

# EGS-MX1

Embedded System w/Fan and MXM Graphic Card

## Quick Reference Guide

1<sup>st</sup> Ed – 15 October 2020

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## 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.
- (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRE OPERATION.

THIS EQUIPMENT HAS BEEN TESTED AND FOUND TO COMPLY WITH THE LIMITS FOR A CLASS "A" DIGITAL DEVICE, PURSUANT TO PART 15 OF THE FCC RULES.

THESE LIMITS ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST HARMFUL INTERFERENCE WHEN THE EQUIPMENT IS OPERATED IN A COMMERCIAL ENVIRONMENT. THIS EQUIPMENT GENERATES, USES, AND CAN RADIATE RADIO FREQUENCY ENERGY AND, IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTION MANUAL, MAY CAUSE HARMFUL INTERFERENCE TO RADIO COMMUNICATIONS.

OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE HARMFUL INTERFERENCE IN WHICH CASE THE USER WILL BE REQUIRED TO CORRECT THE INTERFERENCE AT HIS OWN EXPENSE.

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To receive the latest version of the user's manual; please visit our Web site at:

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# Content

<b>1. Getting Started .....</b>	<b>7</b>
1.1 Safety Precautions .....	7
1.2 Packing List .....	7
1.3 System Specifications .....	8
1.4 System Overview.....	11
1.4.1 Front View .....	11
1.4.2 Rear View.....	11
1.5 System Dimensions.....	12
<b>2. Hardware Configuration.....</b>	<b>13</b>
2.1 EGS-MX1 connector mapping.....	14
2.1.1 Serial Port 1 connector (COM1).....	14
2.1.2 Serial Port 2 connector (COM2).....	14
2.1.3 General purpose I/O connector (GPIO) .....	15
2.1.4 DC power-in connector (DC-in).....	16
2.2 EEV-MX01 Overviews .....	17
2.3 EEV-MX01 Jumper & Connector list.....	18
2.4 EEV-MX01 Jumpers & Connectors settings .....	19
2.4.1 Multi-function select (SW1) .....	19
2.4.2 Clear CMOS (JBAT1) .....	20
2.4.3 Power connector (PWR1) .....	20
2.4.4 General Purpose I/O connector (DIO1) .....	21
2.4.5 General Purpose I/O connector (DIO2) .....	21
2.4.6 CPU Fan connector (CPUFAN1) .....	22
2.4.7 MXM Fan connector (JMXMFAN1).....	22
2.4.8 System Fan connector (JSYSFAN1) .....	23
2.4.9 Front panel connector (JFP1) .....	23
2.4.10 Battery connector (BH1) .....	24
2.4.11 LPC port connector (JLPC1) .....	24
2.4.12 SATA power connector 1 (SATAPW1).....	25
2.4.13 SATA power connector 2 (SATAPW2).....	25
2.4.14 Serial port 1 connector (JCOM1).....	26
2.4.15 Serial port 2 connector (JCOM2).....	26
2.4.16 COM Express connector (CN1).....	27
2.4.16.1 Signal Description – COM Express connector (CN1).....	35
2.4.16.1.1 Audio Signals .....	35

## EGS-MX1

2.4.16.1.2 Gigabit Ethernet Signals .....	35
2.4.16.1.3 PCI Express Signals .....	35
2.4.16.1.4 LPC Signals.....	35
2.4.16.1.5 GPIO Signals.....	36
2.4.16.1.6 Power & System Management Signals.....	36
2.4.16.1.7 SATA Signals .....	36
2.4.16.1.8 USB Signals .....	36
2.4.16.1.9 I2C Signals .....	37
2.4.16.1.10 USB3.0 Signals .....	37
2.4.16.1.11 DDI Signals .....	37
2.4.16.1.12 USB3.0 Signals .....	37
2.4.16.1.13 DDI Signals .....	38
2.4.16.1.14 PEG PCI Express Lanes Signals.....	38
2.5 Installing Hard Disk & Memory (EGS-MX1) .....	39
2.6 Installing M.2 B-key/E-key cards (EGS-MX1) .....	41
2.7 Installing Mini PCIe card (EGS-MX1) .....	42
2.8 Installing COMe / Cooler (EGS-MX1) .....	43
2.9 Installing MXM card w/Cooler (EGS-MX1) .....	44
<b>3.BIOS Setup .....</b>	<b>45</b>
3.1 Introduction.....	46
3.2 Starting Setup.....	46
3.3 Using Setup .....	47
3.4 Getting Help.....	48
3.5 In Case of Problems .....	48
3.6 BIOS setup .....	49
3.6.1 Main Menu .....	49
3.6.1.1 System Language.....	50
3.6.1.2 System Date .....	50
3.6.1.3 System Time.....	50
3.6.2 Advanced Menu .....	51
3.6.2.1 CPU Configuration.....	51
3.6.2.1.1 CPU – Power Management Control .....	52
3.6.2.2 PCH-FW Configuration.....	53
3.6.2.2.1 OEM Flags Settings.....	54
3.6.2.2.2 Firmware Update Configuration.....	54
3.6.2.3 Trusted Computing .....	55
3.6.2.4 APCI Settings .....	55
3.6.2.5 NCT6106D Super IO Configuration.....	56
3.6.2.5.1 Serial Port 2 Configuration .....	57
3.6.2.5.2 Serial Port 5 Configuration .....	57

## 4 EGS-MX1 Quick Reference Guide

3.6.2.6	NCT6106D HW Monitor .....	58
3.6.2.6.1	Smart Fan Function .....	58
3.6.2.7	IT8528SEC Super IO Configuration .....	59
3.6.2.7.1	SER0_TX/SER0_RX (JCN3) Configuration .....	60
3.6.2.7.2	SER1_TX/SER1_RX (JCN3) Configuration .....	60
3.6.2.8	H/W Monitor .....	61
3.6.2.8.1	Smart Fan Mode Configuration .....	61
3.6.2.9	S5 RTC Wake Settings.....	62
3.6.2.10	Serial Port Console Redirection .....	64
3.6.2.10.1	COM0 .....	65
3.6.2.10.2	Legacy Console Redirection Settings .....	66
3.6.2.10.3	Console Redirection Settings .....	67
3.6.2.11	USB Configuration .....	68
3.6.2.12	NVMe Configuration .....	69
3.6.2.13	Network Stack Configuration .....	69
3.6.3	Chipset .....	71
3.6.3.1	System Agent (SA) Configuration.....	71
3.6.3.1.1	Memory Configuration .....	72
3.6.3.1.2	Graphics Configuration.....	73
3.6.3.1.3	DMI/OPI Configuration .....	74
3.6.3.1.4	PEG Port Configuration .....	74
3.6.3.1.4.1	PEG Port Feature Configuration .....	75
3.6.3.2	PCH-IO Configuration.....	76
3.6.3.2.1	PCI Express Configuration .....	76
3.6.3.2.1.1	PCI Express Root Port 9 (NC) .....	77
3.6.3.2.1.2	PCI Express Root Port 21 (M2KB1 x2).....	78
3.6.3.2.1.3	PCI Express Root Port 22 (M2KB1 x2).....	79
3.6.3.2.1.4	PCI Express Root Port 23.....	80
3.6.3.2.1.5	PCI Express Root Port 24.....	81
3.6.3.2.2	SATA And RST Configuration .....	82
3.6.3.2.2.1	Software Feature Mask Configuration .....	83
3.6.3.2.3	USB Configuration .....	83
3.6.3.2.4	Security Configuration .....	84
3.6.3.2.5	HD Audio Configuration .....	85
3.6.3.2.6	SCS Configuration .....	85
3.6.3.3	Board & Panel Configuration .....	86
3.6.4	Security .....	87
3.6.4.1	Secure Boot .....	87
3.6.4.1.1	Key Management.....	88
3.6.5	Boot .....	89

**EGS-MX1**

3.6.6    Save and exit ..... 90

    3.6.6.1    Save Changes and Reset..... 90

    3.6.6.2    Discard Changes and Reset..... 90

    3.6.6.3    Restore Defaults ..... 90

# 1. Getting Started

## 1.1 Safety Precautions

### Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

### Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

## 1.2 Packing List

- 1 x EGS-MX1 system
- Other major components include the followings:
  - Wall mount
  - Screw kit
  - Adapter (optional)
  - Power cord (optional)



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If any of the above items is damaged or missing, contact your retailer.

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## 1.3 System Specifications

System	
CPU	Core™ i7-9850HE 45W (35W cTDP), 6C/GT2 (non-ECC) Core™ i5-8400H 45W (35W cTDP), 4C/GT2 (non-ECC) Core™ i3-9100HL 25W, 4C/GT2 (ECC/non-ECC)
SBC	ESM-CFH+EEV-MX01+MXM graphic card (MXM card optional)
BIOS	AMI uEFI BIOS, 128 Mbit SPI Flash ROM iAMT 12.0 supported (only on specific models with i7/i5 SKU)
System Chipset	QM370
I/O Chip	NCT6106D
System Memory	Up to 3x 260-pin DDR4-2400/2133 SO-DIMM with up to 96 GByte, depends on CPU sku.
Watchdog Timer	H/W Reset, 1sec. ~ 65535sec. and 1sec./step
Battery	1 x RTC Battery 2-Pin Wafer
H/W Status Monitor	Monitoring System Temperature, Voltage and FAN Status with Auto Throttling Control
Expansion	
Expansion	1 x M.2 Key-B 2242/3042/2260/2280 signal support SATA/ 2x PCIe x 1/ USB2.0 1 x M.2 Key-E 2230 for Wi-Fi & BT Module (PCIe/USB2.0) 1 x Full/Half Size mini PCIe (PCIe + USB2.0) 1 x Type A/B MXM Slot
Storage	
Combination	1 x 2.5" internal Drive Bay 1 x M.2 Key-B 2242/2280, support SATA
Edge I/O	
USB Port	4 x USB 3.2 Gen.1 Type-A (Gen. depends on COMe module, contain 4 x USB2.0 signal)
Button	1 x Push Button for Power on/off, w/ LED
SIM slot	2 x internal SIM slot
LED	1 x Power LED (blue) 1 x Storage LED (red)
Serial Port	2 x RS-232 (via cable)
LAN	2 x RJ45
Audio	1 x Mic-In, 1 x Line-Out
GPIO	1 x 8/16 bit GPIO (via cable) 8-bit as default, 16-bit as optional
Others	4 x Antenna with dust cover (2 x LTE+GPS / 2 x Wifi)



Display	
Chipset	<ul style="list-style-type: none"> <li>- Intel® Coffee Lake Processor integrated Graphics</li> <li>- MXM GPU</li> </ul>
Display Interface	<ul style="list-style-type: none"> <li>- 3 x HDMI1.4 from COMe (depends on COMe module)</li> <li>- 4 x HDMI2.0 from MXM Graphic (depends on MXM module)</li> </ul>
Resolution	<ul style="list-style-type: none"> <li>- 3 x HDMI 1.4: 4096x2160 @30Hz (from COMe)</li> <li>- 4 x HDMI 2.0: 4096x2160 @60Hz (from MXM)</li> </ul>
Multiple Display	7 displays
Ethernet	
Chipset	1 x Intel i219-LM 1 x Intel i210-AT
Ethernet Interface	2 x 10/100/1000Base-Tx GbE compatible.
Audio	
Chipset	Realtek ALC892 HD codec
Audio Interface	Mic-In, Line-Out
Mechanical & Environmental	
Power Connector	10 pin DC power-in connector (DC-in) (not Intel ATX12VO 10-pin spec., and pin define please refer to P.16)
Power Requirement	+12Vdc (±5%)
Power Type	ATX/AT mode, default set as ATX.
ACPI	Single power ATX Support S0,S3, S4, S5 ACPI 5.0 Compliant
Dimension (W x L x H)	240mm x 240mm x 85mm
Weight	3.2kg
Color	Avalue Box PC family design
Mounting Kit	Wall mount kit (standard)
Reliability	
Vibration Test (operation)	1. PSD: 0.0454G <sup>2</sup> /Hz , 1.5 Grms 2. Operation mode 3. Test Frequency : 5-500Hz 4. Test Axis : X,Y and Z axis 5. 30 minutes per each axis 6. IEC 60068-2-64 Test:Fh
Vibration Test (non-operation)	1. Test Acceleration : 2G 2. Test frequency : 5~500 Hz 3. Sweep : 1 Oct/ per one minute. (logarithmic) 4. Test Axis : X,Y and Z axisTest time :30 min. each axis 5. System condition : Non-Operating mode

## EGS-MX1

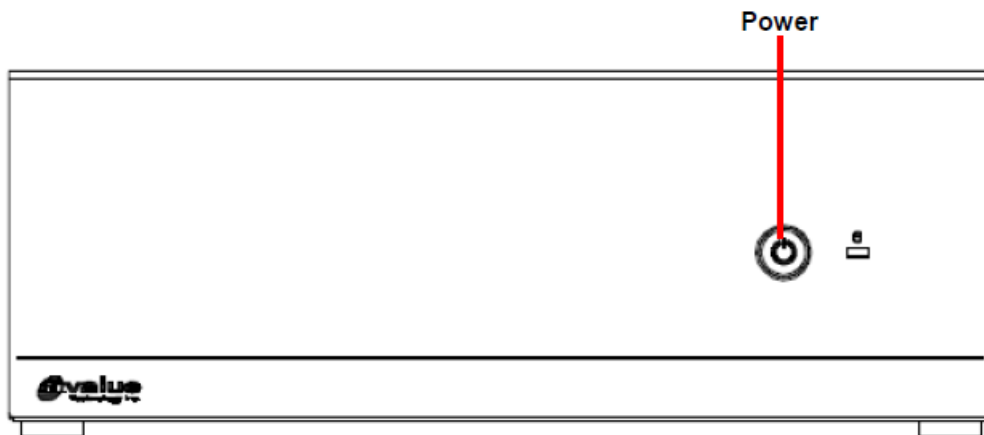
	6. Reference IEC 60068-2-6 Testing procedures
<b>Package vibration test</b>	<ol style="list-style-type: none"> <li>1. PSD: 0.026G<sup>2</sup>/Hz , 2.16 Grms</li> <li>2. Non-operation mode</li> <li>3. Test Frequency : 5-500Hz</li> <li>4. Test Axis : X,Y and Z axis</li> <li>5. 30 min. per each axis</li> <li>6. IEC 60068-2-64 Test:Fh</li> </ol>
<b>Shock</b>	<ol style="list-style-type: none"> <li>1. Wave form : Half Sine wave</li> <li>2. Acceleration Rate : 10g for operation mode</li> <li>3. Duration Time : 11ms</li> <li>4. No. of Shock : Z axis 300 times</li> <li>5. Test Axis: Z axis</li> <li>6. Operation mode</li> <li>7. Reference IEC 60068-2-27 Testing procedures Test Eb : Shock Test</li> </ol>
<b>Package Drop Test</b>	<ol style="list-style-type: none"> <li>1. One corner , three edges, six faces</li> <li>2. ISTA 2A, IEC-60068-2-32 Test:Ed</li> </ol>
<b>Operating Temperature</b>	0°C ~ 50°C (w/SSD) ambient w/ 0.2 air flow
<b>Operating Humidity</b>	40°C @ 95% Relative Humidity, Non-condensing
<b>Storage Temperature</b>	-40°C ~ 75°C (-40°F ~ 167°F)
<b>Certification</b>	CE, FCC Class A
<b>OS Supported</b>	Windows 10 (64-bit), Linux
<b>Reliability</b>	
<b>M3N1030-JN</b>	3.1 Type A, NVIDIA GT 1030
<b>M3N1050TI-LN</b>	3.1 Type A, NVIDIA GTX 1050Ti
<b>M3N1060-MN</b>	3.1 Type B, NVIDIA GTX 1060
<b>ESM-CFH-8400H</b>	Core™ i5-8400H 45W (35W cTDP), 4C/GT2 (non-ECC)
<b>ESM-CFH-9100HL</b>	Core™ i3-9100HL 25W, 4C/GT2 (ECC/non-ECC)



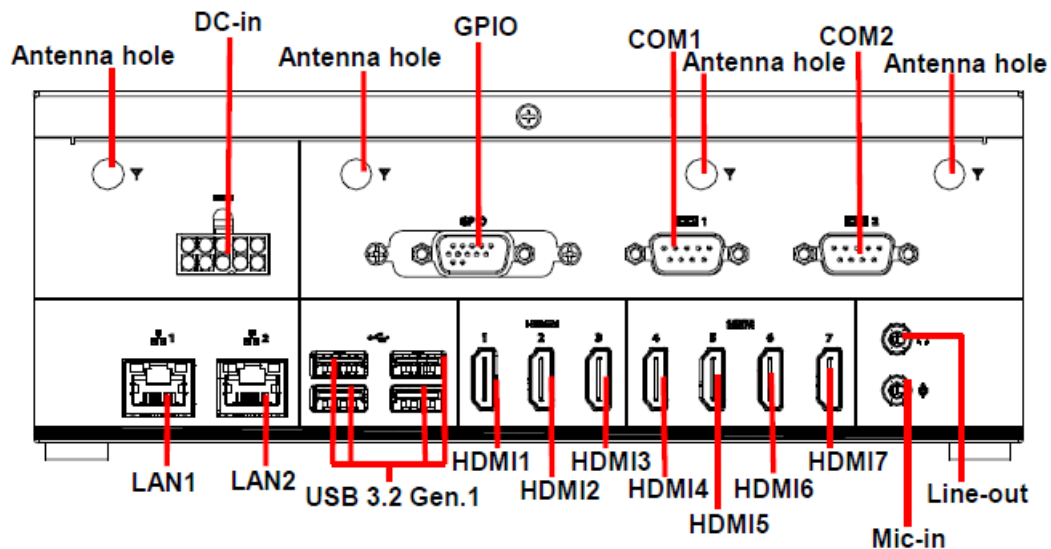
**Note:** Specifications are subject to change without notice.

## 1.4 System Overview

### 1.4.1 Front View



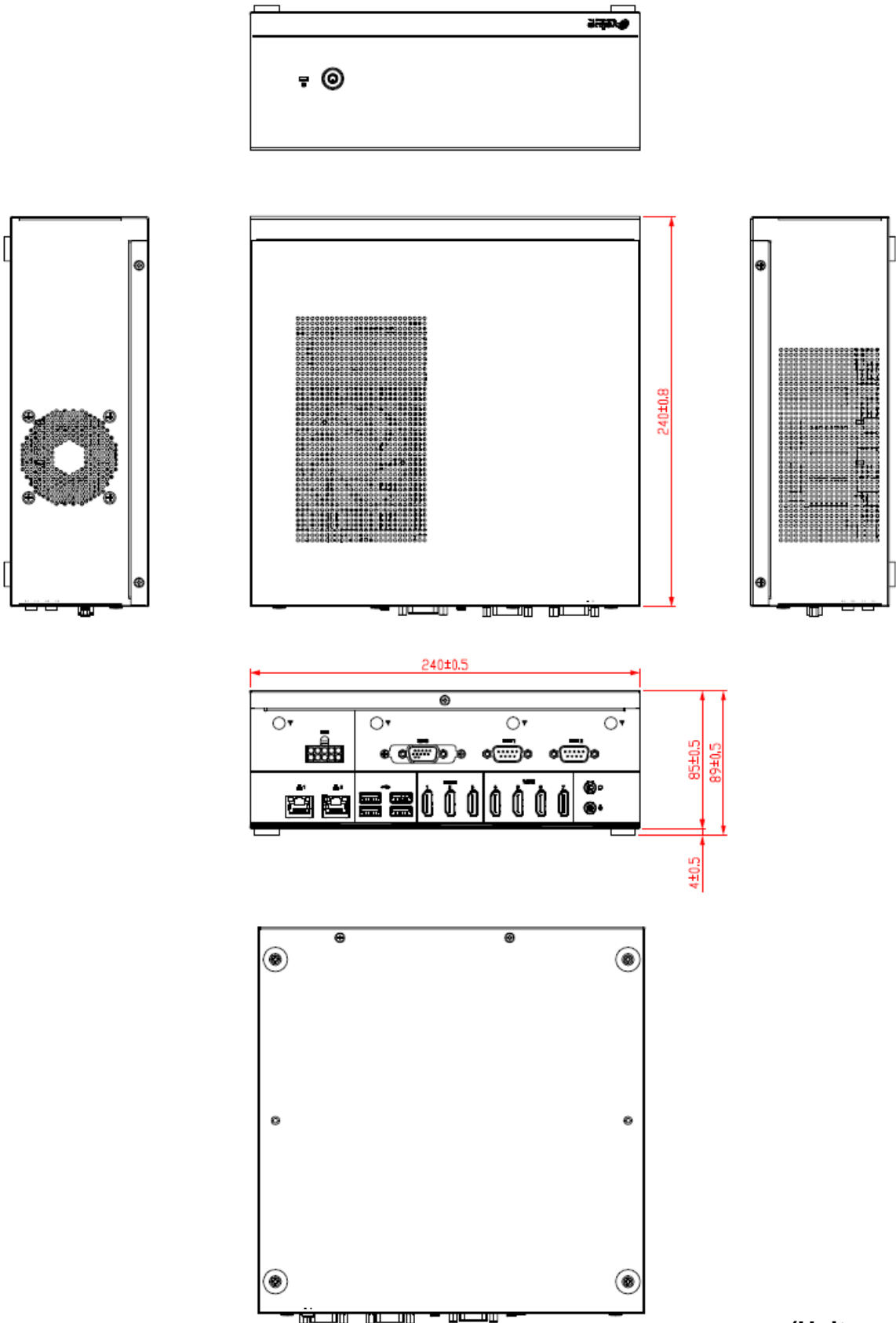
### 1.4.2 Rear View



### Connectors

Label	Function	Note
Power	Power on button	
USB 3.2 Gen 1	4 x USB 3.2 Gen 1 connector	
GPIO	General purpose I/O connector	
Line-out	Line-out jack	
Mic-in	Mic-in audio jack	
LAN1/2	2 x RJ-45 Ethernet connector	
COM1/2	Serial port 1/2 connector	
DC-in	DC power-in connector	
HDMI	7 x HDMI connector	
Antenna hole	4 x Antenna hole	

1.5 System Dimensions



(Unit: mm)

## 2. Hardware Configuration

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For advanced information, please refer to:

- 1- EEV-MX01 included in this manual.

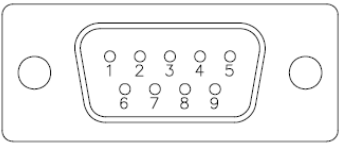
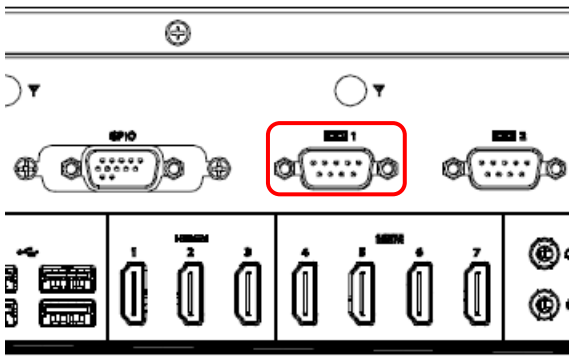


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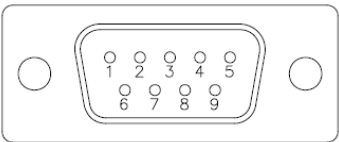
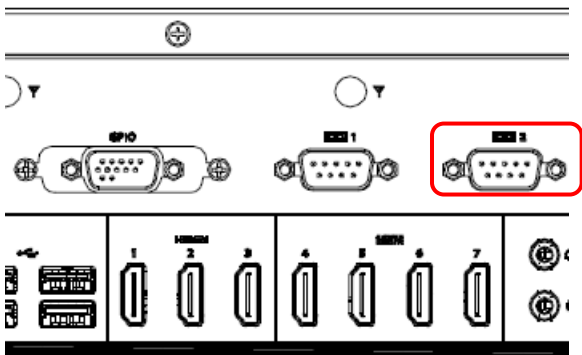
2.1 EGS-MX1 connector mapping

2.1.1 Serial Port 1 connector (COM1)



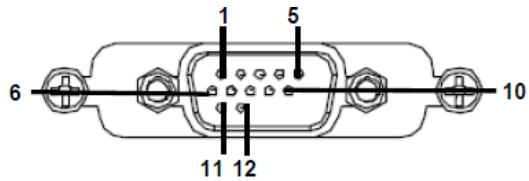
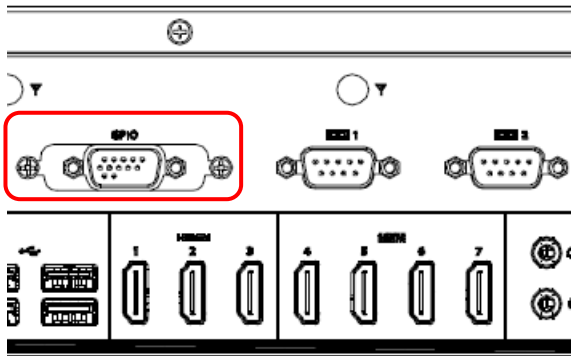
Signal	PIN	PIN	Signal
NDCD#	1	6	NDSR#
NRXD	2	7	NRTS#
NTXD	3	8	NCTS#
NDTR#	4	9	NRI#
GND	5		

2.1.2 Serial Port 2 connector (COM2)



Signal	PIN	PIN	Signal
NDCD#	1	6	NDSR#
NRXD	2	7	NRTS#
NTXD	3	8	NCTS#
NDTR#	4	9	NRI#
GND	5		

2.1.3 General purpose I/O connector (GPIO)



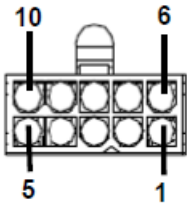
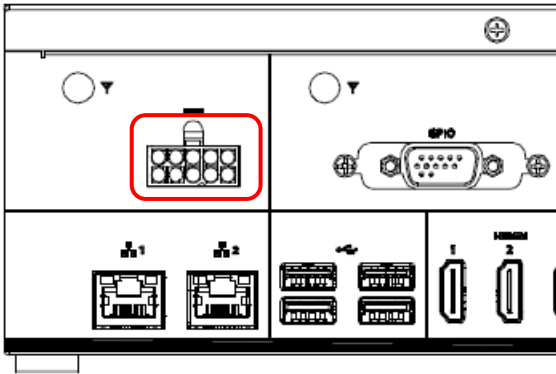
GPIO 8 bit (default)

Signal	PIN	PIN	Signal
DIO_OUT0	1	7	DIO_OUT3
DIO_IN0	2	8	DIO_IN3
DIO_OUT1	3	9	SMB_CLK
DIO_IN1	4	10	SMB_DAT
DIO_OUT2	5	11	GND
DIO_IN2	6	12	+5V

GPIO 16 bit (optional)

Signal	PIN	PIN	Signal
GPI_1	1	14	GPO_1
GPI_2	2	15	GPO_2
GPI_3	3	16	GPO_3
GPI_4	4	17	GPO_4
GPI_5	5	18	GPO_5
GPI_6	6	19	GPO_6
GPI_7	7	20	GPO_7
GPI_8	8	21	GPO_8
NC	9	22	NC
SMB_CLK	10	23	SMB_DAT
NC	11	24	NC
NC	12	25	+5V
GND	13		

2.1.4 DC power-in connector (DC-in)

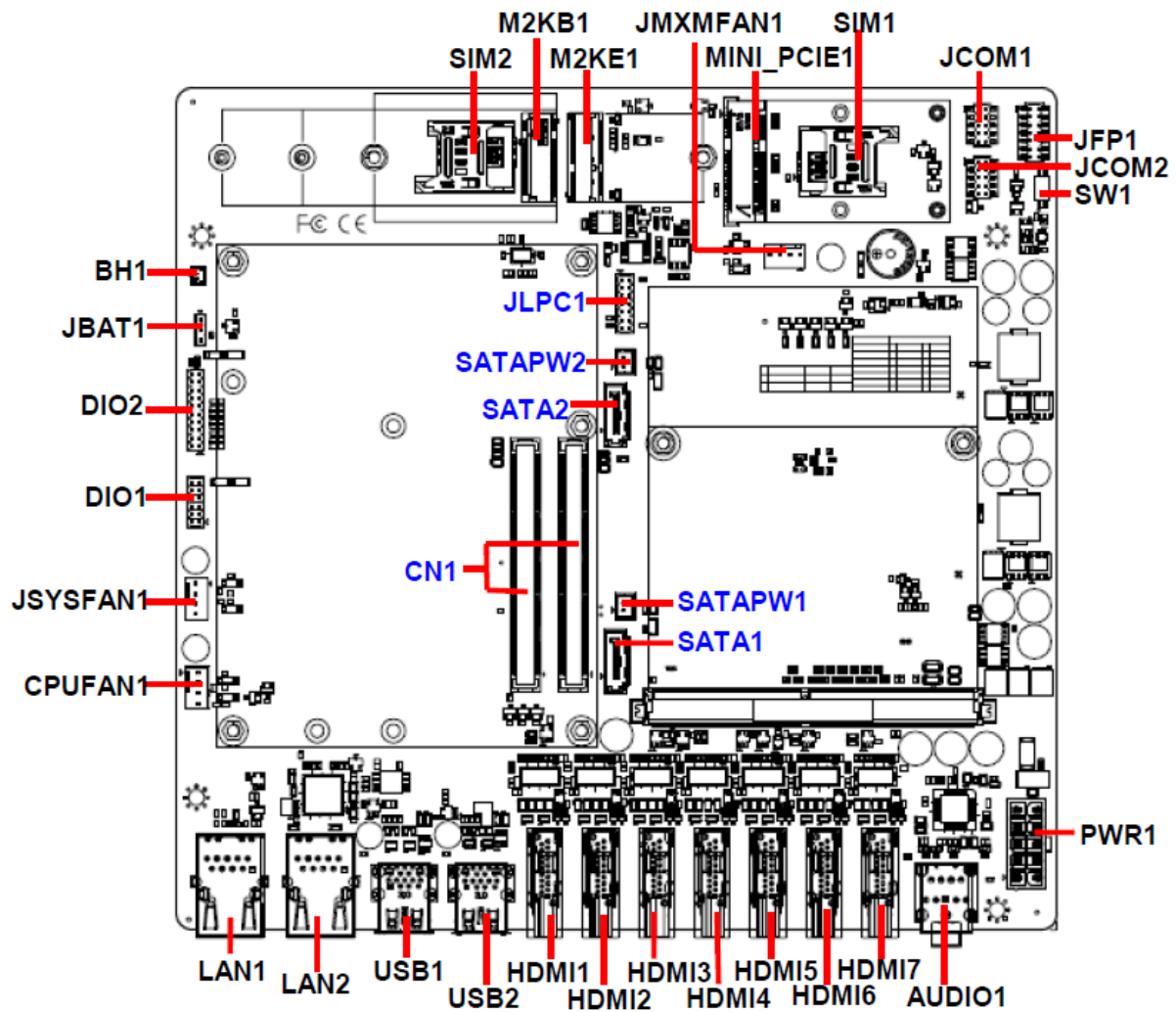


**Note:**  
Not following Intel ATX12VO 10-pin spec.

Signal	PIN	PIN	Signal
+DC_IN	1	6	GND
+DC_IN	2	7	GND
+DC_IN	3	8	GND
+DC_IN	4	9	GND
+DC_IN	5	10	GND



## 2.2 EEV-MX01 Overviews



## 2.3 EEV-MX01 Jumper & Connector list

### Jumpers

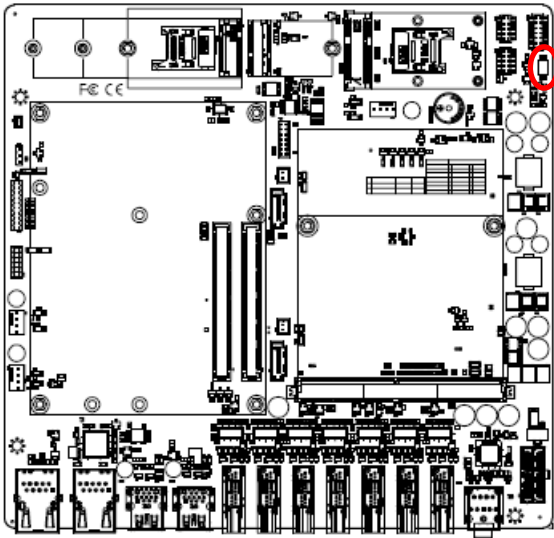
Label	Function	Note
SW1	Multi-function select	
JBAT1	Clear CMOS	3 x 1 header, pitch 2.54mm

### Connectors

Label	Function	Note
PWR1	Power connector	5 x 2 wafer, pitch 4.20mm
CPUFAN1	CPU Fan connector	4 x 1 wafer, pitch 2.54mm
JMXMFAN1	MXM Fan connector	4 x 1 wafer, pitch 2.54mm
JSYSFAN1	System Fan connector	4 x 1 wafer, pitch 2.54mm
HDMI1~7	7 x HDMI connector	
DIO1	General Purpose I/O connector	6 x 2 header, pitch 2.00mm
DIO2	General Purpose I/O connector	10 x 2 header, pitch 2.00mm
JFP1	Front panel connector	7 x 2 header, pitch 2.00mm
LAN1/2	2 x Ethernet connector	
USB1/2	4 x USB3.2 connector	
AUDIO1	1 x Mic-In (Audio Jack) 1 x Line-Out (Audio Jack)	
SATA1/2	2 x Serial ATA connector	
SATAPW1	SATA power connector 1	2 x 1 wafer, pitch 2.00mm
SATAPW2	SATA power connector 2	2 x 1 wafer, pitch 2.00mm
JLPC1	LPC port connector	7 x 2 header, pitch 2.00mm
BH1	Battery connector	2 x 1 wafer, pitch 1.25mm
JCOM1	Serial port 1 connector	5 x 2 header, pitch 2.00mm
JCOM2	Serial port 2 connector	5 x 2 header, pitch 2.00mm
SIM1/2	SIM card slot 1/2	
M2KB1	Key-B Slot	
M2KE1	Key-E Slot	
MINI_PCIE1	Full size Mini-PCI-e connector	
CN1	COM Express connector	

2.4 EEV-MX01 Jumpers & Connectors settings

2.4.1 Multi-function select (SW1)



	Function	ON	OFF
1	ERP setting	ERP ON	ERP OFF
2	PWR Mode	AT	ATX

\*Default

ERP ON/ERP OFF mode

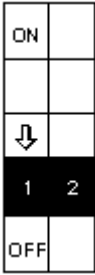
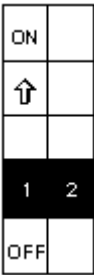


AT/ATX mode



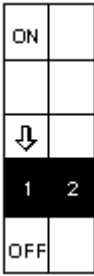
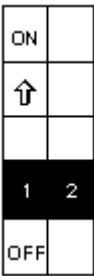
ERP ON mode

ERP OFF mode\*

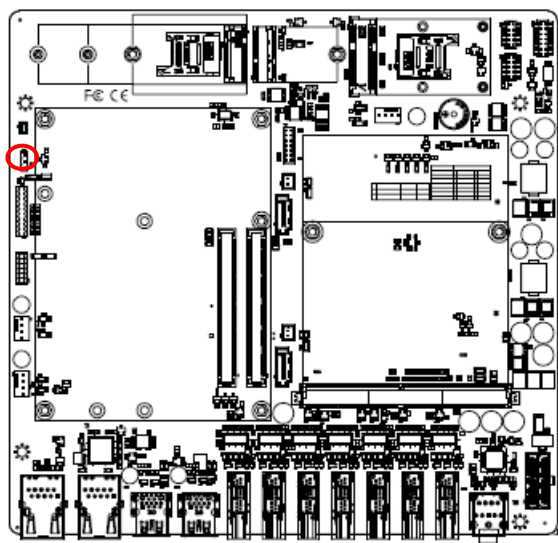


AT mode\*

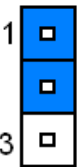
ATX mode



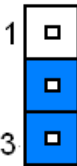
2.4.2 Clear CMOS (JBAT1)



Protect\*

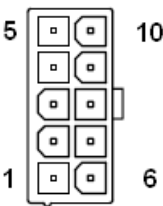
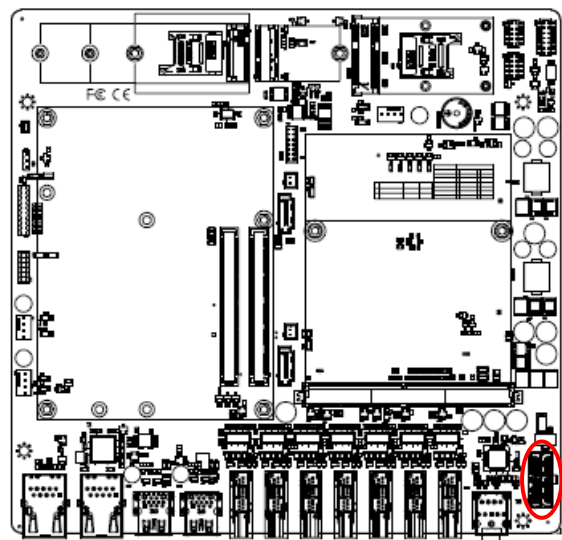


Clear CMOS



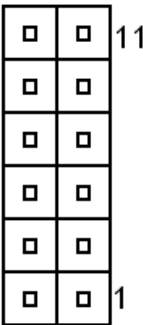
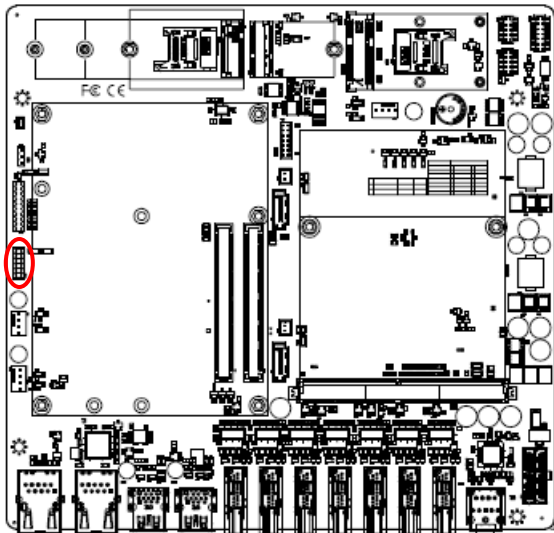
\* Default

2.4.3 Power connector (PWR1)



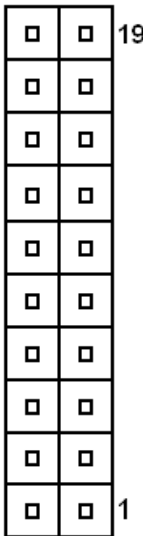
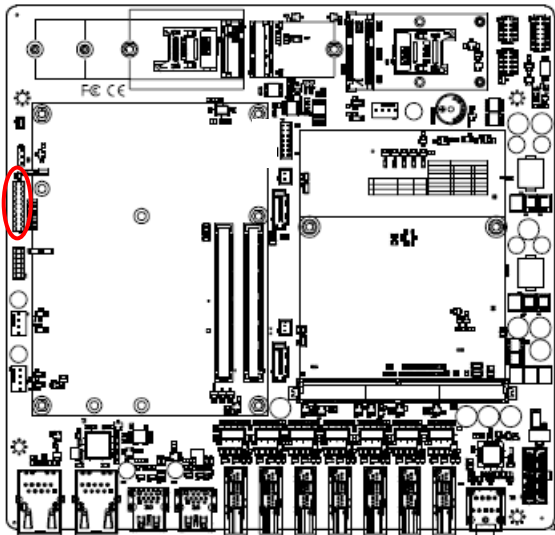
Signal	PIN	PIN	Signal
+DC_IN	5	10	GND
+DC_IN	4	9	GND
+DC_IN	3	8	GND
+DC_IN	2	7	GND
+DC_IN	1	6	GND

2.4.4 General Purpose I/O connector (DIO1)



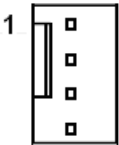
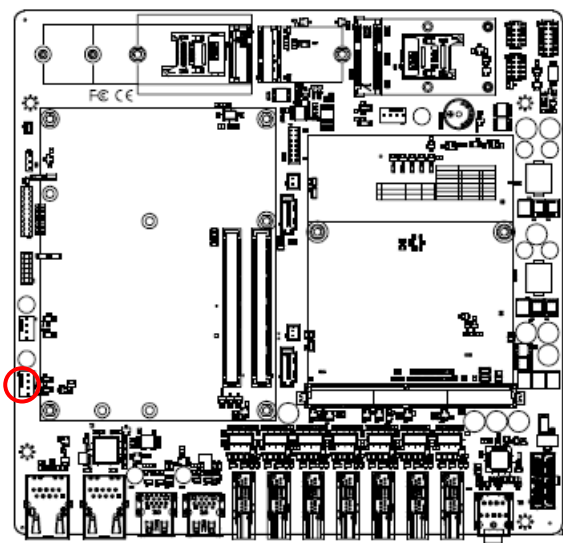
Signal	PIN	PIN	Signal
+5V	12	11	GND
SMB_DAT	10	9	SMB_CLK
DIO_IN3	8	7	DIO_OUT3
DIO_IN2	6	5	DIO_OUT2
DIO_IN1	4	3	DIO_OUT1
DIO_IN0	2	1	DIO_OUT0

2.4.5 General Purpose I/O connector (DIO2)



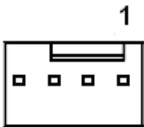
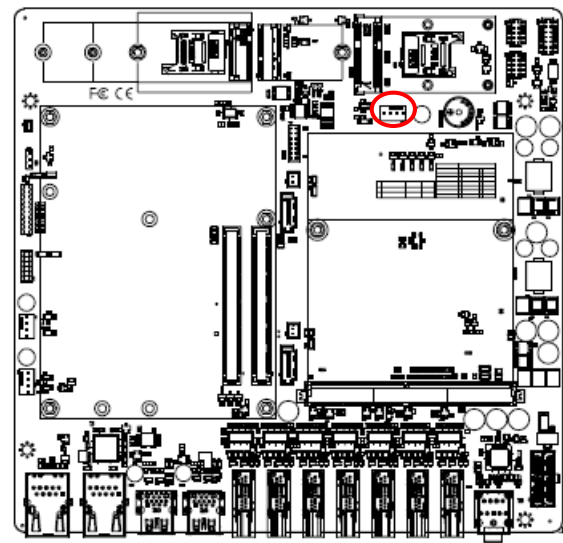
Signal	PIN	PIN	Signal
+5V	20	19	GND
SMB_DAT	18	17	SMB_CLK
GPO_8	16	15	GPI_8
GPO_7	14	13	GPI_7
GPO_6	12	11	GPI_6
GPO_5	10	9	GPI_5
GPO_4	8	7	GPI_4
GPO_3	6	5	GPI_3
GPO_2	4	3	GPI_2
GPO_1	2	1	GPI_1

2.4.6 CPU Fan connector (CPUFAN1)



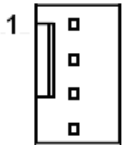
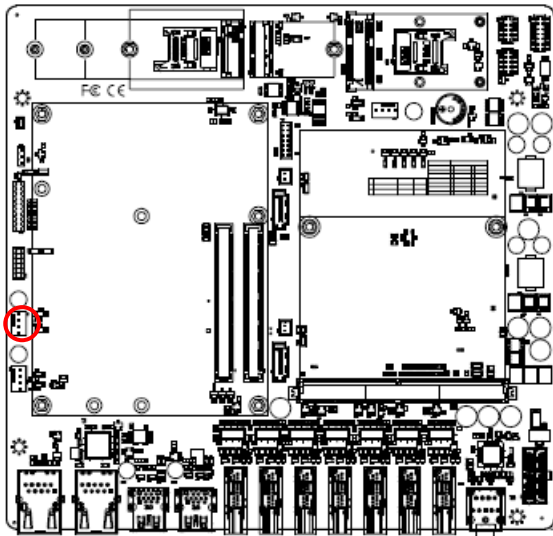
Signal	PIN
GND	1
+12V	2
CPUFANIN	3
+5V	4

2.4.7 MXM Fan connector (JMXMFAN1)



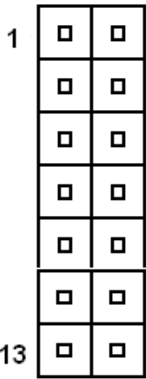
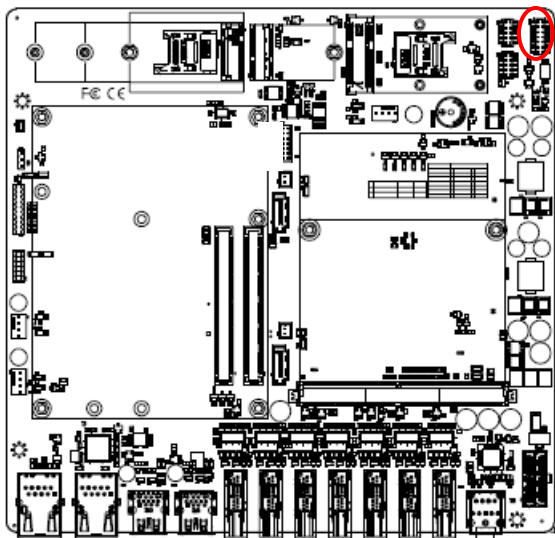
Signal	PIN
GND	1
+12V	2
MXMFANIN	3
+5V	4

2.4.8 System Fan connector (JSYSFAN1)



Signal	PIN
GND	1
+12V	2
SYSFANIN	3
+5V	4

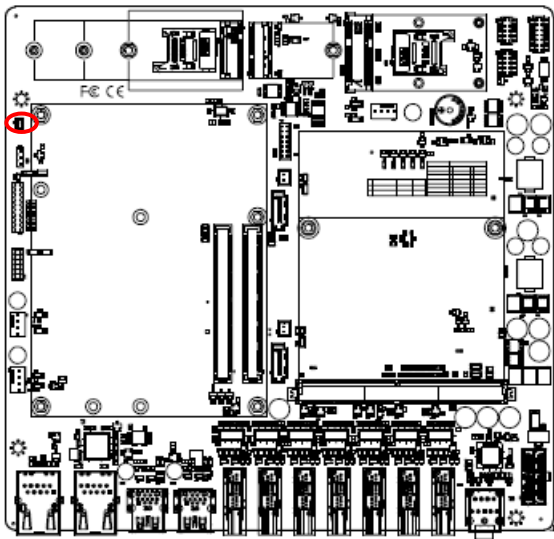
2.4.9 Front panel connector (JFP1)



Signal	PIN	PIN	Signal
EXT_PWRBTN#	1	2	GND
SYS_RERST#	3	4	GND
+5V	5	6	GND
SATA_LED_OUT#	7	8	+5V
SER0_TX	9	10	SER0_RX
SER1_TX	11	12	SER1_RX
LID#	13	14	GND

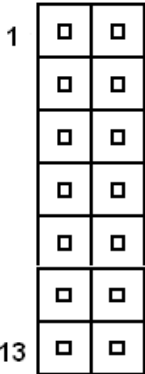
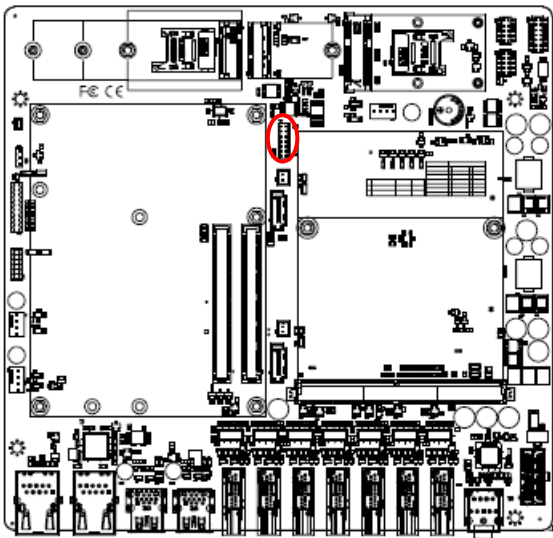
Pin	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Signal	Power Button		Reset Button		Power LED		SATA LED		Serial port0		Serial port1		LID switch	

2.4.10 Battery connector (BH1)



Signal	PIN
+3.3VSB	1
GND	2

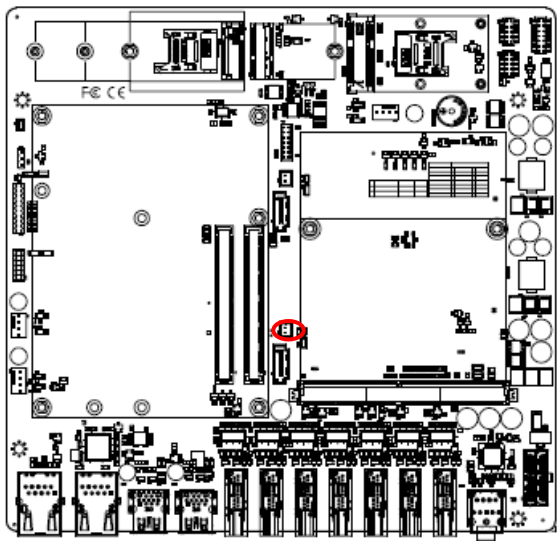
2.4.11 LPC port connector (JLPC1)



Signal	PIN	PIN	Signal
LPC_AD0	1	2	+3.3V
LPC_AD1	3	4	CB_RST#
LPC_AD2	5	6	LPC_FRAME#
LPC_AD3	7	8	PORT80_CLK
LPC_SERIRQ	9	10	GND
+5V	11	12	GND
+5VSB	13	14	LPC_DRQ1#

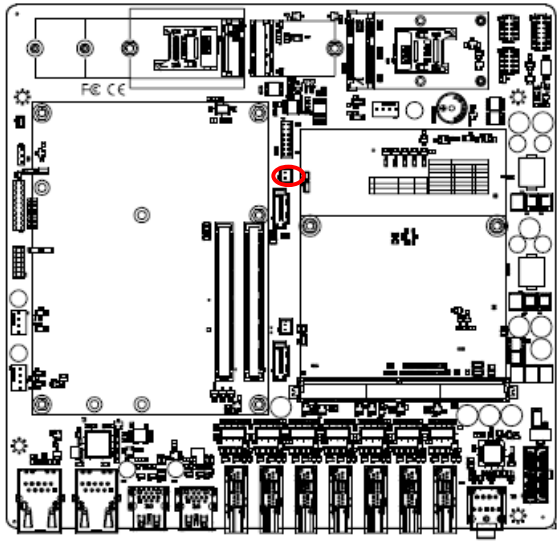


2.4.12 SATA power connector 1 (SATAPW1)



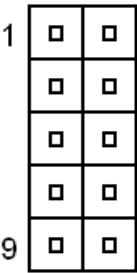
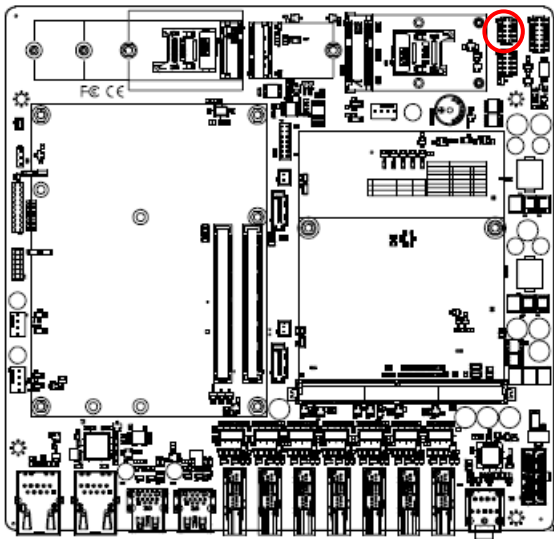
Signal	PIN
+5V	2
GND	1

2.4.13 SATA power connector 2 (SATAPW2)



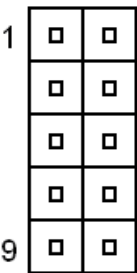
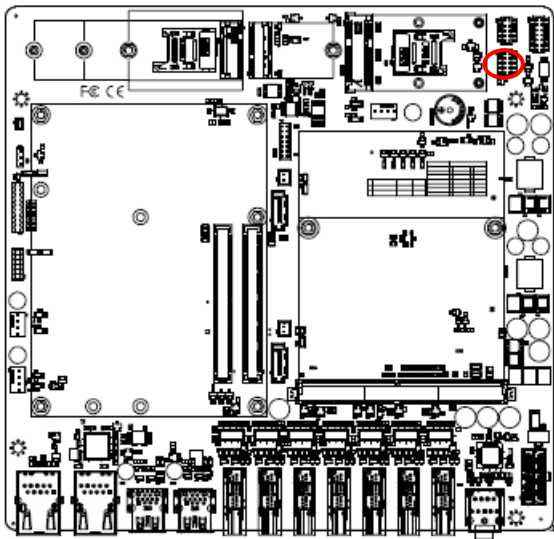
Signal	PIN
+5V	2
GND	1

2.4.14 Serial port 1 connector (JCOM1)



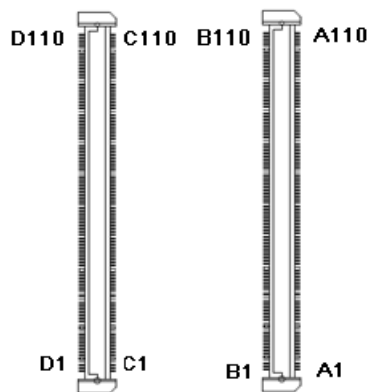
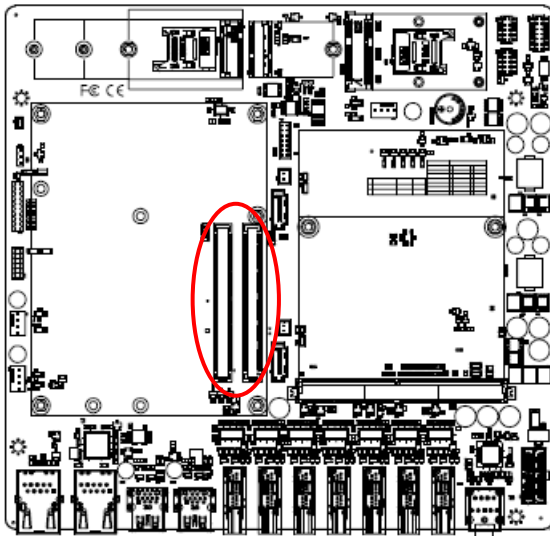
Signal	PIN	PIN	Signal
COM_DCD#_2	1	2	COM_RXD_2
COM_TXD_2	3	4	COM_DTR#_2
GND	5	6	COM_DSR#_2
COM_RTS#_2	7	8	COM_CTS#_2
COM_RI_2	9	10	NC

2.4.15 Serial port 2 connector (JCOM2)



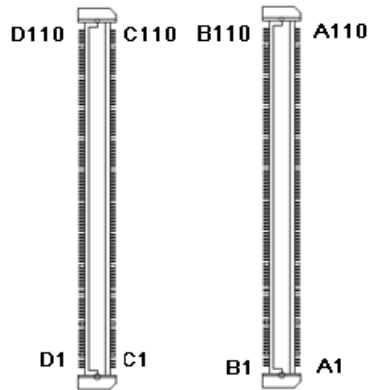
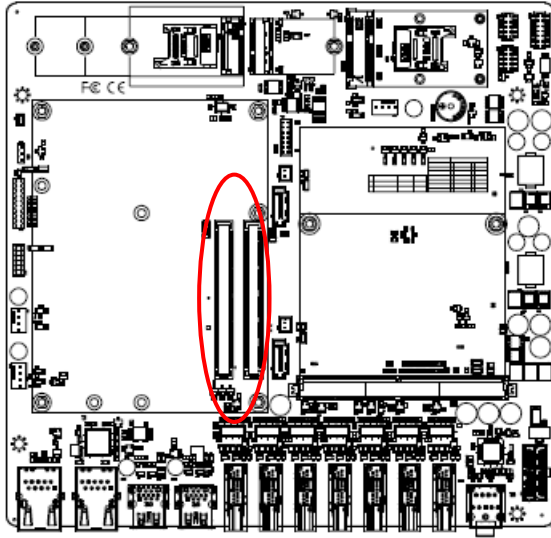
Signal	PIN	PIN	Signal
COM_DCD#_5	1	2	COM_RXD_5
COM_TXD_5	3	4	COM_DTR#_5
GND	5	6	COM_DSR#_5
COM_RTS#_5	7	8	COM_CTS#_5
COM_RI_5	9	10	NC

## 2.4.16 COM Express connector (CN1)

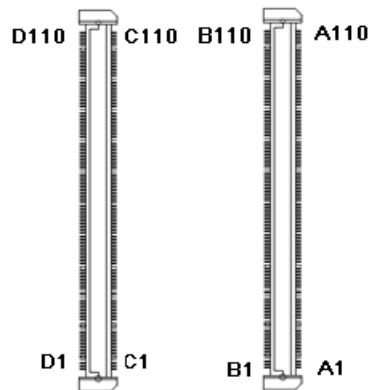
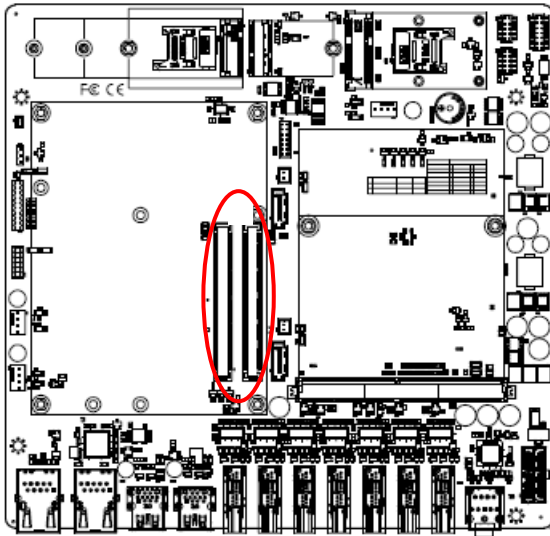


Signal	PIN	PIN	Signal
GND	B110	A110	GND
+12V	B109	A109	+12V
+12V	B108	A108	+12V
+12V	B107	A107	+12V
+12V	B106	A106	+12V
+12V	B105	A105	+12V
+12V	B104	A104	+12V
NC	B103	A103	LID#
FAN_TACHIM	B102	A102	SER1_RX
FAN_PWMOUT	B101	A101	SER1_TX
GND	B100	A100	GND
NC	B99	A99	SER0_RX
NC	B98	A98	SER0_TX
NC	B97	A97	NC
NC	B96	A96	NC
NC	B95	A95	NC
NC	B94	A94	NC
NC	B93	A93	GPO0
NC	B92	A92	NC
NC	B91	A91	NC
GND	B90	A90	GND
NC	B89	A89	PCIE_CLK_REF-
NC	B88	A88	PCIE_CLK_REF+
+VCC_5VSB	B87	A87	NC
+VCC_5VSB	B86	A86	NC
+VCC_5VSB	B85	A85	GPI3
+VCC_5VSB	B84	A84	NC
NC	B83	A83	NC
NC	B82	A82	NC
NC	B81	A81	NC

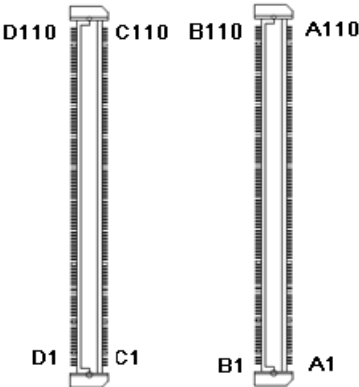
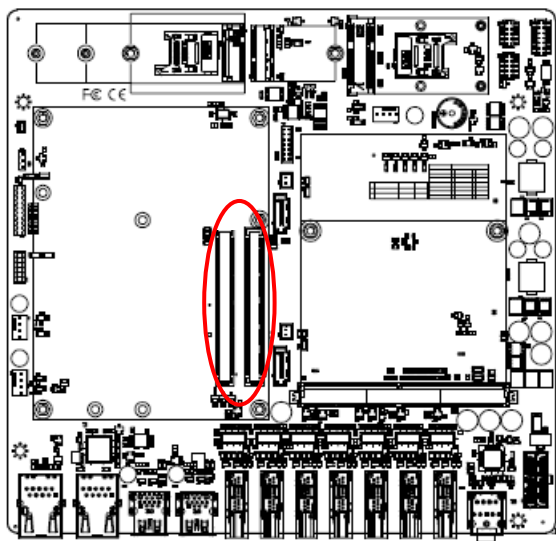
## EGS-MX1



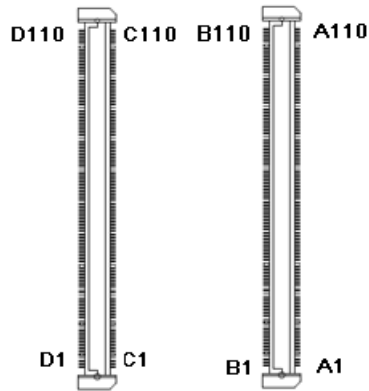
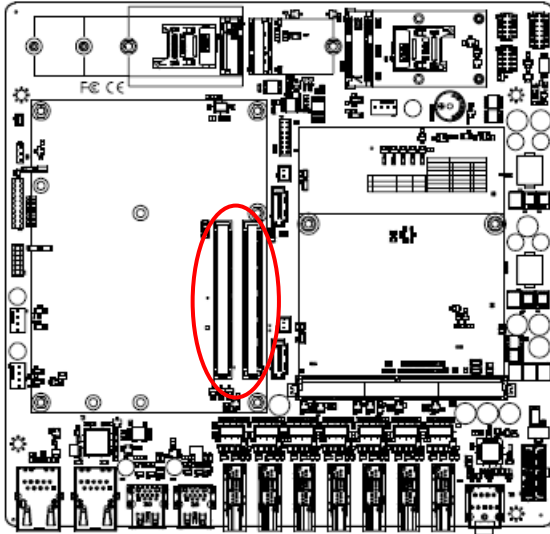
Signal	PIN	PIN	Signal
GND	B80	A80	GND
NC	B79	A79	NC
NC	B78	A78	NC
NC	B77	A77	NC
NC	B76	A76	NC
NC	B75	A75	NC
NC	B74	A74	NC
NC	B73	A73	NC
NC	B72	A72	NC
NC	B71	A71	NC
GND	B70	A70	GND
PCIE_RX0-	B69	A69	PCIE_TX0-
PCIE_RX0+	B68	A68	PCIE_TX0+
WAKE1#	B67	A67	GPI2
WAKE0#	B66	A66	GND
PCIE_RX1-	B65	A65	PCIE_TX1-
PCIE_RX1+	B64	A64	PCIE_TX1+
GPO3	B63	A63	GPI1
PCIE_RX2-	B62	A62	PCIE_TX2-
PCIE_RX2+	B61	A61	PCIE_TX2+
GND	B60	A60	GND
PCIE_RX3-	B59	A59	PCIE_TX3-
PCIE_RX3+	B58	A58	PCIE_TX3+
GPO2	B57	A57	GND
PCIE_RX4-	B56	A56	PCIE_TX4-
PCIE_RX4+	B55	A55	PCIE_TX4+
GPO1	B54	A54	GPI0
PCIE_RX5-	B53	A53	PCIE_TX5-
PCIE_RX5+	B52	A52	PCIE_TX5+
GND	B51	A51	GND



Signal	PIN	PIN	Signal
CB_RESET#	B50	A50	LPC_SERIRQ
SYS_RESET#	B49	A49	NC
NC	B48	A48	MXM_PRSENT#
NC	B47	A47	+3.3V
USB1+	B46	A46	USB0+
USB1-	B45	A45	USB0-
USB_0_1_OC#	B44	A44	USB_2_3_OC#
USB3+	B43	A43	USB2+
USB3-	B42	A42	USB2-
GND	B41	A41	GND
USB5+	B40	A40	USB4+
USB5-	B39	A39	USB4-
NC	B38	A38	NC
NC	B37	A37	USB6+
NC	B36	A36	USB6-
THRM#	B35	A35	NC
I2C_DAT	B34	A34	NC
I2C_CLK	B33	A33	HDA_SDOUT
HDA_SPKR	B32	A32	HDA_BITCLK
GND	B31	A31	GND
HDA_SDIN0	B30	A30	HDA_RST#
NC	B29	A29	HDA_SYNC
NC	B28	A28	SATA_ACT#
WDT	B27	A27	NC
NC	B26	A26	SATA2_RX-
NC	B25	A25	SATA2_RX+
PWR_OK	B24	A24	SUS_S5#
NC	B23	A23	SATA2_TX-
NC	B22	A22	SATA2_TX+
GND	B21	A21	GND

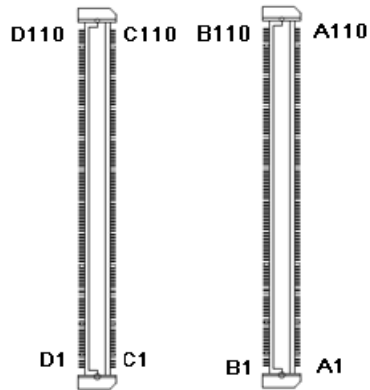
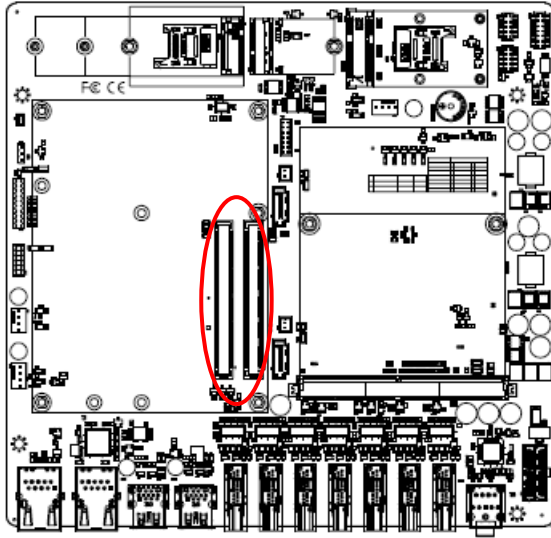


Signal	PIN	PIN	Signal
SATA1_RX-	B20	A20	SATA0_RX-
SATA1_RX+	B19	A19	SATA0_RX+
NC	B18	A18	SUS_S4#
SATA1_TX-	B17	A17	SATA0_TX-
SATA1_TX+	B16	A16	SATA0_TX+
SMB_ALERT#	B15	A15	SUS_S3#
SMB_DAT	B14	A14	GBE0_CTREF
SMB_CK	B13	A13	GBE0_MDI0+
PWRBTN#	B12	A12	GBE0_MDI0-
GND	B11	A11	GND
LPC_CLK	B10	A10	GBE0_MDI1+
LPC_DRQ1#	B9	A9	GBE0_MDI1-
LPC_DRQ0#	B8	A8	GBE0_LINK#
LPC_AD3	B7	A7	GBE0_MDI2+
LPC_AD2	B6	A6	GBE0_MDI2-
LPC_AD1	B5	A5	GBE0_LINK1000#
LPC_AD0	B4	A4	GBE0_LINK100#
LPC_FRAME#	B3	A3	GBE0_MDI3+
GBE0_ACT#	B2	A2	GBE0_MDI3-
GND	B1	A1	GND



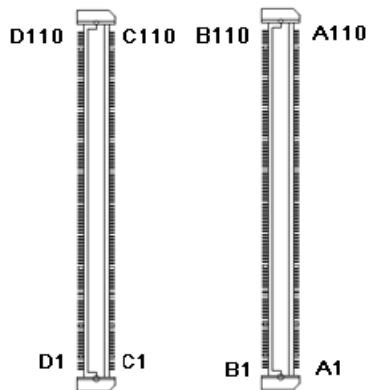
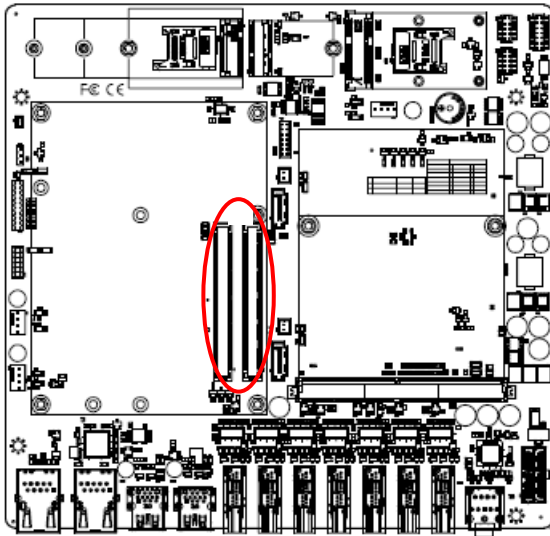
Signal	PIN	PIN	Signal
GND	D110	C110	GND
+12V	D109	C109	+12V
+12V	D108	C108	+12V
+12V	D107	C107	+12V
+12V	D106	C106	+12V
+12V	D105	C105	+12V
+12V	D104	C104	+12V
GND	D103	C103	GND
PEG_TX15-	D102	C102	PEG_RX15-
PEG_TX15+	D101	C101	PEG_RX15+
GND	D100	C100	GND
PEG_TX14-	D99	C99	PEG_RX14-
PEG_TX14+	D98	C98	PEG_RX14+
NC	D97	C97	NC
GND	D96	C96	GND
PEG_TX13-	D95	C95	PEG_RX13-
PEG_TX13+	D94	C94	PEG_RX13+
GND	D93	C93	GND
PEG_TX12-	D92	C92	PEG_RX12-
PEG_TX12+	D91	C91	PEG_RX12+
GND	D90	C90	GND
PEG_TX11-	D89	C89	PEG_RX11-
PEG_TX11+	D88	C88	PEG_RX11+
GND	D87	C87	GND
PEG_TX10-	D86	C86	PEG_RX10-
PEG_TX10+	D85	C85	PEG_RX10+
GND	D84	C84	GND
NC	D83	C83	NC
PEG_TX9-	D82	C82	PEG_RX9-
PEG_TX9+	D81	C81	PEG_RX9+

## EGS-MX1

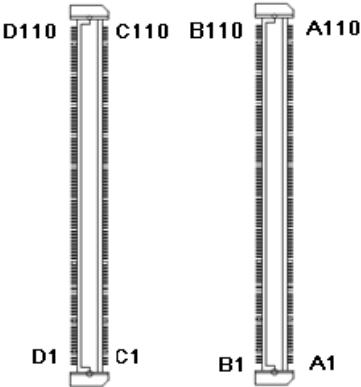
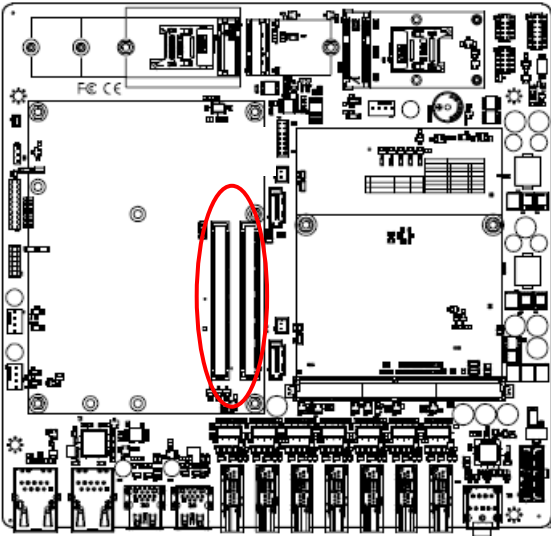


Signal	PIN	PIN	Signal
GND	D80	C80	GND
PEG_TX8-	D79	C79	PEG_RX8-
PEG_TX8+	D78	C78	PEG_RX8+
NC	D77	C77	NC
GND	D76	C76	GND
PEG_TX7-	D75	C75	PEG_RX7-
PEG_TX7+	D74	C74	PEG_RX7+
GND	D73	C73	GND
PEG_TX6-	D72	C72	PEG_RX6-
PEG_TX6+	D71	C71	PEG_RX6+
GND	D70	C70	GND
PEG_TX5-	D69	C69	PEG_RX5-
PEG_TX5+	D68	C68	PEG_RX5+
GND	D67	C67	NC
PEG_TX4-	D66	C66	PEG_RX4-
PEG_TX4+	D65	C65	PEG_RX4+
NC	D64	C64	NC
NC	D63	C63	NC
PEG_TX3-	D62	C62	PEG_RX3-
PEG_TX3+	D61	C61	PEG_RX3+
GND	D60	C60	GND
PEG_TX2-	D59	C59	PEG_RX2-
PEG_TX2+	D58	C58	PEG_RX2+
TYPE2#	D57	C57	NC
PEG_TX1-	D56	C56	PEG_RX1-
PEG_TX1+	D55	C55	PEG_RX1+
PEG_LANE_RV#	D54	C54	NC
PEG_TX0-	D53	C53	PEG_RX0-
PEG_TX0+	D52	C52	PEG_RX0+
GND	D51	C51	GND





Signal	PIN	PIN	Signal
DDI2_PAIR3-	D50	C50	DDI3_PAIR3-
DDI2_PAIR3+	D49	C49	DDI3_PAIR3+
NC	D48	C48	NC
DDI2_PAIR2-	D47	C47	DDI3_PAIR2-
DDI2_PAIR2+	D46	C46	DDI3_PAIR2+
NC	D45	C45	NC
DDI2_HPD	D44	C44	DDI3_HPD
DDI2_PAIR1-	D43	C43	DDI3_PAIR1-
DDI2_PAIR1+	D42	C42	DDI3_PAIR1+
GND	D41	C41	GND
DDI2_PAIR0-	D40	C40	DDI3_PAIR0-
DDI2_PAIR0+	D39	C39	DDI3_PAIR0+
NC	D38	C38	DDI3_DDC_AUX_SEL
DDI1_PAIR3-	D37	C37	DDI3_CTRLDATA_AUX-
DDI1_PAIR3+	D36	C36	DDI3_CTRLCLK_AUX+
NC	D35	C35	NC
DDI1_DDC_AUX_SEL	D34	C34	DDI2_DDC_AUX_SEL
DDI1_PAIR2-	D33	C33	DDI2_CTRLDATA_AUX-
DDI1_PAIR2+	D32	C32	DDI2_CTRLCLK_AUX+
GND	D31	C31	GND
DDI1_PAIR1-	D30	C30	NC
DDI1_PAIR1+	D29	C29	NC
NC	D28	C28	NC
DDI1_PAIR0-	D27	C27	RSVD7
DDI1_PAIR0+	D26	C26	NC
NC	D25	C25	NC
NC	D24	C24	DDI1_HPD
NC	D23	C23	NC
NC	D22	C22	NC
GND	D21	C21	GND



Signal	PIN	PIN	Signal
PCIE_TX6-	D20	C20	PCIE_RX6-
PCIE_TX6+	D19	C19	PCIE_RX6+
NC	D18	C18	NC
NC	D17	C17	NC
DDI1_CTRLDATA_AUX-	D16	C16	NC
DDI1_CTRLCLK_AUX+	D15	C15	NC
GND	D14	C14	GND
USB_SSTX3+	D13	C13	USB_SSRX3+
USB_SSTX3-	D12	C12	USB_SSRX3-
GND	D11	C11	GND
USB_SSTX2+	D10	C10	USB_SSRX2+
USB_SSTX2-	D9	C9	USB_SSRX2-
GND	D8	C8	GND
USB_SSTX1+	D7	C7	USB_SSRX1+
USB_SSTX1-	D6	C6	USB_SSRX1-
GND	D5	C5	GND
USB_SSTX0+	D4	C4	USB_SSRX0+
USB_SSTX0-	D3	C3	USB_SSRX0-
GND	D2	C2	GND
GND	D1	C1	GND

### 2.4.16.1 Signal Description – COM Express connector (CN1)

#### 2.4.16.1.1 Audio Signals

Signal	Signal Description
HDA_SYNC	HD Audio Sync
HDA_RST#	HD Audio Reset

#### 2.4.16.1.2 Gigabit Ethernet Signals

Signal	Signal Description			
GBE0_MD[0:3] +/-	Gigabit Ethernet Controller 0: Media Dependent Interface Differential Pairs 0,1,2,3. The MDI can operate in 1000, 100 and 10 Mbit / sec modes. Some pairs are unused in some modes, per the following:			
		1000B-T	100B-T	10B-T
	MDI[0]+/-	B1_DA+/-	TX+/-	TX+/-
	MDI[1]+/-	B1_DB+/-	RX+/-	RX+/-
	MDI[2]+/-	B1_DC+/-	X	X
	MDI[3]+/-	B1_DD+/-	X	X
GBE0_ACT#	Gigabit Ethernet Controller 0 activity indicator, active low.			
GBE0_Link#	Gigabit Ethernet Controller 0 link indicator, active low.			
GBE0_Link100#	Gigabit Ethernet Controller 0 100 Mbit / sec link indicator, active low.			
GBE0_Link1000#	Gigabit Ethernet Controller 0 1000 Mbit / sec link indicator, active low.			

#### 2.4.16.1.3 PCI Express Signals

Signal	Signal Description
PCIE_TX[0:6] +/-	PCI Express Differential Transmit Pair 0-6
PCIE_RX[0:6] +/-	PCI Express Differential Receive Pair 0-6

#### 2.4.16.1.4 LPC Signals

Signal	Signal Description
LPC_FRAME#	LPC frame indicates the start of an LPC cycle
LPC_AD[0:3]	LPC multiplexed address, command and data bus
LPC_CLKOUT1	LPC clock output - 33MHz nominal

## EGS-MX1

LPC_SERIRQ	LPC serial interrupt
------------	----------------------

### 2.4.16.1.5 GPIO Signals

Signal	Signal Description
GPI[0:4]	General purpose input pins.
GPO[0:4]	General purpose output pins.

### 2.4.16.1.6 Power & System Management Signals

Signal	Signal Description
SUS_S3#	Indicates system is in Suspend to RAM state. Active low output.
PWRBTN#	Power button to bring system out of S5 (soft off), active on rising edge.
SMB_SCL_S5	System Management Bus bidirectional clock line.
SMB_SDA_S5	System Management Bus bidirectional data line.
SMB_ALERT#	System Management Bus Alert - input can be used to generate an SMI# (System Management Interrupt) or to wake the system.
SUS_STAT#/ESPI_RESET#	Indicates imminent suspend operation.
PWR_OK	Power OK from main power supply
SYS_RESET#	Reset button input. Active low input.
WAKE0#	PCI Express wake up signal.
WAKE1#	General purpose wake up signal.

### 2.4.16.1.7 SATA Signals

Signal	Signal Description
SATA[0:2]_TX +/-	Serial ATA Channel 0-2 transmit differential pair.
SATA[0:2]_RX +/-	Serial ATA Channel 0-2 receive differential pair.
ATA_ACT#	ATA (parallel and serial) activity indicator, active low.

### 2.4.16.1.8 USB Signals

Signal	Signal Description
USB[0:7] +/-	USB differential pairs, channels 0 through 7
USB_0_1_OC#	USB over-current sense, USB channels 0 and 1
USB_2_3_OC#	USB over-current sense, USB channels 2 and 3

**2.4.16.1.9 I2C Signals**

Signal	Signal Description
I2C_CLK	General purpose I2C port clock output.
I2C_DATA	General purpose I2C port data I/O line.

**2.4.16.1.10 USB3.0 Signals**

Signal	Signal Description
USB_SSTX[0:1]+ USB_SSTX[0:1]-	Additional transmit signal differential pairs for the SuperSpeed USB data path.
USB_SSRX[0:1]+ USB_SSRX[0:1]-	Additional receive signal differential pairs for the SuperSpeed USB data path.

**2.4.16.1.11 DDI Signals**

Signal	Signal Description
DDI0_PAIR[0:2]+ DDI0_PAIR[0:2]-	Digital Display Interface0 Pair[0:2] differential pairs
DDI0_DDC_AUX_SEL	Selects the function of DDI0_CTRLCLK_AUX+ and DDI0_CTRLDATA_AUX-. If this input is floating the AUX pair is used for the DP AUX+/- signals. If pulled-high the AUX pair contains the CTRLCLK and CTRLDATA signals.
DDI0_CTRLCLK_AUX+	DP AUX+function if DDI0_DDC_AUX_SEL is no connect HDMI/DVI 12C CTRLCLK if DDI0_DDC_AUX_SEL is pulled high
DDI0_CTRLDATA_AUX-	DP AUX-function if DDI0_DDC_AUX_SEL is no connect HDMI/DVI 12C CTRLDATA if DDI0_DDC_AUX_SEL is pulled high
DDI0_HPD	Digital Display Interface Hot-Plug Detect

**2.4.16.1.12 USB3.0 Signals**

Signal	Signal Description
USB_SSTX[0:3]+ USB_SSTX[0:3]-	Additional transmit signal differential pairs for the SuperSpeed USB data path.
USB_SSRX[0:3]+ USB_SSRX[0:3]-	Additional receive signal differential pairs for the SuperSpeed USB data path.

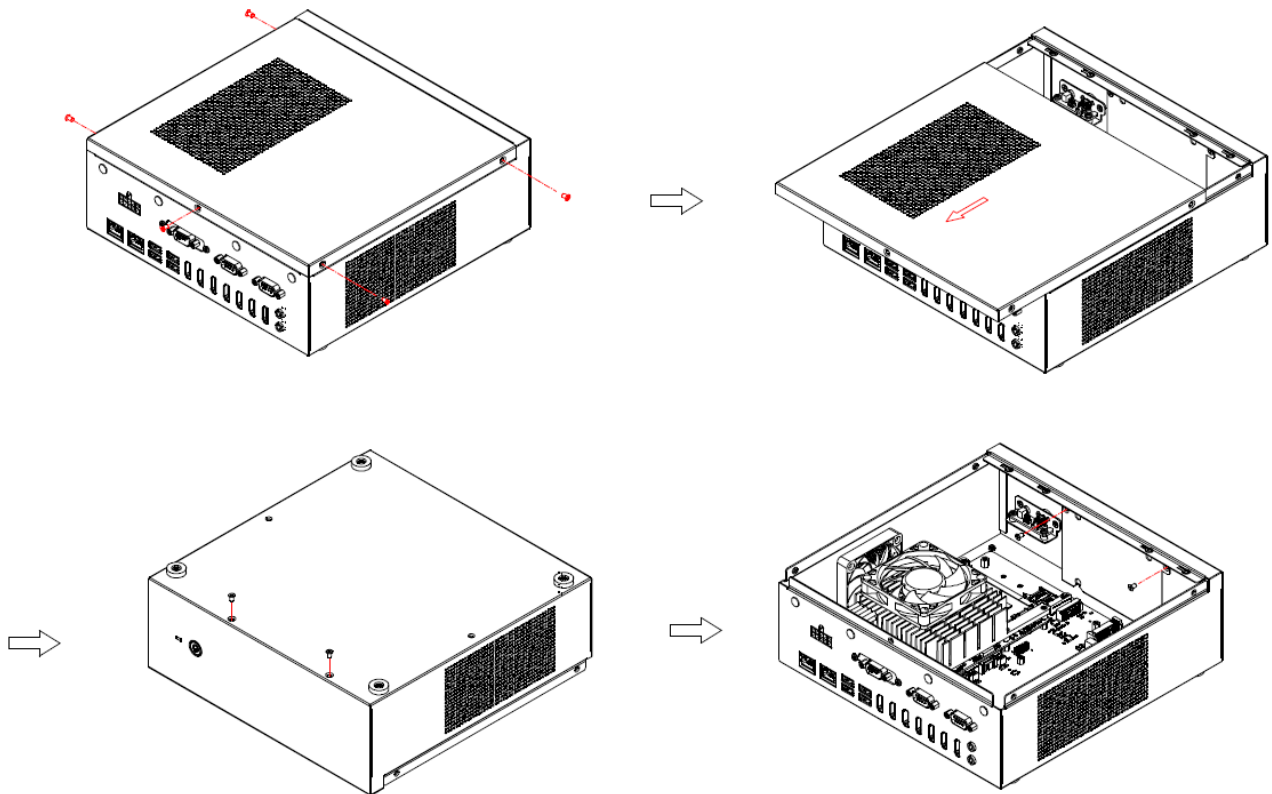
## 2.4.16.1.13 DDI Signals

Signal	Signal Description
DDI[1:3]_PAIR[0:3]+ DDI[1:3]_PAIR[0:3]-	Digital Display Interface 1 to 3Pair[0:3] differential pairs
DDI[1:3]_DDC_AUX_SEL	Selects the function of DDI[1:3]_CTRLCLK_AUX+ and DDI[1:3]_CTRLDATA_AUX-. If this input is floating the AUX pair is used for the DP AUX+/- signals. If pulled-high the AUX pair contains the CTRLCLK and CTRLDATA signals.
DDI[1:3]_CTRLCLK_AUX+	DP AUX+function if DDI[1:3]_DDC_AUX_SEL is no connect HDMI/DVI 12C CTRLCLK if DDI[1:3]_DDC_AUX_SEL is pulled high
DDI[1:3]_CTRLDATA_AUX-	DP AUX-function if DDI[1:3]_DDC_AUX_SEL is no connect HDMI/DVI 12C CTRLDATA if DDI[1:3]_DDC_AUX_SEL is pulled high
DDI[1:3]_HPD	Digital Display Interface Hot-Plug Detect

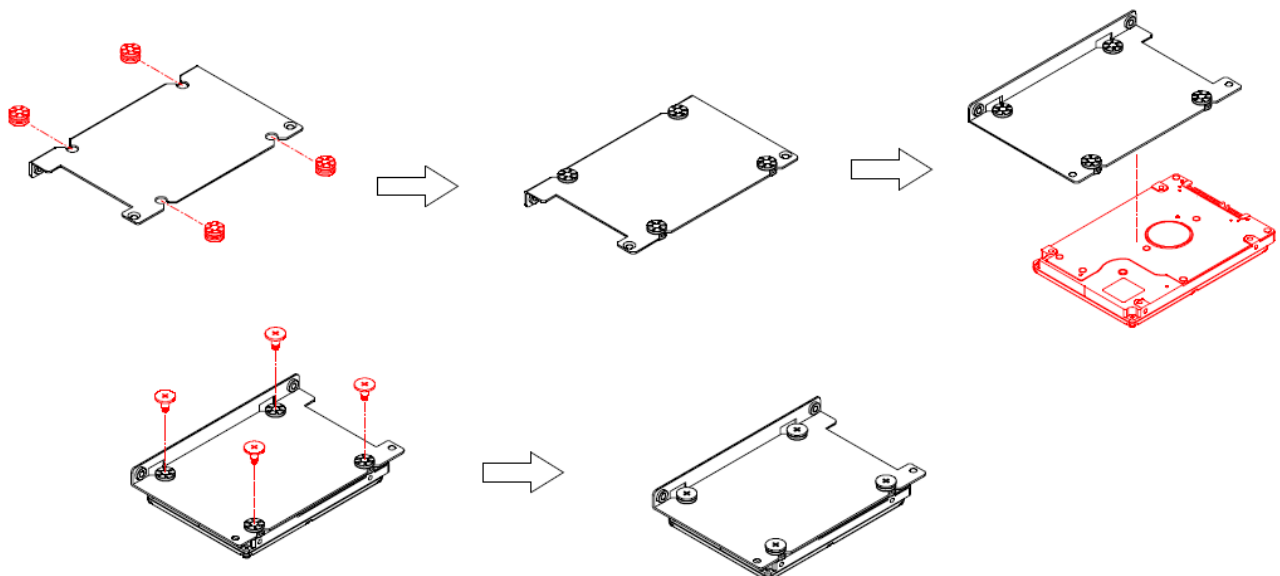
## 2.4.16.1.14 PEG PCI Express Lanes Signals

Signal	Signal Description
PEG_TX[0:15]+ PEG_TX[0:15]-	PCI Express Graphics transmit differential paris.
PEG_RX[0:15]+ PEG_RX[0:15]-	PCI Express Graphics recevie differential paris.

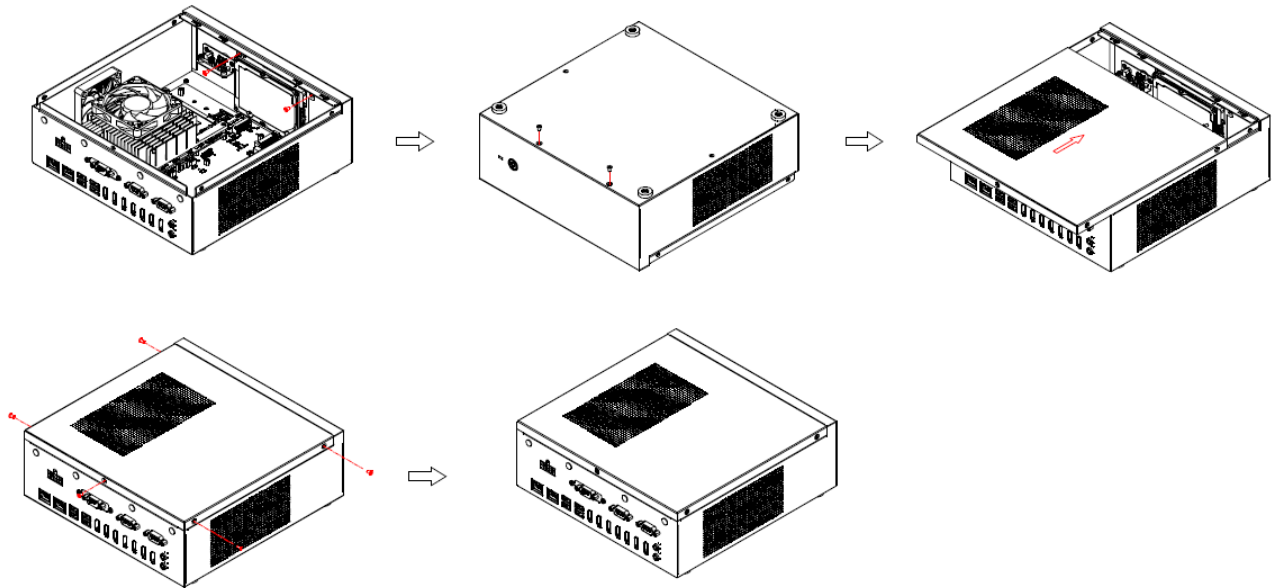
## 2.5 Installing Hard Disk & Memory (EGS-MX1)



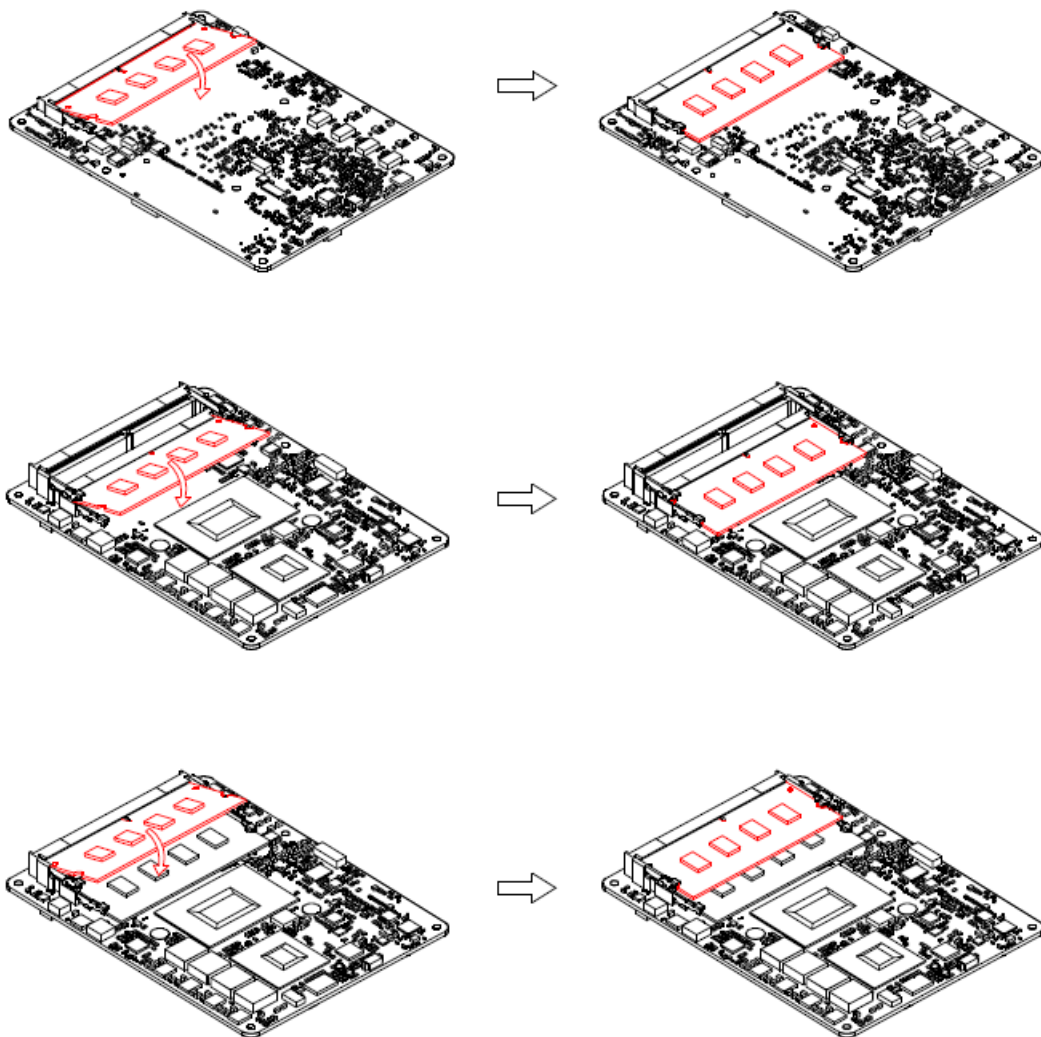
**Step1.** Remove screws from the bottom of your system and take it off.



**Step2.** Fix HDD using the 4 screws in the Accessory Kit.



**Step3.** Place back the cover and fasten screws back to complete.

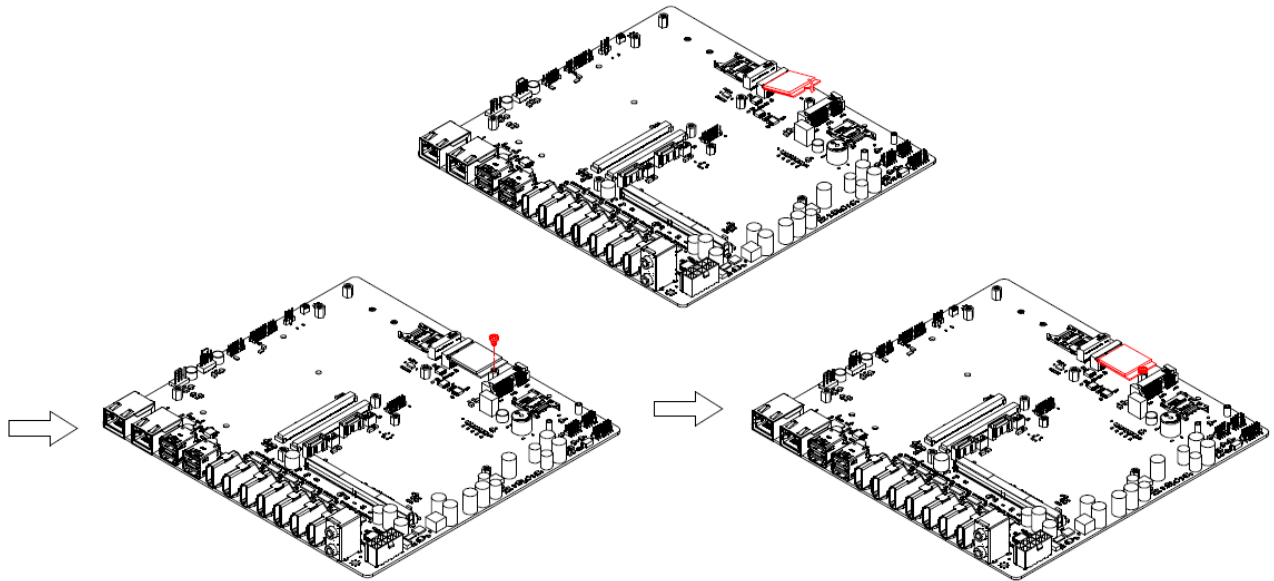


**Step4.** Properly install the memory modules and press until properly seated.

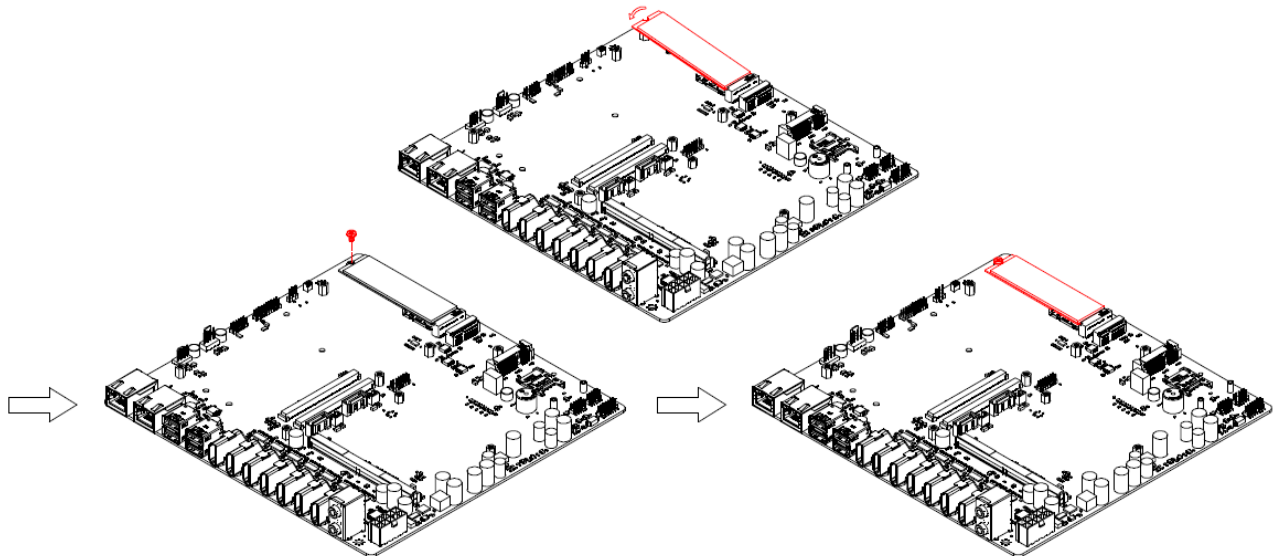


## 2.6 Installing M.2 B-key/E-key cards (EGS-MX1)

### M.2 E-Key-1

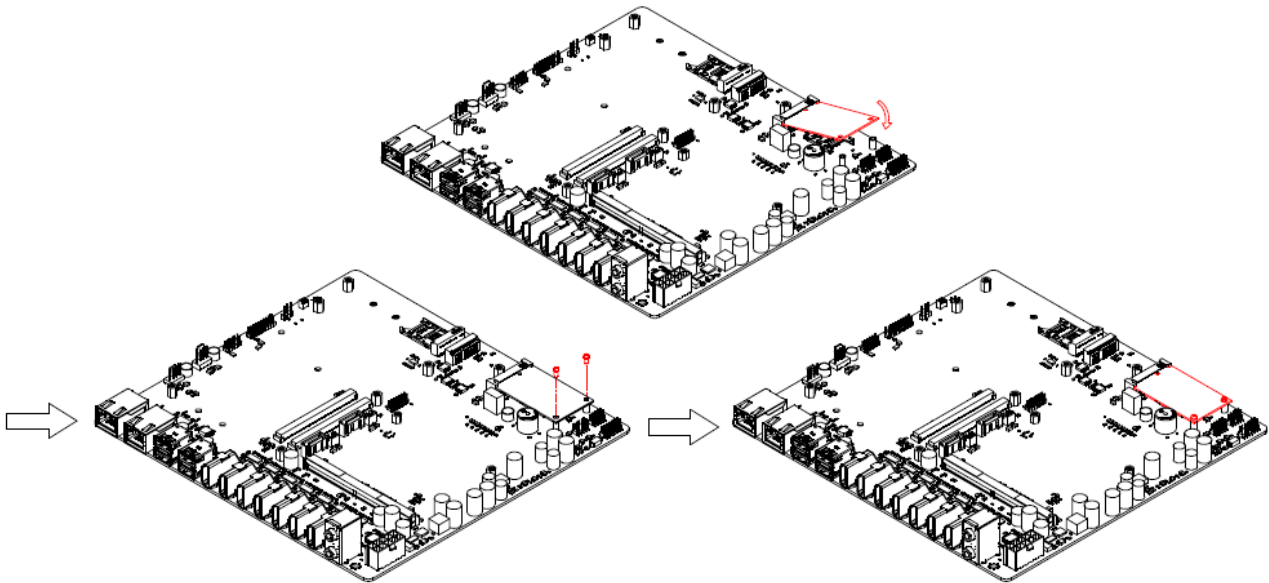


### M.2 B-Key-2



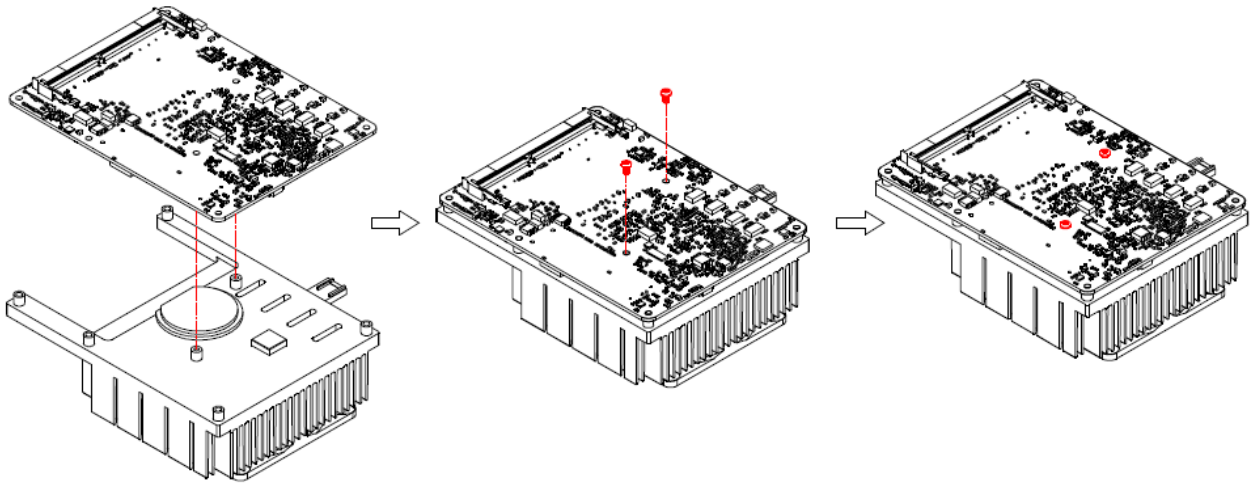
**Step1.** Insert M.2 B-Key/E-key cards into designated locations and fasten with the screws to complete installation.

## 2.7 Installing Mini PCIe card (EGS-MX1)

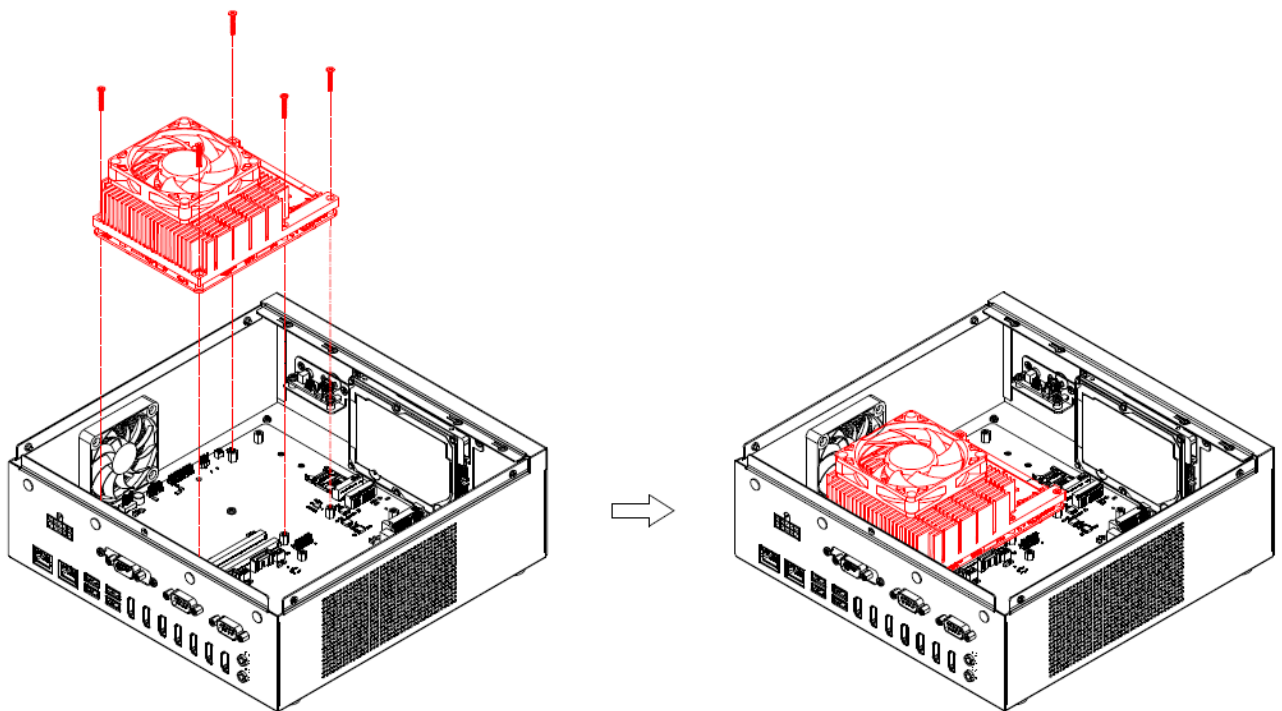


**Step1.** Insert Mini PCIe card into designated locations and fasten with the screws to complete installation.

## 2.8 Installing COMe / Cooler (EGS-MX1)

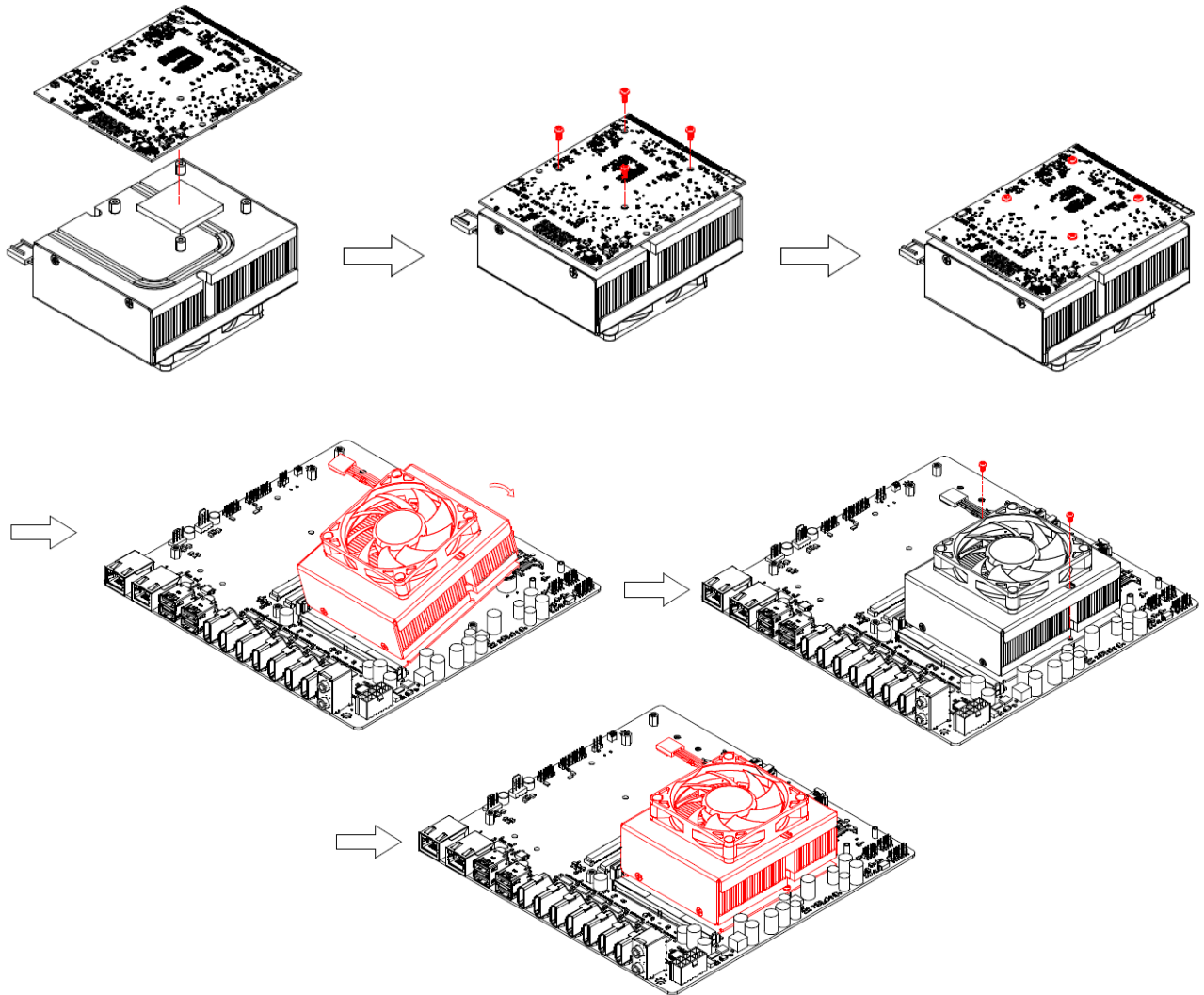


**Step1.** Insert COMe board into designated locations and fasten with 2 screws to complete installation.



**Step2.** Insert Cooler into designated locations and fasten with 5 screws to complete installation.

## 2.9 Installing MXM card w/Cooler (EGS-MX1)



**Step1.** Fasten 4 screws on the system to secure board.

**Step2.** Insert MXM card w/Cooler into designated locations and fasten with 2 screws to complete installation.

## 3.BIOS Setup

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### **3.1 Introduction**

The BIOS setup program allows users to modify the basic system configuration. In this following chapter will describe how to access the BIOS setup program and the configuration options that may be changed.

### **3.2 Starting Setup**

AMI BIOS™ is immediately activated when you first power on the computer. The BIOS reads the system information contained in the NVRAM and begins the process of checking out the system and configuring it. When it finishes, the BIOS will seek an operating system on one of the disks and then launch and turn control over to the operating system.

While the BIOS is in control, the Setup program can be activated in one of two ways:

By pressing <F2> or <Del> immediately after switching the system on, or

By pressing the <F2> or <Del> key when the following message appears briefly at the left-top of the screen during the POST (Power On Self Test).

**Press <F2> or <Del> to enter SETUP**

If the message disappears before you respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt>, and <Delete> keys.

### 3.3 Using Setup

In general, you use the arrow keys to highlight items, press <Enter> to select, use the PageUp and PageDown keys to change entries, press <F1> for help and press <Esc> to quit. The following table provides more detail about how to navigate in the Setup program using the keyboard.

Button	Description
↑	Move to previous item
↓	Move to next item
←	Move to the item in the left hand
→	Move to the item in the right hand
Esc key	Main Menu -- Quit and not save changes into NVRAM Status Page Setup Menu and Option Page Setup Menu -- Exit current page and return to Main Menu
+ key	Increase the numeric value or make changes
- key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key	Previous Values
F3 key	Optimized defaults
F4 key	Save & Exit Setup

- **Navigating Through The Menu Bar**

Use the left and right arrow keys to choose the menu you want to be in.



**Note:** Some of the navigation keys differ from one screen to another.

- **To Display a Sub Menu**

Use the arrow keys to move the cursor to the sub menu you want. Then press <Enter>. A “➤” pointer marks all sub menus.

### **3.4 Getting Help**

Press F1 to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window press <Esc> or the F1 key again.

### **3.5 In Case of Problems**

If, after making and saving system changes with Setup, you discover that your computer no longer is able to boot, the BIOS supports an override to the NVRAM settings which resets your system to its defaults.

The best advice is to only alter settings which you thoroughly understand. To this end, we strongly recommend that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both your systems manufacturer to provide the absolute maximum performance and reliability. Even a seemingly small change to the chipset setup has the potential for causing you to use the override.

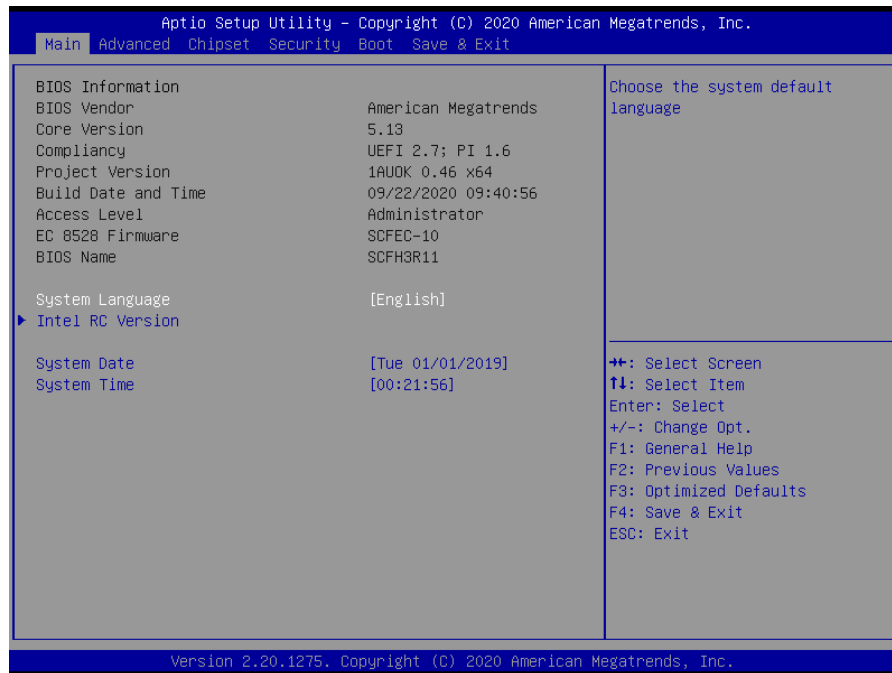


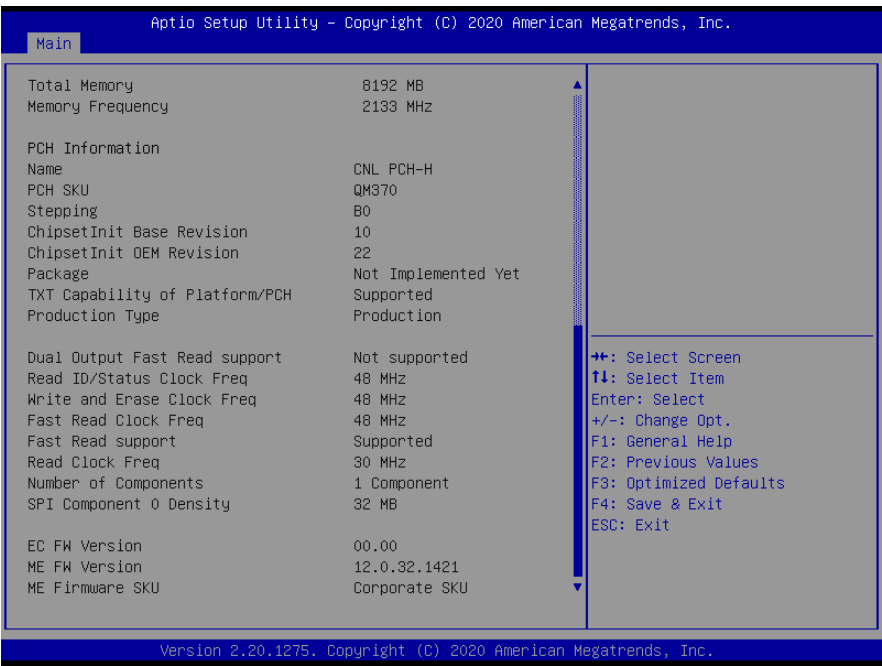
### 3.6 BIOS setup

Once you enter the Aptio Setup Utility, the Main Menu will appear on the screen. The Main Menu allows you to select from several setup functions and exit choices. Use the arrow keys to select among the items and press <Enter> to accept and enter the sub-menu.

#### 3.6.1 Main Menu

This section allows you to record some basic hardware configurations in your computer and set the system clock.





3.6.1.1 System Language

This option allows choosing the system default language.

3.6.1.2 System Date

Use the system date option to set the system date. Manually enter the day, month and year.

3.6.1.3 System Time

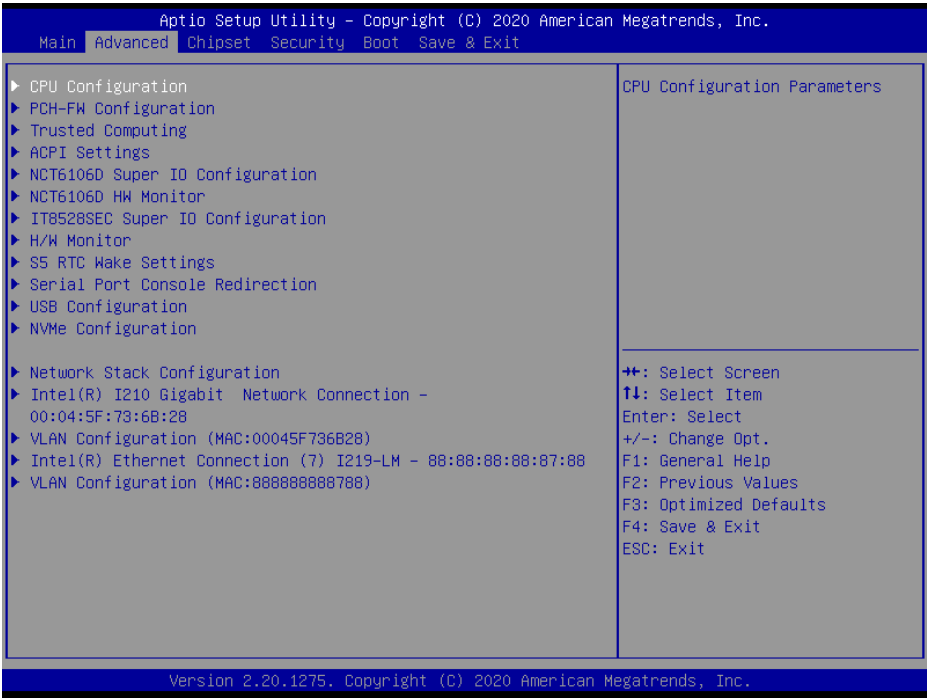
Use the system time option to set the system time. Manually enter the hours, minutes and seconds.



**Note:** The BIOS setup screens shown in this chapter are for reference purposes only, and may not exactly match what you see on your screen. Visit the Avalue website ([www.avalue.com.tw](http://www.avalue.com.tw)) to download the latest product and BIOS information.

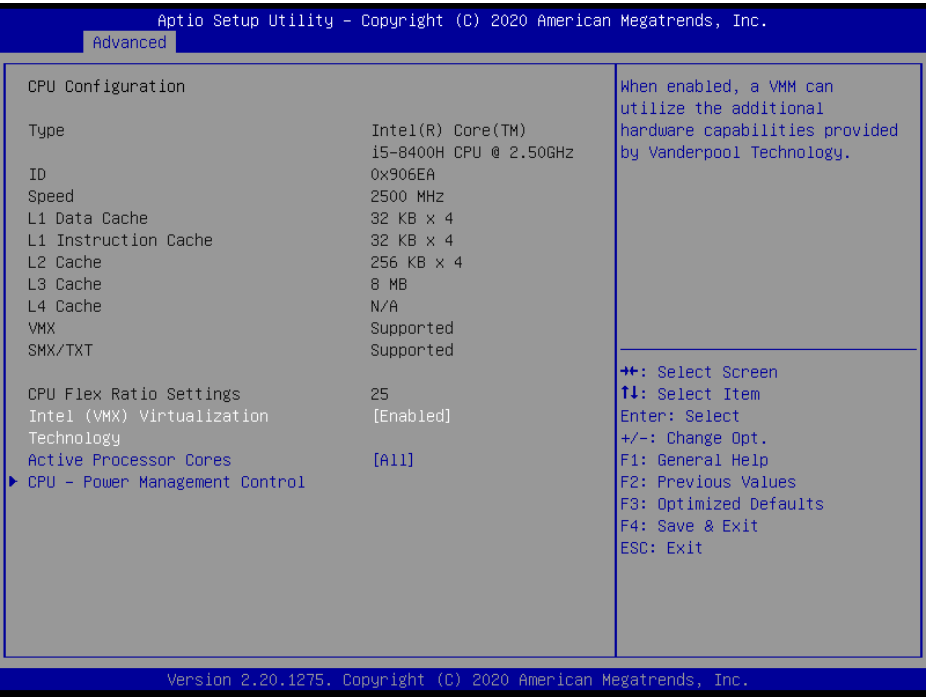
3.6.2 Advanced Menu

This section allows you to configure your CPU and other system devices for basic operation through the following sub-menus.



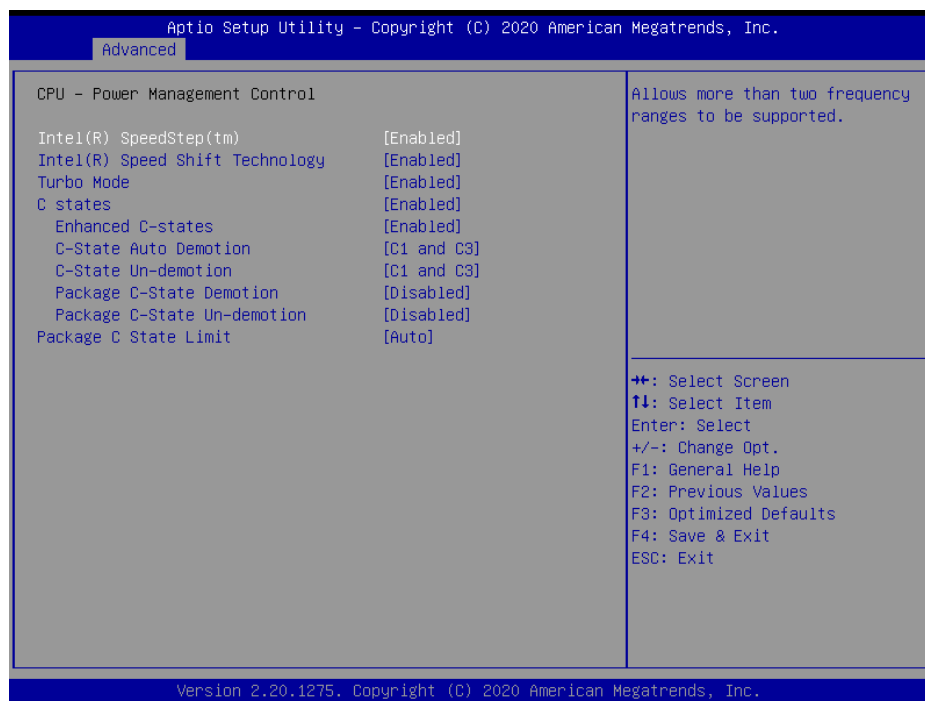
3.6.2.1 CPU Configuration

Use the CPU configuration menu to view detailed CPU specification and configure the CPU.



Item	Options	Description
Intel (VMX) Virtualization Technology	Disabled Enabled[Default]	When enabled, a VMM can utilize the additional hardware capabilities provided by Vanderpool Technology.
Active Processor Cores	All[Default] 1 2 3 4 5 6 7 8	Number of cores to enable in each processor package.

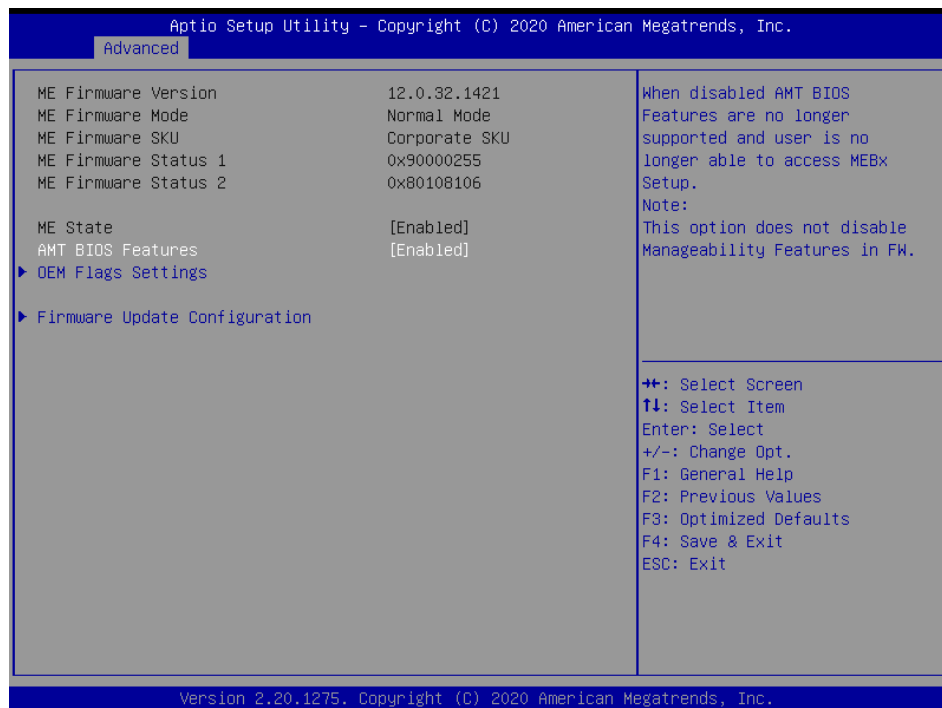
### 3.6.2.1.1 CPU – Power Management Control



Item	Option	Description
Intel® SpeedStep™	Enabled[Default], Disabled	Allows more than two frequency ranges to be supported.
Intel® Speed Shift Technology	Enabled[Default], Disabled	Enable/Disable Intel® Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.
Turbo Mode	Enabled[Default], Disabled	Enable/Disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).
C States	Enabled[Default], Disabled	Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100391151632tilized.
Enhanced C-states	Enabled[Default], Disabled	Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

<b>C-State Auto Demotion</b>	Disabled, C1 C3 C1 and C3[Default]	Configure C-State Auto Demotion.
<b>C-State Un-demotion</b>	Disabled, C1 C3 C1 and C3[Default]	Configure C-State Un-demotion.
<b>Package C-State Demotion</b>	Enabled Disabled[Default],	Package C-State Demotion.
<b>Package C-State Un-demotion</b>	Enabled Disabled[Default],	Package C-State Un-demotion.
<b>Package C State Limit</b>	C0/C1 C2 C3 C6 C7 C7S C8 C9 C10 CPU Default Auto[Default]	Maximum Package C State Limit Setting. CPU Default: Leaves to Factory default value. Auto: Initializes to deepest available Package C State Limit.

### 3.6.2.2 PCH-FW Configuration



Item	Options	Description
<b>ME State</b>	Disabled, Enabled[Default]	When Disabled ME will be put into ME Temporarily Disabled Mode.
<b>AMT BIOS Features</b>	Disabled, Enabled[Default]	When disable AMT BIOS Features are no longer supported and user is no longer able to access MEBx Setup. Note: This option does not disable Manageability Features in FW.

### 3.6.2.2.1 OEM Flags Settings



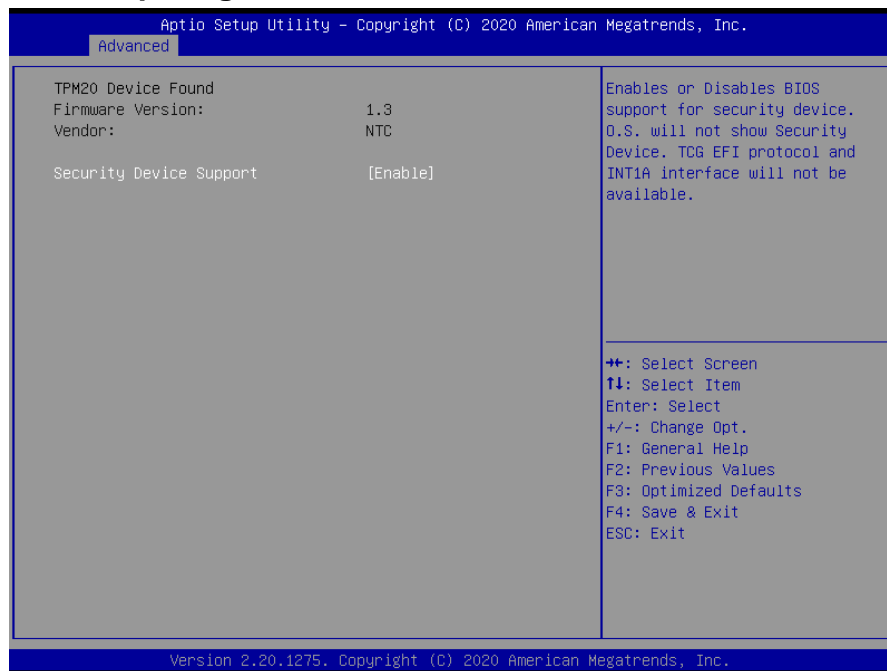
Item	Option	Description
Unconfigure ME	Disabled[Default], Enabled	OEMFlag Bit 15: Unconfigure ME with resetting MEBx password to default.

### 3.6.2.2.2 Firmware Update Configuration



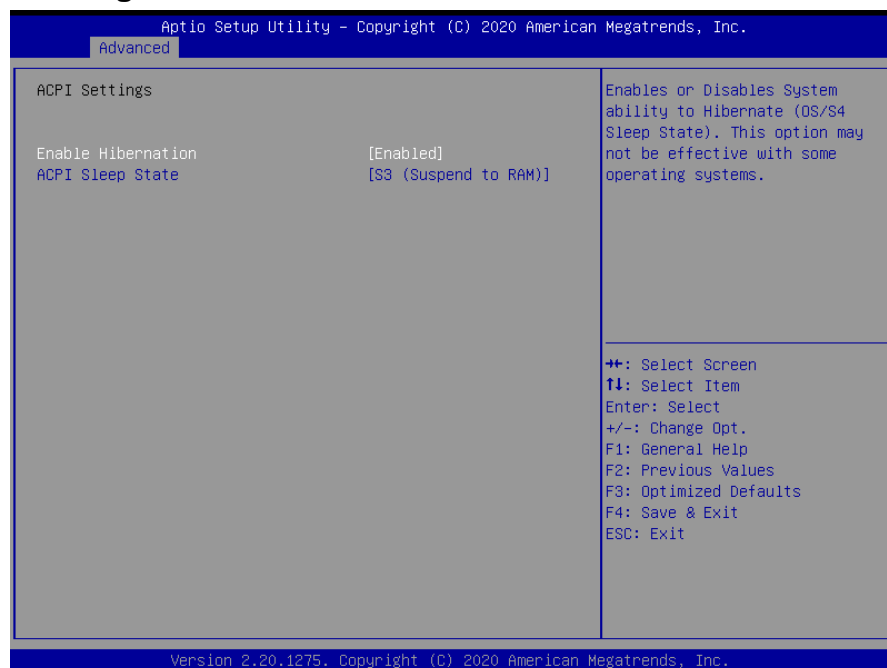
Item	Option	Description
Me FW Image Re-Flash	Disabled[Default], Enabled	Enable/Disable Me FW Image Re-Flash function.

### 3.6.2.3 Trusted Computing



Item	Options	Description
<b>Security Device Support</b>	Disable, Enable <b>[Default]</b>	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.

### 3.6.2.4 APCI Settings

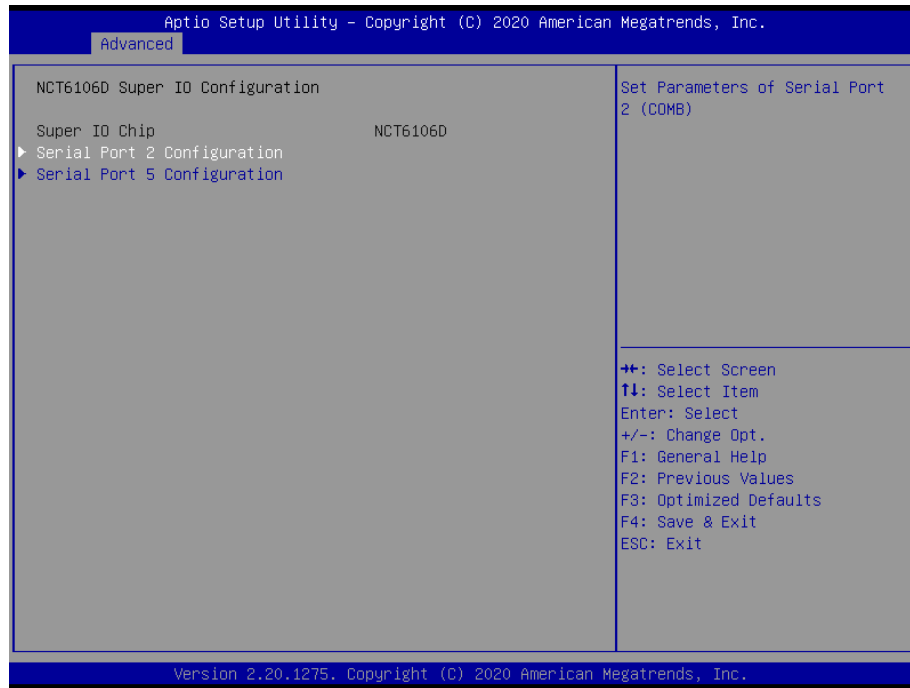


Item	Options	Description
<b>Enable Hibernation</b>	Disabled Enabled <b>[Default]</b>	Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some OS.

<b>ACPI Sleep State</b>	Suspend Disabled, S3 (Suspend to RAM)[Default]	Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.
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### 3.6.2.5 NCT6106D Super IO Configuration

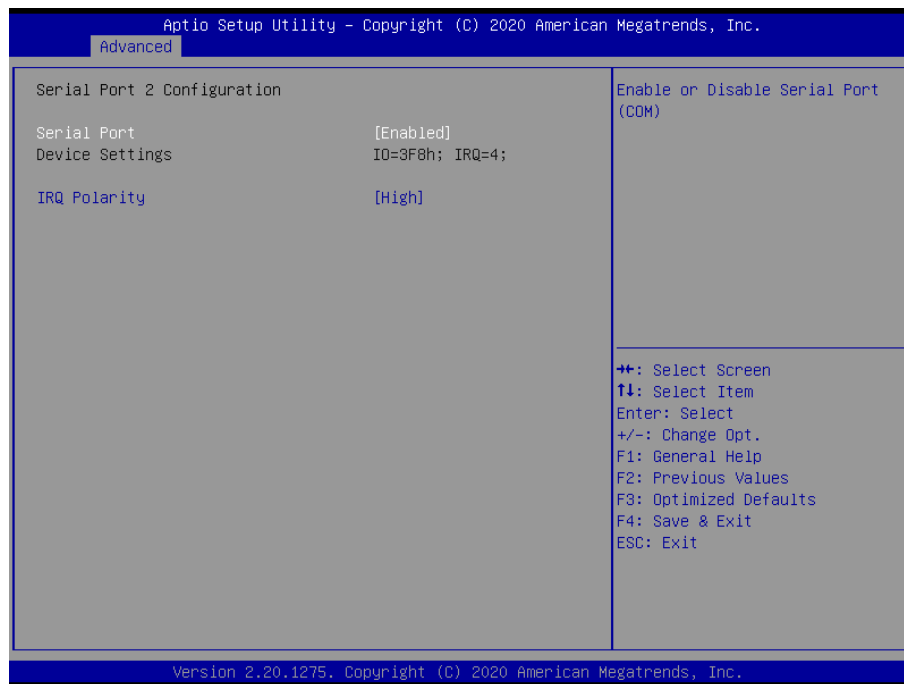
You can use this item to set up or change the NCT6106D Super IO configuration for serial ports. Please refer to 3.6.2.5.1~ 3.6.2.5.2 for more information.



Item	Description
<b>Serial Port 2 Configuration</b>	Set Parameters of Serial Port 2 (COMB).
<b>Serial Port 5 Configuration</b>	Set Parameters of Serial Port 5 (COME).

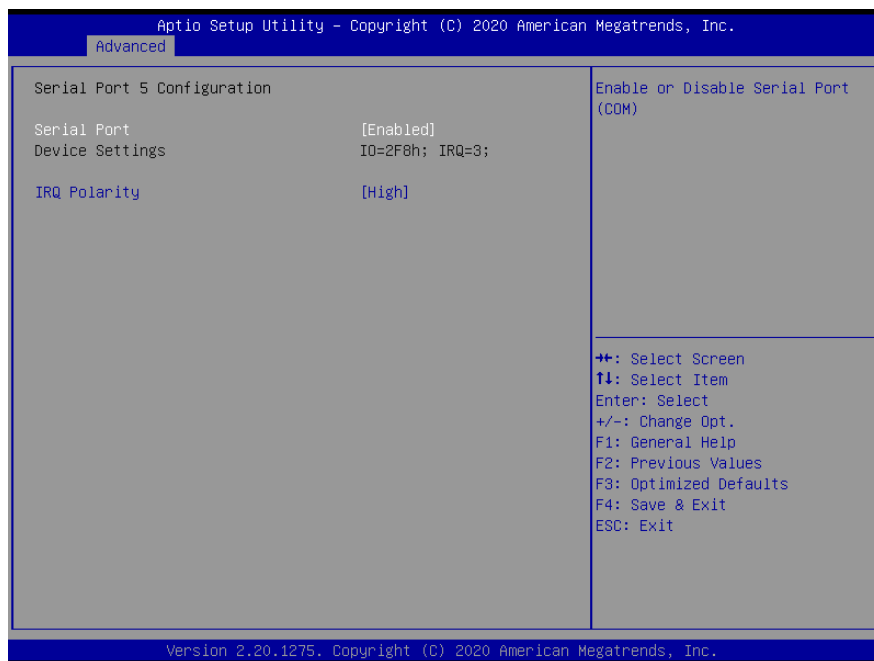


### 3.6.2.5.1 Serial Port 2 Configuration



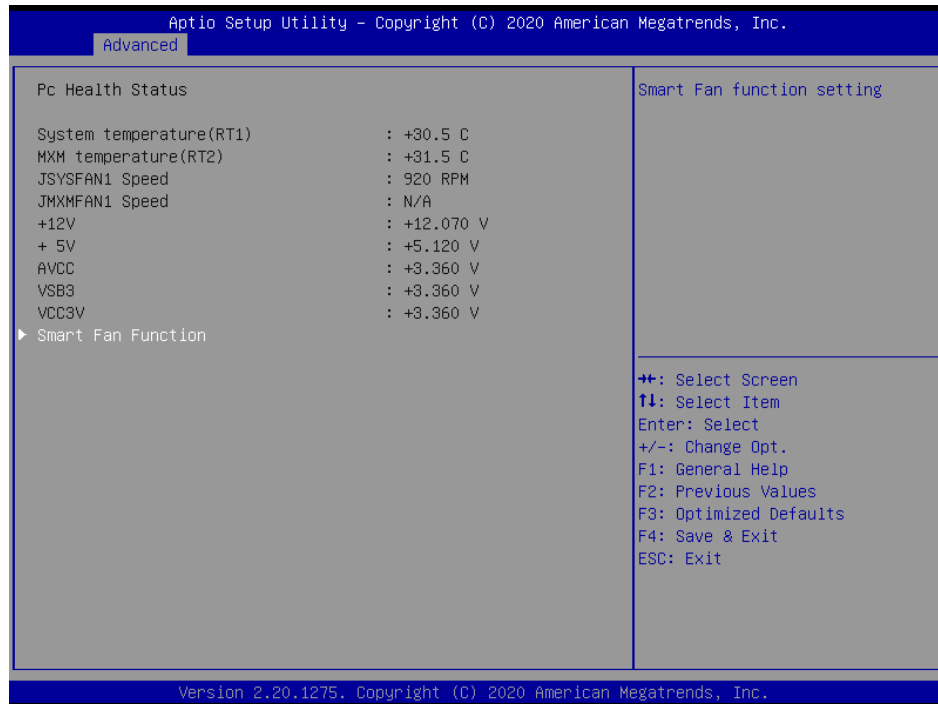
Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM).
IRQ Polarity	High[Default] Low	Low or High for both COM1 IRQ4/COM2 IRQ3.

### 3.6.2.5.2 Serial Port 5 Configuration

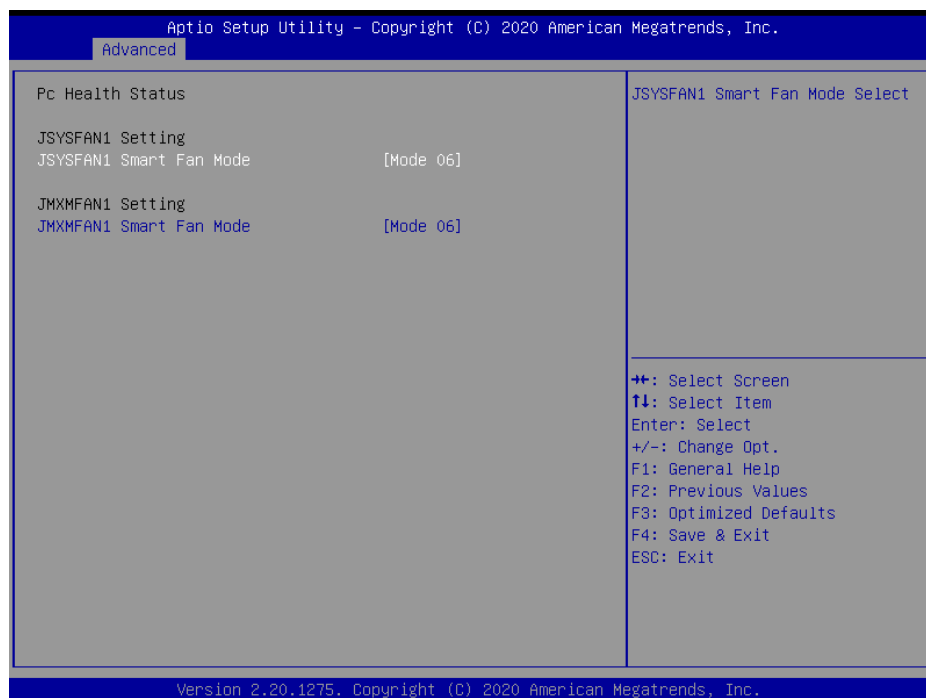


Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM).
IRQ Polarity	High[Default] Low	Low or High for both COM1 IRQ4/COM2 IRQ3.

## 3.6.2.6 NCT6106D HW Monitor

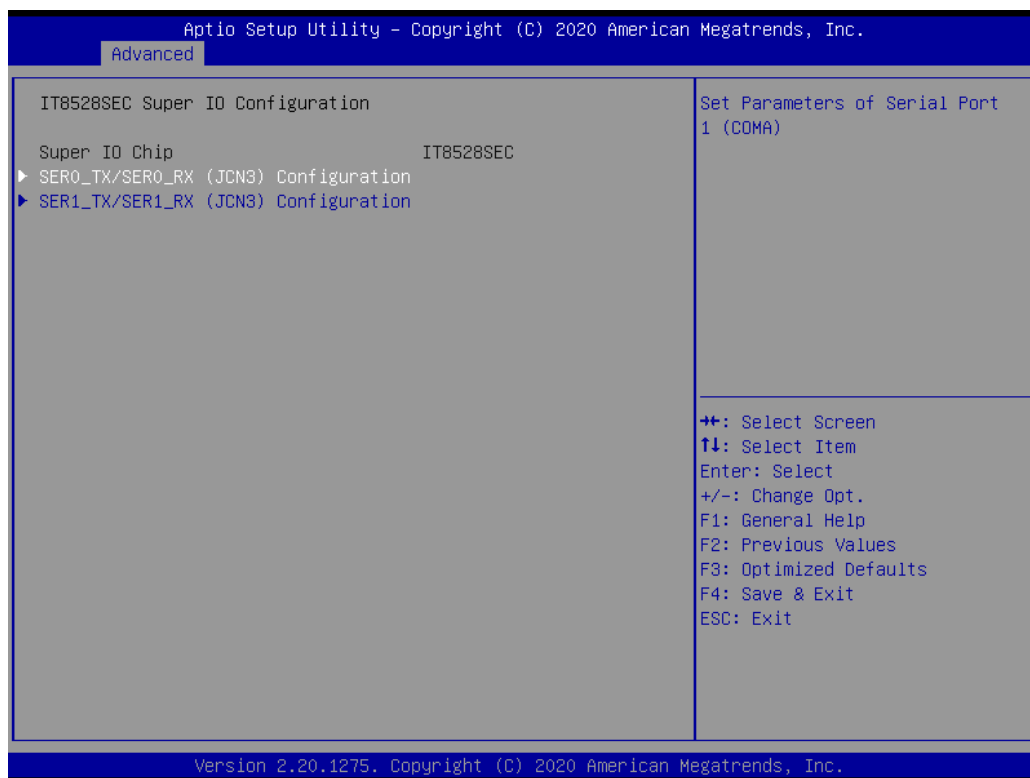


### 3.6.2.6.1 Smart Fan Function



Item	Option	Description
<b>JSYSFAN1 Smart Fan Mode</b>	Manual mode/Thermal Cruise/Speed Cruise/SMART FAN IV/Manual Mode/Mode 01/Mode 01 /Mode 02/Mode 03/Mode 04/Mode 05/Mode 06[Default]/Mode 07/Mode 08/Mode 09/Mode 10/Mode 11/Mode 12/Mode 13/Mode 14/Mode 15/Mode 16/Mode 17/Mode 18 /Mode 19/Mode 20	JSYSFAN1 Smart Fan Mode Select.
<b>JMXMFAN1 Smart Fan Mode</b>	Manual mode/Thermal Cruise/Speed Cruise/SMART FAN IV/Manual Mode/Mode 01/Mode 01 /Mode 02/Mode 03/Mode 04/Mode 05/Mode 06[Default]/Mode 07/Mode 08/Mode 09/Mode 10/Mode 11/Mode 12/Mode 13/Mode 14/Mode 15/Mode 16/Mode 17/Mode 18 /Mode 19/Mode 20	JMXMFAN1 Smart Fan Mode Select.

### 3.6.2.7 IT8528SEC Super IO Configuration

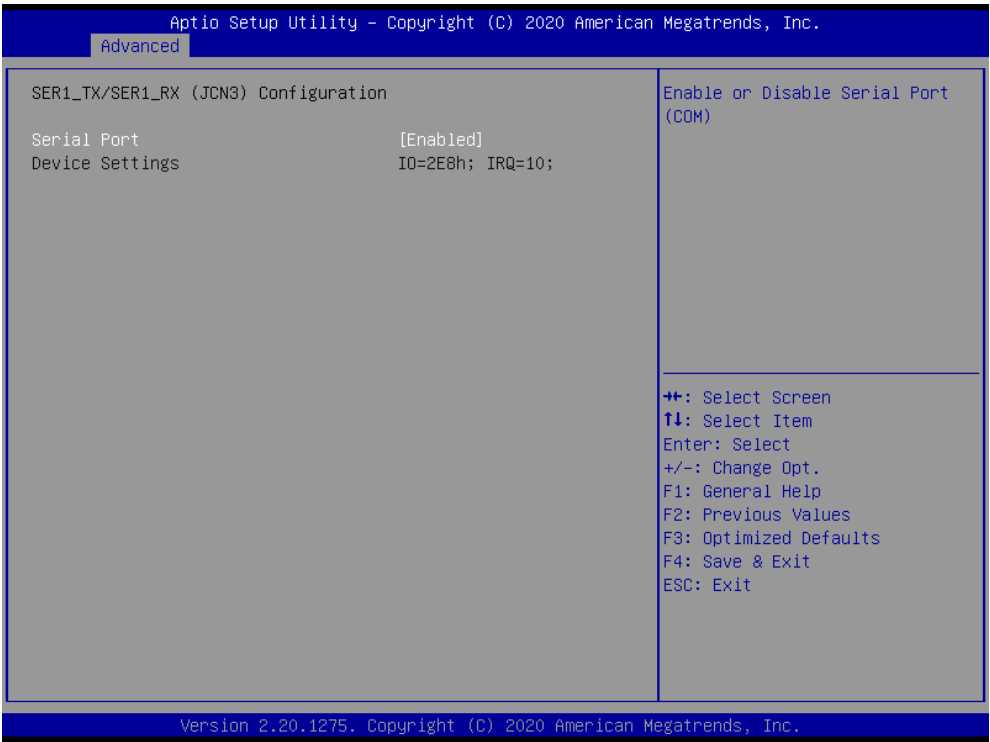


3.6.2.7.1 SER0\_TX/SER0\_RX (JCN3) Configuration



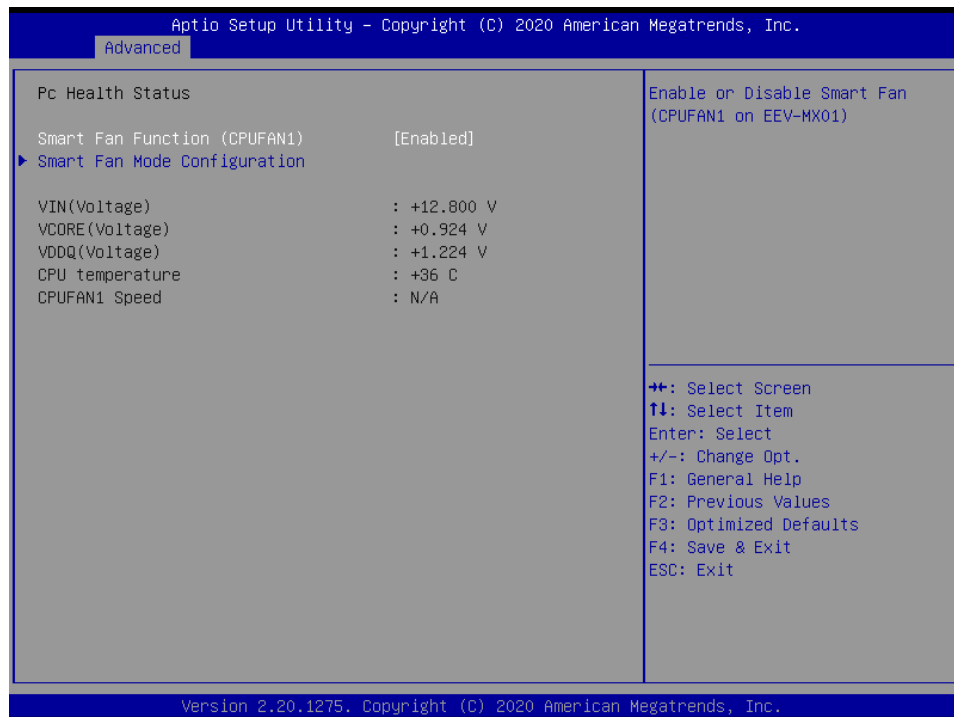
Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM).

3.6.2.7.2 SER1\_TX/SER1\_RX (JCN3) Configuration



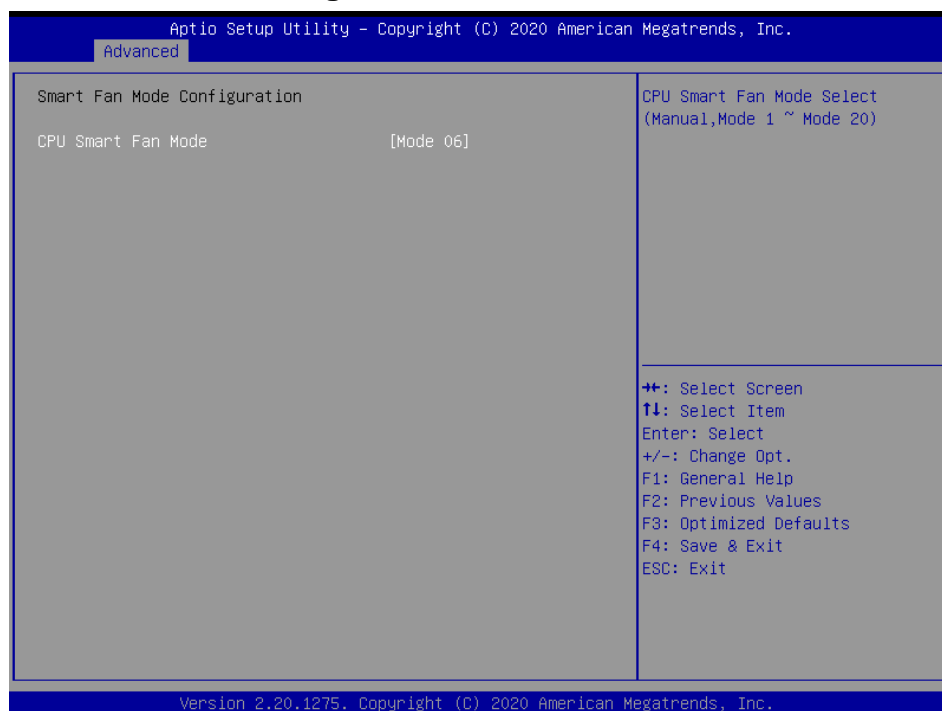
Item	Option	Description
Serial Port	Enabled[Default], Disabled	Enable or Disable Serial Port (COM).

### 3.6.2.8 H/W Monitor



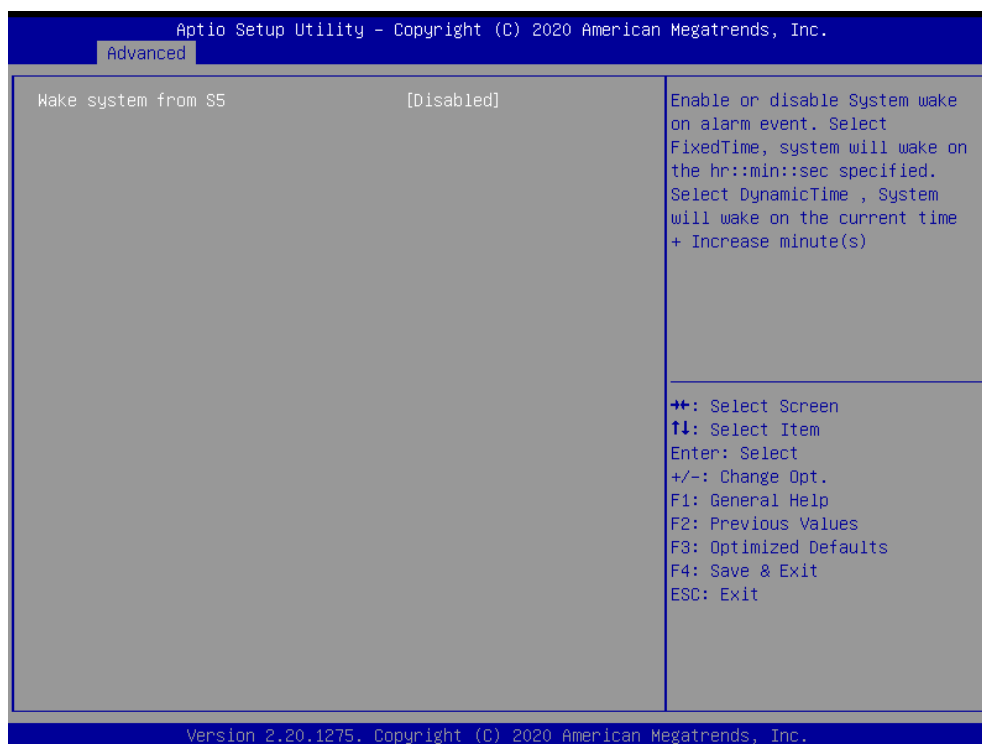
Item	Options	Description
Smart Fan Function(CPUFAN1)	Enabled[Default] Disabled	Enables or Disables Smart Fan(CPUFAN1 on EEV-MX01).

#### 3.6.2.8.1 Smart Fan Mode Configuration

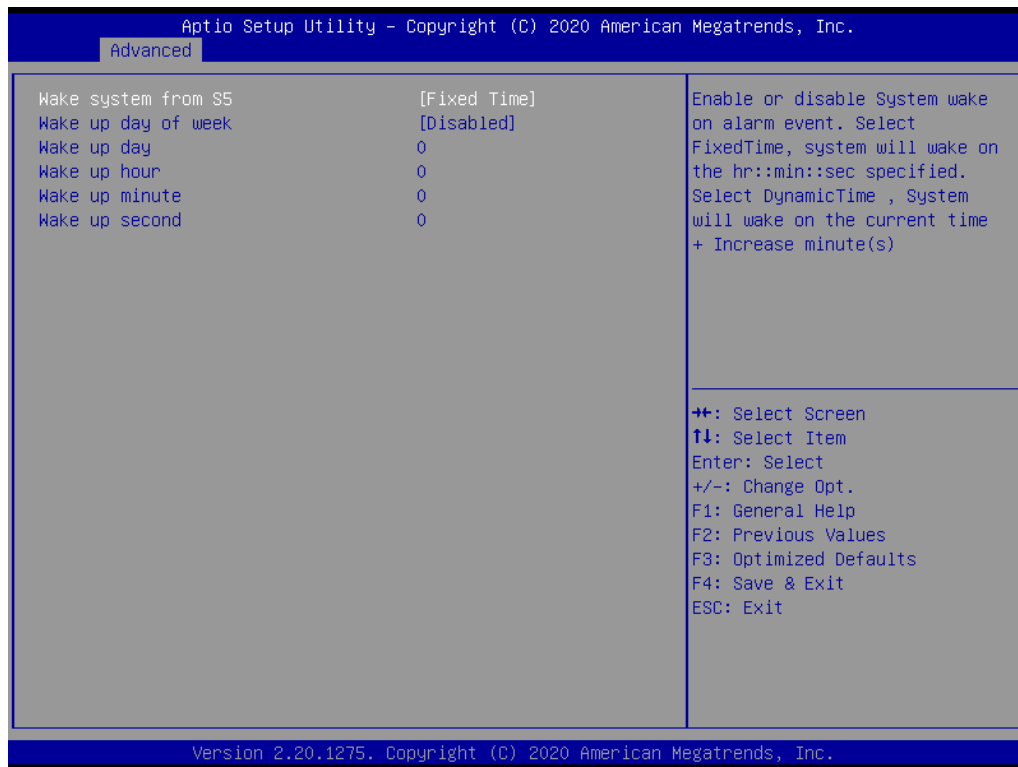


Item	Option	Description
<b>CPU Smart Fan Mode</b>	Manual Mode]/Mode 01/Mode 02/Mode 03/ Mode 04/Mode 05/Mode 06 <b>[Default</b> / Mode 07/Mode 08/Mode 09/ Mode 10/Mode 11/Mode 12/ Mode 13/Mode 14/Mode 15/ Mode 16/Mode 17/Mode 18/ Mode 19/Mode 20	CPU Smart Fan Mode Select(Manual, Mode1 ~ Mode 20).

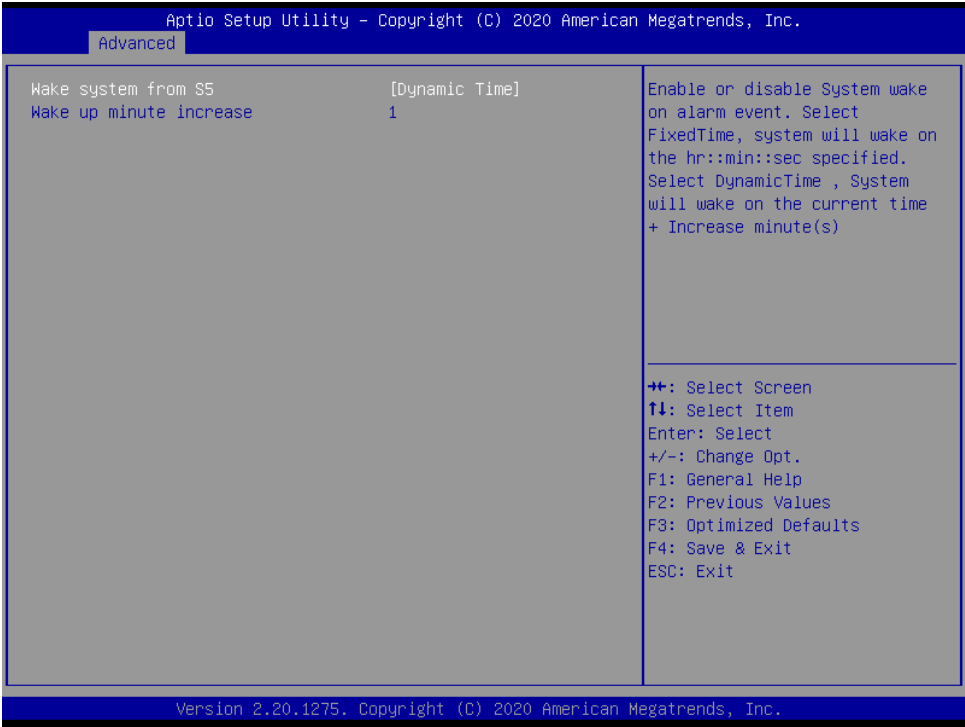
### 3.6.2.9 S5 RTC Wake Settings



Item	Options	Description
<b>Wake system from S5</b>	Disabled <b>[Default]</b> , Fixed Time Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).

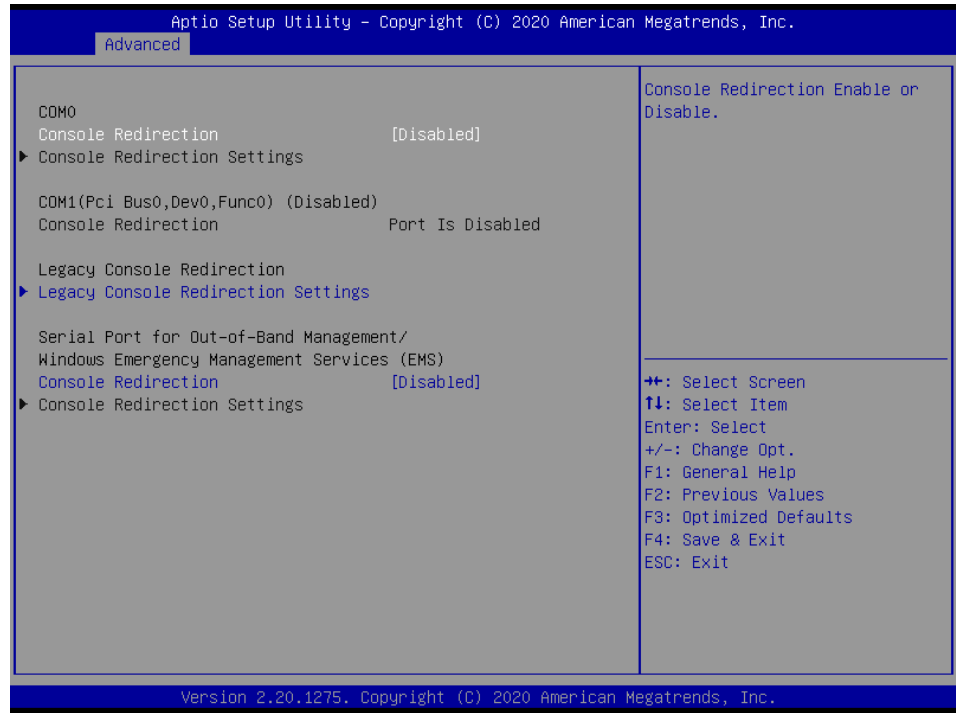


Item	Options	Description
<b>Wake system from S5</b>	Disabled, Fixed Time[Default] Dynamic Time	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).
<b>Wake up day of week</b>	Disabled[Default] Monday-Friday Monday-Saturday	Wake up day of week. (Monday-Friday) or (Monday-Saturday).
<b>Wake up day</b>	0	Select 0 for daily system wake up 1-31 for which day of the month that you would like the system to wake up.
<b>Wake up hour</b>	0	Select 0-23 For example enter 3 for 3am and 15 for 3pm.
<b>Wake up minute</b>	0	Select 0-59 For Minute.
<b>Wake up second</b>	0	Select 0-59 For Second.



Item	Options	Description
Wake system from S5	Disabled, Fixed Time Dynamic Time <b>[Default]</b>	Enable or disable System wake on alarm event. Select Fixed Time, system will wake on the hr::min::sec specified. Select Dynamic Time, System will wake on the current time + Increase minute(s).
Wake up minute increase	1-5	1-5.

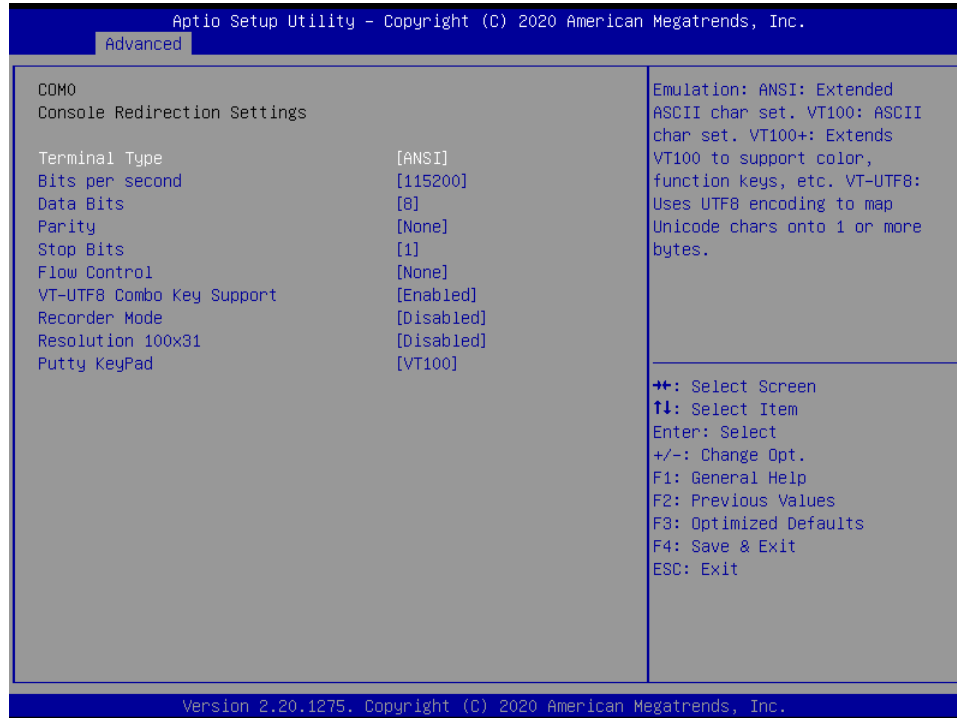
3.6.2.10 Serial Port Console Redirection





Item	Options	Description
Console Redirection	Disabled[Default], Enabled	Console Redirection Enable or Disable.

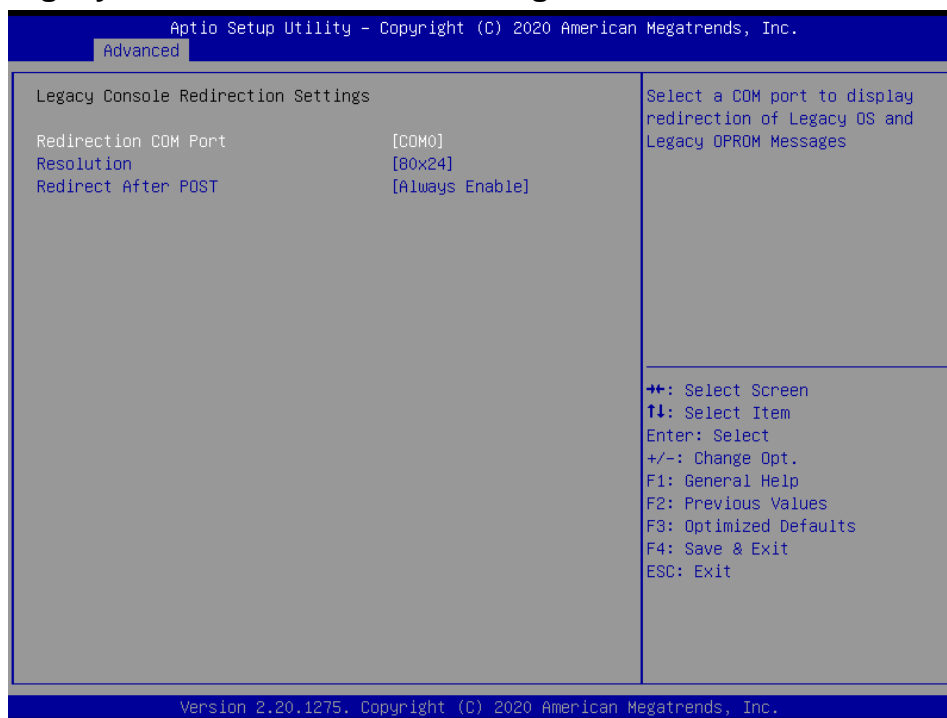
### 3.6.2.10.1 COM0



Item	Option	Description
Terminal Type	VT100 VT100+ VT-UTF8 ANSI[Default]	Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600 19200 38400 57600 115200[Default]	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Data Bits	7 8[Default]	Data Bits.
Parity	None[Default] Even Odd Mark	A parity bit can be sent with the data bits to detect some transmission errors. Even: parity bit is 0 if the num of 1's in the data bits is even. Odd: parity bit is 0 if num of 1's in the data bits is odd. Mark: parity bit is always 1. Space: Parity bit is always 0. Mark and Space Parity do not allow for error detection.
Stop Bits	1[Default] 2	Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

<b>Flow Control</b>	None[Default] Hardware RTS/CTS	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
<b>VT-UTF8 Combo Key Support</b>	Disabled, Enabled[Default]	Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
<b>Recorder Mode</b>	Disabled[Default], Enabled	With this mode enabled only text will be sent. This is to capture Terminal data.
<b>Resolution 100x31</b>	Disabled[Default], Enabled	Enables or disables extended terminal resolution.
<b>Putty KeyPad</b>	VT100[Default] LINUX XTERMR6 SCO ESCN VT400	Select FunctionKey and KeyPad on Putty.

### 3.6.2.10.2 Legacy Console Redirection Settings



Item	Option	Description
<b>Redirection COM Port</b>	COM0[Default]	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
<b>Resolution</b>	80x24[Default] 80x25	On Legacy OS, the Number of Rows and Columns supported redirection.
<b>Redirect After POST</b>	Always Enable[Default] BootLoader	When Bootloader is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When Always Enable is selected, then Legacy Console Redirection is enabled for

		legacy OS. Default setting for this option is set to Always Enable.
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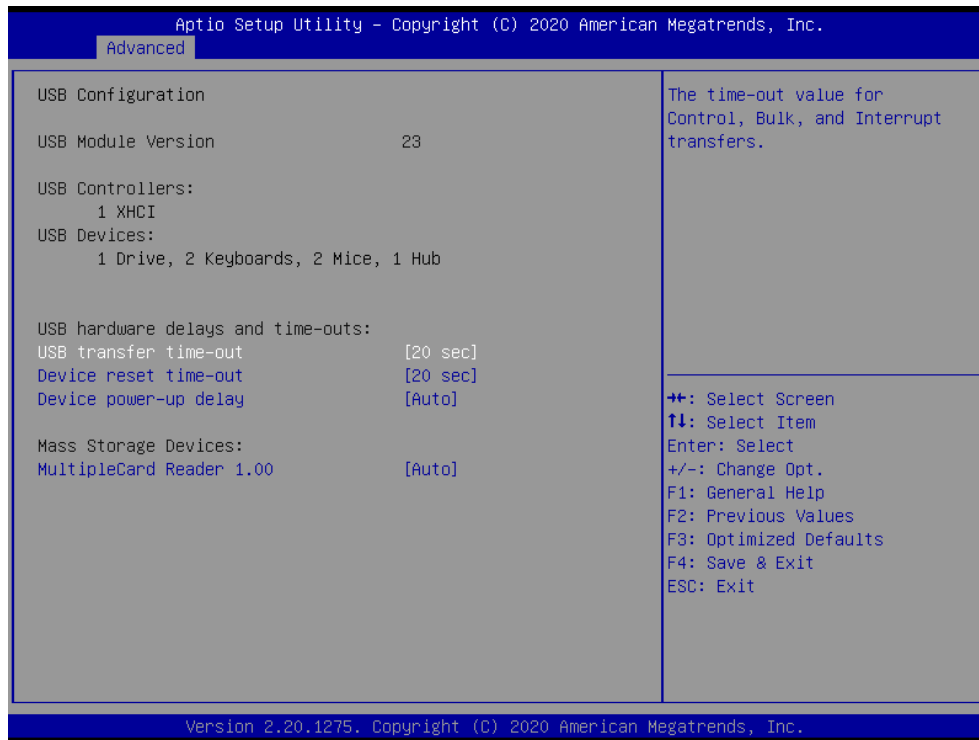
### 3.6.2.10.3 Console Redirection Settings



Item	Option	Description
<b>Out-of-Band Mgmt Port</b>	COM0[Default]	Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.
<b>Terminal Type</b>	VT100 VT100+ VT-UTF8[Default] ANSI	VT-UTF8 is the preferred terminal type for out-of-band management. The next best choice is VT100+ and then VT100. See above, in Console Redirection Settings page, for more Help with Terminal Type/Emulation.
<b>Bits per second</b>	9600 19200 57600 115200[Default]	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
<b>Flow Control</b>	None[Default] Hardware RTS/CTS Software Xon/Xoff	Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

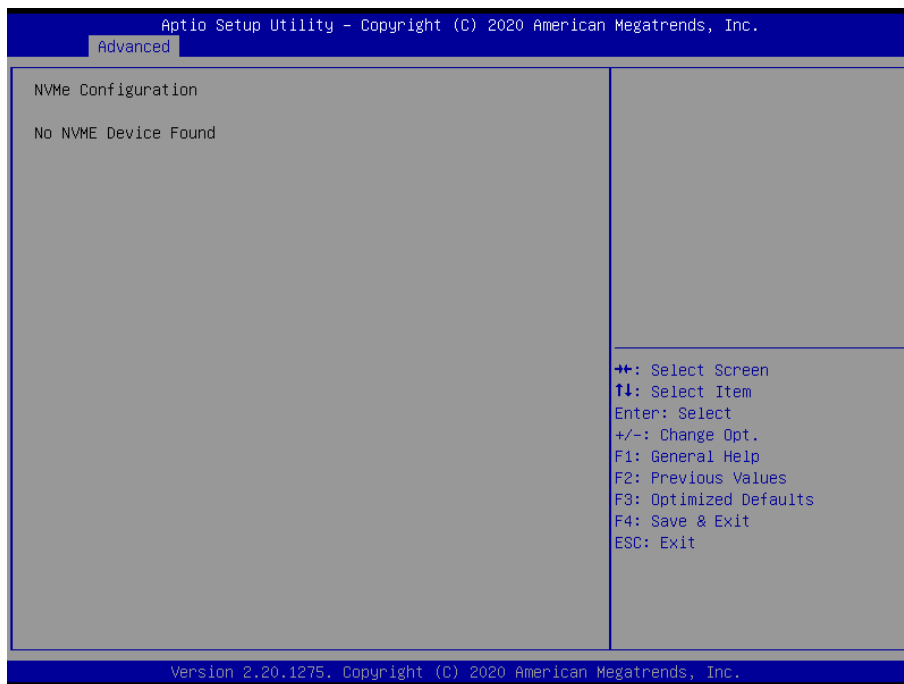
### 3.6.2.11 USB Configuration

The USB Configuration menu helps read USB information and configures USB settings.



Item	Options	Description
<b>USB transfer time-out</b>	1 sec 5 sec 10 sec 20 sec <b>[Default]</b>	The time-out value for Control, Bulk, and Interrupt transfers.
<b>Device reset time-out</b>	10 sec 20 sec <b>[Default]</b> 30 sec 40 sec	USB mass storage device Start Unit command time-out.
<b>Device power-up delay</b>	Auto <b>[Default]</b> Manual	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 100ms, for a Hub port the delay is taken from Hub descriptor.
<b>Mass Storage Devices</b>	Auto <b>[Default]</b> Floppy Forced FDD Hard Disk CD-ROM	Mass storage device emulation type. 'AUTO' enumerates devices according to their media format. Optical drives are emulated as 'CDROM', drives with no media will be emulated according to a drive type.

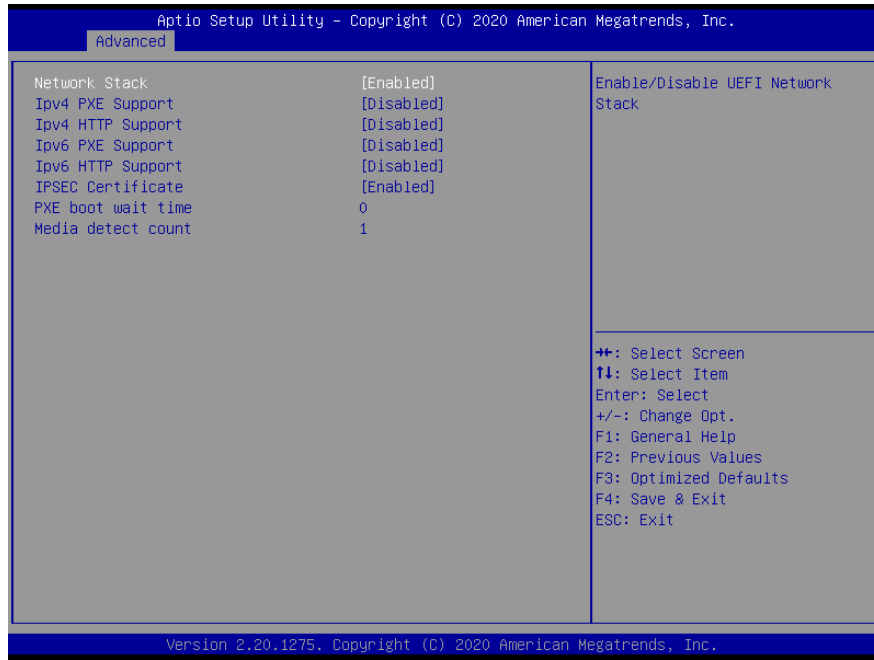
### 3.6.2.12 NVMe Configuration



### 3.6.2.13 Network Stack Configuration



Item	Options	Description
Network Stack	Enabled Disabled[Default]	Enable/Disable UEFI Network Stack.

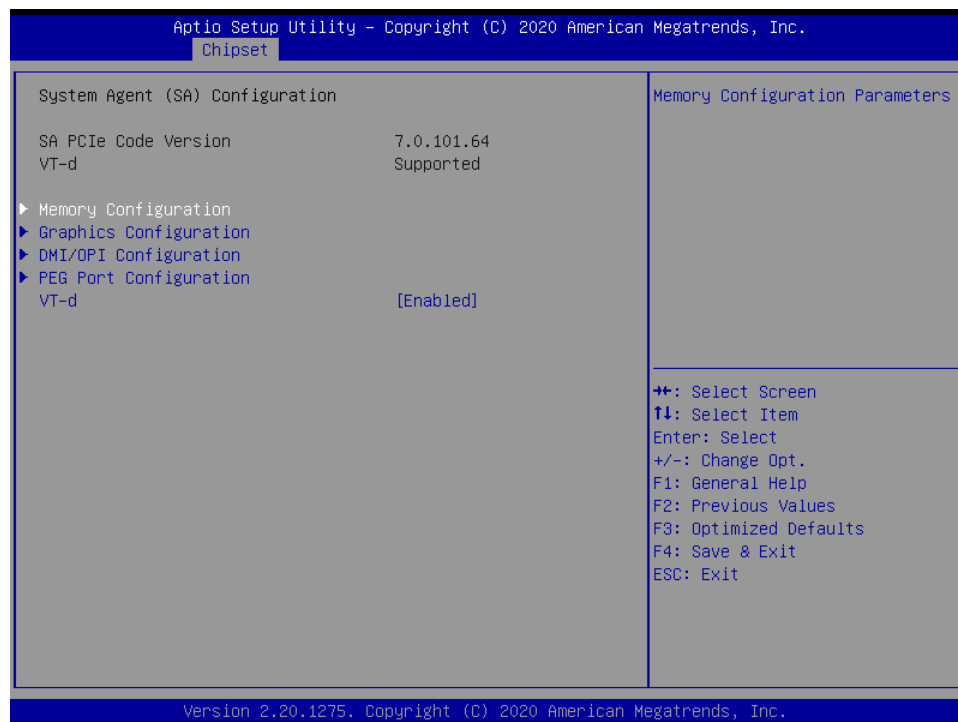


Item	Options	Description
<b>Network Stack</b>	Enabled[Default] Disabled	Enable/Disable UEFI Network Stack.
<b>Ipv4 PXE Support</b>	Enabled Disabled[Default]	Enable Ipv4 PXE Boot Support. If disabled IPV4 PXE boot option will not be created.
<b>Ipv4 HTTP Support</b>	Enabled Disabled[Default]	Enable Ipv4 HTTP Boot Support. If disabled IPV4 HTTP boot option will not be created.
<b>Ipv6 PXE Support</b>	Enabled Disabled[Default]	Enable Ipv6 PXE Boot Support. If disabled IPV6 PXE boot option will not be created.
<b>Ipv6 HTTP Support</b>	Enabled Disabled[Default]	Enable Ipv6 HTTP Boot Support. If disabled IPV6 HTTP boot option will not be created.
<b>IPSEC Certificate</b>	Enabled[Default] Disabled	Support to Enable/Disable IPSEC certificate for Ikev.
<b>PXE boot wait time</b>	0[Default] ~ 5	Wait time to press ESC key to abort the PXE boot.
<b>Media detect count</b>	1[Default] ~ 50	Number of times presence of media will be checked.

### 3.6.3 Chipset

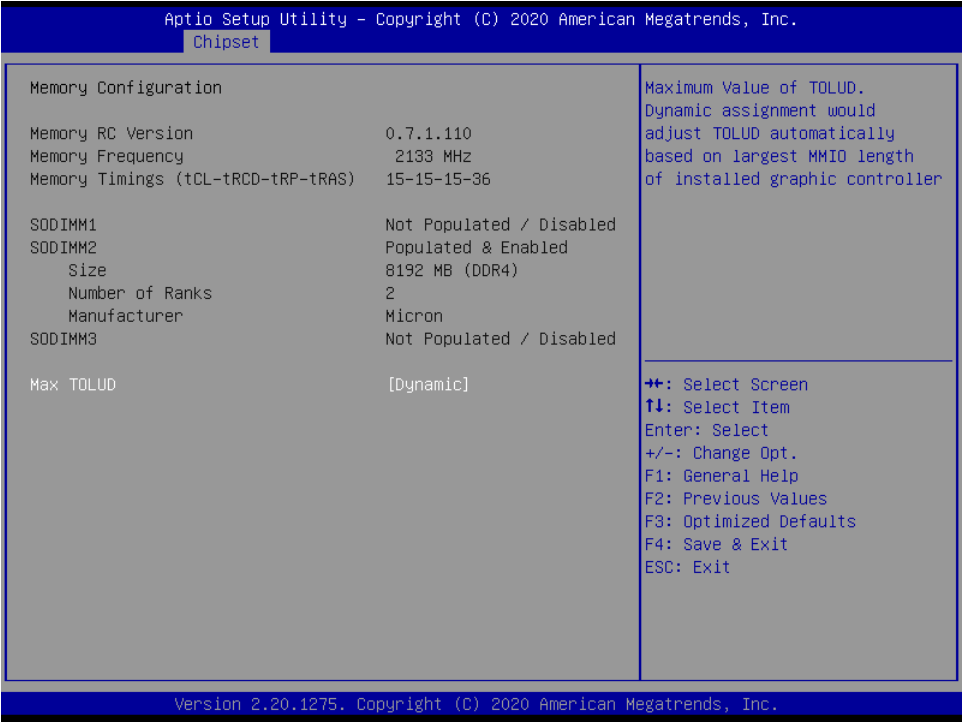


#### 3.6.3.1 System Agent (SA) Configuration



Item	Option	Description
VT-d	Enabled[Default] Disabled	VT-d capability.

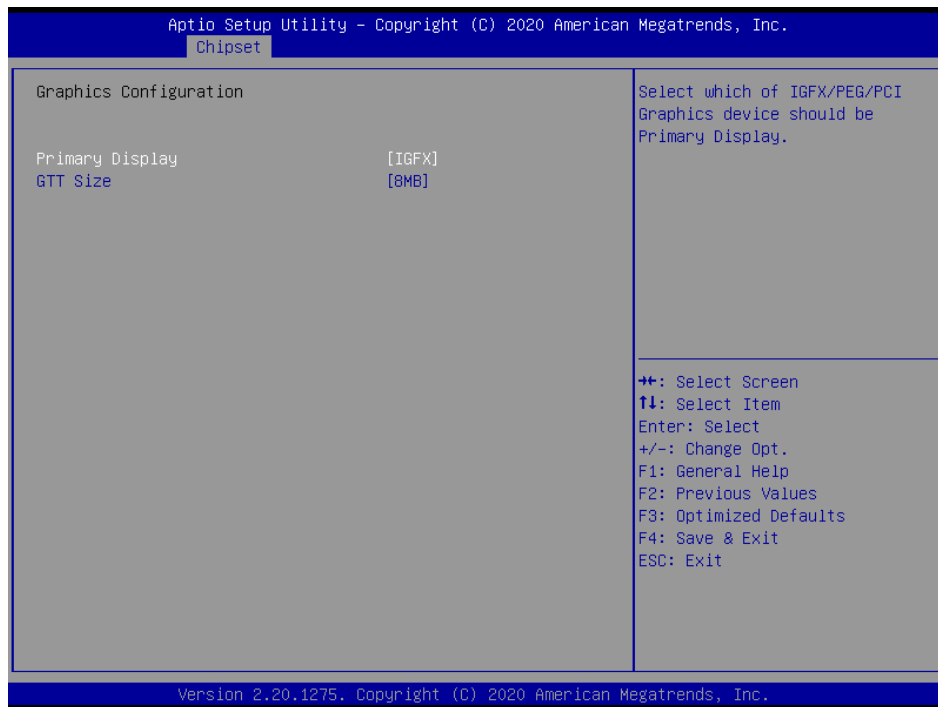
3.6.3.1.1 Memory Configuration



Item	Option	Description
Max TOLUD	Dynamic[Default]	Maximum Value of TOLUD. Dynamic assignment would adjust TOLUD automatically based on largest MMIO length of installed graphic controller.
	1 GB	
	1.25 GB	
	1.5 GB	
	1.75 GB	
	2 GB	
	2.25 GB	
	2.5 GB	
	2.75 GB	
	3 GB	

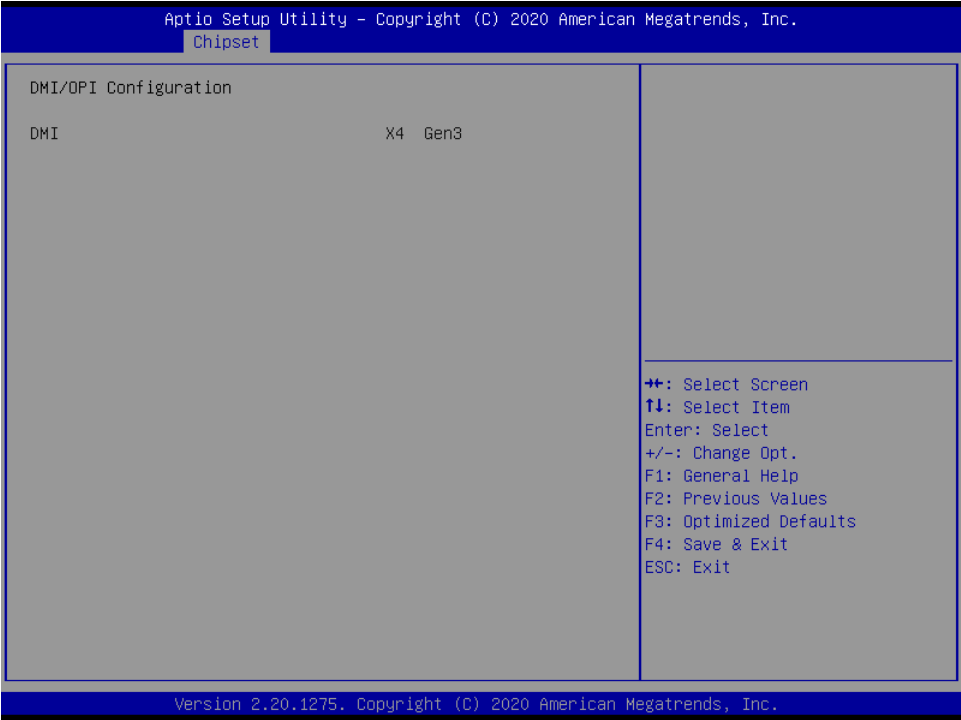


### 3.6.3.1.2 Graphics Configuration

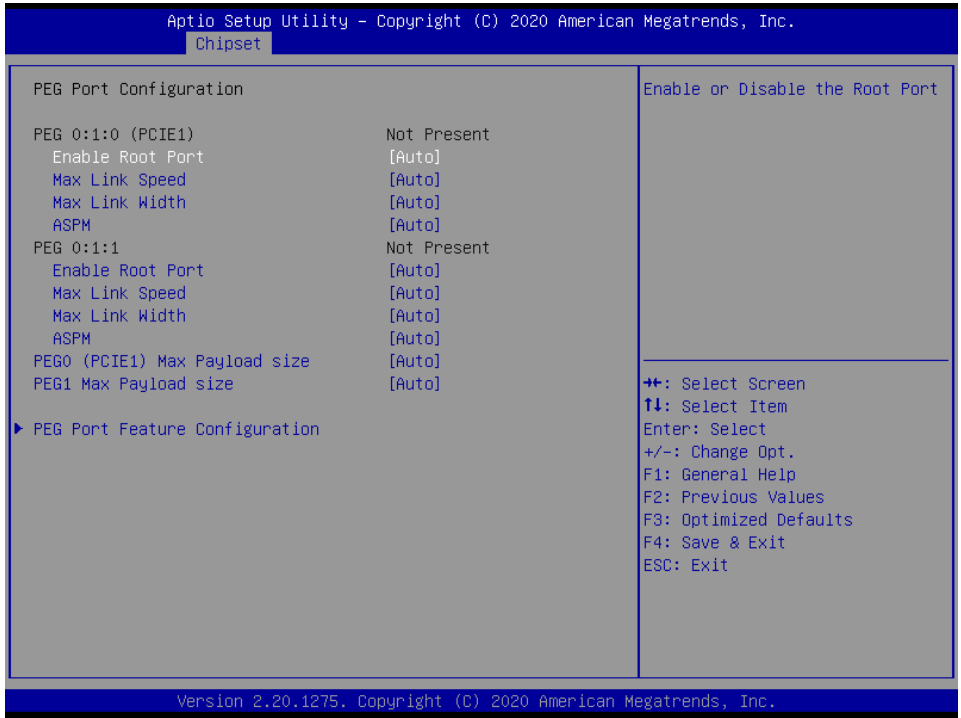


Item	Option	Description
<b>Primary Display</b>	Auto IGFX[Default] PEG PCI	Select which of IGFX/PEG/PCI Graphics device should be Primary Display.
<b>GTT Size</b>	2MB 4MB 8MB[Default]	Select the GTT Size.

3.6.3.1.3 DMI/OPI Configuration



3.6.3.1.4 PEG Port Configuration



Item	Option	Description
Enable Root Port	Disabled Enabled Auto[Default]	Enable or Disable the Root Port.

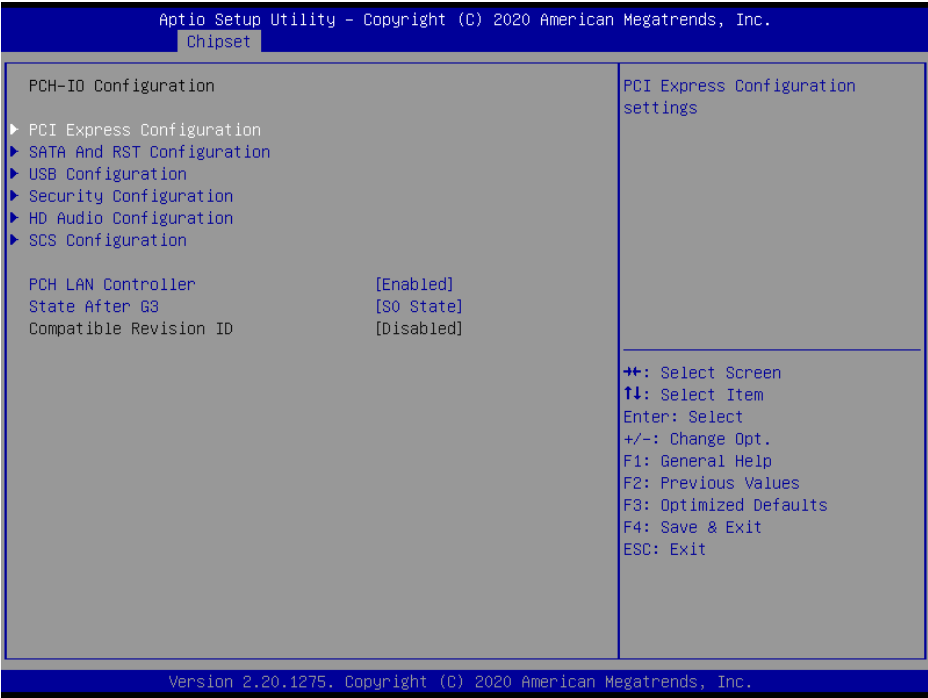
<b>Max Link Speed</b>	Auto[Default] Gen1 Gen2 Gen3	Configure PEG 0:1:0 Max Speed.
<b>Max Link Width</b>	Auto[Default] Force X1 Force X2 Force X4 Force X8	Force PEG link to retrain to X1/2/4/8.
<b>ASPM</b>	Disabled Auto[Default] ASPM L0s ASPM L1s ASPM L0sL1	Control ASPM support for the PEG 0. This has no effect if PEG is not the currently active device.
<b>PEG0(PCIe1) Max Payload size</b>	Auto[Default] 128 256 TLP	Select PEG0 Max Payload Size; Choose Auto(Default Device Capability) or force to 128/256 Bytes.
<b>PEG1 Max Payload size</b>	Auto[Default] 128 256 TLP	Select PEG1 Max Payload Size; Choose Auto(Default Device Capability) or force to 128/256 Bytes.

### 3.6.3.1.4.1 PEG Port Feature Configuration



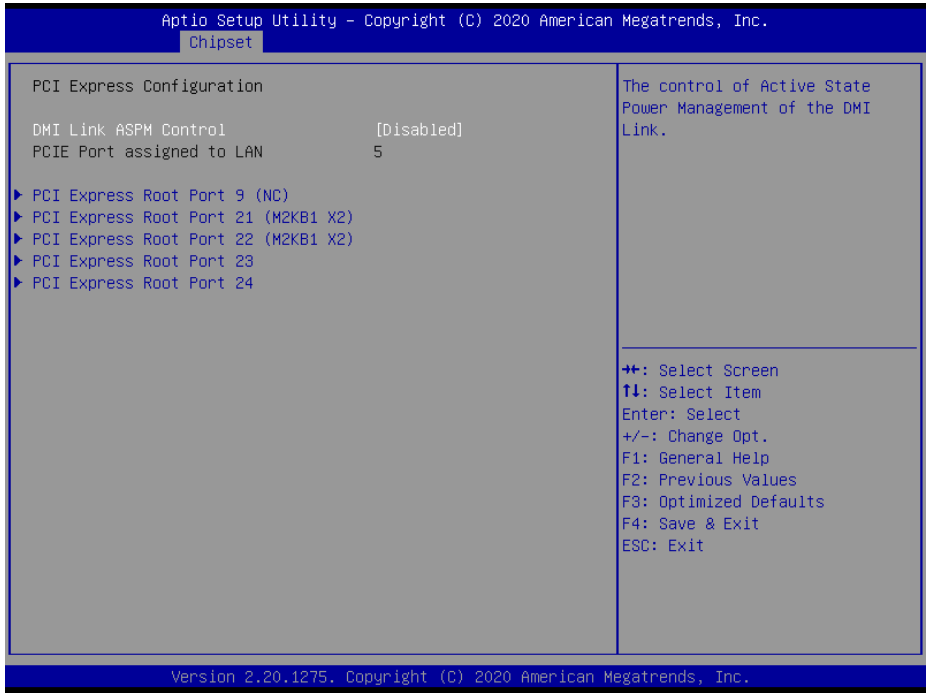
Item	Option	Description
<b>Detect Non-Compliance Device</b>	Enabled, Disabled[Default]	Detect Non-Compliance PCI Express Device in PEG.

3.6.3.2 PCH-IO Configuration



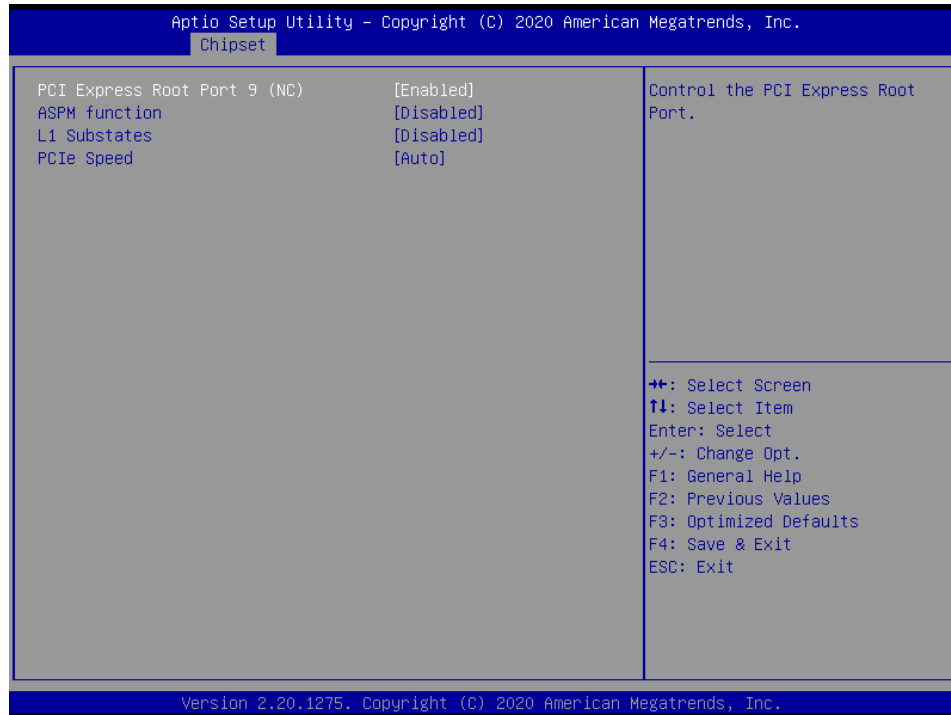
Item	Option	Description
PCH LAN Controller	Disabled Enabled[Default]	Enable/Disable onboard NIC.
State After G3	S0 State[Default] S5 State	Specify what state to go to when power is re-applied after a power failure (G3 state).

3.6.3.2.1 PCI Express Configuration



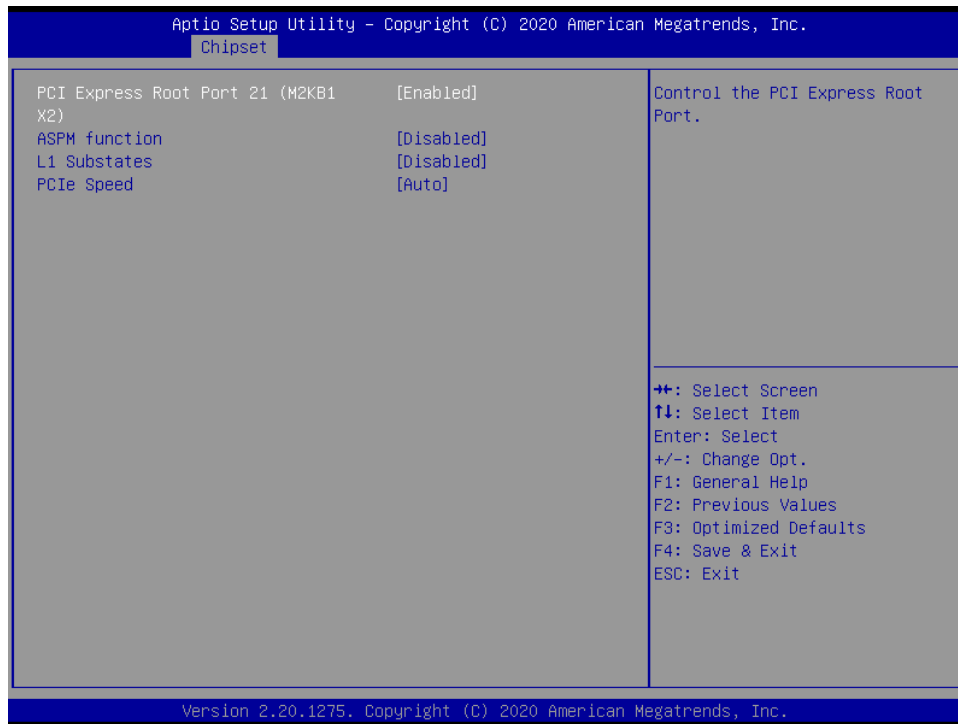
Item	Option	Description
<b>DMI Link ASPM Control</b>	Disabled[Default] L0s L1 L0sL1 Auto	The control of Active State Power Management of the DMI Link.

### 3.6.3.2.1.1 PCI Express Root Port 9 (NC)



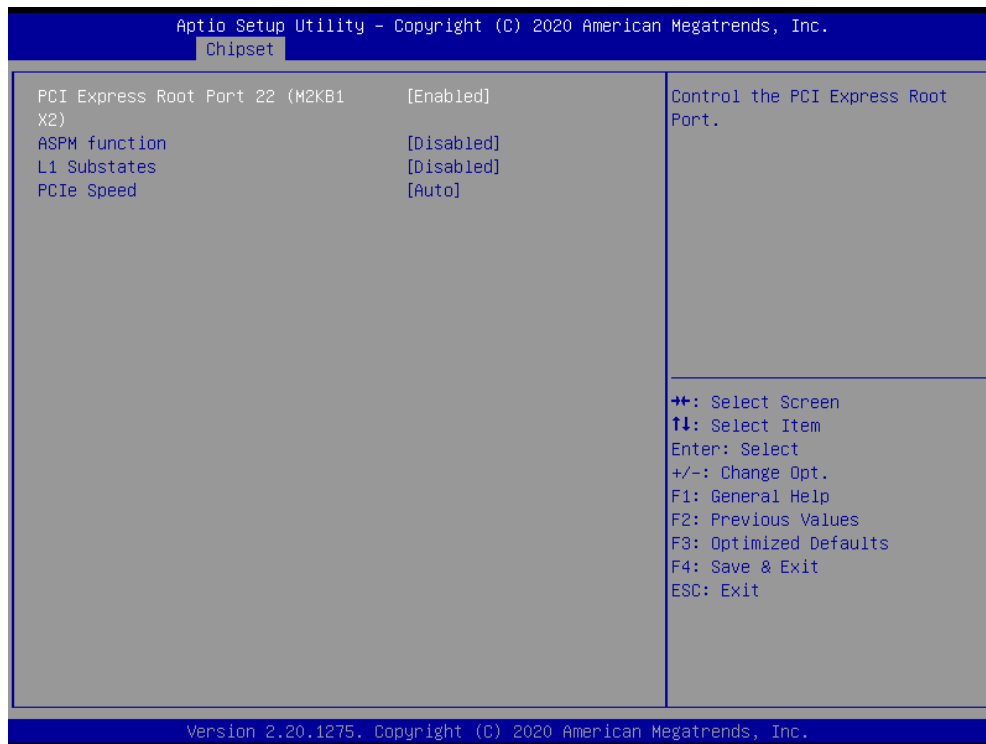
Item	Option	Description
<b>PCI Express Root Port 9 (NC)</b>	Enabled[Default], Disabled	Control the PCI Express Root Port.
<b>ASPM function</b>	Disabled[Default], L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
<b>L1 Substates</b>	Disabled[Default], L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
<b>PCIe Speed</b>	Auto[Default] Gen1 Gen2 Gen3	Configure PCIe Speed.

### 3.6.3.2.1.2 PCI Express Root Port 21 (M2KB1 x2)



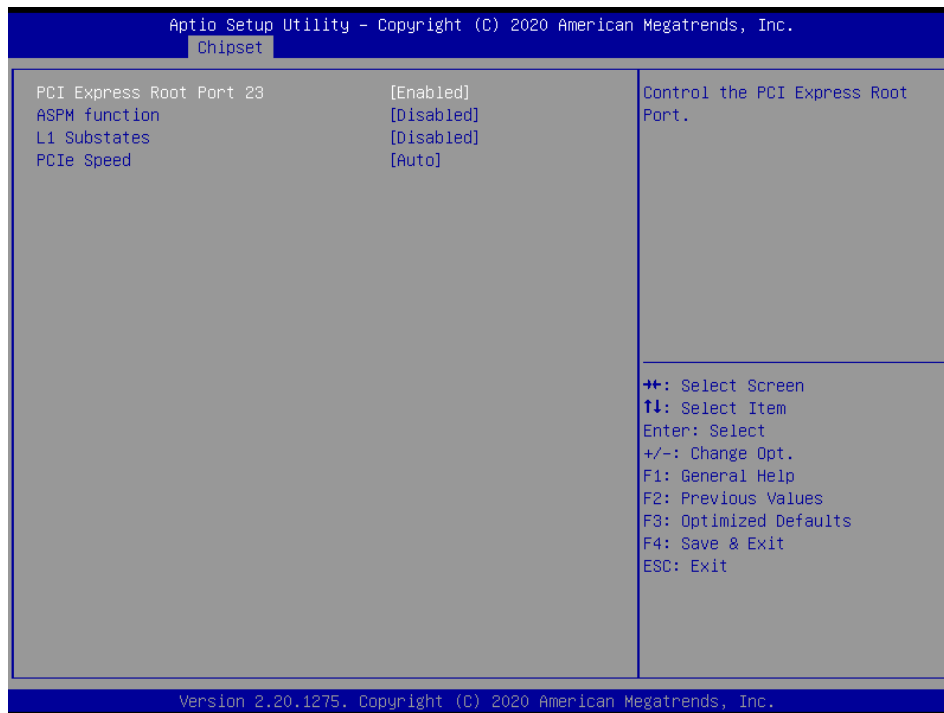
Item	Option	Description
<b>PCI Express Root Port 21 (M2KB1 x2)</b>	Enabled[Default], Disabled	Control the PCI Express Root Port.
<b>ASPM function</b>	Disabled[Default], L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
<b>L1 Substates</b>	Disabled[Default], L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
<b>PCIe Speed</b>	Auto[Default] Gen1 Gen2 Gen3	Configure PCIe Speed.

### 3.6.3.2.1.3 PCI Express Root Port 22 (M2KB1 x2)



Item	Option	Description
<b>PCI Express Root Port 22 PCIE4 (x1)</b>	Enabled[Default], Disabled	Control the PCI Express Root Port.
<b>ASPM function</b>	Disabled[Default], L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
<b>L1 Substates</b>	Disabled[Default], L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
<b>PCIe Speed</b>	Auto[Default] Gen1 Gen2 Gen3	Configure PCIe Speed.

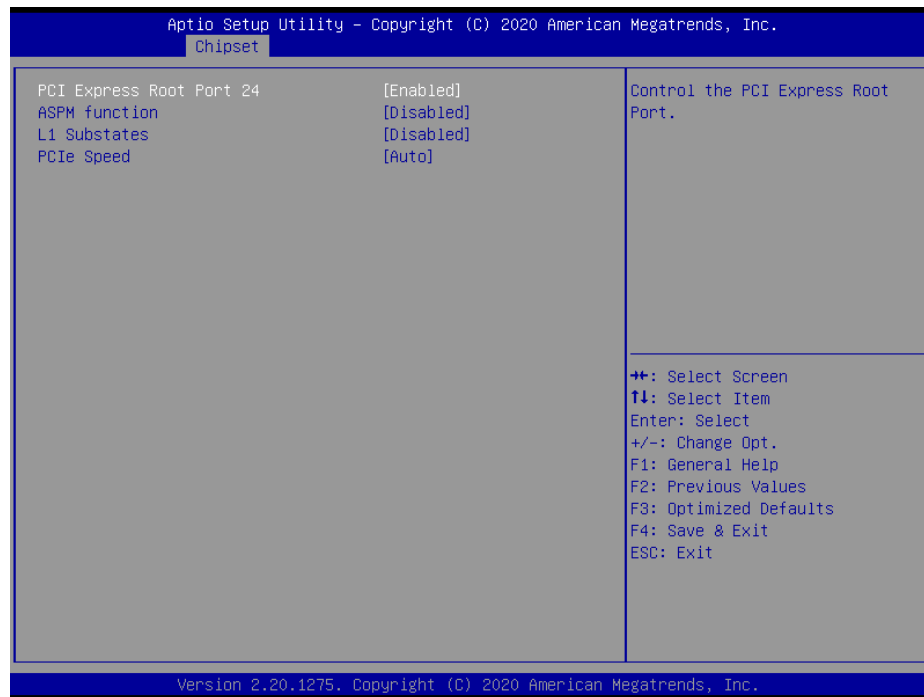
### 3.6.3.2.1.4 PCI Express Root Port 23



Item	Option	Description
<b>PCI Express Root Port 23</b>	Enabled[Default], Disabled	Control the PCI Express Root Port.
<b>ASPM function</b>	Disabled[Default], L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
<b>L1 Substates</b>	Disabled[Default], L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
<b>PCIe Speed</b>	Auto[Default] Gen1 Gen2 Gen3	Configure PCIe Speed.

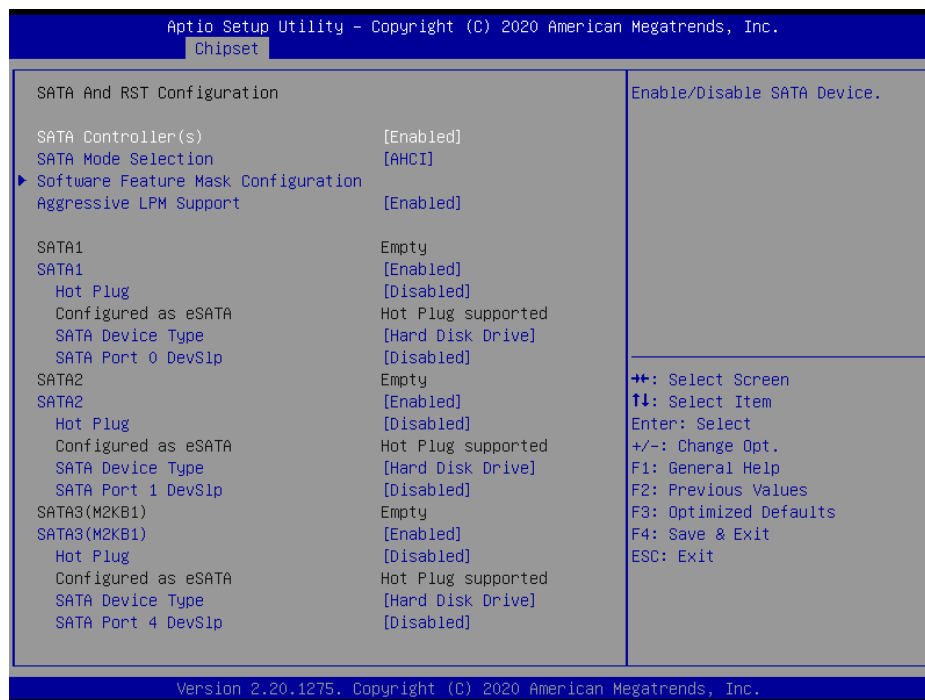


## 3.6.3.2.1.5 PCI Express Root Port 24



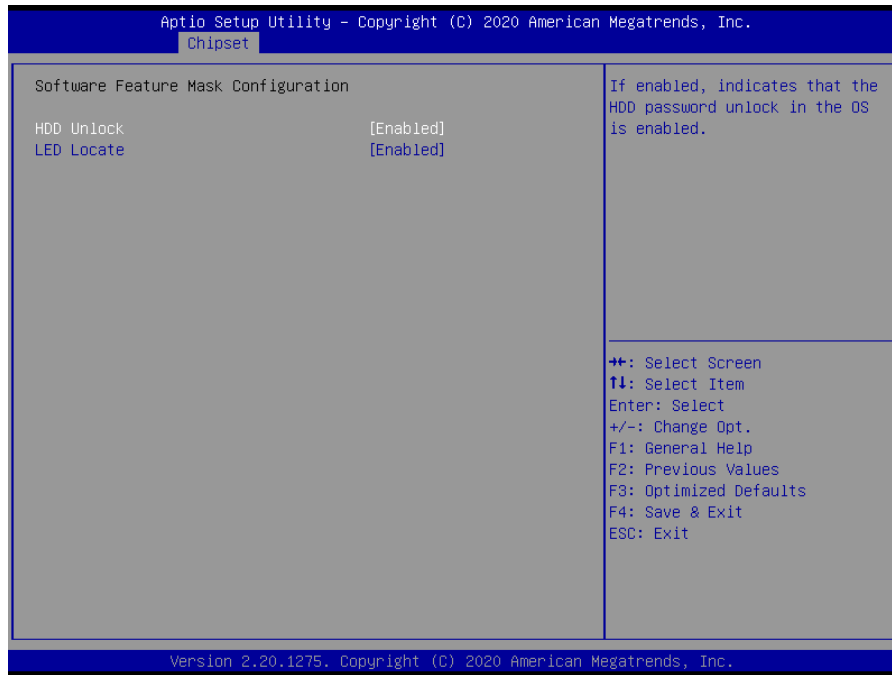
Item	Option	Description
<b>PCI Express Root Port 24</b>	Enabled[Default], Disabled	Control the PCI Express Root Port.
<b>ASPM function</b>	Disabled[Default] L0s L1 L0sL1 Auto	Set the ASPM Level: Force L0s – Force all links to L0s State AUTO – BIOS auto configure DISABLE – Disables ASPM.
<b>L1 Substates</b>	Disabled[Default] L1.1 L1.1 & L1.2	PCI Express L1 Substates settings.
<b>PCIe Speed</b>	Auto[Default] Gen1 Gen2 Gen3	Configure PCIe Speed.

### 3.6.3.2.2 SATA And RST Configuration



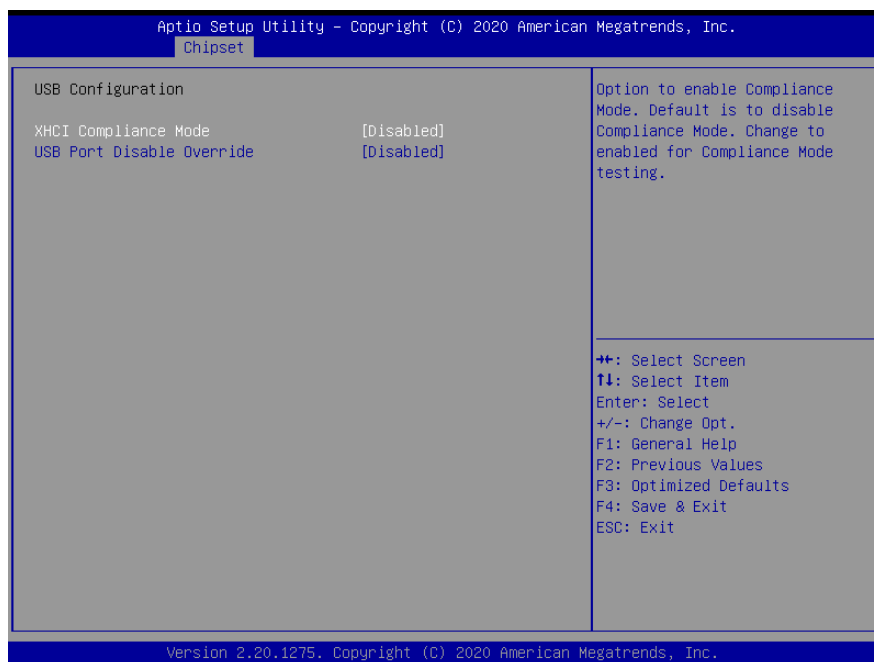
Item	Options	Description
<b>SATA Controller(s)</b>	Enabled[ <b>Default</b> ] Disabled	Enable/Disable SATA Device.
<b>SATA Mode Selection</b>	AHCI[ <b>Default</b> ], Intel RST Premium With Intel Optane System Acceleration	Determines how SATA controller(s) operate.
<b>Aggressive LPM Support</b>	Disabled Enabled[ <b>Default</b> ]	Enable PCH to aggressively enter link power state.
<b>SATA1/2/3</b>	Disabled Enabled[ <b>Default</b> ]	Enable or Disable SATA Port.
<b>Hot Plug</b>	Disabled[ <b>Default</b> ] Enabled	Designates this port as Hot Pluggable.
<b>SATA Device Type</b>	Hard Disk Drive[ <b>Default</b> ] Solid State Drive	Identify the SATA port is connected to Solid State Drive or Hard Disk Drive.
<b>SATA Port 0/1/4 DevSlp</b>	Disabled[ <b>Default</b> ] Enabled	Enable/Disable SATA Port 0/1/4 DevSlp. For DevSlp to work , both hard drive and SATA port need to support DevSlp function, otherwise an unexpected behaviour might happen. Please check board design before enabling it.

### 3.6.3.2.2.1 Software Feature Mask Configuration



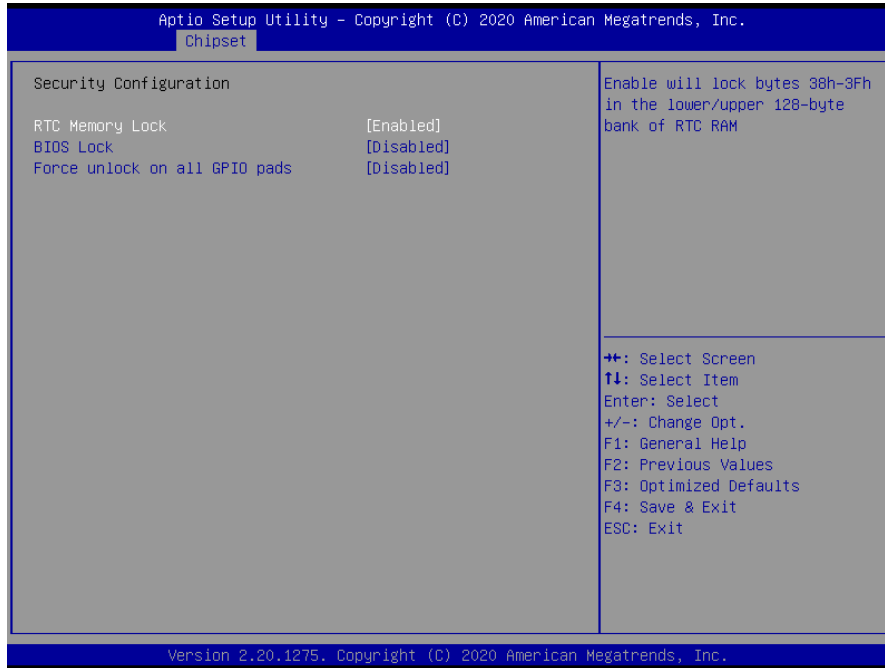
Item	Option	Description
HDD Unlock	Disabled Enabled[Default],	If enabled, indicates that the HDD password unlock in the OS is enabled.
LED Locate	Disabled Enabled[Default],	If enabled, indicates that the LED/SGPIO hardware is attached and ping to locate feature is enabled on OS.

### 3.6.3.2.3 USB Configuration



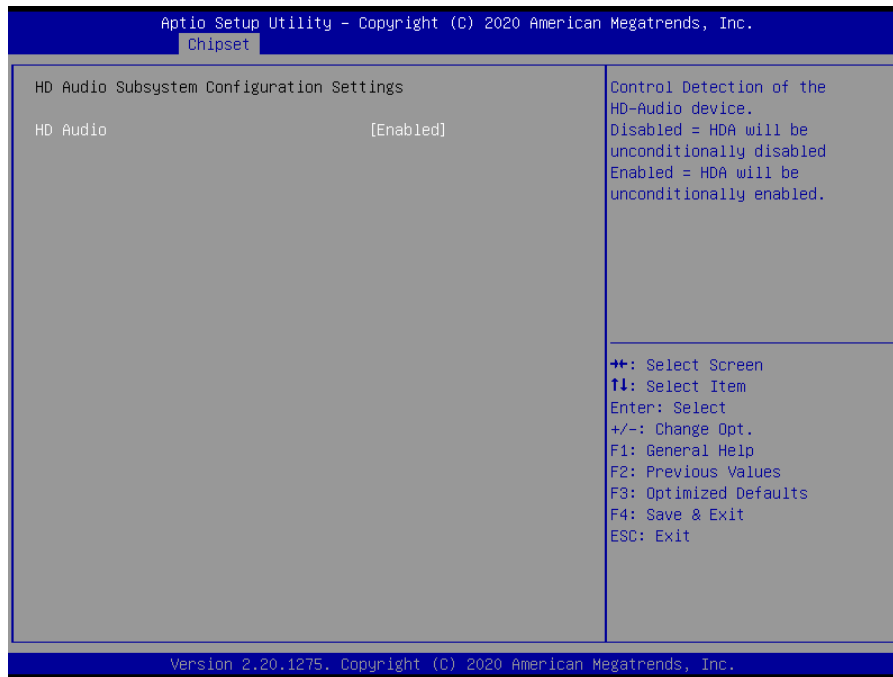
Item	Option	Description
<b>XHCI Compliance Mode</b>	Disabled[Default] Enabled	Option to enable Compliance Mode. Default is to disable Compliance Mode. Change to enabled for Compliance Mode testing.
<b>USB Port Disable Override</b>	Disabled[Default] Select Per-Pin	Selectively Enable/Disable the corresponding USB port from reporting a Device Connection to the controller.

### 3.6.3.2.4 Security Configuration



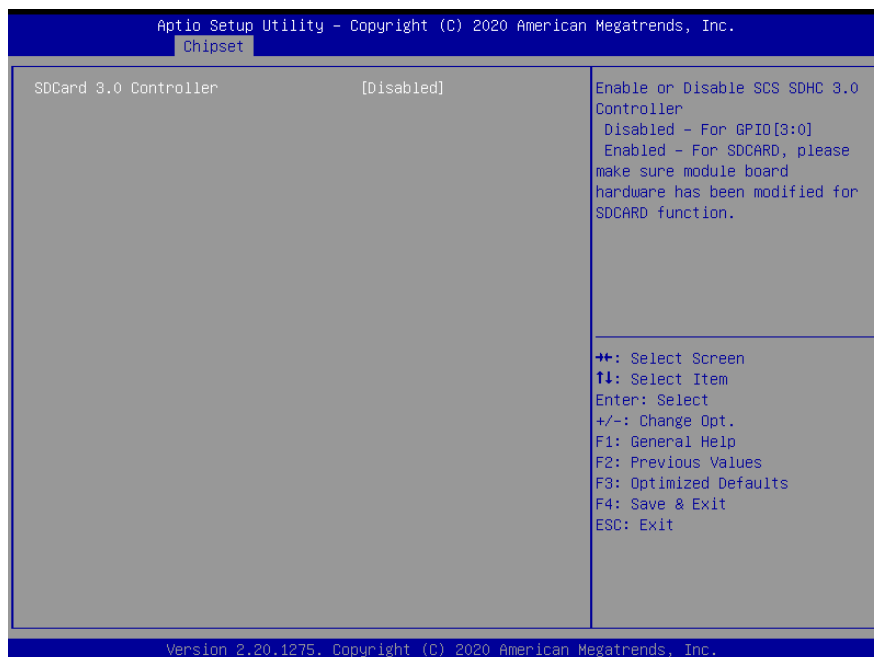
Item	Option	Description
<b>RTC Memory Lock</b>	Disabled Enabled[Default]	Enable will lock bytes 38h-3Fh in the lower/upper 128-byte bank of RTC RAM.
<b>BIOS Lock</b>	Disabled[Default] Enabled	Enable/Disable the PCH BIOS Lock Enable feature. Required to be enabled to ensure SMM protection of flash.
<b>Force unlock on all GPIO pads</b>	Disabled[Default] Enabled	If Enabled BIOS will force all GPIO pads to be in unlocked state.

### 3.6.3.2.5 HD Audio Configuration



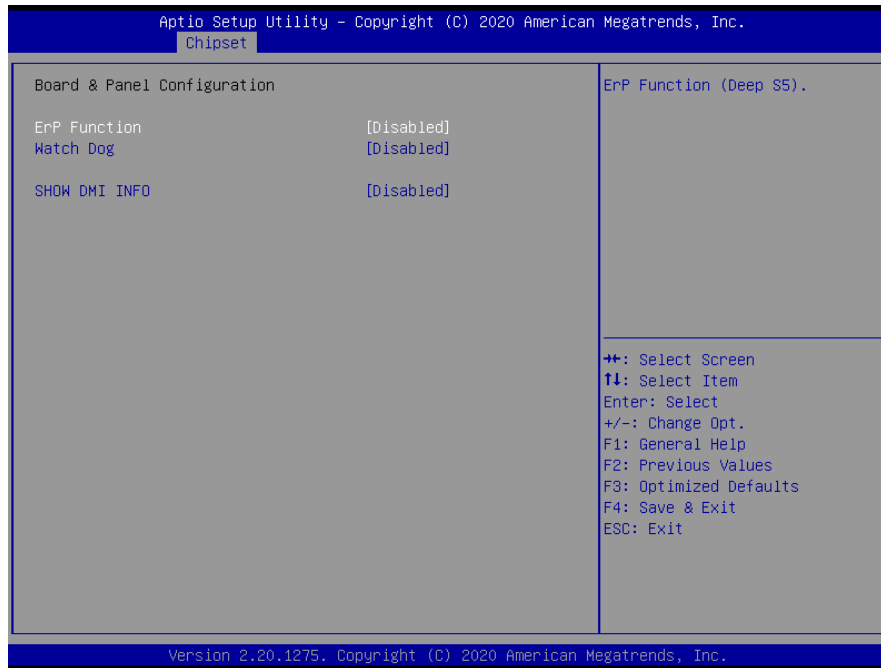
Item	Option	Description
HD Audio	Disabled Enabled[Default]	Control Detection of the HD-Audio device. Disable = HDA will be unconditionally disabled Enabled = HDA will be unconditionally enabled

### 3.6.3.2.6 SCS Configuration



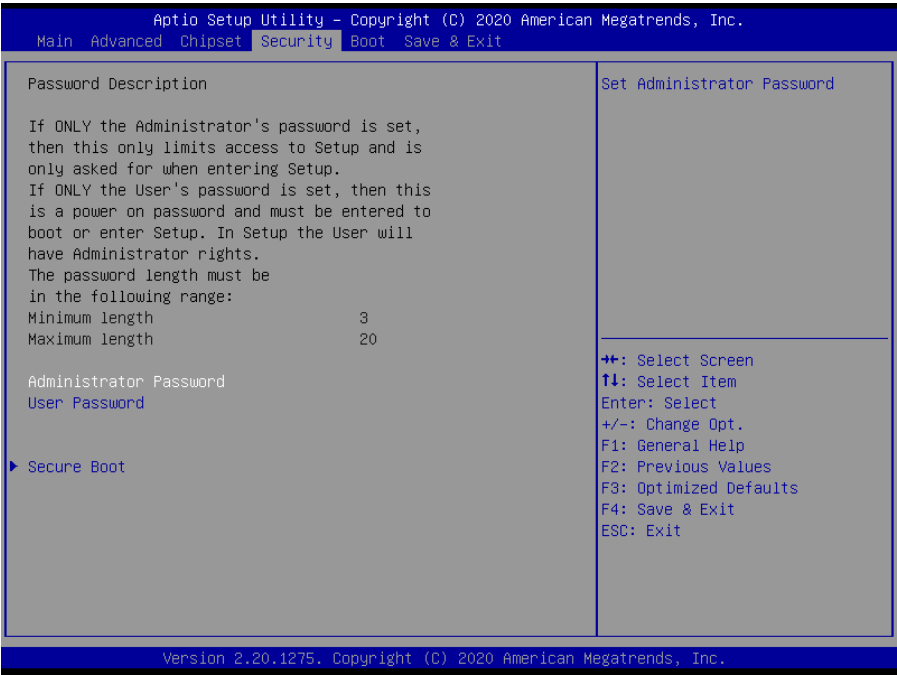
Item	Option	Description
<b>SDCard 3.0 Controller</b>	Disabled[Default] Enabled	Enable or Disable SCS SDHC 3.0 Controller Disabled - For GPIO [3:0] Enabled – For SDCARD, please make sure module board hardware has been modified for SDCARD function.

### 3.6.3.3 Board & Panel Configuration



Item	Option	Description
<b>ErP Function</b>	Disabled[Default] Enabled	ErP Function (Deep S5).
<b>Watch Dog</b>	Disabled[Default] 30 sec 40 sec 50 sec 1 min 2 min 10 min 30 min	Select WatchDog.
<b>SHOW DMI INFO</b>	Disabled[Default] Enabled	SHOW DMI INFO.

3.6.4 Security



- Administrator Password

Set setup Administrator Password

- User Password

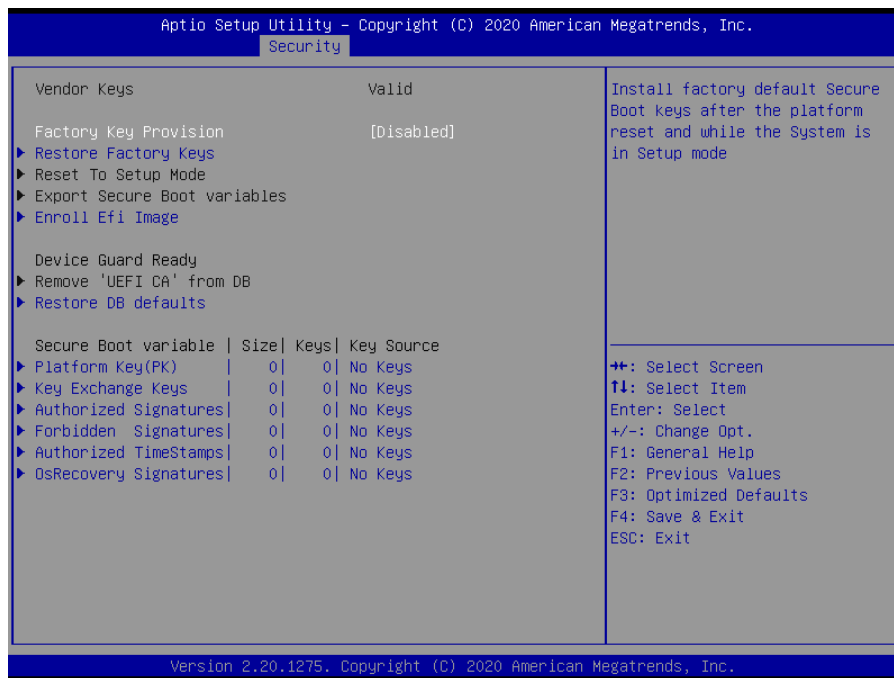
Set User Password

3.6.4.1 Secure Boot



Item	Option	Description
<b>Secure Boot</b>	Disabled[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.
<b>Secure Boot Mode</b>	Standard Custom[Default]	Secure Boot mode selector: Standard/Custom. In Custom mode Secure Boot Variables can be configured without authentication.

### 3.6.4.1.1 Key Management



Item	Option	Description
<b>Factory Key Provision</b>	Disabled[Default] Enabled	Install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

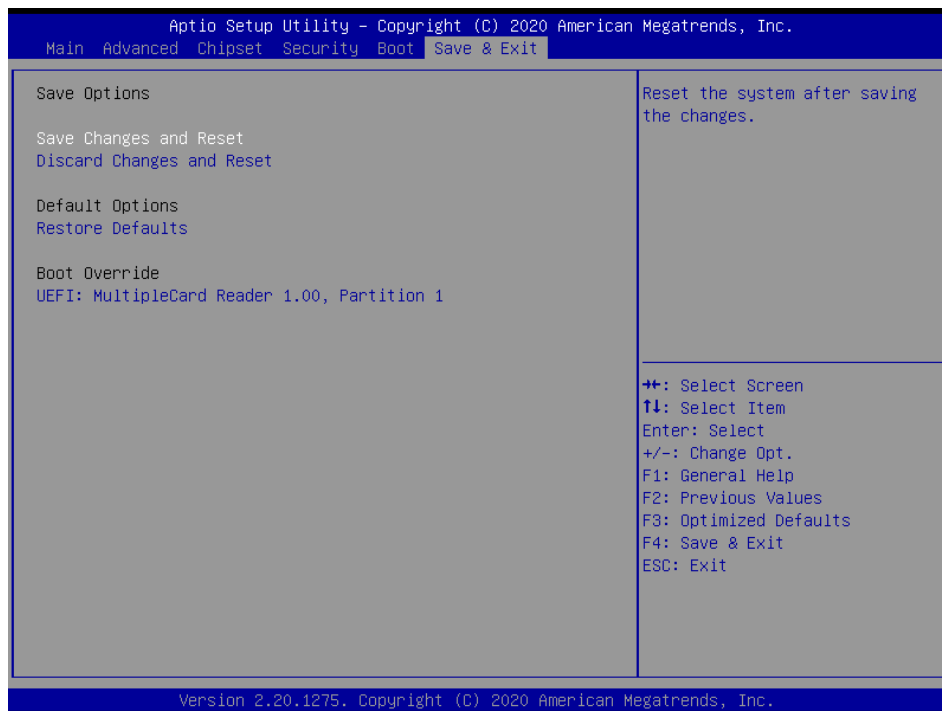


### 3.6.5 Boot



Item	Option	Description
Setup Prompt Timeout	1~ 65535	Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
Bootup NumLock State	On[Default] Off	Select the Keyboard NumLock state
Quiet Boot	Disabled[Default] Enabled	Enables or disables Quiet Boot option
Boot Option #1	Set the system boot order.	

### 3.6.6 Save and exit



#### 3.6.6.1 *Save Changes and Reset*

Reset the system after saving the changes.

#### 3.6.6.2 *Discard Changes and Reset*

Any changes made to BIOS settings during this session of the BIOS setup program are discarded. The setup program then exits and reboots the controller.

#### 3.6.6.3 *Restore Defaults*

This option restores all BIOS settings to the factory default. This option is useful if the controller exhibits unpredictable behavior due to an incorrect or inappropriate BIOS setting.

