

# ECX-3200/3100 USER Manual

14th Gen Intel® Core™ i9/i7/i5/i3 Expandable Fanless System  
Workstation-grade, 4 2.5G LAN w/4 X-coded M12 PoE+, 2 SSD Tray, 1 PCIe Slot

# Record of Revision

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Version	Date	Page	Description	Remark
1.00	2023/5/29	All	Official Release	
2.00	2024/1/29	All	Update	
3.00	2024/7/9	All	Update	
3.10	2024/10/16	3, 5, 7, 18, 142	Update	

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# Declaration of Conformity

**FCC** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if it is not installed and used in accordance with the instruction manual, it may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

**CE** The products described in this manual comply with all applicable European Union (CE) directives if it has a CE marking. For computer systems to remain CE compliant, only CE-compliant parts may be used. Maintaining CE compliance also requires proper cable and cabling techniques.

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## Order Information

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Part Number	Description
ECX-3200MX	ECX-3200MX, 4 2.5G M12 LAN with PoE+, 2 GigE LAN, 2 Front-access SSD trays, 1 PCIe x16 slot, 6 USB 3.2, 1 USB Type C, 4 COM, 32 Isolated DIO
ECX-3200	ECX-3200, 4 2.5G RJ45 LAN with PoE+, 2 GigE LAN, 2 Front-access SSD trays, 1 PCIe x16 slot, 6 USB 3.2, 1 USB Type C, 4 COM, 32 Isolated DIO
ECX-3100	ECX-3100, 2 GigE LAN, 2 Front-access SSD trays, 1 PCIe x16 slot, 6 USB 3.2, 1 USB Type C, 4 COM, 16 GPIO



# CPU List

Series	CPU	Cores	GHz	TDP (W)	ECC
Intel® Core™ (14th Gen)*	i9-14900	24	5.8	65	Y
	i7-14700	20	5.4		
	i5-14500	14	5		
	i3-14100	4	4.7		
	i9-14900T	24	5.5	35	
	i7-14700T	20	5.2		
	i5-14500T	14	4.8		
	i3-14100T	4	4.4		
Intel® Core™ (13th Gen)	i9-13900E	24	5.2	65	
	i7-13700E	16	5.1		
	i5-13500E	14	4.6		
	i3-13100E	4	4.4		
	i9-13900TE	24	5	35	
	i7-13700TE	16	4.8		
	i5-13500TE	14	4.5		
	i3-13100TE	4	4.1		
Intel® Core™ (12th Gen)	i9-12900E	16	5	65	
	i7-12700E	12	4.8		
	i5-12500E	6	4.5		
	i3-12100E	4	4.2		
	i9-12900TE	16	4.8	35	
	i7-12700TE	12	4.7		
	i5-12500TE	6	4.3		
	i3-12100TE	4	4		

\* 14th Gen support PC Client use condition only.

## Optional Accessories

Part Number	Description
DDR5 48G	Certified DDR5 48GB 5600MHz RAM
DDR5 32G	Certified DDR5 32GB 4800/5600MHz RAM
DDR5 24G	Certified DDR5 24GB 5600MHz RAM
DDR5 16G	Certified DDR5 16GB 4800/5600MHz RAM
DDR5 8G	Certified DDR5 8GB 4800/5600MHz 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-180WB	180W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block (7.62mm pitch)
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
PWA-330WB	330W, 24V, 90V AC to 264V AC Power Adapter with 3-pin Terminal Block (7.62mm pitch)
PWS-480W-WT	480W, 24V, 90V AC to 305V AC Power Supply, Wide-Temp, IP65
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
Rackmount	2U Rackmount Kit
DIN Rail	DIN Rail and VESA Mounting Kit
VESA Mount	VESA Mounting Kit
Anti-Vibration Kit	Anti-Vibration Wall Mount Bracket for ECX-3200/3100 (Vibration : 5Grms)
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-3200/3100 is a workstation-grade expandable Fanless Embedded System. Featuring 14th Gen Intel® Core™ processors that run with an Intel® R680E PCH and support max 65W TDP CPU, the ECX-3200/3100 is rugged, expandable and flexible and designed for meeting requirements across industry applications from Machine Vision, Robot Waiter and Rolling Stock to Smart Retail and any Edge AI applications.

The ECX-3200/3100 comes with various I/O Interfaces; the ECX-3200MX supports 4 2.5G LAN with 4 M12 PoE+ and brings reliability and performance to railway applications in harsh operating environments. The ECX-3200 offers flexibility to select the most optimal configuration for smart retail, machine vision and more. Among other applications that require simplified GigE LAN capabilities, front-access data storage and PCIe flexible expansion, the ECX-3100 is a good fit solution.

The ECX-3200/3100 provides industrial-grade features of rugged X-coded M12 PoE+, fanless design and supports -40°C to 75°C operation temperature, 9V to 50V power input and software ignition power control, enabling a broad range of demanding applications.

## 1.2 Features

- Workstation-grade Platform : Intel® Core™ i9/i7/i5/i3 Processor (14th gen, codename : RPL-S Refresh/RPL-S/ADL-S) running with Intel® R680E PCH supports max 65W TDP CPU
- 2 DDR5 5200MHz Memory support up to 96GB
- 4 Independent 2.5GigE LAN with 4 IEEE 802.3at PoE+
- 1 USB 3.2 Gen 2x2 Type C support up to 20Gbps data transfer
- DC 9V to 50V Power Input, Software Ignition Control
- 1 PCIe x16, 32 Isolated DIO, 4 COM RS-232/422/485
- 5G/WiFi/BT/4G/LTE/GPRS/UMTS, Supports Intel® vPro, TCC, Time-Sensitive Networking (TSN), and TPM 2.0
- Optional VHub One-Stop AIoT Solution Service supports OpenVINO based AI accelerator and advanced Edge AI applications
- Fanless, -40°C to 75°C Operation Temperature

## 1.3 Product Specification

### 1.3.1 Specifications of ECX-3200MX

System	
Processor	<ul style="list-style-type: none"> <li>24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh)</li> <li>24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S)</li> <li>16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)</li> </ul>
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 5200MHz SO-DIMM, up to 96GB (ECC/Non-ECC)
I/O Interface	
Serial	4 COM RS-232/422/485 (ESD 8KV)
USB	<ul style="list-style-type: none"> <li>6 USB 3.2 Gen 2, USB Type A Connector</li> <li>1 USB 3.2 Gen 2x2, USB Type C Connector supports max 20Gbps data transfer (15W, 5V/3A)</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD, Wireless, PoE
SIM Card	3 External Nano SIM Card Sockets
RTC Battery	1 Front-access RTC Battery
Expansion	
Mini PCIe	1 Mini PCIe sockets for PCIe/USB/SIM Card
PCI/PCIe	1 PCIe x16 Slot
M.2	<ul style="list-style-type: none"> <li>1 M.2 Key B Socket (2280/3042)</li> <li>1 M.2 Key B Socket (2280/3052)</li> <li>1 M.2 Key E Socket (2230)</li> </ul>
SUMIT A, B	<ul style="list-style-type: none"> <li>2 SUMIT Slot (Optional)</li> </ul>
Graphics	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® X <sup>e</sup> Architecture
Interface	<ul style="list-style-type: none"> <li>1 DVI-I : Up to 1920 x 1080 @60Hz</li> <li>1 HDMI : Up to 1920 x 1080 @60Hz</li> <li>2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz</li> </ul>
Storage	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 Front-access 2.5" SSD/HDD Tray
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
LAN 2	Intel® I210 GigE LAN
<b>PoE</b>	
LAN 3	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226, X-Coded M12 Connector
LAN 4	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226, X-Coded M12 Connector
LAN 5	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226, X-Coded M12 Connector
LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226, X-Coded M12 Connector
<b>Power</b>	
Input Voltage	DC 9V to 50V Power Input
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
<b>Others</b>	
TPM	Infineon SLB9670 supports TPM 2.0, SPI 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 79.0mm (10.24" x 9.45" x 3.11")
Weight	4.5 kg (9.92 lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail and VESA Mounting (Optional)</li> <li>• 2U Rackmount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature (with air flow)	<b>35W TDP CPU</b> : -40°C to 75°C (-40°F to 167°F) <b>65W TDP CPU</b> : -40°C to 55°C (-40°F to 131°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock	<ul style="list-style-type: none"> <li>• IEC 60068-2-27</li> <li>• SSD : 50G @ wallmount, Half-sine, 11ms</li> </ul>
Vibration	<ul style="list-style-type: none"> <li>• IEC 60068-2-64</li> <li>• SSD : 5Grms, 5Hz to 500Hz, 3 Axis</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2



### 1.3.2 Specifications of ECX-3200

<b>System</b>	
Processor	<ul style="list-style-type: none"> <li>• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh)</li> <li>• 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S)</li> <li>• 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)</li> </ul>
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 5200MHz SO-DIMM, up to 96GB (ECC/Non-ECC)
<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 Gen 2, USB Type A Connector</li> <li>• 1 USB 3.2 Gen 2x2, USB Type C Connector supports max 20Gbps data transfer (15W, 5V/3A)</li> </ul>
Isolated DIO	32 Isolated DIO : 16 DI, 16 DO
LED	Power, HDD, Wireless, PoE
SIM Card	3 External Nano SIM Card Sockets
RTC Battery	1 Front-access RTC Battery
<b>Expansion</b>	
Mini PCIe	1 Mini PCIe sockets for PCIe/USB/SIM Card
PCI/PCIe	1 PCIe x16 Slot
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (2280/3042)</li> <li>• 1 M.2 Key B Socket (2280/3052)</li> <li>• 1 M.2 Key E Socket (2230)</li> </ul>
SUMIT A, B	• 2 SUMIT Slot (Optional)
<b>Graphics</b>	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® X <sup>e</sup> Architecture
Interface	<ul style="list-style-type: none"> <li>• 1 DVI-I : Up to 1920 x 1080 @60Hz</li> <li>• 1 HDMI : Up to 1920 x 1080 @60Hz</li> <li>• 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz</li> </ul>
<b>Storage</b>	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 Front-access 2.5" SSD/HDD Tray
<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
LAN 2	Intel® I210 GigE LAN

<b>PoE</b>	
LAN 3	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226, RJ45 Connector
LAN 4	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226, RJ45 Connector
LAN 5	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226, RJ45 Connector
LAN 6	2.5GigE IEEE 802.3at (25.5W/48V) PoE+ by Intel® I226, RJ45 Connector
<b>Power</b>	
Input Voltage	DC 9V to 50V Power Input
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
<b>Others</b>	
TPM	Infineon SLB9670 supports TPM 2.0, SPI 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 79.0mm (10.24" x 9.45" x 3.11")
Weight	4.5 kg (9.92 lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail and VESA Mounting (Optional)</li> <li>• 2U Rackmount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature (with air flow)	<b>35W TDP CPU</b> : -40°C to 75°C (-40°F to 167°F) <b>65W TDP CPU</b> : -40°C to 55°C (-40°F to 131°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock	<ul style="list-style-type: none"> <li>• IEC 60068-2-27</li> <li>• SSD : 50G @ wallmount, Half-sine, 11ms</li> </ul>
Vibration	<ul style="list-style-type: none"> <li>• IEC 60068-2-64</li> <li>• SSD : 5Grms, 5Hz to 500Hz, 3 Axis</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

### 1.3.3 Specifications of ECX-3100

<b>System</b>	
Processor	<ul style="list-style-type: none"> <li>• 24-core Intel® Core™ i9/i7/i5/i3 Processor (14th gen, Raptor Lake-S Refresh)</li> <li>• 24-core 13th Gen Intel® Core™ i9/i7/i5/i3 Processor (Raptor Lake-S)</li> <li>• 16-core 12th Gen Intel® Core™ i9/i7/i5/i3 Processor (Alder Lake-S)</li> </ul>
Chipset	Intel® R680E
BIOS	AMI
SIO	IT8786E
Memory	2 DDR5 5200MHz SO-DIMM, up to 96GB (ECC/Non-ECC)
<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 Gen 2, USB Type A Connector</li> <li>• 1 USB 3.2 Gen 2x2, USB Type C Connector supports max 20Gbps data transfer (15W, 5V/3A)</li> </ul>
Isolated DIO	16 GPIO
LED	Power, HDD, Wireless, PoE
SIM Card	3 External Nano SIM Card Sockets
RTC Battery	1 Front-access RTC Battery
<b>Expansion</b>	
Mini PCIe	1 Mini PCIe sockets for PCIe/USB/SIM Card
PCI/PCIe	1 PCIe x16 Slot
M.2	<ul style="list-style-type: none"> <li>• 1 M.2 Key B Socket (2280/3042)</li> <li>• 1 M.2 Key B Socket (2280/3052)</li> <li>• 1 M.2 Key E Socket (2230)</li> </ul>
SUMIT A, B	• 2 SUMIT Slot (Optional)
<b>Graphics</b>	
Graphics Processor	Intel® UHD Graphics 770/730 driven by Intel® X <sup>e</sup> Architecture
Interface	<ul style="list-style-type: none"> <li>• 1 DVI-I : Up to 1920 x 1080 @60Hz</li> <li>• 1 HDMI : Up to 1920 x 1080 @60Hz</li> <li>• 2 DisplayPort : Up to 7680 x 4320 @60Hz/5120 x 2880 @120Hz</li> </ul>
<b>Storage</b>	
SATA	2 SATA III (6Gbps) support S/W RAID 0, 1
M.2	1 M.2 Key M Socket (2280, PCIe x4)
Storage Device	2 Front-access 2.5" SSD/HDD Tray
<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
LAN 2	Intel® I210 GigE LAN

<b>Power</b>	
Input Voltage	DC 9V to 50V Power Input
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
<b>Others</b>	
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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 79.0mm (10.24" x 9.45" x 3.11")
Weight	4.5 kg (9.92 lb)
Mounting	<ul style="list-style-type: none"> <li>• Wallmount by mounting bracket</li> <li>• DIN Rail and VESA Mounting (Optional)</li> <li>• 2U Rackmount (Optional)</li> </ul>
<b>Environment</b>	
Operating Temperature (with air flow)	<b>35W TDP CPU</b> : -40°C to 75°C (-40°F to 167°F) <b>65W TDP CPU</b> : -40°C to 55°C (-40°F to 131°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% humidity, non-condensing
Relative Humidity	95% at 75°C
Shock	<ul style="list-style-type: none"> <li>• IEC 60068-2-27</li> <li>• SSD : 50G @ wallmount, Half-sine, 11ms</li> </ul>
Vibration	<ul style="list-style-type: none"> <li>• IEC 60068-2-64</li> <li>• SSD : 5Grms, 5Hz to 500Hz, 3 Axis</li> </ul>
EMC	CE, FCC, EN50155, EN50121-3-2

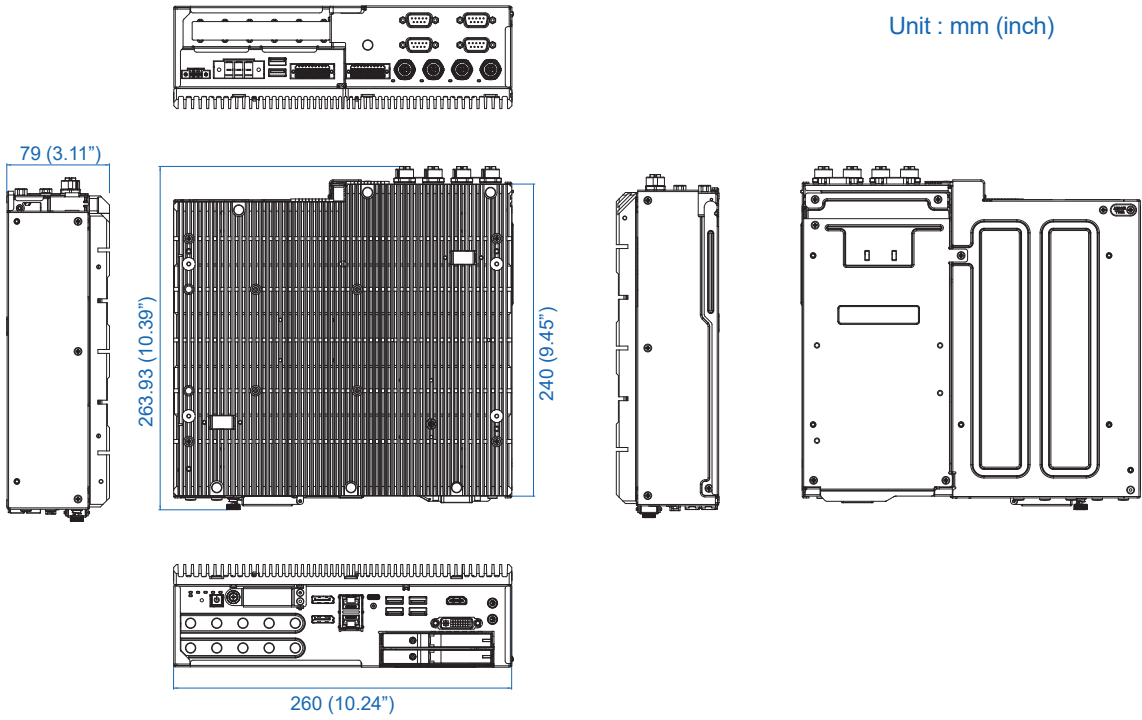
## 1.4 Supported CPU List

Series	CPU	Cores	GHz	TDP (W)	ECC
Intel® Core™ (14th Gen)*	i9-14900	24	5.8	65	Y
	i7-14700	20	5.4		
	i5-14500	14	5		
	i3-14100	4	4.7		
	i9-14900T	24	5.5	35	
	i7-14700T	20	5.2		
	i5-14500T	14	4.8		
	i3-14100T	4	4.4		
Intel® Core™ (13th Gen)	i9-13900E	24	5.2	65	
	i7-13700E	16	5.1		
	i5-13500E	14	4.6		
	i3-13100E	4	4.4		
	i9-13900TE	24	5	35	
	i7-13700TE	16	4.8		
	i5-13500TE	14	4.5		
	i3-13100TE	4	4.1		
Intel® Core™ (12th Gen)	i9-12900E	16	5	65	
	i7-12700E	12	4.8		
	i5-12500E	6	4.5		
	i3-12100E	4	4.2		
	i9-12900TE	16	4.8	35	
	i7-12700TE	12	4.7		
	i5-12500TE	6	4.3		
	i3-12100TE	4	4		

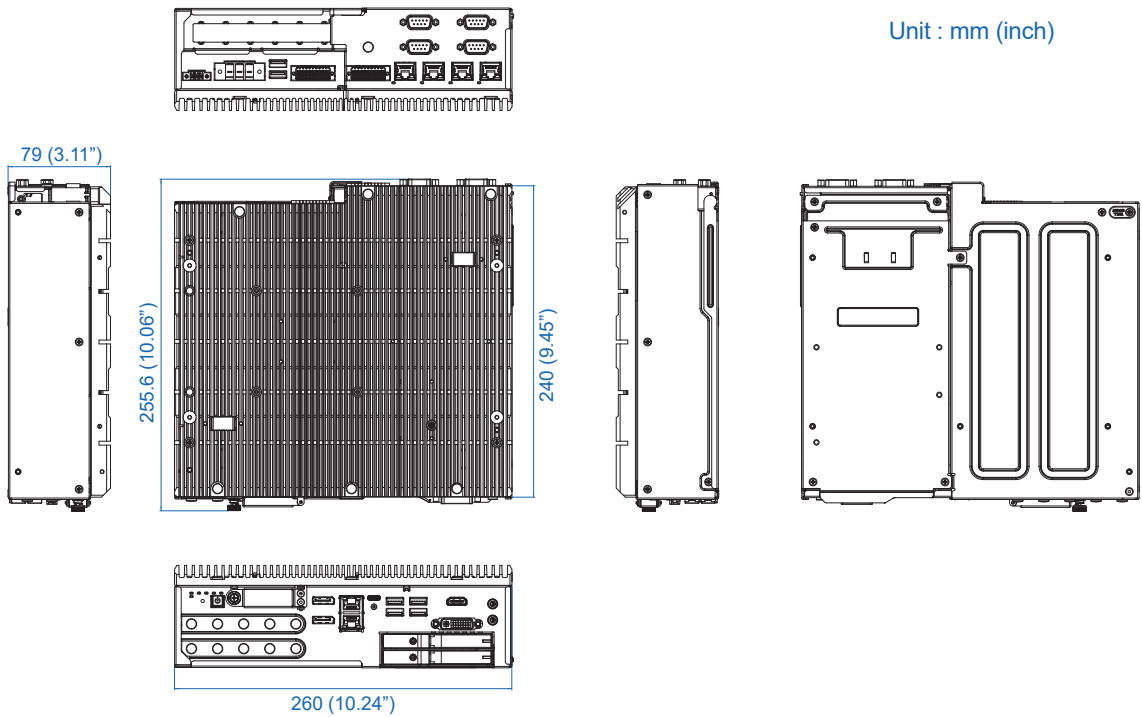
\* 14th Gen support PC Client use condition only.

# 1.5 Mechanical Dimension

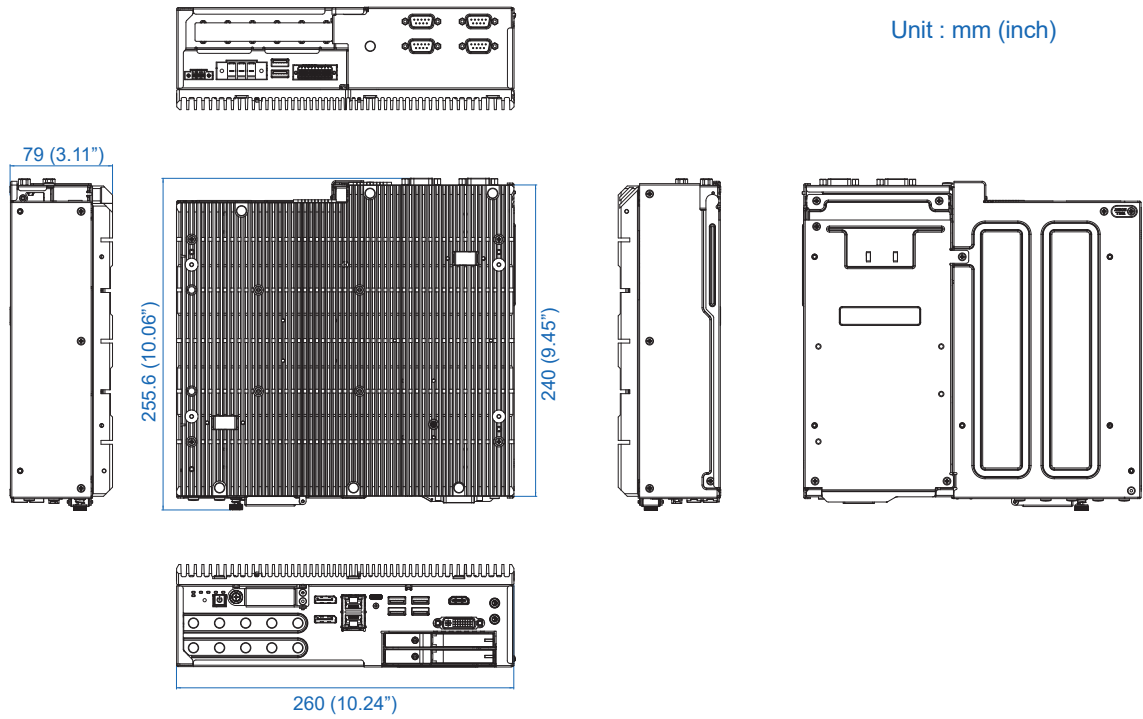
## 1.5.1 Dimensions of ECX-3200MX



## 1.5.2 Dimensions of ECX-3200



### 1.5.3 Dimensions of ECX-3100



# 2

## GETTING TO KNOW YOUR ECX-3200/3100

### 2.1 Packing List

#### 2.1.1 ECX-3200MX Packing List

Item	Description	Qty
1	ECX-3200MX Expandable Fanless System (According to the configuration of you order, the ECX-3200/3100 series may contain SSD/HDD and DDR5 SO-DIMM. Please verify these items if necessary.)	1

Item	Description	Outlook	Usage	P/N	Qty
1	P head_ M2.5x6L_ Ni		Mini PCIe module card	53-M009310-000	1
2	I head_ M3x4L_ Ni_ Nylok		M.2 module card	53-M006400-010	4
3	Hex. standoff_ M3x11.5L_ Nylok		Wall mount bracket	53-M006281-214	4
4	Flat head_ M3x5L_ Black_ Nylok		Wall mount bracket	53-M004950-310	6
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	62-03P1100-20B	2
9	Key		SSD/HDD tray	N/A	2



## 2.1.2 ECX-3200 Packing List

Item	Description	Qty
1	ECX-3200 Expandable Fanless System (According to the configuration of you order, the ECX-3200/3100 series may contain SSD/HDD and DDR5 SO-DIMM. Please verify these items if necessary.)	1

Item	Description	Outlook	Usage	P/N	Qty
1	P head_ M2.5x6L_Ni		Mini PCIe module card	53-M009310-000	1
2	I head_ M3x4L_ Ni_Nylok		M.2 module card	53-M006400-010	4
3	Hex. standoff_ M3x11.5L_ Nylok		Wall mount bracket	53-M006281-214	4
4	Flat head_ M3x5L_ Black_Nylok		Wall mount bracket	53-M004950-310	6
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	62-03P1100-20B	2
9	Key		SSD/HDD tray	N/A	2

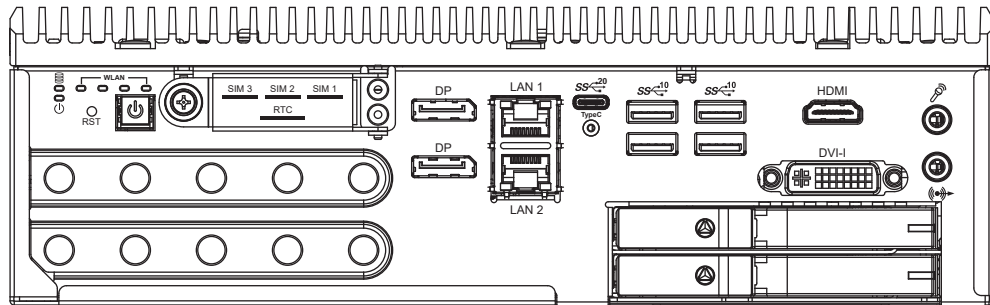
### 2.1.3 ECX-3100 Packing List

Item	Description	Qty
1	ECX-3100 Expandable Fanless System (According to the configuration of you order, the ECX-3200/3100 series may contain SSD/HDD and DDR5 SO-DIMM. Please verify these items if necessary.)	1

Item	Description	Outlook	Usage	P/N	Qty
1	P head_ M2.5x6L_ Ni		Mini PCIe module card	53-M009310-000	1
2	I head_ M3x4L_ Ni_ Nylok		M.2 module card	53-M006400-010	4
3	Hex. standoff_ M3x11.5L_ Nylok		Wall mount bracket	53-M006281-214	4
4	Flat head_ M3x5L_ Black_ Nylok		Wall mount bracket	53-M004950-310	6
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	62-03P1100-20B	2
9	Key		SSD/HDD tray	N/A	2

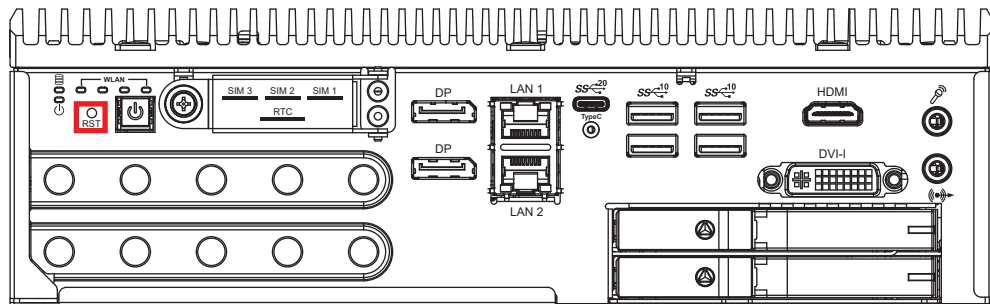
## 2.2 Front Panel I/O Functions

In Vecow ECX-3200/3200MX/3100 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, USB TYPE-C, HDMI, DVI-I, Display Port and any additional storage, are placed on the front panel.



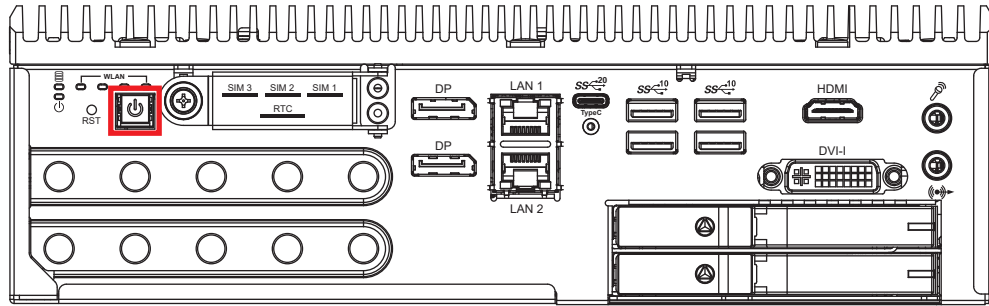
It is a hardware reset switch. Use this switch to reset the system without power off the system. Press the Reset Switch for a few seconds, then reset will be enabled.

### 2.2.1 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

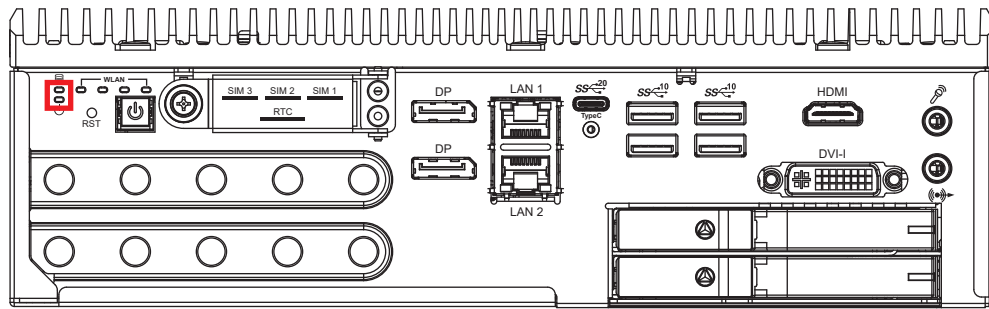
To power on the system, press the power button and then the blue LED is lightened.

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

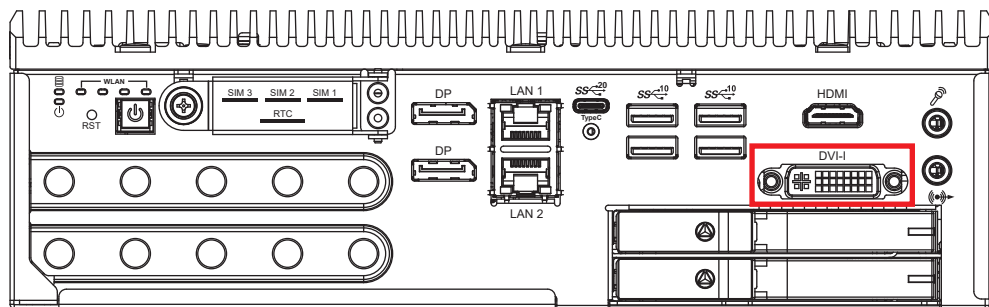


**HDD LED/Yellow** : A Hard Disk LED. If the LED is on, it indicates that the system's storage is functional. If it is off, it indicates that the system's storage is not functional. If it is flashing, it indicates data access activities.

**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)

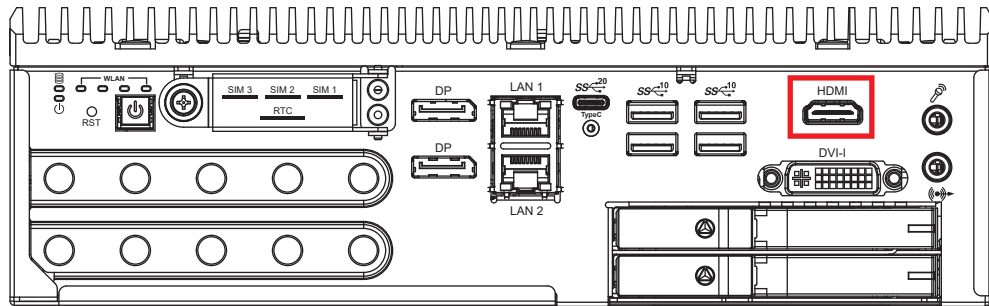
### 2.2.4 DVI-I Connector



- The DVI-I connector on the front panel supports both DVI and VGA display modes.
- This connector can output DVI signals. The DVI output mode supports up to 1920x1200 resolution.
- The DVI mode is automatically selected according to the display device connected.
- You will need a DVI-I cable when connecting to a display device.
- The VGA output mode supports up to 1920x1200 resolution.
- If use VGA function will need a DVII to VGA module connecting to DVI-I device.
- Below is the DVII to VGA module picture

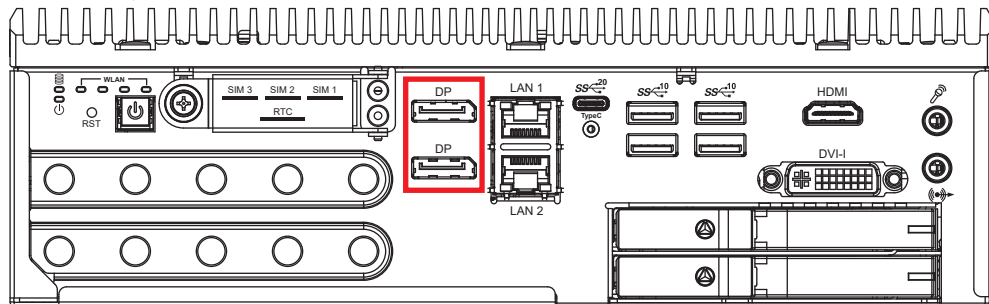


## 2.2.5 HDMI Connector



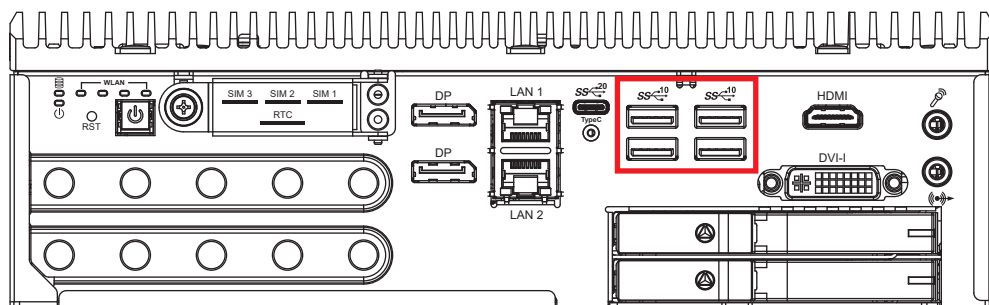
Onboard HDMI Port supports DDC channel mode. The connection supports up to 3840 x 2160 resolution at 30Hz.

## 2.2.6 DisplayPort



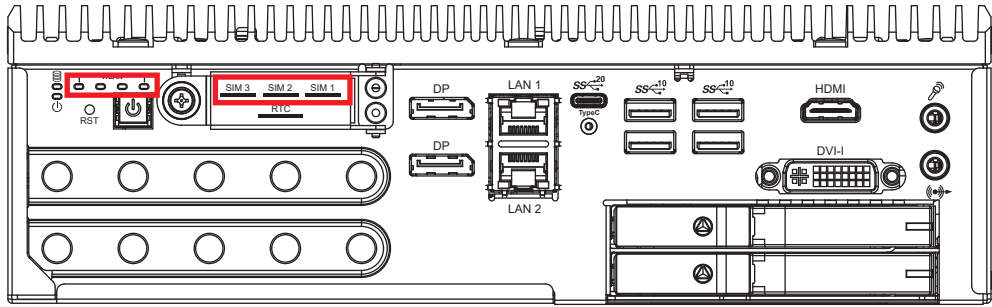
Onboard Display Port support auxiliary channel dual mode, connection supports up to 7680x4320 resolution at 60 Hz.

## 2.2.7 USB 3.2



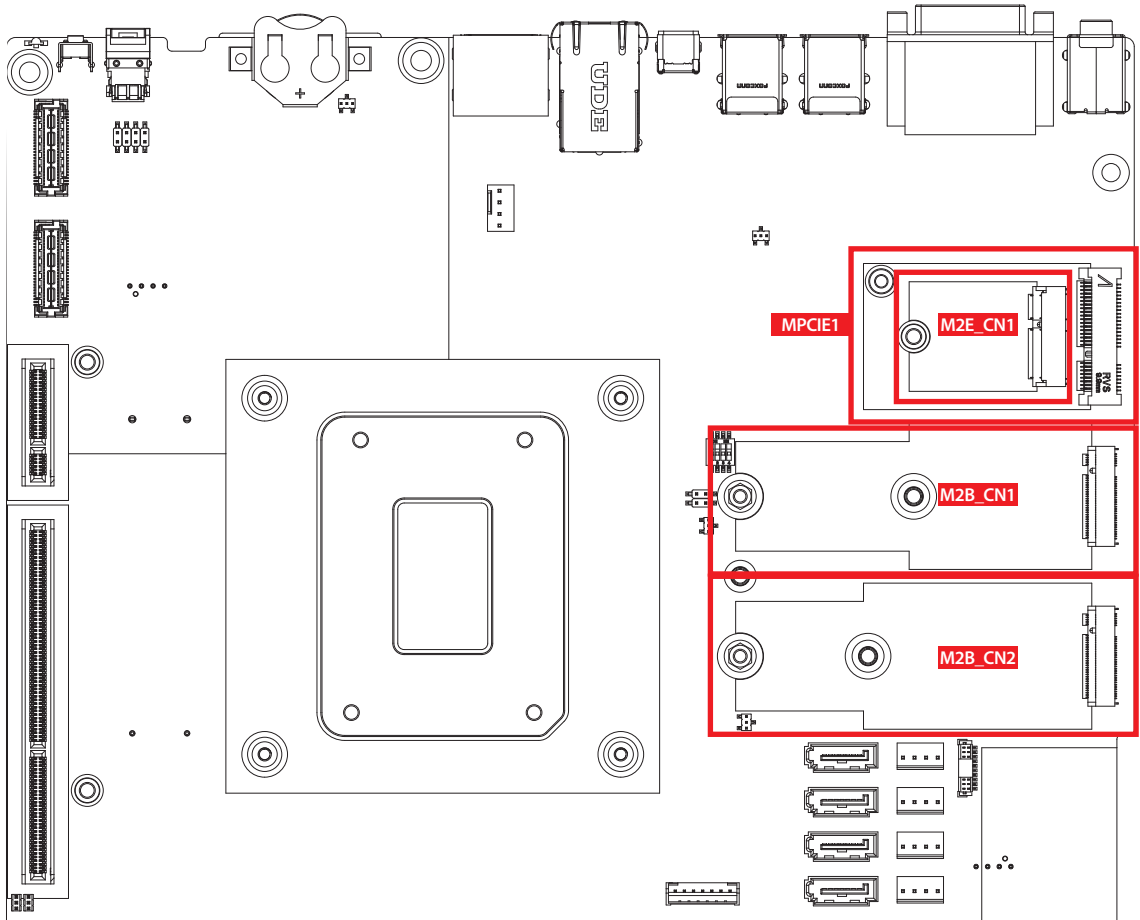
There are 4 USB 3.2 connections available supporting up to 10GB per second data rate in the front side of ECX-3200/3200MX/3100 series. It also compliant with the requirements of Super Speed (SS), high speed (HS), full speed (FS) and low speed (LS).

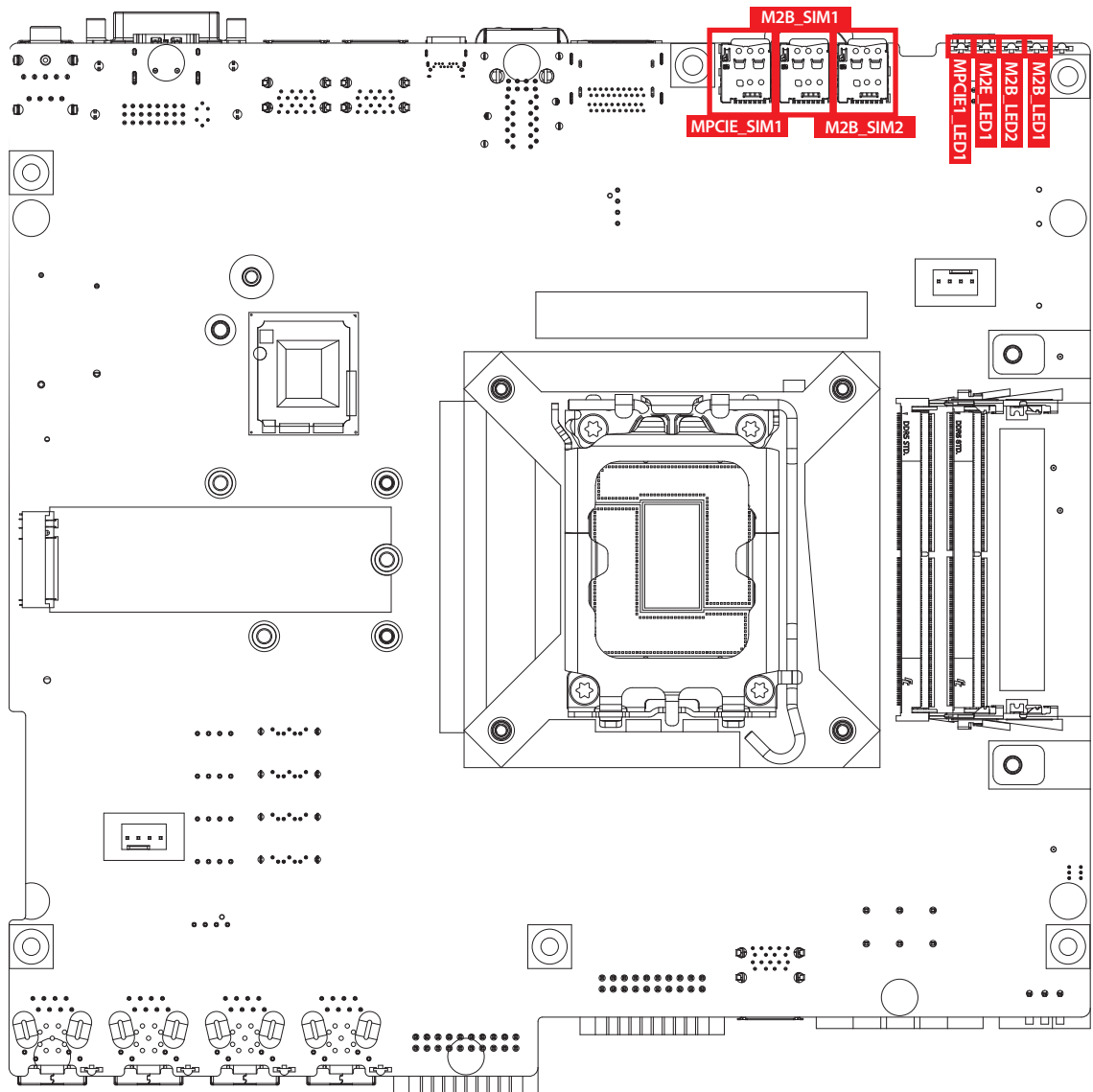
## 2.2.8 WLAN LED, Mini PCIe, M.2 KEY B, M.2 KEY M, Nano SIM Card Comparison



Mini PCIe Slot/ Nano SIM Slot/ M.2 KEY B/ M.2 KEY M / WLAN LED Mapping Table :

Mini PCIe	SIM	LED
MPCIe 1	SIM 1	1
M.2 KEY B	SIM 2	3
M.2 KEY B	SIM 3	4
M.2 KEY E	X	2



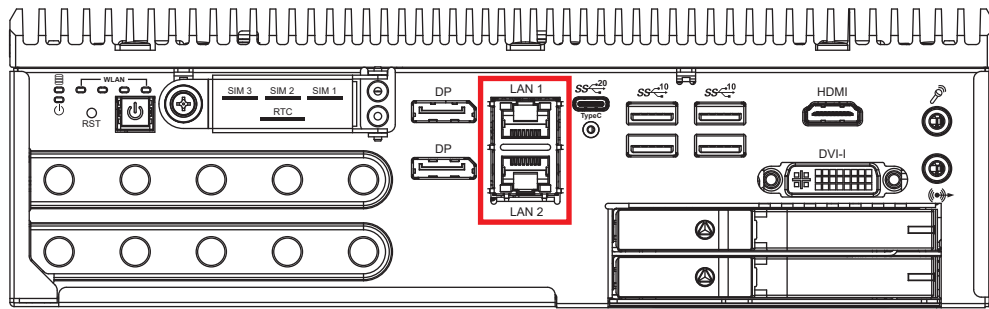


**Note :**

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 work in normal status, iAMT 16.0 function is enabled.

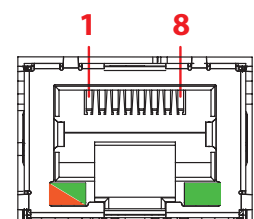
Using suitable RJ-45 cable, you can connect the system to a computer, or to any other devices with Ethernet connection, for example, a hub or a switch. Moreover, both of LAN 1 and LAN 2 supports Wake on LAN and Pre-boot functions. The pin-outs of LAN 1 and LAN 2 are listed as follows:

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

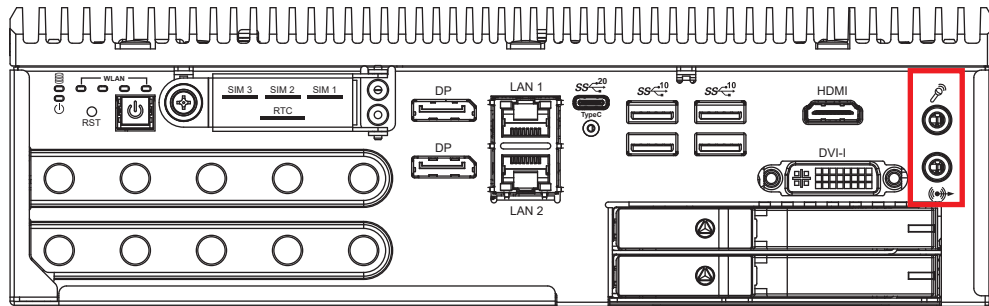
Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/Link/Speed status of the connection.

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



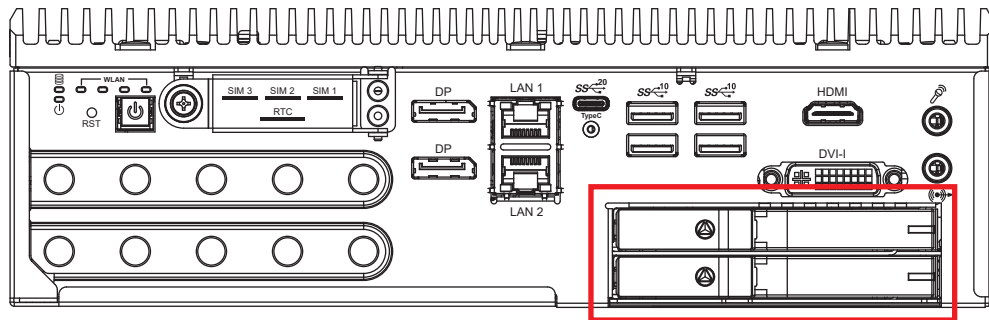
## 2.2.10 Audio Connector



There are 2 audio connectors, Mic-in and Line-out, in the front side of ECX-3200/3200MX/3100. Onboard Realtek ALC888 audio codec supports 7.1 channel HD audio and fully complies with Intel® High Definition Audio (Azalia) specifications.

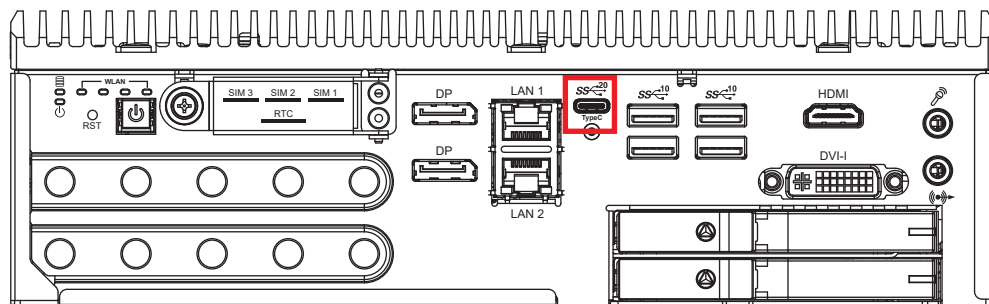
To utilize the audio function in Windows platform, you need to install corresponding drivers for both Intel Sunrise Point chipset and Realtek ALC888S-VD codec.

## 2.2.11 SSD/HDD Tray



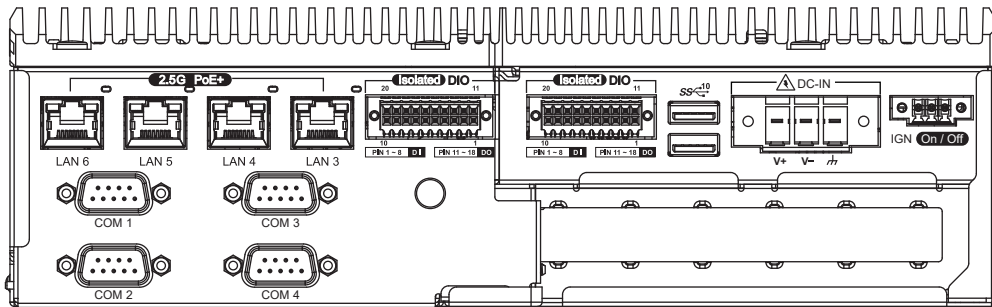
There are 2 front-access 2.5" SSD/HDD trays in the front side of ECX-3200/3200MX/3100 series. Just trigger to open the SSD/HDD tray, up to 4TB is available.

## 2.2.12 USB TYPE-C Connector

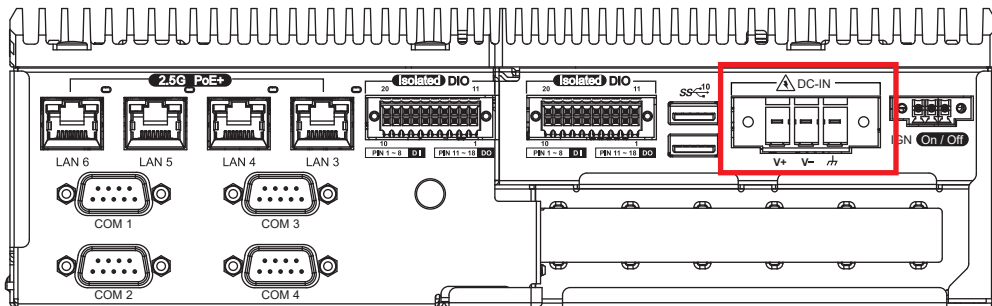


USB Type-C connector support up to 20GB per second data rate in the front side of ECX-3200/3200MX/3100 series.

## 2.3 Rear Panel I/O & Functions



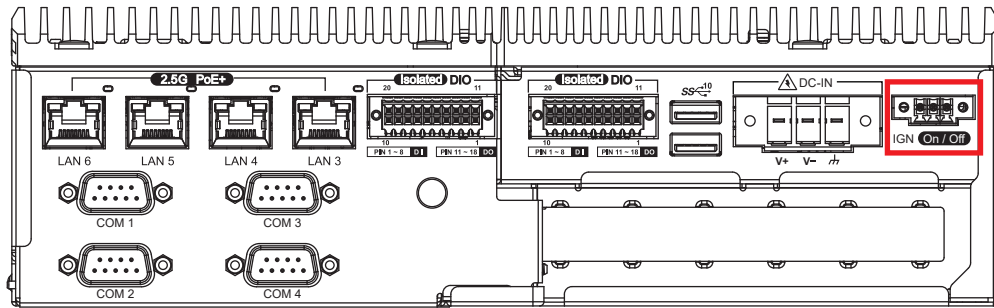
### 2.3.1 Power Terminal Block



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.

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

## 2.3.2 Remote Power On/Off Switch Terminal Block

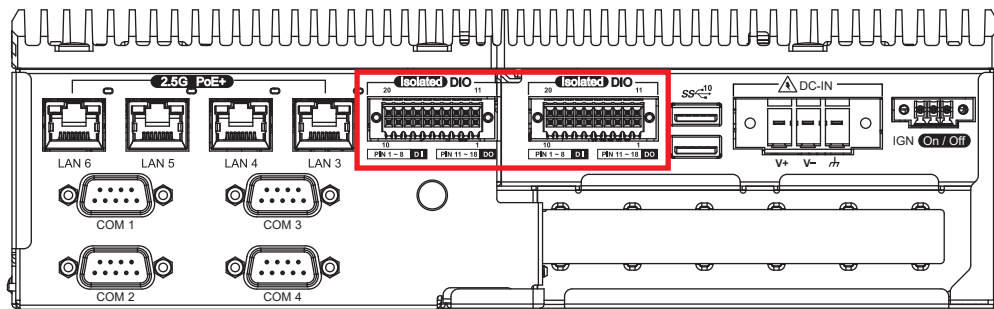


It is a 3-pin power-on or power-off switch through Phoenix Contact terminal block. You could turn on or off the system power by using this contact. This terminal block supports dual function of soft power-on/ power-off (instant off or delay 4 second), and suspend mode.

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

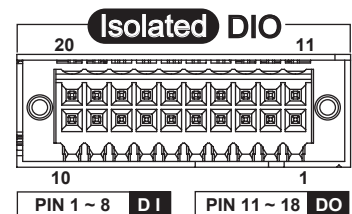
## 2.3.3 Isolated DIO

### 2.3.3.1 ECX-3200/3200MX 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



DIO1 Connectors pin out:

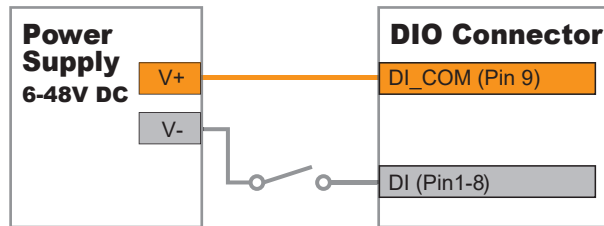
Pin Number	Definition	Mapping to SIO GPIO Function
1	INPUT 0	SIO_GPI80
2	INPUT 1	SIO_GPI81
3	INPUT 2	SIO_GPI82
4	INPUT 3	SIO_GPI83
5	INPUT 4	SIO_GPI84
6	INPUT 5	SIO_GPI85
7	INPUT 6	SIO_GPI86
8	INPUT 7	SIO_GPI87
9	DI_COM	-
10	DIO_GND	-
11	OUTPUT 0	SIO_GPO70
12	OUTPUT 1	SIO_GPO71
13	OUTPUT 2	SIO_GPO72
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)	-

DIO2 Connectors pin out:

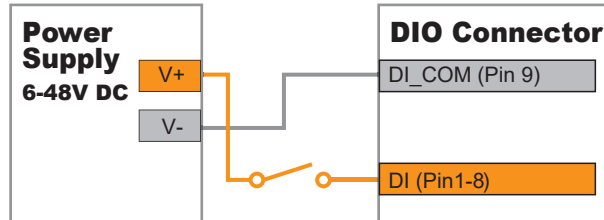
Pin Number	Definition	Mapping to SIO GPIO Function
1	INPUT 0	SIO_GPA3
2	INPUT 1	SIO_GPI56
3	INPUT 2	SIO_GPI57
4	INPUT 3	SIO_GPI15
5	INPUT 4	SIO_GPI16
6	INPUT 5	SIO_GPI35
7	INPUT 6	SIO_GPI46
8	INPUT 7	SIO_GPI11
9	DI2_COM	-
10	DIO2_GND	-
11	OUTPUT 0	SIO_GPO22
12	OUTPUT 1	SIO_GPO26
13	OUTPUT 2	SIO_GPO64
14	OUTPUT 3	SIO_GPO65
15	OUTPUT 4	SIO_GPO41
16	OUTPUT 5	SIO_GPA5
17	OUTPUT 6	SIO_GPA4
18	OUTPUT 7	SIO_GPO27
19	DIO2_GND	-
20	External 6-40VDC (NPN) External 6-48VDC (PNP)	-

### DI Reference Circuit :

Sink Mode (NPN)

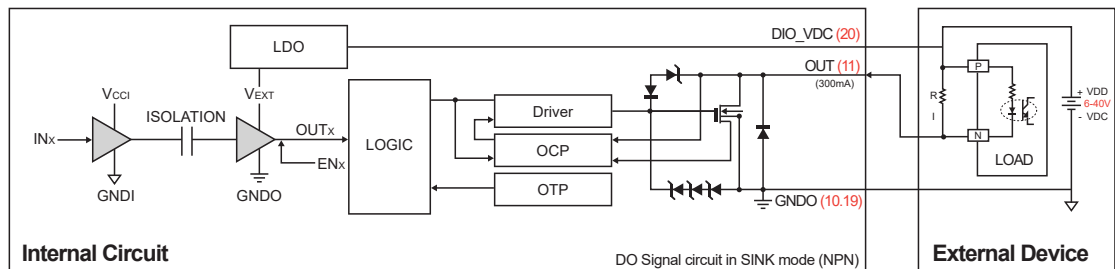


Source Mode (PNP)

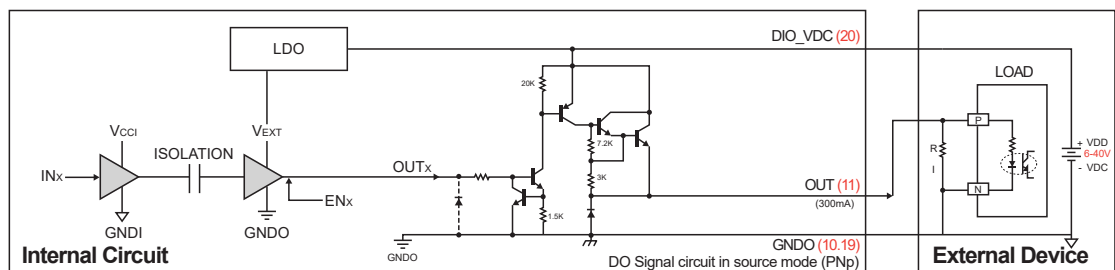


### DO reference circuit :

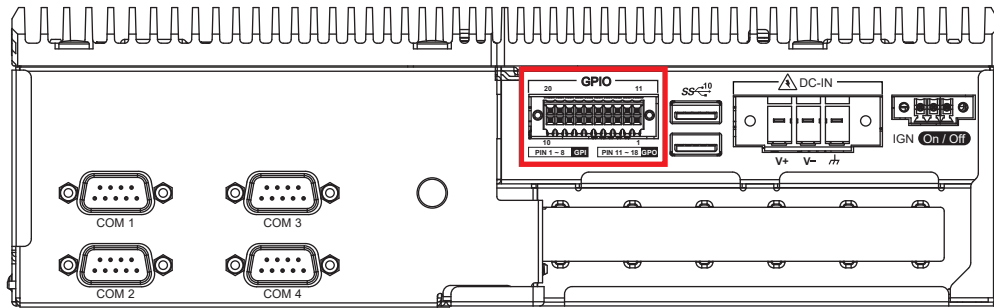
Sink Mode (NPN, Default)



Source (PNP)



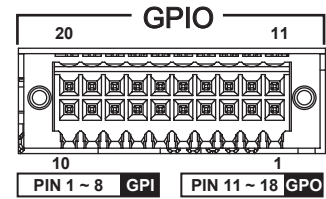
### 2.3.3.2 ECX-3100 series



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.

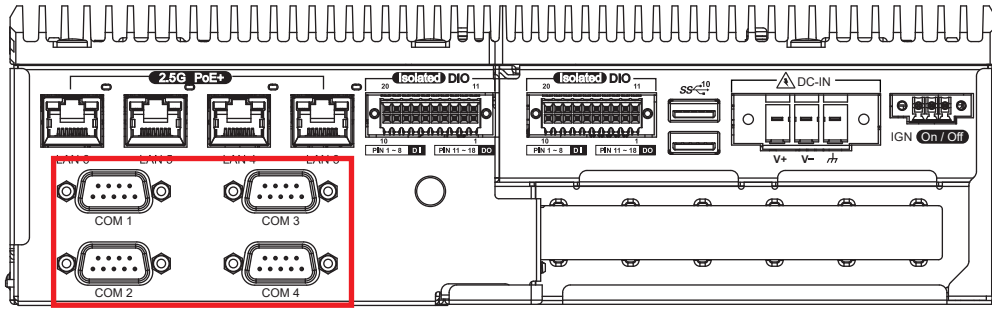


GPIO Connectors pin assignments

Pin No.	Definition	Pin No.	Definition
1	SIO_GPA3	11	SIO_GPO22
2	SIO_GPI56	12	SIO_GPO26
3	SIO_GPI57	13	SIO_GPO64
4	SIO_GPI15	14	SIO_GPO65
5	SIO_GPI16	15	SIO_GPO41
6	SIO_GPI35	16	SIO_GPA5
7	SIO_GPI46	17	SIO_GPA4
8	SIO_GPI11	18	SIO_GPO27
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-485
COM 4	RS-485 w/z auto-flow control

The pin assignments are listed in the following table :

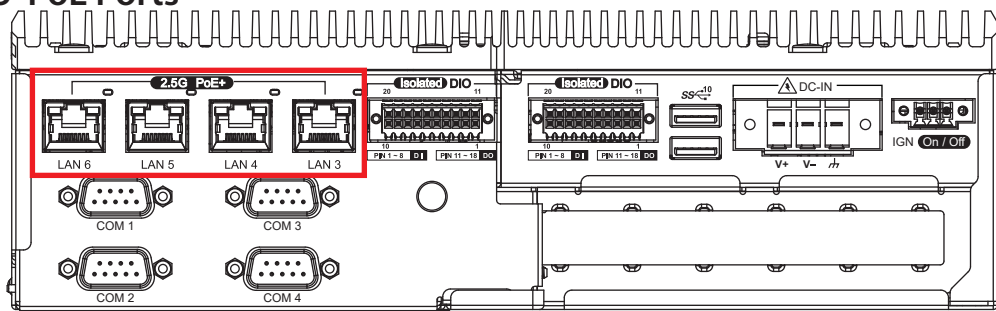
Serial Port	Pin No.	RS-232	RS-422 (5-wire)	RS-485 (3-wire)
1 to 4	1	DCD	TXD-	DATA-
	2	RXD	TXD+	DATA+
	3	TXD	RXD+	-
	4	DTR	RXD-	-
	5	GND	GND	GND
	6	DSR	-	-
	7	RTS	-	-
	8	CTS	-	-
	9	RI	-	-

COM 1 to COM 4 MB connector table :

COM Port	MB Connector	COM Port	MB Connector
COM 1	JCOM1	COM 2	JCOM2
COM 3	JCOM3	COM 4	JCOM4

CN	Pin No.	Signal Name
JCOM1 to JCOM4	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



There are 4 RJ45 connectors in the rear side of ECX-3200. It supports IEEE 802.3at (PoE+) Power over Ethernet (PoE) connection delivering up to 25W/54V per port and 1000BASE-T gigabit data signals over standard Ethernet Cat 5/Cat 6 cable.

Each PoE connection is powered by Intel® I226 2.5Gigabit 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	-

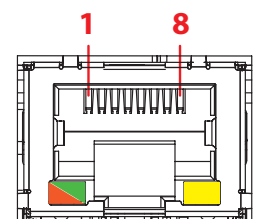
Each LAN port is supported by standard RJ-45 connector with LED indicators to present Active/Link/Speed status of the connection.

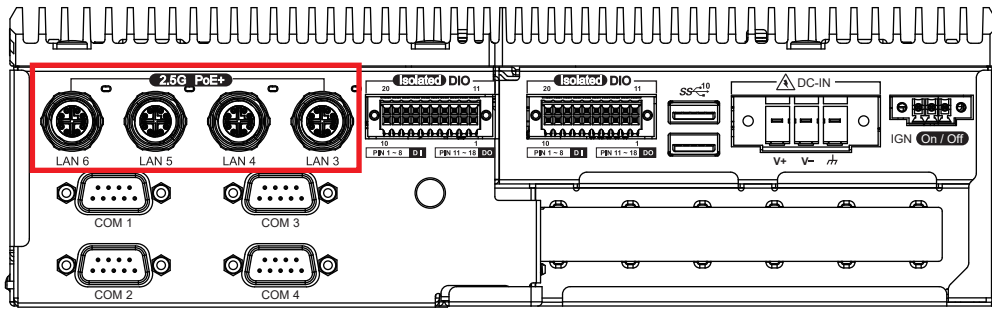
The LED indicator on the right bottom corner lightens in solid green when the cable is properly connected to a 100 Mbps Ethernet network; The LED indicator on the right bottom corner lightens in solid orange when the cable is properly connected to a 1000 Mbps Ethernet network; The left LED will keep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

LED Location	LED Color	10/100 Mbps	1000 Mbps	2500 Mbps
Right	Yellow	Twinkling Yellow	Twinkling Yellow	Twinkling Yellow
Left	Green/ Orange	Off	Solid Green	Solid Orange

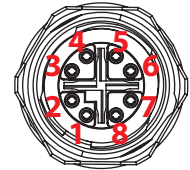
  

POE LED	LED Color	POE Status
LED 1 - 4	Solid Green	POE ON





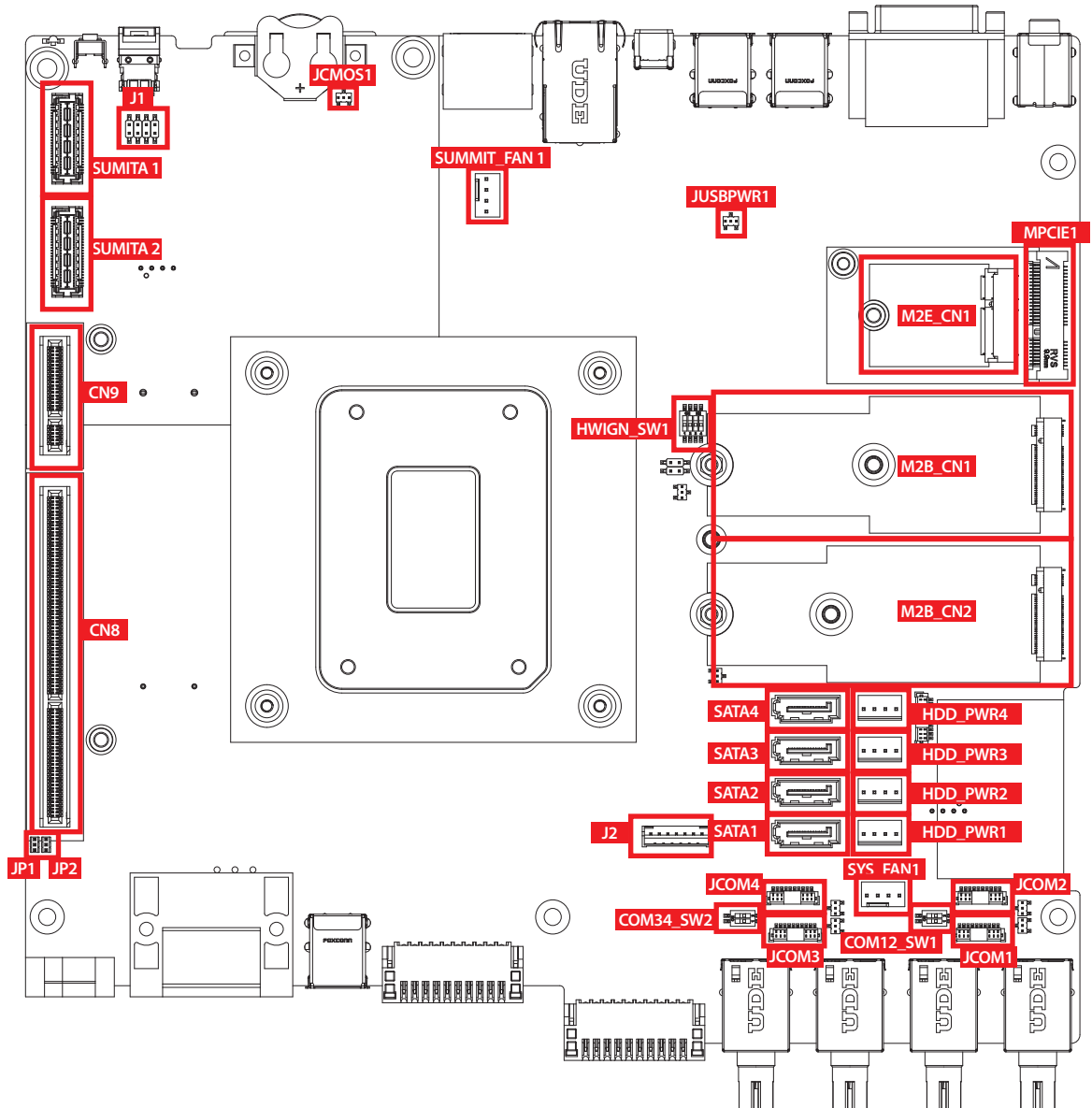
There are 4 M12 connectors in the rear side of ECX-3200MX . It supports IEEE 802.3at (PoE+) Power over Ethernet (PoE) connection delivering up to 25W/54V per port and 1000BASE-T gigabit data signals over standard Ethernet Cat 5/Cat 6 cable.



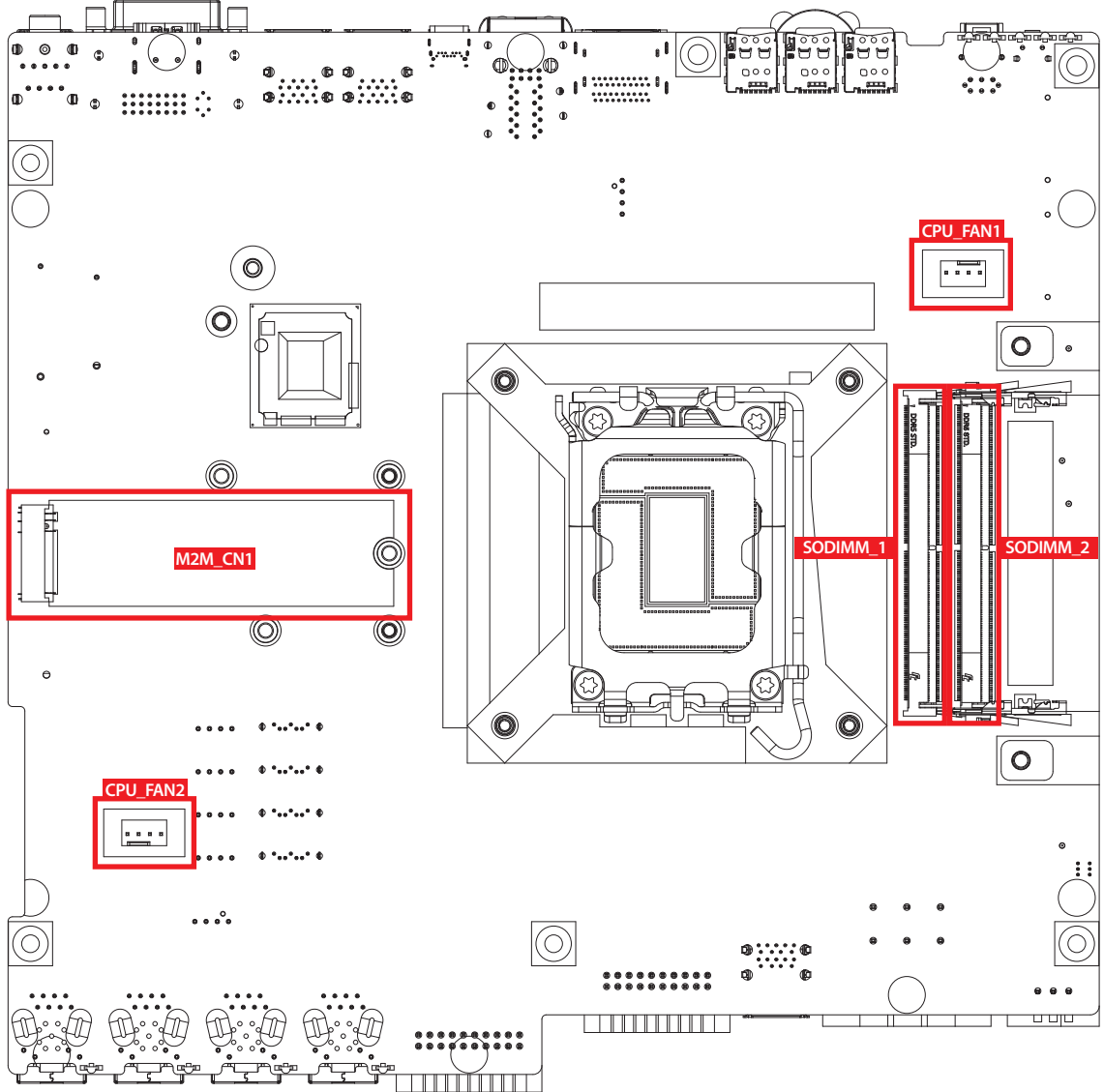
M12 X-Code Pin No.	10/100 Mbps	1000Mbps	PoE
1	E_TX+	MDI0_P	PoE+
2	E_TX-	MDI0_N	PoE+
3	E_RX+	MDI1_P	PoE-
4	E_RX-	MDI1_N	PoE-
8	-	MDI2_P	-
7	-	MDI2_N	-
5	-	MDI3_P	-
6	-	MDI3_N	-

## 2.4 Main Board Expansion Connectors

### 2.4.1 Top View (Component Side) of ECX-3200/3200MX/3100 Main Board With Connector Location



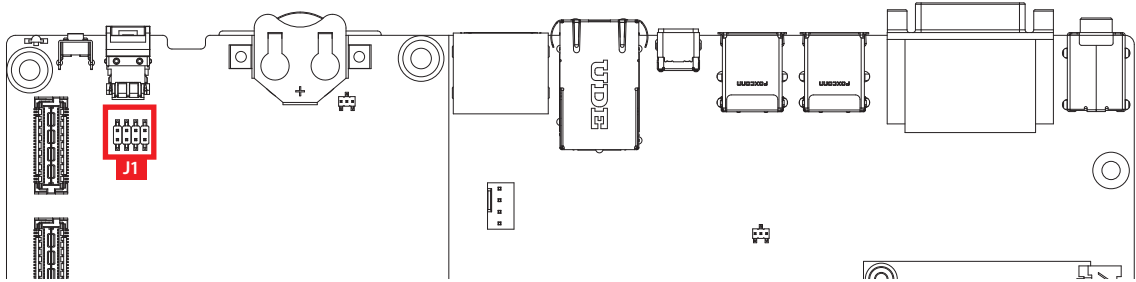
## 2.4.2 Bottom View (Solder Side) of ECX-3200/3100 Main Board With Connector Location

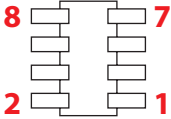


### 2.4.3 J1 : Miscellaneous Pin Header

2.0mm 2x4p header

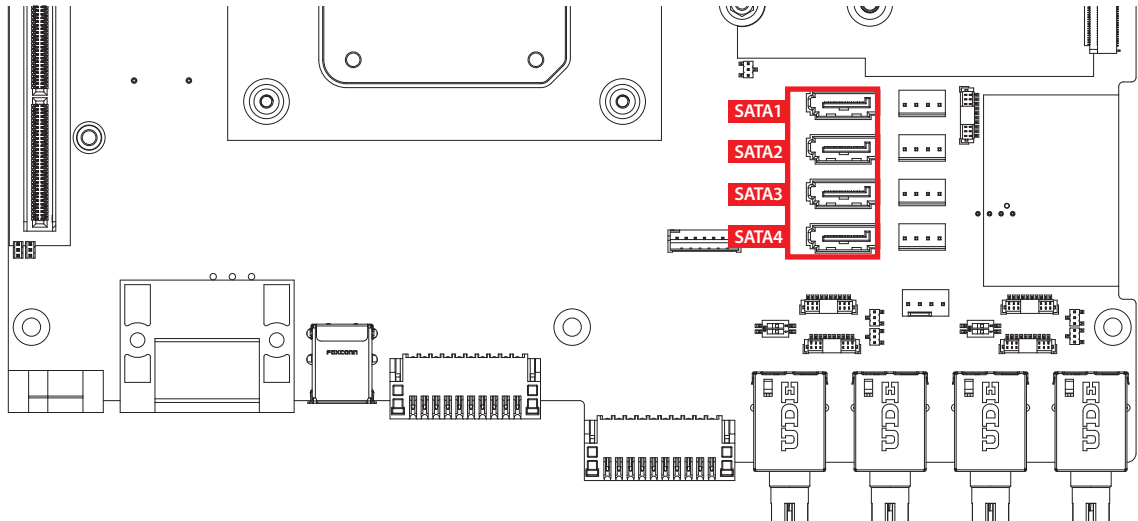
This pin header can be used as a backup for following functions, hard drive LED indicator, reset button, power LED indicator, and power-on/off button, which already can be accessed by front panel and top panel. The pin-outs of Miscellaneous port are listed in following table:



	Group	Pin No.	Description
	HDD LED		1
		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 to SATA4: SATA III Connector

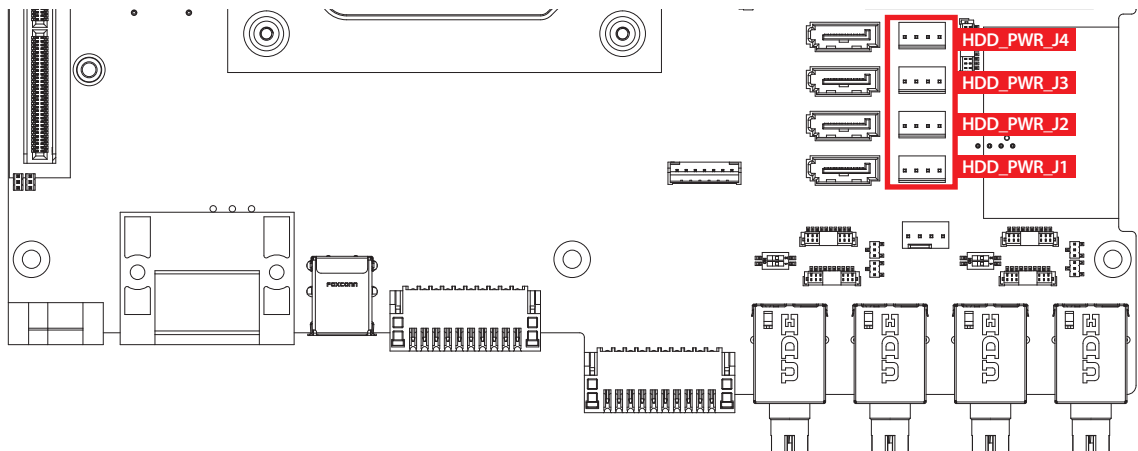
There are 4 onboard high performance Serial ATA III (SATA III) on ECX-3200/3200MX/3100. It supports higher storage capacity with less cabling effort and smaller required space. The pin assignments of SATA1 to SATA4 are listed in the following table :



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

## 2.4.5 HDD\_PWR1 to HDD\_PWR4 : SATA Power Connector

The ECX-3200/3200MX/3100 also equip with 4 SATA power connector. Each port supports 5V (Up to 2A) and 12V (Up to 2A) current to the hard drive or SSD. The pin assignments of HDD\_PWR1 to HDD\_PWR4 are listed in the following table:

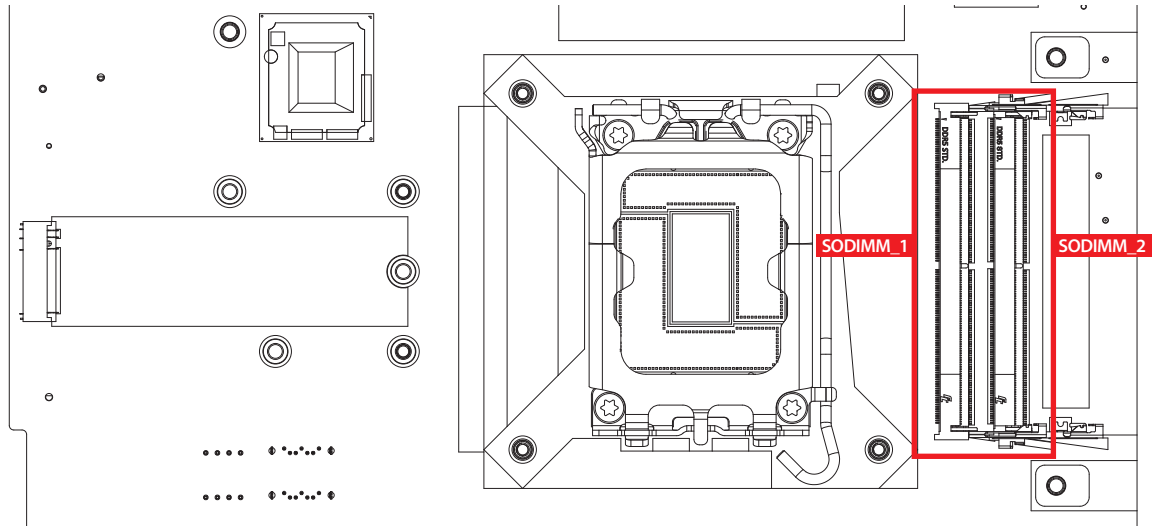


Pin No.	Definition	Pin No.	Definition
1	+12V	3	GND
2	GND	4	+5V



## 2.4.6 SODIMM\_1, SODIMM\_1 : DDR5 Slot

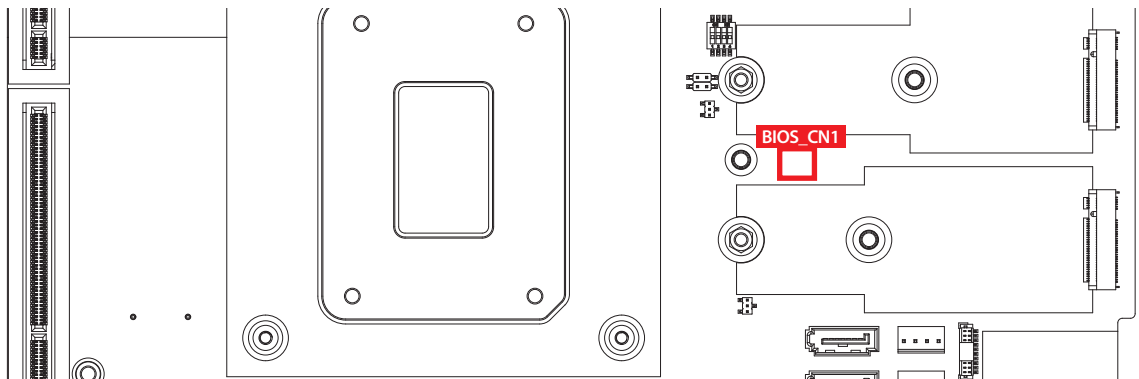
There are 2 DDR5 channel onboard, support DDR5 4800, max 64GB  
Each channel 32GB



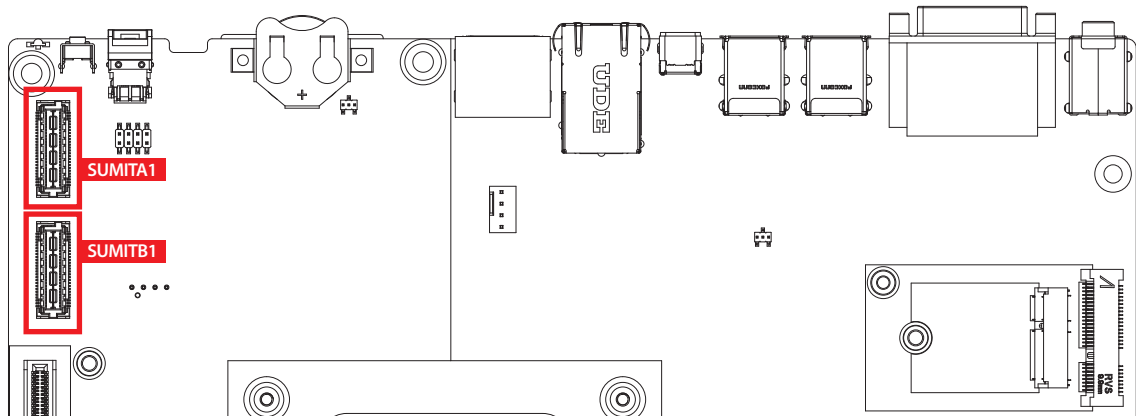
Slot	Description
SODIMM_1	DDR5 Channel A
SODIMM_2	DDR5 Channel B

## 2.4.7 BIOS\_CN1 : BIOS Socket

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

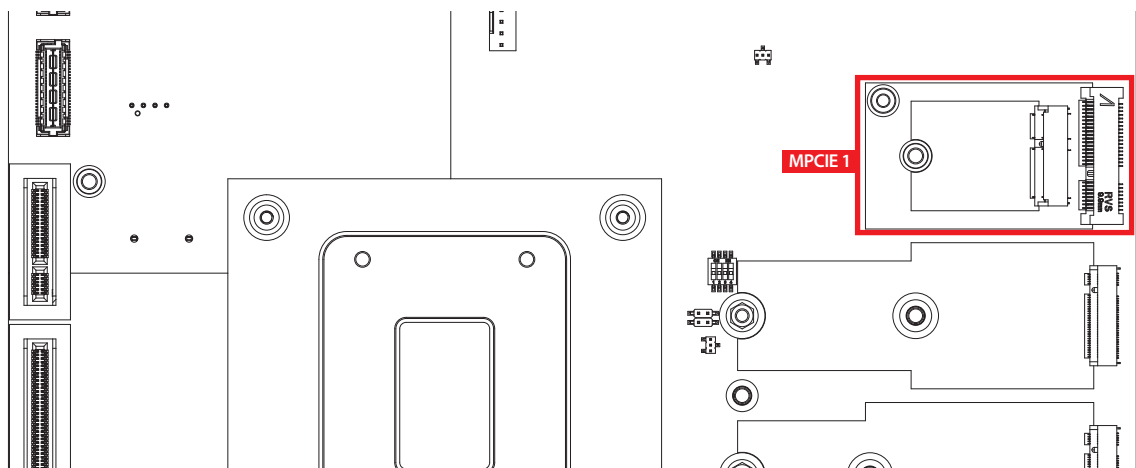


## 2.4.8 SUMITA1, SUMITB1



## 2.4.9 Mini PCIe : MPCIE1

Standard full length mini PCIe slot.



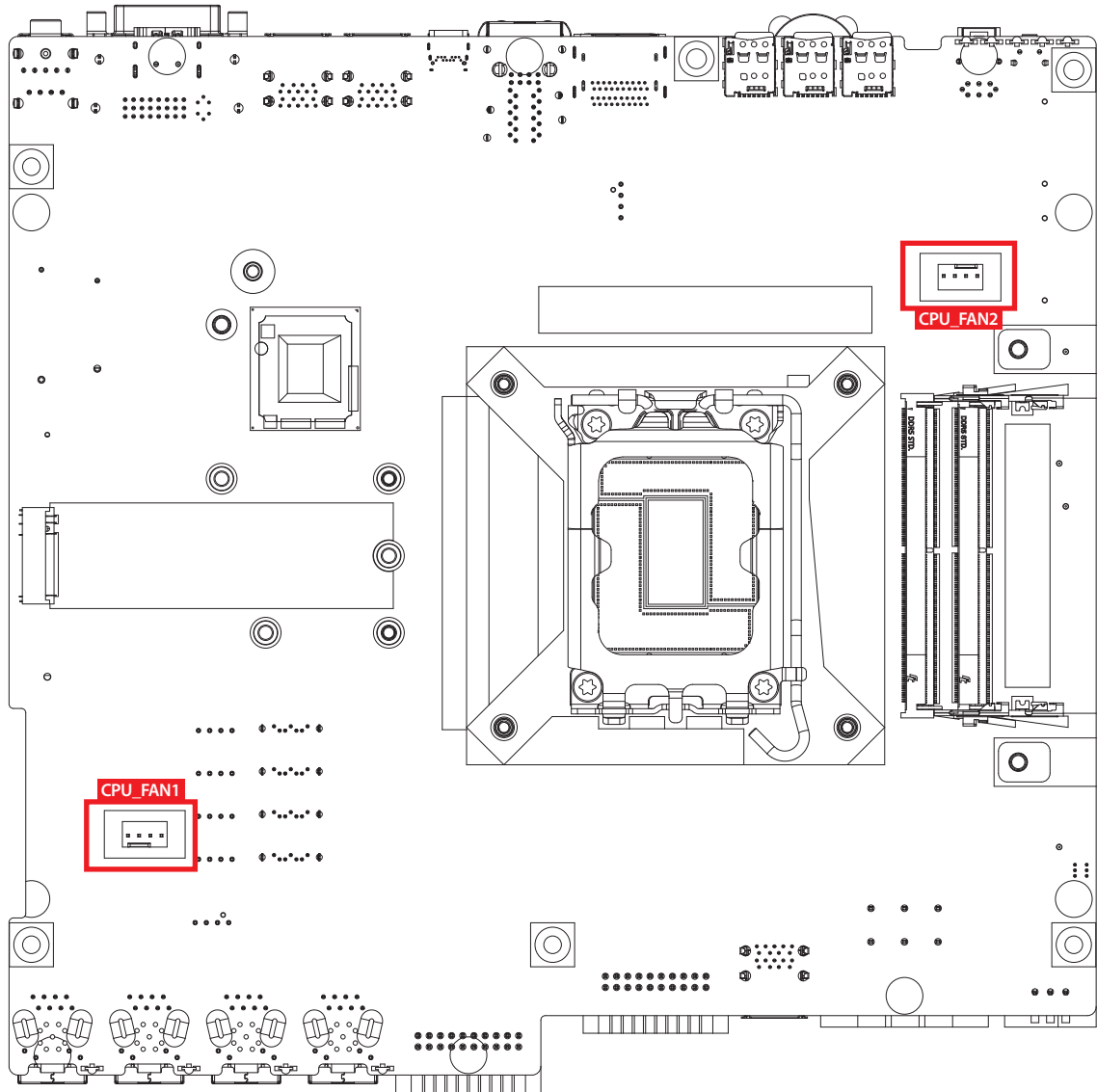
The pin assignments of MPCIE 1, MPCIE2 in the following table :

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
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

Pin No.	Signal Name	Pin No.	Signal Name
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 CPU\_FAN1 : CPU\_FAN2 : FAN Header

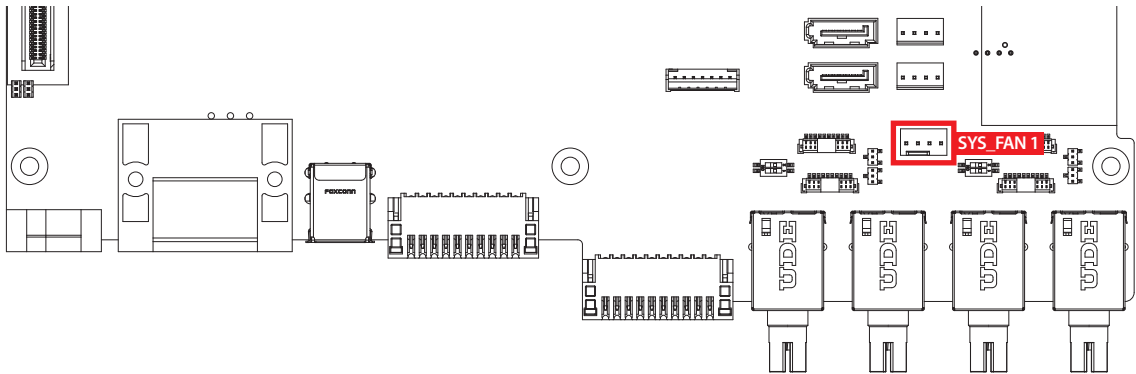
Fan power connector supports for additional thermal requirements. The pin assignments of CPU\_FAN1 and CPU\_FAN2 are listed in the following table.



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

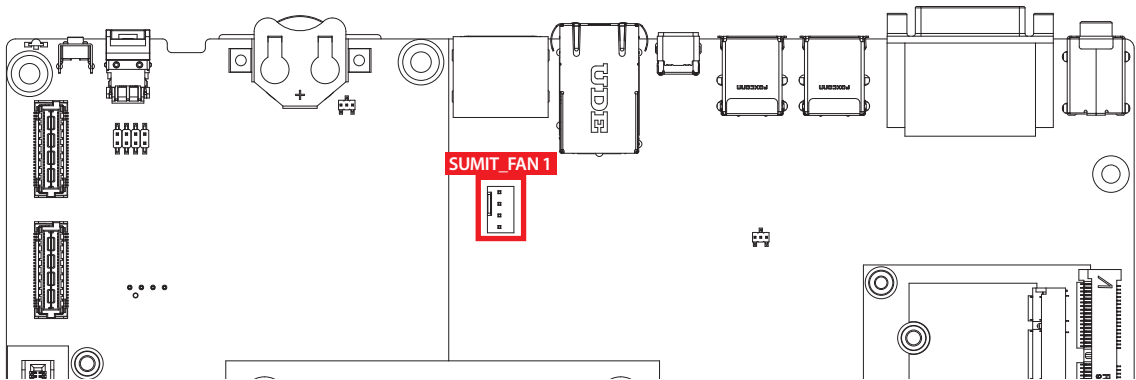
### 2.4.11 SYS\_FAN1 : System Fan Header

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	Fan Speed Sencer
	4	Fan PWM

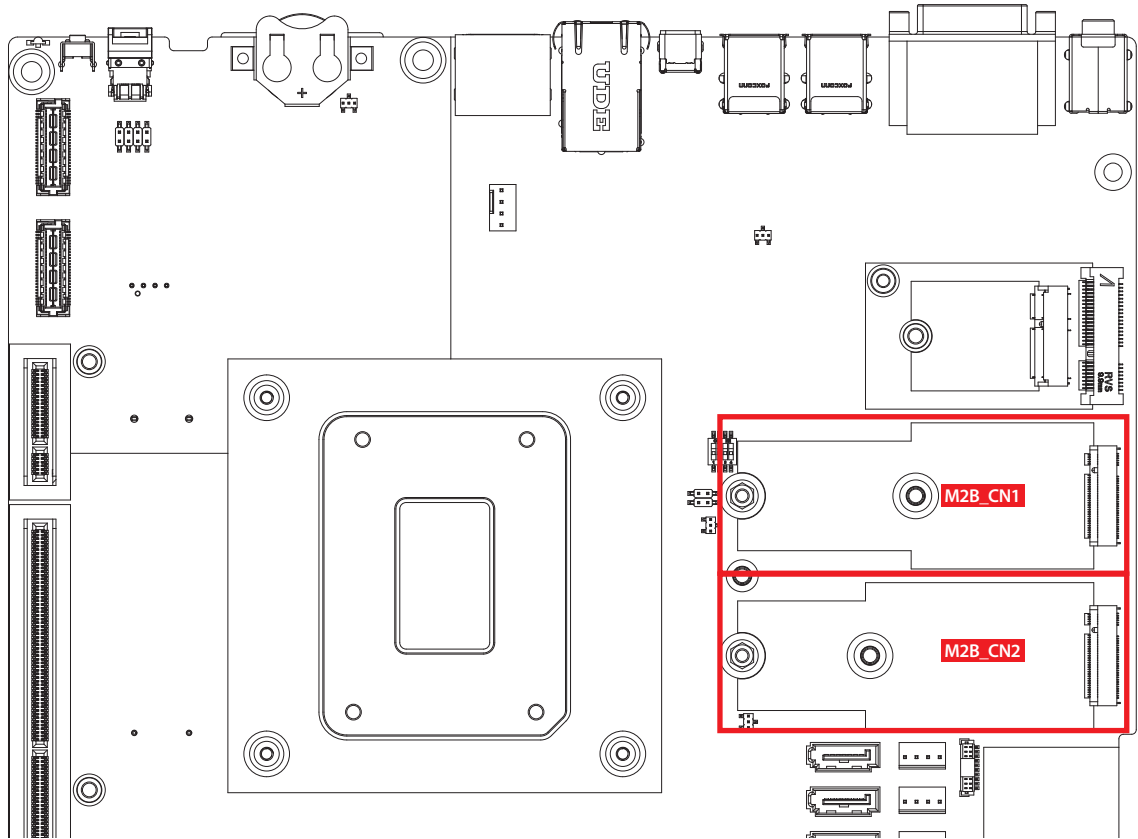
### 2.4.12 SUMIT\_FAN1 : SUMIT Fan Header



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

### 2.4.13 M2B\_CN1, M2B\_CN2 : M.2 slot

The pin assignments of M2B\_CN1, M2B\_CN2 in the following table :



Module card types include 3042,3052.

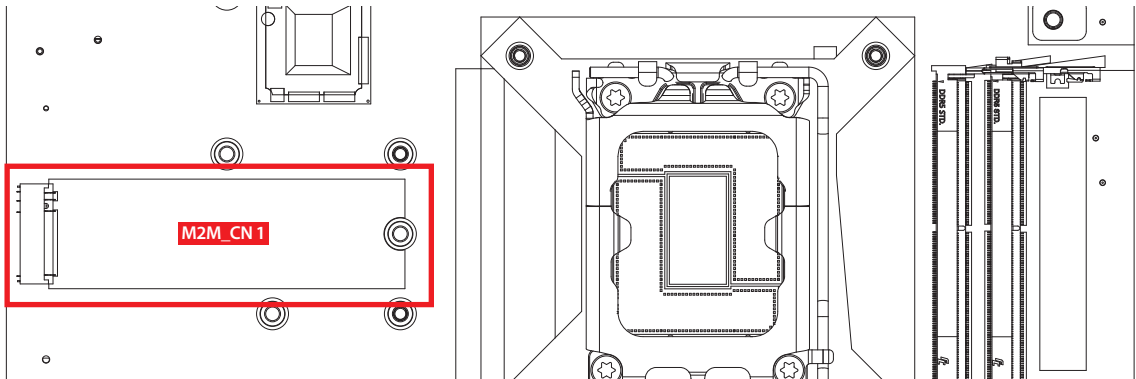
M2B\_CN1, M2B\_CN2: M.2 KEY B

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#

Pin No.	Signal Name	Pin No.	Signal Name
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/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

### 2.4.14 M.2 KEY M: PCIe x4

M.2 key M connector is suitable for applications that use Host I/Fs supported by either PCIe Module card types include 2280 (Only Support PCIe).



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

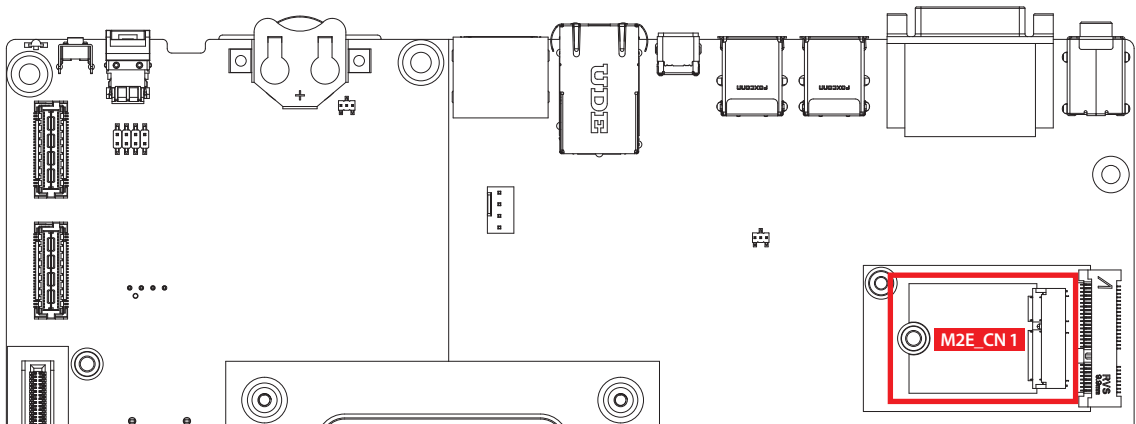
Pin No.	Signal Name	Pin No.	Signal Name
75	Ground		
73	Ground	74	3.3V
71	Ground	72	3.3V
69	PEDET	70	3.3V
67	Ground	68	NC
Mechanical Key			
57	Ground	58	NC
55	REFCLKp	56	NC
53	REFCLKn	54	PEWAKE#
51	Ground	52	CLKREQ#
49	PETp0/SATA_A+	50	PERST#
47	PETn0/SATA_A-	48	NC
45	Ground	46	NC
43	PERp0/SATA_B-	44	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



Pin No.	Signal Name	Pin No.	Signal Name
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

#### 2.4.15 M2E\_CN1 : USB2.0/2x PCIe1

M.2 key E connector is suitable for applications that use wireless connectivity including Wi-Fi, Bluetooth, NFC or GNSS. Module card types include 2230.

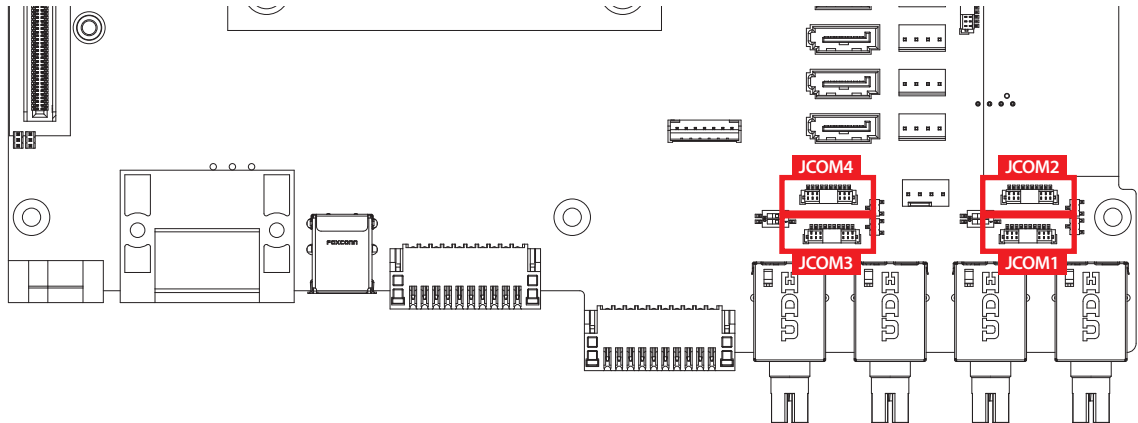


M2E\_CN1 : M.2 KEY E (Dimension : 2230)

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

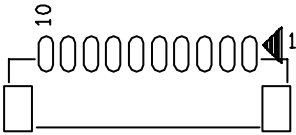
Pin No.	Signal Name	Pin No.	Signal Name
63	Ground	64	NC
61	NC	62	ALERT
59	NC	60	I2C_CLK
57	Ground	58	I2C_DATA
55	PEWAKE0#	56	NC
53	CLKREQ0#	54	NC
51	Ground	52	PERST0#
49	REFCLKn0	50	NC
47	REFCLKp0	48	NC
45	Ground	46	NC
43	PERn0	44	NC
41	PERp0	42	NC
39	Ground	40	NC
37	PETn0	38	DEVSLP
35	PETp0	36	NC
33	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

## 2.4.16 JCOM1,JCOM2,JCOM3,JCOM4 : Serial Port cable Connector

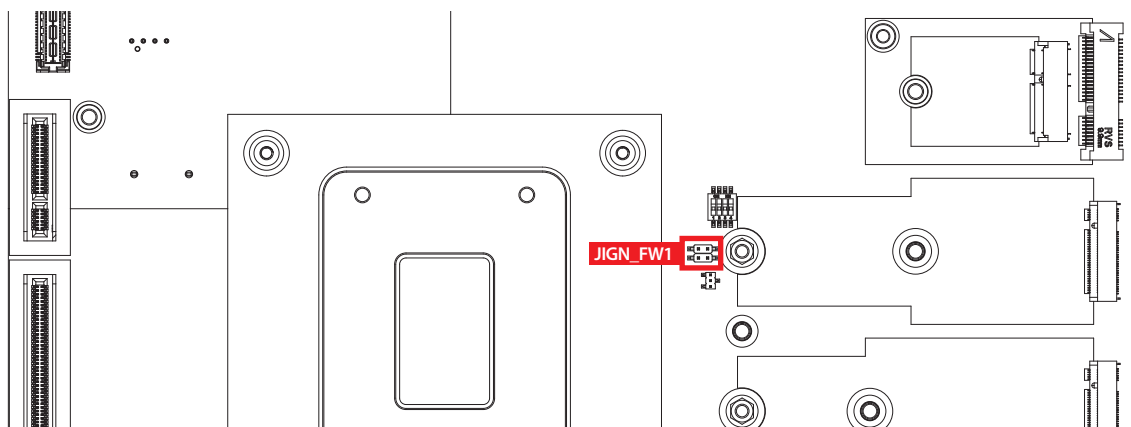


Location	Description
JCOM1	COM1
JCOM2	COM2
JCOM3	COM3
JCOM4	COM4

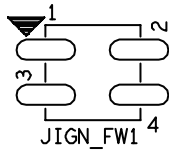
Pin No.	Function
1	NC
2	GND
3	RI
4	DTR
5	CTS
6	TXD
7	RTS
8	RXD
9	DSR
10	DCD



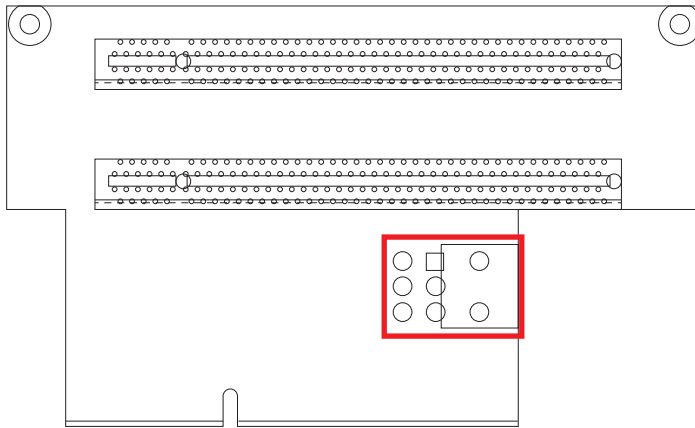
### 2.4.17 JIGN\_FW1 : IGNITION FW Programming Header



Pin No.	Description
1	GND
2	MCU_RST#
3	+V3.3_MCU
4	MCU_PRG



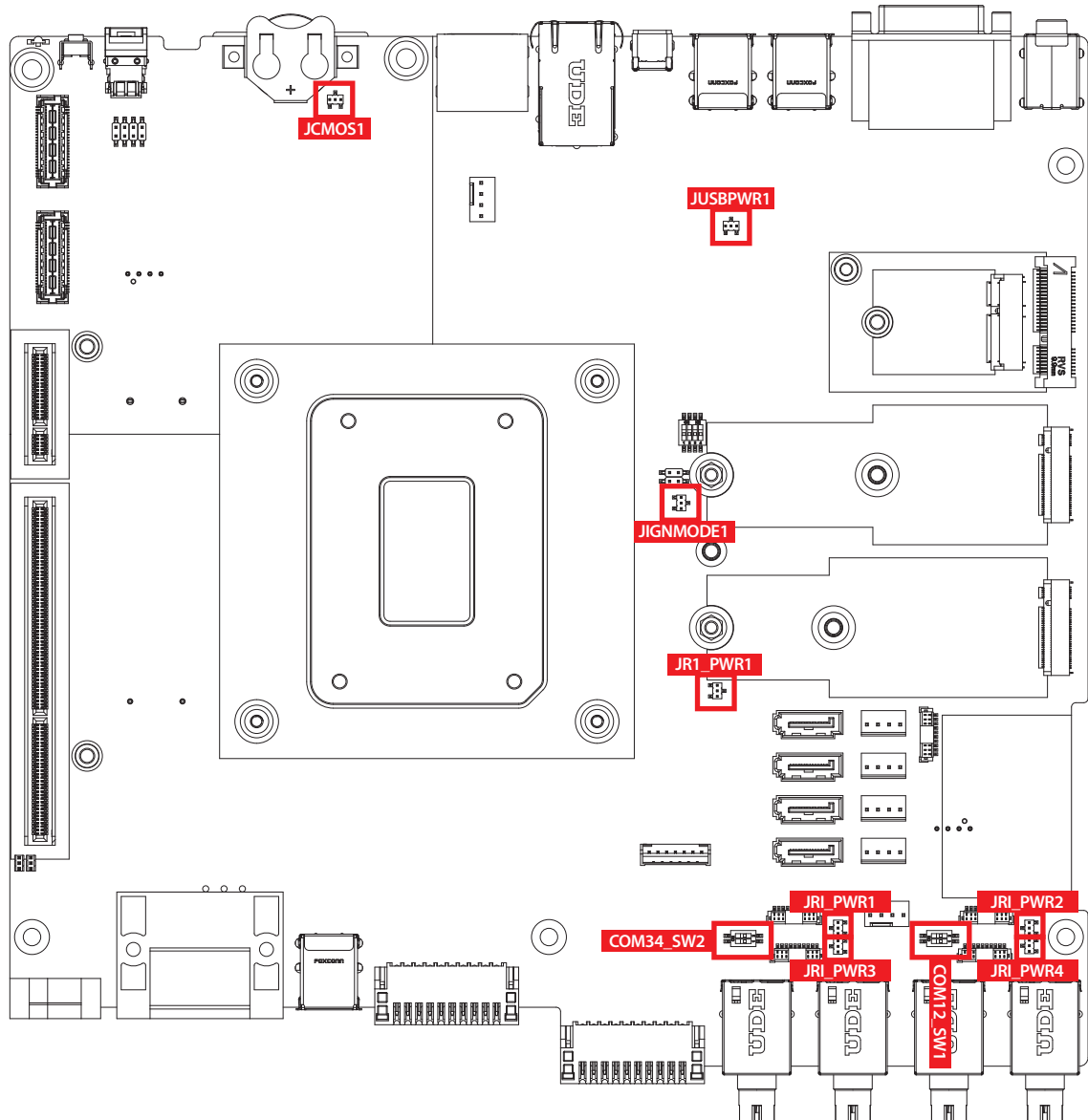
## 2.4.18 Graphic Card Power Connector



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

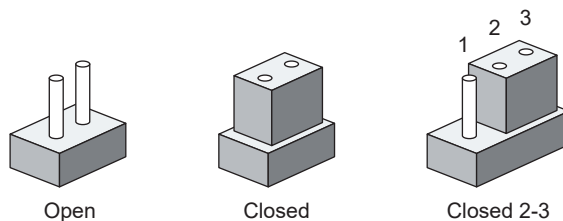
## 2.5 Main Board Jumper Settings

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

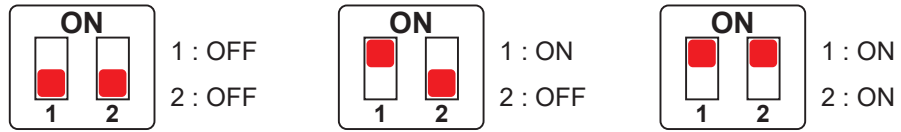


The figure below is the top view of the system main board which is the main board. It shows the location of the jumpers and the switches.

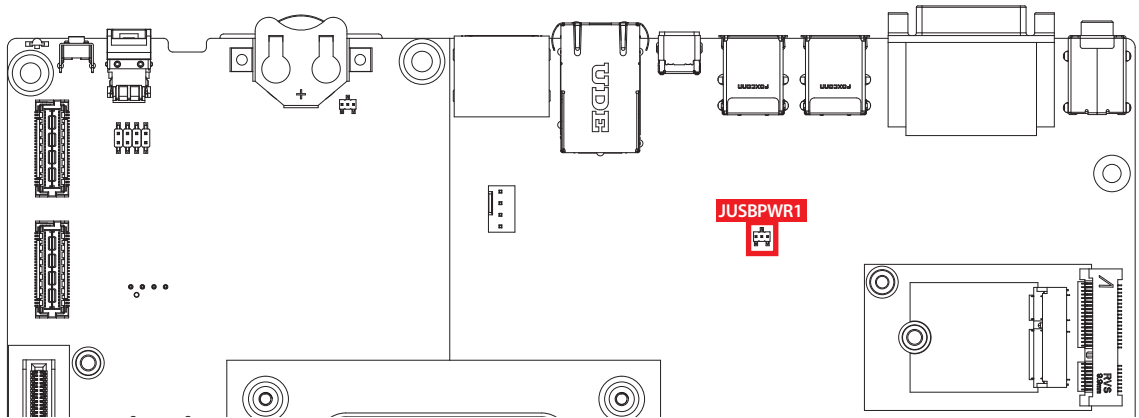
You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, 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.

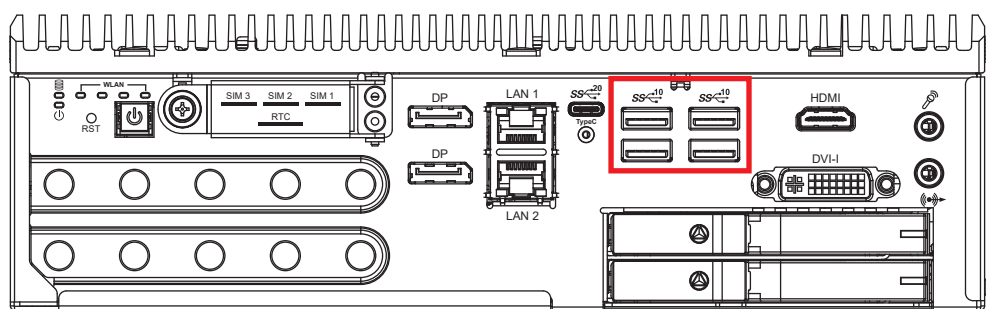


### 2.5.2 JUSBPWR1 : USB Wake Up

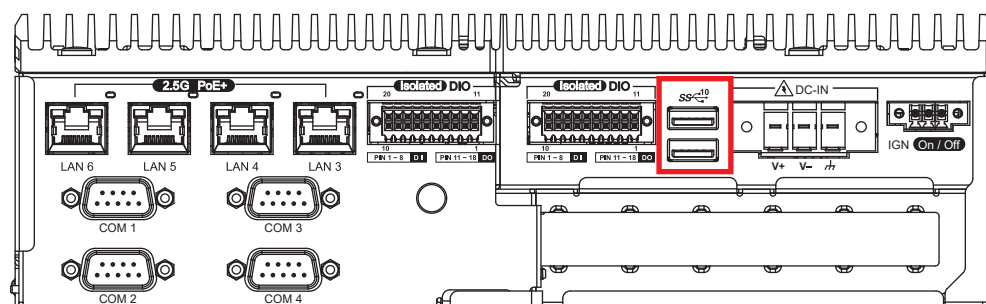


Location	Description	Function
JUSBPWR1	2 - 3	Non Wake Up support
	1 - 2	Supported Wake Up(Default)

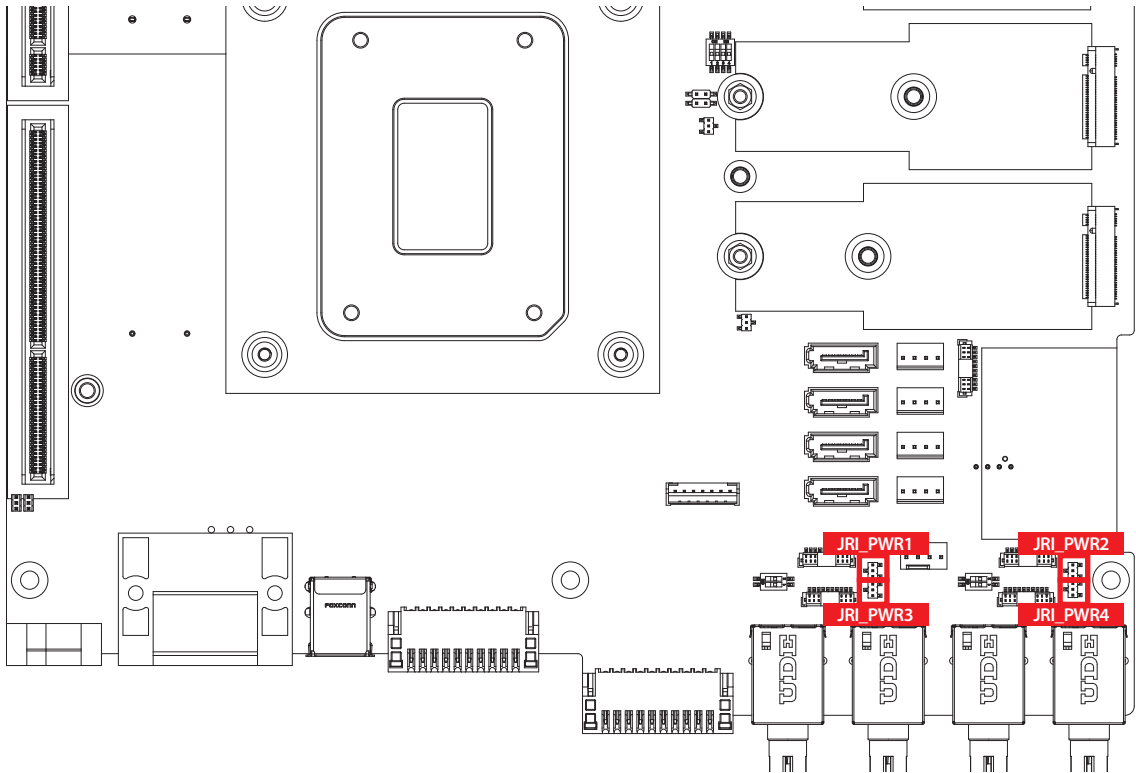
Front Plane View



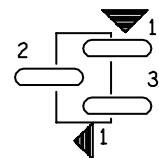
Rear Plane View



### 2.5.3 JRI\_PWR1,JRI\_PWR2, JRI\_PWR3, JRI\_PWR4 : COM Port RI pin Select

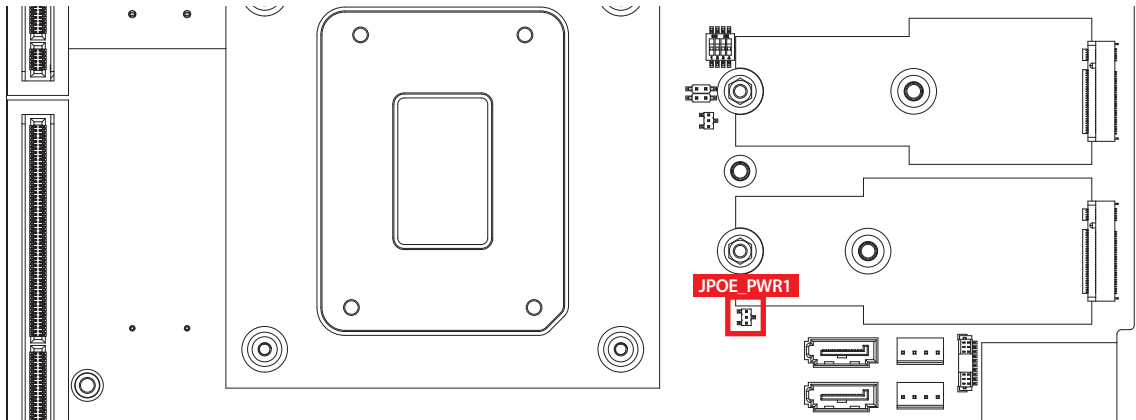


Location	Pin Number	Description	COM Port
JRI_PWR1	1 - 2	+12V (0.5A max.)	COM1
	2 - 3	RI(Default)	
JRI_PWR2	1 - 2	+12V (0.5A max.)	COM2
	2 - 3	RI(Default)	
JRI_PWR3	1 - 2	+12V (0.5A max.)	COM3
	2 - 3	RI(Default)	
JRI_PWR4	1 - 2	+12V (0.5A max.)	COM4
	2 - 3	RI(Default)	



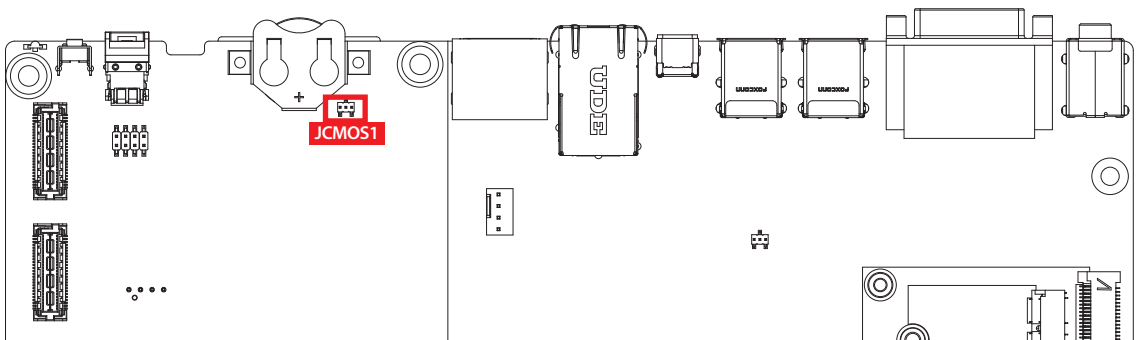


## 2.5.4 JPOE\_PWR1 : PoE Power ON Select



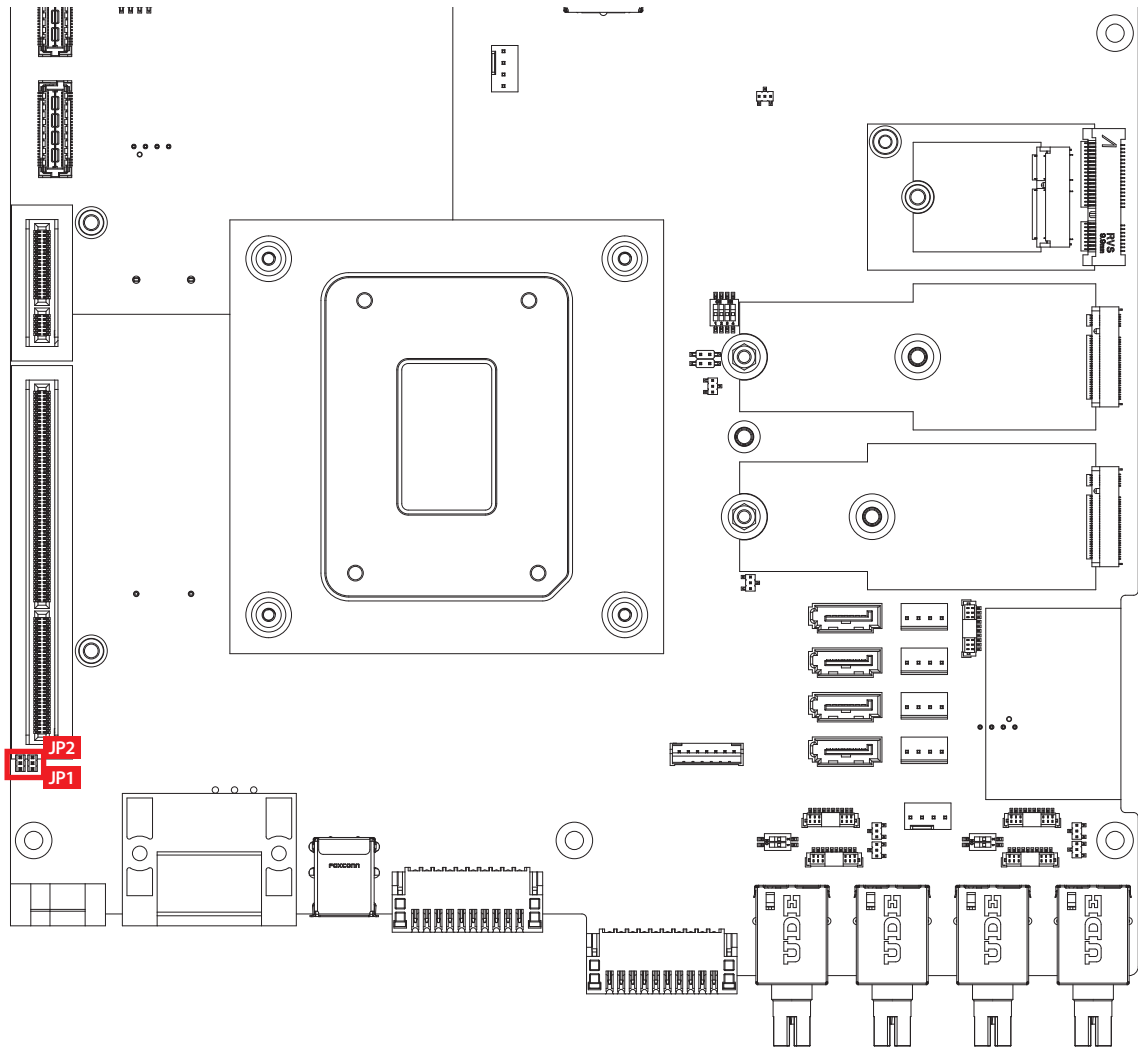
Location	Description	Function	
JPOE_PWR1	1 - 2	PoE power on at standby power ready	
	2 - 3	PoE power on after system power on(Default)	
	No Jumper	Disable PoE power	

## 2.5.5 JCMOS1 : Clear CMOS



Location	Description	Function	
JCMOS1	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.

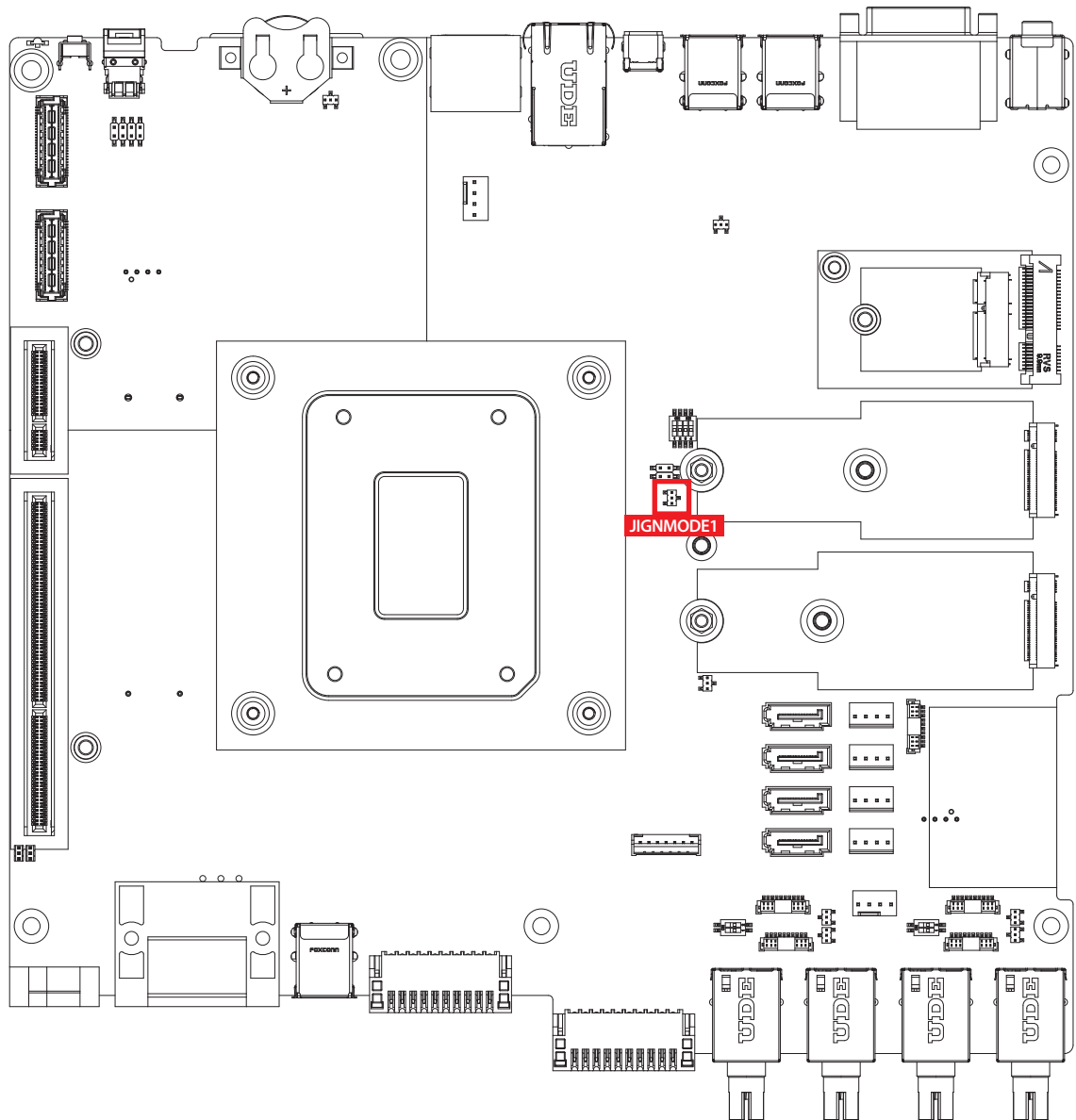
JP1	Logic
1-2	0
2-3	1

JP2	Logic
1-2	0
2-3	1

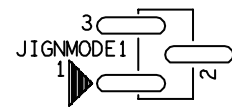
JP1, JP2 PCI Express configurations are listed in the following table.

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

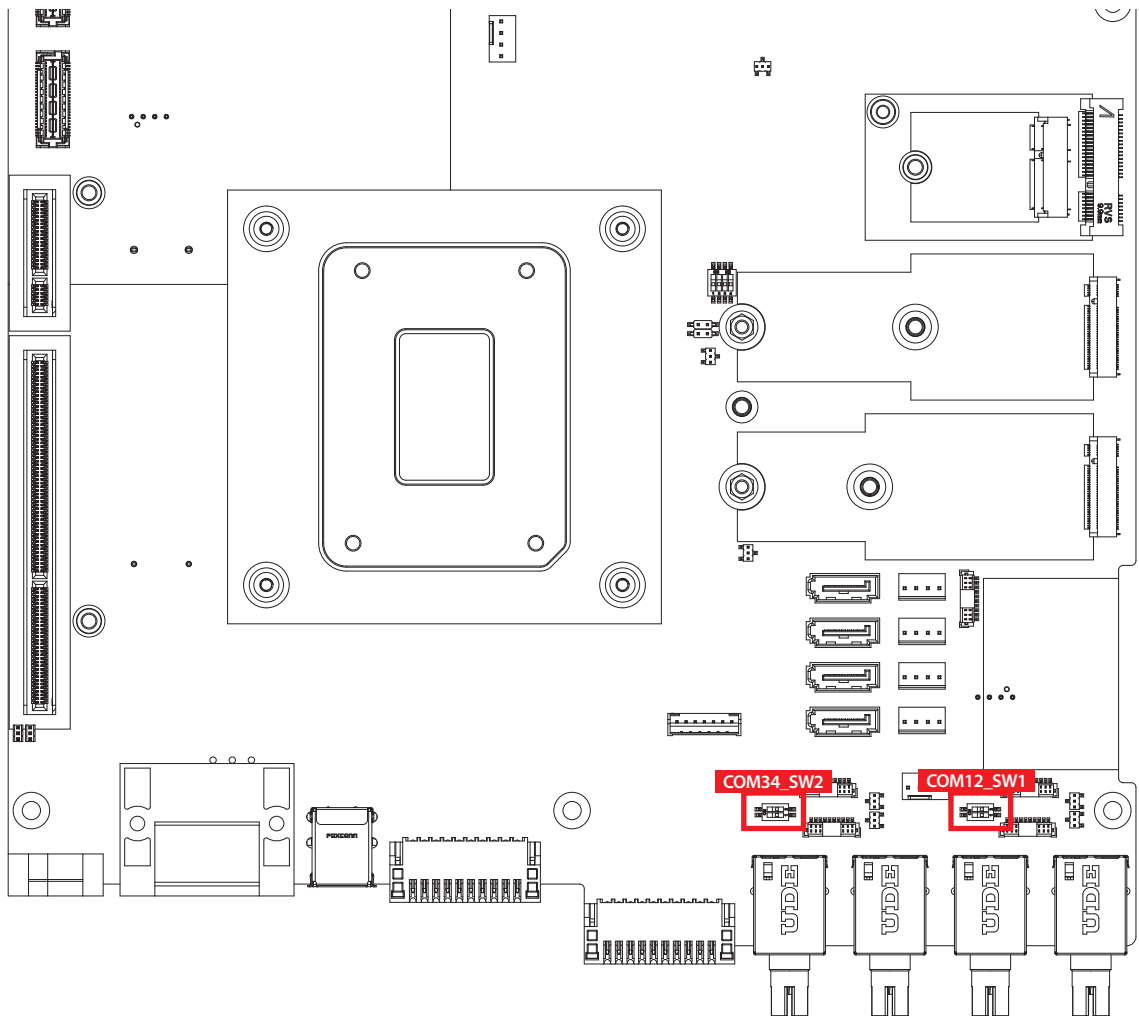
## 2.5.7 JIGNMODE1 : IGNITION Mode



Location	Description	Function
JIGNMODE1	1 - 2	H/W mode
	2 - 3	S/W mode(default)

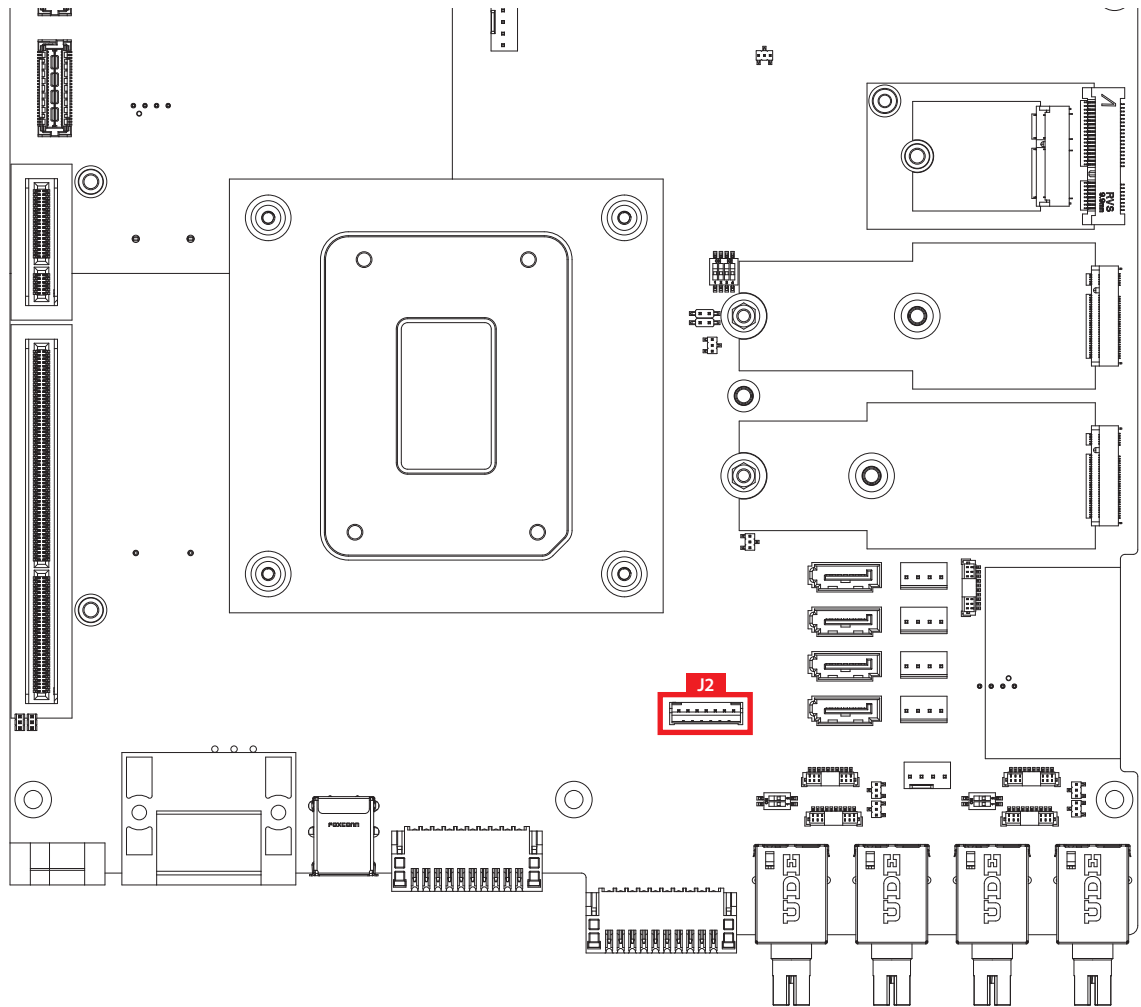


## 2.5.8 COM12\_120R\_SW1,COM34\_120R\_SW1 : RS-485/422 RECEIVER TERMINATION RESISTANCE

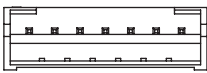


JP2	Setting	Function	Port
COM12_120R_SW1	1(ON)	DCD / RXD Termination 120R enable	COM1
	1(OFF)	DCD / RXD Termination 120R Disable(default)	
	2(ON)	DCD / RXD Termination 120R enable	COM2
	2(OFF)	DCD / RXD Termination 120R Disable(default)	
COM34_120R_SW1	1(ON)	DCD / RXD Termination 120R enable	COM1
	1(OFF)	DCD / RXD Termination 120R Disable(default)	
	2(ON)	DCD / RXD Termination 120R enable	COM2
	2(OFF)	DCD / RXD Termination 120R Disable(default)	

## 2.5.9 J2: UPM module CONN



Pin No.	Definition
1	GND
2	SDA
3	SCL
4	NC
5	NC
6	INTVCC
7	VBAT RATE



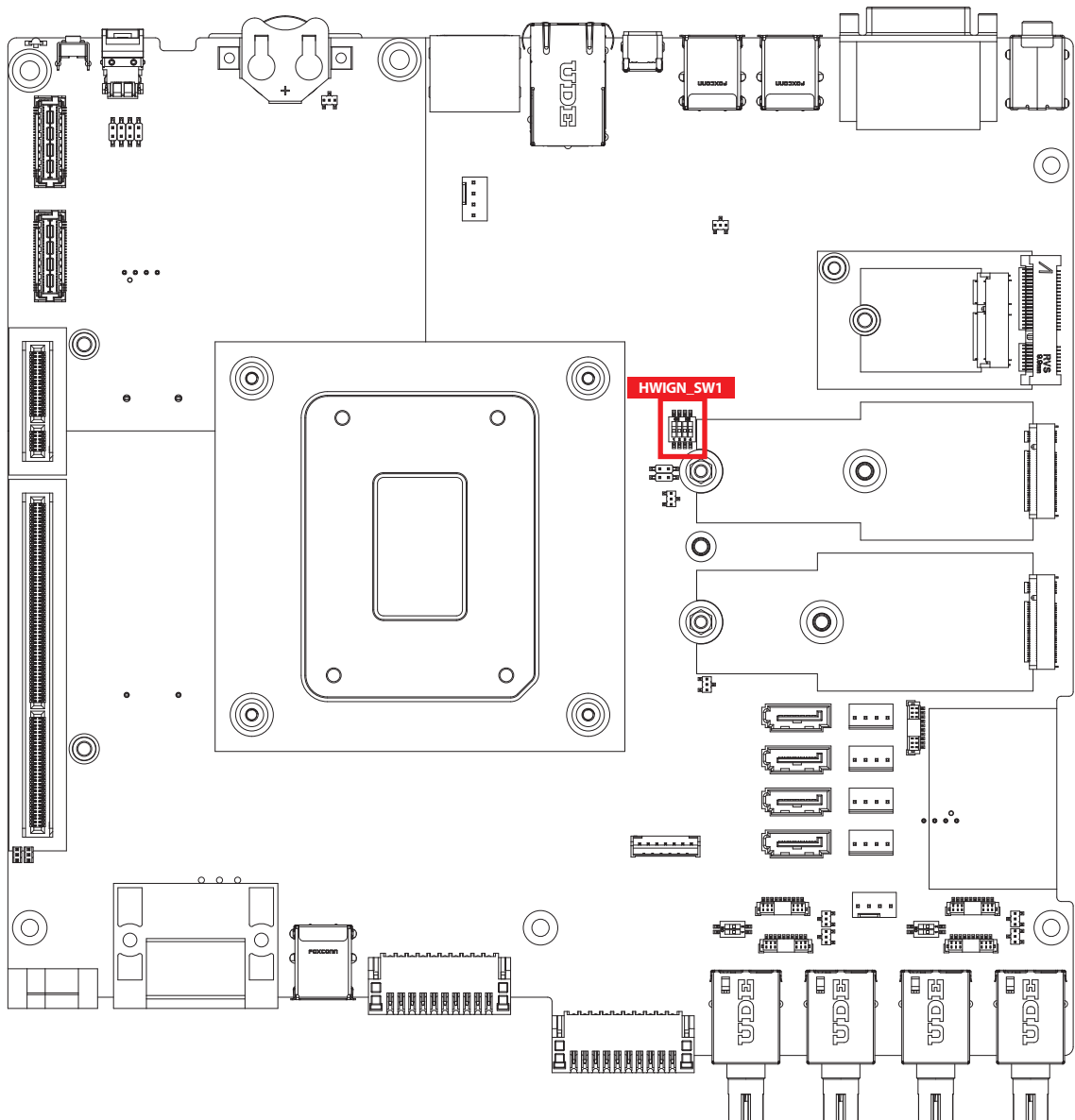
## 2.6 Ignition Control

ECX-3200/3200MX/3100 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.

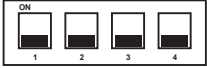

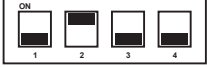
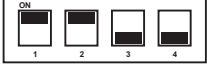
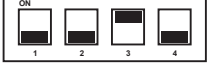
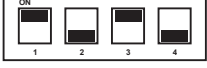
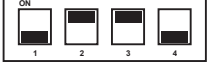
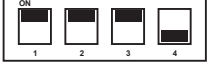

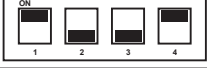
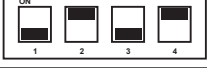
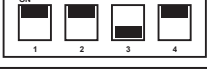
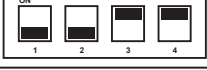
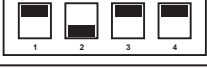
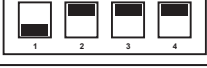
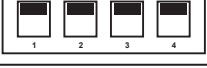
### 2.6.1 Adjust Ignition Control Modes

ECX-3200/3200MX/3100 provides 16 modes of different power on/off delay periods adjustable via SW2 switch. The default rotary switch is set to 0 in ATX/AT power mode.

HWIGN\_SW1 : Ignition Control

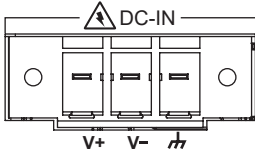


The modes are listed in below table :

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.



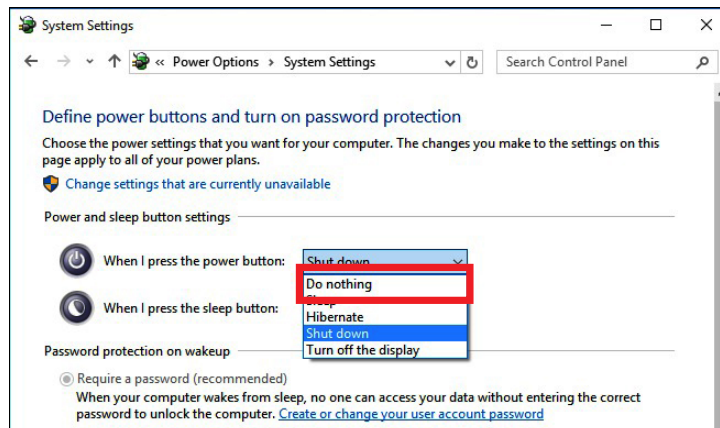
Pin No.	Definition
1	Ignition
2	SW+
3	SW-



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-3200/3200MX/3100 supports 9V to 50V wide range DC power input in ATX/AT mode. In Ignition mode, the input voltage is fixed to 12V/24V for car battery scenario.
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.

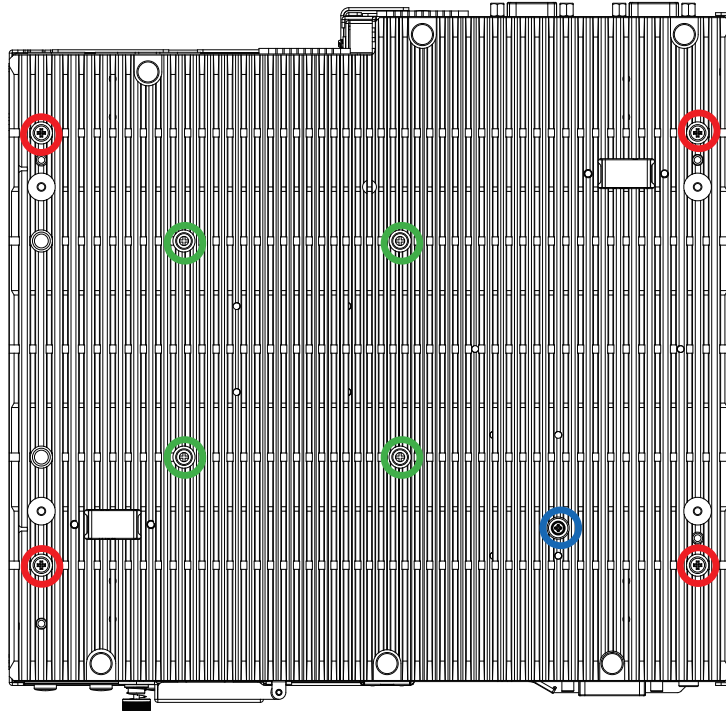


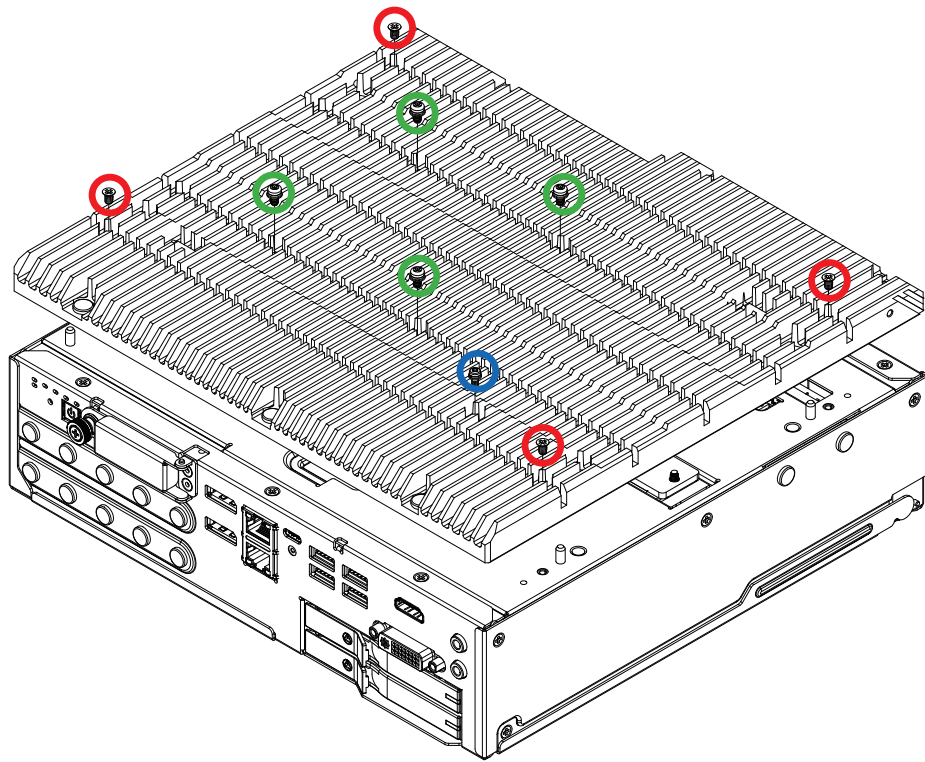
# 3

## SYSTEM SETUP

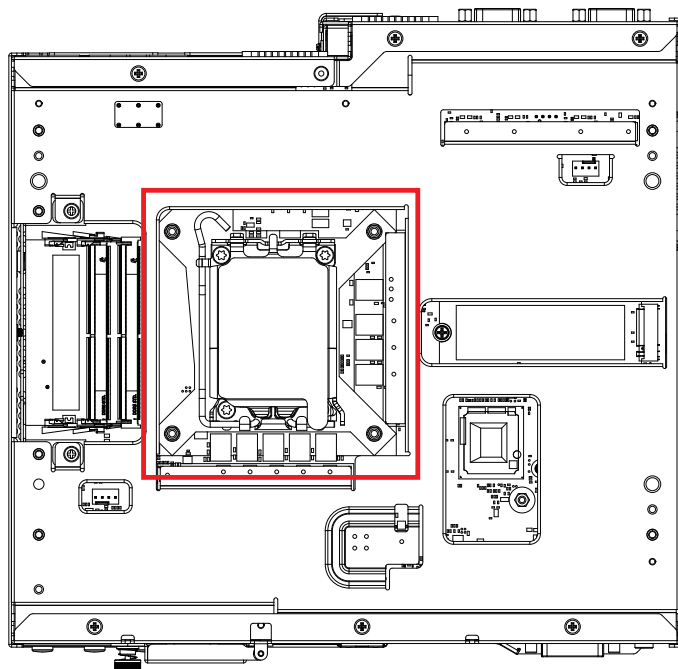
### 3.1 Installing CPU

**Step 1** Remove **four flat head M3x5L screws**, **four pan head SFW M3x6L screws** and **pan head SFW M2.5x6L screw**, and take out heat sink.

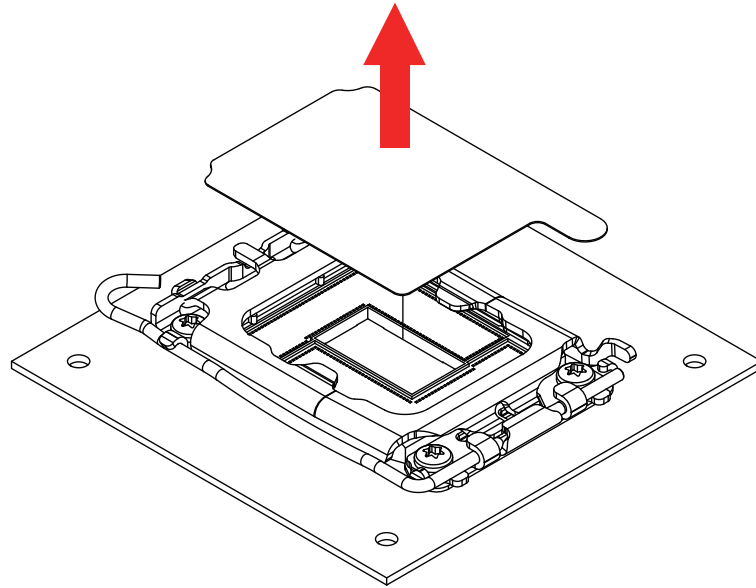




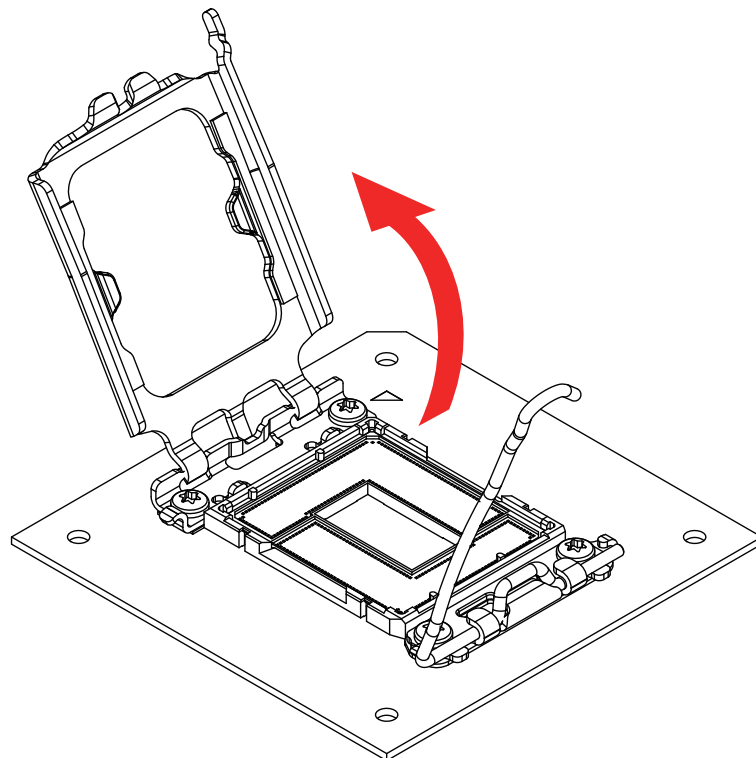
**Step 2** Take out heat sink.



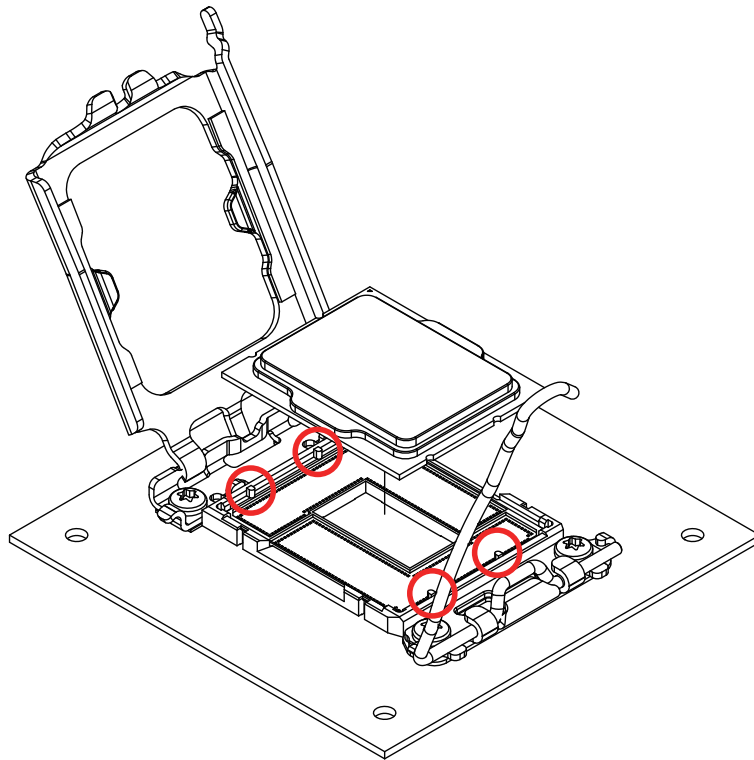
**Step 3** Remove CPU mylar



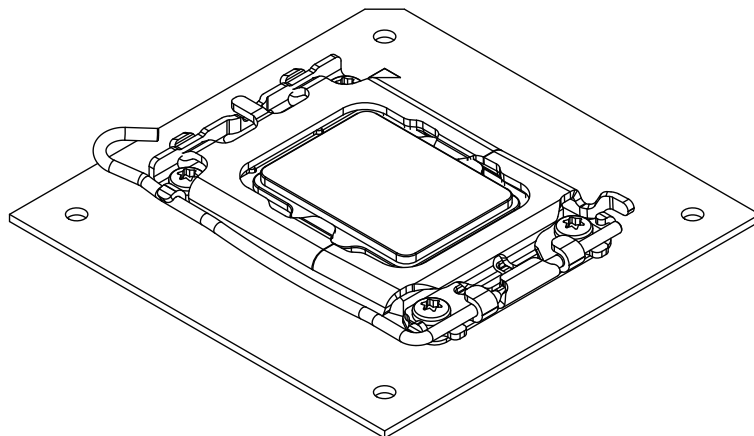
**Step 4** Open CPU independent loading mechanism (ILM)



**Step 5** Install CPU. (Be careful CPU pin)

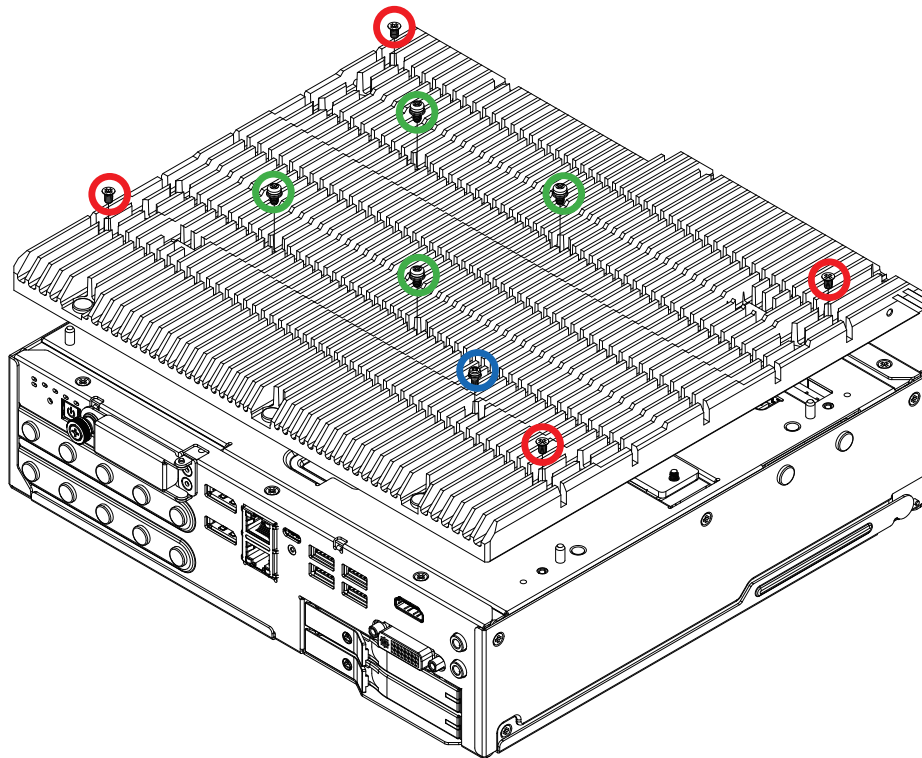
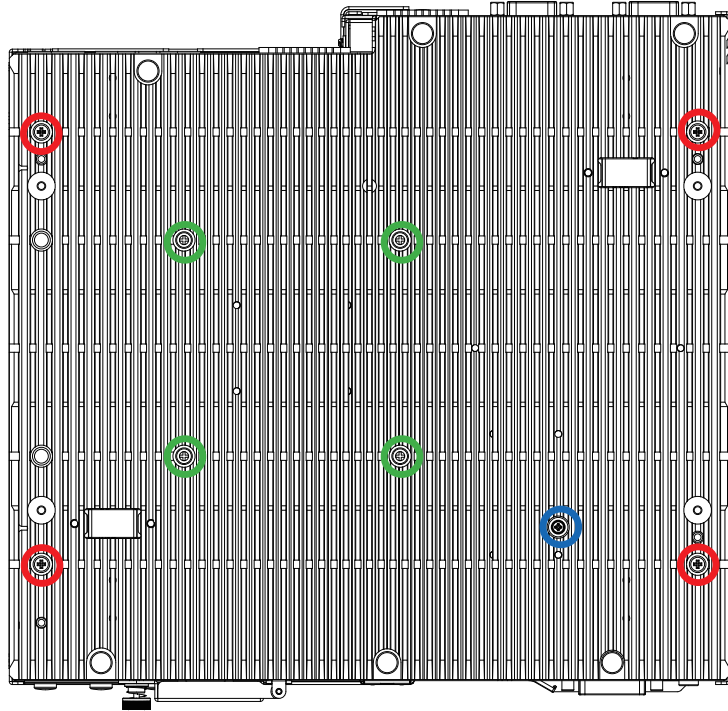


**Step 6** Close CPU independent loading Mechanism (ILM) and finish

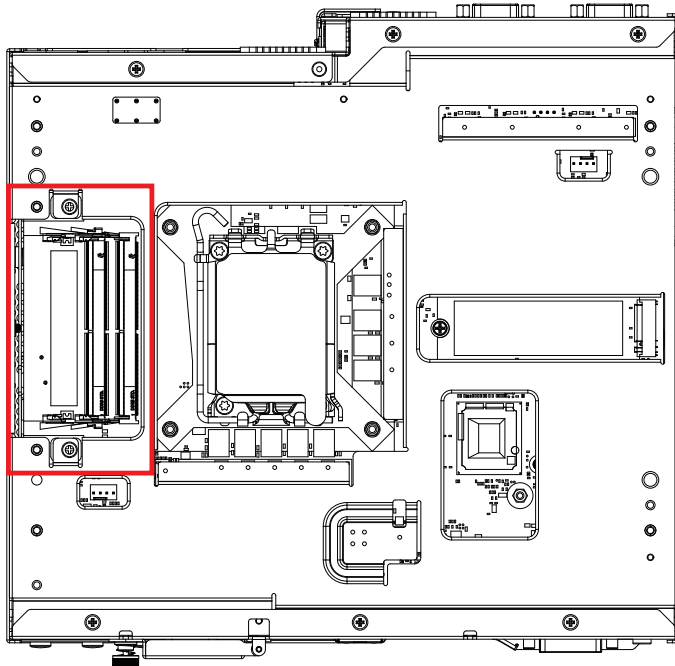


## 3.2 Installing DDR5 SO-DIMM Modules

**Step 1** Remove **four flat head M3x5L screws**, **four pan head SFW M3x6L screws** and **pan head SFW M2.5x6L screw**, and take out heat sink.



**Step 2** Take out heat sink.



**Step 3** Install DDR5 RAM module into SO-DIMM socket



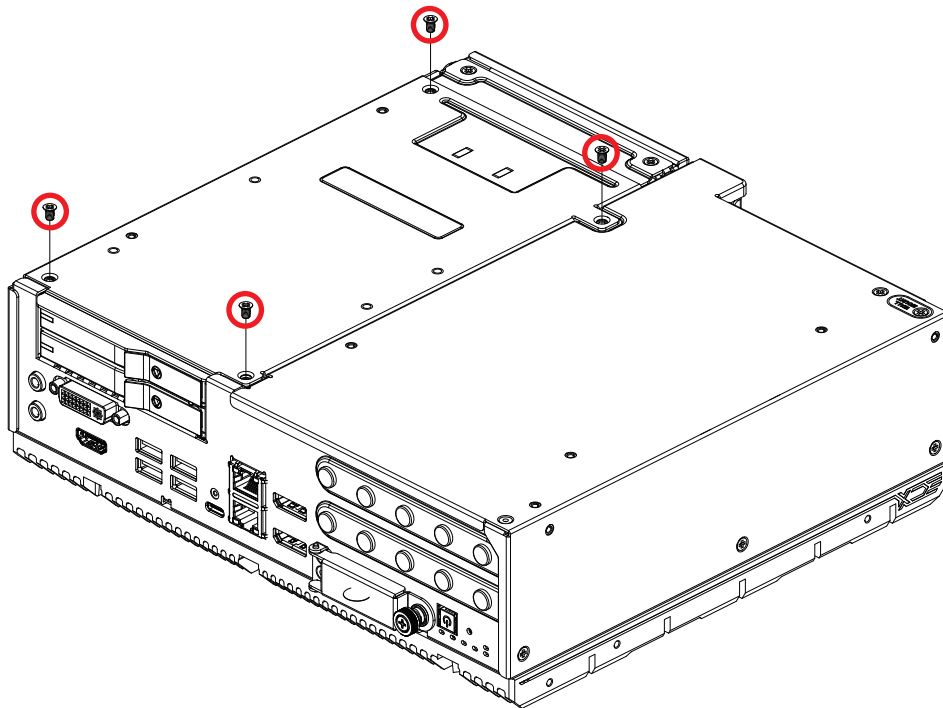
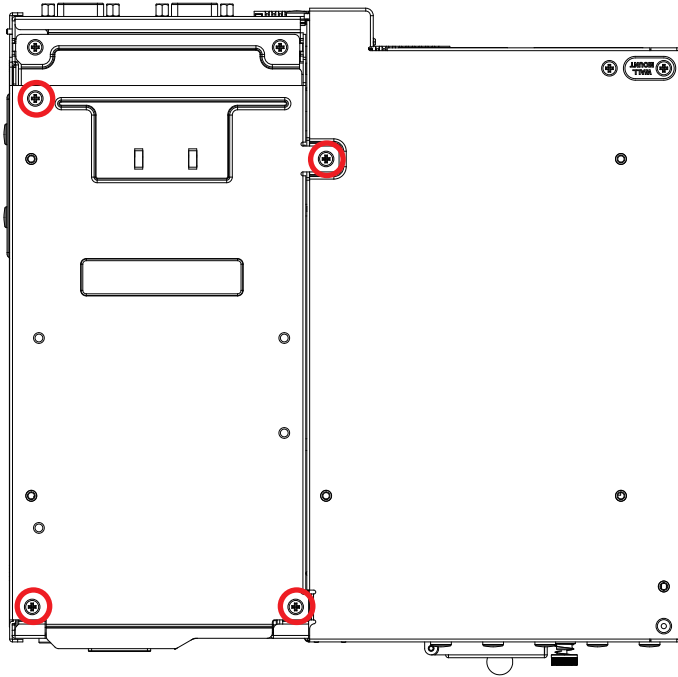


**Step 4** Make sure RAM module is locked by the memory slot



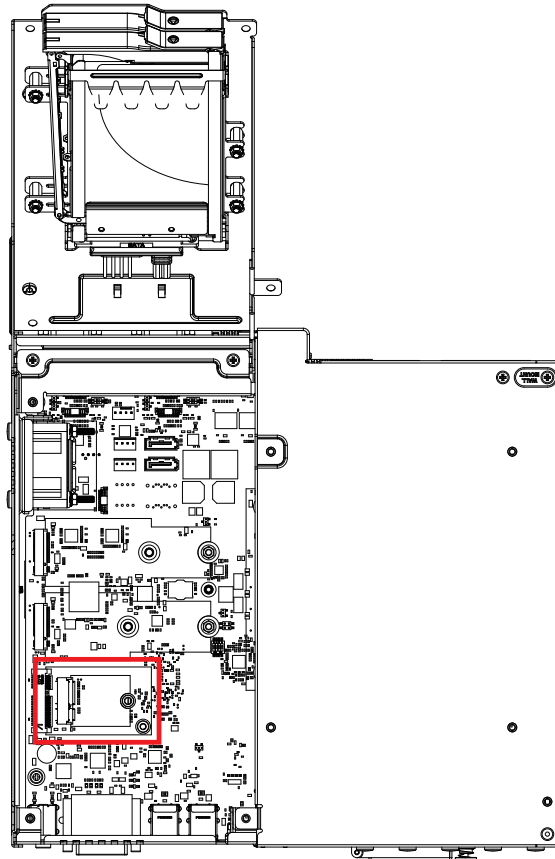
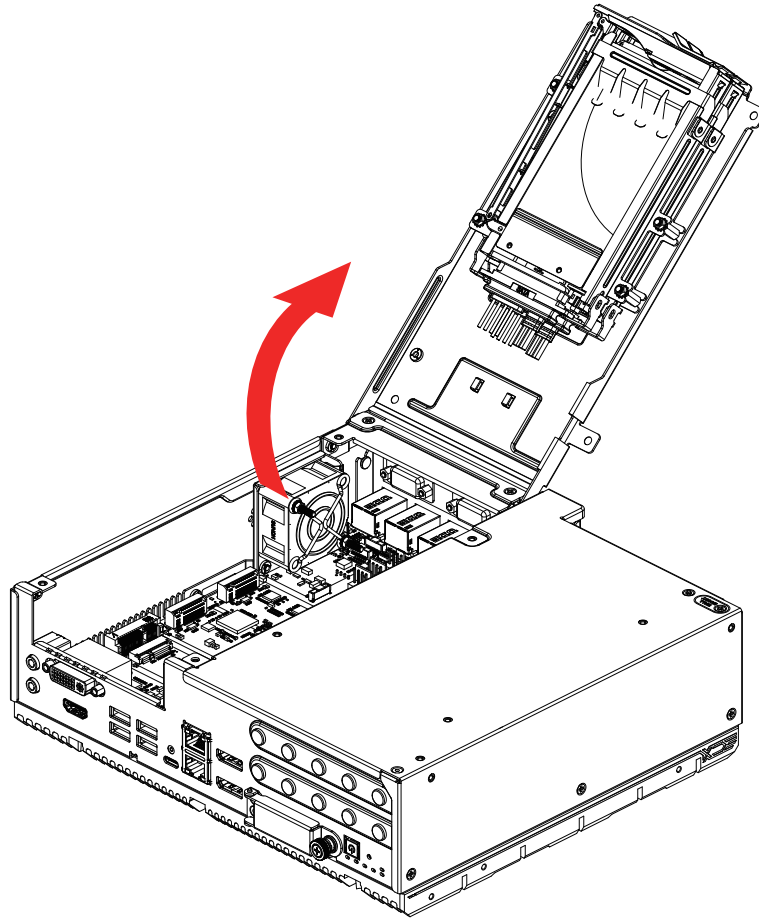
### 3.3 Installing Mini PCIe Card

Step 1 Remove four flat head M3x5L screws.





**Step 2** Open bottom cover.



**Step 3** Install mini PCIe card into slot

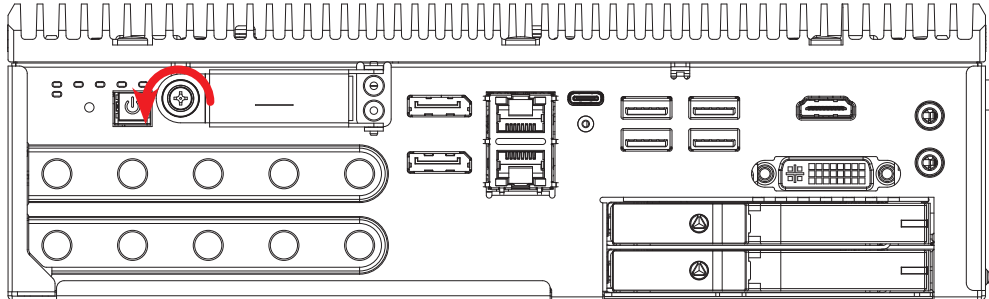


**Step 4** Fasten pan head SFW M2.5x6L screw

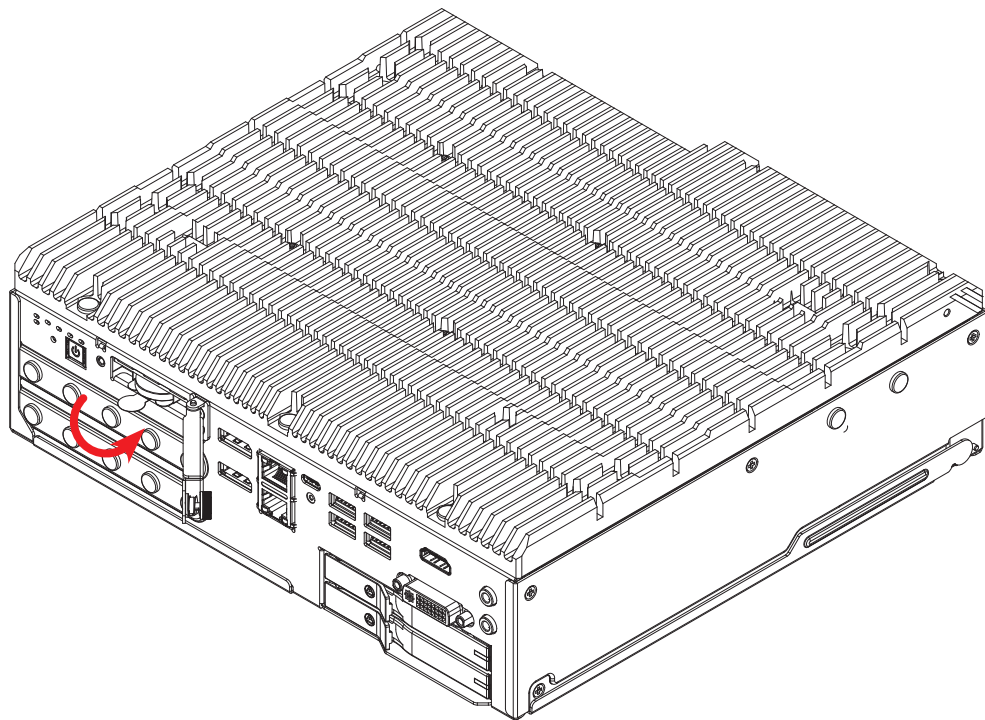


## 3.4 Installing Nano SIM Card

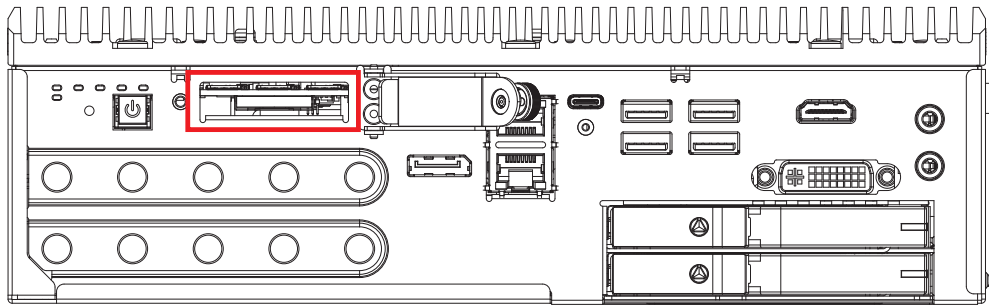
**Step 1** Release captive panel screw.



**Step 2** Open service Card.

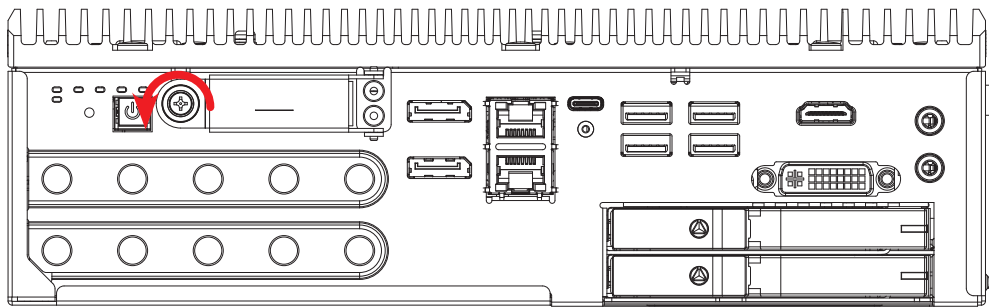


**Step 3** Insert nano SIM card and push to lock.

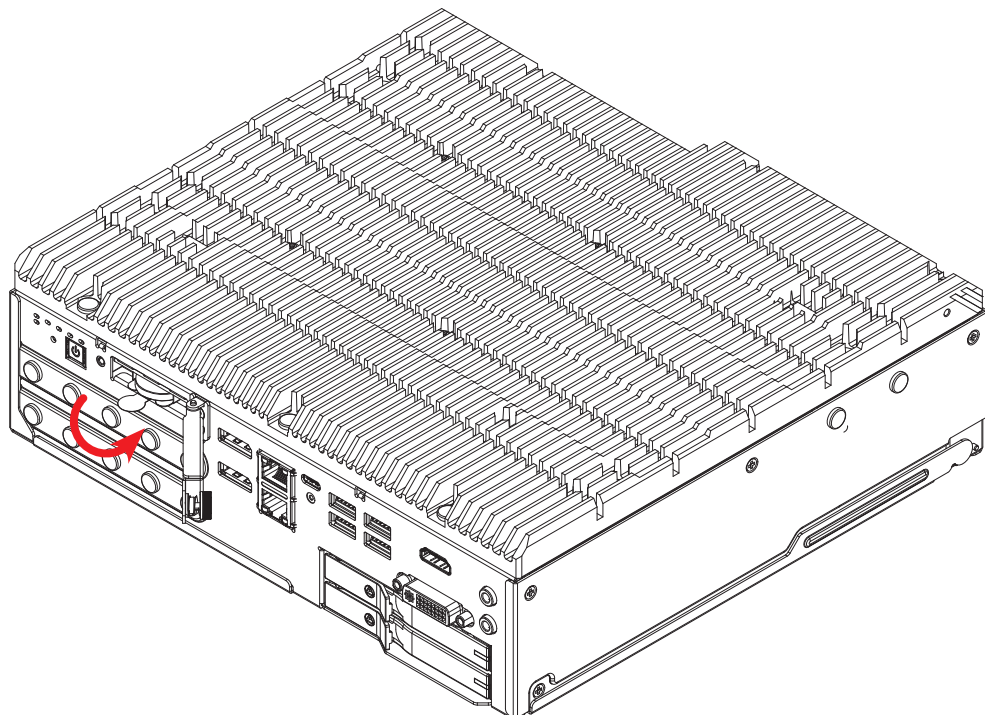


### 3.5 Installing Removable RTC Battery

**Step 1** Release captive panel screw.

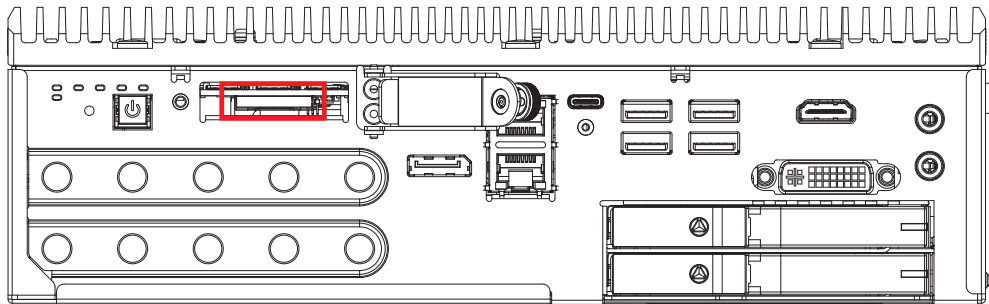


**Step 2** Open service Card.





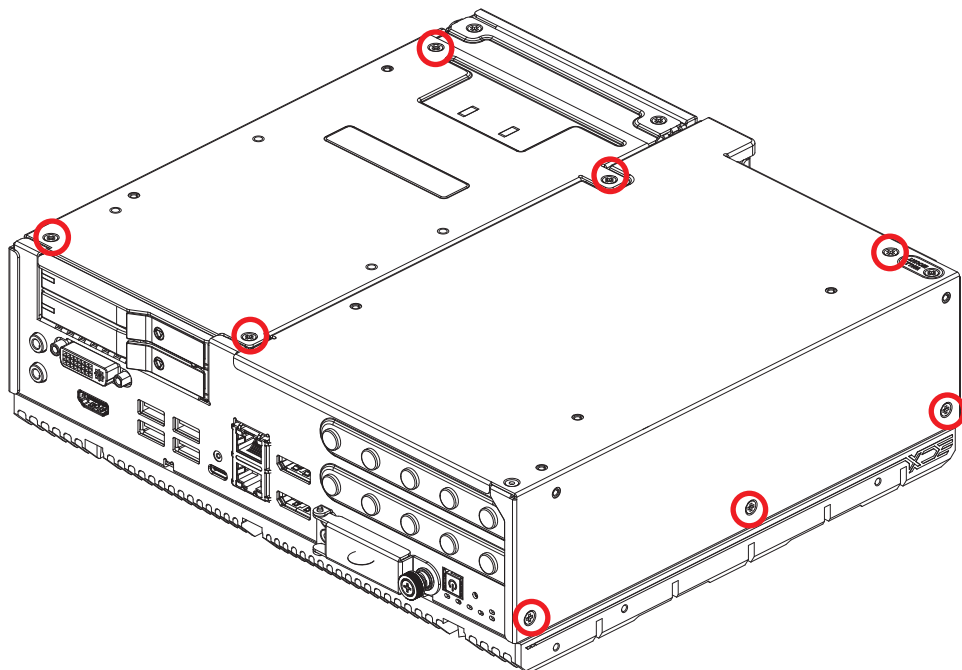
**Step 3** Insert removable RTC battery.

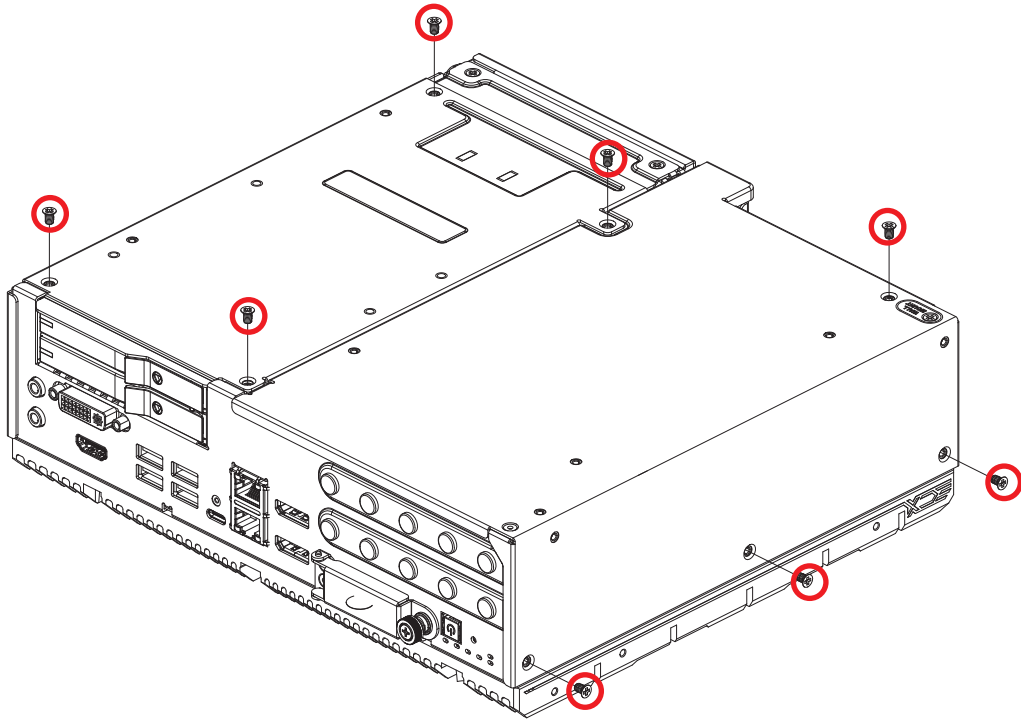


### 3.6 Installing PCIe Card

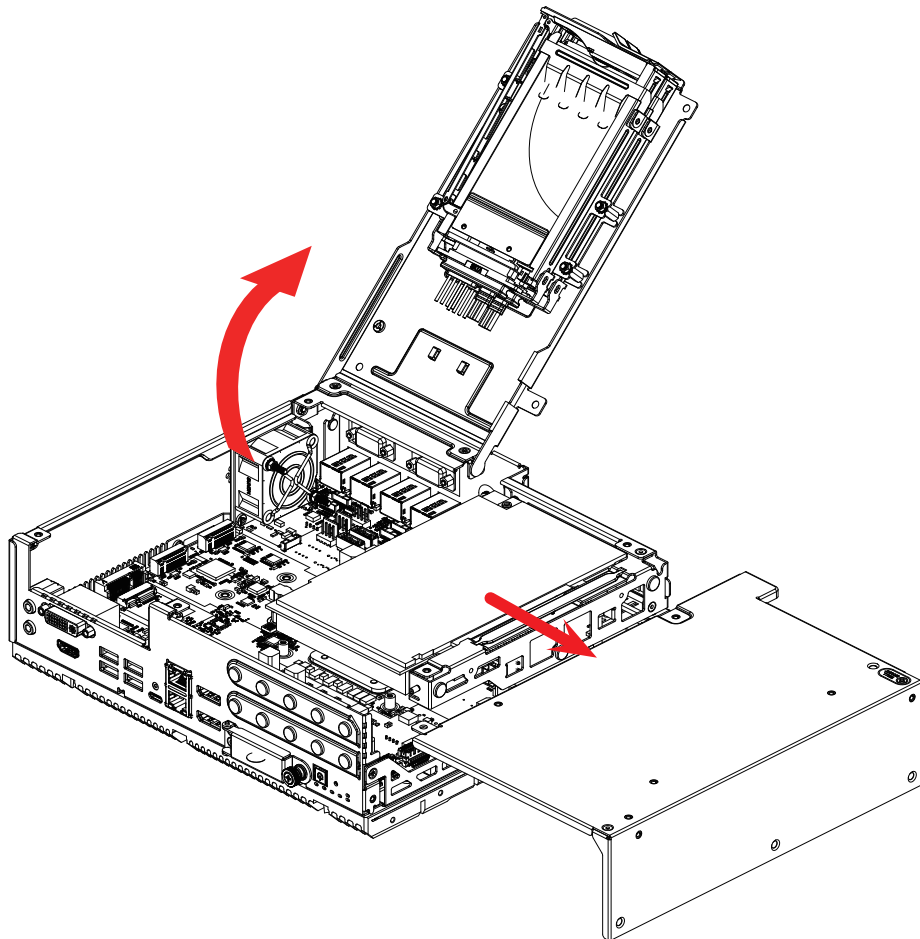
System designs will support 126 mm maximum height, 219 mm maximum length (Without the I/O bracket & auxiliary power card) PCI Express add-in cards.

**Step 1** Remove eight flat head M3x5L screws.

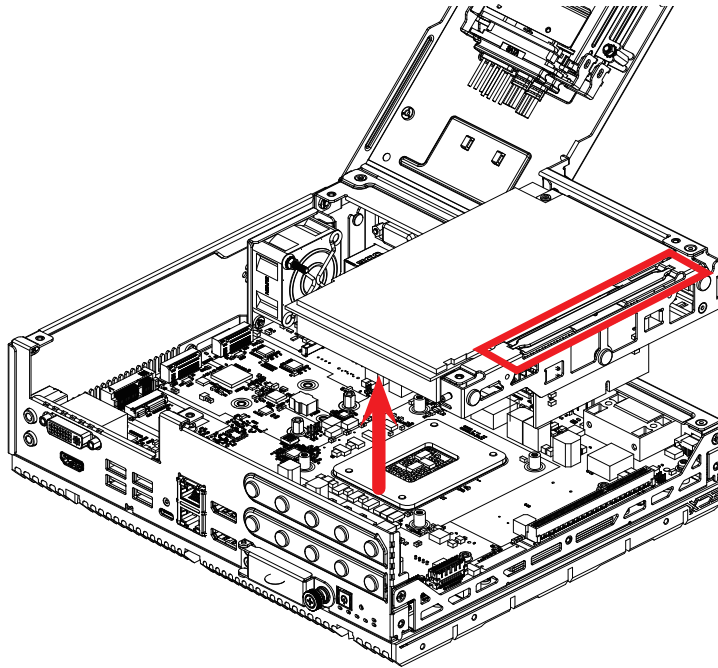




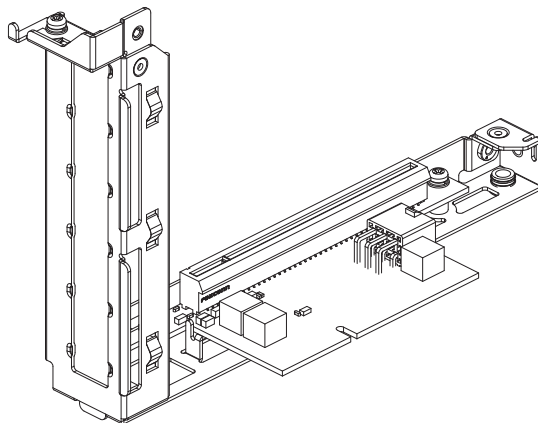
**Step 2** Open bottom cover & add-in card cover.



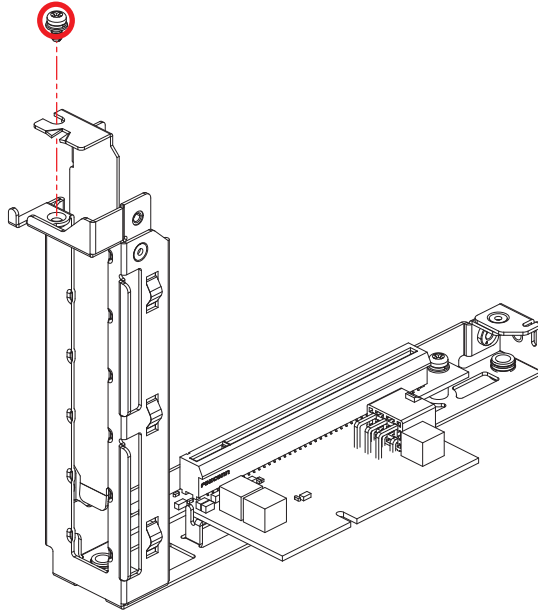
**Step 3** Separate Assembly\_Riser Card from the enclosure with the puller.



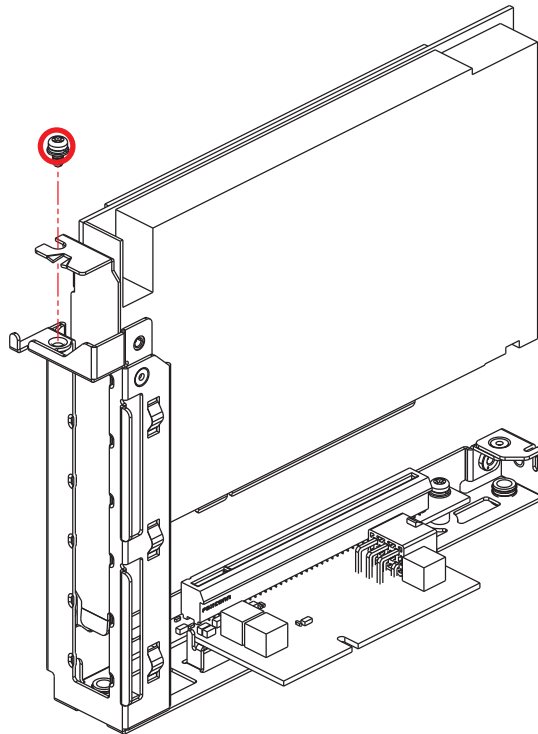
**Step 4** Turn riser card assembly upside-down on a steady surface.



**Step 5** Remove the screw indicated, and separate I/O bracket from riser card assembly.



**Step 6** Install PCIe add-in card, and fasten the screw indicated.





### 3.7 Installing SSD/HDD

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



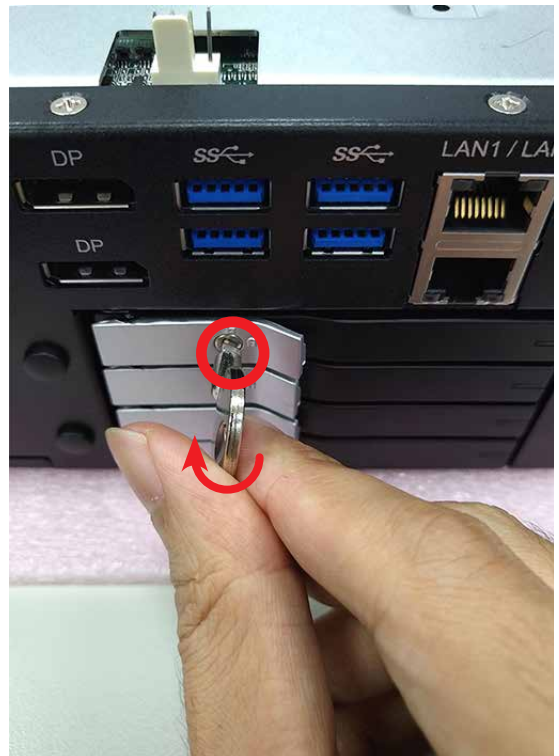
**Step 2** Open front door of SSD/HDD tray.



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



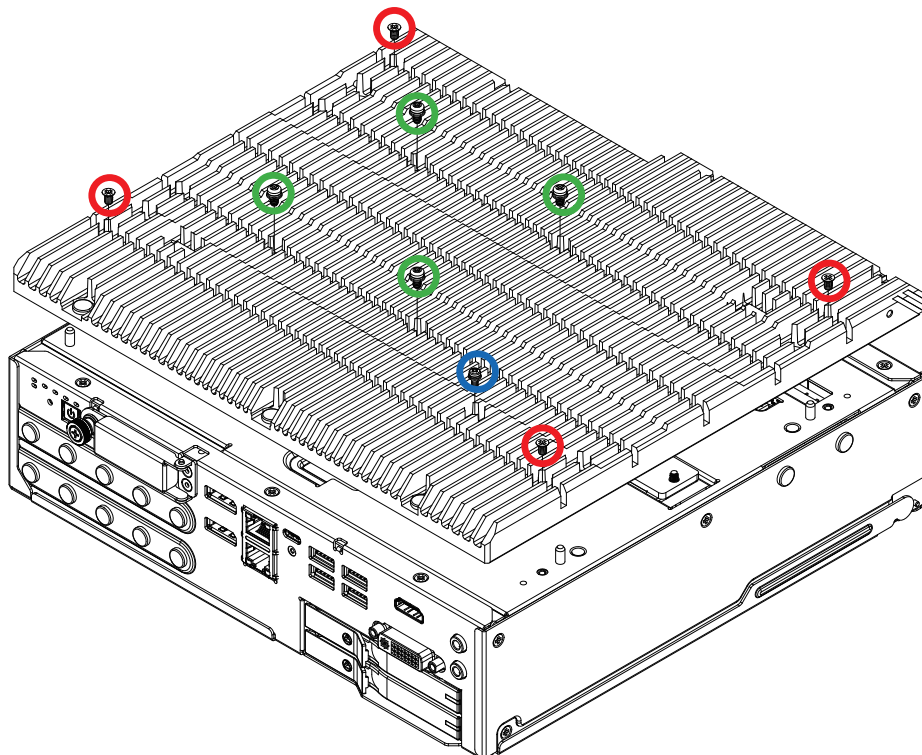
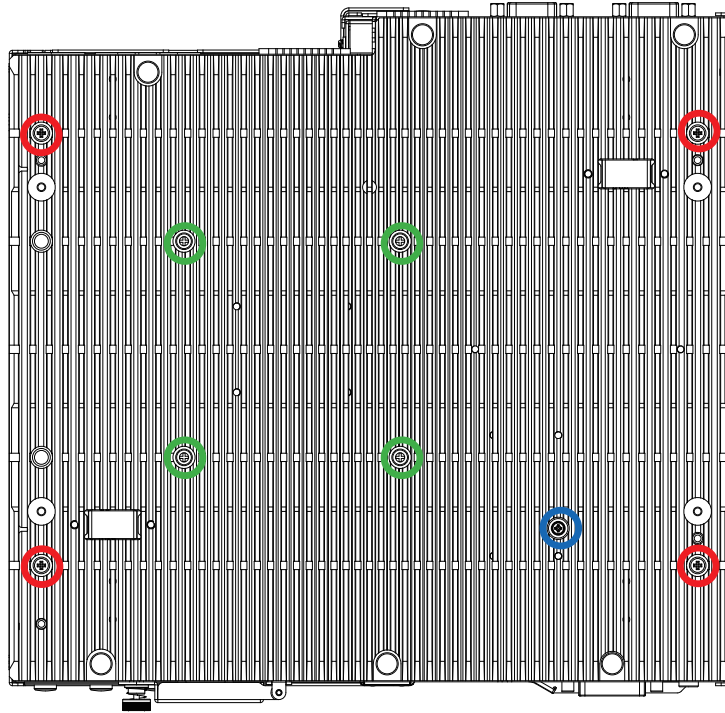
**Step 4** Lock the SSD/HDD tray with key.



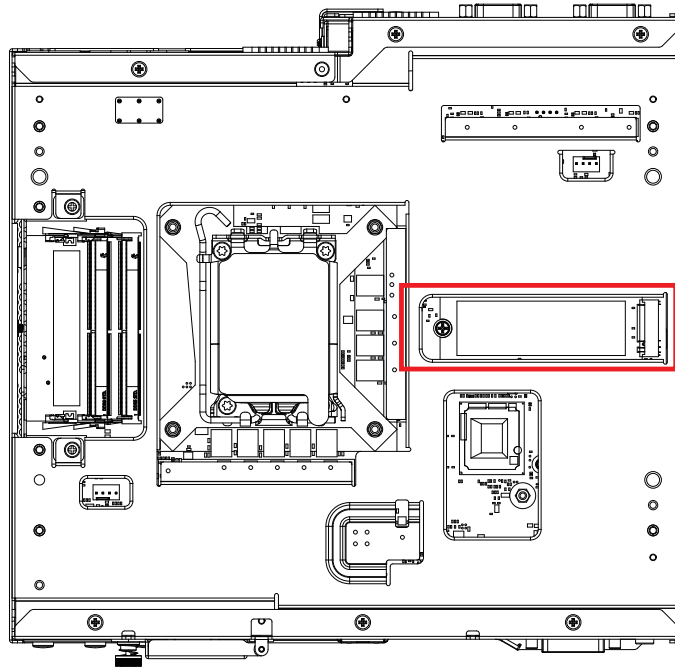
## 3.8 Installing M.2

### 3.8.1 M.2 Key M 2280

**Step 1** Remove **four flat head M3x5L screws**, **four pan head SFW M3x6L screws** and **pan head SFW M2.5x6L screw**, and take out heat sink.

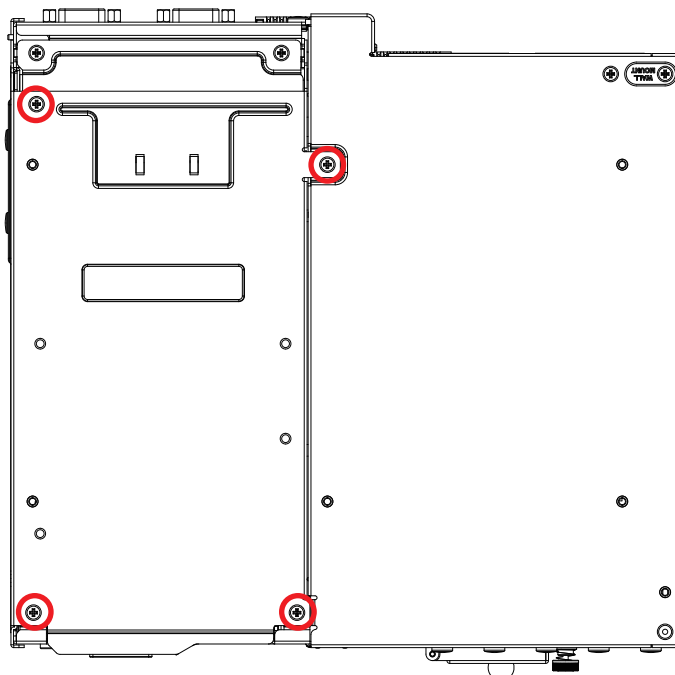


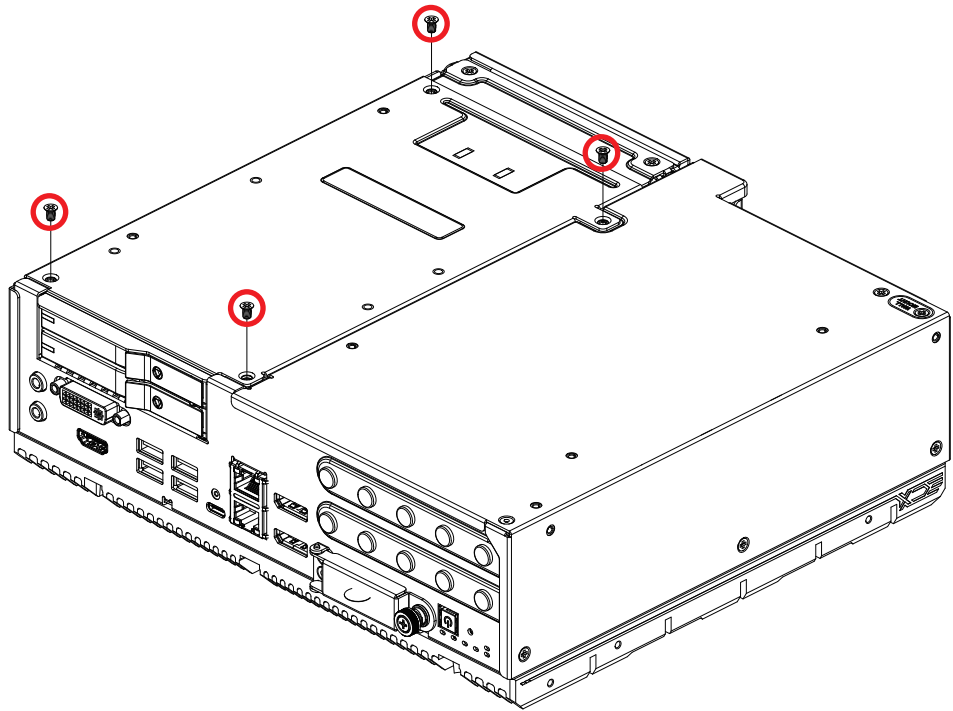
**Step 2** Take out heat sink, and install M.2 module card into slot and fasten I head M3x4L screw.



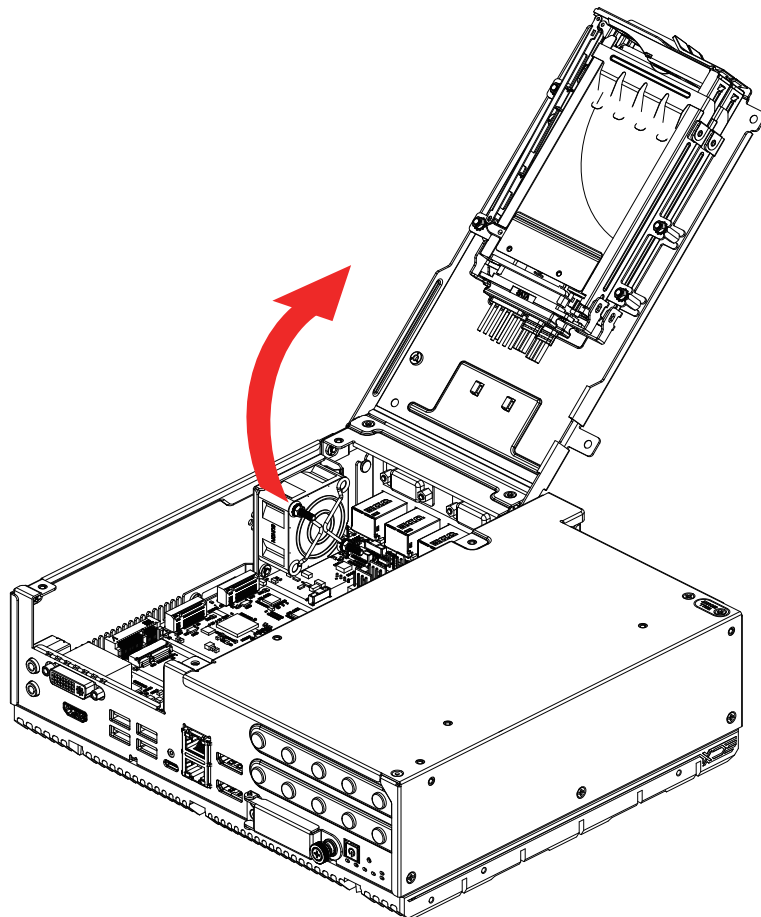
### 3.8.2 M.2 Key B 3042/3052/2280 & Key E 2230

**Step 1** Remove four flat head M3x5L screws.





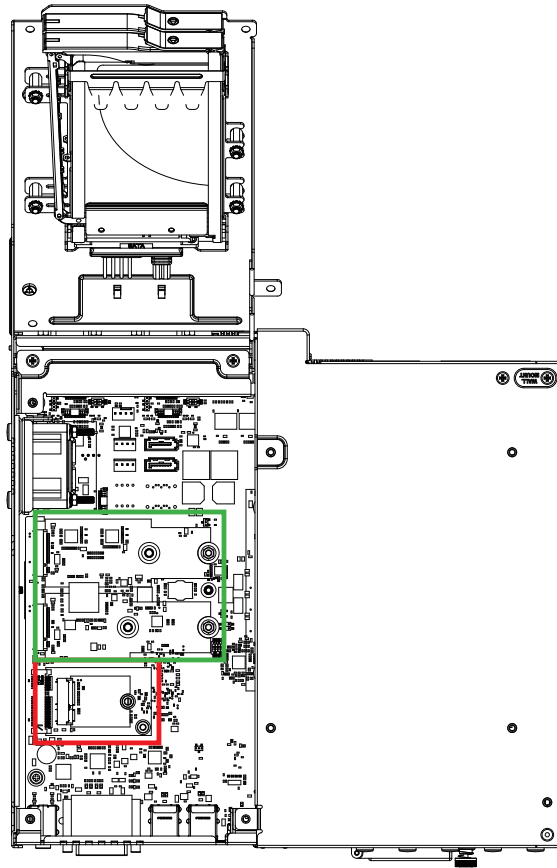
**Step 2** Open bottom cover.



**Step 3** **M.2 Key B 3052/2280:** Remove hexagon M3 standoff on the position of Key B 2280, and install hexagon M3 standoff on the position of Key B 3052, and install M.2 Key B 3052 module card and fasten I head M3x4L screw.

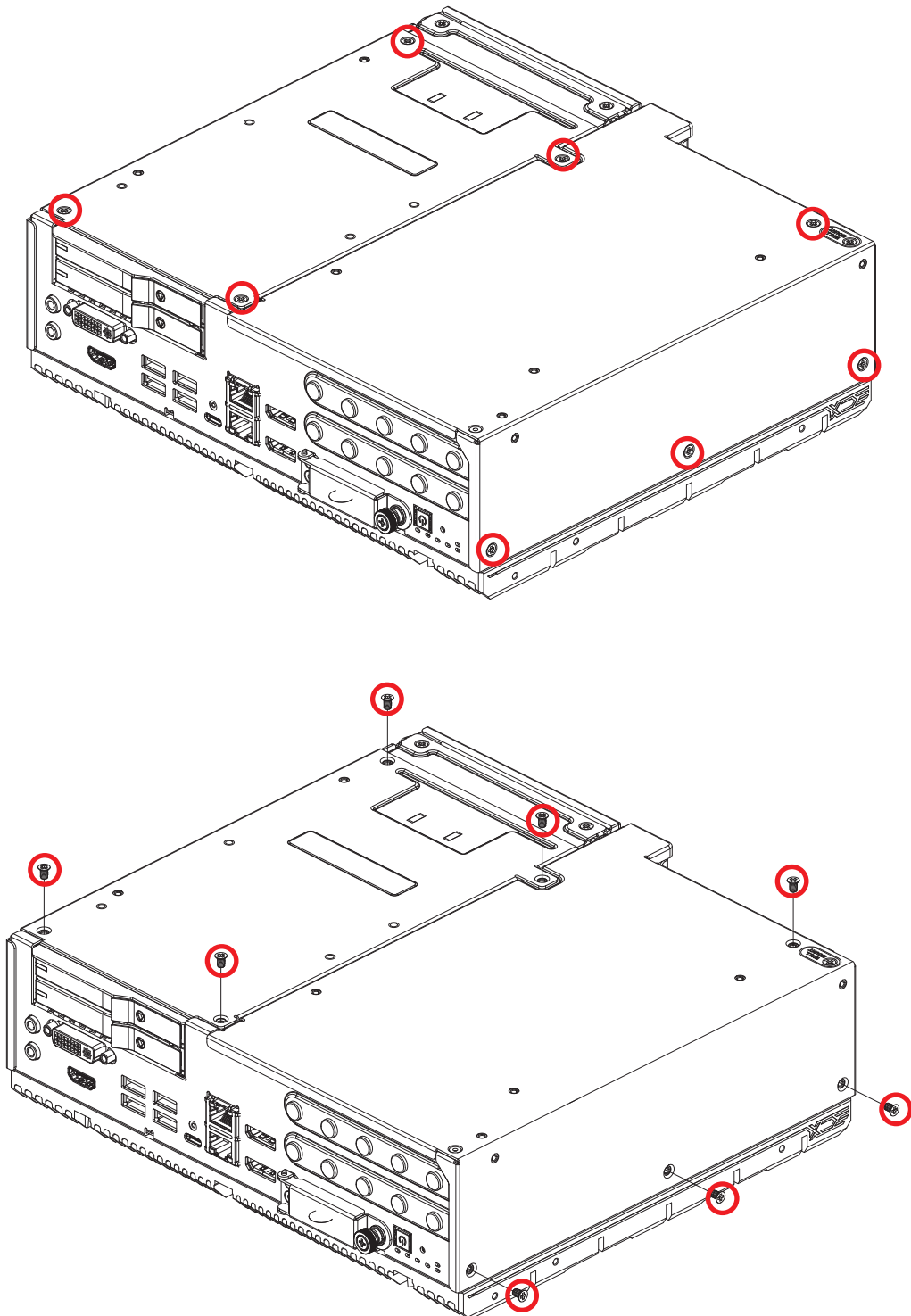
**M.2 Key B 3042/2280:** I Remove hexagon M3 standoff on the position of Key B 2280, and install hexagon M3 standoff on the position of Key B 3042, and install M.2 Key B 3042 module card and fasten I head M3x4L screw.

**M.2 Key E 2230 :** I Install M.2 Key E 2230 module card into slot, and fasten I head M3x4L screw

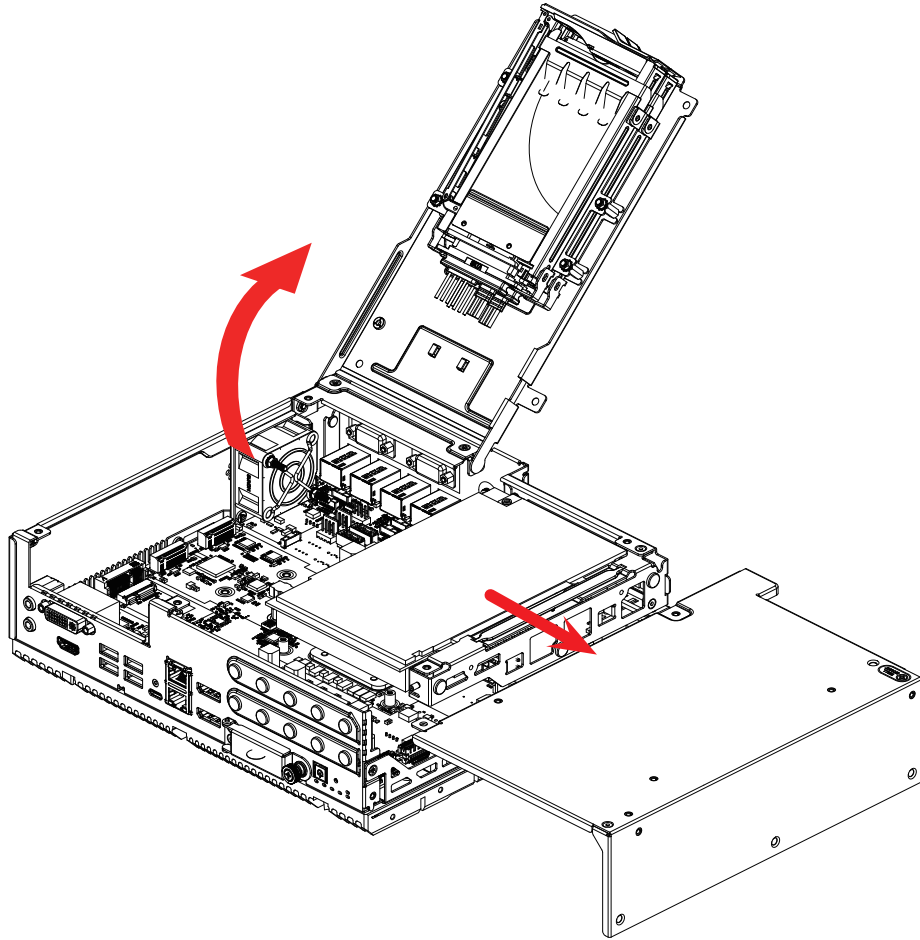


## 3.9 Installing Antenna Cable

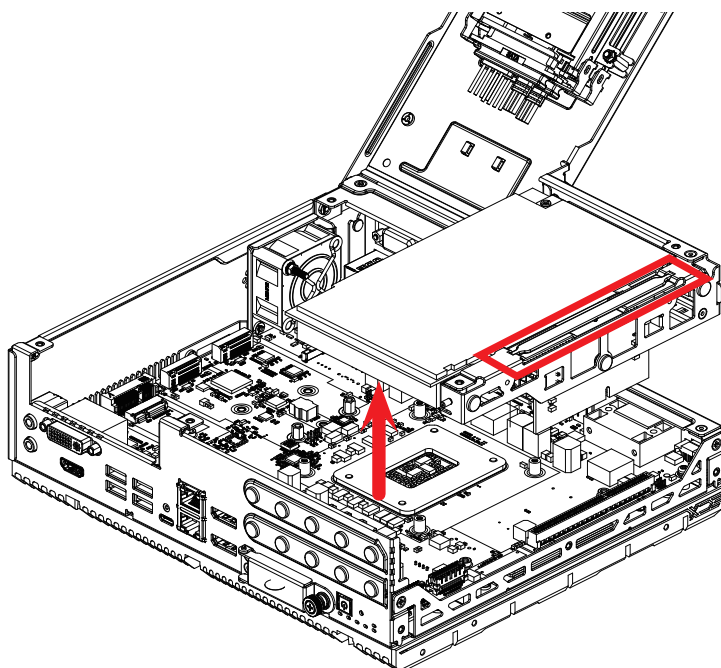
**Step 1** Remove eight flat head M3x5L screws.



**Step 2** Open bottom cover & add-in card cover.

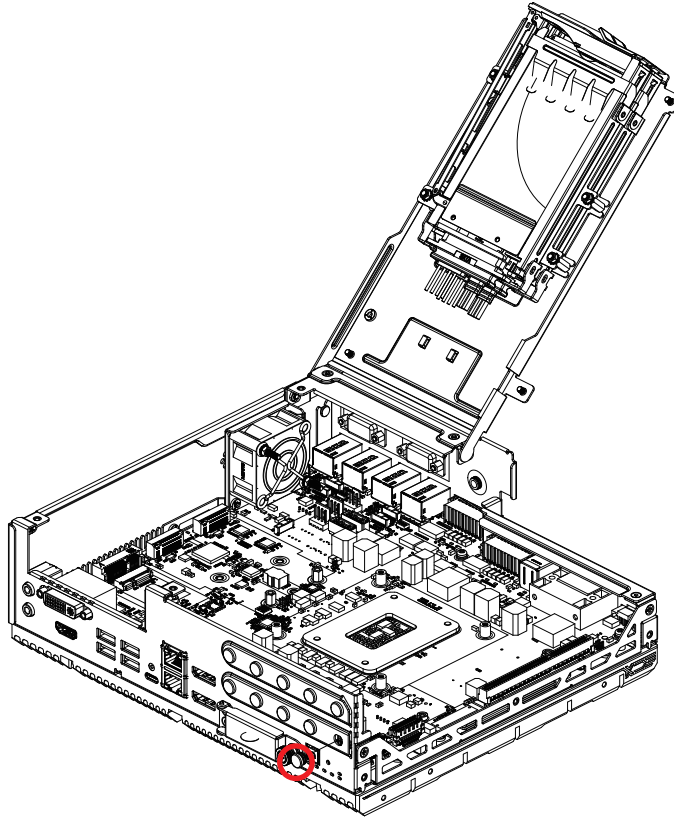


**Step 3** Separate Assembly\_Riser Card from the enclosure with the puller.

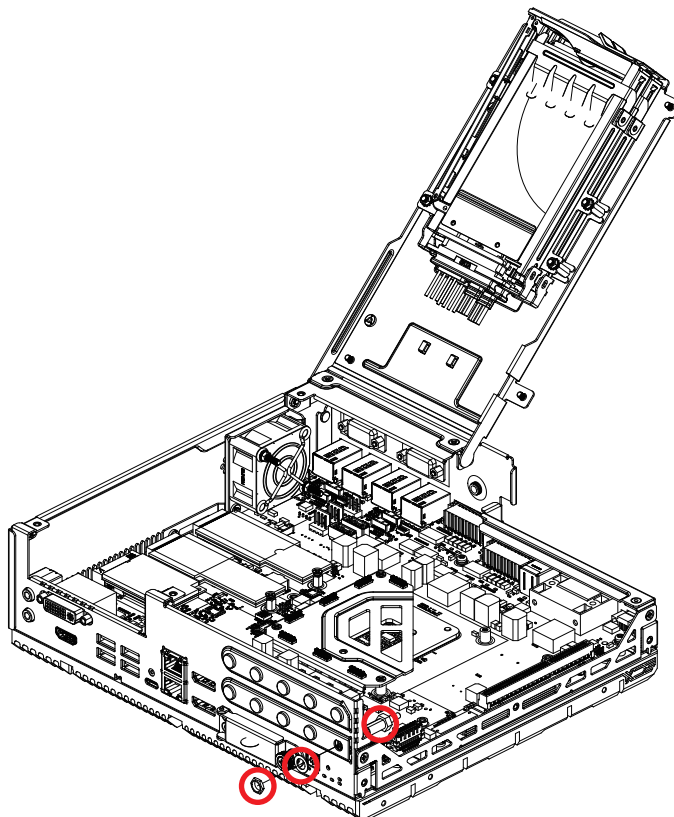




**Step 4** Remove hole plug.



**Step 5** Install SMA cable, and fasten washer and nut.

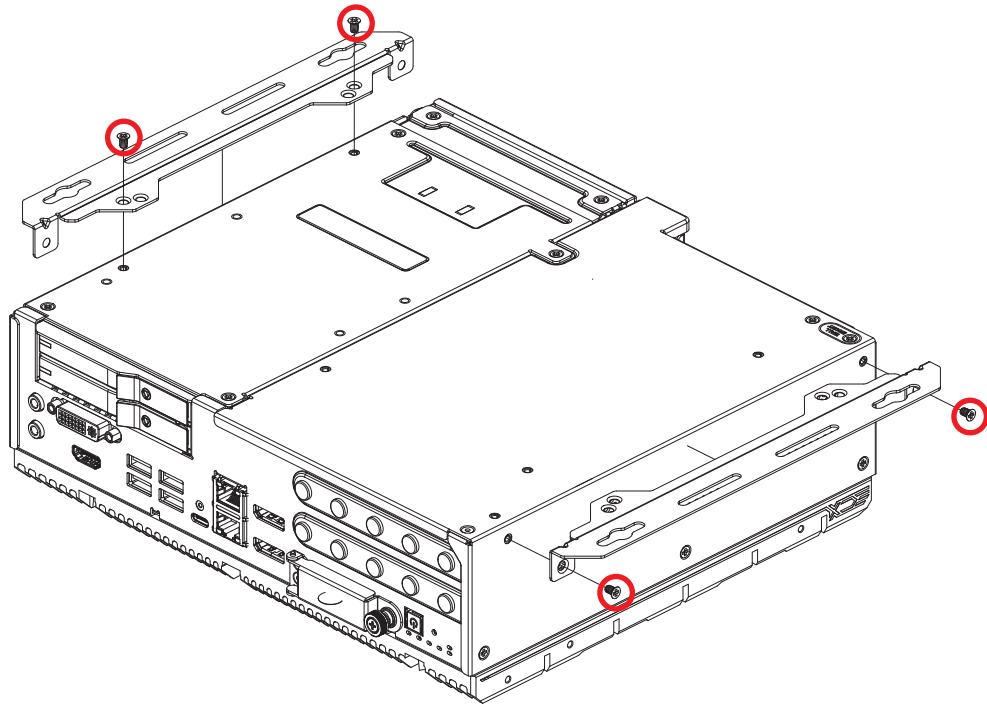




## 3.10 Mounting Your ECX-3200/3100

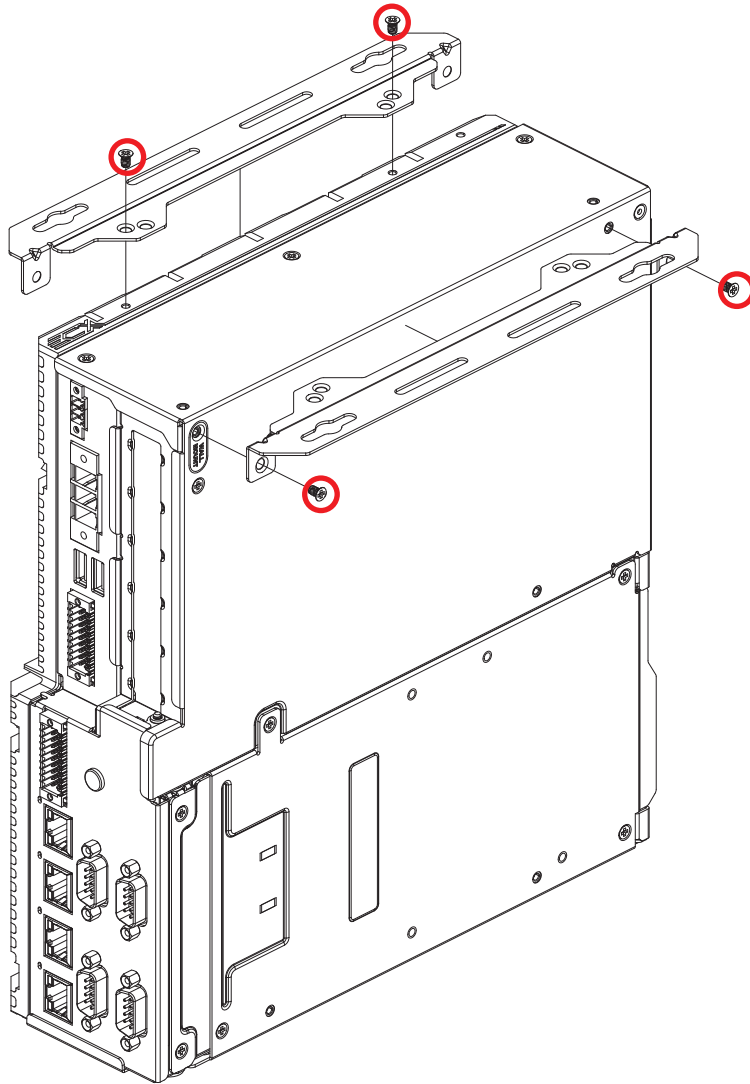
### 3.10.1 Wall Mount (Type I)

Fasten four flat head M3x5L screws.



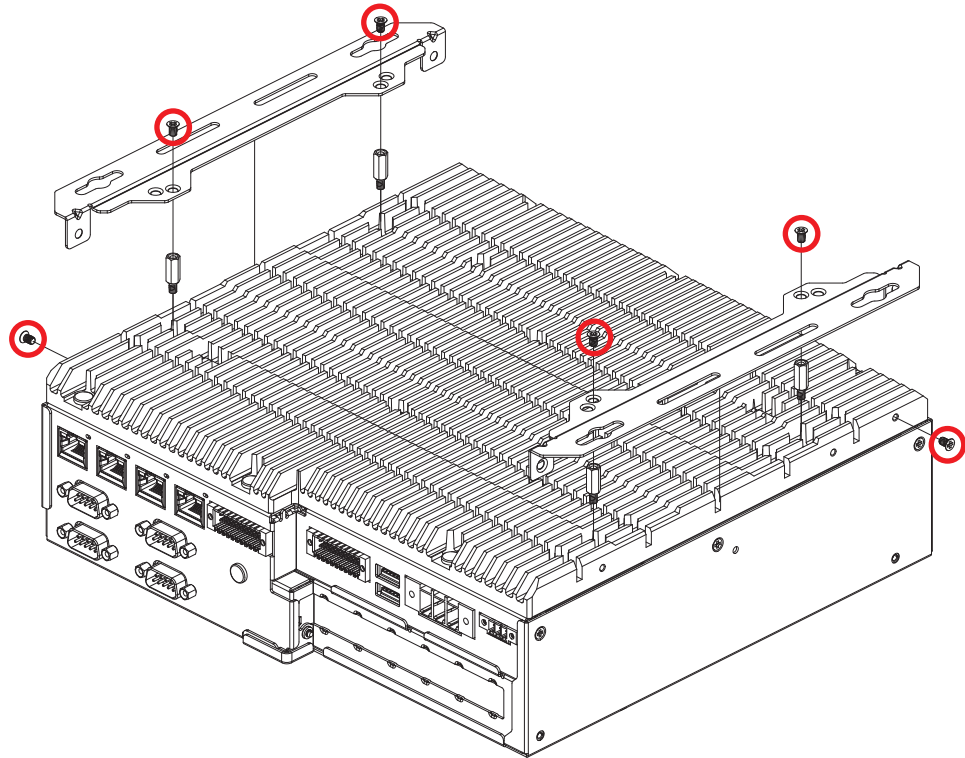
### 3.10.2 Wall Mount (Type II)

Fasten four flat head M3x5L screws.



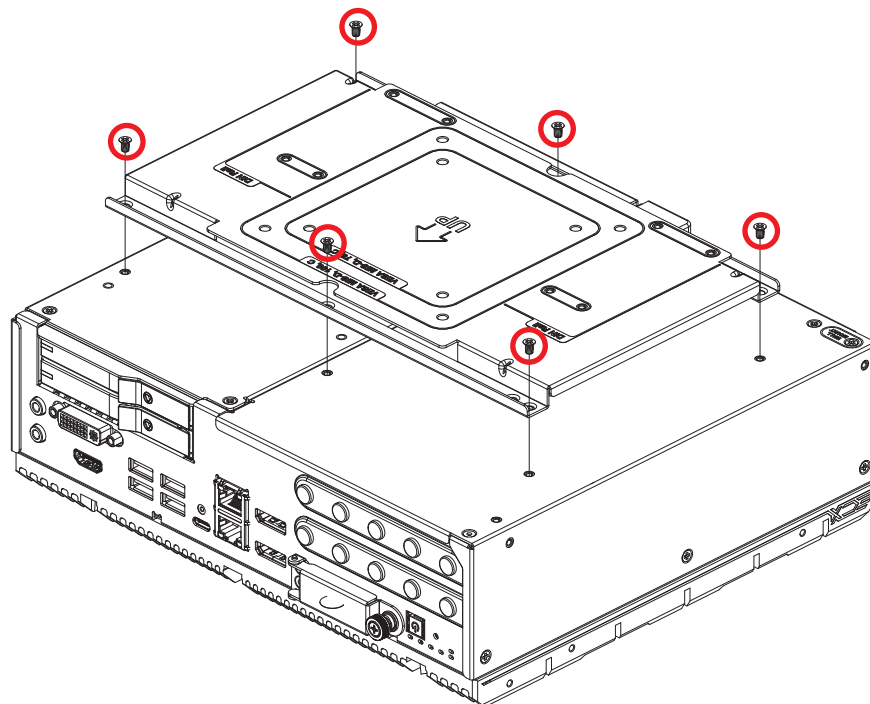
### 3.10.3 Wall Mount (Type III)

Fasten six flat head M3x5L screws.



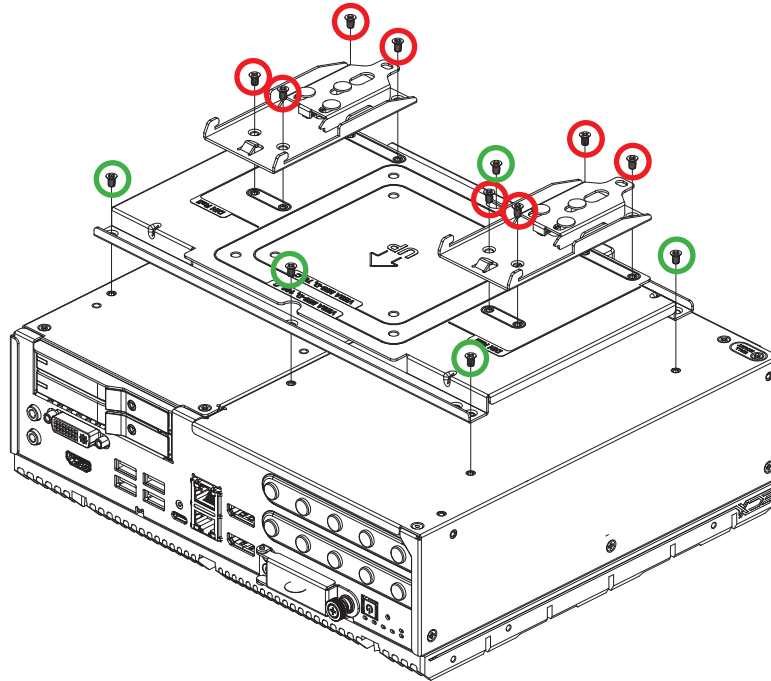
### 3.10.4 VESA Mount (Optional)

Fasten six flat head M3x5L screws.

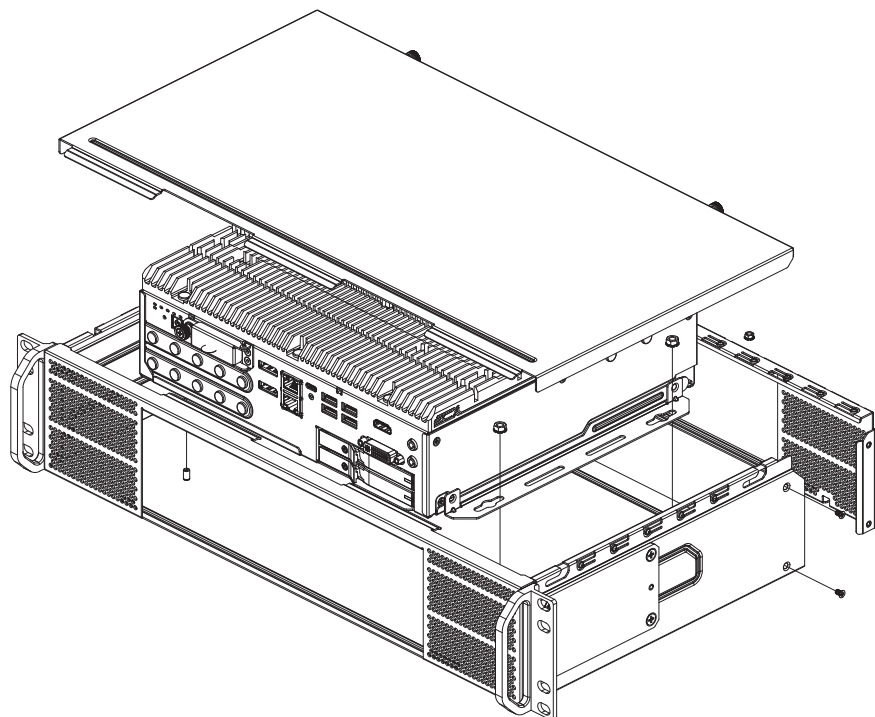


### 3.10.5 DIN Rail Mount ( Optional )

Install DIN Rail with **eight flat head M3x5L screws**, and Install DIN Rail assembly with **six flat head M3x5L screws**.



### 3.10.6 2U Rack Mount ( Optional )



# 4

## BIOS SETUP

### 4.1 Entering BIOS Setup

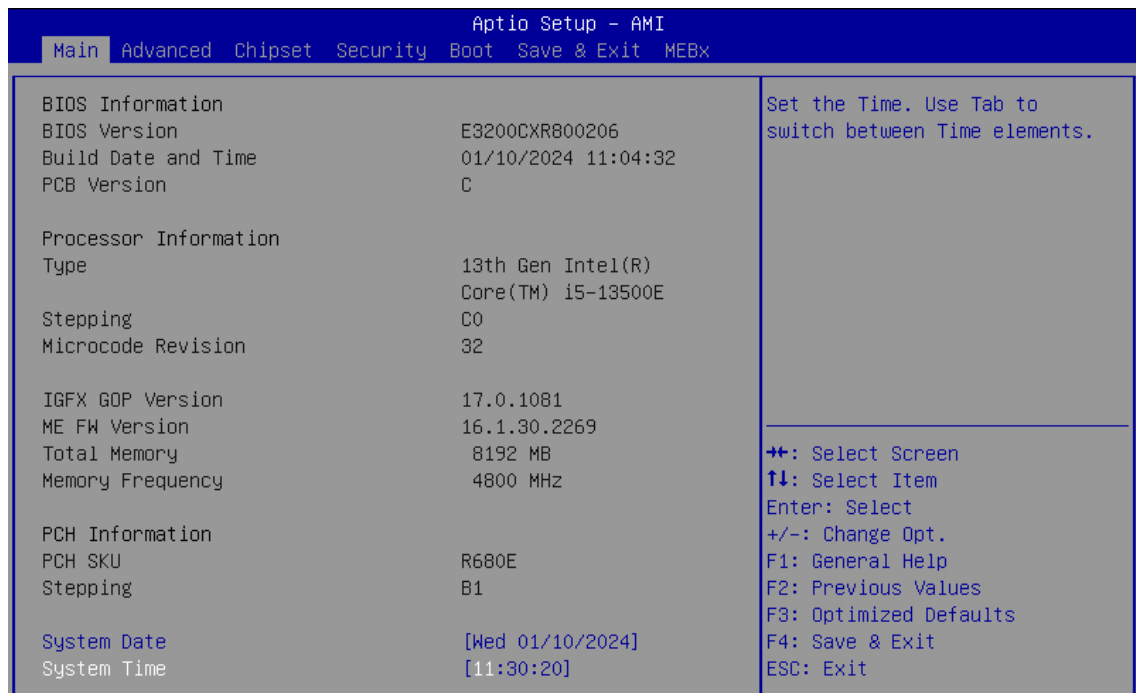


Figure 4-1 : Entering Setup Screen

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 Menu

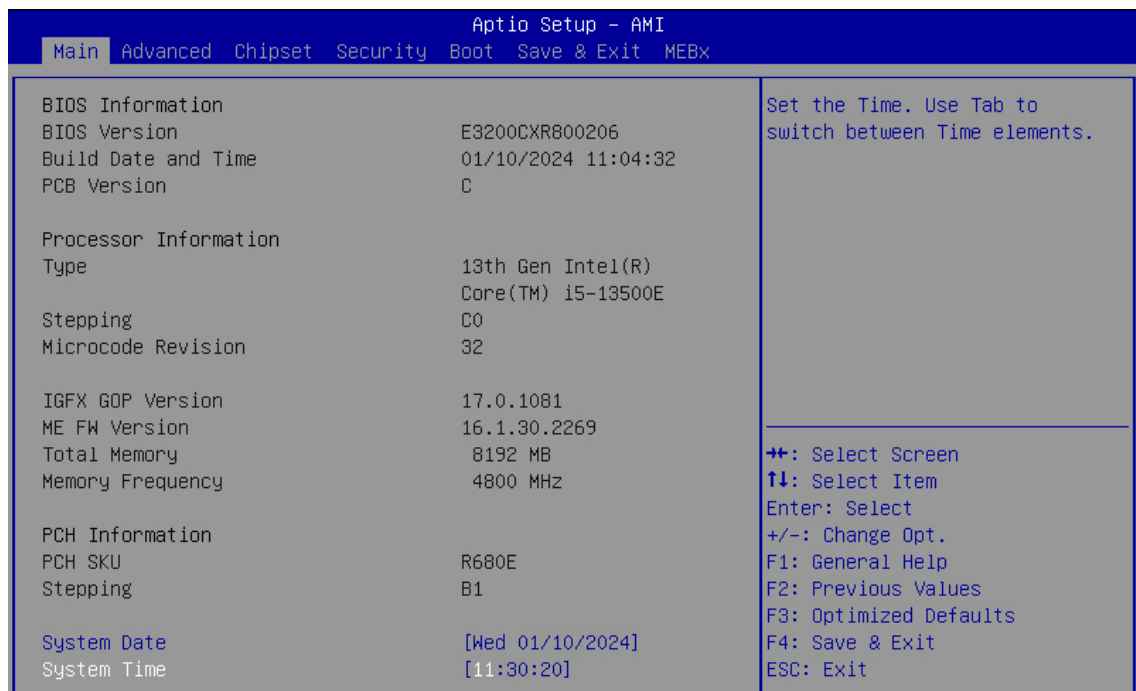


Figure 4-2 : BIOS Main Menu

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.

Default Ranges:

Year: 1998-9999

Months: 1-12

Days: Dependent on month

Range of Years may vary.

### System Time

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

## 4.3 Advanced Menu

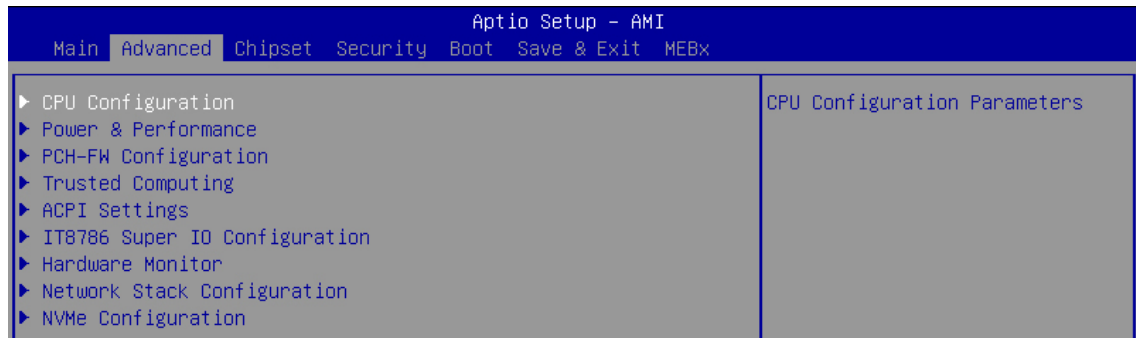


Figure 4-3 : BIOS Advanced Menu

Select advanced tab to enter advanced BIOS setup options, such as CPU configuration, ACPI settings, and Super IO configuration.

### 4.3.1 CPU Configuration

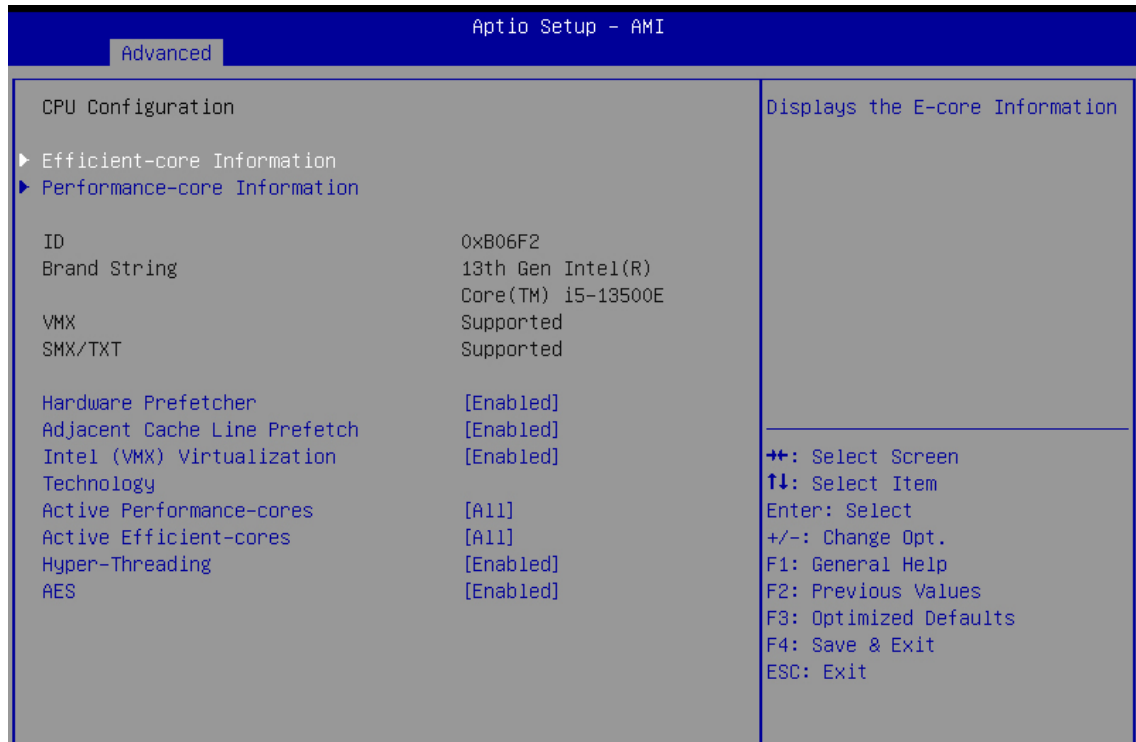


Figure 4-3-1 : CPU Configuration

#### Efficient-core Information

Displays the E-core Information.

#### Performance-core Information

Displays the P-core Information.

#### 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 Performance-cores

Number of P-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.

## Active Efficient-cores

Number of E-cores to enable in each processor package. Note: Number of Cores and E-cores are looked at together. When both are {0,0}, Pcode will enable all cores.

## Hyper-Threading

Enable or Disable Hyper-Threading Technology.

## AES

Enable/Disable AES (Advanced Encryption Standard).

## 4.3.2 Power & Performance

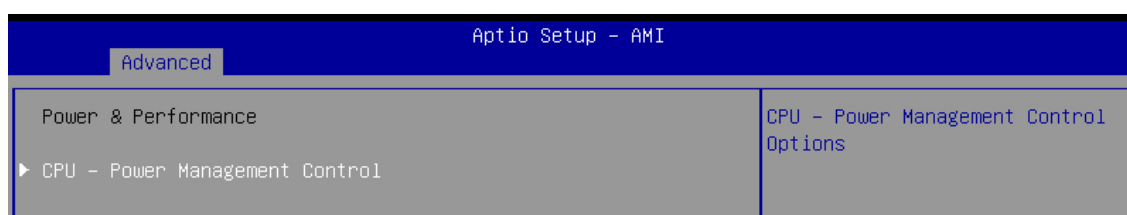


Figure 4-3-2 : Power & Performance

### 4.3.2.1 CPU – Power Management Control

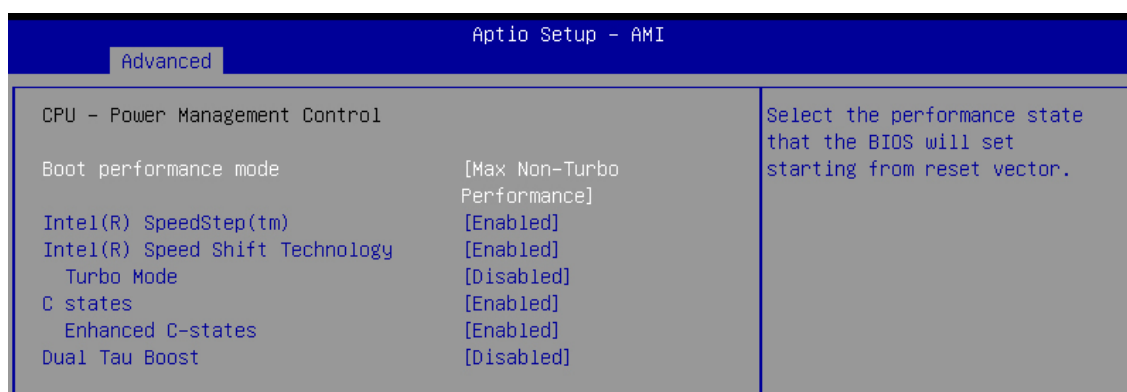


Figure 4-3-2-1 : CPU – Power Management Control

#### Boot performance mode

Select the performance state that the BIOS will set starting from reset vector.

#### Intel(R) SpeedStep(tm)

Allows more than two frequency ranges to be supported.



### Intel(R) Speed Shift Technology

Enable/Disable Intel(R) Speed Shift Technology support. Enabling will expose the CPPC v2 interface to allow for hardware controlled P-states.

### Turbo Mode

Enable/Disable processor Turbo Mode (requires EMTTM enabled too). AUTO means enabled.

### C states

Enable/Disable CPU Power Management. Allows CPU to go to C states when it's not 100% utilized.

### 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 Desktop 35W/65W/125W sku. When DPTF is enabled this feature is ignored.

## 4.3.3 PCH-HW Configuration

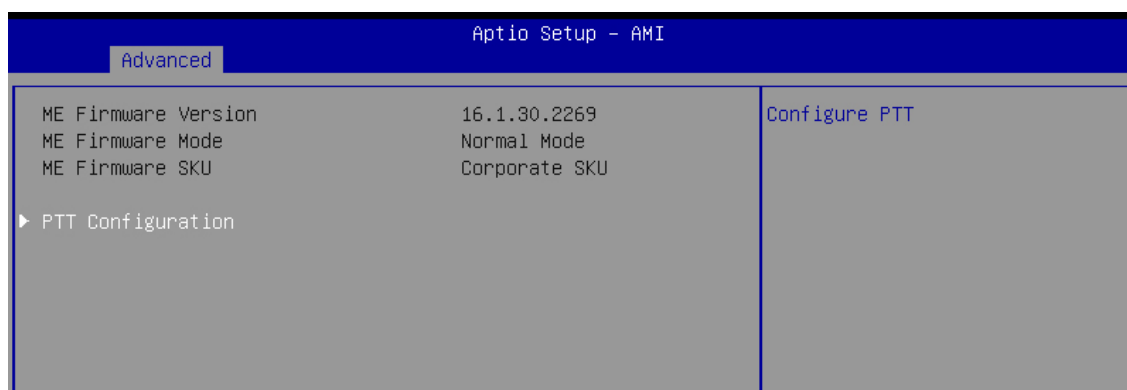


Figure 4-3-3 : PCH-HW Configuration

### PTT Configuration

Configure PTT.

### 4.3.3.1 PTT Configuration

Aptio Setup - AMI		
Advanced		
PTT Capability / State	1 / 0	Selects TPM device: PTT or dTPM. PTT - Enables PTT in SkuMgr dTPM 1.2 - Disables PTT in SkuMgr Warning ! PTT/dTPM will be disabled and all data saved on it will be lost.
TPM Device Selection	[dTPM]	

Figure 4-3-3-1 : PTT Configuration

#### PTT Capability / State

Platform Trust Technology Capability / Enablement State.

#### TPM Device Selection

Selects TPM device: PTT or discrete TPM.

PTT - Enables PTT in SkuMgr dTPM 1.2 - Disables PTT in SkuMgr Warning!  
PTT/dTPM will be disabled and all data saved on it will be lost.

### 4.3.4 Trusted Computing

Aptio Setup - AMI		
Advanced		
TPM 2.0 Device Found		Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
Firmware Version:	7.85	
Vendor:	IFX	
Security Device Support	[Enable]	
Active PCR banks	SHA256	
Available PCR banks	SHA256	
SHA256 PCR Bank	[Enabled]	

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

Aptio Setup - AMI		
Advanced		
ACPI Settings		Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.
Enable Hibernation	[Enabled]	
ACPI Sleep State	[S3 (Suspend to RAM)]	

Figure 4-3-5 : ACPI Settings

#### Enable Hibernation

Enables or Disables System ability to Hibernate (OS/S4 Sleep State). This option may not be effective with some operating systems.

#### ACPI Sleep State

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

## 4.3.6 IT8786 Super IO Configuration

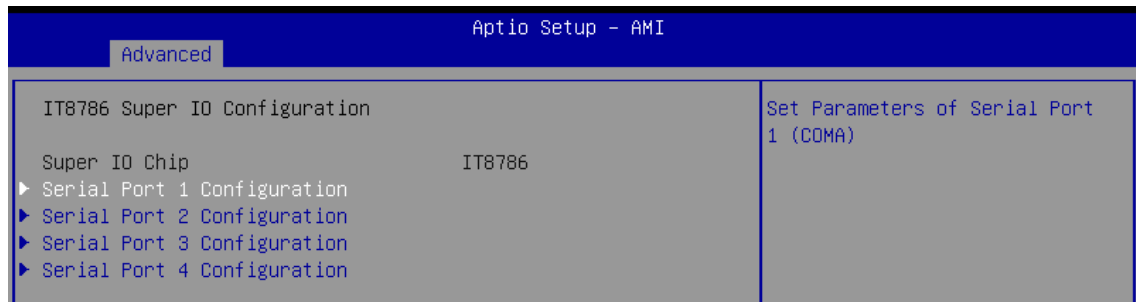


Figure 4-3-6 : IT8786 Super IO Configuration

### 4.3.6.1 Serial Port X Configuration

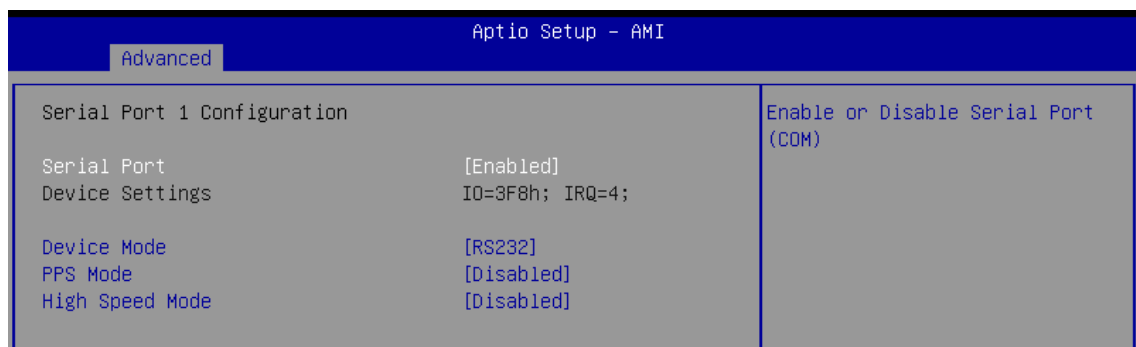


Figure 4-3-6-1 : Serial Port X Configuration

#### Serial Port

Enable or Disable Serial Port (COM).

#### Device Mode

Select Device Mode.

#### PPS Mode

Enable or Disable PPS.

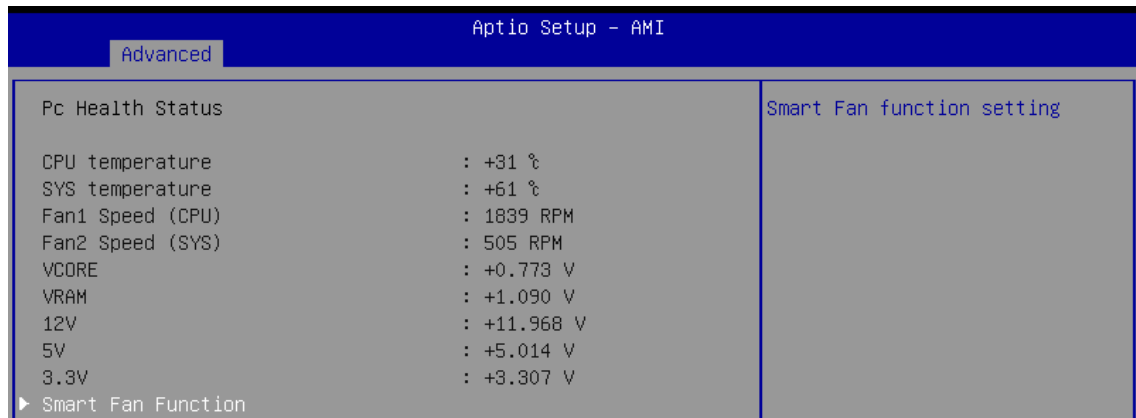
#### High Speed Mode

Enable or disable High Speed Serial Port.

Note: A device driver is required on OS for high speed serial port function.

(High Speed Serial Port is Port 1 only)

## 4.3.7 Hardware Monitor

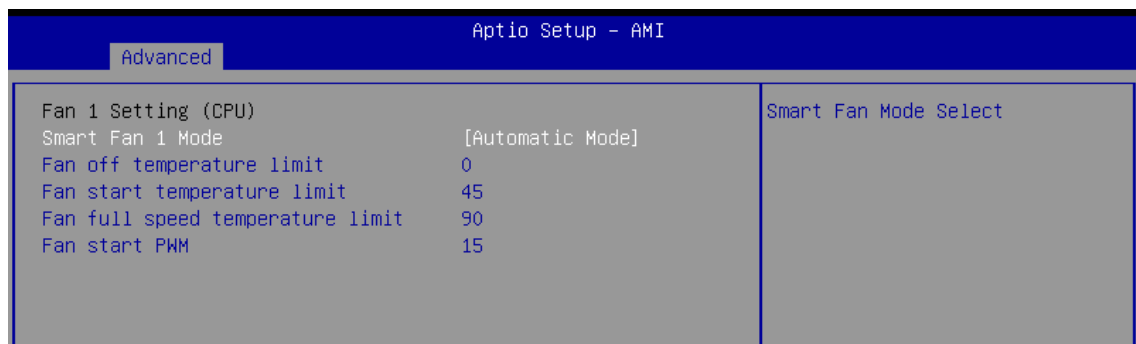


Pc Health Status		Smart Fan function setting
CPU temperature	: +31 %	
SYS temperature	: +61 %	
Fan1 Speed (CPU)	: 1839 RPM	
Fan2 Speed (SYS)	: 505 RPM	
VCORE	: +0.773 V	
VRAM	: +1.090 V	
12V	: +11.968 V	
5V	: +5.014 V	
3.3V	: +3.307 V	
▶ Smart Fan Function		

Figure 4-3-7 : Hardware Monitor

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

### 4.3.7.1 Smart Fan Function



Fan 1 Setting (CPU)		Smart Fan Mode Select
Smart Fan 1 Mode	[Automatic Mode]	
Fan off temperature limit	0	
Fan start temperature limit	45	
Fan full speed temperature limit	90	
Fan start PWM	15	

Figure 4-3-7-1 : Smart Fan Function

#### Smart Fan X Mode

Smart Fan Mode Select.

#### Fan off temperature limit

Fan will off when temperature lower than this limit.

#### Fan start temperature limit

Fan will work when temperature higher than this limit.

#### Fan full speed temperature limit

Fan will full speed when temperature higher than this limit.

#### Fan start PWM

Fan will start with this PWM value.

#### Manual PWM Setting

Fan will work with this Manual PWM Value.

### 4.3.8 Network Stack Configuration

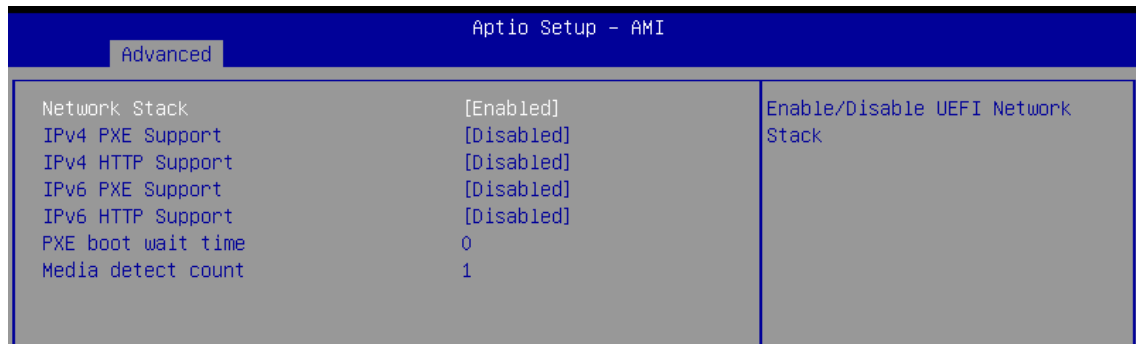


Figure 4-3-8 : Network Stack Configuration

#### Network Stack

Enable/Disable UEFI Network Stack.

#### IPv4 PXE Support

Enable/Disable IPv4 PXE boot support. If disabled, IPv4 PXE boot support will not be available.

#### IPv4 HTTP Support

Enable/Disable IPv4 HTTP boot support. If disabled, IPv4 HTTP boot support will not be available.

#### IPv6 PXE Support

Enable/Disable IPv6 PXE boot support. If disabled, IPv6 PXE boot support will not be available.

#### IPv6 HTTP Support

Enable/Disable IPv6 HTTP boot support. If disabled, IPv6 HTTP boot support will not be available.

#### PXE boot wait time

Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.

#### Media detect count

Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

### 4.3.9 NVMe Configuration



Figure 4-3-9 : NVMe Configuration

Display NVMe controller and Drive information.

## 4.4 Chipset Menu

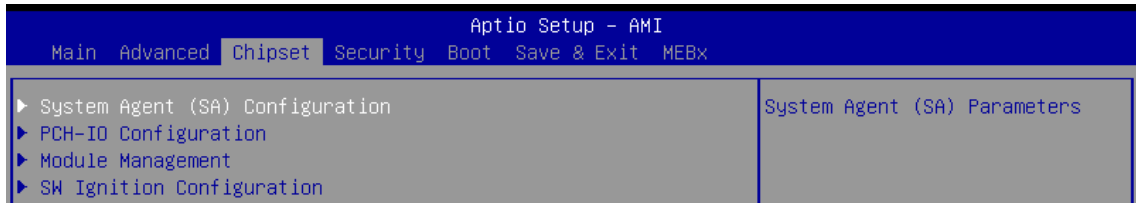


Figure 4-4 : BIOS Chipset Menu

Select Chipset tab to enter chipset BIOS setup options, such as System Agent (SA) Configuration, PCH-IO Configuration, and SW Ignition Configuration.

### 4.4.1 System Agent (SA) Configuration

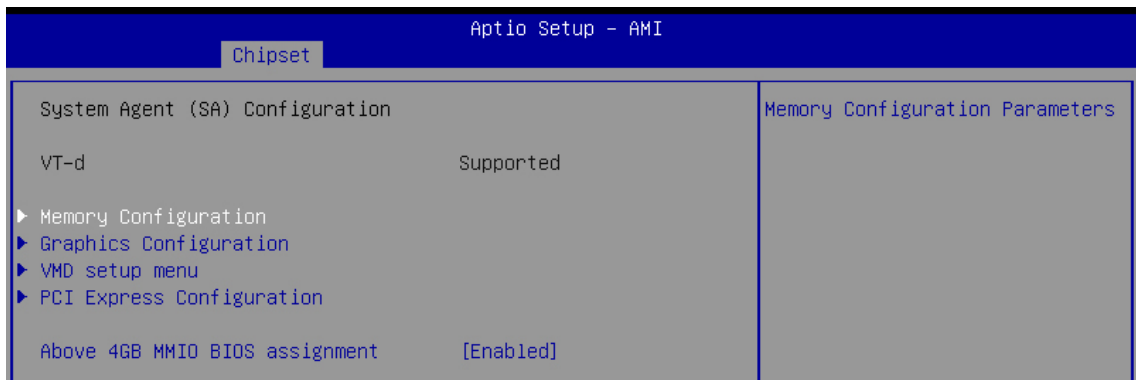


Figure 4-4-1 : System Agent (SA) Configuration

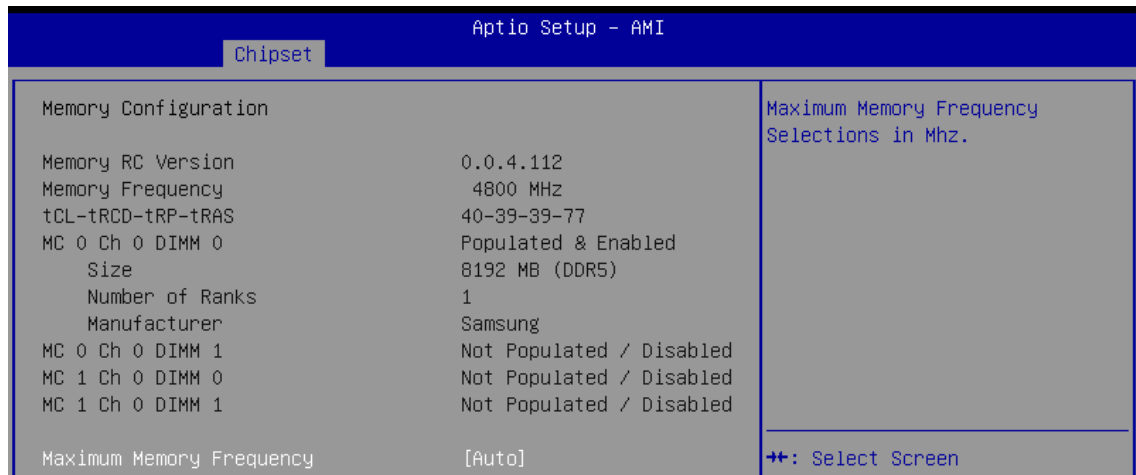
#### VT-d

VT-d capability.

#### Above 4GB MMIO BIOS assignment

Enable/disable above 4GB MemoryMappedIO BIOS assignment. This is enabled automatically when Aperture Size is set to 2048MB.

### 4.4.1.1 Memory Configuration



Memory Configuration		Maximum Memory Frequency Selections in Mhz.
Memory RC Version	0.0.4.112	
Memory Frequency	4800 MHz	
tCL-tRCD-tRP-tRAS	40-39-39-77	
MC 0 Ch 0 DIMM 0	Populated & Enabled	
Size	8192 MB (DDR5)	
Number of Ranks	1	
Manufacturer	Samsung	
MC 0 Ch 0 DIMM 1	Not Populated / Disabled	
MC 1 Ch 0 DIMM 0	Not Populated / Disabled	
MC 1 Ch 0 DIMM 1	Not Populated / Disabled	
Maximum Memory Frequency	[Auto]	↔: Select Screen

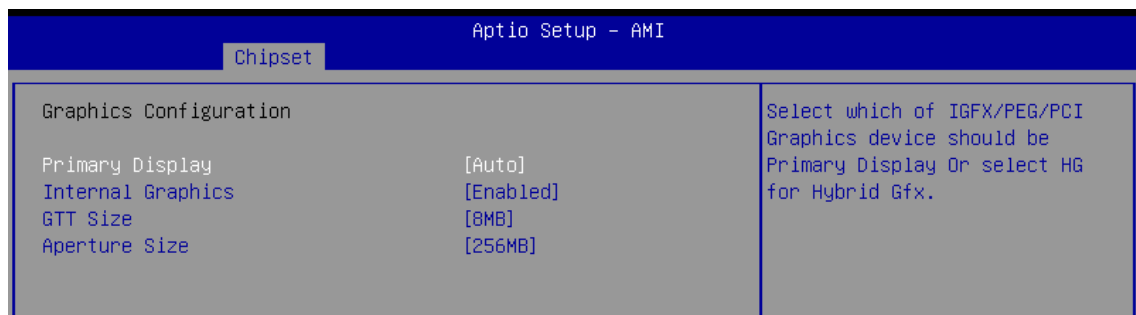
Figure 4-4-1-1 : Memory Configuration

Displays memory information.

#### Maximum Memory Frequency

Maximum Memory Frequency Selections in Mhz.

### 4.4.1.2 Graphics Configuration



Graphics Configuration		Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select HG for Hybrid Gfx.
Primary Display	[Auto]	
Internal Graphics	[Enabled]	
GTT Size	[8MB]	
Aperture Size	[256MB]	

Figure 4-4-1-2 : Graphics Configuration

#### Primary Display

Select which of IGFX/PEG/PCI Graphics device should be Primary Display.

#### 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.

### 4.4.1.3 VMD setup menu



Figure 4-4-1-3 : VMD setup menu

#### Enable VMD controller

Enable/Disable to VMD controller.

### 4.4.1.4 PCI Express

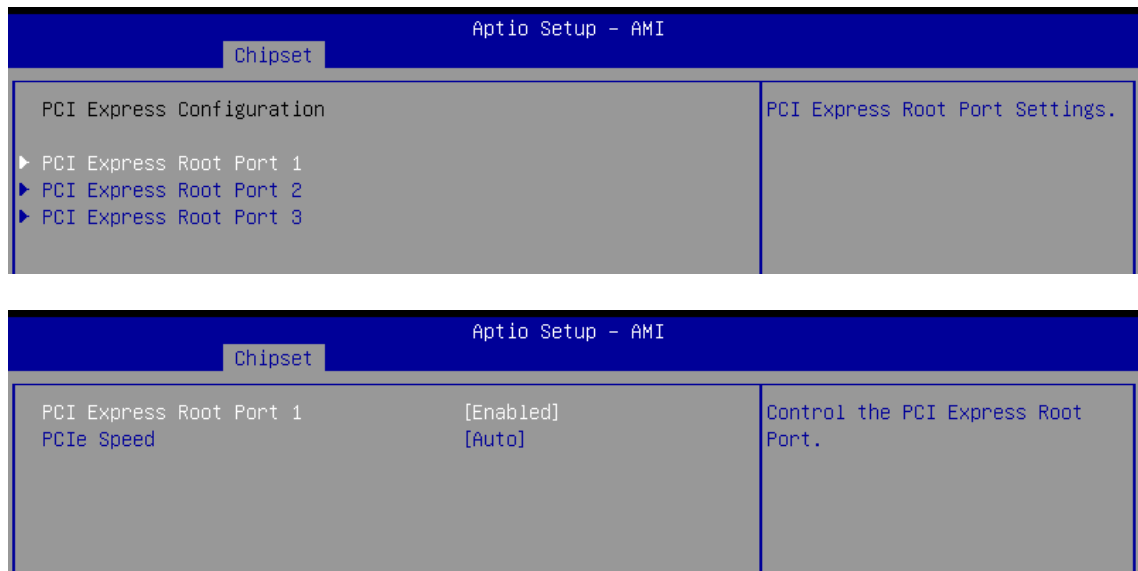


Figure 4-4-1-4 : PCI Express

#### PCI Express Root Port

Control the PCI Express Root Port.

#### PCIe Speed

Configure PCIe Speed.



## 4.4.2 PCH-IO Configuration

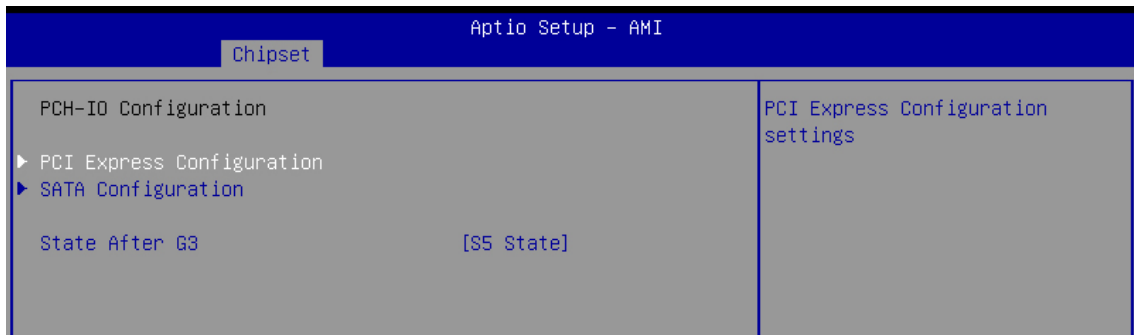


Figure 4-4-2 : PCH-IO Configuration

### PCI Express Configuration

PCI Express Configuration settings.

### SATA Configuration

SATA Device Options Settings.

### 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

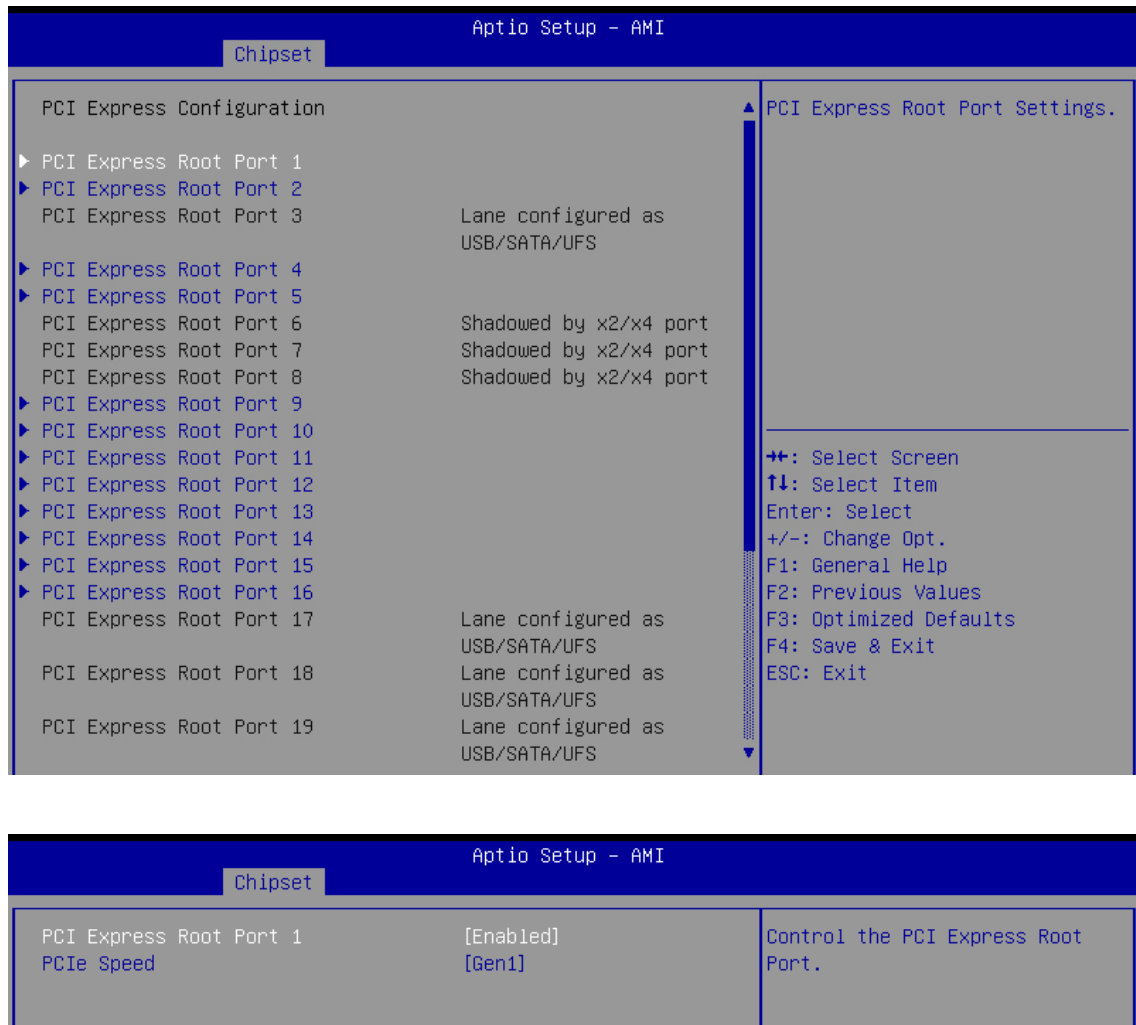


Figure 4-4-2-1 : PCI Express Configuration

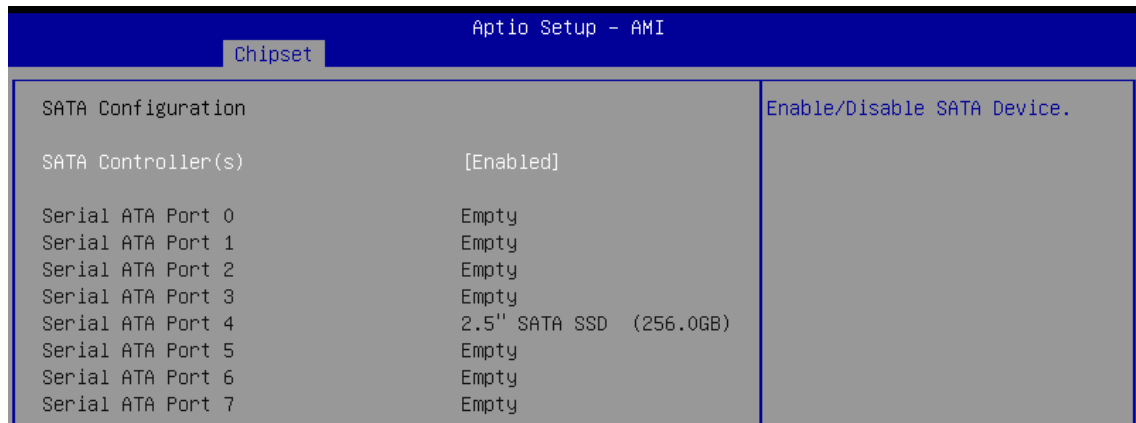
### PCI Express Root Port

Control the PCI Express Root Port.

### PCIe Speed

Configure PCIe Speed.

## 4.4.2.2 SATA Configuration



The screenshot shows the 'Chipset' menu in the Aptio Setup - AMI BIOS. The 'SATA Configuration' section is highlighted, showing the following settings:

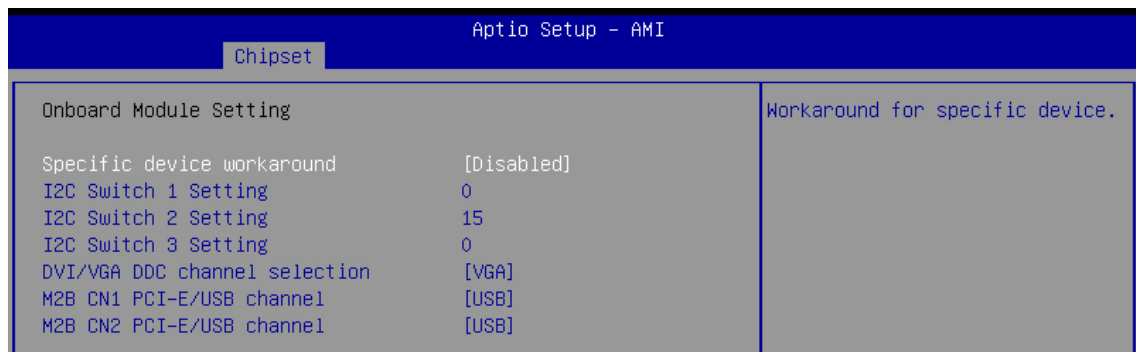
Setting	Value
SATA Configuration	Enable/Disable SATA Device.
SATA Controller(s)	[Enabled]
Serial ATA Port 0	Empty
Serial ATA Port 1	Empty
Serial ATA Port 2	Empty
Serial ATA Port 3	Empty
Serial ATA Port 4	2.5" SATA SSD (256.0GB)
Serial ATA Port 5	Empty
Serial ATA Port 6	Empty
Serial ATA Port 7	Empty

Figure 4-4-2-2 : SATA Configuration

### SATA Controller(s)

Enable / Disable SATA Device.

## 4.4.3 Module Management



The screenshot shows the 'Chipset' menu in the Aptio Setup - AMI BIOS. The 'Onboard Module Setting' section is highlighted, showing the following settings:

Setting	Value
Onboard Module Setting	Workaround for specific device.
Specific device workaround	[Disabled]
I2C Switch 1 Setting	0
I2C Switch 2 Setting	15
I2C Switch 3 Setting	0
DVI/VGA DDC channel selection	[VGA]
M2B CN1 PCI-E/USB channel	[USB]
M2B CN2 PCI-E/USB channel	[USB]

Figure 4-4-3 : Module Management

### Specific device workaround

Workaround for specific device.(Boot delay / Warm reset / Cold reset).

### I2C Switch Setting

Bit 0~3 for Channel 0~3, 1 to enable, 0 to disable.

For example:

For channel 0, 2 & 3 enter 13 (1101b).

Switch IC	Channel	Device
I2C Switch 1	Channel 0	MPCI E1
	Channel 1	KEY-E
	Channel 2	SUMITA
	Channel 3	No Device
I2C Switch 2	Channel 0	PoE
	Channel 1	Ignition
	Channel 2	TYPE C
	Channel 3	Battery
I2C Switch 3	Channel 0	CPU PEG SLOT
	Channel 1	PCH_PCl e_SLOT1
	Channel 2	PCH_PCl e_SLOT2
	Channel 3	No Device

#### **DVI/VGA DDC channel selection**

Configure DVI/VGA DCC channel selection.

#### **M2B CN1 PCI-E/USB channel**

Select M2B CN1 PCI-E/USB channel selection.

#### **M2B CN2 PCI-E/USB channel**

Select M2B CN2 PCI-E/USB channel selection.

## 4.4.4 SW Ignition Configuration

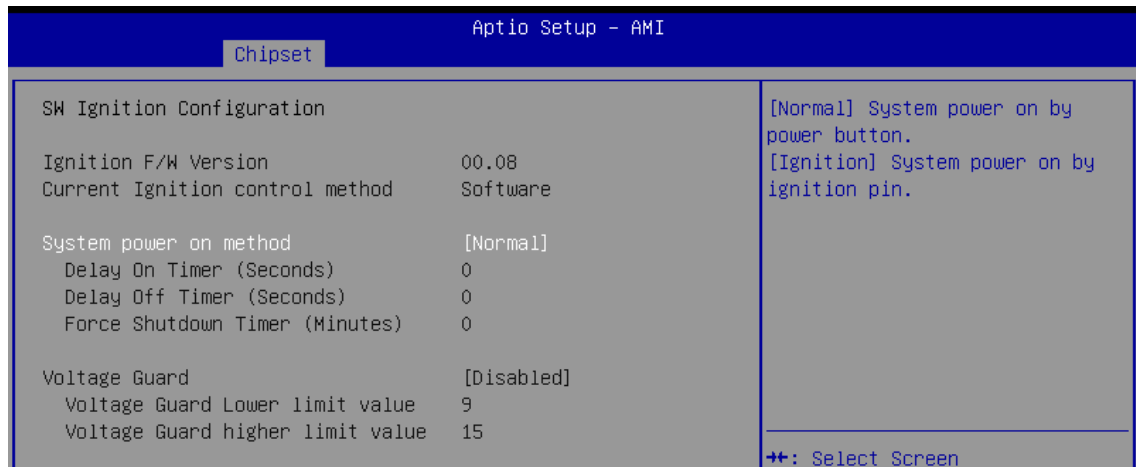


Figure 4-4-4 : SW Ignition Configuration

### System power on method

[Normal] System power on by power button.

[Ignition] System power on by ignition pin.

### Delay On Timer (Seconds)

The delay time after user trigger ignition on signal (Seconds).

### Delay Off Timer (Seconds)

The delay time after user trigger ignition off signal (Seconds)..

### 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 Menu

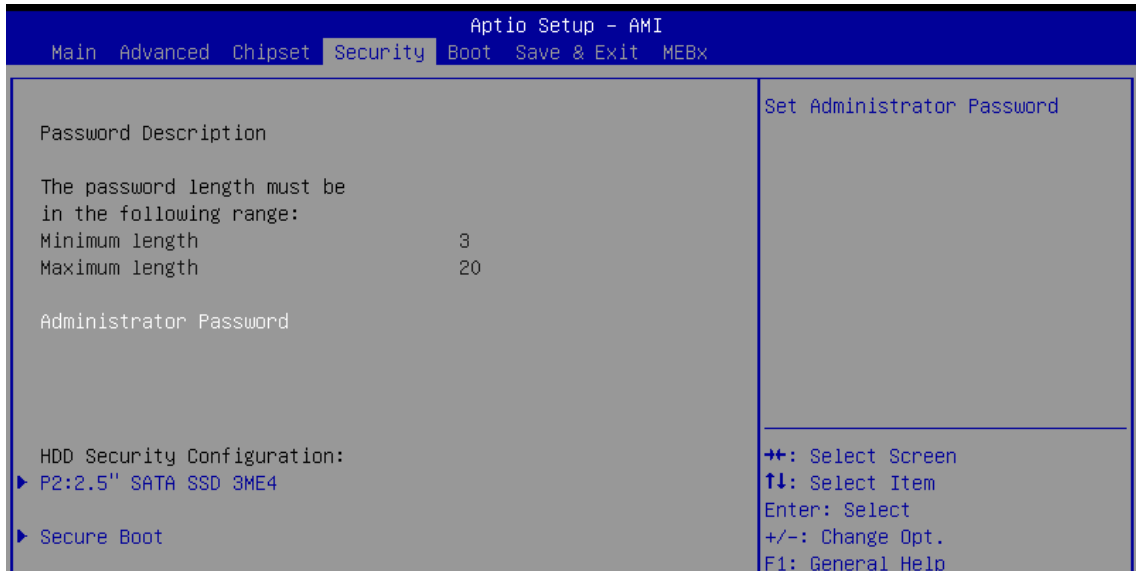


Figure 4-5 : BIOS Security Menu

### Administrator Password

Set administrator password.

## 4.5.1 HDD Security Configuration

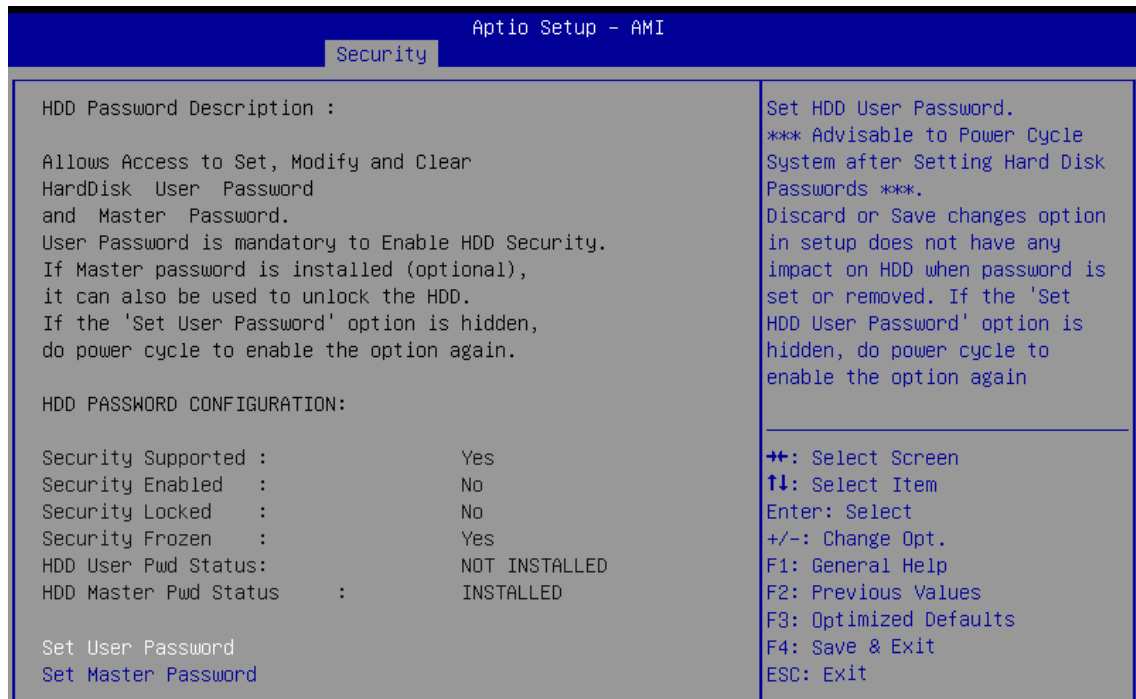


Figure 4-5-1 : HDD Security Configuration

### 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 hidden, do power cycle to enable the option again.

### Set Master Password

Set Master Password.

## 4.5.2 Secure Boot

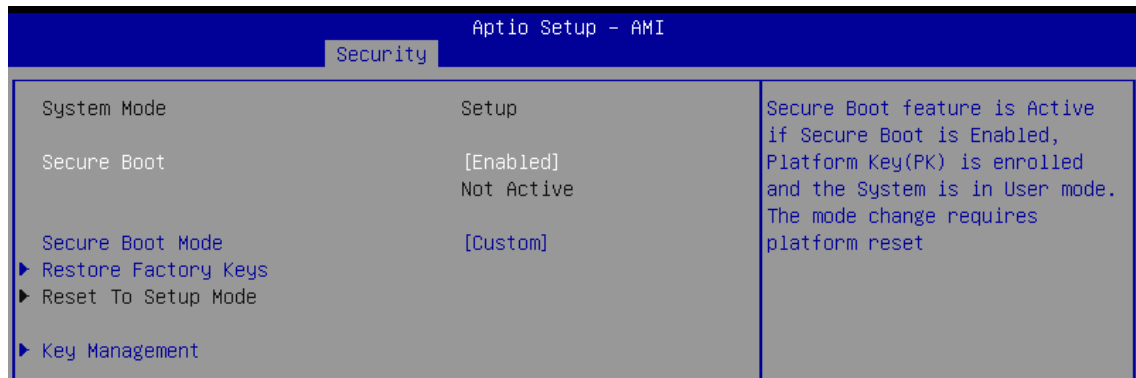


Figure 4-5-2 : Secure Boot

### Secure Boot

Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset.

### Secure Boot Mode

Secure Boot mode options: Standard or Custom.

In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

### Restore Factory Keys

Force System to User Mode. Install factory default Secure Boot key databases.

### Reset To Setup Mode

Delete all Secure Boot key databases from NVRAM.

### Key Management

Enables expert users to modify Secure Boot Policy variables without variable authentication.



## 4.6 Boot Menu

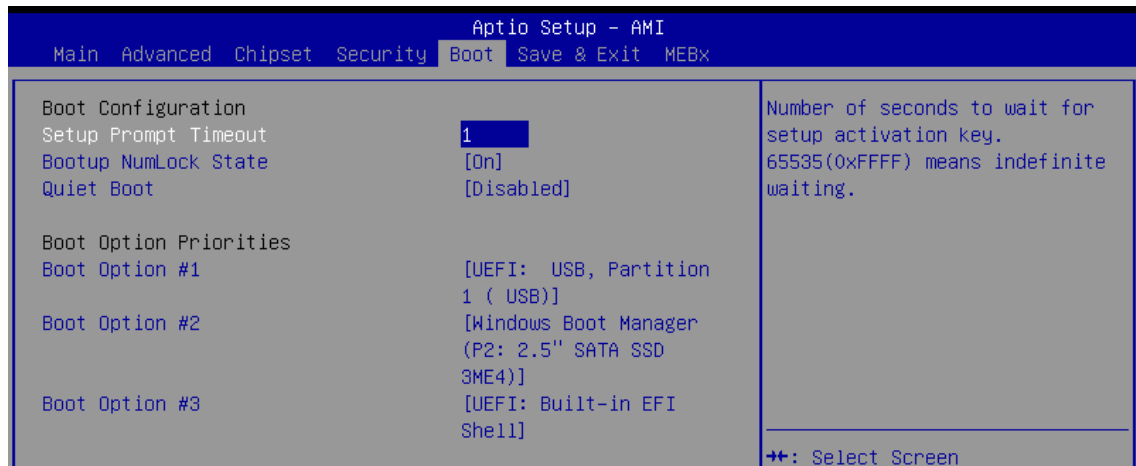


Figure 4-6 : BIOS Boot Menu

### 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 Priorities

Sets the system boot order.

## 4.7 Save & Exit

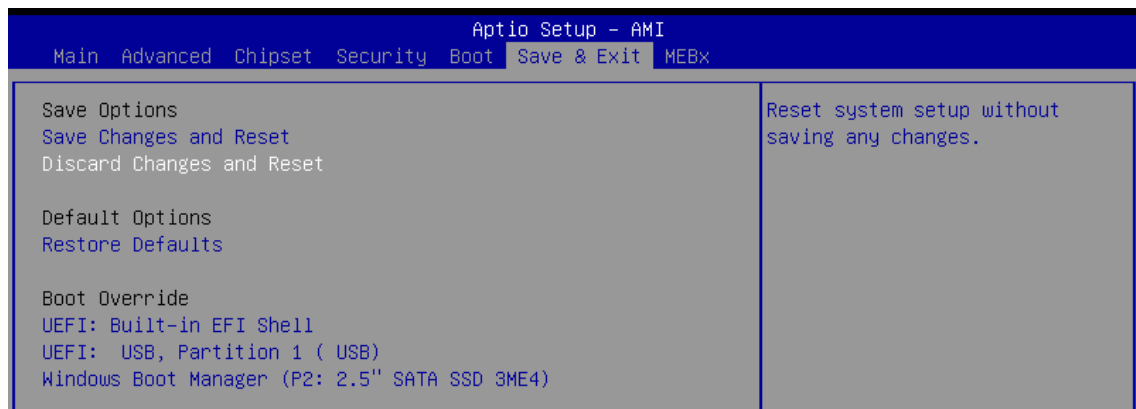


Figure 4-7 : BIOS Save and Exit Menu

### Save Changes and Reset

Reset the system after saving the changes.

### Discard Changes and Reset

Reset system setup without saving any changes.

### Restore Defaults

Restore/Load Default values for all the setup options.

# A

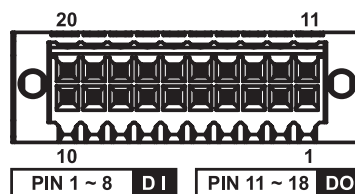
## APPENDIX A : Isolated DIO/GPIO Guide

### A.1 Function Description

The ECX-3200/3200MX/3100 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 :



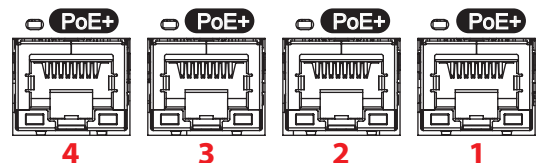
Pin No.	DIO Definition	GPIO Definition	Pin No.	DIO Definition	GPIO Definition
1	DI 0	DIO 0	11	DO 0	DIO 8
2	DI 1	DIO 1	12	DO 1	DIO 9
3	DI 2	DIO 2	13	DO 2	DIO 10
4	DI 3	DIO 3	14	DO 3	DIO 11
5	DI 4	DIO 4	15	DO 4	DIO 12
6	DI 5	DIO 5	16	DO 5	DIO 13
7	DI 6	DIO 6	17	DO 6	DIO 14
8	DI 7	DIO 7	18	DO 7	DIO 15
9	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 :

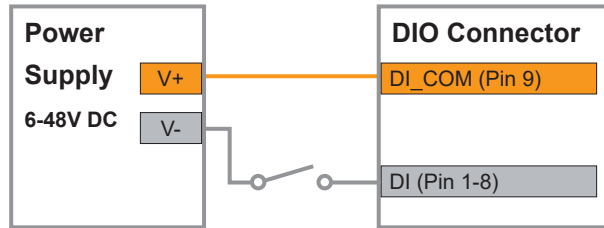
1. PE-2000 : DIO1 (ID = 0), POE
2. PE-3000 : POE
3. UE-1000 : USB (ID = 0)



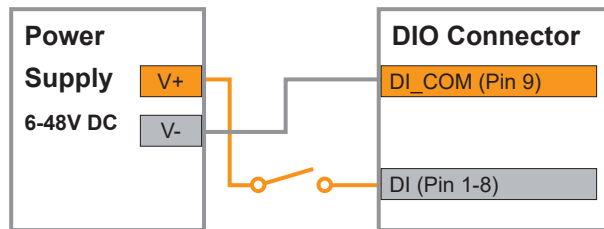
## A.2 Isolated DIO Signal Circuit

DI reference circuit :

Sink Mode  
(NPN)

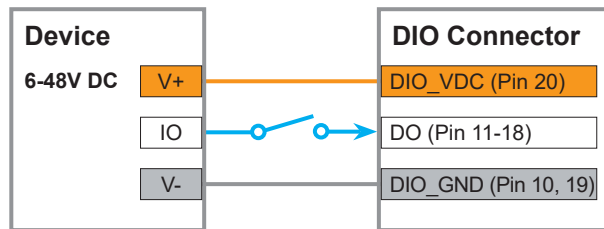


Source Mode  
(PNP)

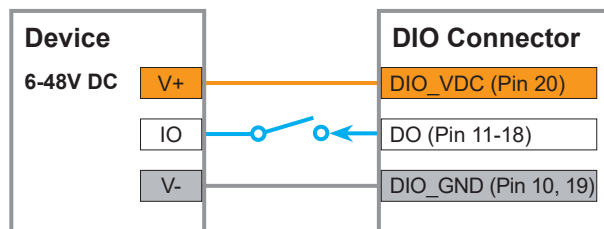


DO reference circuit :

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.

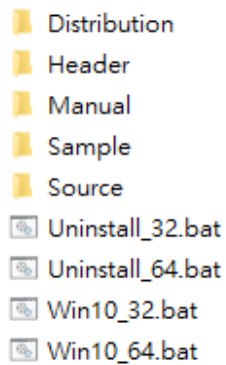
Make sure Windows version before installation.

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

Manual folder include API description.

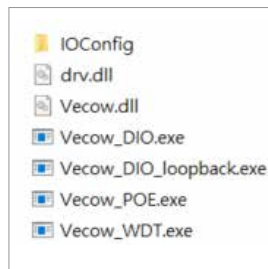
Sample folder include sample program, driver library, and API library for Windows/Linux

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

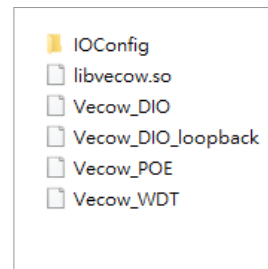


## A.4 Sample

Execute demo tool.



Windows



Linux

### A.4.1 DIO Sample

A.4.1.1 Auto load SIO configuration(.\\IOConfig\\ machine series) and initial SIO then choosing IO port you want to control.

```
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)
```

A.4.1.2 Select IO port mode(see Config).

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1)
```

#### A.4.1.2.1 Isolated DIO access then choose DI or DO access.

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 1

Isolated DIO access
Choose DI/DO : (0/1)
```

Figure. Isolated DIO access.

#### Step 1 DI access and set DI mode(sink or source).

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 1

Isolated DIO access
Choose DI/DO : (0/1) 0
Setlect Sink/Source mode : (0/1)
```

Figure. Get DI sink/source mode data

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 1

Isolated DIO access
Choose DI/DO : (0/1) 0
Setlect Sink/Source mode : (0/1) 0
Set DIO config success!
Get DI & DO data success!
Get DI2 data = 00
Press any key to continue . . .
```

Figure. DI sink mode data.

```
E:\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 1

Isolated DIO access
Choose DI/DO : (0/1) 0
Setlect Sink/Source mode : (0/1) 1
Set DIO config success!
Get DI & DO data success!
Get DI2 data = FF
Press any key to continue . . .
```

Figure. DI source mode data.



**Step 2** DO access and set DO mode (sink or source).

```
E:\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 1

Isolated DIO access
Choose DI/DO : (0/1) 1
Setlect Sink/Source mode : (0/1)
```

Figure. Get DI sink/source mode data

**Step 2.1** Choose DO port.

```
E:\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 1

Isolated DIO access
Choose DI/DO : (0/1) 1
Setlect Sink/Source mode : (0/1) 0
Set DIO config success!
Get DI & DO data success!
Choose DO port : (1~8, 9 = All port)
```



## Step 2.2 Set DO high or low then show message.

```
E:\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 1

Isolated DIO access
Choose DI/DO : (0/1) 1
Setlect Sink/Source mode : (0/1) 0
Set DIO config success!
Get DI & DO data success!
Choose DO port : (1~8, 9 = All port) 9
Set High/Low : (0/1)
```

## A.4.1.2.2 GPIO access and set GPIO configuration.

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0308.1108
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 0

GPIO access
Current GPIO config : 0xFF00
Set GPIO config In/Out(0/1) : 0x
```

**Step 1** Example : Set GPIO configuration 0xFF00 and get GPIO data(loopback test).

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0308.1108
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 0

GPIO access
Current GPIO config : 0xFF00
Set GPIO config In/Out(0/1) : 0xFF00
Set GPIO config success!
Get GPIO data success!
Current GPIO data : 0x1212
Set GPIO data : 0x
```

**Step 2** Set GPIO data 0x4321 and get GPIO data(loopback test).

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_DIO.exe
DIO sample version : v1.0.0308.1108
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Non-Isolated DIO(GPIO)

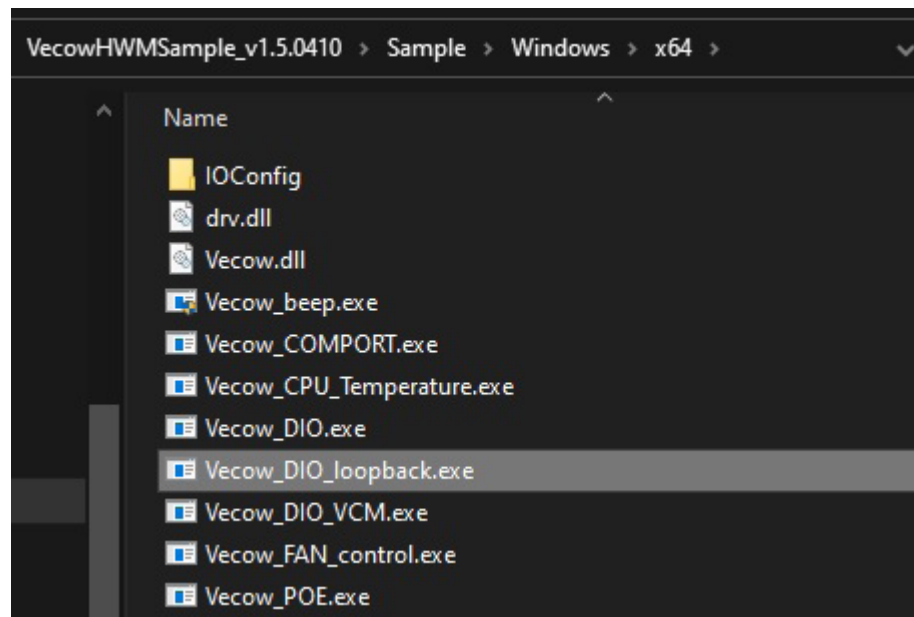
Initial SIO success!
Choose IO : (1/2) 2
Get initial IO config success!
Select Non-Isolated/Isolated mode : (0/1) 0

GPIO access
Current GPIO config : 0xFF00
Set GPIO config In/Out(0/1) : 0xFF00
Set GPIO config success!
Get GPIO data success!
Current GPIO data : 0x1212
Set GPIO data : 0x4321
Set GPIO data success!
GPIO data : 0x4343
Press any key to continue . . .
```

## A.4.2 DIO Loopback Test

To use the Vecow\_DIO\_loopback function, a test fixture is required. For the detailed connection method of the test fixture, please refer to the relevant documents of vecow.

**Step 1** Please select Vecow\_DIO\_loopback



**Step 2** Please select the mode to test

```
C:\Users\CFL1909\Desktop\VecowHWMSample_v1.5.0410\VecowHWMSample_v1.5.0410\S:  
DIO loopback sample version : v1.1.0406  
Load Vecow.dll at least v1.9.0331  
Vecow.dll Version : v1.26.0413.0000  
PCB_ver = A  
How many IO temp_port : (1/2) 1  
Select Non-Isolated(GPIO)/Isolated mode : (0/1) 1  
Setlect DO Sink(NPN)/Source mode(PNP) : (0/1) 0
```

**Step 3** A normal test will continue to send data from DO, and DI will receive the same data and execute it repeatedly (the test will not stop).

```
C:\Users\CFL1909\Desktop\VecowHWMSample_v1.5.0410\VecowHWMSample_v1.5  
DI1 = 0x80  
DI check = 0x80  
  
DO = 0x81  
DI1 = 0x81  
DI check = 0x81  
  
DO = 0x82  
DI1 = 0x82  
DI check = 0x82  
  
DO = 0x83  
DI1 = 0x83  
DI check = 0x83  
  
DO = 0x84  
DI1 = 0x84  
DI check = 0x84  
  
DO = 0x85  
DI1 = 0x85  
DI check = 0x85  
  
DO = 0x86  
DI1 = 0x86  
DI check = 0x86  
  
DO = 0x87  
DI1 = 0x87
```

**Step 4** When the test is wrong, it will stop the test after 6 consecutive tests and display an error message.

```
C:\Users\CFL1909\Desktop\VecowHWMSample_v1.5.041
Set DIO config success!

DO = 0x00
DI1 = 0xff
DI check = 0x00

DO = 0x01
DI1 = 0xff
DI check = 0x01

DO = 0x02
DI1 = 0xff
DI check = 0x02

DO = 0x03
DI1 = 0xff
DI check = 0x03

DO = 0x04
DI1 = 0xff
DI check = 0x04

DO = 0x05
DI1 = 0xff
DI check = 0x05

IO port 1 error 6 times
Sat Jun 18 00:36:24 2185
```

### A.4.3 POE

**Step 1** Initial POE and auto detected useful slave address ID.

```
Select C:\Users\van\Desktop\1111\Vecow_POE.exe
POE sample version : v1.0.1408.1112
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.4.6108.1114

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

**Step 2** Choose useful slave address ID and show its address, then choose POE port that you want to control.

```
C:\Users\van\Desktop\1111\Vecow_POE.exe
POE sample version : v1.0.1408.1112
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.4.6108.1114

Initial POE success!
Usable slave address ID : 0
Select slave address ID : 0
Salve address : 0x40
Choose POE port : (0~3, 4 = All port)
```

**Step 3** Set Manual or Auto mode.

```
C:\Users\van\Desktop\1111\Vecow_POE.exe
POE sample version : v1.0.1408.1112
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.4.6108.1114

Initial POE success!
Usable slave address ID : 0
Select slave address ID : 0
Salve address : 0x40
Choose POE port : (0~3, 4 = All port) 4
Set Manual/Auto mode : (0/1)
```



**Step 3.1** Set Auto mode and show success message.

```
C:\Users\van\Desktop\1111\Vecow_POE.exe
POE sample version : v1.0.1408.1112
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.4.6108.1114

Initial POE success!
Usable slave address ID : 0
Select slave address ID : 0
Salve address : 0x40
Choose POE port : (0~3, 4 = All port) 4
Set Manual/Auto mode : (0/1) 1
Set Auto mode success!
Press any key to continue . . .
```

**Step 3.2** Set Manual mode and then turn OF/OFF POE port.

```
Select C:\Users\van\Desktop\1111\Vecow_POE.exe
POE sample version : v1.0.1408.1112
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.4.6108.1114

Initial POE success!
Usable slave address ID : 0
Select slave address ID : 0
Salve address : 0x40
Choose POE port : (0~3, 4 = All port) 4
Set Manual/Auto mode : (0/1) 0
Set Manual mode success!
Set POE port OFF/ON : (0/1)
```

**Step 3.3** Set POE port success message.

```
C:\Users\van\Desktop\1111\Vecow_POE.exe
POE sample version : v1.0.1408.1112
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.4.6108.1114

Initial POE success!
Usable slave address ID : 0
Select slave address ID : 0
Salve address : 0x40
Choose POE port : (0~3, 4 = All port) 4
Set Manual/Auto mode : (0/1) 0
Set Manual mode success!
Set POE port OFF/ON : (0/1) 1
Set POE success!
Press any key to continue . . .
```

## A.4.4 WDT

### A.4.4.1 WDT once

**Step 1** Auto load SIO configuration and initial SIO then set WDT seconds.

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_WDT.exe
WDT sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Get initial WDT success!
Set WDT timer seconds (1~3932100) :
```

**Step 2** Set WDT success message.

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_WDT.exe
WDT sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Get initial WDT success!
Set WDT timer seconds (1~3932100) : 10
Set WDT success!
```

**Step 3** Time out message.

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_WDT.exe
WDT sample version : v1.0.0208.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Get initial WDT success!
Set WDT timer seconds (1~3932100) : 10
Set WDT success!
if reboot, WDT out early
if reboot, WDT out in range
if reboot, WDT out late
```



## A.4.5 WDT LOOP

**Step 1** Auto load SIO configuration and initial SIO then set WDT loop seconds.

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_WDT_loop.exe
WDT loop sample version : v1.0.0108.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Get initial WDT success!
Set WDT timer loop seconds (1~3932100) :
```

**Step 2** 80% WDT time will rest WDT again, if close .exe will reboot.

```
C:\Users\van\Desktop\sample_08.1018\x64\Vecow_WDT_loop.exe
WDT loop sample version : v1.0.0108.1018
Load Vecow.dll at least v1.0.1008.0812
Vecow.dll Version : v1.3.5008.1008
Config : IO port I - Isolated DIO
         IO port II - Isolated DIO

Initial SIO success!
Get initial WDT success!
Set WDT timer loop seconds (1~3932100) : 10
Set WDT success!
Set WDT success!
Set WDT success!
Set WDT success!
Set WDT success!
Set WDT success!
Set WDT success!
```

# 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).

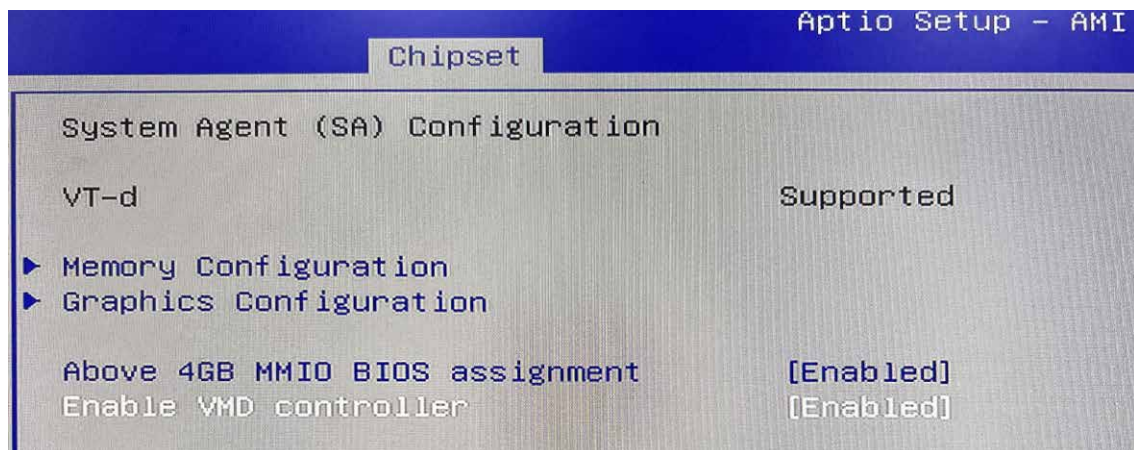
# C

## APPENDIX C : RAID Functions

### C.1.1 VMD Controller for RAID

Please set Enable VMD controller as Enabled on BIOS menu.

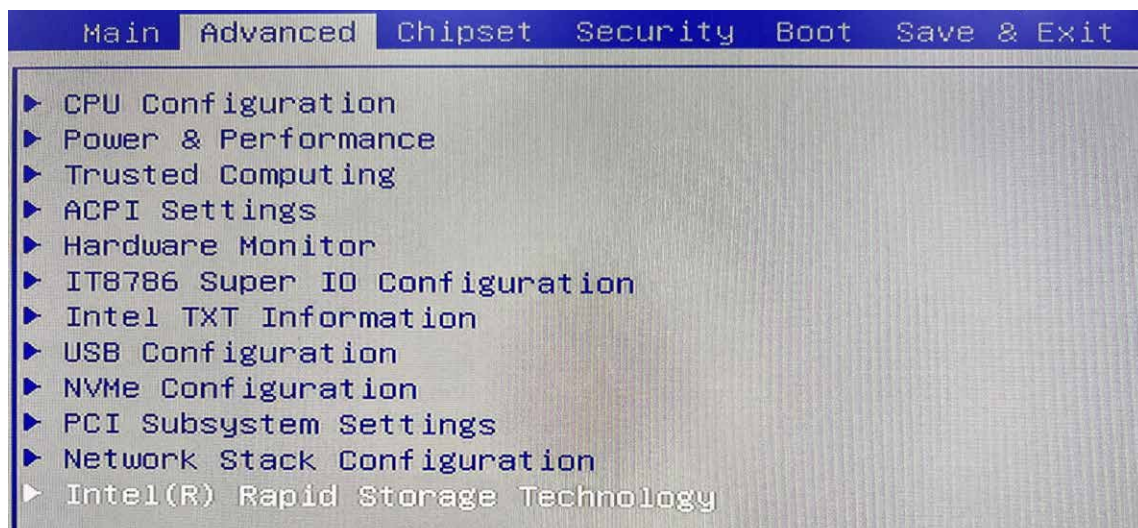
Chipset → System Agent (SA) Configuration → Enable VMD controller → Enabled → Save Changes and Reset.



### C.1.2 UEFI Mode for RAID

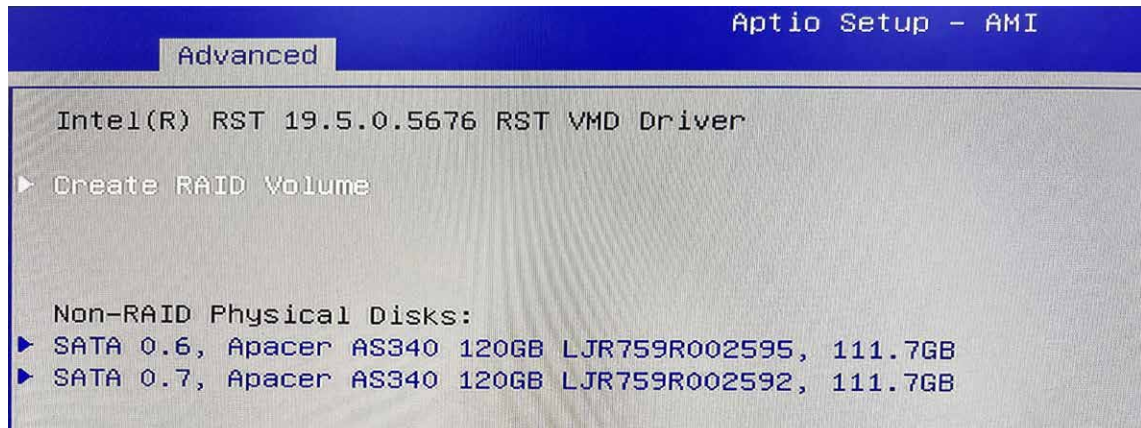
1. Into BIOS menu again, select Intel(R) Rapid Storage Technology on BIOS menu.

Advanced → Intel(R) Rapid Storage Technology

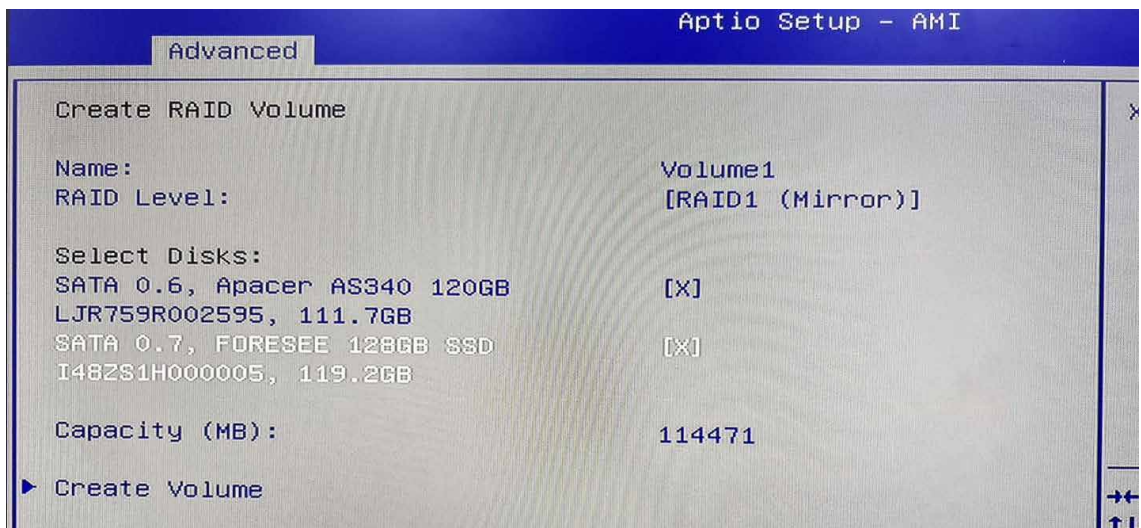




2. Select Create RAID Volume on BIOS menu.



3. 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.

Note:

ECX-3100 PEG, ECX-3200 PEG, ECX-3200MX PEG are equipped with 2 SATA.

ECX-3400 PEG, ECX-3600 PEG, ECX-3800 PEG are equipped with 4 SATA.

## 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 find the latest information and software directly from Intel's website.

[http://www.intel.com/p/en\\_US/support/highlights/chpsts/ims](http://www.intel.com/p/en_US/support/highlights/chpsts/ims)

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.



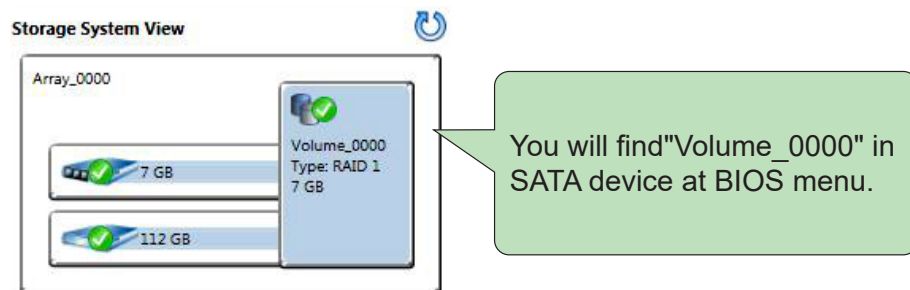
## C.6 To Create RAID Volume on "Rapid Storage Technology" Software

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".

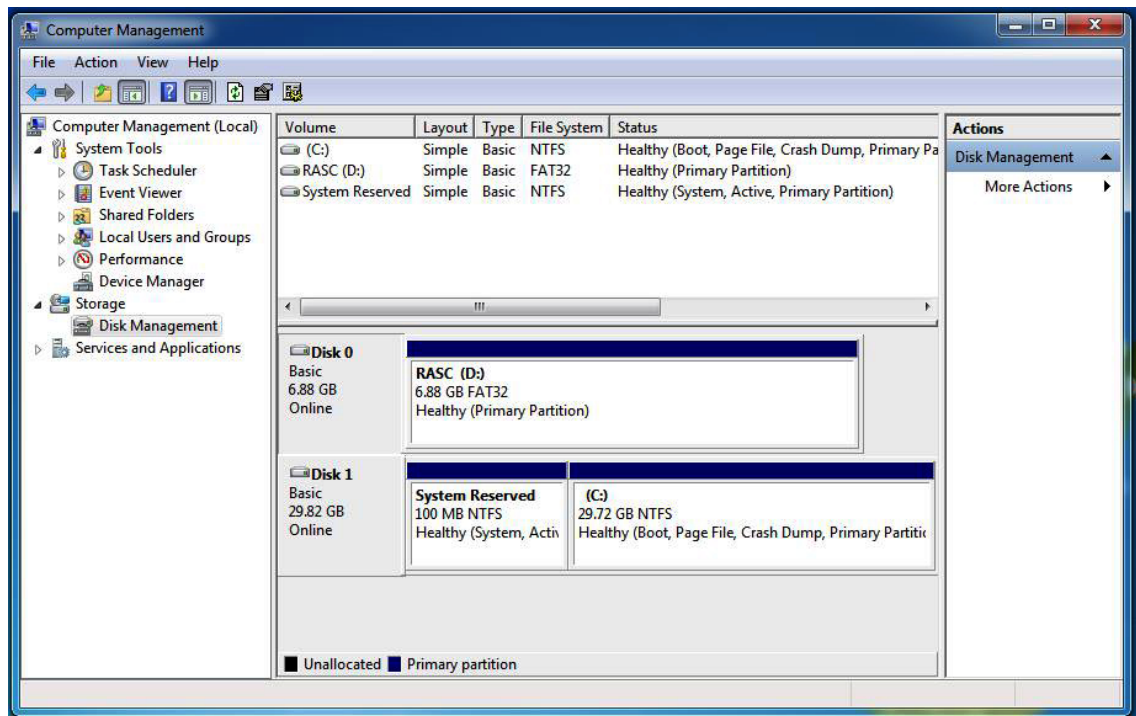


## C.7 Disk Management : Partition the Disk

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

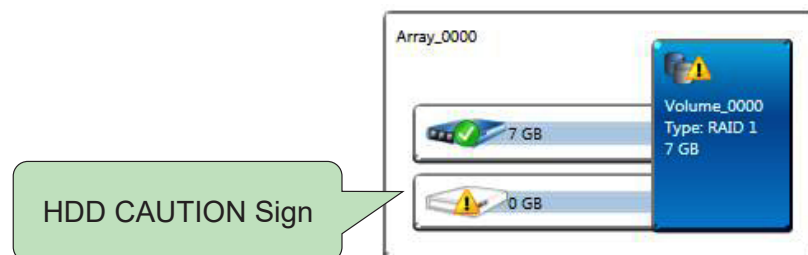


To start disk management tool, select "initialize disk".  
 Then add "Logical Device" for Windows access.



### 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.



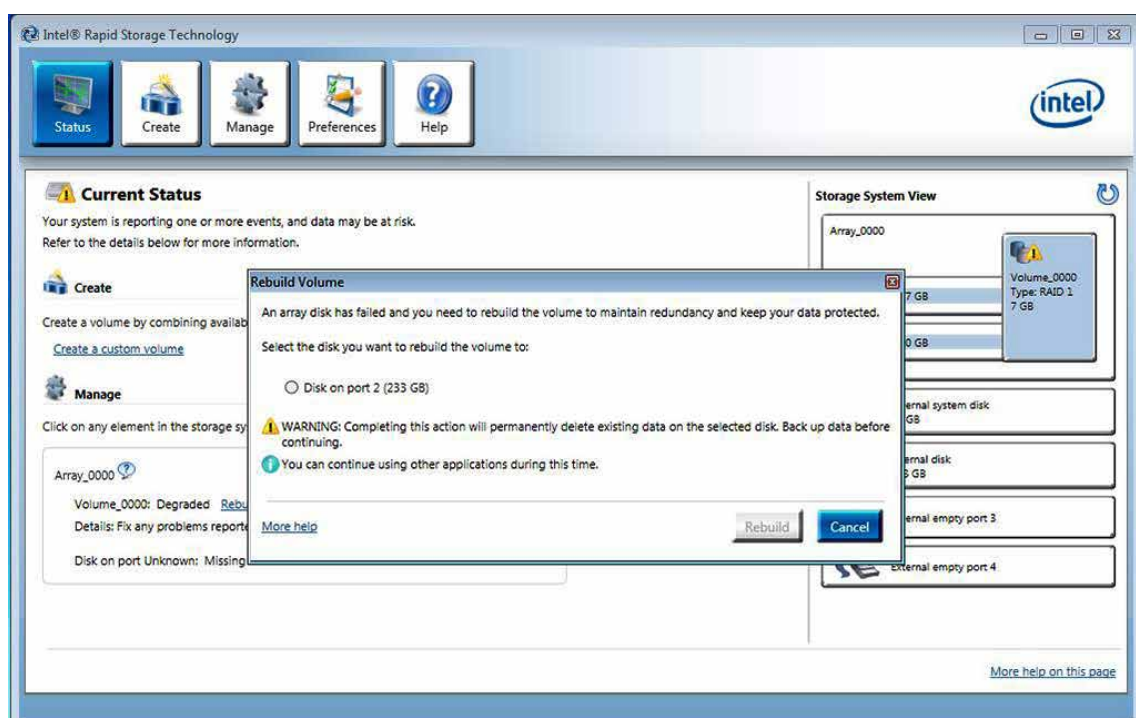
## C.9 Recovery and Auto Rebuild When Use the **SAME** RAID HDD



## 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-3200
RAM	32GB * 2
USB-1	USB Microsoft Wired Keyboard 600
USB-2	USB Mouse HP G1K28AA
USB-3	USB Flash Transcend 3.0 16GB
USB-4	USB Flash Transcend 3.0 16GB
SATA 0	Transcend SATA SSD420 128GB
SATA 1	Seagate HDD 500GB
LAN1 (i219)	1.0 Gbps
LAN2 (i210)	1.0 Gbps
LAN3 (i226-IT)	2.5 Gbps
LAN4 (i226-IT)	2.5 Gbps
LAN5 (i226-IT)	2.5 Gbps
LAN6 (i226-IT)	2.5 Gbps
Graphics output	HDMI
Power plan	Balance(Windows10 Power plan)
Power Source :	Chroma 62006P-100-25
Test Program-1	BurnInTest

## D.1 Intel® Core i7-12700TE 1.40 GHz (25M Cache, up to 4.60 GHz)

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
Intel® Core i7-12700TE	9V	0.528A	04.76W	0.678A	06.10W	3.004A	27.04W
Intel® Core i7-12700TE	12V	0.449A	05.39W	0.516A	06.19W	2.435A	29.22W
Intel® Core i7-12700TE	24V	0.352A	08.44W	0.390A	09.36W	1.242A	29.81W
Intel® Core i7-12700TE	50V	0.257A	12.84W	0.303A	15.13W	0.889A	44.46W

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
Intel® Core i7-12700TE	9V	6.735A	60.62W	9.468A	85.21W
Intel® Core i7-12700TE	12V	4.963A	59.56W	6.725A	80.70W
Intel® Core i7-12700TE	24V	2.414A	57.94W	3.467A	83.21W
Intel® Core i7-12700TE	50V	1.504A	75.18W	1.951A	97.54W

## D.2 Intel® Core i9-12900E 2.30 GHz (30M Cache, up to 5.00 GHz)

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
Intel® Core i9-12900E	9V	0.593A	05.34W	0.747A	06.72W	4.984A	44.85W
Intel® Core i9-12900E	12V	0.485A	05.82W	0.611A	07.34W	3.677A	44.12W
Intel® Core i9-12900E	24V	0.329A	07.90W	0.424A	10.18W	1.939A	46.53W
Intel® Core i9-12900E	50V	0.286A	14.32W	0.334A	16.71W	0.932A	46.58W

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
Intel® Core i9-12900E	9V	11.747A	105.72W	11.019A	99.17W
Intel® Core i9-12900E	12V	7.725A	92.70W	7.947A	95.36W
Intel® Core i9-12900E	24V	3.962A	95.09W	4.949A	118.77W
Intel® Core i9-12900E	50V	2.136A	106.82W	2.271A	113.56W

## D.3 Intel® Core i7-13700E 1.90 GHz (30M Cache, up to 5.10 GHz)

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
Intel® Core i7-13700E	9V	0.609A	05.48W	0.752A	06.77W	3.612A	32.51W
Intel® Core i7-13700E	12V	0.508A	06.09W	0.599A	07.18W	2.763A	33.15W
Intel® Core i7-13700E	24V	0.374A	08.97W	0.417A	10.02W	1.421A	34.10W
Intel® Core i7-13700E	50V	0.311A	15.56W	0.331A	16.55W	0.862A	43.10W

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
Intel® Core i7-13700E	9V	6.990A	62.91W	9.553A	85.98W
Intel® Core i7-13700E	12V	5.289A	63.47W	7.154A	85.85W
Intel® Core i7-13700E	24V	2.521A	60.50W	3.635A	87.24W
Intel® Core i7-13700E	50V	1.434A	71.72W	1.870A	93.51W

## D.4 Intel® Core i7-13700E Add GTX 1650 Graphics Card

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

CPU	Power Input	Power on and boot to Win 10 (64-bit)					
		Standby Mode		Sleep Mode		idle status CPU usage less 3%	
		Max Current	Max Consumption	Max Current	Max Consumption	Max Current	Max Consumption
Intel® Core i7-13700E	12V	0.499A	05.99W	0.601A	07.21W	4.999A	59.99W
Intel® Core i7-13700E	24V	0.374A	08.98W	0.413A	09.91W	1.848A	44.34W
Intel® Core i7-13700E	36V	0.331A	11.92W	0.356A	12.82W	1.280A	46.09W
Intel® Core i7-13700E	50V	0.310A	15.50W	0.332A	16.61W	1.054A	52.70W

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
Intel® Core i7-13700E	12V	6.173A	74.07W	9.251A	111.01W
Intel® Core i7-13700E	24V	3.085A	74.05W	4.455A	106.91W
Intel® Core i7-13700E	36V	2.105A	75.77W	3.028A	109.00W
Intel® Core i7-13700E	50V	1.691A	84.56W	2.367A	118.37W



# E

## APPENDIX E : Supported Memory & Storage List

### E.1 Test Item

Testing Board	ECX-3200
Memory Test	MemTest86 V10.4
BurnInTest	V9.2

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)
TEAMGROUP 48G DDR5 5600 SO-DIMM	TE48GFSXV2TH	25°C
Goldkey 32G DDR5 4800 SO-DIMM	NMSO532F81-4800JA0C	25°C
SLLINK 32G DDR5 4800 SO-DIMM	J5BGSH2G8A4FC	25°C
SMART 32G DDR5 4800 SO-DIMM	SR4G6SO5285-SB	25°C

## E.3 Supported ECC Memory List

Brand	Info	Test Temp. (Celsius)
TEAMGROUP 48G DDR5 5600 SO-DIMM	TE48GFSEV2TH	25°C
Goldkey 32G DDR5 4800 SO-DIMM	NMES532F81-4800JA0C	25°C
SMART 32G DDR5 4800 SO-DIMM	SR4G7SO5285-SB	25°C
SLLINK 32G DDR5 4800 SO-DIMM	J5BGDH2G8A4XC	25°C
Innodisk 32G DDR5 4800 SO-DIMM	M5D0-BGS2QCVP-H03	25°C

## E.4 Supported Storage Device List

Type	Brand	Model	Capacity
SATA HDD	Seagate	SDC001	500GB
SATA SSD	Apacer	AS340X	120GB
	SMART	FDMP8960GTCXA111	960GB
	MEMXPRO	M3A MI3MA1212802WN	128GB
	Transcend	TS128GSSD420K	128GB
		TS128GSSD230S	128GB
	Kingston	SHFS37A	240GB
	Innodisk	2.5" SATA SSD 3TE4 DES25-A28M41BW1DC-H03	128GB
		2.5" SATA SSD 3TG2-P DGS25-64GD81BC1QC	64GB
M.2 PCIe SSD	Toshiba	KXG50ZNV512G	512GB
	Kingston	SA2000MB	250GB
	SAMSUNG	970 EVO PLUS MZ-V7S250	250GB
		980 EVO PRO MZ-V8P250BW	250GB
	INTEL	760P SSDPEKKW128G8	128GB
	SMART	FDMP8960GTCXA111	960GB

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



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