



***AXIOMTEK***

**CEB94701**

**COM Express™ Type 7  
Development Baseboard**

**User's Manual**



## **Disclaimers**

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## **CAUTION**

If you replace wrong batteries, it causes the danger of explosion. It is recommended by the manufacturer that you follow the manufacturer's instructions to only replace the same or equivalent type of battery, and dispose of used ones.

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## **ESD Precautions**

Computer boards have integrated circuits sensitive to static electricity. To prevent chipsets from electrostatic discharge damage, please take care of the following jobs with precautions:

- Do not remove boards or integrated circuits from their anti-static packaging until you are ready to install them.
- Before holding the board or integrated circuit, touch an unpainted portion of the system unit chassis for a few seconds. It discharges static electricity from your body.
- Wear a wrist-grounding strap, available from most electronic component stores, when handling boards and components.

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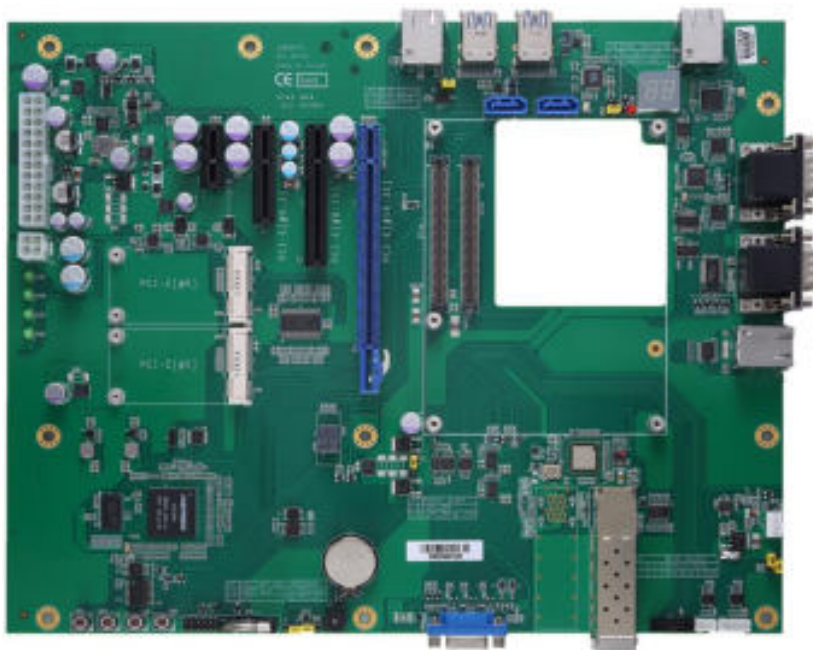
# Table of Contents

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Disclaimers.....	ii
ESD Precautions .....	iii
<b>Chapter 1 Introduction.....</b>	<b>1</b>
1.1 Features .....	1
1.2 Specifications .....	2
1.3 Utilities Supported .....	3
<b>Chapter 2 Board and Pin Assignments.....</b>	<b>5</b>
2.1 Board Dimensions and Fixing Holes .....	5
2.2 Board Layout .....	7
2.3 Installing CEM Module and Heatsink .....	8
2.4 Jumper Settings .....	9
2.4.1 Thermal Trip Indicator (JP2).....	10
2.4.2 Module Power Selection (JP5).....	10
2.4.3 Boot BIOS Selection (JP6).....	10
2.4.4 LPC/eSPI Selection (JP7).....	10
2.4.5 Restore BIOS Optimal Defaults (JP8).....	10
2.5 Connectors .....	11
2.5.1 USB 3.0 Ports (CN1 and CN2).....	12
2.5.2 ATX Power Connectors (CN3 and ATX1).....	13
2.5.3 COM D-Sub Connectors (CN4 and CN5) .....	13
2.5.4 PCI-Express Mini Card Connectors (CN6 and CN7) .....	14
2.5.5 SFP+ Connector (CN9) .....	15
2.5.6 VGA Connector (CN10).....	15
2.5.7 Digital I/O Port Connector (CN11) .....	16
2.5.8 Front Panel Connector (CN12) .....	16
2.5.9 I <sup>2</sup> C Connectors (CN13) .....	17
2.5.10 SMBus Connector (CN14) .....	17
2.5.11 CPU Fan Connector (FAN1) .....	17
2.5.12 SATA Connectors (SATA1 and SATA2).....	17
2.5.13 Ethernet Ports (LAN1 and LAN2).....	18
2.5.14 BMC Console Connector (LAN3).....	18
2.5.15 BMC Debug Connector (JP4) .....	18
2.5.16 COM Express™ Connectors (RECS1 and RECS2) .....	19
2.6 Switch Buttons .....	22
2.7 LED Indicators .....	22

# Chapter 1

## Introduction



The CEB94701 is a new COM Express™ type 7 development baseboard which is compatible with COM Express™ CPU type 7 module and fully compliant with the PCI Industrial Computer Manufactures PICMG COM Express™ standard. In addition to the standard output signals for converting, CEB94701 provides one PCI-Express x16 slot, one PCI-Express x8 slot, one PCI-Express x4 slot, one PCI-Express x1 slot and two PCI-Express Mini Card sockets for expansion purposes. The CEB94701 also supports various I/O features: one display interface (VGA), two Gigabit/Fast Ethernet and two 10G base KR Ethernet port / SFP+ cages, two SATA-600 interfaces, four USB 3.0 ports, two RS-232/422/485 ports.

With CEB94701, customers can emulate the functionality and develop their own applications, perform software and hardware development verification or upgrade the system configuration in advance to meet faster time-to-market.

### 1.1 Features

- COM Express™ type 7 baseboard for evaluation purpose
- USB 3.0 supported
- Port 80 display for debugging
- Switch button for PWRBTN, RESET, SLEEP, LID

## 1.2 Specifications

- **CPU**
  - COM Express™ type 7 module.
- **System Chipset**
  - On the COM Express™ module.
- **BIOS**
  - On the COM Express™ module.
- **System Memory**
  - On the COM Express™ module.
- **Onboard Multi I/O**
  - Two TX/RX ports.
  - Two RS-232/422/485 ports.
- **Serial ATA**
  - Two SATA-600 connectors.
- **Ethernet**
  - Two RJ-45 interfaces for 1000/100/10Mbps.
  - Two 10G Base KR Ethernet port / SFP+ cages
- **USB Interface**
  - Four USB ports comply with USB Spec. Rev. 3.0.
- **I<sup>2</sup>C**
  - Supported.
- **SMBus**
  - Supported.
- **Digital I/O**
  - Four input channels and four output channels.
- **FAN**
  - FAN connector with PWM control.
- **Port 80 Display**
  - Dual 7 segments Port 80 display for convenient debugging purpose through LPC interface.
- **Display**
  - One 15-pin D-Sub connector as VGA connector.
- **Expansion Interface**
  - One PCIe x16 slot.
  - One PCIe x8 slot.
  - One PCIe x4 slot.
  - One PCIe x1 slot.
  - Two PCI-Express Mini Card socket which complies with PCI-Express Mini Card Spec. V1.2.

- **Battery**
  - Lithium 3V/220mAH.
- **Size**
  - 244 x 291mm.
- **Board Thickness**
  - 1.6mm.
- **Operation Temperature**
  - -20°C ~ +70°C.
- **Operation Humidity**
  - 10% ~ 95% relative humidity, non-condensing.



*All specifications and images are subject to change without notice.*

**Note**

### 1.3 Utilities Supported

- BMC VGA driver
- LAN driver

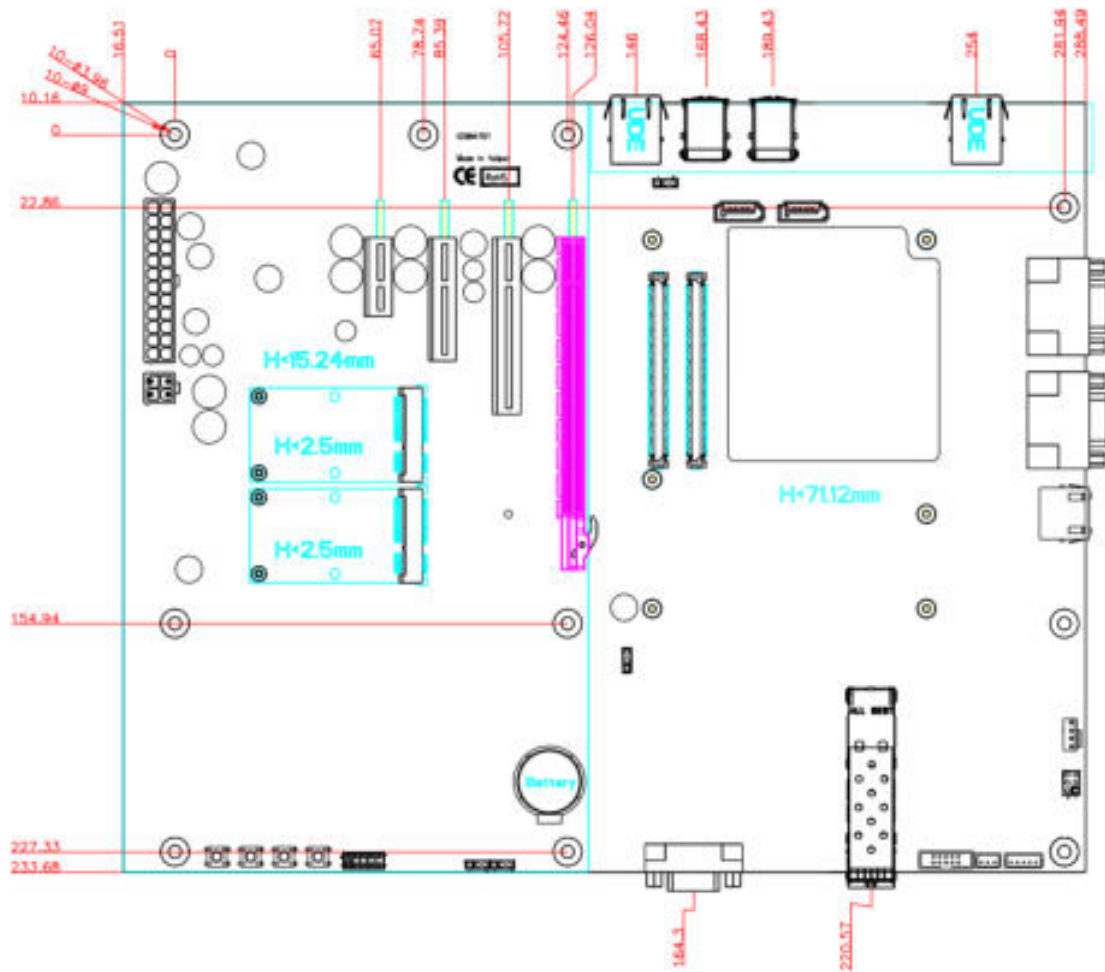
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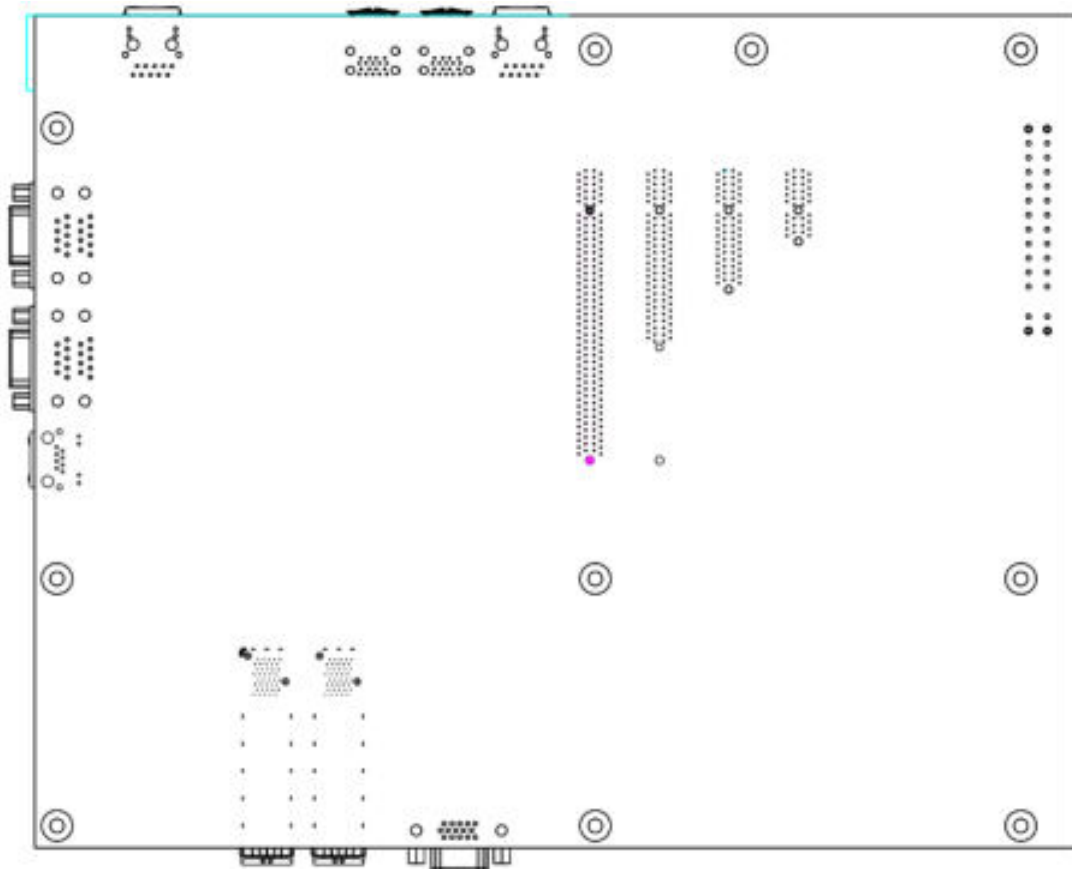
# Chapter 2

## Board and Pin Assignments

### 2.1 Board Dimensions and Fixing Holes

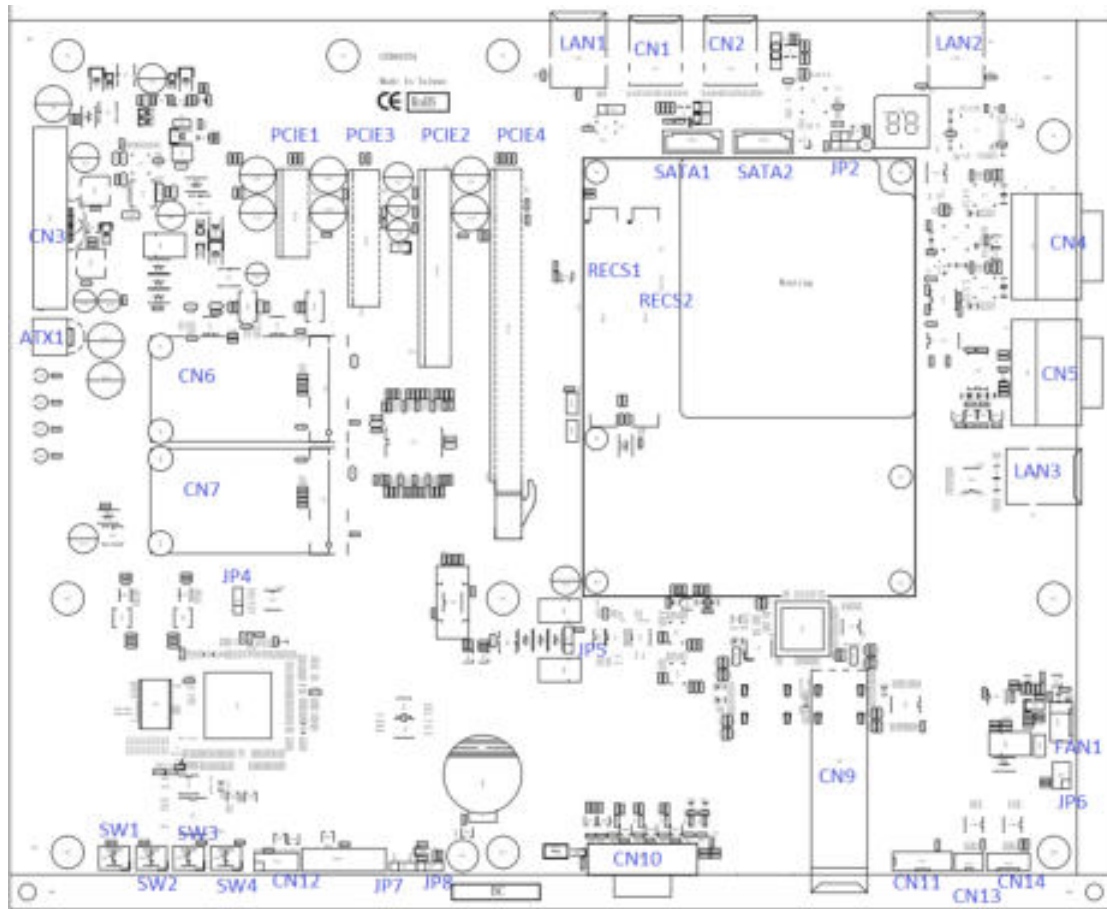


Top Side



**Bottom Side**

## 2.2 Board Layout

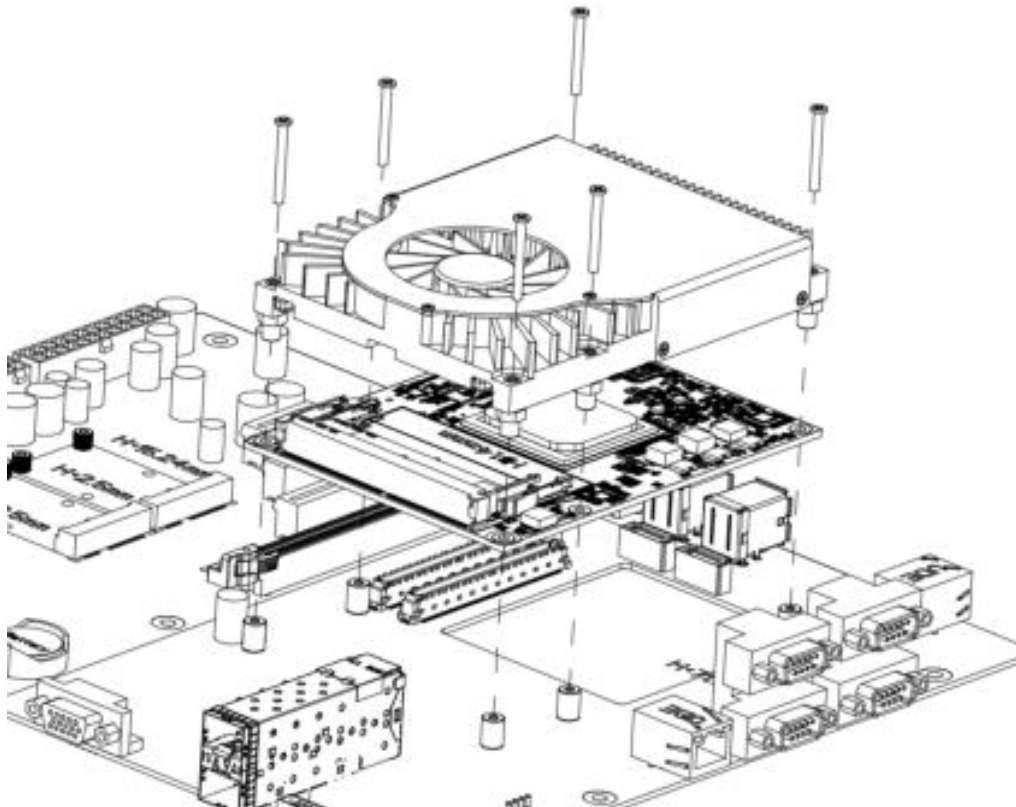


Top Side

## 2.3 Installing CEM Module and Heatsink

For thermal dissipation, a heatsink enables the components on the CEM module to dissipate heat efficiently. All heat generating components are thermally conducted to the heatsink in order to avoid hot spots. Below images illustrate how to install the heatsink.

1. There is a protective plastic covering on the thermal pads. This must be removed before the heatsink can be mounted.
2. Each heatsink is designed for a specific CEM module. The thermal pads on the heatsink are designed to make contact with the necessary components on the CEM module. When mounting the heatsink you must make sure that the thermal pads on the heatsink make complete contact (no space between thermal pad and component) with the corresponding components on the CEM module. This is especially critical for CEM modules that have higher CPU speeds (for example 1.0GHz or more) to ensure that the heatsink acts as a proper thermal interface for cooling solutions.
3. This CPU module has six assembly holes for installing heatsink plate. Use screws to secure heatsink plate to the CEM module. Be careful not to over-tighten the screws.

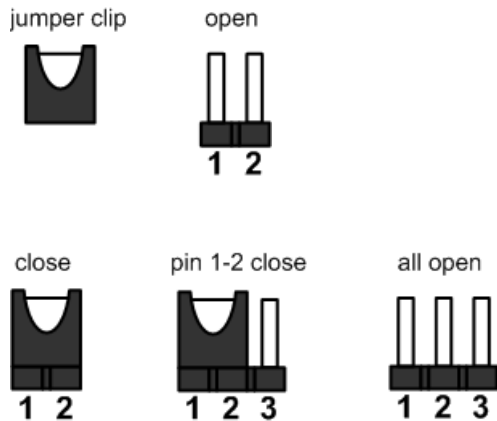


Note

***When installing the compact size CEM module on CEB94701 baseboard, please add stand-off and secure with nut. Then, use screws to secure heatsink plate to the CEM module.***

## 2.4 Jumper Settings

Jumper is a small component consisting of jumper clip and jumper pins. Install jumper clip on 2 jumper pins to close. And remove jumper clip from 2 jumper pins to open. Below illustration shows how to set up jumper.



Properly configure jumper settings on the CEB94701 to meet your application purpose. Below you can find a summary table of all jumpers and onboard default settings.



Note

*Once the default jumper setting needs to be changed, please do it under power-off condition.*

Jumper	Description	Setting
JP2	Thermal Trip Indicator Default: Disable LED	1-2 Close
JP5	Module Power Selection Default: +12V(24P) & +12V(4P)	2-3 Close
JP6	Boot BIOS Selection Default: Boot from Module BIOS	1-3, 2-4 Close
JP7	LPC/eSPI Selection Default: LPC	2-3 Close
JP8	Restore BIOS Optimal Defaults Default: Normal Operation	1-2 Close

### 2.4.1 Thermal Trip Indicator (JP2)

Use JP2 to enable or disable thermal trip LED indicator.

Function	Setting
Disable LED (Default)	1-2 close
Enable LED	2-3 close



### 2.4.2 Module Power Selection (JP5)

Use JP5 to select module power.

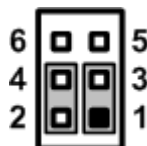
Function	Setting
+12V(24P)	1-2 close
+12V(24P) & +12V(4P) (Default)	2-3 close



### 2.4.3 Boot BIOS Selection (JP6)

Use JP6 to select system to boot from module BIOS or baseboard BIOS.

Function	Setting
Module BIOS (Default)	1-3, 2-4 close
Baseboard BIOS	1-3, 4-6 close



### 2.4.4 LPC/eSPI Selection (JP7)

Use JP7 to select LPC or eSPI.

Function	Setting
eSPI	1-2 close
LPC (Default)	2-3 close



### 2.4.5 Restore BIOS Optimal Defaults (JP8)

Put jumper clip to pin 2-3 for a few seconds then move it back to pin 1-2. Doing this procedure can restore BIOS optimal defaults.

Function	Setting
Normal (Default)	1-2 close
Restore BIOS optimal defaults	2-3 close



## 2.5 Connectors

Signals go to other parts of the system through connectors. Loose or improper connection might cause problems, please make sure all connectors are properly and firmly connected. Here is a summary table which shows all connectors on the hardware.

Connector	Description
CN1, CN2	USB 3.0 Port 0~4
CN3	24-pin ATX Power Connector
CN4	COM1 and COM2 D-Sub Connectors
CN5	COM3 and COM4 D-Sub Connectors
CN6, CN7	PCI-Express Mini Card Connectors
CN9	SFP+ Connector
CN10	VGA Connector
CN11	Digital I/O Connector
CN12	Front Panel Connector
CN13	I <sup>2</sup> C Connector
CN14	SMBus Connector
ATX1	4-pin +12V ATX Power Connector
FAN1	CPU Fan Connector
PCIE1	PCIe x1 Slot
PCIE2	PCIe x8 Slot
PCIE3	PCIe x4 Slot
PCIE4	PCIe x16 Slot
SATA1, SATA2	SATA Connectors
LAN1, LAN2	Ethernet Ports
LAN3	BMC Console Connector
JP4	BMC Debug Connector
RECS1, RECS2	COM Express™ Connectors



### Note

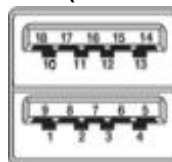
*The module design defines whether or not the system supports USB 3.0 and SATA 3.0.*

## 2.5.1 USB 3.0 Ports (CN1 and CN2)

This Universal Serial Bus 3.0 (USB 3.0) connector on this board is for installing versatile USB interface peripherals. It is an 18-pin standard USB connector which is also compatible with USB 2.0 device.

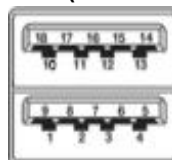
Pin	Signal	Pin	Signal
1	USB_PWR01	10	USB_PWR01
2	USB_Data0-	11	USB_Data1-
3	USB_Data0+	12	USB_Data1+
4	GND	13	GND
5	SSRX0-	14	SSRX1-
6	SSRX0+	15	SSRX1+
7	GND Drain	16	GND Drain
8	SSTX0-	17	SSTX1-
9	SSTX0+	18	SSTX1+

**CN7 (for USB 3.0 port 0 and 1)**



Pin	Signal	Pin	Signal
1	USB_PWR23	10	USB_PWR23
2	USB_Data2-	11	USB_Data3-
3	USB_Data2+	12	USB_Data3+
4	GND	13	GND
5	SSRX2-	14	SSRX3-
6	SSRX2+	15	SSRX3+
7	GND Drain	16	GND Drain
8	SSTX2-	17	SSTX3-
9	SSTX2+	18	SSTX3+

**CN8 (for USB 3.0 port 2 and 3)**





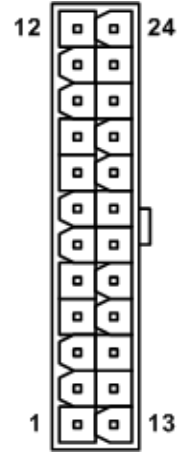
### 2.5.2 ATX Power Connectors (CN3 and ATX1)

Steady and sufficient power can be supplied to all components on the board by connecting power connector. Please make sure all components and devices are properly installed before connecting the power connector.

External power supply plug fits into this connector in only one orientation. Properly press down power supply plug until it completely and firmly fits into this connector. Loose connection may cause system instability.

The CN3 is a 24-pin ATX power connector.

Pin	Signal	Pin	Signal
1	+3.3V	13	+3.3V
2	+3.3V	14	-12V
3	GND	15	GND
4	+5V	16	PS_ON#
5	GND	17	GND
6	+5V	18	GND
7	GND	19	GND
8	PWR_ON	20	N.C.
9	+5VSB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	+3.3V	24	GND



The ATX1 is a 4-pin +12V ATX power connector to supply power to the COM Express™ module.

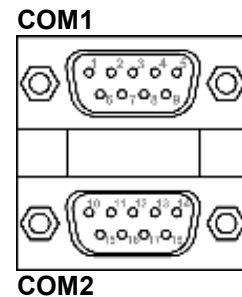
Pin	Signal	Pin	Signal
1	GND	2	GND
3	+12V	4	+12V



### 2.5.3 COM D-Sub Connectors (CN4 and CN5)

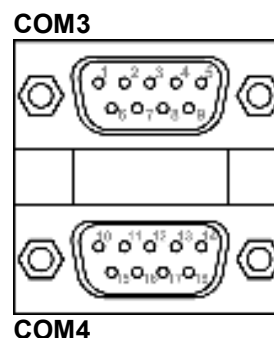
The CN4 is a double-deck 9-pin D-Sub connector for RS-232/422/485 signals from carrier board SIO.

Pin	Pin	RS-232	RS-422	RS-485
1	10	Data Carrier Detect (DCD)	TX-	D-
2	11	Receive Data (RXD)	TX+	D+
3	12	Transmit Data (TXD)	RX+	No use
4	13	Data Terminal Ready (DTR)	RX-	No use
5	14	Ground (GND)	No use	No use
6	15	Data Set Ready (DSR)	No use	No use
7	16	Request to Send (RTS)	No use	No use
8	17	Clear to Send (CTS)	No use	No use
9	18	Ground (GND)	No use	No use



The CN5 is a double-deck 9-pin D-Sub connector for RS-232 carrying only TXD and RXD signals from COM Express™ module.

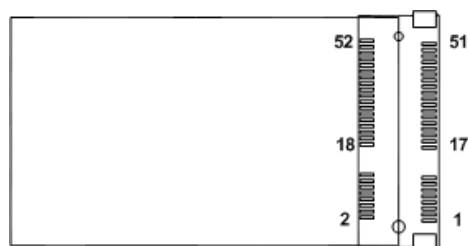
Pin	Pin	Signal
1	10	NC
2	11	Receive Data (RXD)
3	12	Transmit Data (TXD)
4	13	NC
5	14	Ground (GND)
6	15	NC
7	16	NC
8	17	NC
9	18	NC



## 2.5.4 PCI-Express Mini Card Connectors (CN6 and CN7)

CN6 and CN7 are PCI-Express Mini Card connectors which support a PCI-Express x1 link and a USB 2.0 link. The PCI-Express Mini Card can be applied to either PCI-Express or USB 2.0.

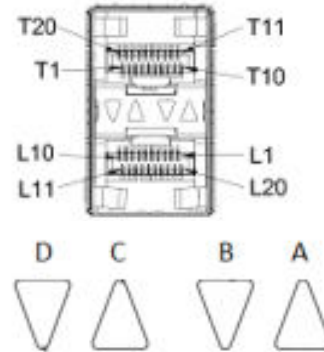
Pin	Signal	Pin	Signal
1	WAKE#	2	+3.3VSB
3	No use	4	GND
5	No use	6	+1.5V
7	CLKREQ#	8	No use
9	GND	10	No use
11	REFCLK-	12	No use
13	REFCLK+	14	No use
15	GND	16	No use
17	No use	18	GND
19	No use	20	No use
21	GND	22	PERST#
23	PCIE_RX4-	24	+3.3VSB
25	PCIE_RX4+	26	GND
27	GND	28	+1.5V
29	GND	30	SMB_CLK
31	PCIE_TX4-	32	SMB_DATA
33	PCIE_TX4+	34	GND
35	GND	36	C_USB_PN6
37	GND	38	C_USB_PP6
39	No use	40	GND
41	No use	42	No use
43	No use	44	No use
45	No use	46	No use
47	No use	48	+1.5V
49	No use	50	GND
51	No use	52	+3.3VSB



### 2.5.5 SFP+ Connector (CN9)

The board is equipped with SFP+ connector for 8 Gbit/s Fibre Channel, 10 Gigabit Ethernet and Optical Transport Network standard OTU2.

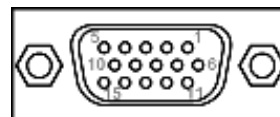
Pin	Signal	Pin	Signal
T1	GNDTA1	L1	GNDTB1
T2	TX_FAULT_A	L2	TX_FAULT_B
T3	TX_DIS_A	L3	TX_DIS_B
T4	SDA_A	L4	SDA_B
T5	SCL_A	L5	SCL_B
T6	MOD_ABS_A	L6	MOD_ABS_B
T7	RS0_A	L7	RS0_B
T8	RX_LOS_A	L8	RX_LOS_B
T9	RS1_A	L9	RS1_B
T10	GNDRA1	L10	GNDRB1
T11	GNDRA2	L11	GNDRB2
T12	RD1-	L12	RD2-
T13	RD1+	L13	RD2+
T14	GNDRA3	L14	GNDRB3
T15	VCCRA	L15	VCCRB
T16	VCCTA	L16	VCCTB
T17	GNDTA2	L17	GNDTB2
T18	TD1+	L18	TD2+
T19	TD1-	L19	TD2-
T20	GNDTA3	L20	GNDTB3
A	Port 1 STATUS/ACT; Color: Amber		
B	Port 2 STATUS/ACT; Color: Amber		
C	Port 1 LINK SPEED 1G: Green 10G: Amber		
D	Port 2 LINK SPEED 1G: Green 10G: Amber		



### 2.5.6 VGA Connector (CN10)

The CN10 is a standard 15-pin D-Sub connector which is commonly used for VGA monitor. This VGA interface configuration can be configured via software utility.

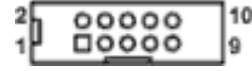
Pin	Signal	Pin	Signal
1	Red	2	Green
3	Blue	4	N/A
5	GND	6	AGND
7	AGND	8	AGND
9	N.C.	10	GND
11	N.C.	12	DDC DATA
13	Horizontal Sync	14	Vertical Sync
15	DDC CLK		



### 2.5.7 Digital I/O Port Connector (CN11)

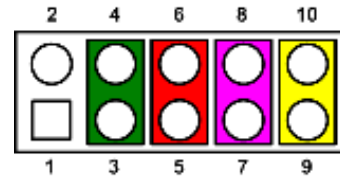
The board has an 8-channel (4 inputs and 4 outputs) digital I/O that meets requirements for a system customary automation control. The digital I/O can be configured to control cash drawers and sense warning signals from an Uninterrupted Power System (UPS), or perform store security control. You may use software programming to control these digital signals.

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



### 2.5.8 Front Panel Connector (CN12)

Pin	Signal	Pin	Signal
1	GND	2	ATX_PSON-
3	GND	4	PWR LED
5	GND	6	PWR ON
7	GND	8	RESET
9	HDD Activity LED-	10	HDD Activity LED+



#### ATX Power Supply ON

Pin 1 and Pin 2 connect to switch button. If switch button turn on, it means ATX power supply forcing to turn on state. Otherwise, system will control ATX power supply state.

#### Power LED

Pin 4 connects anode(+) of LED and pin 3 connects cathode(-) of LED. The power LED lights up when the system is powered on.

#### Power On/Off Button

Pin 5 and 6 connect the power button on front panel to the CPU board, which allows users to turn on or off power supply.

#### System Reset Switch

Pin 7 and 8 connect the case-mounted reset switch that reboots your computer without turning off the power switch. It is a better way to reboot your system for a longer life of system power supply.

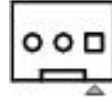
#### HDD Activity LED

This connection is linked to hard drive activity LED on the control panel. LED flashes when HDD is being accessed. Pin 9 and 10 connect the hard disk drive to the front panel HDD LED, pin 9 is assigned as cathode(-) and pin 10 is assigned as anode(+).

### 2.5.9 I<sup>2</sup>C Connectors (CN13)

The I<sup>2</sup>C interface is available through CN13. The I<sup>2</sup>C is a simple bus for the purpose of lightweight communication.

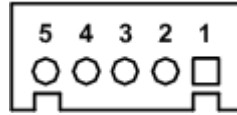
Pin	Signal
1	I2C_CLK
2	I2C_DATA
3	GND



### 2.5.10 SMBus Connector (CN14)

The SMBus interface is available through CN14. The SMBus (System Management Bus) is a simple bus for the purpose of lightweight communication.

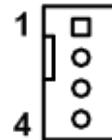
Pin	Signal
1	+3.3V
2	SMB_CLK_S
3	SMB_DATA_S
4	SMB_ALERT
5	GND



### 2.5.11 CPU Fan Connector (FAN1)

Fan is needed for cooling down CPU temperature. The CPU fan interface is available through FAN1.

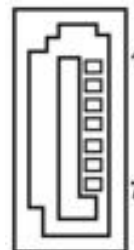
Pin	Signal
1	GND
2	VIN
3	FAN_TACHIN
4	PWM



### 2.5.12 SATA Connectors (SATA1 and SATA2)

The Serial Advanced Technology Attachment (Serial ATA or SATA) connector is computer bus interface for connecting to devices such as hard disk drive.

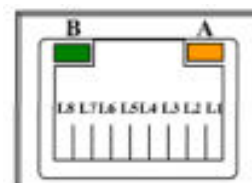
Pin	Signal
1	GND
2	SATA_TX+
3	SATA_TX-
4	GND
5	SATA_RX-
6	SATA_RX+
7	GND



### 2.5.13 Ethernet Ports (LAN1 and LAN2)

The board is equipped with high performance plug and play Ethernet interface fully compliant with the IEEE 802.3 standard. The Ethernet port uses RJ-45 connector. Connection can be established by plugging one end of the Ethernet cable into this RJ-45 connector and the other end to a 1000/100/10-Base-T hub.

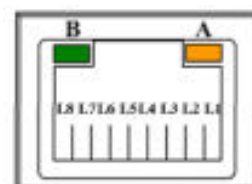
Pin	Signal	Pin	Signal
L1	MDI0+	L5	MDI2+
L2	MDI0-	L6	MDI2-
L3	MDI1+	L7	MDI3+
L4	MDI1-	L8	MDI3-
A	Activity link LED OFF: No link Blinking: Link established; data activity detected		
B	Speed LED Orange: 1Gbps data rate Green: 100Mbps data rate OFF: 10Mbps data rate		



### 2.5.14 BMC Console Connector (LAN3)

The BMC Console connector interface is available through connector LAN3.

Pin	Signal	Pin	Signal
L1	RTS	L5	GND
L2	DTR	L6	RXD
L3	TXD	L7	DSR
L4	GND	L8	CTS



### 2.5.15 BMC Debug Connector (JP4)

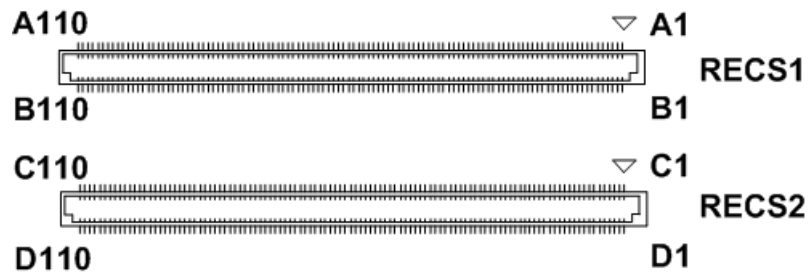
The BMC Debug connector interface is available through connector JP4.

Pin	Signal
1	RXD
2	TXD
3	GND



### 2.5.16 COM Express™ Connectors (RECS1 and RECS2)

The RECS1 and RECS2 are 220-pin connectors for connecting COM Express™ module and COM Express™ baseboard. The pin assignments are as follows.



CEB94701 COM Express™ Type 7 Development Baseboard

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A1	GND_A1 (FIXED)	B1	GND_B1 (FIXED)	C1	GND_C1 (FIXED)	D1	GND_D1 (FIXED)
A2	GBE0_MDI3-	B2	GBE0_ACT#	C2	GND_C2	D2	GND_D2
A3	GBE0_MDI3+	B3	LPC_FRAME#/ESPI_CS0#	C3	USB_SSRX0-	D3	USB_SSTX0-
A4	GBE0_LINK100#	B4	LPC_AD0/ESPI_IO_0	C4	USB_SSRX0+	D4	USB_SSTX0+
A5	GBE0_LINK1000#	B5	LPC_AD1/ESPI_IO_1	C5	GND_C5	D5	GND_D5
A6	GBE0_MDI2-	B6	LPC_AD2/ESPI_IO_2	C6	USB_SSRX1-	D6	USB_SSTX1-
A7	GBE0_MDI2+	B7	LPC_AD3/ESPI_IO_3	C7	USB_SSRX1+	D7	USB_SSTX1+
A8	GBE0_LINK#	B8	LPC_DRQ0#/ESPI_ALERT0#	C8	GND_C8	D8	GND_D8
A9	GBE0_MDI1-	B9	LPC_DRQ1#/ESPI_ALERT1#	C9	USB_SSRX2-	D9	USB_SSTX2-
A10	GBE0_MDI1+	B10	LPC_CLK/ESPI_CK	C10	USB_SSRX2+	D10	USB_SSTX2+
A11	GND_A11 (FIXED)	B11	GND_B11 (FIXED)	C11	GND_C11 (FIXED)	D11	GND_D11 (FIXED)
A12	GBE0_MDI0-	B12	PWRBTN#	C12	USB_SSRX3-	D12	USB_SSTX3-
A13	GBE0_MDI0+	B13	SMB_CK	C13	USB_SSRX3+	D13	USB_SSTX3+
A14	GBE0_CTREF	B14	SMB_DAT	C14	GND_C14	D14	GND_D14
A15	SUS_S3#	B15	SMB_ALERT#	C15	10G_PHY_MDC_SCL3	D15	10G_PHY_MDIO_SDA3
A16	SATA0_TX+	B16	SATA1_TX+	C16	10G_PHY_MDC_SCL2	D16	10G_PHY_MDIO_SDA2
A17	SATA0_TX-	B17	SATA1_TX-	C17	10G_SDP2	D17	10G_SDP3
A18	SUS_S4#	B18	SUS_STAT#/ESPI_RESET#	C18	GND_C18	D18	GND_D18
A19	SATA0_RX+	B19	SATA1_RX+	C19	PCIE_RX6+	D19	PCIE_TX6+
A20	SATA0_RX-	B20	SATA1_RX-	C20	PCIE_RX6-	D20	PCIE_TX6-
A21	GND_A21 (FIXED)	B21	GND_B21 (FIXED)	C21	GND_C21 (FIXED)	D21	GND_D21 (FIXED)
A22	PCIE_TX15+	B22	PCIE_RX15+	C22	PCIE_RX7+	D22	PCIE_TX7+
A23	PCIE_TX15-	B23	PCIE_RX15-	C23	PCIE_RX7-	D23	PCIE_TX7-
A24	SUS_S5#	B24	PWR_OK	C24	10G_INT2	D24	10G_INT3
A25	PCIE_TX14+	B25	PCIE_RX14+	C25	GND_C25	D25	GND_D25
A26	PCIE_TX14-	B26	PCIE_RX14-	C26	10G_KR_RX3+	D26	10G_KR_TX3+
A27	BATLOW#	B27	WDT	C27	10G_KR_RX3-	D27	10G_KR_TX3-
A28	(S)ATA_ACT#	B28	RSVD_B28	C28	GND_C28	D28	GND_D28
A29	RSVD_A29	B29	RSVD_B29	C29	10G_KR_RX2+	D29	10G_KR_TX2+
A30	RSVD_A30	B30	RSVD_B30	C30	10G_KR_RX2-	D30	10G_KR_TX2-
A31	GND_A31 (FIXED)	B31	GND_B31 (FIXED)	C31	GND_C31 (FIXED)	D31	GND_D31 (FIXED)
A32	RSVD_A32	B32	SPKR	C32	10G_SFP_SDA3	D32	10G_SFP_SCL3
A33	RSVD_A33	B33	I2C_CK	C33	10G_SFP_SDA2	D33	10G_SFP_SCL2
A34	BIOS_DIS0#/ESPI_SAFS	B34	I2C_DAT	C34	10G_PHY_RST_23	D34	10G_PHY_CAP_23
A35	THRMTrip#	B35	THRm#	C35	10G_PHY_RST_01	D35	10G_PHY_CAP_01
A36	PCIE_TX13+	B36	PCIE_RX13+	C36	10G_LED_SDA	D36	RSVD_D36
A37	PCIE_TX13-	B37	PCIE_RX13-	C37	10G_LED_SCL	D37	RSVD_D37
A38	GND_A38	B38	GND_B38	C38	10G_SFP_SDA1	D38	10G_SFP_SCL1
A39	PCIE_TX12+	B39	PCIE_RX12+	C39	10G_SFP_SDA0	D39	10G_SFP_SCL0
A40	PCIE_TX12-	B40	PCIE_RX12-	C40	10G_SDP0	D40	10G_SDP1
A41	GND_A41 (FIXED)	B41	GND_B41 (FIXED)	C41	GND_C41 (FIXED)	D41	GND_D41 (FIXED)
A42	USB2-	B42	USB3-	C42	10G_KR_RX1+	D42	10G_KR_TX1+
A43	USB2+	B43	USB3+	C43	10G_KR_RX1-	D43	10G_KR_TX1-
A44	USB_2_3_OC#	B44	USB_0_1_OC#	C44	GND_C44	D44	GND_D44
A45	USB0-	B45	USB1-	C45	10G_PHY_MDC_SCL1	D45	10G_PHY_MDIO_SDA1
A46	USB0+	B46	USB1+	C46	10G_PHY_MDC_SCL0	D46	10G_PHY_MDIO_SDA0
A47	VCC_RTC	B47	ESPI_EN#	C47	10G_INT0	D47	10G_INT1
A48	RSVD_A48	B48	USB0_HOST_PRsNT	C48	GND_C48	D48	GND_D48
A49	GBE0_SDP	B49	SYS_RESET#	C49	10G_KR_RX0+	D49	10G_KR_TX0+
A50	LPC_SERIRQ/ESPI_CS1#	B50	CB_RESET#	C50	10G_KR_RX0-	D50	10G_KR_TX0-
A51	GND_A51 (FIXED)	B51	GND_B51 (FIXED)	C51	GND_C51 (FIXED)	D51	GND_D51 (FIXED)
A52	PCIE_TX5+	B52	PCIE_RX5+	C52	PCIE_RX16+	D52	PCIE_TX16+
A53	PCIE_TX5-	B53	PCIE_RX5-	C53	PCIE_RX16-	D53	PCIE_TX16-
A54	GPI0	B54	GPO1	C54	TYPE0#	D54	RSVD_D54
A55	PCIE_TX4+	B55	PCIE_RX4+	C55	PCIE_RX17+	D55	PCIE_TX17+



**CEB94701 COM Express™ Type 7 Development Baseboard**

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
A56	PCIE_TX4-	B56	PCIE_RX4-	C56	PCIE_RX17-	D56	PCIE_TX17-
A57	GND_A57	B57	GPO2	C57	TYPE1#	D57	TYPE2#
A58	PCIE_TX3+	B58	PCIE_RX3+	C58	PCIE_RX18+	D58	PCIE_TX18+
A59	PCIE_TX3-	B59	PCIE_RX3-	C59	PCIE_RX18-	D59	PCIE_TX18-
A60	GND_A60 (FIXED)	B60	GND_B60 (FIXED)	C60	GND_C60 (FIXED)	D60	GND_D60 (FIXED)
A61	PCIE_TX2+	B61	PCIE_RX2+	C61	PCIE_RX19+	D61	PCIE_TX19+
A62	PCIE_TX2-	B62	PCIE_RX2-	C62	PCIE_RX19-	D62	PCIE_TX19-
A63	GPI1	B63	GPO3	C63	RSVD_C63	D63	RSVD_D63
A64	PCIE_TX1+	B64	PCIE_RX1+	C64	RSVD_C64	D64	RSVD_D64
A65	PCIE_TX1-	B65	PCIE_RX1-	C65	PCIE_RX20+	D65	PCIE_TX20+
A66	GND_A66	B66	WAKE0#	C66	PCIE_RX20-	D66	PCIE_TX20-
A67	GPI2	B67	WAKE1#	C67	RAPID_SHUTDOWN	D67	GND_D67
A68	PCIE_TX0+	B68	PCIE_RX0+	C68	PCIE_RX21+	D68	PCIE_TX21+
A69	PCIE_TX0-	B69	PCIE_RX0-	C69	PCIE_RX21-	D69	PCIE_TX21-
A70	GND_A70 (FIXED)	B70	GND_B70 (FIXED)	C70	GND_C70 (FIXED)	D70	GND_D70 (FIXED)
A71	PCIE_TX8+	B71	PCIE_RX8+	C71	PCIE_RX22+	D71	PCIE_TX22+
A72	PCIE_TX8-	B72	PCIE_RX8-	C72	PCIE_RX22-	D72	PCIE_TX22-
A73	GND_A73	B73	GND_B73	C73	GND_C73	D73	GND_D73
A74	PCIE_TX9+	B74	PCIE_RX9+	C74	PCIE_RX23+	D74	PCIE_TX23+
A75	PCIE_TX9-	B75	PCIE_RX9-	C75	PCIE_RX23-	D75	PCIE_TX23-
A76	GND_A76	B76	GND_B76	C76	GND_C76	D76	GND_D76
A77	PCIE_TX10+	B77	PCIE_RX10+	C77	RSVD_C77	D77	RSVD_D77
A78	PCIE_TX10-	B78	PCIE_RX10-	C78	PCIE_RX24+	D78	PCIE_TX24+
A79	GND_A79	B79	GND_B79	C79	PCIE_RX24-	D79	PCIE_TX24-
A80	GND_A80 (FIXED)	B80	GND_B80 (FIXED)	C80	GND_C80 (FIXED)	D80	GND_D80 (FIXED)
A81	PCIE_TX11+	B81	PCIE_RX11+	C81	PCIE_RX25+	D81	PCIE_TX25+
A82	PCIE_TX11-	B82	PCIE_RX11-	C82	PCIE_RX25-	D82	PCIE_TX25-
A83	GND_A83	B83	GND_B83	C83	RSVD_C83	D83	RSVD_D83
A84	NCSI_TX_EN	B84	VCC_5V_SBY	C84	GND_C84	D84	GND_D84
A85	GPI3	B85	VCC_5V_SBY	C85	PCIE_RX26+	D85	PCIE_TX26+
A86	RSVD_A86	B86	VCC_5V_SBY	C86	PCIE_RX26-	D86	PCIE_TX26-
A87	RSVD_A87	B87	VCC_5V_SBY	C87	GND_C87	D87	GND_D87
A88	PCIE_CK_REF+	B88	BIOS_DIS1#	C88	PCIE_RX27+	D88	PCIE_TX27+
A89	PCIE_CK_REF-	B89	NCSI_RX_ER	C89	PCIE_RX27-	D89	PCIE_TX27-
A90	GND_A90 (FIXED)	B90	GND_B90 (FIXED)	C90	GND_C90 (FIXED)	D90	GND_D90 (FIXED)
A91	SPL_POWER	B91	NCSI_CLK_IN	C91	PCIE_RX28+	D91	PCIE_TX28+
A92	SPL_MISO	B92	NCSI_RXD1	C92	PCIE_RX28-	D92	PCIE_TX28-
A93	GPO0	B93	NCSI_RXD0	C93	GND_C93	D93	GND_D93
A94	SPL_CLK	B94	NCSI_CRS_DV	C94	PCIE_RX29+	D94	PCIE_TX29+
A95	SPL_MOSI	B95	NCSI_TXD1	C95	PCIE_RX29-	D95	PCIE_TX29-
A96	TPM_PP	B96	NCSI_TXD0	C96	GND_C96	D96	GND_D96
A97	TYPE10#	B97	SPL_CS#	C97	RSVD_C97	D97	RSVD_D97
A98	SER0_TX	B98	NCSI_ARB_IN	C98	PCIE_RX30+	D98	PCIE_TX30+
A99	SER0_RX	B99	NCSI_ARB_OUT	C99	PCIE_RX30-	D99	PCIE_TX30-
A100	GND_A100 (FIXED)1	B100	GND_B100 (FIXED)1	C100	GND_C100 (FIXED)	D100	GND_D100 (FIXED)
A101	SER1_TX	B101	FAN_PWNOUT	C101	PCIE_RX31+	D101	PCIE_TX31+
A102	SER1_RX	B102	FAN_TACHIN	C102	PCIE_RX31-	D102	PCIE_TX31-
A103	LID#	B103	SLEEP#	C103	GND_C103	D103	GND_D103
A104	VCC_12V1	B104	VCC_12V7	C104	VCC_12V	D104	VCC_12V
A105	VCC_12V2	B105	VCC_12V8	C105	VCC_12V	D105	VCC_12V
A106	VCC_12V3	B106	VCC_12V9	C106	VCC_12V	D106	VCC_12V
A107	VCC_12V4	B107	VCC_12V10	C107	VCC_12V	D107	VCC_12V
A108	VCC_12V5	B108	VCC_12V11	C108	VCC_12V	D108	VCC_12V
A109	VCC_12V6	B109	VCC_12V12	C109	VCC_12V	D109	VCC_12V
A110	GND_A110 (FIXED)	B110	GND_B110 (FIXED)	C110	GND_C110 (FIXED)	D110	GND_D110 (FIXED)

## 2.6 Switch Buttons

The board has four switch buttons, see table below.

Push Button	Description
SW1	Sleep switch button
SW2	LID switch button
SW3	Reset switch button
SW4	Power switch button



## 2.7 LED Indicators

The board has five LEDs and one dual 7-segment LED display. See table below for detailed information.

LED	Description
Power LED	Power state LED indicators for +5V_SBY, +5V, +3.3V and +12V
Thermal Trip Indicator LED	LED ON means thermal trip signal is low active. The default setting is Disable. You can change the setting with JP2, see section 2.4.1.
7-segment LED	Dual 7-segment LED. Displays BIOS codes pushed out to LPC Port 80 during boot up process; which is very handy for debugging.

