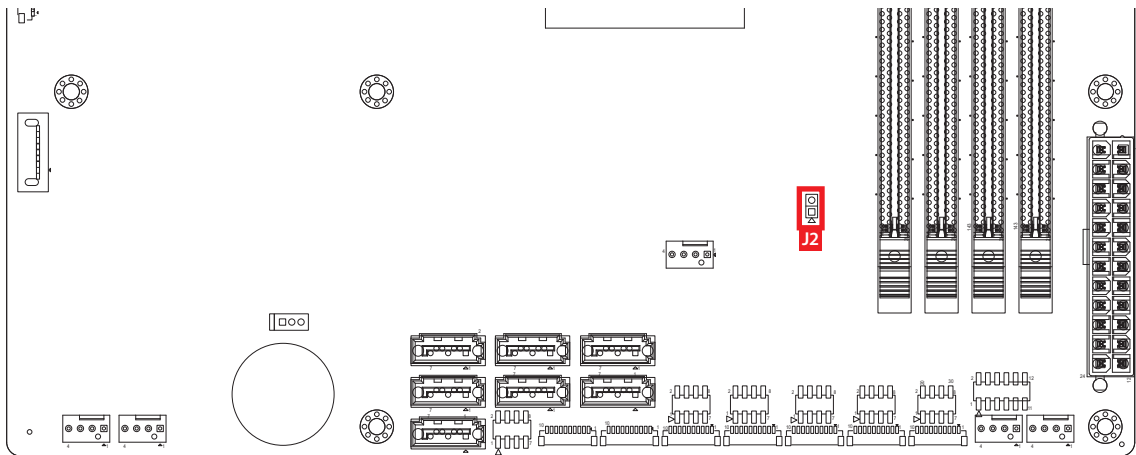
M.2 key M connector is suitable for applications that use Host I/Fs supported by either PCIe or Solid State Storage Devices (SSD). Module card types include, 2280.





Pin No.	Definition	Pin No.	Definition
74	3.3V	75	GND
72	3.3V	73	GND
70	3.3V	71	GND
68	SCUSCLK (3.2KHz)(O)(0/3.3V)	69	PEDET (NC-PCIe/GND-SATA)
	Connector Key	67	N/C
	Connector Key		Connector Key
	Connector Key		Connector Key
	Connector Key		Connector Key
58	N/C		Connector Key
56	N/C	57	GND
54	PEWAKE# (I/O)(O)(0/3.3V) or n/C	55	REFCLKp

Pin No.	Definition	Pin No.	Definition
52	CLKREQ# (I/O)(O)(0/3.3V) or N/C	53	PEFCLKn
50	PERST# (I/O)(O)(0/3.3V) or N/C	51	GND
48	N/C	49	PETp0/SATA-A+
46	N/C	47	PETp0/SATA-A-
44	N/C	45	GND
42	N/C	43	PETp0/SATA-B+
40	N/C	41	PETp0/SATA-B-
38	DEVSLP (O)	39	GND
36	N/C	37	PETp1
34	N/C	35	PETn1
32	N/C	33	GND
30	N/C	31	PERp1
28	N/C	29	PERn1
26	N/C	27	GND
24	N/C	25	PETp2
22	N/C	23	PETn2
20	N/C	21	GND
18	3.3V	19	PERp2
16	3.3V	17	PERn2
14	3.3V	15	GND
12	3.3V	13	PETp3
10	DAS/DDS# (I/O)/LED1# (I) (0/3.3V)	11	PETn3
8	N/C	9	GND
6	N/C	7	PERp3
4	3.3V	5	PERn3
2	3.3V	3	GND
		1	GND

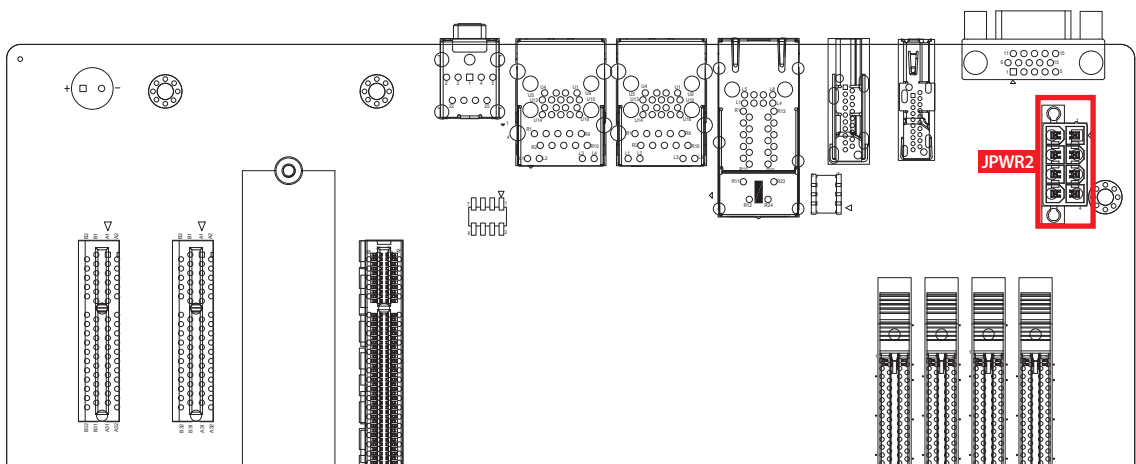
2.2.15 J2 : case open detection

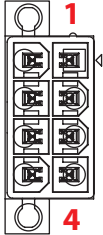


	Pin No.		Definition	
	1			+V3.3A_RTC
	2			GND

2.2.16 JPWR2 : ATX-6pin 12V Power connector

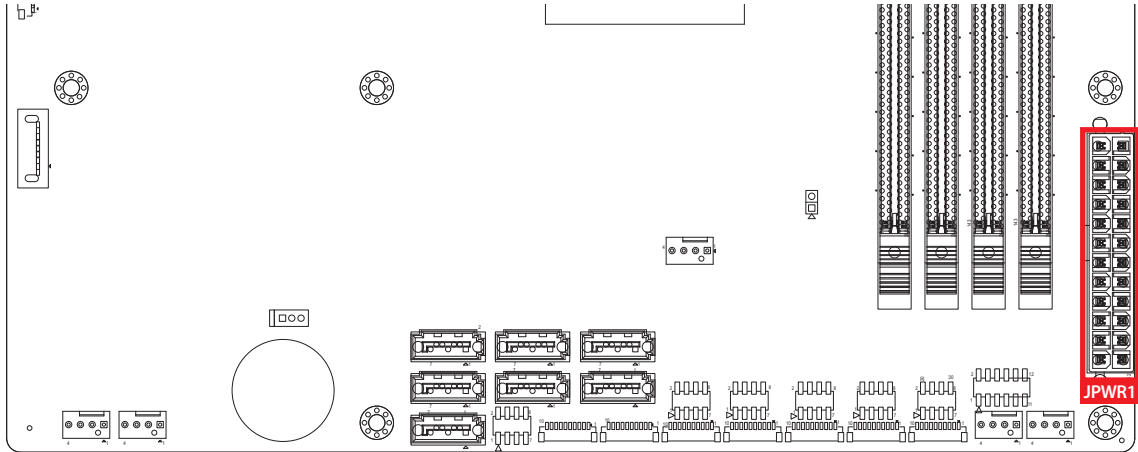
JPWR2 must also be connected to the power supply. This connector is used to power the processor(s).



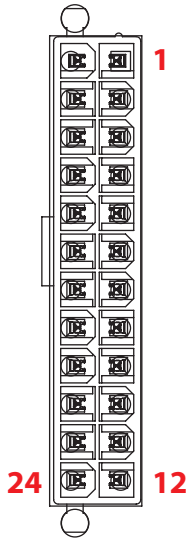
	Pin No.		Definition	
	1	GND	5	+12V
	2	GND	6	+12V
	3	GND	7	+12V
	4	GND	8	+12V

2.2.17 JPWR1 : ATX-24pin Power connector

The primary power supply connector (JPWR1) meets the ATX SSI EPS 24-pin specification. You must also connect the 8-pin (JPWR2) processor power connector to your power supply.

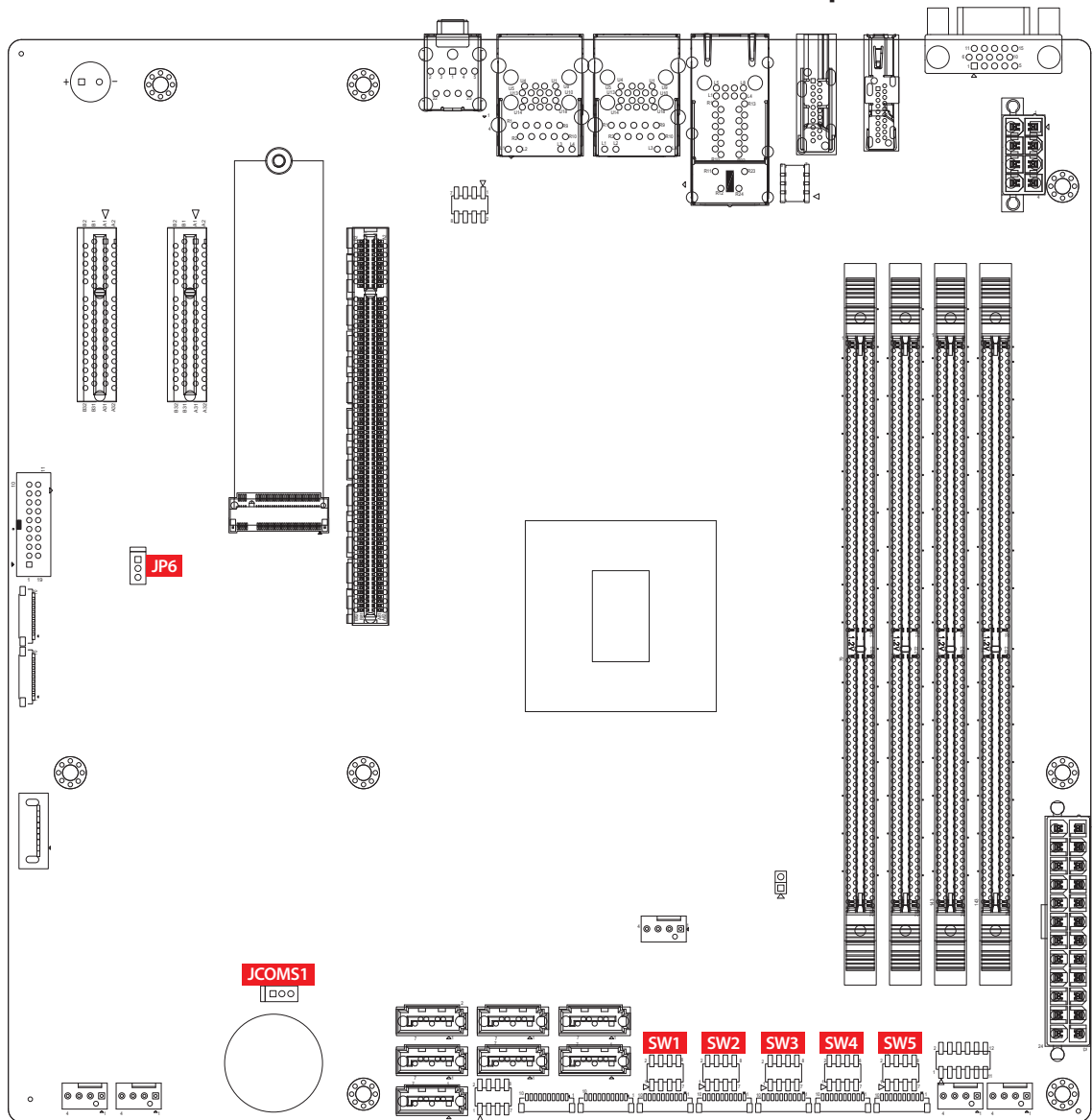


Pin No.	Definition	Pin No.	Definition
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	Power OK	20	-5V
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND

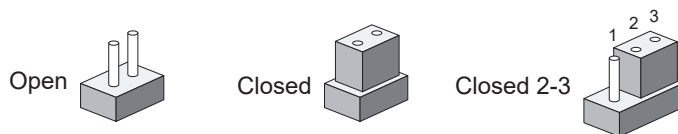


2.3 Jumper Settings

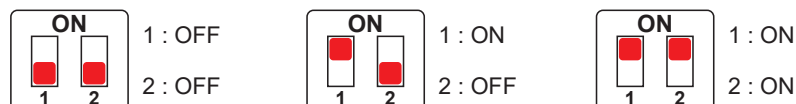
2.3.1 Front View of UMBC-1100 Main Board With Jumper Location



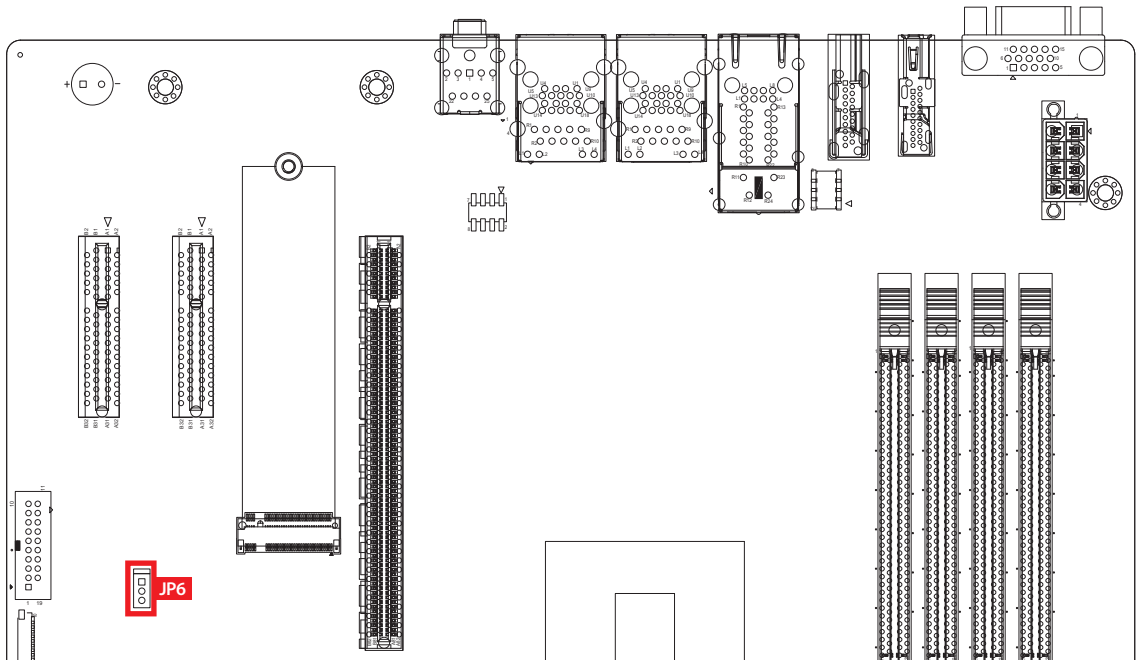
You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" a jumper, you connect the pins with the clip. To "open" a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



You may configure your card to match the needs of your application by DIP switch. As below show the DIP switch on and off.

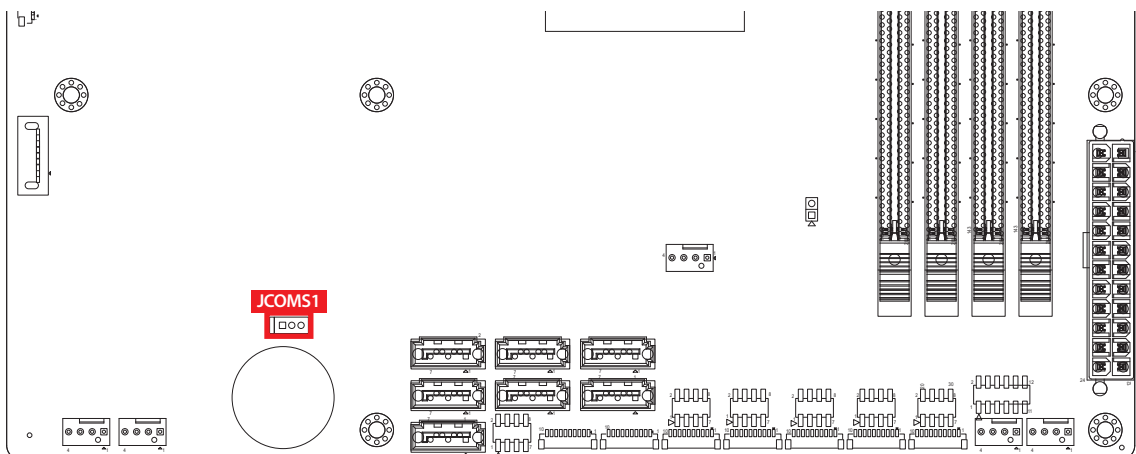


2.3.2 JP6 : External USB 3.1/2.0 Power Select



	Pin No.	Function
	1-2	+5V Standby Power (Default)
	2-3	+5V System Power

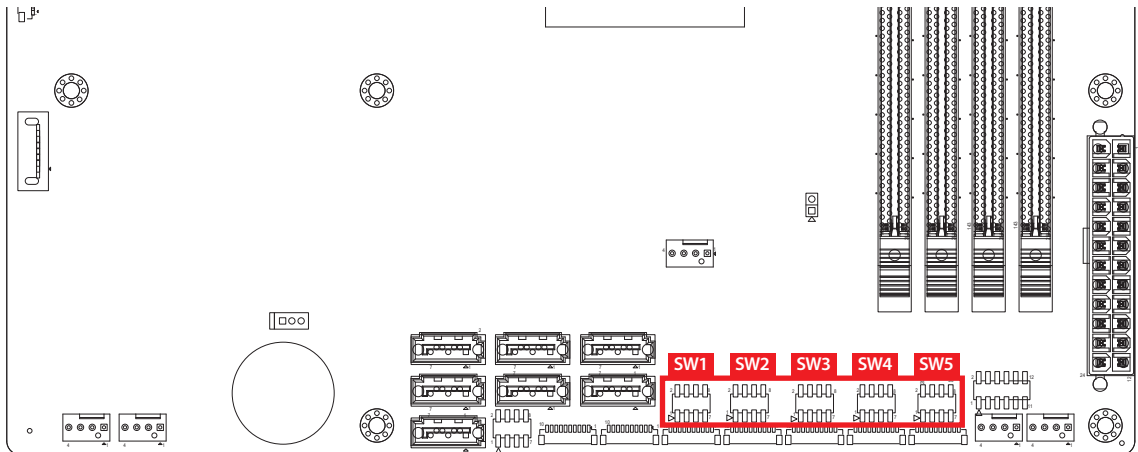
2.3.3 JCMOS1 : CMOS Clear



	Pin No.	Function
	1-2	Normal (Default)
	2-3	Clear CMOS

2.3.3 SW1~SW5 : Pull-up and Pull-down Bias Resistors

When an RS-422 and RS-485 network is in an idle state, all nodes are in listen (receive) mode. Under this condition there are no active drivers on the network, all drivers are tristated. Without anything driving the network, the state of the LINE is UNKNOWN. If the voltage level at the RECEIVER's A and B inputs is less than ± 200 mV the LOGIC level at the OUTPUT of the RECEIVERS will be the VALUE of the last bit received. In order to maintain the proper idle voltage state, bias RESISTORS must be applied to force the data LINES to the idle condition.



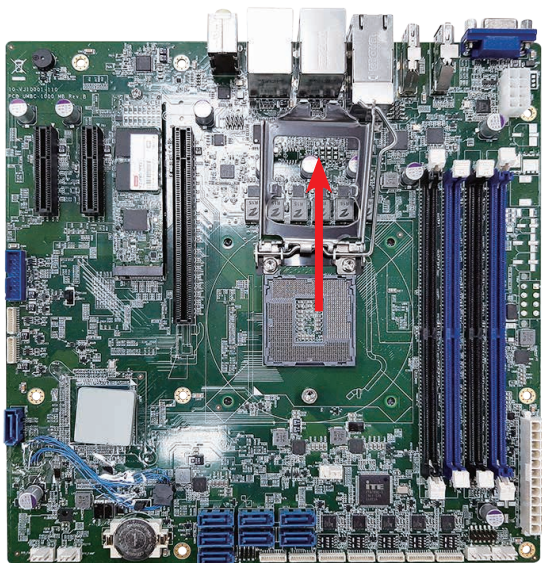
	RS232	RS422	RS485
JCOM1			
JCOM2			
JCOM3			
JCOM4			
JCOM5			

3

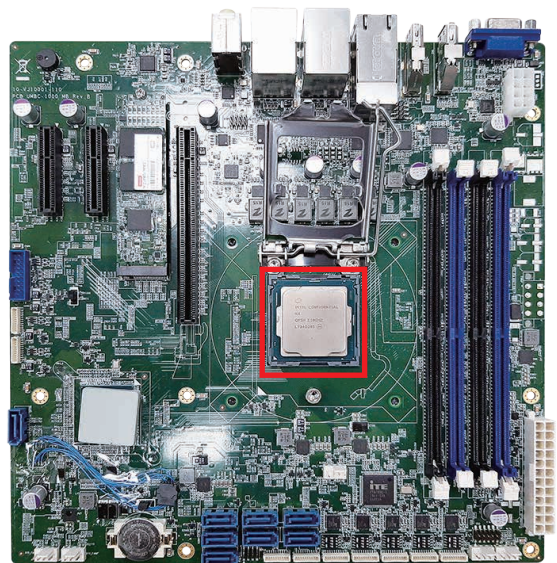
SYSTEM SETUP

3.1 Installing CPU

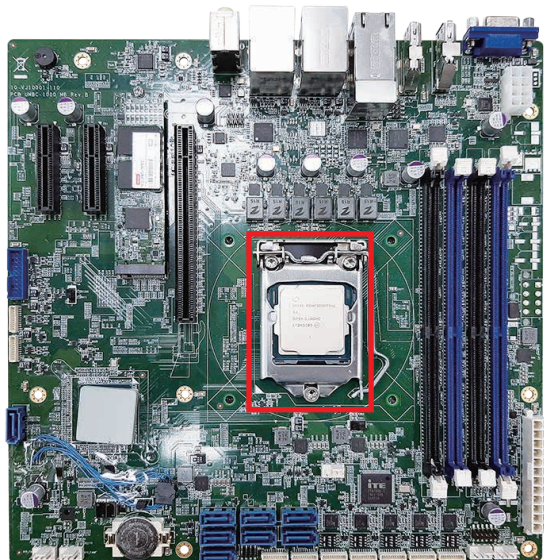
Step 1 Open CPU Slot cover.



Step 2 Install CPU into the CPU Slot.



Step 3 Close and lock CPU Slot cover.

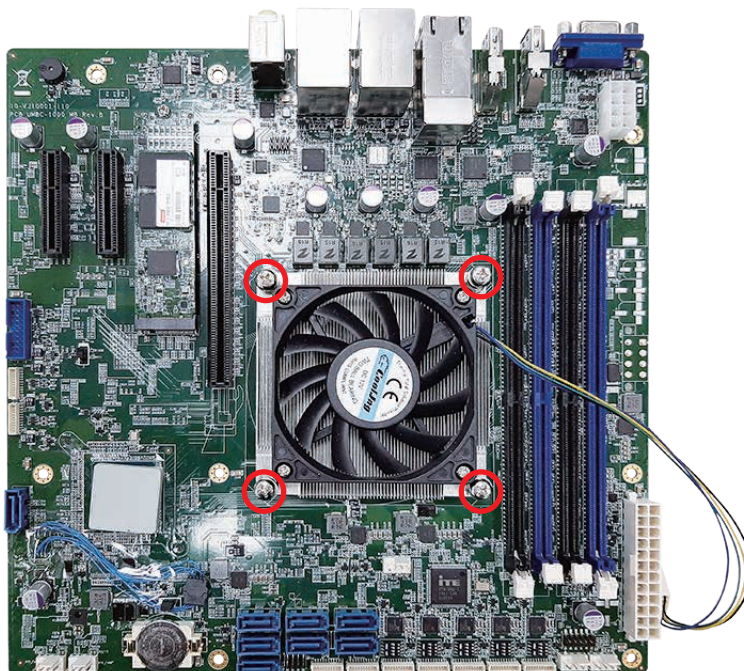


3.2 Installing CPU Cooler

Step 1 Follow the printed instructions to put the cooler cover on.

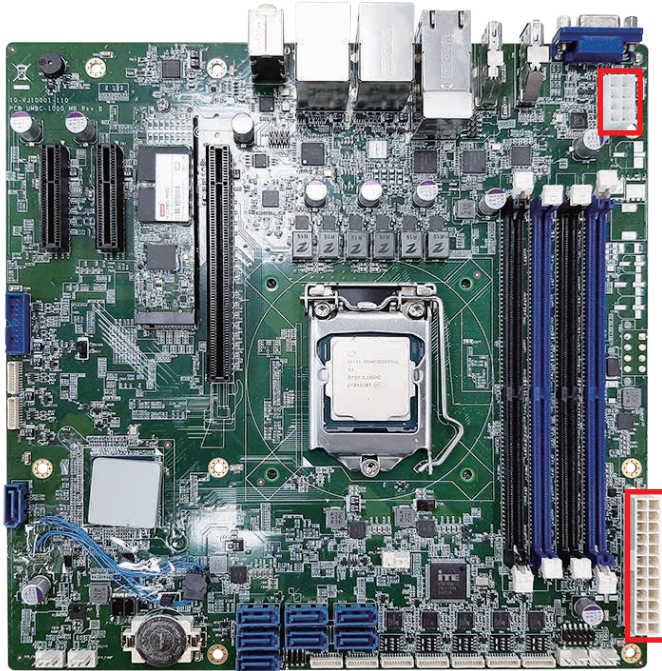


Step 2 Fasten four screws (circled in red).

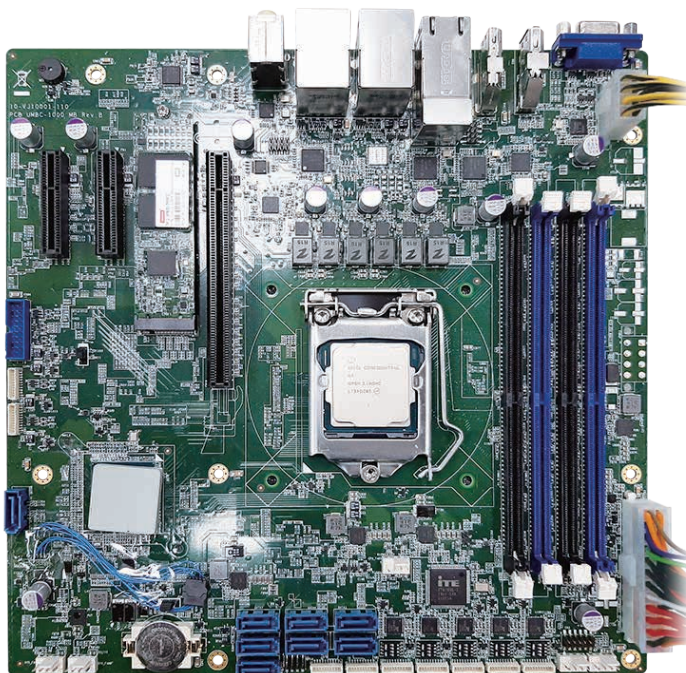


3.3 Installing ATX Power

Step 1 Connect the cable according to the red circle (circled in red).

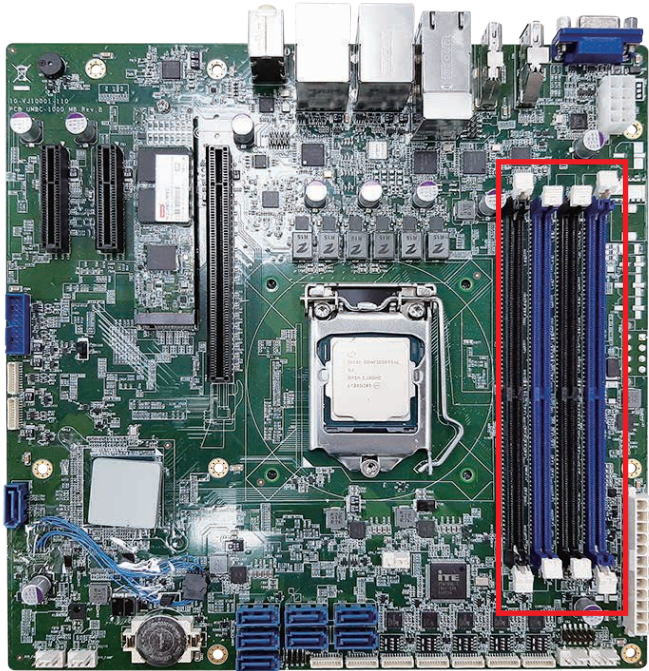


Step 2 Finish.

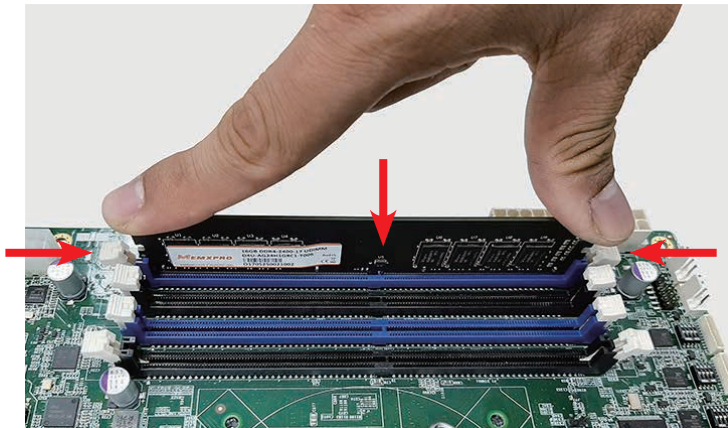


3.4 Installing DDR4 U-DIMM Modules

Step 1 Install DDR4 RAM module into U-DIMM slot.



Step 2 Push DDR4 until locked.

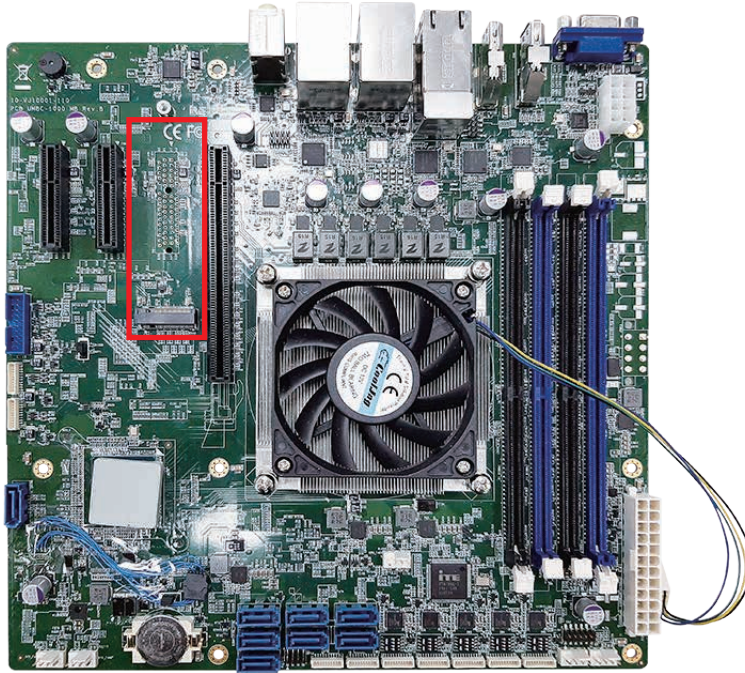


Step 3 Finish.

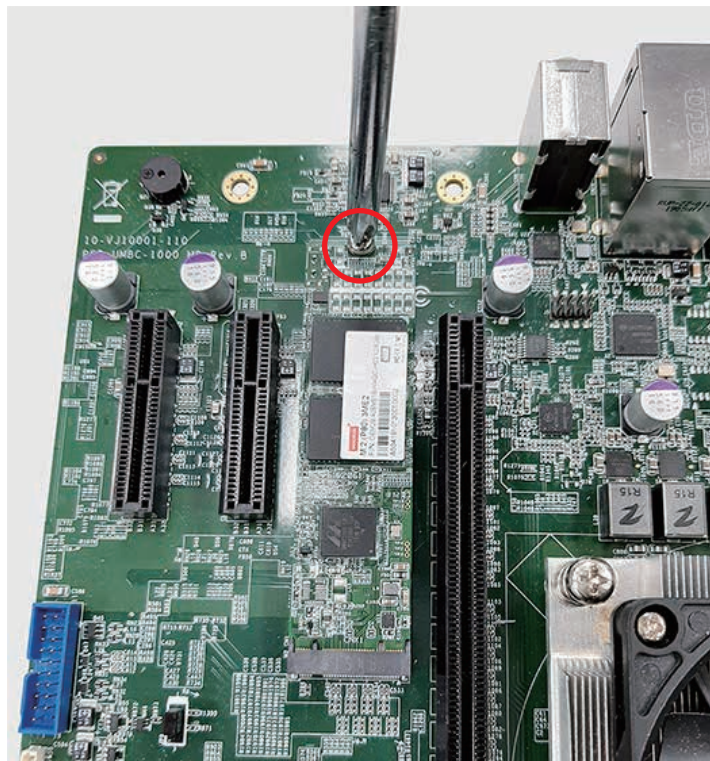


3.5 Installing M.2

Step 1 Install M.2 module into M.2 slot.



Step 2 Fasten one screws (circled in red).



4

BIOS SETUP

4.1 Entering BIOS Setup

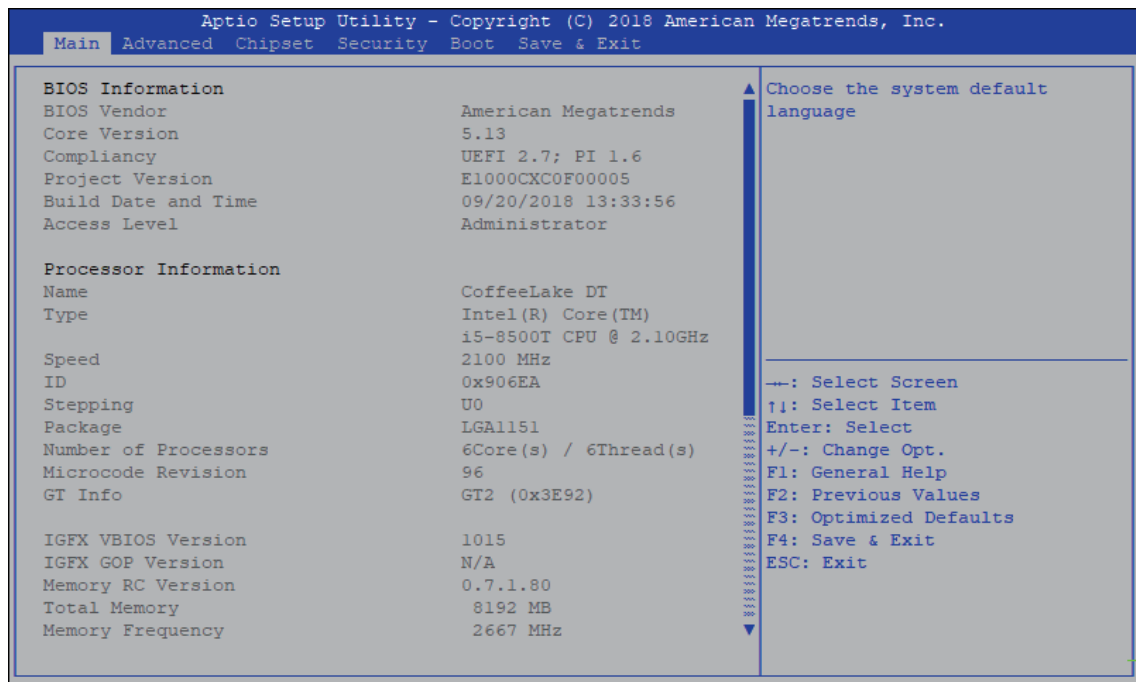


Figure 4-1 : Entering Setup Screen

BIOS provides an interface for users to check and change system configuration. The BIOS setup program is accessed by pressing the key when POST display output is shown.

4.2 Main

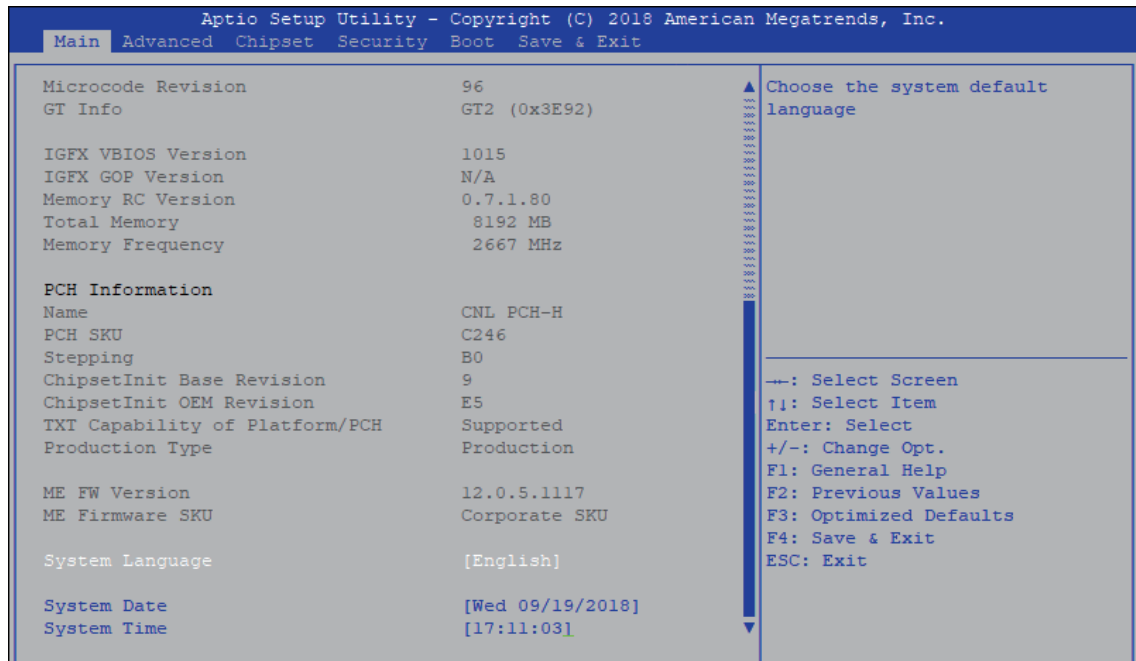


Figure 4-2 : BIOS Main Menu

The main menu displays BIOS version and system information. There are two options on Main menu.

System Date

Set the date. Use <Tab> to switch between date elements.

System Time

Set the time. Use <Tab> to switch between time elements.

4.3 Advanced

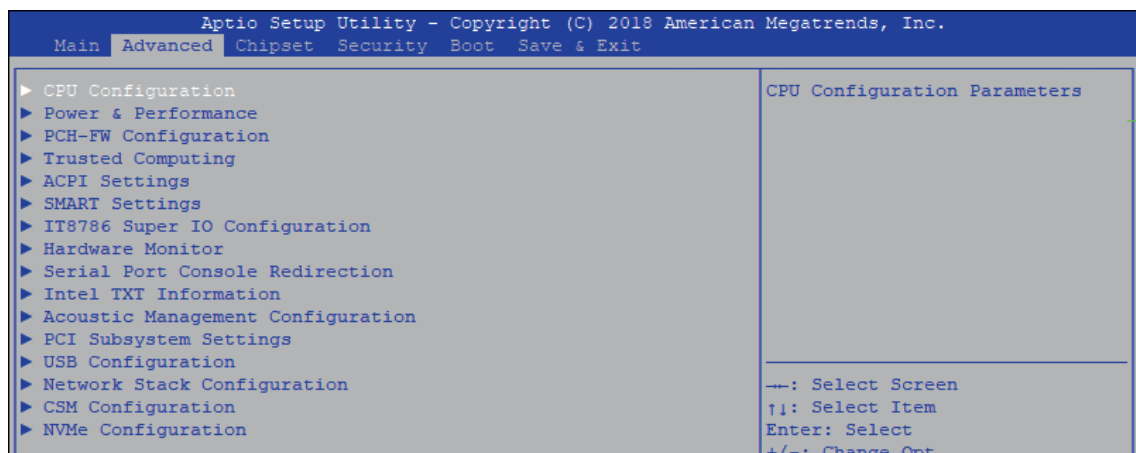


Figure 4-3 : BIOS Advanced Menu

Select advanced tab to enter advanced BIOS setup options, such as CPU configuration, SATA configuration, and USB configuration.

4.3.1 CPU Configuration

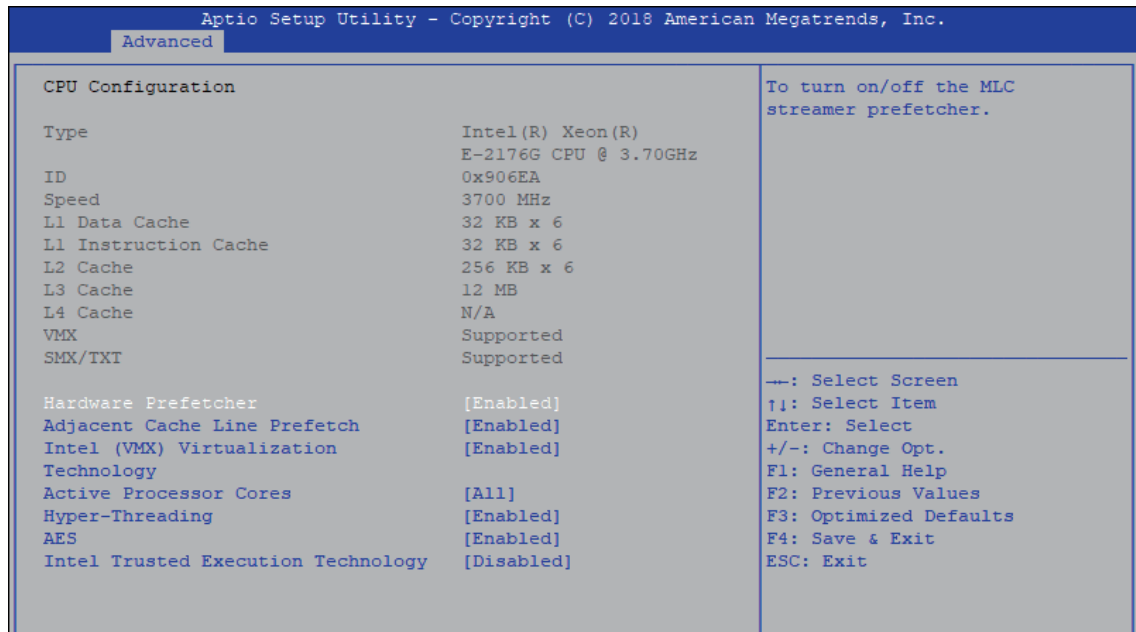


Figure 4-3-1 : CPU Configuration

Hardware Prefetcher

To turn on/off the MLC streamer prefetcher.

Adjacent Cache Line Prefetch

To turn on/off prefetching of adjacent cache lines.

Intel (VMX) Virtualization Technology

When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.

Active Processor Cores

Number of cores to enable in each processor package.

Hyper-threading

Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and disabled for other OS (OS not optimized for Hyper-Threading Technology). When disabled only one thread per core is enabled.

AES

Enable/disable CPU Advanced Encryption Standard instructions.

Intel Trusted Execution Technology

Enables utilization of additional hardware capabilities provided by Intel® Trusted Execution Technology.

Changes require a full power cycle to take effect.

4.3.2 Power & Performance

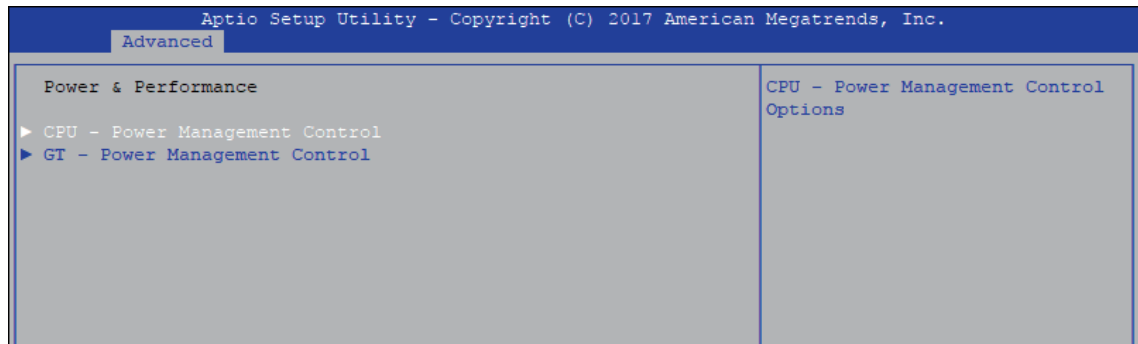


Figure 4-3-2 : Power & Performance

4.3.2.1 CPU – Power Management Control

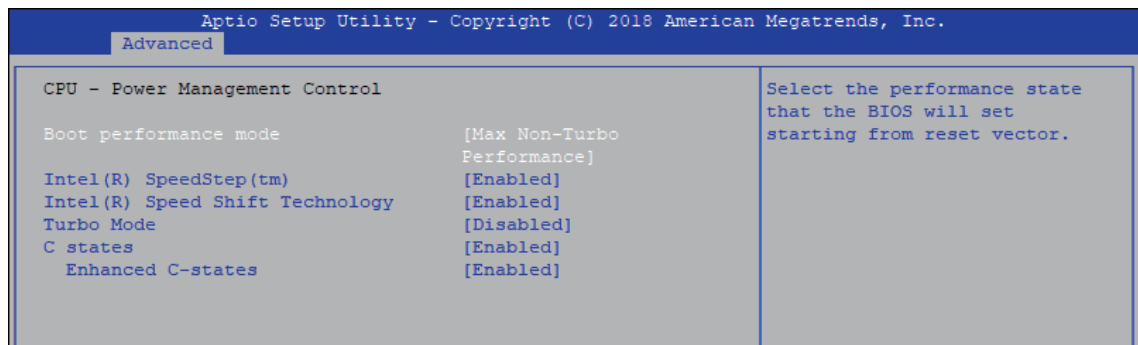


Figure 4-3-2-1 : CPU – Power Management Control

Boot performance mode

Select the performance state that the BIOS will set before OS handoff.

Intel(R) SpeedStep(tm)

Allows more than two frequency ranges to be supported.

Intel(R) Speed shift Technology

Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPCv2 interface to allow for hardware controlled P-states.

Turbo Mode

Turbo Mode.

C states

Enable or disable CPU C states.

Enhanced C-states

Enable/disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

4.3.2.2 GT – Power Management Control

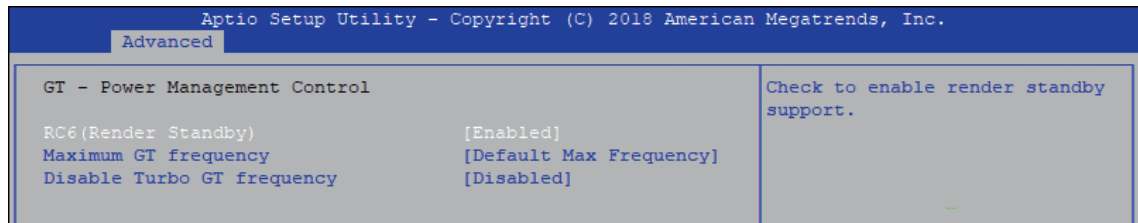


Figure 4-3-2-2 : GT – Power Management Control

RC6 (Render Standby)

Check to enable render standby support.

Maximum GT frequency

Maximum GT frequency limited by the user. Choose between 350MHz (RPN) and 1150MHz (RP0). Value beyond the range will be clopped to min/max supported by SKU

Disable Turbo GT frequency

Check to enable render standby support.

4.3.3 PCH-FW Configuration



Figure 4-3-3 : PCH-FW Settings

ME State

Set ME to Soft temporarily disabled.

AMT BIOS Features

When disabled AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup.

AMT Configuration

Configure Intel® Active Management Technology Parameters.

ME Unconfig on RTC Clear State

Disabling this option will cause ME not to unconfigure on RTC clear.

4.3.4 Trusted Computing

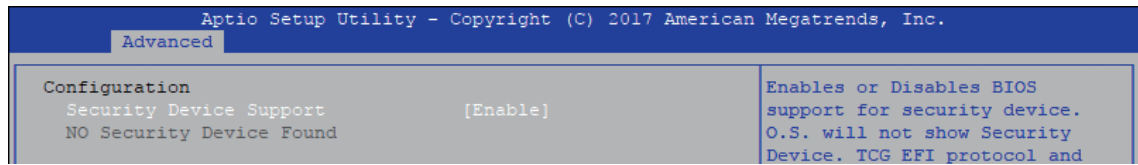


Figure 4-3-4 : Trusted Computing

Control the TPM device status and display related information if TPM chip is present.

4.3.5 ACPI Settings

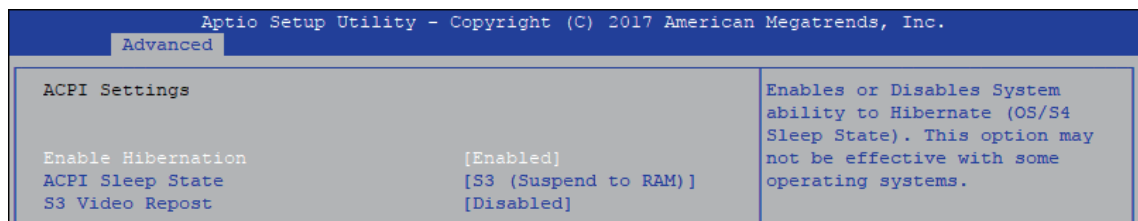


Figure 4-3-5 : ACPI Settings

Enable Hibernation

Enables or disables system's ability to hibernate (OS/S4 sleep state). This option may not be effective with some OS.

ACPI Sleep State

Selects the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

S3 Video Repost

Enables or disables S3 video repost.

4.3.6 SMART Settings

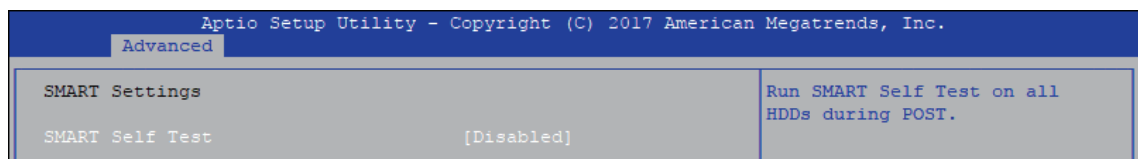


Figure 4-3-6 : SMART Settings

SMART Self Test

Run SMART self test on all HDDs during POST.

4.3.7 IT8786 Super IO Configuration

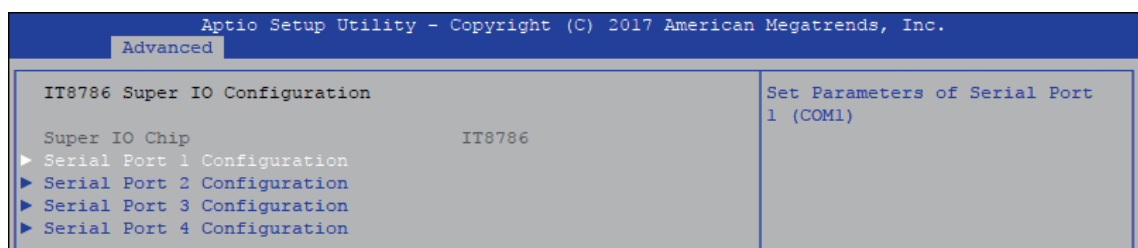


Figure 4-3-7 : IT8786 Super IO Settings

4.3.7.1 Serial Port X Configuration

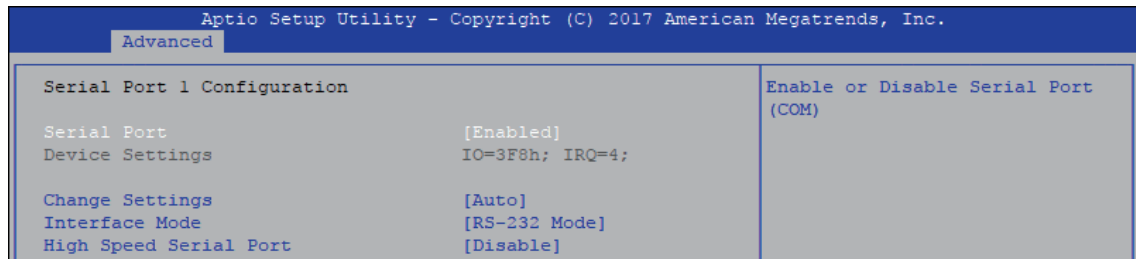


Figure 4-3-7-1 : Serial Port X Configuration

Serial Port 1 to port 5 Configuration

Options for Serial Port 1 to Serial Port 5.

Entering the corresponding Port option then end user can change the settings such as I/O resource and UART mode (High Speed Serial Port is Port 1 only).

4.3.8 Hardware Monitor

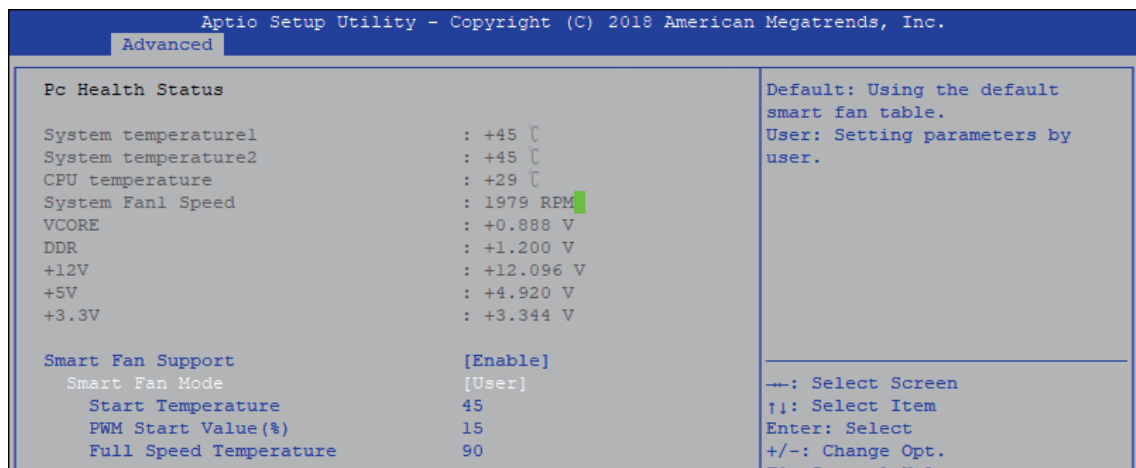


Figure 4-3-8 : Hardware Monitor Settings

The IT8786 SIO features an enhanced hardware monitor providing thermal, fan speed, and system voltages' status monitoring.

Smart Fan Support

Smart Fan Support. Work with Full Speed if "Smart Fan Support" is Disabled.

Smart Fan Mode

Default : Using the default smart fan table.

User : Setting parameters by user.

Start Temperature

Temperature Limit value of Fan Start (Degree C).

(Range : 10~80)

PWM Start Value (%)

Default PWM Value of Fan.

(Range : 15%~100%)

Full Speed Temperature

Temperature Limit value of Fan Full Speed (Degree C).

(Range : 50~90)

4.3.9 Serial Port Console Redirection

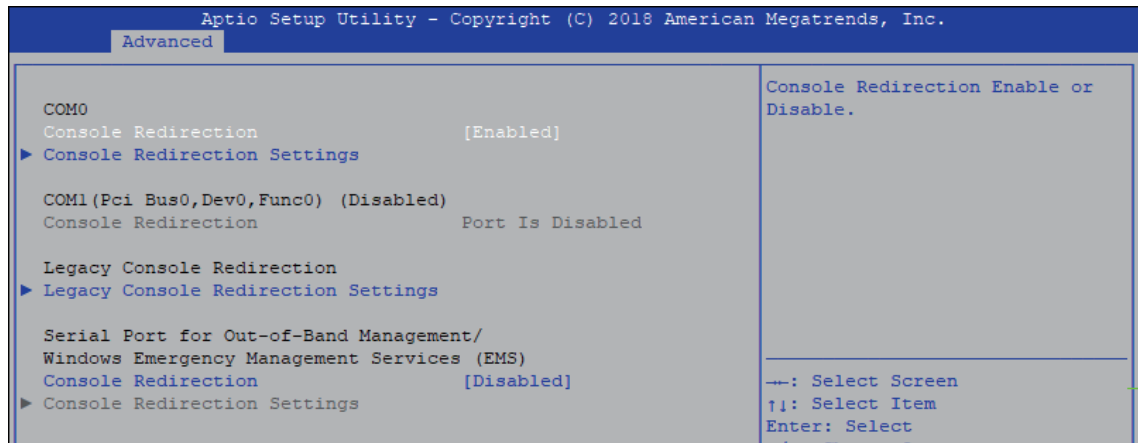


Figure 4-3-9 : Serial Port Console Redirection Settings

Console Redirection

Console redirection enable or disable.

Console Redirection Settings

These settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Legacy Console Redirection

Legacy Console Redirection Settings.

Serial Port for Out-of-Band Management/Windows Emergency Management Services (EMS)

Console redirection enable or disable.

4.3.10 Intel TXT Information

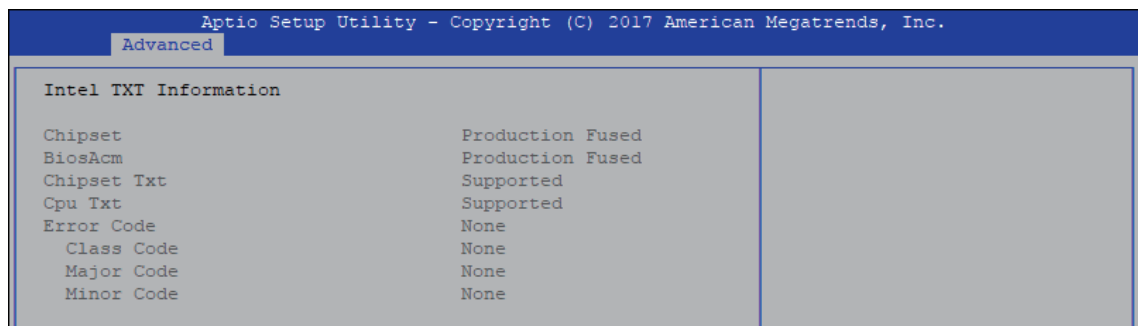


Figure 4-3-10 : Intel TXT Information

Display Intel TXT information.

4.3.11 Acoustic Management Configuration

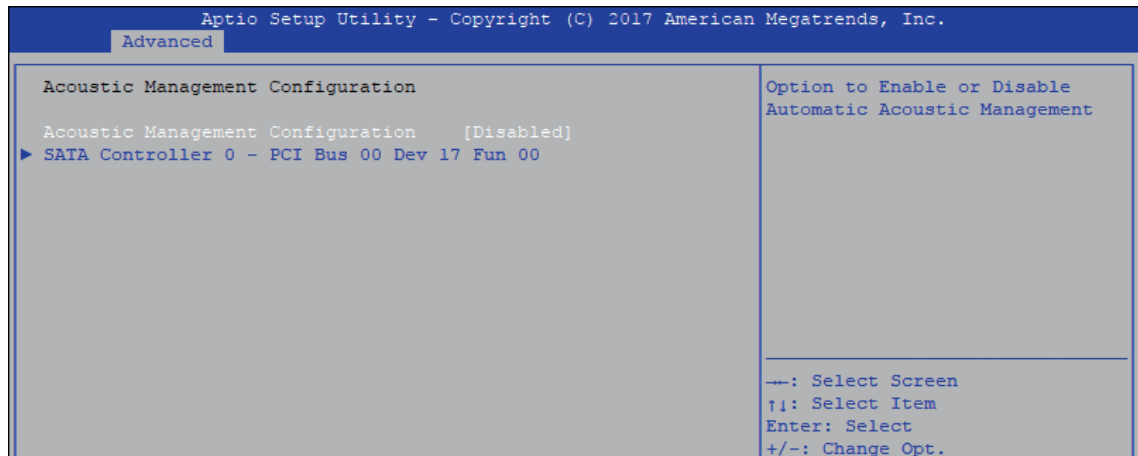


Figure 4-3-11 : Acoustic Management Settings

Acoustic Management Configuration

Option to enable or disable automatic acoustic management.

4.3.12 PCI Subsystem Setting

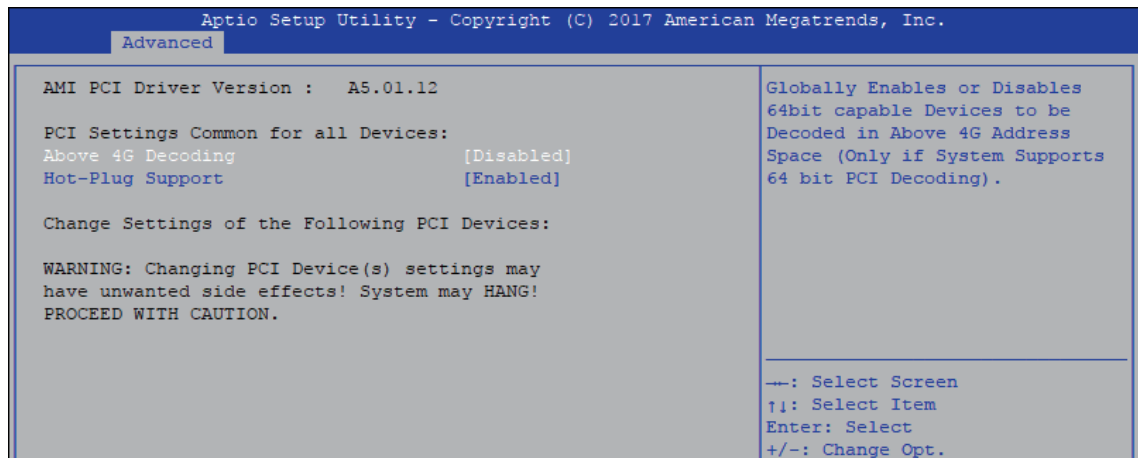


Figure 4-3-12 : PCI Subsystem Settings

Above 4G Decoding

Globally Enables or Disables 64bit capable Devices to be Decoded in Above 4G Address Space (Only if System Supports bot PCI Decoding)

Hot-Plug Support

Globally Enables or Disables Hot-Plug support for the entire System. If system has Hot-Plug Capable Slots and this option set to Enabled, it provides a Setup screen for selecting PCI resource padding for Hot-Plug.

4.3.13 Network Stack Configuration

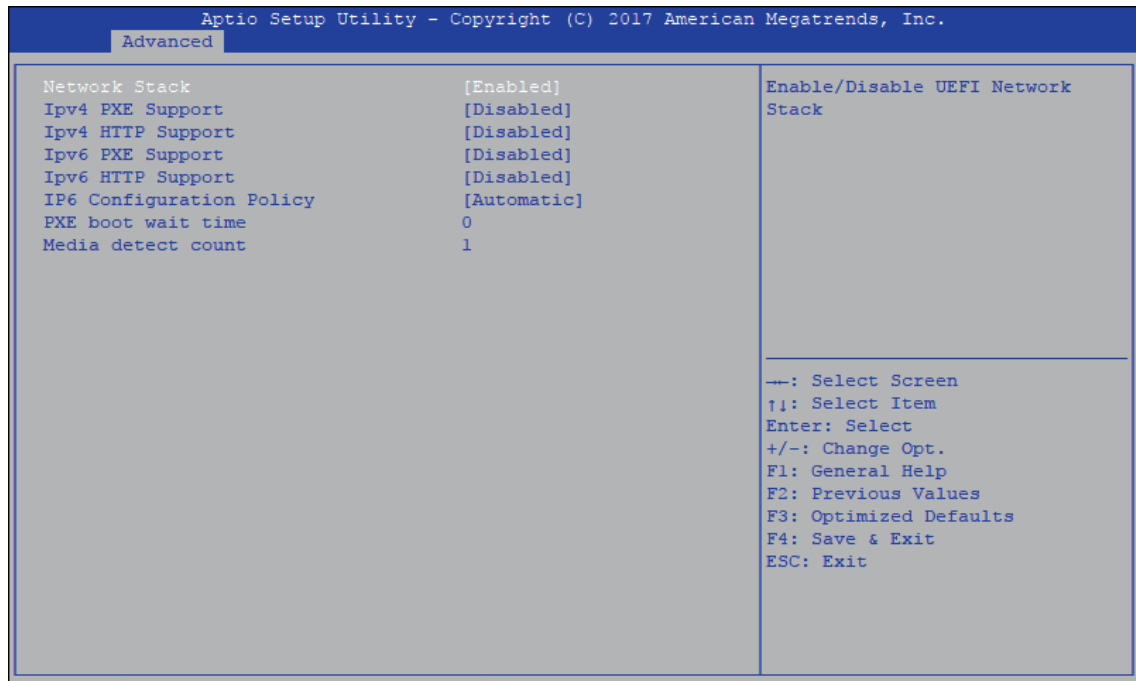


Figure 4-3-13 : Network Stack Settings

Network Stack

Enable/Disable UEFI Network Stack

Ipv4 PXE Support

Enable/Disable IPv4 PXE boot support.

Ipv4 HTTP Support

Enable/Disable IPv4 HTTP boot support.

Ipv6 PXE Support

Enable/Disable IPv6 PXE boot support.

Ipv6 HTTP Support

Enable/Disable IPv6 HTTP boot support.

IP6 Configuration Policy

Set IP6 Configuration Policy.

PXE boot wait time

Wait time to press ESC key to abort the PXE boot.

Media detect count

Number of times presence of media will be checked.

4.3.14 CSM Configuration

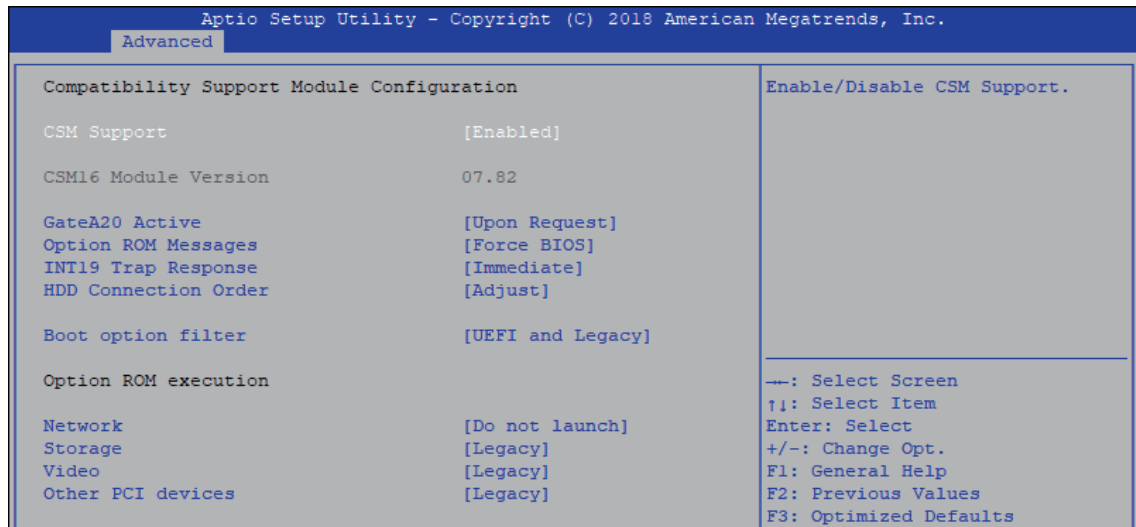


Figure 4-3-14 : CSM Settings

CSM Support

Enable/disable CSM support

GateA20 Active

UPON REQUEST - GA20 can be disabled using BIOS services.

ALWAYS - do not allow GA20 to be disabled; this option is useful when any RT code is executed above 1MB.

Option ROM Messages

Set display mode for Option ROM.

INT19 Trap Response

BIOS reaction on INT19 trapping by Option ROM :

IMMEDIATE - execute the trap right away;

POSTPONED - execute the trap during legacy boot.

HDD Connection Order

Some OS require HDD handles to be adjusted, i.e. OS is installed on drive 80h.

Boot option filter

This option controls Legacy/UEFI ROM's priority.

Network

Controls the execution of UEFI and Legacy PXE OpROM.

Storage

Controls the execution of UEFI and Legacy Storage OpROM.

Video

Allows more than two frequency ranges to be supported.

Other PCI devices

Determines OpROM execution policy for devices other than network, storage, or video.

4.3.15 NVMe Configuration

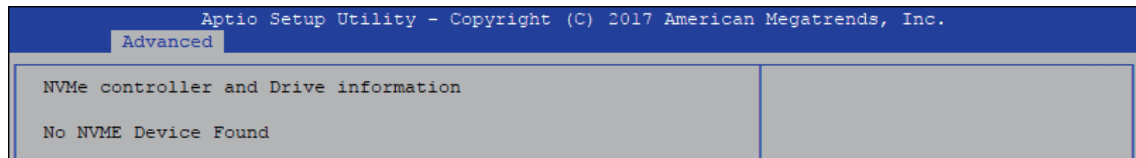


Figure 4-3-15 : NVMe Settings

Display NVMe controller and Drive information.

4.3.16 USB Configuration

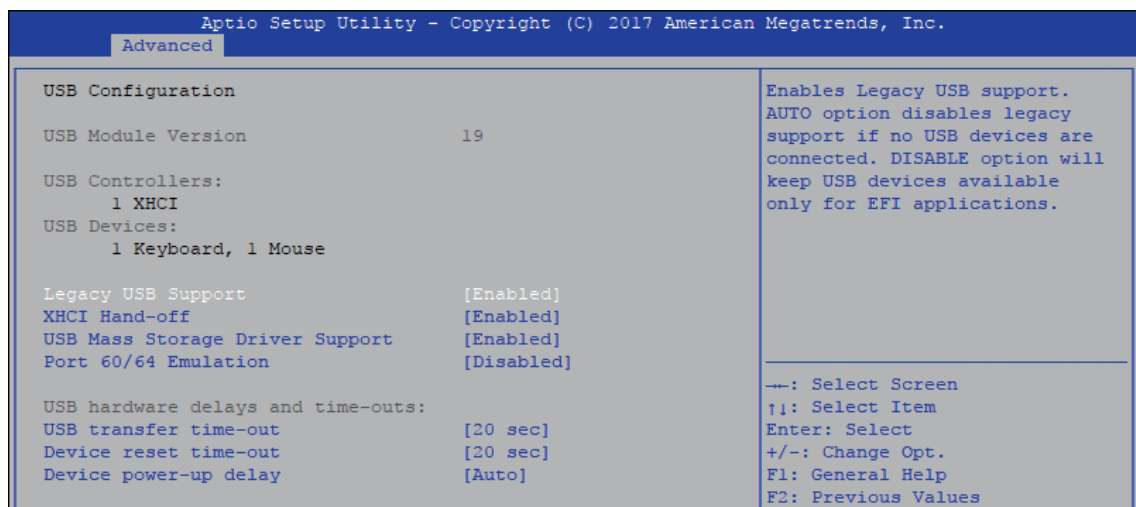


Figure 4-3-16 : USB Settings

Legacy USB Support

Enables Legacy USB support.

AUTO option disables Legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.

XHCI Hand-off

This is a workaround for OS-es without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.

USB Mass Storage Driver Support

Enable/disable USB mass storage driver support.

Port 60/64 Emulation

Enables I/O port 60h/64h emulation support. This should be enabled for the complete USB keyboard legacy support for non-USB aware OSes.

USB transfer time-out

The time-out value for control, bulk, and interrupt transfers.

Device reset time-out

USB mass storage device start unit command time-out.

Device power-up delay

Maximum time the device will take before it properly reports itself to the Host Controller. 'Auto' uses default value, for a root port it is 100 ms, for a hub port the delay is taken from the hub descriptor.

4.4 Chipset

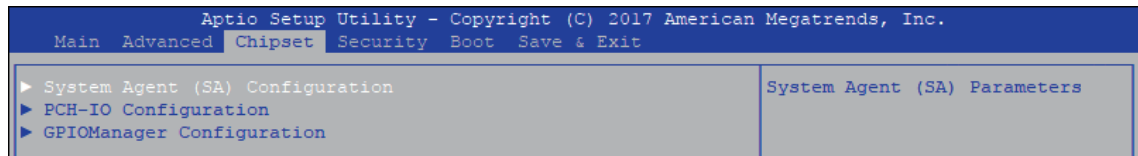


Figure 4-4 : BIOS Chipset Menu

System Agent (SA) Configuration

System Agent (SA) parameters.

PCH-IO Configuration

PCH parameters.

GPIOManager Configuration

GPIOManager Configuration.

4.4.1 System Agent (SA) Configuration

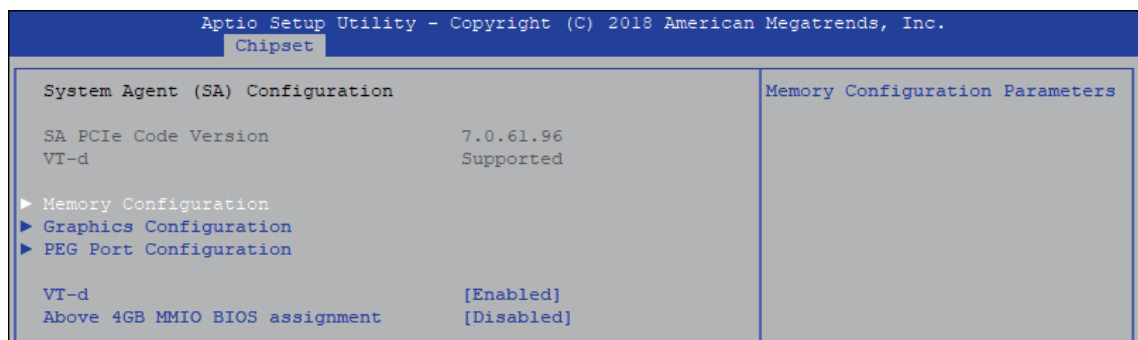


Figure 4-4-1 : System Agent Settings

VT-d

VT-d capability.

Above 4GB MMIO BIOS assignment

Enable/disable above 4GB MemoryMappedIO BIOS assignment. This is disabled automatically when aperture size is set to 2048MB.

4.4.1.1 Memory Configuration

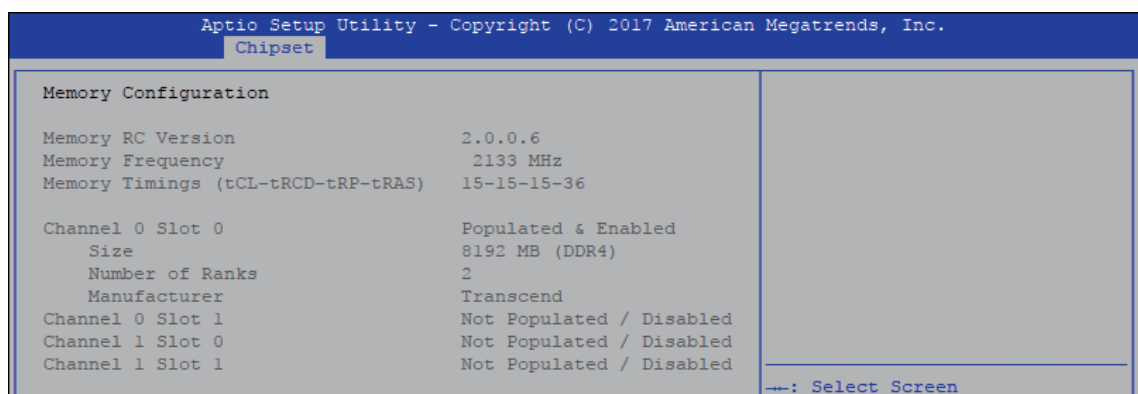


Figure 4-4-1-1 : Memory Information

Displays memory information.

4.4.1.2 Graphics Configuration

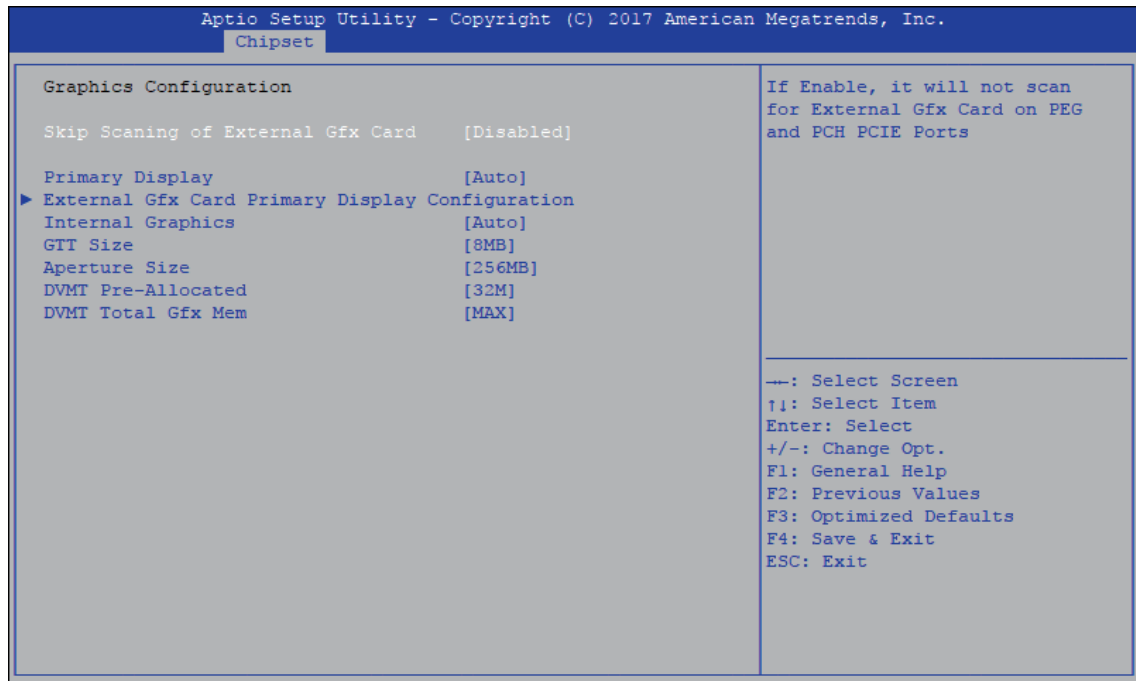


Figure 4-4-1-2 : Graphics Settings

Skip Scanning of External Gfx Card

If Enable, it will not scan for External Gfx Card on PEG and PCH PCIE Ports.

Primary Display

Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.

Internal graphics

Keep IGFX enabled based on the setup options.

GTT Size

Select the GTT Size.

Aperture Size

Select the Aperture Size.

Note : Above 4GB MMIO BIOS assignment is automatically enabled when selecting 2048MB aperture. To use this feature, please disable CSM Support.

DVMT Pre-Allocated

Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.

DVMT Total Gfx Mem

Select DVMT5.0 Total Graphic Memory size used by the Internal Graphics Device.

4.4.1.3 PEG Port Configuration

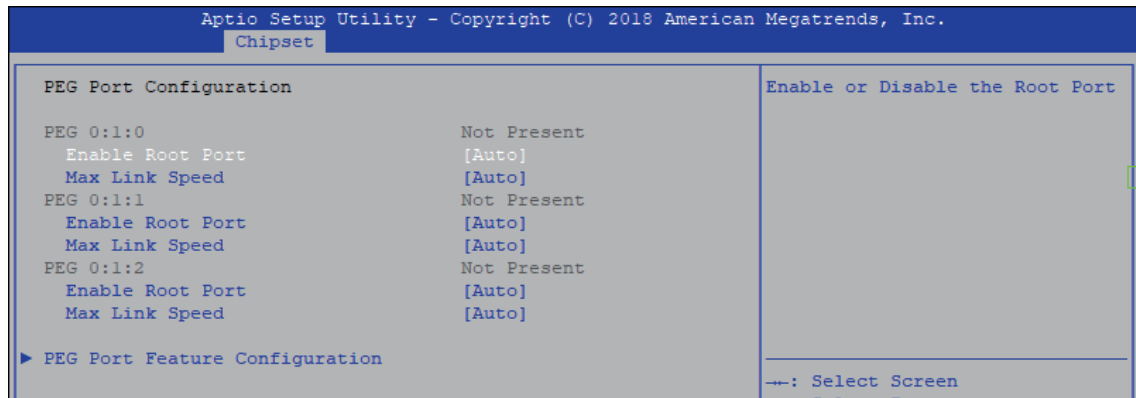


Figure 4-4-1-3 : PEG Port Configuration

PEG port options for PCIe device.

4.4.2 PCH-IO Configuration

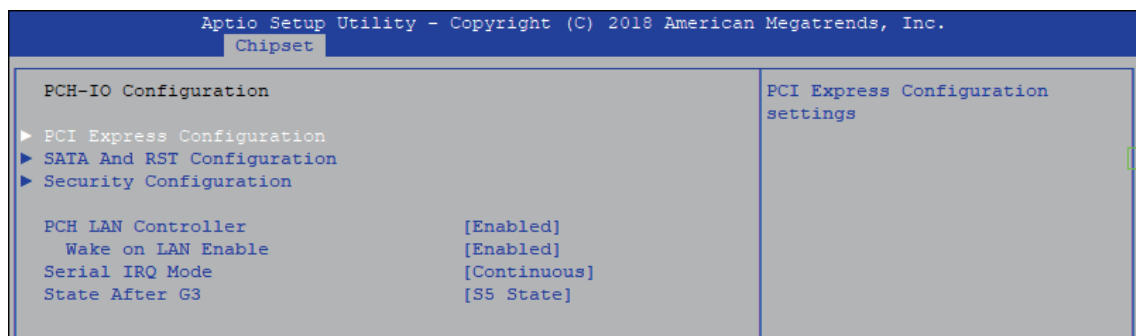


Figure 4-4-2 : PCH-IO Settings

PCH LAN Controller

Enable or disable onboard NIC.

Wake on LAN

Enable or disable integrated LAN to wake the system. (The wake On LAN cannot be disabled if ME is on at Sx state.)

Serial IRQ Mode

Configure serial IRQ mode.

State After G3

Specify what state to go to when power is re-applied after a power failure (G3 state).

S0 State : Always turn-on the system when power source plugged-in.

S5 State : Always turn-off the system when power source plugged-in.

4.4.2.1 PCI Express Configuration of PCH-IO

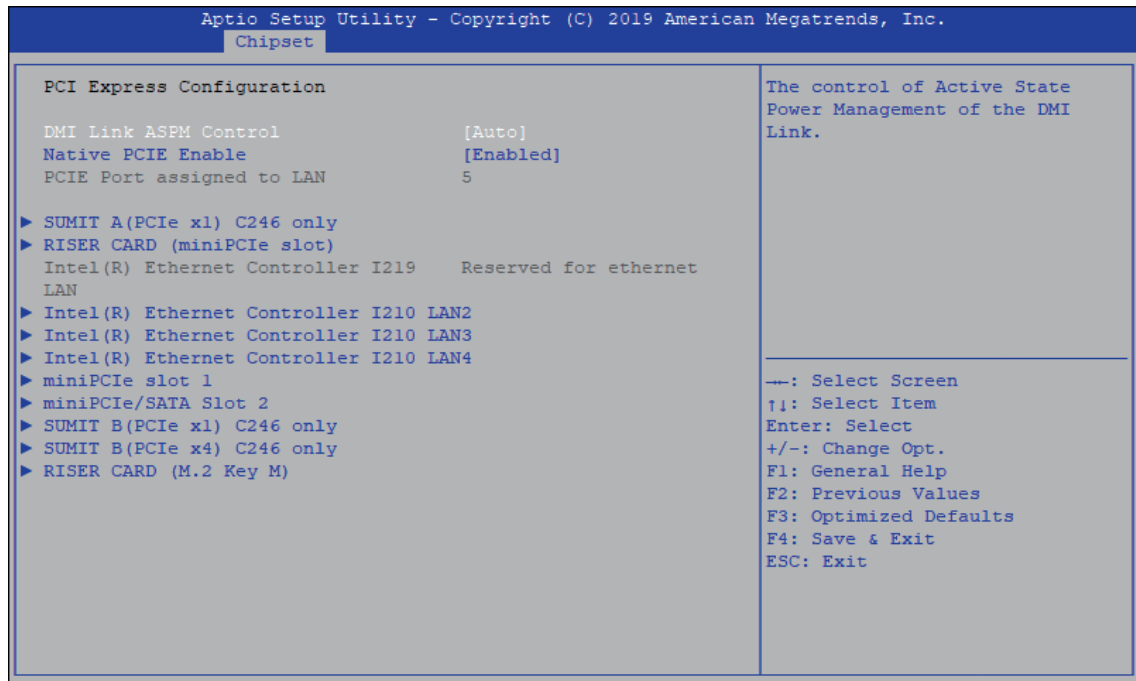


Figure 4-4-2-1 : PCH-IO Settings

DMI Link ASPM Control

Enable/Disable the control of Active State Power Management on SA side of the DMI Link.

Native PCIE Enable

PCIE Express Native Support Enable/Disable.

PCI Express device settings

Bios options for PCI Express device setting.

4.4.2.2 SATA and RST Configuration

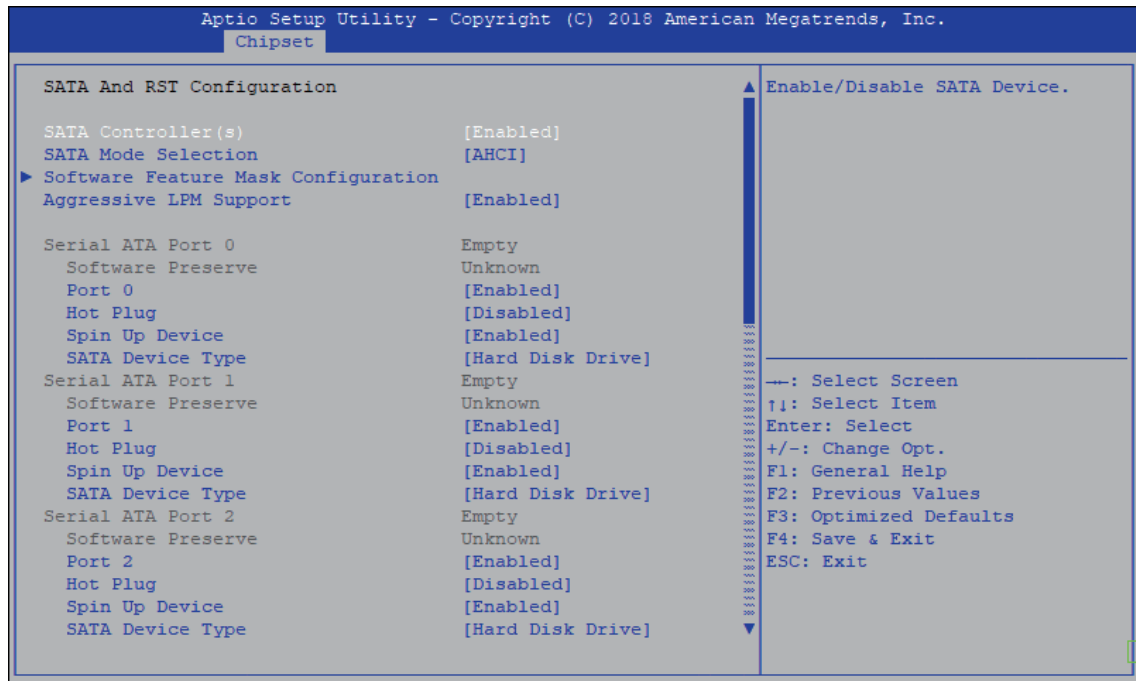


Figure 4-4-2-2 : SATA and RST Settings

SATA Controller(s)

Enable or disable SATA Device.

SATA Mode Selection

Determines how SATA controller(s) operate.

Software Feature Mask Configuration

RAID OROM/RST driver will refer to the SWFM configuration to enable or disable the storage features.

Aggressive LPM Support

Enable PCH to aggressively enter link power state.

Options for each SATA port :

Port n

Enable or disable SATA Port.

Hot Plug

Designated this port as Hot Pluggable.

Spin Up Device

On an edge detect from 0 to 1, the PCH starts a COMRESET initialization sequence to the device.

SATA Device Type

Identifies that the SATA port is connected to solid state drive or hard disk drive.

4.4.2.3 Security Configuration

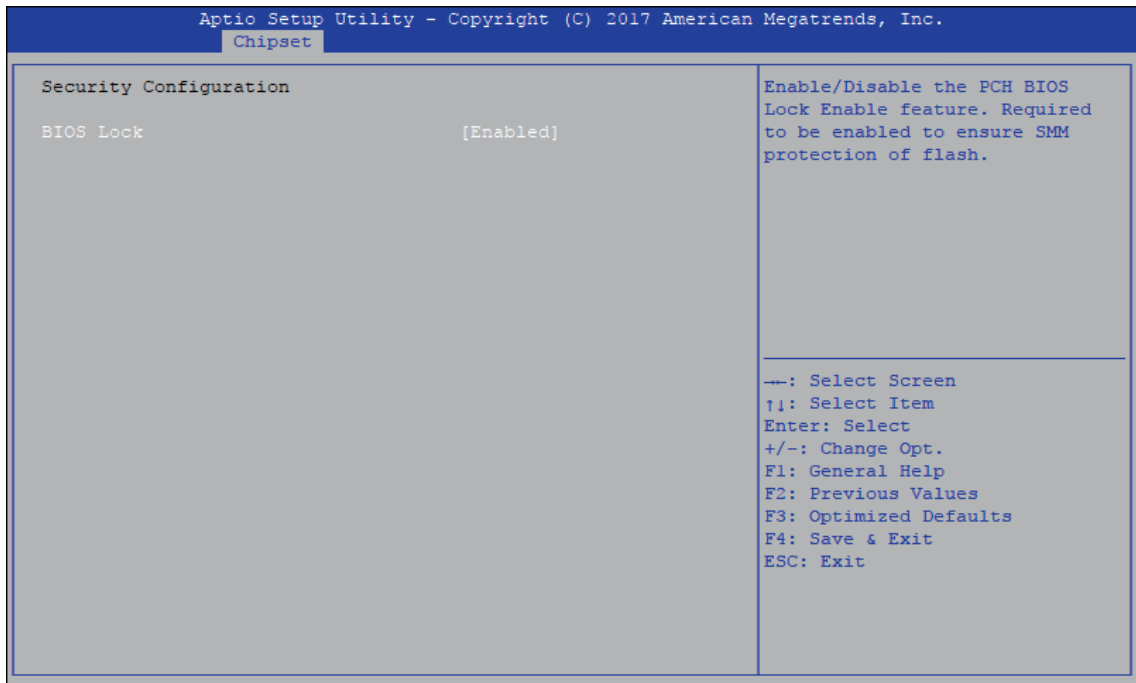


Figure 4-4-2-3 : Security Settings

BIOS Lock

Enable/disable the PCH BIOS Lock Enable (BLE bit) feature.

4.5 Security

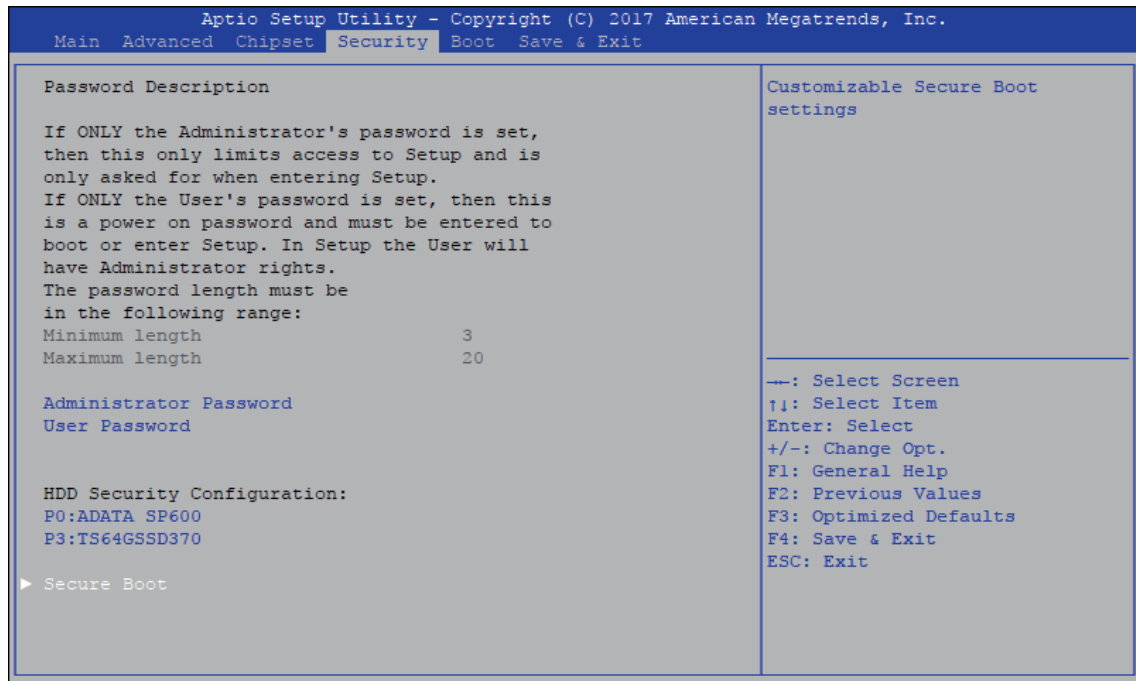


Figure 4-5 : BIOS Security Menu

Administrator Password

Set administrator password.

User Password

Set user password.

Secure Boot

Customizable Secure Boot Settings.

4.5.1 HDD Security Configuration

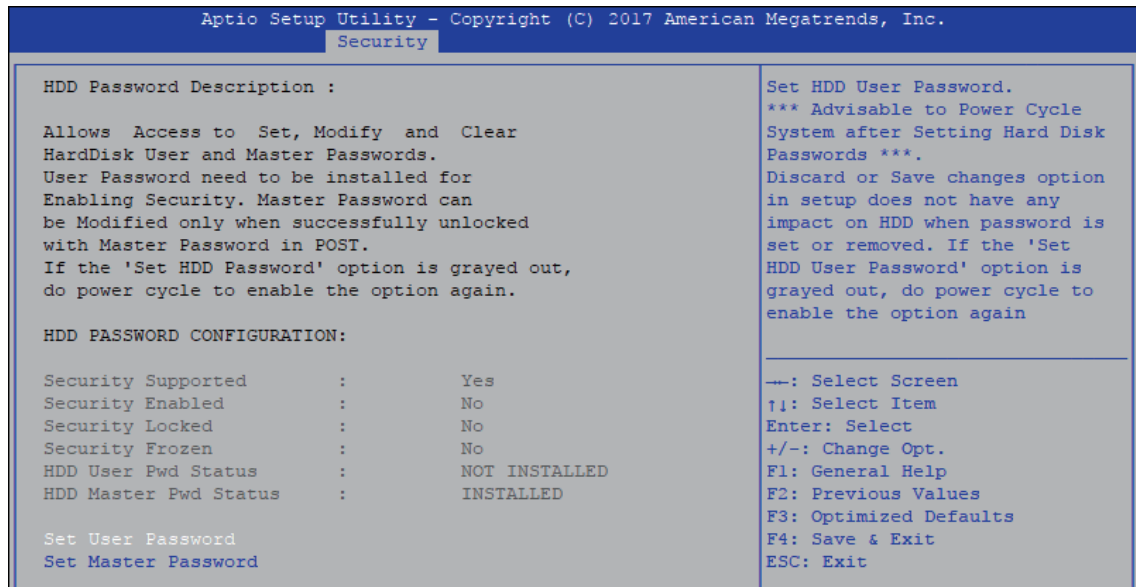


Figure 4-5-1 : HDD Security Settings

Set User Password

Set HDD user password.

*** Advisable to power cycle system after setting hard disk passwords ***

Discard or save changes option in setup does not have any impact on HDD when password is set or removed. If the 'Set HDD User Password' option is gray, do power cycle to enable the option again.

4.5.2 Security Boot

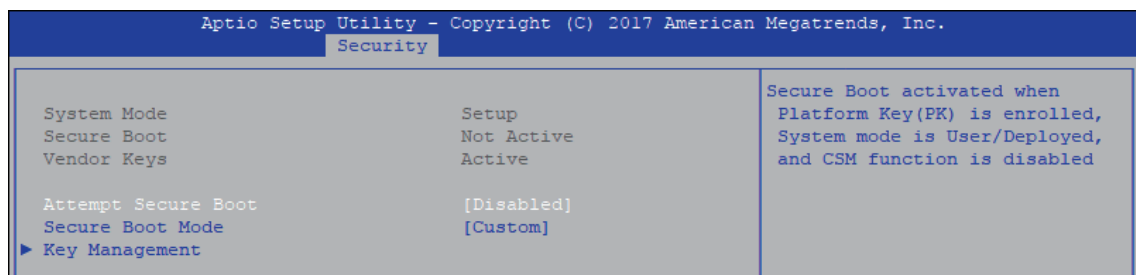


Figure 4-5-2 : Security Boot Settings

Attempt Secure Boot

Secure Boot activated when Platform Key (PK) is enrolled, System mode is User/Deployed, and CSM function is disabled.

Secure Boot Mode

Secure Boot mode selector Standard/Custom.

In custom mode Secure Boot Variables can be configured without authentication

Key Management

Enables expert users to modify Secure boot policy variables without full authentication

4.6 Boot

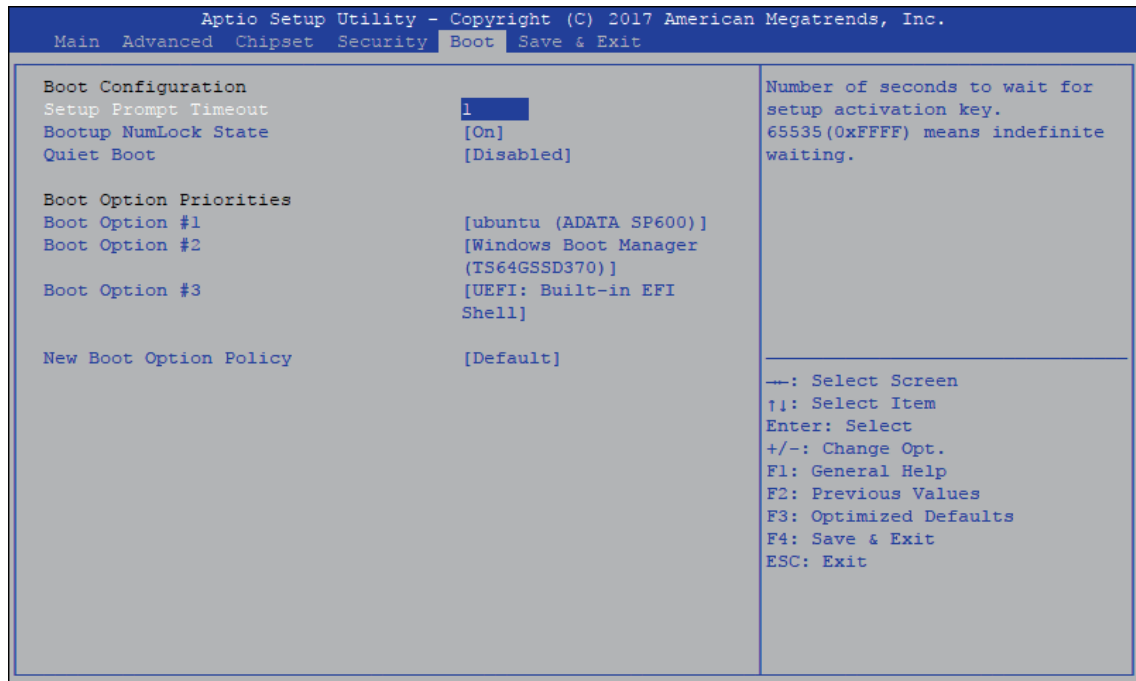


Figure 4-6 : BIOS Boot Menu

Setup Prompt Timeout

Number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Bootup NumLock State

Select the keyboard NumLock state.

Quiet Boot

Enables or disables Quiet Boot option.

Boot Option

Sets the system boot order.

New Boot Option Policy

Controls the placement of newly detected UEFI boot options.

Hard Drive BBS Priorities

Set the order of the Legacy devices in this group.

4.7 Save & Exit

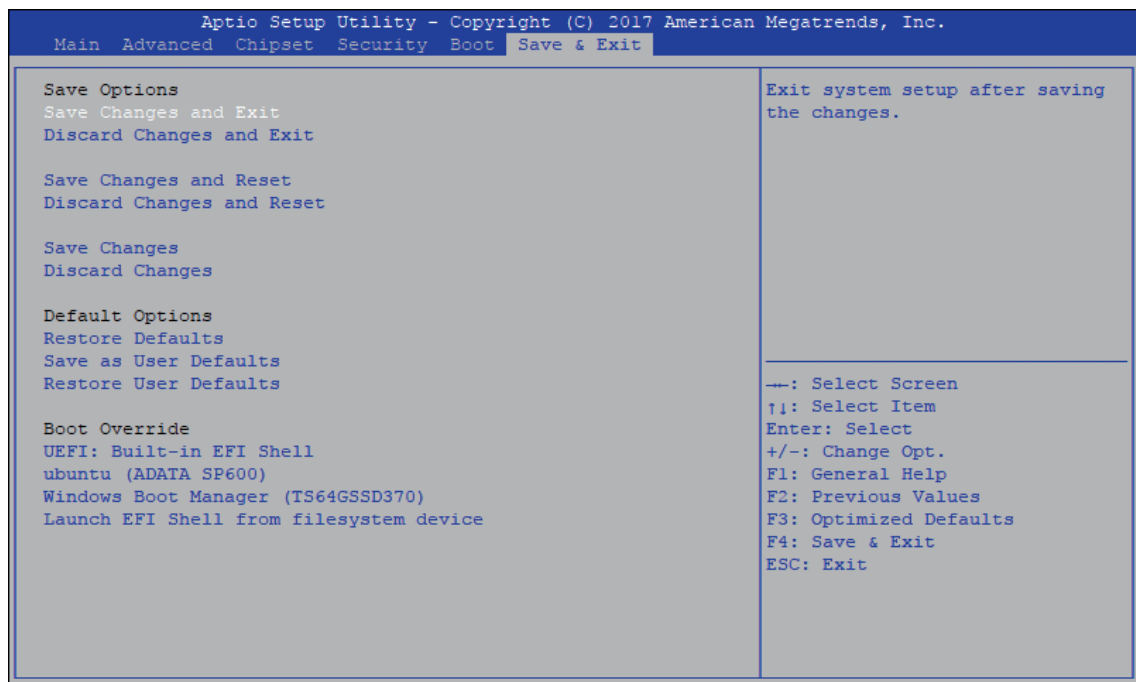


Figure 4-7 : BIOS Save and Exit Menu

Save Changes and Exit

Exit system setup after saving the changes.

Discard Changes and Exit

Exit system setup without saving any changes.

Save Changes and Reset

Reset the system after saving the changes.

Discard Changes and Reset

Reset system setup without saving any changes.

Save Changes

Save Changes done so far to any of the setup options.

Discard Changes

Discard Changes done so far to any of the setup options.
Default Options

Restore Defaults

Restore/Load Default values for all the setup options.

Save as User Defaults

Save the changes done so far as User Defaults.

Restore User Defaults

Restore the User Defaults to all the setup options

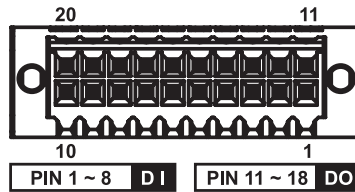
A

APPENDIX A : Isolated DIO Guide

A.1 Function Description

The UMBC-1000 series offers a 16-bit Non-Isolated DIO(GPIO) 20-pin terminal block connector, and a watchdog timer.

GPIO definition is shown below :



Pin No.	GPIO Definition	Pin No.	GPIO Definition
1	GPIO 0	11	GPIO 8
2	GPIO 1	12	GPIO 9
3	GPIO 2	13	GPIO 10
4	GPIO 3	14	GPIO 11
5	GPIO 4	15	GPIO 12
6	GPIO 5	16	GPIO 13
7	GPIO 6	17	GPIO 14
8	GPIO 7	18	GPIO 15
9	NC	19	NC
10	NC	20	NC

A.2 Software Package contain

Distribution folder include x32 and x64 versions, use batch file for installation.

There are included as followed :

Win7_32.bat :

Installation for 32-bit driver

Win7_64.bat :

Windows update package which driver required (need to restart), and Installation for 64-bit driver

Win8_32.bat, Win8_64.bat :

Installation for driver, and guideline to Framework 3.5 distribution for sample

Win10_32.bat, and Win10_64.bat :

Installation for driver, and installation to Framework 3.5 distribution for sample

Uninstall_32.bat, and Uninstall_64.bat :

Uninstallation for driver

Run batch file as Administrator.

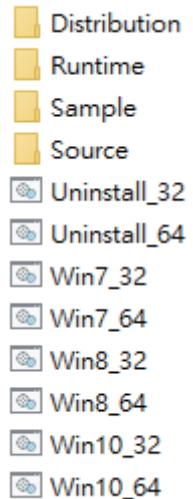
Support Windows 7 above.

Make sure Windows version before installation.

Runtime folder include head file for software developer or System Integration.

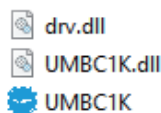
Sample folder include sample program, driver library, and API library. Source

folder include sample program source code that compile on Visual Studio 2008.

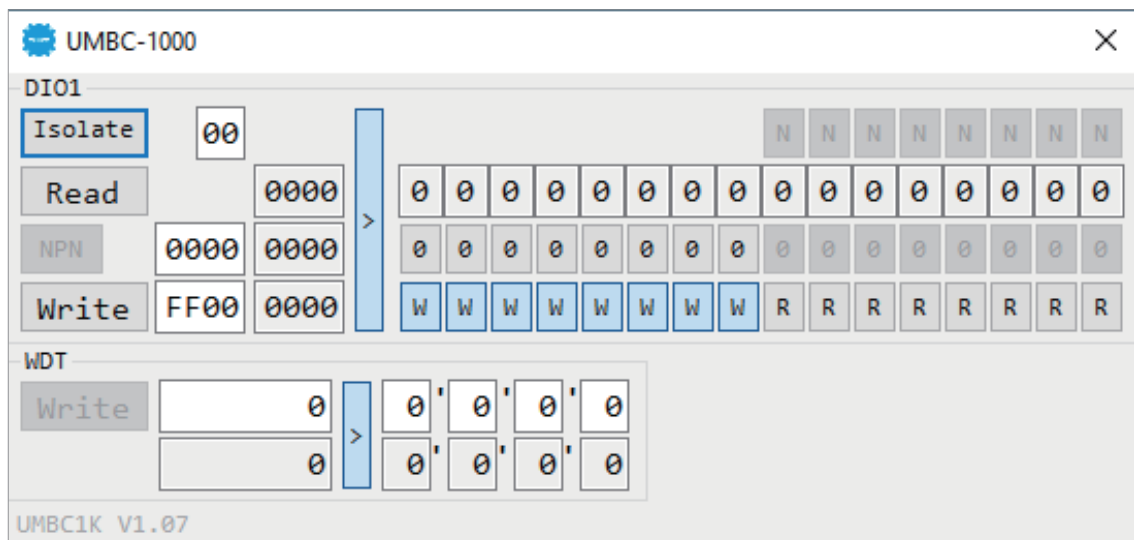


A.3 Sample

Execute DIO demo tool (UMBC1K.exe)



Sample UMBC1K.exe, as shown below :



GPIO group :

Read button :

Set GPIO configuration to get GPIO state.

Write button :

Set GPIO configuration to set GPIO state.

GPIO output text :

User setting, GPIO output state by hexadecimal bitmask - High/Low.

Use for Write button activate.

GPIO writable text :

User setting, GPIO writable of GPIO configuration by hexadecimal bitmask - yes/no.

Use for Read/Write button activate.

GPIO input text (read only) :

GPIO input state by hexadecimal bitmask - High/Low.

Use for Read button activate.

GPIO text (read only) :

GPIO output state with input state and configuration.

Use for Write button activate.

GPIO output text (read only) :

GPIO output state with configuration.

Use for Write button activate.

GPIO input pin text (read only, pin 18 ~ pin 11, pin 8 ~ pin 1) :

GPIO input pin state

Use for Read button activate.

GPIO output pin check button (pin 18 ~ pin 11, pin 8 ~ pin 1) :

User setting, GPIO output pin state

Use for Write button activate.

GPIO pin writable check button (pin 18 ~ pin 11, pin 8 ~ pin 1) :

User setting, GPIO pin writable of GPIO configuration.

Use for Read/Write button activate.

WDT group :

Write button :

Set WDT when WDT setup text is valid.

Stop button :

Cancel WDT and counting.

Use after Write button action.

WDT setup text :

User setting, WDT value, unit : second.

Use for Write button activate.

WDT counting text (read only) :

WDT counting by program timer after set WDT.

Shown after Write button action.

WDT setup day format texts (user setting) :

User setting, WDT value, format : day'hour'minute'second.

WDT counting day format text (read only) :

WDT counting, format : day'hour'minute'second.

B

APPENDIX B : Software Functions

B.1 Driver API Guide

In Runtime folder, on UMBC1K.h :

`_DLL_IMPORT_` definition is used on LoadLibrary API for UMBC1K.dll.
`UMBC1K_EXPORTS` definition is used on UMBC1K.dll building.

BOOL Initial ()

Initial machine for GPIO, and watchdog timer

Return :

TRUE (1) : Success;

FALSE (0) : Fail (Driver not exists, or initial error (version is too old, or machine not match))

BOOL GetGPIOConfig (WORD *Mask)

Get GPIO configuration (by variable)

Mask ([15:0]) : In/Out, pin setting by hexadecimal bitmask

1 : Output;

0 : Input

Return :

TRUE (1) : Success;

FALSE (0) : Fail (Initial error, or call by pointer error, or hardware problem)

BOOL SetGPIOConfig (WORD Mask)

Set GPIO configuration

Mask ([15:0]) : In/Out, pin setting by hexadecimal bitmask

1 : Output;

0 : Input

Return :

TRUE (1) : Success;

FALSE (0) : Fail (Initial error, or hardware problem)

BOOL GetGPIO (WORD *DI)

Get GPIO input

DI ([15:0]) : Input state, pin setting by hexadecimal bitmask

1 : High;

0 : Low

Return :

TRUE (1) : Success;

FALSE (0) : Fail (Initial error, or call by pointer error, or hardware problem)

BOOL SetGPIO (WORD DO)

Set GPIO output

DO ([15:0]) : output state, pin setting by hexadecimal bitmask

1 : High;

0 : Low

Return :

TRUE (1) : Success;

FALSE (0) : Fail (Initial error, or hardware problem)

BOOL GetWDT (DWORD *WDT)

Get watchdog timer setup

WDT : watchdog timer setup

Unit : second. (Range : 0 ~ 65535 sec, 1093 ~ 65535 min (=65580 ~ 3932100 sec))

Return :

TRUE (1): Success;

FALSE (0): Fail (Initial error, or call by pointer error, or hardware problem)

BOOL SetWDT (DWORD WDT)

Set watchdog timer setup

WDT : watchdog timer setup

Unit : second. (Range : 1 ~ 65535 sec, 1093 ~ 65535 min (=65580 ~ 3932100 sec))

Return :

TRUE (1) : Success;

FALSE (0) : Fail (Initial error, or setup 0 error, or hardware problem)

BOOL CancelWDT ()

Cancel watchdog timer

Return :

TRUE (1) : Success;

FALSE (0) : Fail (Initial error, or hardware problem)

C

APPENDIX C : RAID Functions

C.1 SATA Mode for RAID

Please select SATA Device to RAID mode on BIOS menu.

Advanced → SATA Configuration → SATA Mode Selection

Main	Advanced	Chipset	Boot	Security	Save & Exit
SATA Controller(s) [Enabled]					Item Specific Help
SATA Model Selection [AHCI]					

C.2 OS Installation

The system is featured with 8 SATA

You can select one of SATA ports for OS installation

We used internal SATA for Windows 10 OS installation as an example.

C.3 To Install All Device Drivers of the System

The instructions are as follows :

1. To install Chipset driver
2. To install VGA driver
3. To install ME driver (if available)
4. To install Network driver
5. To install Audio driver

C.4 To Install "Intel Rapid Storage Technology" Software

You can get the software from the driver CD.

Also, you can find latest information and software directly from Intel website.

http://www.intel.com/p/en_US/support/highlights/chpsts/ismm

The RAID environment has been done if you completed the steps above.

C.5 To Insert SATA HDD for RAID 1

Please notice, you can use 4 SATA ports for SATA storage devices.

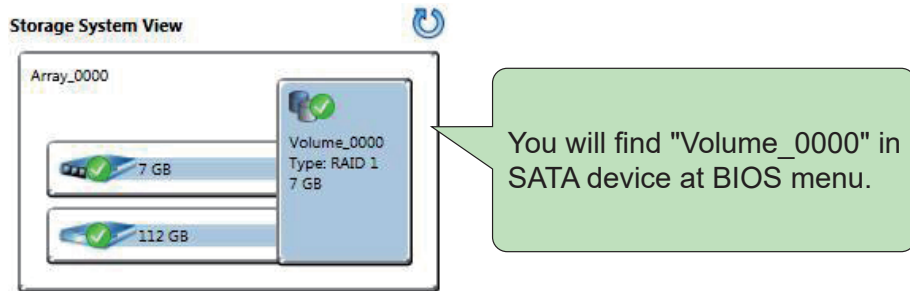
C.6 To Create RAID Volume on "Rapid Storage Technology" Software

The system is featured with two SATA HDD's for RAID volume, so there are two options to choose on this page. Let's take RAID 1 as an example, select "RAID 1".



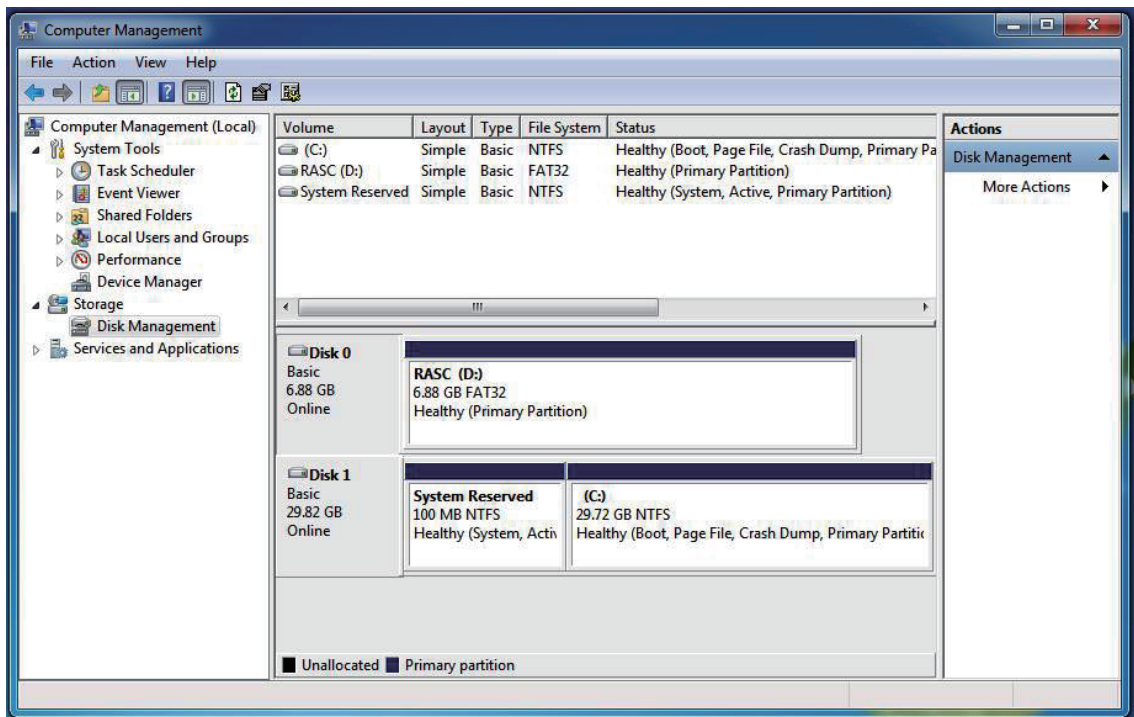
C.7 Disk Management : Partition the Disk

After RAID 1 volume created, you can see the figure of SATA device allocation.



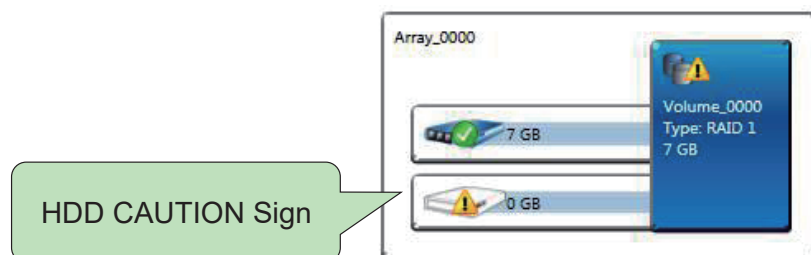
To start disk management tool, select "initialize disk".

Then add "Logical Device" for Windows access.

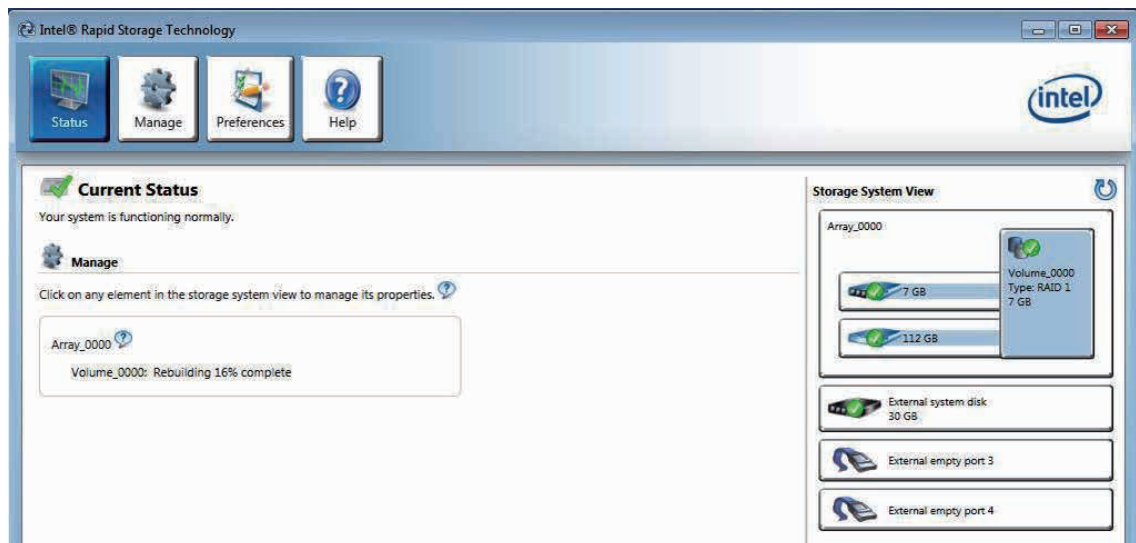


C.8 If One SATA HDD on RAID Volume is Out-of-use

After RAID 1 volume created, you can see the figure of SATA device allocation.



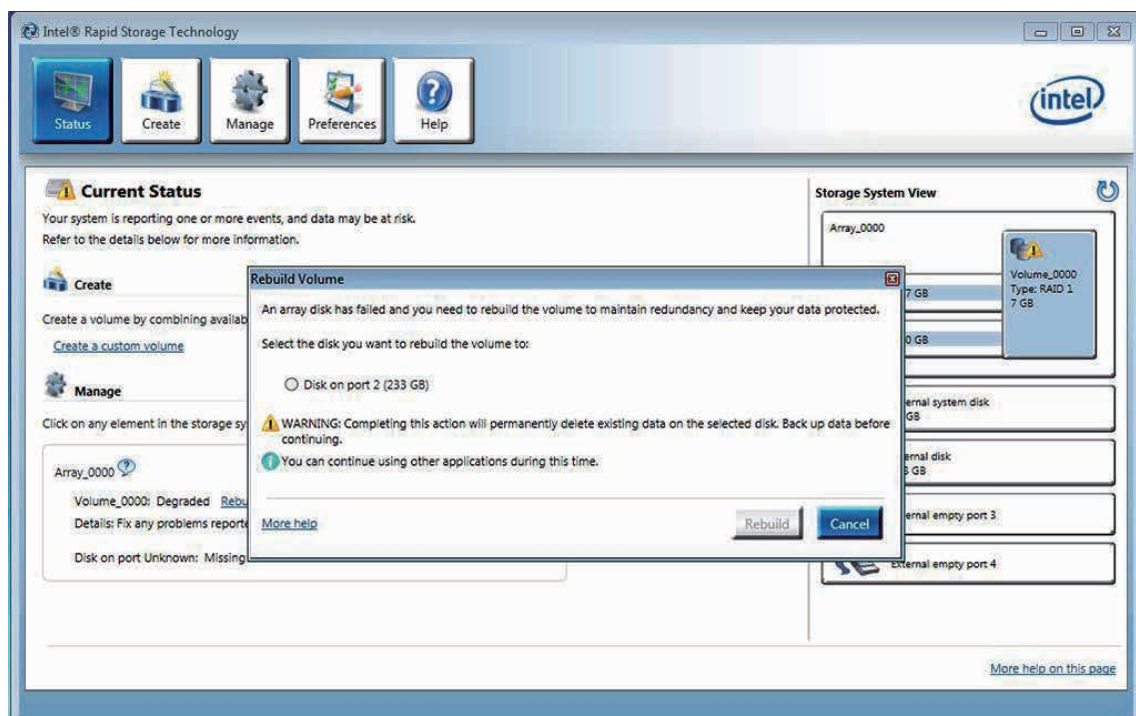
C.9 Recovery and Auto Re-build When Use the SAME RAID HDD



C.10 Recovery and Auto Re-build When Use DIFFERENT RAID HDD

There is a warning will pop-up to ask you if the disk is not a member of original RAID volume.

If you press "Rebuild", it will replace the broken SATA HDD to the last one SATA HDD of RAID volume.



D

APPENDIX D : Power Consumption

Testing Board	UMBC-1000
RAM	16GB * 4
USB-1	USB Keyboard Microsoft Wired Keyboard 600
USB-2	USB Mouse Logitech M105
SATA 0	Innodisk 3MG2-P DGS25-64GD81BC1QC 64GB
Graphics Output	DP
Power Plan	High Performance (Windows10 Power plan)
Power Source	CHANNEL WELL RPG600E-G 600W

D.1 Intel® Xeon® E-2176G 3.70GHz (12M Cache, up to 4.70GHz)

CPU	Power Input	+12V		+5V		+5VSB	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Xeon® E-2176G	ATX	7.250A	87.00W	0.580A	02.90W	0.071A	00.36W

CPU	Power Input	+3.3V	
		Max Current	Max Consumption
Xeon® E-2176G	ATX	0.273A	00.90W

E

APPENDIX E : Supported Memory & Storage List

E.1 Supported Memory List

Testing Board	UMBC-1000
Memory Test	MemTest86 V8.2
BurnInTest	BurnInTest Pro V8.1 (build 1025)

Channel	Memory Test	Burn-in Test	Flash BIOS	Remove Battery	Sleep	Hibernate	Reset	HWiNFO64
*4 (P1_DIMMA1-A4)	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS
*1 (P1_DIMMA1)	PASS	PASS	----	----	PASS	PASS	PASS	PASS
*1 (P1_DIMMA2)	PASS	PASS	----	----	PASS	PASS	PASS	PASS
*1 (P1_DIMMA3)	PASS	PASS	----	----	PASS	PASS	PASS	PASS
*1 (P1_DIMMA4)	PASS	PASS	----	----	PASS	PASS	PASS	PASS

E.2 Supported Non-ECC Memory List

Brand	Info	Test Temp. (Celsius)
Kingston 4GB DDR4-2400 UDIMM	KVR24N17S6/4	25°C
Kingston 16GB DDR4-2400 UDIMM	KVR24N17D8/16	25°C
innodisk 16GB DDR4-2400 UDIMM	M4U0-AGS1KCSJ-H03	25°C
ATLA 8GB DDR4-2666 UDIMM	AD4LSX8GFABB-GTGC	25°C
Panram 8GB DDR4-2666 UDIMM	M418148	25°C
Panram 16GB DDR4-2666 UDIMM	M41A049	25°C
Kingston 16GB DDR4-2666 UDIMM	KVR26N19D8/16	25°C
innodisk 16GB DDR4-2666 UDIMM	M4U0-AGS1KCIK-H03	25°C
ATLA 16GB DDR4-2666 UDIMM	AD4LSX10F1WB-GTGC	25°C

E.3 Supported ECC Memory List

Brand	Info	Test Temp. (Celsius)
MEMXPRO 16GB DDR4-2400 ECC UDIMM	D4V-AG24H1G8C1-T006	25°C
innodisk 16GB DDR4-2400 ECC UDIMM	M4C0-AGS1MCSJ-H03	25°C
Panram 16GB DDR4-2666 ECC UDIMM	M44A012	25°C
innodisk 16GB DDR4-2666 ECC UDIMM	M4C0-AGS1MCIK-H03	25°C
Kingston 16GB DDR4-2666 ECC UDIMM	KSM26ED8/16ME	25°C

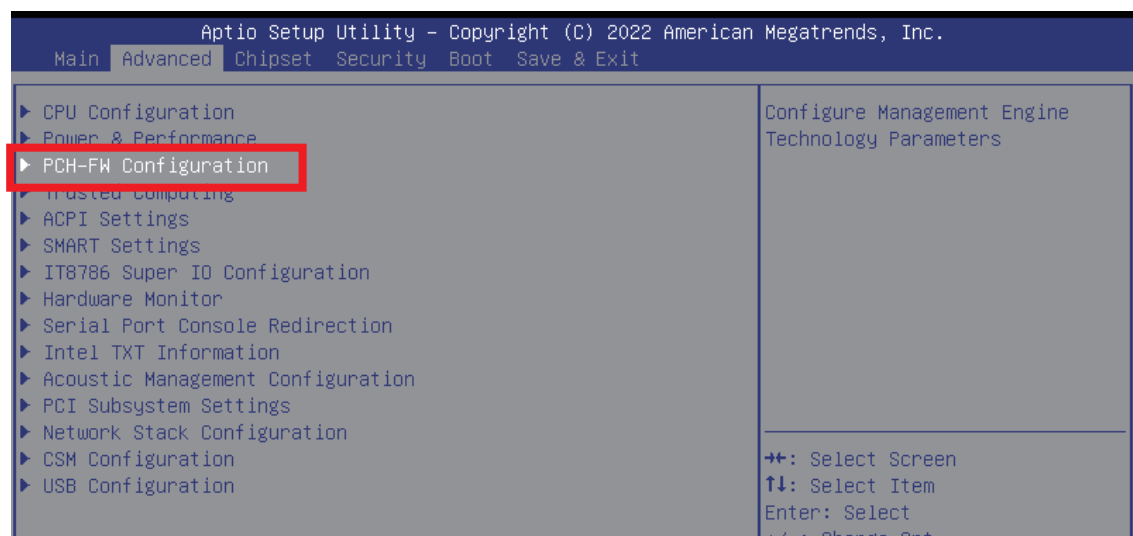
E.4 Supported Storage List

Type	Brand	Model	Capacity
SATA HDD	TOSHIBA	MQ01ABF050	500GB
	HGST	Z5K500-500 HTS545050A7E680	500GB
SATA SSD	Transcend	SSD370 TS64GSSD370	64GB
	Transcend	SSD370 TS64GSSD370I	64GB
	innodisk	3MG2-P DGS25-64GD81BC1QC	64GB
	Kingston	SA400S371120G	120GB
	Intel	540s SSDSC2KW120H6	120GB
	Intel	E 5400s SSDSC2KR120H6	120GB
	MEMXPRO	M3A MI3MA1212802WN	128GB
	FORESEE	S903S128G	128GB
	FORESEE	S903S256G	256GB
	LITE-ON	K8-L1256	256GB
	LITE-ON	K8-L1512	512GB
M.2 PCIe SSD	Intel	SSDPEKKW128G8	128GB
	SAMSUNG	MZ-V7S250	250GB
	FORESEE	P700F256G	256GB
	innodisk	3TG3-P	512GB
	TOSHIBA	KXG50ZNV512G	512GB
	innodisk	3TG3-P	1TB
	innodisk	3TG3-P	2TB

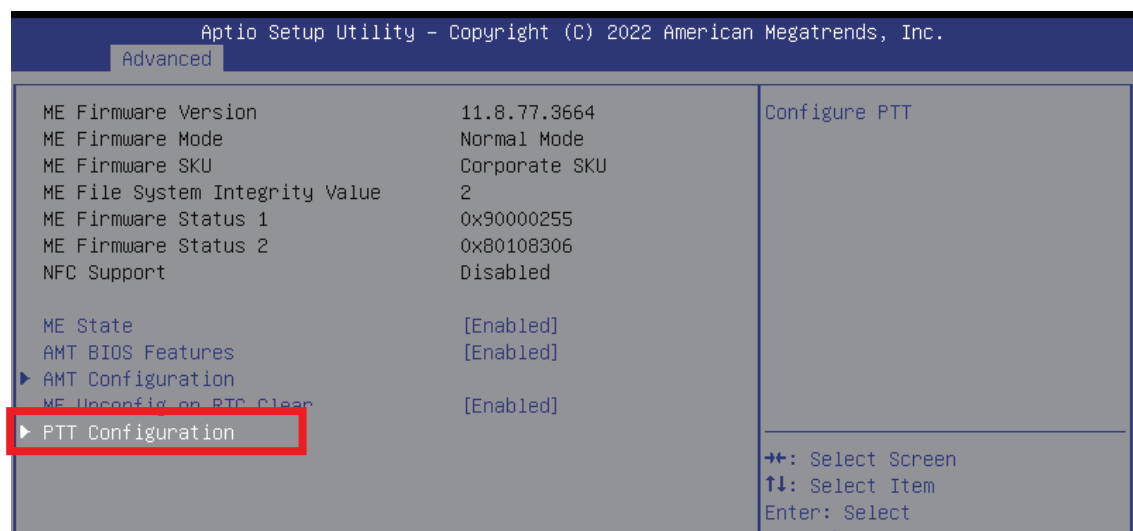
F

APPENDIX F : Install Win11 (BIOS TPM Setting)

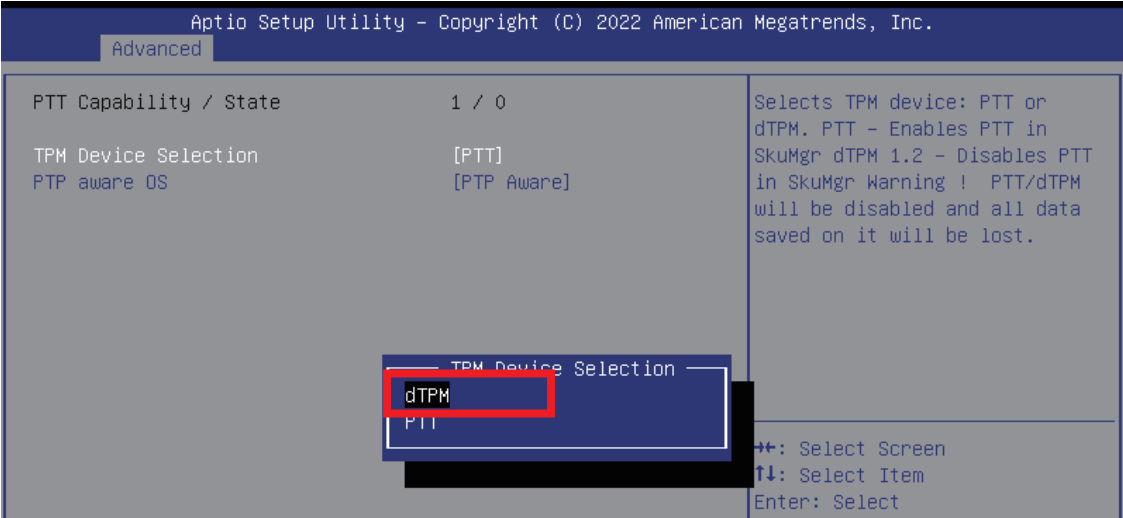
Step 1 Click on “Advanced”, then click on “PCH-FW Configuration”



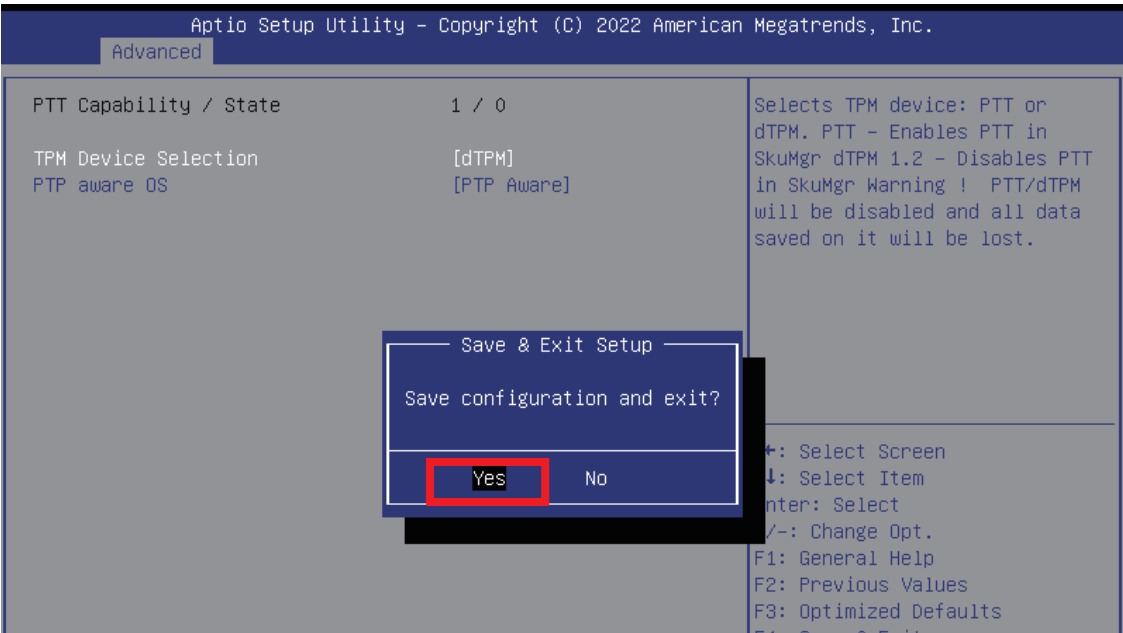
Step 2 Click on “PTT Configuration”



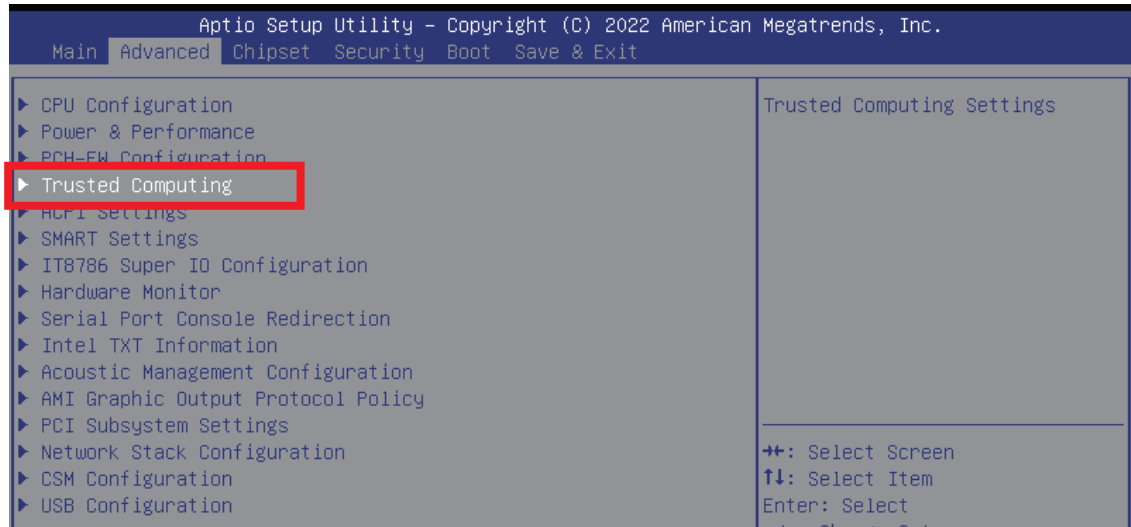
Step 3 Click on “dTPM” (TPM Device Selection)



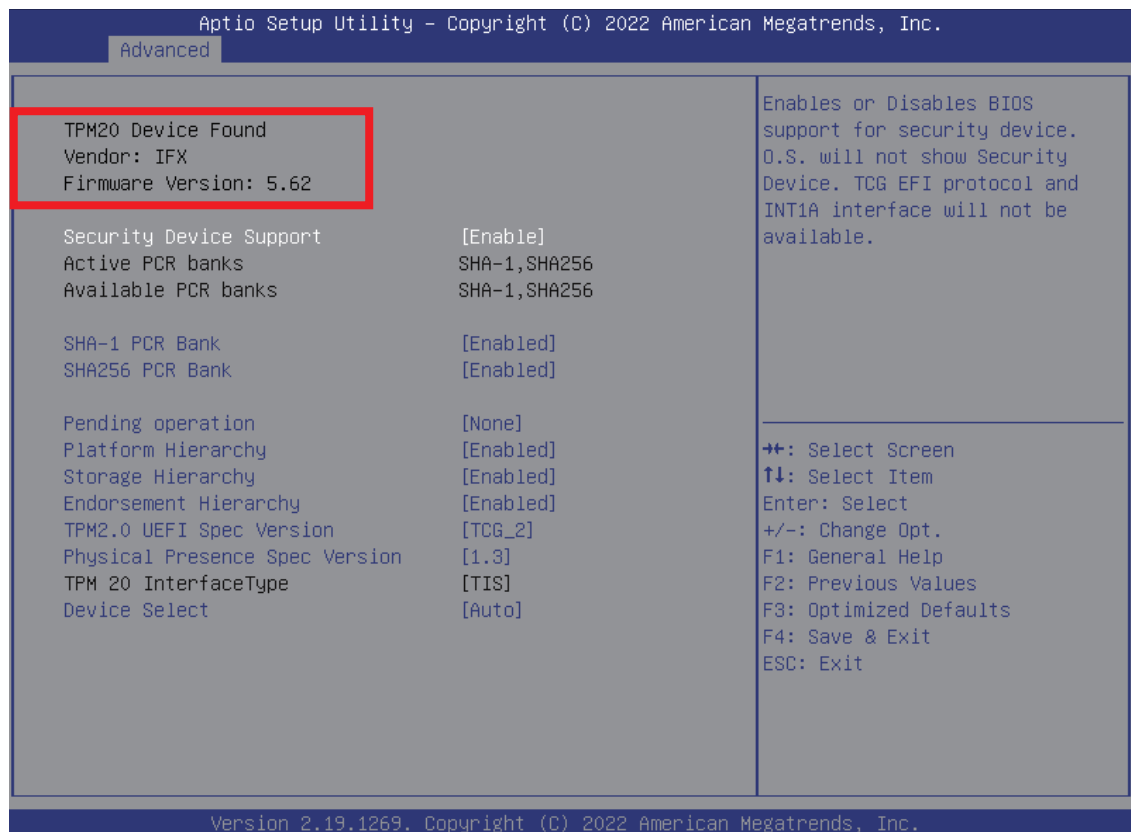
Step 4 Please save the BIOS settings by pressing F4. Please press Enter when the pop-up window which asks “Save configuration and exit?” appears. The computer will then restart.



Step 5 Click on “Trusted Computing”



Step 6 If the window shows “TPM2.0 Device Found Firmware Version:5.62”, then the setting is completed.



** If more help is needed, please contact Vecow technical support **



For further support information, please visit www.vecow.com

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