

# EEV-EX16-B1

Micro ATX Type6 COM Express Carrier Board

## User's Manual



1<sup>st</sup> Ed – 13 September 2022

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# 1. Getting Started

## 1.1 Safety Precautions

### Warning!



Always completely disconnect the power cord from your chassis whenever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.

### Caution!



Always ground yourself to remove any static charge before touching the CPU card. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components in a static-dissipative surface or static-shielded bag when they are not in the chassis.

## 1.2 Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:

- 1 x EEV-EX16 Micro ATX Type6 COM Express Carrier Board
- 1 x Expansion board for PCIe
- 8 x M3\*5mm Ni Screws for installing Carrier Board
- 1 x I/O Shield
- 1 x Desiccant (5g)



If any of the above items is damaged or missing, contact your retailer.

### 1.3 Document Amendment History

| Revision        | Date           | By     | Comment         |
|-----------------|----------------|--------|-----------------|
| 1 <sup>st</sup> | September 2022 | Avalue | Initial Release |

## 1.4 System Specifications

|                                        |                                                                             |
|----------------------------------------|-----------------------------------------------------------------------------|
| <b>System</b>                          |                                                                             |
| <b>BIOS</b>                            | SPI FLASH SOIC 8PIN Socket                                                  |
| <b>Expansion Slot</b>                  |                                                                             |
| <b>PCIe</b>                            | 1 x PCIe x 16 Slot (Gen4 connector),<br>2 x PCIe x 4 Slots (Gen4 connector) |
| <b>Storage</b>                         |                                                                             |
| <b>SD Card</b>                         | 1 x SDIO                                                                    |
| <b>Edge I/O</b>                        |                                                                             |
| <b>LAN</b>                             | 1 x LAN                                                                     |
| <b>USB 3.1</b>                         | 4 x USB 3.2 (Gen2 / 10Gbps)                                                 |
| <b>DP</b>                              | 3 x DP Connector                                                            |
| <b>HDMI</b>                            | 3 x HDMI Connector                                                          |
| <b>VGA</b>                             | 1 x VGA                                                                     |
| <b>Audio</b>                           | MIC In & Line Out                                                           |
| <b>Onboard I/O</b>                     |                                                                             |
| <b>USB</b>                             | 4 x USB2.0                                                                  |
| <b>CPU/System FAN</b>                  | 1 x CPU FAN, 1x System FAN                                                  |
| <b>Buzzer</b>                          | 1 x Buzzer                                                                  |
| <b>Front Panel</b>                     | 1 x Front Panel                                                             |
| <b>RTC Battery</b>                     | 1 x RTC Battery                                                             |
| <b>AT/ATX Selector</b>                 | 1 x ATX (Default)                                                           |
| <b>Clear CMOS</b>                      | 1 x Clear CMOS                                                              |
| <b>LVDS</b>                            | 1 x LVDS                                                                    |
| <b>Other</b>                           | 1 x eDP                                                                     |
| <b>I/O Interface (SOM)</b>             |                                                                             |
| <b>PCI Express</b>                     | 1 x COM Express connector (connector row AB,CD)                             |
| <b>SATA</b>                            | 4 x SATAIII                                                                 |
| <b>Display</b>                         |                                                                             |
| <b>Digital Display Interface (SOM)</b> | VGA, LVDS, eDP, HDMI, DisplayPort                                           |
| <b>Audio</b>                           |                                                                             |
| <b>Audio Codec</b>                     | ALC888S                                                                     |
| <b>Ethernet</b>                        |                                                                             |
| <b>LAN Spec.</b>                       | 1 x RJ45 (2.5G LAN)                                                         |
| <b>Mechanical &amp; Environmental</b>  |                                                                             |

|                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Power Type</b>                                                                                                                                         | ATX                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Operating Temp.</b>                                                                                                                                    | Standard: 0°C to 60°C (32°F ~ 140°F)<br>*Except Audio IC, all components are wide-temperature SKUs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Storage Temp.</b>                                                                                                                                      | -40°C to 85°C (-40°F ~ 185°F)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Operating Humidity</b>                                                                                                                                 | 40°C @ 95% Relative Humidity, Non-condensing                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Size (L x W)</b><br>(Please consult product engineers for the production feasibility if the size is larger than 410 x 360mm or smaller than 80 x 70mm) | 243.84 mm x 243.84 mm (Micro-ATX Form Factor)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Weight</b>                                                                                                                                             | 0.42g                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Vibration Test</b>                                                                                                                                     | <p>Random Vibration Operation 1 Test PSD : 0.00454G<sup>2</sup>/Hz , 1.5 Grms 2 System condition : operation mode 3 Test frequency : 5~500 Hz 4 Test axis : X,Y and Z axis 5 Test time : 30 minutes per each axis 6 IEC60068-2-64 Test Fh 6 Storage : mSATA</p> <p>Random vibration test (Non-operation)</p> <p>1 PSD: 0.01818G<sup>2</sup>/Hz, 3.0 Grms</p> <p>2 Non-Operation mode</p> <p>3 Test Frequency: 5-500Hz</p> <p>4 Test Axis: X, Y and Z axis</p> <p>5 30 min. per each axis</p> <p>6 IEC 60068-2-64 Test:Fh</p> <p>Package Vibration Test:</p> <p>1 Test PSD: 0.026G<sup>2</sup>/Hz , 2.16 Grms</p> <p>2 Test frequency: 5~500 Hz</p> <p>3 Test axis : X,Y and Z axis</p> <p>4 Test time : 30 minutes per each axis</p> <p>5 IEC 60068-2-64 Test Fh</p> |
| <b>Shock Test</b>                                                                                                                                         | <p>1 Wave from : Half Sine wave</p> <p>2 Acceleration Rate : 10g</p> <p>3 Duration Time : 11ms</p> <p>4 No. of shock : Z axis 300 times</p> <p>5 Test Axis : Z axis</p> <p>6 operation mode</p> <p>7 Reference IEC 60068-2-27 testing procedures Test Eb : Shock Test</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Drop Test</b>                                                                                                                                          | <p>Package drop test</p> <p>Reference ISTA 2A, Method : IEC-60068-2-32 Test: Ed Test Ea : Drop Test</p> <p>1 Test phase : One corner, three edges, six faces</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

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|                       |                                                                  |
|-----------------------|------------------------------------------------------------------|
|                       | 2 Test high : 96.5cm<br>3 Package weight : 5Kg<br>4 Test drawing |
| <b>OS Information</b> | According to COMe Module solution                                |

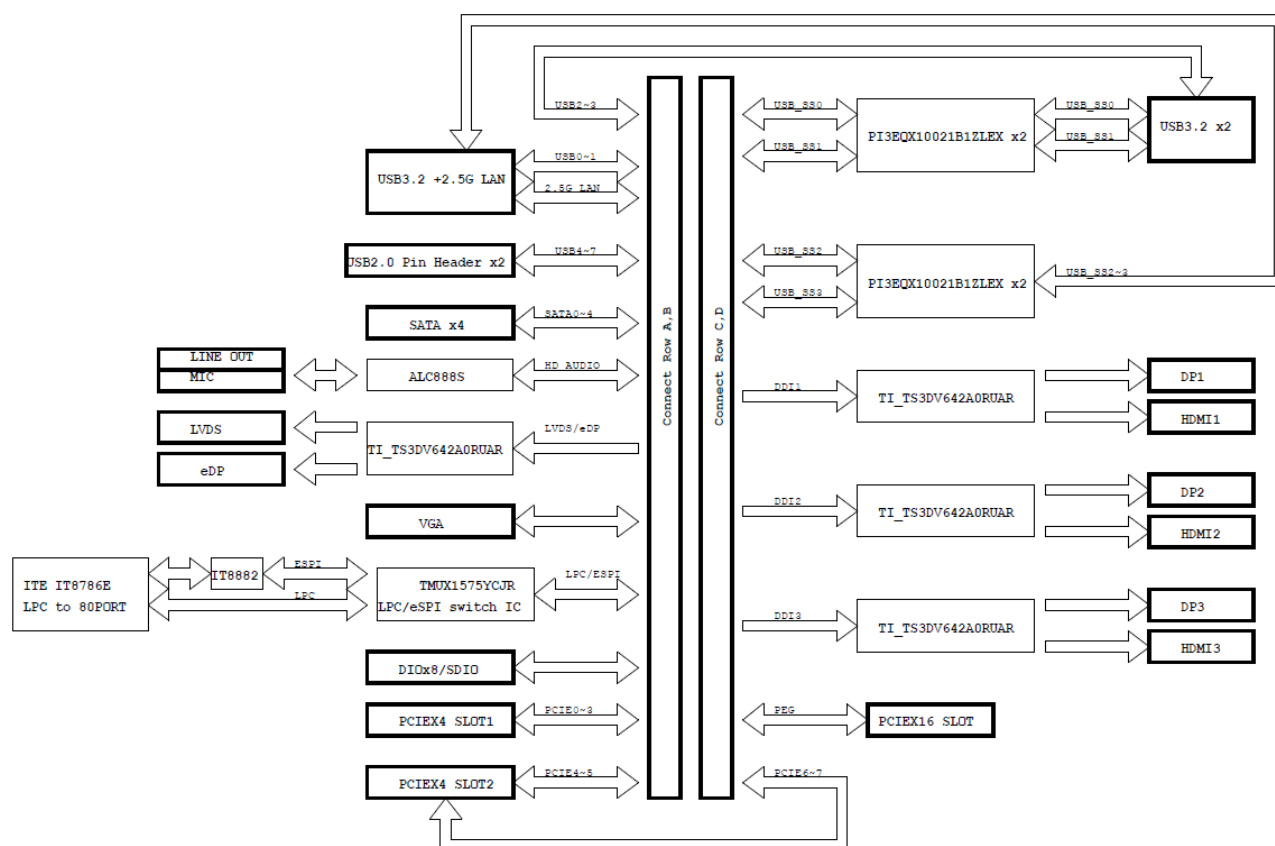


**Note:** Specifications are subject to change without notice.



## 1.5 Architecture Overview—Block Diagram

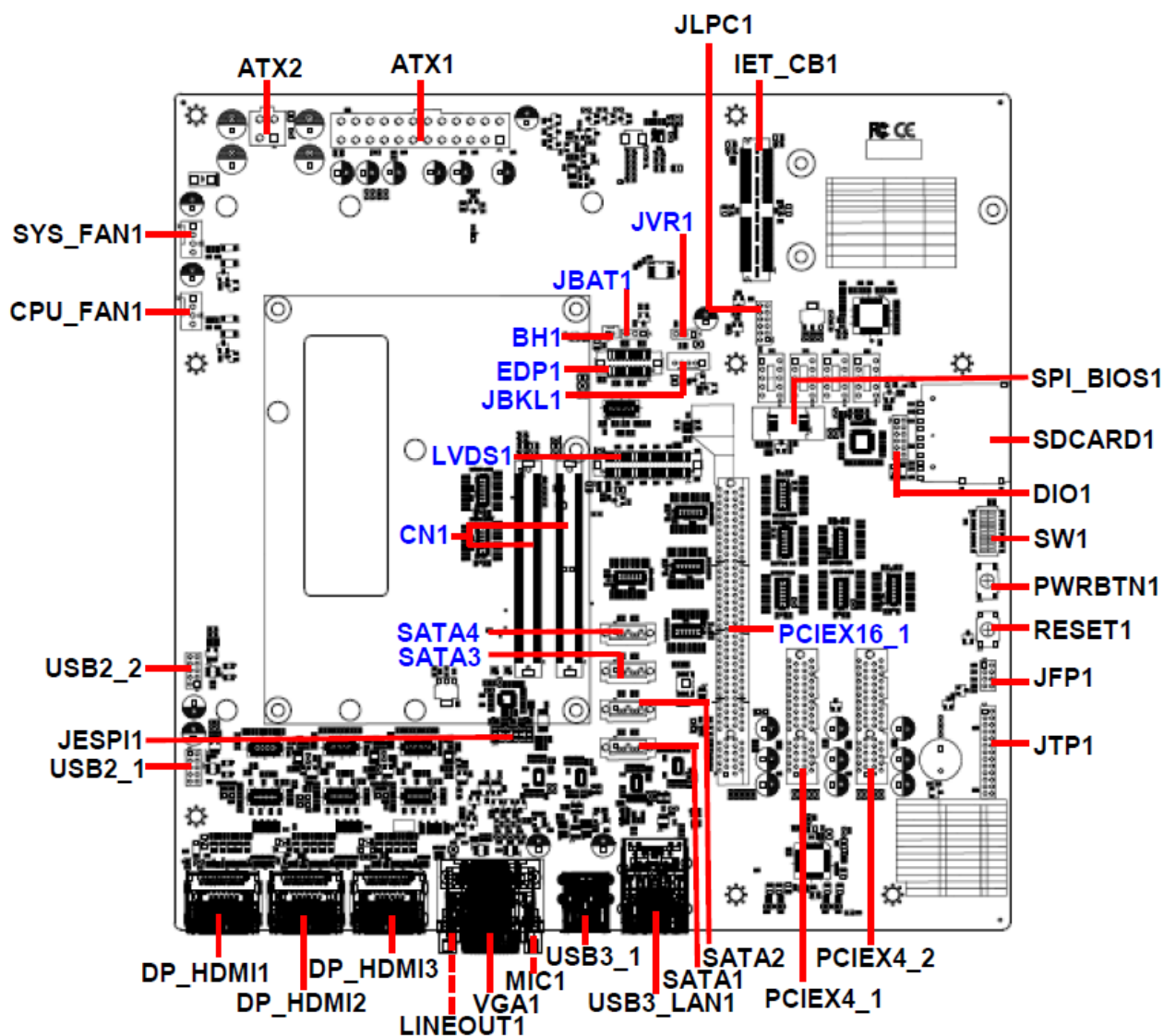
The following block diagram shows the architecture and main components of EEV-EX16-B1.



## 2. Hardware Configuration

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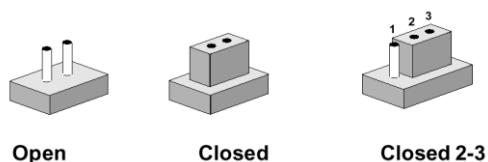
## 2.1 Product Overview



## 2.2 Jumper and Connector List

You can configure your board to match the needs of your application by setting jumpers. A jumper is the simplest kind of electric switch.

It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper you connect the pins with the clip. To “open” a jumper you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2, and 3. In this case, you would connect either two pins.



The jumper settings are schematically depicted in this manual as follows:



A pair of needle-nose pliers may be helpful when working with jumpers.

Connectors on the board are linked to external devices such as hard disk drives, a keyboard, or floppy drives. In addition, the board has a number of jumpers that allow you to configure your system to suit your application.

If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes.

The following tables list the function of each of the board's jumpers and connectors.

### Jumpers

| Label        | Function              | Note                       |
|--------------|-----------------------|----------------------------|
| <b>SW1</b>   | Multi-function select | DIP switch 10pin           |
| <b>JBAT1</b> | Clear CMOS            | 3 x 1 header, pitch 2.54mm |

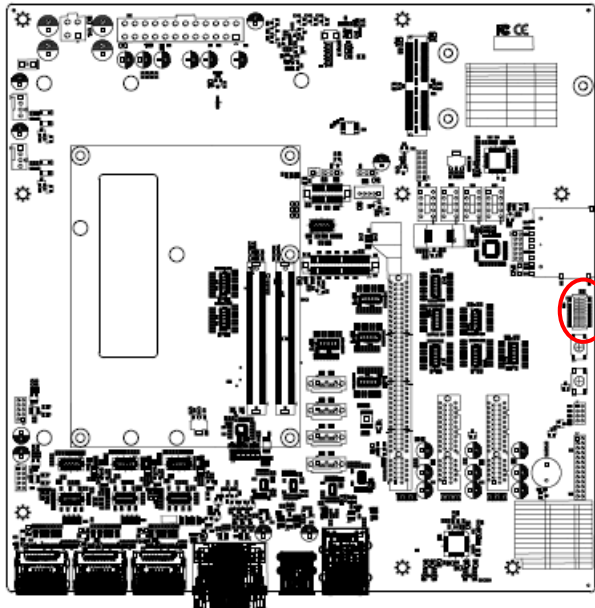
### Connectors

| Label               | Function                                         | Note                       |
|---------------------|--------------------------------------------------|----------------------------|
| <b>ATX1</b>         | ATX1 Power connector                             | 12 x 2 wafer, pitch 4.20mm |
| <b>ATX2</b>         | ATX2 Power connector                             | 2 x 2 wafer, pitch 4.20mm  |
| <b>CPU_FAN1</b>     | CPU Fan connector                                | 4 x 1 wafer, pitch 2.54mm  |
| <b>SYS_FAN1</b>     | System Fan connector                             | 4 x 1 wafer, pitch 2.54mm  |
| <b>DP_HDMI1/2/3</b> | 3 x Display port connector<br>3 x HDMI connector |                            |

|                    |                                                |                                                                              |
|--------------------|------------------------------------------------|------------------------------------------------------------------------------|
| <b>SDCARD1</b>     | SD card slot                                   |                                                                              |
| <b>JTP1</b>        | Test position connector                        | 13 x 2 header, pitch 2.00mm                                                  |
| <b>IET_CB1</b>     | IET connector                                  | 40 x 2 wafer, pitch 0.80mm<br>(only used in production testing)              |
| <b>JVR1</b>        | LCD backlight brightness adjustment            | 3 x 1 header, pitch 2.54mm                                                   |
| <b>JBKL1</b>       | LCD Inverter connector                         | 5 x 1 wafer, pitch 2.00mm<br>Matching Connector: JST PHR-5                   |
| <b>DIO1</b>        | General Purpose I/O connector                  | 6 x 2 header, pitch 2.00mm                                                   |
| <b>JFP1</b>        | Front panel connector                          | 4 x 2 header, pitch 2.00mm                                                   |
| <b>PWRBTN1</b>     | Power button                                   |                                                                              |
| <b>RESET1</b>      | Reset button                                   |                                                                              |
| <b>USB3_LAN1</b>   | 2 x USB3.2 connector<br>1 x Ethernet connector |                                                                              |
| <b>USB3_1</b>      | 2 x USB3.2 connector                           |                                                                              |
| <b>USB2_1</b>      | USB connector                                  | 5 x 2 header, pitch 2.00mm                                                   |
| <b>USB2_2</b>      | USB connector                                  | 5 x 2 header, pitch 2.00mm                                                   |
| <b>PCIEX4_1</b>    | PCIx4 Express connector 1                      |                                                                              |
| <b>PCIEX4_2</b>    | PCIx4 Express connector 2                      |                                                                              |
| <b>PCIEX16_1</b>   | PCIx16 Express connector                       |                                                                              |
| <b>SATA1/2/3/4</b> | 4 x Serial ATA connector                       |                                                                              |
| <b>LVDS1</b>       | LVDS connector                                 | 20 x 2 wafer, pitch 1.25 mm<br>Matching Connector: Hirose<br>DF13-40DS-1.25C |
| <b>JLPC1</b>       | LPC port connector                             | 6 x 2 header, pitch 2.00mm                                                   |
| <b>EDP1</b>        | EDP connector                                  | 10 x 2 wafer, pitch 1.25mm                                                   |
| <b>BH1</b>         | Battery connector                              | 2 x 1 wafer, pitch 1.25mm                                                    |
| <b>VGA1</b>        | VGA connector                                  |                                                                              |
| <b>LINEOUT1</b>    | Audio line-out connector                       |                                                                              |
| <b>MIC1</b>        | Audio mic-in connector                         |                                                                              |
| <b>SPI_BIOS1</b>   | (Reserved for BIOS programming)                | 5 x 2 header, pitch 2.00mm                                                   |
| <b>CN1</b>         | COM Express connector                          |                                                                              |
| <b>JESPI1</b>      | ESPI connector                                 | 6 x 2 header, pitch 2.00mm                                                   |

## 2.3 Setting Jumpers & Connectors

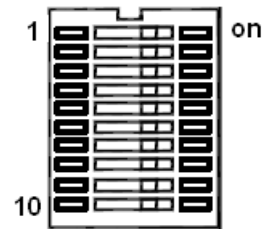
### 2.3.1 Multi-function select (SW1)



**\* Default**

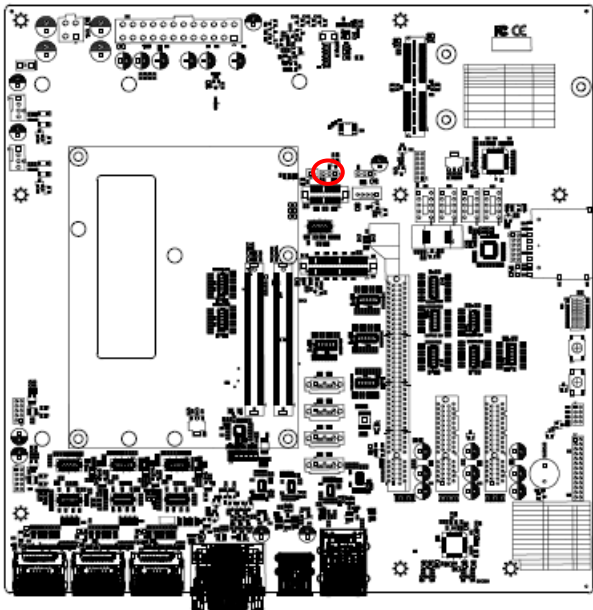
**\*a:** Both signal comes from COMe module, use BIOS ROM Select to choose boot with the BIOS IC from module or carrier board.

**\*b:** Control ErP on both module and carrier board. BIOS ErP setting will only affect on module.

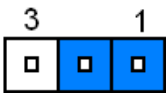


|    | Function                                        | ON          | OFF      |
|----|-------------------------------------------------|-------------|----------|
| 1  | BIOS Entry<br>(Ref. BIOS_DIS0# <b>*a</b> )      | Carrier FWH | SPI*     |
| 2  | BIOS ROM Select<br>(Ref. BIOS_DIS1# <b>*a</b> ) | Carrier     | Module*  |
| 3  | LPC/eSPI SELECT                                 | eSPI        | LPC*     |
| 4  | ErP setting <b>*b</b>                           | ErP ON      | ErP Off* |
| 5  | AT/ATX (PSON)                                   | ATX*        | AT       |
| 6  | DP/HDMI select1<br>(optional)                   | DP1         | HDMI1    |
| 7  | DP/HDMI select2<br>(optional)                   | DP2         | HDMI2    |
| 8  | DP/HDMI select3<br>(optional)                   | DP3         | HDMI3    |
| 9  | LVDB/eDP select<br>(optional)                   | LVDB        | eDP      |
| 10 | PCIe x16 lane<br>direction                      | Reverse     | Normal*  |

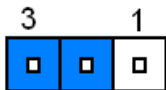
2.3.2 Clear CMOS (JBAT1)



Protect\*

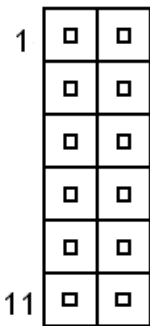
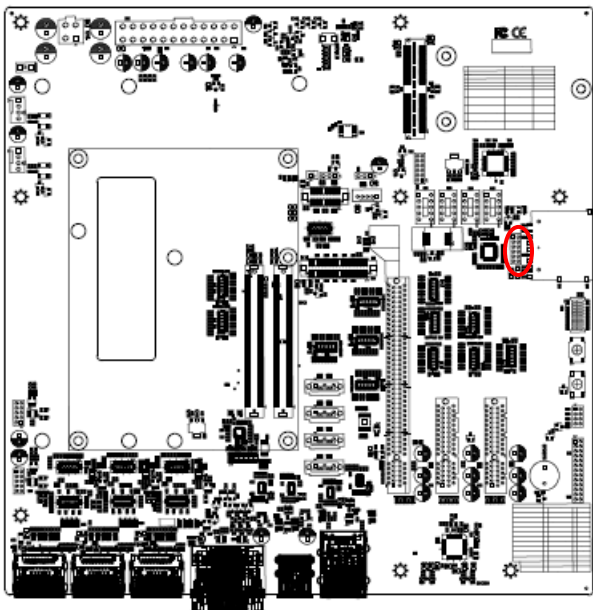


Clear CMOS



\* Default

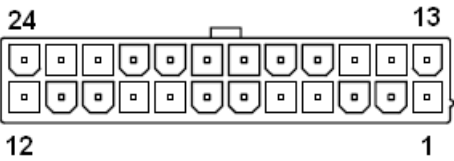
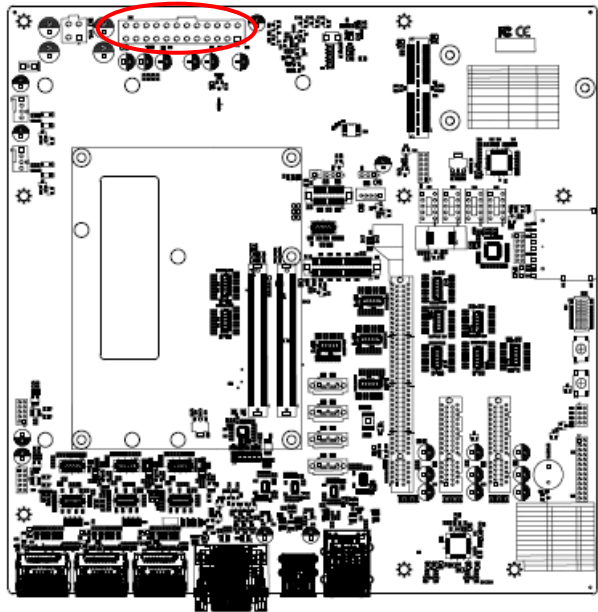
2.3.3 General Purpose I/O connector (DIO1)



| Signal          | PIN | PIN | Signal           |
|-----------------|-----|-----|------------------|
| DIO_OUT0_SD_CLK | 1   | 2   | DIO_IN0_SD_DATA0 |
| DIO_OUT1_SD_CMD | 3   | 4   | DIO_IN1_SD_DATA1 |
| DIO_OUT2_SD_WP  | 5   | 6   | DIO_IN2_SD_DATA2 |
| DIO_OUT3_SD_CD# | 7   | 8   | DIO_IN3_SD_DATA3 |
| SMB_CLK         | 9   | 10  | SMB_DAT          |
| GND             | 11  | 12  | +5V              |

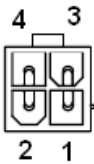
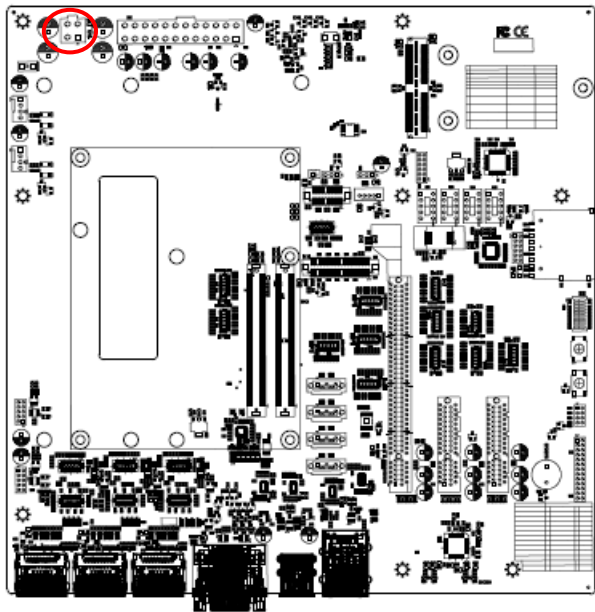
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2.3.4 ATX1 Power connector (ATX1)



| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| +3.3V  | 13  | 1   | +3.3V  |
| NC     | 14  | 2   | +3.3V  |
| GND    | 15  | 3   | GND    |
| PSON#  | 16  | 4   | +5V    |
| GND    | 17  | 5   | GND    |
| GND    | 18  | 6   | +5V    |
| GND    | 19  | 7   | GND    |
| NC     | 20  | 8   | PWR_OK |
| +5V    | 21  | 9   | +5VSB  |
| +5V    | 22  | 10  | +12V   |
| +5V    | 23  | 11  | +12V   |
| GND    | 24  | 12  | +3.3V  |

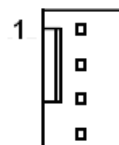
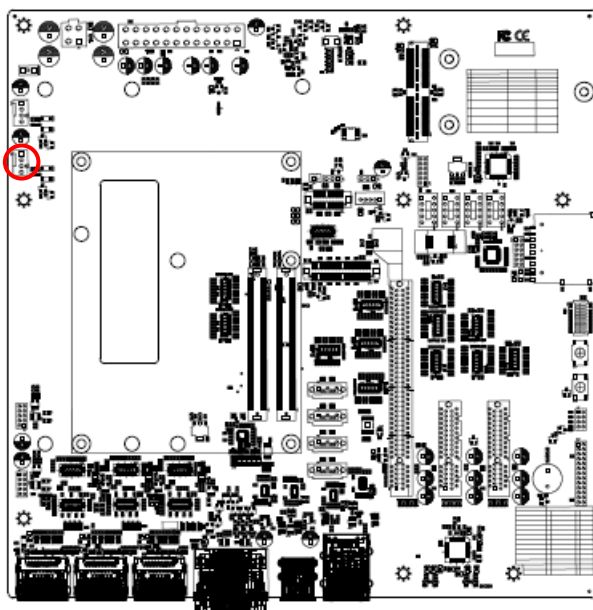
2.3.5 ATX2 Power connector (ATX2)



| Signal | PIN | PIN | Signal |
|--------|-----|-----|--------|
| +VIN   | 4   | 3   | +VIN   |
| GND    | 2   | 1   | GND    |

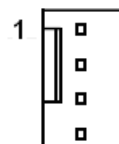
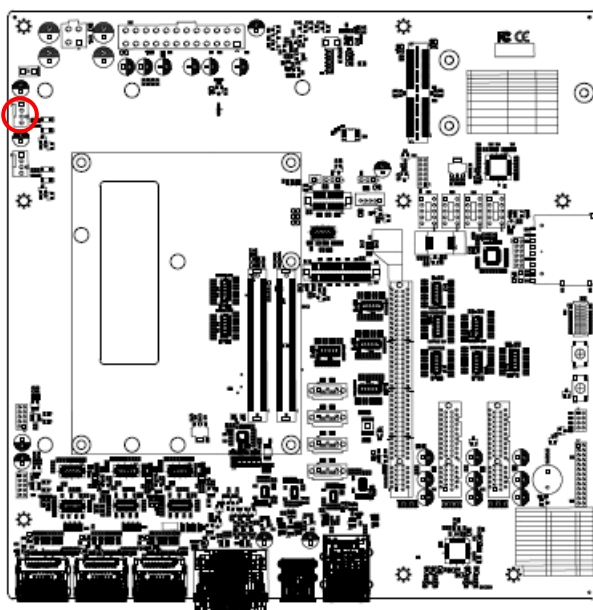


### 2.3.6 CPU Fan connector (CPU\_FAN1)



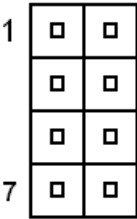
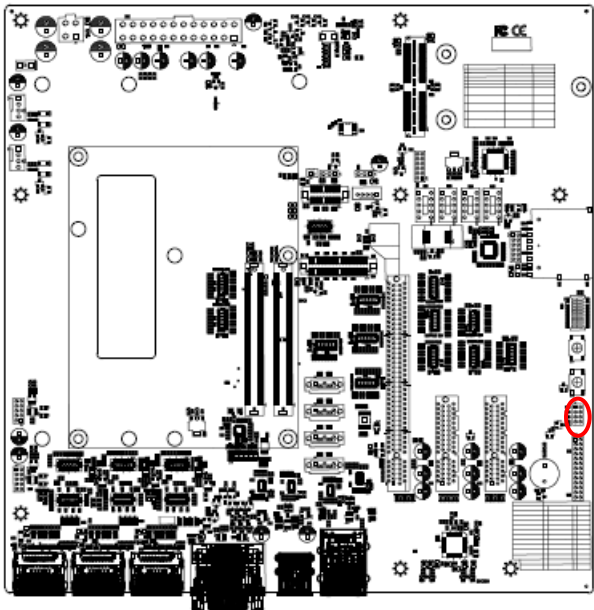
| Signal          | PIN |
|-----------------|-----|
| GND             | 1   |
| +12V            | 2   |
| FAN_TACHIM      | 3   |
| CPUFANOUT_SHIFT | 4   |

### 2.3.7 System Fan connector (SYS\_FAN1)



| Signal          | PIN |
|-----------------|-----|
| GND             | 1   |
| +12V            | 2   |
| SYS_FAN_TACHIM  | 3   |
| SYSFANOUT_SHIFT | 4   |

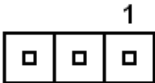
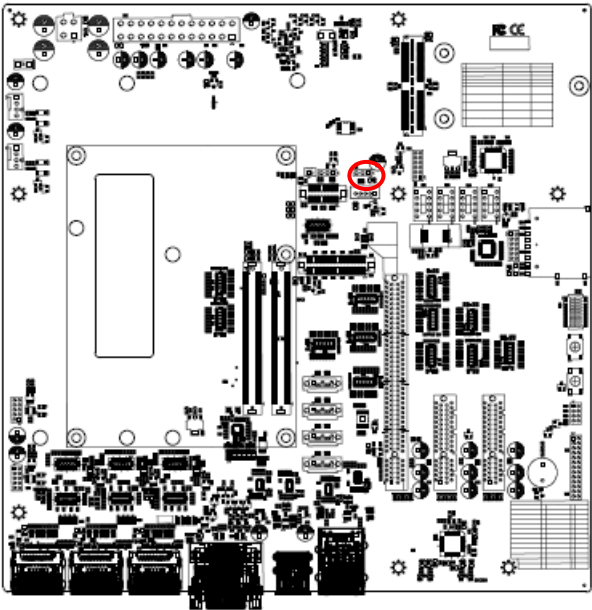
2.3.8 Front panel connector (JFP1)



| Signal      | PIN | PIN | Signal        |
|-------------|-----|-----|---------------|
| EXT_PWRBTN# | 1   | 2   | GND           |
| SYS_RERST#  | 3   | 4   | GND           |
| +5V         | 5   | 6   | GND           |
| +5V         | 7   | 8   | SATA_LED_OUT# |

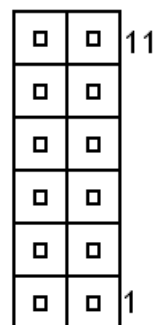
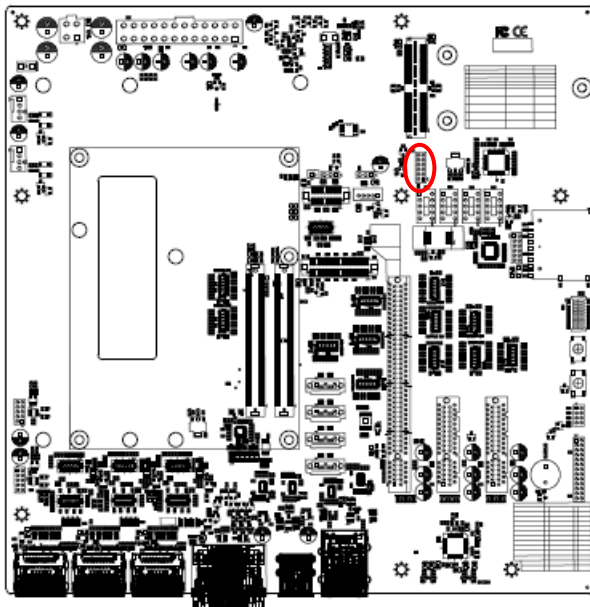
| Pin    | 1            | 2 | 3     | 4 | 5         | 6 | 7        | 8 |
|--------|--------------|---|-------|---|-----------|---|----------|---|
| Signal | Power Button |   | Reset |   | Power LED |   | SATA LED |   |

2.3.9 LCD backlight brightness adjustment (JVR1)



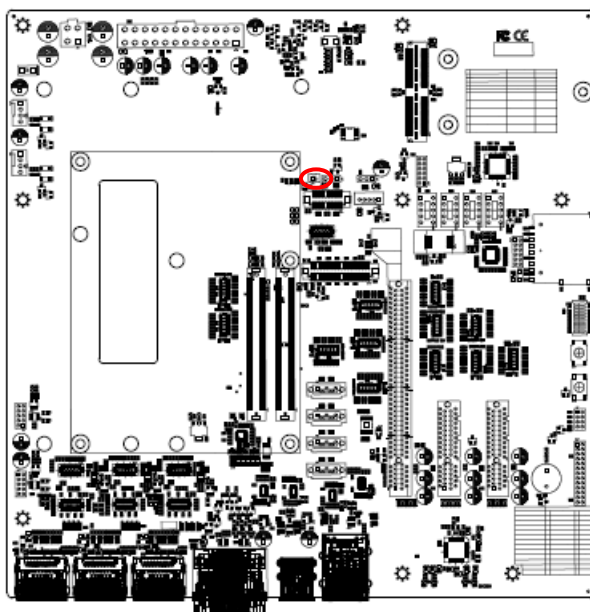
| Signal          | PIN |
|-----------------|-----|
| +5V             | 1   |
| EDP_BRIGHT_CTRL | 2   |
| GND             | 3   |

### 2.3.10 LPC port connector (JLPC1)



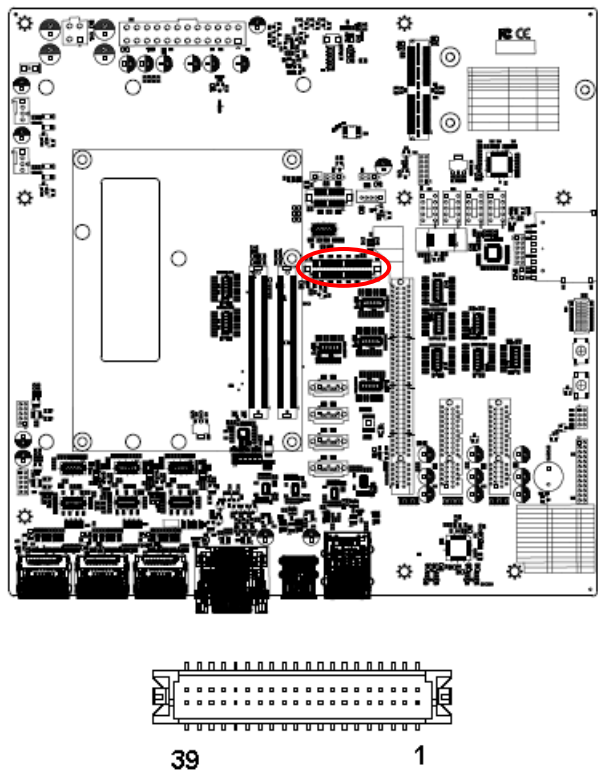
| Signal                | PIN | PIN | Signal            |
|-----------------------|-----|-----|-------------------|
| LPC_DRQ0#             | 12  | 11  | NC                |
| GND                   | 10  | 9   | LPC_PORT80_SERIRQ |
| PORT80_CLK            | 8   | 7   | LPC_PORT80_AD3    |
| LPC_PORT80_LPC_FRAME# | 6   | 5   | LPC_PORT80_AD2    |
| CB_RST#               | 4   | 3   | LPC_PORT80_AD1    |
| +3.3V                 | 2   | 1   | LPC_PORT80_AD0    |

### 2.3.11 Battery connector (BH1)



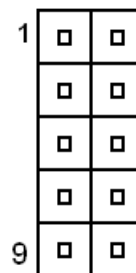
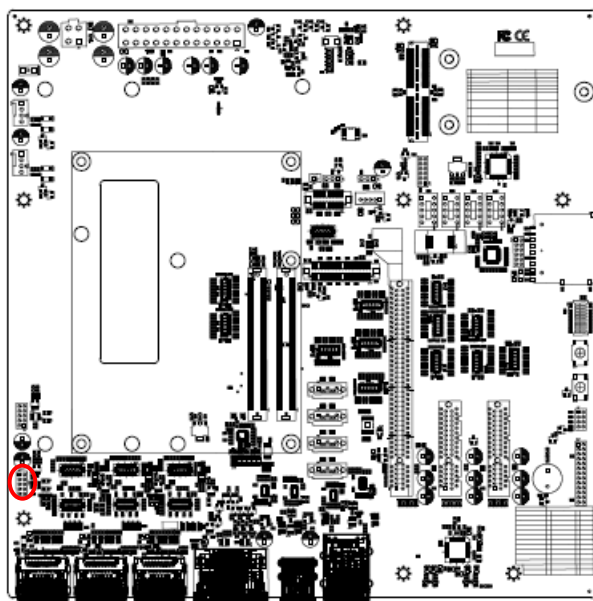
| Signal  | PIN |
|---------|-----|
| +3.3VSB | 1   |
| GND     | 2   |

2.3.12 LVDS connector (LVDS1)



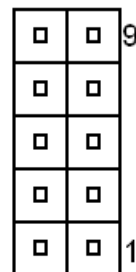
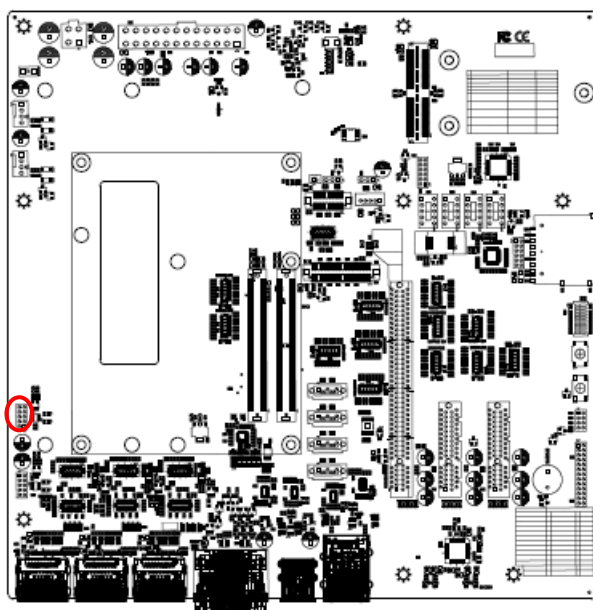
| Signal       | PIN | PIN | Signal       |
|--------------|-----|-----|--------------|
| +5V          | 2   | 1   | +3.3V        |
| +5V          | 4   | 3   | +3.3V        |
| LVDS_DDC_SD  | 6   | 5   | LVDS_DDC_SC  |
| GND          | 8   | 7   | GND          |
| LVDSA_DATA0  | 10  | 9   | LVDSA_DATA1  |
| LVDSA_DATA0# | 12  | 11  | LVDSA_DATA1# |
| GND          | 14  | 13  | GND          |
| LVDSA_DATA2  | 16  | 15  | LVDSA_DATA3  |
| LVDSA_DATA2# | 18  | 17  | LVDSA_DATA3# |
| GND          | 20  | 19  | GND          |
| LVDSB_DATA0  | 22  | 21  | LVDSB_DATA1  |
| LVDSB_DATA0# | 24  | 23  | LVDSB_DATA1# |
| GND          | 26  | 25  | GND          |
| LVDSB_DATA2  | 28  | 27  | LVDSB_DATA3  |
| LVDSB_DATA2# | 30  | 29  | LVDSB_DATA3# |
| GND          | 32  | 31  | GND          |
| LVDSA_CLK    | 34  | 33  | LVDSB_CLK    |
| LVDSA_CLK#   | 36  | 35  | LVDSB_CLK#   |
| GND          | 38  | 37  | GND          |
| +12V         | 40  | 39  | +12V         |

## 2.3.13 USB connector (USB2\_1)



| Signal    | PIN | PIN | Signal    |
|-----------|-----|-----|-----------|
| +5V       | 1   | 2   | GND       |
| USB_Z_PN6 | 3   | 4   | GND       |
| USB_Z_PP6 | 5   | 6   | USB_Z_PP7 |
| GND       | 7   | 8   | USB_Z_PN7 |
| GND       | 9   | 10  | +5V       |

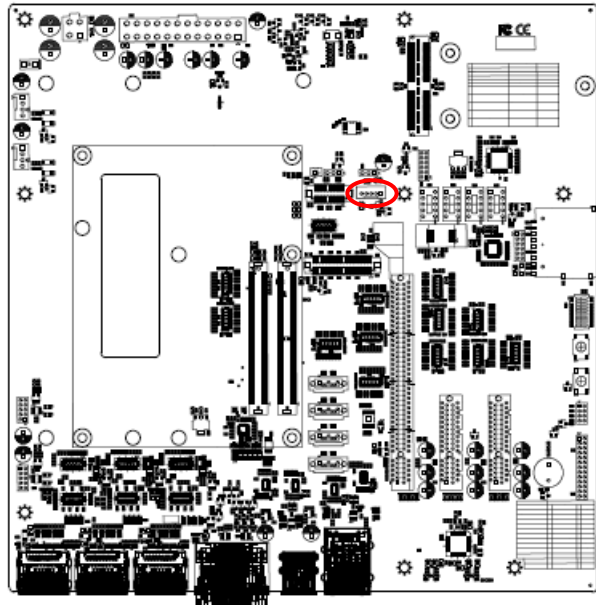
## 2.3.14 USB connector (USB2\_2)



| Signal    | PIN | PIN | Signal    |
|-----------|-----|-----|-----------|
| +5V       | 10  | 9   | GND       |
| USB_Z_PN5 | 8   | 7   | GND       |
| USB_Z_PP5 | 6   | 5   | USB_Z_PP4 |
| GND       | 4   | 3   | USB_Z_PN4 |
| GND       | 2   | 1   | +5V       |

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2.3.15 LCD Inverter connector (JBKL1)

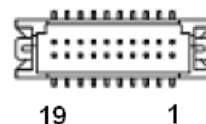
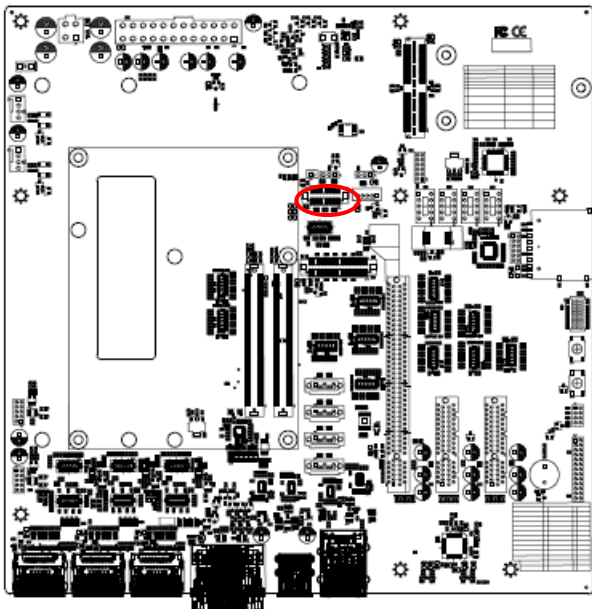


| Signal          | PIN |
|-----------------|-----|
| +VCC_BKL        | 1   |
| GND             | 2   |
| BKLEN           | 3   |
| EDP_BRIGHT_CTRL | 4   |
| +5V             | 5   |

2.3.15.1 Signal Description – LCD Inverter connector (JBKL1)

| Signal         | Signal Description                                                                                           |
|----------------|--------------------------------------------------------------------------------------------------------------|
| LVDS_BKLT_CTRL | when LVDS_BKLT_CTRL is controlled by carrier board's JVR1, Vadj = 0.75V ~ 4.25V (Recommended: 4.7KΩ, >1/16W) |
| BKLEN          | LCD backlight ON/OFF control signal                                                                          |

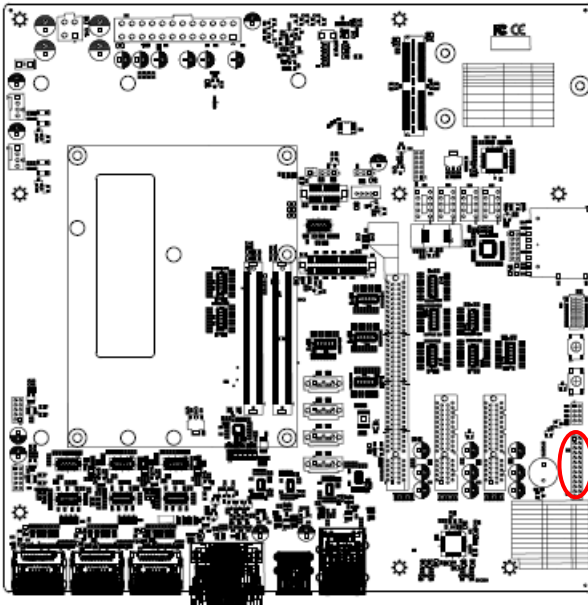
2.3.16 EDP connector (EDP1)



| Signal   | PIN | PIN | Signal   |
|----------|-----|-----|----------|
| GND      | 2   | 1   | GND      |
| EDP_TX3# | 4   | 3   | EDP_TX0# |
| EDP_TX3  | 6   | 5   | EDP_TX0  |
| NC       | 8   | 7   | GND      |
| GND      | 10  | 9   | EDP_TX1# |
| EDP_AUX# | 12  | 11  | EDP_TX1  |
| EDP_AUX  | 14  | 13  | GND      |
| GND      | 16  | 15  | EDP_TX2# |
| EMB_HPD  | 18  | 17  | EDP_TX2  |
| +VDD_EDP | 20  | 19  | +VDD_EDP |



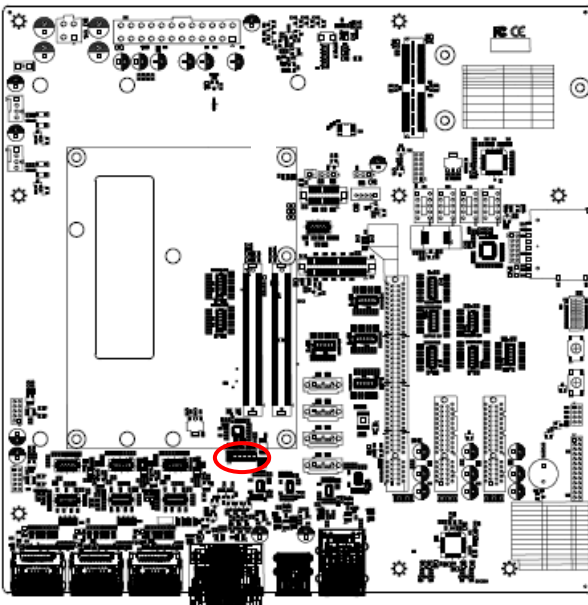
### 2.3.17 Test position connector (JTP1)



|    |   |   |
|----|---|---|
| 1  | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
|    | □ | □ |
| 25 | □ | □ |

| Signal           | PIN | PIN | Signal  |
|------------------|-----|-----|---------|
| SER0_TX          | 1   | 2   | SER0_RX |
| SER1_TX          | 3   | 4   | SER1_RX |
| I2C_CK           | 5   | 6   | I2C_DAT |
| TPM_PP           | 7   | 8   | +3.3VSB |
| LID#             | 9   | 10  | GND     |
| SLEEP#           | 11  | 12  | GND     |
| GBE0_SDP         | 13  | 14  | GND     |
| USB0_HOST_PRSENT | 15  | 16  | GND     |
| THRM#            | 17  | 18  | GND     |
| WAKE0#           | 19  | 20  | GND     |
| WAKE1#           | 21  | 22  | GND     |
| BATLOW#          | 23  | 24  | GND     |
| RAPID_SHUTDOWN   | 25  | 26  | +5VSB   |

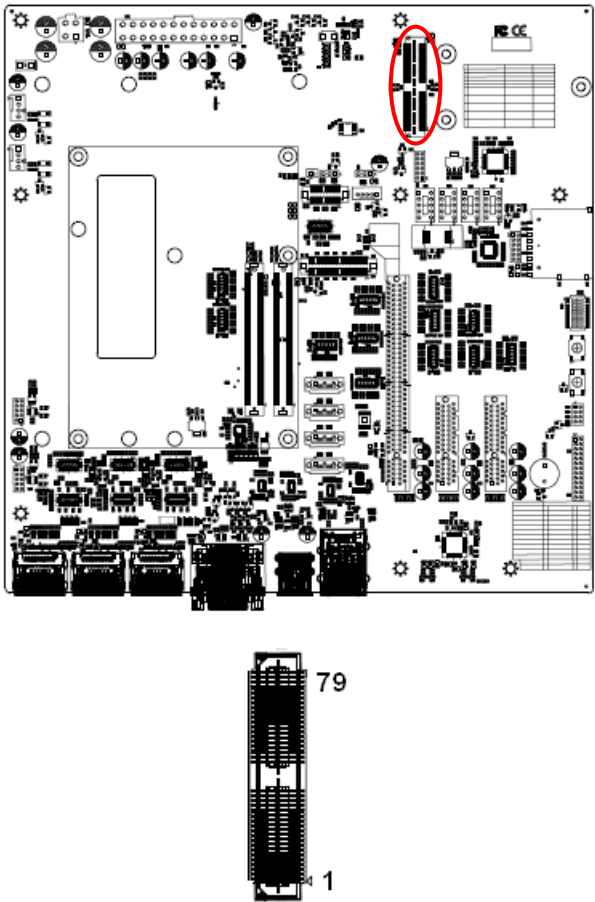
### 2.3.18 ESPI connector (JESPI1)



|   |   |   |   |   |    |
|---|---|---|---|---|----|
| □ | □ | □ | □ | □ | □  |
| □ | □ | □ | □ | □ | □  |
| 1 |   |   |   |   | 11 |

| Signal                | PIN | PIN | Signal             |
|-----------------------|-----|-----|--------------------|
| LPC_AD0/ESPI_IO_0     | 1   | 2   | +3.3VSB            |
| LPC_AD1/ESPI_IO_1     | 3   | 4   | CB_RST#            |
| LPC_AD2/ESPI_IO_2     | 5   | 6   | ESPI_PORT80_CS#    |
| LPC_AD3/ESPI_IO_3     | 7   | 8   | LPC_CLK/ESPI_CK    |
| SWITCH_EN             | 9   | 10  | GND                |
| SUS_STAT#/ESPI_RESET# | 11  | 12  | ESPI_PORT80_ALERT# |

2.3.19 IET connector (IET\_CB1) only used in production testing

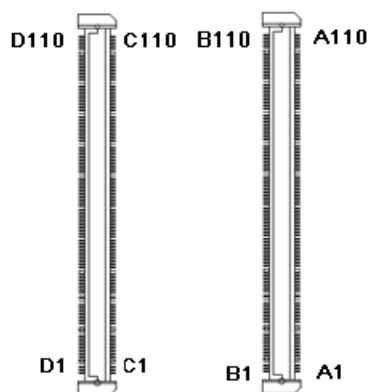
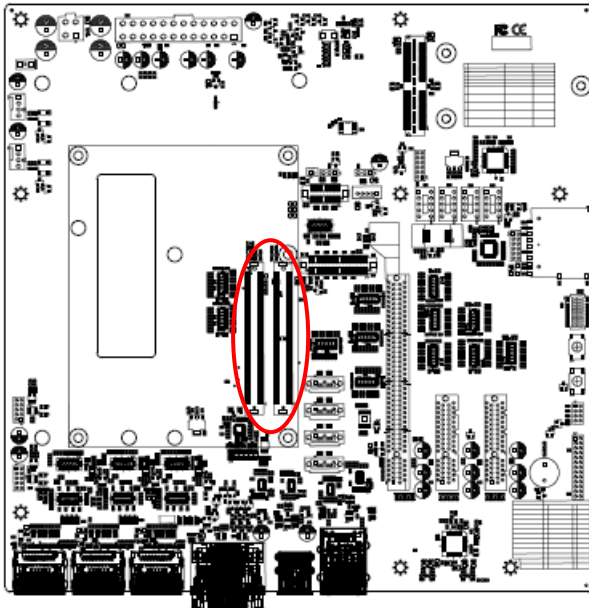


| Signal         | PIN | PIN | Signal |
|----------------|-----|-----|--------|
| +12V           | 80  | 79  | +12V   |
| NC             | 78  | 77  | GND    |
| GND            | 76  | 75  | NC     |
| SYS_FAN_PWMOUT | 74  | 73  | NC     |
| SYS_FAN_TACHIM | 72  | 71  | GND    |
| GND            | 70  | 69  | NC     |
| NC             | 68  | 67  | NC     |
| NC             | 66  | 65  | GND    |
| GND            | 64  | 63  | NC     |
| NC             | 62  | 61  | NC     |

| Signal                | PIN | PIN | Signal  |
|-----------------------|-----|-----|---------|
| NC                    | 60  | 59  | GND     |
| GND                   | 58  | 57  | NC      |
| LPC_FRAME#/ESPI_CS0#  | 56  | 55  | NC      |
| LPC_SERIRQ/ESPI_CS1#  | 54  | 53  | GND     |
| LPC_DRQ0#/ESPI_ALERT0 | 52  | 51  | NC      |
| LPC_AD3/ESPI_IO_3     | 50  | 49  | NC      |
| LPC_AD2/ESPI_IO_2     | 48  | 47  | GND     |
| LPC_AD1/ESPI_IO_1     | 46  | 45  | NC      |
| LPC_AD0/ESPI_IO_0     | 44  | 43  | NC      |
| IET_CLK               | 42  | 41  | SLP_S3# |
| ESPI_RESET#           | 40  | 39  | CB_RST# |
| NC                    | 38  | 37  | WAKE1#  |
| NC                    | 36  | 35  | SMB_DAT |
| NC                    | 34  | 33  | SMB_CLK |
| NC                    | 32  | 31  | GND     |
| NC                    | 30  | 29  | NC      |
| NC                    | 28  | 27  | NC      |
| GND                   | 26  | 25  | GND     |
| NC                    | 24  | 23  | NC      |
| NC                    | 22  | 21  | NC      |
| GND                   | 20  | 19  | GND     |
| NC                    | 18  | 17  | NC      |
| NC                    | 16  | 15  | NC      |
| GND                   | 14  | 13  | GND     |
| NC                    | 12  | 11  | NC      |
| NC                    | 10  | 9   | NC      |
| GND                   | 8   | 7   | GND     |
| NC                    | 6   | 5   | NC      |
| NC                    | 4   | 3   | NC      |
| GND                   | 2   | 1   | GND     |

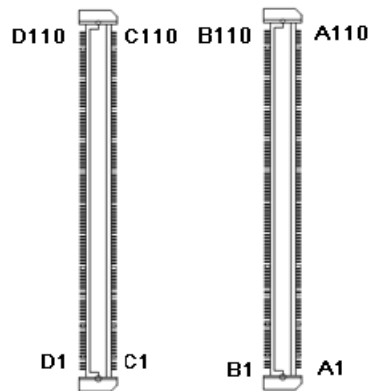
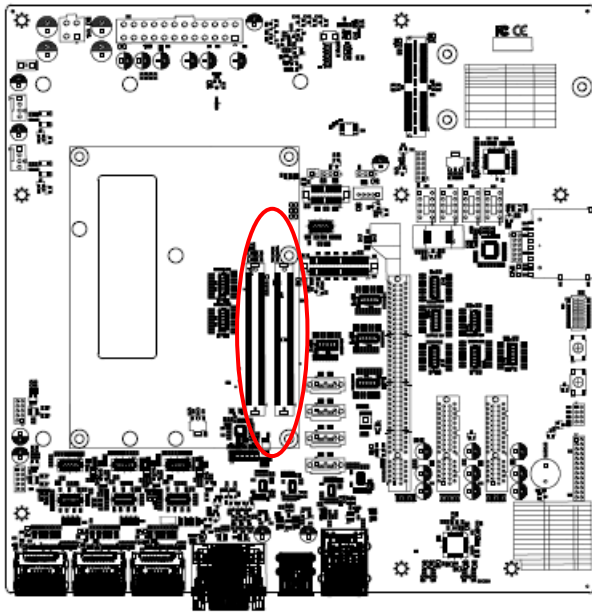


### 2.3.20 COM Express connector (CN1)

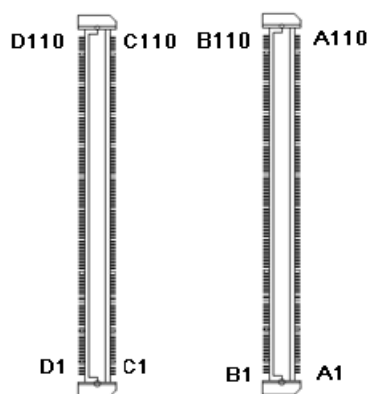
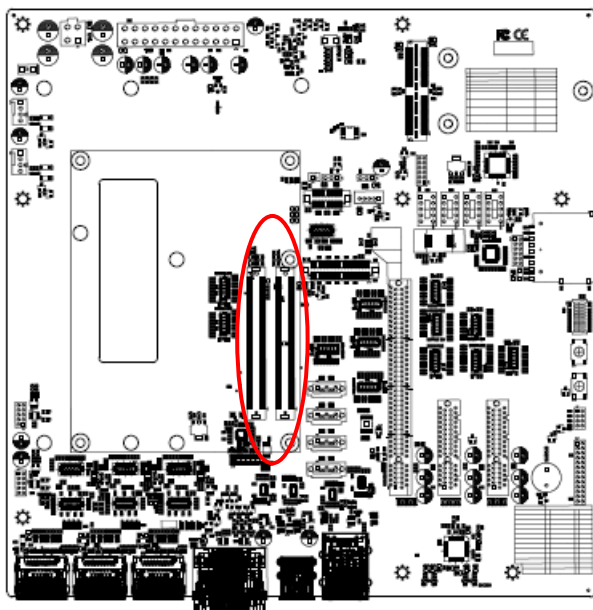


| Signal                           | PIN  | PIN  | Signal                |
|----------------------------------|------|------|-----------------------|
| GND                              | B110 | A110 | GND                   |
| VCC                              | B109 | A109 | VCC                   |
| VCC                              | B108 | A108 | VCC                   |
| VCC                              | B107 | A107 | VCC                   |
| VCC                              | B106 | A106 | VCC                   |
| VCC                              | B105 | A105 | VCC                   |
| VCC                              | B104 | A104 | VCC                   |
| SLEEP#                           | B103 | A103 | LID#                  |
| FAN_TACHIN                       | B102 | A102 | SER1_RX               |
| FAN_PWMOUT                       | B101 | A101 | SER1_TX               |
| GND                              | B100 | A100 | GND                   |
| NC                               | B99  | A99  | SER0_RX               |
| NC                               | B98  | A98  | SER0_TX               |
| SPI_CS#                          | B97  | A97  | NC                    |
| VGA_I2C_DAT                      | B96  | A96  | TPM_PP                |
| VGA_I2C_CK                       | B95  | A95  | SPI_MOSI              |
| VGA_VSYNC                        | B94  | A94  | SPI_CLK               |
| VGA_HSYNC                        | B93  | A93  | GPO0/SD_CLK           |
| VGA_BLU                          | B92  | A92  | SPI_MISO              |
| VGA_GRN                          | B91  | A91  | SPI_POWER             |
| GND                              | B90  | A90  | GND                   |
| VGA_RED                          | B89  | A89  | PCIE_CLK_REF-         |
| BIOS_DIS1#                       | B88  | A88  | PCIE_CLK_REF+         |
| +VCC_5VSB                        | B87  | A87  | EDP_HDP               |
| +VCC_5VSB                        | B86  | A86  | NC                    |
| +VCC_5VSB                        | B85  | A85  | GPI3/SD_DATA3         |
| +VCC_5VSB                        | B84  | A84  | LVDS_I2C_DAT/EDP_AUX- |
| LVDS_BKLT_CTRL/<br>EDP_BKLT_CTRL | B83  | A83  | LVDS_I2C_CK/EDP_AUX+  |
| LVDS_B_CK-                       | B82  | A82  | LVDS_A_CK-/EDP_TX3-   |
| LVDS_B_CK+                       | B81  | A81  | LVDS_A_CK+/EDP_TX3+   |

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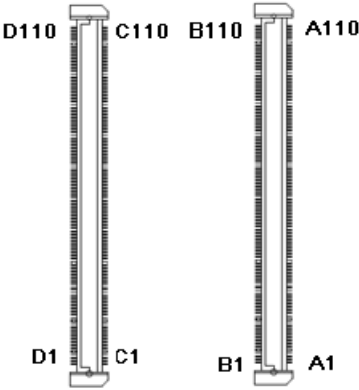
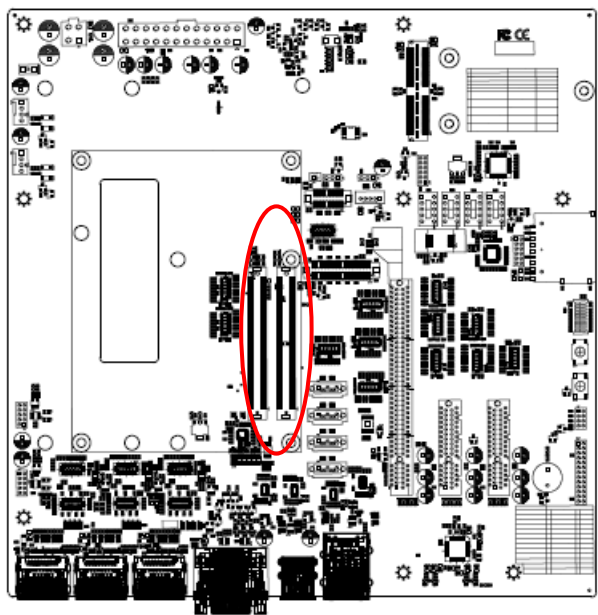


| Signal                       | PIN | PIN | Signal                     |
|------------------------------|-----|-----|----------------------------|
| GND                          | B80 | A80 | GND                        |
| LVDS_BKLT_EN/<br>EDP_BKLT_EN | B79 | A79 | LVDS_A3-                   |
| LVDS_B3-                     | B78 | A78 | LVDS_A3+                   |
| LVDS_B3+                     | B77 | A77 | LVDS_VDD_EN<br>/EDP_VDD_EN |
| LVDS_B2-                     | B76 | A76 | LVDS_A2-/EDP_TX0-          |
| LVDS_B2+                     | B75 | A75 | LVDS_A2+/EDP_TX0+          |
| LVDS_B1-                     | B74 | A74 | LVDS_A1-/EDP_TX1-          |
| LVDS_B1+                     | B73 | A73 | LVDS_A1+/EDP_TX1+          |
| LVDS_B0-                     | B72 | A72 | LVDS_A0-/EDP_TX2-          |
| LVDS_B0+                     | B71 | A71 | LVDS_A0+/EDP_TX2+          |
| GND                          | B70 | A70 | GND                        |
| PCIE_RX0-                    | B69 | A69 | PCIE_TX0-                  |
| PCIE_RX0+                    | B68 | A68 | PCIE_TX0+                  |
| WAKE1#                       | B67 | A67 | GPI2/SD_DATA2              |
| WAKE0#                       | B66 | A66 | GND                        |
| PCIE_RX1-                    | B65 | A65 | PCIE_TX1-                  |
| PCIE_RX1+                    | B64 | A64 | PCIE_TX1+                  |
| GPO3/SD_CD#                  | B63 | A63 | GPI1/SD_DATA1              |
| PCIE_RX2-                    | B62 | A62 | PCIE_TX2-                  |
| PCIE_RX2+                    | B61 | A61 | PCIE_TX2+                  |
| GND                          | B60 | A60 | GND                        |
| PCIE_RX3-                    | B59 | A59 | PCIE_TX3-                  |
| PCIE_RX3+                    | B58 | A58 | PCIE_TX3+                  |
| GPO2/SD_WP                   | B57 | A57 | GND                        |
| PCIE_RX4-                    | B56 | A56 | PCIE_TX4-                  |
| PCIE_RX4+                    | B55 | A55 | PCIE_TX4+                  |
| GPO1/SD_CMD                  | B54 | A54 | GPI0/SD_DATA0              |
| PCIE_RX5-                    | B53 | A53 | PCIE_TX5-                  |
| PCIE_RX5+                    | B52 | A52 | PCIE_TX5+                  |
| GND                          | B51 | A51 | GND                        |

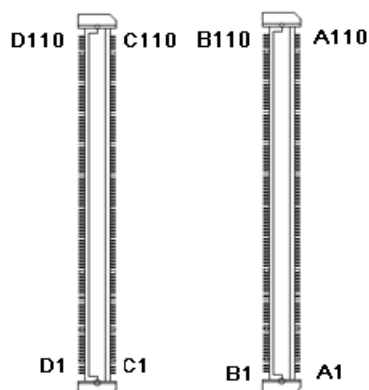
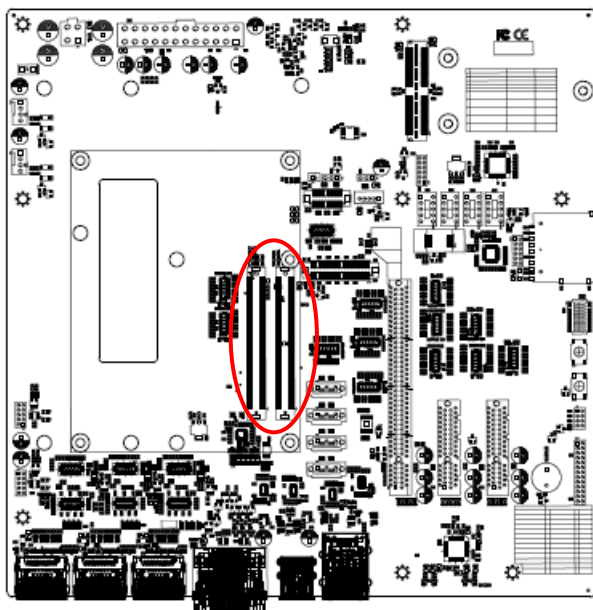


| Signal           | PIN | PIN | Signal                   |
|------------------|-----|-----|--------------------------|
| CB_RESET#        | B50 | A50 | LPC_SERIRQ/<br>ESPI_CS1# |
| SYS_RESET#       | B49 | A49 | GBE0_SDP                 |
| USB0_HOST_PRSENT | B48 | A48 | NC                       |
| ESPI_EN#         | B47 | A47 | +3.3V                    |
| USB1+            | B46 | A46 | USB0+                    |
| USB1-            | B45 | A45 | USB0-                    |
| USB_0_1_OC#      | B44 | A44 | USB_2_3_OC#              |
| USB3+            | B43 | A43 | USB2+                    |
| USB3-            | B42 | A42 | USB2-                    |
| GND              | B41 | A41 | GND                      |
| USB5+            | B40 | A40 | USB4+                    |
| USB5-            | B39 | A39 | USB4-                    |
| USB_4_5_OC#      | B38 | A38 | USB_6_7_OC#              |
| USB7+            | B37 | A37 | USB6+                    |
| USB7-            | B36 | A36 | USB6-                    |
| THRM#            | B35 | A35 | THRMTRIP#                |
| I2C_DAT          | B34 | A34 | BIOS_DIS0#/<br>ESPI_SAFS |
| I2C_CLK          | B33 | A33 | HDA_SDOUT                |
| HDA_SPKR         | B32 | A32 | HDA_BITCLK               |
| GND              | B31 | A31 | GND                      |
| HDA_SDIN0        | B30 | A30 | HDA_RST#                 |
| HDA_SDIN1        | B29 | A29 | HDA_SYNC                 |
| HDA_SDIN2        | B28 | A28 | SATA_ACT#                |
| WDT              | B27 | A27 | BATLOW#                  |
| SATA3_RX-        | B26 | A26 | SATA2_RX-                |
| SATA3_RX+        | B25 | A25 | SATA2_RX+                |
| PWR_OK           | B24 | A24 | SUS_S5#                  |
| SATA3_TX-        | B23 | A23 | SATA2_TX-                |
| SATA3_TX+        | B22 | A22 | SATA2_TX+                |
| GND              | B21 | A21 | GND                      |

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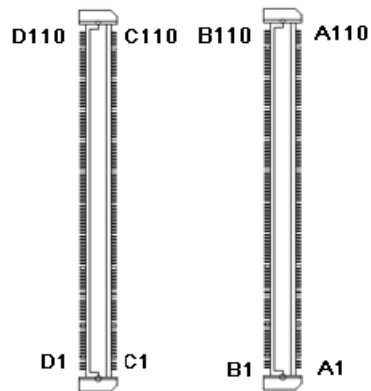
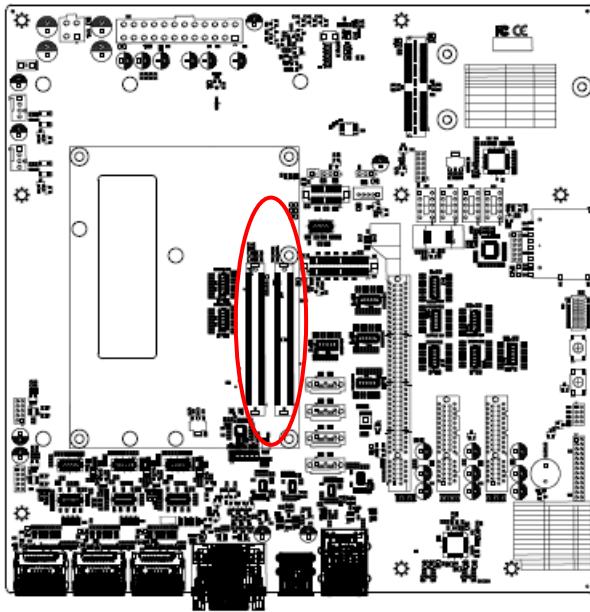


| Signal                 | PIN | PIN | Signal         |
|------------------------|-----|-----|----------------|
| SATA1_RX-              | B20 | A20 | SATA0_RX-      |
| SATA1_RX+              | B19 | A19 | SATA0_RX+      |
| SUS_STAT#/ESPI_RESET#  | B18 | A18 | SUS_S4#        |
| SATA1_TX-              | B17 | A17 | SATA0_TX-      |
| SATA1_TX+              | B16 | A16 | SATA0_TX+      |
| SMB_ALERT#             | B15 | A15 | SUS_S3#        |
| SMB_DAT                | B14 | A14 | GBE0_CTREF     |
| SMB_CK                 | B13 | A13 | GBE0_MDI0+     |
| PWRBTN#                | B12 | A12 | GBE0_MDI0-     |
| GND                    | B11 | A11 | GND            |
| LPC_CLK/ESPI_CK        | B10 | A10 | GBE0_MDI1+     |
| LPC_DRQ1#/ESPI_ALERT1# | B9  | A9  | GBE0_MDI1-     |
| LPC_DRQ0#/ESPI_ALERT0# | B8  | A8  | GBE0_LINK#     |
| LPC_AD3/ESPI_IO_3      | B7  | A7  | GBE0_MDI2+     |
| LPC_AD2/ESPI_IO_2      | B6  | A6  | GBE0_MDI2-     |
| LPC_AD1/ESPI_IO_1      | B5  | A5  | GBE0_LINK1000# |
| LPC_AD0/ESPI_IO_0      | B4  | A4  | GBE0_LINK100#  |
| LPC_FRAME#/ESPI_CS0#   | B3  | A3  | GBE0_MDI3+     |
| GBE0_ACT#              | B2  | A2  | GBE0_MDI3-     |
| GND                    | B1  | A1  | GND            |

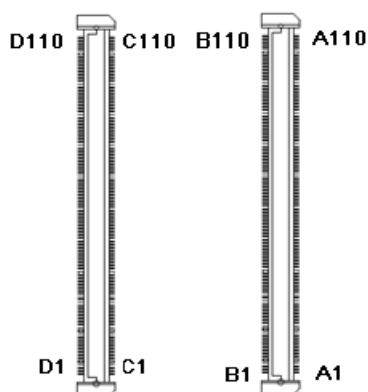
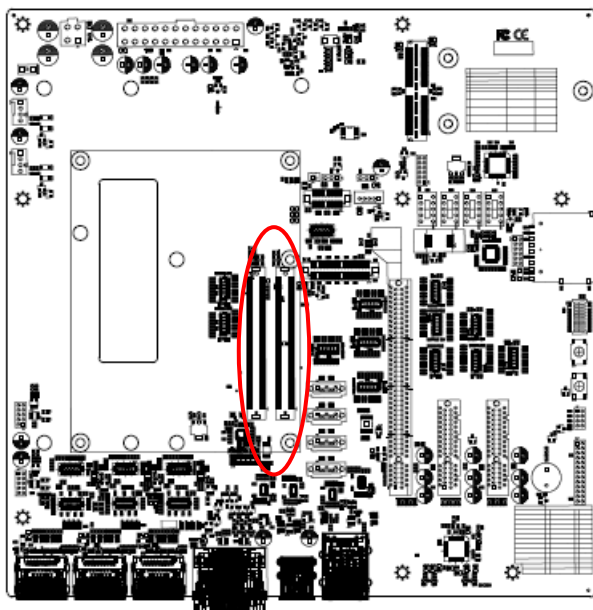


| Signal    | PIN  | PIN  | Signal    |
|-----------|------|------|-----------|
| GND       | D110 | C110 | GND       |
| +VIN      | D109 | C109 | +VIN      |
| +VIN      | D108 | C108 | +VIN      |
| +VIN      | D107 | C107 | +VIN      |
| +VIN      | D106 | C106 | +VIN      |
| +VIN      | D105 | C105 | +VIN      |
| +VIN      | D104 | C104 | +VIN      |
| GND       | D103 | C103 | GND       |
| PEG_TX15- | D102 | C102 | PEG_RX15- |
| PEG_TX15+ | D101 | C101 | PEG_RX15+ |
| GND       | D100 | C100 | GND       |
| PEG_TX14- | D99  | C99  | PEG_RX14- |
| PEG_TX14+ | D98  | C98  | PEG_RX14+ |
| RSVD30    | D97  | C97  | NC        |
| GND       | D96  | C96  | GND       |
| PEG_TX13- | D95  | C95  | PEG_RX13- |
| PEG_TX13+ | D94  | C94  | PEG_RX13+ |
| GND       | D93  | C93  | GND       |
| PEG_TX12- | D92  | C92  | PEG_RX12- |
| PEG_TX12+ | D91  | C91  | PEG_RX12+ |
| GND       | D90  | C90  | GND       |
| PEG_TX11- | D89  | C89  | PEG_RX11- |
| PEG_TX11+ | D88  | C88  | PEG_RX11+ |
| GND       | D87  | C87  | GND       |
| PEG_TX10- | D86  | C86  | PEG_RX10- |
| PEG_TX10+ | D85  | C85  | PEG_RX10+ |
| GND       | D84  | C84  | GND       |
| NC        | D83  | C83  | NC        |
| PEG_TX9-  | D82  | C82  | PEG_RX9-  |
| PEG_TX9+  | D81  | C81  | PEG_RX9+  |

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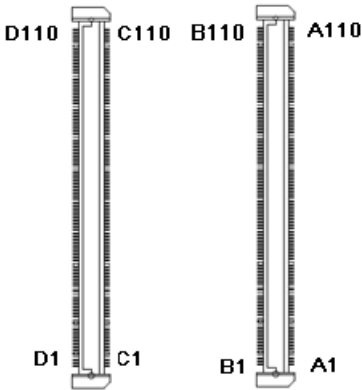
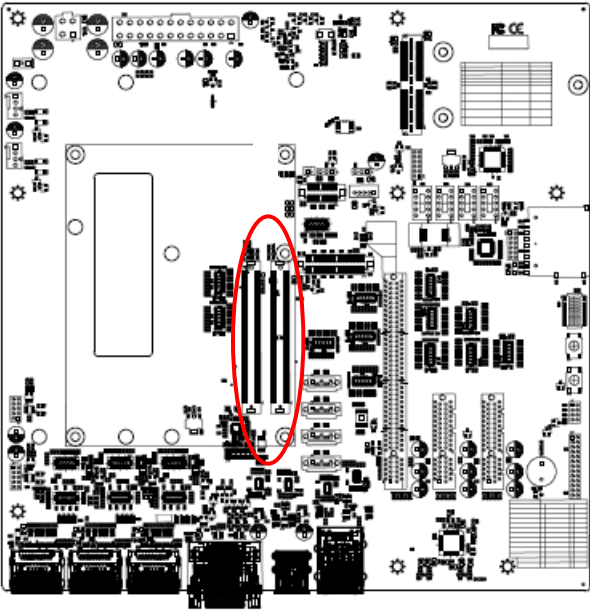


| Signal      | PIN | PIN | Signal         |
|-------------|-----|-----|----------------|
| GND         | D80 | C80 | GND            |
| PEG_TX8-    | D79 | C79 | PEG_RX8-       |
| PEG_TX8+    | D78 | C78 | PEG_RX8+       |
| NC          | D77 | C77 | NC             |
| GND         | D76 | C76 | GND            |
| PEG_TX7-    | D75 | C75 | PEG_RX7-       |
| PEG_TX7+    | D74 | C74 | PEG_RX7+       |
| GND         | D73 | C73 | GND            |
| PEG_TX6-    | D72 | C72 | PEG_RX6-       |
| PEG_TX6+    | D71 | C71 | PEG_RX6+       |
| GND         | D70 | C70 | GND            |
| PEG_TX5-    | D69 | C69 | PEG_RX5-       |
| PEG_TX5+    | D68 | C68 | PEG_RX5+       |
| GND         | D67 | C67 | RAPID_SHUTDOWN |
| PEG_TX4-    | D66 | C66 | PEG_RX4-       |
| PEG_TX4+    | D65 | C65 | PEG_RX4+       |
| NC          | D64 | C64 | NC             |
| NC          | D63 | C63 | NC             |
| PEG_TX3-    | D62 | C62 | PEG_RX3-       |
| PEG_TX3+    | D61 | C61 | PEG_RX3+       |
| GND         | D60 | C60 | GND            |
| PEG_TX2-    | D59 | C59 | PEG_RX2-       |
| PEG_TX2+    | D58 | C58 | PEG_RX2+       |
| TYPE2#      | D57 | C57 | NC             |
| PEG_TX1-    | D56 | C56 | PEG_RX1-       |
| PEG_TX1+    | D55 | C55 | PEG_RX1+       |
| PEG_LAN_RV# | D54 | C54 | NC             |
| PEG_TX0-    | D53 | C53 | PEG_RX0-       |
| PEG_TX0+    | D52 | C52 | PEG_RX0+       |
| GND         | D51 | C51 | GND            |



| Signal           | PIN | PIN | Signal             |
|------------------|-----|-----|--------------------|
| DDI2_PAIR3-      | D50 | C50 | DDI3_PAIR3-        |
| DDI2_PAIR3+      | D49 | C49 | DDI3_PAIR3+        |
| NC               | D48 | C48 | NC                 |
| DDI2_PAIR2-      | D47 | C47 | DDI3_PAIR2-        |
| DDI2_PAIR2+      | D46 | C46 | DDI3_PAIR2+        |
| NC               | D45 | C45 | NC                 |
| DDI2_HPD         | D44 | C44 | DDI3_HPD           |
| DDI2_PAIR1-      | D43 | C43 | DDI3_PAIR1-        |
| DDI2_PAIR1+      | D42 | C42 | DDI3_PAIR1+        |
| GND              | D41 | C41 | GND                |
| DDI2_PAIR0-      | D40 | C40 | DDI3_PAIR0-        |
| DDI2_PAIR0+      | D39 | C39 | DDI3_PAIR0+        |
| NC               | D38 | C38 | DDI3_DDC_AUX_SEL   |
| DDI1_PAIR3-      | D37 | C37 | DDI3_CTRLDATA_AUX- |
| DDI1_PAIR3+      | D36 | C36 | DDI3_CTRLCLK_AUX+  |
| NC               | D35 | C35 | NC                 |
| DDI1_DDC_AUX_SEL | D34 | C34 | DDI2_DDC_AUX_SEL   |
| DDI1_PAIR2-      | D33 | C33 | DDI2_CTRLDATA_AUX- |
| DDI1_PAIR2+      | D32 | C32 | DDI2_CTRLCLK_AUX+  |
| GND              | D31 | C31 | GND                |
| DDI1_PAIR1-      | D30 | C30 | NC                 |
| DDI1_PAIR1+      | D29 | C29 | NC                 |
| NC               | D28 | C28 | NC                 |
| DDI1_PAIR0-      | D27 | C27 | PEG_GEN3_RESET#    |
| DDI1_PAIR0+      | D26 | C26 | NC                 |
| NC               | D25 | C25 | NC                 |
| NC               | D24 | C24 | DDI1_HPD           |
| PCIE_TX7-        | D23 | C23 | PCIE_RX7-          |
| PCIE_TX7+        | D22 | C22 | PCIE_RX7+          |
| GND              | D21 | C21 | GND                |





| Signal             | PIN | PIN | Signal     |
|--------------------|-----|-----|------------|
| PCIE_TX6-          | D20 | C20 | PCIE_RX6-  |
| PCIE_TX6+          | D19 | C19 | PCIE_RX6+  |
| NC                 | D18 | C18 | NC         |
| NC                 | D17 | C17 | NC         |
| DDI1_CTRLDATA_AUX- | D16 | C16 | NC         |
| DDI1_CTRLCLK_AUX+  | D15 | C15 | NC         |
| GND                | D14 | C14 | GND        |
| USB_SSTX3+         | D13 | C13 | USB_SSRX3+ |
| USB_SSTX3-         | D12 | C12 | USB_SSRX3- |
| GND                | D11 | C11 | GND        |
| USB_SSTX2+         | D10 | C10 | USB_SSRX2+ |
| USB_SSTX2-         | D9  | C9  | USB_SSRX2- |
| GND                | D8  | C8  | GND        |
| USB_SSTX1+         | D7  | C7  | USB_SSRX1+ |
| USB_SSTX1-         | D6  | C6  | USB_SSRX1- |
| GND                | D5  | C5  | GND        |
| USB_SSTX0+         | D4  | C4  | USB_SSRX0+ |
| USB_SSTX0-         | D3  | C3  | USB_SSRX0- |
| GND                | D2  | C2  | GND        |
| GND                | D1  | C1  | GND        |



### 2.3.20.1 Signal Description – COM Express connector (CN1)

#### 2.3.20.1.1 Audio Signals

| Signal   | Signal Description |
|----------|--------------------|
| HDA_SYNC | HD Audio Sync      |
| HDA_RST# | HD Audio Reset     |

#### 2.3.20.1.2 Gigabit Ethernet Signals

| Signal           | Signal Description                                                                                                                                                                                        |          |        |       |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|-------|
| GBE0_MD[0:3] +/- | Gigabit Ethernet Controller 0: Media Dependent Interface Differential Pairs 0,1,2,3.<br>The MDI can operate in 1000, 100 and 10 Mbit / sec modes. Some pairs are unused in some modes, per the following: |          |        |       |
|                  |                                                                                                                                                                                                           | 1000B-T  | 100B-T | 10B-T |
|                  | MDI[0]+/-                                                                                                                                                                                                 | B1_DA+/- | TX+/-  | TX+/- |
|                  | MDI[1]+/-                                                                                                                                                                                                 | B1_DB+/- | RX+/-  | RX+/- |
|                  | MDI[2]+/-                                                                                                                                                                                                 | B1_DC+/- | X      | X     |
|                  | MDI[3]+/-                                                                                                                                                                                                 | B1_DD+/- | X      | X     |
|                  |                                                                                                                                                                                                           |          |        |       |
| GBE0_ACT#        | Gigabit Ethernet Controller 0 activity indicator, active low.                                                                                                                                             |          |        |       |
| GBE0_Link#       | Gigabit Ethernet Controller 0 link indicator, active low.                                                                                                                                                 |          |        |       |
| GBE0_Link100#    | Gigabit Ethernet Controller 0 100 Mbit / sec link indicator, active low.                                                                                                                                  |          |        |       |
| GBE0_Link1000#   | Gigabit Ethernet Controller 0 1000 Mbit / sec link indicator, active low.                                                                                                                                 |          |        |       |

#### 2.3.20.1.3 PCI Express Signals

| Signal           | Signal Description                         |
|------------------|--------------------------------------------|
| PCIE_TX[0:7] +/- | PCI Express Differential Transmit Pair 0-7 |
| PCIE_RX[0:7] +/- | PCI Express Differential Receive Pair 0-7  |

#### 2.3.20.1.4 Flat Panel LVDS Signals

| Signal         | Signal Description                     |
|----------------|----------------------------------------|
| LVDS_BKLT_CTRL | Controls panel digital power.          |
| LVDS_I2C_CLK   | I2C clock output for LVDS display use. |
| LVDS_I2C_DAT   | I2C data line for LVDS display use.    |
| LVDS_VDD_EN    | LVDS panel power enables.              |

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### 2.3.20.1.5 LPC Signals

| Signal               | Signal Description                            |
|----------------------|-----------------------------------------------|
| LPC_FRAME#/ESPI_CS0# | LPC frame indicates the start of an LPC cycle |
| LPC_AD[0:3]          | LPC multiplexed address, command and data bus |
| LPC_CLKOUT1          | LPC clock output - 33MHz nominal              |
| LPC_SERIRQ           | LPC serial interrupt                          |

### 2.3.20.1.6 GPIO Signals

| Signal   | Signal Description           |
|----------|------------------------------|
| GPI[0:4] | General purpose input pins.  |
| GPO[0:4] | General purpose output pins. |

### 2.3.20.1.7 Power & System Management Signals

| Signal                | Signal Description                                                                                                       |
|-----------------------|--------------------------------------------------------------------------------------------------------------------------|
| SUS_S3#               | Indicates system is in Suspend to RAM state. Active low output.                                                          |
| BATLOW#               | Indicates that external battery is low                                                                                   |
| PWRBTN#               | Power button to bring system out of S5 (soft off), active on rising edge.                                                |
| SMB_SCL_S5            | System Management Bus bidirectional clock line.                                                                          |
| SMB_SDA_S5            | System Management Bus bidirectional data line.                                                                           |
| SMB_ALERT#            | System Management Bus Alert - input can be used to generate an SMI# (System Management Interrupt) or to wake the system. |
| SUS_STAT#/ESPI_RESET# | Indicates imminent suspend operation.                                                                                    |
| PWR_OK                | Power OK from main power supply                                                                                          |
| SYS_RESET#            | Reset button input. Active low input.                                                                                    |
| WAKE0#                | PCI Express wake up signal.                                                                                              |
| WAKE1#                | General purpose wake up signal.                                                                                          |

### 2.3.20.1.8 SATA Signals

| Signal           | Signal Description                                        |
|------------------|-----------------------------------------------------------|
| SATA[0:2]_TX +/- | Serial ATA Channel 0-2 transmit differential pair.        |
| SATA[0:2]_RX +/- | Serial ATA Channel 0-2 receive differential pair.         |
| ATA_ACT#         | ATA (parallel and serial) activity indicator, active low. |

## 2.3.20.1.9 USB Signals

| Signal       | Signal Description                           |
|--------------|----------------------------------------------|
| USB[0:7] +/- | USB differential pairs, channels 0 through 7 |
| USB_0_1_OC#  | USB over-current sense, USB channels 0 and 1 |
| USB_2_3_OC#  | USB over-current sense, USB channels 2 and 3 |
| USB_4_5_OC#  | USB over-current sense, USB channels 4 and 5 |
| USB_6_7_OC#  | USB over-current sense, USB channels 6 and 7 |

## 2.3.20.1.10 I2C Signals

| Signal   | Signal Description                      |
|----------|-----------------------------------------|
| I2C_CLK  | General purpose I2C port clock output.  |
| I2C_DATA | General purpose I2C port data I/O line. |

## 2.3.20.1.11 USB3.0 Signals

| Signal                           | Signal Description                                                              |
|----------------------------------|---------------------------------------------------------------------------------|
| USB_SSTX[0:1]+<br>USB_SSTX[0:1]- | Additional transmit signal differential pairs for the SuperSpeed USB data path. |
| USB_SSRX[0:1]+<br>USB_SSRX[0:1]- | Additional receive signal differential pairs for the SuperSpeed USB data path.  |

## 2.3.20.1.12 DDI Signals

| Signal                             | Signal Description                                                                                                                                                                                                 |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DDIO_PAIR[0:2]+<br>DDIO_PAIR[0:2]- | Digital Display Interface0 Pair[0:2] differential pairs                                                                                                                                                            |
| DDIO_DDC_AUX_SEL                   | Selects the function of DDIO_CTRLCLK_AUX+ and DDIO_CTRLDATA_AUX-. If this input is floating the AUX pair is used for the DP AUX+/- signals. If pulled-high the AUX pair contains the CTRLCLK and CTRLDATA signals. |
| DDIO_CTRLCLK_AUX+                  | DP AUX+function if DDIO_DDC_AUX_SEL is no connect<br>HDMI/DVI 12C CTRLCLK if DDIO_DDC_AUX_SEL is pulled high                                                                                                       |
| DDIO_CTRLDATA_AUX-                 | DP AUX-function if DDIO_DDC_AUX_SEL is no connect<br>HDMI/DVI 12C CTRLDATA if DDIO_DDC_AUX_SEL is pulled high                                                                                                      |
| DDIO_HPD                           | Digital Display Interface Hot-Plug Detect                                                                                                                                                                          |

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### 2.3.20.1.13 USB3.0 Signals

| Signal                           | Signal Description                                                              |
|----------------------------------|---------------------------------------------------------------------------------|
| USB_SSTX[0:3]+<br>USB_SSTX[0:3]- | Additional transmit signal differential pairs for the SuperSpeed USB data path. |
| USB_SSRX[0:3]+<br>USB_SSRX[0:3]- | Additional receive signal differential pairs for the SuperSpeed USB data path.  |

### 2.3.20.1.14 DDI Signals

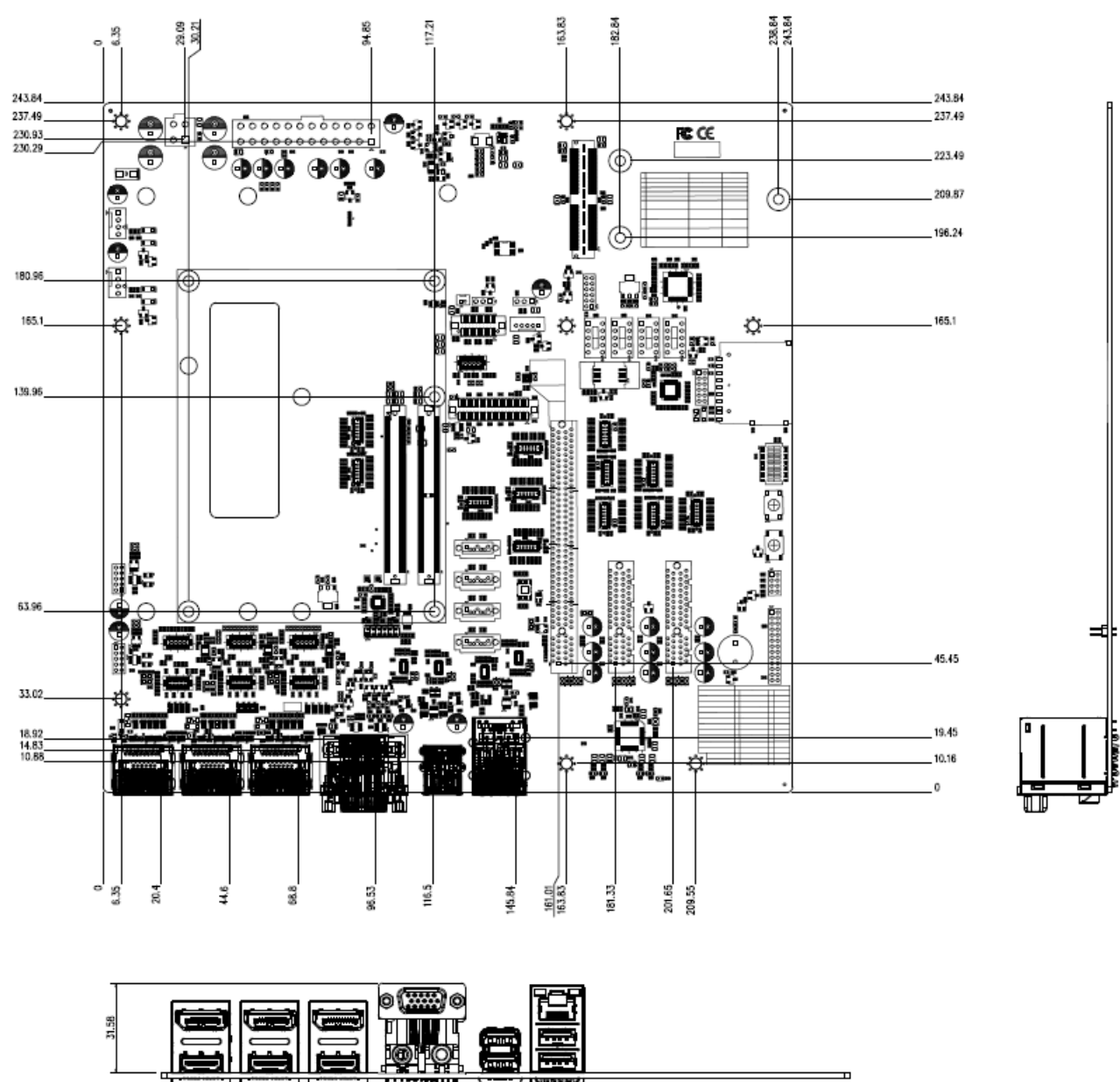
| Signal                                     | Signal Description                                                                                                                                                                                                         |
|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DDI[1:3]_PAIR[0:3]+<br>DDI[1:3]_PAIR[0:3]- | Digital Display Interface 1 to 3Pair[0:3] differential pairs                                                                                                                                                               |
| DDI[1:3]_DDC_AUX_SEL                       | Selects the function of DDI[1:3]_CTRLCLK_AUX+ and DDI[1:3]_CTRLDATA_AUX-. If this input is floating the AUX pair is used for the DP AUX+/- signals. If pulled-high the AUX pair contains the CTRLCLK and CTRLDATA signals. |
| DDI[1:3]_CTRLCLK_AUX+                      | DP AUX+function if DDI[1:3]_DDC_AUX_SEL is no connect<br>HDMI/DVI 12C CTRLCLK if DDI[1:3]_DDC_AUX_SEL is pulled high                                                                                                       |
| DDI[1:3]_CTRLDATA_AUX-                     | DP AUX-function if DDI[1:3]_DDC_AUX_SEL is no connect<br>HDMI/DVI 12C CTRLDATA if DDI[1:3]_DDC_AUX_SEL is pulled high                                                                                                      |
| DDI[1:3]_HPD                               | Digital Display Interface Hot-Plug Detect                                                                                                                                                                                  |

### 2.3.20.1.15 PEG PCI Express Lanes Signals

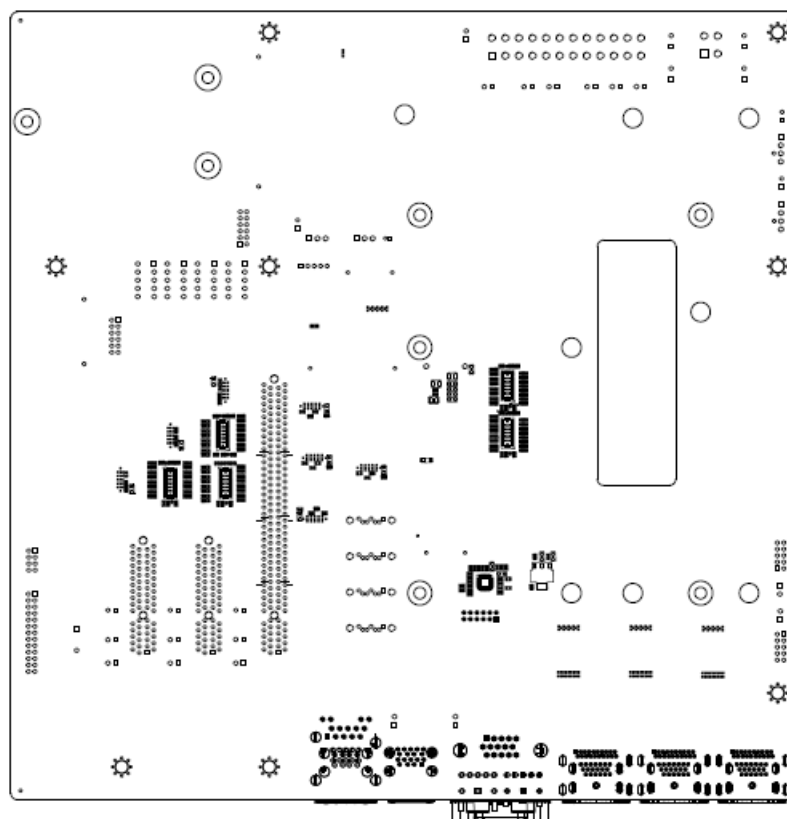
| Signal                         | Signal Description                                |
|--------------------------------|---------------------------------------------------|
| PEG_TX[0:15]+<br>PEG_TX[0:15]- | PCI Express Graphics transmit differential paris. |
| PEG_RX[0:15]+<br>PEG_RX[0:15]- | PCI Express Graphics recevie differential paris.  |

## 3. Mechanical Drawing

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Unit: mm



Unit: mm

