IVC-4700

In-Vehicle Computing

User's Manual

Version 1.0

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Cadia Networks, Inc.

User Manual

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This device complies to Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must withstand any background interference including those that may cause undesired operation.

Safety Information

Read the following precautions before setting up a CADIA NETWORKS Product.

Electrical safety

- To prevent electrical shock hazard, disconnect the power cable from the electrical outlet 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 you add a device.
- Before connecting or removing signal cables from the motherboard, ensure that all power cables are unplugged.
- Seek professional assistance before using an adapter or extension cord. These devices could interrupt the grounding circuit.
- Make sure that your power supply is set to the correct voltage in your area. If you are not sure about the voltage of the electrical outlet you are using, contact your local power company.
- If the power supply is broken, do not try to fix it by yourself. Contact a qualified service technician or your retailer.

Operation safety

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

CAUTION

Incorrectly replacing the battery may damage this computer. Replace only with the same or its equivalent as recommended by Cadia Networks, Inc.Dispose used battery according to the manufacturer's instructions.

Table of contents

page

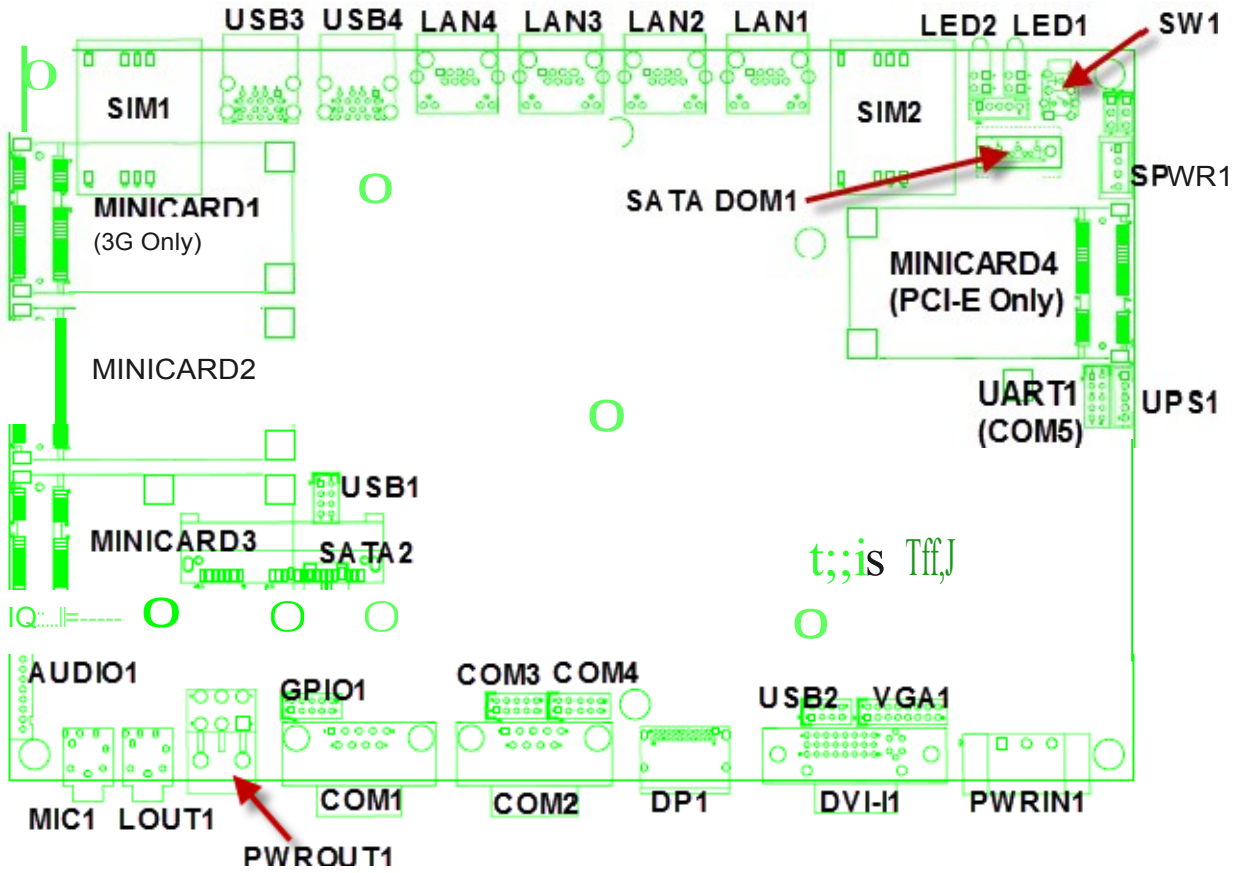
1.1 Model Specification

System	
CPU	Intel Gen 3 Core i7-3517UE 1.7GHz Intel Gen 3 Core i3-3217UE 1.6GHz Intel Gen 3 Celeron Dual Core 1047E 1.4GHz
Memory	1 x DDR3 1066/1333/1600 MHz SO-DIMM up to 8 GB
Chipset	QM77
LAN Chipset	Intel I210-AT Gb/s Ethernet Controllers Onboard Support PXE and WOL
Audio	Realtek ALC662 HD Codec onboard
Watchdog	Watchdog Timer Support, Offer 1 – 255 Step
Power Requirement	
Power Input	9V-32V DC Power input
Power Protection	Automatics Recovery Short Circuit Protection
Power Management	Vehicle Power Ignition for Variety Vehicle
Power Off Control	Power off Delay Time Setting by Software
Battery	Internal Battery Kit for 10 Mins Operating (Optional)
Storage	
Type	2 x 2.5” Drive Bay for SATA Type HDD / SSD, Support RAID 0, 1 1 x SATA DOM

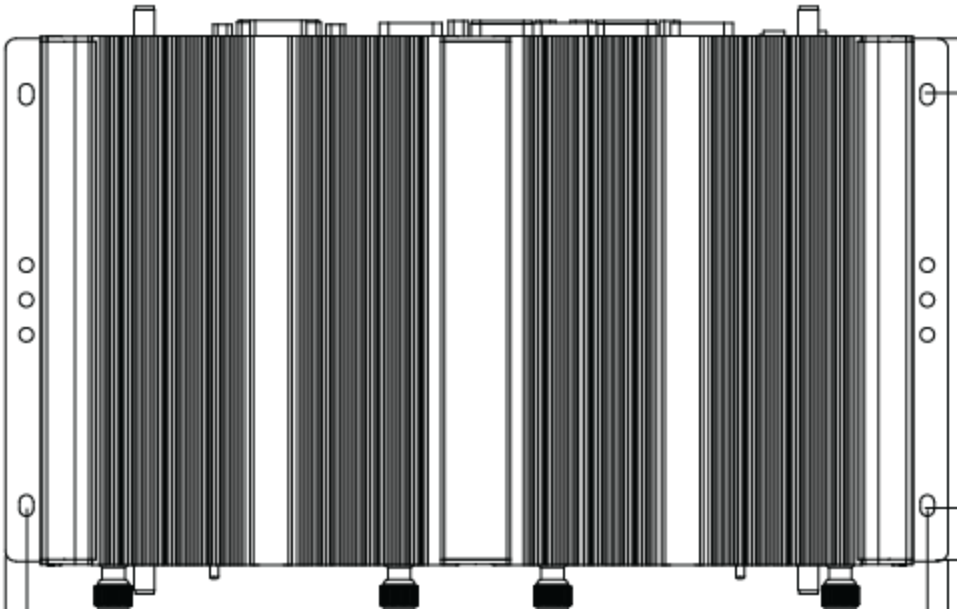
Graphics	
Graphics	Intel® HD Graphics 4000 DirectX Video Acceleration (DXVA) for Accelerating Video Processing - Full AVC/VC1/MPEG2 HW Decode Supports DirectX 11/10.1/10/9 and OpenGL 3.0
Resolution	Up to 1920 x 1200
Qualification	
Certifications	CE, FCC Class A, eMark
I/O	
Serial Port	4 x RS-232 (COM1,2 with RS-422/485, RS-485 Support Auto Direction Control)
USB Port	4 x USB 2.0 Ports on Front I/O
LAN	2 x RJ45 Ports for GbE
Video Port	1 x DVI-I, 1 x VGA and 1 x Display Port Output
DIO Port	4 in and 4 out with Relay 12V / 80mA
Audio	1 x Line-out and 1 x MIC-in
SIM Card Socket	2 x SIM Card sockets supported onboard with eject
Environment	
Operating Temp.	-40ºC ~ 70ºC (Default CPU 17Watt)
Storage Temp.	-40 ~ 80ºC
Relative Humidity	0% RH– 95% RH
Vibration (random)	2.5g@5~500 Hz with SSD
Vibration Operating	MIL-STD-810F, Method 514.5, Category 20, Ground Vehicle-Highway
Truck Storage	MIL-STD-810F, Method 514.5, Category 24, Integrity Test
Shock	Operating: MIL-STD-810F, Method 516.5, Procedure I, Trucks and semi-trailers=40G (11ms) with SSD
Crash Hazard	MIL-STD-810F, Method 516.5, Procedure V, Ground equipment=100
Mechanical	
Construction	Aluminum alloy
Mounting	Supports both of wall-mount/VESA-mount
Weight	1.780 kg (bare-bone)
Dimensions	250 x 150 x 55 mm

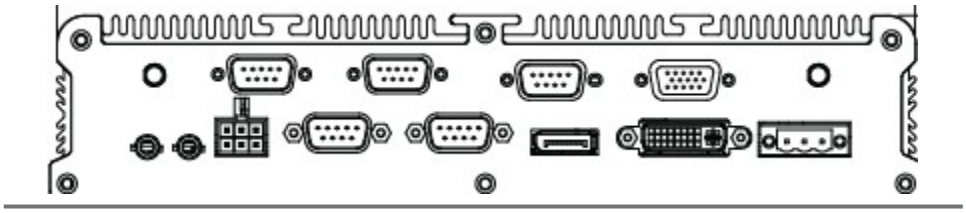
1.2 IVC-4700 Illustration

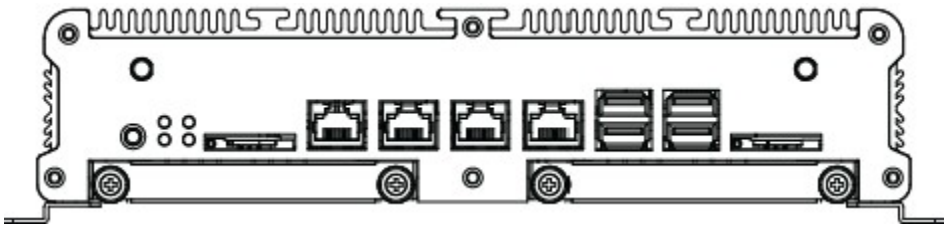
Main board



System







(2) Internal connector specification

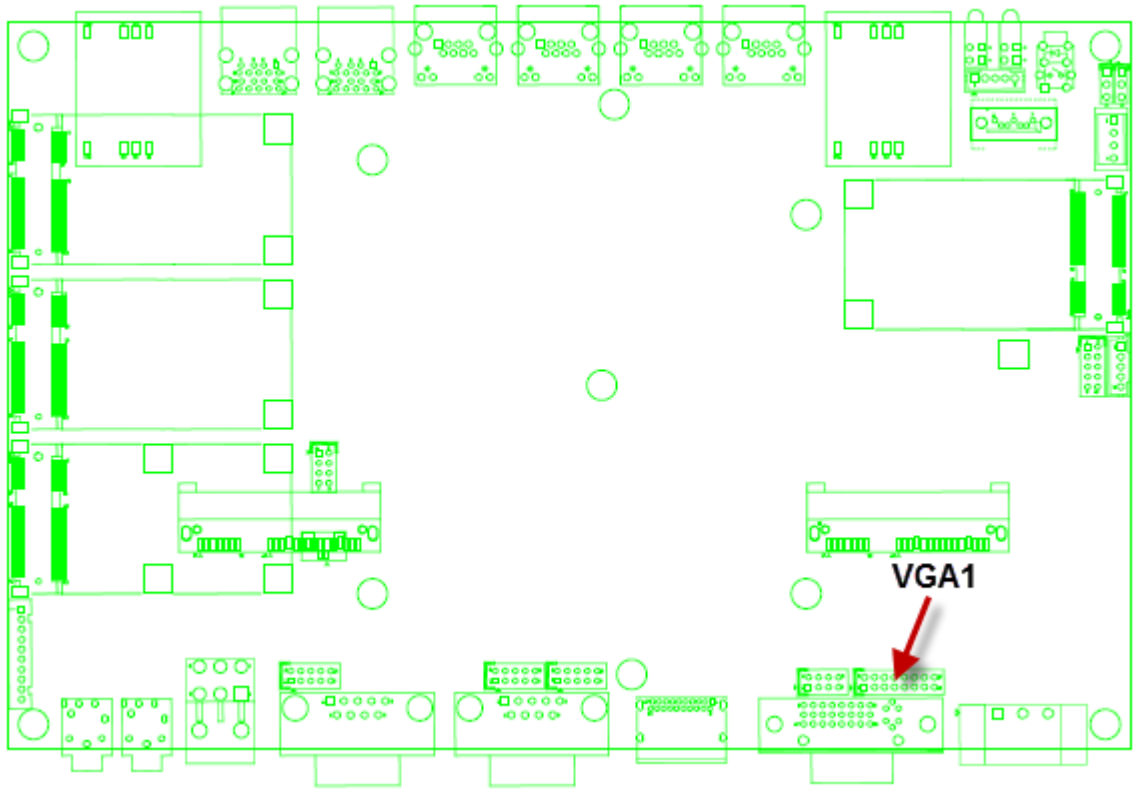
2.1 VGA connector

Connector size	2 X 8 = 16 Pin
Connector type	JST-2.0mm-M-180
Connector location	**VGA1**

Connector pin definition

Pin	Signal	Pin	Signal
1	RED	2	GREEN
3	BLUE	4	NC
5	CER_DET	6	GND
7	GND	8	GND
9	+5V	10	GND
11	NC	12	DAC_SDA
13	HSYNC	14	VSYNC
15	DAC_SCL	16	NC

Connector map



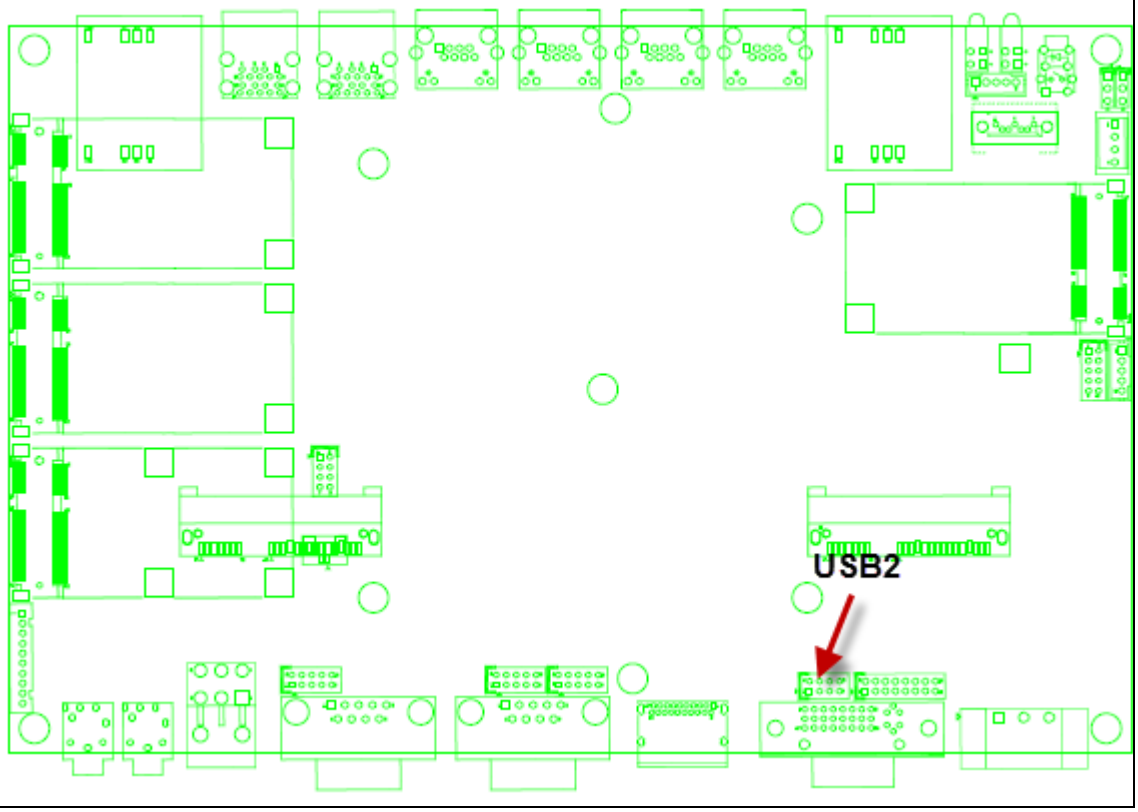
2.2 USB connector

Connector size	2 X 4 = 8 Pin
Connector type	JST-2.0mm-M-180
Connector location	**USB2 (Co-layout with DVI-I1)**

Connector pin definition

Pin	Signal	Pin	Signal
1	5VSB	2	5VSB
3	USB_7N	4	NC
5	USB_7P	6	NC
7	GND	8	GND

Connector map



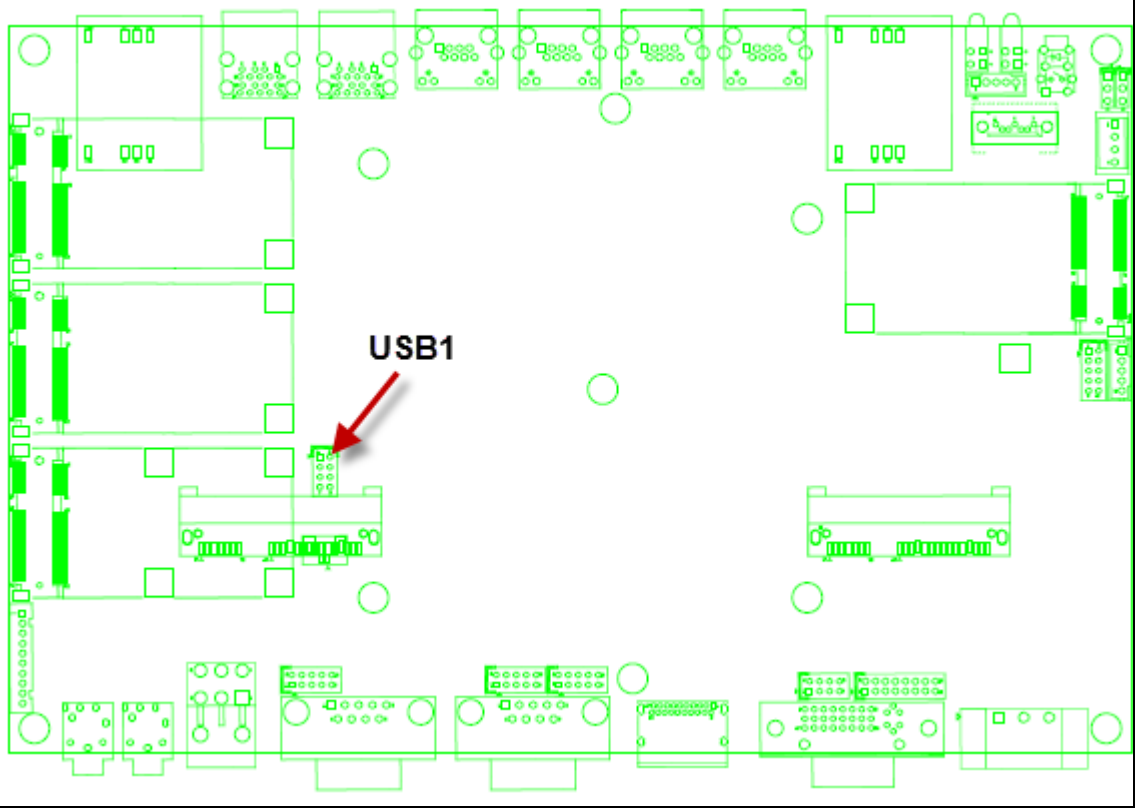
2.3 USB connector

Connector size	2 X 4 = 8 Pin
Connector type	JST-2.0mm-M-180
Connector location	**USB3 (Co-layout with MINICARD3)**

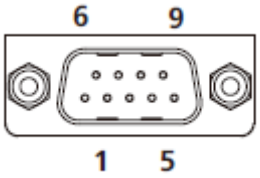
Connector pin definition

Pin	Signal	Pin	Signal
1	5VSB	2	5VSB
3	USB_6N	4	NC
5	USB_6P	6	NC
7	GND	8	GND

Connector map



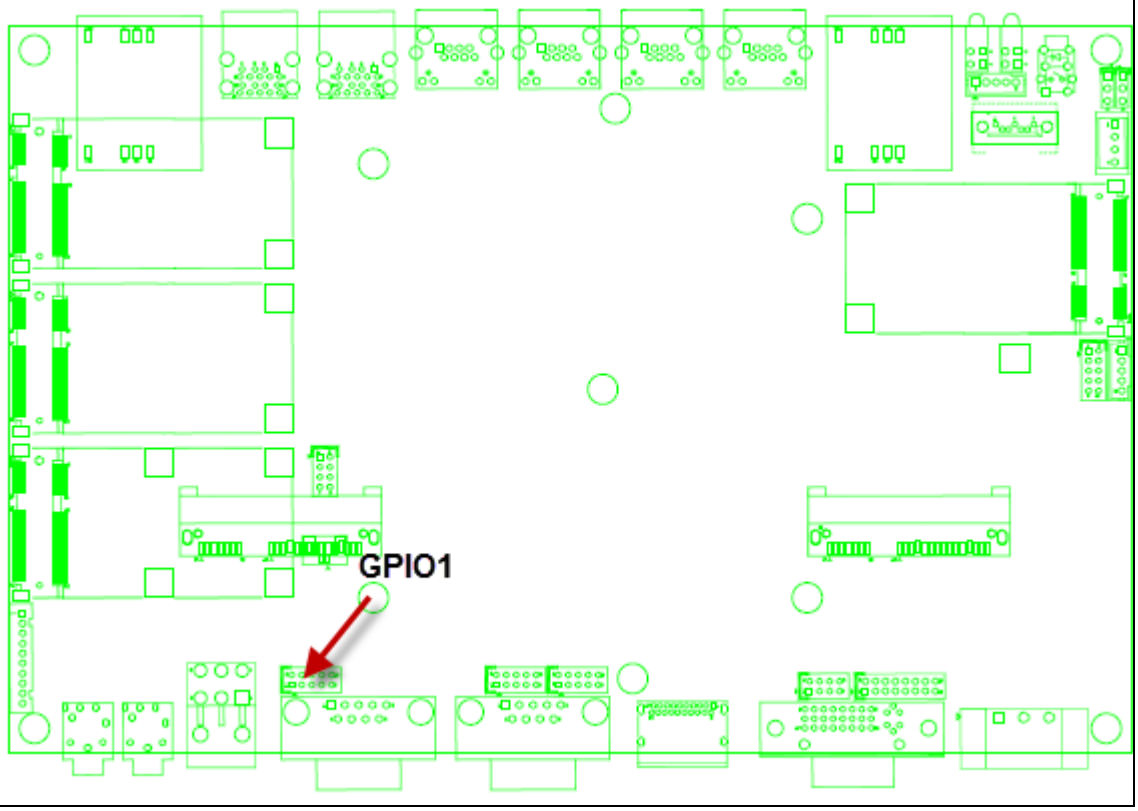
2.4 GPIO connector

Connector size	2 X 5 = 10 Pin
Connector type	JST-2.0mm-M-180
Connector location	**GPIO1** 

Connector pin definition

Pin	Signal	Pin	Signal
1	GPI0	2	GPI1
3	GPI2	4	GPI3
5	GPO0	6	GPO1
7	GPO2	8	GPO3
9	GND	10	+12V

Connector map



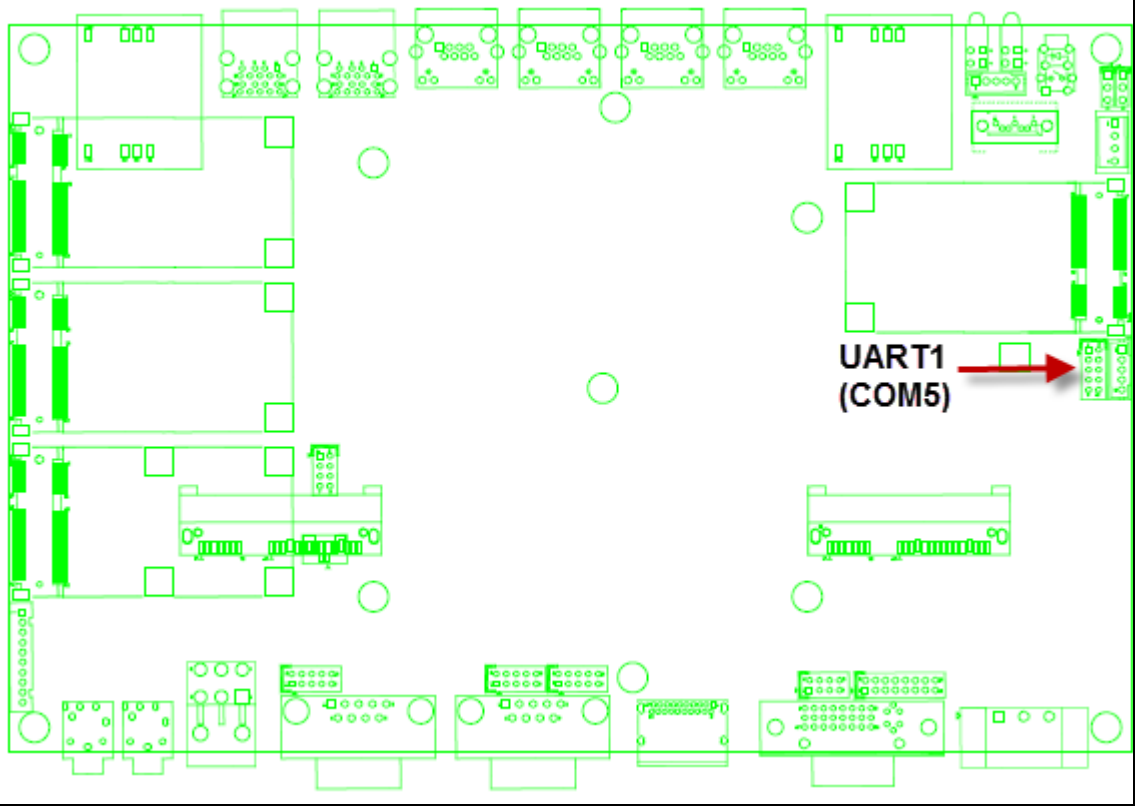
2.5 UART connector

Connector size	2 X 5 = 10 Pin
Connector type	JST-2.0mm-M-180
Connector location	**UART1 (COM5 for GPS Module when VDB-800 is installed)** **Baud Rate : 9600**

Connector pin definition

Pin	Signal	Pin	Signal
1	NC	2	COM5_RX
3	COM5_TX	4	NC
5	GND	6	NC
7	NC	8	GND
9	NC	10	+5V

Connector map



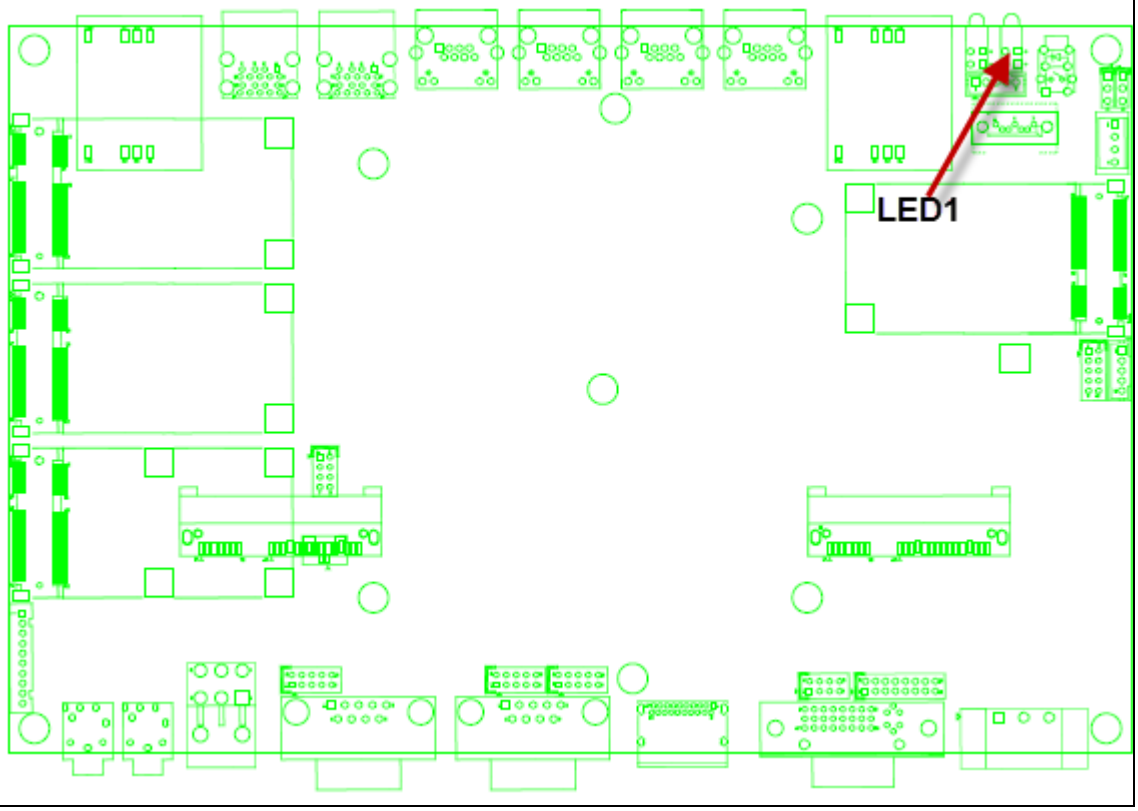
2.6 LED connector

Connector size	2 X 2 = 4 Pin
Connector type	LED WITH HOUSING
Connector location	**LED1**

Connector pin definition

Pin	Signal	Pin	Signal
A1	3.5G_LED_P	A2	UPS_LED_P
C1	3.5G_LED_N	C2	UPS_LED_N

Connector map



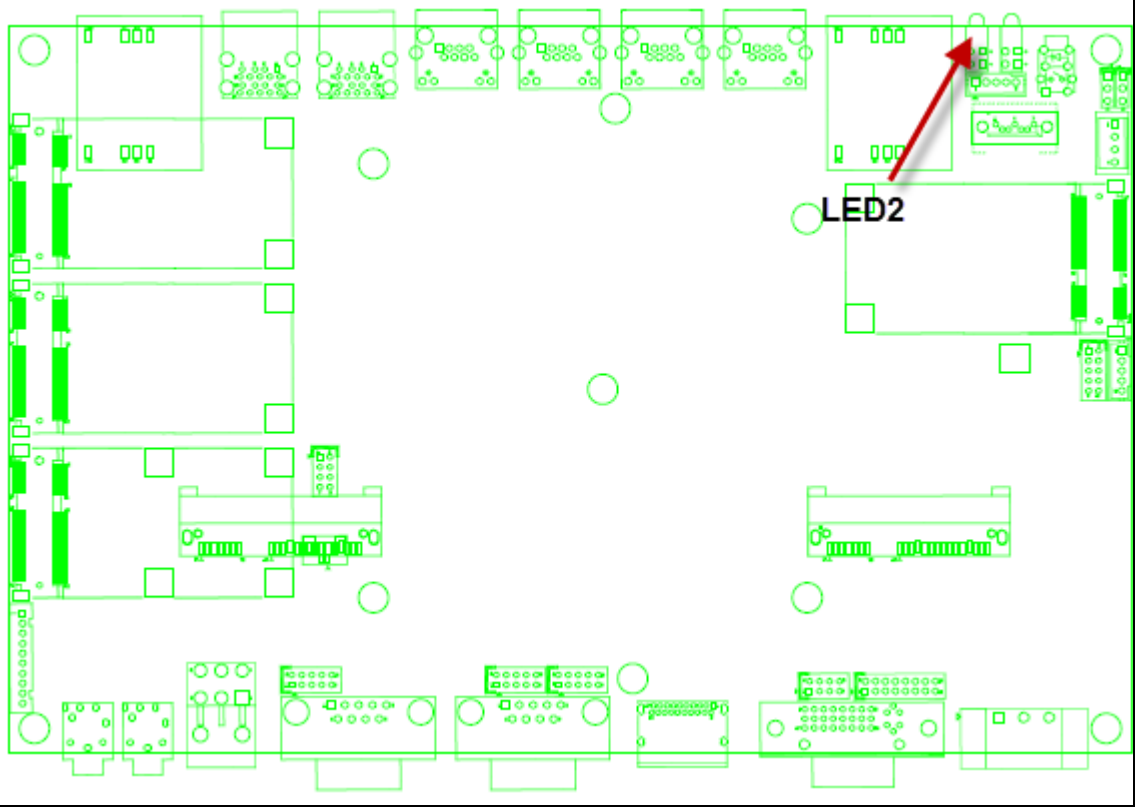
2.7 LED connector

Connector size	2 X 2 = 4 Pin
Connector type	LED WITH HOUSING
Connector location	**LED2**

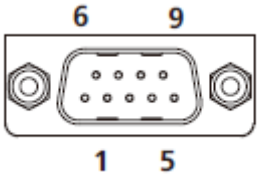
Connector pin definition

Pin	Signal	Pin	Signal
A1	ACC_LED_P	A2	HDD_LED_P
C1	ACC_LED_N	C2	HDD_LED _N

Connector map



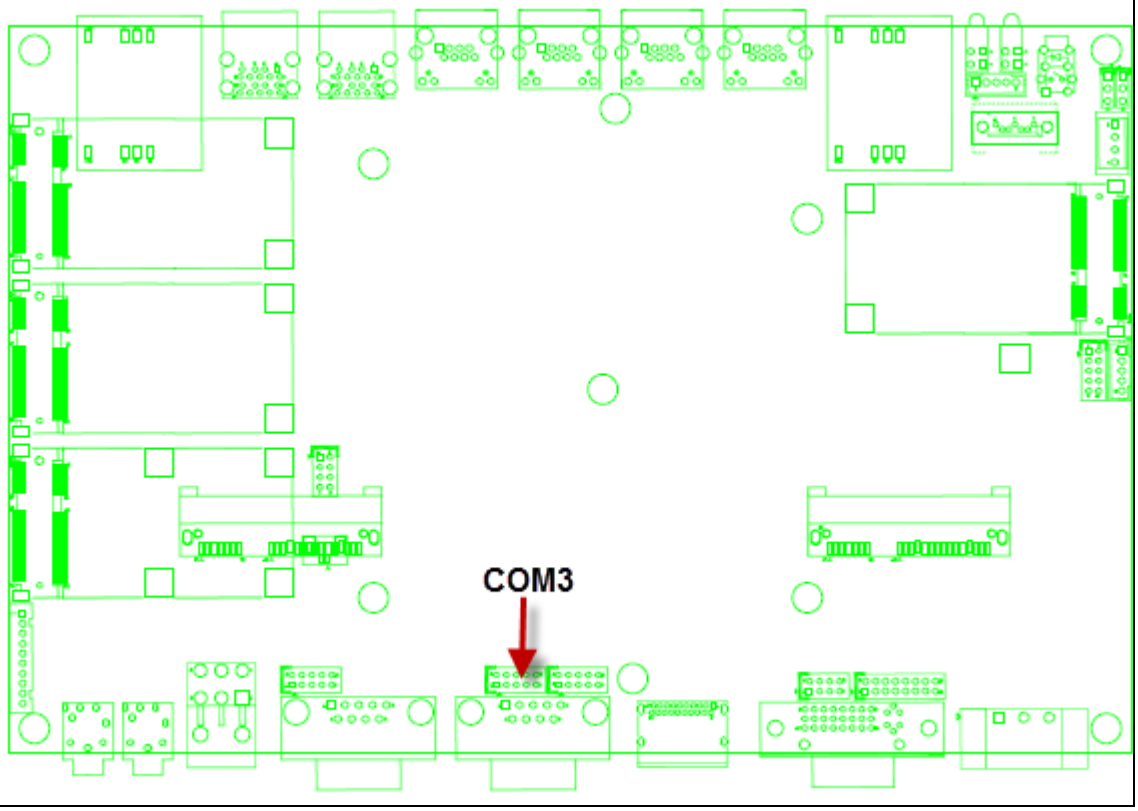
2.8 COM connector

Connector size	2 X 5 = 10 Pin
Connector type	JST-2.0mm-M-180
Connector location	**COM3** 

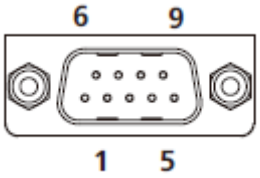
Connector pin definition

Pin	Signal	Pin	Signal
1	COM3_DCD	2	COM3_RXD
3	COM3_TXD	4	COM3_DTR
5	GND	6	COM3_DSR
7	COM3_RTS	8	COM3_CTS
9	COM3_RI	10	GND

Connector map



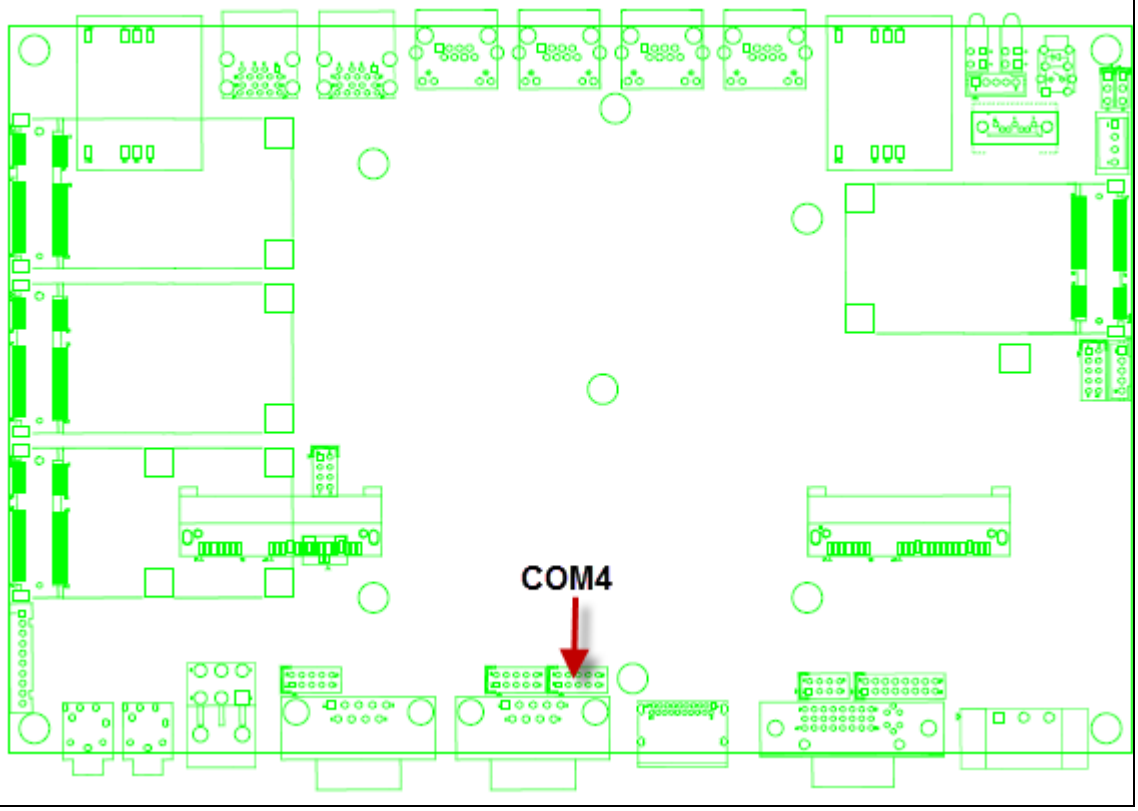
2.9 COM connector

Connector size	2 X 5 = 10 Pin
Connector type	JST-2.0mm-M-180
Connector location	**COM4** 

Connector pin definition

Pin	Signal	Pin	Signal
1	COM4_DCD	2	COM4_RXD
3	COM4_TXD	4	COM4_DTR
5	GND	6	COM4_DSR
7	COM4_RTS	8	COM43_CTS
9	COM4_RI	10	GND

Connector map



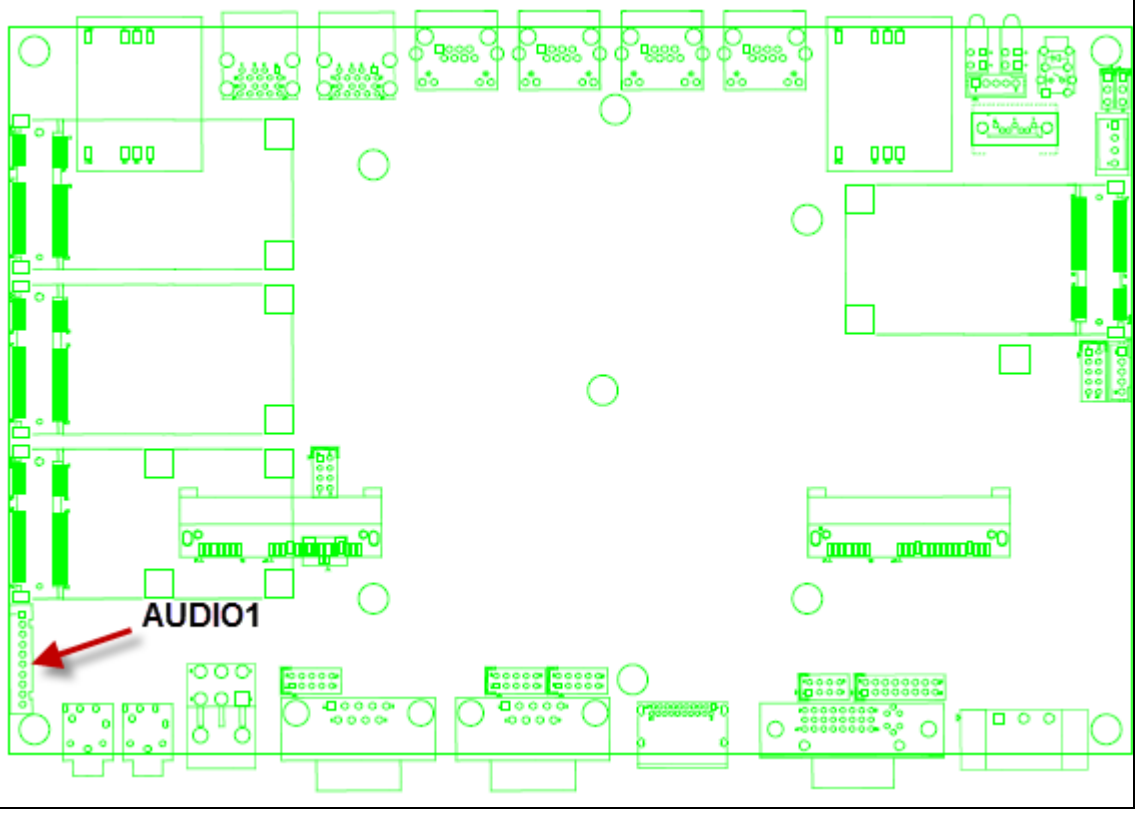
2.10 AUDIO connector

Connector size	1 X 10 = 10 Pin
Connector type	JST-2.0mm-M-180
Connector location	**AUDIO1**

Connector pin definition

Pin	Signal
1	NC
2	NC
3	NC
4	NC
5	NC
6	NC
7	MIC_IN_ L
8	MIC_IN_R
9	MIC-JD
10	GND

Connector map



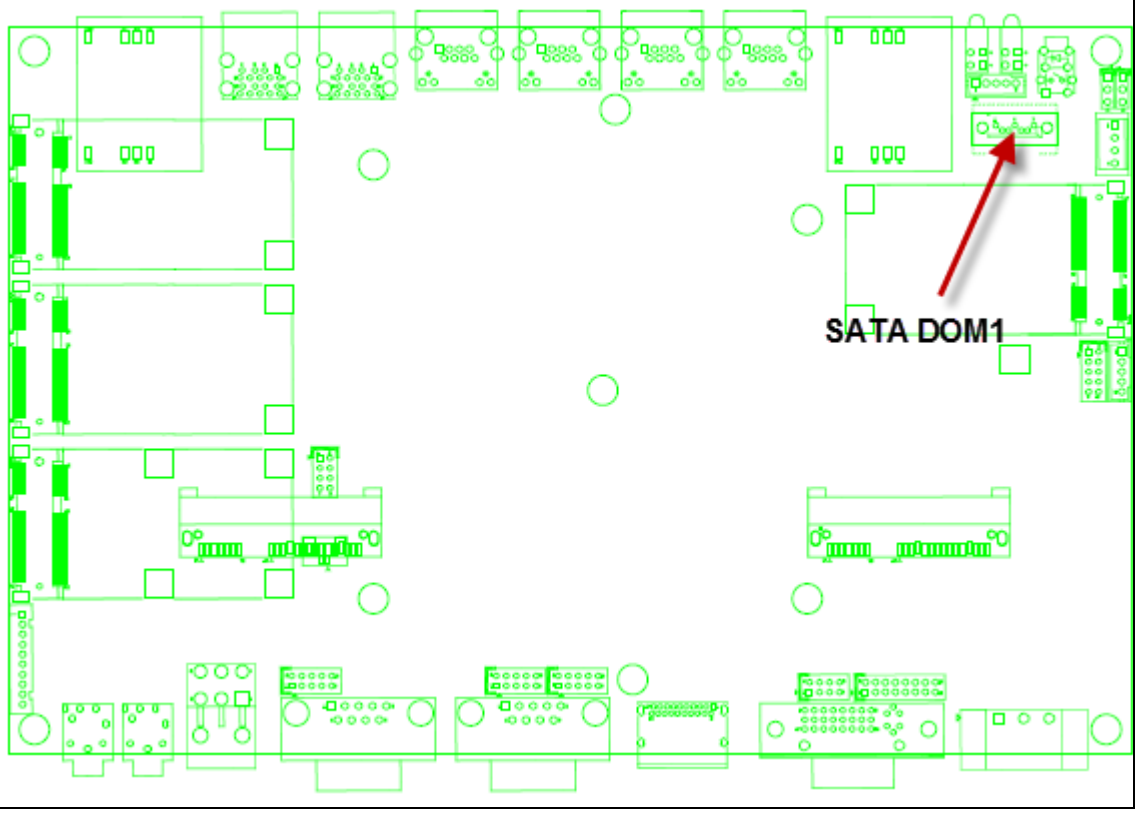
2.11 SATA connector

Connector size	1 X 7 = 7 Pin
Connector type	SATA 1.27mm-M-180D
Connector location	**SATA DOM1**

Connector pin definition

Pin	Signal
1	GND
2	SATA_TXP2
3	SATA_TXN2
4	GND
5	SATA_RXN2
6	SATA_RXP2
7	GND

Connector map



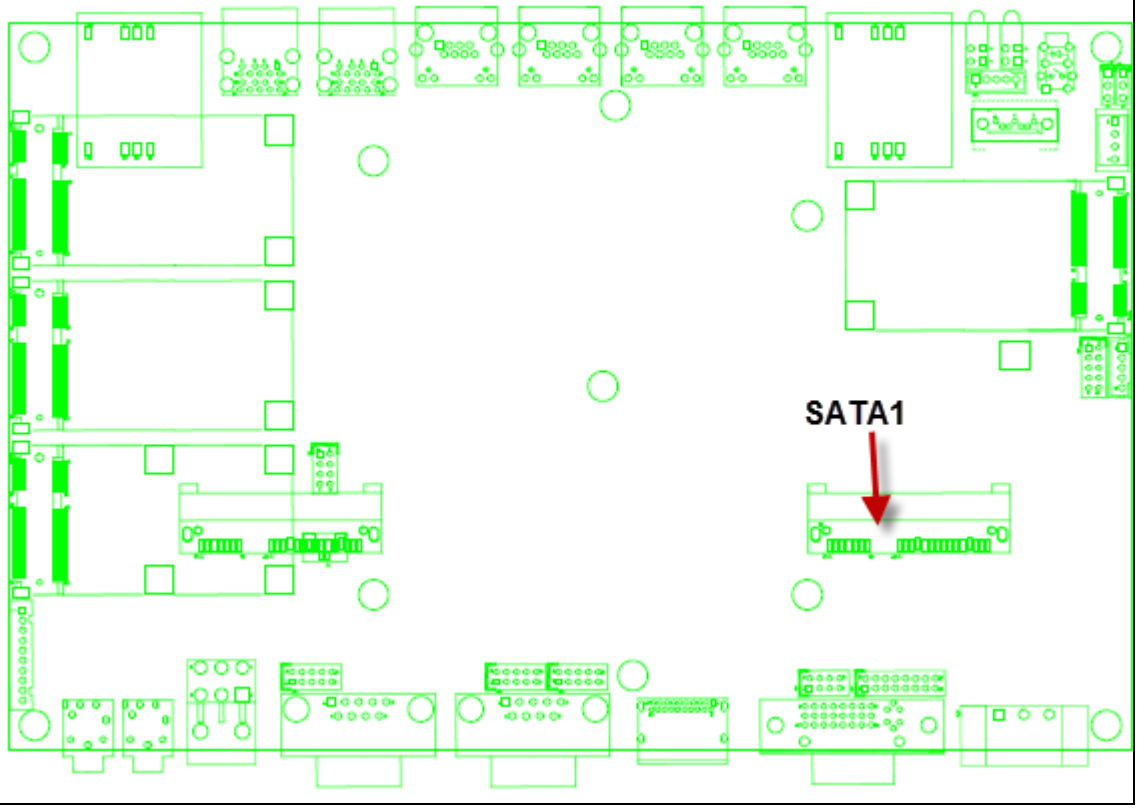
2.12 SATA connector

Connector size	1 X 7 = 7 Pin
Connector type	SATA 1.27mm-M-180D
Connector location	**SATA1**

Connector pin definition

Pin	Signal	Pin	Signal
S1	GND	P1	NC
S2	SATA_TXP0	P2	NC
S3	SATA_TXN0	P3	NC
S4	GND	P4	GND
S5	SATA_RXN0	P5	GND
S6	SATA_RXP0	P6	GND
S7	GND	P7	+5V
		P8	+5V
		P9	+5V
		P10	NC
		P11	GND
		P12	GND
		P13	NC
		P14	NC
		P15	NC

Connector map



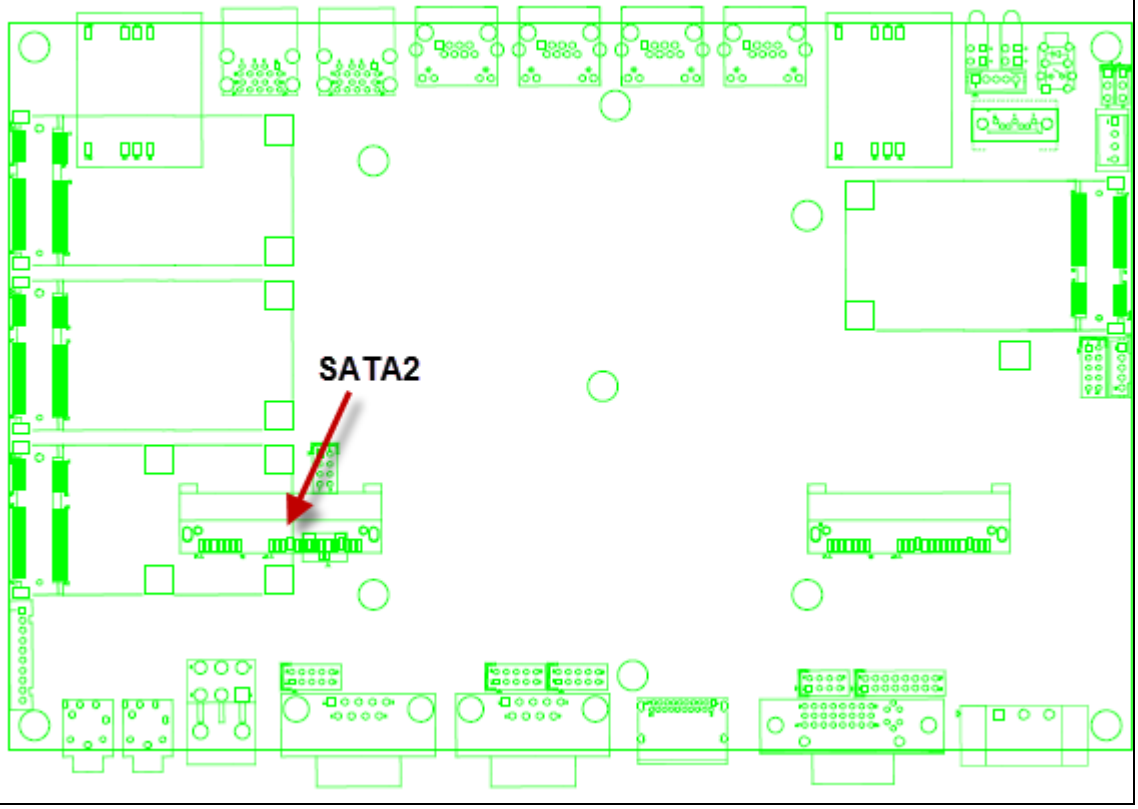
2.13 SATA connector

Connector size	1 X 7 = 7 Pin
Connector type	SATA 1.27mm-M-180D
Connector location	**SATA2**

Connector pin definition

Pin	Signal	Pin	Signal
S1	GND	P1	NC
S2	SATA_TXP1	P2	NC
S3	SATA_TXN1	P3	NC
S4	GND	P4	GND
S5	SATA_RXN1	P5	GND
S6	SATA_RXP1	P6	GND
S7	GND	P7	+5V
		P8	+5V
		P9	+5V
		P10	NC
		P11	GND
		P12	GND
		P13	NC
		P14	NC
		P15	NC

Connector map

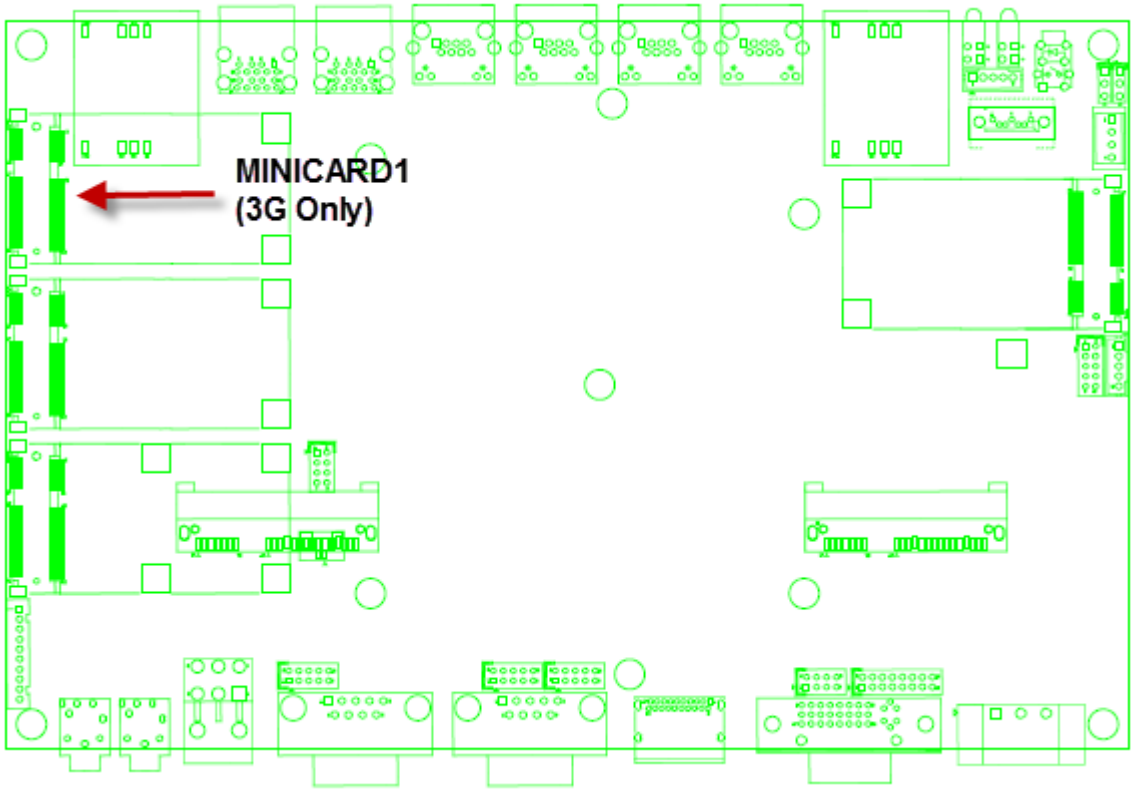


2.14 Mini PCI-E connector

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	PCIE_WAKE#	2	3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	MINICARD1_CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DAT
11	NC	12	UIM_CLK
13	NC	14	UIM_RST
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD 1_DIS#
21	GND	22	PCIE_RST#
23	NC	24	3VSB
25	NC	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	NC	32	SMB_DATA
33	NC	34	GND
35	GND	36	USB_4N
37	GND	38	USB_4P
39	3VSB	40	GND
41	3VSB	42	LED_WWA N#
43	GND	44	LED_WAN#
45	NC	46	LED_WPAN #
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	3VSB

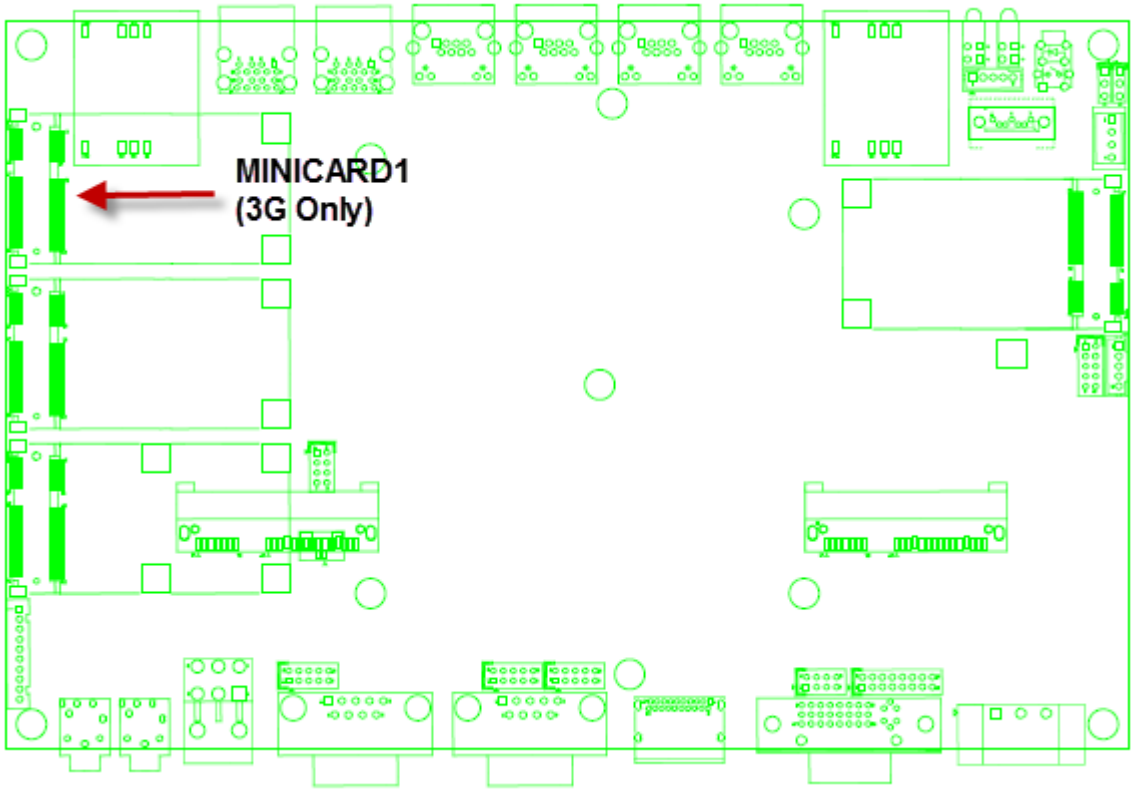
Connector map	

2.15 Mini PCI-E connector

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	PCIE_WAKE#	2	3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	MINICARD2_CLKREQ#	8	UIM_PWR
9	GND	10	UIM_DAT
11	PCIE_MCARD2_CLK_N	12	UIM_CLK
13	PCIE_MCARD2_CLK_P	14	UIM_RST
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD2_DIS#
21	GND	22	PCIE_RST#
23	PCIE_MCARD2_RX_N	24	3VSB
25	PCIE_MCARD2_RX_P	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_MCARD2_TX_N	32	SMB_DATA
33	PCIE_MCARD2_TX_P	34	GND
35	GND	36	USB_5N
37	GND	38	USB_5P
39	3VSB	40	GND
41	3VSB	42	LED_WWAN#
43	GND	44	LED_WAN#
45	NC	46	LED_WPAN#
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	3VSB

Connector map	

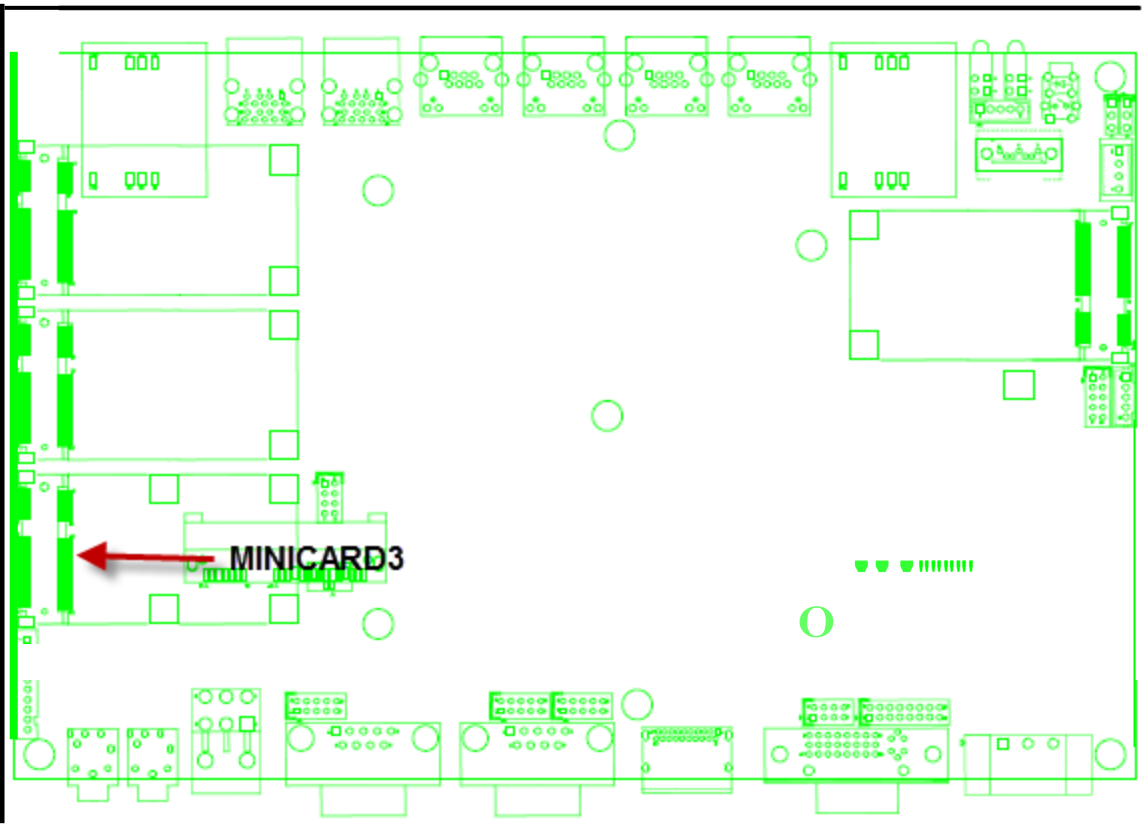
2.16 Mini PCI-E connector

Connector size	2 X 26 = 52 Pin
Connector type	MINI PCI-E CON 9.2mmH
Connector location	**MINICARD3**

Connector pin definition

Pin	Signal	Pin	Signal
1	PCIE_WAKE#	2	3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	MINICARD3_CLKREQ#	8	NC
9	GND	10	NC
11	PCIE_MCARD3_CLK_N	12	NC
13	PCIE_MCARD3_CLK_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD3_DIS#
21	GND	22	PCIE_RST#
23	PCIE_MCARD3_RX_N	24	3VSB
25	PCIE_MCARD3_RX_P	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_MCARD3_TX_N	32	SMB_DATA
33	PCIE_MCARD3_TX_P	34	GND
35	GND	36	USB_6N
37	GND	38	USB_6P
39	3VSB	40	GND
41	3VSB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	3VSB

Connector map

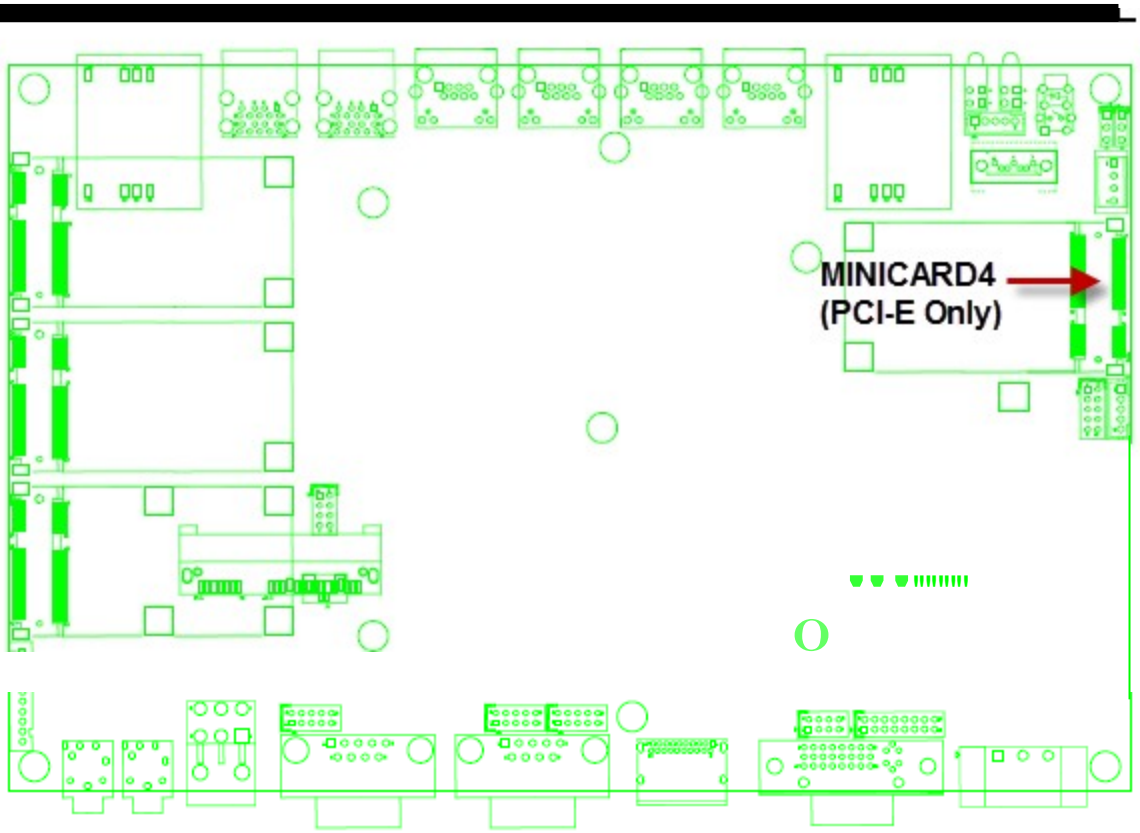


2.17 Mini PCI-E connector

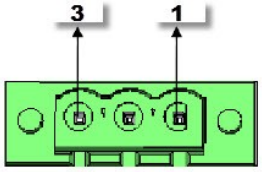
Connector size	2 X 26 = 52 Pin
Connector type	MINI PCI-E CON 9.2mmH
Connector location	**MINICARD4**

Connector pin definition

Pin	Signal	Pin	Signal
1	PCIE_WAKE#	2	3VSB
3	NC	4	GND
5	NC	6	+1.5V
7	MINICARD4_CLKREQ#	8	NC
9	GND	10	NC
11	PCIE_MCARD4_CLK_N	12	NC
13	PCIE_MCARD4_CLK_P	14	NC
15	GND	16	NC
17	NC	18	GND
19	NC	20	MINICARD4_DIS#
21	GND	22	PCIE_RST#
23	PCIE_MCARD4_RX_N	24	3VSB
25	PCIE_MCARD4_RX_P	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_MCARD4_TX_N	32	SMB_DATA
33	PCIE_MCARD4_TX_P	34	GND
35	GND	36	NC
37	GND	38	NC
39	3VSB	40	GND
41	3VSB	42	NC
43	GND	44	NC
45	NC	46	NC
47	NC	48	+1.5V
49	NC	50	GND
51	NC	52	3VSB

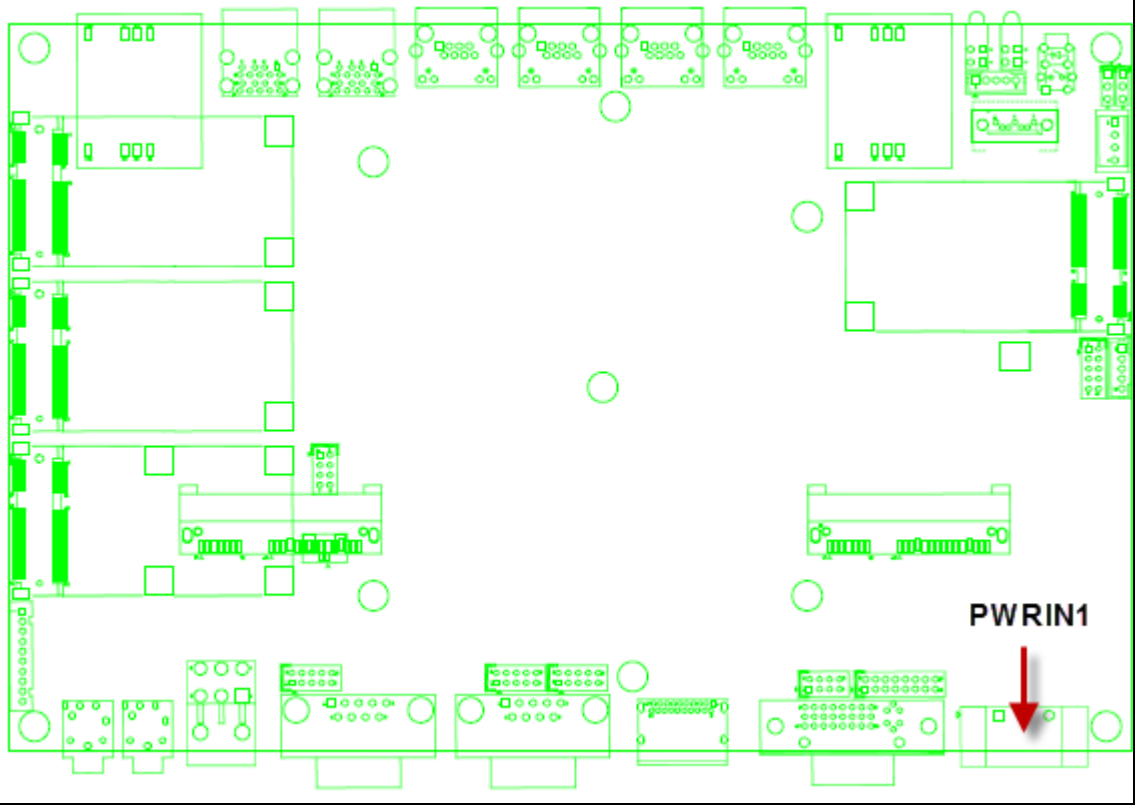
Connector map	

2.18 POWER Input connector

Connector size	1 X 3 = 3 Pin
Connector type	DIP ME050-508-03G MALE 90D (5.08mm-90D)
Connector location	**PWRIN1** 
Connector pin definition	

Pin	Signal
1	GND
2	VIN (9-32V)
3	IGNITION

Connector map

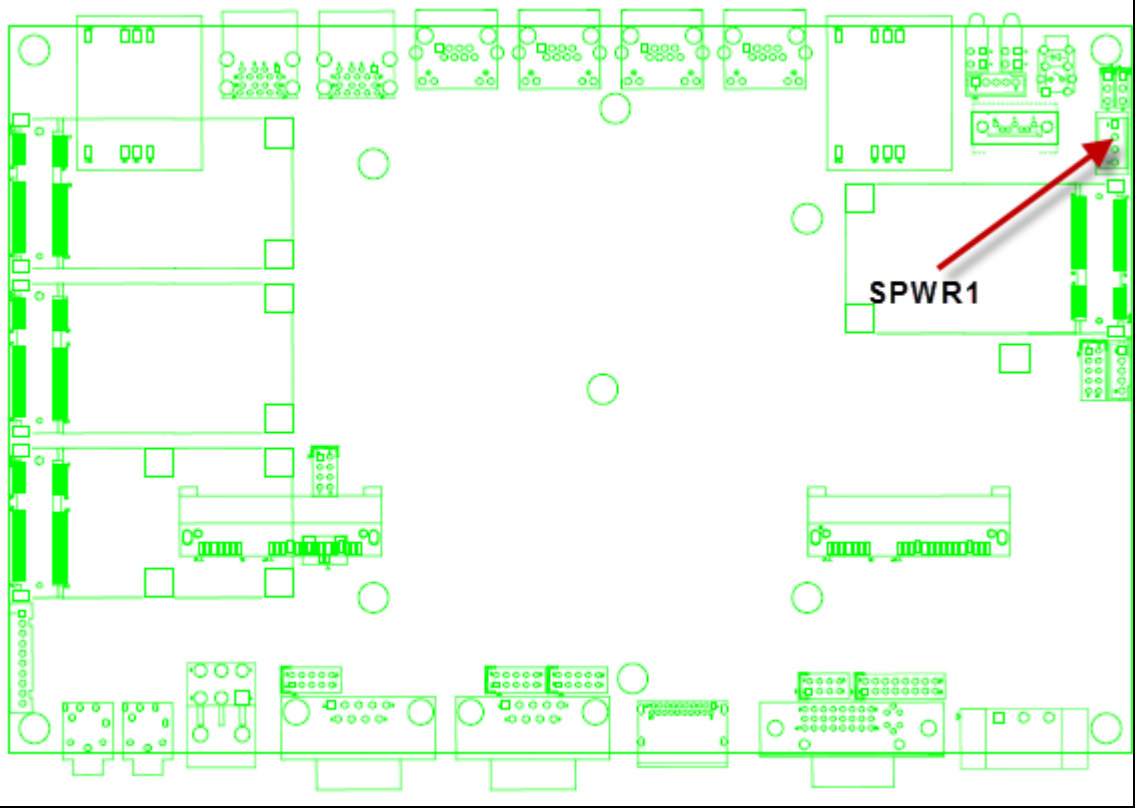


2.19 SATA power connector

Connector size	1 X 4 = 4 Pin
Connector type	WAFER 2.54mm-M-180
Connector location	**SPWR1**
Connector pin definition	

Pin	Signal
1	+5V
2	GND
3	GND
4	+12V

Connector map

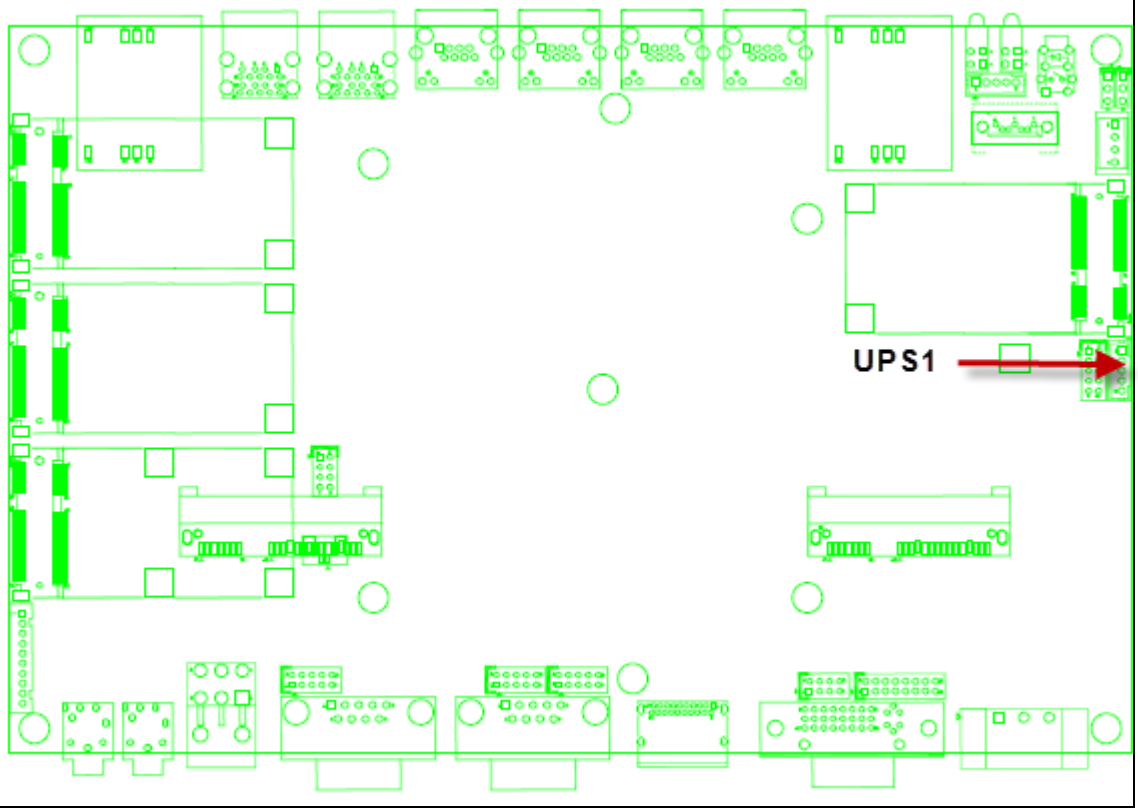


2.20 UPS power connector

Connector size	1 X 4 = 4 Pin
Connector type	WAFER 2.54mm-M-180
Connector location	**UPS1**
Connector pin definition	

Pin	Signal
1	+12V
2	+12V
3	GND
4	GND

Connector map



(3) External connector specification

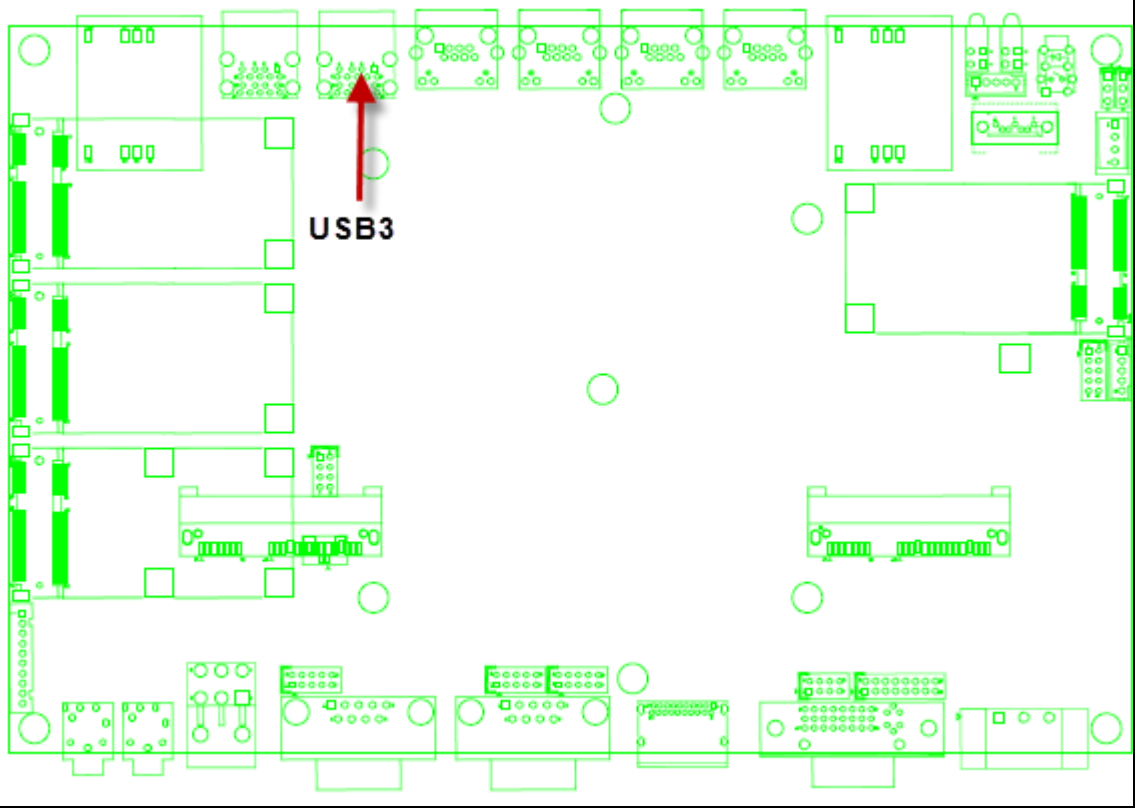
3.1 USB connector

Connector size	8 Pin
Connector type	USB3.0 Type A
Connector location	**USB3**

Connector pin definition

Pin	Signal	Pin	Signal
1	5VSB	2	USB0_N
3	USB0_P	4	GND
5	SSRX0_ON	6	SSRX0_OP
7	GND	8	SSTX0_ON
9	SSTX0_OP	10	5VSB
11	USB1_N	12	USB1_P
13	GND	14	SSRX1_ON
15	SSRX1_OP	16	GND
17	SSTX1_ON	18	SSTX1_OP

Connector map



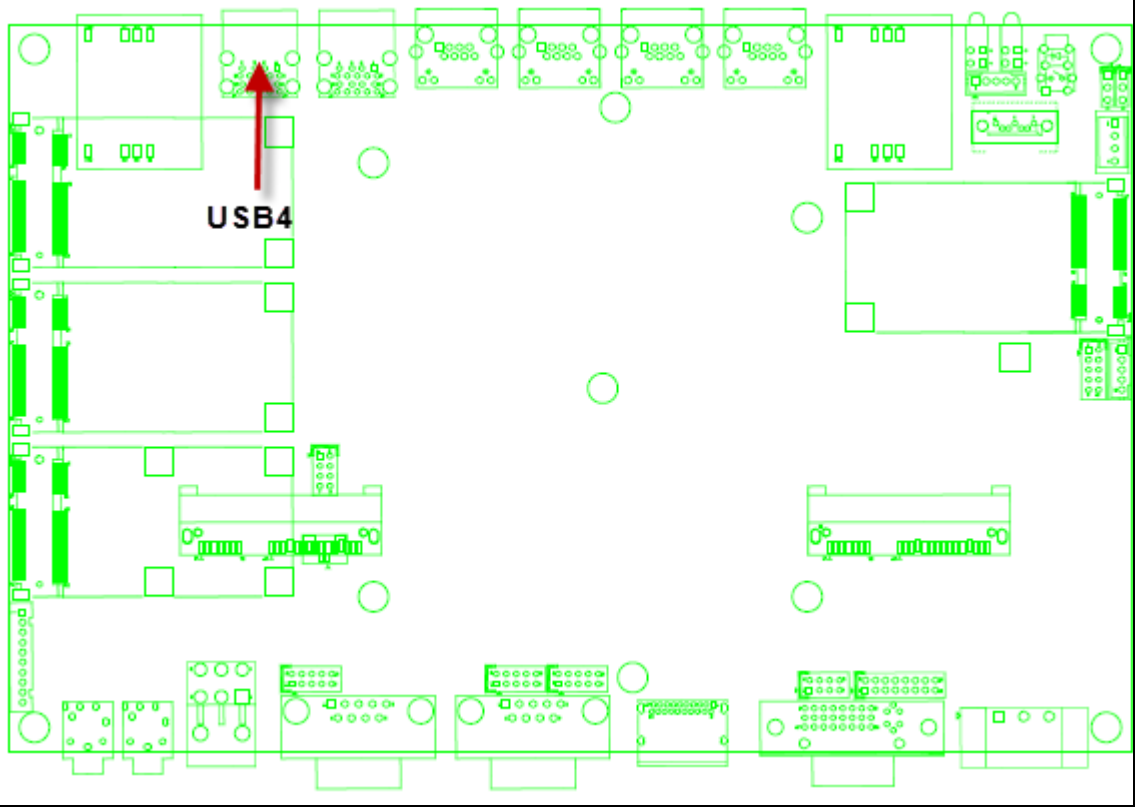
3.2 USB connector

Connector size	8 Pin
Connector type	USB3.0 Type A
Connector location	**USB4**

Connector pin definition

Pin	Signal	Pin	Signal
1	5VSB	2	USB2_N
3	USB2_P	4	GND
5	SSRX2_ON	6	SSRX2_OP
7	GND	8	SSTX20_ON
9	SSTX2_OP	10	5VSB
11	USB3_N	12	USB3_P
13	GND	14	SSRX3_ON
15	SSRX3_OP	16	GND
17	SSTX3_ON	18	SSTX3_OP

Connector map



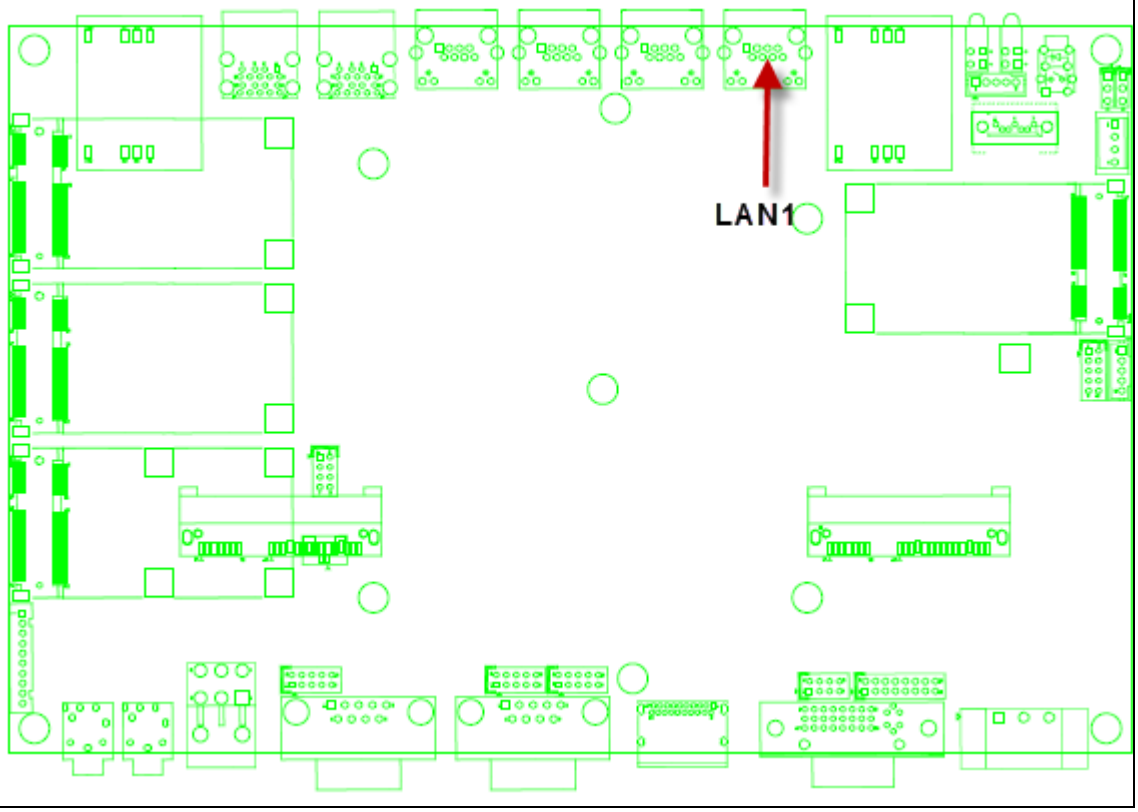
3.3 LAN connector

Connector size	12 Pin
Connector type	RJ45+LED
Connector location	**LAN1**

Connector pin definition

Pin	Signal	Pin	Signal
1	LAN0_MDI0P	2	LAN0_MDI0N
3	LAN0_MDI1P	4	LAN0_MDI2P
5	LAN0_MDI2N	6	LAN0_MDI1N
7	LAN0_MDI3P	8	LAN0_MDI3N
9	LAN0_ACT#	10	LAN0_ACTPW
11	LAN0_LINK#	12	LAN0_LINKPW

Connector map



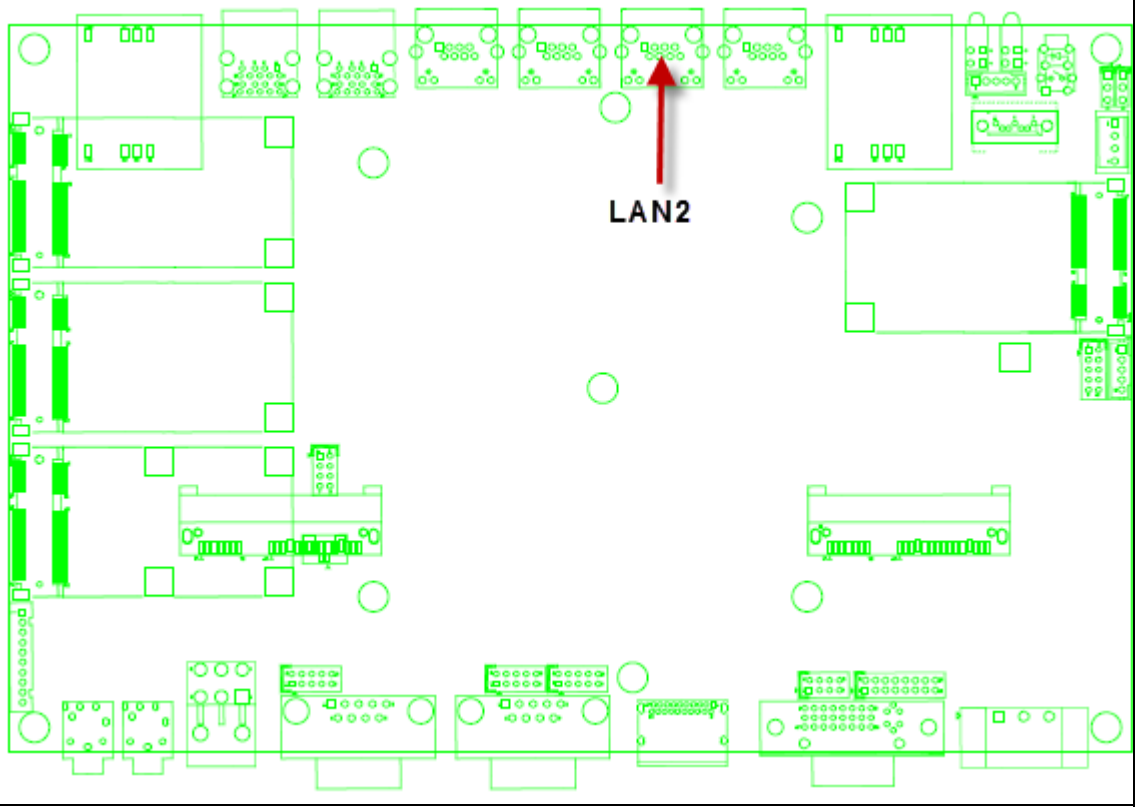
3.4 LAN connector

Connector size	12 Pin
Connector type	RJ45+LED
Connector location	**LAN2**

Connector pin definition

Pin	Signal	Pin	Signal
1	LAN1_MDI0P	2	LAN1_MDI0N
3	LAN1_MDI1P	4	LAN1_MDI2P
5	LAN1_MDI2N	6	LAN1_MDI1N
7	LAN1_MDI3P	8	LAN1_MDI3N
9	LAN1_ACT#	10	LAN1_ACTPW
11	LAN1_LINK#	12	LAN1_LINKPW

Connector map



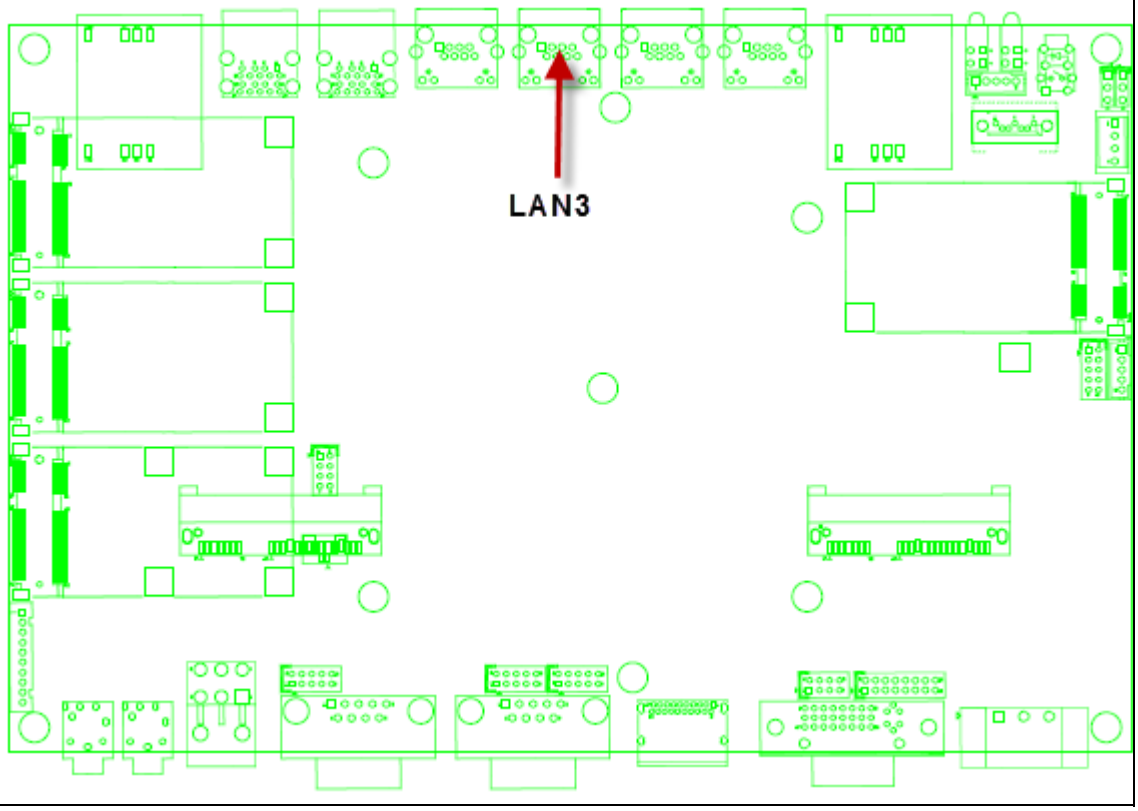
3.5 LAN connector

Connector size	12 Pin
Connector type	RJ45+LED
Connector location	**LAN3**

Connector pin definition

Pin	Signal	Pin	Signal
1	LAN2_MDI0P	2	LAN2_MDI0N
3	LAN2_MDI1P	4	LAN2_MDI2P
5	LAN2_MDI2N	6	LAN2_MDI1N
7	LAN2_MDI3P	8	LAN2_MDI3N
9	LAN2_ACT#	10	LAN2_ACTPW
11	LAN2_LINK#	12	LAN2_LINKPW

Connector map



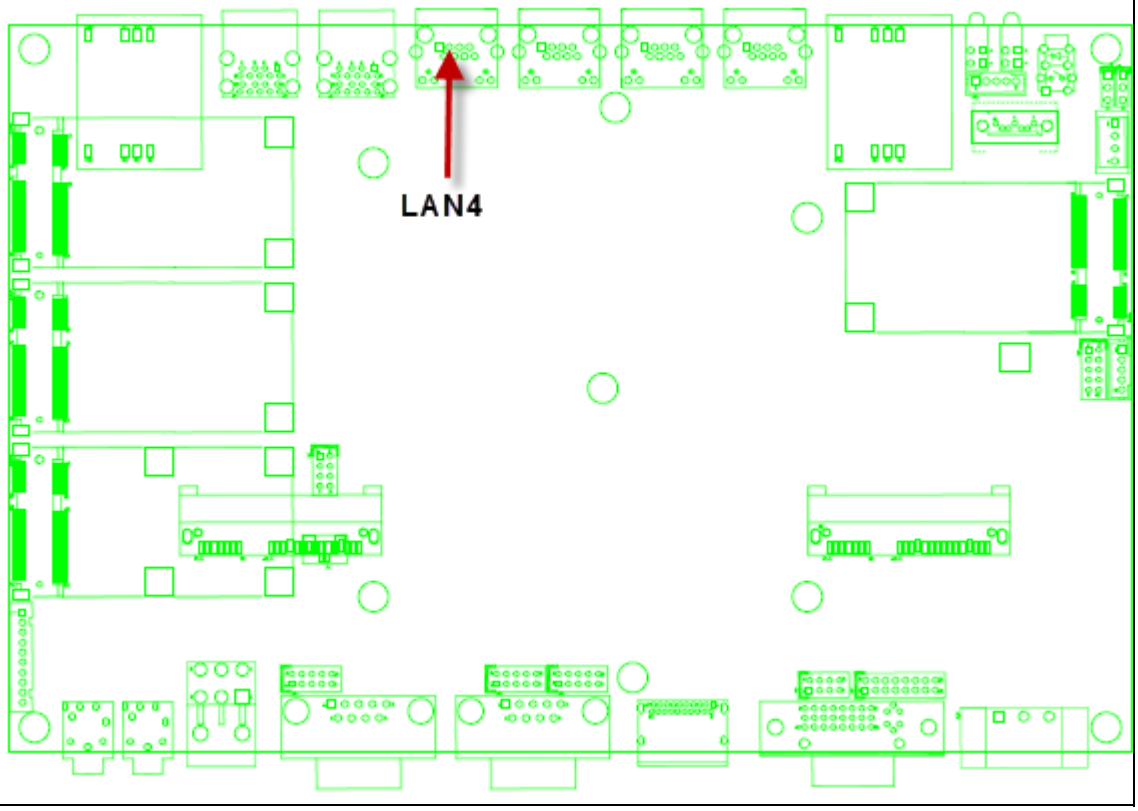
3.6 LAN connector

Connector size	12 Pin
Connector type	RJ45+LED
Connector location	**LAN4**

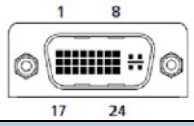
Connector pin definition

Pin	Signal	Pin	Signal
1	LAN3_MDI0P	2	LAN3_MDI0N
3	LAN3_MDI1P	4	LAN3_MDI2P
5	LAN3_MDI2N	6	LAN3_MDI1N
7	LAN3_MDI3P	8	LAN3_MDI3N
9	LAN3_ACT#	10	LAN3_ACTPW
11	LAN3_LINK#	12	LAN3_LINKPW

Connector map



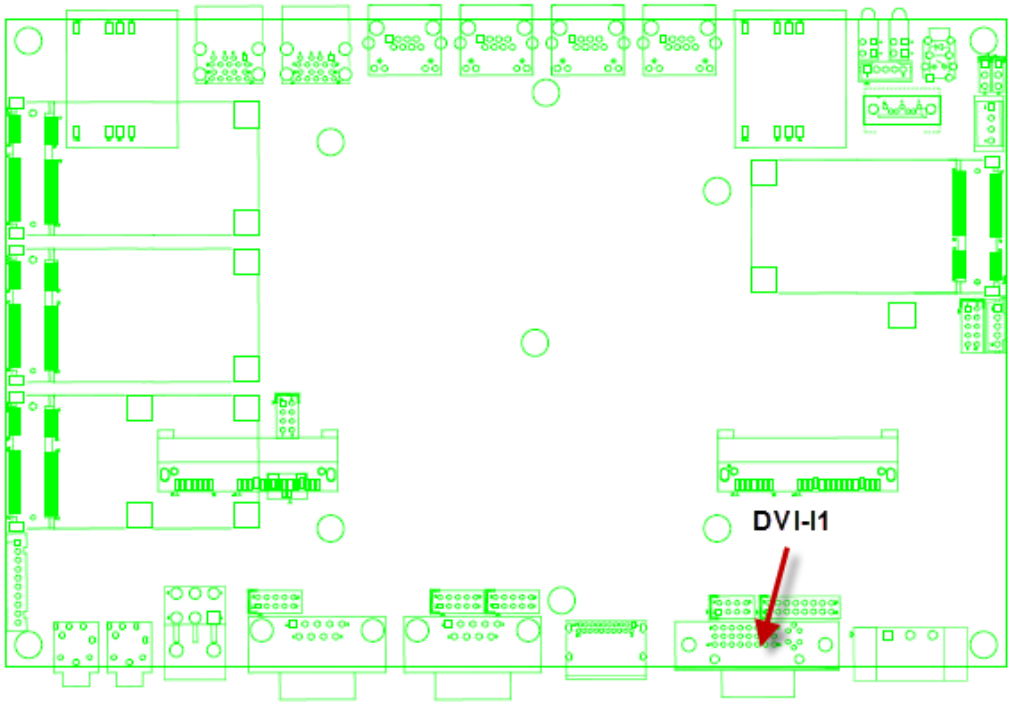
3.7 DVI-I connector

Connector size	50 Pin
Connector type	DVI-I
Connector location	**DVI-I1** 

Connector pin definition

Pin	Signal	Pin	Signal
1	DVI_TX2_N	2	DVI_TX2_P
3	GND	4	5VSB
5	+12V	6	DVI_DDC_CLK
7	DVI_DDC_DATA	8	CRT_VSYNC
9	DVI_TX1_N	10	DVI_TX1_P
11	GND	12	USB_7N
13	USB_7P	14	+5V
15	GND	16	DVI_HPD
17	DVI_TX0_N	18	DVI_TX0_P
19	GND	20	CRT_DAC_SDA
21	CRT_DAC_SCL	22	NC
23	DVI_CLK_P	24	DVI_CLK_N
C1	CRT_RED	C2	CRT_GREEN
C3	CRT_BLUE	C4	CRT_HSYNC
C5	CRT_DET	C6	GND

Connector map



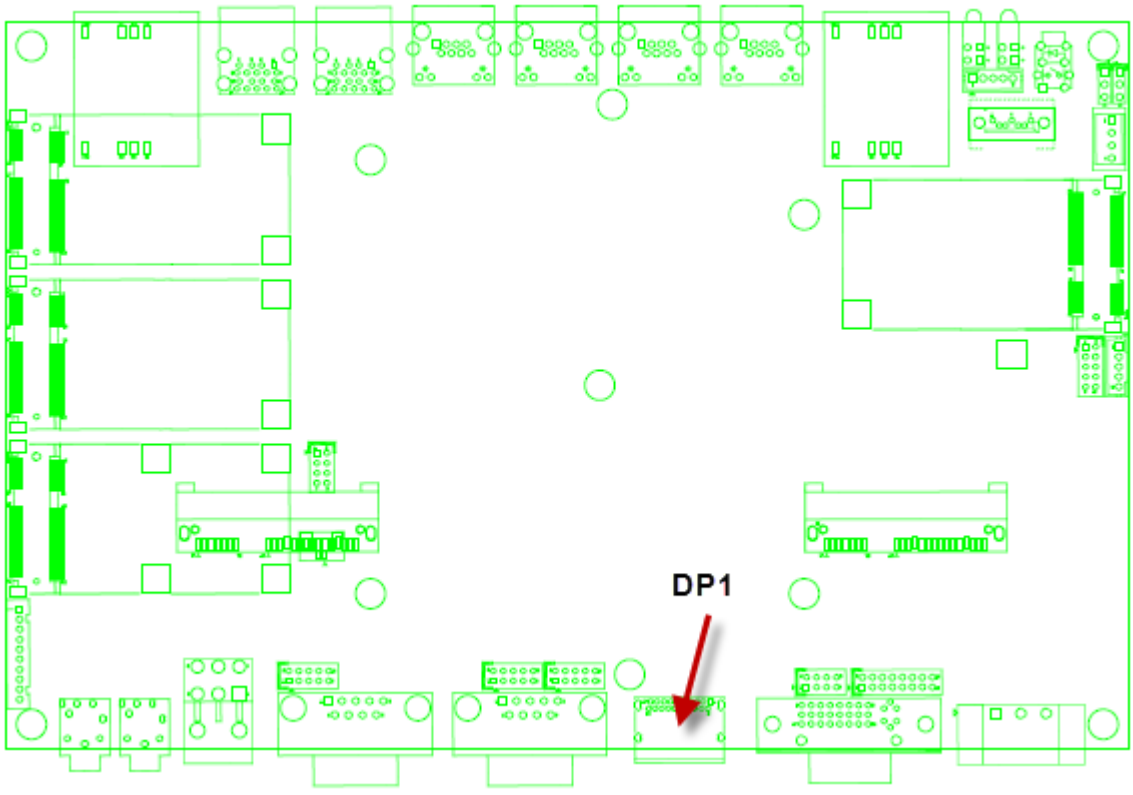
3.8 DP connector

Connector size	20 Pin
Connector type	Display port
Connector location	**DP1**

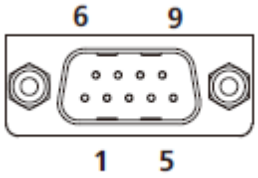
Connector pin definition

Pin	Signal	Pin	Signal
1	DP2_LANE_0P	2	GND
3	DP2_LANE_0N	4	DP2_LANE_1P
5	GND	6	DP2_LANE_1N
7	DP2_LANE_2P	8	GND
9	DP2_LANE_2N	10	DP2_LANE_3P
11	GND	12	DP2_LANE_3N
13	DP2_AUX_EN#	14	GND
15	DP2_AUXP_CLK	16	GND
17	DP2_AUXN_DATA	18	DP2_HPD
19	GND	20	DP2_VCC3

Connector map



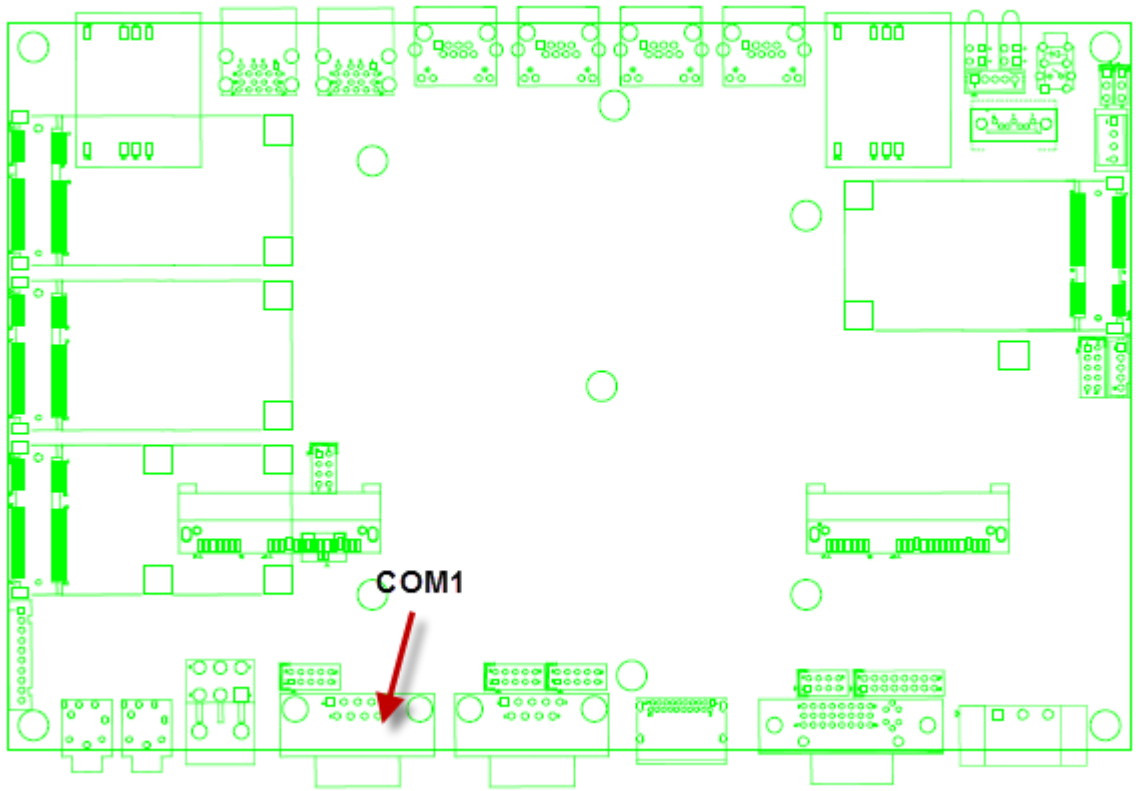
3.9 COM connector

Connector size	9 Pin
Connector type	DSUB
Connector location	**COM1** 

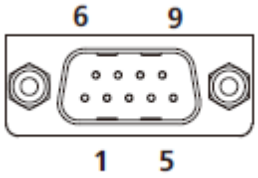
Connector pin definition

Pin	Signal	Pin	Signal
1	COM1_DCD / (RS-485_TXD-/RXD-)	2	COM1_RXD (RS-485_TXD+/RXD+)
3	COM1_TXD	4	COM1_DTR
5	GND	6	COM1_DSR
7	COM1_RTS	8	COM1_CTS
9	COM1_RI#		

Connector map



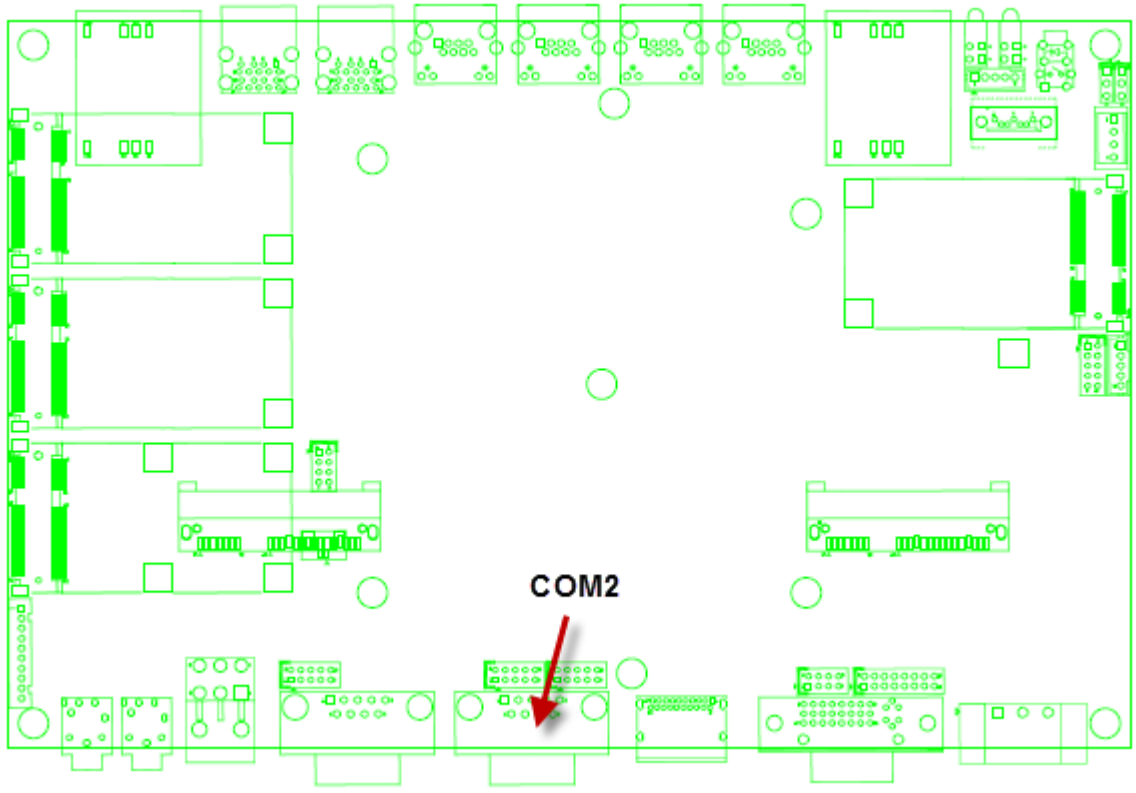
3.10 COM connector

Connector size	9 Pin
Connector type	DSUB
Connector location	**COM2** 

Connector pin definition

Pin	Signal	Pin	Signal
1	COM2_DCD (RS-485_TXD-/RXD-)	2	COM2_RXD (RS-485_TXD+/RXD+)
3	COM2_TXD	4	COM2_DTR
5	GND	6	COM2_DSR
7	COM2_RTS	8	COM2_CTS
9	COM2_RI#		

Connector map



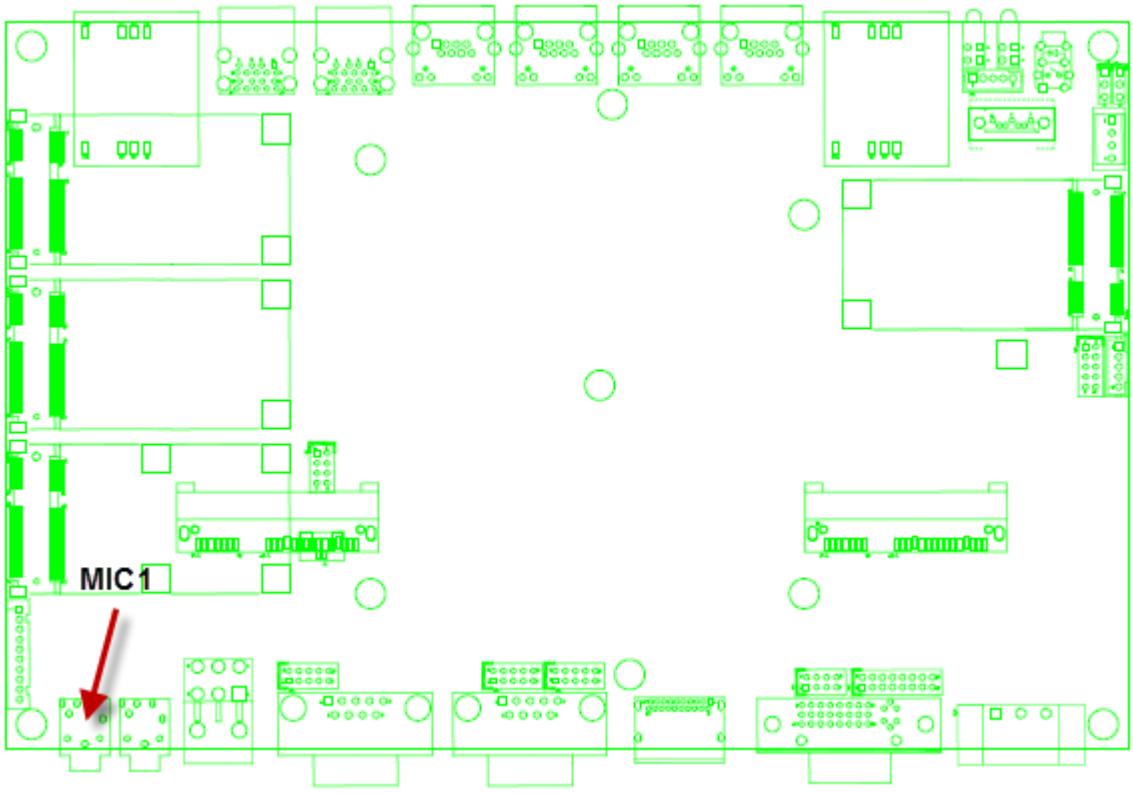
3.11 MIC connector

Connector size	6 Pin
Connector type	Phone Jack
Connector location	**MIC1**

Connector pin definition

Pin	Signal	Pin	Signal
1	MIC_OUT-L	2	MIC-JD
3	NC	4	MIC_OUT-R
5	GND	6	GND

Connector map



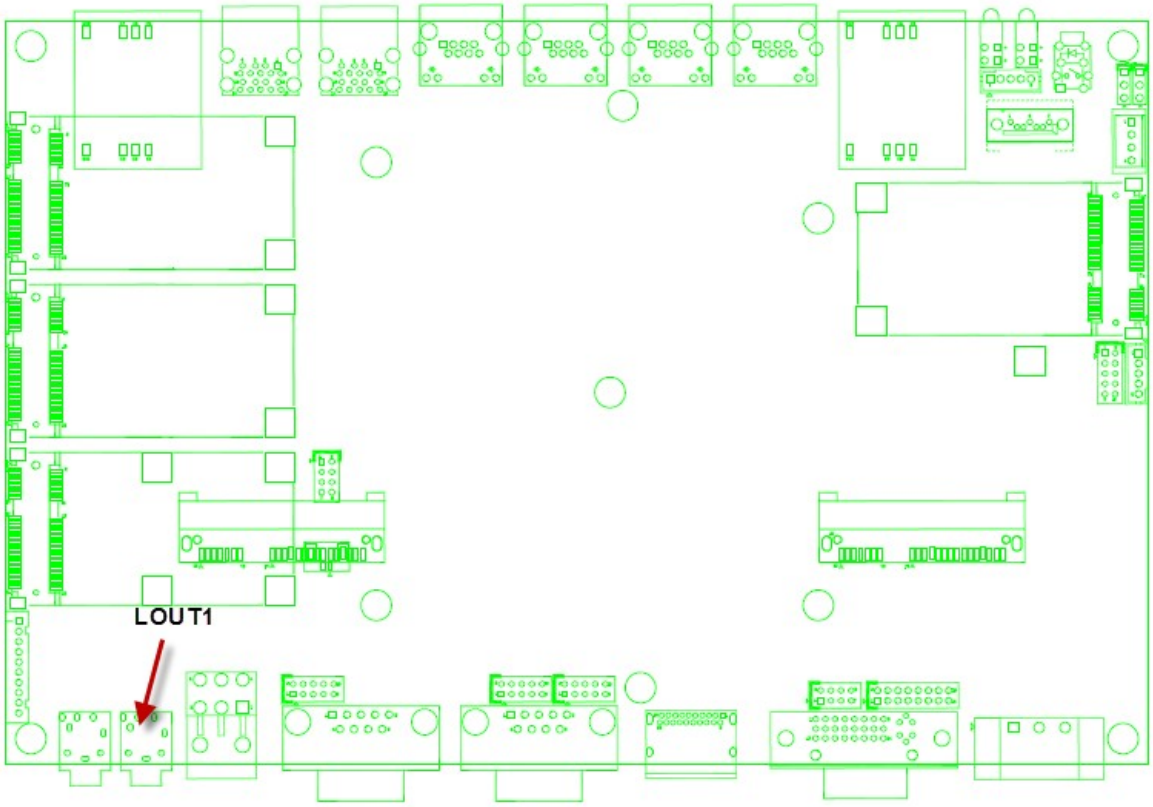
3.12 LINE OUT connector

Connector size	6 Pin
Connector type	Phone Jack
Connector location	**LOUT1**

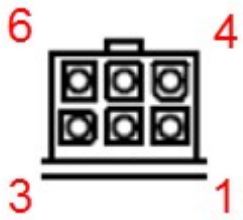
Connector pin definition

Pin	Signal	Pin	Signal
1	FRONT_OUT_L	2	FRONT-JD
3	NC	4	FRONT_OUT_R
5	GND	6	GND

Connector map



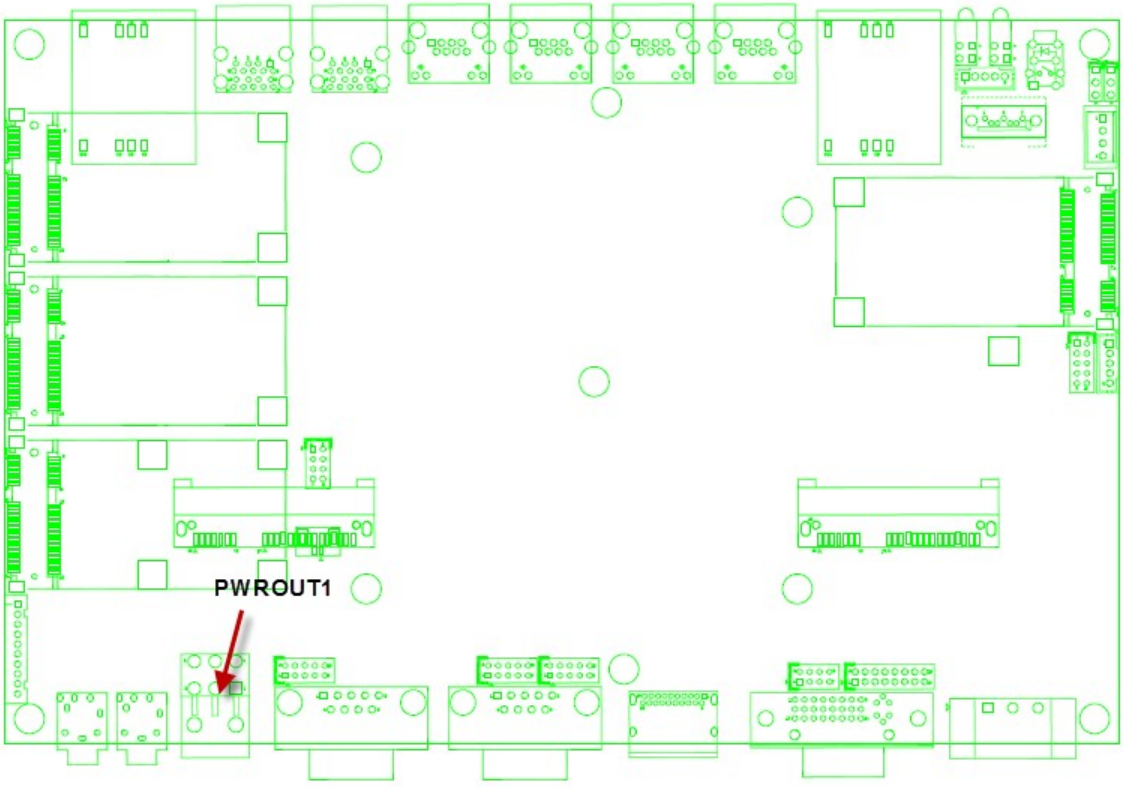
3.13 POWER OUT connector

Connector size	6 Pin
Connector type	ATX 6PIN
Connector location	**PWROUT1** 

Connector pin definition

Pin	Signal	Pin	Signal
1	+12V	2	+12V
3	EXT_DI1	4	GND
5	GND	6	EXT_DI2

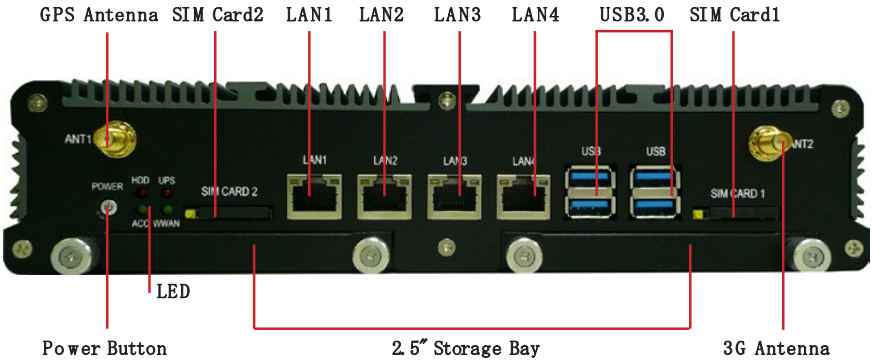
Connector map

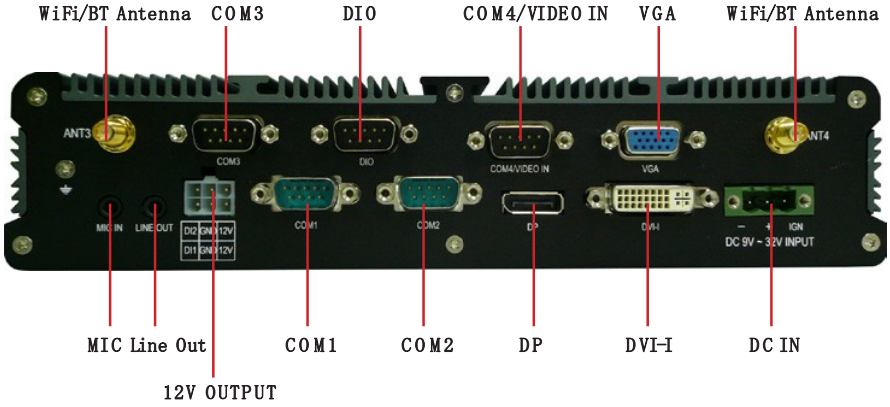


4 System Installation

English

■ 4.1 System Introduction



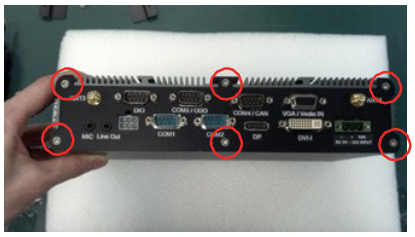


■ 4.2 Opening Chassis

Step 1. Unscrew the six screws of the Back Cover as shown in the picture.

Step 2. Unscrew the six screws of the Front Panel as shown in the picture.

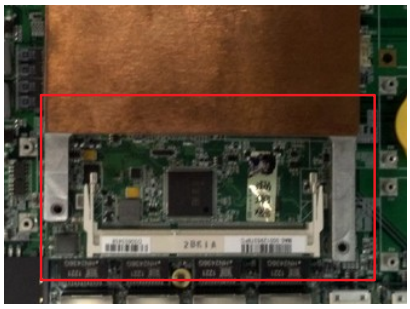
Step 3. Unscrew the six screws of the Rear Panel as shown in the picture.



Step 4. Open Top Cover as shown in the picture.

■ 4.3 Installing Memory

Step 1. Put Memory on this place as shown in the picture.

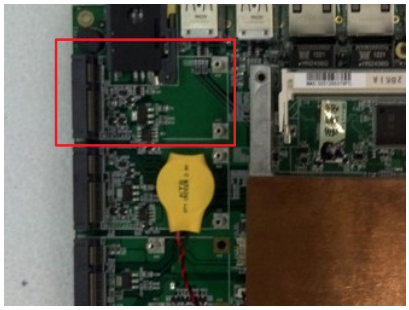


Step 2. Hold the Memory with its notch aligned with the Memory socket of the board and insert it at a 30-degree angle into the socket as shown in the picture.

Step 3. Press down on the Memory so that the tabs of the socket lock on both sides of the module as shown in the picture.

■ 4.4 Installing MINI PCIe Expansion Card (PCIe 1, 3G Module only)

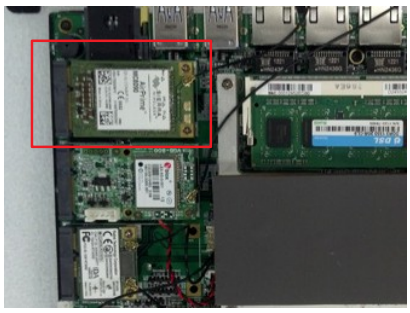
Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.



Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.

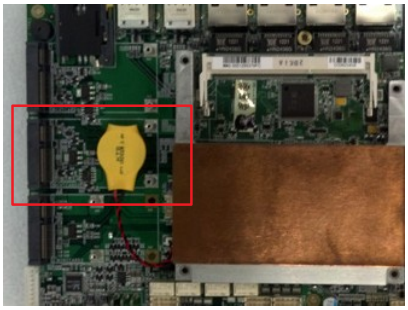
Step 3. Screw two screws to the holder as shown in the picture.

Step 4. Done as shown in the picture.

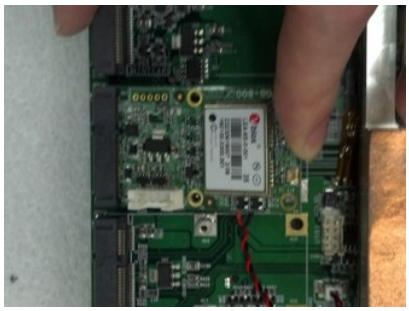


■ 4.5 Installing MINI PCIe Expansion Card (PCIe 2)

Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.

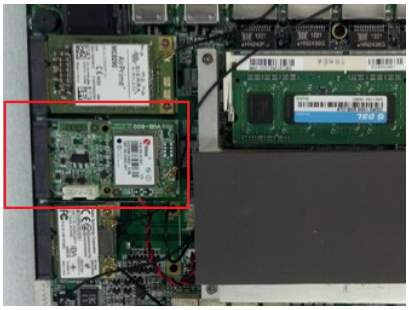


Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.



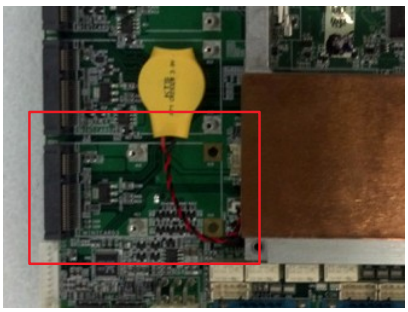
Step 3. Screw two screws to the holder as shown in the picture.

Step 4. Done as shown in the picture.



■ 4.6 Installing MINI PCIe Expansion (PCIe 3)

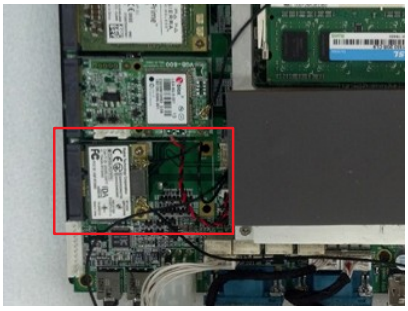
Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.



Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.

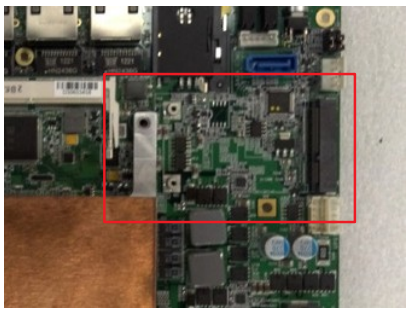
Step 3. Screw two screws to the holder as shown in the picture.

Step 4. Done as shown in the picture.



■ 4.7 Installing MINI PCIe Expansion (PCIe 4, PCIe only)

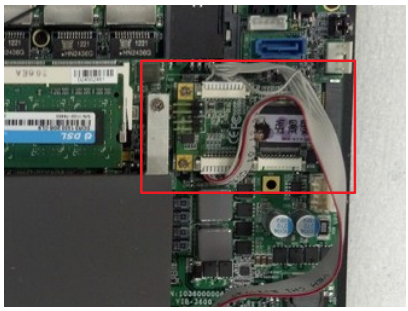
Step 1. Put MINI PCIe Expansion Card on this place as shown in the picture.



Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.

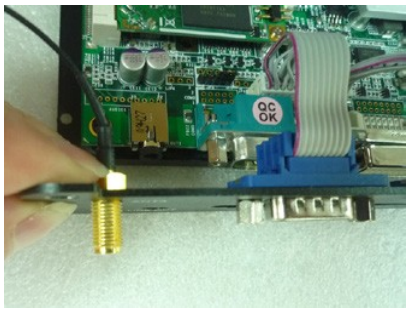
Step 3. Screw two screws to the holder as shown in the picture.

Step 4. Done as shown in the picture.



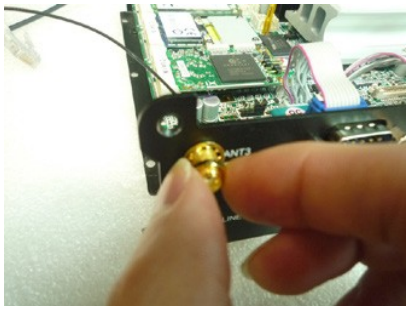
■ 4.8 Installing Internal Antenna Cable

Step 1. Take the SMA Connector and Plug into IO Panel as shown in the picture.



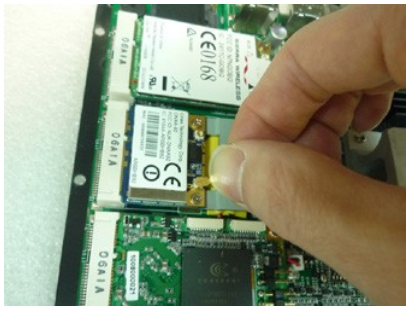
Step 2. Put the Washer into the SMA Connector as shown in the picture.

Step 3. Put the Oring to SMA Connector and tighten as shown in the picture.



Step 4. Done as shown in the picture.

Step 5. Take the Ipex Connector and press on the wifi module as shown in the picture.(Wifi)



Step 6. Take the Ipex Connector and press on the 3G module as shown in the picture. (3G)

Step 7. Take the Ipex Connector and press on the GPS module as shown in the picture. (GPS, only support passive Antenna)

■ 4.9 Installing SIM Card

Step 1. Use thin stick to push the button as shown in the picture.

Step 2. Take the holder away from front panel as shown in the picture.

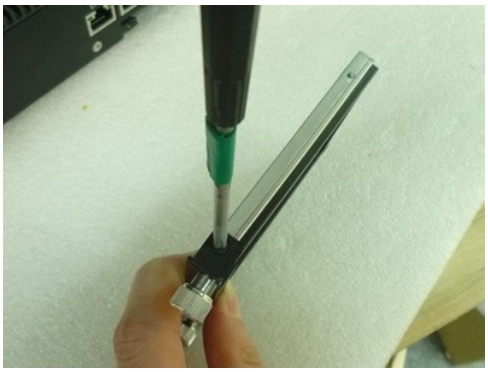
Step 3. Put your SIM Card into the holder as shown in the picture.

Step 4. Take the SIM card holder and Insert it into the socket as shown in the picture.

■ 4.10 Installing HDD

Step 1. Put the HDD into HDD Holder as shown in the picture.

Step 2. Screw two screws on both side as shown in the picture.



Step 3. Push the HDD Holder into the socket as shown in the picture.

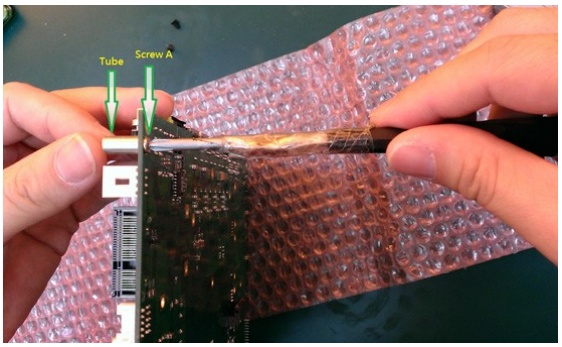
Step 4. Fully insert the HDD Holder into the socket until a “click” is heard as shown in the picture.

Step 5. Tighten to Storage Bracket screws as shown in the picture.

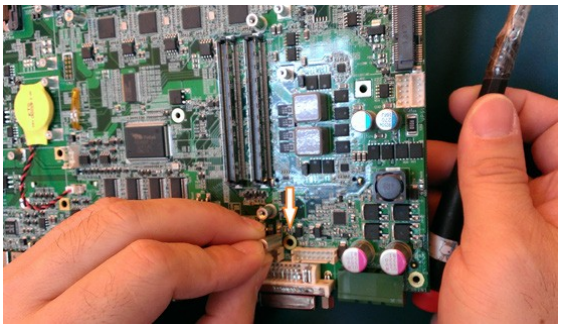
■ 4.11 Installing Battery Module

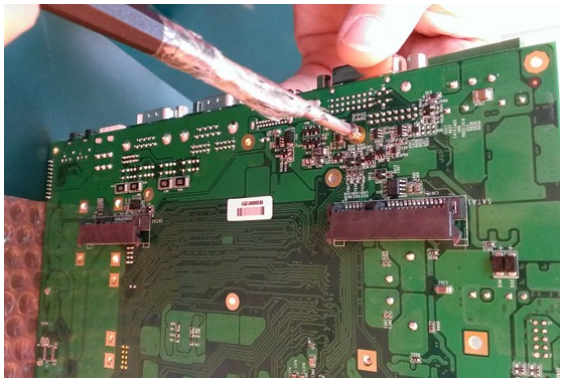
Step 1. Accessories list

Step 2. Fix the Tube with Screw A on the motherboard

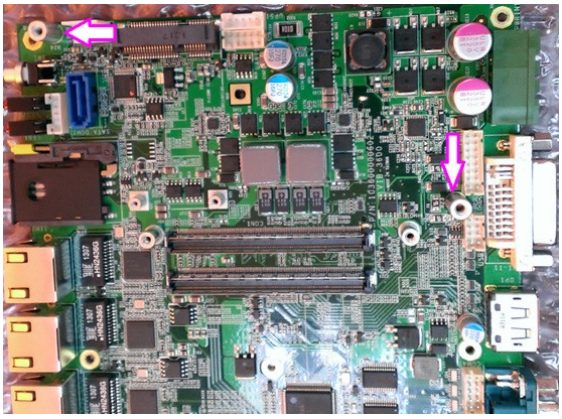


Step 3. Fix the Tube with Screw A to another hole.



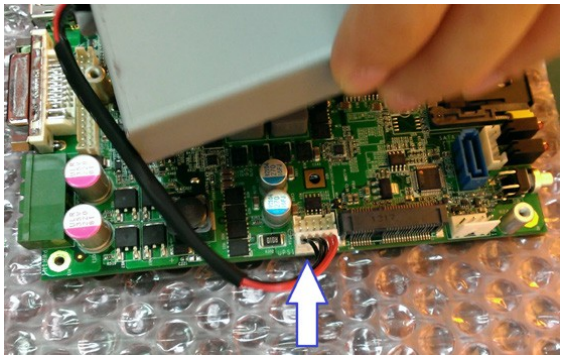


Step 4. Fix the Scew A from back side

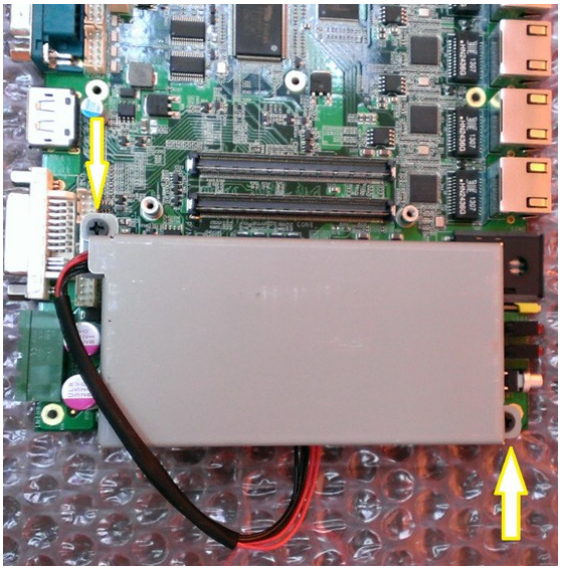


Step 5. Tube Location check.

Step 6. Connect the battery with motherboard on UPS location.



Step 7. Fix the battery with Screw B. (Done)



(5) System Resources

5.1 Ignition Power Management Quick Guide

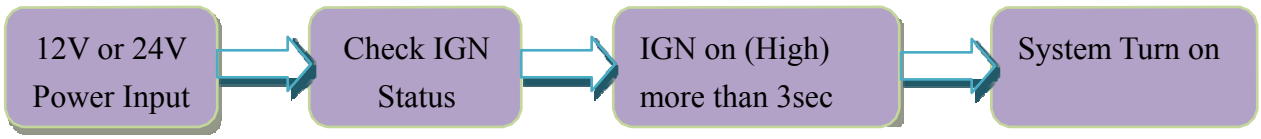
Startup/shutdown conditions from the IGNITION signal:

- IGNITION startup signal must be valid during 3 sec. (anti noise protection).
- IGNITION shutdown – IGNITION signal must be inactive during 3 Sec, then PIC controller initiate Power Button signal (**OS must be set to shutdown from the Power Button**). It generate Main Button shutdown event and then goes to complete power off.

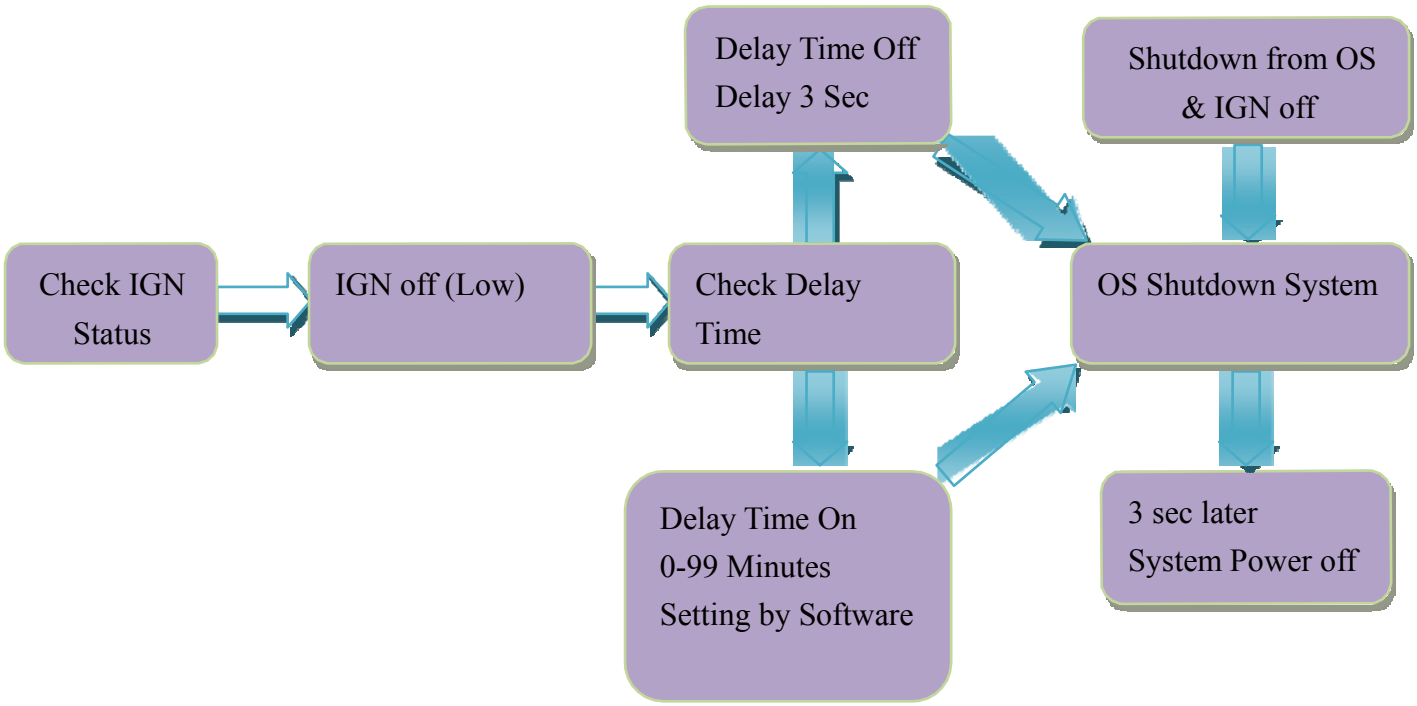
Typically the system can start only from IGNITION signal, because startup PIC controller is disconnected from the power source.

The system can be switched off from:

- Power IGNITION OFF signal.
- ACPI OS shutdown
- Power Button – generate ACPI event (OS dependent).



Power Ignition Startup Procedure



Power Ignition Shutdown Procedure

Power Management

- Power-off delay time is selectable by Software to disable and enable in 0-99 minutes
- Ignition On/Off status detectable by SW
- If the ignition is off and the system is still on after 3 Sec, IVC-4700 will shut down automatically.
- If the ignition is turned on again and the power-off delay is in progress, IVC-4700 will cancel the delay function and will continue to operate normally.
- If the ignition is turned on again and the power-off delay ended, IVC-4700 will shut down completely will power-on again automatically.

5.2 GPIO & Ignition Register

5.2.1 GPIO and Ignition Control Register

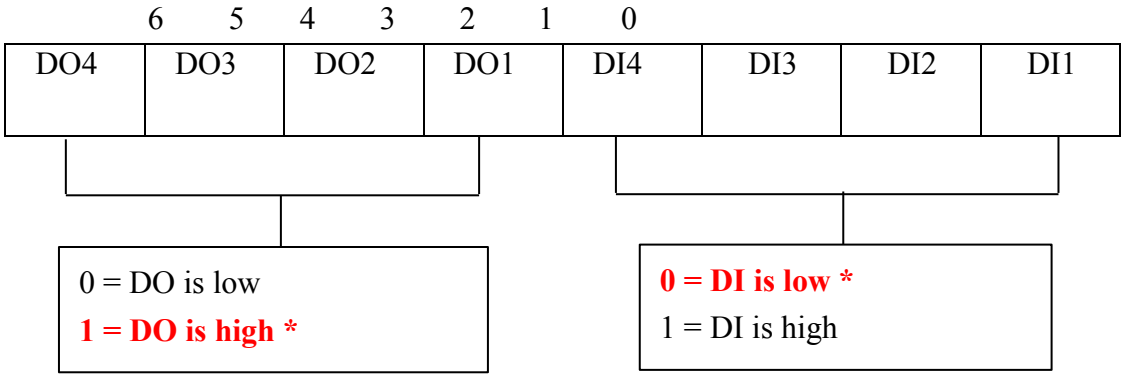
The General Purpose I/O is an interface available on some devices. These can read digital signals from other parts of a circuit, or output to control other devices. At GPIO control register, the GPI is use to receive data, the GPO is set data to send.

I/O port: **0xA35 (base address)** for Control Register (Read 0xA2h / Write 0xA1h)

0xA36 (base address) for Control Data Value

Debug Command Line

- **O A35 A1**
- **O A36 0F // Set Bit 4-7 to Low**



GPIO5 Output Enable Register — Index A0h

Bit	Name	R/W	Default	Description
7	GPIO57_OE	R/W	0	0: GPIO57 is input. 1: GPIO57 is output.
6	GPIO56_OE	R/W	0	0: GPIO56 is input. 1: GPIO56 is output.
5	GPIO55_OE	R/W	0	0: GPIO55 is input. 1: GPIO55 is output.
4	GPIO54_OE	R/W	0	0: GPIO54 is input. 1: GPIO54 is output.
3	GPIO53_OE	R/W	0	0: GPIO53 is input. 1: GPIO53 is output.
2	GPIO52_OE	R/W	0	0: GPIO52 is input. 1: GPIO52 is output.
1	GPIO51_OE	R/W	0	0: GPIO51 is input. 1: GPIO51 is output.
0	GPIO50_OE	R/W	0	0: GPIO50 is input. 1: GPIO50 is output.

GPIO5 Output Data Register — Index A1h

Bit	Name	R/W	Default	Description
7	GPIO57_DATA	R/W	1	GPIO57 output data in output mode.
6	GPIO56_DATA	R/W	1	GPIO56 output data in output mode.
5	GPIO55_DATA	R/W	1	GPIO55 output data in output mode.
4	GPIO54_DATA	R/W	1	GPIO54 output data in output mode.
3	GPIO53_DATA	R/W	1	GPIO53 output data in output mode.
2	GPIO52_DATA	R/W	1	GPIO52 output data in output mode.
1	GPIO51_DATA	R/W	1	GPIO51 output data in output mode.
0	GPIO50_DATA	R/W	1	GPIO50 output data in output mode.

GPIO5 Pin Status Register — Index A2h

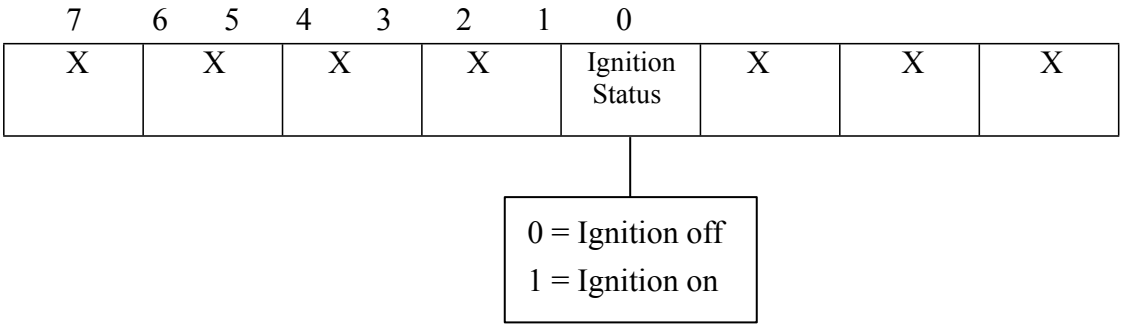
Bit	Name	R/W	Default	Description
7	GPIO57_ST	R	1	GPIO57 pin status.
6	GPIO56_ST	R	1	GPIO56 pin status.
5	GPIO55_ST	R	1	GPIO55 pin status.
4	GPIO54_ST	R	1	GPIO54 pin status.
3	GPIO53_ST	R	1	GPIO53 pin status.
2	GPIO52_ST	R	1	GPIO52 pin status.
1	GPIO51_ST	R	1	GPIO51 pin status.
0	GPIO50_ST	R	1	GPIO50 pin status.

GPIO5 Drive Enable Register — Index A3h

Bit	Name	R/W	Default	Description
7	GPIO57_DRV_EN	R/W	0	GPIO57 Drive Enable. 0: GPIO57 is open drain. 1: GPIO57 is push pull.
6	GPIO56_DRV_EN	R/W	0	GPIO56 Drive Enable. 0: GPIO56 is open drain. 1: GPIO56 is push pull.
5	GPIO55_DRV_EN	R/w	0	GPIO55 Drive Enable. 0: GPIO55 is open drain. 1: GPIO55 is push pull.
4	GPIO54_DRV_EN	R/W	0	GPIO54 Drive Enable. 0: GPIO54 is open drain. 1: GPIO54 is push pull.
3	GPIO53_DRV_EN	R/W	0	GPIO53 Drive Enable. 0: GPIO53 is open drain. 1: GPIO53 is push pull.
2	GPIO52_DRV_EN	R/W	0	GPIO52 Drive Enable. 0: GPIO52 is open drain. 1: GPIO52 is push pull.
1	GPIO51_DRV_EN	R/W	0	GPIO51 Drive Enable. 0: GPIO51 is open drain. 1: GPIO51 is push pull.
0	GPIO50_DRV_EN	R/W	0	GPIO50 Drive Enable. 0: GPIO50 is open drain. 1: GPIO50 is push pull.

I/O port: I/O port: 0xA35 (base address) for Control Register (Read 0xF2h bit 3)

0xA36 (base address) for Control Data Value



Debug Command Line

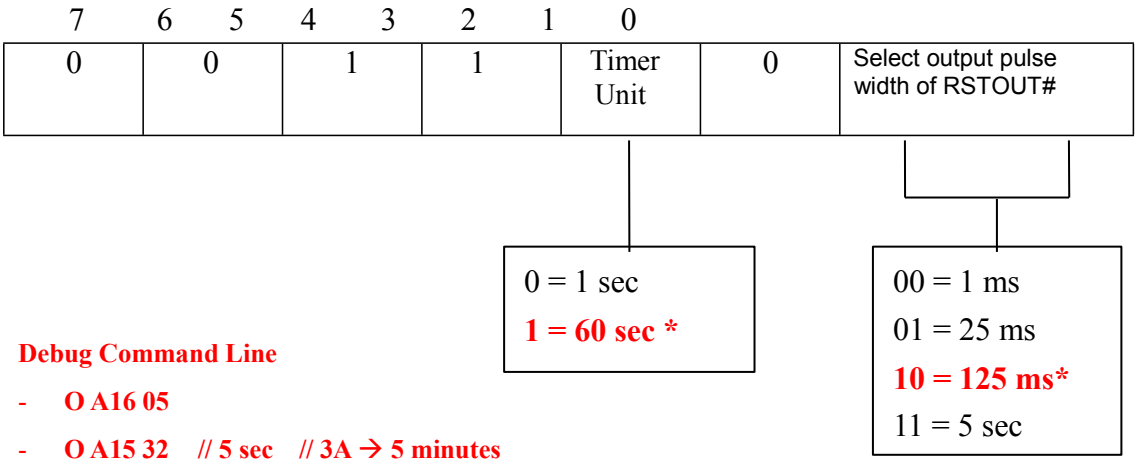
- O A35 F2
- I A36 // Check Bit 3 Status

5.2.2 WDT Setting

I/O port: A10 (base address) + 05h and 06h

1 Watchdog Timer Control Register

The Watchdog Timer Control Register controls the WDT working mode. Write the value to the WDT Configuration Port. The following table describes the Control Register bit definition:



Debug Command Line

- **O A16 05**
- **O A15 32 // 5 sec // 3A → 5 minutes**

7.9. Watchdog Timer Function

Watch dog timer is provided for system controlling. If time-out can trigger one signal to high/low level/pulse, the signal is depend on register setting.

The time unit has two ways from 1sec or 60sec. In pulse mode, there are four pulse widths can be selected (1ms/25ms/125ms/5sec). Others, please refer the device register description as below.

Watchdog Timer Configuration Register 1— base address + 05h

Bit	Name	R/W	Default	Description
7	Reserved	R	0	Reserved
6	WDTMOUT_STS	R/W	0	If watchdog timeout event occurs, this bit will be set to 1. Write a 1 to this bit will clear it to 0.
5	WD_EN	R/W	0	If this bit is set to 1, the counting of watchdog time is enabled.
4	WD_PULSE	R/W	0	Select output mode (0: level, 1: pulse) of RSTOUT# by setting this bit.
3	WD_UNIT	R/W	0	Select time unit (0: 1sec, 1: 60 sec) of watchdog timer by setting this bit.
2	WD_HACTIVE	R/W	0	Select output polarity of RSTOUT# (1: high active, 0: low active) by setting this bit.
1-0	WD_PSWIDTH	R/W	0	Select output pulse width of RSTOUT# 0: 1 ms 1: 25 ms 2: 125 ms 3: 5 sec

Watchdog Timer Configuration Register 2 — base address + 06h

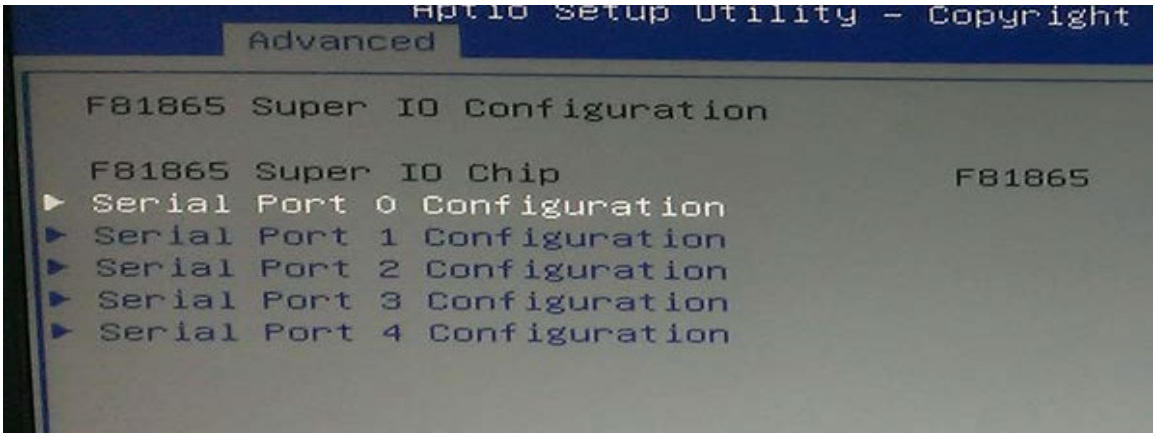
Bit	Name	R/W	Default	Description
7-0	WD_TIME	R/W	0	Time of watchdog timer

Watchdog PME Control Register — base address + 0Ah

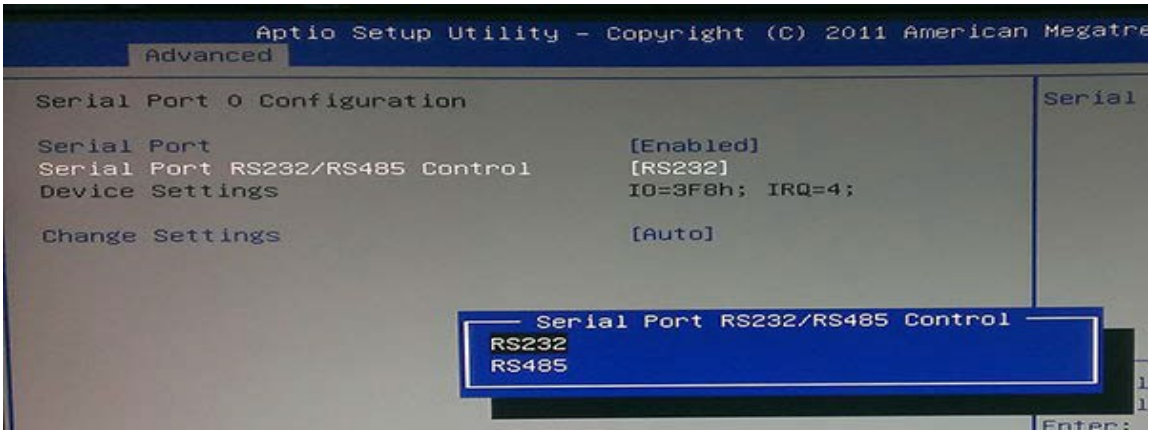
Bit	Name	R/W	Default	Description
7	WDT_PME	R	--	The PME Status. This bit will set when WDT_PME_EN is set and the watchdog timer is 1 unit before time out (or time out).
6	WDT_PME_EN	R/W	0	0: Disable Watchdog PME. 1: enable Watchdog PME.
5-1	Reserved	--	--	Reserved.
0	WDOUT_EN	R/W	0	0: disable Watchdog time out output via WDTRST#. 1: enable Watchdog time out output via WDTRST#.

(6) BIOS

6.1 Super IO Configuration



Select Serial Port Mode



(7) Packing List

7.1 Packing List

Item	Part Number	Module Name
1	763600000100	IVC-4700 System
2	370832001100	IVC-4700 Mount Bracket
3	351103040250	Screw F Type M3*4L ISO BK
4	326710039661	CABLING PHOENIX CON MALE 3PIN

Optional

Part No.	Vendor / Model	Description
577710140090	**MC7710**	LTE – DD 800MHz (Band 20) / 900MHz (Band 8) /2600MHz (Band 7) / 1800MHz (Band 3) / 2100MHz (Band 11) MHz DC-HSPA+1/HSPA+/HSUPA/HSDPA/UMTS – 900/2100MHz Quad-band EDGE/GPRS/GSM – 850/900/1800/1900MHz GPS is Standalone, gpsOne XTRA assistance for enhanced standalone GPS performance, MS-based assisted (support varies based on network carrier) (3G or 4G Antenna Kit be included)
573000011092	**Gobi3000-Dual (MC8355)**	HSDPA/UMTS –800/850/900/1900/2100MHz Quad-band EDGE/GPRS/GSM –850/900/1800/1900MHz Dual-band EV-DO/CDMA –800/1900MHz GPS is Standalone, gpsOne XTRA assistance for enhanced standalone GPS performance, MS-based assisted (support varies based on network carrier) (3G Antenna Kit be included)
573000120009	**Gobi3000-Single (MC8305)**	HSDPA/UMTS –850/900/1800/1900/2100MHz Quad-band EDGE/GPRS/GSM –850/900/1800/1900MHz **Single-band CDMA –1900MHz** GPS is Standalone, gpsOne XTRA assistance for enhanced standalone GPS performance, MS-based assisted (3G Antenna Kit be included)
578090120091	**(MC8090)**	HSDPA/UMTS –850/900/1900/2100MHz Quad-band EDGE/GPRS/GSM –850/900/1800/1900MHz Single-band CDMA –1900MHz GPS is Standalone, gpsOne XTRA assistance for enhanced standalone GPS performance, MS-based assisted **Supports Voice function** (3G Antenna Kit be included)

570800100109	**VDB-800S**	Embedded u-blox6 GPS Mini PCIe Card Very high sensitivity (Tracking Sensitivity: -160 dBm) 50 Channels / Hot Start 1s / Warm Start 28s / Cold Start 28s AssistNow Online and Offline A-GPS Services,OMA SUPL Compliant Support NMEA 0183 V3.0 Update Rate 5 Hz (Max.) (GPS Active Antenna be included)
570800100101	**VDB-800DR**	Embedded u-blox6 GPS with **Dead Reckoning** **and** **G-sensor** Mini PCIe Card Very high sensitivity (Tracking Sensitivity: -160 dBm) 50 Channels / Hot Start 1s / Warm Start 40s / Cold Start 45s Support NMEA 0183 V3.0 AssistNow Online and Offline A-GPS Services,OMA SUPL Compliant 100% Coverage with Continuous Position Fixes Even in Tunnels Highly Accurate and Reliable Navigation Performance Automatic Sensor Calibration and Temperature **Include odometer cable.** (GPS Active Antenna be included)
570800160009	**VDB-800SG**	Embedded u-blox6 GPS Mini PCIe Card and **G-sensor** Very high sensitivity (Tracking Sensitivity: -160 dBm) 50 Channels / Hot Start 1s / Warm Start 28s / Cold Start 28s AssistNow Online and Offline A-GPS Services,OMA SUPL Compliant Support NMEA 0183 V3.0 Update Rate 5 Hz (Max.) (GPS Active Antenna be included)
346123002001	**VDB-801**	•50-channel u-blox6 Engine with Over 2 Million Effective Correlators •-146dBm SuperSense® Acquisition and Tracking Sensitivity •AssistNow Online and Offline A-GPS Services,OMA SUPL Compliant •100% Coverage with Continuous Position Fixes Even in Tunnels •Highly Accurate and Reliable Navigation Performance •Automatic Sensor Calibration and Temperature •Operating Temperature : -40ºC to 80ºC
570802090009	**Q802XKN3B**	Ralink(RT3090BC4) 1X1 802.11n, Wireless Lan and CSR Bluecore4 Bluetooth2.1+EDR (Microsoft in-box driver, profiles;Motorola profiles) / software upgradable to BT3.0+HS(Motorola) Combo Mini-PCIe Card (Wifi Antenna Kit be included)

570195090090	**DHXA-195**	802.11n b/g 1x1 wifi plus Bluetooth combo PCIe half-size mini card, WB195/AR9285+AR3011 (Wifi Antenna Kit be included)
570802010009	**Q802XKN5F**	Ralink 802.11b/g/N, 2T2R,Mini PCIe Card (Full size) (Wifi Antenna Kit be included)
570802011009	**Q802XKN5**	Ralink 802.11b/g/N, 2T2R,Mini PCIe Card (Half size)(Wifi Antenna Kit be included)
571350010090	**DNXA-116**	802.11 a/b/g/n, Atheros AR9382, 2T2R, Half-size Mini-PCIe card (Wifi Antenna Kit be included)
345570033000	**7-in-1-1dBi-5M**	GPS+3G+WIFI Combo Antenna SMA Male, 7-in-1 Multi-band / 5M
342631091000	**WiFi-2dB**	Wifi Antenna 2dBi / 2.4G / SMA Female (silver color)
342631391031	**WiFi-5dB-3M**	Wifi Antenna 5dBi / 2.4G / 3M / SMA Male (Flat Type)
343131091000	**3G-2dBi**	3G Antenna 2dBi / 3.5G / GPRS / SMA Female (gold color)
344220033000	**3G-1.5dBi-3M**	3G Antenna 1.5dBi / 3.5G / GPRS / 3M / SMA Female (Flat Type)

343225003000	**GPS-Passive-5M**	GPS **Passive** Antenna 5M / SMA male (Only for GOBI Series)
343235002000	**GPS-Active-5M**	GPS **Active** Antenna 5M / SMA male
221401280006	**BAT-3600**	Neosonic-Polymer 1100mAH 3S1P Battery kit for IVC-4700
972009720000	**Microsoft**	Windows Embedded Standard 2009 (Windows XP Embedded)
970000750000	**Microsoft**	Windows XP Pro license fee
970007740000	**Microsoft**	Windows® Embedded Standard 7 Runtime (WS7E)(ESD)
970022730000	**Microsoft**	Windows® 7 Professional for Embedded Systems x32/x64