

RT130

Ivy Bridge Rugged In-Vehicle Computer

User's Manual

Version 1.1

User Manual**Copyright**

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Logic Supply makes no representation or warranty regarding the content of this manual. Information in this manual had been carefully checked for accuracy; however, no guarantee is given as to the correctness of the contents. For continuing product improvement, Logic Supply 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.

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 Logic Supply 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 Logic Supply. Dispose used battery according to the manufacturer's instructions.

Table of contents page

(1) Introduction

| | |
|---|---|
| 1.1 Model Specifications | 5 |
| 1.2 RT130 Illustration (Main board, System) | 7 |

(2) Internal connector specification

| | |
|------------------------------------|----|
| 2.1 VGA JST connector | 9 |
| 2.2 USB JST connector | 10 |
| 2.3 USB JST connector | 11 |
| 2.4 GPIO JST connector | 12 |
| 2.5 UART JST connector | 13 |
| 2.6 LED JST connector (LED1) | 14 |
| 2.7 LED JST connector (LED2) | 15 |
| 2.8 COM port JST connector: (COM3) | 16 |
| 2.9 COM port JST connector: (COM4) | 17 |
| 2.10 AUDIO JST connector | 18 |
| 2.11 SATA 7PIN connector: (SATA3) | 19 |
| 2.12 SATA 7PIN connector: (SATA1) | 20 |
| 2.13 SATA 7PIN connector: (SATA2) | 21 |
| 2.14 MINI PCI-E slot: (MINICARD1) | 22 |
| 2.15 MINI PCI-E slot: (MINICARD2) | 24 |
| 2.16 MINI PCI-E slot: (MINICARD3) | 26 |
| 2.17 MINI PCI-E slot: (MINICARD4) | 28 |
| 2.18 POWER IN connector | 29 |
| 2.19 SATA Power connector: (SPWR1) | 31 |
| 2.20 UPS Power connector | 32 |

(3) External connector specification

| | |
|-----------------------------|----|
| 3.1 USB3.0 Type A connector | 33 |
| 3.2 USB3.0 Type A connector | 34 |
| 3.3 RJ45 connector: (LAN1) | 35 |
| 3.4 RJ45 connector: (LAN2) | 36 |
| 3.5 RJ45 connector: (LAN3) | 37 |
| 3.6 RJ45 connector: (LAN4) | 38 |
| 3.7 DB29 connector: (DVI-I) | 39 |
| 3.8 DP connector | 40 |
| 3.9 DB9 connector: (COM1) | 41 |

| | |
|--|----|
| 3.10 DB9 connector: (COM2) | 42 |
| 3.11 PHONE JACK: (MIC IN) | 43 |
| 3.12 PHONE JACK: (LINE OUT) | 44 |
| 3.13 ATX 6PIN connector : (POWER OUT) | 45 |
| (4) System Installation | |
| 4.1 System Introduction | 46 |
| 4.2 Opening Chassis | 47 |
| 4.3 Installing Memory | 48 |
| 4.4 Installing MINI PCIe Expansion Card (PCIe 1, 3G Module only) | 49 |
| 4.5 Installing MINI PCIe Expansion Card (PCIe 2) | 50 |
| 4.6 Installing MINI PCIe Expansion Card (PCIe 3) | 51 |
| 4.7 Installing MINI PCIe Expansion Card (PCIe 4, PCIe only) | 52 |
| 4.8 Installing Internal Antenna Cable | 53 |
| 4.9 Installing SIM Card | 55 |
| 4.10 Installing HDD | 56 |
| 4.11 Installing Battery Module | 58 |
| (5) System Resources | |
| 5.1 Ignition Power Management Quick Guide | 60 |
| 5.2 GPIO & Delay Time Setting | 62 |
| (6) BIOS | |
| 6.1 Super IO Configuration | 66 |



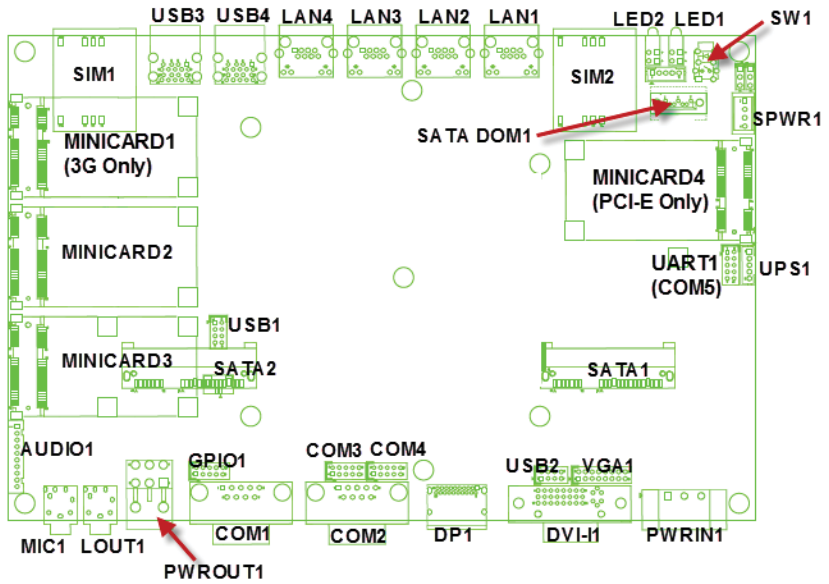
1.1 Model Specification

| 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 |

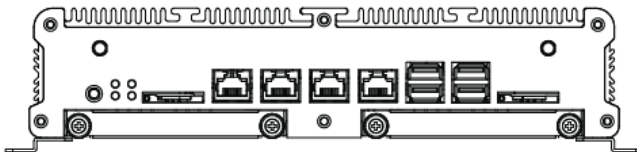
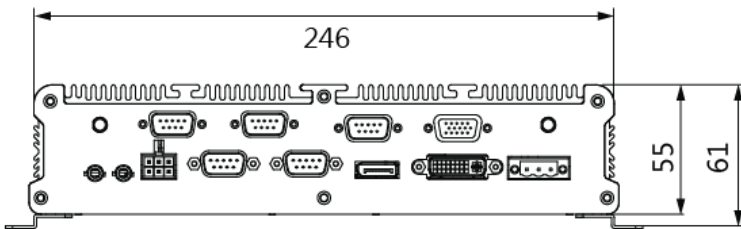
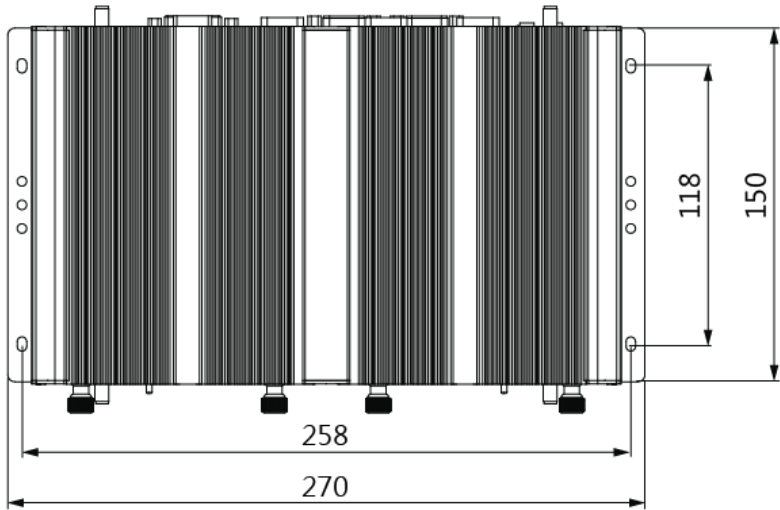
| Graphics | |
|----------------------|---|
| Graphics | Intel® HD Graphics 4000 DirectX Video Acceleration (DXVA) for Accelerating Video Processing - Full AVC/VC1/MPEG2 HW Decode Supports DirectX 11/10.1/10/9 and OpenGL 3.0 |
| Resolution | Up to 1920 x 1200 |
| Qualification | |
| Certifications | CE, FCC Class A, eMark |
| I/O | |
| Serial Port | 3 x RS-232 (COM1,2 with RS-422/485, RS-485 Support Auto Direction Control) |
| USB Port | 4 x USB 3.0 Ports on Front I/O |
| LAN | 4 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. | -40°C ~ 70°C (Default CPU 17Watt) |
| Storage Temp. | -40 ~ 80°C |
| 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 RT130 Illustration

Mainboard



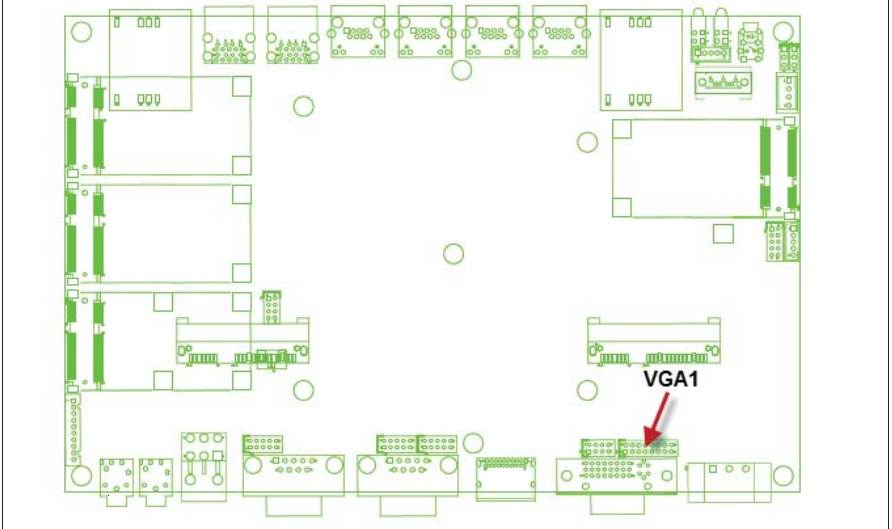
System



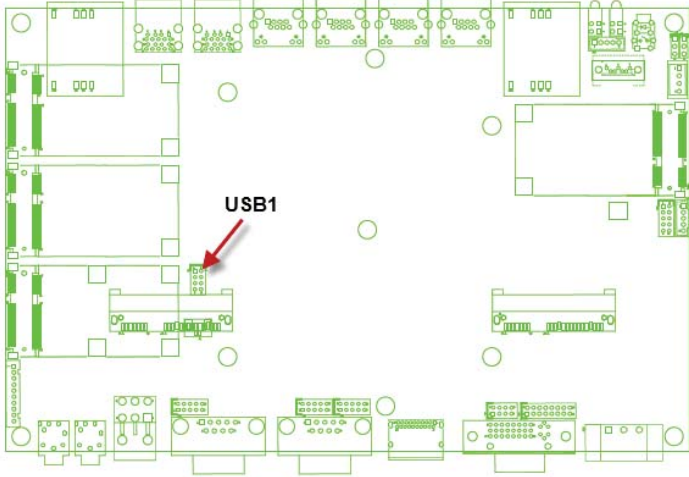
(2) Internal connector specification

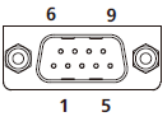
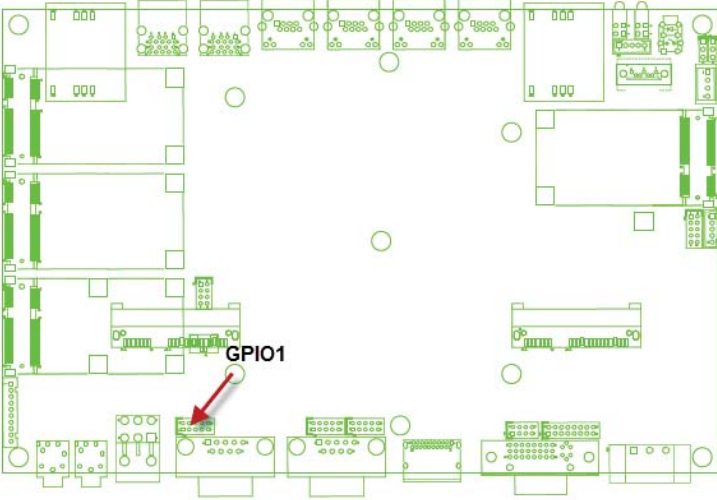
| 2.1 VGA Connector | | | | |
|--------------------------|-----------------|---------|-----|---------|
| Connector size | 2 X 8 = 16 Pin | | | |
| Connector type | JST-2.0mm-M-180 | | | |
| Connector location | VGA1 | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | RED | 2 | 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

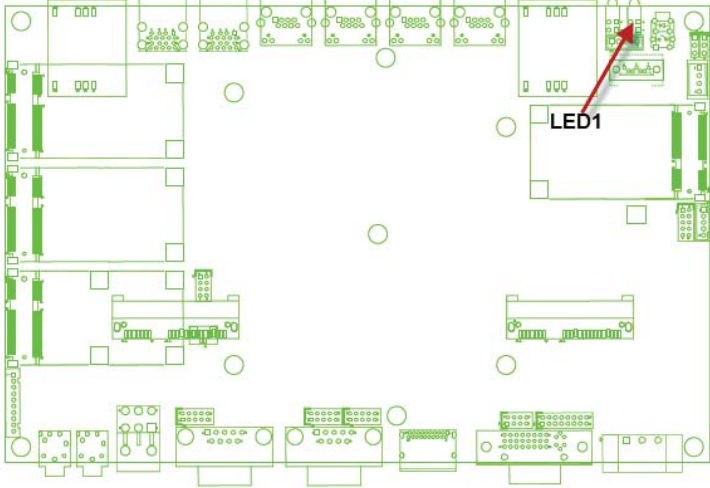


| 2.2 USB Connector | | | | |
|--------------------------|------------------------------|--------|-----|--------|
| Connector size | 2 X 4 = 8 Pin | | | |
| Connector type | JST-2.0mm-M-180 | | | |
| Connector location | USB2 (Co-layout with DVI-I1) | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | 5VSB | 2 | 5VSB |
| | 3 | USB_7N | 4 | NC |
| | 5 | USB_7P | 6 | NC |
| | 7 | GND | 8 | GND |
| Connector map | | | | |
| | | | | |

| 2.2 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 | <p>GPIO1</p>  | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | GPIO0 | 2 | GPI1 |
| | 3 | GPI2 | 4 | GPI3 |
| | 5 | GPO0 | 6 | GPO1 |
| | 7 | GPO2 | 8 | GPO3 |
| | 9 | GND | 10 | +12V |
| Connector map | | | | |
|  | | | | |

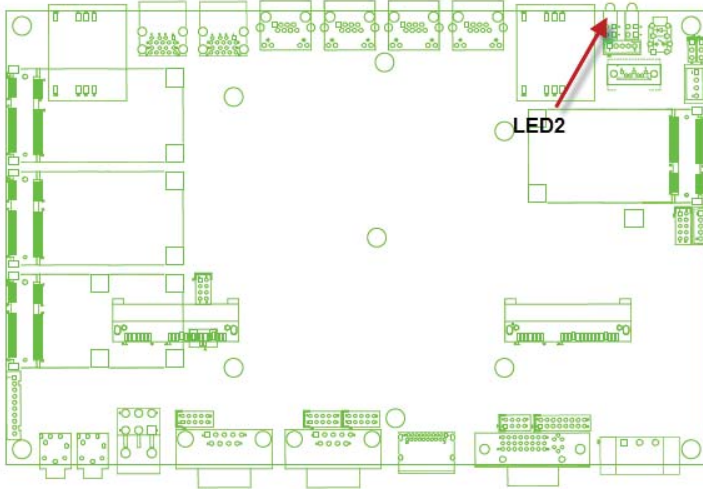
| 2.5 UART Connector | | | | |
|--------------------------|---|---------|-----|---------|
| Connector size | 2 X 5 = 10 Pin | | | |
| Connector type | JST-2.0mm-M-180 | | | |
| Connector location | UART1 (COM5 for GPS Module when installed) Baud Rate : 9600 | | | |
| Connector pin definition | Pin | 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 | | | | |
|  | | | | |

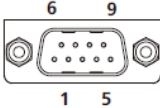
2.7 LED Connector

| | | | | |
|--------------------------|------------------|-----------|-----|-----------|
| 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 |

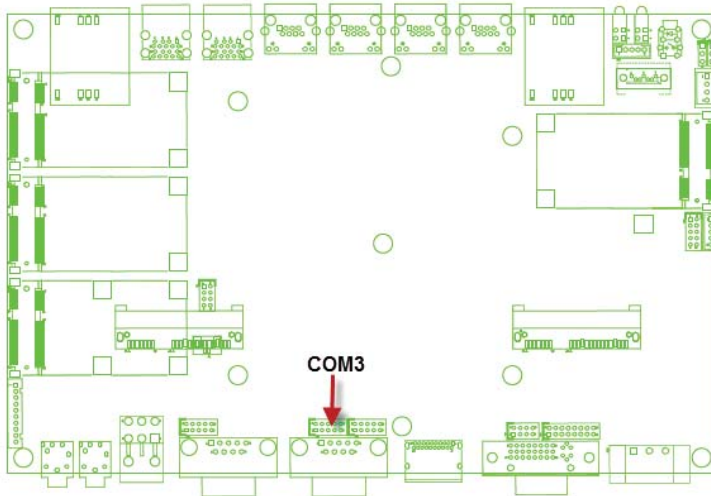
Connector map

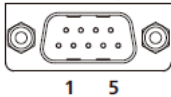
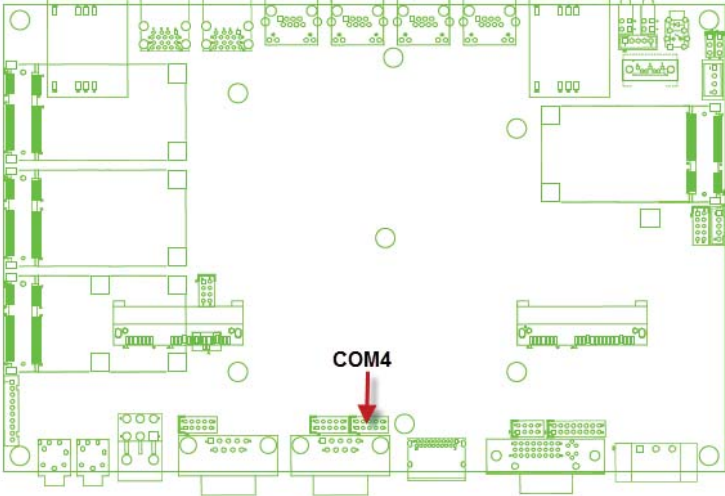


2.8 COM Connector

| | | | | |
|--------------------------|--|----------|-----|----------|
| Connector size | 2 X 5 = 10 Pin | | | |
| Connector type | JST-2.0mm-M-180 | | | |
| Connector location | <p>COM3</p>  | | | |
| 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

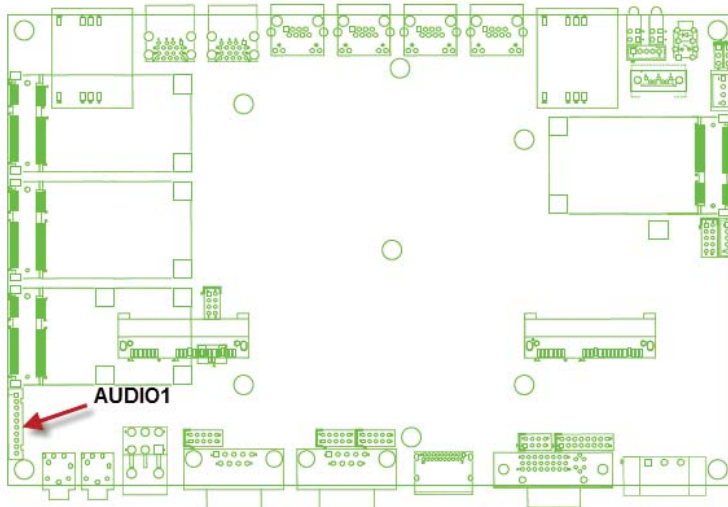


| 2.9 COM Connector | | | | |
|--|--|----------|-----|-----------|
| Connector size | 2 X 5 = 10 Pin | | | |
| Connector type | JST-2.0mm-M-180 | | | |
| Connector location | <p>COM4</p>  | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | COM4_DCD | 2 | COM4_RXD |
| | 3 | COM4_TXD | 4 | COM4_DTR |
| | 5 | GND | 6 | COM4_DSR |
| | 7 | COM4_RTS | 8 | COM43_CTS |
| | 9 | COM4_RI | 10 | GND |
| Connector map | | | | |
|  | | | | |

2.10 COM 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 | |

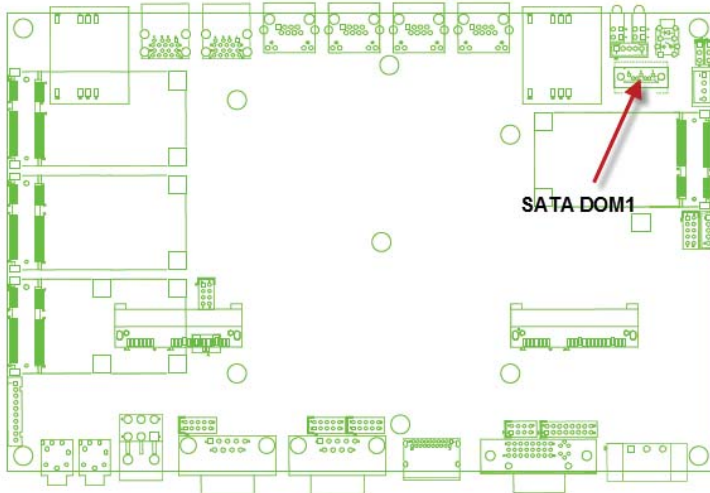
Connector map



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 | |

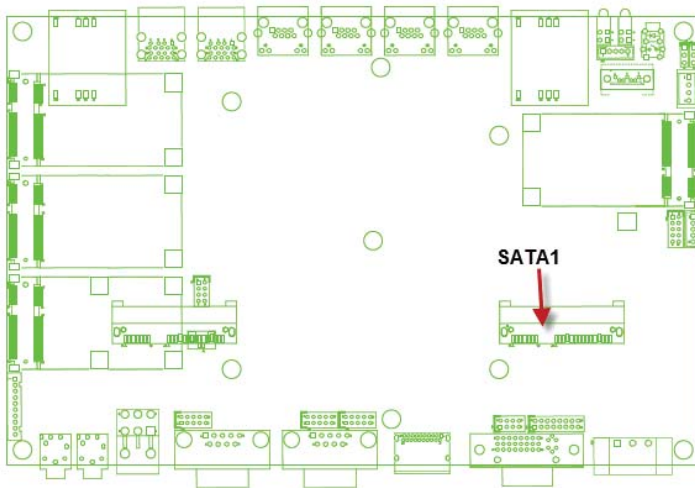
Connector map



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 | |

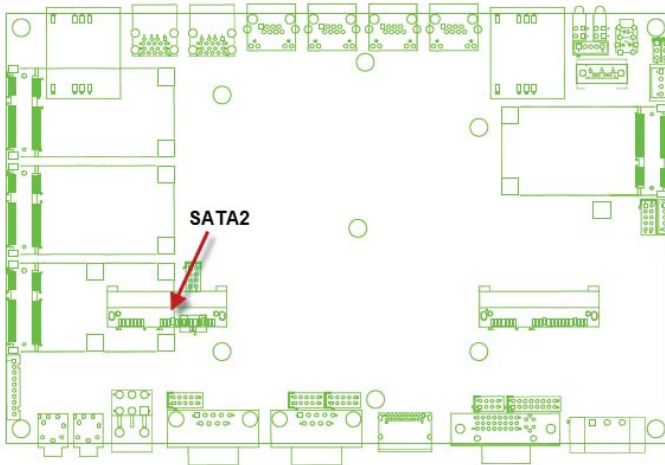
Connector map



2.13 SATA Connector

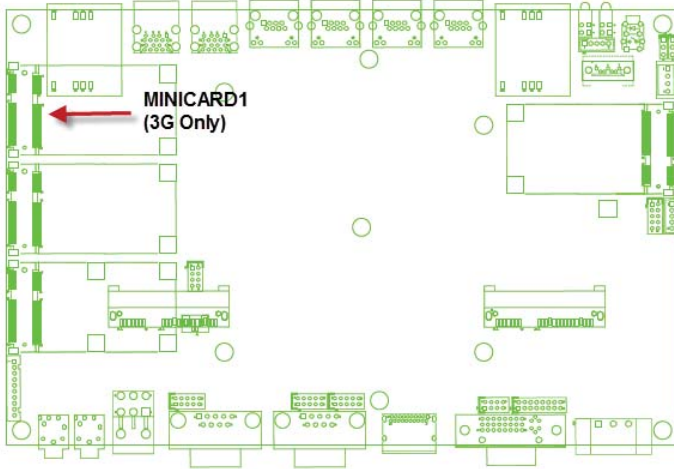
| | | | | |
|--------------------------|--------------------|-----------|-----|--------|
| Connector size | 1 X 7 = 7 Pin | | | |
| Connector type | SATA 1.27mm-M-180D | | | |
| Connector location | SATA2 | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | S1 | GND | P1 | NC |
| | 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 | MINICARD1_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_WWAN# | |
| 43 | GND | 44 | LED_WAN# | |
| 45 | NC | 46 | LED_WPAN# | |
| 47 | NC | 48 | +1.5V | |
| 49 | NC | 50 | GND | |
| 51 | NC | 52 | 3VSB | |

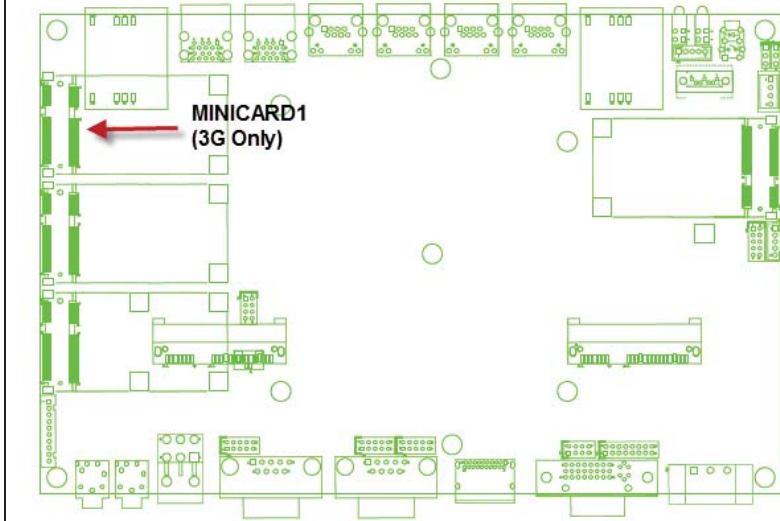
Connector map



2.15 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 | |

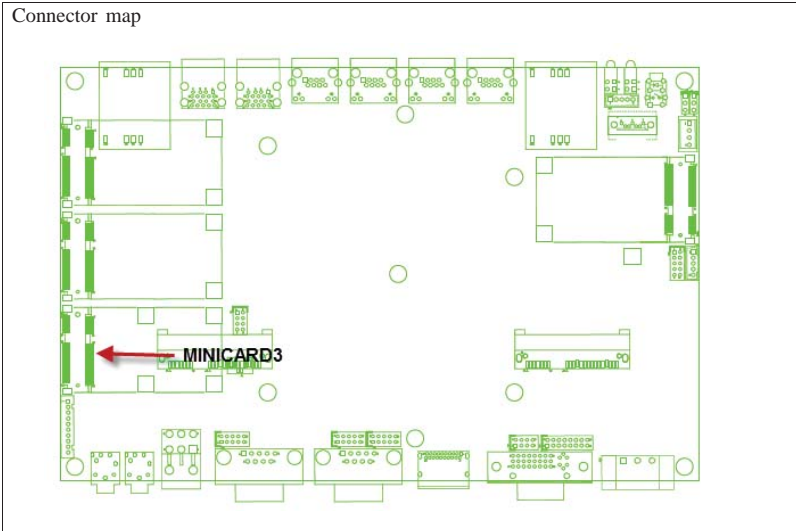
Connector map



2.16 Mini PCI-E Connector

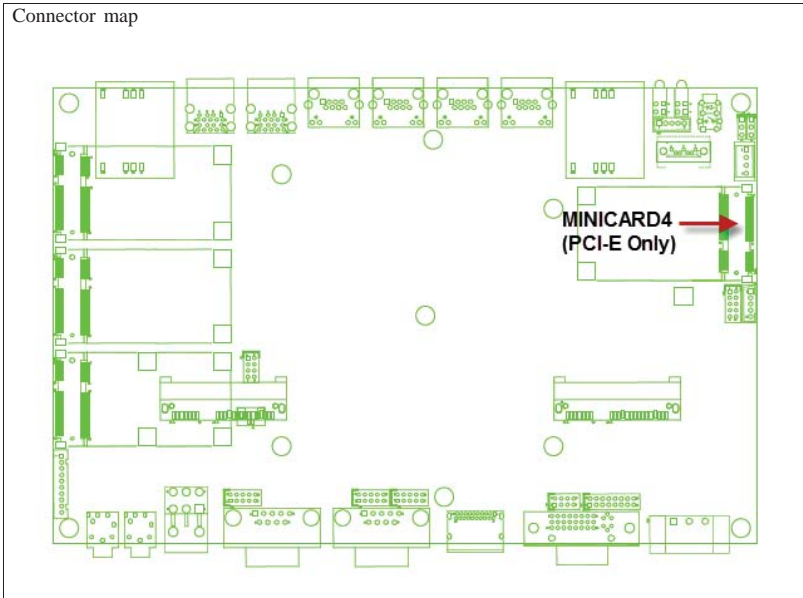
| | | | | |
|--------------------------|-----------------------|-------------------|------|----------------|
| Connector size | 2 X 26 = 52 Pin | | | |
| Connector type | MINI PCI-E CON 9.2mmH | | | |
| Connector location | MINICARD3 | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 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

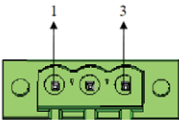


| 2.17 Mini PCI-E Connector | | | | |
|---------------------------|-----------------------|-------------------|------|----------------|
| Connector size | 2 X 26 = 52 Pin | | | |
| Connector type | MINI PCI-E CON 9.2mmH | | | |
| Connector location | MINICARD4 | | | |
| Connector pin definition | Pin | 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 | |

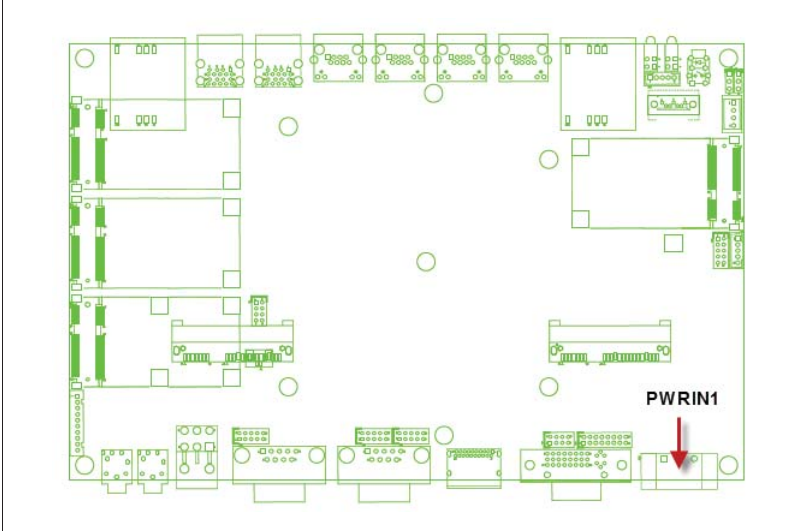
Connector map

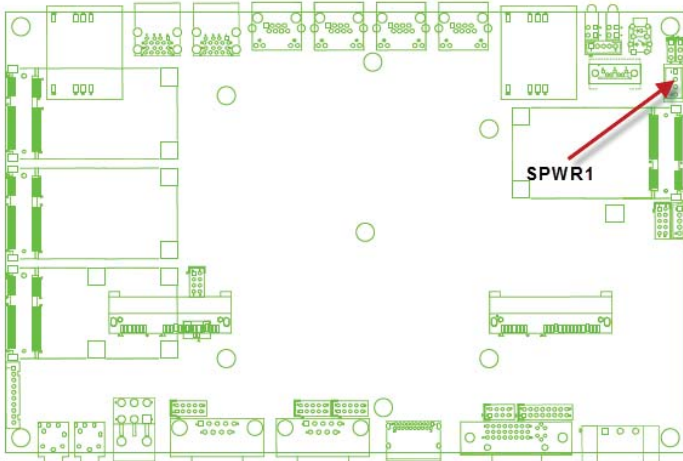


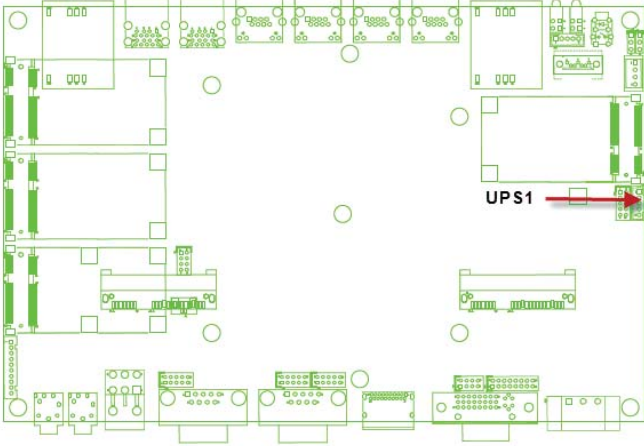
2.18 POWER Input Connector

| | | |
|--------------------------|--|-------------|
| Connector size | 1 X 4 = 4 Pin | |
| Connector type | WAFER 2.54mm-M-180 | |
| Connector location | <p>PWRIN1</p>  | |
| Connector pin definition | Pin | Signal |
| | 1 | GND |
| | 2 | VIN (9-32V) |
| | 3 | IGNITION |

Connector map



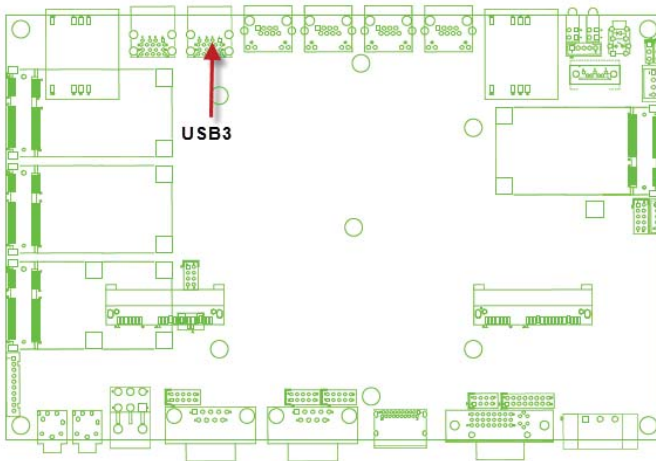
| 2.19 SATA Power Connector | | |
|--|--------------------|---------------|
| Connector size | 1 X 4 = 4 Pin | |
| Connector type | WAFER 2.54mm-M-180 | |
| Connector location | SPWR1 | |
| Connector pin definition | Pin | Signal |
| | 1 | +5V |
| | 2 | GND |
| | 3 | GND |
| | 4 | +12V |
| Connector 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 | |

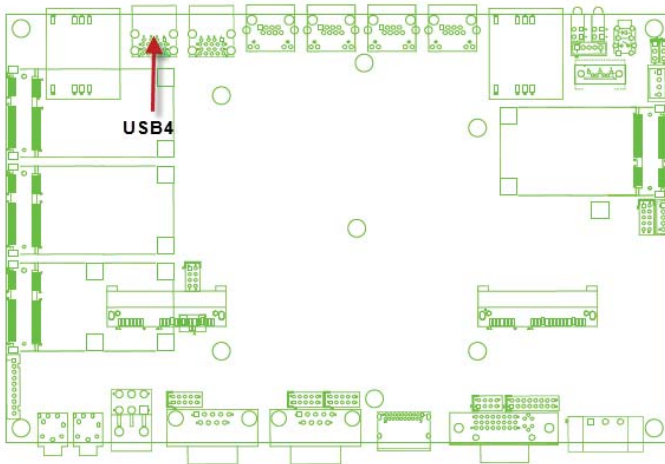
Connector map

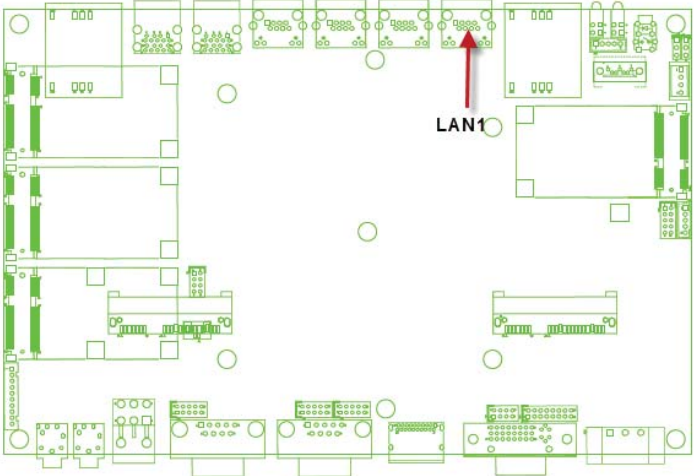


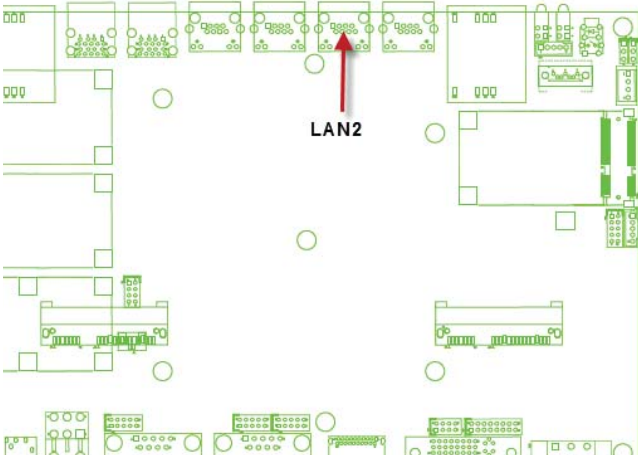
3.2 USB Connector

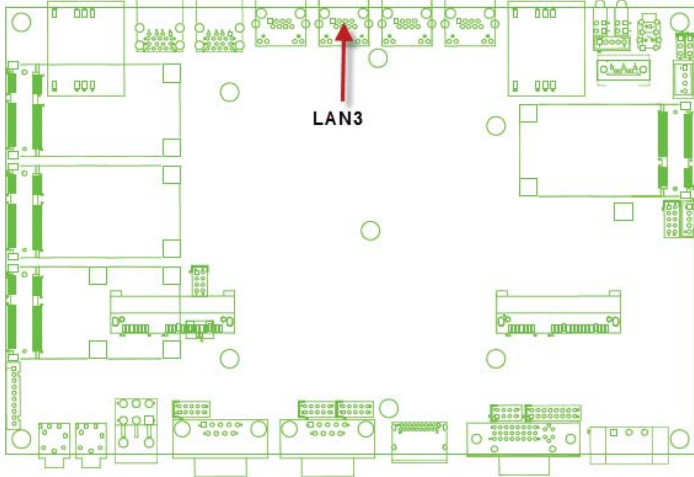
| | | | | |
|--------------------------|---------------|----------|----------|----------|
| Connector size | 8 Pin | | | |
| Connector type | USB3.0 Type A | | | |
| Connector location | USB4 | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | 5VSB | 2 | USB2_N |
| | 3 | USB2_P | 4 | GND |
| | 5 | SSRX2_ON | 6 | SSRX2_OP |
| | 7 | GND | 8 | SSTX2_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



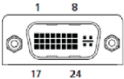
| 3.3 LAN Connector | | | | |
|--|-------------|------------|-----|-----------------|
| Connector size | 12 Pin | | | |
| Connector type | RJ45+LED | | | |
| Connector location | LAN1 | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | LAN0_MDI0P | 2 | LAN0_MDI0N |
| | 3 | LAN0_MDI1P | 4 | LAN0_MDI2P |
| | 5 | LAN0_MDI2N | 6 | LAN0_MDI1N |
| | 7 | LAN0_MDI3P | 8 | LAN0_MDI3N |
| | 9 | LAN0_ACT# | 10 | LAN0_ACTP W |
| | 11 | LAN0_LINK# | 12 | LAN0_LINKP W |
| 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 | | | | |
|  | | | | |

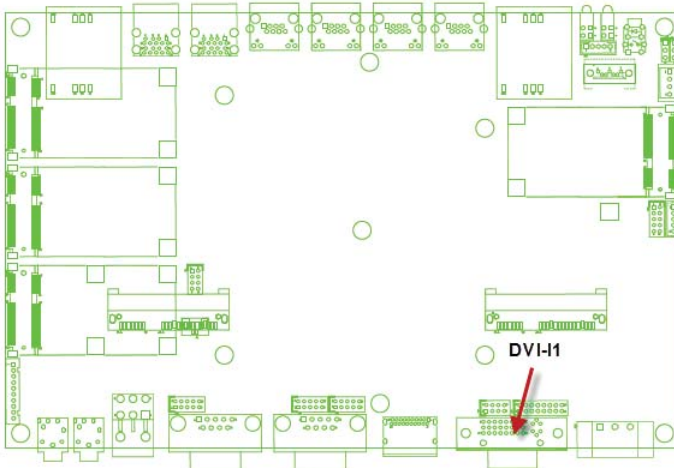
| 3.5 LAN Connector | | | | |
|--|-------------|------------|-----|-------------|
| Connector size | 12 Pin | | | |
| Connector type | RJ45+LED | | | |
| Connector location | LAN3 | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | LAN2_MDI0P | 2 | LAN2_MDI0N |
| | 3 | LAN2_MDI1P | 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 | | | | |
| | | | | |

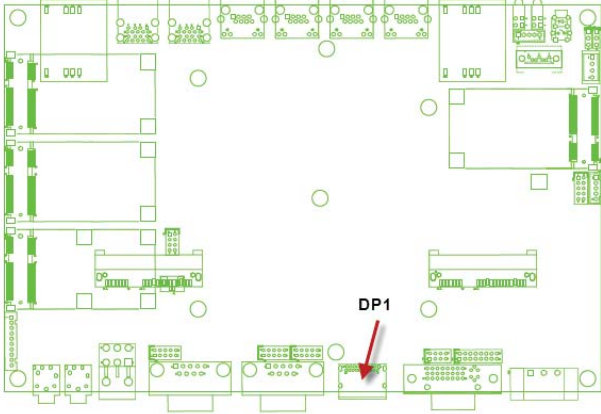
3.7 DVI-I Connector

| | | | | |
|--------------------------|--|--------------|-----|-------------|
| 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 | |

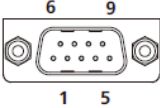
Connector map



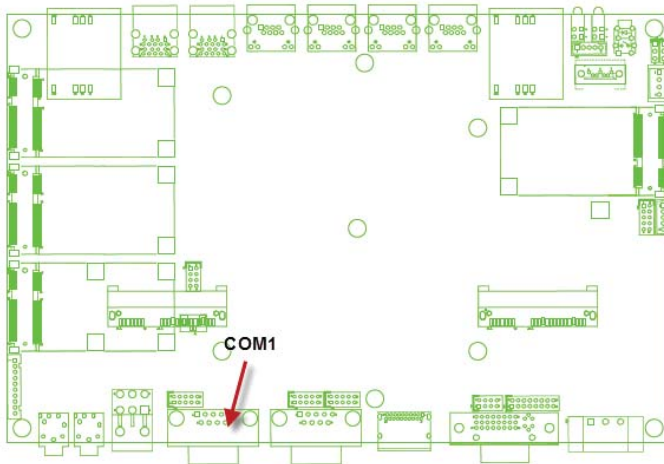
3.8 DP Connector

| | | | | |
|--------------------------|--|---------------|-----|-------------|
| 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 |  | | | |

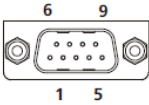
3.9 COM Connector

| | | | | |
|--------------------------|--|---|-----|---------------------------------------|
| Connector size | 9 Pin | | | |
| Connector type | DSUB | | | |
| Connector location | COM1  | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | COM1_DCD / <i>(RS-485_TXD-/RXD-)</i> | 2 | COM1_RXD <i>(RS-485_TXD+/RXD+)</i> |
| | 3 | COM1_TXD | 4 | COM1_DTR |
| | 5 | GND | 6 | COM1_DSR |
| | 7 | COM1_RTS | 8 | COM1_CTS |
| | 9 | COM1_RI# | | |

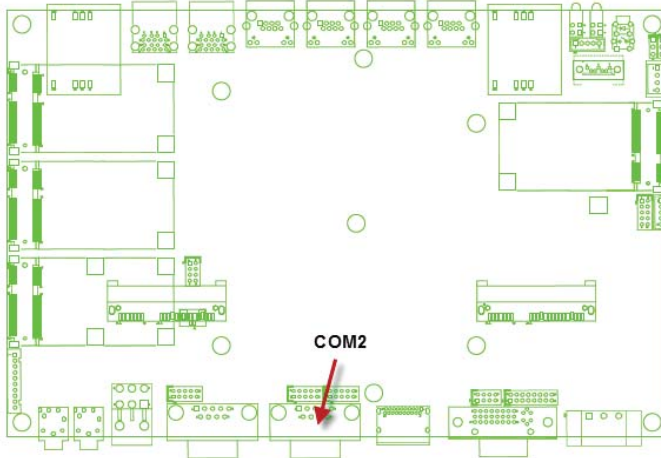
Connector map



3.10 COM Connector

| | | | | |
|--------------------------|--|---------------------------------------|-----|---------------------------------------|
| Connector size | 9 Pin | | | |
| Connector type | DSUB | | | |
| Connector location | COM2  | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | COM2_DCD <i>(RS-485_TXD-/RXD-)</i> | 2 | COM2_RXD <i>(RS-485_TXD+/RXD+)</i> |
| | 3 | COM2_TXD | 4 | COM2_DTR |
| | 5 | GND | 6 | COM2_DSR |
| | 7 | COM2_RTS | 8 | COM2_CTS |
| | 9 | COM2_RI# | | |

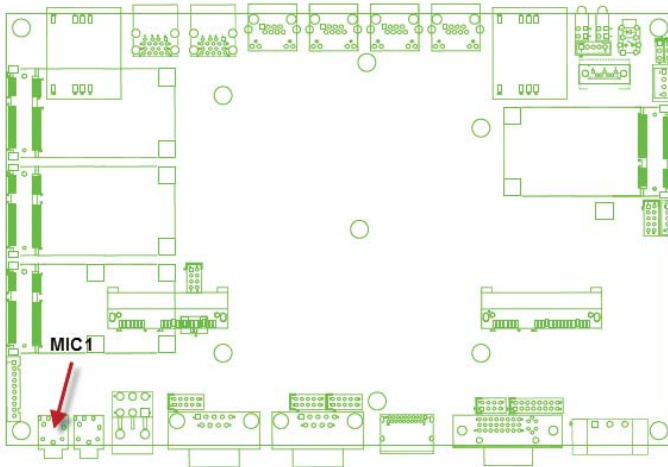
Connector map



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 |

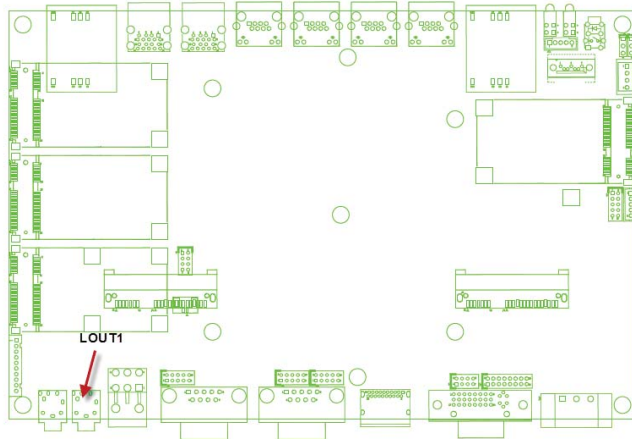
Connector map

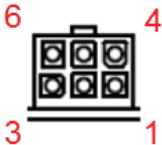
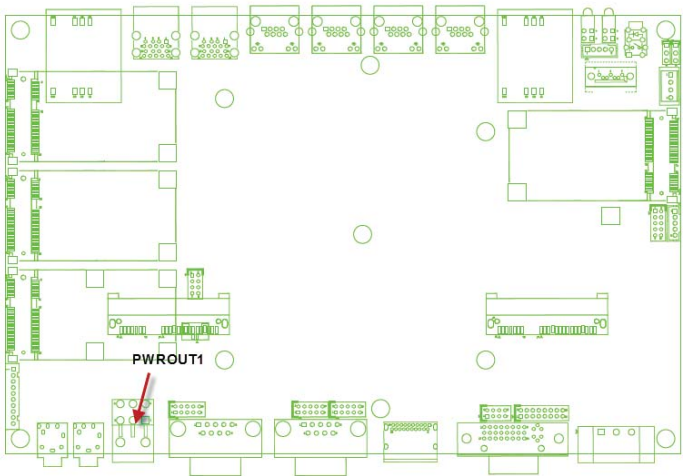


3.12 LINE OUT Connector

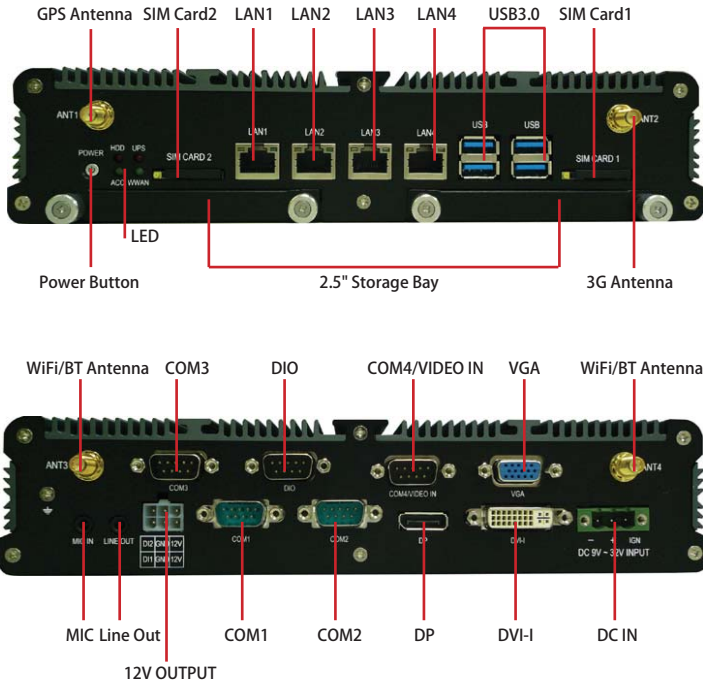
| | | | | |
|--------------------------|--------------|-------------|-----|-------------|
| Connector size | 6 Pin | | | |
| Connector type | Phone Jack | | | |
| Connector location | LOUT1 | | | |
| Connector pin definition | Pin | Signal | Pin | Signal |
| | 1 | FRONT_OUT_L | 2 | FRONT-JD |
| | 3 | 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 |  | | | |

■ 4.1 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.



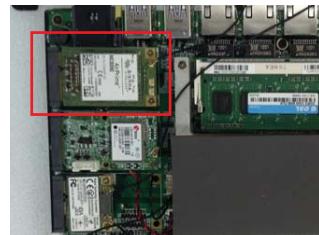
Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.



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

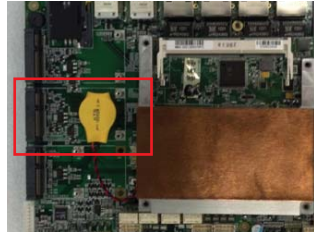


Step 4. Done as shown in the picture.



■ 4.5 Installing MINI PCIe Expansion Card (PCIe 2)

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



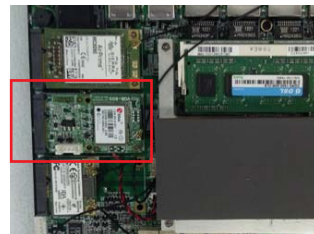
Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.



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



Step 4. Done as shown in the picture.

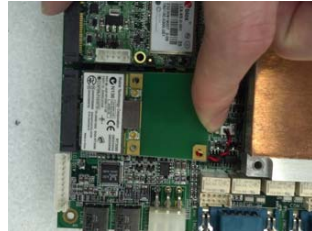


■ 4.6 Installing MINI PCIe Expansion (PCIe 3)

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.

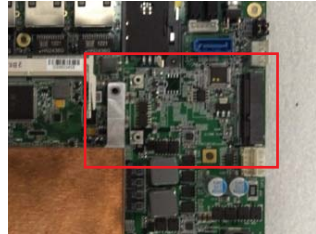


Step 4. Done as shown in the picture.

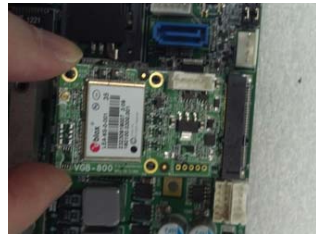


■ 4.7 Installing MINI PCIe Expansion (PCIe 4, PCIe only)

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



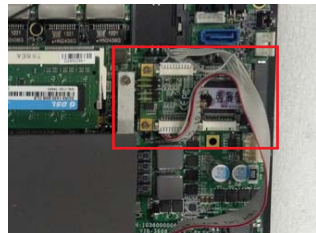
Step 2. Hold the Module with its notch aligned with the socket of the board and insert it at a 30 degree angle into the socket as shown in the picture.



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

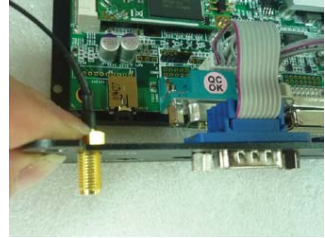


Step 4. Done as shown in the picture.



■ 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.

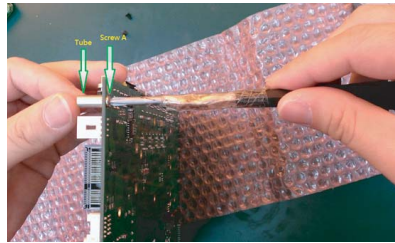
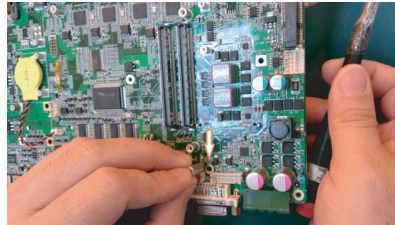
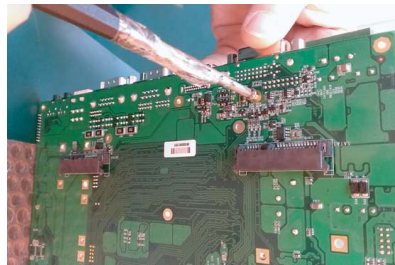


- Step 4.** Fully insert the HDD Holder into the socket until a “click” is heard as shown in the picture.

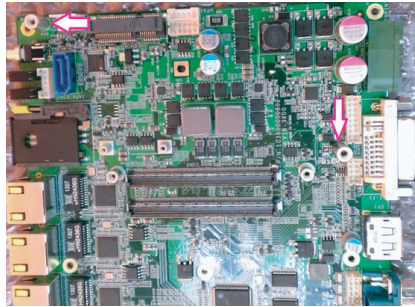


- Step 5.** Tighten to Storage Bracket screws as shown in the picture.

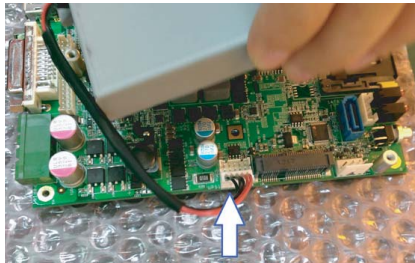


■ 4.11 Installing Battery Module**Step 1.** Accessories list**Step 2.** Fix the Tube with Screw A on the motherboard**Step 3.** Fix the Tube with Screw A to another hole.**Step 4.** Fix the Screw A from back side

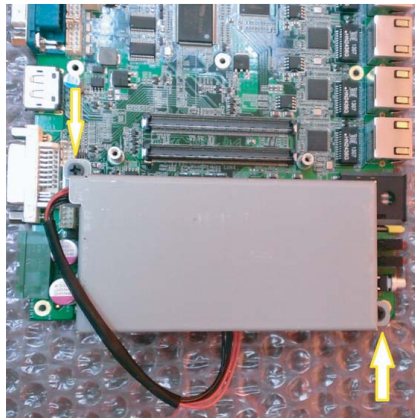
Step 5. Tube Location check.



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

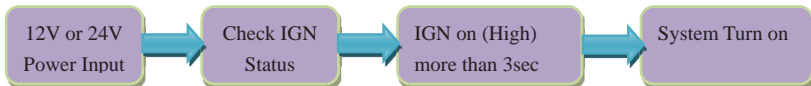
Startup/shutdown conditions from the IGNITION signal:

- 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 generates Main Button shutdown event and then goes to complete power off.

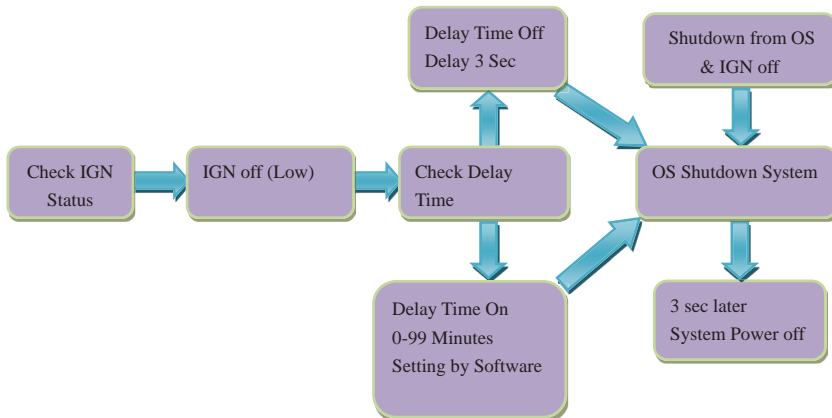
Typically the system can start only from IGNITION signal, because startup PIC controller is disconnected from the power source.

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, RT130 will shut down automatically.
- If the ignition is turned on again and the power-off delay is in progress, RT130 will cancel the delay function and will continue to operate normally.
- If the ignition is turned on again and the power-off delay ended, RT130 will shut down completely will power-on again automatically.

5.2 GPIO & Ignition Register

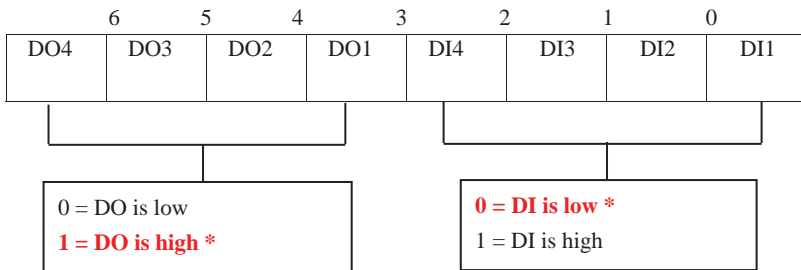
5.2.1 GPIO and Ignition Control Register

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

- OA35 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. |

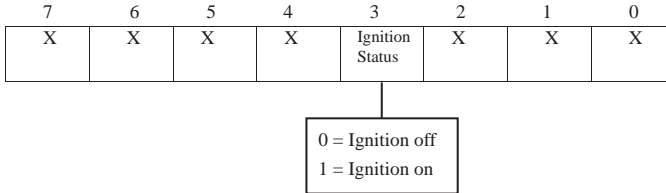
GPIO5 Pin Status Register — Index A2h

| 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



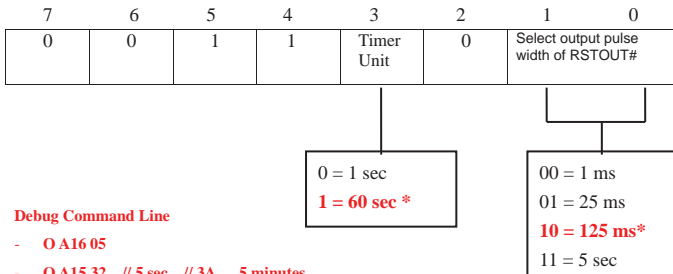
Debug Command Line

- 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

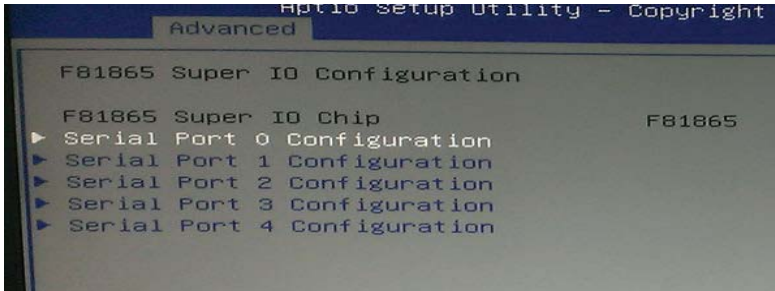
| Bit | Name | R/W | Default | Description |
|-----|---------|-----|---------|------------------------|
| 7-0 | WD_TIME | R/W | 0 | Time of watchdog timer |

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

