In-Vehicle Computing

FleetPC-12B

User Manual Ver.2024-07-07

CarTFT.com e.K.

User Manual

Copyright

Disclaimer

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CarTFT.com e.K. makes no representation or warranty regarding the content of this manual. Information in this manual has been carefully checked for accuracy; however, no guarantee is given to the correctness of the contents. For continuing product improvement, CarTFT.com e.K. reserves the right to revise the manual or make changes to the specifications of this product at any time without notice and obligation to any person or entity regarding such change. The information contained in this manual is provided for general use by customers.

Declaration of Conformity

The CE symbol on your product indicates that it complies with the European Union (EU) directives. A Certificate of Compliance is available by contacting Technical Support. This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables.

This product has been tested and found to comply with the limits for a Class B device, according to Part 15 of the FCC Rules. These limits are designed to protect reasonably against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used by the manufacturer’s instructions, may cause harmful interference to radio communications.

Trademarks

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All the trademarks, registrations, and brands mentioned herein are used for identification purposes only and may be trademarks and registered trademarks of their respective owners.

Safety Information

Read the following precautions before setting up a CarTFT.com e.K. Product.

Electrical safety

- Disconnect the power cable from the electrical outlet to prevent shock hazards before relocating the system.
- When adding or removing devices to or from the system, ensure that the power cables for the devices are unplugged before the signal cables are connected. If possible, disconnect all power cables from the existing system before adding a device.
- Before connecting or removing signal cables from the motherboard, ensure all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Ensure your power supply is set to the correct voltage in your area. If you are unsure of the voltage of your current electrical outlets, contact your local power company.
- If the power supply is broken, do not fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

- Before installing the motherboard and adding devices, carefully read all the manuals that came with the package.
- Before using the product, ensure all cables are correctly connected and the power cables are not damaged. If you detect any damage, contact your dealer immediately.
- Keep paper clips, screws, and staples away from connectors, slots, sockets, and circuitry to avoid short circuits.
- Avoid dust, humidity, and temperature extremes. Please do not place the product in any area that may become wet.
- Place the product on a stable surface.
- Contact a qualified service technician or retailer if you encounter technical problems with the product.

Environmental safety

- Use this product in environments with ambient temperatures between -40˚C and 70˚C.
- Do not leave this product in an environment where the storage temperature may be below -40°C or above 80°C. To prevent damage, the product must be used in a controlled environment.

CAUTION

Incorrectly replacing the battery may damage this computer. Replace only with the same or equivalent recommended by CarTFT.com e.K. Dispose of the used battery according to the manufacturer's instructions.

Technical Support

Please call or e-mail our customer service when you cannot fix the problems.

- TEL: +4971213878264
- FAX: +4971213878265
- E-mail: sales@cartft.com
- Website: www.cartft.com

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Chapter 1

Product Introduction

1.0 PRODUCT INTRODUCTION

1.1 OVERVIEW

The FleetPC-12B Series is a robust line of in-vehicle computers designed for high-performance and reliable operation in challenging mobile environments. Powered by the Intel® 11th Gen Core™ i7-1185G7E CPU, these systems can easily handle demanding applications. Key features include a wide range of power input (9V-60VDC), intelligent vehicle power ignition, and an array of communication interfaces. The series ensures seamless wireless connectivity with expansion slots supporting WWAN, Wi-Fi, GPS, and CAN modules. Two RS-232/422/485 serial ports, four digital inputs/outputs, and two analog inputs provide versatile interfacing options. Additionally, the system offers multiple video outputs with 2 HDMI and 1 DVI ports. The FleetPC-12B, engineered for the diverse needs of modern vehicular systems, is a testament to the convergence of advanced computing technology with rugged mobile applications.

1.2 KEY FEATURES

- Intel® 11th Gen Core™ i7-1185G7E
- 3 x M.2 & 2 x mPCIe Slots for WWAN / Wi-Fi / SSD /GPS / CAN Expansion
- Wide Range 9V - 60V DC Power Input
- Smart Vehicle Power Management
- 2 x RS-232/422/485 Serial Ports
- 4 x DI / 4 x DO / 2 x Analog Inputs

1.3 SPECIFICATION

System	
CPU	Intel® 11th Gen Core™ i7-1185G7E up to 2.8 GHz* Intel® 11th Gen Core™ i5-1145G7E up to 2.6 GHz* Intel® 11th Gen Core™ i3-1115G4E up to 3.0 GHz* Intel® Celeron® 6305E 1.8 GHz *CPU TPD is configured at 15W as the default setting.
Memory	1 x DDR4-3200 SO-DIMM up to 32 GB
Graphics	Intel® Iris® Xe / UHD Graphics (for Celeron® 6305E only)
Network	1 x Intel® 2.5GbE
Watchdog	1 ~ 255 Level Reset
Security	TPM 2.0
I/O	
Serial SATA	1 x SATA 6Gb/s
Serial Port	2 x RS-232/422/485
USB Port	2 x USB 3.2 Gen 2 (10 Gbps) 2x USB 2.0
Ethernet	2 x RJ-45 Ports for 1 x 2.5GbE and 1 x GbE
Video Port	2 x HDMI 2.0b, 1 x DVI-D *Only supports Single-Link DVI-D cables

GPIO Port	4 x DI (9~60V) / 4 x DO (5V / 100mA) 2 x Analog Input (0~60V w/0.5V accuracy)
Audio	1 x MIC-in, 1 x Line-out
Expansion Bus	1 x M.2 3042/52 Key B Slot w/ 2 x SIM Card Sockets for WWAN expansion 1 x M.2 2230 Key E slot for Wi-Fi/BT module 1 x mPCIe Full-size slot supports USB 3.0 and USB 2.0 w/ SIM card slot 1 x mPCIe Full-size Slot supports PCIe 3.0 x1 and USB 2.0
Antenna	6 x Pre-cut Hole for External SMA Antenna
Storage	
Type	1 x SATA Connector for 2.5" SATA HDD/SSD 1 x M.2 2280 Key M for NVMe SSD and SATA SSD
Operating System	
Windows	Windows 10/11 IoT 64-bit
Linux	Ubuntu 20.04/22.04 LTS 64-bit
Environment	
Operating Temp.	-40 ~ 70ºC (with SSD), ambient w/ 0.6m/s airflow
Storage Temp.	-40 ~ 80ºC
Relative Humidity	Relative Humidity 10% RH – 90% RH (non-condensing)
Vibration (with SSD)	IEC60068-2-64, random, 2.5G@5~500Hz, 1hr/axis
	MIL-STD-810G, Method 514.6, Procedure I, Cat.4, DUT Operating
Shock	MIL-STD-810G, Method 516.6, Procedure I, Trucks and semitrailers= 15G (11ms) with SSD, DUT Operating
Certifications/Approvals	CE, FCC Class A, E-Mark
Power	
Power Input	DC 9 ~ 60V Input
Power Management	Vehicle Power Ignition for Variety Vehicle
Power Off Control	Power off delay time setting by BIOS and CarTFT.com utility
UPS (Optional)	Internal battery Kit for about 10 mins operating *UPS backup time varies depending on actual overall system power consumption. *Operating temperature will be 0~55°C with the battery kit. Patent No.: M447854 - Build-in Battery

Mechanical	
Construction	Aluminum Alloy
Mounting	Wall mount, VESA-mount, Din Rail Mounting Kit
Weight	1,800 g
Dimension	210 (L) x 171 (W) x 54 (H) mm (w/ mounting kit)

1.4 POWER CONSUMPTION

FleetPC-12B -i7										
Voltage	9V		12V		24V		48V		60V	
	Ampere	Watts	Ampere	Watts	Ampere	Watts	Ampere	Watts	Ampere	Watts
S0 (Maximum Loading)	7.24	65.16	5.41	64.92	2.71	65.04	1.38	66.24	1.10	66.00
S0 (Burn-In Test)	4.04	36.36	3.04	36.48	1.52	36.48	0.85	40.80	0.69	41.40
S0 (Idle)	1.79	16.11	1.41	19.92	0.72	17.28	0.42	20.16	0.33	19.80
S4	0.22	1.98	0.19	2.28	0.14	3.36	0.11	5.28	0.07	4.20
S5	0.22	1.98	0.18	2.16	0.13	3.12	0.10	4.80	0.07	4.20

FleetPC-12B -C1										
Voltage	9V		12V		24V		48V		60V	
	Ampere	Watts	Ampere	Watts	Ampere	Watts	Ampere	Watts	Ampere	Watts
S0 (Maximum Loading)	6.78	61.02	5.01	60.12	2.46	59.04	1.31	62.88	0.99	59.40
S0 (Burn-In Test)	3.16	28.44	2.38	28.56	1.15	27.60	0.61	29.28	0.49	29.40
S0 (Idle)	1.85	16.65	1.40	16.80	0.71	17.04	0.35	16.80	0.31	18.60

S4	0.18	1.62	0.16	1.92	0.09	2.16	0.07	3.36	0.06	3.60
S5	0.16	1.44	0.15	1.80	0.09	2.16	0.06	2.88	0.05	3.00

1.5 PACKAGE CONTENTS

Your product package should include the items listed below. If any of the items below need to be included, contact the distributor or dealer from whom you purchased the product.

Item	Description	Function	Q'ty
326910039661	CABLING MC101-508-03G F 90D	Terminal block for DC power input connector	1
351102050110	Screw I Type M2*5L ISO	For fastening mini PCIe modules	2
372800000900	M.2 Data Storage Heatsink Type_3	Heatsink for DRAM and M.2 Modem	1
265066022010	Thermal PAD 66x22x1.75T mm	Thermal pad for sticking on (372800000900) heat sink for DRAM	1
265016037010	Thermal PAD 16x37x1.0T mm	Thermal pad for sticking on the side of (372800000900) heat sink	1
351103060810	ROUND HAND SCREW W/SPRING_ P3x6L	For fastening (372800000900), the heat sink	1
351125100110	Screw I Type M2.5x10L	For fastening (372800000900), the heat sink	2
351125050110	Screw I Type M2.5x5L	For fastening M.2 modules	3
370831310200	FleetPC-12B mount bracket	For wall mount bracket	2
351451060210	Screw F Type #6-32*6L Ni	For fastening wall mount bracket	4

1.6 ORDERING INFORMATION

Part Number	**FleetPC-12B -zz** zz=i7=Core™ i7-1185G7E, zz=i5=Core™ i5-1145G7E, zz=i3=Core™ i3-1115G4E; zz=C1=Celeron® 6305E

Description	Intel® 11th Gen Core™ i7 / i5 / i3 / Celeron® Processor with 2 x LAN/ 2 x HDMI/ 1 x DVI/ 2 x COM/ DC IN 9-60V In-Vehicle Computer
State of Origin	Made in Taiwan

1.7 OPTIONAL ACCESSORY

CarTFT.com e.K. provides optional accessories as follows. Please get in touch with your dealer or us if you need anything.

Item	Description
DRAM	DDR4 SO-DIMM 3200 4GB ~ 32GB (-40~85°C)
SATA SSD	2.5-inch SATA SSD TLC 128GB ~ 1TB (-40~85°C)
NVMe SSD	M.2 2280 Key M NVMe 256 GB ~ 1 TB TLC (-40~85°C)
Wi-Fi / BT Module	Wi-Fi / BT Module M.2 2230 Key A+E Wi-Fi 6 + Bluetooth 5.2 module
WWAN Modem	WWAN Modem M.2 3042/52 5G/LTE modem
GPS	GPS mPCIe GPS module
CAN Bus	CAN Bus mPCIe CAN module
Battery Backup Kit	Battery Backup Kit BAT-3000 kit 1150mAH 3S1P Battery kit (-10~60°C for Discharge)

*Please check with CarTFT.com e.K.' sales representatives for availability.

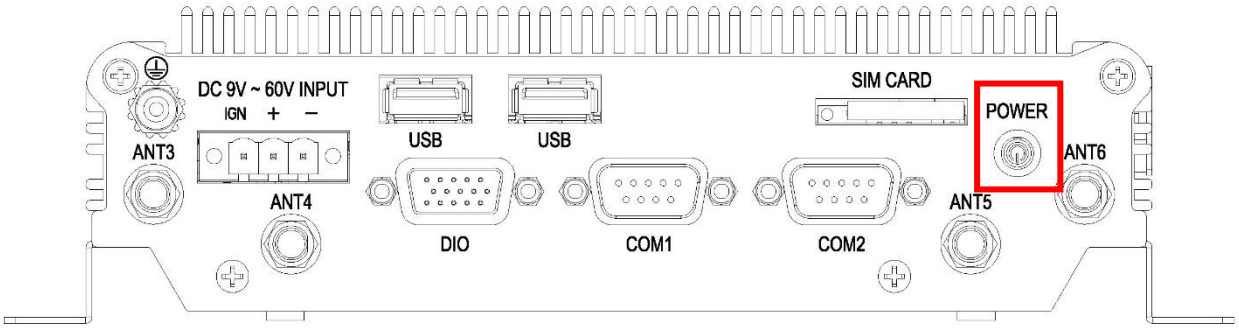
Chapter 2

I/O and Connectors

2.0 SYSTEM I/O

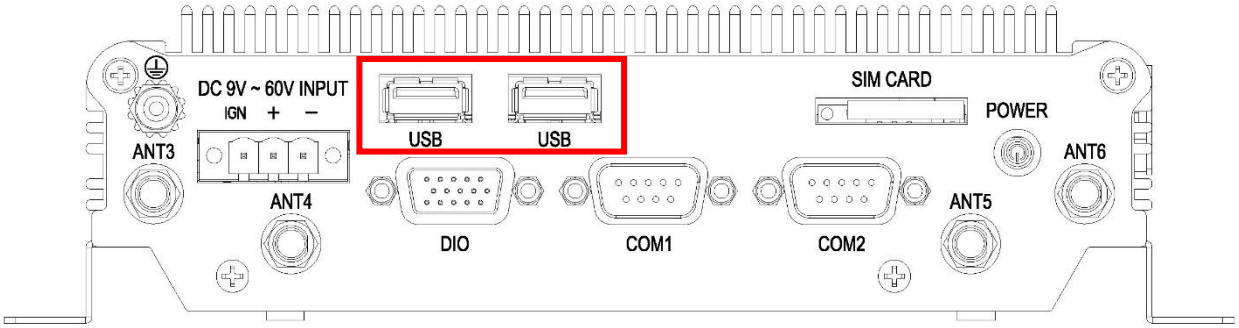
2.1 FRONT PANEL INFORMATION

2.1.1 POWER BUTTON



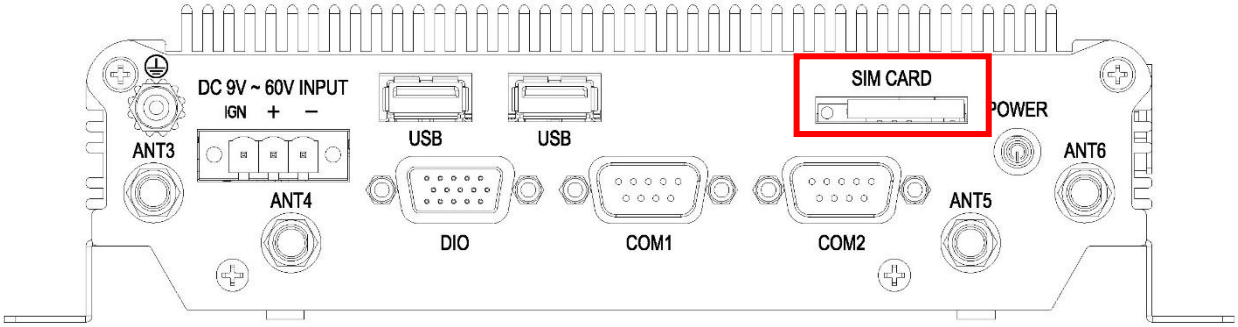
- RED light: Standby
- BLUE light: Power On

2.1.2 USB



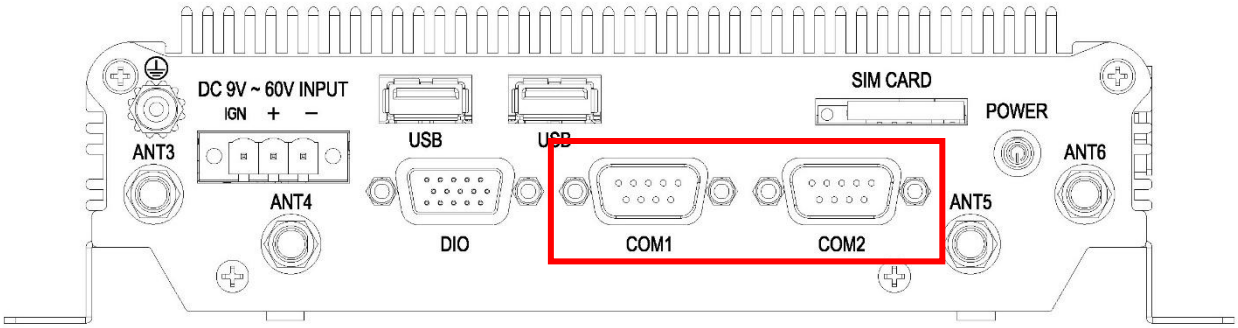
- 2 x USB 2.0 support 480 Mbps* transfer rates (5V/500 mA)
- *480 Mbps is the maximum theoretical data throughput of USB 2.0

2.1.3 SIM CARDS



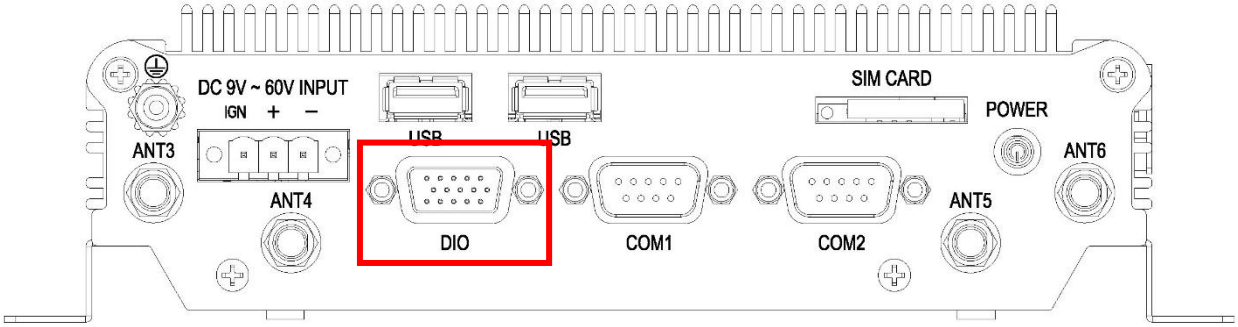
- SIM Card slots support mini-SIM card
- SIM CARD signal is connected to the mPCIe slot 1
- Before removing the SIM card, please turn off the device's power.

2.1.4 SERIAL PORT



- COM 1 – 2 are programmable RS-232/422/485 interfaces via utility software.

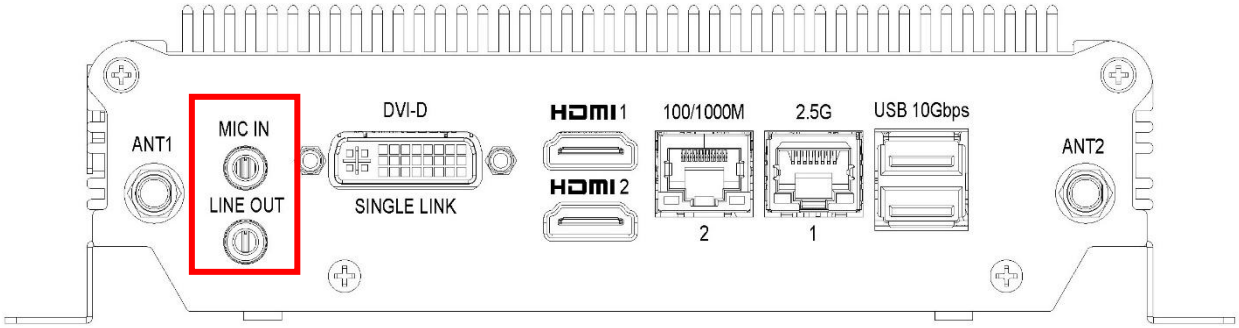
2.1.5 DIO



- DIO port provides 4 x DI (0~60VDC), 4 x DO (5V 100mA), and 2 x Analog Input. (0~60V w/0.5V accuracy)

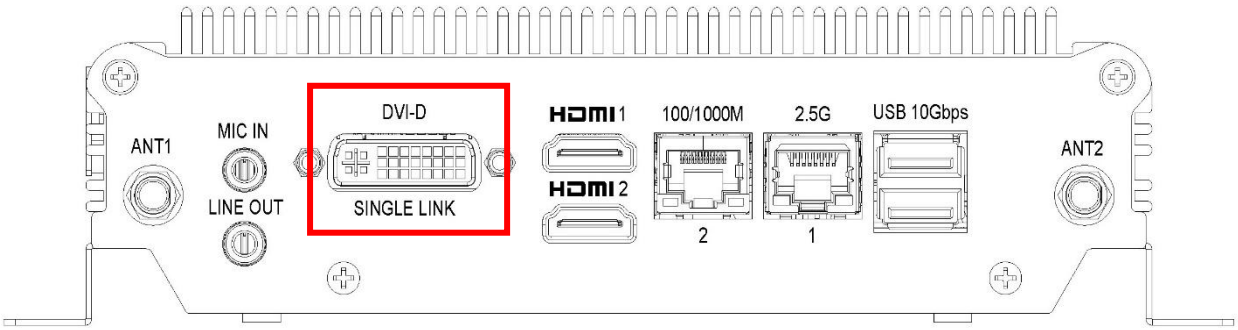
2.2 REAR PANEL INFORMATION

2.2.1 AUDIO



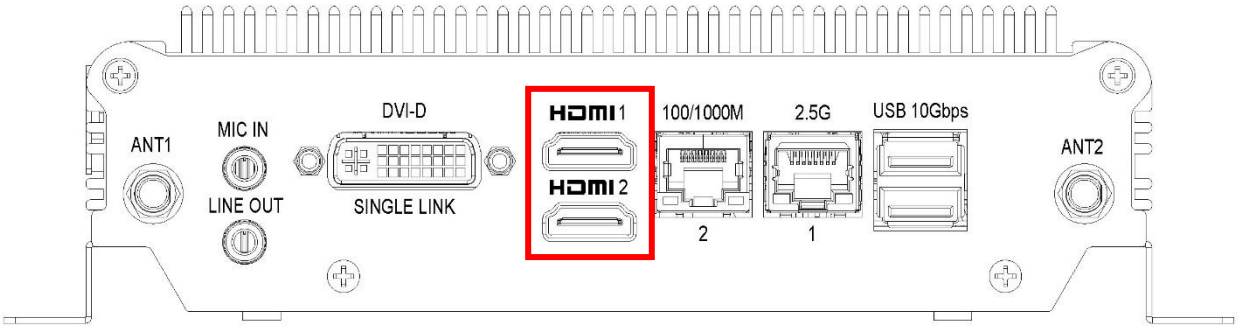
- MIC IN: This port accepts stereo audio input from a 3.5mm TRS microphone or audio input.
- LINE OUT: This port provides the stereo audio output signal to 3.5 mm TRS speakers with amplifiers.

2.2.2 DVI



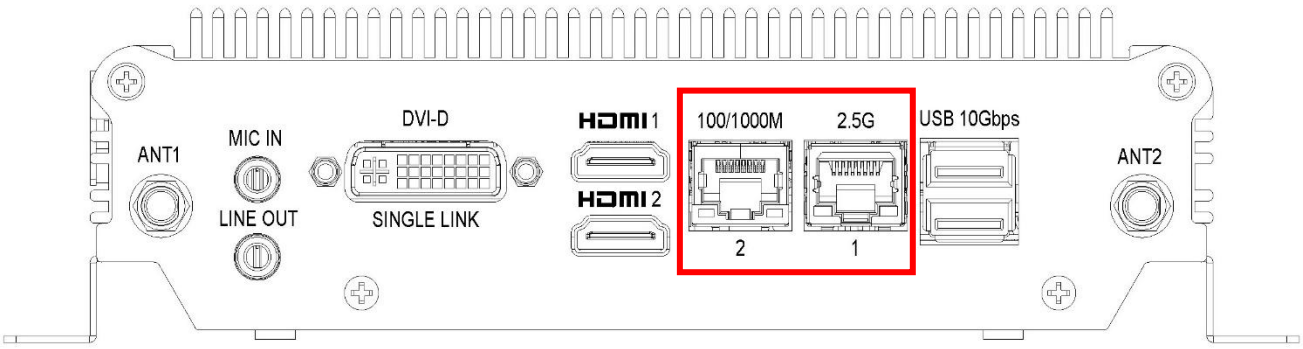
- DVI Single link provides 1920 x 1080 resolution at 60 Hz.
- The DVI port supports single-link cable only.

2.2.3 HDMI



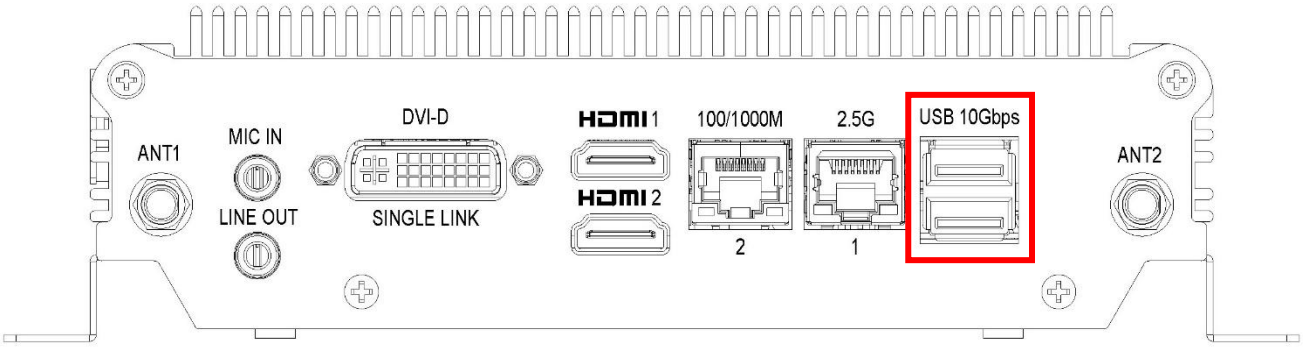
- HDMI 1- 2: HDMI 2.0b provides 3840 x 2160p resolution at 60 Hz.

2.2.4 ETHERNET



- LAN 1: Intel 2.5 gigabit Ethernet controller supports 2.5GBASE-T and muti-gigabit Ethernet.
- LAN 2: Intel gigabit Ethernet controller support 10/100/1000BAST-T.

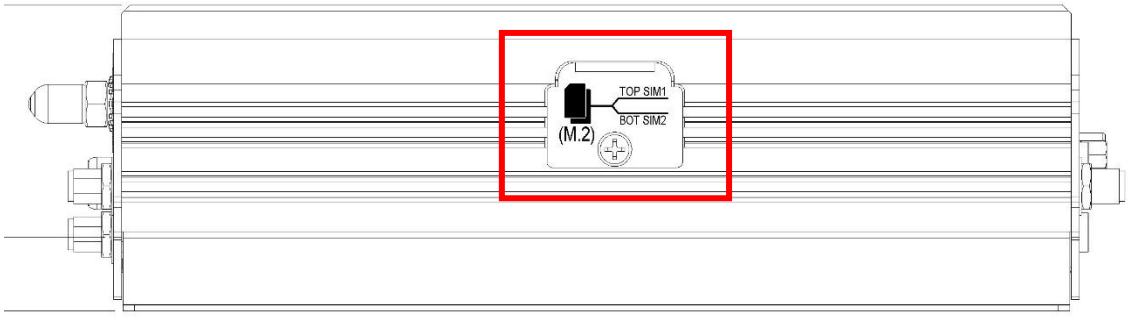
2.2.5 USB 10Gbps



- USB 10 Gpbs: 2 x USB 3.2 Gen 2 support 10 Gbps* transfer rates (5V/900 mA).

  *10 Gbps is the maximum theoretical data throughput of USB 3.2 Gen2.

2.2.6 SIDE SIM CARD SLOTS

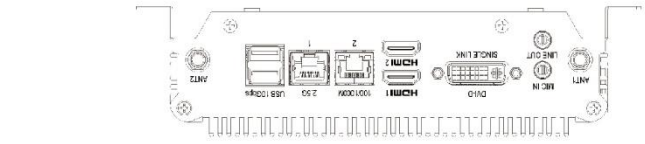


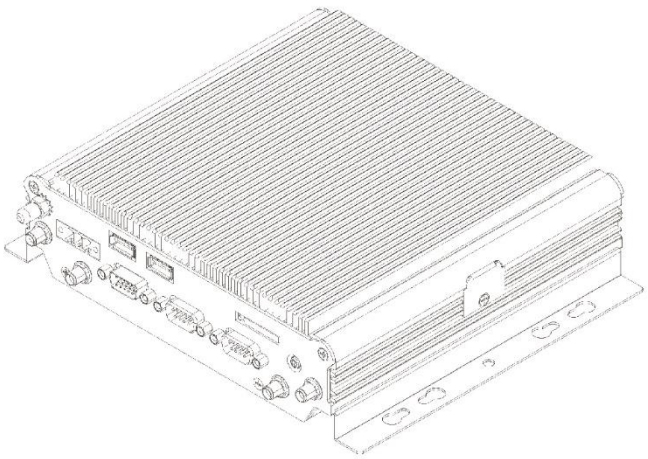
- SIM Card slots support mini-SIM cards; two slots can be switched via utility software.
- SIM CARD signal is connected to the M.2 Key B slot on SMB-2612.
- Before removing the SIM card, please turn off the power of the device.

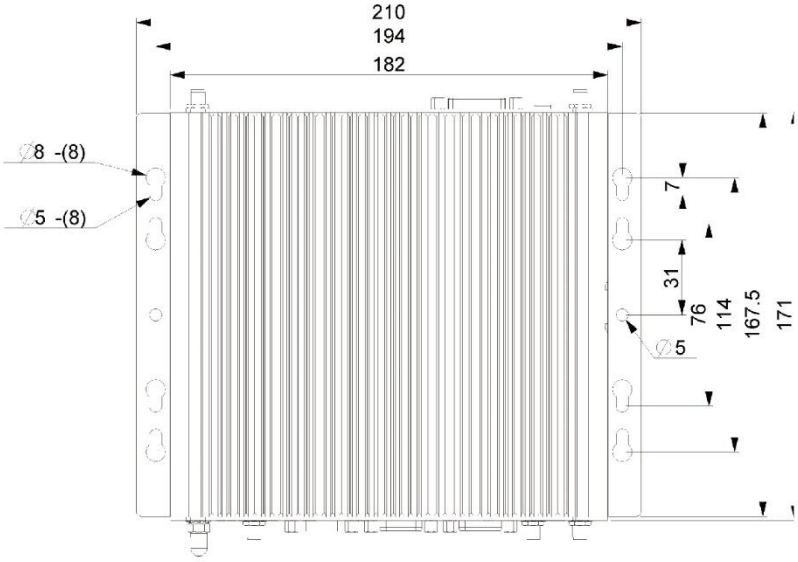
2.3 ILLUSTRATION

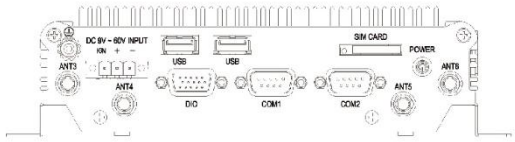
2.3.1 SYSTEM

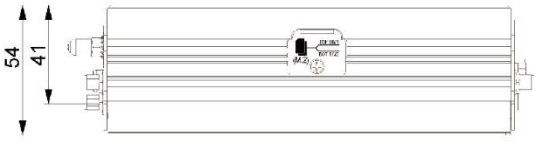
Unit: mm





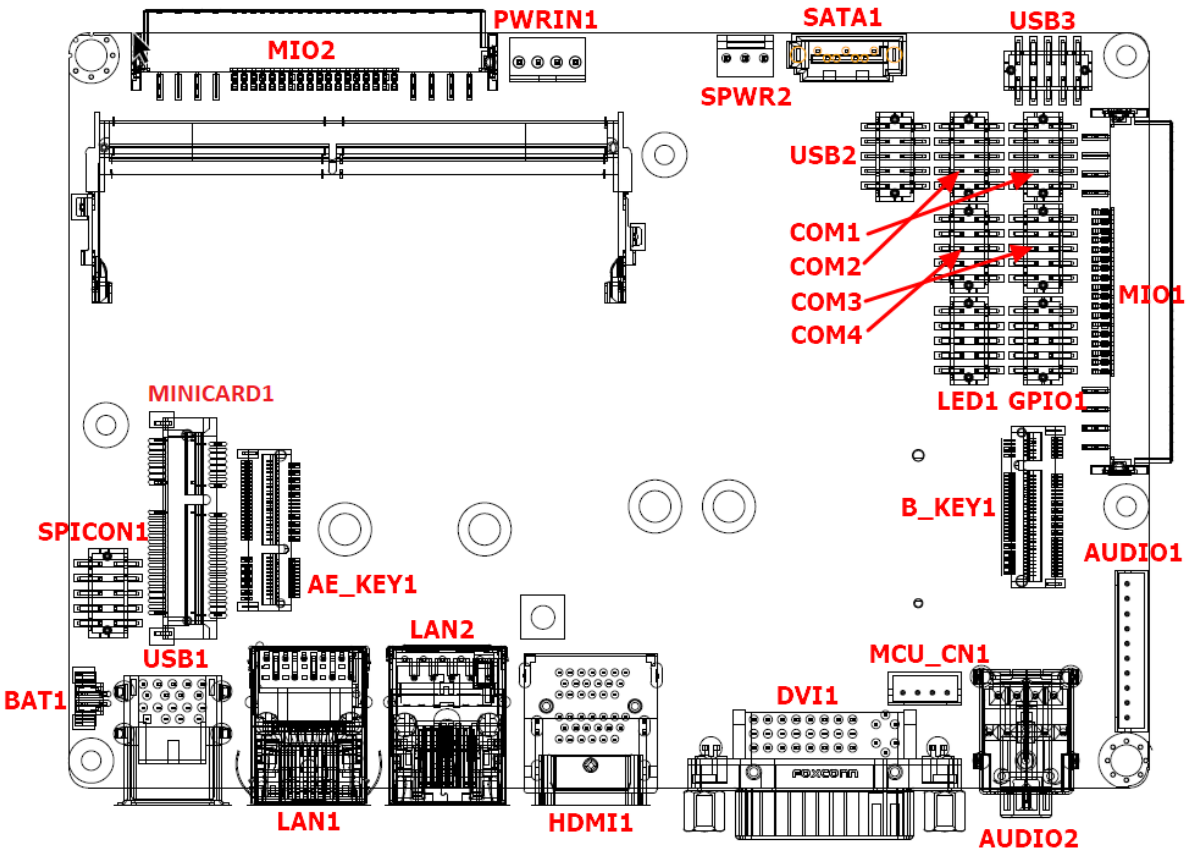


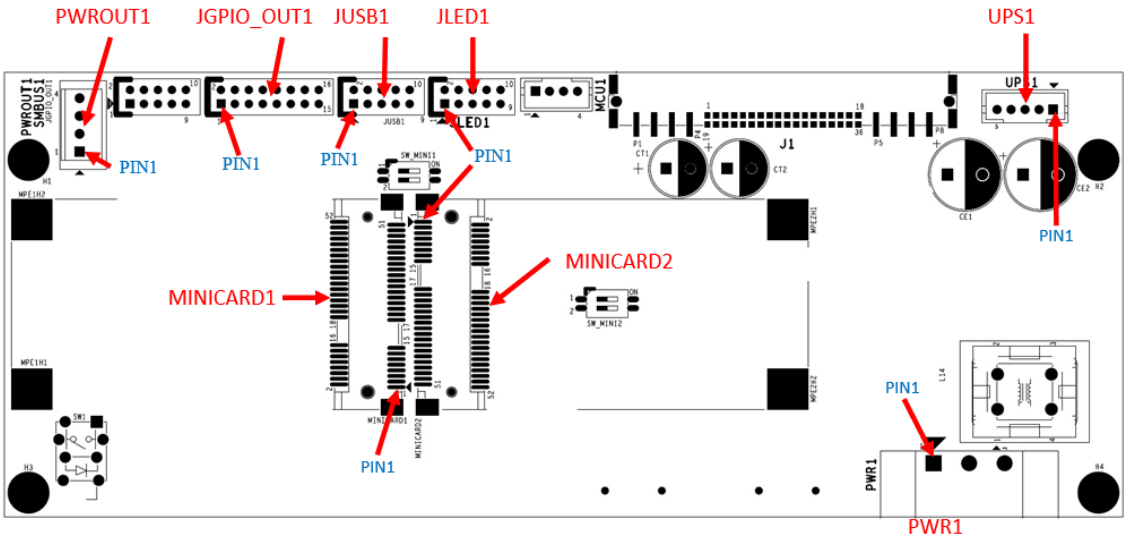




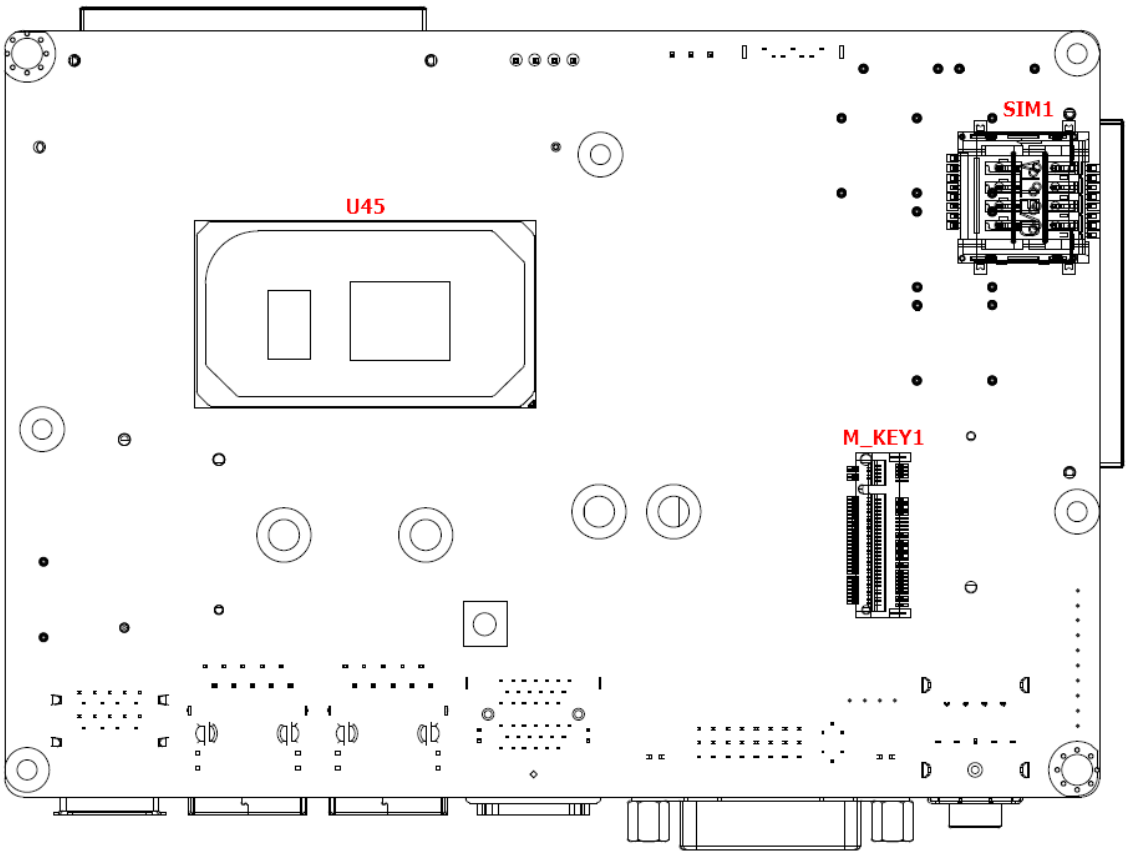
2.3.2 MAIN BOARD

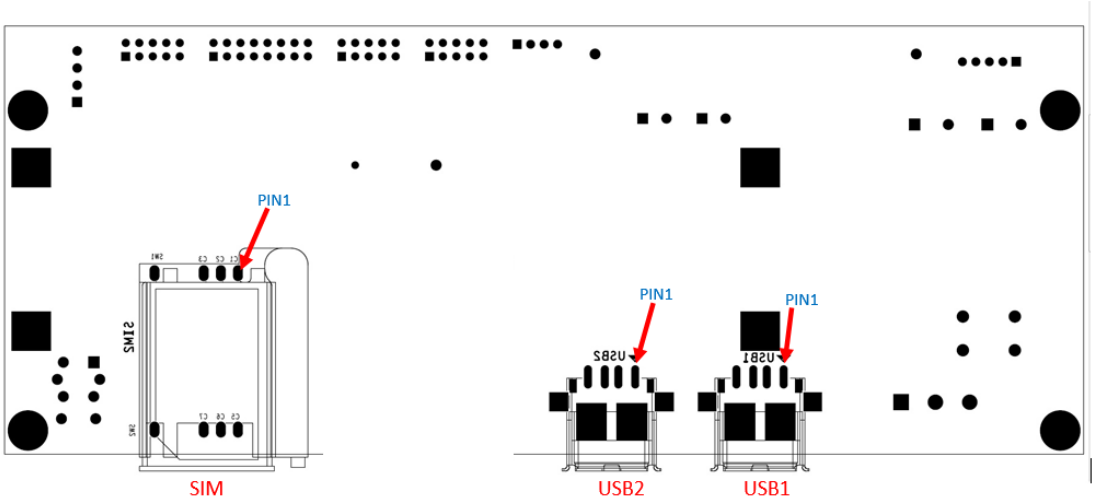
Top View





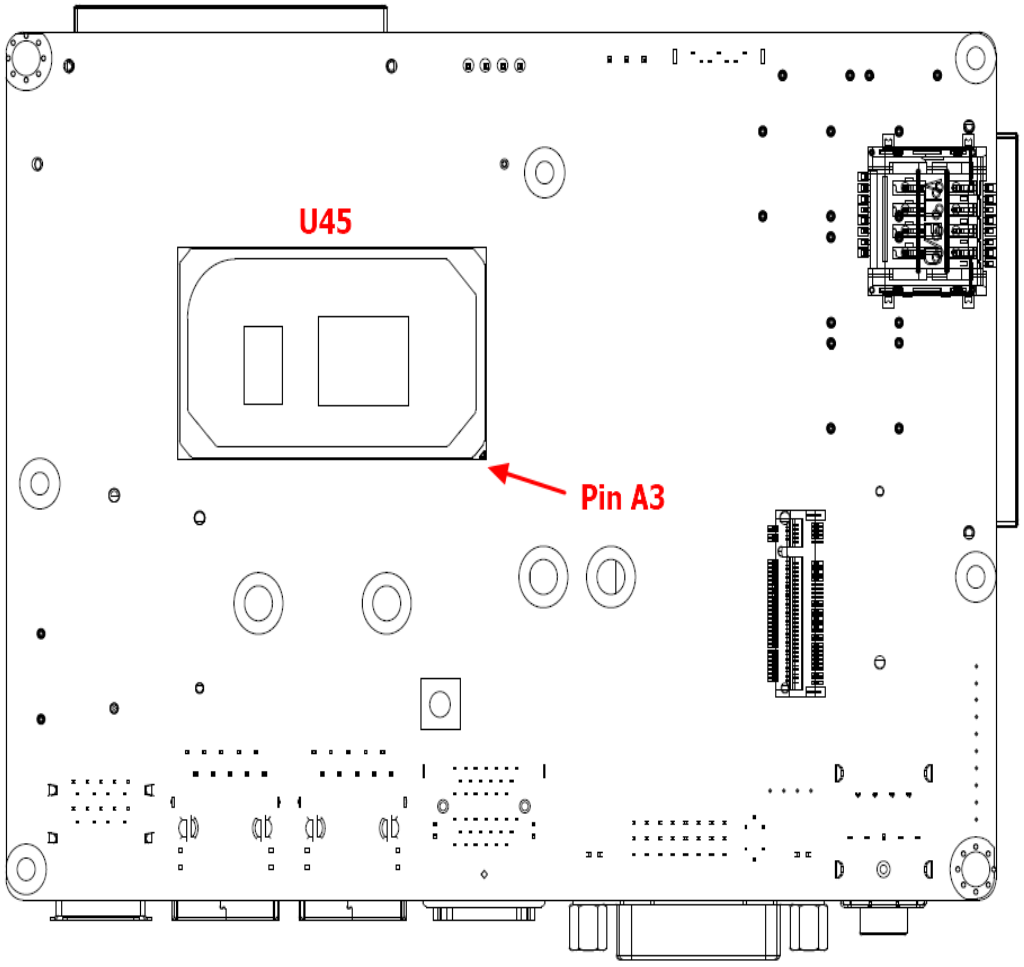
Bottom View



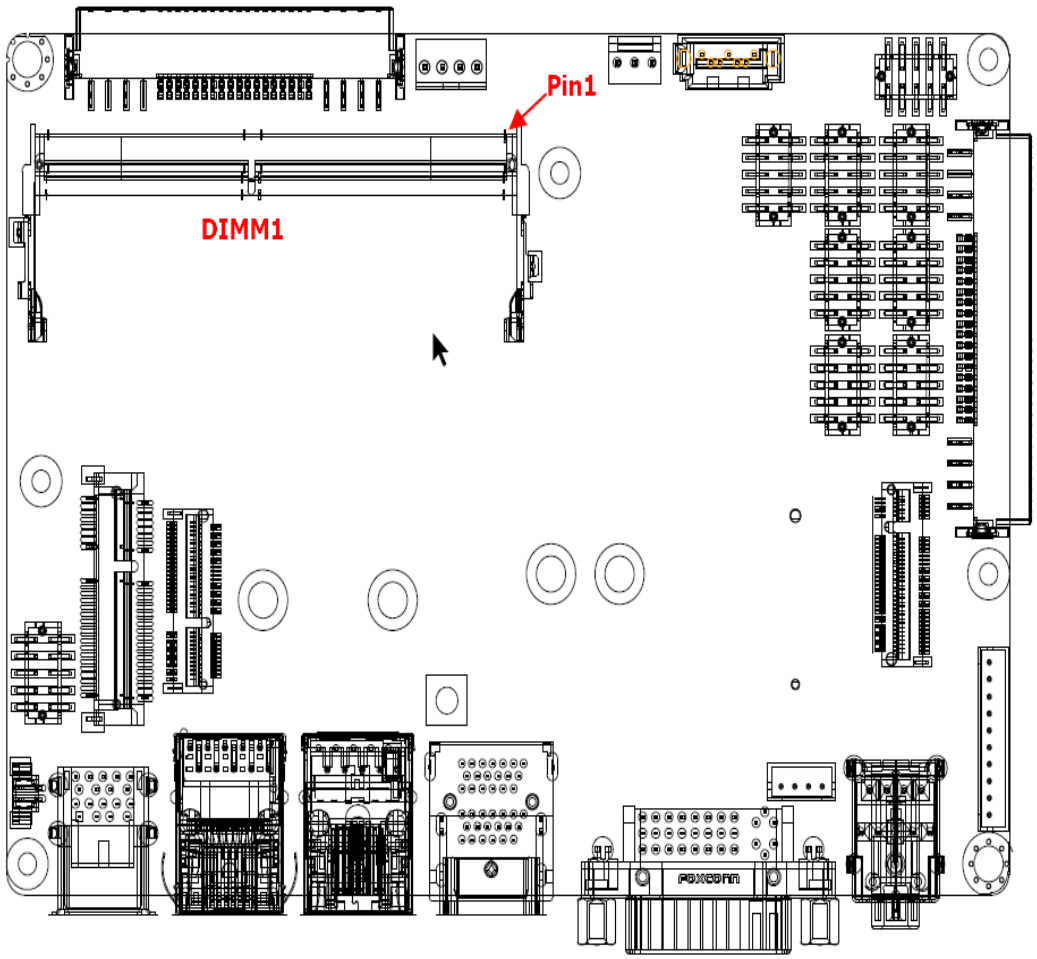


2.4 I/O CONNECTOR DEFINITION

2.4.1 CPU

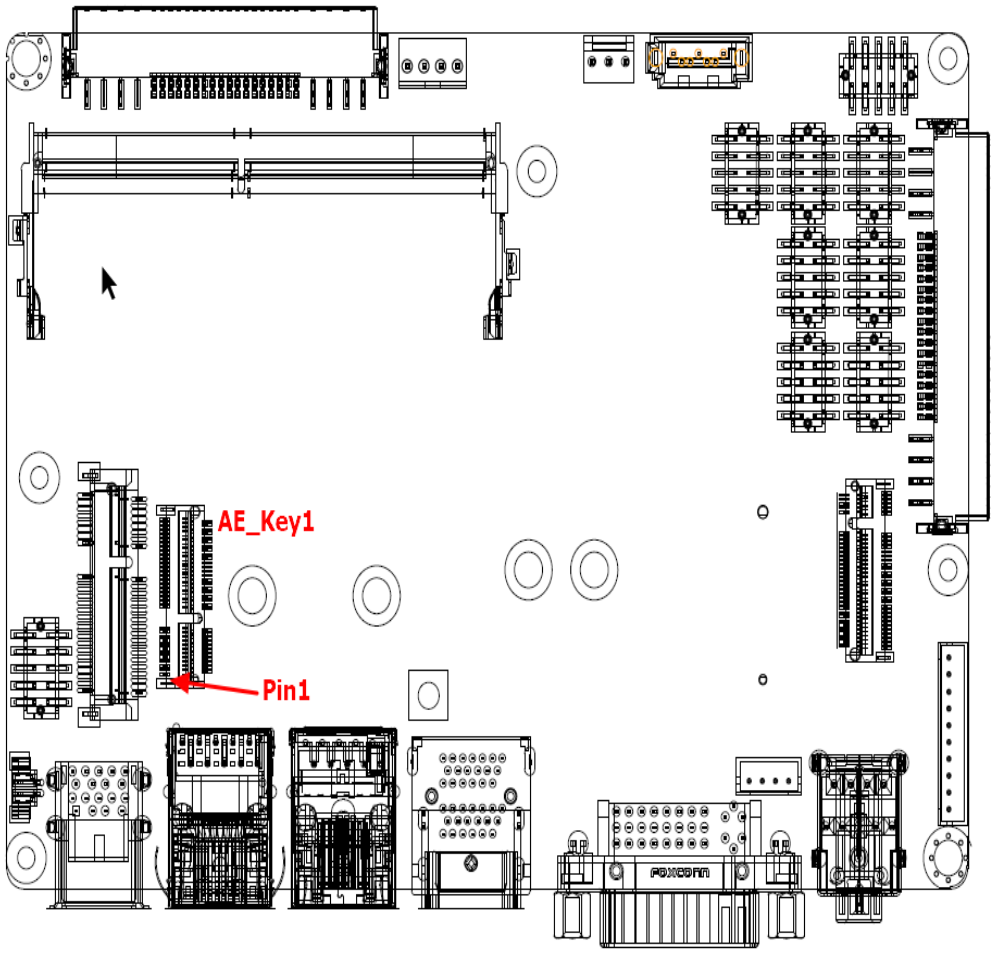
CPU	
Connector size	**1449 Pin**
Connector type	**BGA**
Connector location	U45
Connector pin definition	
Connector map	

2.4.2 SO-DIMM connector

SO-DIMM connector	
Connector size	260 Pin
Connector type	DDR4L SO-DIMM Socket
Connector location	DIMM1
Connector pin definition	
Connector map	

2.4.3 M2_AE_KEY connector

M2_AE_KEY connector				
Connector size	NGFF 2230 /75 Pin			
Connector type	M.2 A/E Key H:8.5mm			
Connector location	**AE_Key1 (PCI-E&USB2.0)**			
Connector pin definition	Pin	Signal	Pin	Signal
	1	GND	2	3.3V
	3	USB_D+	4	3.3V
	5	USB_D-	6	NC
	7	GND	8	NC
	9	NC	10	NC
	11	NC	12	NC
	13	GND	14	NC
	15	NC	16	NC
	17	NC	18	NC
	19	GND	20	NC
	21	NC	22	NC
	23	NC	24	KEY
	25	KEY	26	KEY
	27	KEY	28	KEY
	29	KEY	30	KEY
	31	KEY	32	NC
	33	GND	34	NC
	35	PCIE_TXP	36	NC
	37	PCIE_TXN	38	NC
	39	GND	40	NC
	41	PCIE_RXP	42	NC
	43	PCIE_RXN	44	NC
	45	GND	46	NC
	47	REFCLK_P	48	NC
	49	REFCLK_N	50	NC
	51	GND	52	PERST#
	53	CLKREQ#	54	DIS2#
	55	PEWAKE#	56	DIS1#
	57	GND	58	NC
	59	NC	60	NC
	61	NC	62	NC
	63	GND	64	NC
	65	NC	66	PRESET

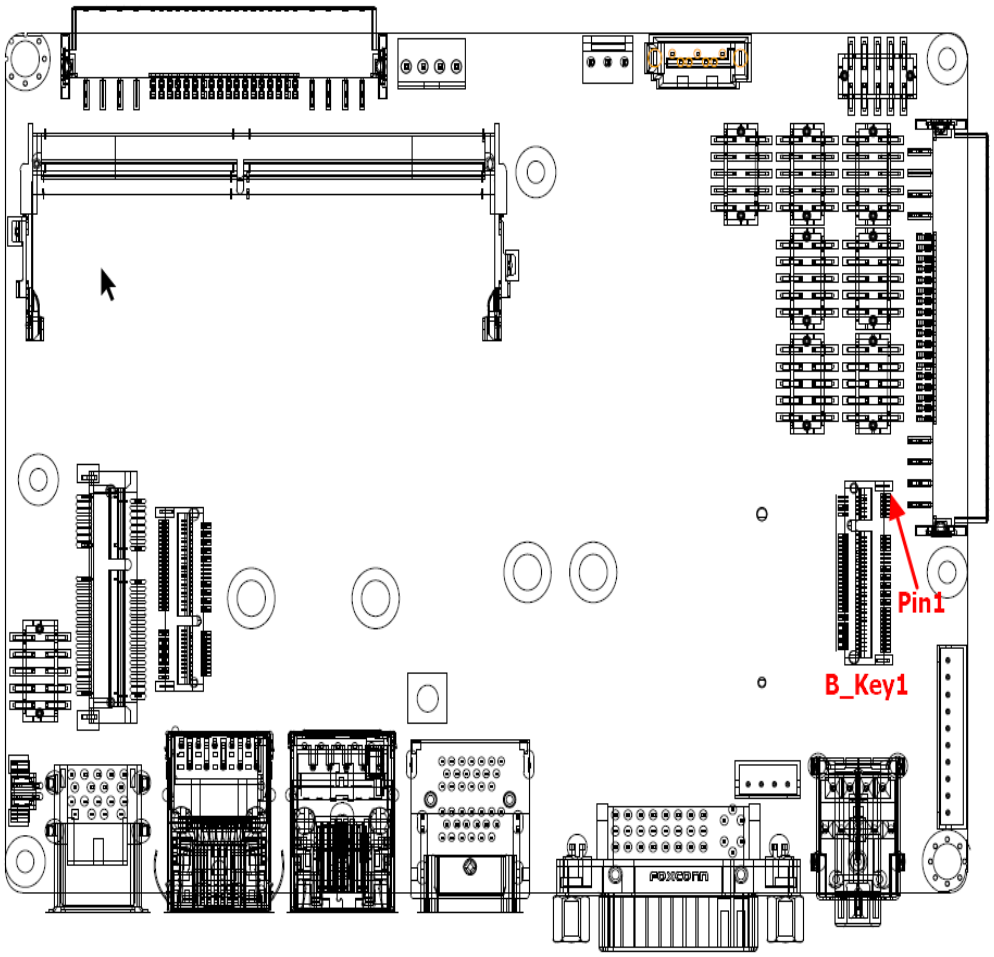
	67	NC	68	PCIE_CLKREQ1#
	69	GND	70	WAKE#
	71	NC	72	3.3V
	73	NC	74	3.3V
	75	GND		
Connector map				

2.4.4 M2_B_KEY connector

M2_B_KEY connector	
Connector size	NGFF 2230 /2242 /75 Pin
Connector type	M.2 B Key H:8.5mm
Connector location	**B_KEY1 (USB 3.0 &USB2.0 /PCIE)**

Connector pin definition

Pin	Signal	Pin	Signal
1	NC	2	3.3V
3	GND	4	3.3V
5	GND	6	NC
7	USB_D+	8	NC
9	USB_D-	10	3.3V
11	GND	12	KEY
13	KEY	14	KEY
15	KEY	16	KEY
17	KEY	18	KEY
19	KEY	20	NC
21	NC	22	NC
23	PCH_WAKE#	24	NC
25	DPR	26	3.3V
27	GND	28	NC
29	USB3_RX-	30	UIM_RST
31	USB3_RX+	32	UIM_CLK
33	GND	34	UIM_DAT
35	USB3_TX-	36	UIM_PWR
37	USB3_TX+	38	N/C
39	GND	40	N/C
41	PCIE_RX-	42	N/C
43	PCIE_RX+	44	N/C
45	GND	46	N/C
47	PCIE_TX-	48	N/C
49	PCIE_TX+	50	PERST#
51	GND	52	N/C
53	PCIE_CK-	54	PCH_WAKE#
55	PCIE_CK+	56	NC
57	GND	58	NC
59	NC	60	NC
61	NC	62	NC
63	NC	64	NC
65	NC	66	NC

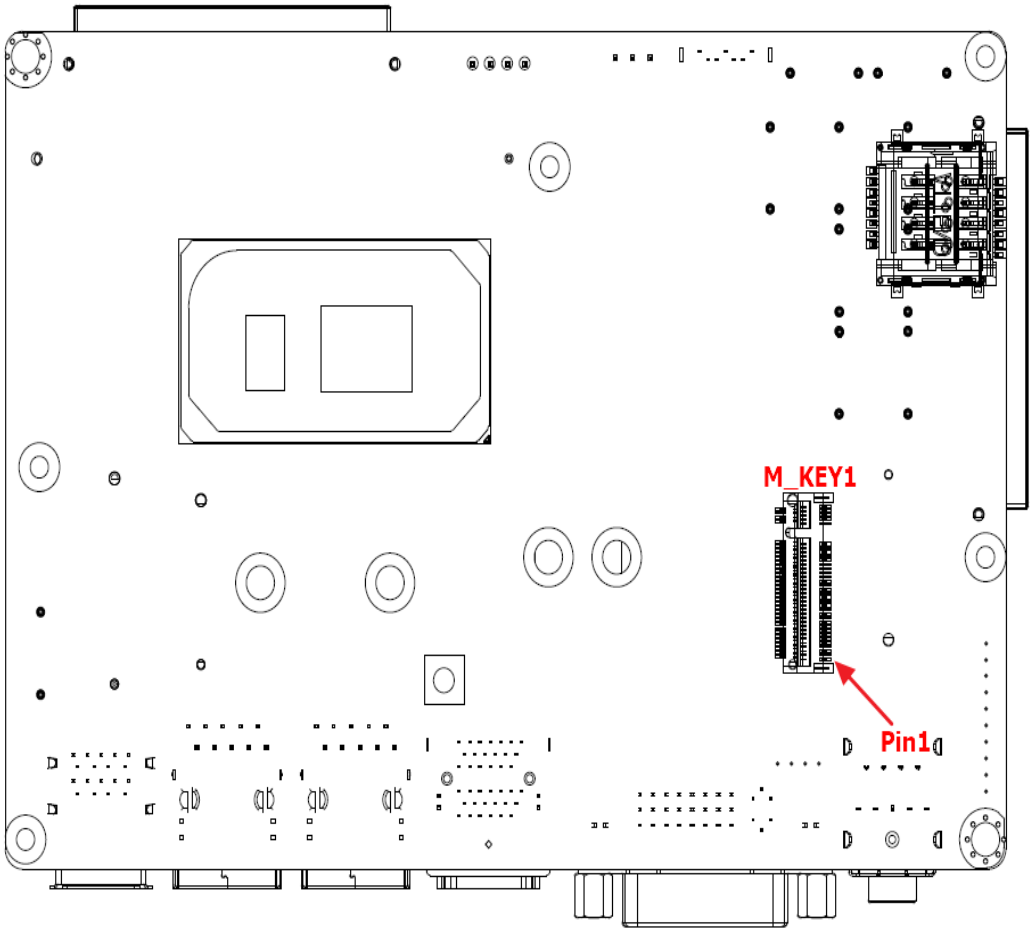
	67	3.3V	68	NC
	69	NC	70	3.3V
	71	GND	72	3.3V
	73	GND	74	3.3V
	75	NC		
Connector map				

2.4.5 M2_M_KEY connector

M2_M_KEY connector	
Connector size	NGFF 2280 /75 Pin
Connector type	M.2 M Key H:8.5mm
Connector location	**M_KEY1 (SATA OR PCIE x4)**

Connector pin definition

Pin	Signal	Pin	Signal
1	GND	2	3.3V
3	GND	4	3.3V
5	PCIE_RX3-	6	NC
7	PCIE_RX3+	8	NC
9	GND	10	LED#
11	PCIE4_TX3-	12	3.3V
13	PCIE4_TX3+	14	3.3V
15	GND	16	3.3V
17	PCIE4_RX2-	18	3.3V
19	PCIE4_RX2+	20	NC
21	GND	22	NC
23	PCIE4_TX-2	24	NC
25	PCIE4_TX+2	26	NC
27	GND	28	NC
29	PCIE4_RX-1	30	NC
31	PCIE4_RX+1	32	NC
33	GND	34	NC
35	PCIE4_TX-1	36	NC
37	PCIE4_TX+1	38	NC
39	GND	40	SMB_IO_CLK
41	PCIE4_RX-0 / SATA_RX+	42	SMB_IO_DAT
43	PCIE4_RX+0 / SATA_RX-	44	NC
45	GND	46	NC
47	PCIE4_TX-0 / SATA_TX-	48	NC
49	PCIE4_TX+0 / SATA_TX+	50	PERST#
51	GND	52	CLKREQ#
53	PCIECLK_-0	54	PEWAKE#
55	PCIECLK_+0	56	NC
57	GND	58	NC
59	KEY	60	KEY
61	KEY	62	KEY
63	KEY	64	KEY
65	KEY	66	KEY

	67	NC	68	NC
	69	PEDET(GND-SATA)	70	3.3V
	71	GND	72	3.3V
	73	GND	74	3.3V
	75	GND		
Connector map				

2.4.6 AUDIO1 JST connector

<table>
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<tr><td>Connector size</td><td>1 X 10 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>AUDIO1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>CEN_OUT</td></tr>
<tr><td>2</td><td>EF_OUT</td></tr>
<tr><td>3</td><td>CEN-JD</td></tr>
<tr><td>4</td><td>LINE_IN_R</td></tr>
<tr><td>5</td><td>LINE_IN_L</td></tr>
<tr><td>6</td><td>LINE1-JD</td></tr>
<tr><td>7</td><td>MIC_OUT-L</td></tr>
<tr><td>8</td><td>MIC_OUT-R</td></tr>
<tr><td>9</td><td>MIC-JD1</td></tr>
<tr><td>10</td><td>GND</td></tr>
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<tr><td>Connector map</td><td></td></tr>
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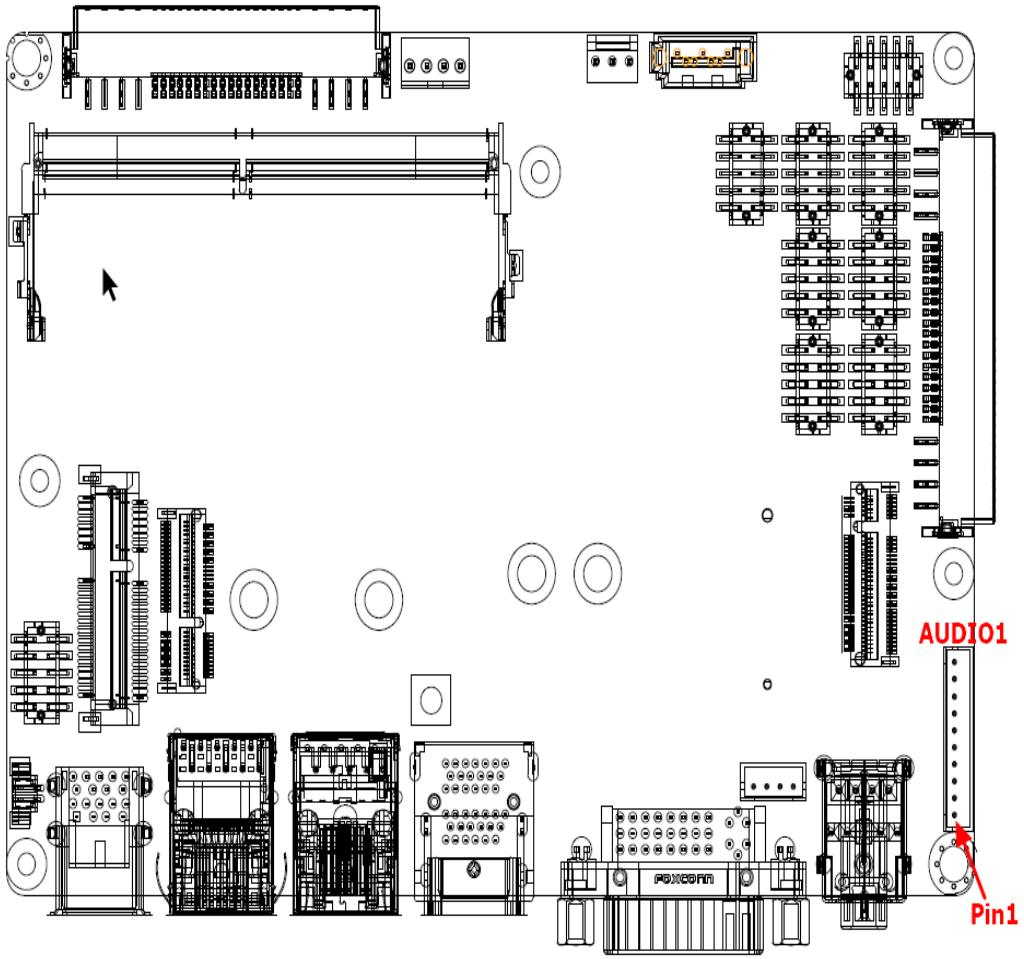
AUDIO1
Pin1

2.4.7 PWRIN1 2.54mm connector

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<tr><td>Connector size</td><td>1 X 4 = 4 Pin</td></tr>
<tr><td>Connector type</td><td>WAEFR-2.54mm-180D</td></tr>
<tr><td>Connector location</td><td>PWRIN1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>12V</td></tr>
<tr><td>2</td><td>12V</td></tr>
<tr><td>3</td><td>GND</td></tr>
<tr><td>4</td><td>GND</td></tr>
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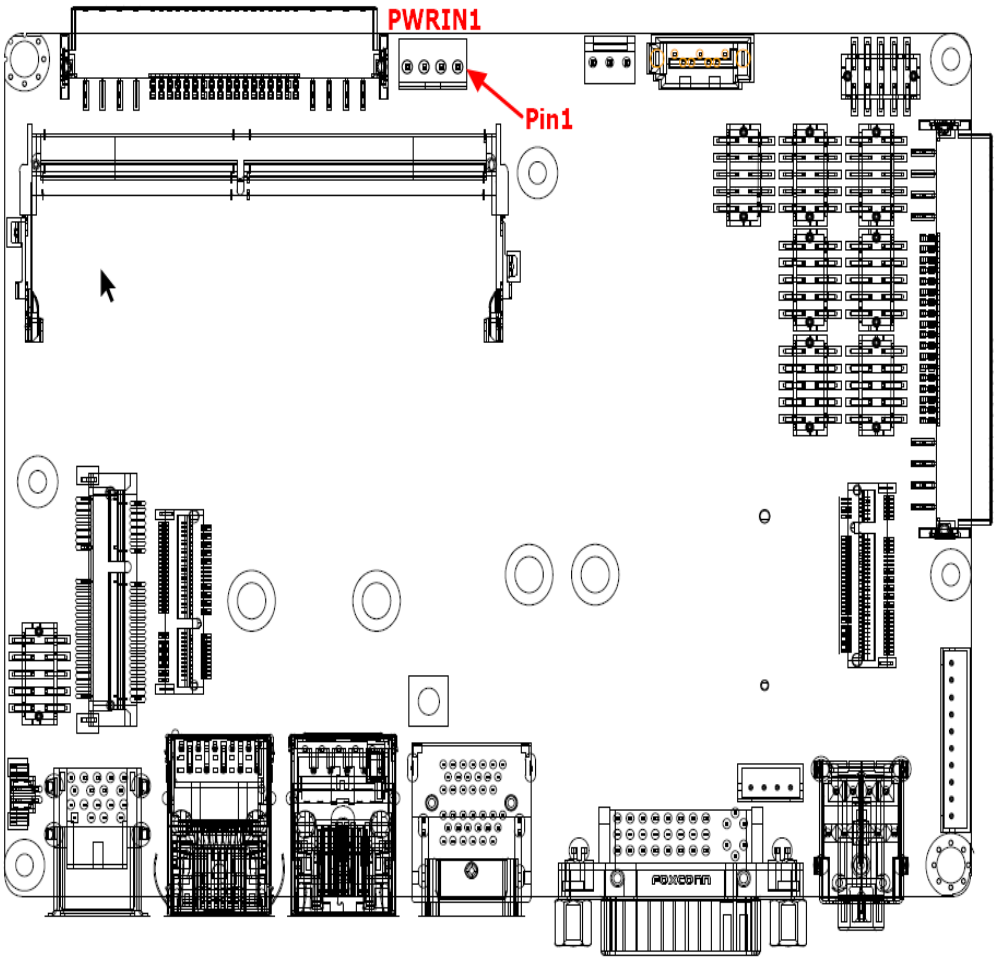
<tr><td>Connector map</td><td> 
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2.4.8 SPI JST-2.0mm connector

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<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.00mm-180D</td></tr>
<tr><td>Connector location</td><td>SPICON1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>HOLD#</td><td>2</td><td>NC</td></tr>
<tr><td>3</td><td>CS#0</td><td>4</td><td>3.3V</td></tr>
<tr><td>5</td><td>MISO</td><td>6</td><td>NC</td></tr>
<tr><td>7</td><td>NC</td><td>8</td><td>CLK</td></tr>
<tr><td>9</td><td>GND</td><td>10</td><td>MOSI</td></tr>
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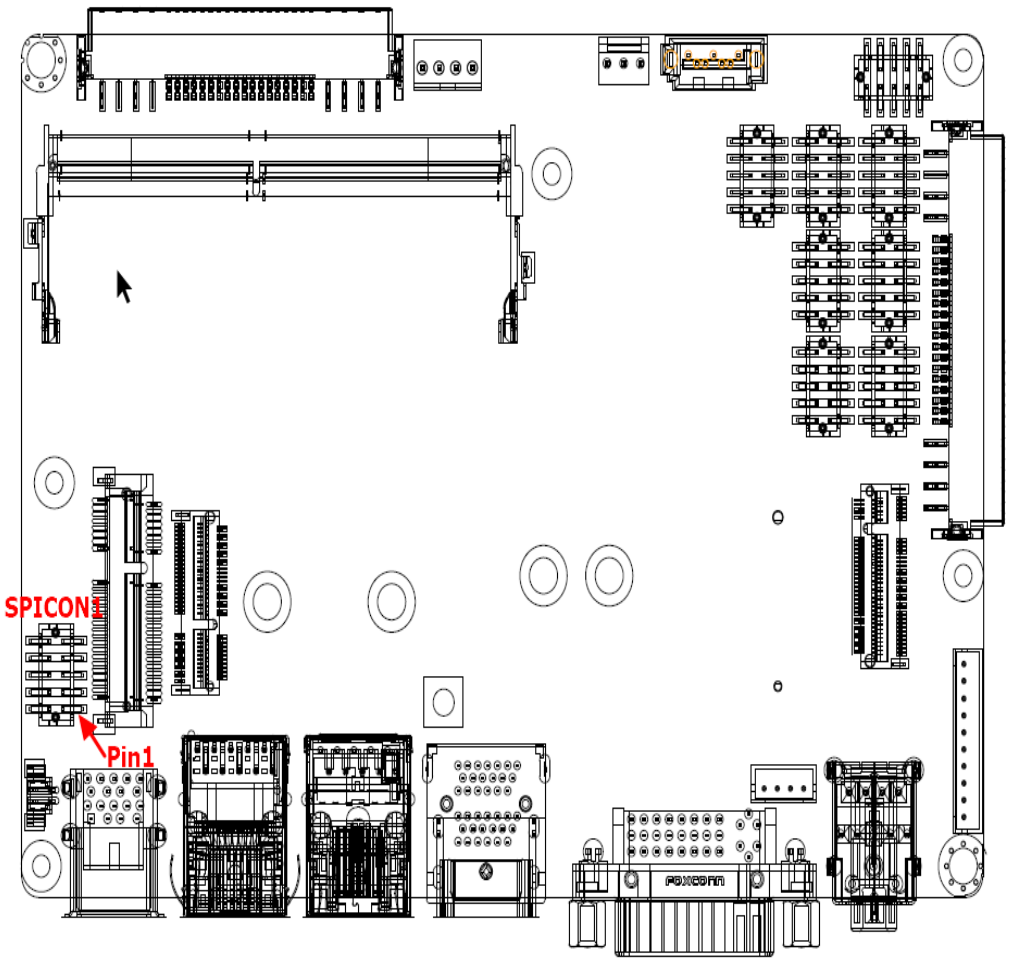
<tr><td>Connector map</td><td> 
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2.4.9 MCU JST connector

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<tr><td>Connector size</td><td>1 X 4 = 4 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>MCU_CN1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>PROGARM</td><td>2</td><td>RS-232-RXD</td></tr>
<tr><td>3</td><td>GND</td><td>4</td><td>RS-232-TXD</td></tr>
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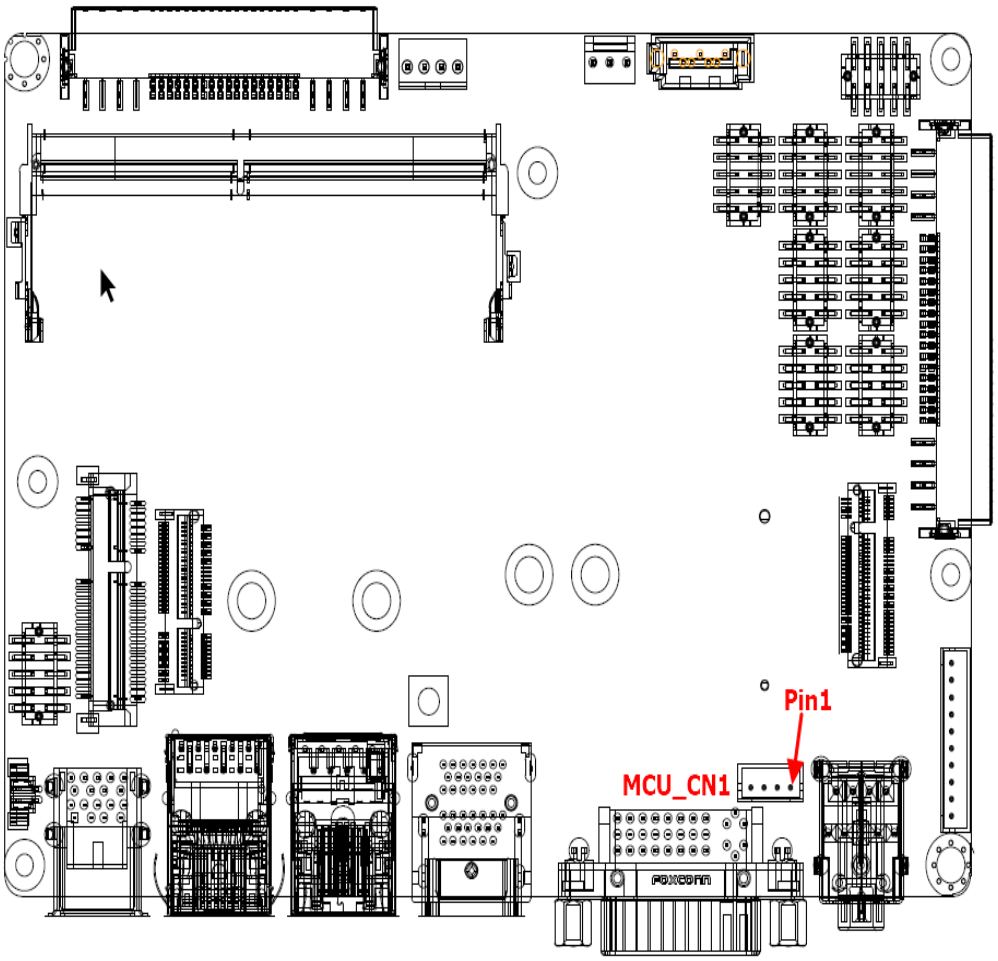
<tr><td>Connector map</td><td> 
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2.4.10 SIM connector

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<tr><td>Connector size</td><td>SIM CARD Dual port 16 Pin</td></tr>
<tr><td>Connector type</td><td>Push-Pull type</td></tr>
<tr><td>Connector location</td><td>SIM1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>A1</td><td>UIM1_PWR</td><td>A2</td><td>UIM1_RST</td></tr>
<tr><td>A3</td><td>UIM1_CLK</td><td>A4</td><td>NC</td></tr>
<tr><td>A5</td><td>GND</td><td>A6</td><td>NC</td></tr>
<tr><td>A7</td><td>UIM1_DAT</td><td>A8</td><td>NC</td></tr>
<tr><td>B1</td><td>UIM2_PWR</td><td>B2</td><td>UIM2_RST</td></tr>
<tr><td>B3</td><td>UIM2_CLK</td><td>B4</td><td>NC</td></tr>
<tr><td>B5</td><td>GND</td><td>B6</td><td>NC</td></tr>
<tr><td>B7</td><td>UIM2_DAT</td><td>B8</td><td>NC</td></tr>
<tr><td>SW1</td><td>GND</td><td>SW2</td><td>GND</td></tr>
<tr><td>G3</td><td>GND</td><td>G4</td><td>GND</td></tr>
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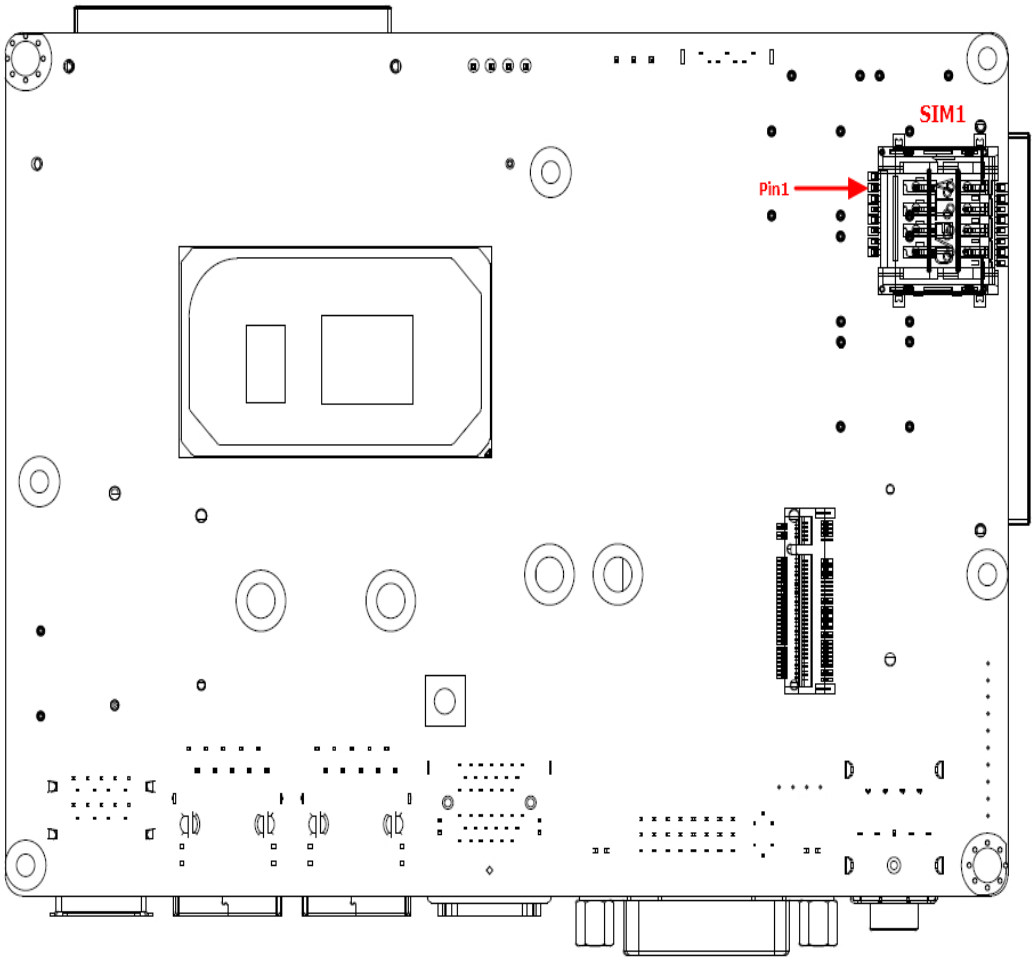
<tr><td>Connector map</td><td> 
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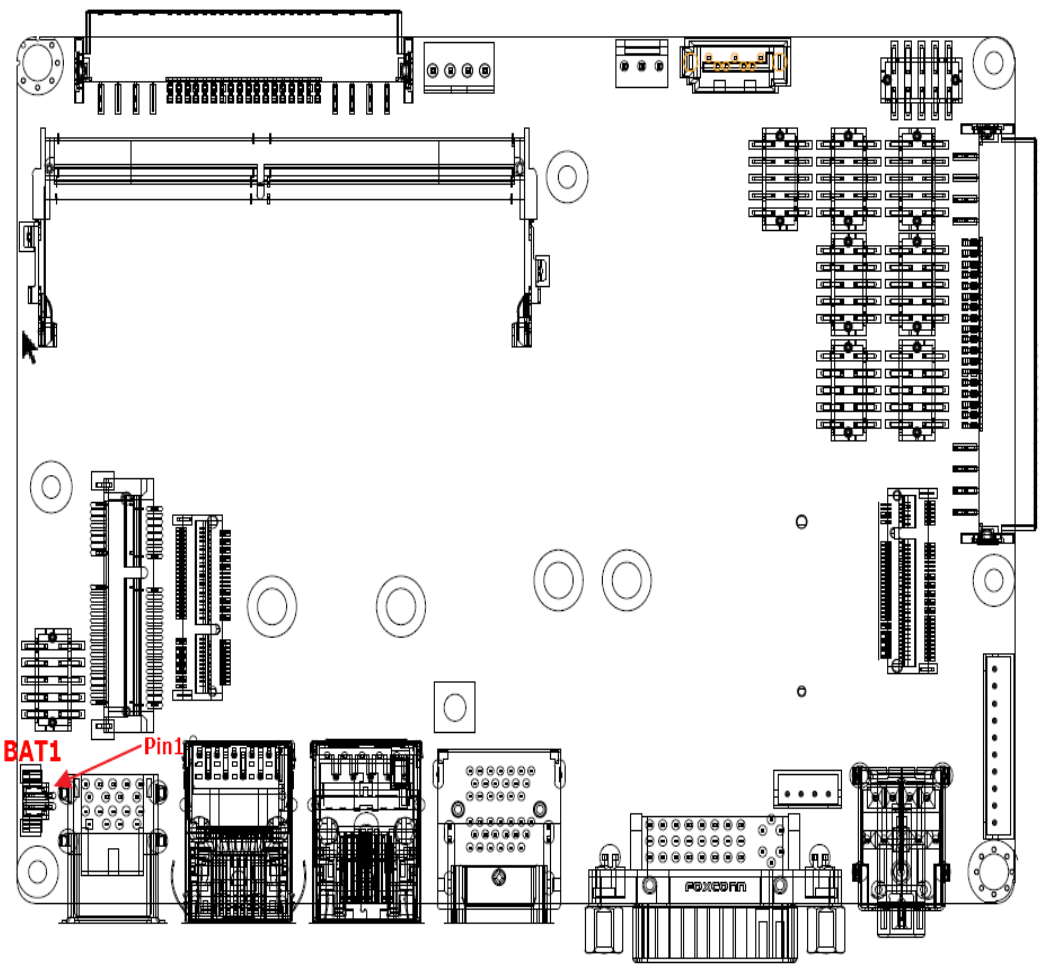
2.4.11 BAT connector

BAT connector				
Connector size	1 X 2 = 2 Pin			
Connector type	JST-1.25mm-M-90			
Connector location	BAT1			
JST Connector pin definition	Pin	Signal	Pin	Signal
	1	3.3V	2	GND
Connector map				

2.4.12 LED connector

<table>
<tr><th colspan="2">LED connector</th></tr>
<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.00mm-M-S-180</td></tr>
<tr><td>Connector location</td><td>LED1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>HDD_LED-</td><td>2</td><td>HDD_LED+</td></tr>
<tr><td>3</td><td>POWER_LED-</td><td>4</td><td>POWER_LED+</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>PWRBTN#</td></tr>
<tr><td>7</td><td>GND</td><td>8</td><td>HW_RESET#</td></tr>
<tr><td>9</td><td>SMB_CLK</td><td>10</td><td>SMB_DATA</td></tr>
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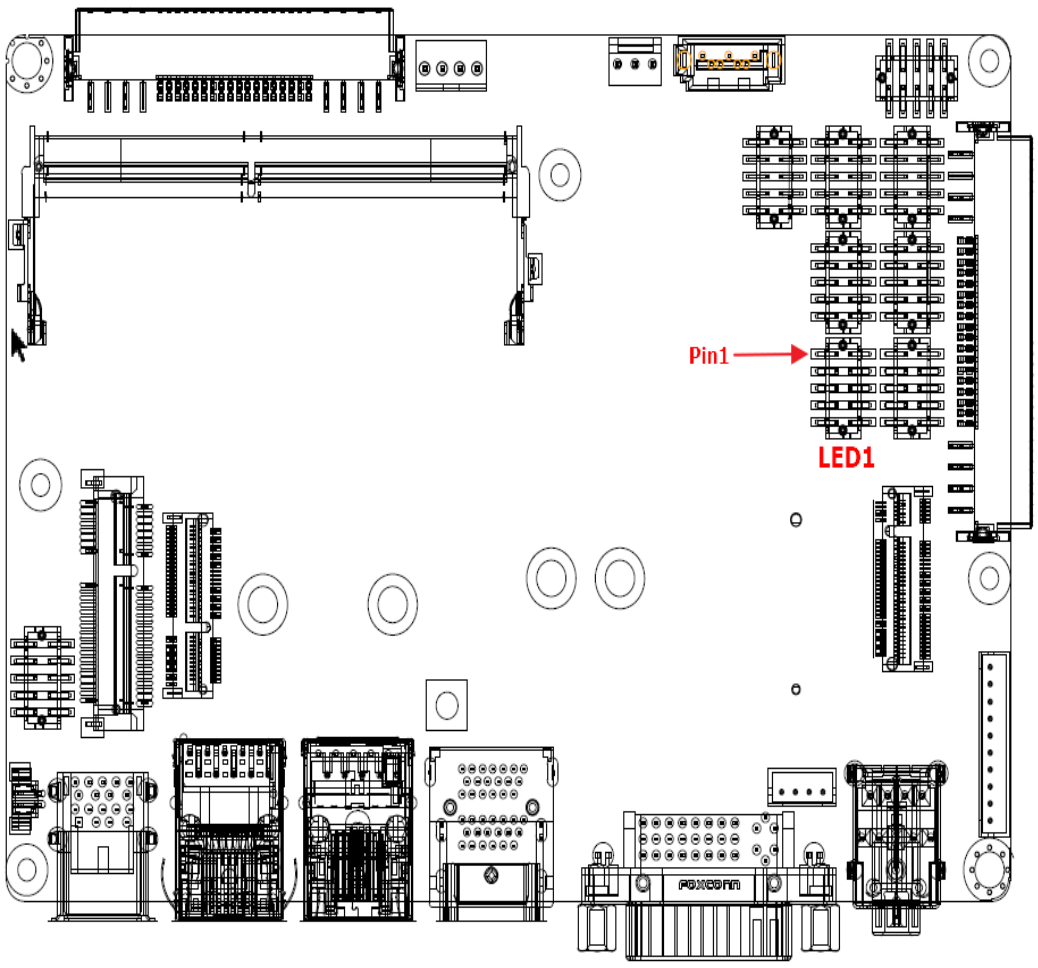
<tr><td>Connector map</td><td> 
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2.4.13 GPIO connector

<table>
<tr><th colspan="2">GPIO connector</th></tr>
<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.00mm-M-S-180</td></tr>
<tr><td>Connector location</td><td>GPIO1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>GND</td><td>2</td><td>5V</td></tr>
<tr><td>3</td><td>GPI0</td><td>4</td><td>GPO0</td></tr>
<tr><td>5</td><td>GPI1</td><td>6</td><td>GPO1</td></tr>
<tr><td>7</td><td>GPI2</td><td>8</td><td>GPO2</td></tr>
<tr><td>9</td><td>GPI3</td><td>10</td><td>GPO3</td></tr>
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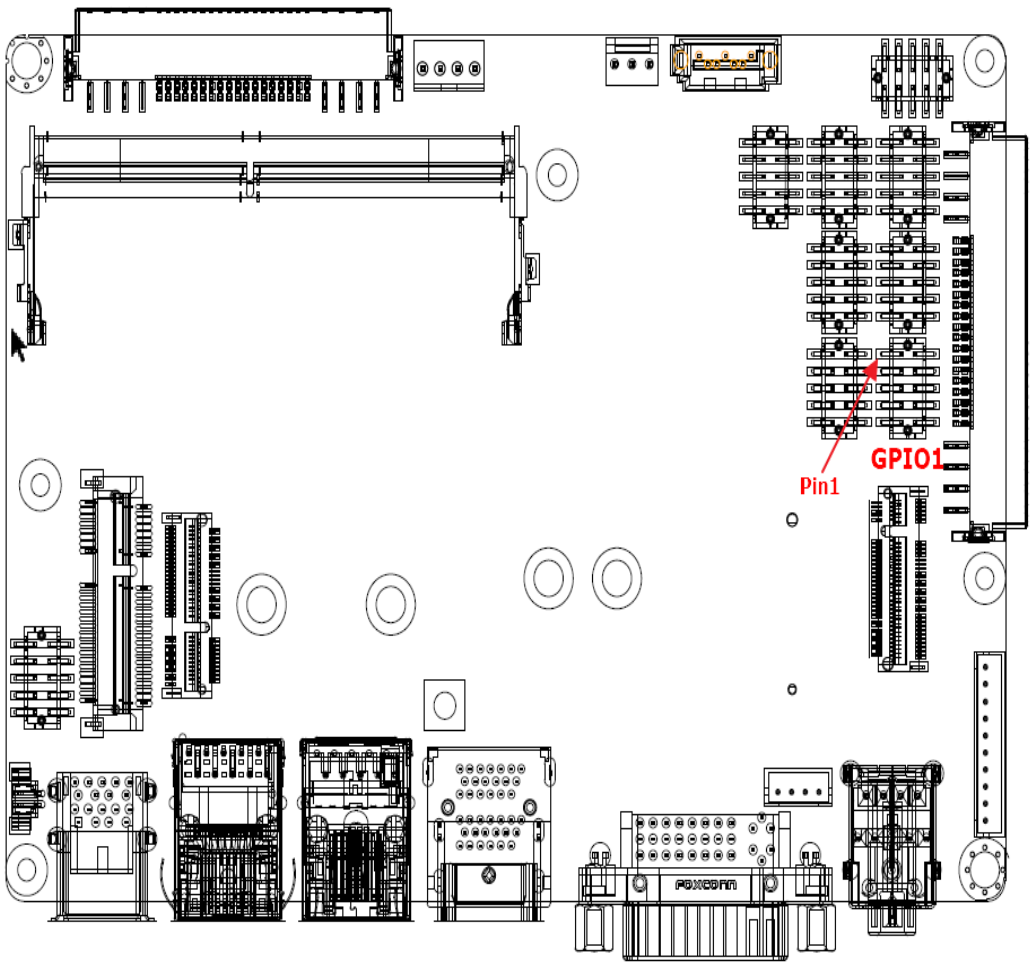
<tr><td>Connector map</td><td> 
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2.4.14 COM1 connector

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<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.00mm-M-S-180</td></tr>
<tr><td>Connector location</td><td>COM1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>DCD#</td><td>2</td><td>RXD</td></tr>
<tr><td>3</td><td>TXD</td><td>4</td><td>DTR#</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>DSR#</td></tr>
<tr><td>7</td><td>RTS#</td><td>8</td><td>CTS#</td></tr>
<tr><td>9</td><td>RI#</td><td>10</td><td>GND</td></tr>
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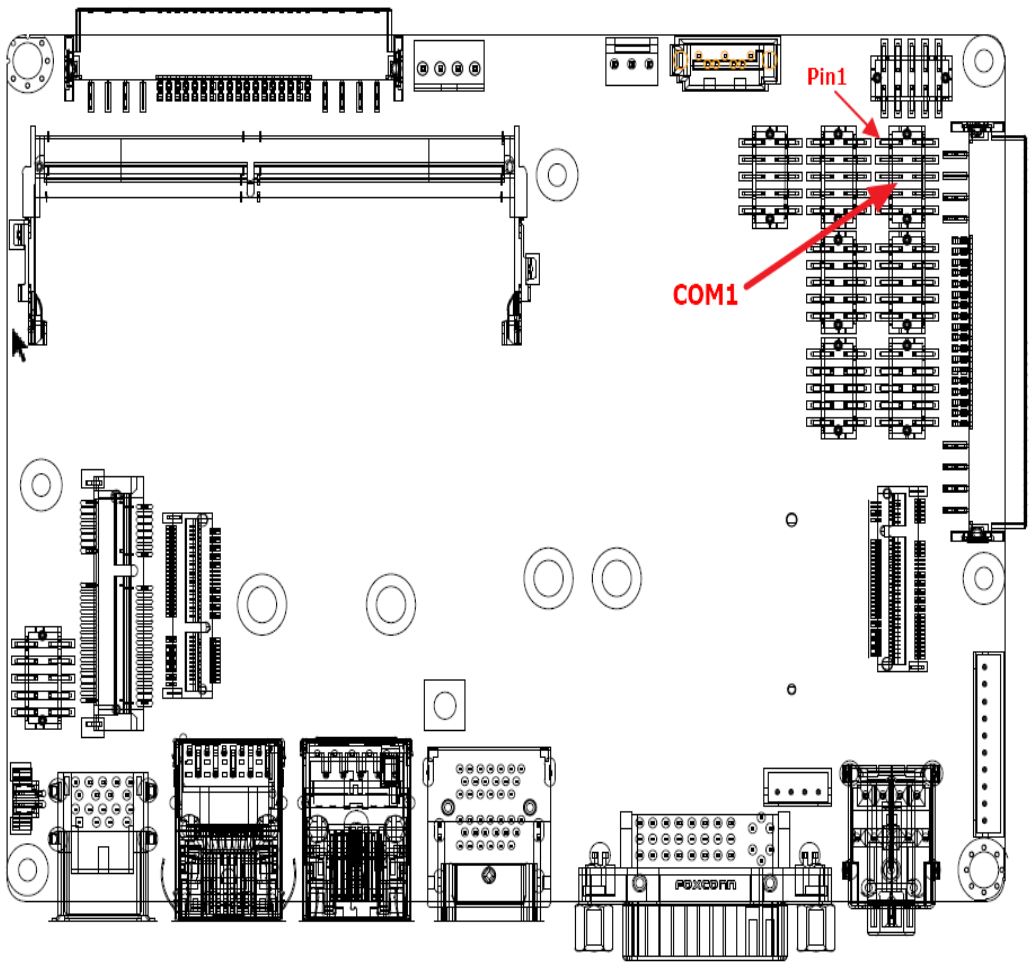
<tr><td>Connector map</td><td> 
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2.4.15 COM2 connector

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<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.00mm-M-S-180</td></tr>
<tr><td>Connector location</td><td>COM2</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>DCD#</td><td>2</td><td>RXD</td></tr>
<tr><td>3</td><td>TXD</td><td>4</td><td>DTR#</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>DSR#</td></tr>
<tr><td>7</td><td>RTS#</td><td>8</td><td>CTS#</td></tr>
<tr><td>9</td><td>RI#</td><td>10</td><td>GND</td></tr>
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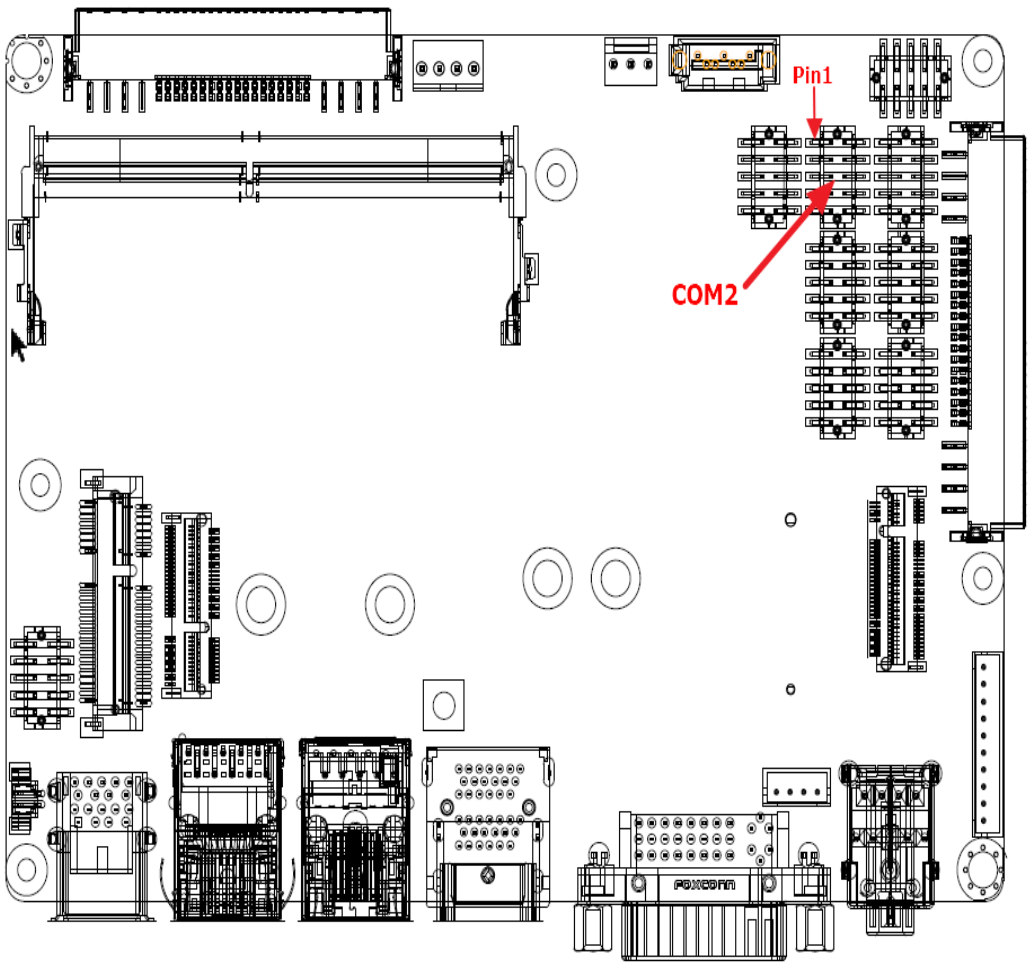
<tr><td>Connector map</td><td> 
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2.4.16 COM3 connector

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<tr><td>Connector type</td><td>JST-2.00mm-M-S-180</td></tr>
<tr><td>Connector location</td><td>COM3</td></tr>
<tr><td>JST Connector pin definition</td><td>
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<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
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<tr><td>3</td><td>TXD</td><td>4</td><td>DTR#</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>DSR#</td></tr>
<tr><td>7</td><td>RTS#</td><td>8</td><td>CTS#</td></tr>
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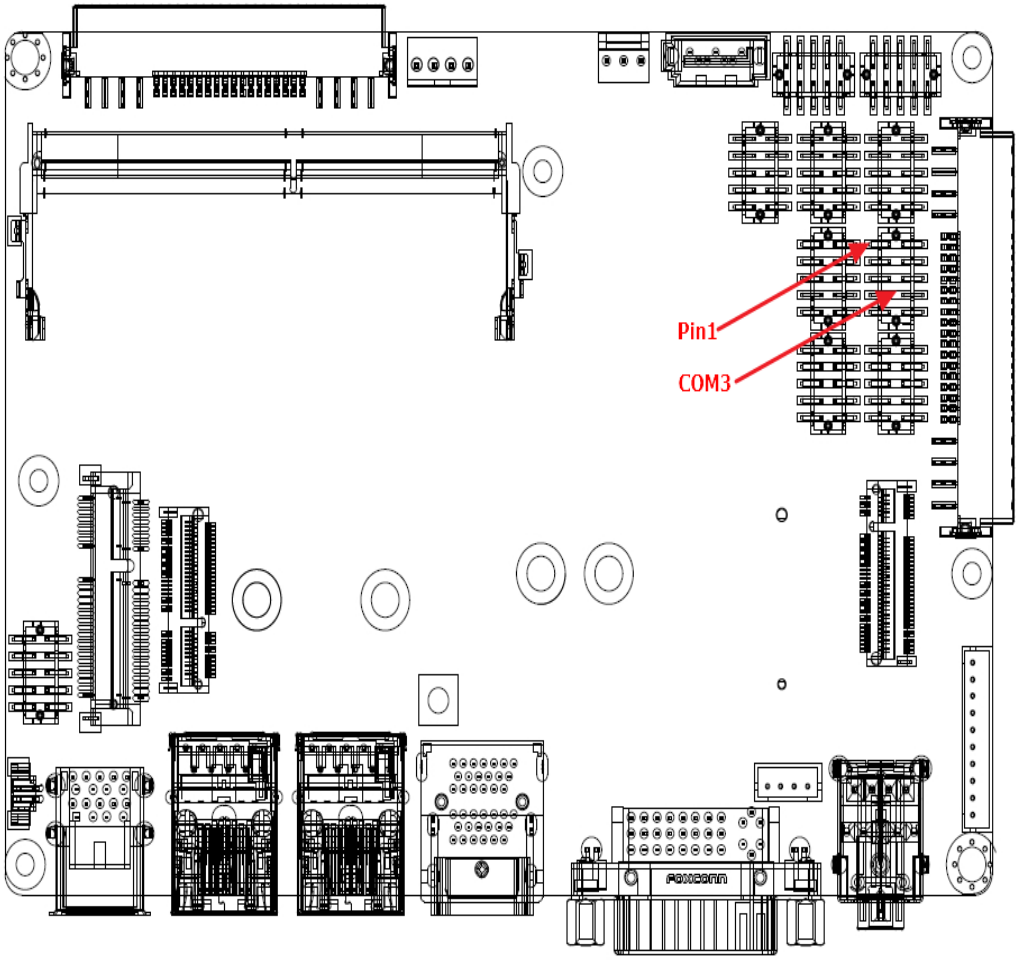
<tr><td>Connector map</td><td> 
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2.4.17 COM4 connector

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<tr><td>Connector location</td><td>COM4</td></tr>
<tr><td>JST Connector pin definition</td><td>
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<tr><td>3</td><td>TXD</td><td>4</td><td>DTR#</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>DSR#</td></tr>
<tr><td>7</td><td>RTS#</td><td>8</td><td>CTS#</td></tr>
<tr><td>9</td><td>RI#</td><td>10</td><td>GND</td></tr>
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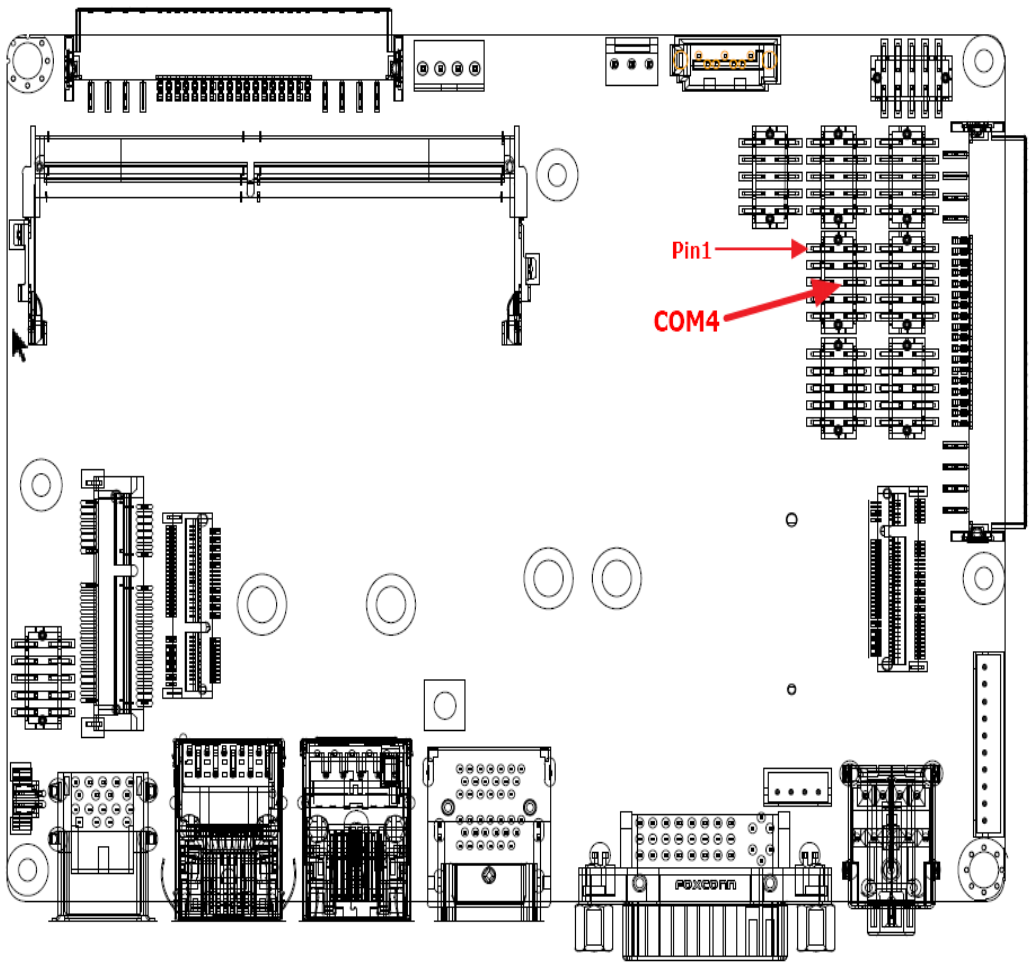
<tr><td>Connector map</td><td> 
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2.4.18 USB2 connector

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<tr><td>Connector type</td><td>JST-2.00mm-M-S-180</td></tr>
<tr><td>Connector location</td><td>USB2</td></tr>
<tr><td>JST Connector pin definition</td><td>
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<tr><td>3</td><td>USB_D-</td><td>4</td><td>USB_D-</td></tr>
<tr><td>5</td><td>USB_D+</td><td>6</td><td>USB_D+</td></tr>
<tr><td>7</td><td>GND</td><td>8</td><td>GND</td></tr>
<tr><td>9</td><td>USB_GND</td><td>10</td><td>USB_GND</td></tr>
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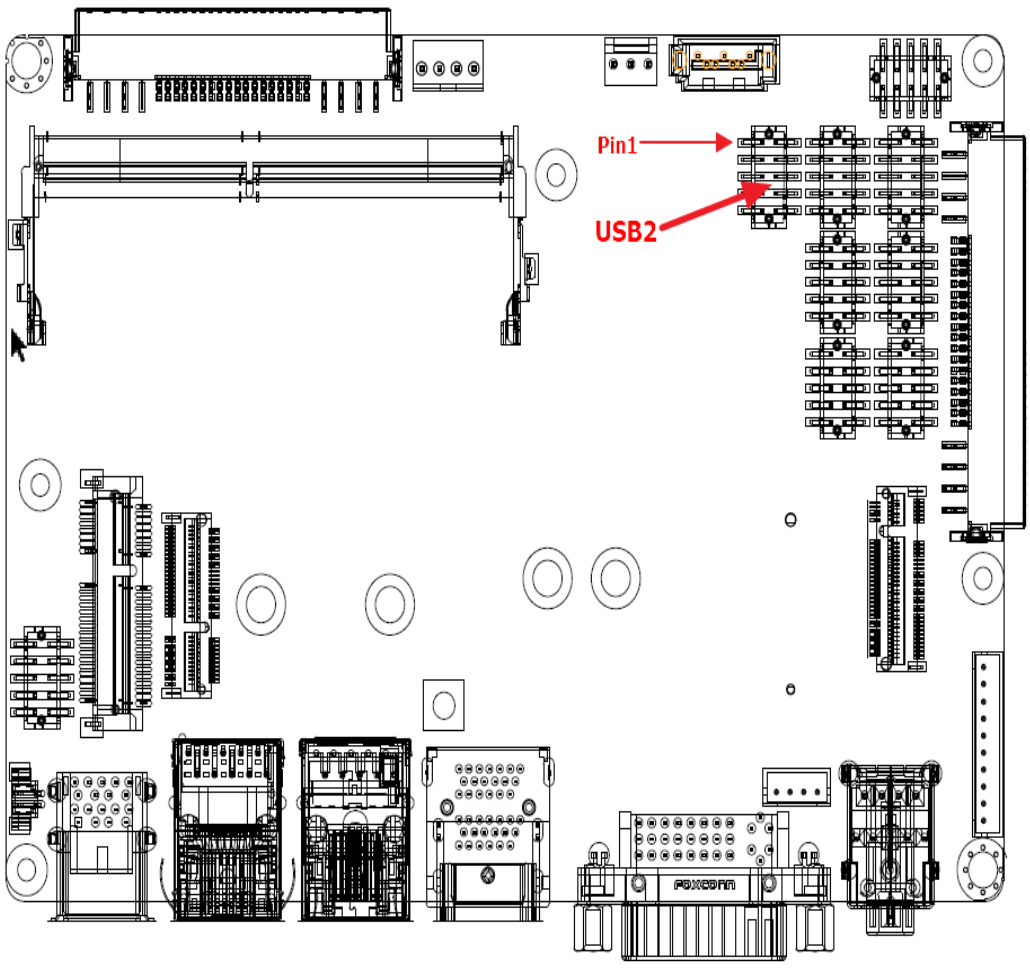
<tr><td>Connector map</td><td> 
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2.4.19 SATA1 connector

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<tr><td>Connector size</td><td>1 X 7= 7 Pin</td></tr>
<tr><td>Connector type</td><td>SATA-D-180</td></tr>
<tr><td>Connector location</td><td>SATA1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>GND</td></tr>
<tr><td>2</td><td>SATA_TX+</td></tr>
<tr><td>3</td><td>SATA_TX-</td></tr>
<tr><td>4</td><td>GND</td></tr>
<tr><td>5</td><td>SATA_RX-</td></tr>
<tr><td>6</td><td>SATA_RX+</td></tr>
<tr><td>7</td><td>GND</td></tr>
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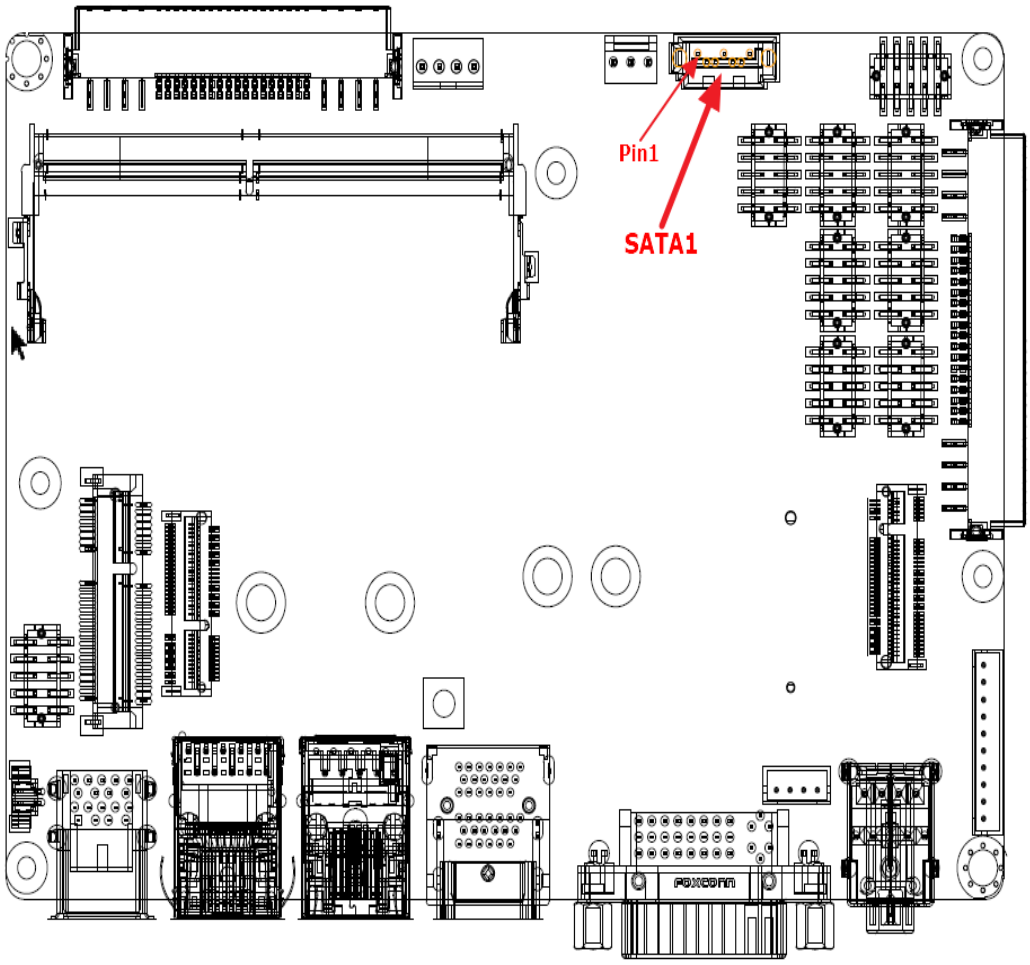
<tr><td>Connector map</td><td> 
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2.4.20 SPWR2 connector

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<tr><td>Connector size</td><td>1 X 3= 3 Pin</td></tr>
<tr><td>Connector type</td><td>FAN-2.54mm-M-180</td></tr>
<tr><td>Connector location</td><td>SPWR2</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>12V</td></tr>
<tr><td>2</td><td>5V</td></tr>
<tr><td>3</td><td>GND</td></tr>
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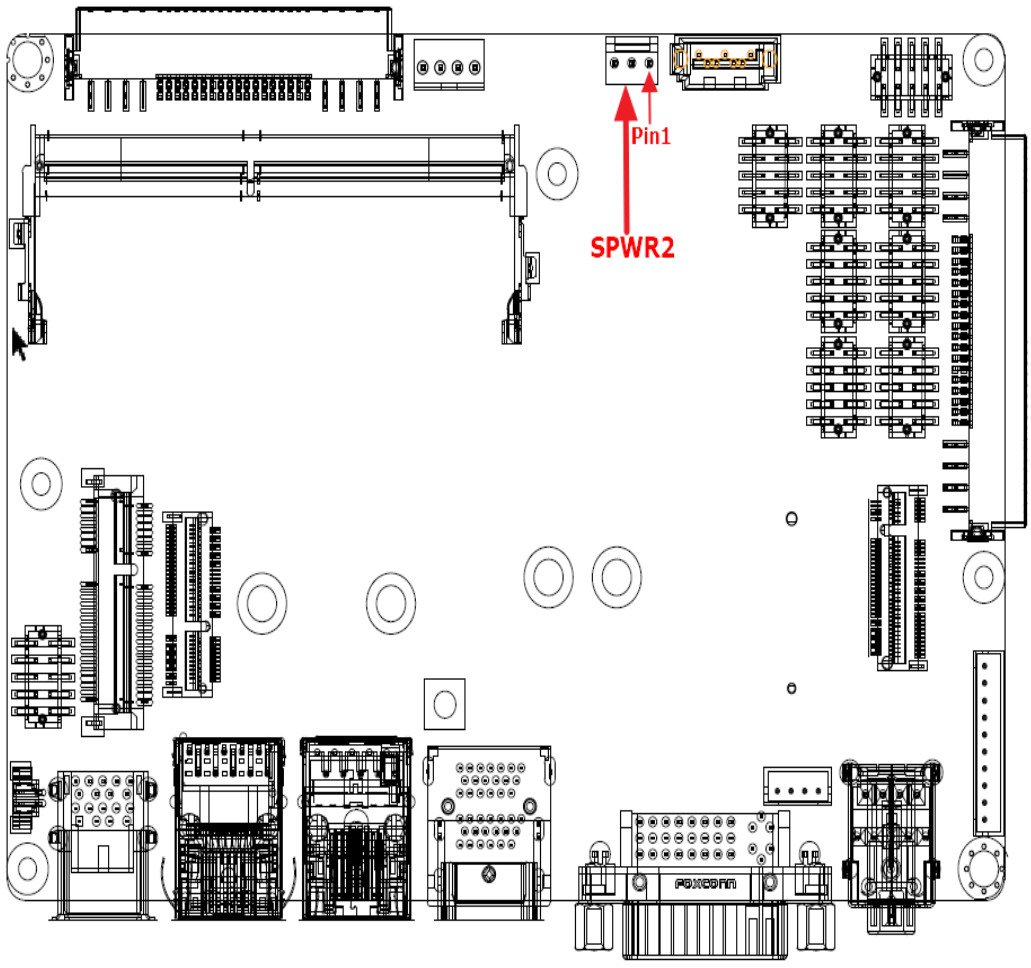
<tr><td>Connector map</td><td> 
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2.4.21 USB3 connector

<table>
<tr><th colspan="2">USB3 connector</th></tr>
<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.00mm-M-S-180</td></tr>
<tr><td>Connector location</td><td>USB3</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>5V</td><td>2</td><td>5V</td></tr>
<tr><td>3</td><td>USB_D-</td><td>4</td><td>USB_D-</td></tr>
<tr><td>5</td><td>USB_D+</td><td>6</td><td>USB_D+</td></tr>
<tr><td>7</td><td>GND</td><td>8</td><td>GND</td></tr>
<tr><td>9</td><td>USB_GND</td><td>10</td><td>USB_GND</td></tr>
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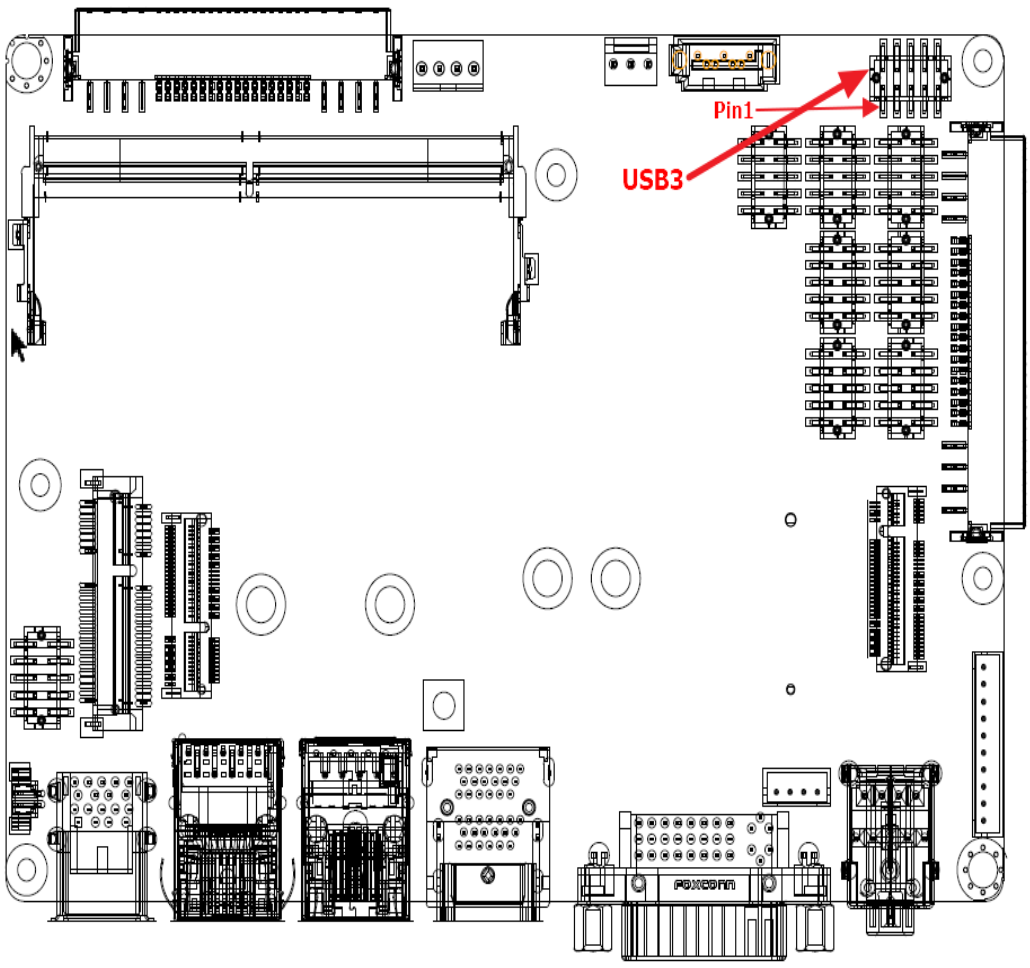
<tr><td>Connector map</td><td> 
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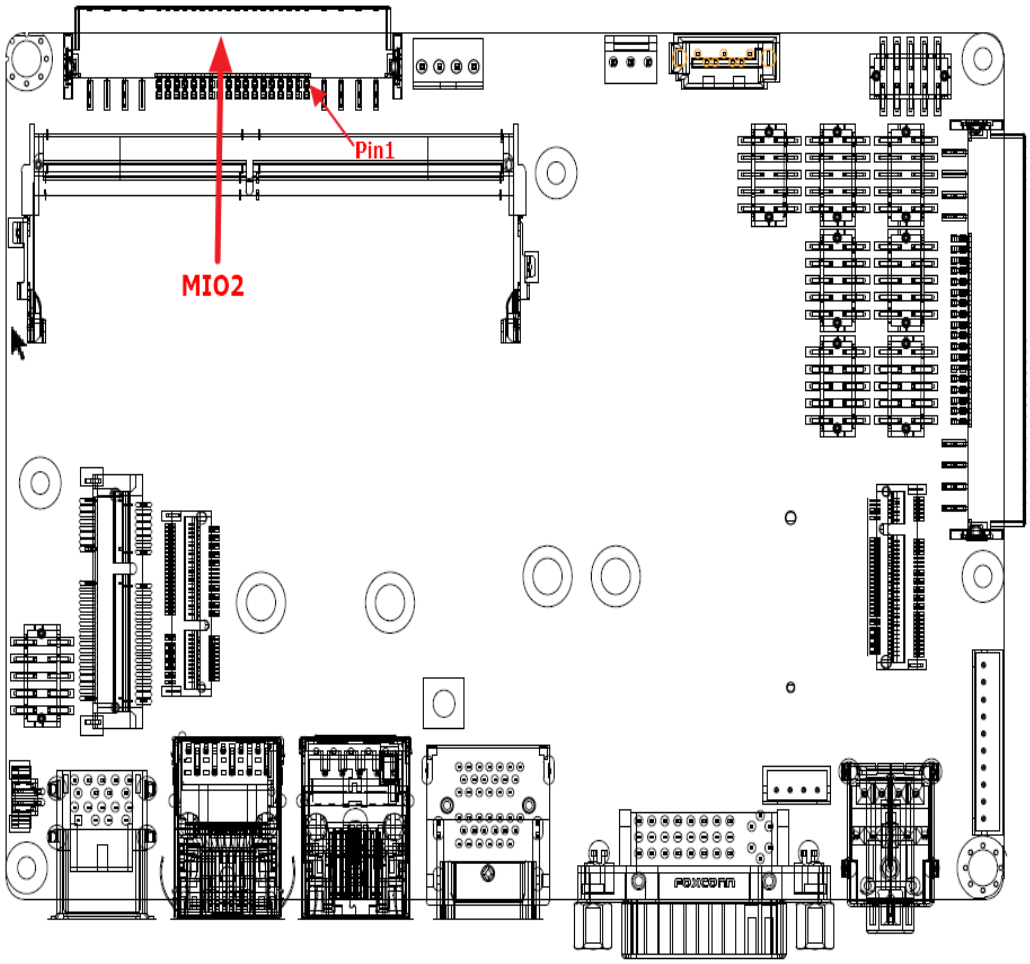
2.4.22 B to B MIO2 connector

B to B MIO2 connector	
Connector size	B2B P8+S36 90D_F /44 Pin
Connector type	B2B P8+S36 90D_F
Connector location	**MIO2**

Connector pin definition

Pin	Signal	Pin	Signal
P1	12V	NH1	NC
P2	12V		
P3	GND		
P4	GND		
19	PCH_PCIE_TXP10	1	12V
20	PCH_PCIE_TXN10	2	DC_VIN
21	PCH_PCIE_RXP10	3	IGNITION
22	PCH_PCIE_RXN10	4	SATALED#
23	GND	5	MCU1_PW_CTRL_DIS
24	PCIECLK_3+	6	PCH_WAKE#
25	PCIECLK_3-	7	MCU2_DIS_SEL
26	GND	8	PM_SLP_S4#
27	USB3_TX1+	9	PM_SLP_S3#
28	USB3_TX1-	10	ISP_PROGRAM_SEL
29	USB3_RX1+	11	ISP_MODE_SEL
30	USB3_RX1-	12	MCU_RESET
31	GND	13	SYS_PWRBT#
32	USB_D+	14	PWRBTN#
33	USB_D-	15	SMB_IO_CLK
34	MCU2_DC_EN	16	SMB_IO_DAT
35	RS232_TXD	17	SYS_RESET#
36	RS232_RXD	18	PLTRST_MCU
P5	NC	NH2	NC
P6	GND		
P7	3.3V		
P8	5V		

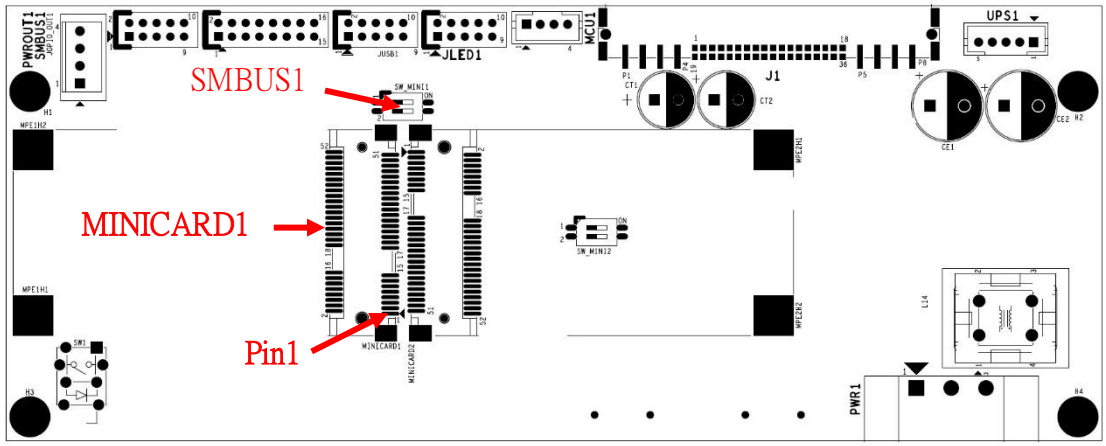
Connector map	

2.4.23 mPCIe slot: (MINICARD1) SIM Card Supported

mPCIe slot: (MINICARD1) (USB3.0 & USB2.0)	
Connector size	2 X 26 = 52 Pin
Connector type	MINI PCI-E CON 9.2mmH
Connector location	**MINICARD1**

Connector pin definition

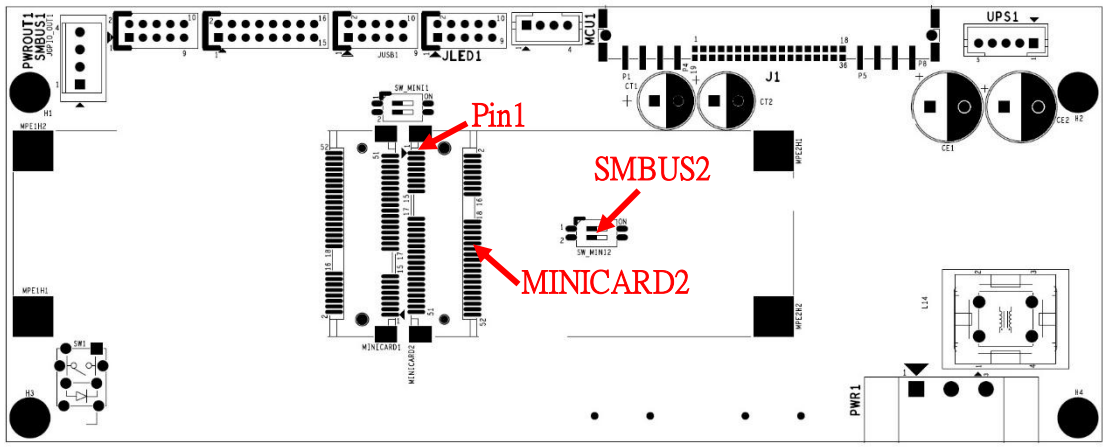
Pin	Signal	Pin	Signal
1	NC	2	V3P3_A
3	NC	4	GND
5	NC	6	V1P5_S
7	NC	8	UIM_PWR_A
9	GND	10	UIM_DATA_A
11	NC	12	UIM_CLK_A
13	NC	14	UIM_RESET_A
15	GND	16	NC
17	NC	18	GND
19	NC	20	MCARD_DIS#
21	GND	22	PLTRST#
23	USB3_SSRX_N	24	V3P3_A
25	USB3_SSRX_P	26	GND
27	GND	28	V1P5_S
29	GND	30	SMB_CLK
31	USB3_SSTX_N	32	SMB_DATA
33	USB3_SSTX_P	34	GND
35	GND	36	USB_2N
37	GND	38	USB_2P
39	V3P3_A	40	GND
41	V3P3_A	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	V1P5_S
49	NC	50	GND
51	NC	52	V3P3_A

Connector map	

2.4.24 **mPCIe slot: (MINICARD2)**

mPCIe slot: (MINICARD2) (PCIE & USB2.0)			
Connector size	2 X 26 = 52 Pin		
Connector type	MINI PCI-E CON 9.2mmH		
Connector location	**MINICARD2**		
Connector pin definition			

Pin	Signal	Pin	Signal
1	NC	2	V3P3_A
3	NC	4	GND
5	NC	6	V1P5_S
7	PCIE_CLKREQ#	8	UIM_PWR_A
9	GND	10	UIM_DATA_A
11	PCIE_CLK_N	12	UIM_CLK_A
13	PCIE_CLK_P	14	UIM_RESET_A
15	GND	16	NC
17	NC	18	GND
19	NC	20	MCARD_DIS#
21	GND	22	PLTRST#
23	PCIE _RX_N	24	V3P3_A
25	PCIE _RX_P	26	GND
27	GND	28	V1P5_S
29	GND	30	SMB_CLK
31	PCIE _TX_N	32	SMB_DATA
33	PCIE _TX_P	34	GND
35	GND	36	USB_1N
37	GND	38	USB_1P

	39	V3P3_A	40	GND
	41	V3P3_A	42	NC
	43	GND	44	NC
	45	NC	46	NC
	47	NC	48	V1P5_S
	49	NC	50	GND
	51	NC	52	V3P3_A
Connector map				

2.4.25 **UPS1 JST connector**

<table>
<tr><th colspan="2">UPS1 JST connector</th></tr>
<tr><td>Connector size</td><td>1 X 5 = 5 Pin</td></tr>
<tr><td>Connector type</td><td>WAFER 2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>UPS1</td></tr>
<tr><td>Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>+12V UPS</td></tr>
<tr><td>2</td><td>+12V UPS</td></tr>
<tr><td>3</td><td>NC</td></tr>
<tr><td>4</td><td>GND</td></tr>
<tr><td>5</td><td>GND</td></tr>
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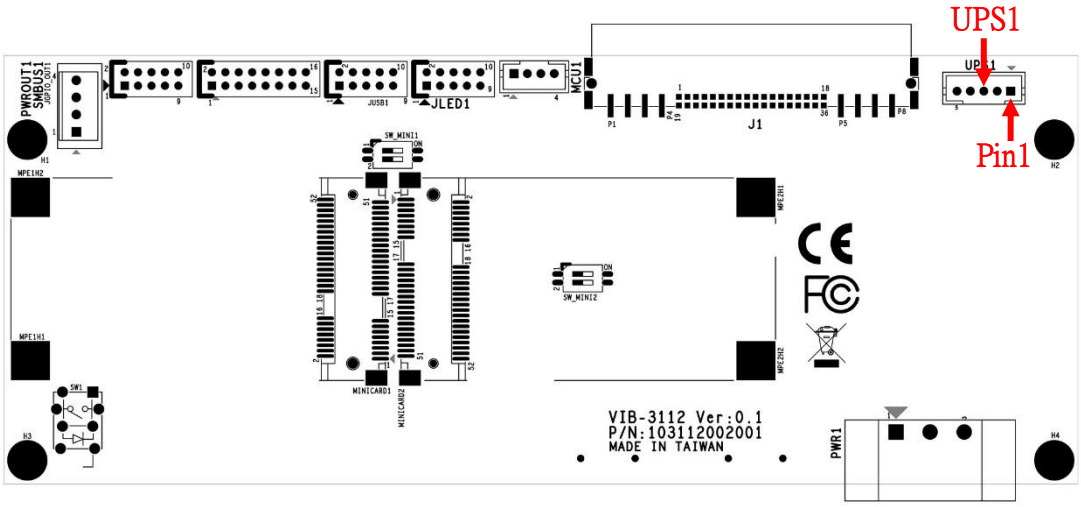
<tr><td>Connector map</td><td> 
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2.4.26 JLED1 JST connector

<table>
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<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>JLED1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>NC</td><td>2</td><td>LED_VCC5V</td></tr>
<tr><td>3</td><td>NC</td><td>4</td><td>LED_VCC5V</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>PWRBT#</td></tr>
<tr><td>7</td><td>GND</td><td>8</td><td>SYS_RESET#</td></tr>
<tr><td>9</td><td>SMB_CLK</td><td>10</td><td>SMB_DATA</td></tr>
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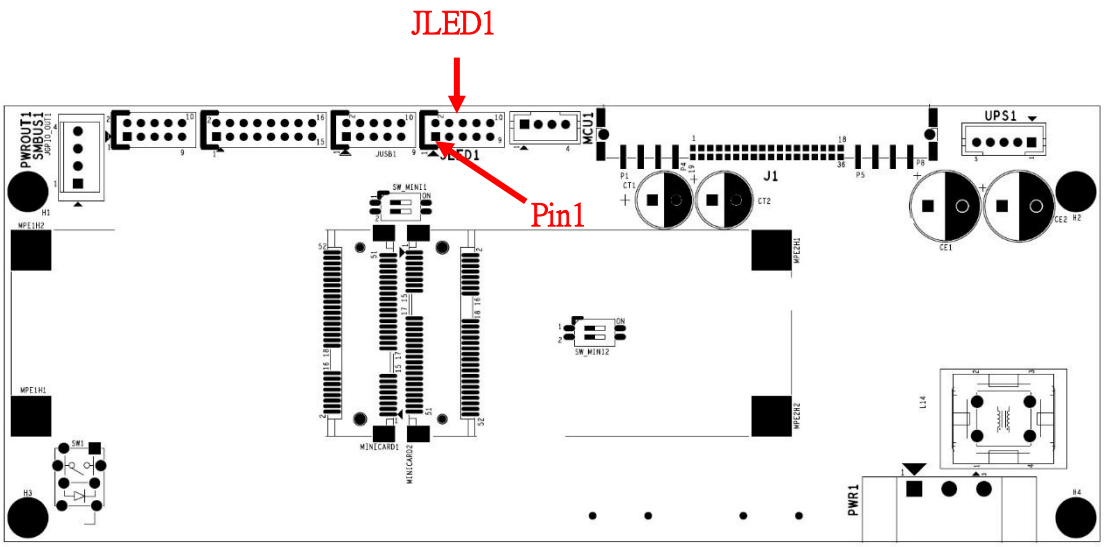
<tr><td>Connector map</td><td> 
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2.4.27 JUSB1 JST connector

<table>
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<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>JUSB1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>+5VSB</td><td>2</td><td>+5VSB</td></tr>
<tr><td>3</td><td>USB_2N</td><td>4</td><td>USB_3N</td></tr>
<tr><td>5</td><td>USB_2P</td><td>6</td><td>USB_3P</td></tr>
<tr><td>7</td><td>GND</td><td>8</td><td>GND</td></tr>
<tr><td>9</td><td>GND</td><td>10</td><td>GND</td></tr>
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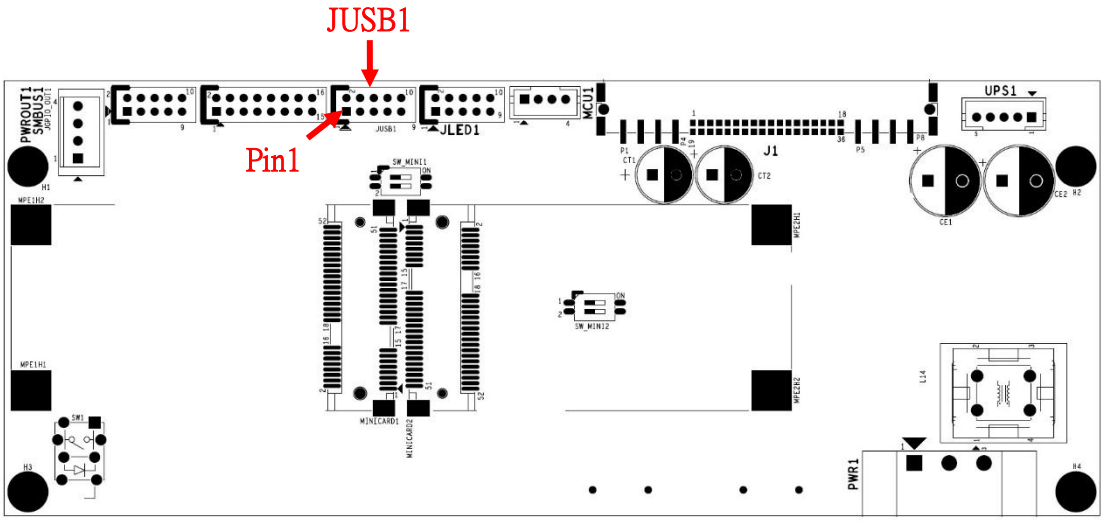
<tr><td>Connector map</td><td> 
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2.4.28 PWROUT1 connector

<table>
<tr><th colspan="2">PWROUT1 connector</th></tr>
<tr><td>Connector size</td><td>1 X 4 = 4 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.54mm-M-180</td></tr>
<tr><td>Connector location</td><td>PWROUT1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>+12VSB</td><td>7</td><td>+12VSB</td></tr>
<tr><td>3</td><td>GND</td><td>4</td><td>GND</td></tr>
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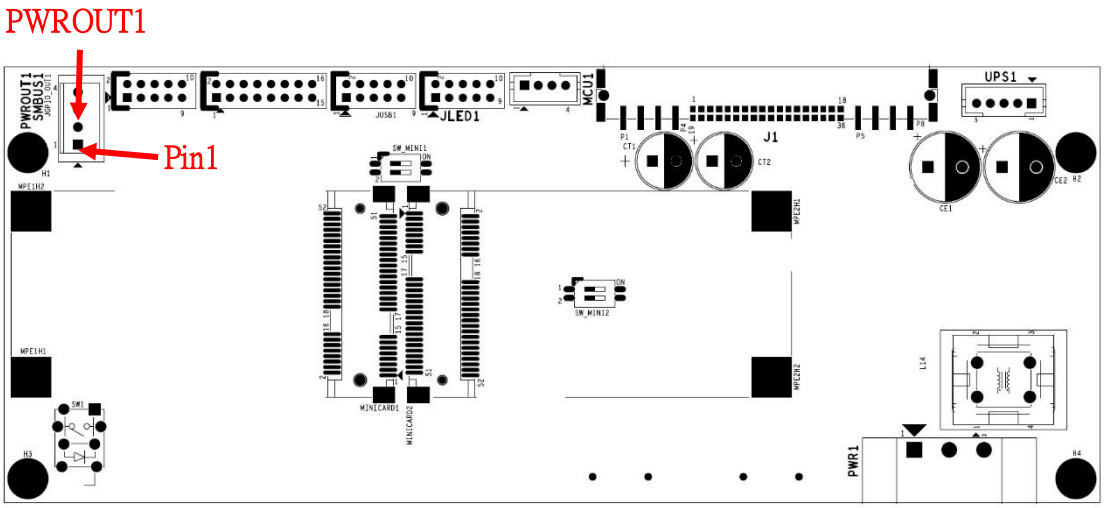
<tr><td>Connector map</td><td> 
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2.5 External connector specification

2.5.1 LAN1 (2.5GbE connector)

<table>
<tr><th colspan="2">LAN1 (2.5G connector)</th></tr>
<tr><td>Connector size</td><td>10 Pin</td></tr>
<tr><td>Connector type</td><td>RJ45+2.5G+TF+LED_L-Y,R-G/O_1X1-90</td></tr>
<tr><td>Connector location</td><td>LAN1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>R1</td><td>MDIO0_DP</td><td>R2</td><td>MDIO0_DN</td></tr>
<tr><td>R3</td><td>MDIO1_DP</td><td>R4</td><td>MDIO1_DN</td></tr>
<tr><td>R5</td><td>LAN_CT</td><td>R6</td><td>LAN_CT</td></tr>
<tr><td>R7</td><td>MDIO2_DP</td><td>R8</td><td>MDIO2_DN</td></tr>
<tr><td>R9</td><td>MDIO3_DP</td><td>R10</td><td>MDIO3_DN</td></tr>
<tr><td>L1</td><td>LAN_ LINK_2.5G</td><td>L2</td><td>LAN_LINK_1G</td></tr>
<tr><td>L3</td><td>LAN_ACT-</td><td>L4</td><td>LAN_ACT+</td></tr>
<tr><td>MH1</td><td>GND</td><td>MH2</td><td>GND</td></tr>
<tr><td>H3</td><td>NC</td><td>H4</td><td>NC</td></tr>
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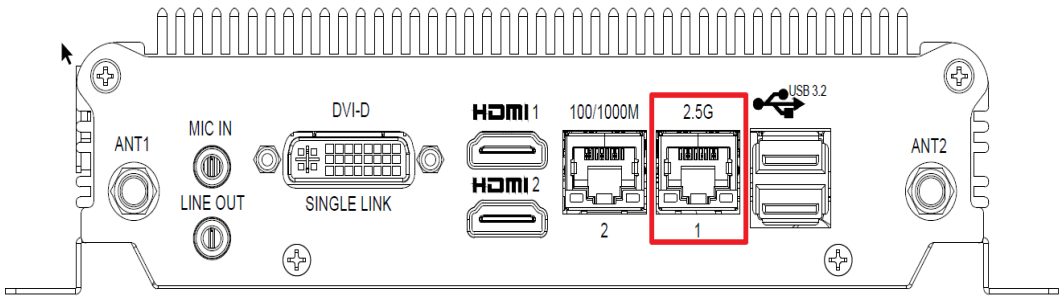
<tr><td>Connector map</td><td> 
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2.5.2 LAN2 (GbE connector)

<table>
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<tr><td>Connector size</td><td>10 Pin</td></tr>
<tr><td>Connector type</td><td>RJ45+TF+LED-90</td></tr>
<tr><td>Connector location</td><td>LAN2</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>R1</td><td>MDIO0_DP</td><td>R2</td><td>MDIO0_DN</td></tr>
<tr><td>R3</td><td>MDIO1_DP</td><td>R4</td><td>MDIO1_DN</td></tr>
<tr><td>R5</td><td>LAN_CT</td><td>R6</td><td>LAN_CT</td></tr>
<tr><td>R7</td><td>MDIO2_DP</td><td>R8</td><td>MDIO2_DN</td></tr>
<tr><td>R9</td><td>MDIO3_DP</td><td>R10</td><td>MDIO3_DN</td></tr>
<tr><td>L1</td><td>LAN_ LINK-</td><td>L2</td><td>LAN_LINKPW</td></tr>
<tr><td>L3</td><td>LAN_ACT-</td><td>L4</td><td>LAN_ACT+</td></tr>
<tr><td>MH1</td><td>GND</td><td>MH2</td><td>GND</td></tr>
<tr><td>H3</td><td>NC</td><td>H4</td><td>NC</td></tr>
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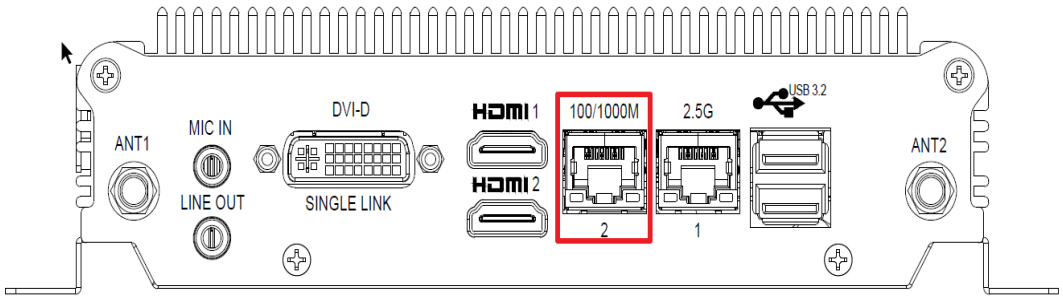
<tr><td>Connector map</td><td> 
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2.5.3 DVI connector

<table>
<tr><th colspan="2">DVI connector</th></tr>
<tr><td>Connector size</td><td>29 Pin</td></tr>
<tr><td>Connector type</td><td>DVI-I Connector Female</td></tr>
<tr><td>Connector location</td><td>DVI1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>TX0-</td><td>2</td><td>TX0+</td></tr>
<tr><td>3</td><td>GND</td><td>4</td><td>USB_5V</td></tr>
<tr><td>5</td><td>12V</td><td>6</td><td>DDC_CLK</td></tr>
<tr><td>7</td><td>DDC_DAT</td><td>8</td><td>DVI_RS232_TXD</td></tr>
<tr><td>9</td><td>TX1-</td><td>10</td><td>TX1+</td></tr>
<tr><td>11</td><td>GND</td><td>12</td><td>USB_D-</td></tr>
<tr><td>13</td><td>USB_D+</td><td>14</td><td>5V</td></tr>
<tr><td>15</td><td>GND</td><td>16</td><td>DVI_HPD</td></tr>
<tr><td>17</td><td>TX2-</td><td>18</td><td>TX2+</td></tr>
<tr><td>19</td><td>GND</td><td>20</td><td>RS232_RXD</td></tr>
<tr><td>21</td><td>12V</td><td>22</td><td>GND</td></tr>
<tr><td>23</td><td>DVI_CLK+</td><td>24</td><td>DVI_CLK-</td></tr>
<tr><td>C1</td><td>LINE_OUT_L</td><td>C2</td><td>LINE_OUT_R</td></tr>
<tr><td>C3</td><td>MIC_IN_L</td><td>C4</td><td>MIC_IN_R</td></tr>
<tr><td>C5</td><td>SENSEB_AUD1_R</td><td></td><td></td></tr>
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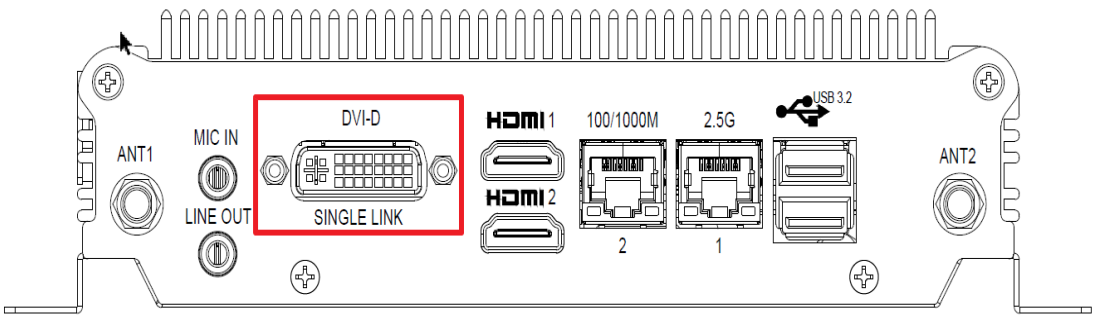
<tr><td>Connector map</td><td> 
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2.5.4 HDMI connector

<table>
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<tr><td>Connector size</td><td>19 Pin</td></tr>
<tr><td>Connector type</td><td>Dual HDMI Port</td></tr>
<tr><td>Connector location</td><td>HDMI 1& 2</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>HDMI_DATA2_P</td><td>G1</td><td>GND_HDMI</td></tr>
<tr><td>2</td><td>GND</td><td>G2</td><td>GND_HDMI</td></tr>
<tr><td>3</td><td>HDMI_DATA2_N</td><td>G3</td><td>GND_HDMI</td></tr>
<tr><td>4</td><td>HDMI_DATA1_P</td><td>G4</td><td>GND_HDMI</td></tr>
<tr><td>5</td><td>GND</td><td>G5</td><td>GND_HDMI</td></tr>
<tr><td>6</td><td>HDMI_DATA1_N</td><td>G6</td><td>GND_HDMI</td></tr>
<tr><td>7</td><td>HDMI_DATA0_P</td><td></td><td></td></tr>
<tr><td>8</td><td>GND</td><td></td><td></td></tr>
<tr><td>9</td><td>HDMI_DATA0_N</td><td></td><td></td></tr>
<tr><td>10</td><td>HDMI_CLK_P</td><td></td><td></td></tr>
<tr><td>11</td><td>GND</td><td></td><td></td></tr>
<tr><td>12</td><td>HDMI_CLK_N</td><td></td><td></td></tr>
<tr><td>13</td><td>NC</td><td></td><td></td></tr>
<tr><td>14</td><td>NC</td><td></td><td></td></tr>
<tr><td>15</td><td>HDMI_SCL</td><td></td><td></td></tr>
<tr><td>16</td><td>HDMI_DATA</td><td></td><td></td></tr>
<tr><td>17</td><td>GND</td><td></td><td></td></tr>
<tr><td>18</td><td>V5P_S_HDMI</td><td></td><td></td></tr>
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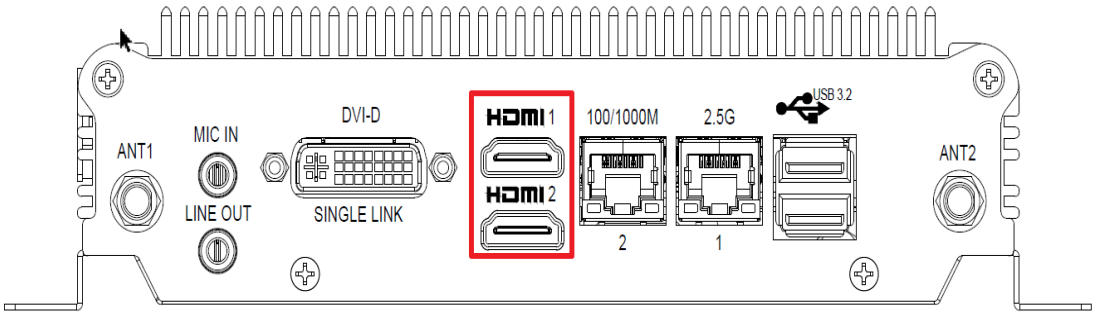
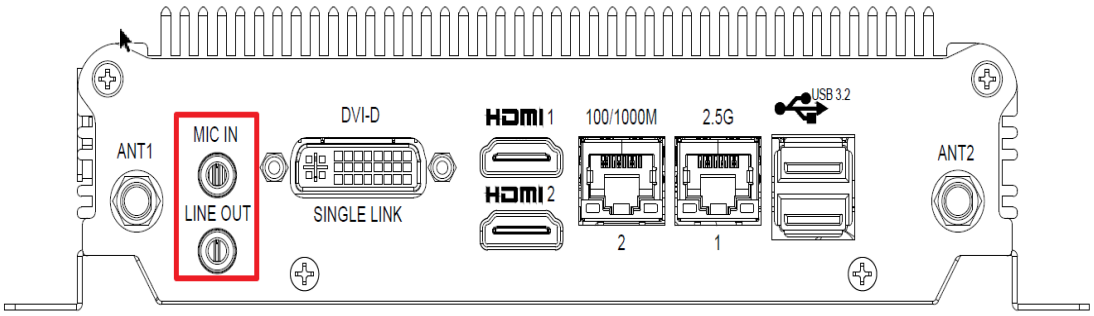
Connector map	

2.5.5 AUDIO2 connector

AUDIO2 connector	
Connector size	1 X 2
Connector type	HAD Jack
Connector location	AUDIO2
JST Connector pin definition	

Pin	Signal	Pin	Signal
1	AGND		
2	FRONT_MIC_IN_R	22	FRONT_OUT_R
3	MIC-JD	23	FRONT-JD
4	AGND	24	AGND
5	RRONT_MIC_IN_L	25	FRONT_OUT_L

Connector map	

2.5.6 USB1 connector

<table>
<tr><th colspan="2">USB1 connector</th></tr>
<tr><td>Connector size</td><td>9 Pin x 2</td></tr>
<tr><td>Connector type</td><td>USB 3.2 Type A x 2</td></tr>
<tr><td>Connector location</td><td>USB1</td></tr>
<tr><td>JST Connector pin definition</td><td>
<table>
<tr><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>+5VSB</td></tr>
<tr><td>2</td><td>USB_DN</td></tr>
<tr><td>3</td><td>USB_DP</td></tr>
<tr><td>4</td><td>GND</td></tr>
<tr><td>5</td><td>USB3_SSRX_DN</td></tr>
<tr><td>6</td><td>USB3_SSRX_DP</td></tr>
<tr><td>7</td><td>GND</td></tr>
<tr><td>8</td><td>USB3_SSTX_DN</td></tr>
<tr><td>9</td><td>USB3_SSTX_DP</td></tr>
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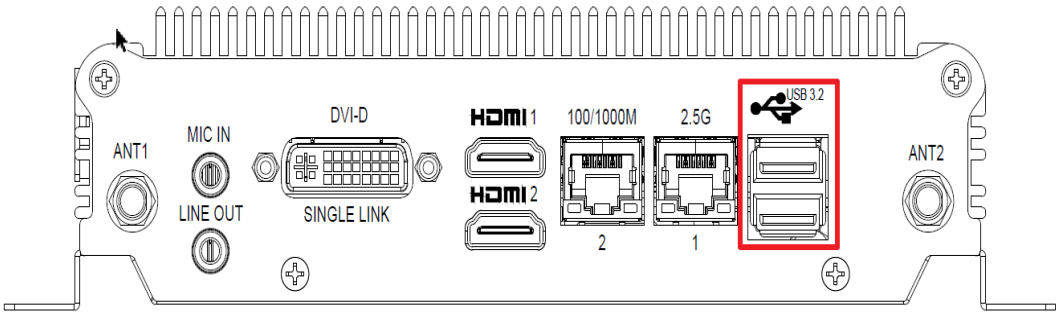
</td></tr>
<tr><td>Connector map</td><td> 
</td></tr>
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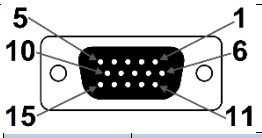
2.5.7 **DIO connector**

<table>
<tr><th colspan="2">DIO connector</th></tr>
<tr><td>Connector size</td><td>2 X 5 = 10 Pin</td></tr>
<tr><td>Connector type</td><td>JST-2.0mm-M-180</td></tr>
<tr><td>Connector location</td><td>JGPIO_OUT1</td></tr>
<tr><td>DB15 Connector pin definition</td><td> 

<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>DO_1 (+5V-100mA)</td><td>2</td><td>DO_2 (+5V-100mA)</td></tr>
<tr><td>3</td><td>DO_3 (+5V-100mA)</td><td>4</td><td>DO_4 (+5V-100mA)</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>GND</td></tr>
<tr><td>7</td><td>DI_1 (+9V~60V)</td><td>8</td><td>DI_2 (+9V~60V)</td></tr>
<tr><td>9</td><td>DI_3 (+9V~60V)</td><td>10</td><td>DI_4 (+9V~60V)</td></tr>
<tr><td>11</td><td>NC</td><td>12</td><td>NC</td></tr>
<tr><td>13</td><td>ADC1 (+9V~60V)</td><td>14</td><td>ADC2 (+9V~60V)</td></tr>
<tr><td>15</td><td>GND</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>JST Connector pin definition</td><td><table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>DO_1 (+5V-100mA)</td><td>2</td><td>DO_2 (+5V-100mA)</td></tr>
<tr><td>3</td><td>DO_3 (+5V-100mA)</td><td>4</td><td>DO_4 (+5V-100mA)</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>GND</td></tr>
<tr><td>7</td><td>DI_1 (+9V~60V)</td><td>8</td><td>DI_2 (+9V~60V)</td></tr>
<tr><td>9</td><td>DI_3 (+9V~60V)</td><td>10</td><td>DI_4 (+9V~60V)</td></tr>
<tr><td>11</td><td>NC</td><td>12</td><td>NC</td></tr>
<tr><td>13</td><td>ADC1 (+9V~60V)</td><td>14</td><td>ADC2 (+9V~60V)</td></tr>
<tr><td>15</td><td>GND</td><td>16</td><td>GND</td></tr>
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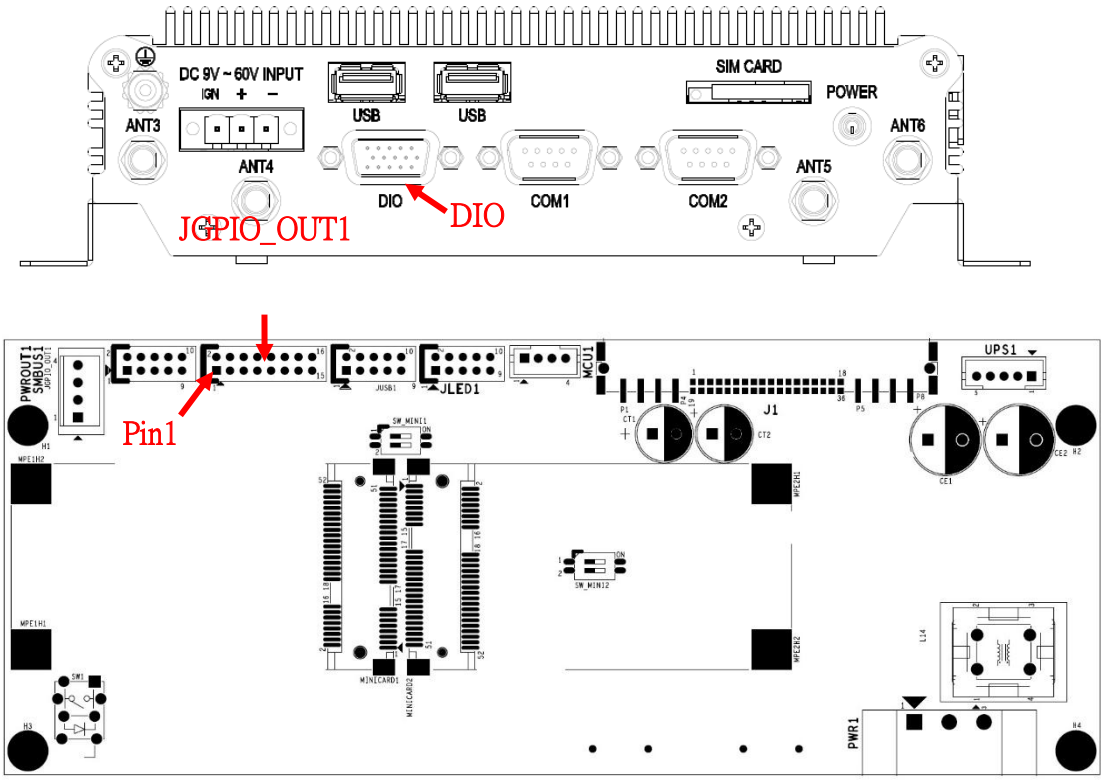
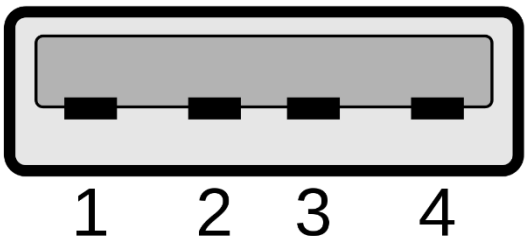
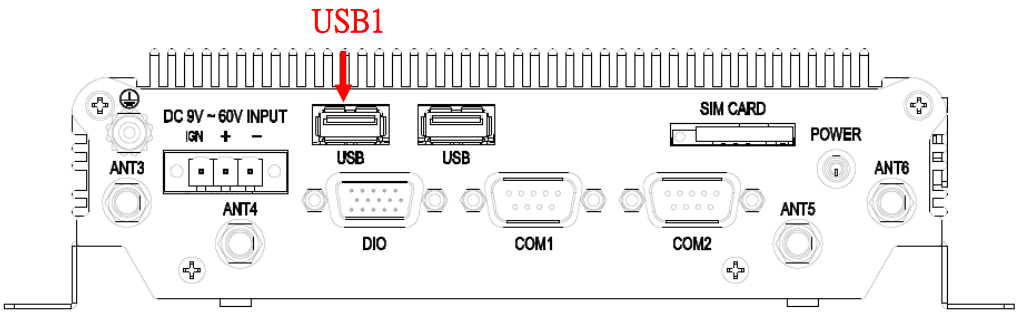
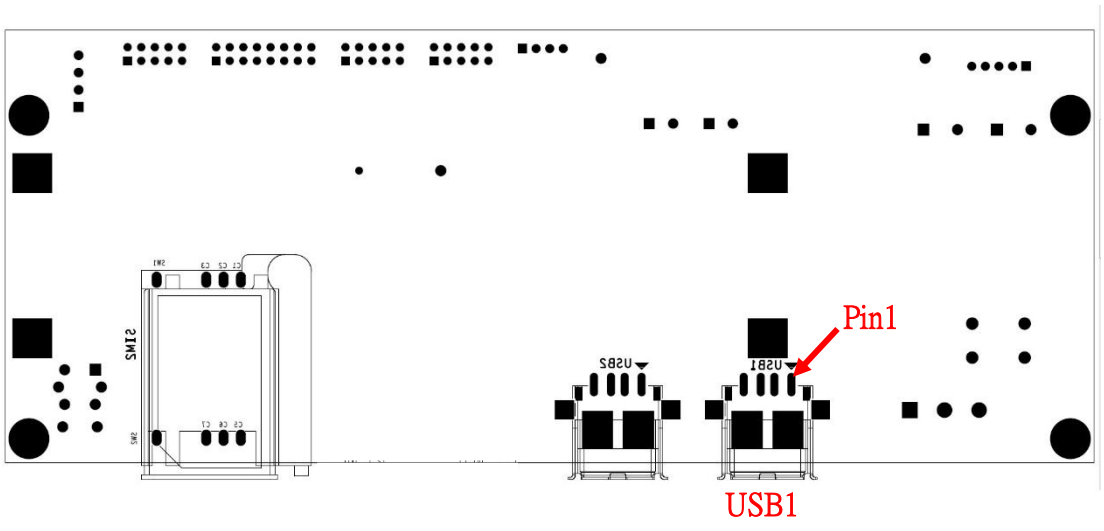
Connector map	

2.5.8 USB2.0 connector : (USB1)

<table>
<tr><th colspan="2">USB2.0 connector : (USB1)</th></tr>
<tr><td>Connector size</td><td>1 X 4 = 4 Pin</td></tr>
<tr><td>Connector type</td><td>USB2.0 Type A</td></tr>
<tr><td>Connector location</td><td>USB1</td></tr>
<tr><td>USB port pin definition</td><td>


<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>+5VSB</td><td>2</td><td>USB_1N</td></tr>
<tr><td>3</td><td>USB_1P</td><td>4</td><td>GND</td></tr>
</table>
</td></tr>
<tr><td>Connector map</td><td>




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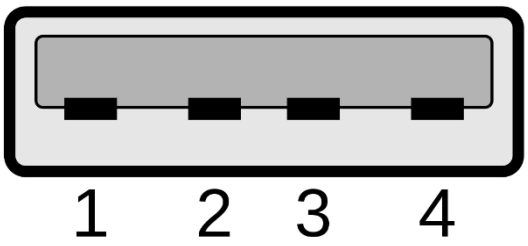
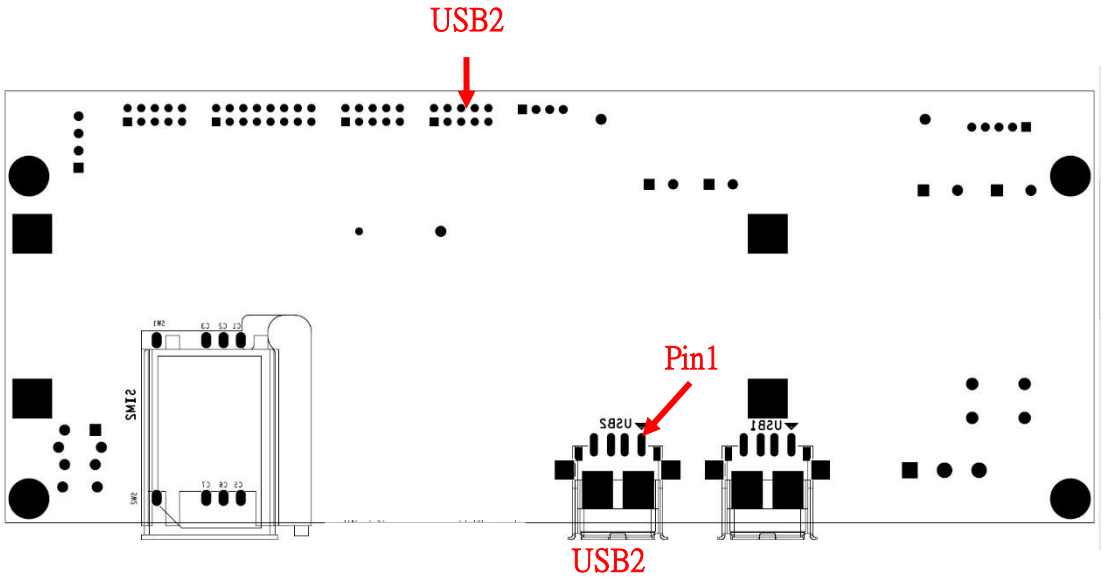
2.5.9 USB2.0 connector : (USB2)

<table>
<tr><th colspan="2">USB2.0 connector : (USB2)</th></tr>
<tr><td>Connector size</td><td>1 X 4 = 4 Pin</td></tr>
<tr><td>Connector type</td><td>USB2.0 Type A</td></tr>
<tr><td>Connector location</td><td>USB2</td></tr>
<tr><td>USB port pin definition</td><td>


<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>+5VSB</td><td>2</td><td>USB_2N</td></tr>
<tr><td>3</td><td>USB_2P</td><td>4</td><td>GND</td></tr>
</table>
</td></tr>
<tr><td>Connector map</td><td>


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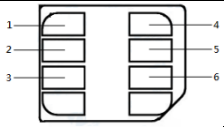
2.5.10 SIM CARD connector

<table>
<tr><th colspan="2">SIM CARD connector</th></tr>
<tr><td>Connector size</td><td>8 Pin</td></tr>
<tr><td>Connector type</td><td>Mini SIM (Standard SIM)</td></tr>
<tr><td>Connector location</td><td>SIM2</td></tr>
<tr><td>Connector pin definition</td><td> 

<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>SIM VCC</td><td>2</td><td>RST</td></tr>
<tr><td>3</td><td>CLOCK</td><td>4</td><td>GND</td></tr>
<tr><td>5</td><td>NC</td><td>6</td><td>DATA</td></tr>
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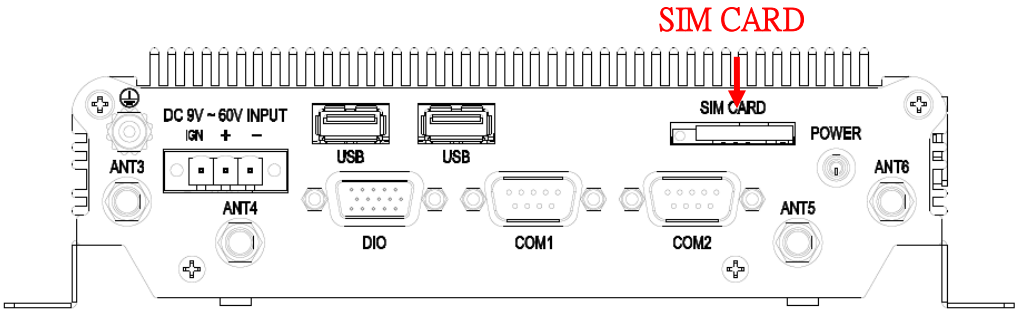
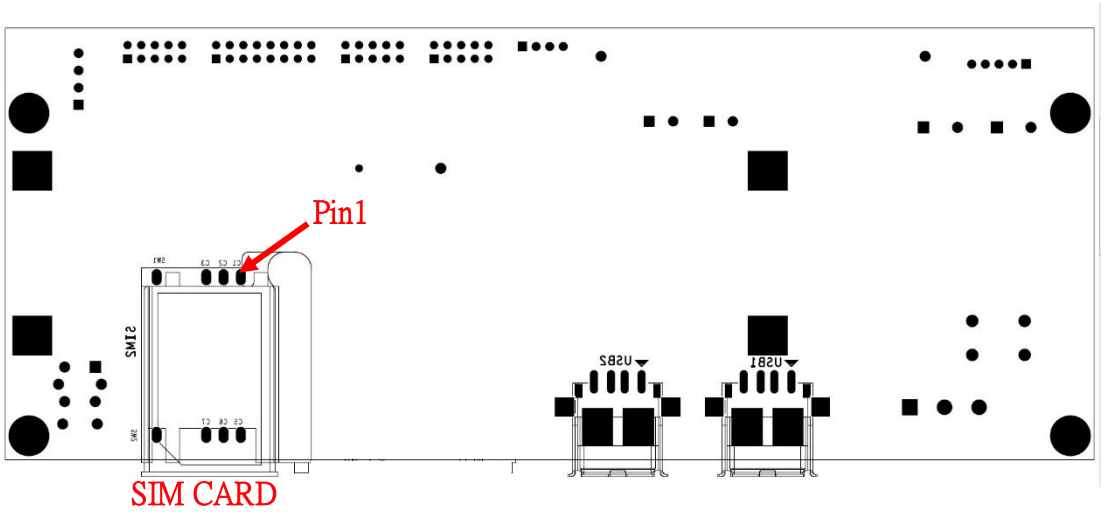
<tr><td>Connector map</td><td> 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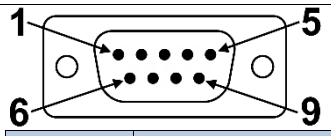
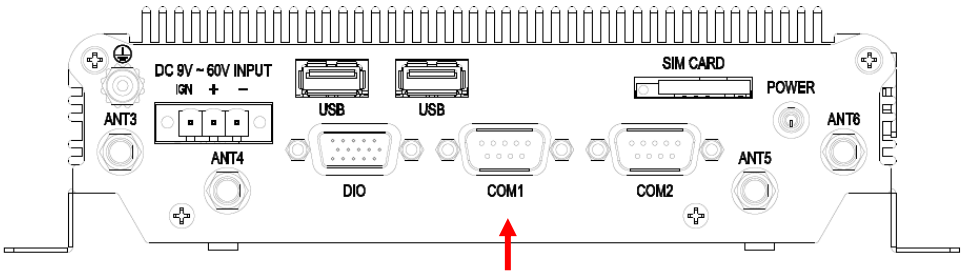
2.5.11 COM1 connector

<table>
<tr><th colspan="2">COM1 connector</th></tr>
<tr><td>Connector size</td><td>9 Pin</td></tr>
<tr><td>Connector type</td><td>D-SUB 9P</td></tr>
<tr><td>Connector location</td><td>COM1</td></tr>
<tr><td>COM port pin definition</td><td> 

<table>
<tr><th>Pin</th><th>Signa</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>COM1_DCD</td><td>2</td><td>COM1_RXD</td></tr>
<tr><td>3</td><td>COM1_TXD</td><td>4</td><td>COM1_DTR</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>COM1_DSR</td></tr>
<tr><td>7</td><td>COM1_RTS</td><td>8</td><td>COM1_CTS</td></tr>
<tr><td>9</td><td>COM1_RI</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>Connector map</td><td> 
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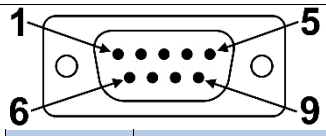
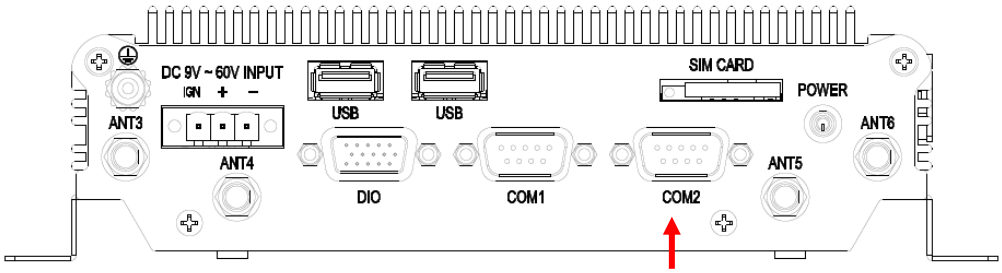
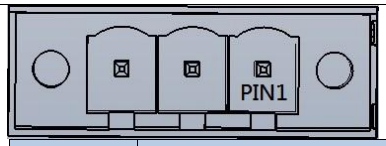
2.5.12 COM2 connector

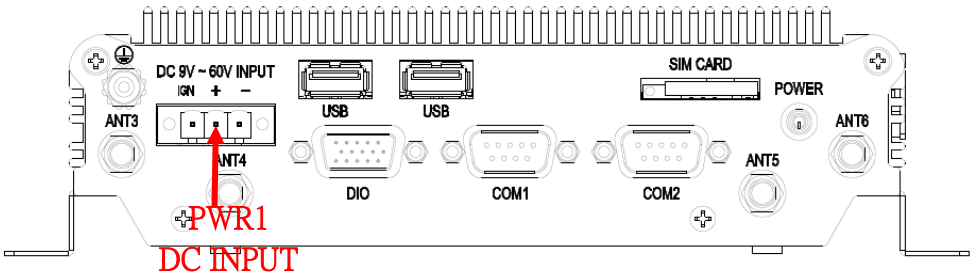
<table>
<tr><th colspan="2">COM2 connector</th></tr>
<tr><td>Connector size</td><td>9 Pin</td></tr>
<tr><td>Connector type</td><td>D-SUB 9P</td></tr>
<tr><td>Connector location</td><td>COM2</td></tr>
<tr><td>COM port pin definition</td><td> 

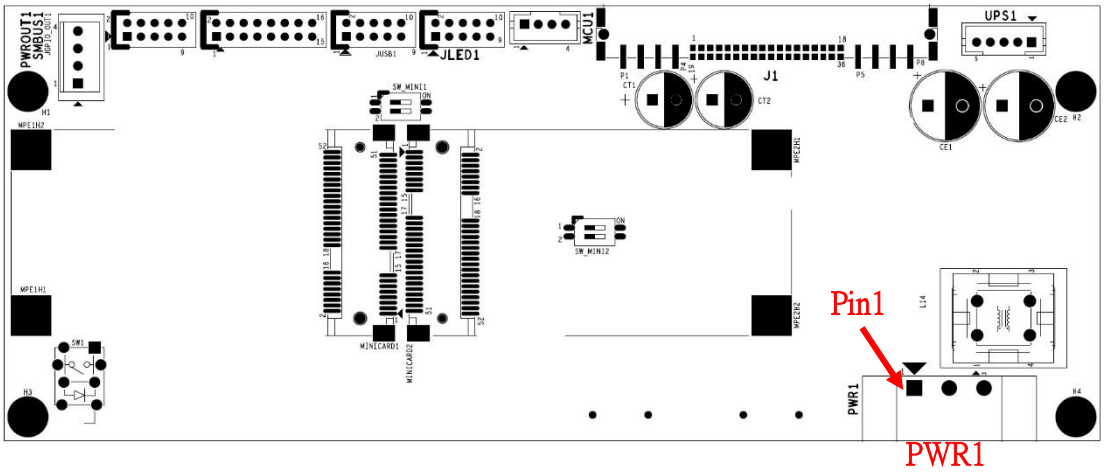
<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>COM2_DCD</td><td>2</td><td>COM2_RXD</td></tr>
<tr><td>3</td><td>COM2_TXD</td><td>4</td><td>COM2_DTR</td></tr>
<tr><td>5</td><td>GND</td><td>6</td><td>COM2_DSR</td></tr>
<tr><td>7</td><td>COM2_RTS</td><td>8</td><td>COM2_CTS</td></tr>
<tr><td>9</td><td>COM2_RI</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>Connector map</td><td> 

COM2</td></tr>
</table>

2.5.13 DC Power connector : (PWR1)

<table>
<tr><th colspan="2">DC Power connector : (PWR1)</th></tr>
<tr><td>Connector size</td><td>1 X 3 = 3 Pin</td></tr>
<tr><td>Connector type</td><td>DECA 3mm-3PIN</td></tr>
<tr><td>Connector location</td><td>PWR1</td></tr>
<tr><td>Connector pin definition</td><td> 

<table>
<tr><th>Pin</th><th>Signal</th><th>Pin</th><th>Signal</th></tr>
<tr><td>1</td><td>GND</td><td></td><td></td></tr>
<tr><td>2</td><td>DC IN (9V~60V)</td><td></td><td></td></tr>
<tr><td>3</td><td>IGNITION</td><td></td><td></td></tr>
</table></td></tr>
<tr><td>Connector map</td><td> 


</td></tr>
</table>

Chapter 3

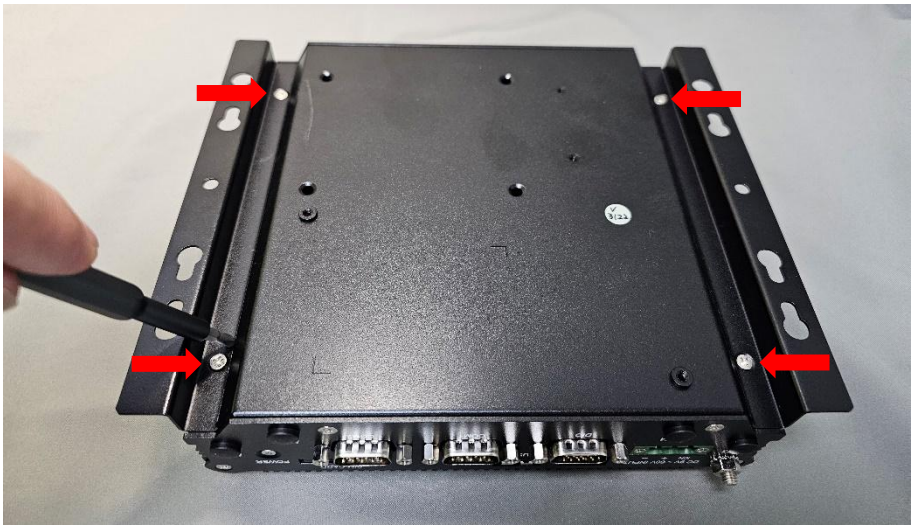
System Setup

3 SYSTEM SETUP

3.1 OPENING THE CHASSIS

Step 1.
Unscrew the four screws on the bottom of the chassis, as shown in the picture.

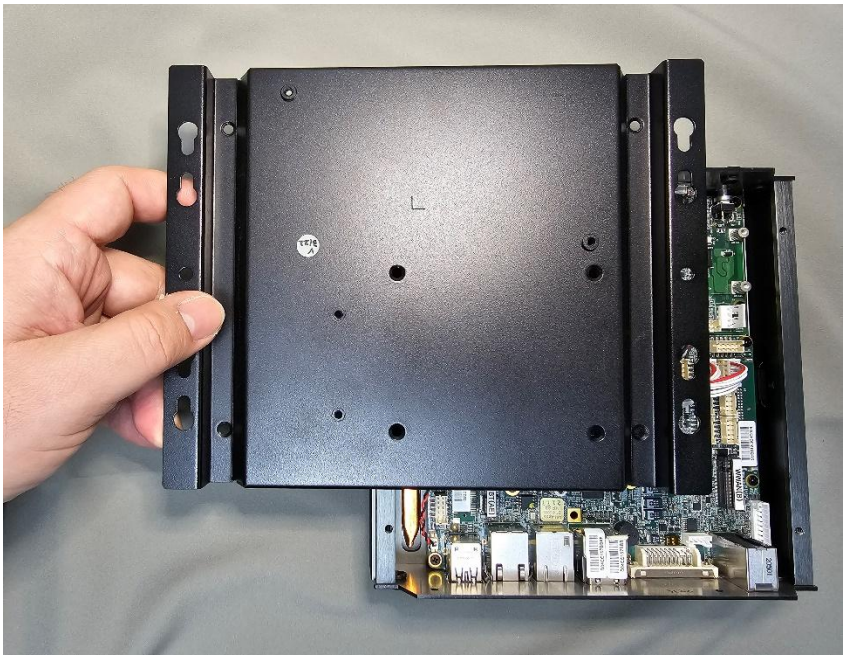
Bottom



Step 2.
Unscrew the two screws on the front panel, as shown in the picture.

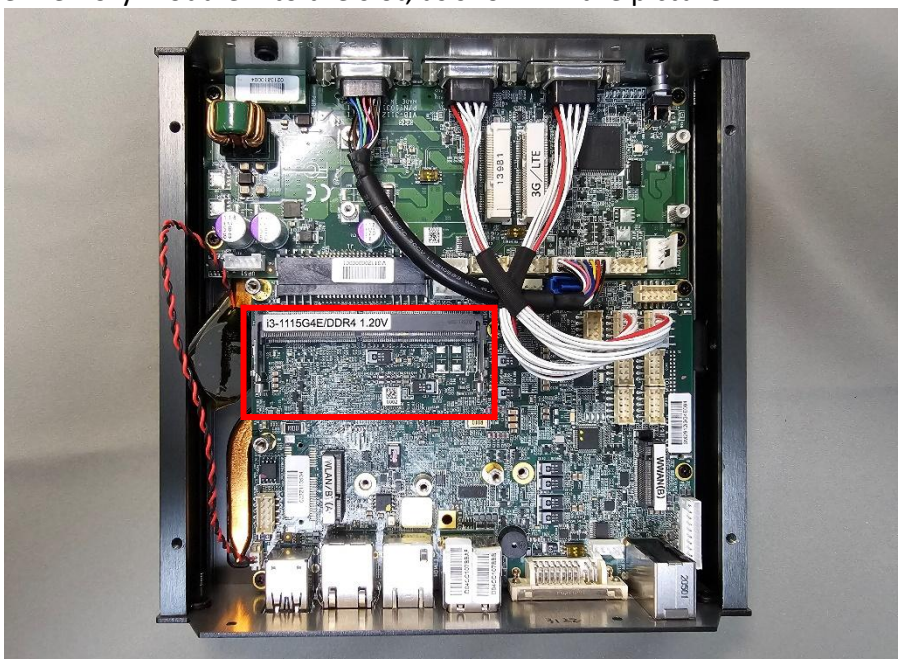
Step 3.
Unscrew the two screws on the rear panel, as shown in the picture.

Step 4.
Remove the chassis.



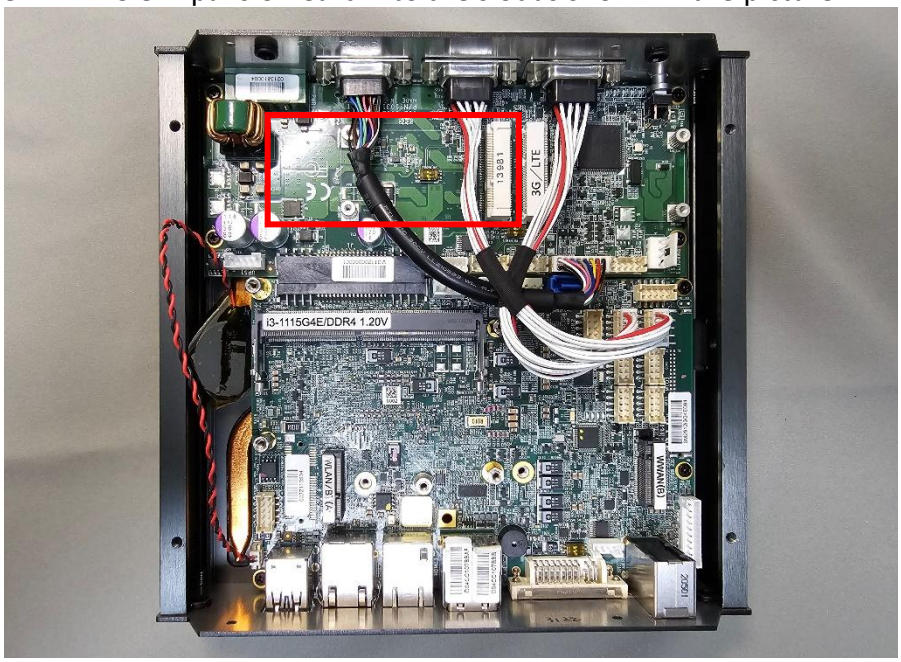
3.2 INSTALLING MEMORY

Insert the memory module into the slot, as shown in the picture.



3.3 INSTALLING MINI PCIE EXPANSION CARD (PCIE/USB2.0)

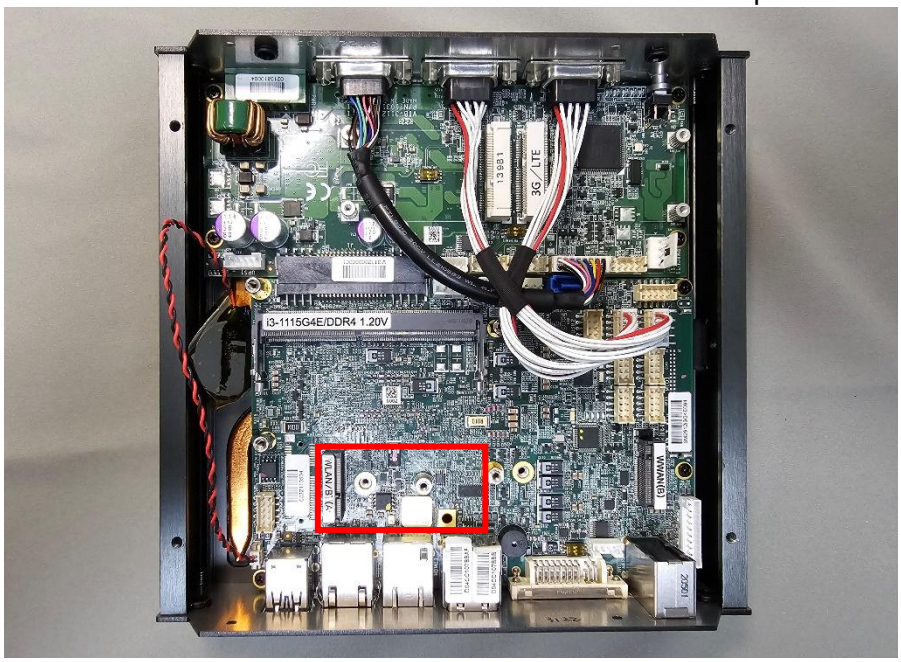
Insert the MINI PCIe Expansion Card into the slot as shown in the picture.



3.4 INSTALLING WI-FI/BLUETOOTH MODULE

Step 1.

Insert the Wi-Fi or Bluetooth module into the slot as shown in the picture.



Chapter 4

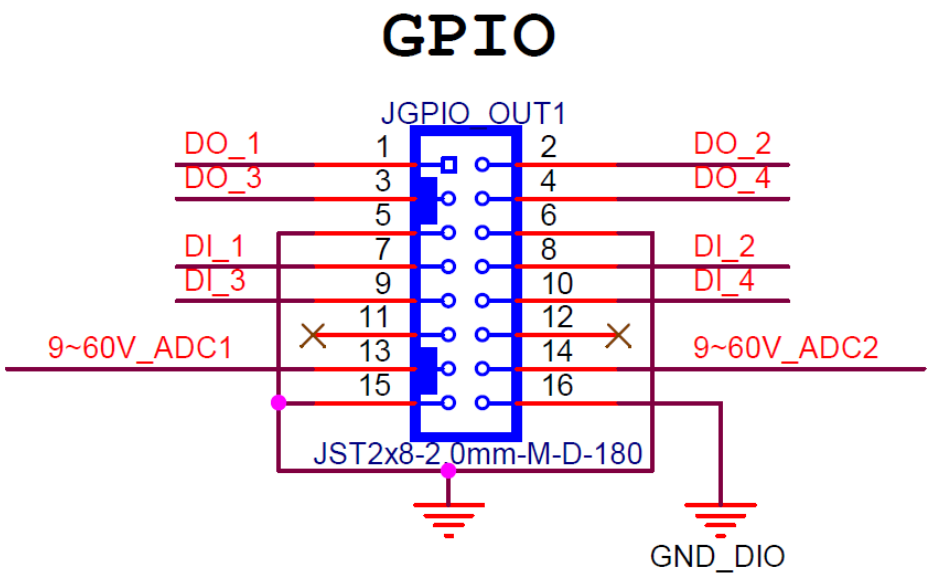
System Resource

4.0 SYSTEM RESOURCE

4.1 GPIO Control Register

Hardware Specification

Model	GPI voltage	GPO voltage	DO max current
FleetPC-12B	0~60V	5V	100mA



Register Definitions

DO Data Register – 0x31

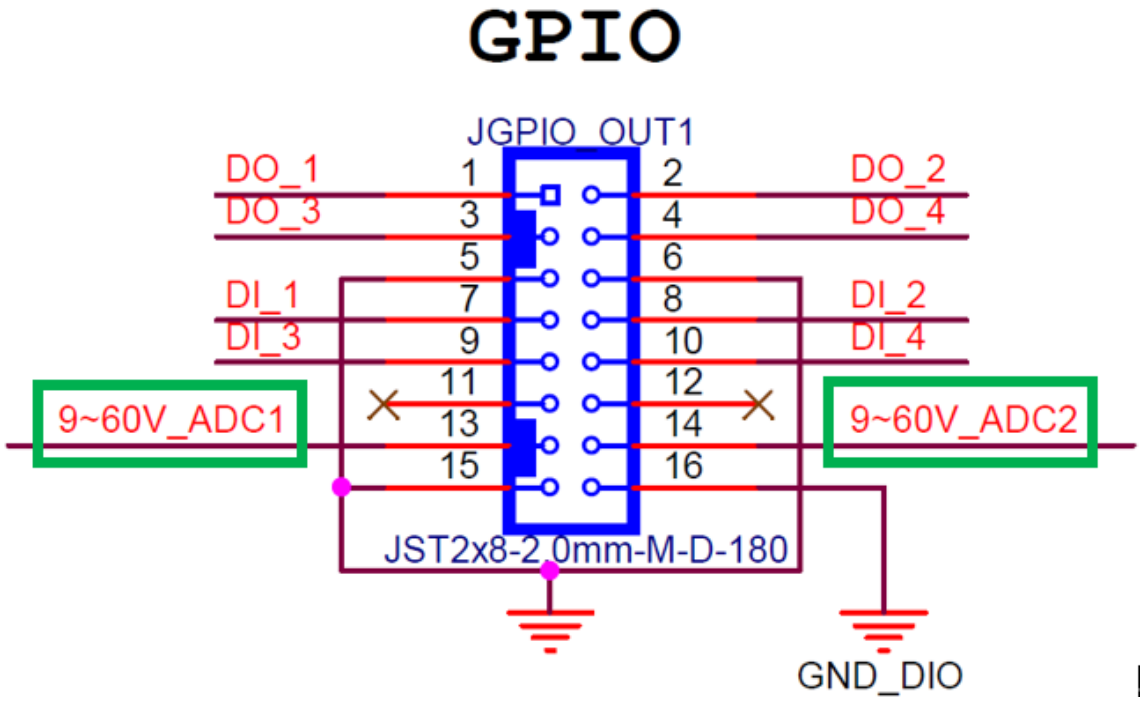
Bit	Name	R/W	DESCRIPTION
3	GPIO4_OUT	R/W	GPIO4 output data.
2	GPIO3_OUT	R/W	GPIO3 output data.
1	GPIO2_OUT	R/W	GPIO2 output data.
0	GPIO1_OUT	R/W	GPIO1 output data.

DI Status Register – 0x30

Bit	Name	R/W	DESCRIPTION
3	GPIO4_IN	R	GPIO4 pin status.
2	GPIO3_IN	R	GPIO3 pin status.
1	GPIO2_IN	R	GPIO2 pin status.
0	GPIO1_IN	R	GPIO1 pin status.

ADC1 Pin13 Status Register – 0x57/0x56

ADC2 Pin14 Status Register – 0x59/0x58



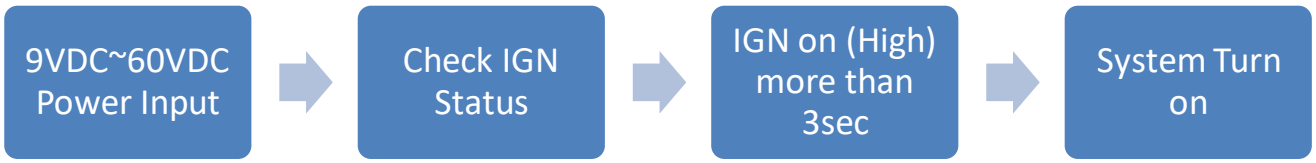
4.2 Ignition Power Management Quick Guide

Startup conditions from the IGNITION signal:

- The IGNITION startup signal must be valid for 3 seconds. (anti-noise protection).

Typically, the system can start only from the IGNITION signal because the startup PIC controller is disconnected from the power source.

Startup Procedure by Ignition



Startup Procedure by Power Button

Technical Support

Please do not hesitate to contact CarTFT.com e.K. for API and utility when you cannot fix the problems.

Chapter 5

BIOS Setting

5.0 BIOS SETTING

5.1 Enter The BIOS

Power on the computer, and the system will start the POST (Power On Self Test) process. Press the (DEL) key to enter Setup when the message below appears on the screen.

Press DEL to enter SETUP

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

Important

- The items under each BIOS category described in this chapter are under continuous update for better system performance. Therefore, the description may be slightly different from the latest BIOS and should be held for reference only.
- Upon boot-up, the 1st line appearing after the memory count is the BIOS version. It is usually in the format.

Control Keys

Power on the computer, and the system will start the POST (Power On Self Test) process. Press the (DEL) key to enter Setup when the message below appears on the screen.

< ↑ >	Move to the previous item.
< ↓ >	Move to the next item.
<← >	Move to the item in the left hand.
<→>	Move to the item in the right hand.
<Enter>	Select the item
<Esc>	Jumps to the Exit menu or returns to the main menu from a submenu
<+/PU>	Increase the numeric value or make changes
<-/PD>	Decrease the numeric value or make changes
<F1>	General Help
<F3>	Load Optimized Defaults
<F4>	Save all the CMOS changes and exit

Getting Help

After entering the Setup menu, the first menu you will see is the Main Menu.

Main Menu

The main menu lists the setup functions you can make changes to. You can use the arrow keys (↑↓) to select the item. The online description of the highlighted setup function is displayed at the bottom of the screen.

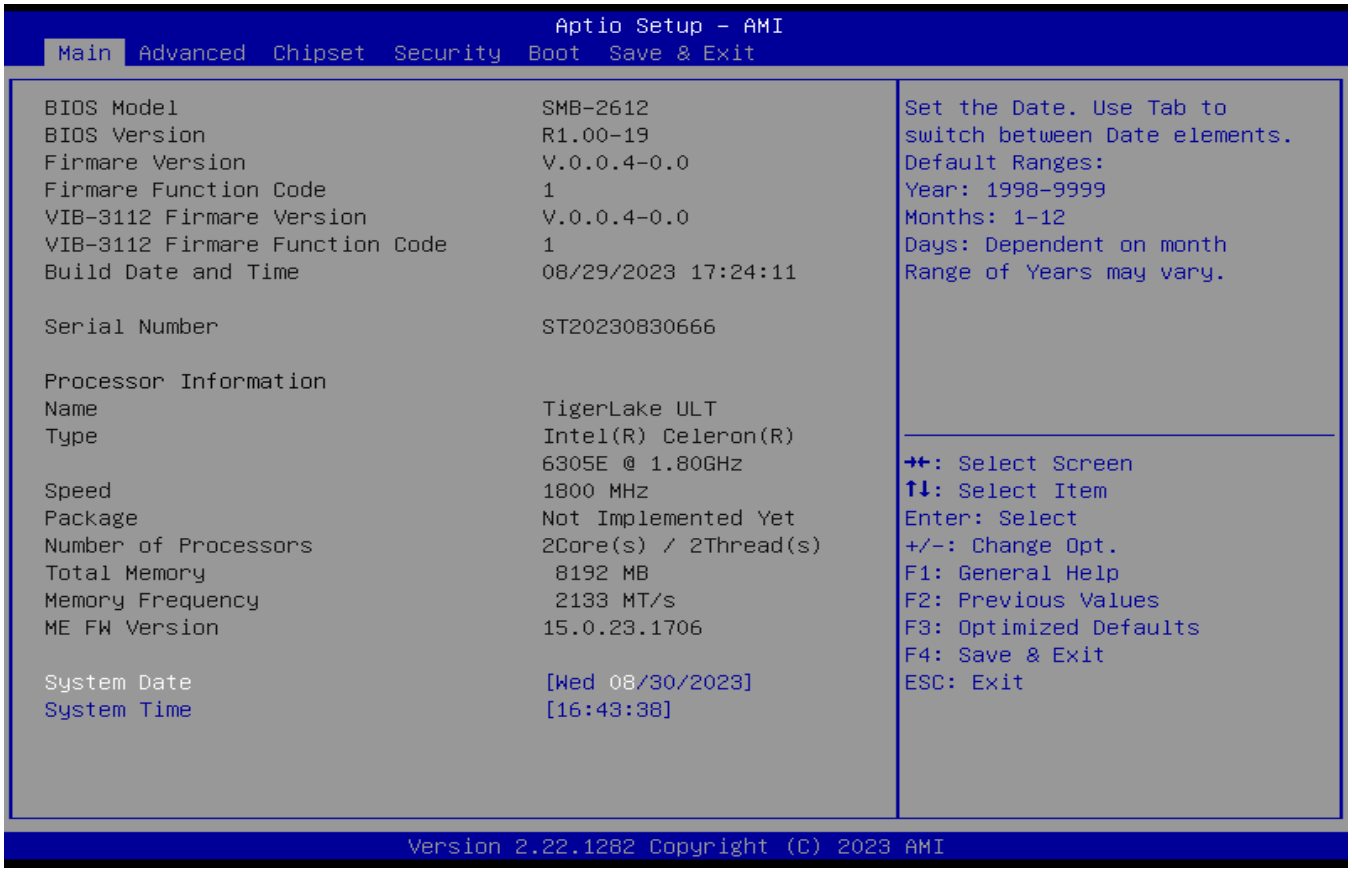
Sub-Menu

If you find a right pointer symbol (as shown in the right view) that appears to the left of certain fields, that means a sub-menu can be launched from this field. A sub-menu contains additional options for a field parameter. You can use arrow keys (↑↓) to highlight the field and press <Enter> to call up the sub-menu. Then, you can use the control keys to enter values and move from field to field within a sub-menu. If you want to return to the main menu, press the <Esc >.

General Help <F1>

The BIOS setup program provides a General Help screen. You can call up this screen from any menu by pressing <F1>. The Help screen lists the appropriate keys and possible selections for the highlighted item. Press <Esc> to exit the Help screen.

5.2 Main



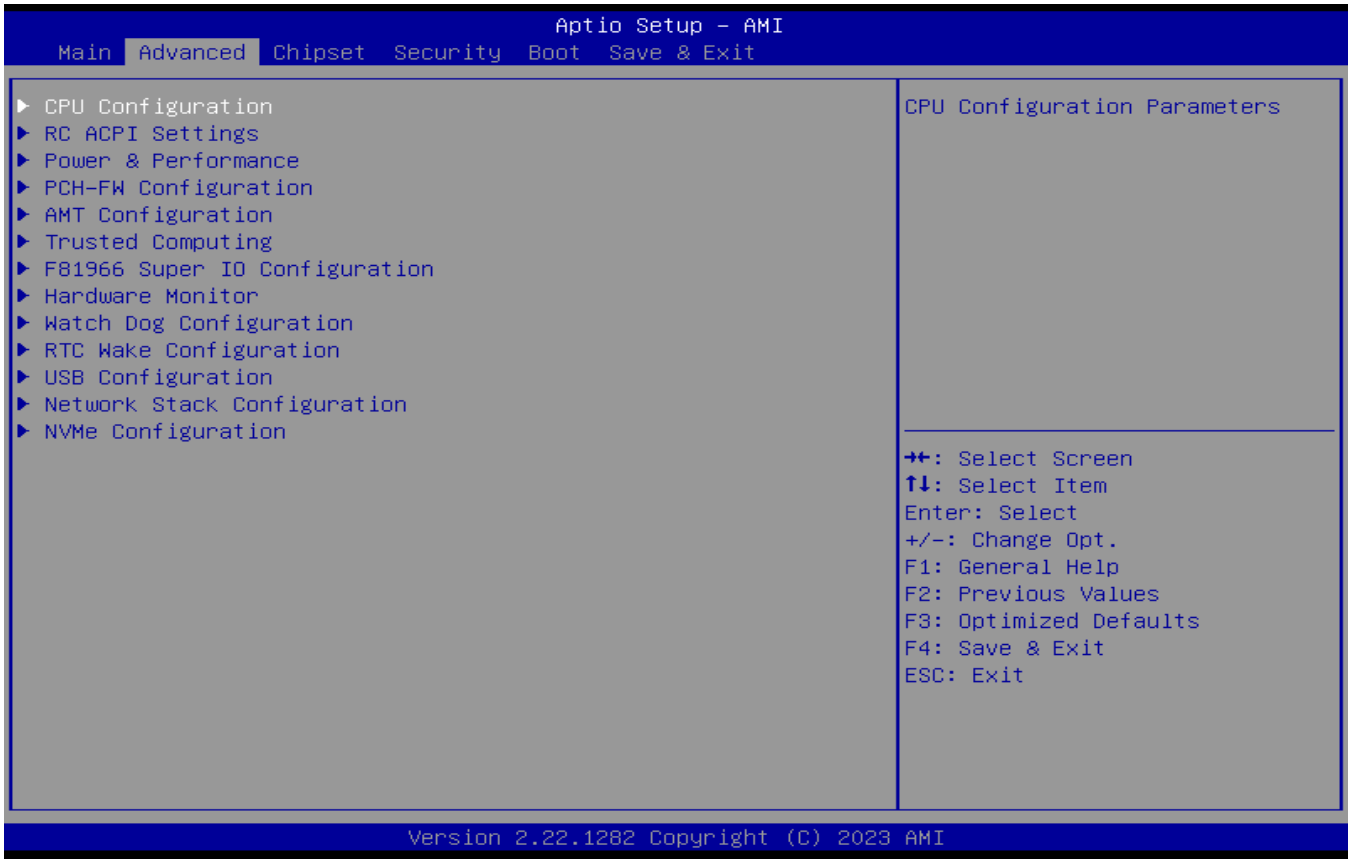
◆ **System Date**

This setting allows you to set the system Date. The time format is <Day> <Month> <Date> <Year>.

◆ **System Time**

This setting allows you to set the system time. The time format is <Hour> <Minute> <Second>.

5.3 Advanced


Aptio Setup – AMI
Main Advanced Chipset Security Boot Save & Exit
CPU Configuration
RC ACPI Settings
Power & Performance
PCH-FW Configuration
AMT Configuration
Trusted Computing
F81966 Super IO Configuration
Hardware Monitor
Watch Dog Configuration
RTC Wake Configuration
USB Configuration
Network Stack Configuration
NVMe Configuration
CPU Configuration Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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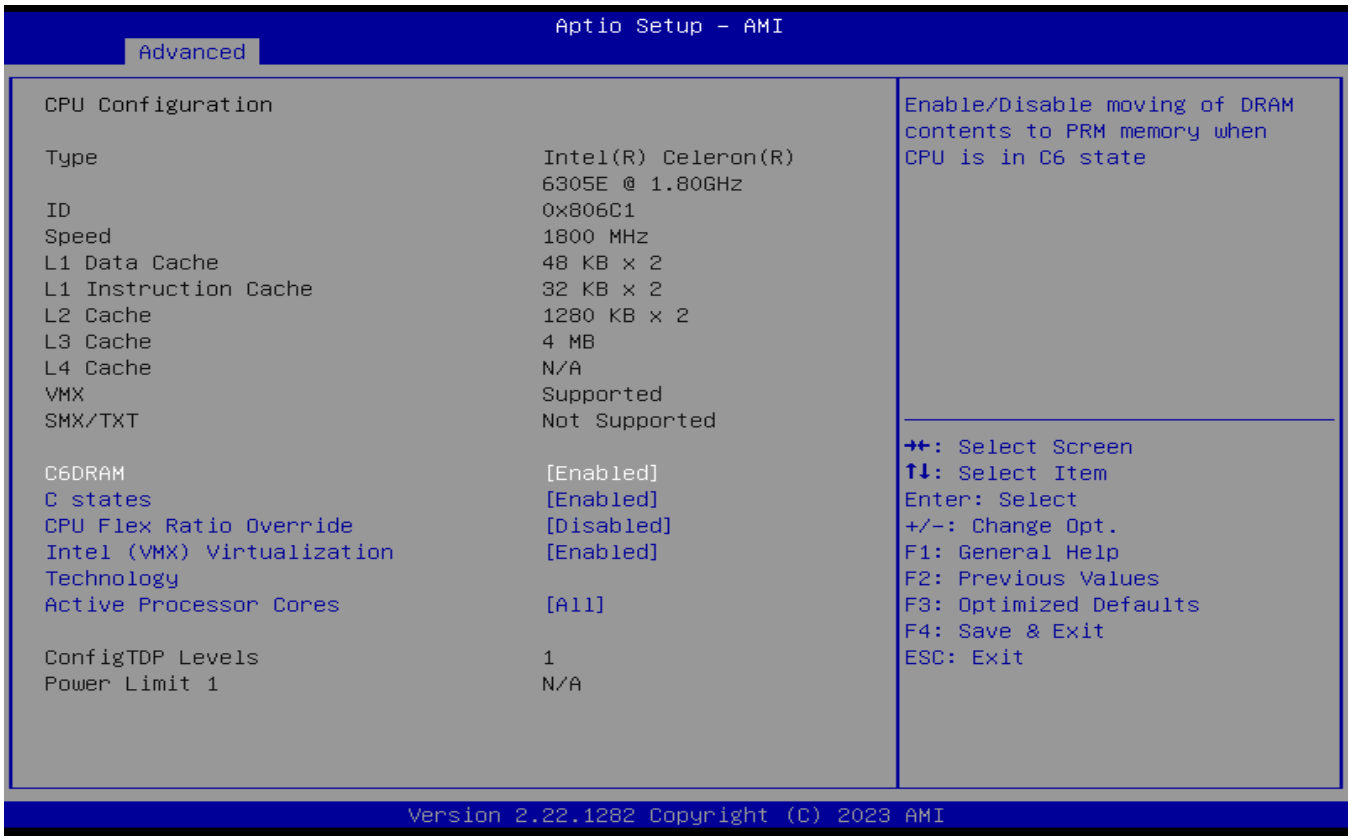
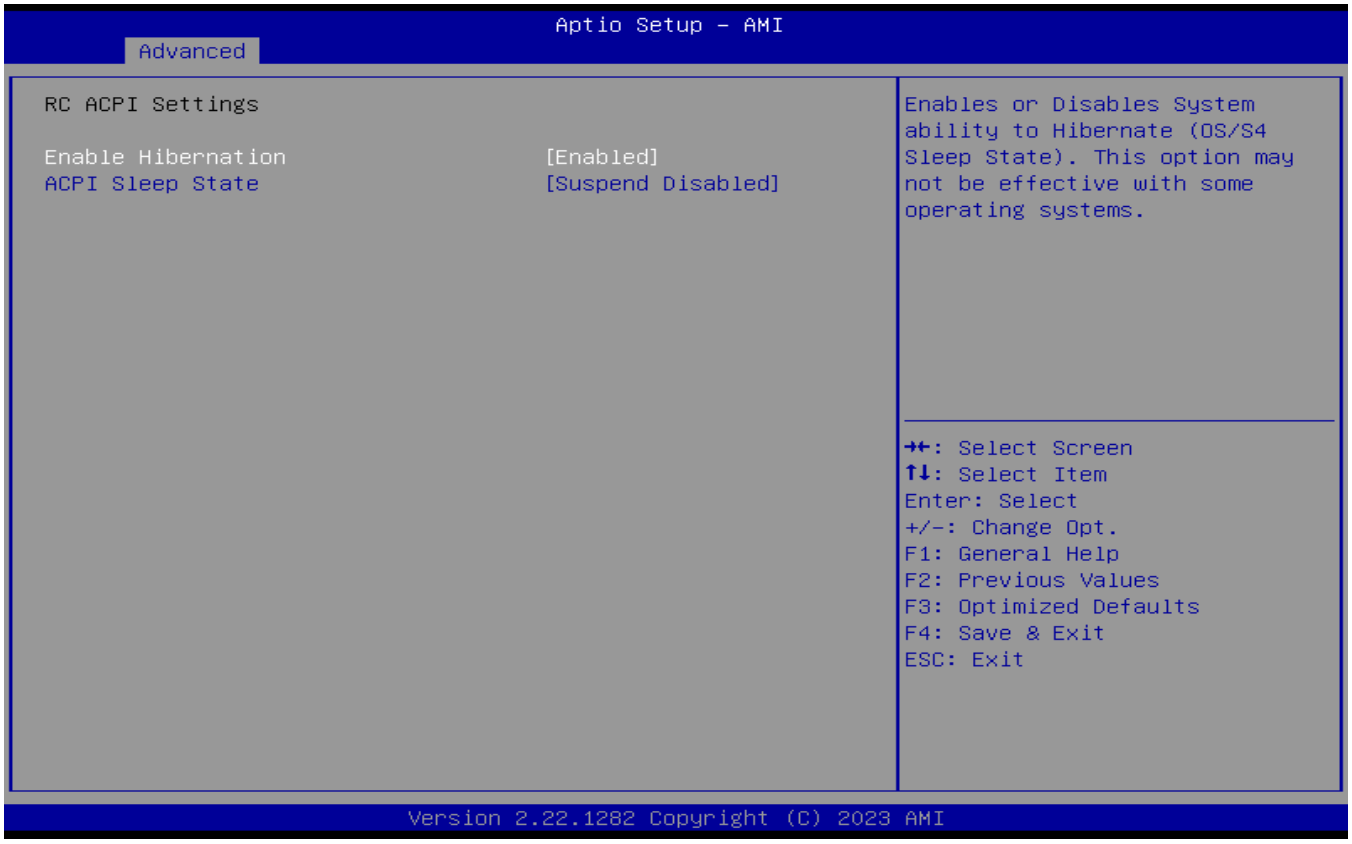
5.3.1 CPU Configuration



- **Intel (VMX) Virtualization Technology**
  Turns Intel® Virtualization Technology on or off. Virtualization enhanced by Intel® Virtualization Technology will allow a platform to run multiple operating systems and applications in independent partitions. With virtualization, one computer system can function as multiple virtual systems.

5.3.2 ACPI Settings

This item allows users to configure ACPI settings.



◆ **Enable Hibernation**

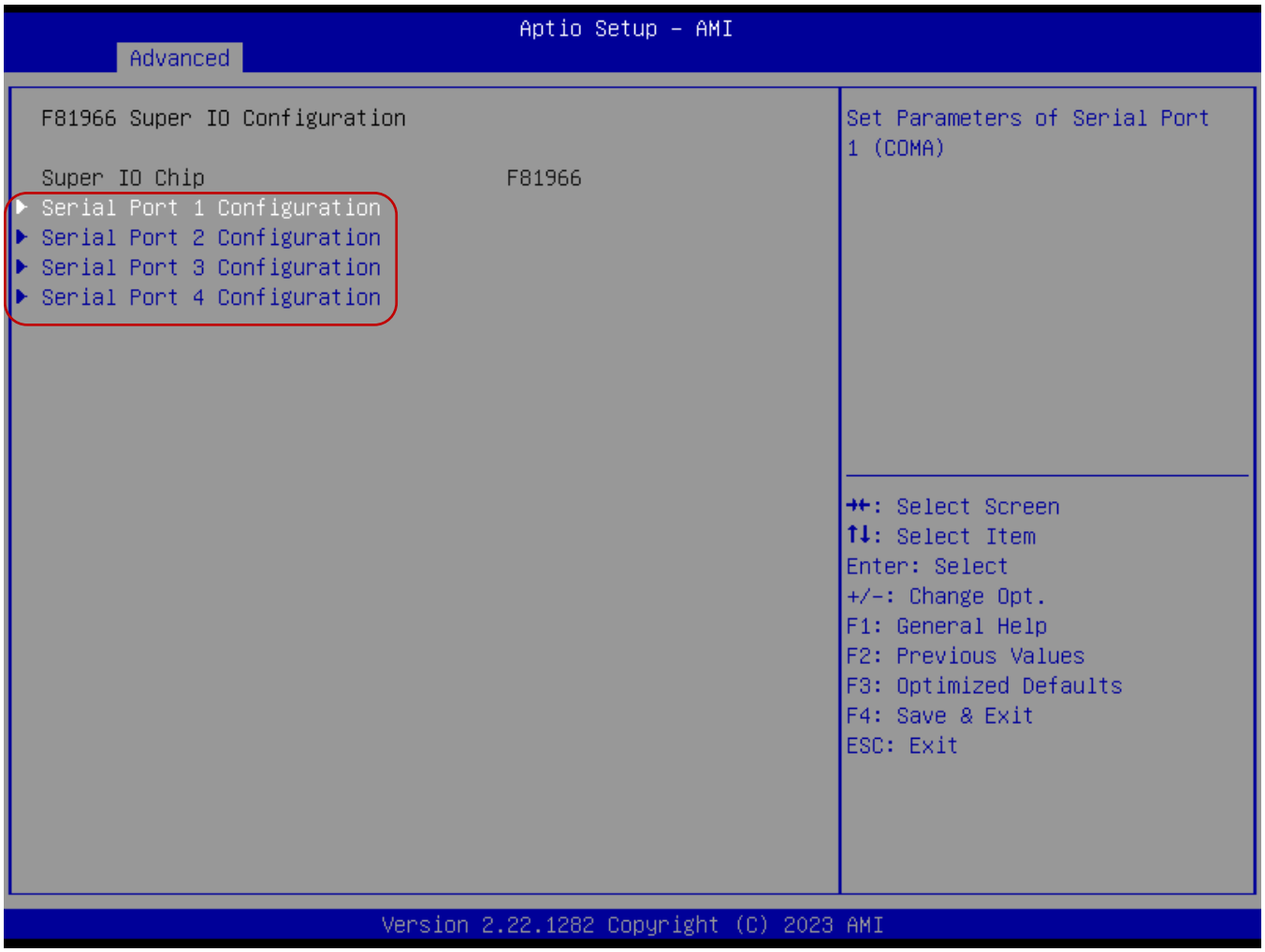
◆ **ACPI Sleep State**

Allows users to select the highest Advanced Configuration Power Interface® (ACPI) sleep state that the system will enter when the suspend button is pressed.

5.3.3 Super I/O

The screen allows users to select options for the Super IO configuration and change the value of the preferred option.

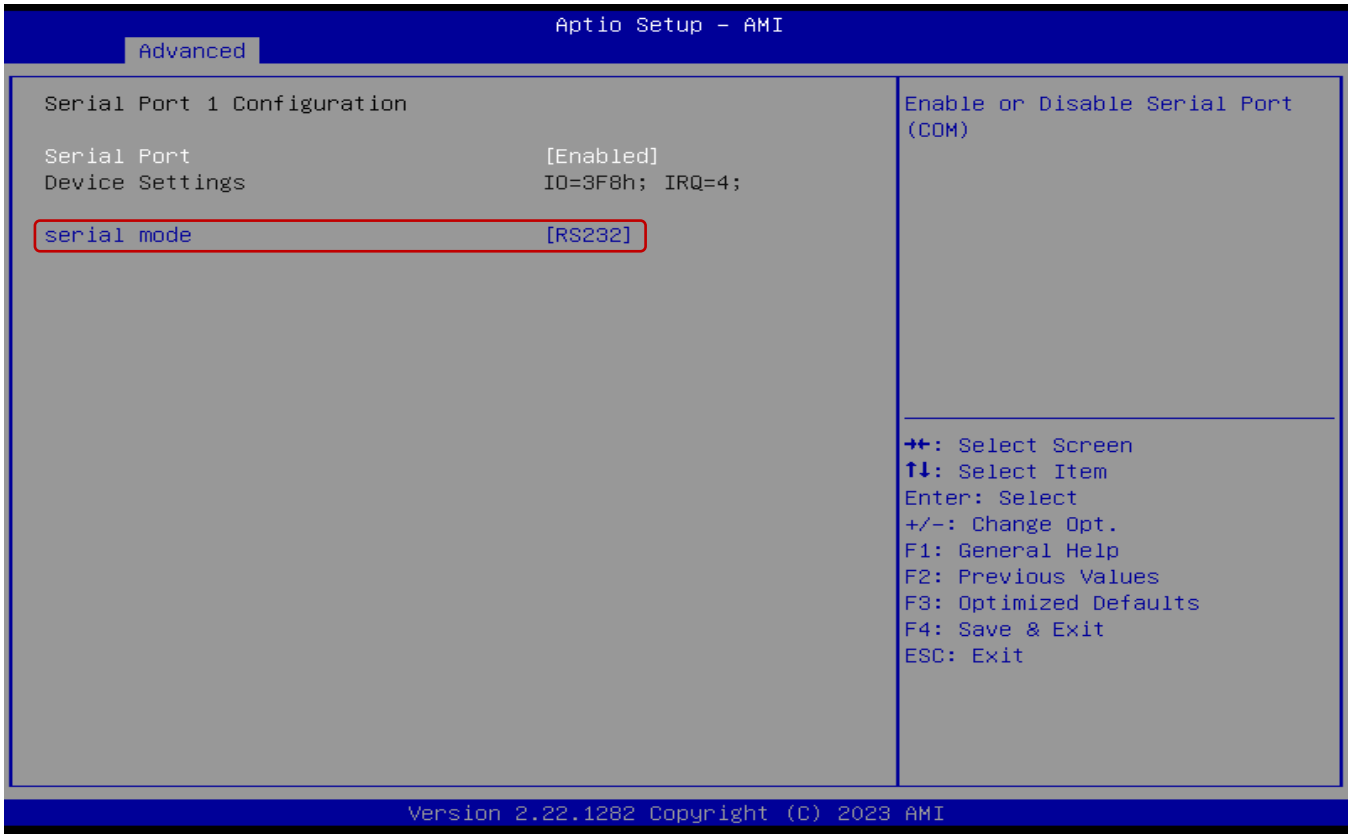
■ **Serial Port Configuration**

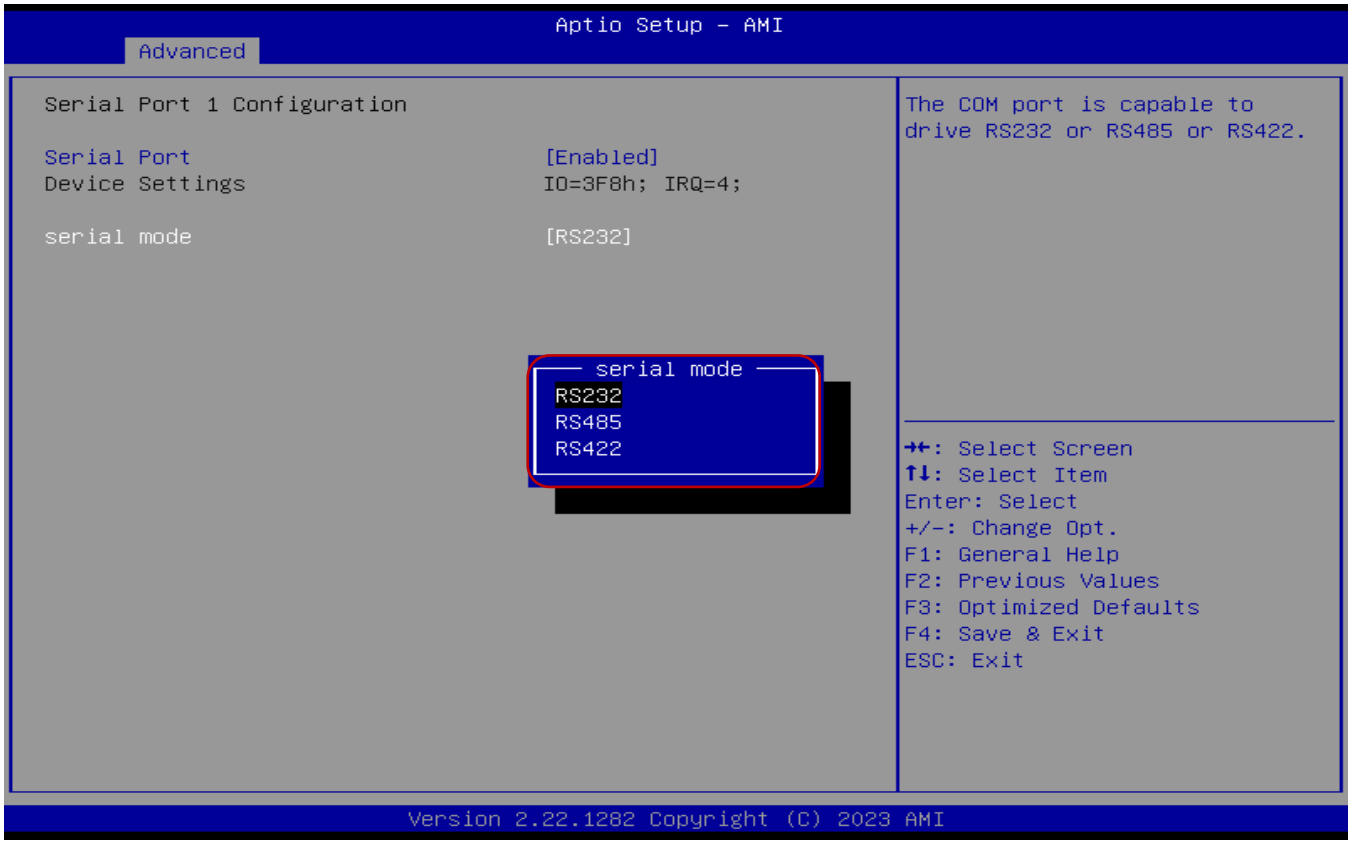


◆ **Serial Port 1/2/3/4 Enable or Disable**

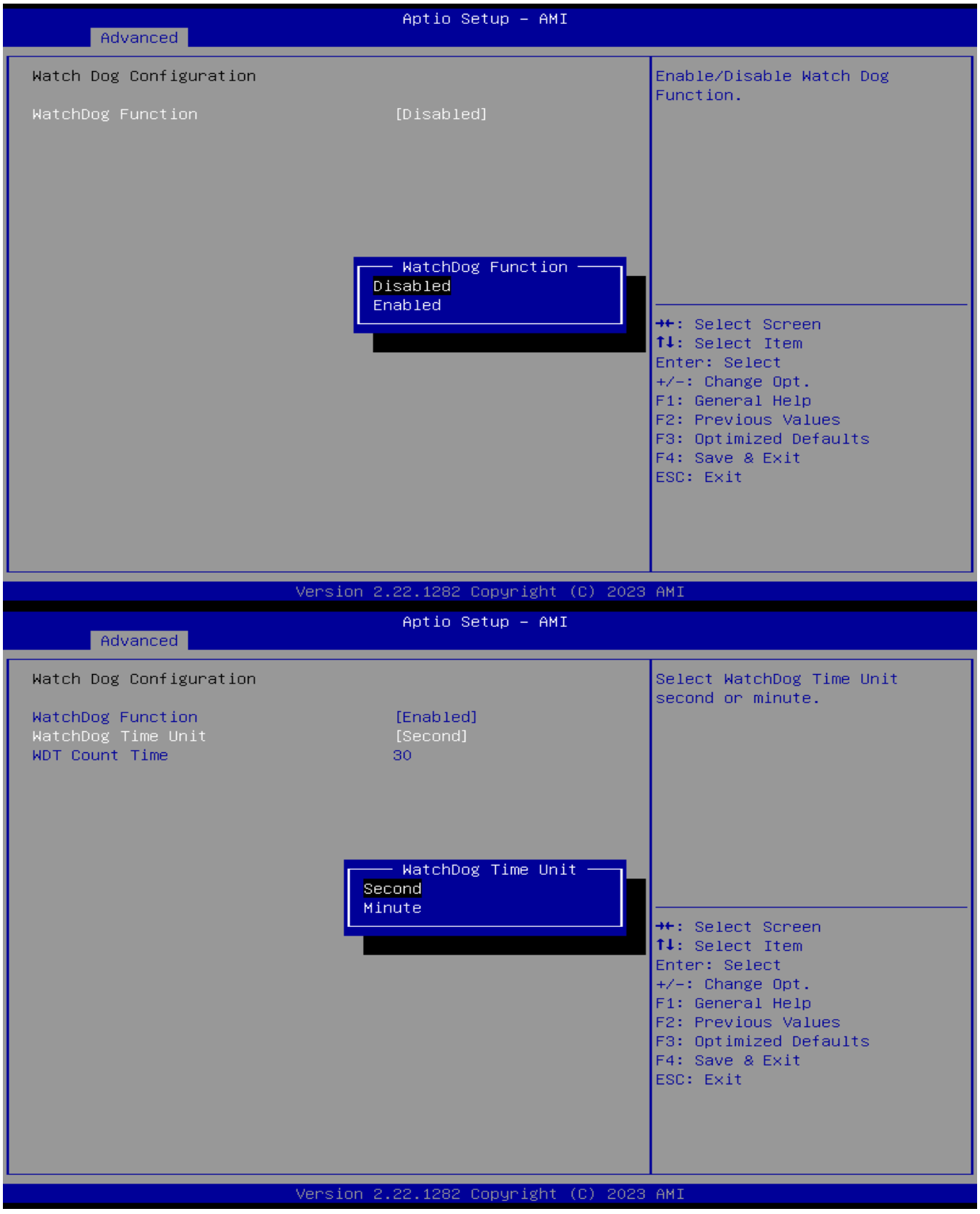
Select an Enable or Disable for the specified serial ports.

◆ **COM1 RS232/422/485 Select**

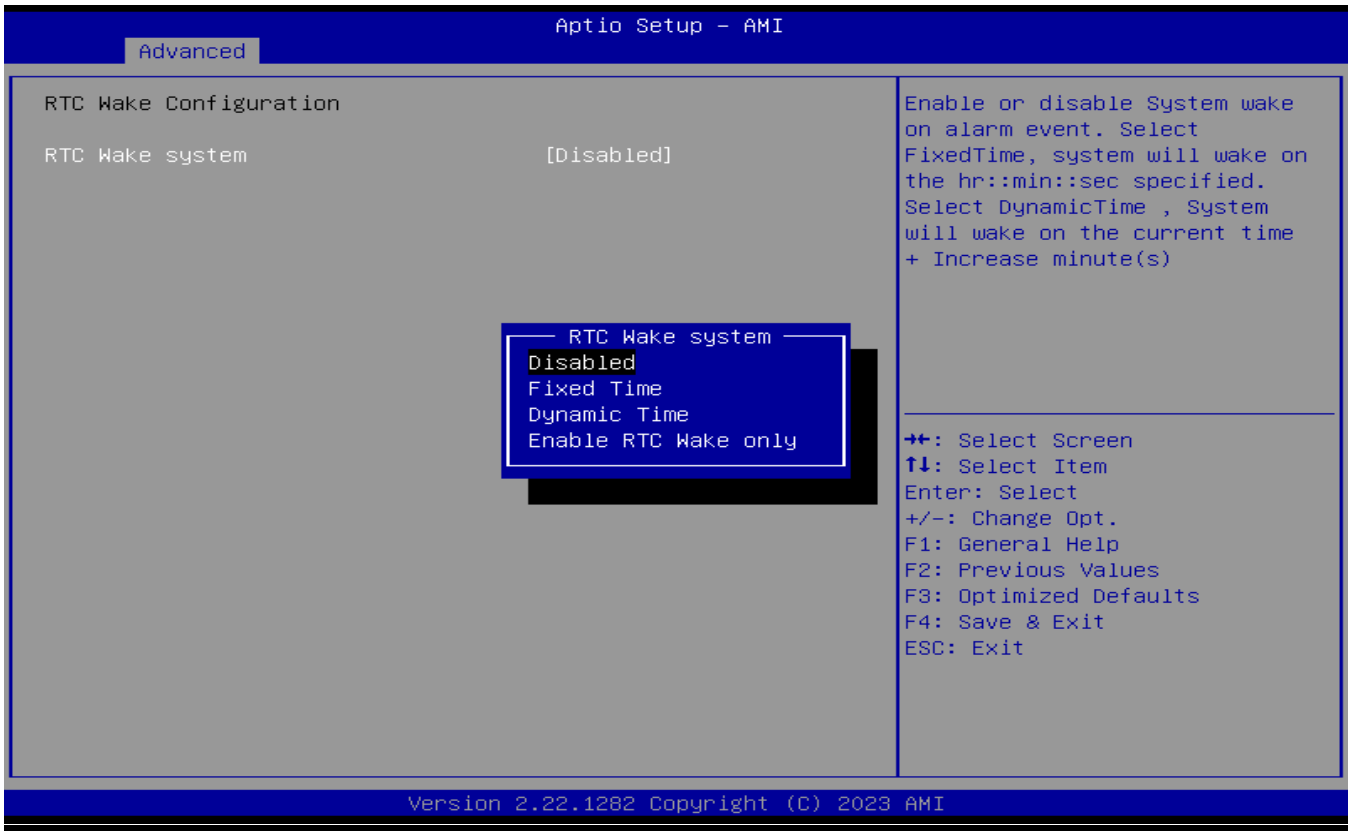

Aptio Setup – AMI
Advanced
Serial Port 1 Configuration
Serial Port [Enabled]
Device Settings IO=3F8h; IRQ=4;
serial mode [RS232]
Enable or Disable Serial Port (COM)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2023 AMI

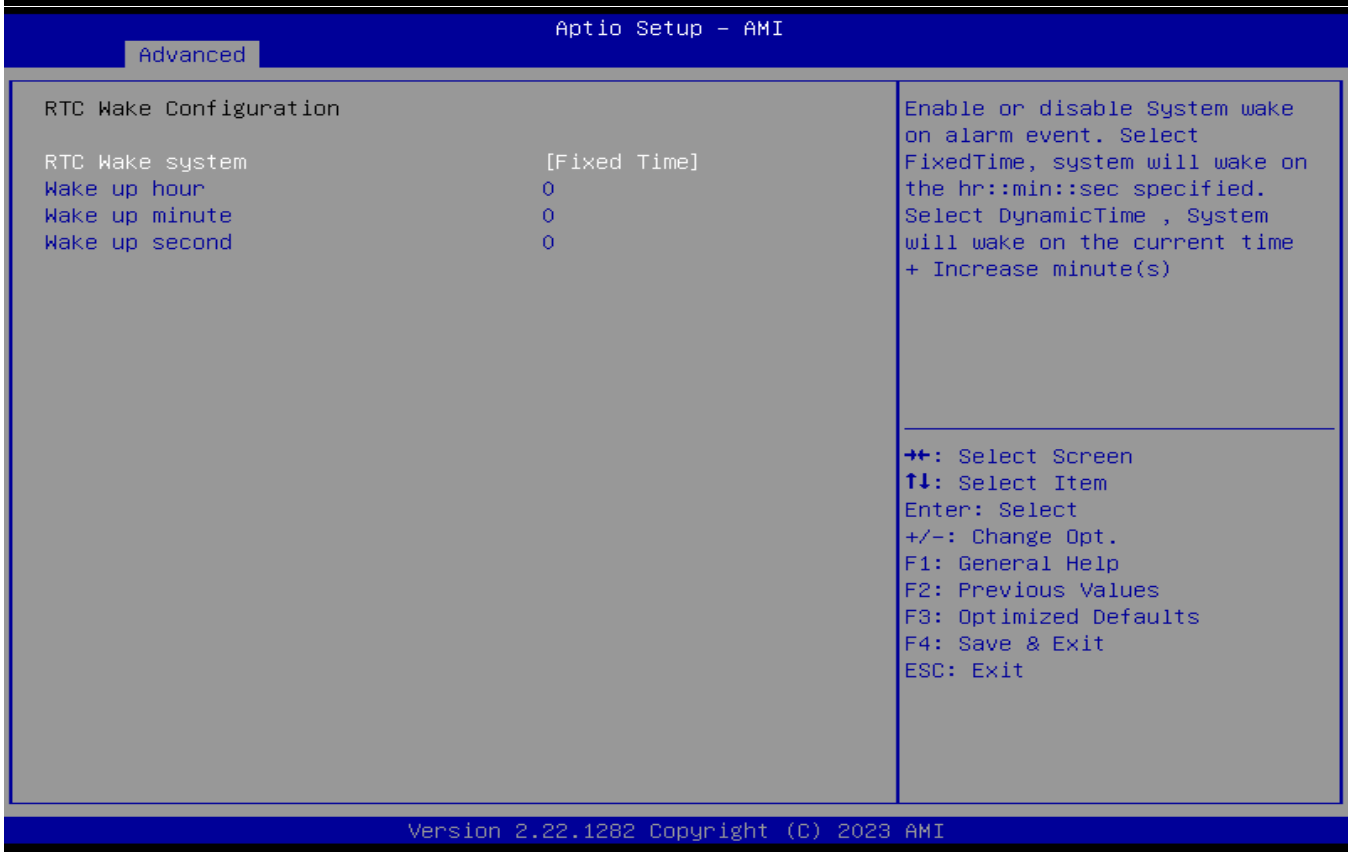

Aptio Setup – AMI
Advanced
Serial Port 1 Configuration
Serial Port [Enabled]
Device Settings IO=3F8h; IRQ=4;
serial mode [RS232]
serial mode
RS232
RS485
RS422
The COM port is capable to drive RS232 or RS485 or RS422.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2023 AMI

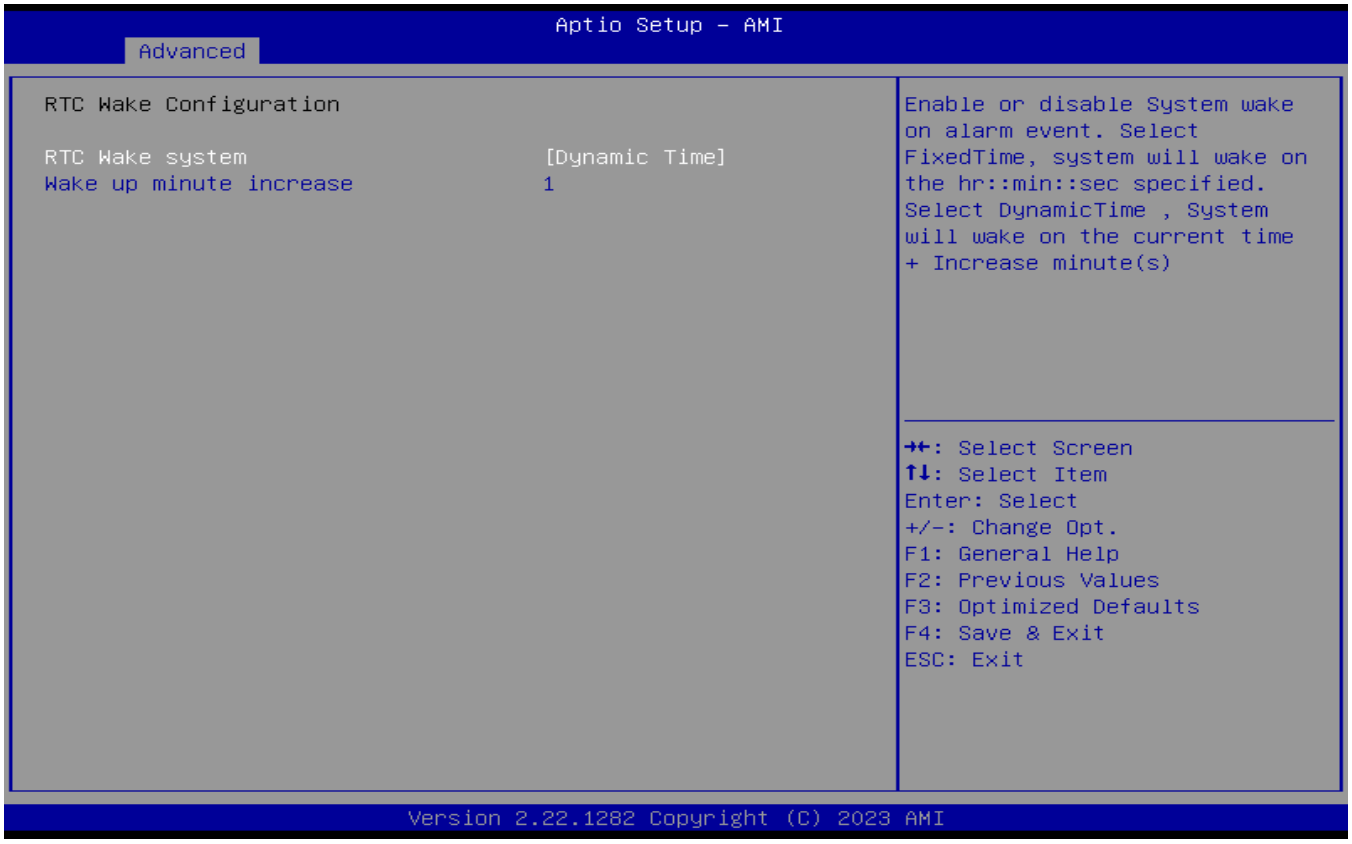
5.3.4 Watch Dog Configuration

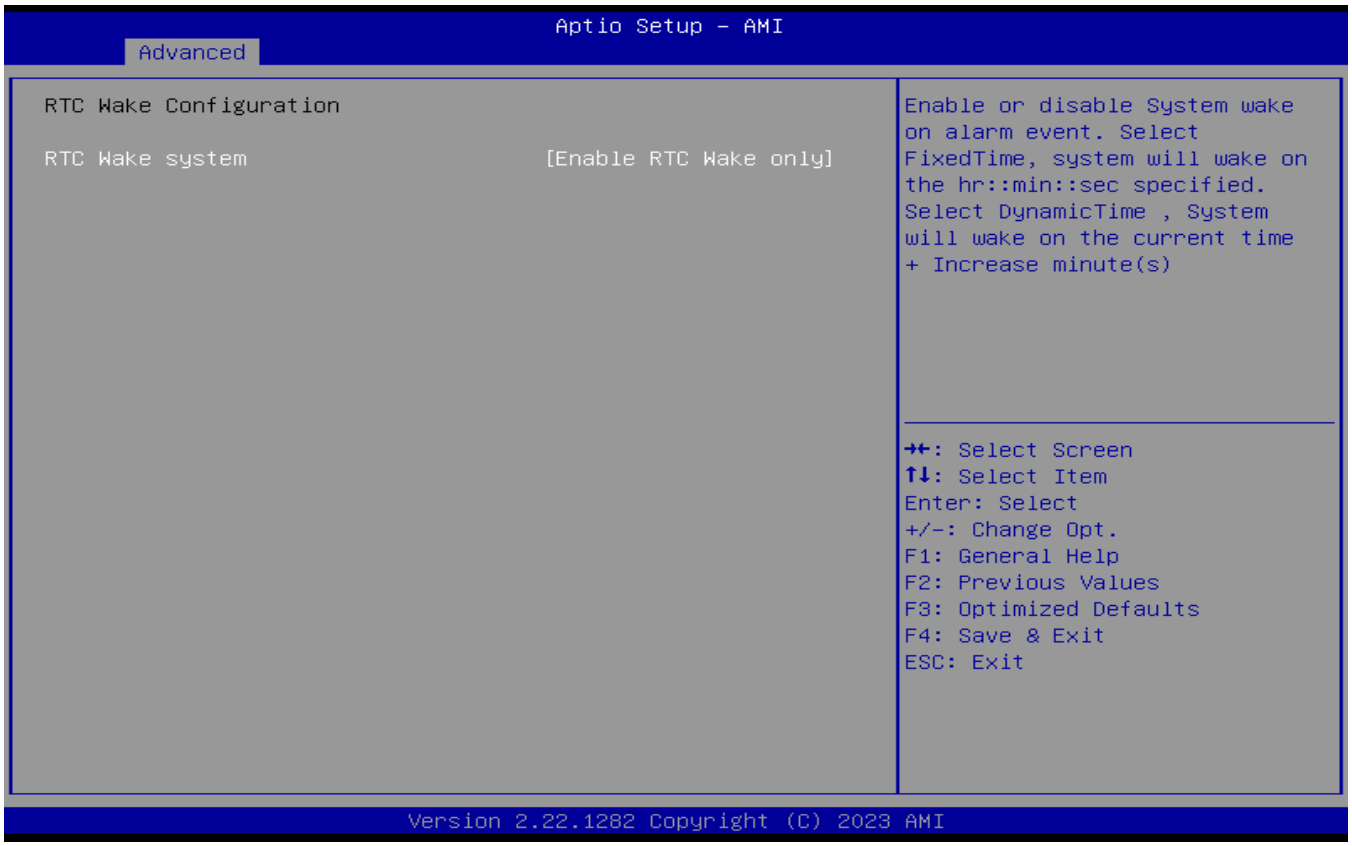


5.3.5 RTC Wake Configuration

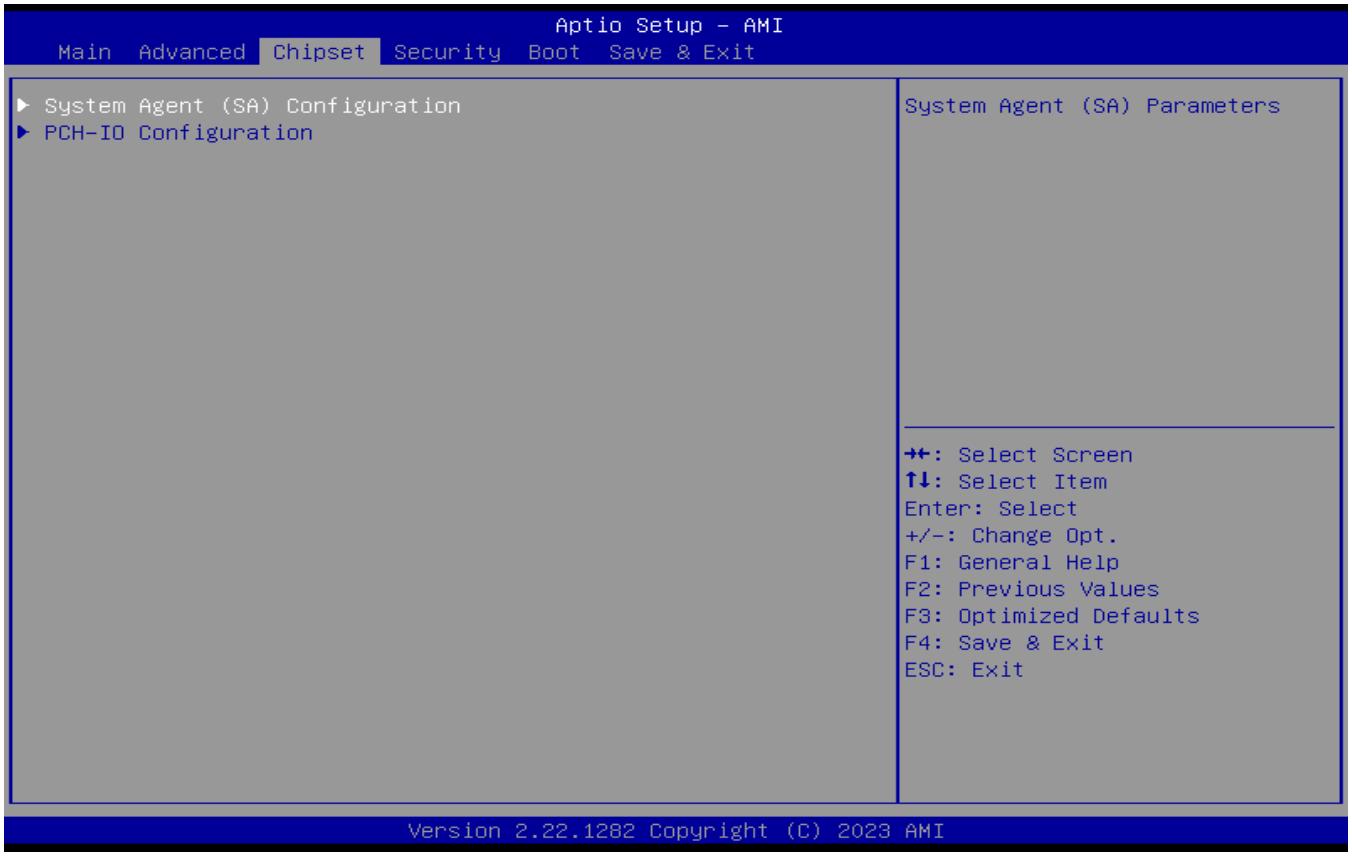




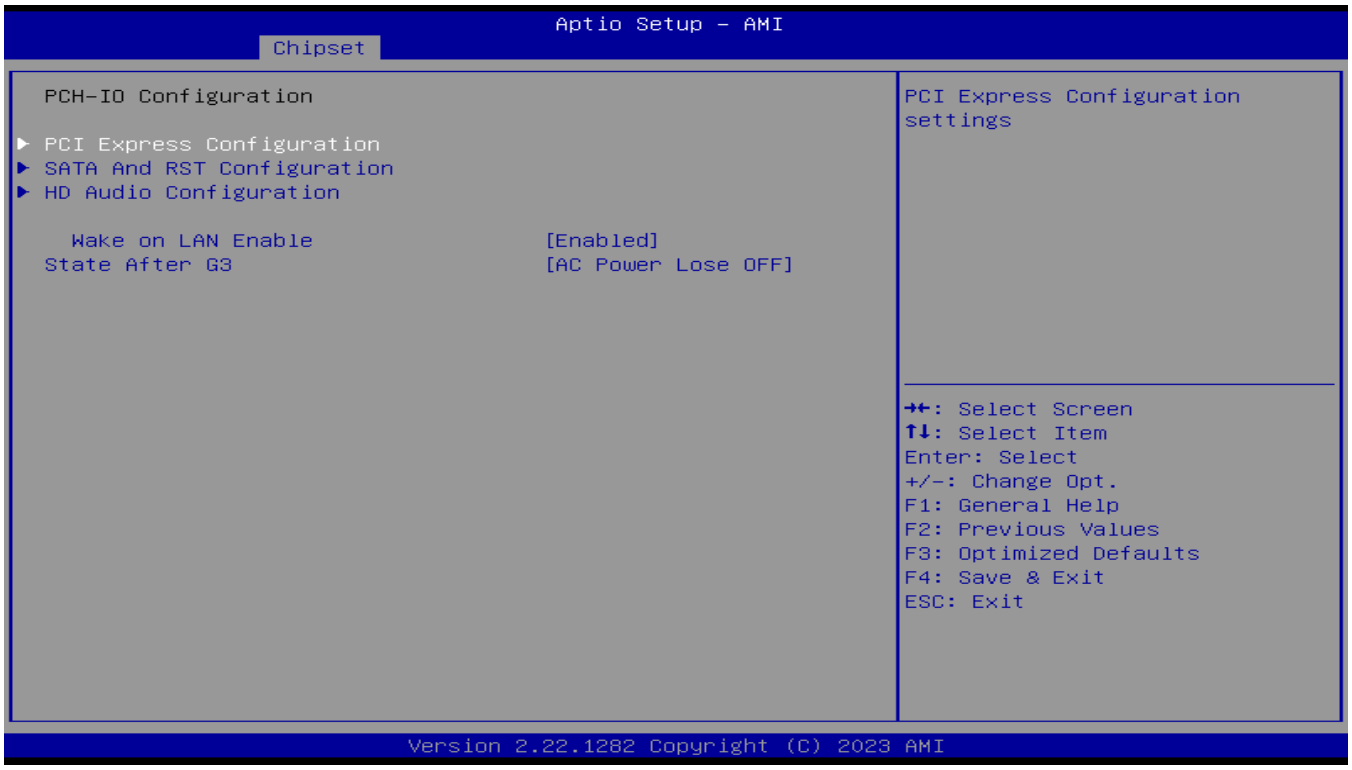

Aptio Setup – AMI
Advanced
RTC Wake Configuration
RTC Wake system [Dynamic Time]
Wake up minute increase 1
Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime , System will wake on the current time + Increase minute(s)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2023 AMI


Aptio Setup – AMI
Advanced
RTC Wake Configuration
RTC Wake system [Enable RTC Wake only]
Enable or disable System wake on alarm event. Select FixedTime, system will wake on the hr::min::sec specified. Select DynamicTime , System will wake on the current time + Increase minute(s)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2023 AMI

5.4 Chipset

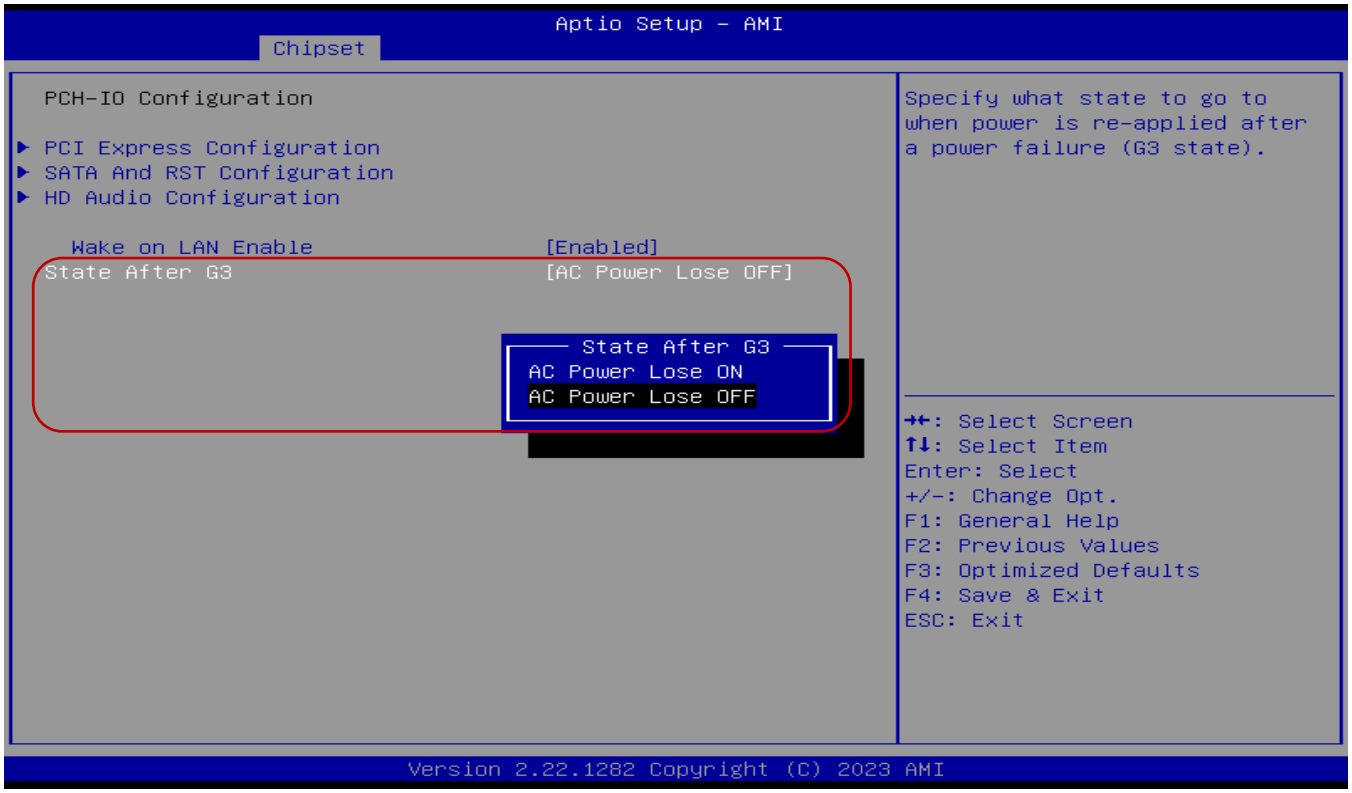

Aptio Setup – AMI
Main Advanced Chipset Security Boot Save & Exit
▶ System Agent (SA) Configuration
▶ PCH-IO Configuration
System Agent (SA) Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2023 AMI

5.4.1 PCH-IO Configuration



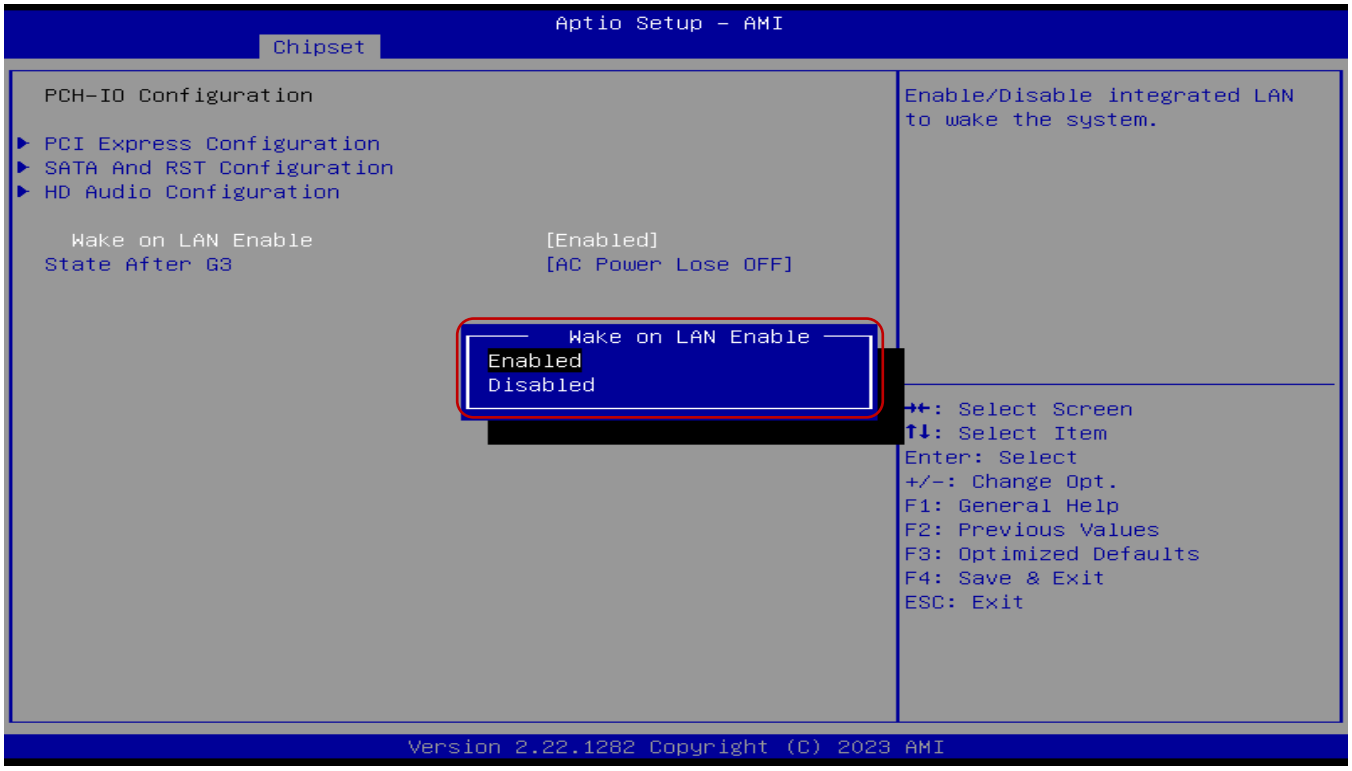
■ **AC Power Loss**

This item lets users choose [OFF] or [ON] mode.

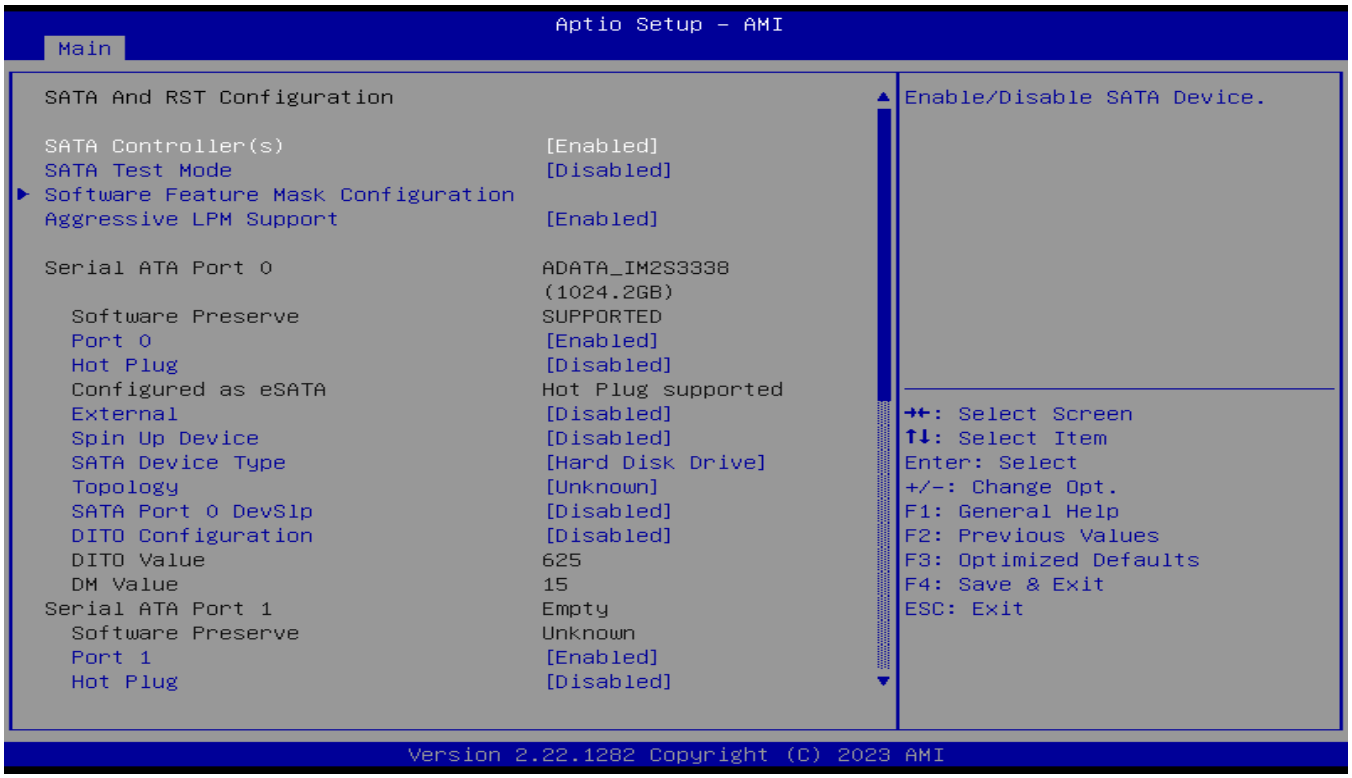


■ **Wake on LAN**

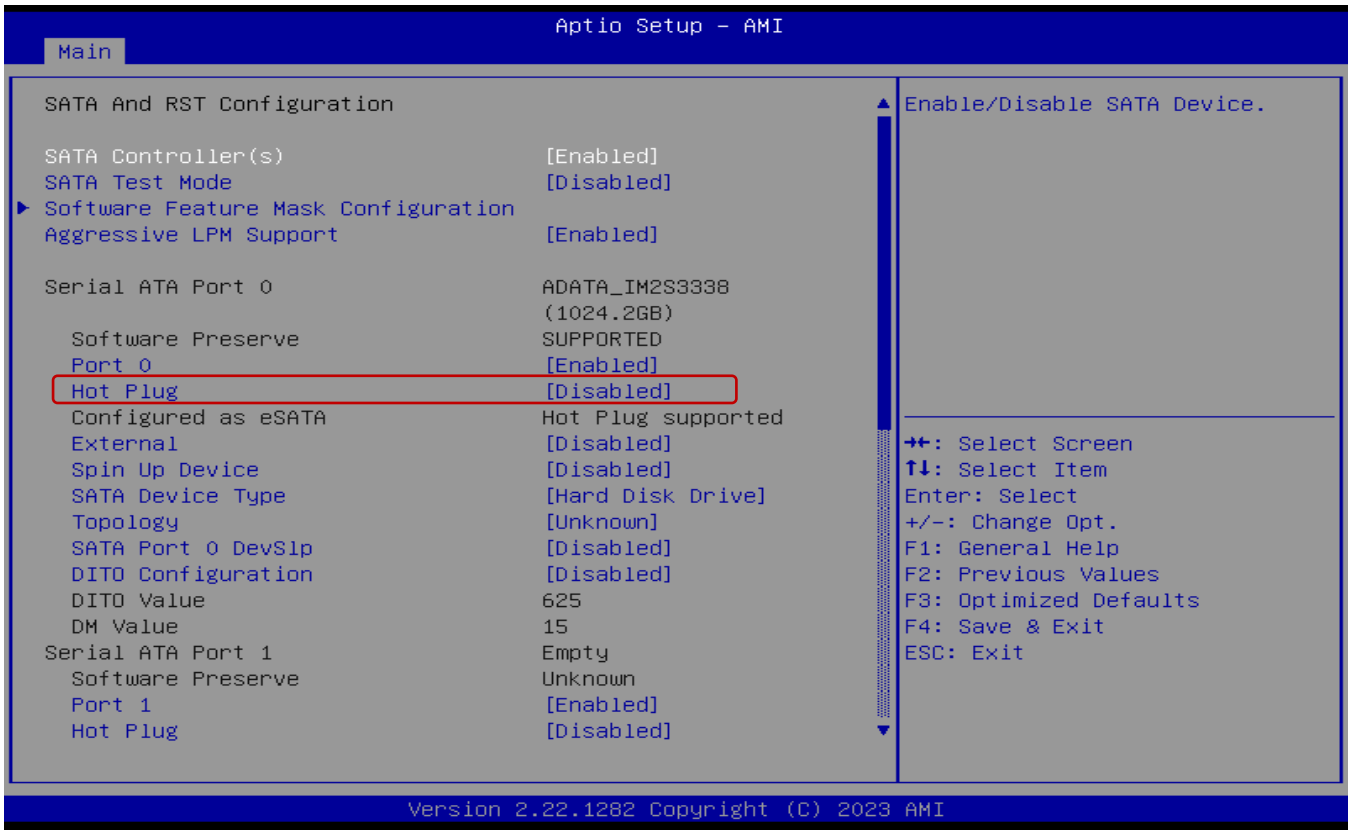
This item allows users to choose [Enabled] or [Disabled] mode.



5.4.2 SATA



■ Hot Plug


Aptio Setup – AMI
Main
SATA And RST Configuration
SATA Controller(s) [Enabled]
SATA Test Mode [Disabled]
Software Feature Mask Configuration
Aggressive LPM Support [Enabled]
Serial ATA Port 0 ADATA_IM2S3338 (1024.2GB)
Software Preserve SUPPORTED
Port 0 [Enabled]
Hot Plug [Disabled]
Configured as eSATA Hot Plug supported
External [Disabled]
Spin Up Device [Disabled]
SATA Device Type [Hard Disk Drive]
Topology [Unknown]
SATA Port 0 DevSlp [Disabled]
DITO Configuration [Disabled]
DITO Value 625
DM Value 15
Serial ATA Port 1 Empty
Software Preserve Unknown
Port 1 [Enabled]
Hot Plug [Disabled]
Enable/Disable SATA Device.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
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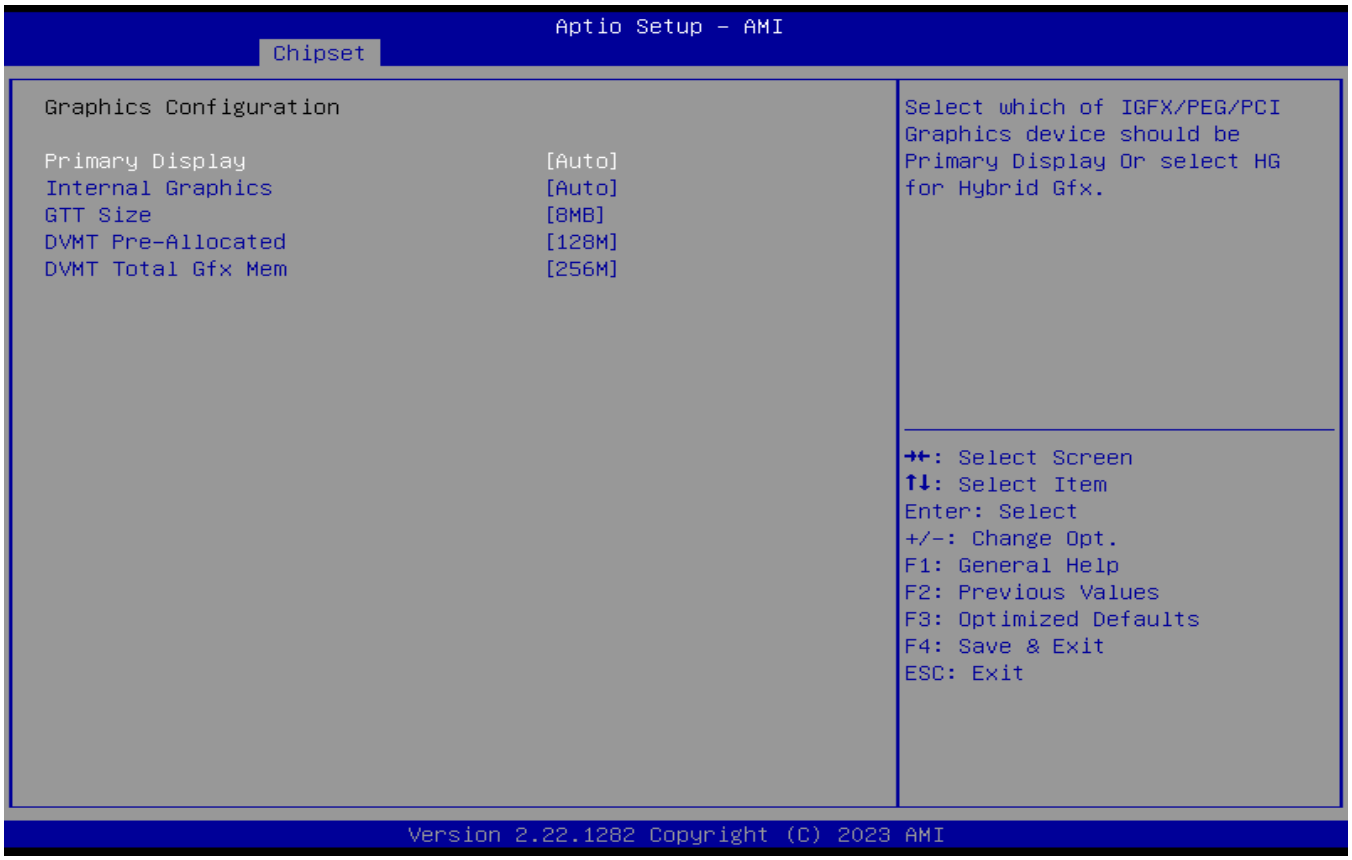
5.4.3 Graphics Configuration



◆ **Primary Display**

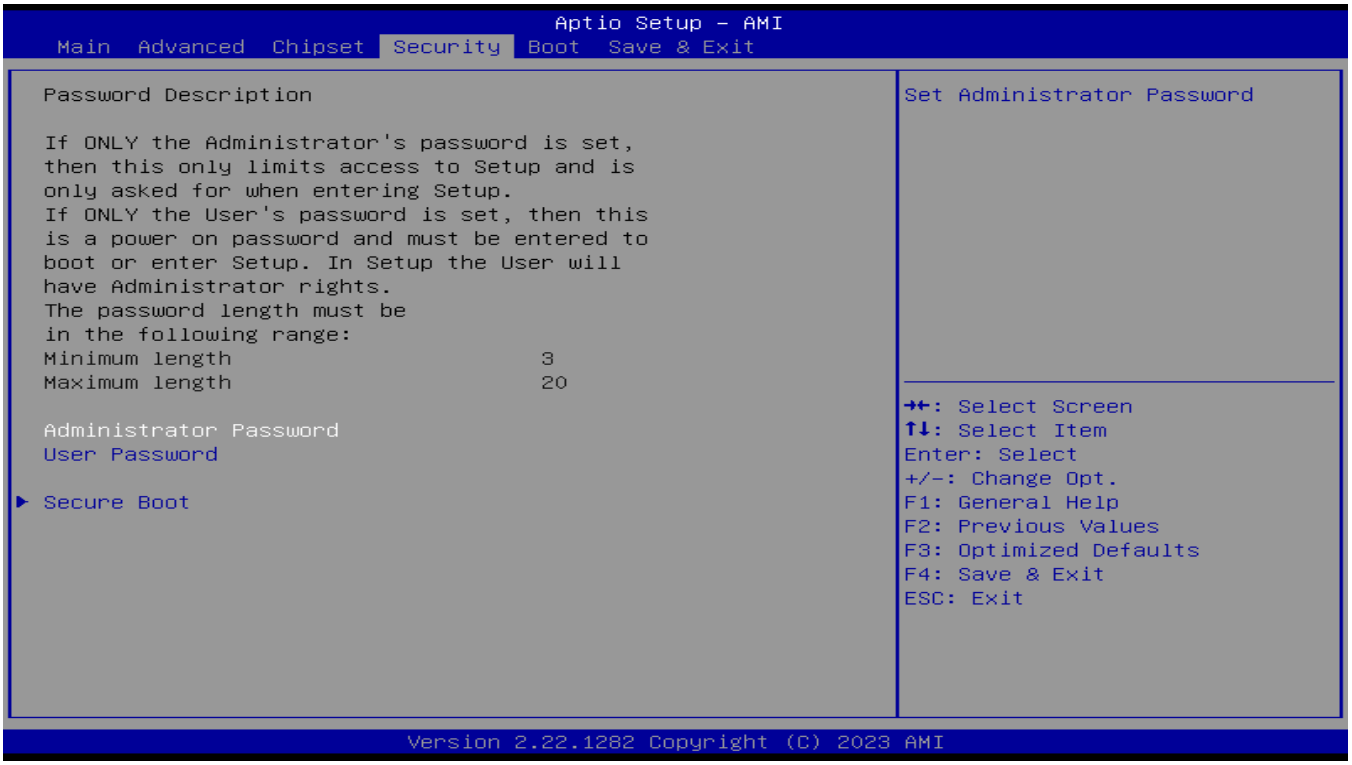
Allows users to select which graphics device should be the primary display or select SG for switchable graphics.

◆ **Internal Graphics**

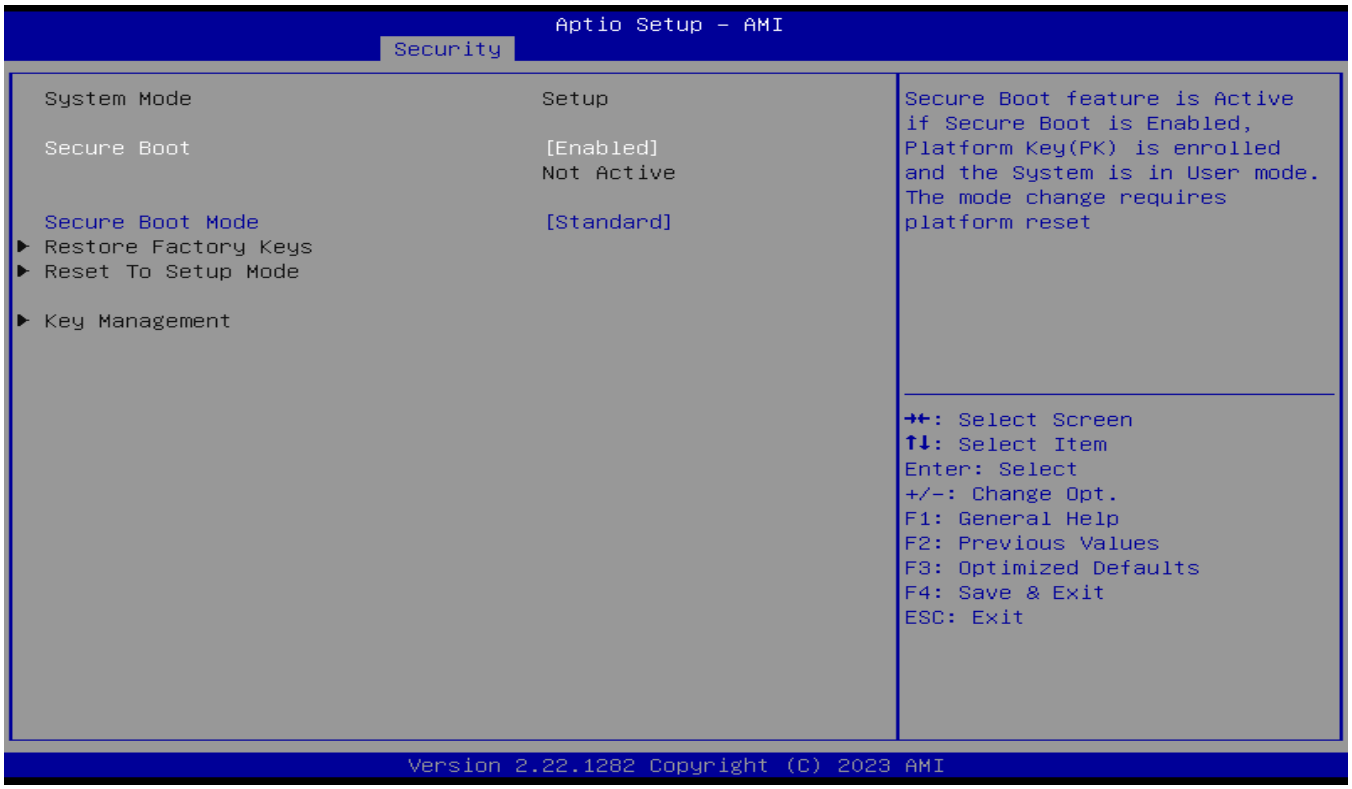
This item allows users to turn Internal Graphics on or off. When set to [Auto], it will be detected by BIOS.

- **GTT Size**
- **DVMT Pre-Allocated**
- **DVMT Total Gfx Mem**

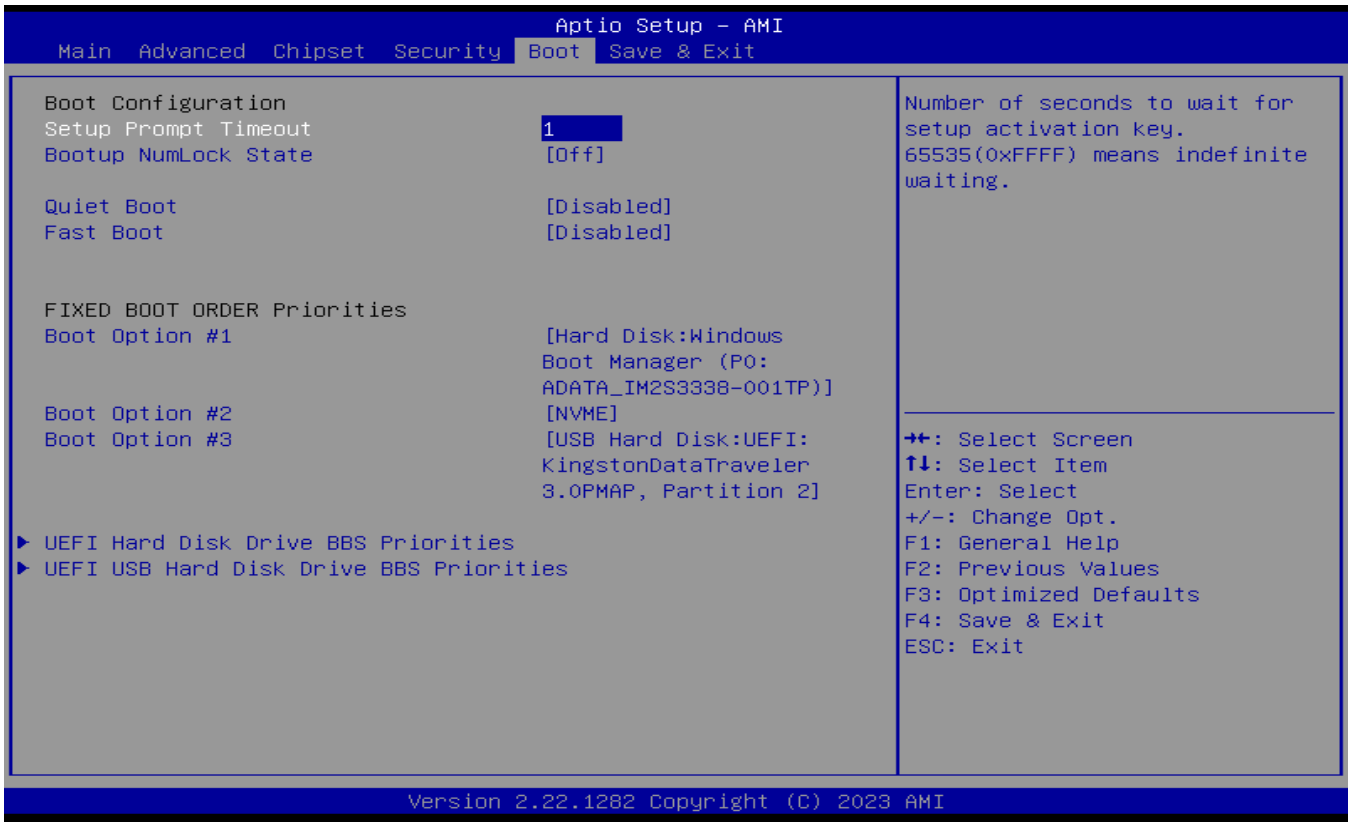
5.5 Security


Aptio Setup – AMI
Main Advanced Chipset Security Boot Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Secure Boot
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.22.1282 Copyright (C) 2023 AMI

5.5.1 Secure Boot



5.6 Boot



◆ Boot Option Priorities

The items allow you to set the sequence of boot devices where BIOS attempts to load the disk operating system.

5.7 Save & Exit