

# ECX-2600/2400/2300 PEG **USER** **Manual**

10th Gen Intel® Xeon®/Core™ i9/i7/i5/i3 AI Computing System  
Workstation-grade, NVIDIA® Tesla®/Quadro®/GeForce® Graphics

## Record of Revision

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1.70	2023/05/31	All	Update	

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# Order Information

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Part Number	Description
ECX-2600-PEG	ECX-2600, 6 GigE LAN with 4 PoE <sup>+</sup> , 2 PCIe x8, 1 PCIe x4, 4 SSD Tray, 6 USB 3.2, 4 COM, 3 Nano SIM, 32 Isolated DIO, with System Fan
ECX-2600F-PEG	ECX-2600, 6 GigE LAN with 4 PoE <sup>+</sup> , 2 PCIe x8, 1 PCIe x4, 4 SSD Tray, 6 USB 3.2, 4 COM, 3 Nano SIM, 32 Isolated DIO, with Fan Sink and System Fan
ECX-2400-PEG	ECX-2400, 6 GigE LAN with 4 PoE <sup>+</sup> , 1 PCIe x16, 1 PCIe x4, 4 SSD Tray, 6 USB 3.2, 4 COM, 3 Nano SIM, 32 Isolated DIO, with System Fan
ECX-2400F-PEG	ECX-2400, 6 GigE LAN with 4 PoE <sup>+</sup> , 1 PCIe x16, 1 PCIe x4, 4 SSD Tray, 6 USB 3.2, 4 COM, 3 Nano SIM, 32 Isolated DIO, with Fan Sink and System Fan
ECX-2300-PEG	ECX-2300, 2 GigE LAN, 1 PCIe x16, 1 PCIe x4, 4 SSD Tray, 6 USB 3.2, 4 COM, 3 Nano SIM, 16 GPIO, with System Fan
ECX-2300F-PEG	ECX-2300, 2 GigE LAN, 1 PCIe x16, 1 PCIe x4, 4 SSD Tray, 6 USB 3.2, 4 COM, 3 Nano SIM, 16 GPIO, with Fan Sink and System Fan

# CPU List

Series	CPU	Cores	TDP	Cache	Max. Frequency	ECC Memory
Intel® Xeon®	W-1290E	10	95W	20M	Up to 4.8GHz	Y
	W-1290TE	10	35W	20M	Up to 4.5GHz	Y
	W-1270E	8	80W	16M	Up to 4.8GHz	Y
	W-1270TE	8	35W	16M	Up to 4.4GHz	Y
	W-1250E	6	80W	12M	Up to 4.7GHz	Y
	W-1250TE	6	35W	12M	Up to 3.8GHz	Y
Intel® Core™	i9-10900E	10	65W	20M	Up to 4.7GHz	NA
	i9-10900TE	10	35W	20M	Up to 4.5GHz	NA
	i7-10700E	8	65W	16M	Up to 4.5GHz	NA
	i7-10700TE	8	35W	16M	Up to 4.4GHz	NA
	i5-10500E	6	65W	12M	Up to 4.2GHz	NA
	i5-10500TE	6	35W	12M	Up to 3.7GHz	NA
	i3-10100E	4	65W	6M	Up to 3.8GHz	Y
	i3-10100TE	4	35W	6M	Up to 3.6GHz	Y

## Optional Accessories

Part Number	Description
DDR4 32G	Certified DDR4 32GB 3200MHz RAM
DDR4 16G	Certified DDR4 16GB 3200MHz RAM
DDR4 8G	Certified DDR4 8GB 3200MHz RAM
DDR4 4G	Certified DDR4 4GB 3200MHz RAM
PWA-160WB-WT	160W, 24V, 85V AC to 264V AC Power Adaptor with 3-pin Terminal Block (7.62mm pitch), Wide Temperature -30°C to +70°C
PWA-280WB-WT	280W, 24V, 85V AC to 264V AC Power Adaptor with 3-pin Terminal Block (7.62mm pitch), Wide Temperature -30°C to +70°C
PWS-480W-WT	480W, 24V, 90V AC to 305V AC Power Supply, Wide-Temp, IP65
VESA Mount	VESA Mounting Kit
DIN-RAIL Kit	DIN Rail and VESA Mounting Kit
TMK2-20P-100	Terminal Block 20-pin to Terminal Block 20-pin Cable, 100cm
TMK2-20P-500	Terminal Block 20-pin to Terminal Block 20-pin Cable, 500cm
TMB-TMBK-20P	Terminal Board with One 20-pin Terminal Block Connector and DIN-Rail Mounting
M.2 Storage Module	M.2 Key M/Key B PCIe Storage Module
5G Module	5G Module with Antenna
4G Module	4G/GPS Module with Antenna
WiFi & Bluetooth	WiFi & Bluetooth Module with Antenna

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# 1

## GENERAL INTRODUCTION

### 1.1 Overview

Vecow ECX-2600/2400/2300 PEG is a rugged AI Computing System. Featuring a new generation workstation-grade platform : 10-core 10th Gen Intel® Xeon®/Core™ processor which provides a 45% increase in system performance and 87% improvement in graphics performance over Vecow previous generation embedded system. By integrating with powerful NVIDIA® Tesla®/Quadro®/GeForce® Graphics, ECX-2600/2400/2300 PEG is taking AI Computing Systems to the next level. This series provides workstation-grade computing capability and brings balance between reliability and power budget for the innovation applications of edge computing. It also supports an array of high-speed configurations, including USB 3.2 (10G), PCIe 3.0 (8GT/S), SATA III (6G) and GigE LAN (1G).

The ECX-2600/2400/2300 PEG provides rich I/O interfaces including 6 GigE LAN with 4 IEEE 802.3at PoE<sup>+</sup>, 4 COM, 6 USB, 32 Isolated DIO, 3 external Nano SIM card socket. Complete with integrated configurations, ECX-2600/2400/2300 PEG provides 4 front-access SSD/HDD trays, 2 PCIe (ECX-2600 PEG with 3 PCIe) expansion slots for dedicated graphics cards including NVIDIA Tesla/Quadro/GeForce with up to 2560 CUDA cores for advanced AI computing.

Powered by 10th Gen Intel® Xeon®/Core™ i9/i7/i5/3 Processor and includes industrial-grade features of PoE<sup>+</sup> GigE LAN port, 12V to 50V DC-in with 80V surge protection and -20°C to 45°C extended operating temperature supported, Vecow ECX-2600/2400/2300 PEG provides high-performance computing and reliable configurations for mission-critical applications at the edge and is ideal for Robotic Control, Traffic Vision, Public Surveillance, Smart Vending, Automatic LPR, AMR/AGV, and any AIoT/Industry 4.0 applications.

## 1.2 Features

- Workstation-grade Platform : 10-core 10th Gen Intel® Xeon®/Core™ i9/i7/i5/i3 Processor (CML-S) running with Intel® W480E chipset supports max 95W TDP CPU
- Supports up to 250W NVIDIA® or AMD Graphics card
- NVIDIA® Tesla®/Quadro®/GeForce® graphics card delivers leading AI computing productivity by advanced NVIDIA® CUDA® cores
- 12V to 50V wide range DC Power Input with 80V Surge Protection
- 6 Independent GigE LAN with 4 IEEE 802.3at PoE+
- 6-port USB 3.2 support up to 10Gbps data transfer
- Storage : 4 2.5" SSD Tray, 1 Micro SD Card, 1 M.2 Key M, 4 SATA III
- Expansion : 2 PCIe (ECX-2600 PEG with 3 PCIe), 1 M.2 Key B, 1 M.2 Key E, 2 Mini PCIe
- Multiple VGA, DVI, HDMI and DisplayPort display interfaces support max 7 independent displays, up to 8K Resolution
- 32 Isolated DIO, 4 COM RS-232/422/485
- External Nano SIM Sockets for 5G/WiFi 6/4G/3G/LTE/GPRS/UMTS
- Supports Configurable Software Ignition Power Control and TPM 2.0
- Optimized user-friendly design for easier system maintenance
- Optional VHub One-Stop AIoT Solution Service supports OpenVINO based AI accelerator and advanced Edge AI applications

## 1.3 Product Specification

### 1.3.1 Specifications of ECX-2600 PEG

System	
Processor	Intel® 10th Generation Xeon®/Core™ i9/i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> <li>• DDR4 2933MHz (ECC/Non-ECC)</li> <li>• Up to 64GB</li> <li>• 2 260-pin SO-DIMM Socket</li> </ul>
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> <li>• 6 USB 3.2 (External)</li> <li>• 1 USB 2.0 (Internal)</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD, Wireless, PoE
SIM Card	3 Nano SIM Card Socket (External)
Expansion	
Mini PCIe	2 Full-size Mini PCIe Socket for PCIe/USB/External SIM Card/mSATA
PCI/PCIe	<ul style="list-style-type: none"> <li>• 2 PCIe x16 Slot with x8 signal</li> <li>• 1 PCIe x8 Slot with x4 signal</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (3042/3052)</li> <li>• 1 M.2 Key E Socket (2230)</li> </ul>
Graphics	
Graphics Processor	<ul style="list-style-type: none"> <li>• Intel® UHD Graphics 630</li> <li>• Independent Graphics : By request</li> </ul>
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 1 VGA : Up to 1920 x 1080 @60Hz</li> <li>• 1 DVI-D : Up to 1920 x 1080 @60Hz</li> <li>• 2 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested graphic card</li> </ul>
Storage	
SATA	4 SATA III (6Gbps) support S/W RAID 0, 1, 5, 10
mSATA	2 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x2)
Storage Device	<ul style="list-style-type: none"> <li>• 1 Micro SD Card, Push-in/Push-out Ejector</li> <li>• 4 Front-access 2.5" SSD/HDD Tray</li> </ul>
Audio	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out

<b>Ethernet</b>	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
<b>PoE</b>	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
<b>Power</b>	
Input Voltage	12V to 50V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
<b>Others</b>	
TPM	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.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	260.0mm x 240.0mm x 123.0mm (10.24" x 9.45" x 4.84")
Weight	6.5 kg (14.33lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail Mount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature	<b>35W, 65W TDP CPU</b> : -20°C to 45°C (-4°F to 113°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 45°C
Shock /Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.2 Specifications of ECX-2600F PEG

<b>System</b>	
Processor	Intel® 10th Generation Xeon®/Core™ i9/i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> <li>• DDR4 2933MHz (ECC/Non-ECC)</li> <li>• Up to 64GB</li> <li>• 2 260-pin SO-DIMM Socket</li> </ul>
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	<ul style="list-style-type: none"> <li>• 6 USB 3.2 (External)</li> <li>• 1 USB 2.0 (Internal)</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD, Wireless, PoE
SIM Card	3 Nano SIM Card Socket (External)
<b>Expansion</b>	
Mini PCIe	2 Full-size Mini PCIe Socket for PCIe/USB/External SIM Card/mSATA
PCI/PCIe	<ul style="list-style-type: none"> <li>• 2 PCIe x16 Slot with x8 signal</li> <li>• 1 PCIe x8 Slot with x4 signal</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (3042/3052)</li> <li>• 1 M.2 Key E Socket (2230)</li> </ul>
<b>Graphics</b>	
Graphics Processor	<ul style="list-style-type: none"> <li>• Intel® UHD Graphics 630</li> <li>• Independent Graphics : By request</li> </ul>
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 1 VGA : Up to 1920 x 1080 @60Hz</li> <li>• 1 DVI-D : Up to 1920 x 1080 @60Hz</li> <li>• 2 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested graphic card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support S/W RAID 0, 1, 5, 10
mSATA	2 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x2)
Storage Device	<ul style="list-style-type: none"> <li>• 1 Micro SD Card, Push-in/Push-out Ejector</li> <li>• 4 Front-access 2.5" SSD/HDD Tray</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out

<b>Ethernet</b>	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN
<b>PoE</b>	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I350
<b>Power</b>	
Input Voltage	12V to 50V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
<b>Others</b>	
TPM	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.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	260.0mm x 240.0mm x 123.0mm (10.24" x 9.45" x 4.84")
Weight	6.5 kg (14.33lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail Mount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature	<b>35W, 65W, 80W, 95W TDP CPU</b> : -20°C to 45°C (-4°F to 113°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 45°C
Shock /Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.3 Specifications of ECX-2400 PEG

<b>System</b>	
Processor	Intel® 10th Generation Xeon®/Core™ i9/i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> <li>• DDR4 2933MHz (ECC/Non-ECC)</li> <li>• Up to 64GB</li> <li>• 2 260-pin SO-DIMM Socket</li> </ul>
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	6 USB 3.2 (External)
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD, Wireless, PoE
SIM Card	3 Nano SIM Card Socket (External)
<b>Expansion</b>	
Mini PCIe	2 Full-size Mini PCIe Socket for PCIe/USB/External SIM Card/mSATA
PCI/PCIe	<ul style="list-style-type: none"> <li>• 1 PCIe x16 Slot</li> <li>• 1 PCIe x4 Slot</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (3042/3052)</li> <li>• 1 M.2 Key E Socket (2230)</li> </ul>
<b>Graphics</b>	
Graphics Processor	<ul style="list-style-type: none"> <li>• Intel® UHD Graphics 630</li> <li>• Independent Graphics : By request</li> </ul>
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 1 VGA : Up to 1920 x 1080 @60Hz</li> <li>• 1 DVI-D : Up to 1920 x 1080 @60Hz</li> <li>• 2 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested graphic card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support S/W RAID 0, 1, 5, 10
mSATA	2 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x2)
Storage Device	<ul style="list-style-type: none"> <li>• 1 Micro SD Card, Push-in/Push-out Ejector</li> <li>• 4 Front-access 2.5" SSD/HDD Tray</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

<b>PoE</b>	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE <sup>+</sup> by Intel <sup>®</sup> I350
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE <sup>+</sup> by Intel <sup>®</sup> I350
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE <sup>+</sup> by Intel <sup>®</sup> I350
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE <sup>+</sup> by Intel <sup>®</sup> I350
<b>Power</b>	
Input Voltage	12V to 50V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
<b>Others</b>	
TPM	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.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	260.0mm x 240.0mm x 104.0mm (10.24" x 9.45" x 4.09")
Weight	5.5 kg (12.13 lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail Mount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature	<b>35W, 65W TDP CPU</b> : -20°C to 45°C (-4°F to 113°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 45°C
Shock /Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2



### 1.3.4 Specifications of ECX-2400F PEG

<b>System</b>	
Processor	Intel® 10th Generation Xeon®/Core™ i9/i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> <li>• DDR4 2933MHz (ECC/Non-ECC)</li> <li>• Up to 64GB</li> <li>• 2 260-pin SO-DIMM Socket</li> </ul>
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	6 USB 3.2 (External)
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD, Wireless, PoE
SIM Card	3 Nano SIM Card Socket (External)
<b>Expansion</b>	
Mini PCIe	2 Full-size Mini PCIe Socket for PCIe/USB/External SIM Card/mSATA
PCI/PCIe	<ul style="list-style-type: none"> <li>• 1 PCIe x16 Slot</li> <li>• 1 PCIe x4 Slot</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (3042/3052)</li> <li>• 1 M.2 Key E Socket (2230)</li> </ul>
<b>Graphics</b>	
Graphics Processor	<ul style="list-style-type: none"> <li>• Intel® UHD Graphics 630</li> <li>• Independent Graphics : By request</li> </ul>
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 1 VGA : Up to 1920 x 1080 @60Hz</li> <li>• 1 DVI-D : Up to 1920 x 1080 @60Hz</li> <li>• 2 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested graphic card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support S/W RAID 0, 1, 5, 10
mSATA	2 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x2)
Storage Device	<ul style="list-style-type: none"> <li>• 1 Micro SD Card, Push-in/Push-out Ejector</li> <li>• 4 Front-access 2.5" SSD/HDD Tray</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

<b>PoE</b>	
LAN 3	GigE IEEE 802.3at (25.5W/48V) PoE <sup>+</sup> by Intel <sup>®</sup> I350
LAN 4	GigE IEEE 802.3at (25.5W/48V) PoE <sup>+</sup> by Intel <sup>®</sup> I350
LAN 5	GigE IEEE 802.3at (25.5W/48V) PoE <sup>+</sup> by Intel <sup>®</sup> I350
LAN 6	GigE IEEE 802.3at (25.5W/48V) PoE <sup>+</sup> by Intel <sup>®</sup> I350
<b>Power</b>	
Input Voltage	12V to 50V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
<b>Others</b>	
TPM	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.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	260.0mm x 240.0mm x 104.0mm (10.24" x 9.45" x 4.09")
Weight	5.5 kg (12.13 lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail Mount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature	<b>35W, 65W, 80W, 95W TDP CPU</b> : -20°C to 45°C (-4°F to 113°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 45°C
Shock /Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.5 Specifications of ECX-2300 PEG

<b>System</b>	
Processor	Intel® 10th Generation Xeon®/Core™ i9/i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> <li>• DDR4 2933MHz (ECC/Non-ECC)</li> <li>• Up to 64GB</li> <li>• 2 260-pin SO-DIMM Socket</li> </ul>
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	6 USB 3.2 (External)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	3 Nano SIM Card Socket (External)
<b>Expansion</b>	
Mini PCIe	2 Full-size Mini PCIe Socket for PCIe/USB/External SIM Card/mSATA
PCI/PCIe	<ul style="list-style-type: none"> <li>• 1 PCIe x16 Slot</li> <li>• 1 PCIe x4 Slot</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (3042/3052)</li> <li>• 1 M.2 Key E Socket (2230)</li> </ul>
<b>Graphics</b>	
Graphics Processor	<ul style="list-style-type: none"> <li>• Intel® UHD Graphics 630</li> <li>• Independent Graphics : By request</li> </ul>
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 1 VGA : Up to 1920 x 1080 @60Hz</li> <li>• 1 DVI-D : Up to 1920 x 1080 @60Hz</li> <li>• 2 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested graphic card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support S/W RAID 0, 1, 5, 10
mSATA	2 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x2)
Storage Device	<ul style="list-style-type: none"> <li>• 1 Micro SD Card, Push-in/Push-out Ejector</li> <li>• 4 Front-access 2.5" SSD/HDD Tray</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

<b>Power</b>	
Input Voltage	12V to 50V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
<b>Others</b>	
TPM	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.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	260.0mm x 240.0mm x 104.0mm (10.24" x 9.45" x 4.09")
Weight	5.5 kg (12.13 lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail Mount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature	<b>35W, 65W TDP CPU</b> : -20°C to 45°C (-4°F to 113°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 45°C
Shock /Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.6 Specifications of ECX-2300F PEG

<b>System</b>	
Processor	Intel® 10th Generation Xeon®/Core™ i9/i7/i5/i3 Processor (Comet Lake-S)
Chipset	Intel® W480E
BIOS	AMI
SIO	IT8786E
Memory	<ul style="list-style-type: none"> <li>• DDR4 2933MHz (ECC/Non-ECC)</li> <li>• Up to 64GB</li> <li>• 2 260-pin SO-DIMM Socket</li> </ul>
<b>I/O Interface</b>	
Serial	4 COM RS-232/422/485 (ESD 8kV)
USB	6 USB 3.2 (External)
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless
SIM Card	3 Nano SIM Card Socket (External)
<b>Expansion</b>	
Mini PCIe	2 Full-size Mini PCIe Socket for PCIe/USB/External SIM Card/mSATA
PCI/PCIe	<ul style="list-style-type: none"> <li>• 1 PCIe x16 Slot</li> <li>• 1 PCIe x4 Slot</li> </ul>
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (3042/3052)</li> <li>• 1 M.2 Key E Socket (2230)</li> </ul>
<b>Graphics</b>	
Graphics Processor	<ul style="list-style-type: none"> <li>• Intel® UHD Graphics 630</li> <li>• Independent Graphics : By request</li> </ul>
Interface	Up to 7 independent displays : <ul style="list-style-type: none"> <li>• 1 VGA : Up to 1920 x 1080 @60Hz</li> <li>• 1 DVI-D : Up to 1920 x 1080 @60Hz</li> <li>• 2 DisplayPort : Up to 4096 x 2304 @60Hz</li> <li>• By requested graphic card</li> </ul>
<b>Storage</b>	
SATA	4 SATA III (6Gbps) support S/W RAID 0, 1, 5, 10
mSATA	2 SATA III (Mini PCIe Type, 6Gbps)
M.2	1 M.2 Key M Socket (2280, PCIe x2)
Storage Device	<ul style="list-style-type: none"> <li>• 1 Micro SD Card, Push-in/Push-out Ejector</li> <li>• 4 Front-access 2.5" SSD/HDD Tray</li> </ul>
<b>Audio</b>	
Audio Codec	Realtek ALC888S-VD, 7.1 Channel HD Audio
Audio Interface	1 Mic-in, 1 Line-out
<b>Ethernet</b>	
LAN 1	Intel® I219LM GigE LAN supports iAMT 14.0
LAN 2	Intel® I210 GigE LAN

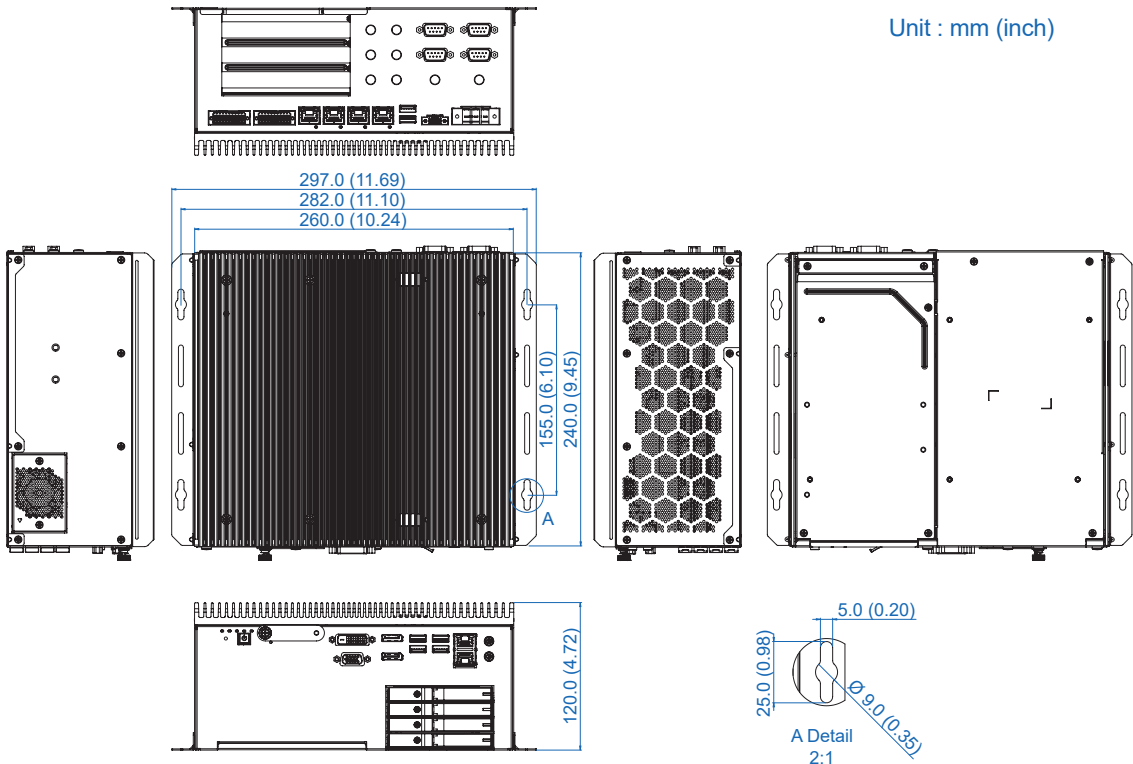
<b>Power</b>	
Input Voltage	12V to 50V, DC-in
Power Interface	3-pin Terminal Block : V+, V-, Frame Ground
Ignition Control	16 Mode Software Ignition Control
Remote Switch	3-pin Terminal Block : On, Off, IGN
Surge Protection	Up to 80V/1ms Transient Power
<b>Others</b>	
TPM	Infineon SLB9665 supports TPM 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.
<b>Software Support</b>	
OS	Windows 10, Linux
<b>Mechanical</b>	
Dimension (W x D x H)	260.0mm x 240.0mm x 104.0mm (10.24" x 9.45" x 4.09")
Weight	5.5 kg (12.13 lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail Mount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature	<b>35W, 65W, 80W, 95W TDP CPU</b> : -20°C to 45°C (-4°F to 113°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 45°C
Shock /Vibration	<ul style="list-style-type: none"> <li>• IEC 61373 : 2010</li> <li>• Railway Applications : Rolling Stock Equipment, Shock and Vibration Tests</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

## 1.4 Supported CPU List

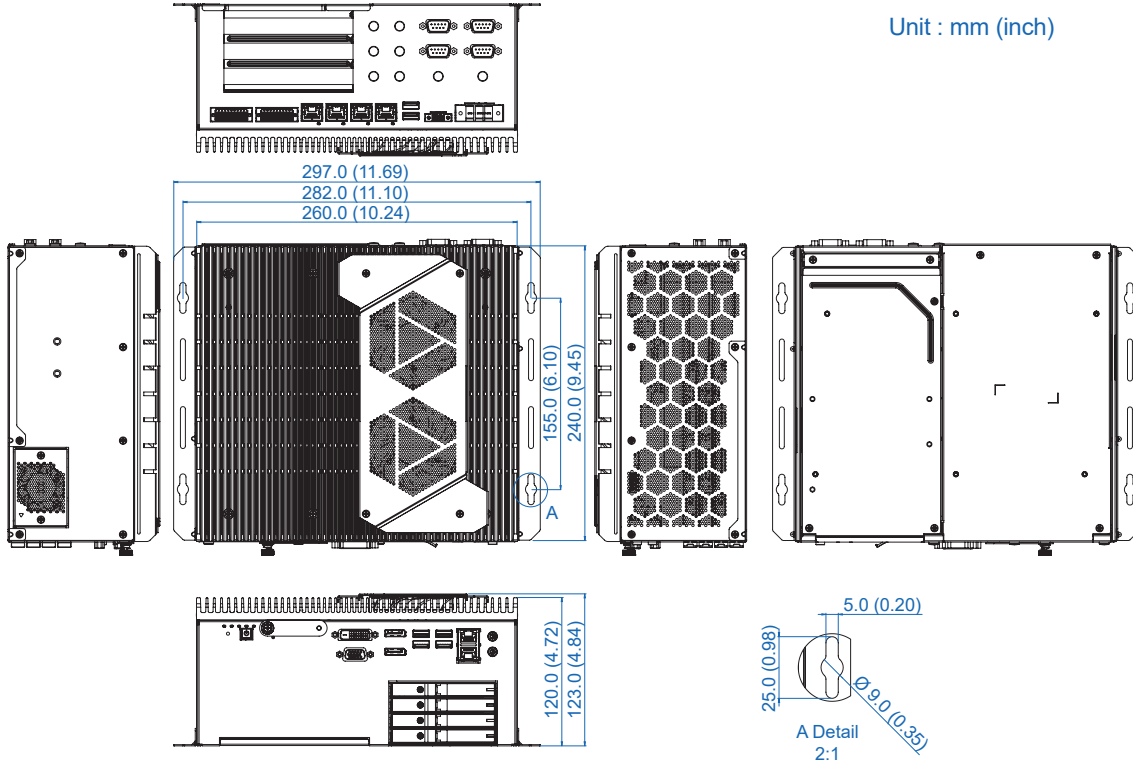
Series	CPU	Cores	TDP	Cache	Max. Frequency	ECC Memory
Intel® Xeon®	W-1290E	10	95W	20M	Up to 4.8GHz	Y
	W-1290TE	10	35W	20M	Up to 4.5GHz	Y
	W-1270E	8	80W	16M	Up to 4.8GHz	Y
	W-1270TE	8	35W	16M	Up to 4.4GHz	Y
	W-1250E	6	80W	12M	Up to 4.7GHz	Y
	W-1250TE	6	35W	12M	Up to 3.8GHz	Y
Intel® Core™	i9-10900E	10	65W	20M	Up to 4.7GHz	NA
	i9-10900TE	10	35W	20M	Up to 4.5GHz	NA
	i7-10700E	8	65W	16M	Up to 4.5GHz	NA
	i7-10700TE	8	35W	16M	Up to 4.4GHz	NA
	i5-10500E	6	65W	12M	Up to 4.2GHz	NA
	i5-10500TE	6	35W	12M	Up to 3.7GHz	NA
	i3-10100E	4	65W	6M	Up to 3.8GHz	Y
	i3-10100TE	4	35W	6M	Up to 3.6GHz	Y

# 1.5 Mechanical Dimension

## 1.5.1 Dimensions of ECX-2600 PEG

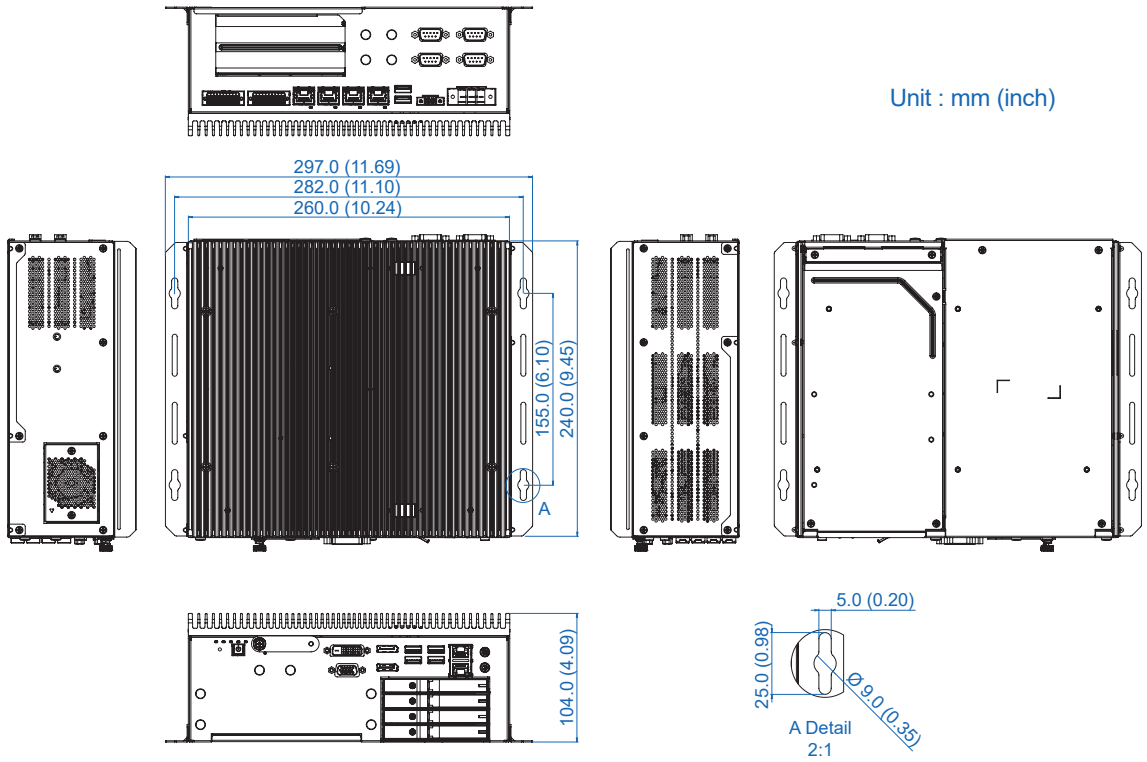


## 1.5.2 Dimensions of ECX-2600F PEG

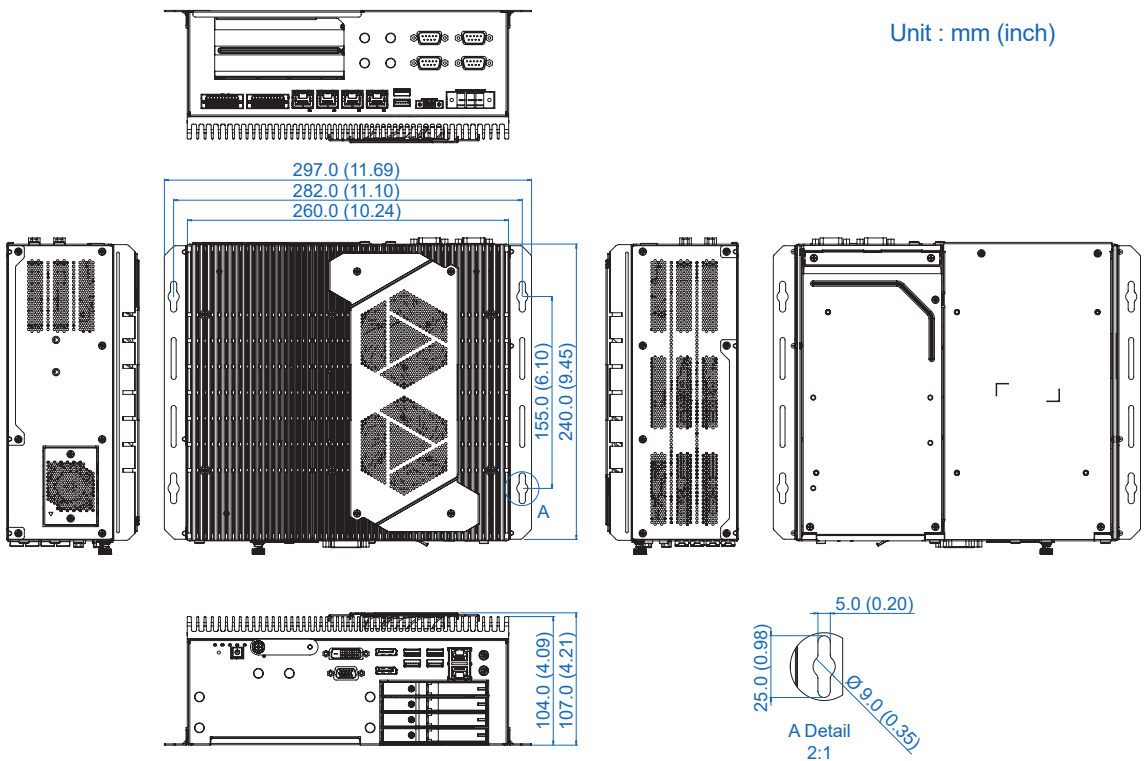




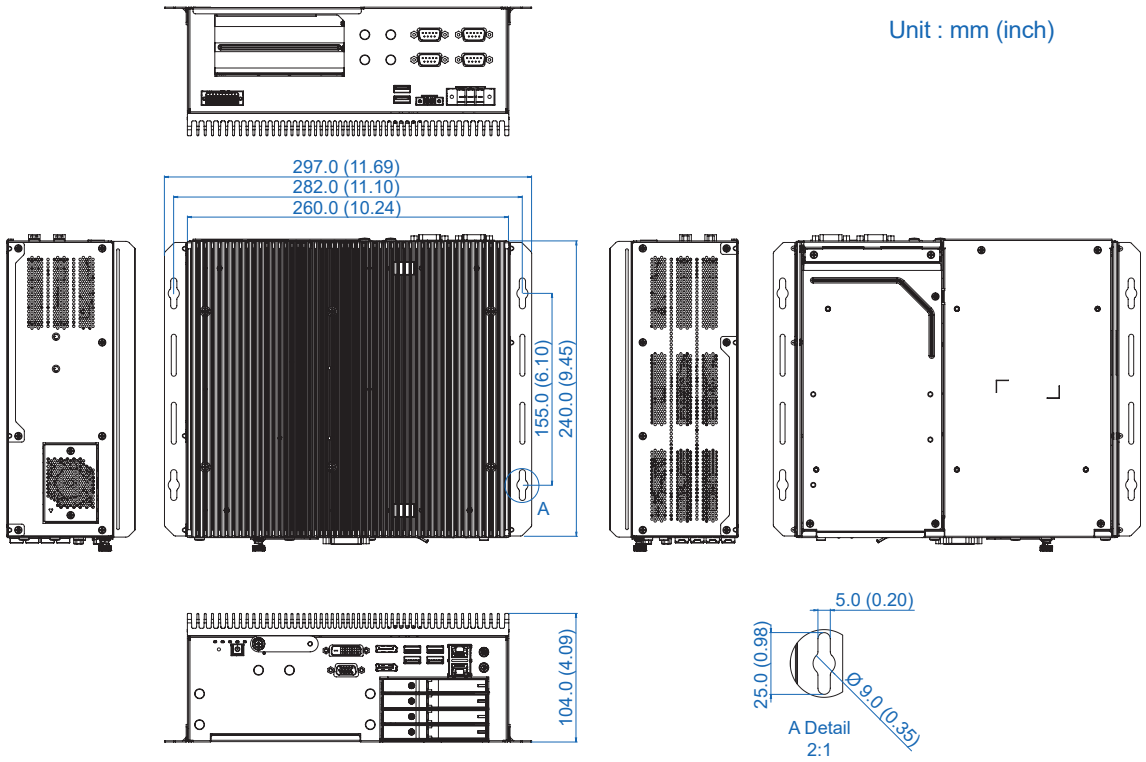
### 1.5.3 Dimensions of ECX-2400 PEG



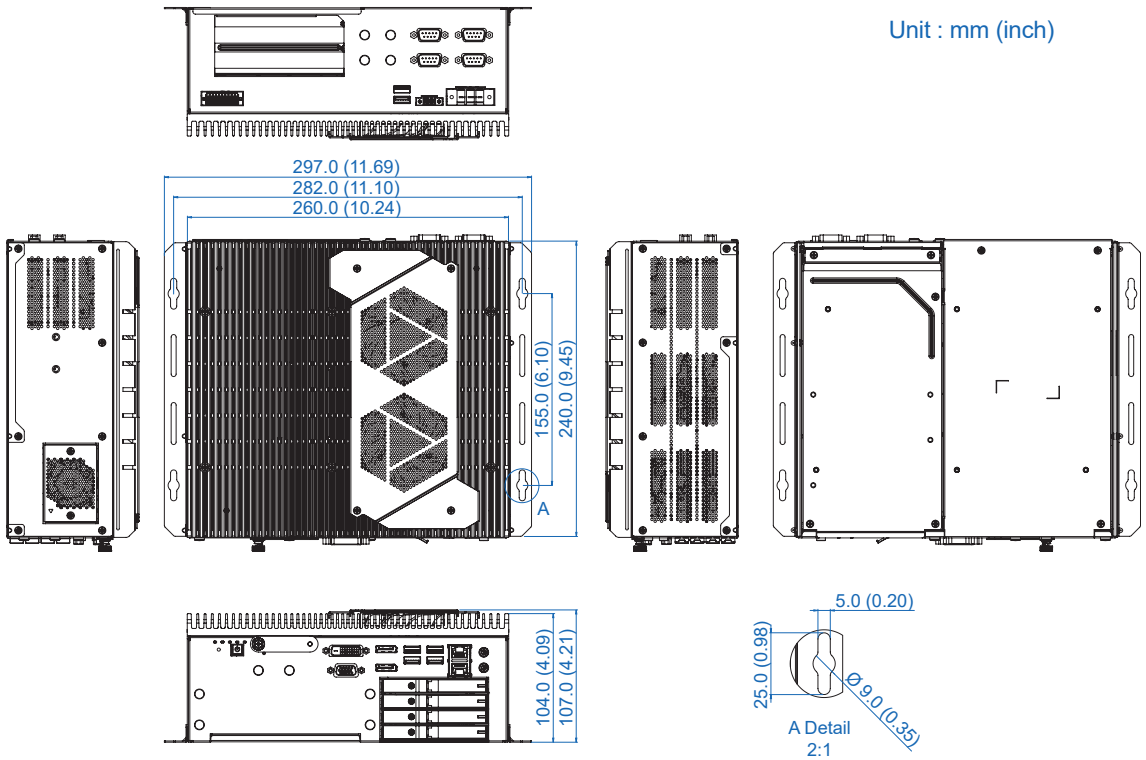
### 1.5.4 Dimensions of ECX-2400F PEG



### 1.5.5 Dimensions of ECX-2300 PEG



### 1.5.6 Dimensions of ECX-2300F PEG



# 2

## GETTING TO KNOW YOUR ECX-2600/2400/2300 PEG

### 2.1 Packing List

#### 2.1.1 ECX-2600/2400 PEG Packing List

Item	Description	Qty
1	ECX-2600/2400 PEG, ECX-2400 AI Computing System (According to the configuration of you order, the ECX-2600/2400 PEG series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.)	1

Item	Description	Outlook	Usage	P/N	Qty
1	P head_ M2.5x6L_Ni		Mini PCIe	53-2426906-30B	2
2	I head_ M3x4L_Ni_Nylok		M.2 Key E 2230 Key M 2280	53-2426206-80B	2
3	I head_ M2x2L_Ni		M.2 Key B 2242, 3050, 3052, 2280	53-M004600-000	1
4	Flat head_ M3x5L_ Black_Nylok		Wall mount bracket	53-M004950-310	2
5	Terminal block 3-pin (7.62mm)		DC-IN	51-2611R03-S1N	1
6	Terminal block 3-pin (3.5mm)		Switch	51-2211R03-S1A	1
7	Terminal block 20-pin (2.54mm)		Isolated DIO/ GPIO	51-2112R20-S1D	2
8	Bracket_Wall Mount		Wall Mount	62-03P0591-000	2
9	Key		SSD/HDD tray	N/A	4

## 2.1.2 ECX-2300 PEG Packing List

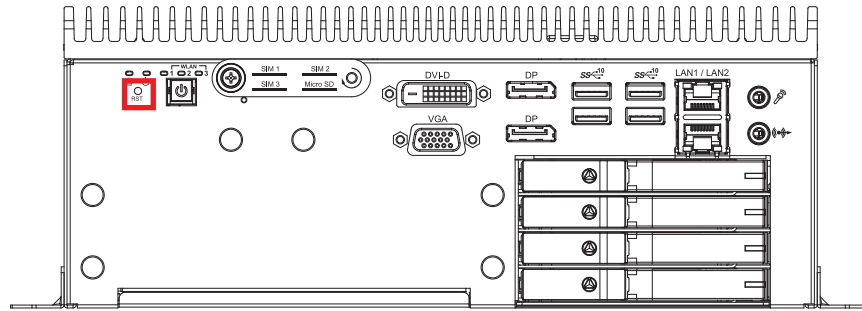
Item	Description	Qty
1	ECX-2300 PEG AI Computing System (According to the configuration of you order, the ECX-2300 PEG series may contain SSD/HDD and DDR4 SO-DIMM. Please verify these items if necessary.)	1

Item	Description	Outlook	Usage	P/N	Qty
1	P head_ M2.5x6L_Ni		Mini PCIe	53-2426906-30B	2
2	I head_ M3x4L_ Ni_Nylok		M.2 Key E 2230 Key M 2280	53-2426206-80B	2
3	I head_ M2x2L_ Ni		M.2 Key B 2242, 3050, 3052, 2280	53-M004600-000	1
4	Flat head_ M3x5L_ Black_Nylok		Wall mount bracket	53-M004950-310	2
5	Terminal block 3-pin (7.62mm)		DC-IN	51-2611R03-S1N	1
6	Terminal block 3-pin (3.5mm)		Switch	51-2211R03-S1A	1
7	Terminal block 20-pin (2.54mm)		Isolated DIO/ GPIO	51-2112R20-S1D	1
8	Bracket_Wall Mount		Wall Mount	62-03P0591-000	2
9	Key		SSD/HDD tray	N/A	4

## 2.2 Front Panel I/O Functions

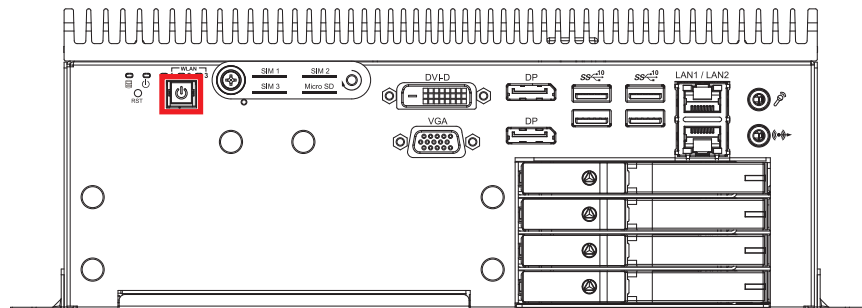
In Vecow ECX-2600/2400/2300 PEG series family, all I/O connectors are located on front panel and rear panel. Most of the general connections to computer device, such as USB, LAN Jack, Display, VGA, DVI-D, Display Port and any additional storage, are placed on the front panel.

### 2.2.1 Reset Tact Switch



It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

### 2.2.2 Power Button



The Power Button is a non-latched switch with dual color LED indication. It indicates power status : S0, S3 and S5. More detail LED indications are listed as follows :

LED Color	Power Status	System Status
Solid Blue	S0	System working
Solid Orange	S3, S5	Suspend to RAM, System off with standby power

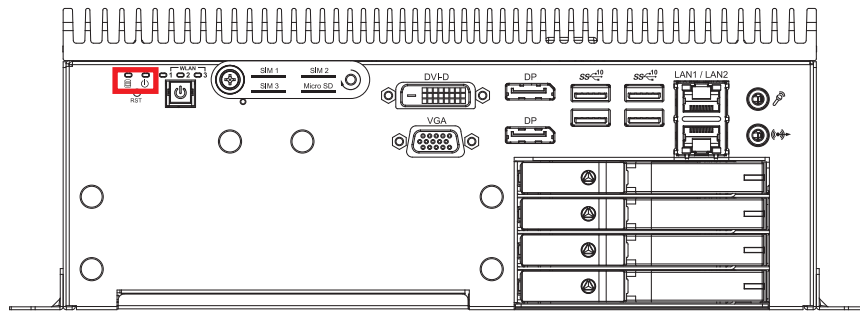
To power on the system, press the power button and then the blue LED is lightened.

To power off the system, you can either command shutdown by OS operation, or just simply press the power button.

If system error, you can just press the power button for 4 seconds to shut down the machine directly.

Please do note that a 4-second interval between each 2 power-on/power-off operation is necessary in normal working status. (For example, once turning off the system, you have to wait for 4 seconds to initiate another power-on operation).

### 2.2.3 PWR & HDD LED Indicator

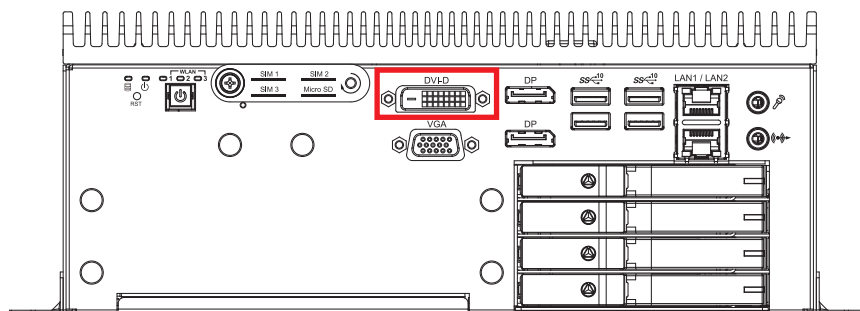


**HDD LED/Yellow** : A Hard Disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

**Power LED/Green** : If the LED is solid green, it indicates that the system is powered on.

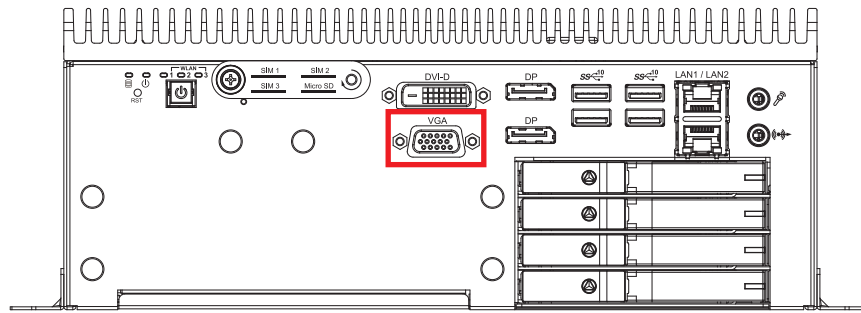
LED Color	Indication	System Status
Yellow	HDD	<ul style="list-style-type: none"> <li>On/Off : Storage status, function or not.</li> <li>Twinkling : Data transferring.</li> </ul>
Green	Power	System power status (on/off)

### 2.2.4 DVI-D Connector



The DVI-D connector on the front panel supports DVI display. This connector can either output DVI signal. The DVI output mode supports up to 1920 x 1200 resolution and output mode supports up to 1920 x 1200 resolution. The DVI is automatically selected according to the display device connected. You will need a DVI-D cable when connecting to a display device.

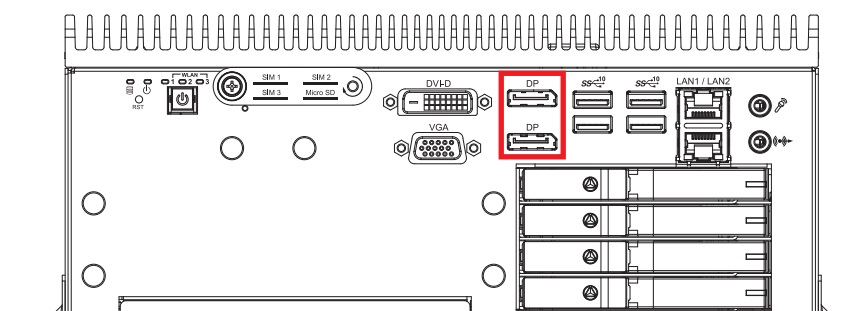
## 2.2.5 VGA Connector



The ECX-2600/2400/2300 PEG series comes with a DB15 female connector on the front panel to connect a VGA monitor. To ensure that the monitor image remains clear, be sure to tighten the monitor cable after connecting it to the ECX-2600/2400/2300 PEG. The VGA output mode supports up to 1920x1200 resolutions. The pin assignments of the VGA connector are shown below.

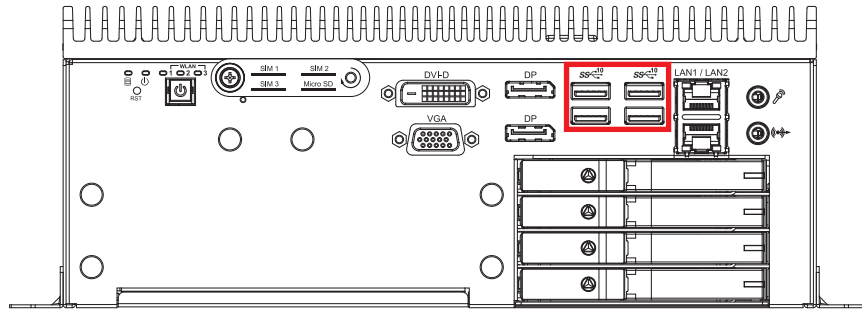
	Pin No.	Description	Pin No.	Description
	1	Red Color Signal	2	Green Color Signal
	3	Blue Color Signal	4	NC
	5	Ground	6	Ground
	7	Ground	8	Ground
	9	VCC	10	Ground
	11	NC	12	DDC-DATA
	13	H-Sync.	14	V-Sync.
	15	DDC-CLK		

## 2.2.6 DisplayPort



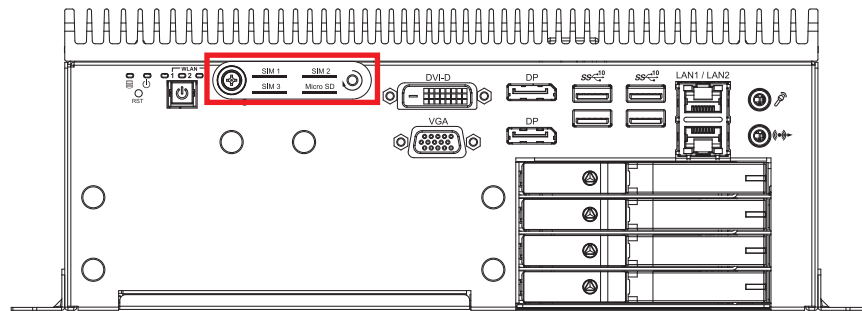
Onboard Display Port support auxiliary channel dual mode, connection supports up to 4096x2304 resolution at 60 Hz.

## 2.2.7 USB 3.1



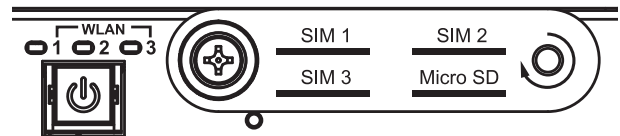
There are 4 USB 3.1 connections available supporting up to 10GB per second data rate in the front side of ECX-2600/2400/2300 PEG series. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

## 2.2.8 WLAN LED, Mini PCIe, SIM Card, Micro SD Comparison

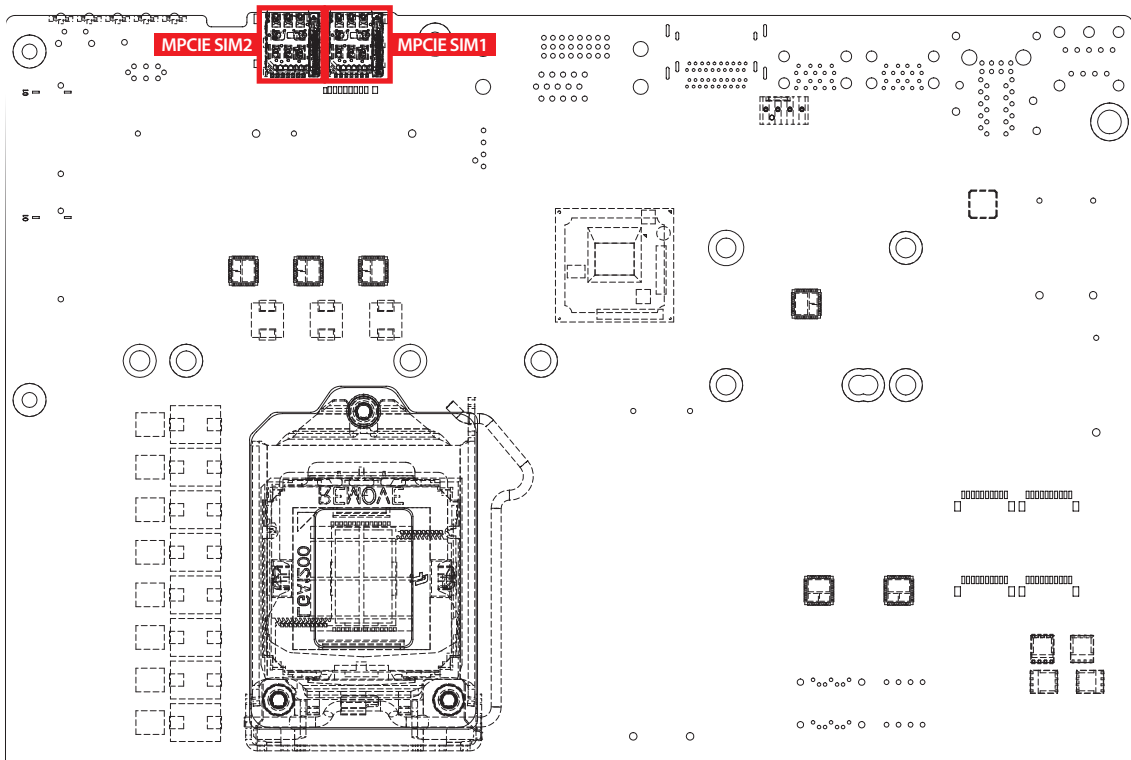
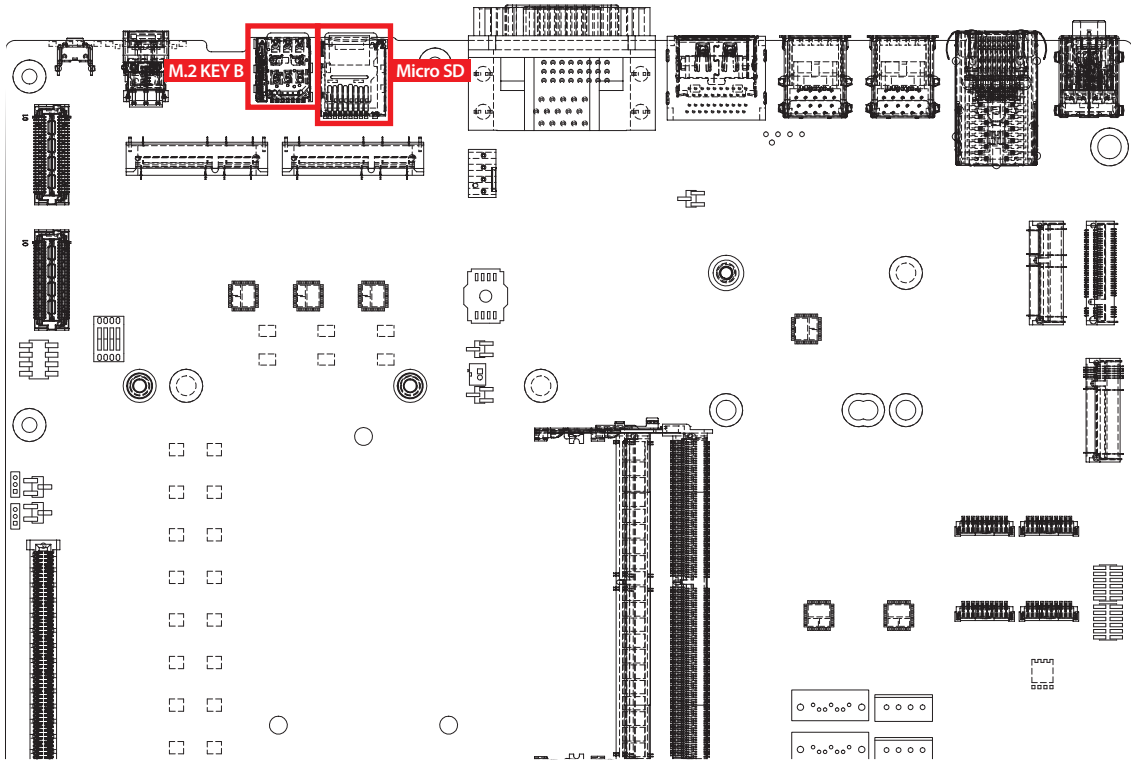


Mini PCIe Slot/SIM Slot/Micro SD/WLAN LED Mapping Table :

MPCIe/M.2	Nano SIM	LED
MPCIe 1	SIM 1	1
MPCIe 2	SIM 2	2
M.2 KEY E	SIM 3	3
Micro SD		



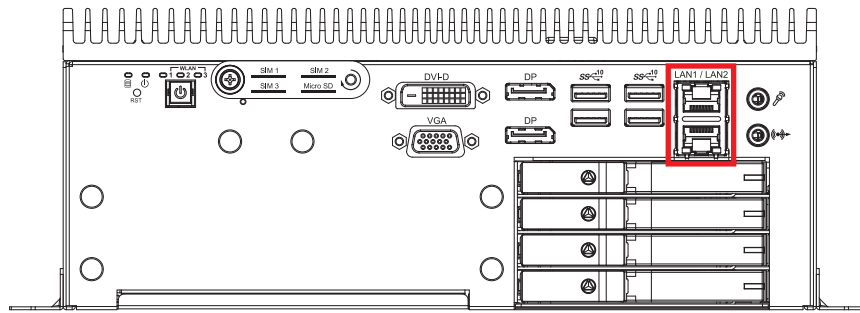




**Note :**

The SIM card sockets do not support hot-plug. Please make sure to unplug the system power before inserting the SIM card(s).

## 2.2.9 Ethernet Port



There are 2 8-pin RJ-45 jacks supporting 10/100/1000 Mbps Ethernet connections in the front side. LAN 1 is powered by Intel® i219 Ethernet Phy; LAN 2 is powered by Intel® I210 Ethernet engine. When both LAN 1 and LAN 2 work in normal status, iAMT 11.0 function is enabled.

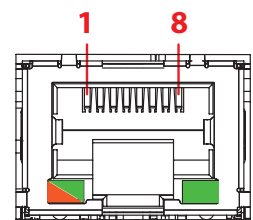
Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both of LAN 1 and LAN 2 supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 and LAN 2 are listed as follows :

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

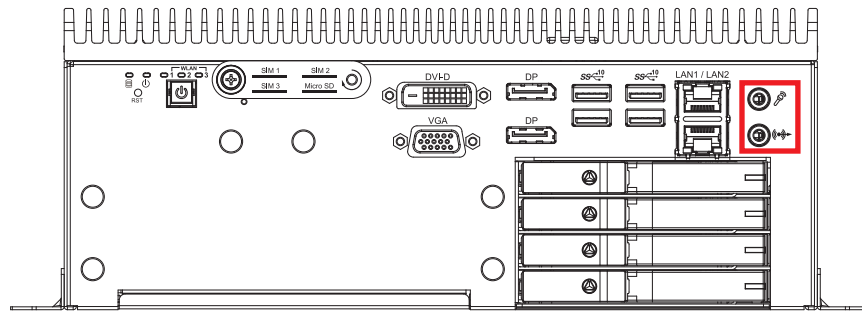
Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/Link/Speed status of the connection.

The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000Mbps Ethernet network; The left LED will keep twinkling/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	Green	Twinkling Green	Twinkling Green	Twinkling Green



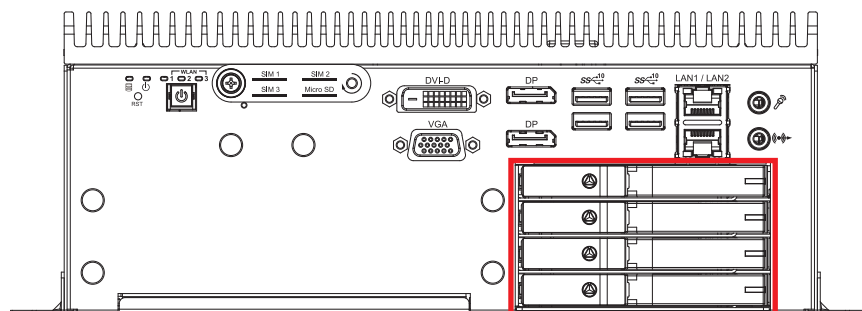
## 2.2.10 Audio Connector



There are 2 audio connectors, Mic-in and Line-out, in the front side of ECX-2600/2400/2300 PEG series. 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 in Windows platform, you need to install corresponding drivers for both Intel Sunrise Point chipset and Realtek ALC888S-VD codec.

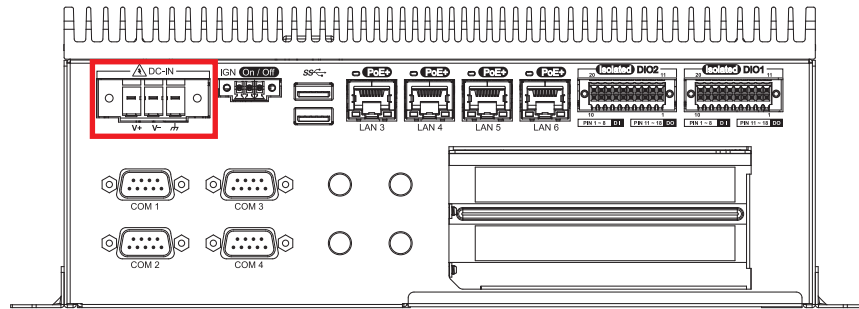
## 2.2.11 SSD/HDD Tray



There are 4 front-access 2.5" SSD/HDD trays in the front side of ECX-2600/2400/2300 PEG series. Just trigger to open the SSD/HDD tray, up to 4TB is available.

## 2.3 Rear Panel I/O & Functions

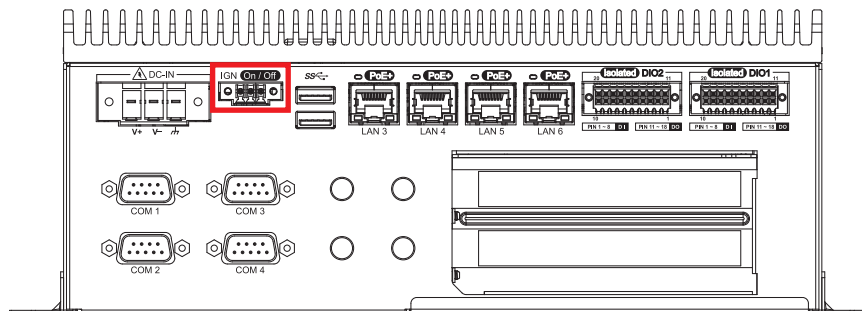
### 2.3.1 Power Terminal Block



This system supports 9V to 50V DC power input by terminal block in the rear side. In normal power operation, power LED lightens in solid green. Supports up to 80V surge protection.

Pin No.	Definition	Pin No.	Definition
1	V+	2	V-
3	Chassis Ground		

### 2.3.2 Remote Power On/Off Switch & IGNITION Terminal Block

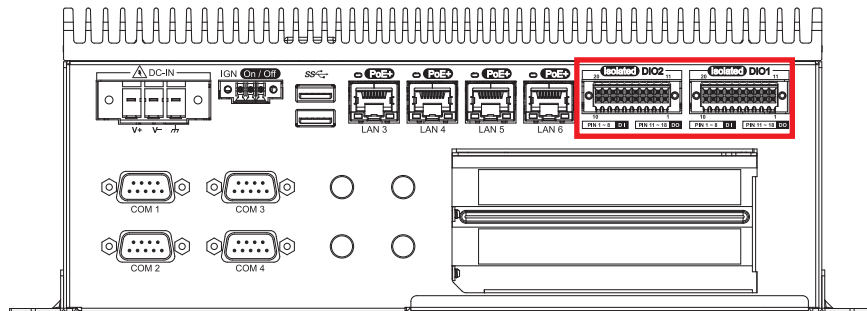


It is a 2-pin power-on or power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function of soft power-on/power-off (instant off or delay 4 second), and suspend mode.

Pin No.	Definition	Pin No.	Definition
1	Ignition	2	SW+
3	SW-		

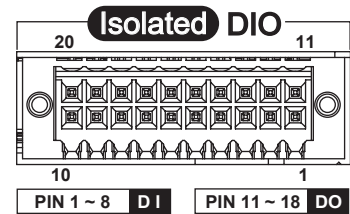
## 2.3.3 Isolated DIO/GPIO

### 2.3.3.1 ECX-2600/2400 PEG Series



There is a 16-bit (8-bit DI, 8-bit DO) connectors in the rear side. DI/DIO support NPN (sink) and PNP (Source) mode, Each DI channel is equipped with a photocoupler for isolated protection. Each DO with isolator chip, Config by a Jumper for each DIO connector. DO Safety-Related Certifications :

- 4242-VPK Basic Isolation per DIN V VDE V 0884-10 and DIN EN 61010-1
- 3-KVRMS Isolation for 1 minute per UL 1577
- CSA Component Acceptance Notice 5A, IEC 60950-1 and IEC 61010-1 End Equipment Standards
- GB4943.1-2011 CQC Certified



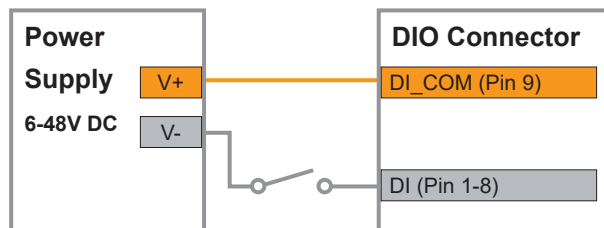
DIO Connectors pin out :

DIO	Pin No.	Definition	Function
DIO1	1	INPUT 0	SIO_GPI80
	2	INPUT 1	SIO_GPI81
	3	INPUT 2	SIO_GPI82
	4	INPUT 3	SIO_GPI83
	5	INPUT 4	SIO_GPI84
	6	INPUT 5	SIO_GPI85
	7	INPUT 6	SIO_GPI86
	8	INPUT 7	SIO_GPI87
	9	DI_COM	-----
	10	DIO_GND	-----
	11	OUTPUT 0	SIO_GPO70
	12	OUTPUT 1	SIO_GPO71
	13	OUTPUT 2	SIO_GPO72
	14	OUTPUT 3	SIO_GPO73
	15	OUTPUT 4	SIO_GPO74
	16	OUTPUT 5	SIO_GPO75
	17	OUTPUT 6	SIO_GPO76
	18	OUTPUT 7	SIO_GPO77
	19	DIO_GND	-----
	20	External 6-40VDC (NPN) External 6-48VDC (PNP)	-----

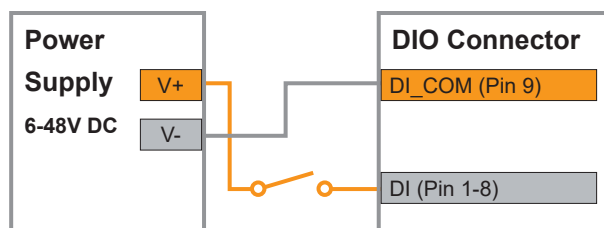
DIO	Pin No.	Definition	Function
DIO2	1	INPUT 0	SIO_GPI37
	2	INPUT 1	SIO_GPI56
	3	INPUT 2	SIO_GPI57
	4	INPUT 3	SIO_GPI15
	5	INPUT 4	SIO_GPI16
	6	INPUT 5	SIO_GPI35
	7	INPUT 6	SIO_GPI46
	8	INPUT 7	SIO_GPI11
	9	DI2_COM	-
	10	DIO2_GND	-
	11	OUTPUT 0	SIO_GPO22
	12	OUTPUT 1	SIO_GPO26
	13	OUTPUT 2	SIO_GPO64
	14	OUTPUT 3	SIO_GPO65
	15	OUTPUT 4	SIO_GPO41
	16	OUTPUT 5	SIO_GPO40
	17	OUTPUT 6	SIO_GPO52
	18	OUTPUT 7	SIO_GPO27
	19	DIO2_GND	-
	20	External 6-40VDC (NPN) External 6-48VDC (PNP)	-

DI reference circuit :

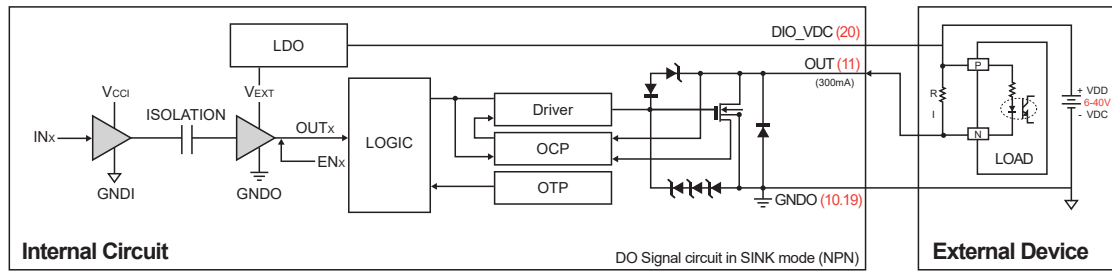
Sink Mode  
(NPN)



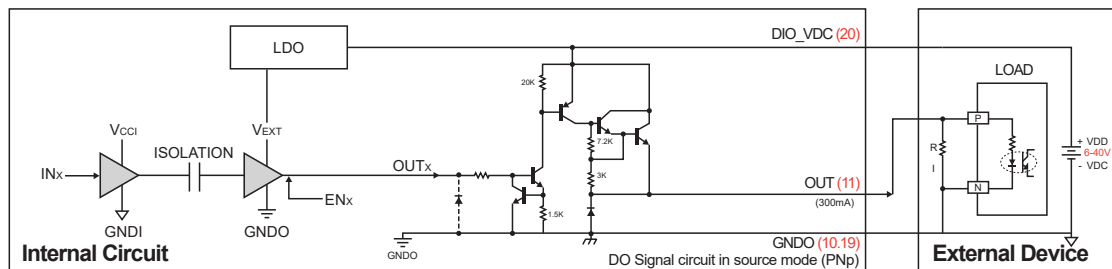
Source Mode  
(PNP)



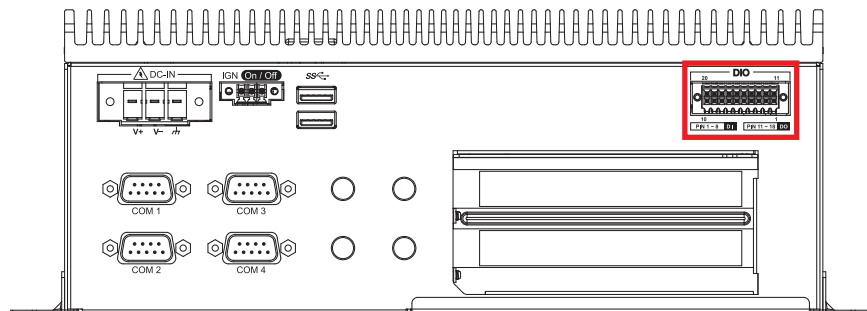
DO reference circuit :  
Sink Mode (NPN, Default)



Source (PNP)



### 2.3.3.2 ECX-2300 PEG series

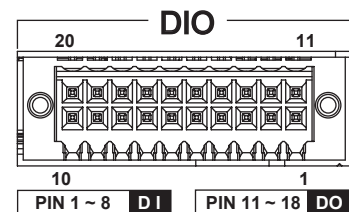


The system offers sixteen programmable I/O (3.3V Level).

If the GPIO is logic high, it indicates that the mapping SIO GPIO pin is logic high level.

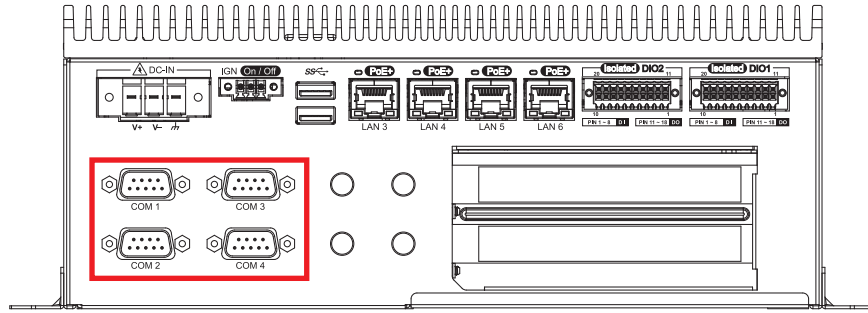
If the GPIO is logic low, it indicates that the mapping SIO GPIO pin is logic low level.

GPIO Connectors pin assignments



Pin No.	Definition	Pin No.	Definition
1	SIO_GPI80	11	SIO_GPO70
2	SIO_GPI81	12	SIO_GPO71
3	SIO_GPI82	13	SIO_GPO72
4	SIO_GPI83	14	SIO_GPO73
5	SIO_GPI84	15	SIO_GPO74
6	SIO_GPI85	16	SIO_GPO75
7	SIO_GPI86	17	SIO_GPO76
8	SIO_GPI87	18	SIO_GPO77
9	-----	19	GND
10	GND	20	-----

## 2.3.4 Serial Port



Serial port 1 to 4 (COM 1 to 4) can be configured for RS-232, RS-422, or RS-485 with auto flow control communication. The default definition of COM 1 and COM 2 is RS-232, if you want to change to RS-422 or RS-485, you can find the setting in BIOS.

BIOS Setting	Function
COM 1	RS-232
COM 2	RS-422 (5-wire)
COM 3	RS-422 (9-wire)
COM 4	RS-485
COM 4	RS-485 w/z auto-flow control

The pin assignments are listed in the following table :

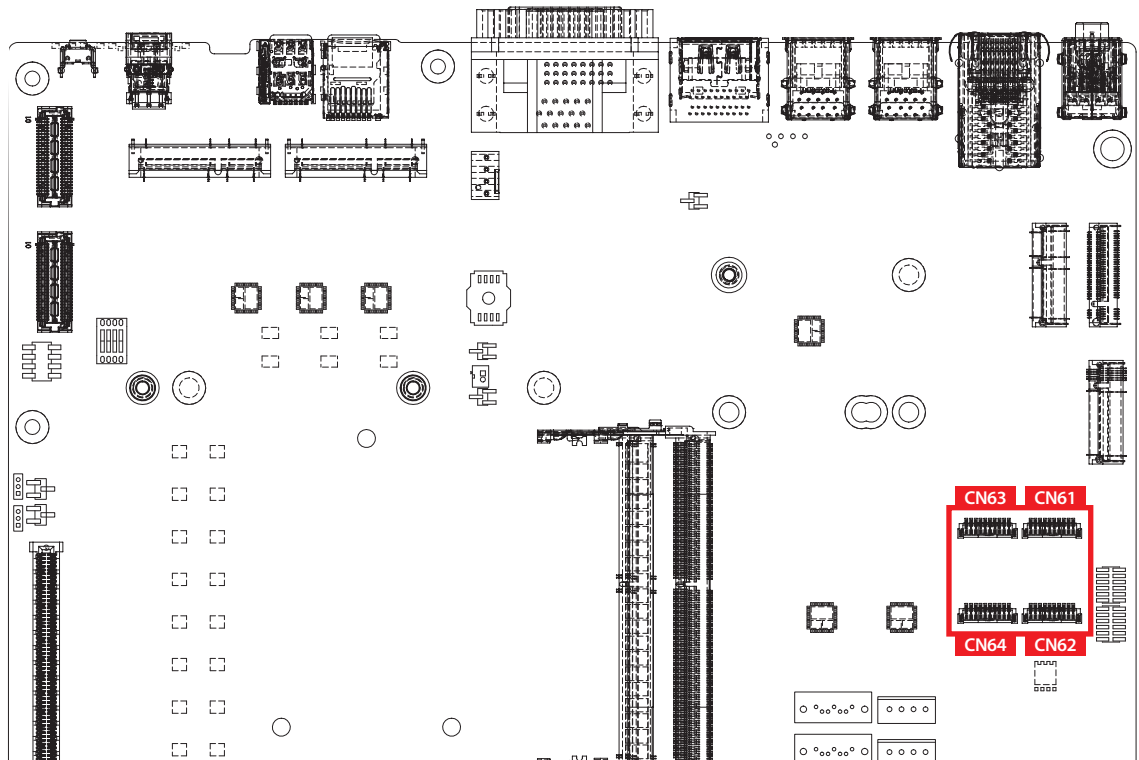
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-422 (9-wire)	RS-485 (3-wire)
1 to 4	1	DCD	TXD-	TXD-	DATA-
	2	RXD	TXD+	TXD+	DATA+
	3	TXD	RXD+	RXD+	-----
	4	DTR	RXD-	RXD-	-----
	5	GND	GND	GND	GND
	6	DSR	-----	RTS-	-----
	7	RTS	-----	RTS+	-----
	8	CTS	-----	CTS+	-----
	9	RI	-----	CTS-	-----



COM 1 to COM 4 MB connector table :

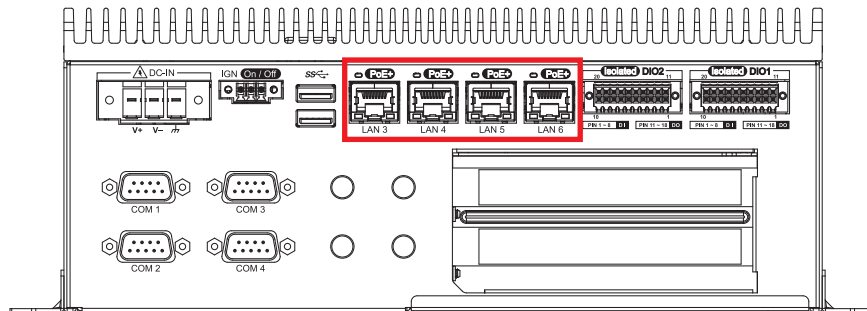
COM Port	MB Connector	COM Port	MB Connector
COM 1	CN61	COM 2	CN62
COM 3	CN63	COM 4	CN64

CN	Pin No.	Signal Name
CN61 to CN64	1	NC
	2	GND
	3	RI
	4	DTR
	5	CTS
	6	TXD
	7	RTS
	8	RXD
	9	DSR
	10	DCD



## 2.3.5 PoE Ports

### 2.3.5.1 ECX-2600/2400 PEG



There are 4 RJ45 connectors in the rear side of ECX-2600/2400 PEG. It supports IEEE 802.3at (PoE+) Power over Ethernet (PoE) connection delivering up to 37W/54V per port and 1000BASE-T gigabit data signals over standard Ethernet Cat 5/Cat 6 cable.

Each PoE connection is powered by Intel® I350 Gigabit Ethernet controller and independent PCI express interface to connect with multi-core processor for network and data transmit optimization. Only when PoE port starts to supply power to power devices, the dedicated LED will be lightened.

**PS. Suggest to use PoE function when power input is over 12V.**

The pin-outs of LAN 3 and LAN 6 are listed as follows :

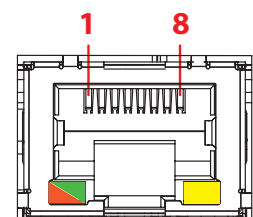
Pin No.	10/100 Mbps	1000Mbps	PoE
1	E_TX+	MDI0_P	PoE+
2	E_TX-	MDI0_N	PoE+
3	E_RX+	MDI1_P	PoE-
4	-----	MDI2_P	-----
5	-----	MDI2_N	-----
6	E_RX-	MDI1_N	PoE-
7	-----	MDI3_P	-----
8	-----	MDI3_N	-----

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

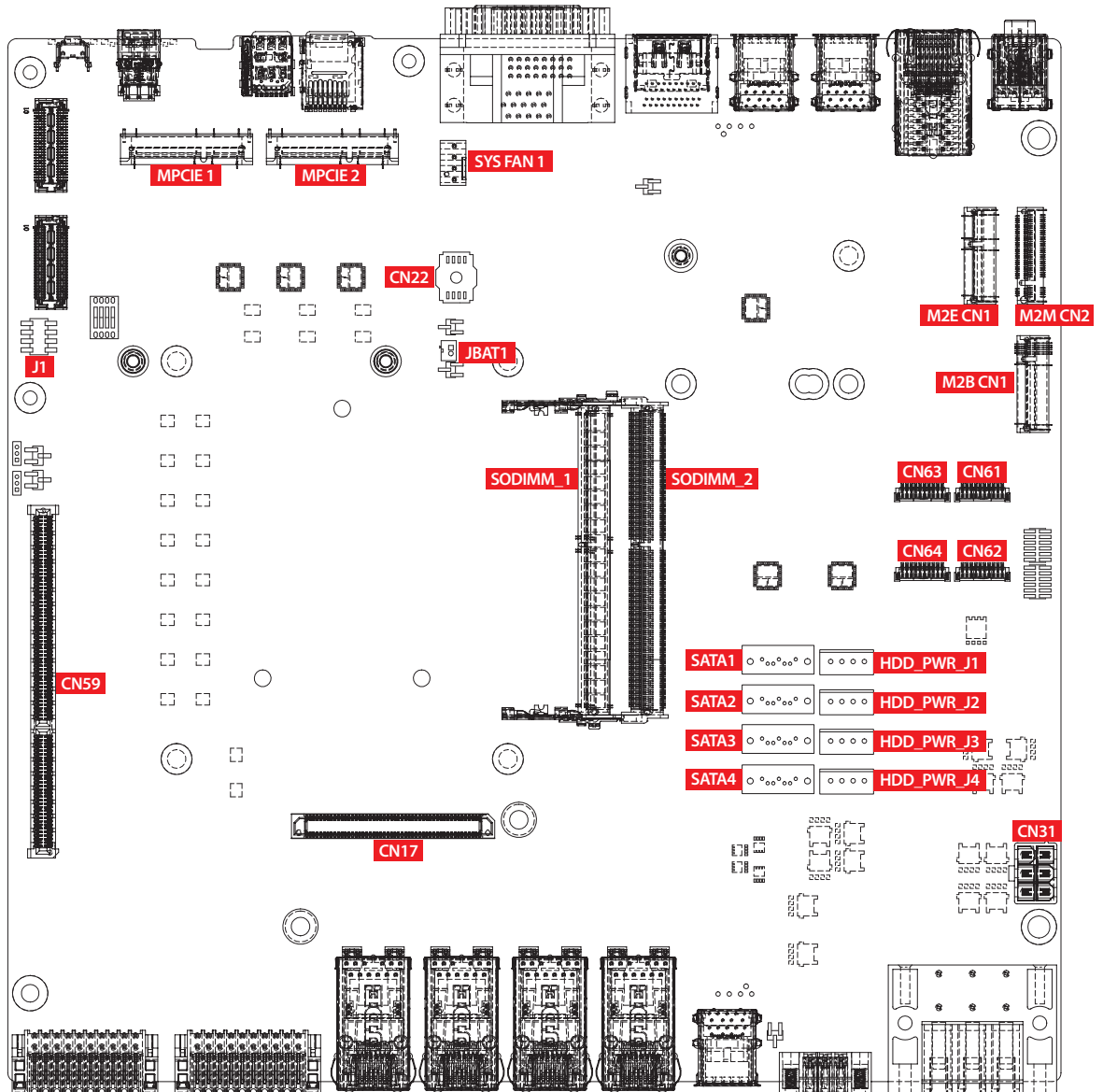
LED Location	LED Color	10Mbps	100Mbps	1000Mbps
Right	Green/ Orange	Off	Solid Green	Solid Orange
Left	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow

POE LED	LED Color	POE Status
LED 1 - 4	Solid Green	POE ON

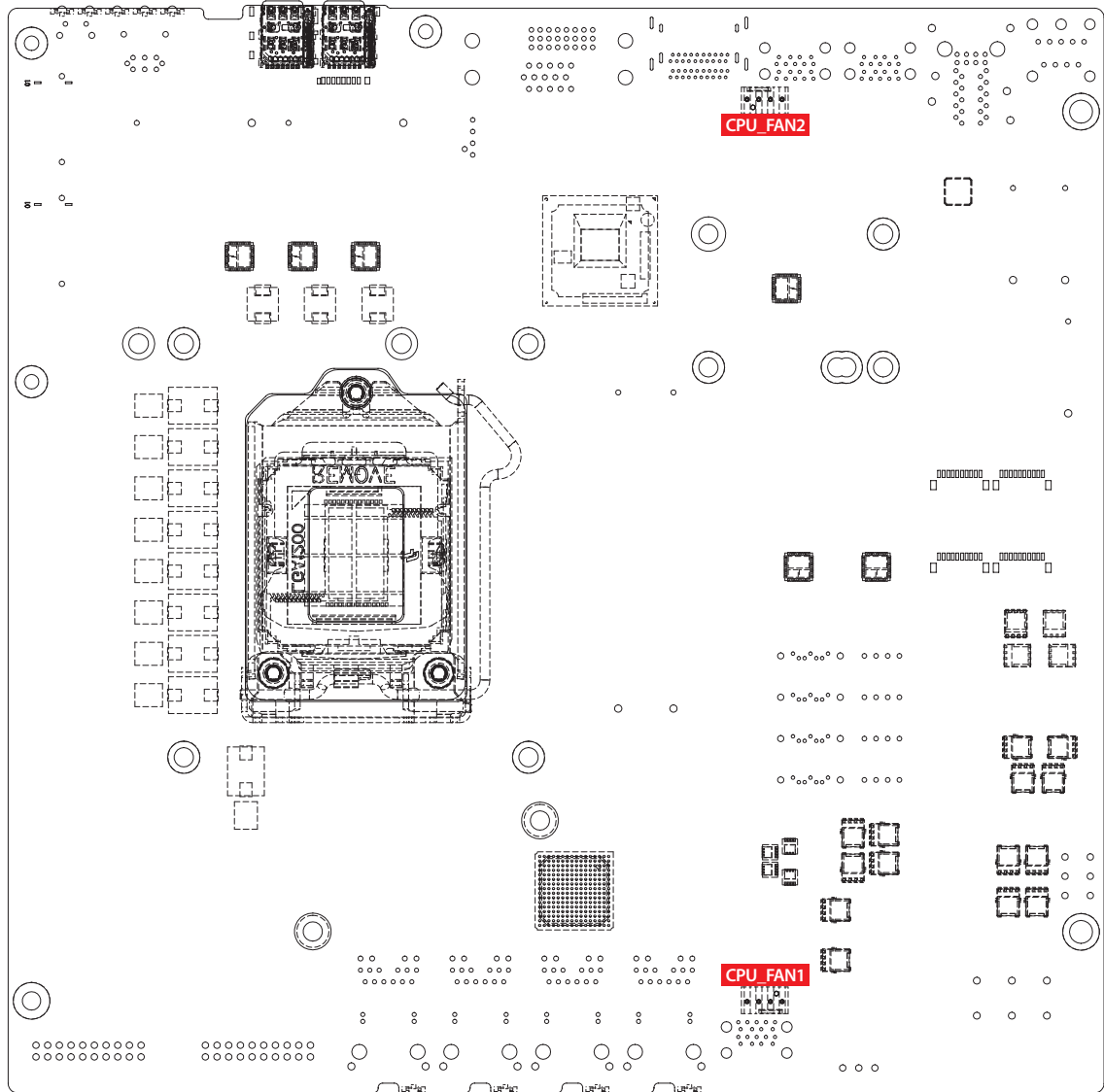


## 2.4 Main Board Expansion Connectors

### 2.4.1 Top View (Component Side) of ECX-2600/2400/2300 PEG Main Board With Connector Location



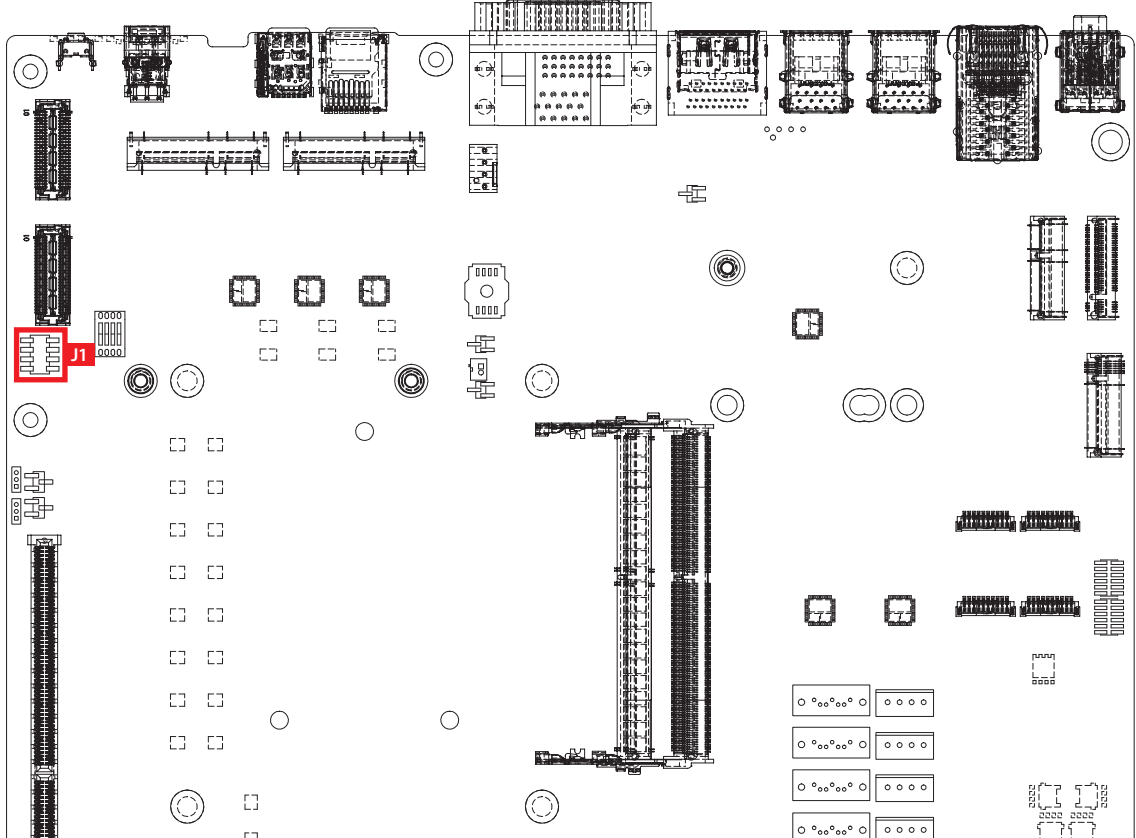
## 2.4.2 Bottom View (Solder Side) of ECX-2600/2400/2300 PEG Main Board With Connector Location



### 2.4.3 J1 : Miscellaneous Pin Header

2.0mm 2x4p header

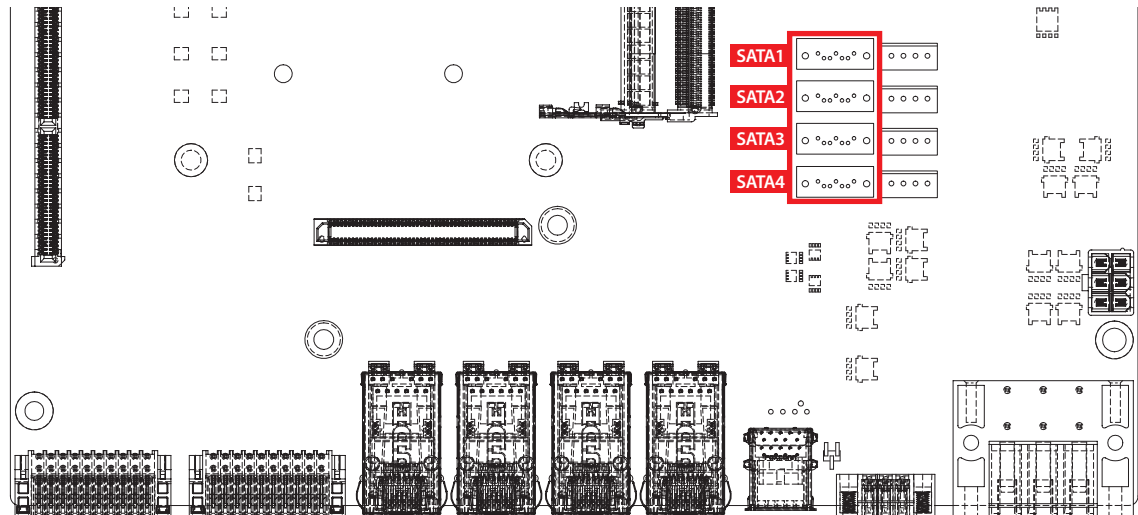
This pin header can be used as a backup for following functions, hard drive LED indicator, reset button, power LED indicator, and power-on/off button, which already can be accessed by front panel and top panel. The pin-outs of Miscellaneous port are listed in following table :



	Group	Pin No.	Description
	HDD LED	1	HDD_LED_P
		3	HDD_LED_N
	RESET BUTTON	5	FP_RST_BTN_N
		7	Ground
	POWER LED	2	PWR_LED_P
		4	PWR_LED_N
	POWER BUTTON	6	FP_PWR_BTN_IN
		8	Ground

## 2.4.4 SATA1, SATA2, SATA3, SATA4 : SATA III Connector

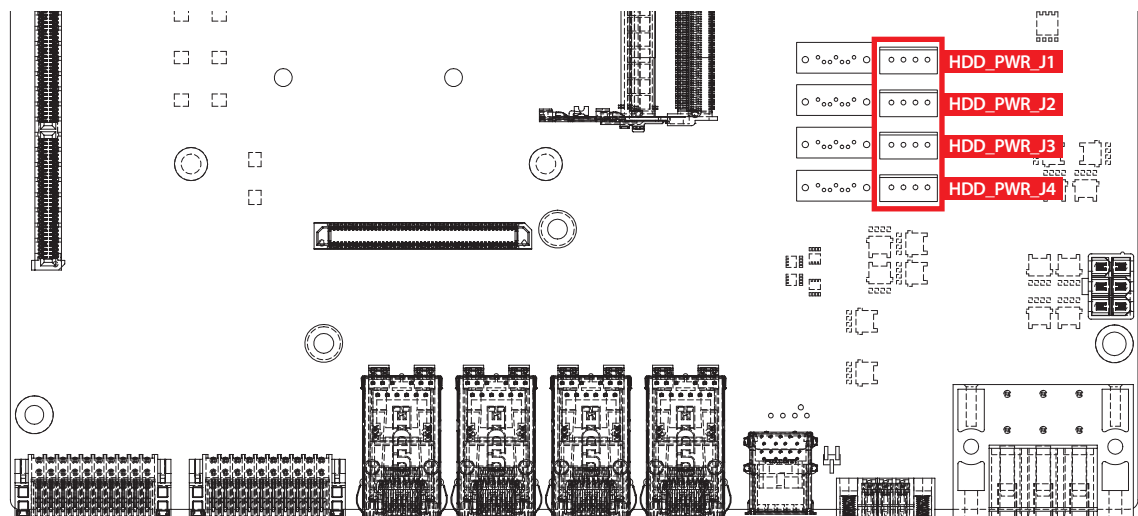
There are 2 onboard high performance Serial ATA III (SATA III) on ECX-2600/2400/2300 PEG. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1 to SATA2 are listed in the following table :



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

## 2.4.5 HDD\_PWR\_J1 to HDD\_PWR\_J4 : SATA Power Connector

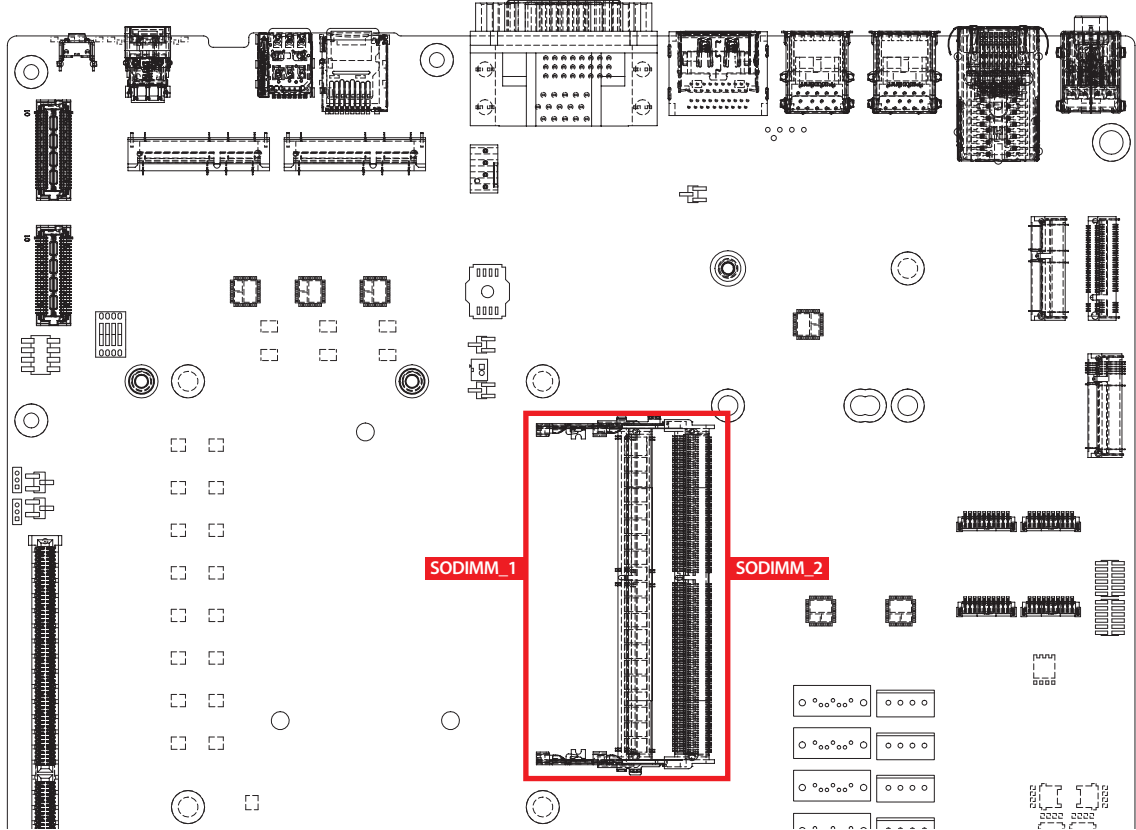
The ECX-2600/2400/2300 PEG also equip with a SATA power connector. The one port supports 5V (Up to 2A) and 12V (Up to 2A) current to the hard drive or SSD. The pin assignments of HDD\_PWR\_J1 to HDD\_PWR\_J2 are listed in the following table :



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

## 2.4.6 SODIMM\_1, SODIMM\_1 : DDR4 Slot

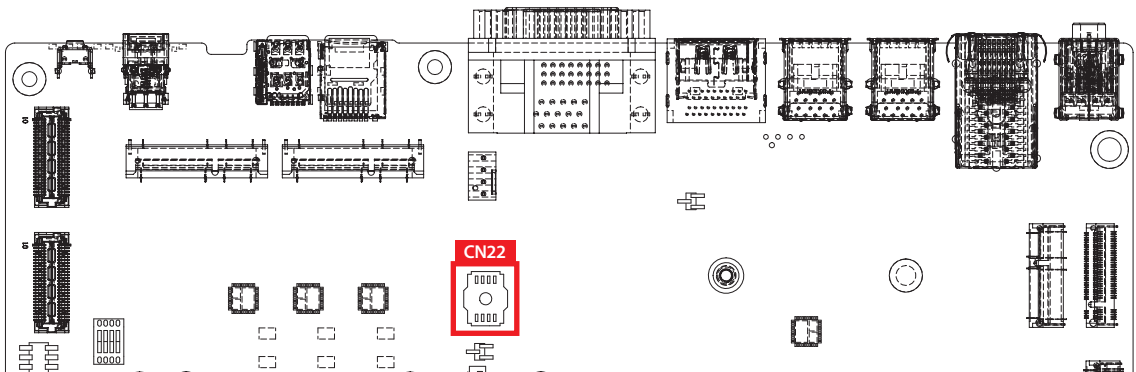
There are 2 DDR4 channel onboard, support DDR4 2933, max 64GB  
Each channel 32GB



Slot	Description
SODIMM_1	DDR4 Channel A
SODIMM_2	DDR4 Channel B

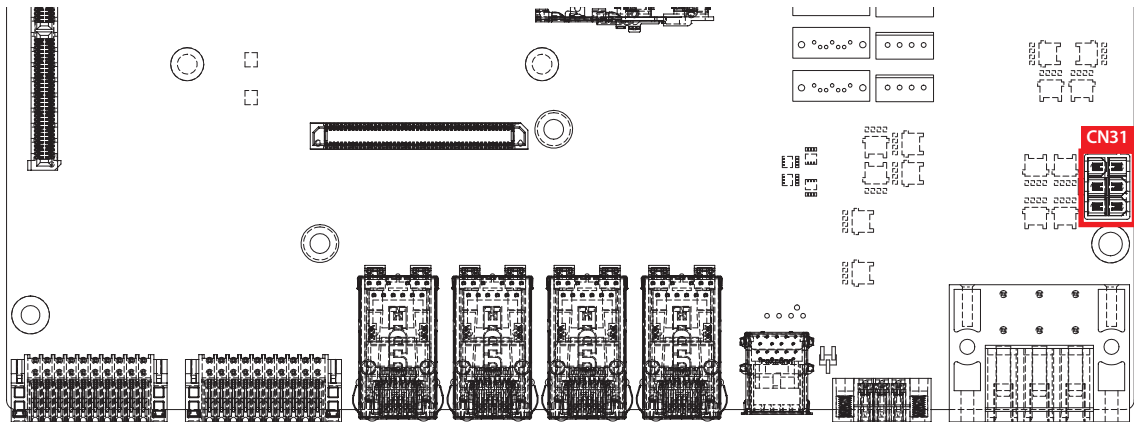
## 2.4.7 CN22 : BIOS Socket

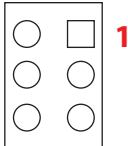
If the BIOS needs to be changed, please contact the Vecow RMA service team.



## 2.4.8 CN31 : UPS Power Connector

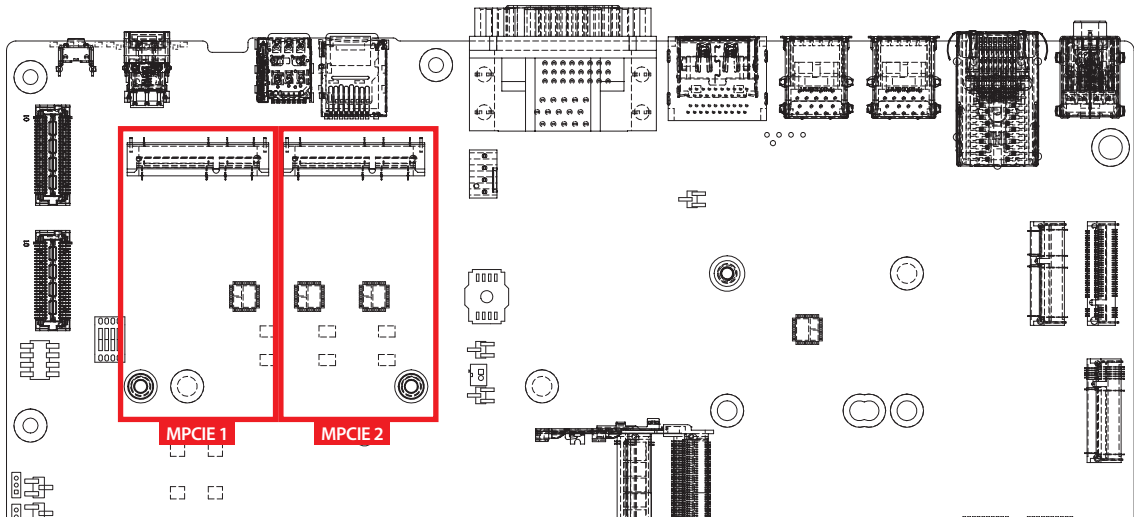
For UPS module optional, we use 4.2mm 3x2p power connector.



	Pin No.	Description	Pin No.	Description
	1	+VDC_IN (9~50V, Max.9A)	2	+VDC_IN (9~50V, Max.9A)
	3	+VDC_IN (9~50V, Max.9A)	4	Ground
	5	Ground	6	Ground

## 2.4.9 Mini PCIe : MPCle\_1, MPCle\_2

Standard full length mini PCIe slot.



The pin assignments of MPCle 1, MPCle2 in the following table :

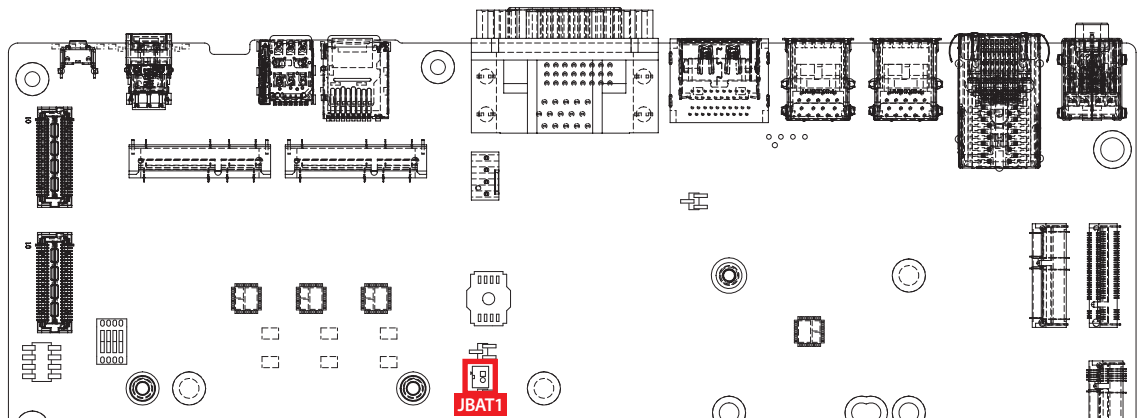
Pin No.	Signal Name	Pin No.	Signal Name
51	Reserved	52	+3.3Vaux
49	Reserved	50	GND
47	Reserved	48	+1.5V
45	Reserved	46	Reserved



Pin No.	Signal Name	Pin No.	Signal Name
43	GND	44	Reserved
41	+3.3Vaux	42	Reserved
39	+3.3Vaux	40	GND
37	GND	38	USB_D+
35	GND	36	USB_D-
33	PETp0	34	GND
31	PETn0	32	SMB_DATA
29	GND	30	SMB_CLK
27	GND	28	+1.5V
25	PERp0	26	GND
23	PERn0	24	+3.3Vaux
21	GND	22	PERST#
19	Reserved	20	reserved
17	Reserved	18	GND
Mechanical Key			
15	GND	16	UIM_VPP
13	REFCLK+	14	UIM_RESET
11	REFCLK-	12	UIM_CLK
9	GND	10	UIM_DATA
7	CLKREQ#	8	UIM_PWR
5	Reserved	6	1.5V
3	Reserved	4	GND
1	WAKE#	2	3.3Vaux

#### 2.4.10 JBAT1 : RTC Battery

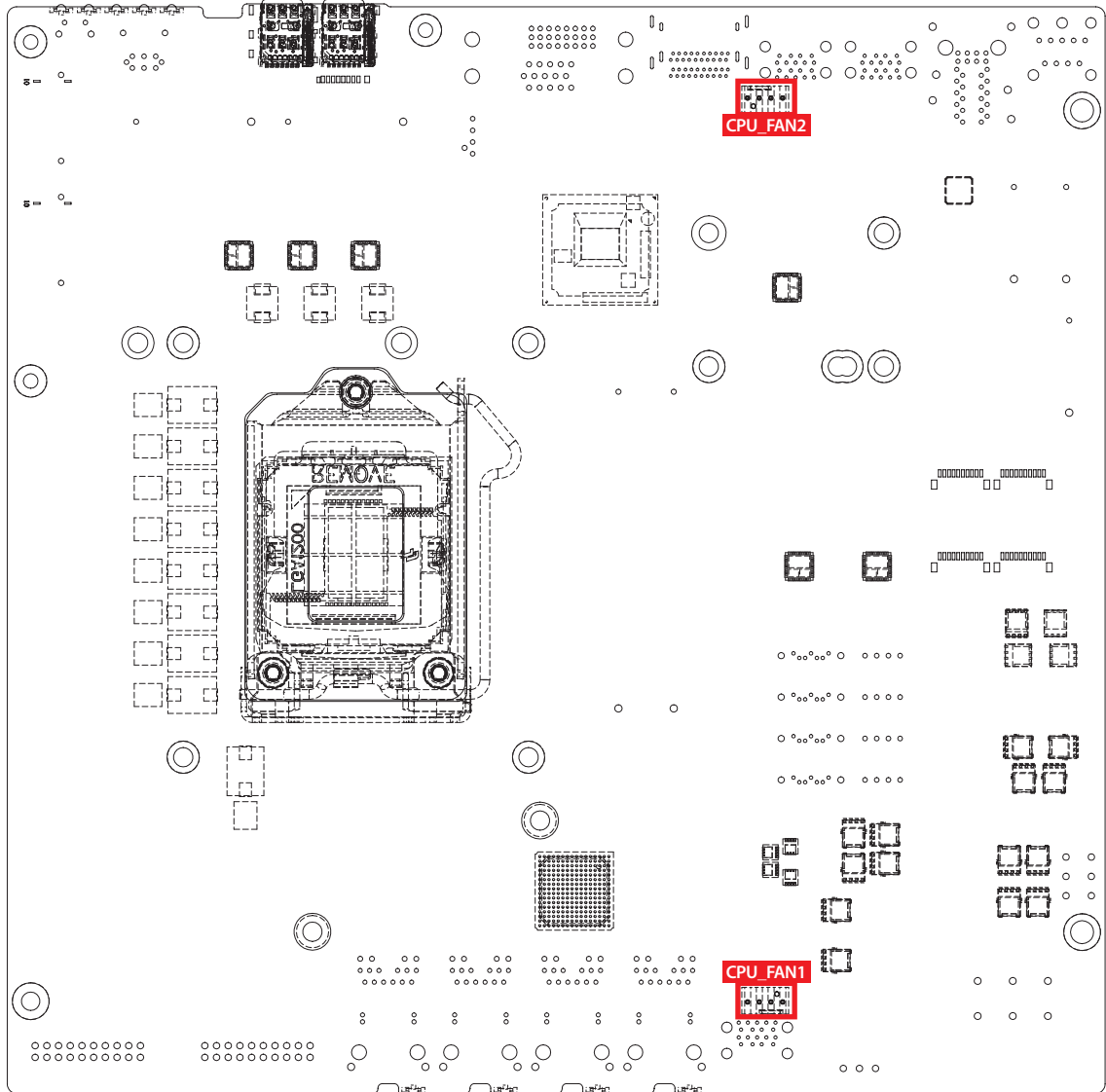
The system's real-time clock is powered by a lithium battery. It is Equipped with MuRata CR2032 190mAh lithium battery. It is recommended that you not replace the lithium battery on your own. If the battery needs to be changed, please contact the Vecow RMA service team.



Pin No.	Description
1	BAT-
2	BAT+

## 2.4.11 CPU\_FAN1, CPU\_FAN2 : FAN Header

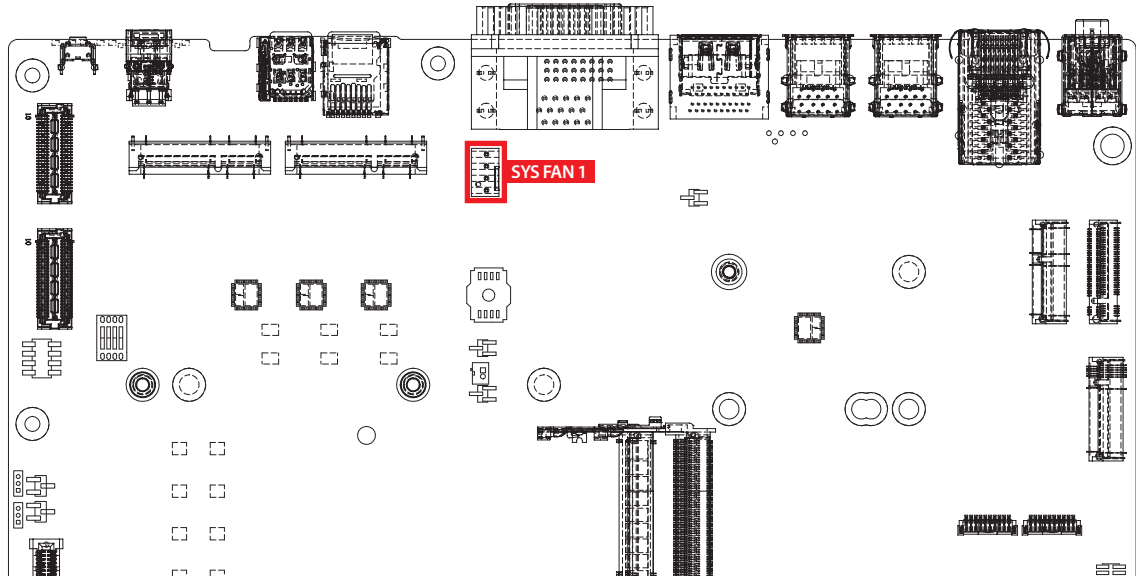
Fan power connector supports for additional thermal requirements. The pin assignments of CPU\_FAN1 and CPU\_FAN2 are listed in the following table.




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

## 2.4.12 SYS\_FAN1 : System Fan Header

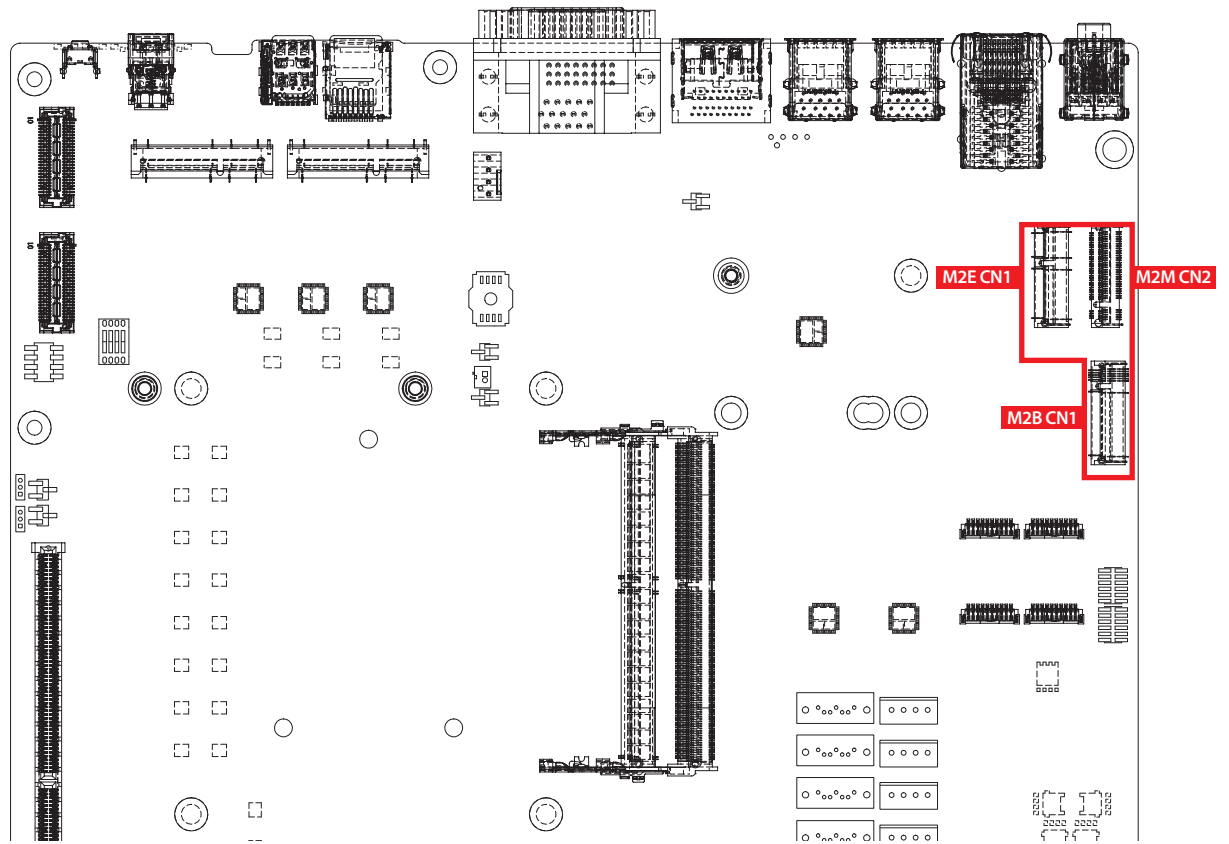
Fan power connector supports for additional PEG device. The pin assignments of SYS\_FAN1 is listed in the following table.



	Pin No.	Function
	1	GND
	2	+12V (2A max)
	3	NC
	4	NC

### 2.4.13 M2B\_CN1, M2M\_CN1, M2E\_CN1 : M.2 slot

The pin assignments of M2B\_CN1, M2M\_CN1, M2E\_CN1 in the following table :



M2B\_CN1 : M.2 KEY B (Dimension : 2280, 2242, 3042, 3050, 3052)

Pin No.	Signal Name	Pin No.	Signal Name
		80	Ground
75	NC		
73	Ground	74	3.3V
71	Ground	72	3.3V
69	CONFIG_1	70	3.3V
67	NC	68	NC
65	NC	66	SIM DETECT
63	NC	64	NC
61	NC	62	NC
59	NC	60	NC
57	Ground	58	NC
55	REFCLKp	56	NC
53	REFCLKn	54	PEWAKE#
51	Ground	52	CLKREQ#
49	PETp0/SATA-A+	50	PERST#

Pin No.	Signal Name	Pin No.	Signal Name
47	PETn0/SATA-A-	48	NC
45	Ground	46	NC
43	PERp0/SATA-B-	44	NC
41	PERn0/SATA-B+	42	NC
39	Ground	40	NC
37	PETp1/USB3.1-Tx+	38	DEVSLP
35	PETn1/USB3.1-Tx-	36	UIM-PWR
33	Ground	34	UIM-DATA
31	PERp1/USB3.1-Rx+	32	UIM-CLK
29	PERn1/USB3.1-Rx-	30	UIM-RESET
27	Ground	28	NC
25	NC	26	NC
23	NC	24	NC
21	NC	22	NC
		20	NC
Mechanical Key			
11	Ground		
9	USB-	10	LED_1#
7	USB+	8	W_DISABLE1
5	Ground	6	FULL_CARD_PWR_OFF/ ON
3	Ground	4	3.3V
1	NC	2	3.3V

M2M\_CN1 : M.2 KEY M (Dimension : 2280)

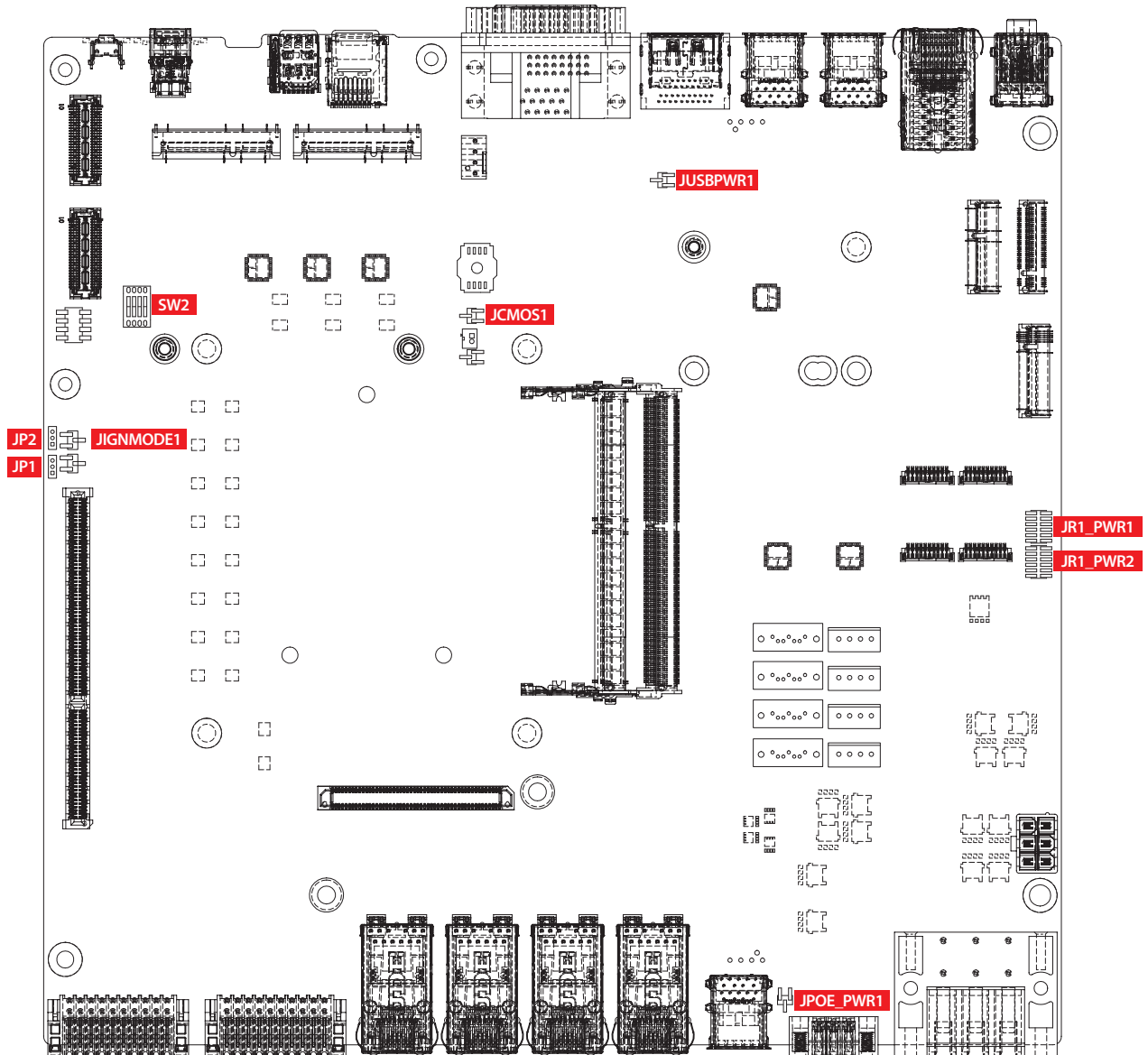
Pin No.	Signal Name	Pin No.	Signal Name
75	Ground		
73	Ground	74	3.3V
71	Ground	72	3.3V
69	PEDET	70	3.3V
67	Ground	68	NC
Mechanical Key			
57	Ground	58	NC
55	REFCLKp	56	NC
53	REFCLKn	54	PEWAKE#
51	Ground	52	CLKREQ#
49	PETp0/SATA_A+	50	PERST#
47	PETn0/SATA_A-	48	NC
45	Ground	46	NC
43	PERp0/SATA_B-	44	NC
41	PERn0/SATA_B+	42	NC
39	Ground	40	NC
37	PETp1	38	DEVSLP
35	PETn1	36	NC
33	Ground	34	NC
31	PERp1	32	NC
29	PERn1	30	NC
27	Ground	28	NC
25	PETp2	26	NC
23	PETn2	24	NC
21	Ground	22	NC
19	PERp2	20	NC
17	PERn2	18	3.3V
15	Ground	16	3.3V
13	PETp3	14	3.3V
11	PETn3	12	3.3V
9	Ground	10	LED1#
7	PERp3	8	NC
5	PERn3	6	NC
3	Ground	4	3.3V
1	Ground	2	3.3V

M2E\_CN1 : M.2 KEY E (Dimension : 2230)

Pin No.	Signal Name	Pin No.	Signal Name
75	Ground		
73	NC	74	3.3V
71	NC	72	3.3V
69	Ground	70	PEWAKE1#
67	NC	68	NC
65	NC	66	NC
63	Ground	64	NC
61	NC	62	ALERT
59	NC	60	I2C_CLK
57	Ground	58	I2C_DATA
55	PEWAKE0#	56	NC
53	CLKREQ0#	54	NC
51	Ground	52	PERST0#
49	REFCLKn0	50	NC
47	REFCLKp0	48	NC
45	Ground	46	NC
43	PERn0	44	NC
41	PERp0	42	NC
39	Ground	40	NC
37	PETn0	38	DEVSLP
35	PETp0	36	NC
33	Ground	34	NC
		32	NC
Mechanical Key			
23	NC		
21	NC	22	NC
19	Ground	20	NC
17	NC	18	Ground
15	NC	16	NC
13	Ground	14	NC
11	NC	12	NC
9	NC	10	NC
7	Ground	8	NC
5	USB-	6	LED1#
3	USB+	4	3.3V
1	Ground	2	3.3V

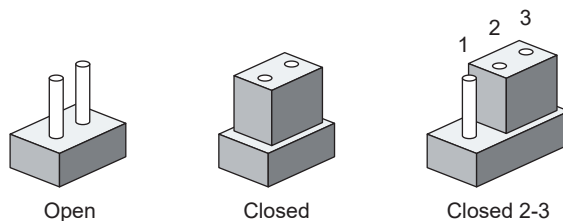
## 2.5 Main Board Jumper Settings

### 2.5.1 Board top view of the system main board with jumper and DIP switch



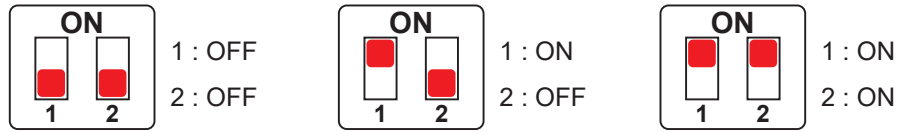
The figure below is the top view of the system main board which is the main board. It shows the location of the jumpers and the switches.

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.

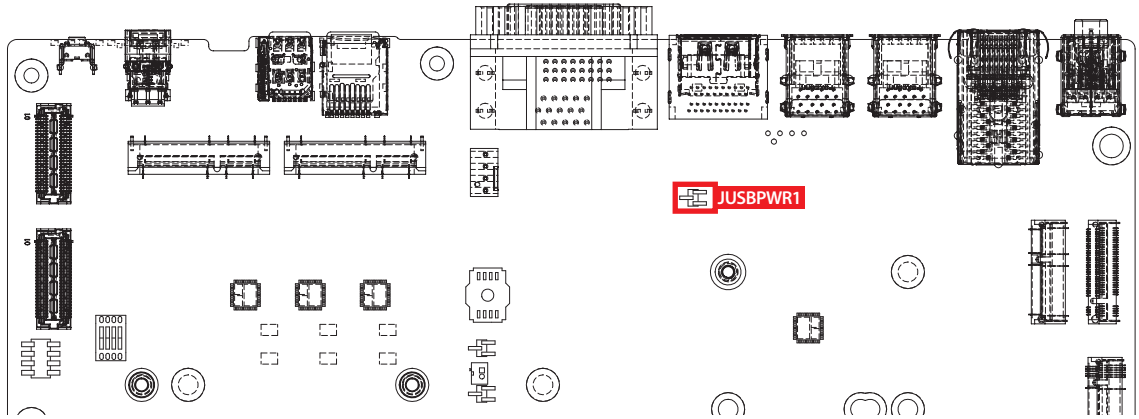




You may configure your card to match the needs of your application by DIP switch. As below show the DIP switch on and off.

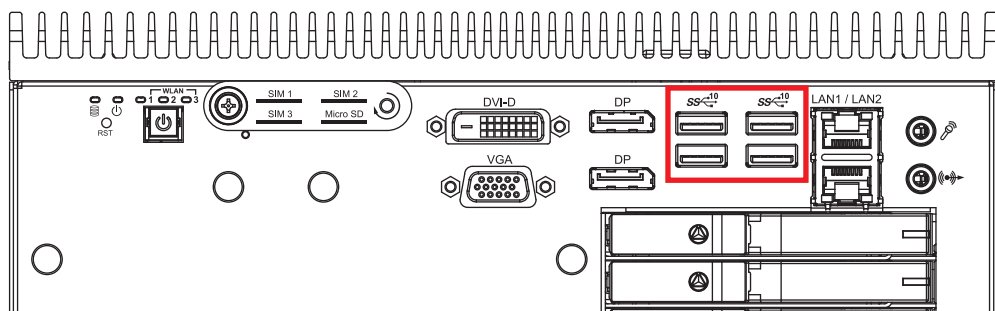


## 2.5.2 JUSBPWR1 : USB Wake Up

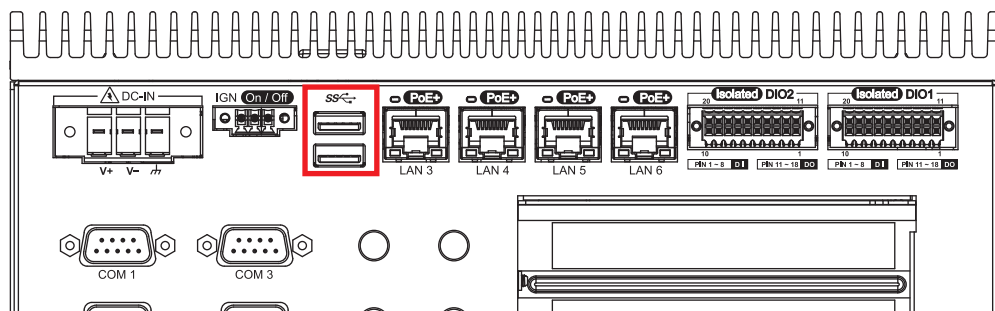


Jumper	Setting	Function
JUSBPWR1	2-3	Non Wake Up support
JUSBPWR1	1-2	Supported Wake Up (Default)

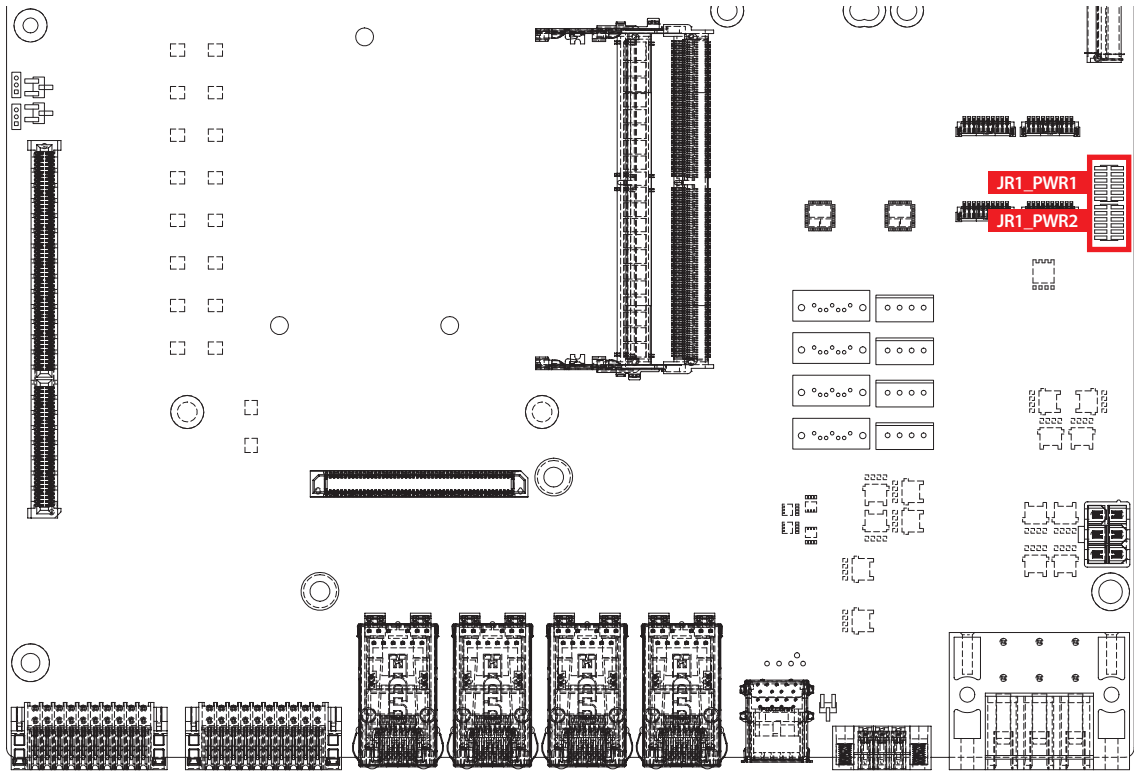
### Front Plane View



### Rear Plane View



### 2.5.3 JRI\_PWR1, JRI\_PWR2 : COM Port RI pin Select



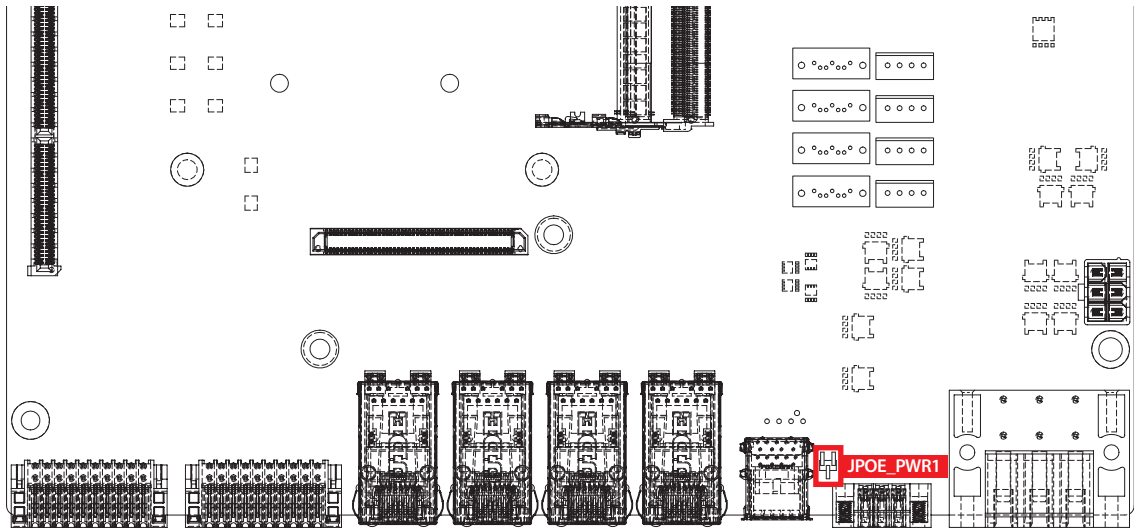
JRI\_PWR1

JRI\_PWR2

Pin No.	Description	COM Port
1 - 2	+5V (1A max.)	COM1
3 - 4	+12V (0.5A max.)	
5 - 6	RI (Default)	
7 - 8	+5V (1A max.)	COM2
9 - 10	+12V (0.5A max.)	
11 - 12	RI (Default)	

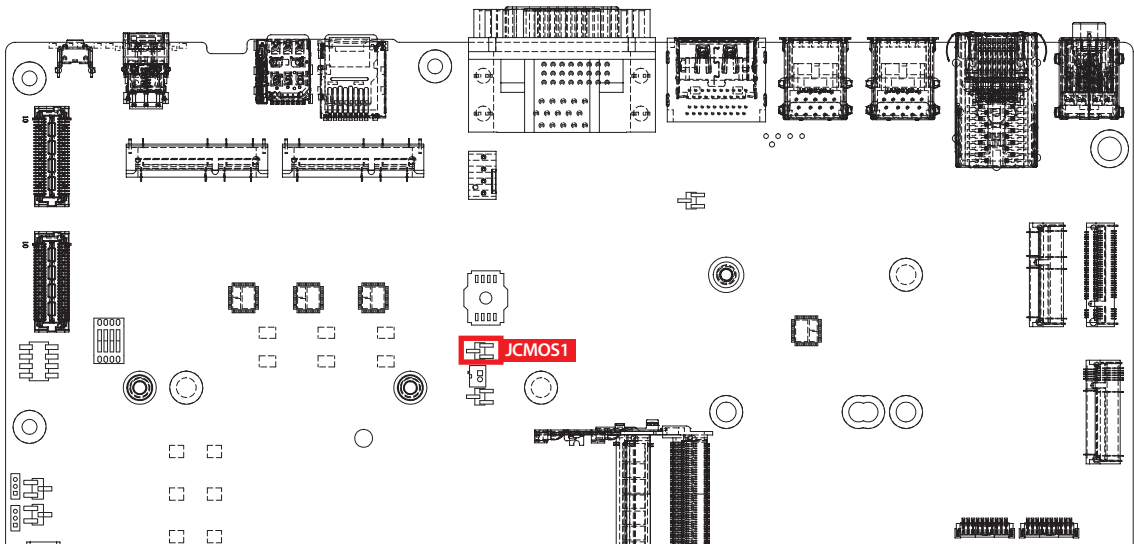
Pin No.	Description	COM Port
1 - 2	+5V (1A max.)	COM3
3 - 4	+12V (0.5A max.)	
5 - 6	RI (Default)	
7 - 8	+5V (1A max.)	COM4
9 - 10	+12V (0.5A max.)	
11 - 12	RI (Default)	

## 2.5.4 JPOE\_PWR1 : PoE Power ON Select



Setting	Function
1-2	PoE power on at standby power ready
2-3	PoE power on after system power on (Default)
No Jumper	Disable PoE power

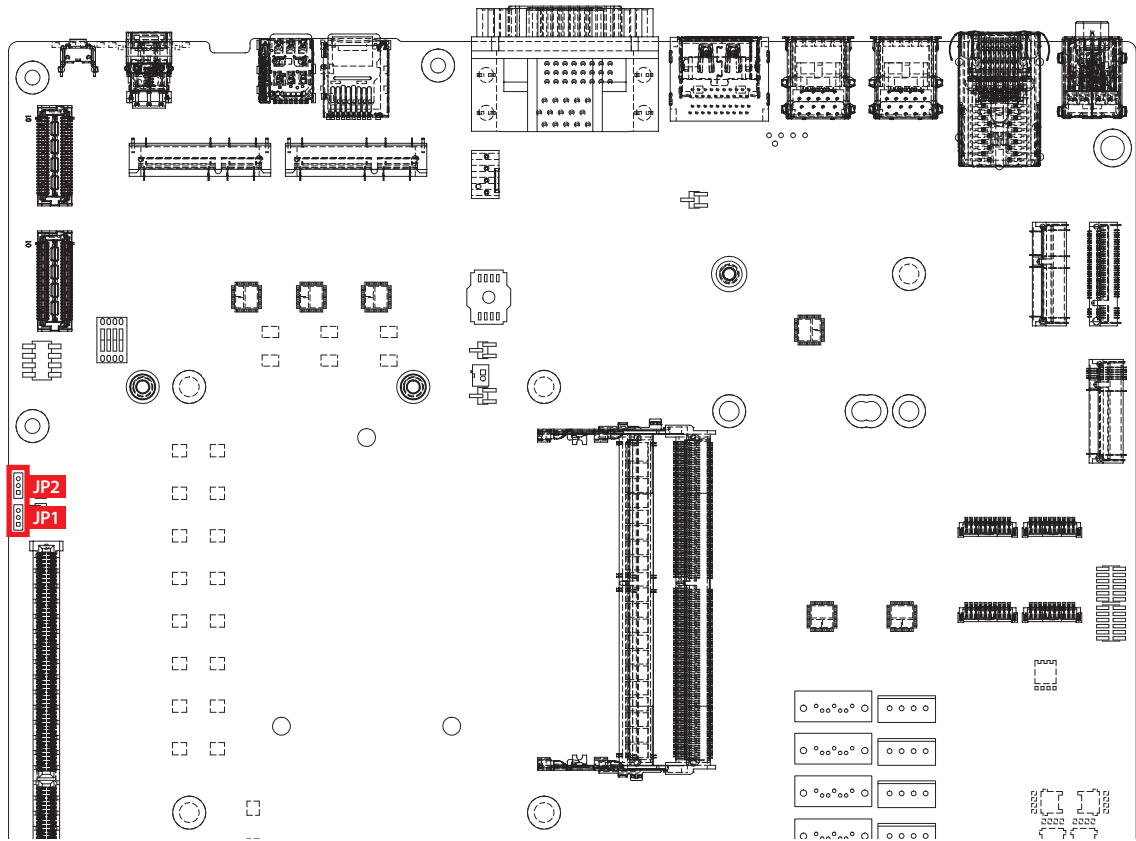
## 2.5.5 JCMOS1 : Clear CMOS



JCMOS1 :

	Setting	Function
	1-2	*Normal (Default)
2-3	Clear CMOS	

## 2.5.6 JP1, JP2 : PCI Express\* Configuration



JP1, JP2 provide PCIe slot (CN59) configuration function, Closing Pin 1 and Pin 2 is logic "0". Closing Pin 2 and Pin 3 is logic "1".

JP1, JP2 logic setting are listed in the following table.

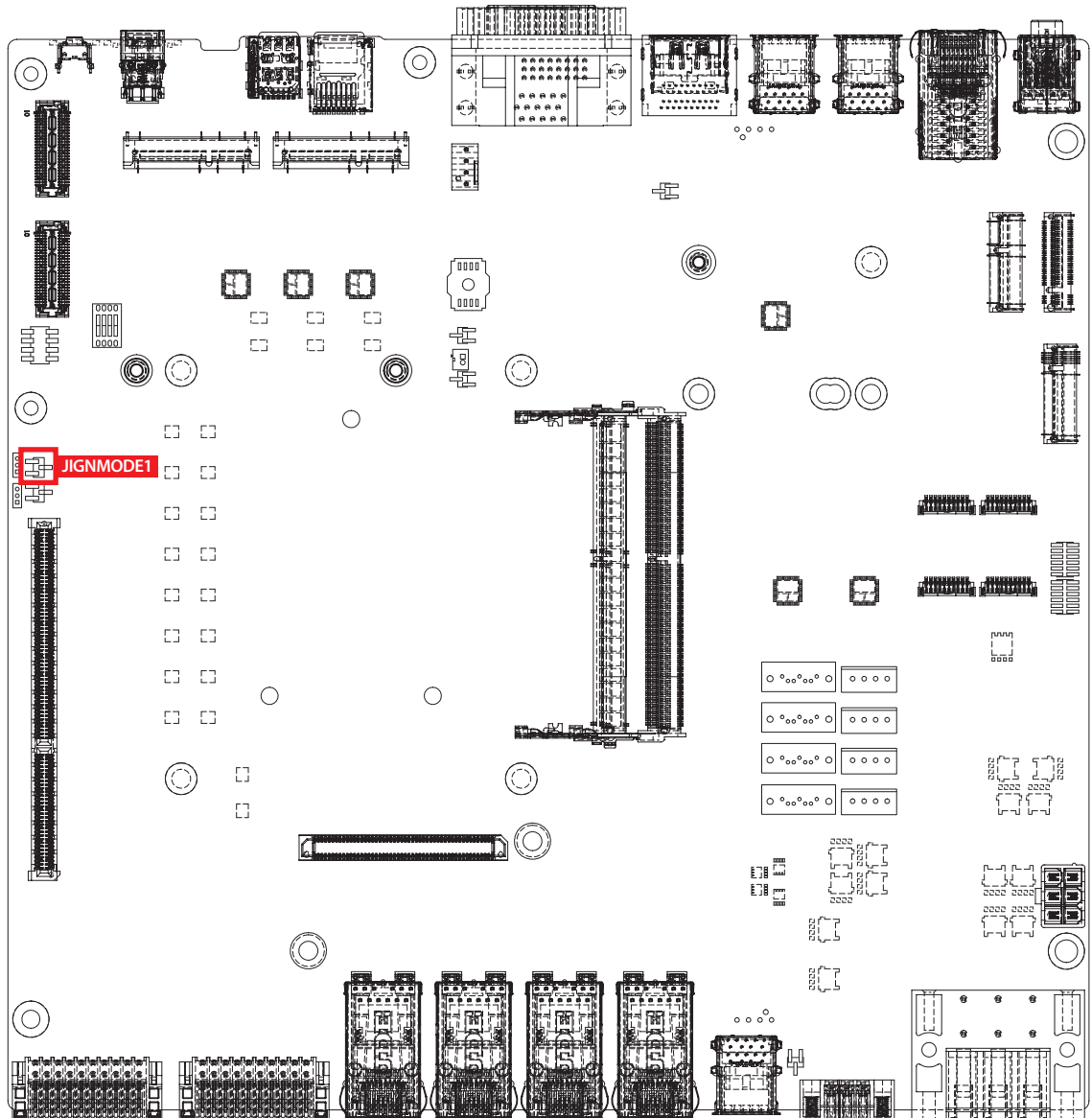
JP1	Logic
1-2	0
2-3	1

JP2	Logic
1-2	0
2-3	1

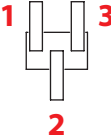
JP1, JP2 PCI Express configurations are listed in the following table.

JP2	JP1	PCI Express* Bifurcation
0	0	1 x8 PCI Express*
1	0	2 x8 PCI Express*
1	1	1 x16 PCI Express*

## 2.5.7 JIGNMODE1 : IGNITION Mode



### JIGNMODE1 :

	Setting	Function
		1-2
	2-3	S/W mode (default)

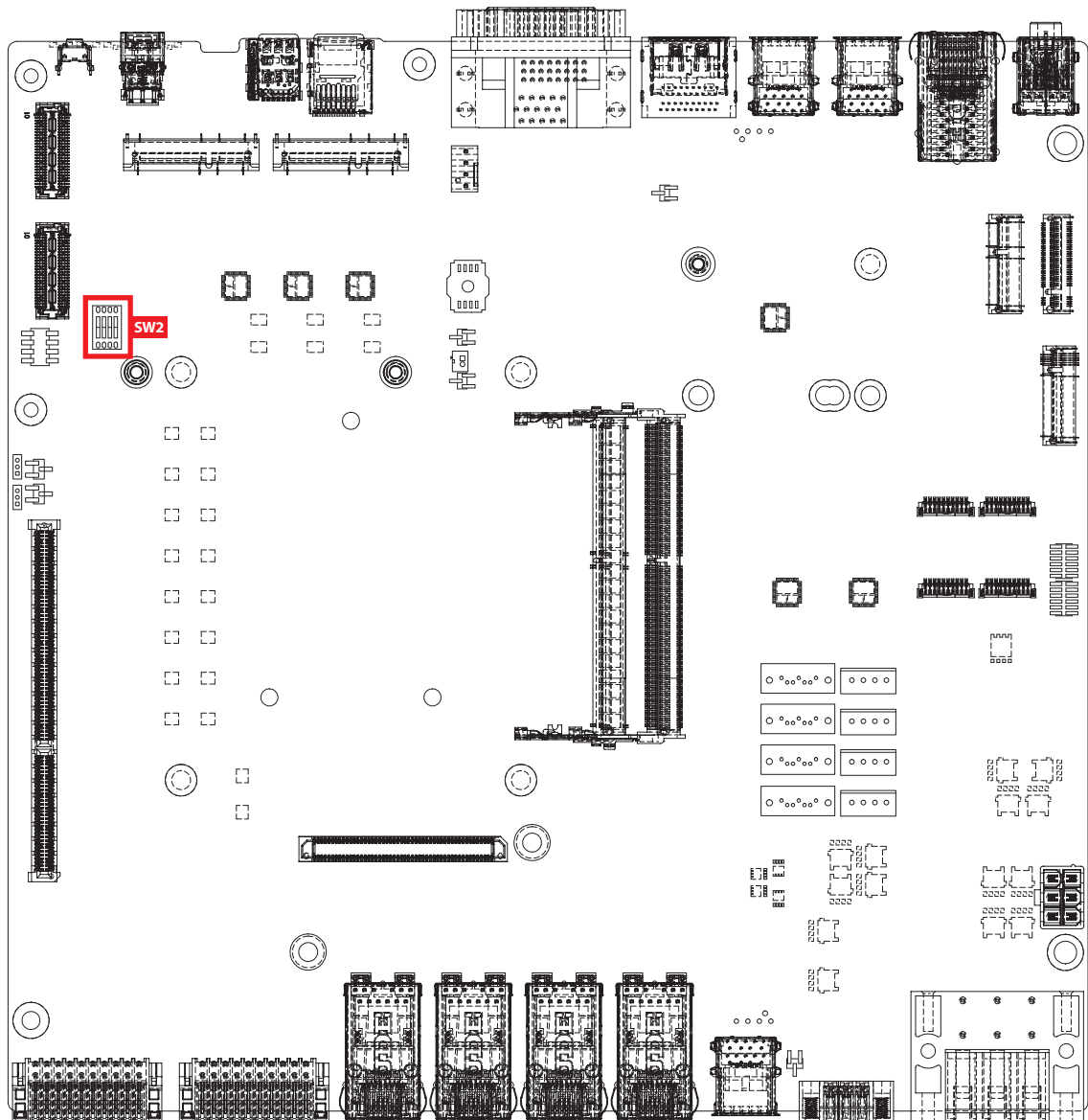
## 2.6 Ignition Control

ECX-2600/2400/2300 PEG series provides ignition power control feature for in-vehicle applications. The built-in MCU monitors the ignition signal and turns on/off the system according to pre-defined on/off delay period.

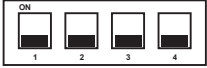

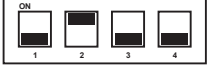
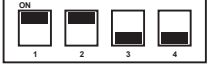
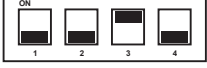
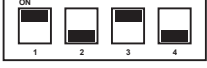
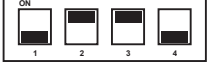
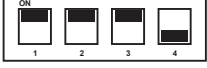

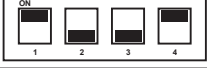
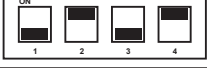
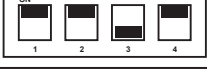
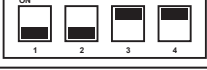
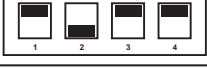
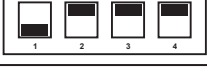

### 2.6.1 Adjust Ignition Control Modes

ECX-2600/2400/2300 PEG series provides 16 modes of different power on/off delay periods adjustable via SW2 switch. The default switch is set to 0 in ATX/AT power mode.

SW2 : Ignition Control

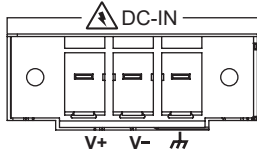


The modes are listed in below table :

DIP Switch Position	Power on delay	Power off delay	Switch Position
0	ATX/AT mode (Default)		
1	No delay	No delay	
2	No delay	5 seconds	
3	No delay	10 seconds	
4	No delay	30 seconds	
5	No delay	60 seconds	
6	5 seconds	10 seconds	
7	5 seconds	30 seconds	
8	5 seconds	60 seconds	
9	5 seconds	90 seconds	
A	5 seconds	120 seconds	
B	10 seconds	10 seconds	
C	10 seconds	30 seconds	
D	10 seconds	60 seconds	
E	10 seconds	90 seconds	
F	10 seconds	120 seconds	

## 2.6.2 Ignition Control Wiring

To activate ignition control, you need to provide IGN signal via the 3-pin pluggable terminal block locates in the back panel. Please find below the general wiring configuration.



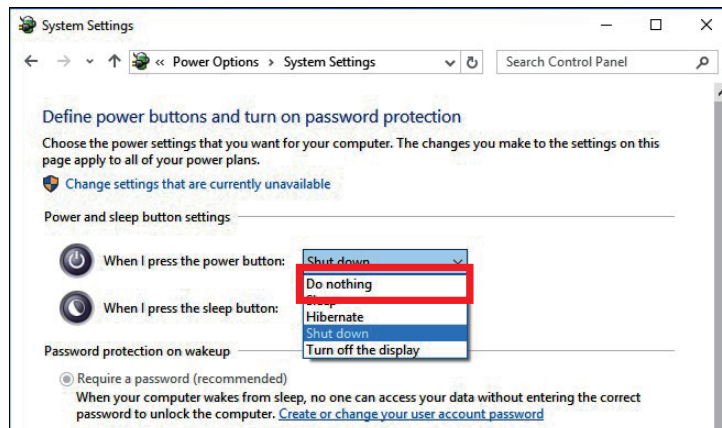
Pin No.	Definition
1	Ignition
2	SW+
3	SW-



For testing purpose, you can refer to the picture blow to simulate ignition signal input controlled by a latching switch.

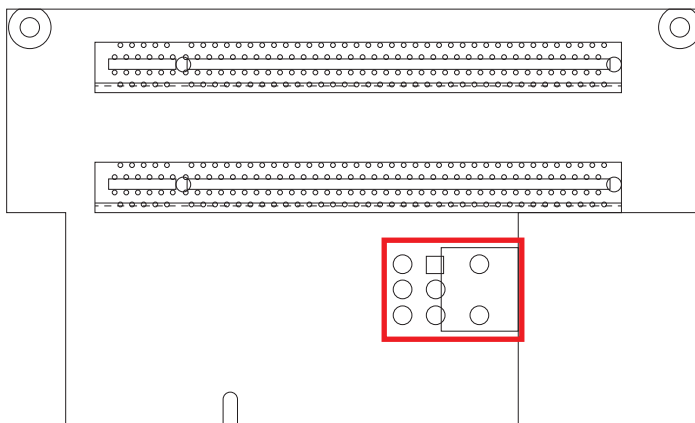
Note :

1. DC power source and IGN share the same ground.
2. ECX-2600/2400/2300 PEG supports 9V to 50V wide range DC power input in ATX/AT mode. In Ignition mode, the input voltage such as the wide voltage operating range of the system is 9V to 50V DC.
3. For proper ignition control, the power button setting should be "Power Down" mode.



In Windows for example, you need to set "When I press the power button" to Shut down.

## 2.7 Graphic Card Power CONN



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



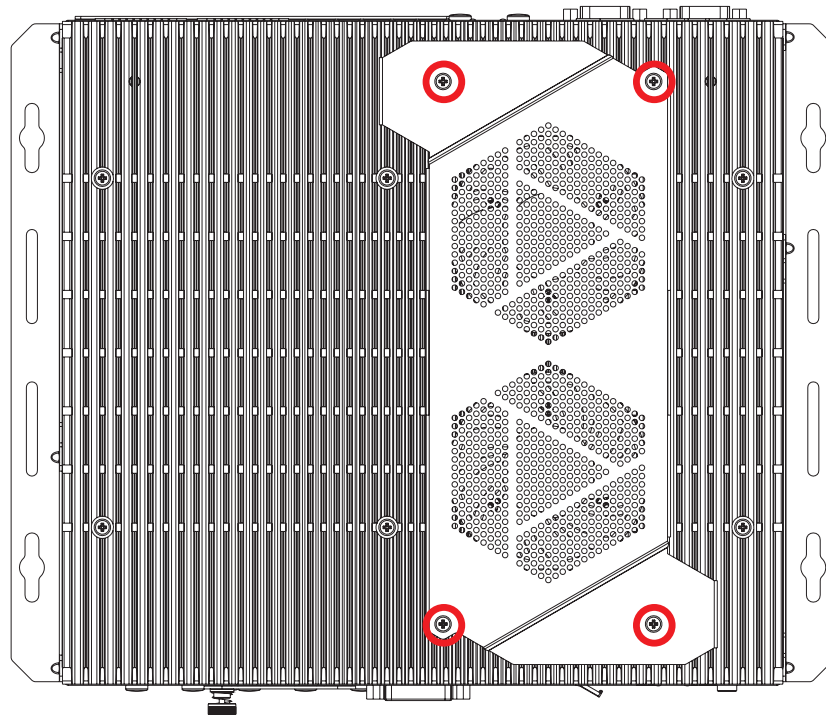
# 3

## SYSTEM SETUP

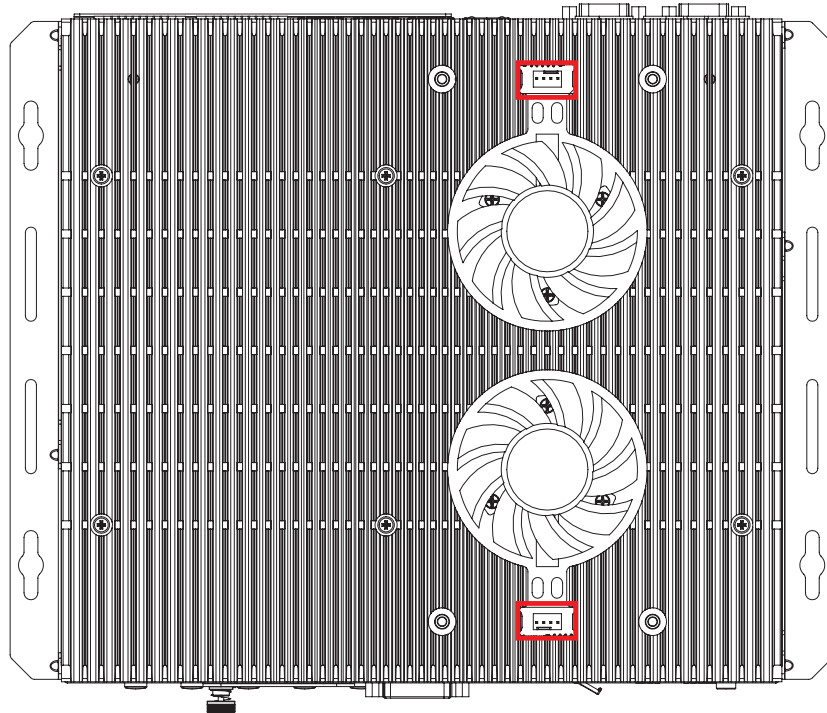
### 3.1 How to Open Your ECX-2600/2400/2300 PEG

#### 3.1.1 ECX-2600F/2400F/2300F PEG Series

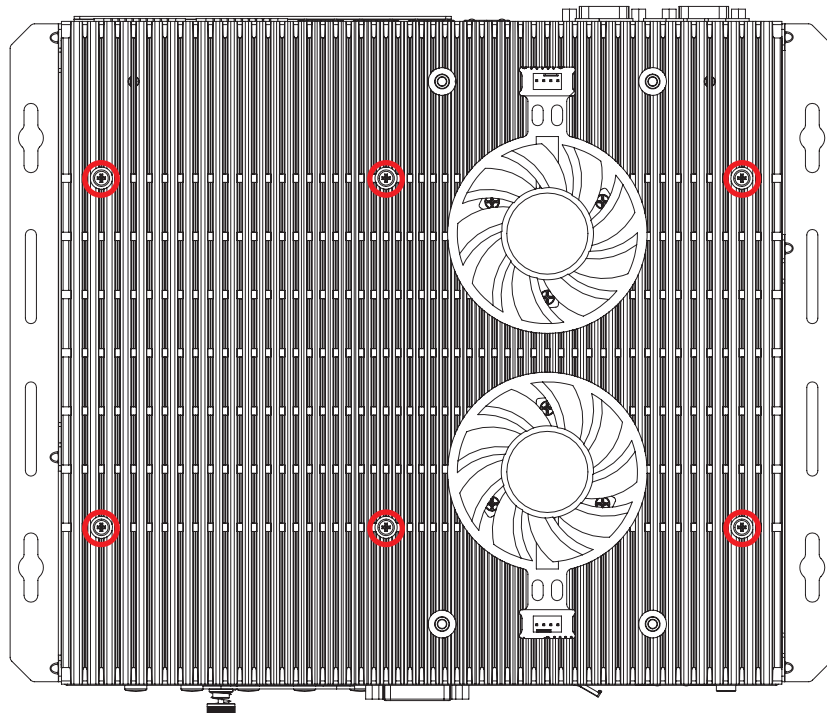
**Step 1** Remove the screws indicated and separate Cover Fan Cpu from the enclosure.



**Step 2** Remove the plugs indicated.

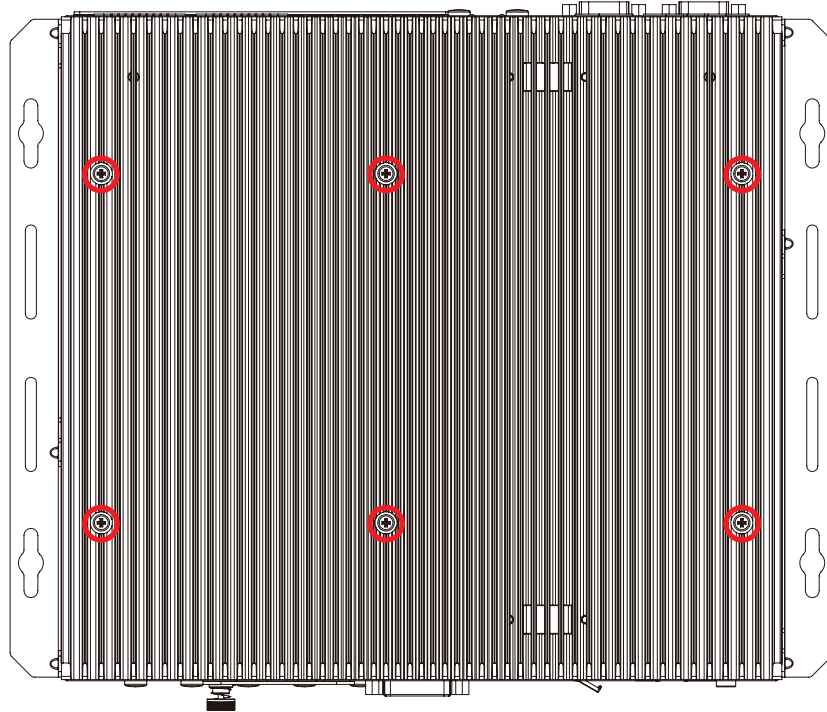


**Step 3** Remove the screws indicated and separate the cooler from the enclosure.



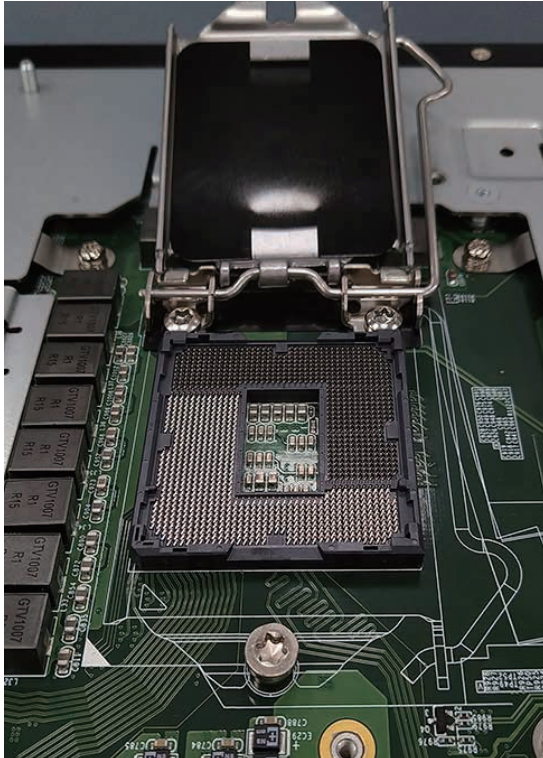
### 3.1.2 ECX-2600/2400/2300 PEG Series

**Step 1** Remove the screws indicated and separate the heat sink from the enclosure.

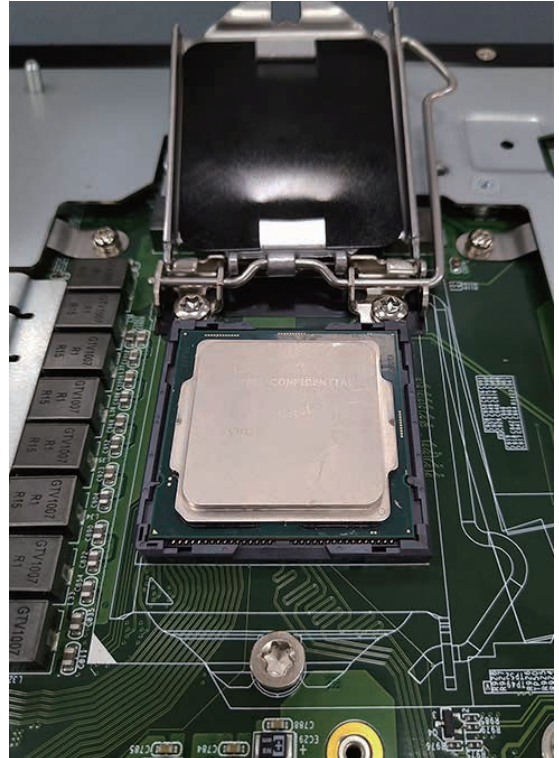


## 3.2 Installing CPU

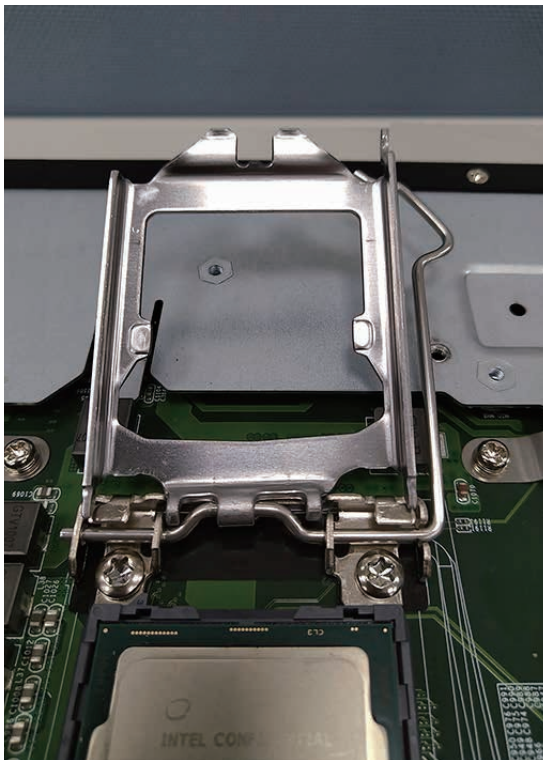
**Step 1** Open CPU Independent Loading Mechanism (ILM).



**Step 2** Install CPU (Be careful CPU pin).



**Step 3** Remove the mylar.

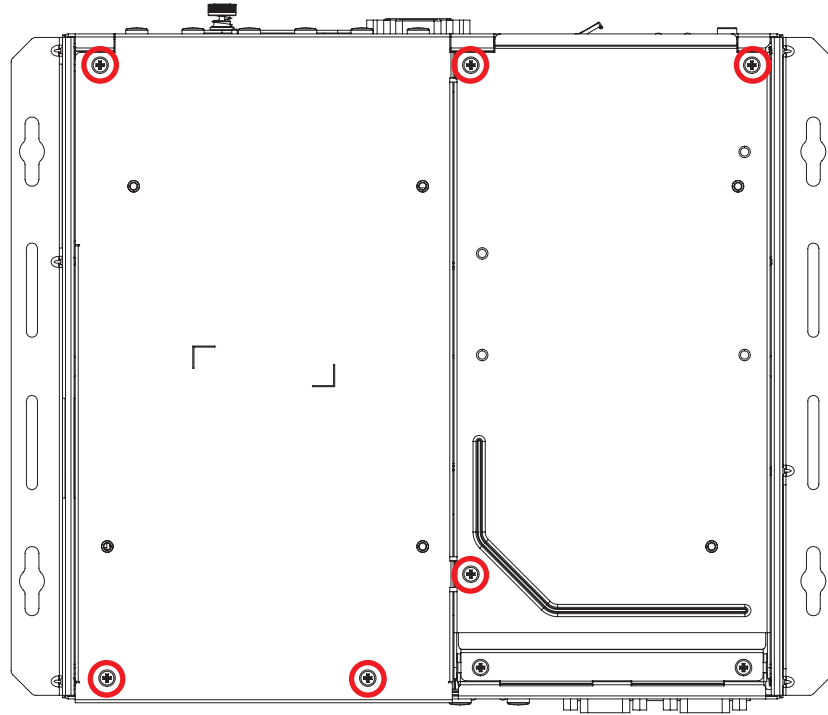


**Step 4** Close CPU Independent Loading Mechanism (ILM) and finish.

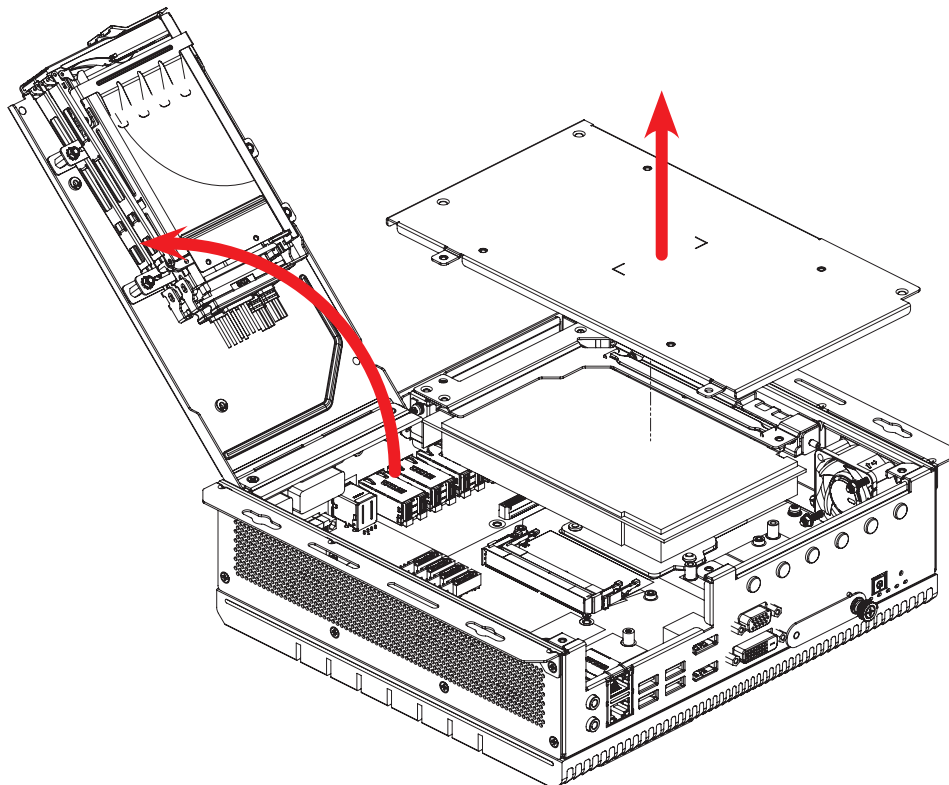


### 3.3 Installing DDR4 SO-DIMM Modules

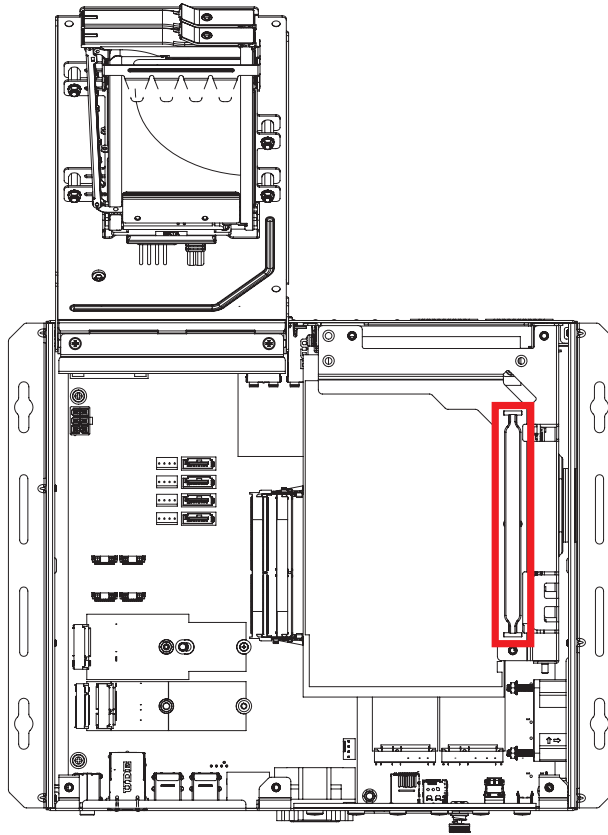
**Step 1** Turn the system upside-down on a steady surface. Remove the screws indicated.



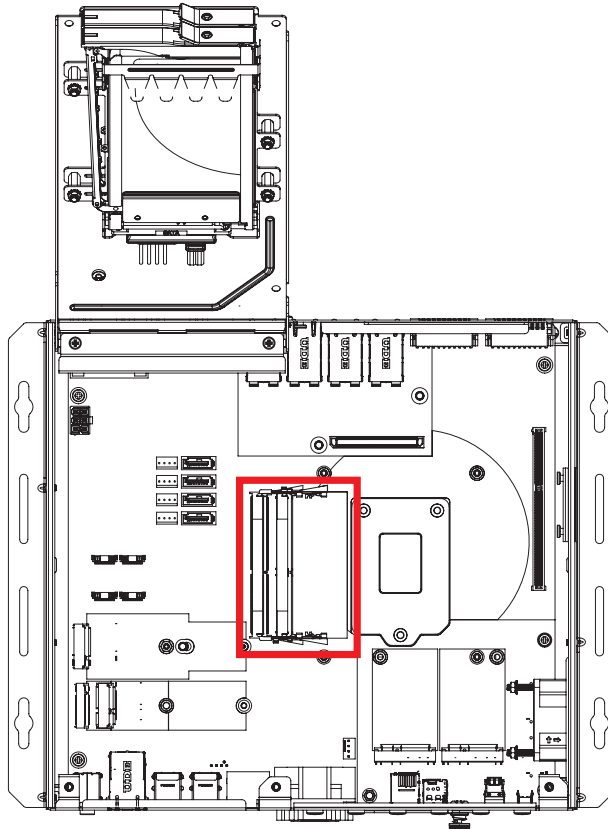
**Step 2** Open Cover Bottom HDD Tray and separate Cover Bottom Riser Card from the enclosure.



**Step 3** Separate Assembly\_Riser Card from the enclosure with the puller.

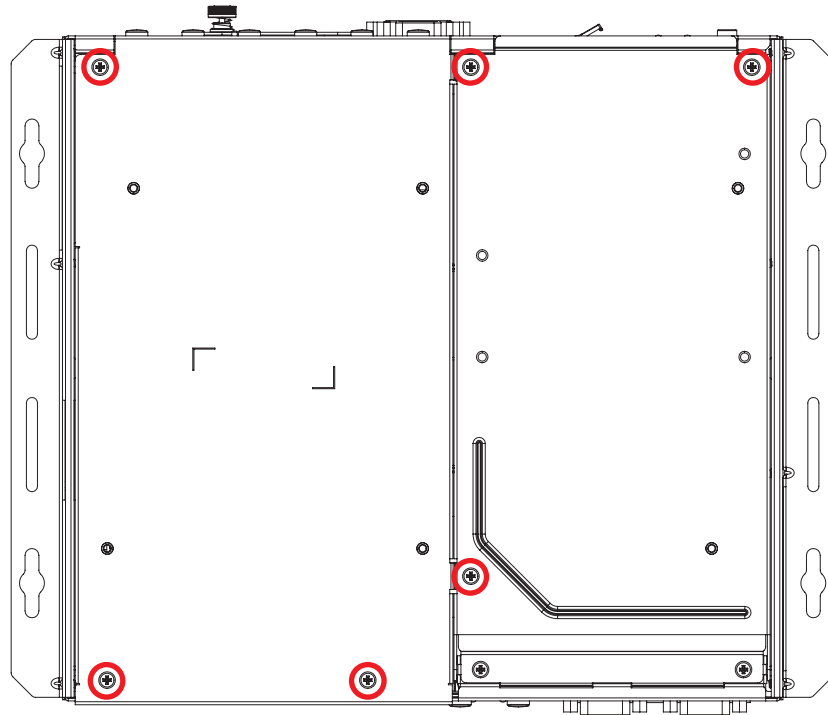


**Step 4** Install DDR4 RAM module into SO-DIMM socket.

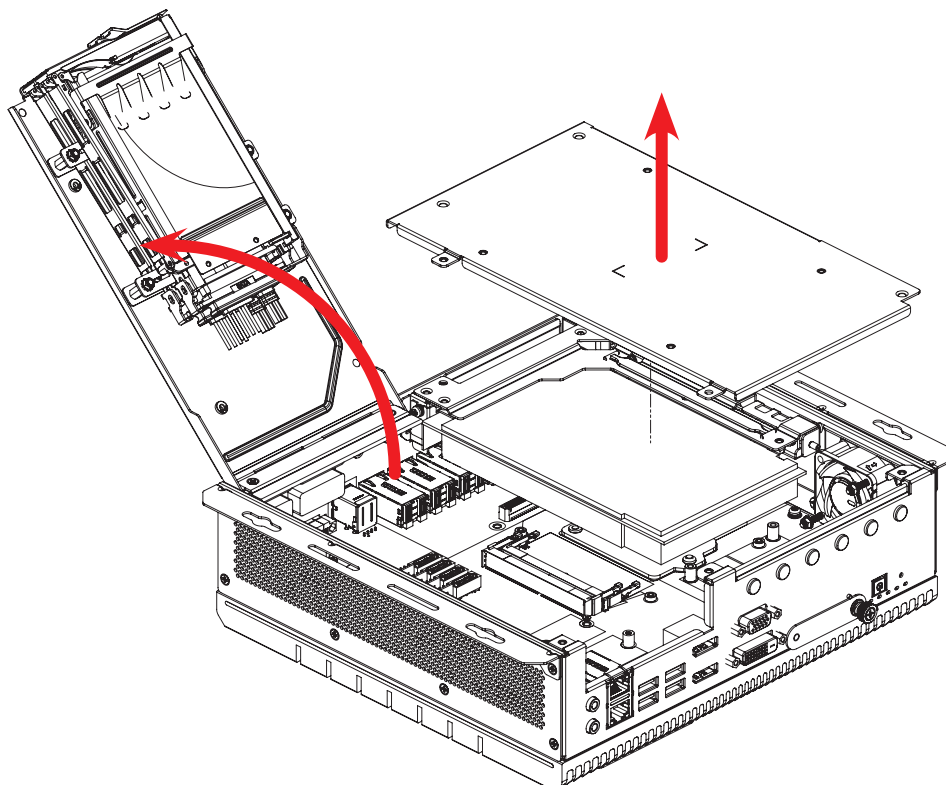


### 3.4 Installing Mini PCIe Card

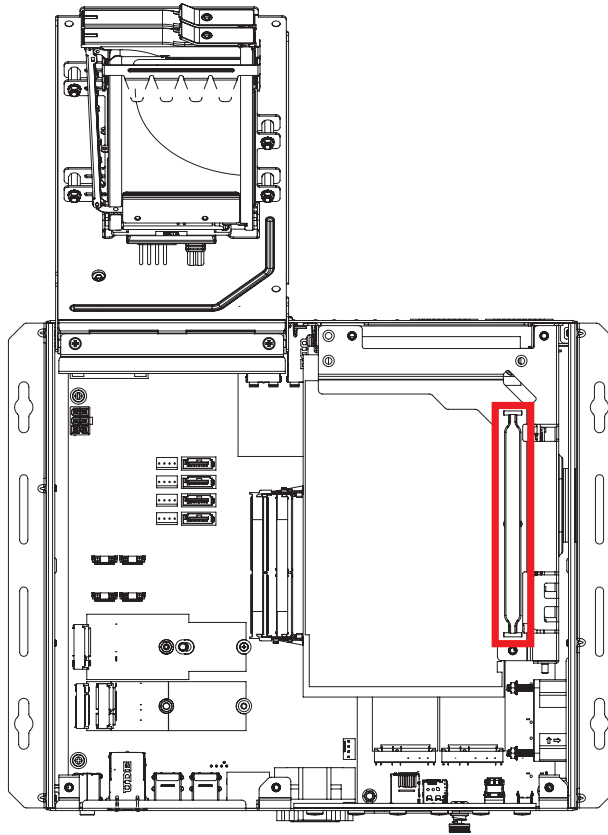
**Step 1** Turn the system upside-down on a steady surface. Remove the screws indicated.



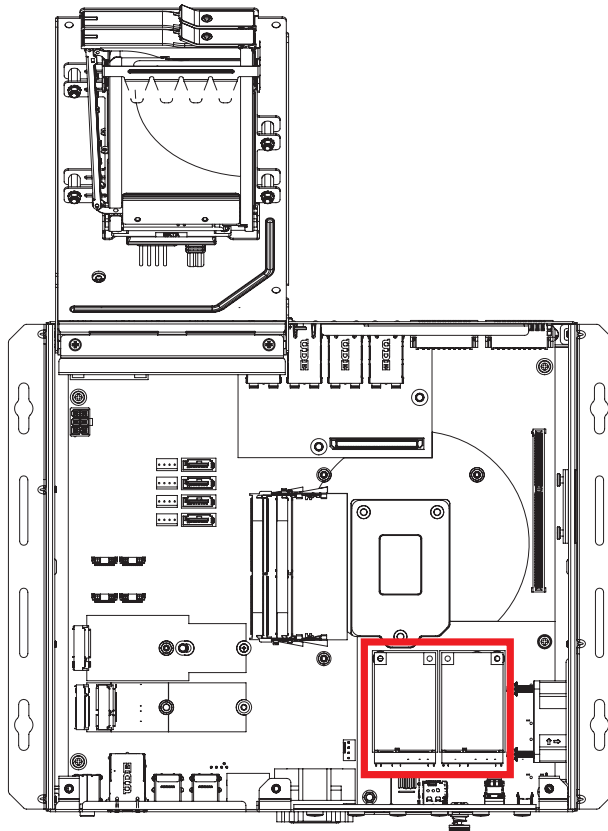
**Step 2** Open Cover Bottom HDD Tray and separate Cover Bottom Riser Card from the enclosure.



**Step 3** Separate Assembly\_Riser Card from the enclosure with the puller.

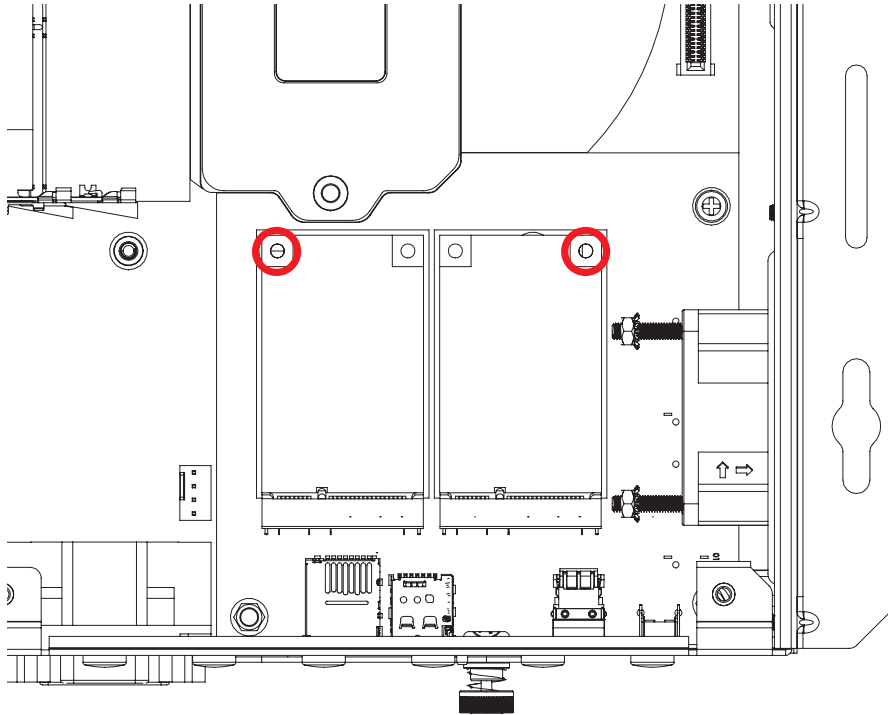


**Step 4** Install mini PCIe card into slot.



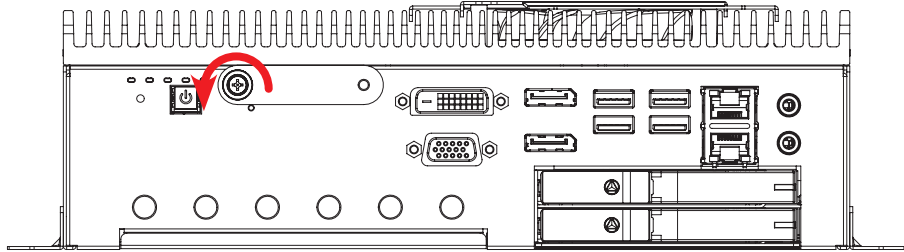


**Step 5** Fasten one PHILLIPS M2.5 screw.

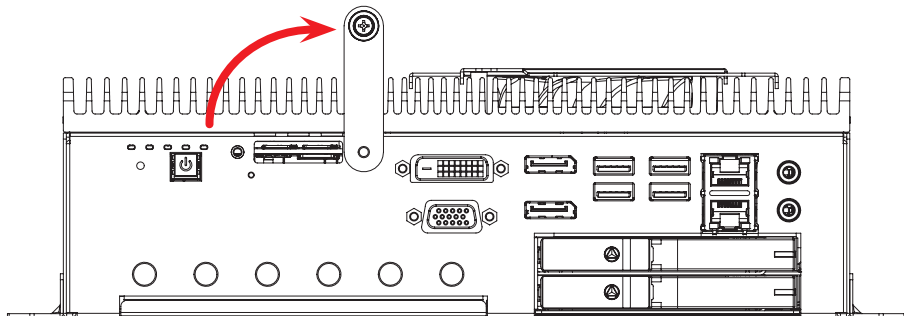


## 3.5 Installing Nano SIM Card

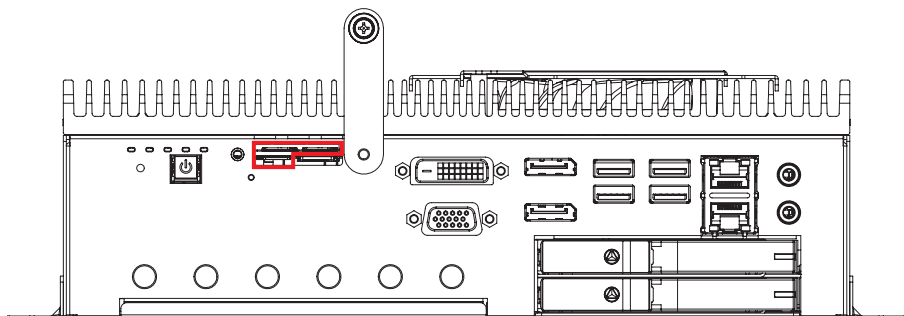
**Step 1** Loosen captive panel screw and open Cover Card.



**Step 2** Open Cover Card.

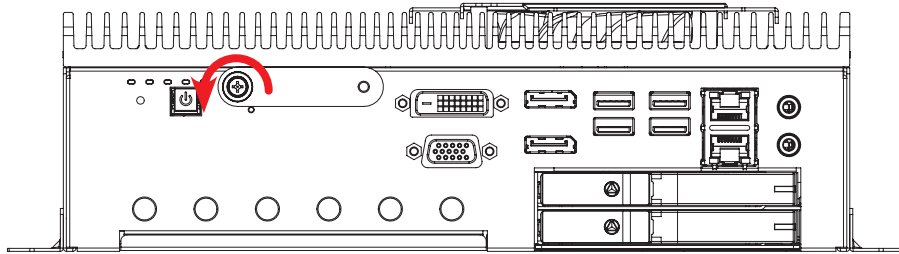


**Step 3** Insert Nano SIM card and push to lock.

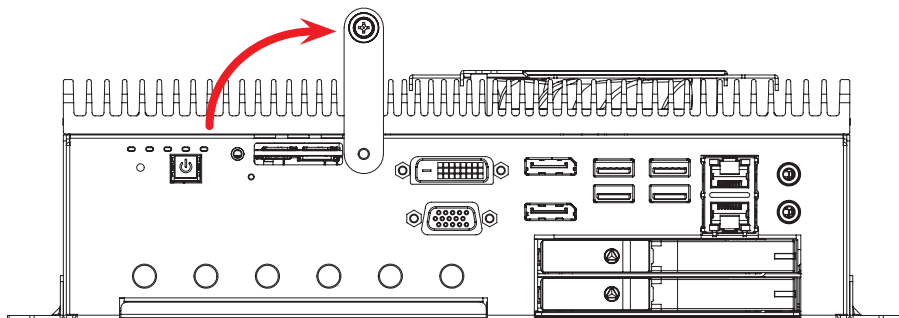


## 3.6 Installing Micro SD Cards

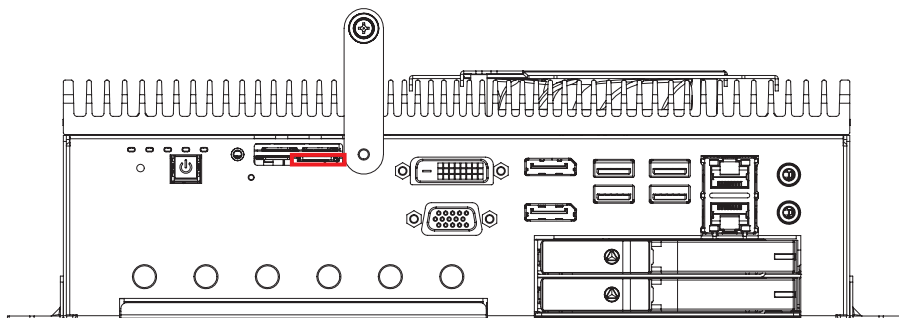
**Step 1** Loosen captive panel screw and open Cover Card.



**Step 2** Open Cover Card.



**Step 3** Insert Micro SD card and push to lock.

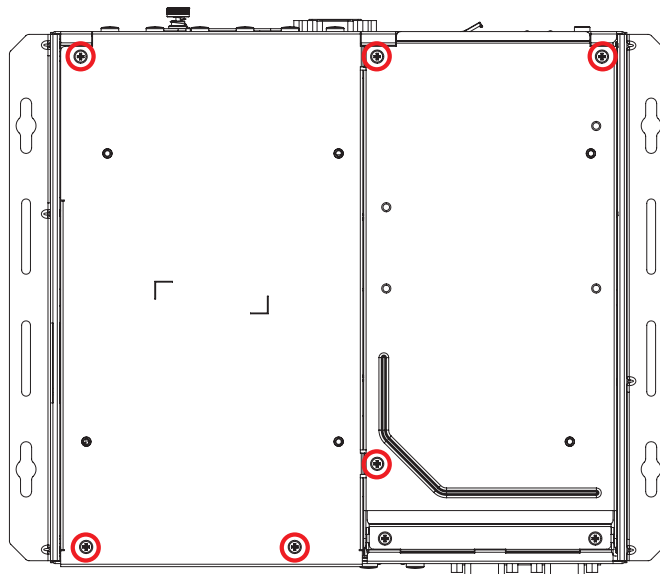


### 3.7 Installing PCI/PCIe Card

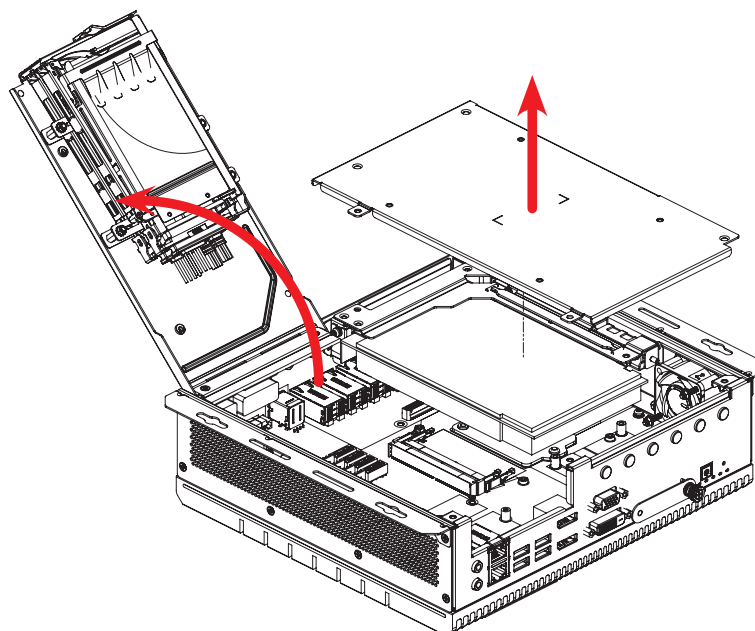
System designs will support 115 mm standard height, 210 mm maximum length (without the I/O bracket & power cable) expansion cards.

(\*Based on the position of power connectors and the card sink/case design, not all expansion card within the maximum dimension can fit in to the system. Please consult the Vecow support team for confirmation.)

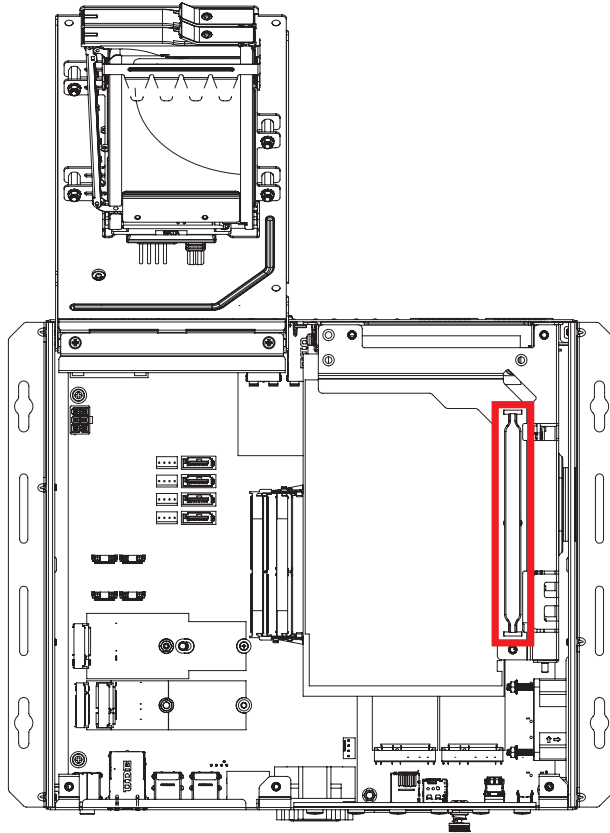
**Step 1** Turn the system upside-down on a steady surface. Remove the screws indicated.



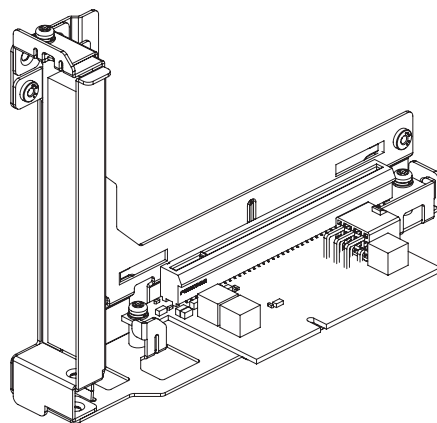
**Step 2** Open Cover Bottom HDD Tray and separate Cover Bottom Riser Card from the enclosure.



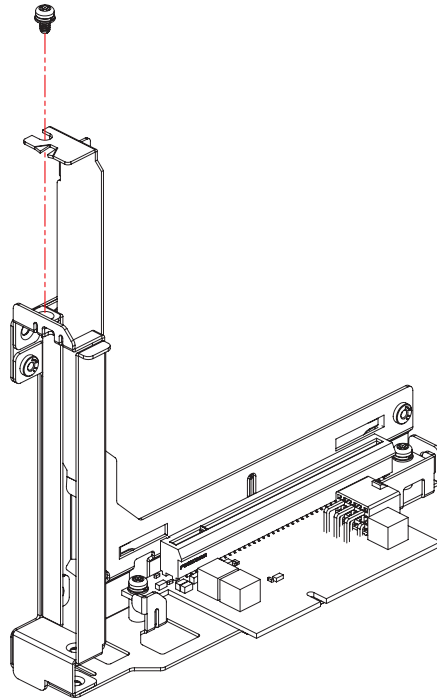
**Step 3** Separate Assembly\_Riser Card from the enclosure with the puller.



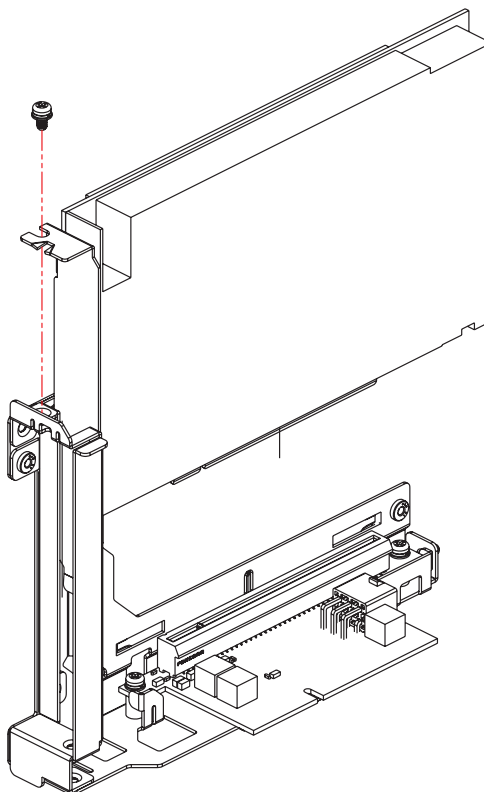
**Step 4** Turn Assembly\_Riser Card upside-down on a steady surface.



**Step 5** Remove the screw indicated and separate I/O bracket from Assembly Riser Card.



**Step 6** Instal PCI/PCIe card and fasten the screw indicated.



### 3.8 Installing SSD/HDD

**Step 1** Use the trigger and open SSD/HDD tray.



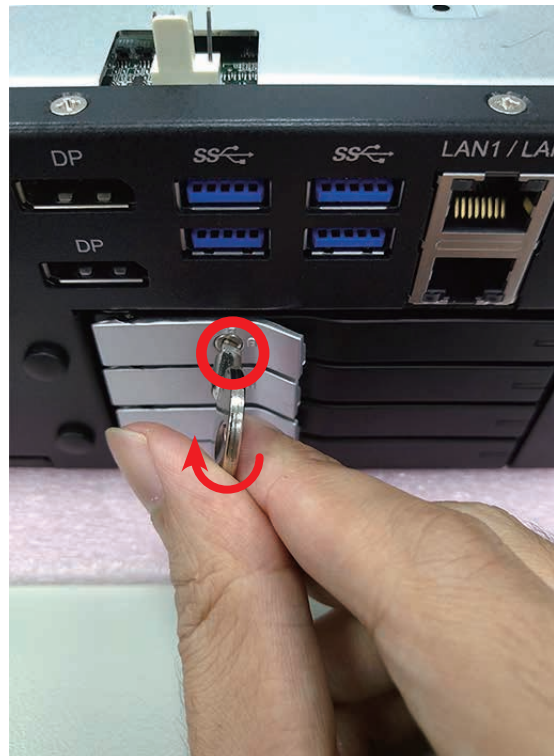
**Step 2** Open front door of SSD/HDD tray.



**Step 3** Install 2.5" SSD/HDD into the tray and close.



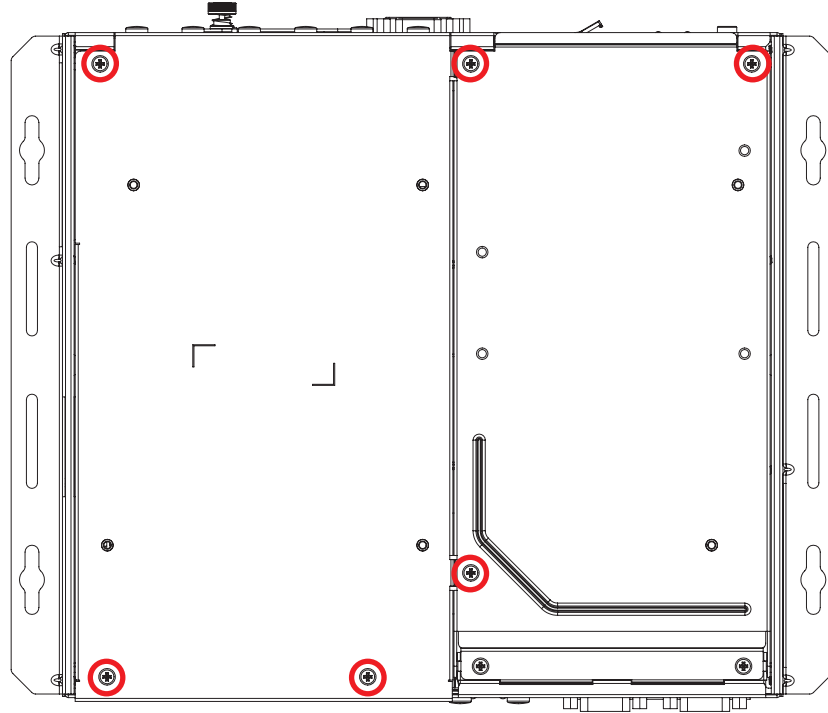
**Step 4** Lock the SSD/HDD tray with key.



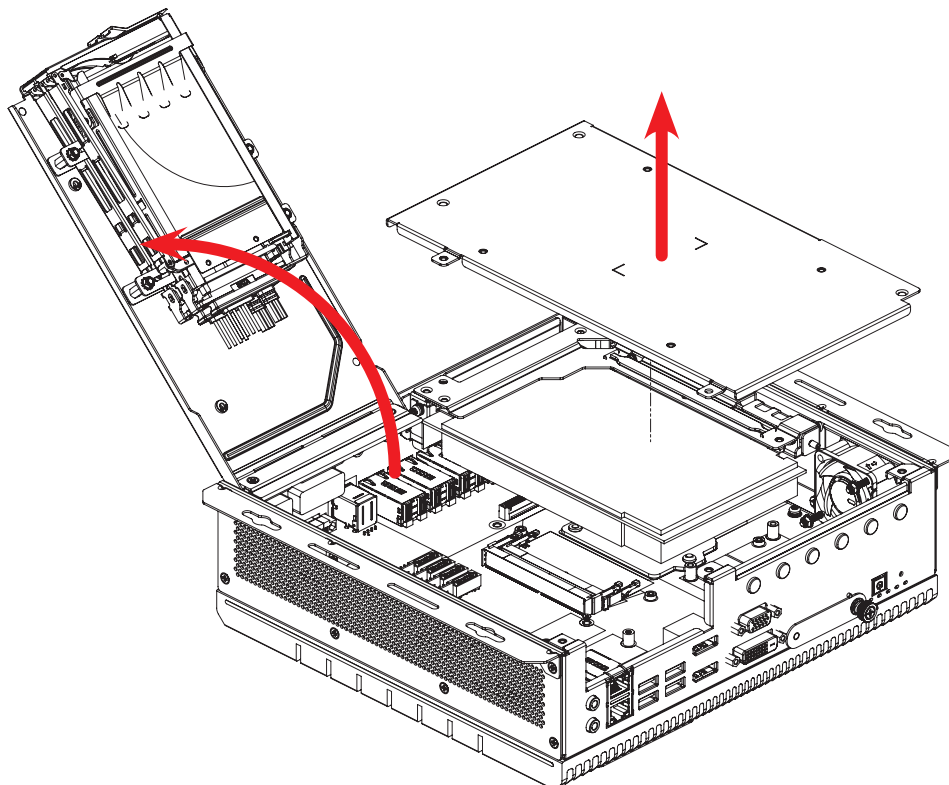
## 3.9 Installing M.2

### 3.9.1 Key E 2230, Key M 2280

**Step 1** Turn the system upside-down on a steady surface. Remove the screws indicated.

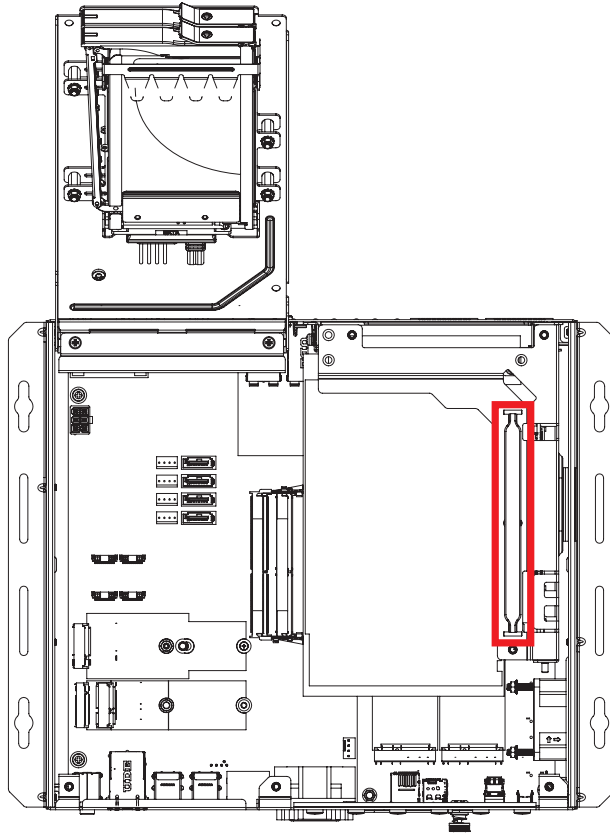


**Step 2** Open Cover Bottom HDD Tray and separate Cover Bottom Riser Card from the enclosure.

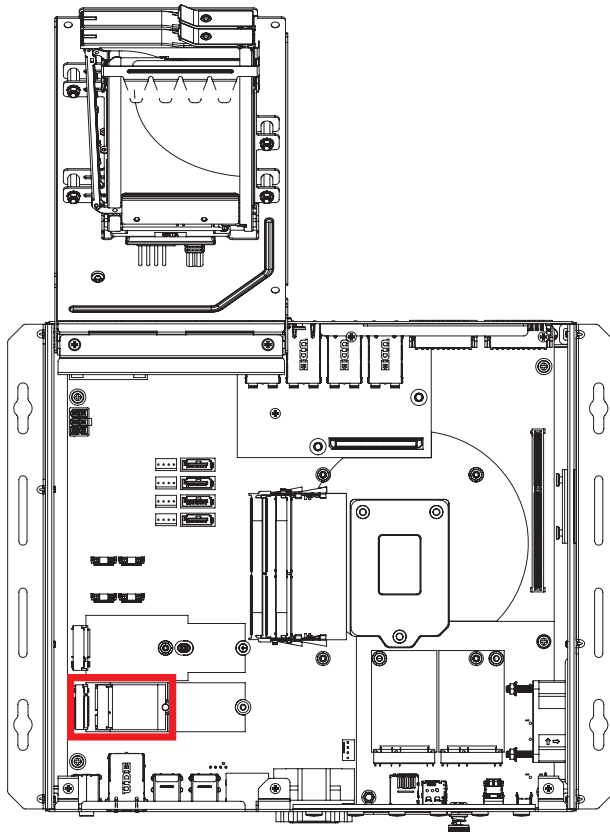


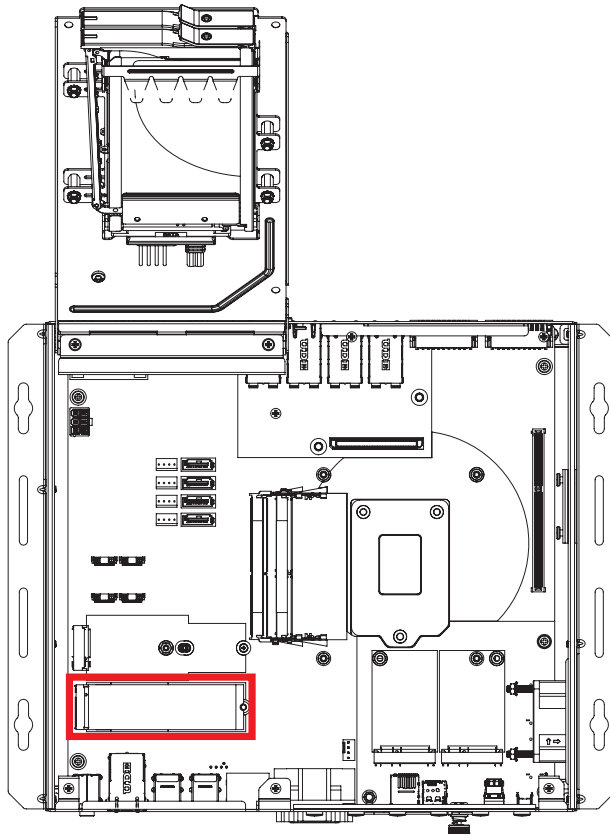


**Step 3** Separate Assembly\_Riser Card from the enclosure with the puller.

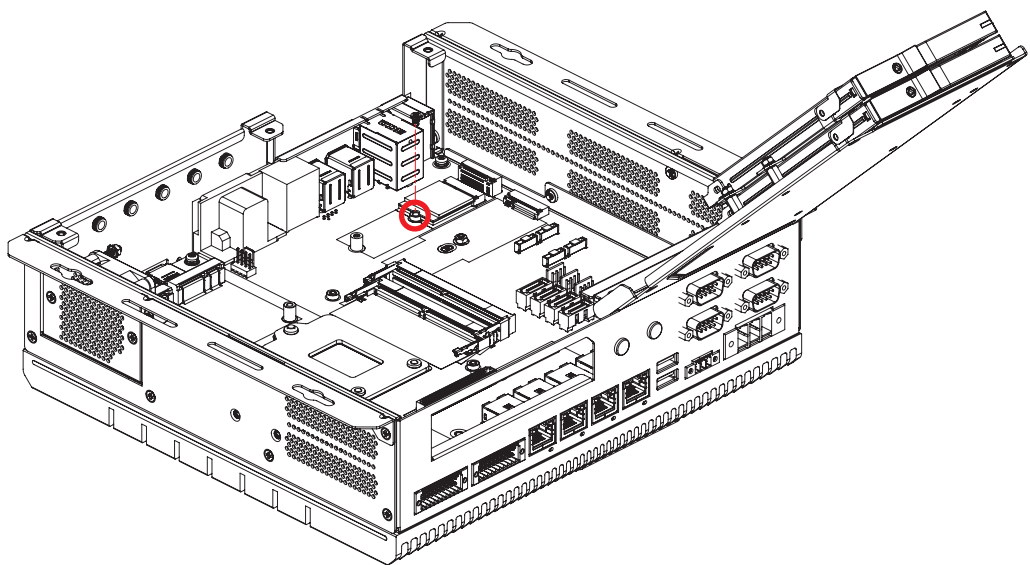


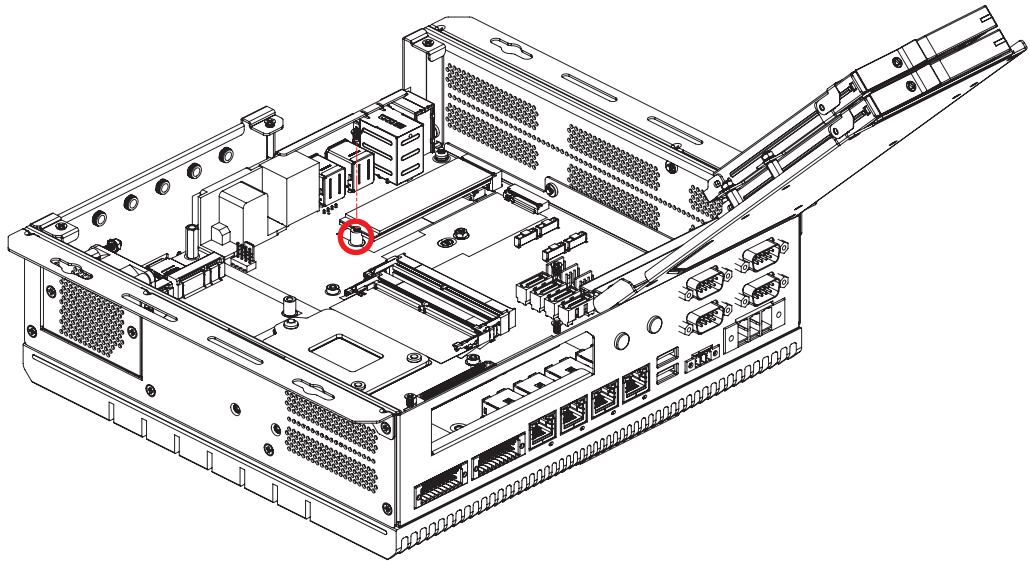
**Step 4** Install M.2 module into the slot.





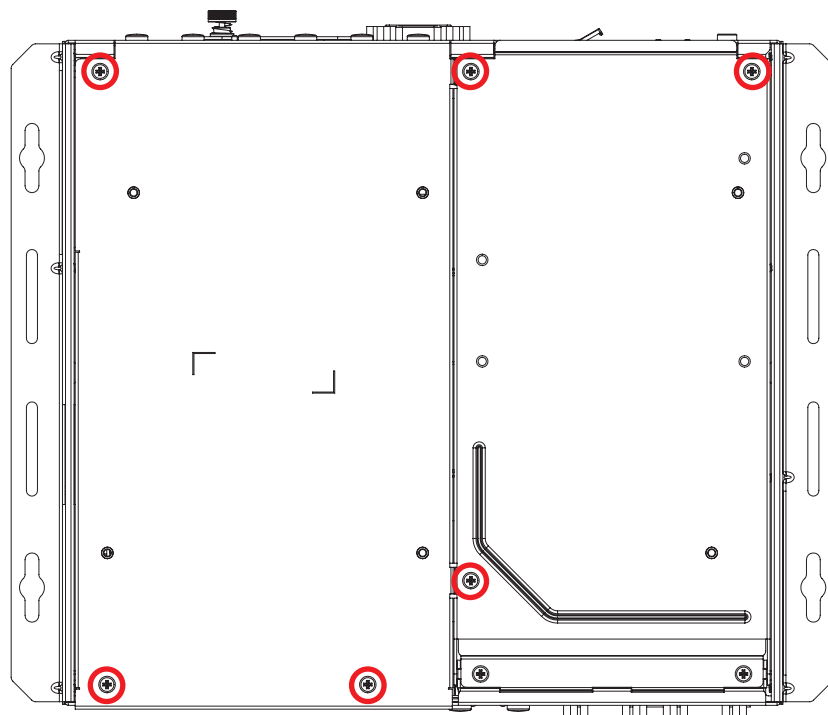
**Step 5** Fasten the module with the screw indicated.



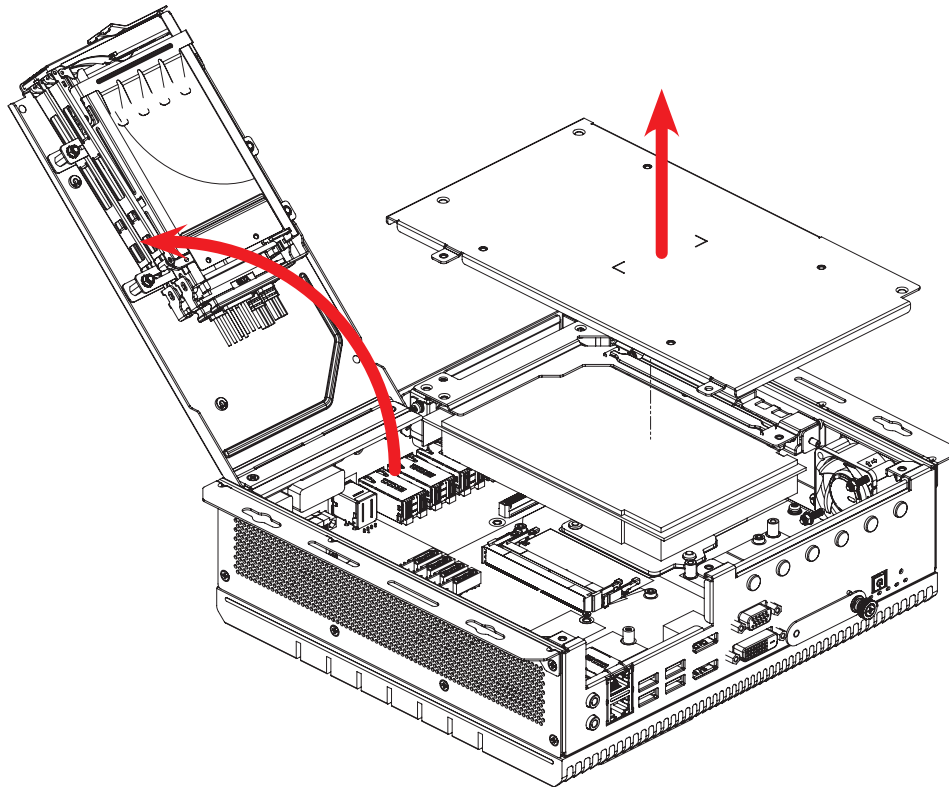


### 3.9.2 Key B 2242, 3050, 3052, 2280

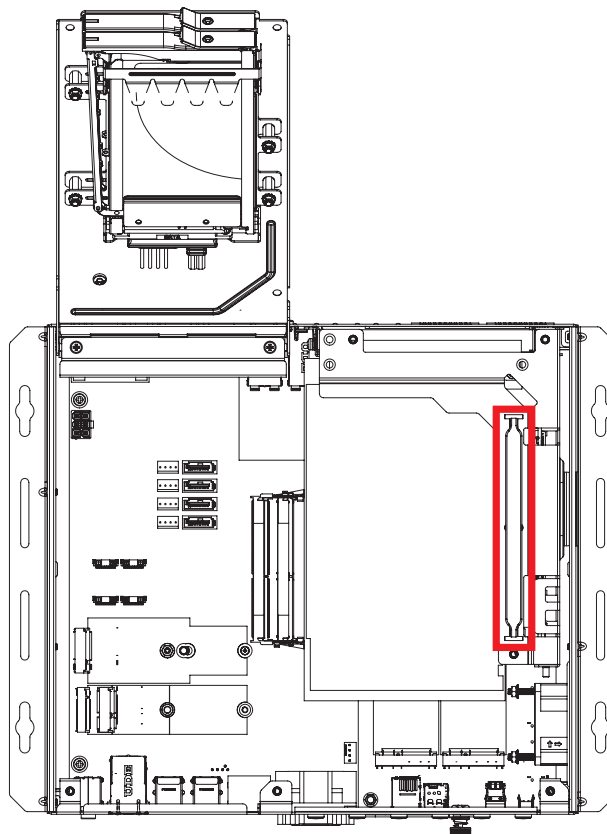
**Step 1** Turn the system upside-down on a steady surface. Remove the screws indicated.



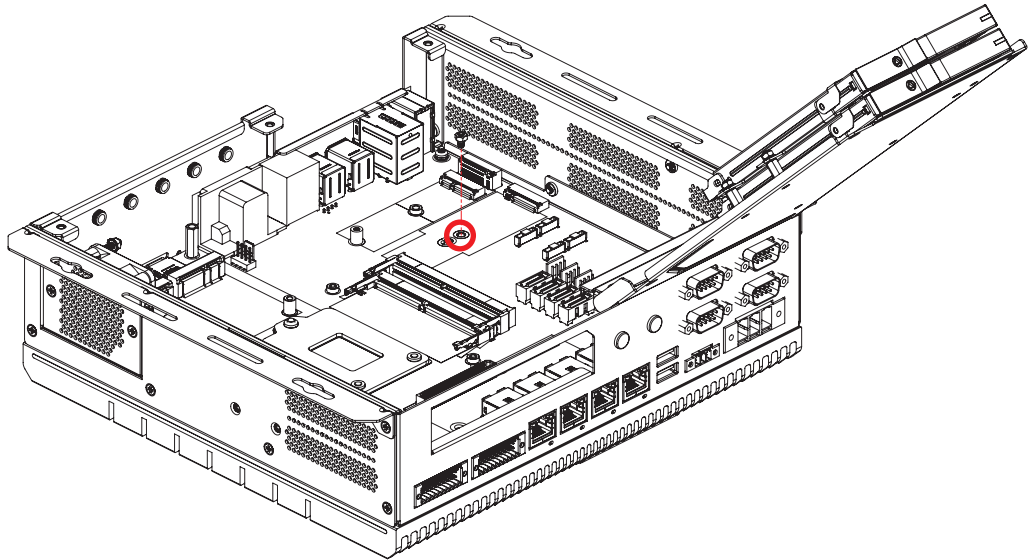
**Step 2** Open Cover Bottom HDD Tray and separate Cover Bottom Riser Card from the enclosure.



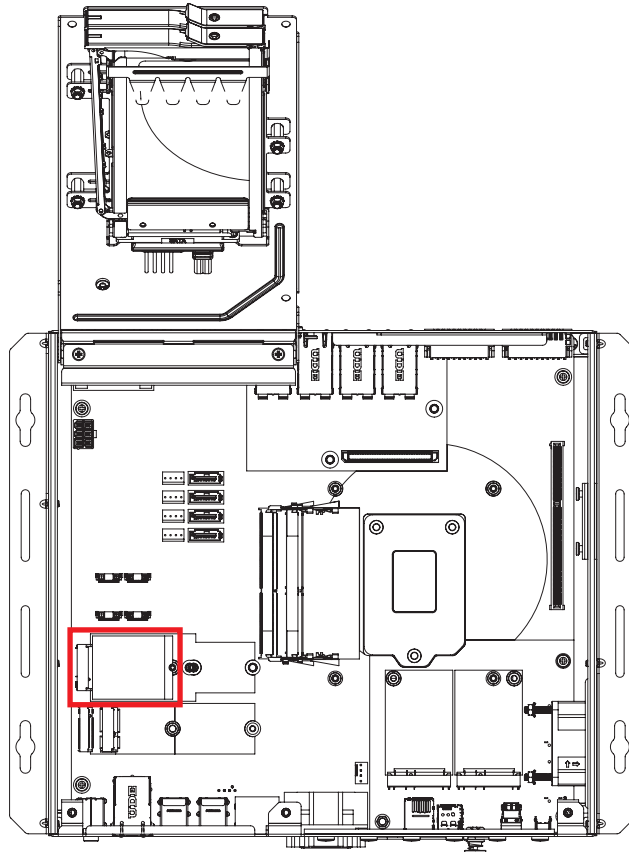
**Step 3** Separate Assembly\_Riser Card from the enclosure with the puller.



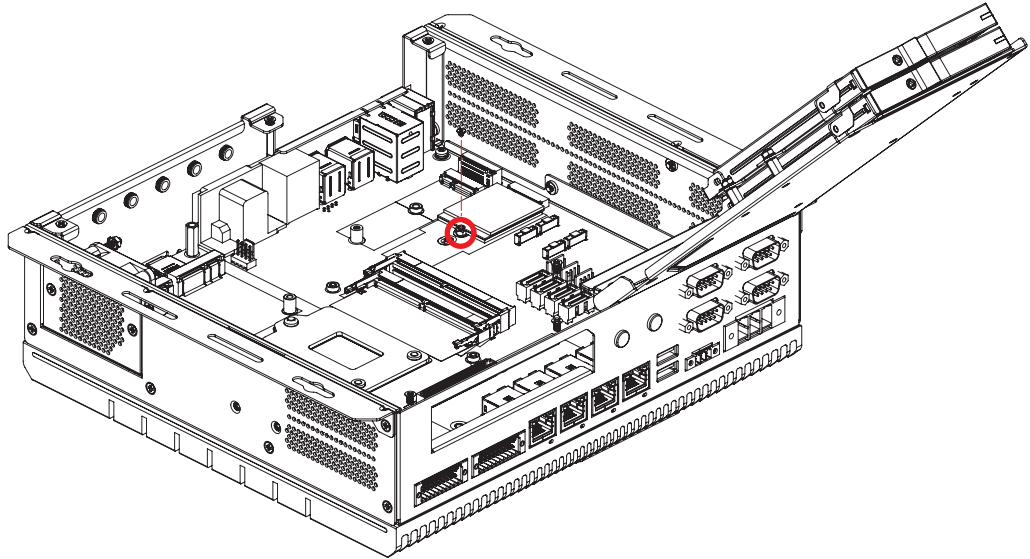
**Step 4** Change the position of the standoff indicated, When using Key B 3050, 3052, 2280.



**Step 5** Install M.2 module into the slot.



**Step 6** Fasten the module with the screw indicated.

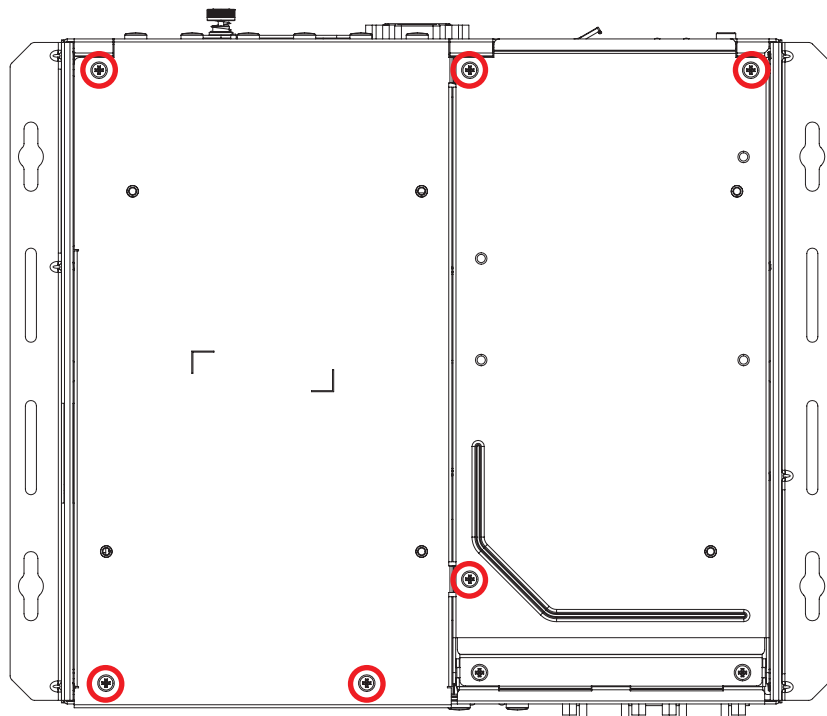


### 3.10 Installing Antenna Cable

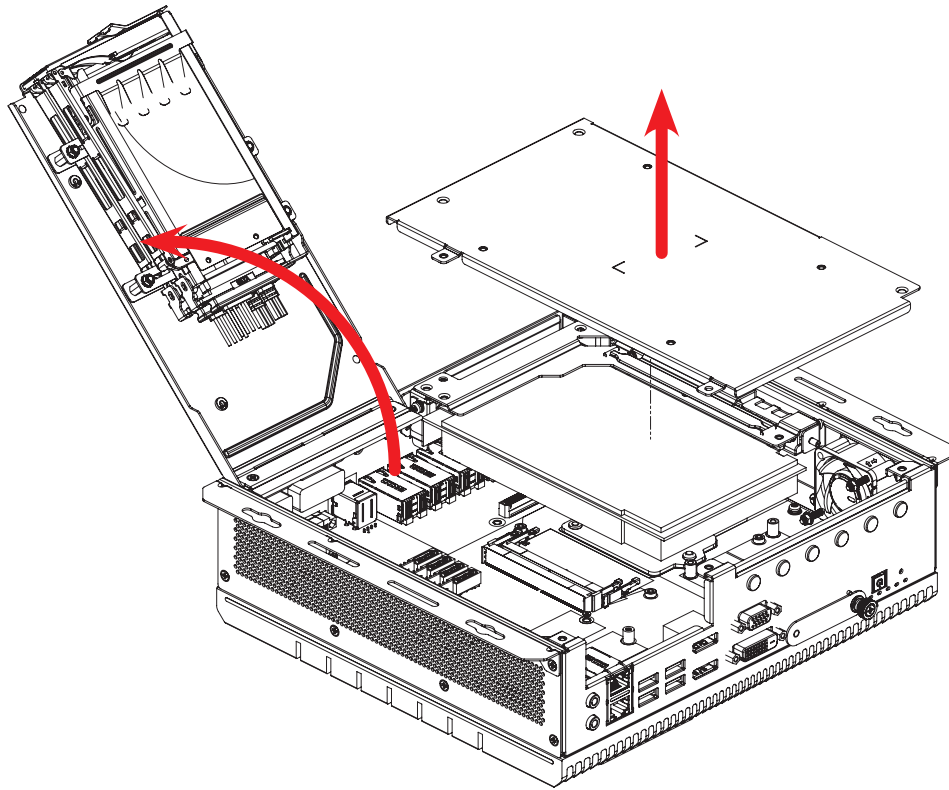
**Step 1** Check antenna cable and washer.



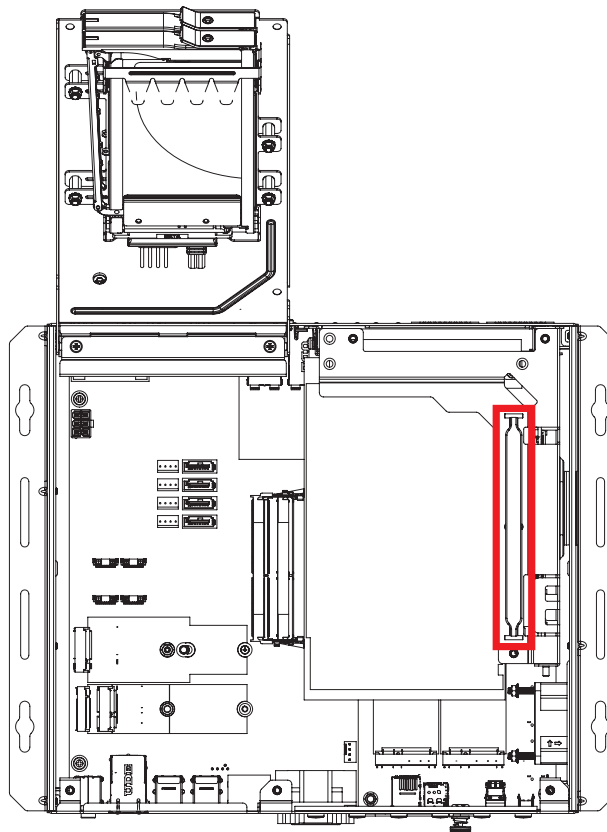
**Step 2** Turn the system upside-down on a steady surface. Remove the screws indicated.



**Step 3** Open Cover Bottom HDD Tray and separate Cover Bottom Riser Card from the enclosure.

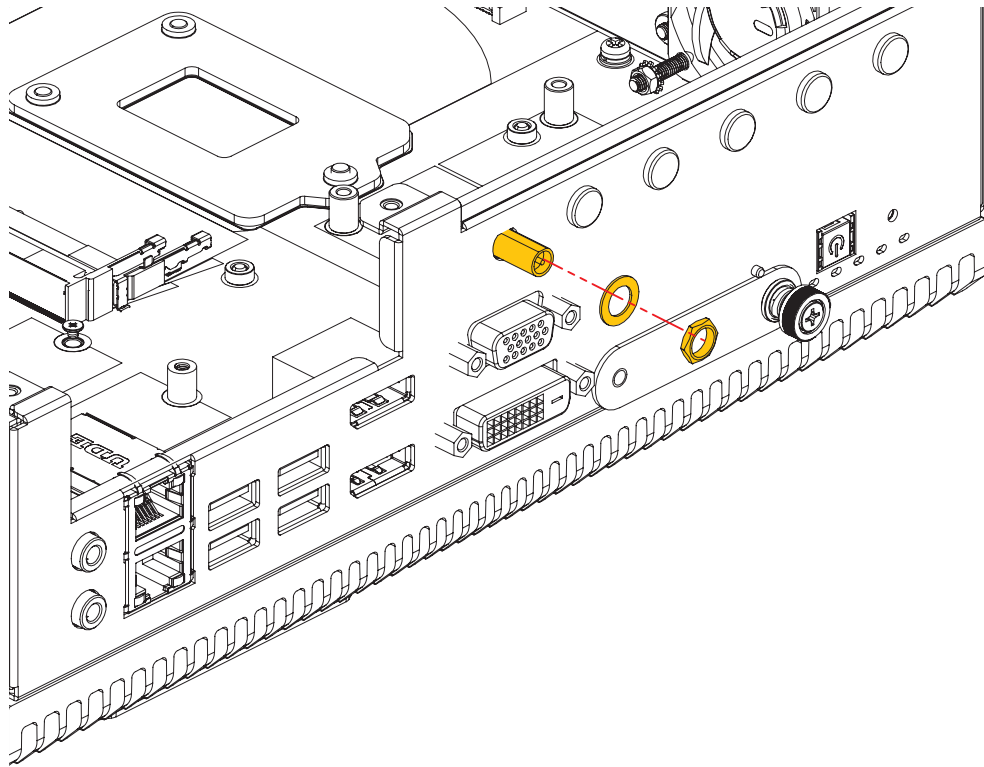


**Step 4** Separate Assembly Riser Card from the enclosure with the puller.





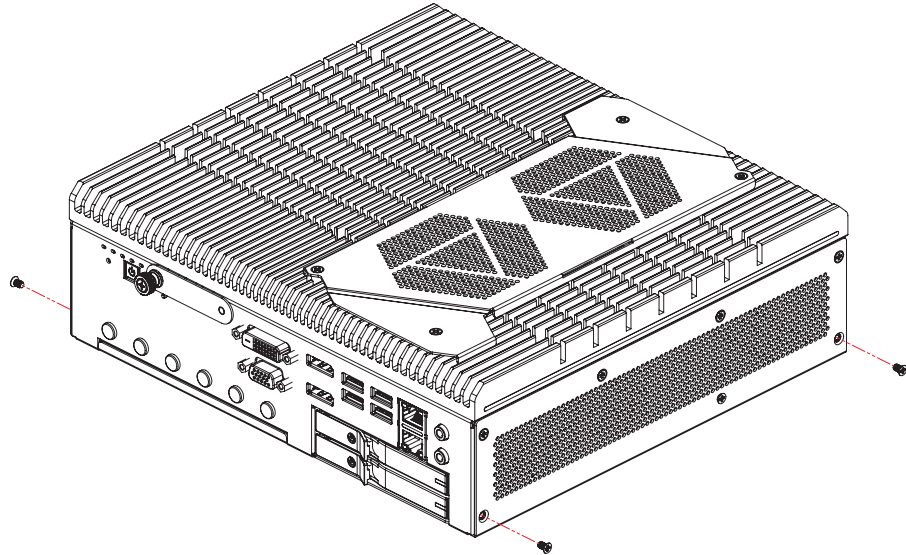
**Step 5** Install the cable with nut and washer indicated.



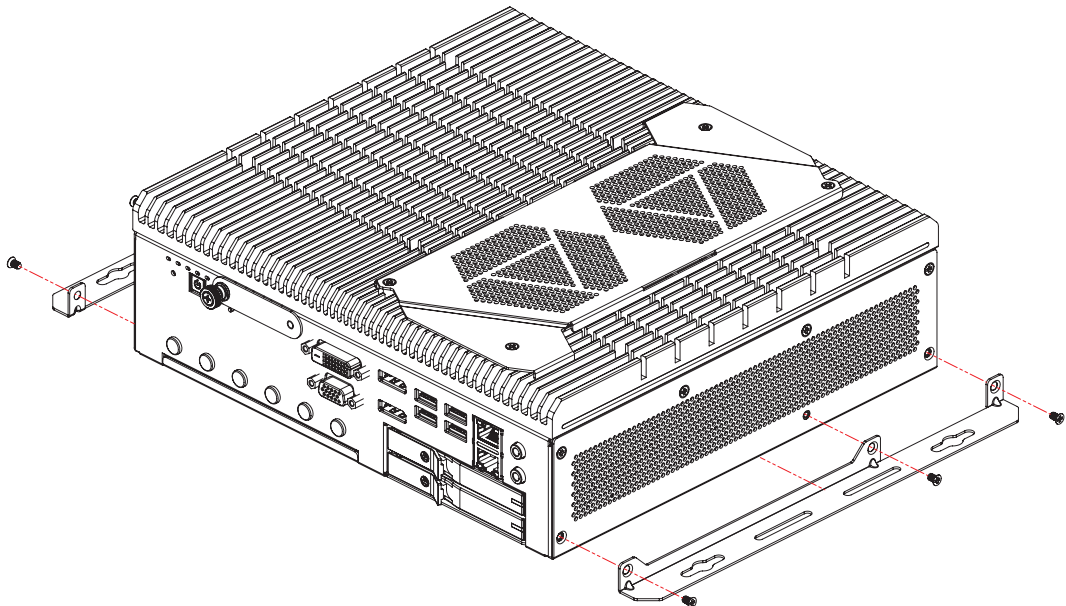
## 3.11 Mounting Your ECX-2600/2400/2300 PEG

### 3.11.1 Wall Mount

**Step 1** Loosen the screws (4 pcs) indicated.

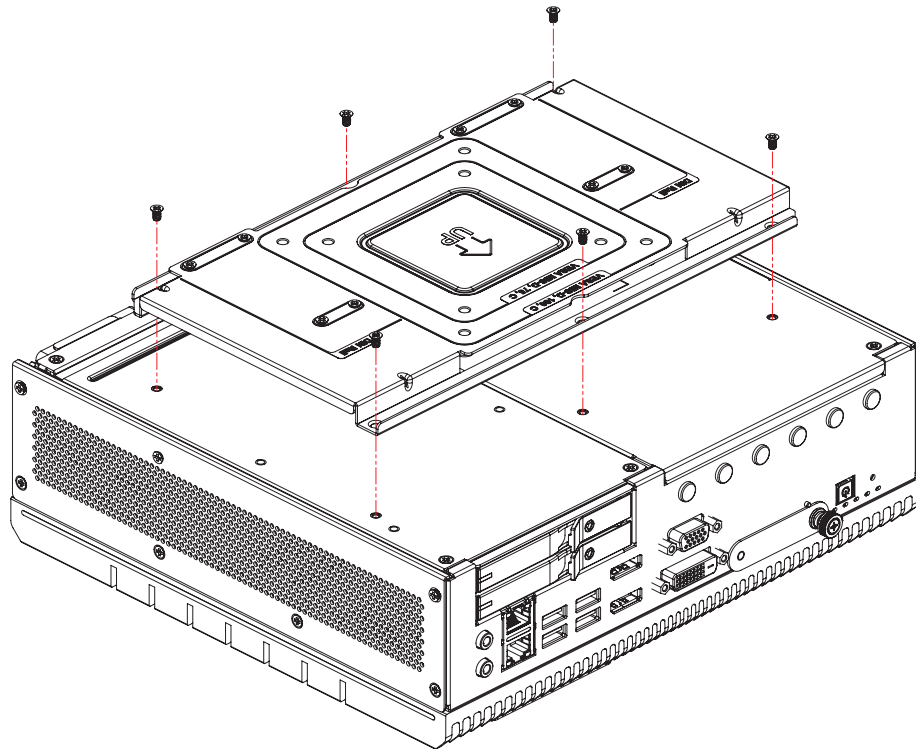


**Step 2** Install the brackets with the screws (6 pcs) indicated.

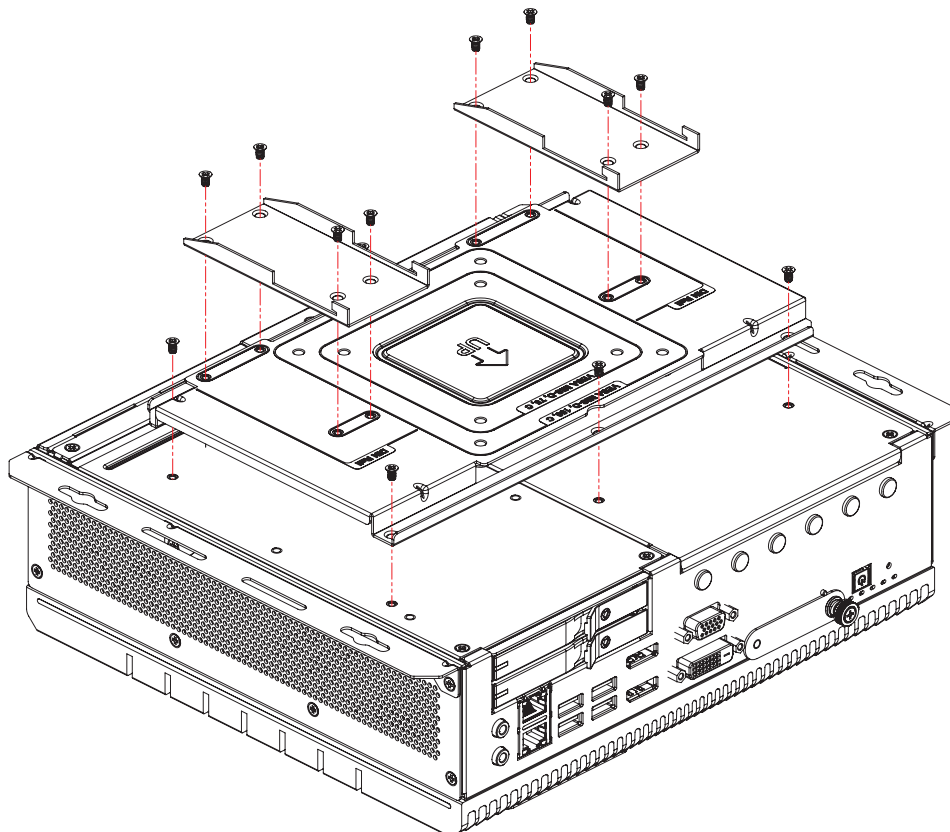


### 3.11.2 VESA Mount

Install the brackets with the screws (6 pcs) indicated.

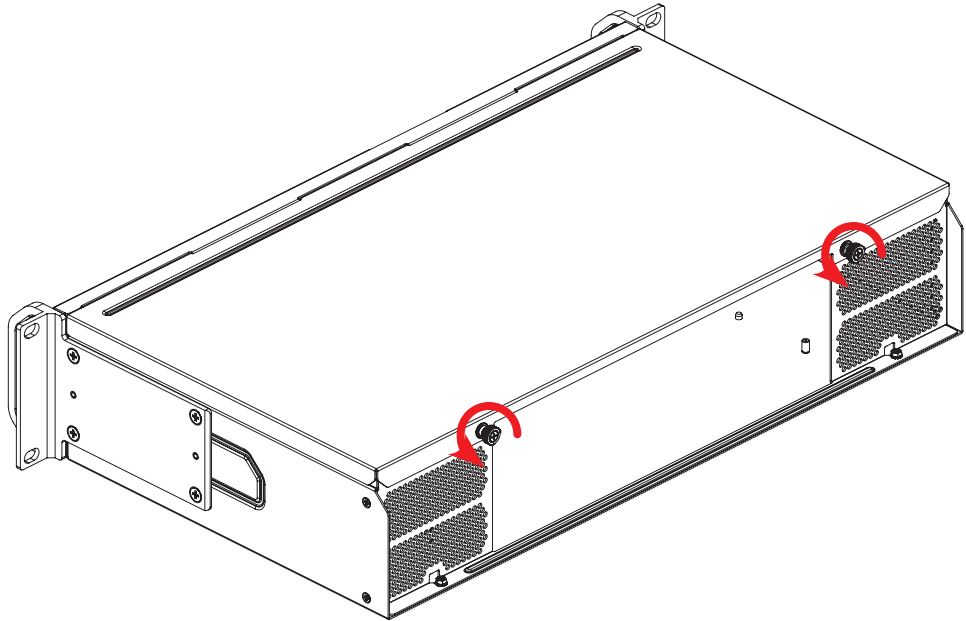


### 3.11.3 DIN Rail Mount

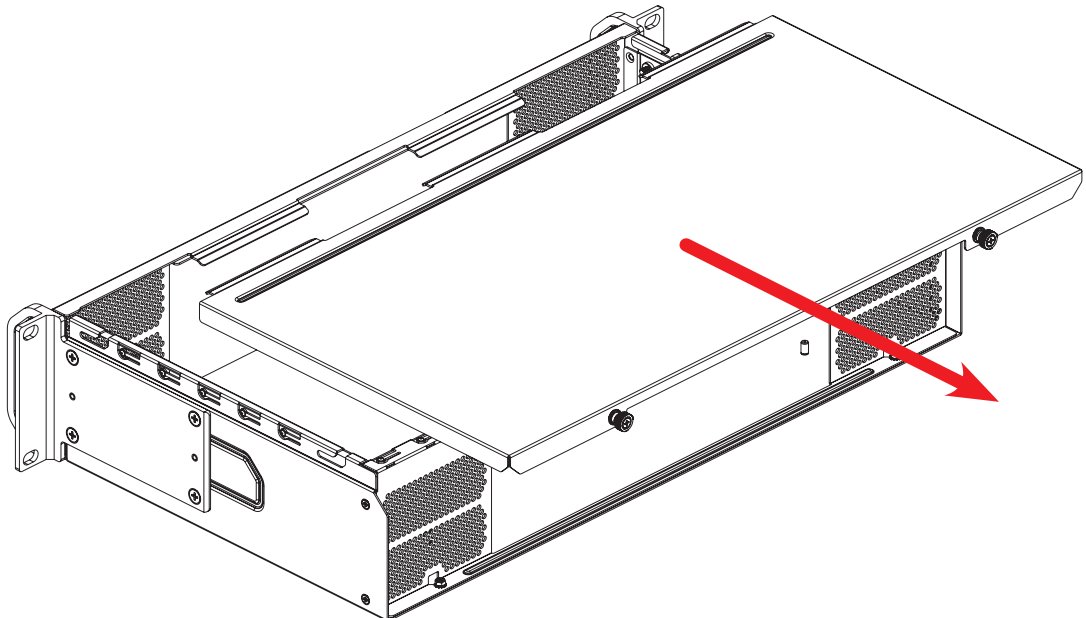


### 3.11.4 2U Rack Mount

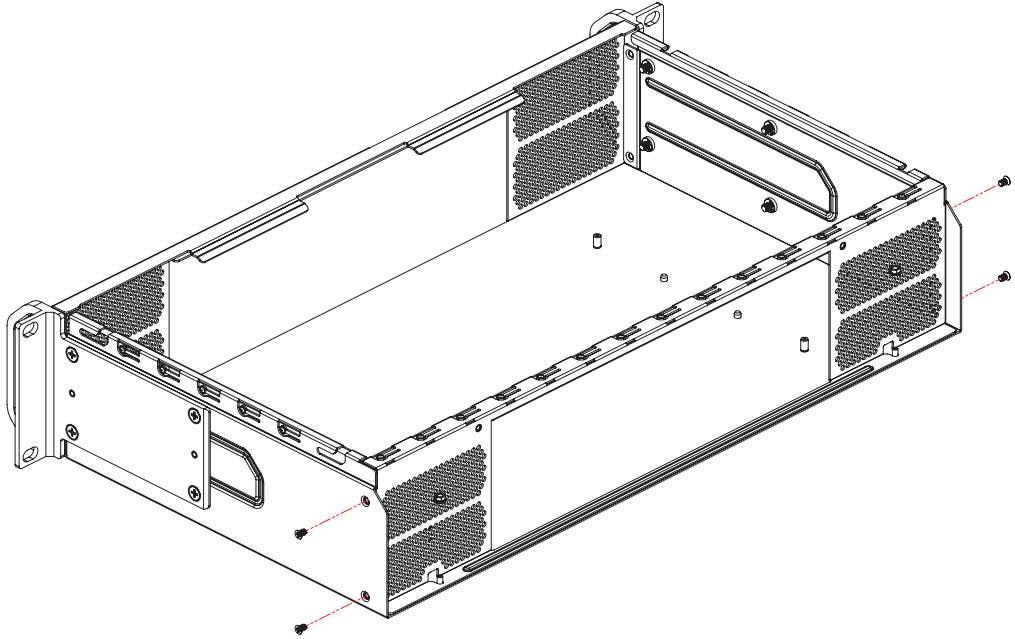
**Step 1** Loosen captive panel screw and open Cover Top.



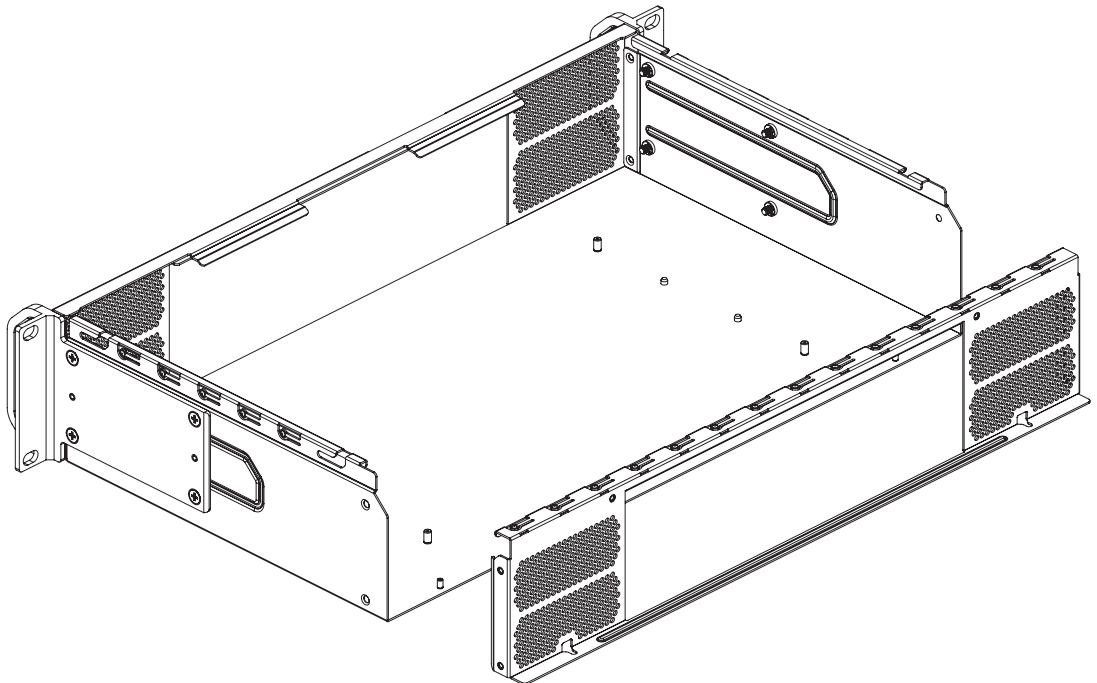
**Step 2** Open Cover Top.



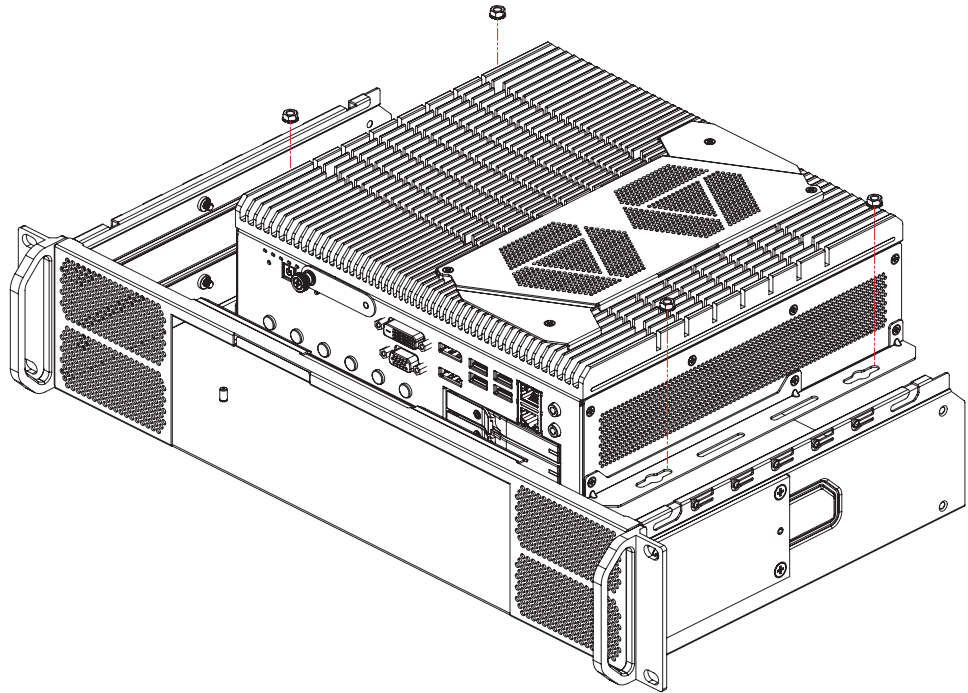
**Step 3** Remove the screws and the nuts indicated.



**Step 4** Open Cover Rear.



**Step 5** Fasten the nuts indicated.





# 4

## BIOS SETUP

### 4.1 Entering BIOS Setup

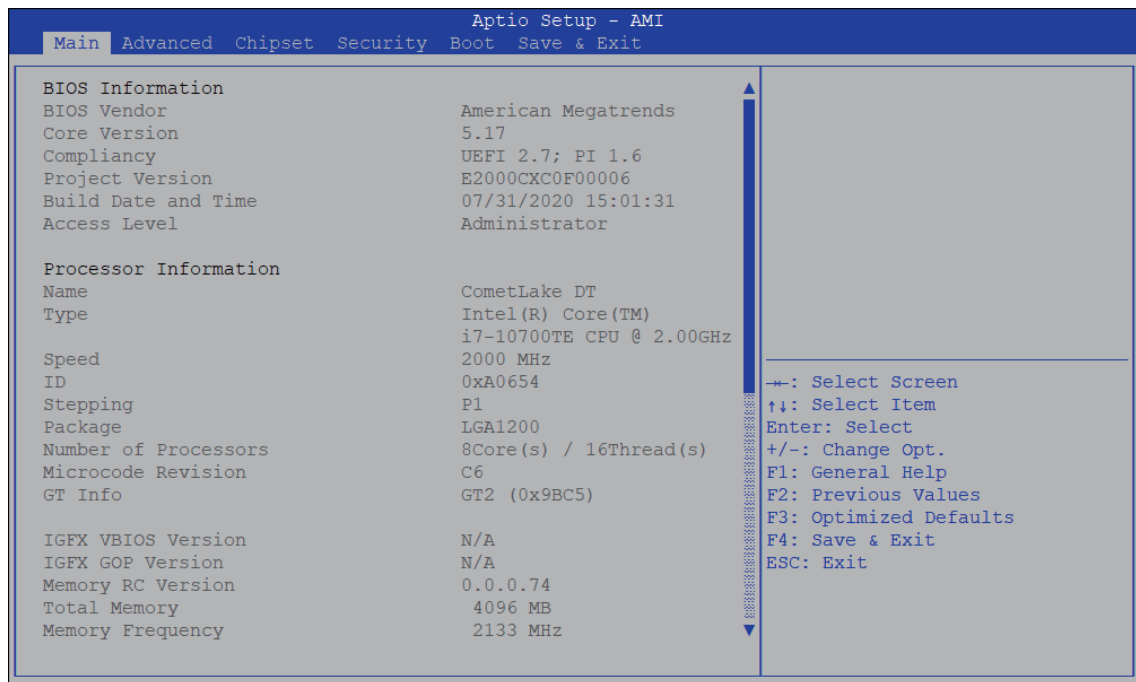


Figure 4-1 : Entering Setup Screen

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



## 4.2 Main

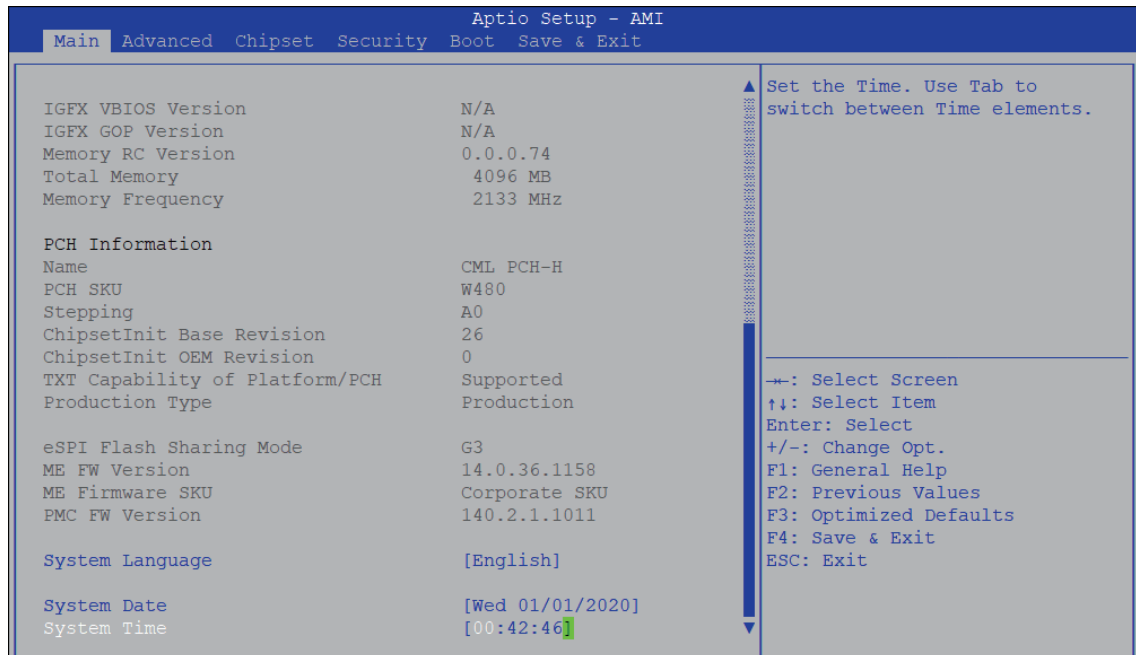


Figure 4-2 : BIOS Main Menu

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

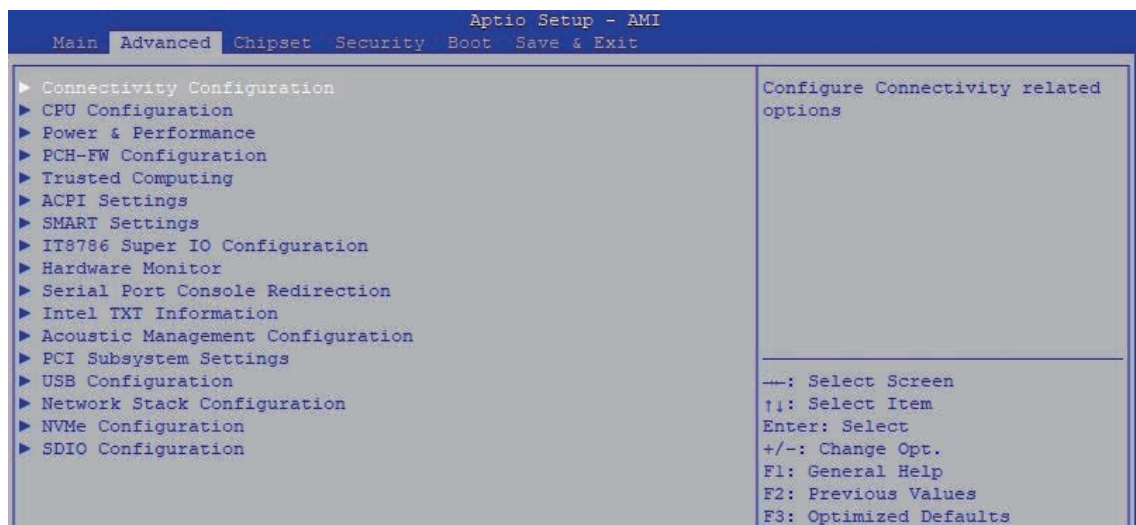


Figure 4-3 : BIOS Advanced Menu

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

## 4.3.1 CPU Configuration

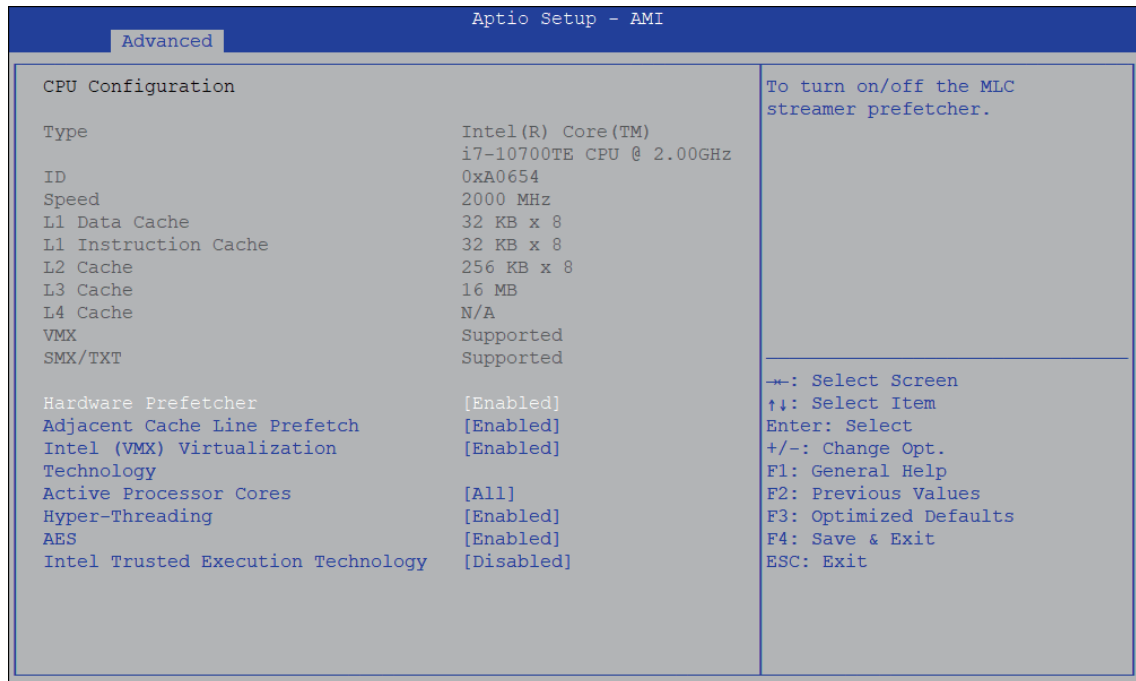


Figure 4-3-1 : CPU Configuration

### 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

Enable or Disable Hyper-Threading Technology.

### 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

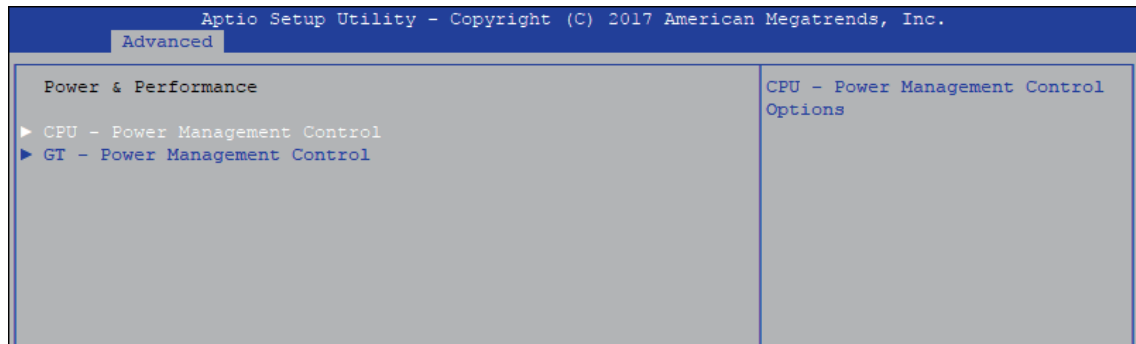


Figure 4-3-2 : Power & Performance

### 4.3.2.1 CPU – Power Management Control

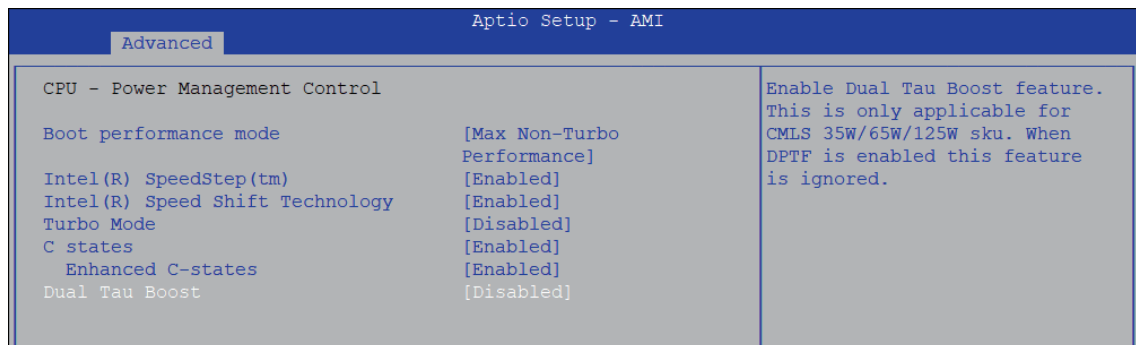


Figure 4-3-2-1 : CPU – Power Management Control

#### 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.

#### Dual Tau Boost

Enable Dual Tau Boost feature. This is only applicable for CML-S 35W/65W/125W sku. When DPTF is enabled, this feature is ignored.

### 4.3.2.2 GT – Power Management Control

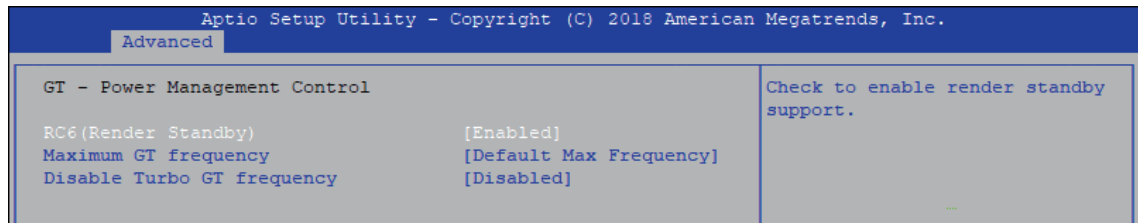


Figure 4-3-2-2 : GT – Power Management Control

#### 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

Enabled : Disabled Turbo GT frequency; Disabled: GT frequency is not limited.

### 4.3.3 PCH-FW Configuration

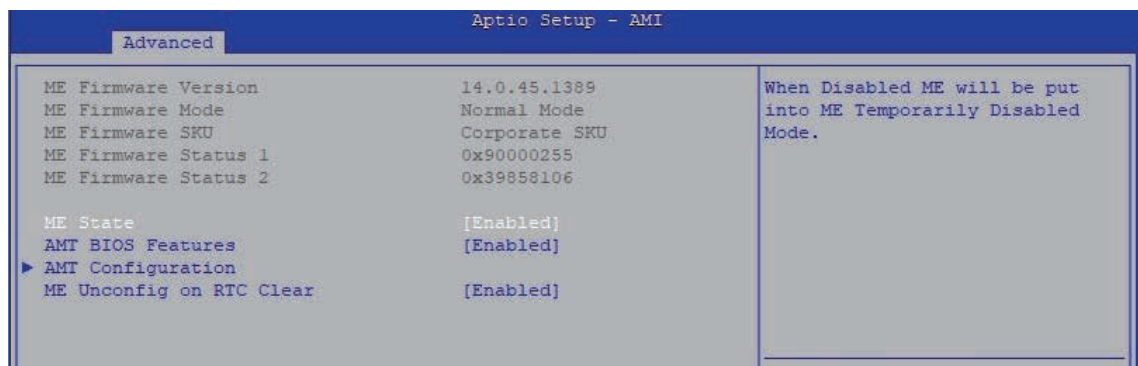


Figure 4-3-3 : PCH-FW Settings

#### 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

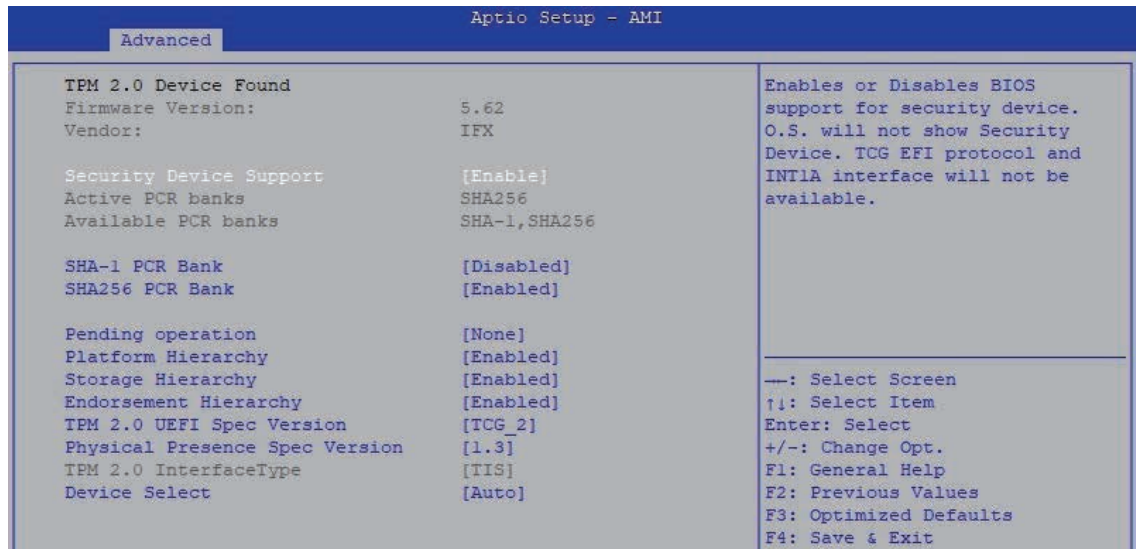


Figure 4-3-4 : Trusted Computing

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

### 4.3.5 ACPI Settings

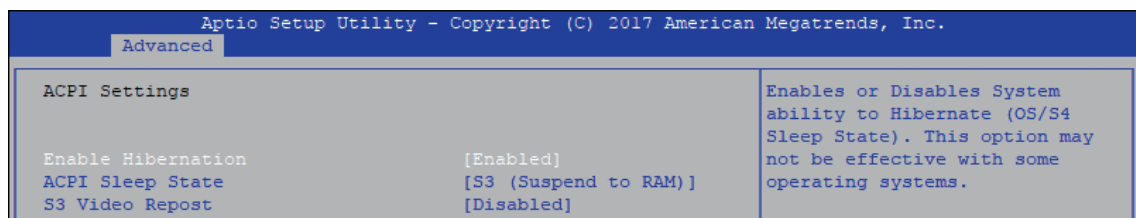


Figure 4-3-5 : ACPI Settings

#### 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

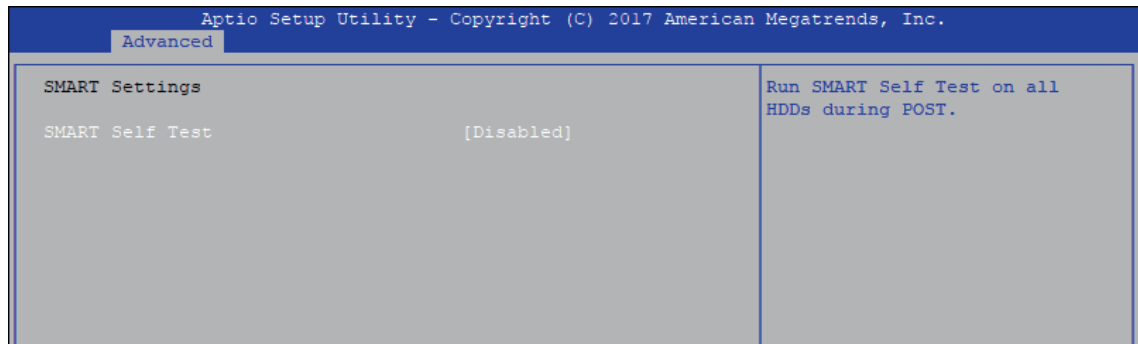


Figure 4-3-6 : SMART Settings

#### SMART Self Test

Run SMART self test on all HDDs during POST.

### 4.3.7 IT8786 Super IO Configuration

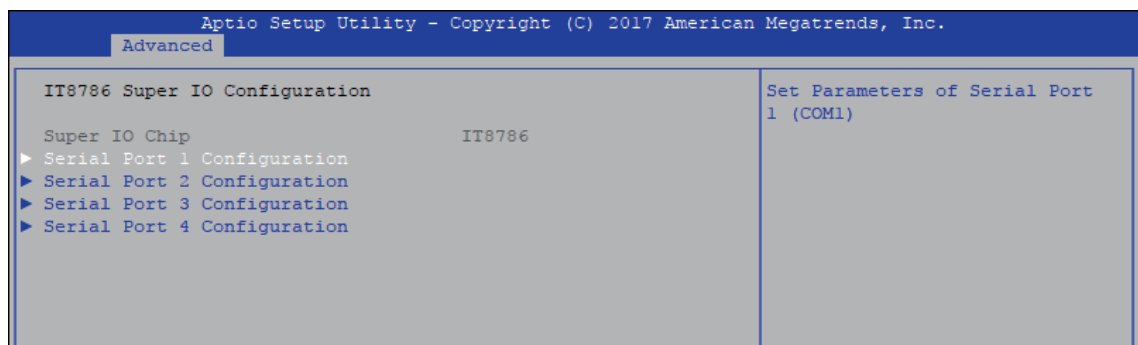


Figure 4-3-7 : IT8786 Super IO Settings

#### 4.3.7.1 Serial Port X Configuration

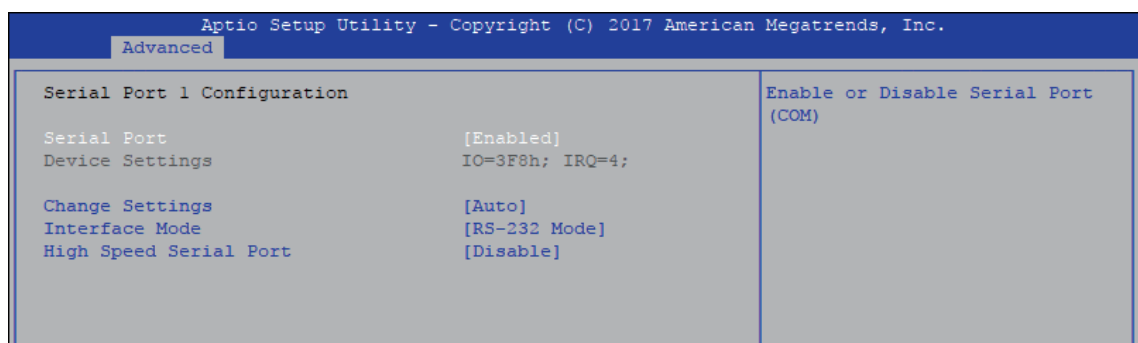


Figure 4-3-7-1 : Serial Port X Configuration

#### Serial Port 1 to port 4 Configuration

Options for Serial Port 1 to Serial Port 4.

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

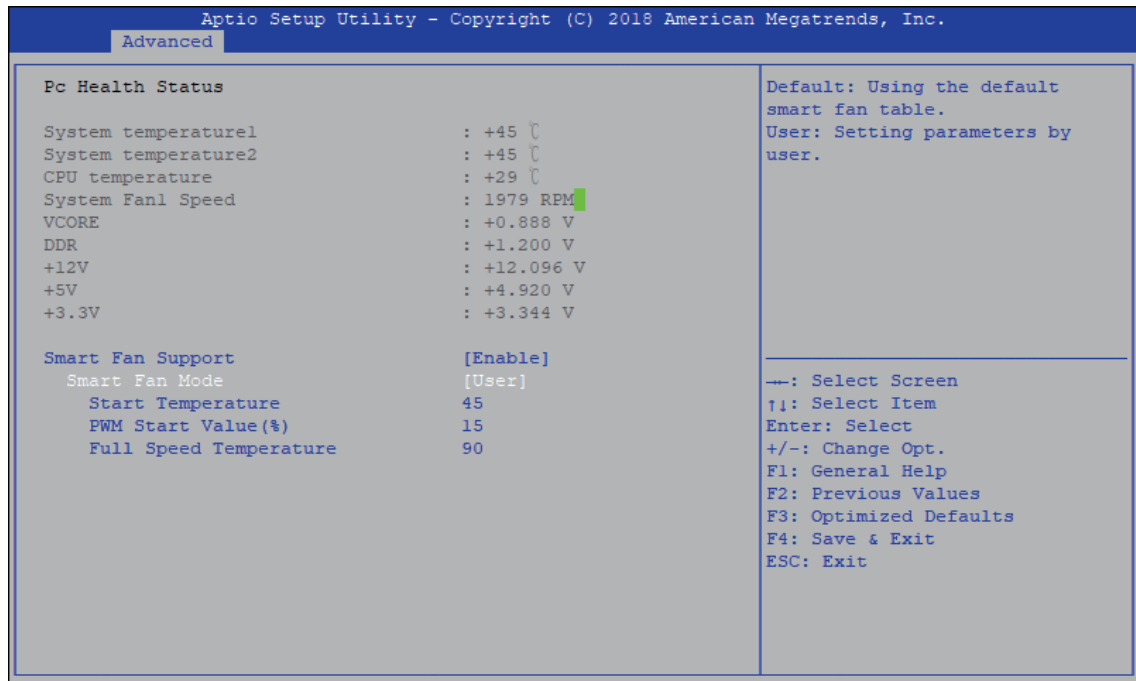


Figure 4-3-8 : Hardware Monitor Settings

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

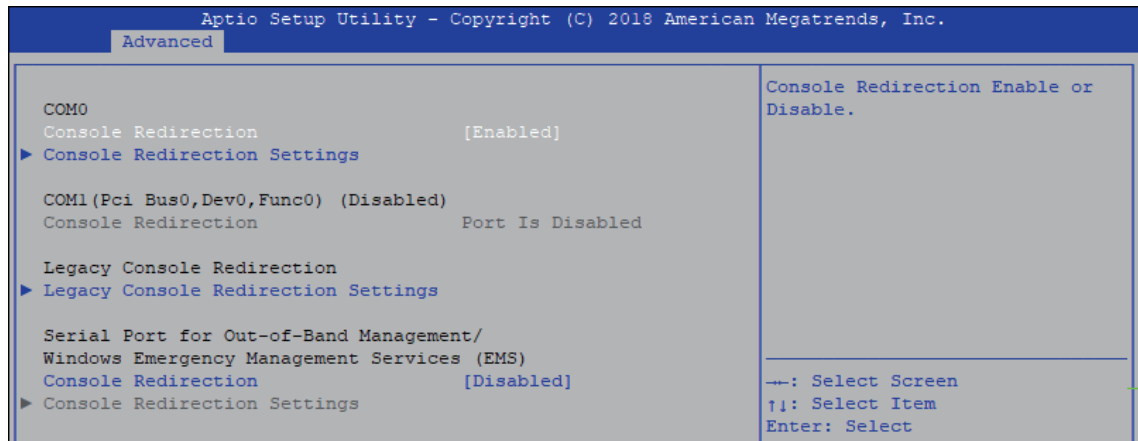


Figure 4-3-9 : Serial Port Console Redirection Settings

#### 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

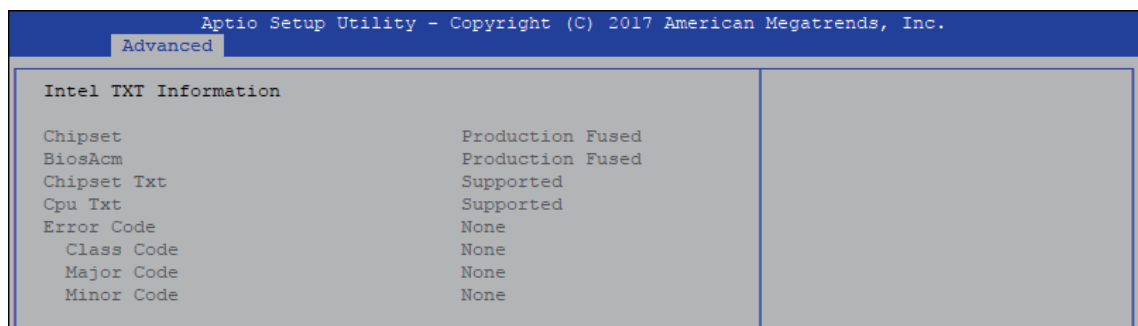


Figure 4-3-10 : Intel TXT Information

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

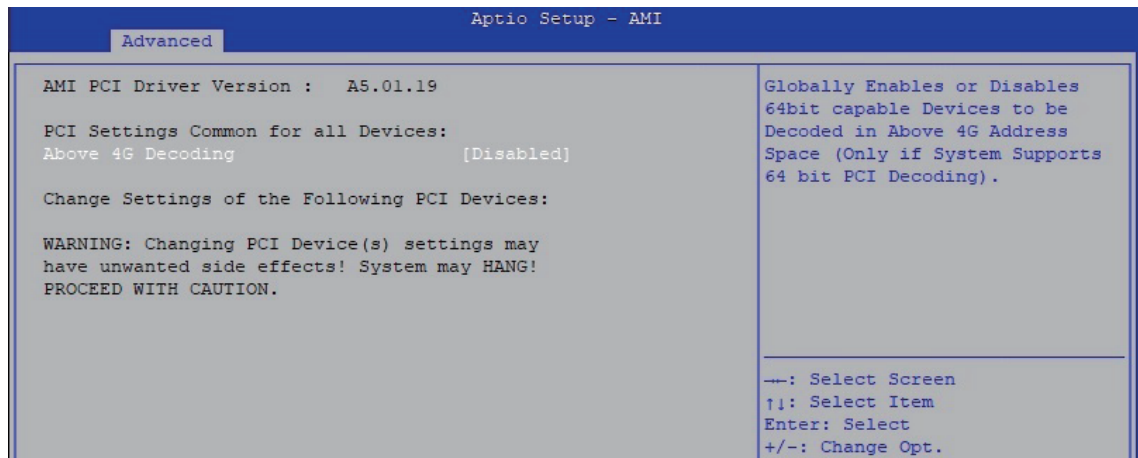


Figure 4-3-12 : PCI Subsystem Settings

#### 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)

### 4.3.13 Network Stack Configuration

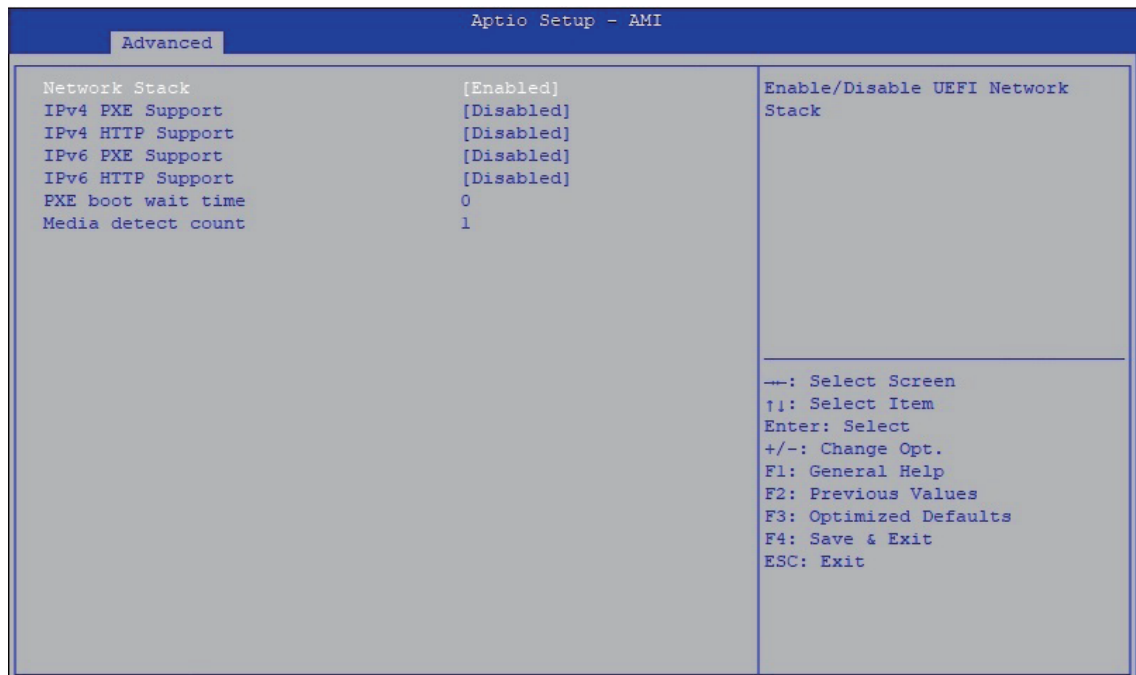


Figure 4-3-13 : Network Stack Settings

#### 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.

#### 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 NVMe Configuration

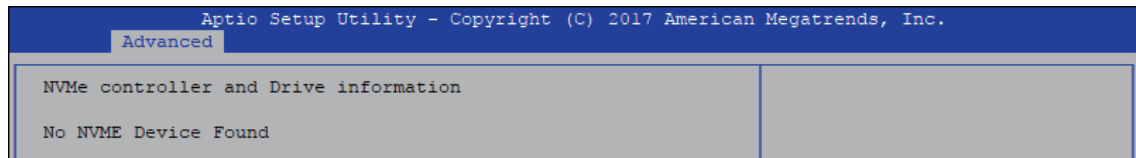


Figure 4-3-14 : NVMe Settings

Display NVMe controller and Drive information.

### 4.3.15 USB Configuration

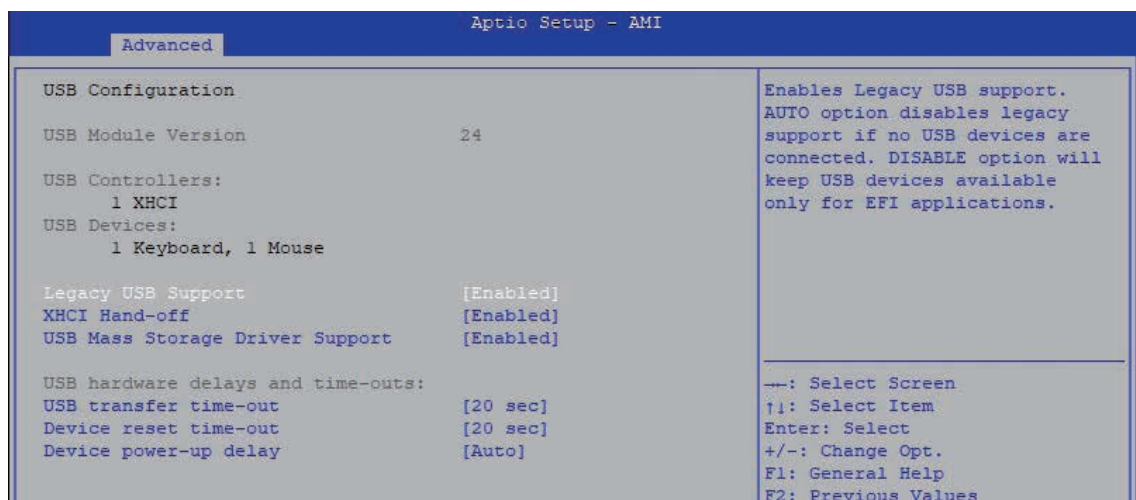


Figure 4-3-15 : USB Settings

#### 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.

#### 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.

## 4.3.16 Connectivity Configuration

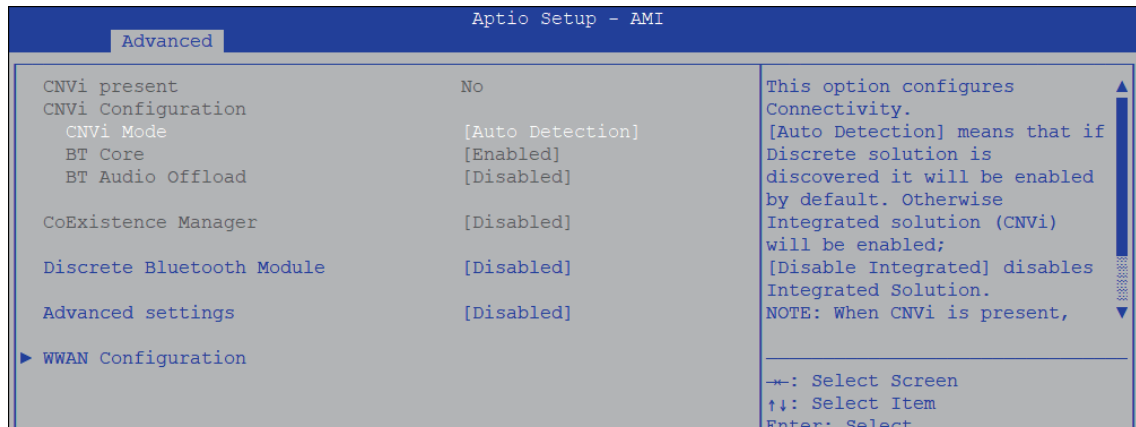


Figure 4-3-16 : Connectivity Settings

### CNVi present

[Yes] means CNVi is the active Connectivity Solution,  
[No] means CNVi was not discovered.

### CNVi Mode

This option configures Connectivity.

[Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVi) will be enabled;  
[Disable Integrated] disables Integrated Solution.

NOTE : When CNVi is present, the GPIO pins that are used for radio interface cannot be assigned to the other native function.

### BT Core

This is an option intended to Enable/Disable BT Core in CNVi

### BT Audio Offload

This is an option to Enable/Disable BT Audio Offload which enables audio input from BT device in HFP format to the audio DSP and enables power efficient audio output to BT device via A2DP format.

This feature only support with Intel(R) Wireless-AX 22560

### CoExistence Manager

CoEx Manager mitigates radio coexistence issues between Intel WWAN (modem) and Intel WLAN (WiFi/BT).

This should be enabled only if both WWAN and WLAN solutions are based on Intel components

### Discrete Bluetooth Module

Seriallo UART0 needs to be enabled to select BT Module

### Advanced settings

Configure ACPI objects for wireless devices

### WWAN Configuration

Configure WWAN related options

### 4.3.17 SDIO Configuration

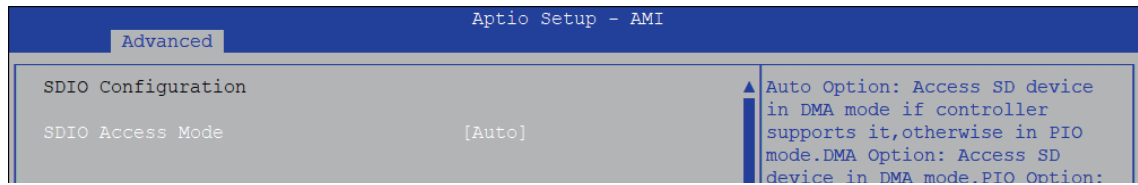


Figure 4-3-17 : SDIO Settings

#### SDIO Access Mode

[Auto] : Access SD device in DMA mode if controller supports it, otherwise in PIO mode.

[DMA] : Access SD device in DMA mode.

[PIO] : Access SD device in PIO mode.

## 4.4 Chipset

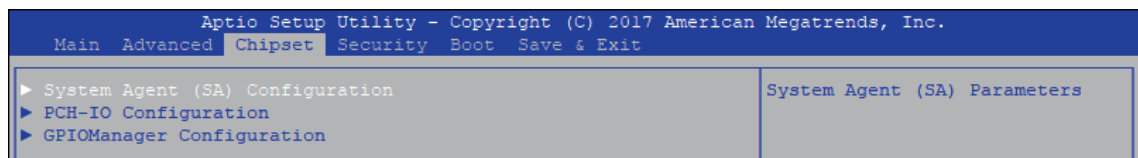


Figure 4-4 : BIOS Chipset Menu

#### System Agent (SA) Configuration

System Agent (SA) parameters.

#### PCH-IO Configuration

PCH parameters.

#### GPIOManager Configuration

GPIOManager Configuration.

### 4.4.1 System Agent (SA) Configuration

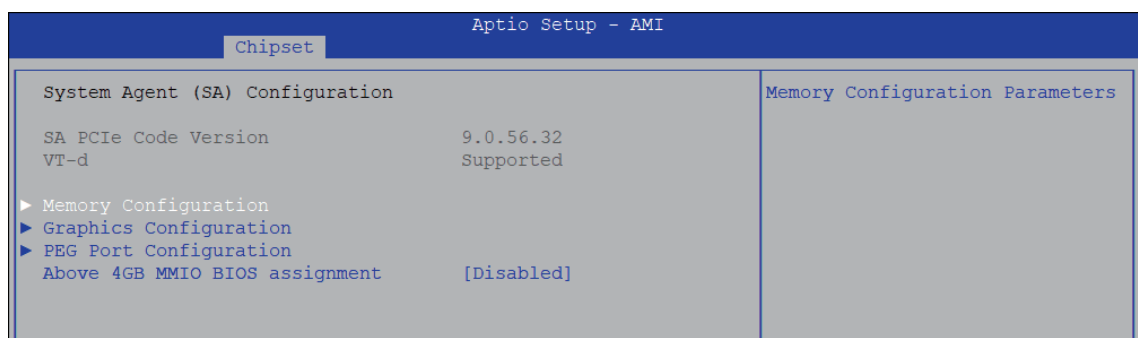


Figure 4-4-1 : System Agent Settings

#### 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

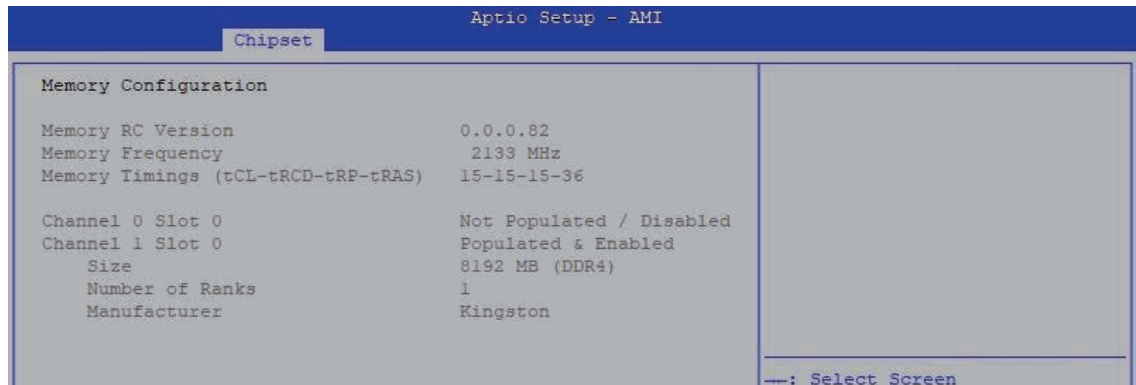


Figure 4-4-1-1 : Memory Configuration

Displays memory information.

### 4.4.1.2 Graphics Configuration

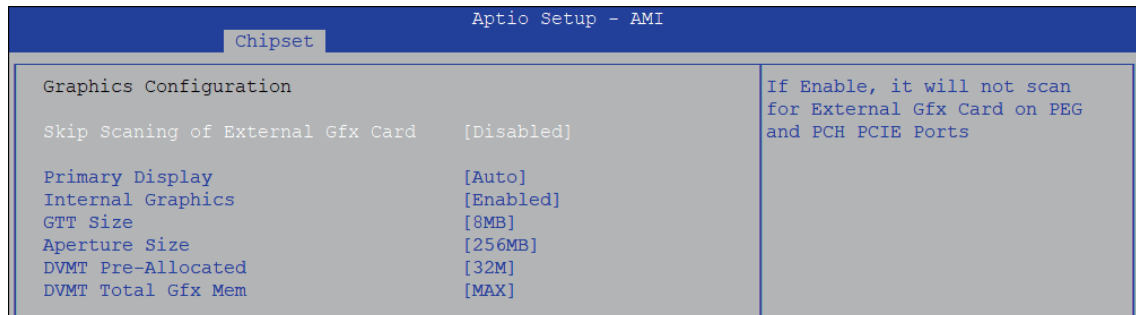


Figure 4-4-1-2 : Graphics Settings

#### 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

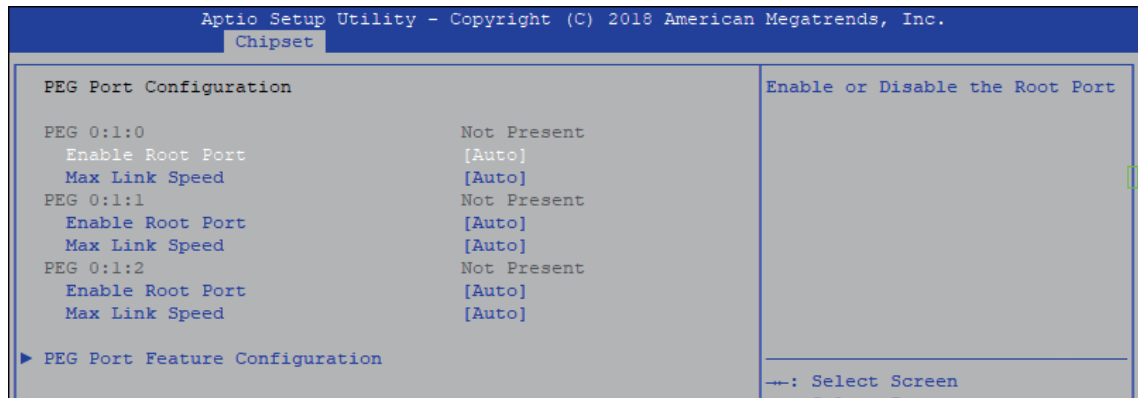


Figure 4-4-1-3 : PEG Port Configuration

PEG port options for PCIe device.

### 4.4.2 PCH-IO Configuration

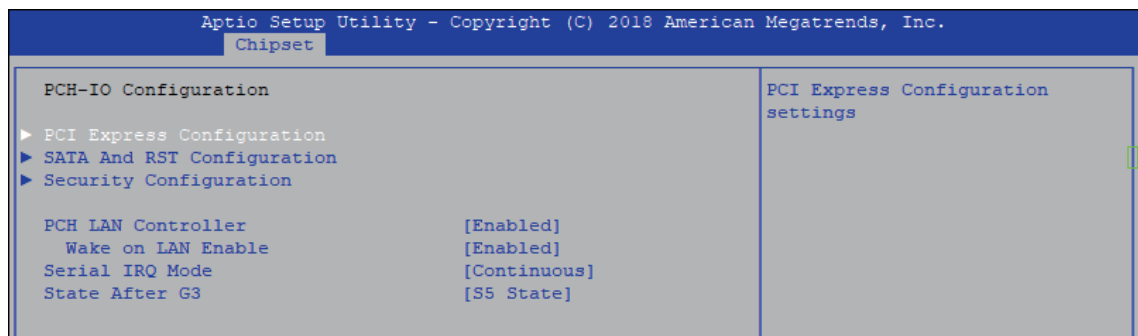


Figure 4-4-2 : PCH-IO Settings

#### 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

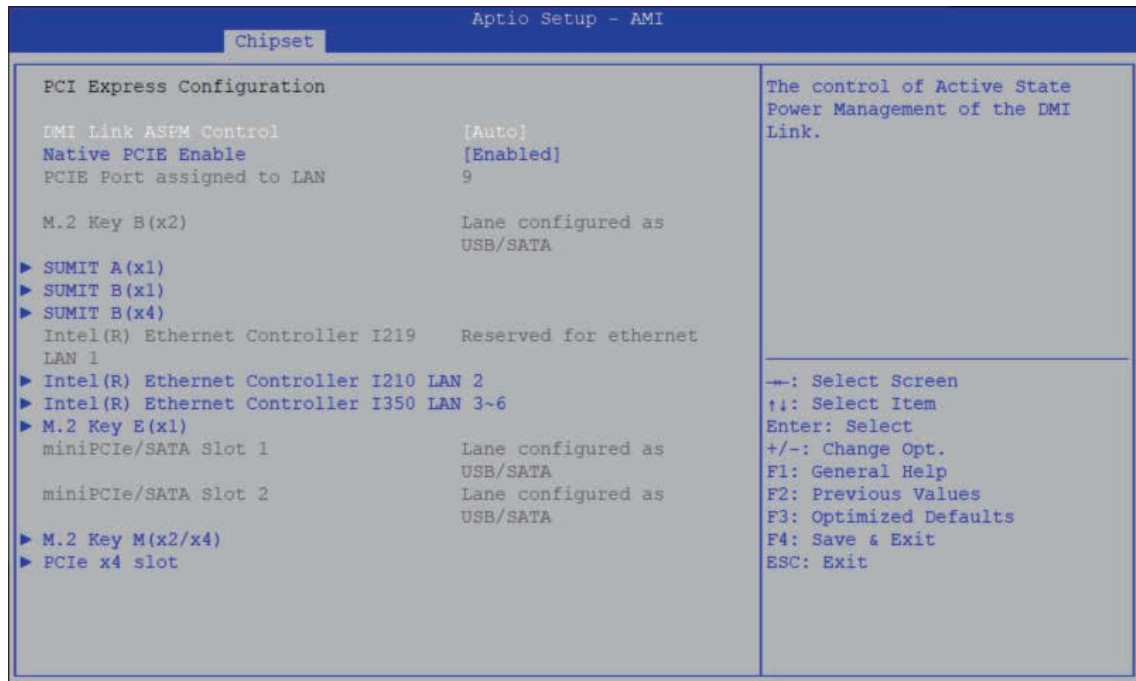


Figure 4-4-2-1 : PCH-IO Settings

### DMI Link ASPM Control

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

### Native PCIE Enable

PCI Express Native Support Enable/Disable.

### PCI Express device settings

Bios options for PCI Express device setting.



## 4.4.2.2 SATA and RST Configuration

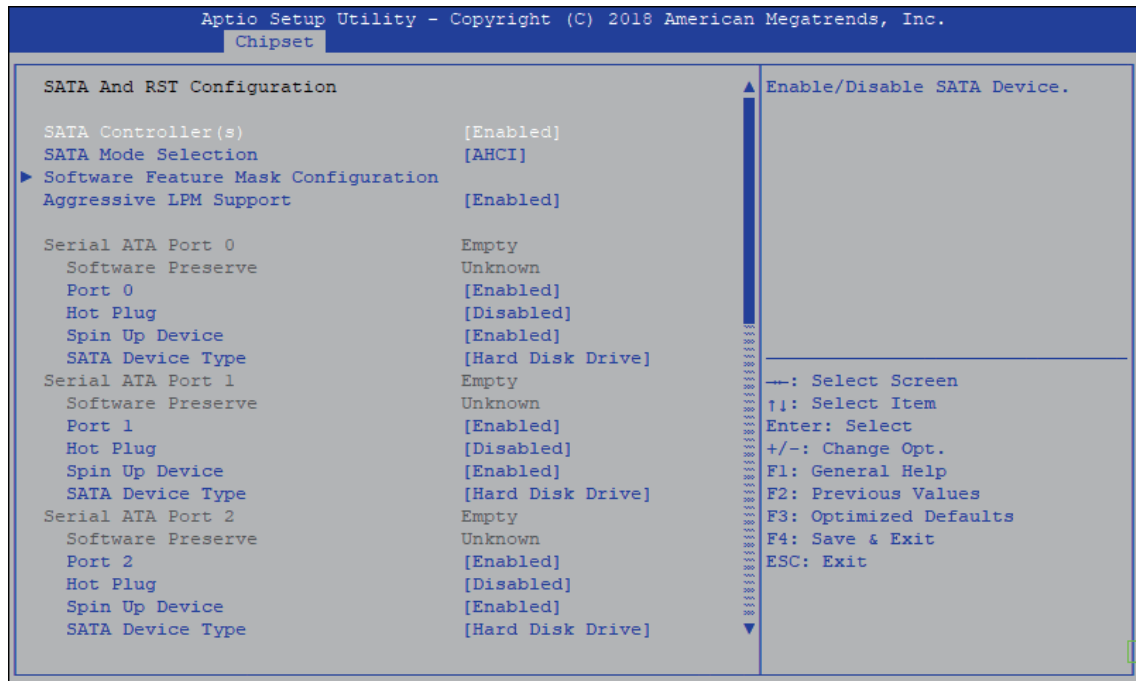


Figure 4-4-2-2 : SATA and RST Settings

### 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

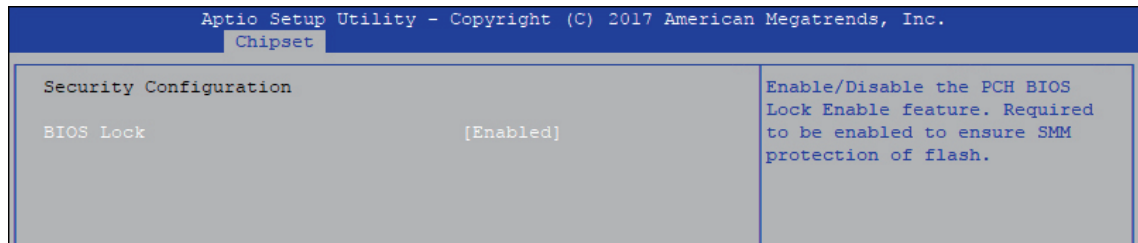


Figure 4-4-2-3 : Security Settings

#### BIOS Lock

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

### 4.4.3 GPIOManager Control

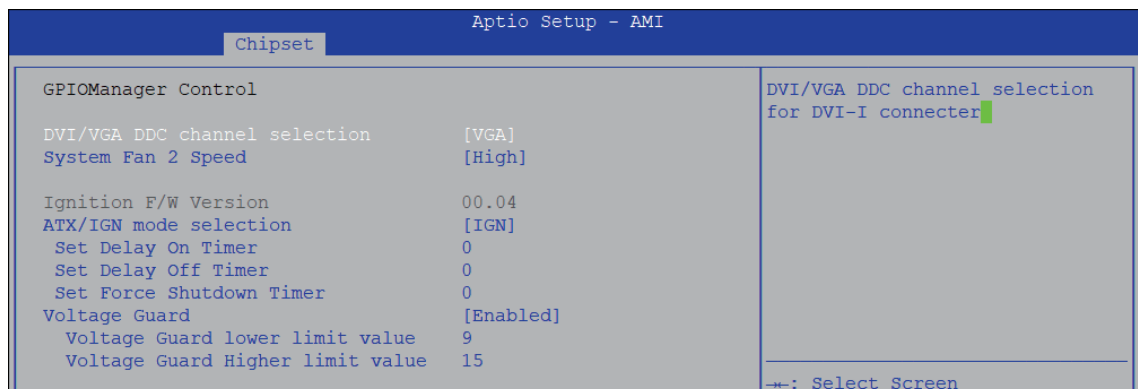


Figure 4-4-3 : GPIOManager Settings

#### DVI/VGA DDC channel selection

DVI/VGA DDC channel selection for DVI-I connector

#### System Fan 2 Speed

System Fan 2 Speed control (CPU\_FAN2)

#### Ignition F/W Version

Indicate current ignition f/w version

#### Current Ignition control method

[Hardware] Ignition mode control by hardware switch.

[Software] Ignition mode control by software

#### System power on method

[Normal] System power on by power button

[Ignition] System power on by ignition pin

#### Delay On Timer (Second)

The delay times after user trigger ignition on signal

#### Delay Off Timer (Second)

The delay times after user trigger ignition off signal

### Force Shutdown Timer (Minutes)

Used to force cut off system power when OS unable gracefully shutdown system successfully.

### Voltage Guard

Voltage Guard enable or disable, only effect on ignition mode.

### Voltage Guard lower limit value

Voltage Guard lower limit value setting  
range : 9V~40V

### Voltage Guard Higher limit value

Voltage Guard Higher limit value setting  
range : 15V~55V

## 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

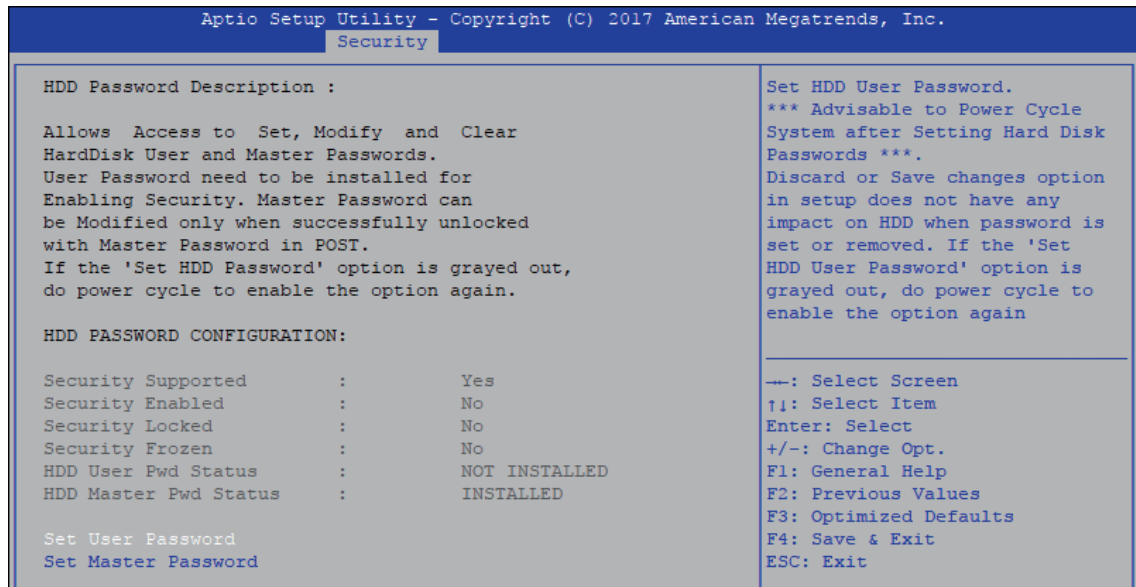


Figure 4-5-1 : HDD Security Settings

### 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

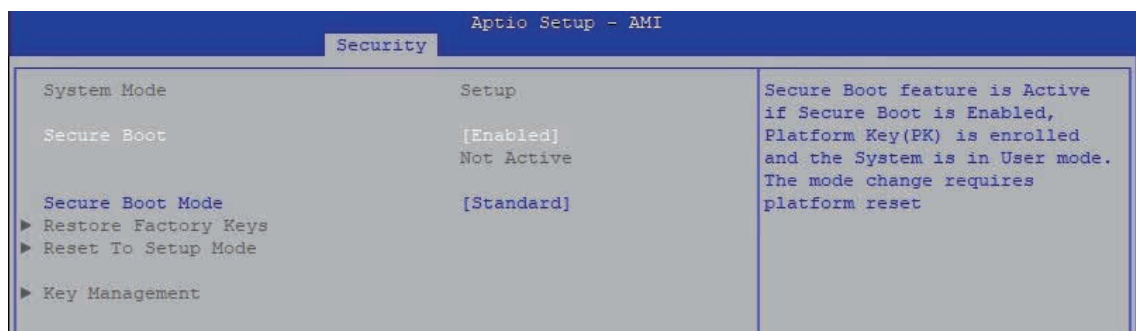


Figure 4-5-2 : Security Boot Settings

### Secure Boot

Secure Boot feature is active if secure boot is enabled, Platform Key (PK) is enrolled and the system is in User mode.

### 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

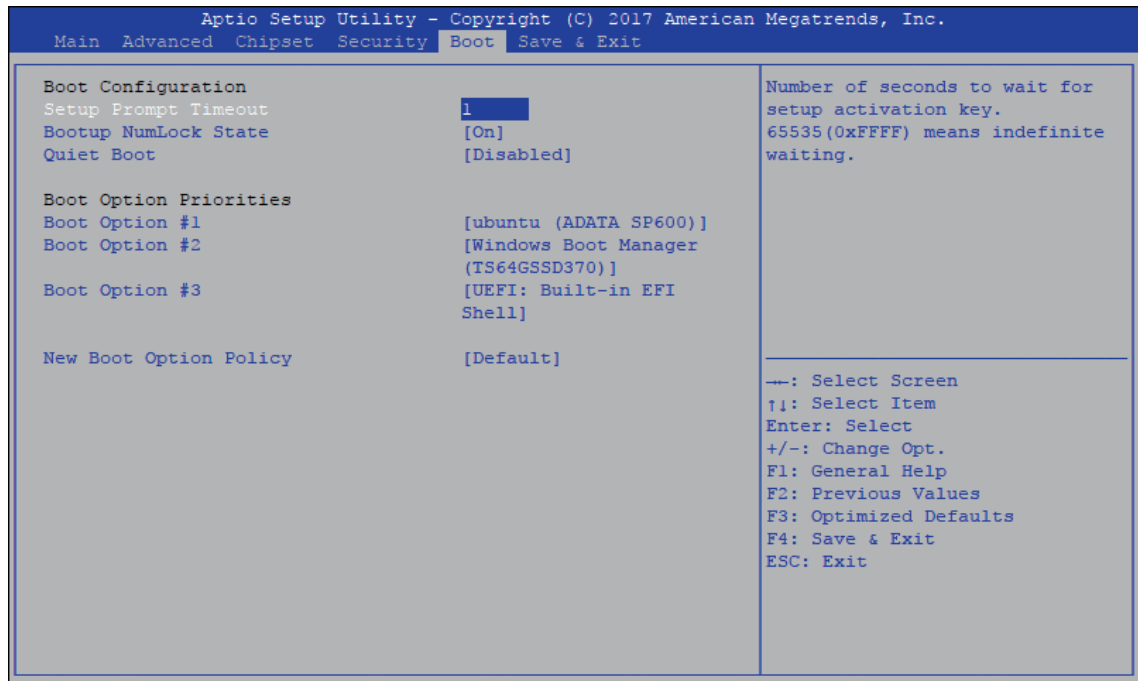


Figure 4-6 : BIOS Boot Menu

### 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

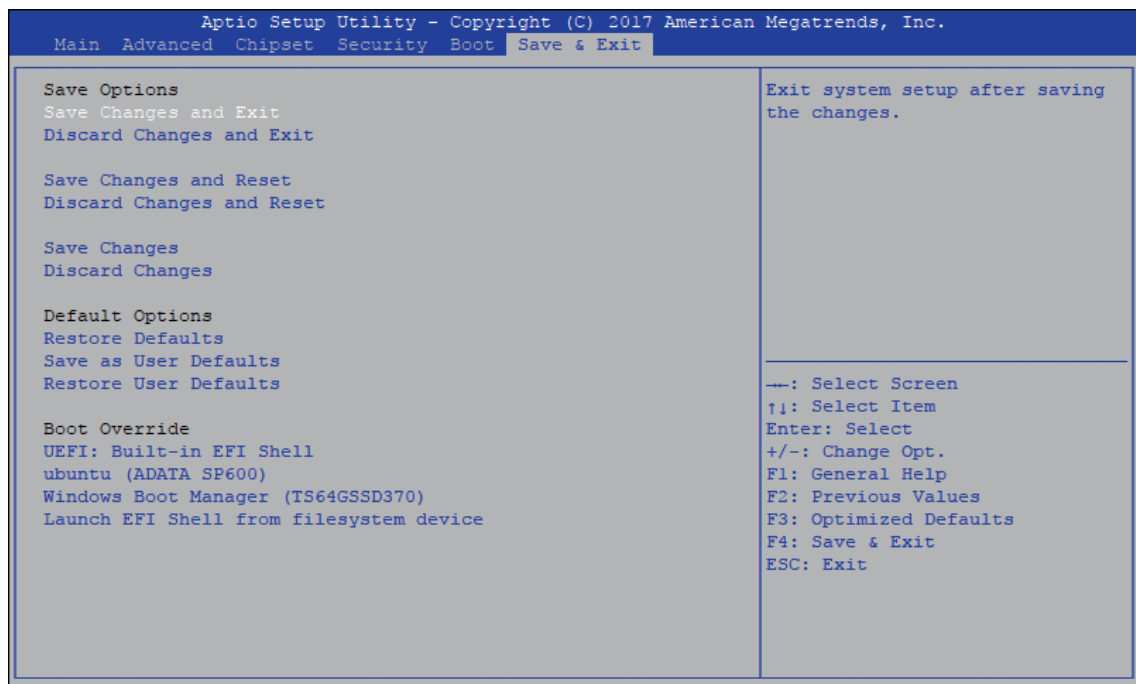


Figure 4-7 : BIOS Save and Exit Menu

### 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

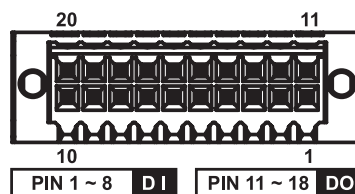
## APPENDIX A : Isolated DIO/GPIO Guide

### A.1 Function Description

The ECX-2600/2400/2300 offers a 16-bit Non-Isolated DIO/two 16-bit Isolated DIO 20-pin terminal block connector, a watchdog timer, and a 4-port POE.

Isolated DIO pins are fix by Hardware design that cannot change in/out direction in runtime process.

DIO definition is shown below :



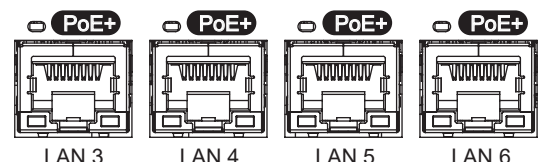
Pin No.	DIO Definition	GPIO Definition	Pin No.	DIO Definition	GPIO Definition
1	DI 0	DIO 0	11	DO 0	DIO 8
2	DI 1	DIO 1	12	DO 1	DIO 9
3	DI 2	DIO 2	13	DO 2	DIO 10
4	DI 3	DIO 3	14	DO 3	DIO 11
5	DI 4	DIO 4	15	DO 4	DIO 12
6	DI 5	DIO 5	16	DO 5	DIO 13
7	DI 6	DIO 6	17	DO 6	DIO 14
8	DI 7	DIO 7	18	DO 7	DIO 15
9	DI COM	NC	19	DIO_GND	DIO_GND
10	DIO_GND	DIO_GND	20	External VDC	NC

POE definition is shown below :

Port No.	Definition	Port No.	Definition
1	POE 0	3	POE 2
2	POE 1	4	POE 3

Do NOT use these functions in below :

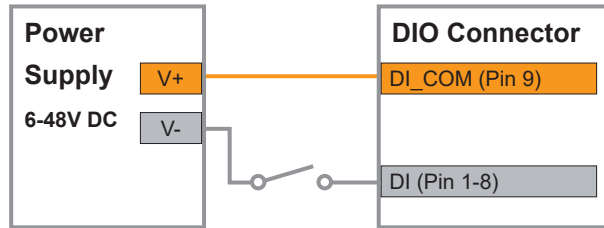
1. PE-2000 : DIO1 (ID = 0), POE
2. PE-3000 : POE
3. UE-1000 : USB (ID = 0)



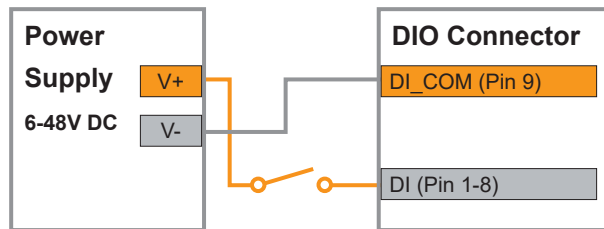
## A.2 Isolated DIO Signal Circuit

DI reference circuit :

Sink Mode  
(NPN)

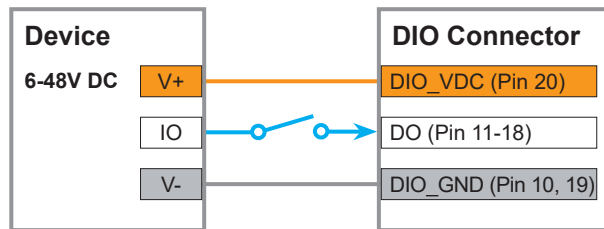


Source Mode  
(PNP)

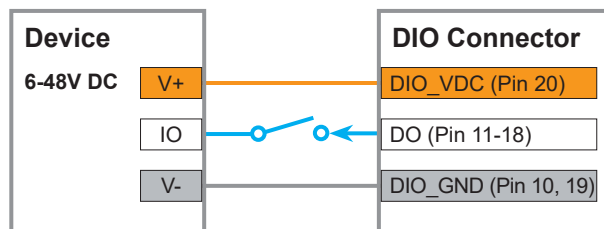


DO reference circuit :

Sink Mode  
(NPN, Default)



Source Mode  
(PNP)





## A.3 Software Package Contain

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

There are included as followed :

Win10\_32.bat, and Win10\_64.bat :

Installation for driver, and

Uninstall\_32.bat, and Uninstall\_64.bat :

Uninstallation for driver

Run batch file as Administrator.

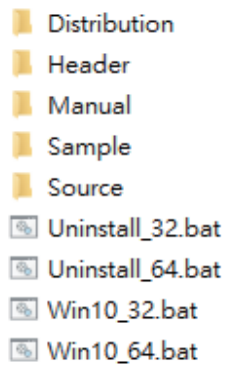
Make sure Windows version before installation.

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

Manual folder include API description.

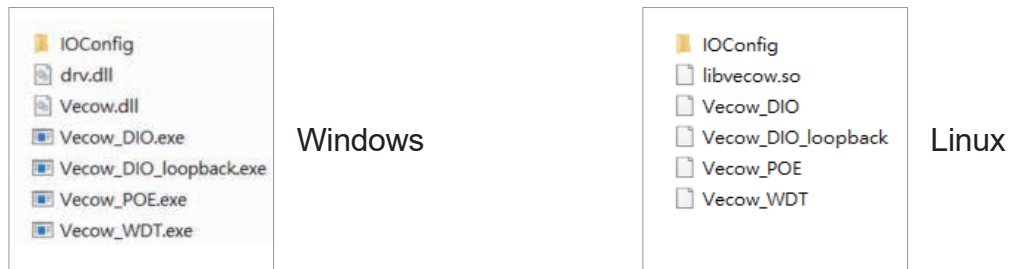
Sample folder include sample program, driver library, and API library for Windows/Linux

Source folder include sample program source code that compile on Visual Studio 2008/ubuntu16.04.



## A.4 Sample

Execute demo tool.



Sample, as shown below :

```
DIO sample version : v1.0.0609.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608
Config : IO port I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

Choose IO : (1/2)
```

Vecow\_DIO

```
DIO loopback sample version : v1.0.1509.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608
Config : IO port I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

How many IO temp_port : (1/2)
```

Vecow\_DIO\_loopback

```
POE sample version : v1.0.1609.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608

Initial POE success!
Usable slave address ID : 0
Select slave address ID :
```

Vecow\_POE

```
WDT sample version : v1.0.0509.0608
Load Vecow.dll at least v1.8.1409.0608
Vecow.dll Version : v1.8.1409.0608
Config : IO port I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

Set WDT timer seconds (1~3932100) :
```

Vecow\_WDT

# B

## APPENDIX B : Software Functions

### B.1 Driver API Guide

In Header folder, Vecow.h and VecowLinux.h contain usable API for Windows/Linux.

#### **BOOL initial\_SIO(BYTE Isolate\_Type, BYTE DIO\_NPN)**

Initial machine for IO and watch dogtimer.

Isolate\_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO(GPIO).

DIO\_NPN : DI/DO type.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Return :

TRUE (1) : Success.

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

#### **BOOL get\_IO1\_configuration(BYTE \*Iso, BYTE \*DI\_mode, BYTE \*DO\_mode, WORD \*Mask)**

#### **BOOL get\_IO2\_configuration(BYTE \*Iso, BYTE \*DI\_mode, BYTE \*DO\_mode, WORD \*Mask)**

Get DIO configuration (by variable)

Isolate\_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO(GPIO).

DI\_mode ([7:0]) : DI type, pin setting by hexadecimal bitmask only for Isolated DIO.

0xFF : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

DO\_mode : DO type only for Isolated DIO.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Mask ([15:0]) : In/Out, pin setting by hexadecimal bitmask only for Non-Isolated DIO(GPIO).

1 : Output;

0 : Input

Return :

TRUE (1) : Success.

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

**BOOL set\_IO1\_configuration(BYTE Iso, BYTE DI\_mode, BYTE DO\_mode, WORD Mask)**

**BOOL set\_IO2\_configuration(BYTE Iso, BYTE DI\_mode, BYTE DO\_mode, WORD Mask)**

Set DIO configuration.

Isolate\_Type : DIO type.

1 : Isolated DIO;

0 : Non-Isolated DIO (GPIO).

DI\_mode ([7:0]) : DI type, pin setting by hexadecimal bitmask only for Isolated DIO.

0xFF : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

DO\_mode : DO type only for Isolated DIO.

1 : PNP (Source) mode for European rule;

0 : NPN (Sink) mode for Japanese rule.

Mask ([15:0]) : In/Out, pin setting by hexadecimal bitmask only for Non-Isolated DIO (GPIO).

1 : Output;

0 : Input

Return :

TRUE (1) : Success.

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

**BOOL get\_DIO1(BYTE \*DO\_data, BYTE \*DI\_data)**

**BOOL get\_DIO2(BYTE \*DO\_data, BYTE \*DI\_data)**

Get isolated DIO output(DO) and input (DI).

DI ([7:0]) : Input state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

DO ([7:0]) : Output state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

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

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

**BOOL set\_DIO1(BYTE DO\_data)**

**BOOL set\_DIO2(BYTE DO\_data)**

Set isolated DIO output(DO).

DO ([7:0]) : Output state, pin setting by hexadecimal bitmask.

1 : High;

0 : Low.

Return :

TRUE (1) : Success.

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

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

**BOOL get\_GPIO1(WORD \*GPIO\_data)**

Get GPIO.

GPIO\_data ([15:0]) : GPIO state, pin setting by hexadecimal bitmask.  
1 : High;  
0 : Low.

Return :

TRUE (1) : Success.  
FALSE (0) : Fail (Initial error or hardware problem).

**BOOL get\_WDT(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 set\_WDT(DWORD WDT)**

Set 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 setup 0, or hardware problem).

**BOOL cancel\_WDT()**

Cancel watchdog timer.

Return :

TRUE (1) : Success.  
FALSE (0) : Fail (Initial error or hardware problem).

**BOOL initial\_POE(BYTE Scan, BYTE ID)**

Initial POE.

Scan : POEID scan type  
2 : Auto scan; 1 : Manual setup.  
ID : POE ID by manual setting.  
Range : 0~15.

Return :

TRUE (1) : Success.  
FALSE (0) : Fail (Driver not exists, or version is too old, or out of range error).

**BOOL get\_POE\_configuration(BYTE ID, BYTE \*Auto, BYTE \*Mask)**

Get POE configuration (by variable).

ID : POE ID.  
Range : 0~15.  
Auto ([3:0]) : Auto mode, pin setting by hexadecimal bitmask.

1 : Auto;  
0 : Manual.  
Mask ([3:0]) : DC Enable/Disable, pin setting by hexadecimal bitmask.  
1 : Enable;  
0 : Disable.

Return :

TRUE (1) : Success.

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

### **BOOL set\_POE\_configuration(BYTE ID, BYTE Auto, BYTE Mask)**

Set POE configuration (by variable).

ID : POE ID.

Range : 0~15.

Auto ([3:0]) : Auto mode, pin setting by hexadecimal bitmask.

1 : Auto;

0 : Manual.

Mask ([3:0]) : DC Enable/Disable, pin setting by hexadecimal bitmask.

1 : Enable;

0 : Disable.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or out of range error, or hardware problem).

### **BOOL get\_POE(BYTE ID, BYTE \*POE)**

Get POE state.

ID : POE ID.

Range : 0~15.

POE ([3:0]) : POE state, pin setting by hexadecimal bitmask.

1 : On;

0 : Off.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or out of range error, or call by pointer error, or hardware problem).

### **BOOL set\_POE(BYTE ID, BYTE POE)**

Set POE state.

A. ID : POE ID.

Range : 0~15.

B. POE ([3:0]) : POE state, pin setting by hexadecimal bitmask.

1 : On;

0 : Off.

Return :

TRUE (1) : Success.

FALSE (0) : Fail (Initial error, or out of range error, or hardware problem).

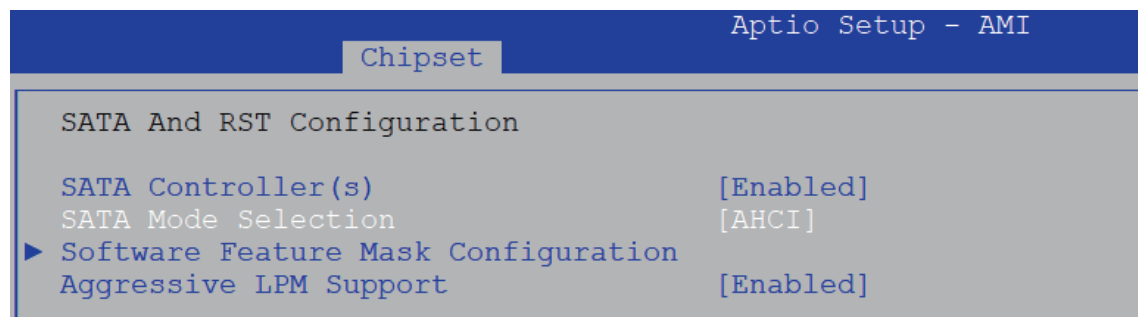
# C

## APPENDIX C : RAID Functions

### C.1.1 SATA Mode for RAID

Please select SATA Device to RAID mode on BIOS menu.

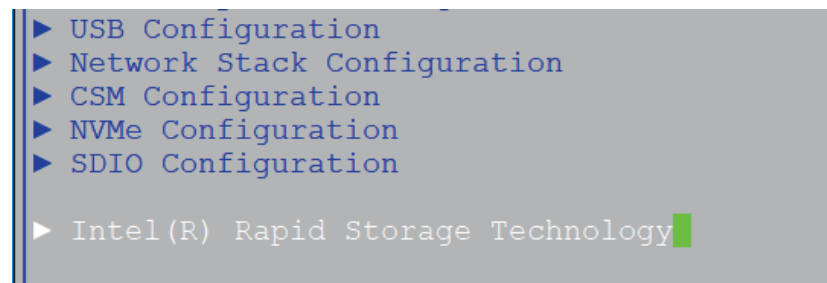
Chipset → PCH-IO Configuration → SATA And RST Configuration → SATA Mode Selection → Intel RST Premium → Save Changes and Reset.



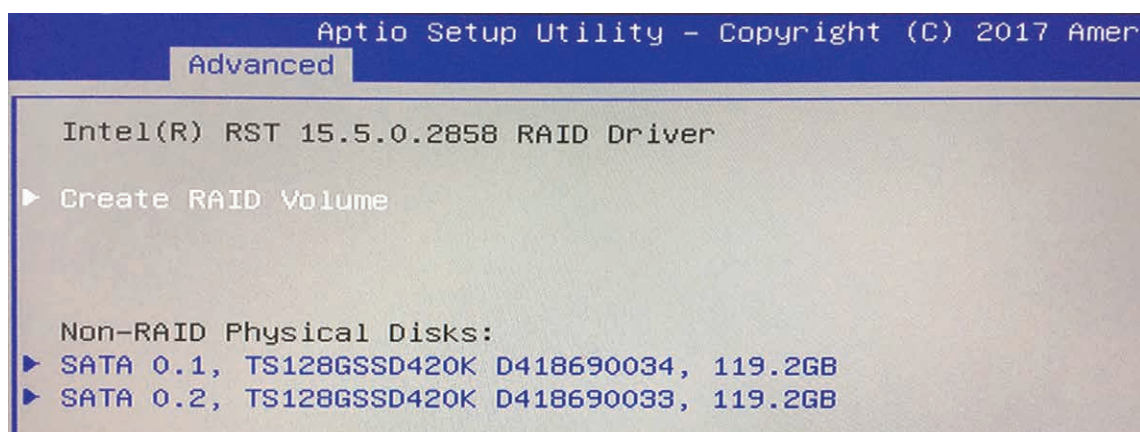
### C.1.2 UEFI Mode for RAID

1. Into BIOS menu again, select Intel(R) Rapid Storage Technology on BIOS menu.

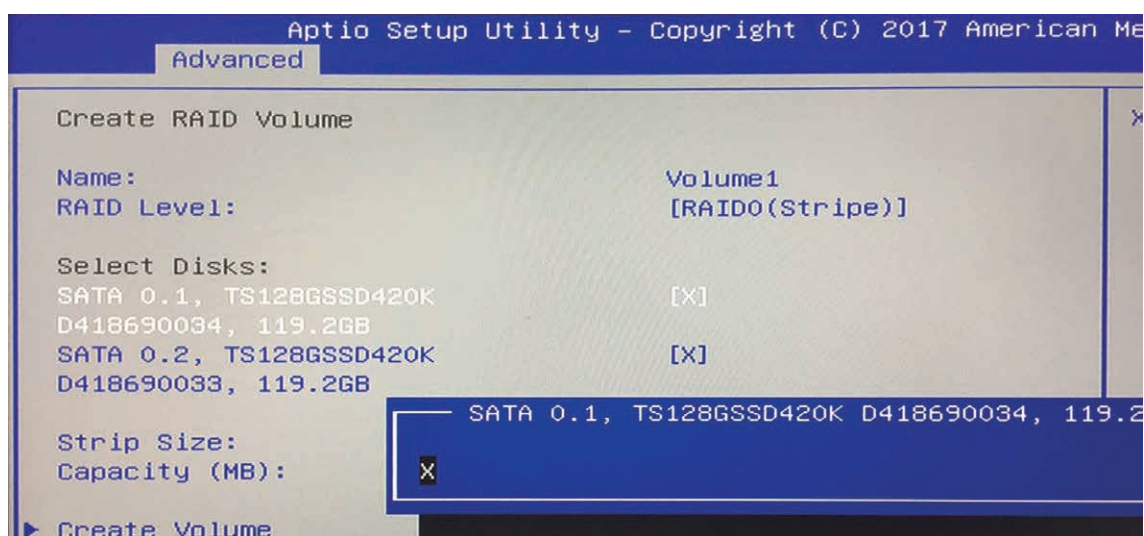
Advanced → Intel(R) Rapid Storage Technology



3. Select Create RAID Volume on BIOS menu.



4. Select disks to create RAID Volume then Save Changes and Reset to install OS with EFI mode.





## **C.2 OS Installation**

The system is featured with one M.2 key M for NVME, one mSATA slot, and including two internal SATA.

We used 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. Install Chipset driver
2. Install Network driver
3. Install ME driver (if available)
4. Install Audio driver
5. Install VGA driver

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

You can get the latest information and the software directly from Intel website.

[http://www.intel.com/p/en\\_US/support/highlights/chpsts/ismm](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 note, you can use two SATA ports for SATA HDD, except for mSATA slot.

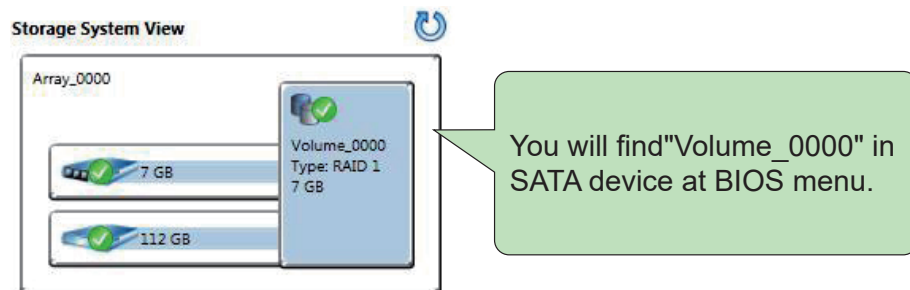
## C.6 To Create RAID Volume on "Rapid Storage Technology" Software

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".

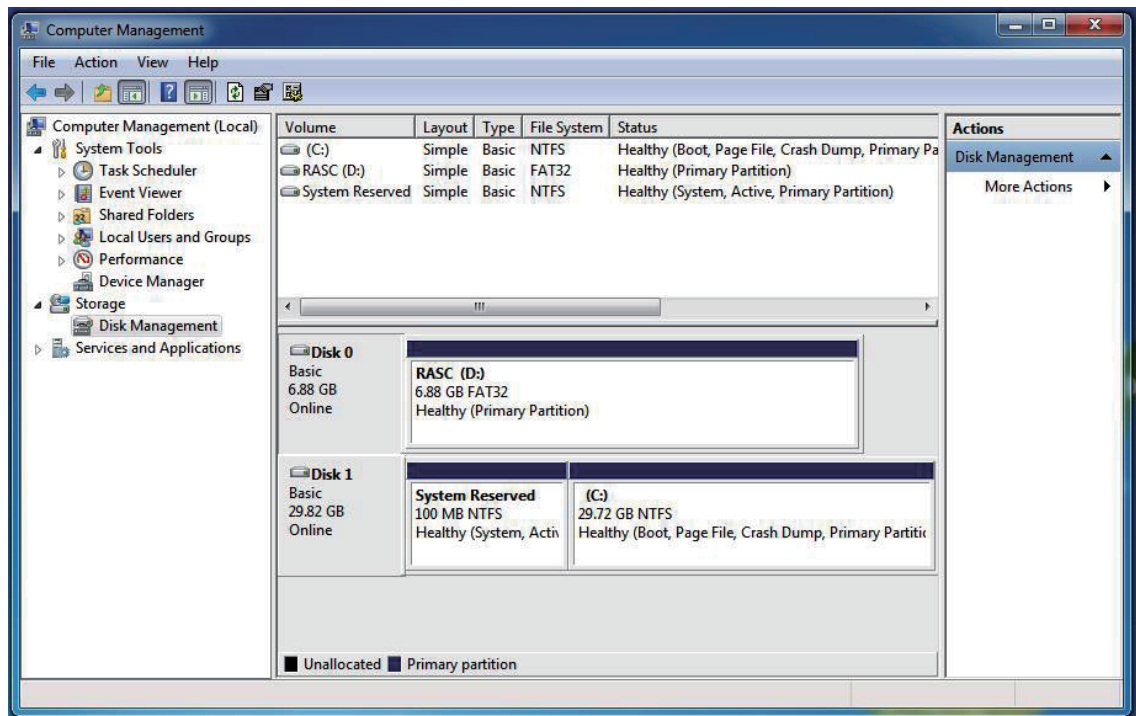


## C.7 Disk Management : Partition the Disk

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

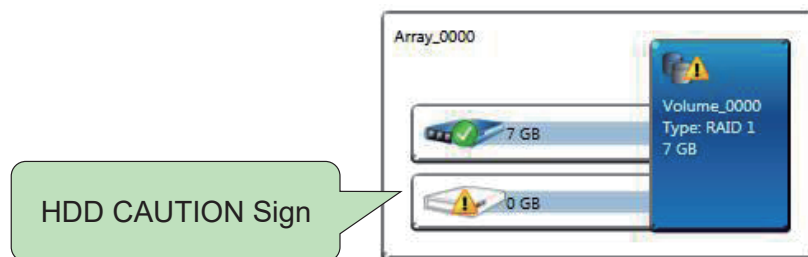


To start disk management tool, select "initialize disk".  
 Then add "Logical Device" for Windows access.

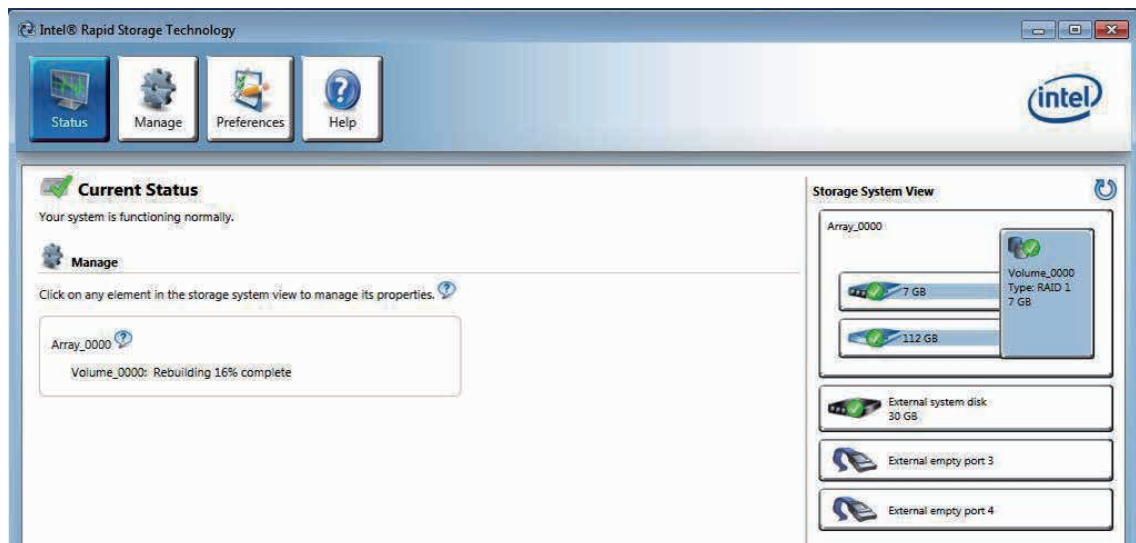


## C.8 If One SATA HDD on RAID Volume is Out-of-use

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



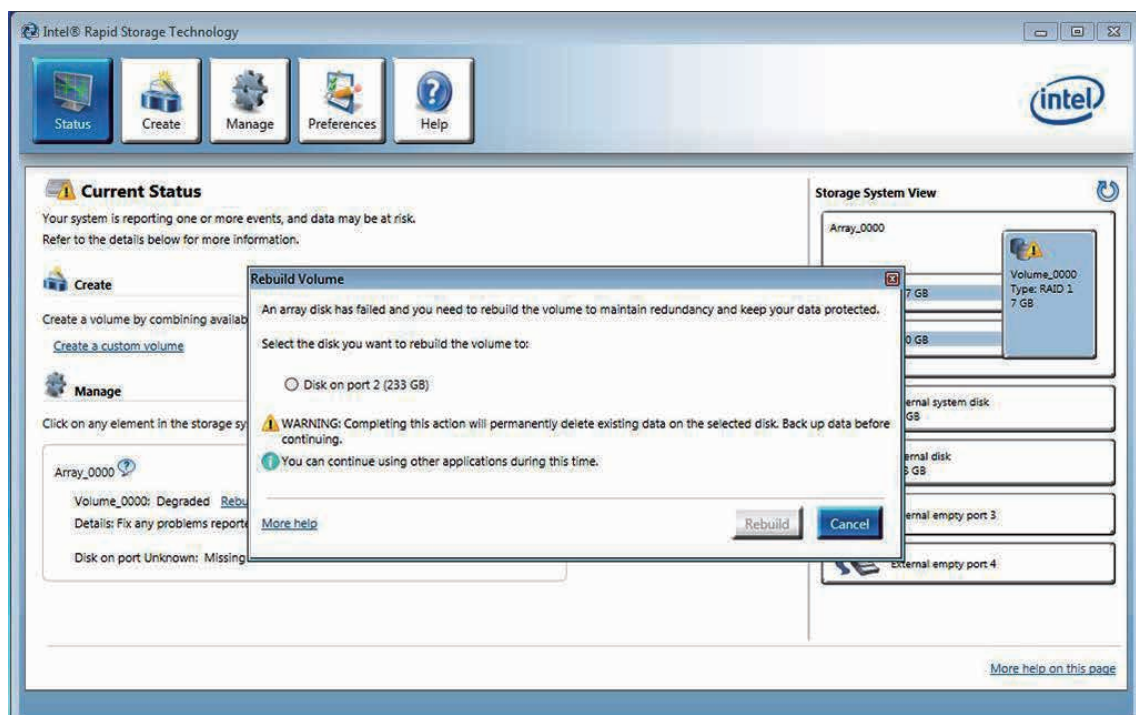
## C.9 Recovery and Auto Rebuild When Use the **SAME** RAID HDD



## C.10 Recovery and Auto Rebuild When Use **DIFFERENT** RAID HDD

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

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



# D

## APPENDIX D : Power Consumption

Testing Board	ECX-2400
RAM	16GB * 2
USB-1	USB Microsoft Wired Keyboard 600
USB-2	USB Mouse HP G1K28AA
USB-3	USB Flash Transcend 3.0 8GB
USB-4	USB Flash Transcend 3.0 16GB
USB-5	USB Flash Kingston 3.0 16GB
USB-6	USB Flash Kingston 3.0 32GB
SATA 0	Transcend SATA SSD420 128GB
SATA 1	Seagate HDD 500GB
LAN 1 (i219)	1.0 Gbps
LAN 2 (i210)	1.0 Gbps
Graphics Output	DVI
Power Plan	Balance (Windows10 Power plan)
Power Source	Chroma 62006P-100-25
Test Program-1	BurnInTest
Test Program-2	FurMark

## D.1 Intel® Core™ i7-10700TE 2.00GHz (16M Cache, 4.40GHz)

Power on and boot to Win 10 (64-bit)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Core™ i7-10700TE	9V	0.404A	03.64W	0.631A	05.68W	1.850A	16.65W
Core™ i7-10700TE	12V	0.349A	04.19W	0.492A	05.90W	1.376A	16.51W
Core™ i7-10700TE	24V	0.230A	05.52W	0.316A	07.59W	1.513A	36.31W
Core™ i7-10700TE	50V	0.165A	08.23W	0.219A	10.95W	0.790A	39.50W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Core™ i7-10700TE	9V	4.038A	36.34W	4.619A	41.57W
Core™ i7-10700TE	12V	3.510A	42.12W	3.601A	43.21W
Core™ i7-10700TE	24V	1.780A	42.72W	1.817A	43.60W
Core™ i7-10700TE	50V	0.968A	48.40W	0.997A	49.85W

## D.2 Intel® Core™ i5-10500E 3.10GHz (12M Cache, 4.20GHz)

Power on and boot to Win 10 (64-bit)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Core™ i5-10500E	9V	0.406A	03.66W	0.630A	05.67W	2.027A	18.24W
Core™ i5-10500E	12V	0.317A	03.80W	0.490A	05.88W	1.383A	16.59W
Core™ i5-10500E	24V	0.214A	05.14W	0.315A	07.55W	0.810A	19.44W
Core™ i5-10500E	50V	0.156A	07.80W	0.217A	10.87W	0.626A	31.32W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Core™ i5-10500E	9V	5.992A	53.93W	7.059A	63.53W
Core™ i5-10500E	12V	4.415A	52.98W	6.151A	73.82W
Core™ i5-10500E	24V	2.414A	57.94W	2.506A	60.15W
Core™ i5-10500E	50V	1.264A	63.19W	1.495A	74.76W

## D.3 Intel® Xeon® W-1270E 3.40GHz (16M Cache, up to 4.80GHz)

Power on and boot to Win 10 (64-bit)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Xeon® W-1270E	9V	0.431A	03.88W	0.604A	05.44W	1.762A	15.86W
Xeon® W-1270E	12V	0.341A	04.10W	0.472A	05.66W	1.324A	15.88W
Xeon® W-1270E	24V	0.269A	06.45W	0.304A	07.30W	1.561A	37.46W
Xeon® W-1270E	50V	0.195A	09.73W	0.212A	10.59W	0.646A	32.29W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Xeon® W-1270E	9V	9.308A	83.77W	9.459A	85.13W
Xeon® W-1270E	12V	6.660A	79.92W	6.775A	81.29W
Xeon® W-1270E	24V	3.412A	81.89W	3.478A	83.46W
Xeon® W-1270E	50V	1.779A	88.95W	1.886A	94.30W



## C.4 Intel® Xeon® W-1290E 3.50GHz (20M Cache, up to 4.80GHz)

Power on and boot to Win 10 (64-bit)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Xeon® W-1290E	9V	0.429A	03.86W	0.604A	05.44W	1.934A	17.41W
Xeon® W-1290E	12V	0.340A	04.08W	0.471A	05.65W	1.902A	22.83W
Xeon® W-1290E	24V	0.237A	05.68W	0.304A	07.29W	1.268A	30.42W
Xeon® W-1290E	50V	0.180A	08.98W	0.213A	10.63W	0.672A	33.60W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Xeon® W-1290E	9V	11.804A	106.23W	13.300A	119.70W
Xeon® W-1290E	12V	8.319A	99.83W	8.462A	101.55W
Xeon® W-1290E	24V	4.195A	100.67W	4.241A	101.79W
Xeon® W-1290E	50V	2.123A	106.15W	2.164A	108.22W

## D.5 Intel® Core™ i5-10500E Add GeForce GTX 1650 Graphics Card

Power on and boot to Win 10 (64-bit)

CPU	Power Input	Standby Mode		Power on and boot to Win 10 (64-bit)			
				Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Core™ i5-10500E	9V	0.402A	03.62W	0.556A	05.00W	3.563A	32.07W
Core™ i5-10500E	12V	0.322A	03.86W	0.438A	05.26W	2.970A	35.64W
Core™ i5-10500E	24V	0.227A	05.45W	0.283A	06.79W	1.107A	26.57W
Core™ i5-10500E	50V	0.173A	08.64W	0.200A	10.00W	0.634A	31.70W

CPU	Power Input	Power on and boot to Win10 (64-bit)			
		Run 100% CPU usage with 2D		Run 100% CPU usage with 3D	
		Max Current	Max Consumption	Max Current	Max Consumption
Core™ i5-10500E	9V	6.626A	59.63W	12.920A	116.28W
Core™ i5-10500E	12V	4.876A	58.51W	9.752A	117.03W
Core™ i5-10500E	24V	2.576A	61.82W	5.011A	120.26W
Core™ i5-10500E	50V	1.370A	68.50W	2.518A	125.90W

# E

## APPENDIX E : Supported Memory & Storage List

### E.1 Test Item

Testing Board	ECX-2400
Memory Test	MemTest86 V8.4
BurnInTest	BurnInTest Pro V8.1 (build 1025)

Channel	Memtest	Bunin	Flash BIOS	Remove Battery
*2	PASS	PASS	PASS	PASS
*1 (Socket 1)	PASS	PASS	N/A	PASS
*1 (Socket 2)	PASS	PASS	N/A	PASS

## E.2 Supported Non-ECC Memory List

Brand	Info	Test Temp. (Celsius)
MEMXPRO 16GB DDR4-2666 SODIMM	D4S-AG26H1G8W2	25°C
UD info 32GB DDR4-2666 SODIMM	UD4S26EBGSLC-A	25°C
Innodisk 16GB DDR4-2933 SODIMM	M4S0-AGS1O5UN-H03	25°C
Innodisk 16GB DDR4-2933 SODIMM	M4S0-AGS1OCUN-H03	25°C
SL LINK 8GB DDR4-3200 SODIMM	J4AGSH1G8TMEC	25°C
SL LINK 16GB DDR4-3200 SODIMM	J4AGSH1G8TMFC	25°C
SL LINK 32GB DDR4-3200 SODIMM	J4BGSH2G8TMFC	25°C
UD info 16GB DDR4-3200 SODIMM	UD4S32GAGSJC-C	25°C
Innodisk 16GB DDR4-3200 SODIMM	M4S0-AGS1OCEM-H03	25°C
Innodisk 16GB DDR4-3200 SODIMM	M4S0-AGS1O5EM-H03	25°C
Innodisk 32GB DDR4-3200 SODIMM	M4S0-BGS2OCEM-H03	25°C
Innodisk 32GB DDR4-3200 SODIMM	M4S0-BGS2O5EM-H03	25°C
AFASTOR 16G DDR4-3200 SODIMM	STI2046SO410825-SD	25°C
AFASTOR 32G DDR4-3200 SODIMM	ST4096SO420825SA	25°C
MEMXPRO 32GB DDR4-3200 SODIMM	D4S-BG32M2G8W1	25°C

### E.3 Supported ECC Memory List

Brand	Info	Test Temp. (Celsius)
KINGSTON 16GB DDR4-2666 SODIMM	KSM26SED8/16ME	25°C
AFASTOR 32GB DDR4-2666 SODIMM	ST4097SO420893SA	25°C
AFASTOR 32GB DDR4-2666 SODIMM	STI4097SO420893SA	25°C
SL LINK 8GB DDR4-3200 SODIMM	J48GDH1G8TMJC	25°C
SL LINK 16GB DDR4-3200 SODIMM	J4AGDH1G8TMKC	25°C
AFASTOR 32GB DDR4-3200 SODIMM	ST4097SO420825SA	25°C
Innodisk 32GB DDR4-3200 SODIMM	M4D0-BGS2QCEM-H03	25°C
Innodisk 32GB DDR4-3200 SODIMM	M4D0-BGS2Q5EM-H03	25°C

## E.4 Supported Storage Device List

Type	Brand	Model	Capacity
Micro SD	Innodisk	3ME2 EA3TFM-064G	64GB
	Innodisk	3ME2 ES3TFW-064G	64GB
	UD info	uSD-08UD	128GB
SATA HDD	Seagate	SDC001	500GB
mSATA SSD	Intel	Intel-310 SSDMAEMC080G2	80GB
	Transcend	mSATA TS64GMSA370	64GB
	Kingston	SUV500MS	120GB
SATA SSD	Kingston	SUV500/120G	120GB
	Intel	540s SSDSC2KW120H6	120GB
	Intel	E5400s SSDSC2KR120H6	120GB
	FORESEE	S903S128G	128GB
	WD	GREEN WDS240G2G0A	240GB
	SAMSUNG	860 EVO MZ-76E250	250GB
	FORESEE	S903S256G	256GB
	LITE-ON	K8-L1256	256GB
	LITE-ON	K8-L1512	512GB
M.2 SSD SATA	SANDISK	X400 SD8SN8U-128G-1002	128GB
	MEMXPRO	M.2 2280 SATA PM31 256GB ST FP28S-B5GTMS464C1	256GB
		M.2 2280 SATA PM31 512GB WT FP28S-E1GTMS464W1	512GB
		M.2 2280 SATA PT31 512GB WT FP28S-E1GMTS594W1	512GB
Innodisk	M.2 (S80) 3TE7 DEM28-01TDK1ECAQF-H03	1TB	

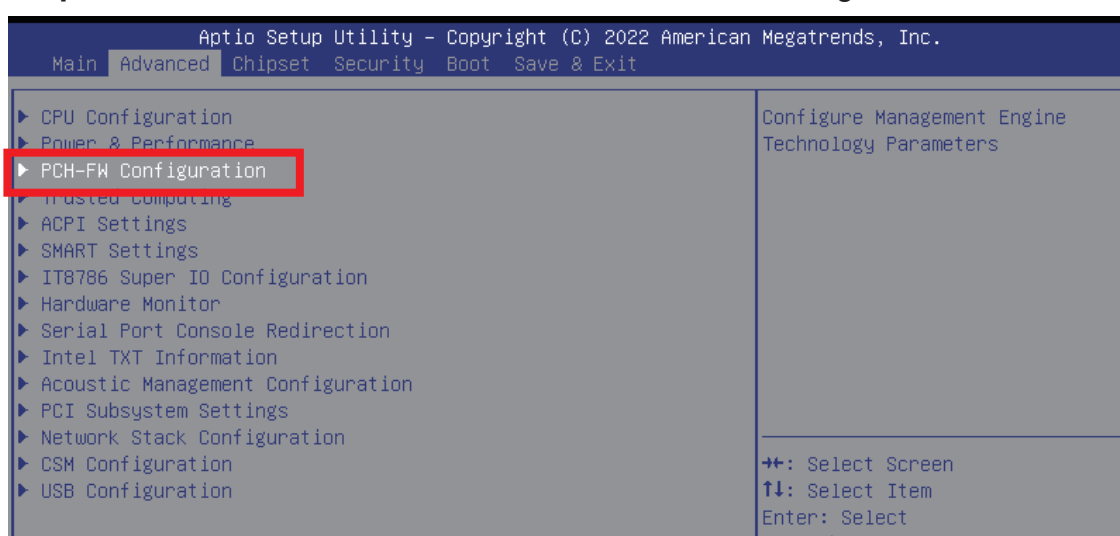
Type	Brand	Model	Capacity
M.2 PCIe SSD	AFASTOR	S1800v (C-temp) SVM2P8B480GST51	480GB
		S1800v (I-temp) SVM2P8B480GSTI51	480GB
		M1400v (C-temp) SVM2PHA480GMT51	480GB
		M1400v (I-temp) SVM2PHA480GMTI51	480GB
	Innodisk	M.2 (P80) 3TE6 DEM28-01TDD1ECAQF-H03	1TB
		M.2 (P80) 3TG3-P DGM28-02TDA1ECBEH-H03	2TB
	INTEL	760P SSDPEKKW128G8	128GB
	SAMSUNG	970 EVO PLUS MZ-V7S250	250GB
	FORESEE	FSGPMMC-256G	256GB
	TOSHIBA	KXG50ZNV512G	512GB
	Kingston	SA1000M8	240GB
SA2000MB		500GB	

\*\* If more help is needed, please contact Vecow Technical Support.\*\*

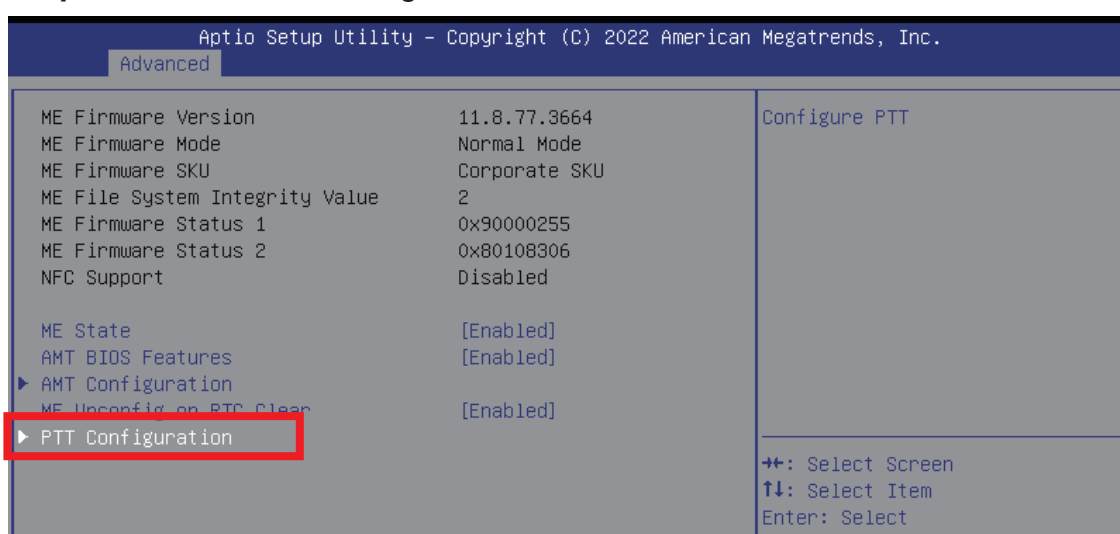
# F

## APPENDIX F : Install Win11 (BIOS TPM Setting)

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

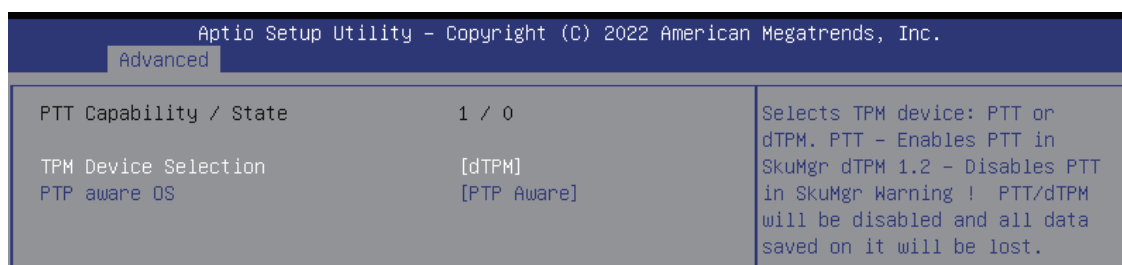
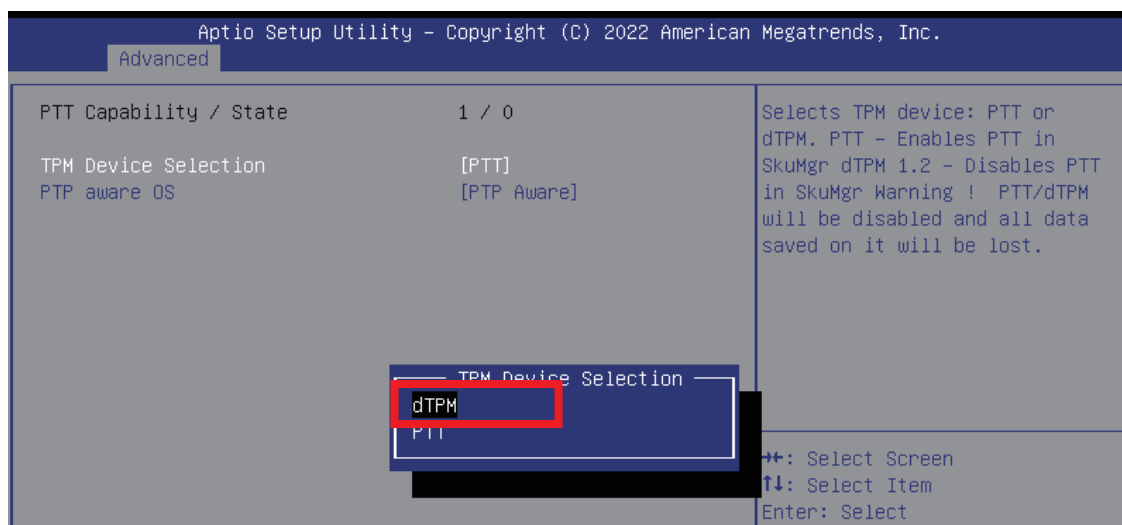


**Step 2** Click on “PTT Configuration”

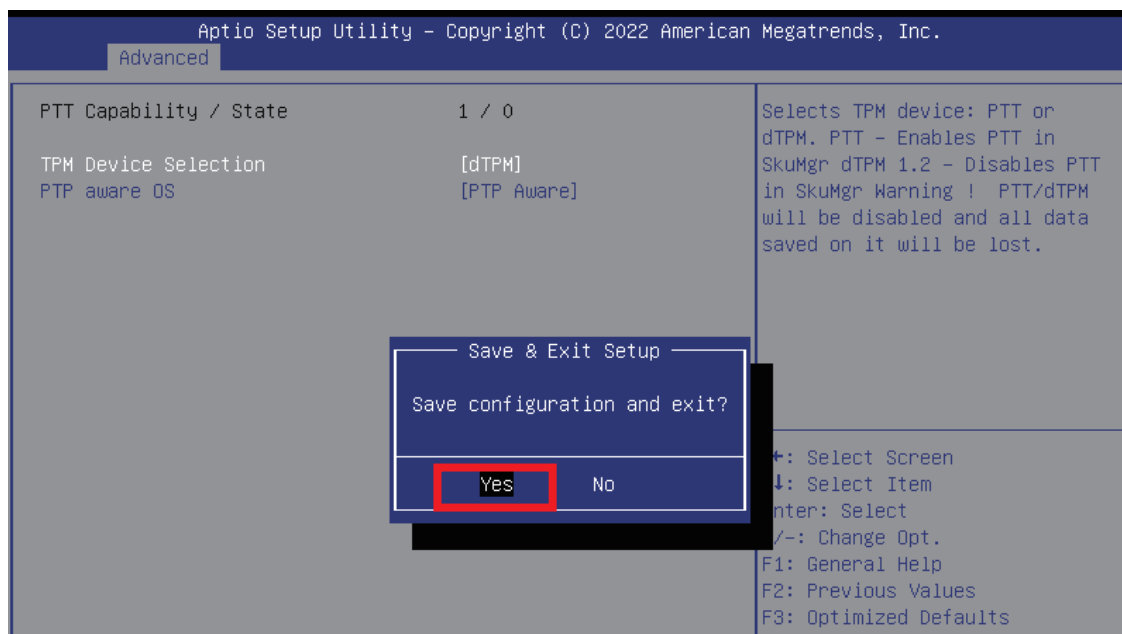




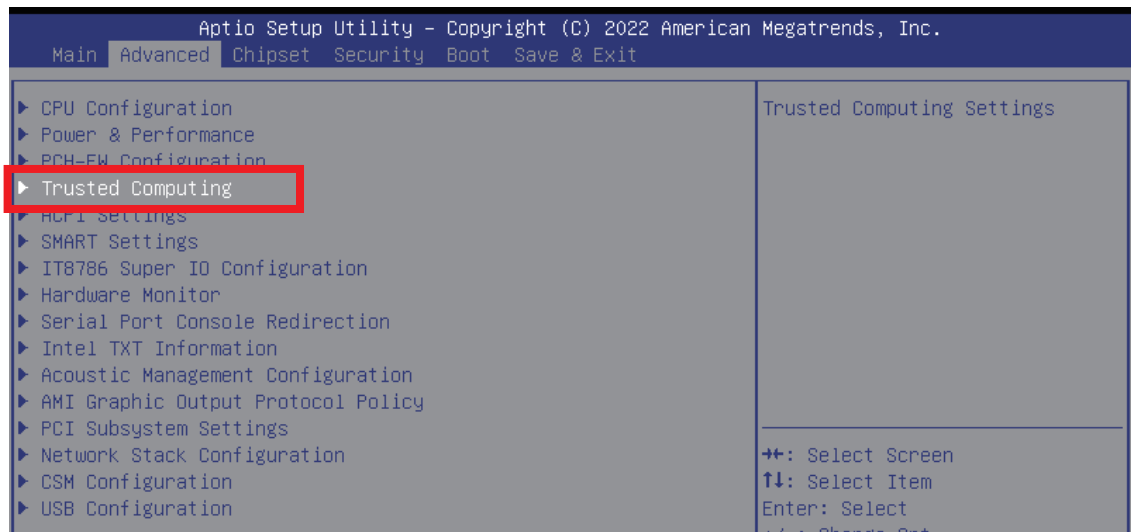
### Step 3 Click on “dTPM” (TPM Device Selection)



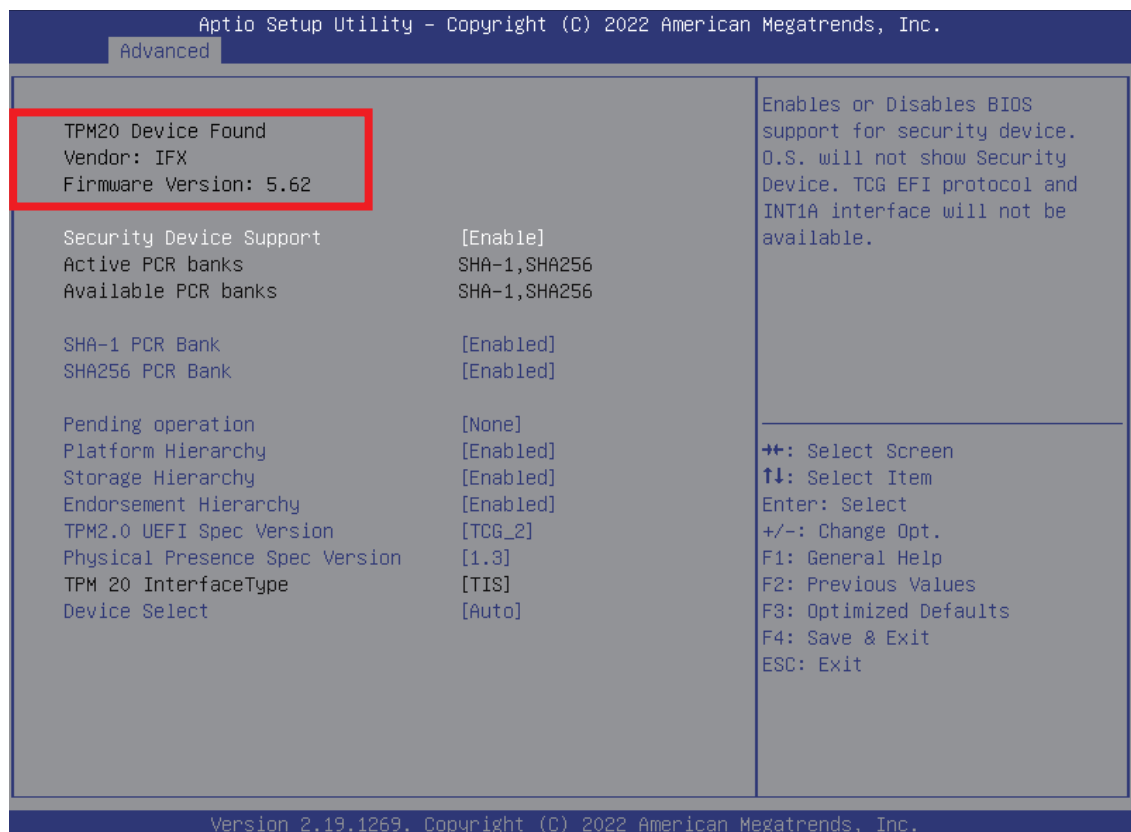
### Step 4 Please save the BIOS settings by pressing F4. Please press Enter when the pop-up window which asks “Save configuration and exit?” appears. The computer will then restart.



**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](http://www.vecow.com)

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