

# DFI



## **COM333-I**

### **COM Express Carrier Board User's Manual**



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## Trademarks

Product names or trademarks appearing in this manual are for identification purpose only and are the properties of the respective owners.

## FCC and DOC Statement on Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

### Notice:

1. The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Shielded interface cables must be used in order to comply with the emission limits.

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## Warranty

1. Warranty does not cover damages or failures that arised from misuse of the product, inability to use the product, unauthorized replacement or alteration of components and product specifications.
2. The warranty is void if the product has been subjected to physical abuse, improper installation, modification, accidents or unauthorized repair of the product.
3. Unless otherwise instructed in this user's manual, the user may not, under any circumstances, attempt to perform service, adjustments or repairs on the product, whether in or out of warranty. It must be returned to the purchase point, factory or authorized service agency for all such work.
4. We will not be liable for any indirect, special, incidental or consequential damages to the product that has been modified or altered.

## Static Electricity Precautions

It is quite easy to inadvertently damage your PC, system board, components or devices even before installing them in your system unit. Static electrical discharge can damage computer components without causing any signs of physical damage. You must take extra care in handling them to ensure against electrostatic build-up.

1. To prevent electrostatic build-up, leave the system board in its anti-static bag until you are ready to install it.
2. Wear an antistatic wrist strap.
3. Do all preparation work on a static-free surface.
4. Hold the device only by its edges. Be careful not to touch any of the components, contacts or connections.
5. Avoid touching the pins or contacts on all modules and connectors. Hold modules or connectors by their ends.



### Important:

Electrostatic discharge (ESD) can damage your processor, disk drive and other components. Perform the upgrade instruction procedures described at an ESD workstation only. If such a station is not available, you can provide some ESD protection by wearing an antistatic wrist strap and attaching it to a metal part of the system chassis. If a wrist strap is unavailable, establish and maintain contact with the system chassis throughout any procedures requiring ESD protection.

## Safety Measures

To avoid damage to the system:

- Use the correct AC input voltage range.

To reduce the risk of electric shock:

- Unplug the power cord before removing the system chassis cover for installation or servicing. After installation or servicing, cover the system chassis before plugging the power cord.

Battery:

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommend by the manufacturer.
- Dispose of used batteries according to local ordinance.

## About the Package

The package contains the following items. If any of these items are missing or damaged, please contact your dealer or sales representative for assistance.

- One COM333-I board
- One Serial ATA data cable (Length: 500mm)

## Optional Items

- Serial ATA data cable (Length: 500mm)
- LPC EXT-RS232 module (4 x RS232 ports)
- LPC EXT-RS485 module (4 x RS485 ports)
- I/O shield
- Standoff (M2.5\*12) (for compact size module)

The board and accessories in the package may not come similar to the information listed above. This may differ in accordance with the sales region or models in which it was sold. For more information about the standard package in your region, please contact your dealer or sales representative.

## Before Using the System Board

Before using the system board, prepare basic system components.

If you are installing the system board in a new system, you will need at least the following internal components.

- Module board
- Storage devices such as hard disk drive, etc.

You will also need external system peripherals you intend to use which will normally include at least a keyboard, a mouse and a video display monitor.

## Chapter 1 - Introduction

### Specifications

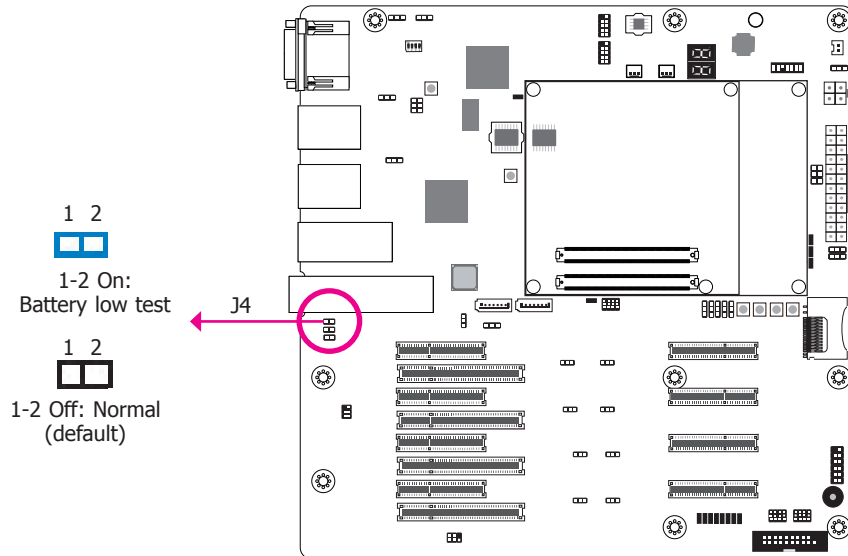
<b>EXPANSION</b>	Interface	B1: 2 x PCIe x4 or 1 x PCIe x8 (Gen 3) B2: 2 x PCIe x4 or 1 x PCIe x8 (Gen 3) B3: 2 x PCIe x4 or 1 x PCIe x8 (Gen 3) B4: 2 x PCIe x4 or 1 x PCIe x8 (Gen 3)	
	<b>REAR I/O</b>	Ethernet	4 x 10GbE LAN (2 x SFP+, 2 x RJ-45) by 10GBASE-KR interface 2 x 1GbE LAN (RJ-45) (one from module; another from BMC for remote management)
		USB	4 x USB 3.0/2.0
		Serial	1 x RS-232 (DB-9) (supports by BMC which default is debug port and may switch to normal RS-232)
<b>INTERNAL I/O</b>	Serial	2 x Serial Interface Connectors (TX/RX) (2.0mm pitch)	
	SATA	2 x SATA 3.0 (up to 6Gb/s)	
	DIO	1 x 8-bit DIO (4 input, 4 output) 1 x SDIO (conditionally available)	
	LPC	1 x LPC	
	SMBus	1 x SMBus	
	I <sup>2</sup> C	1 x I <sup>2</sup> C	
<b>BMC</b>	Features	1. IPMI 2.0 2. Web Browser Support 3. Web Interface 4. iKVM (keyboard, video and mouse) 5. Virtual Media 6. 3rd Party Authentication 7. Firmware Update 8. SMASH/CLP 9. WS-MAN 10. Network Service	
	Processor	AST2500	
	SDRAM	DDR4-2400 1200MHz 8Gb memory down	
	Display	Through BMC to convert VGA signal VGA: resolution up to 1920 x 1200 x 32bpp (share with SOC 16MB memory)	
	<b>POWER</b>	Type	12V, 5VSB, VCC_RTC (ATX mode) 12V, VCC_RTC (AT mode)
		Connector	4-pin ATX 12V power 24-pin ATX power
		RTC Battery	CR2032 Coin Cell

<b>ENVIRONMENT</b>	Temperature	Operating: 0 to 60°C Storage: -40 to 85°C
	Humidity	Operating: 5 to 90% RH Storage: 5 to 90% RH
<b>MECHANICAL</b>	Dimensions	microATX Form Factor 244mm (9.6") x 244mm (9.6")
	Compliance	PICMG COM Express® R3.0, Type 7 Basic, Compact Modules



## Function Test Jumper

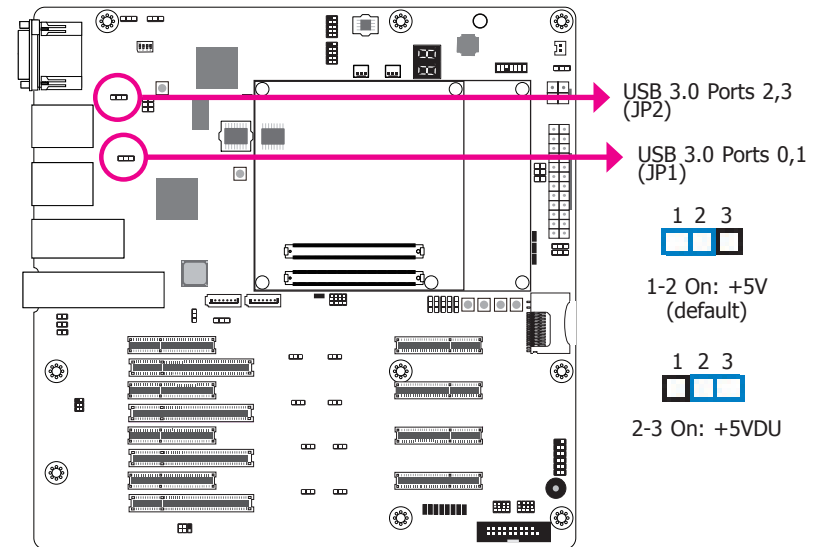
### Battery Low Indicator



This jumper is used to simulate the signal status that indicates the external battery is low. By setting J4 pins 1 and 2 to On, it sends a battery low signal to the module.

## Jumper Settings

### USB Power Select



JP1 (for USB 3.0 Ports 0,1) and JP2 (for USB 3.0 Ports 2,3) are used to select the power of USB ports. Selecting +5VDU will allow you to use a USB keyboard to wake up the system.

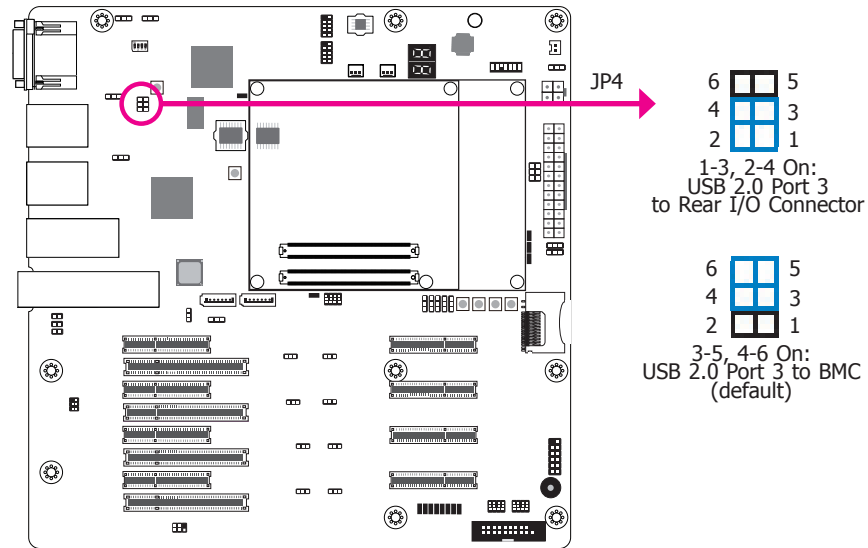


#### Important:

If your module board supports Wake-On-USB Keyboard/Mouse function, the +5V\_ standby power source of your power supply must support  $\geq 2A$  for 2 USB devices.

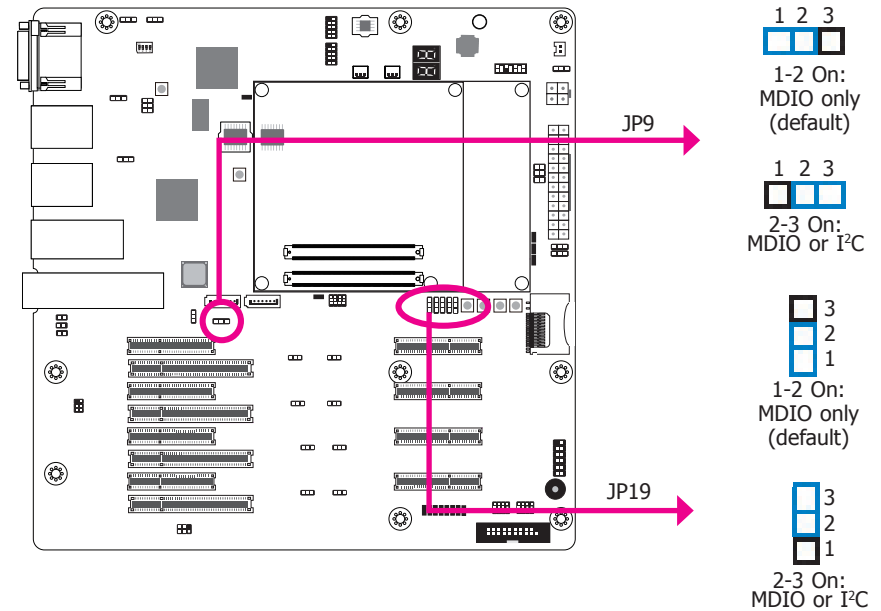


## USB 2.0 Port 3 Select



The JP4 is used to select the USB 2.0 port 3 connection path.

## 10G PHY Capability Select

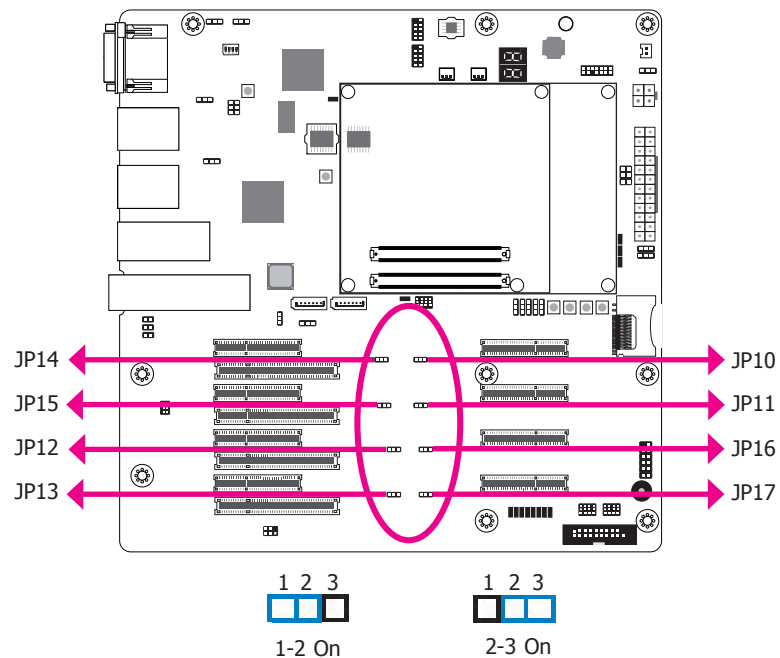


The JP19 and JP9 are used to select the capability of 10G PHY lanes 0,1 and lanes 2,3 respectively.

If 10G\_PHY\_CAP\_0,1 is tied low on the Carrier, this indicates to the Module that the PHY on the Carrier for 10G interfaces 0 and 1 can be configured by either I<sup>2</sup>C or by MDIO.

If the Carrier leaves the line NC, then this indicates to the Module that the Carrier PHY can only be configured by MDIO.

## PCIe Lane Select



The JP14 is used to select the PCIe Lanes 00~03: PCIe5 x4 slot (default, 1-2 On) or PCIe1 x8 slot (2-3 On).

The JP10 is used to select the PCIe Lanes 04~07: PCIe9 x4 slot (default, 1-2 On) or PCIe1 x8 slot (2-3 On).

The JP15 is used to select the PCIe Lanes 08~11: PCIe6 x4 slot (default, 1-2 On) or PCIe2 x8 slot (2-3 On).

The JP11 is used to select the PCIe Lanes 12~15: PCIe10 x4 slot (default, 1-2 On) or PCIe2 x8 slot (2-3 On).

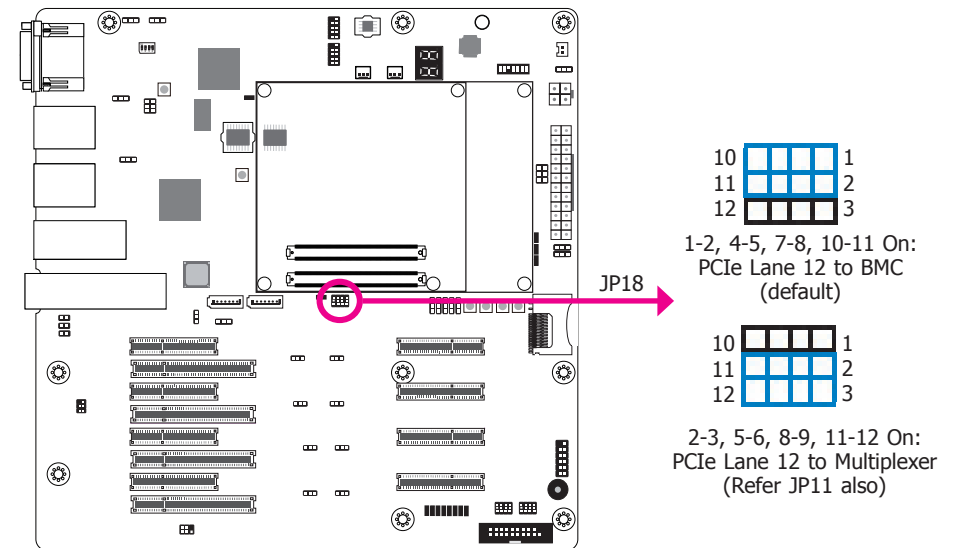
The JP12 is used to select the PCIe Lanes 16~19: PCIe7 x4 slot (1-2 On) or PCIe3 x8 slot (default, 2-3 On).

The JP16 is used to select the PCIe Lanes 20~23: PCIe11 x4 slot (1-2 On) or PCIe3 x8 slot (default, 2-3 On).

The JP13 is used to select the PCIe Lanes 24~27: PCIe8 x4 slot (default, 1-2 On) or PCIe4 x8 slot (2-3 On).

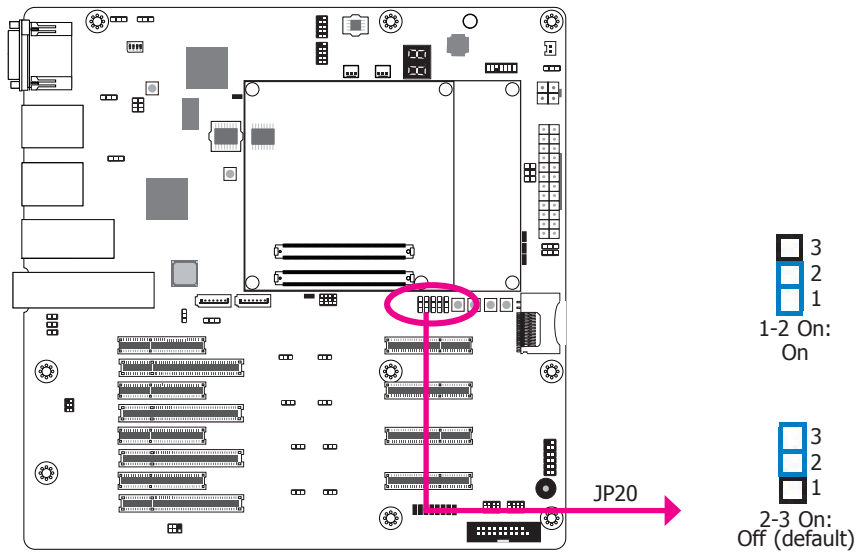
The JP17 is used to select the PCIe Lanes 28~31: PCIe12 x4 slot (default, 1-2 On) or PCIe4 x8 slot (2-3 On).

## PCIe Lane 12 Select



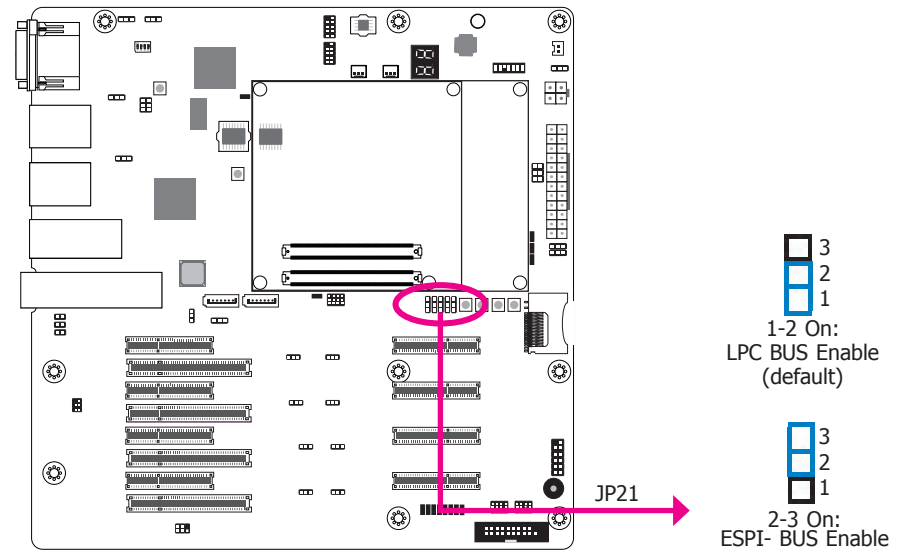
The JP18 is used to select PCIe Lane 12 to BMC or multiplexer.

### TPM\_PP on CB Select



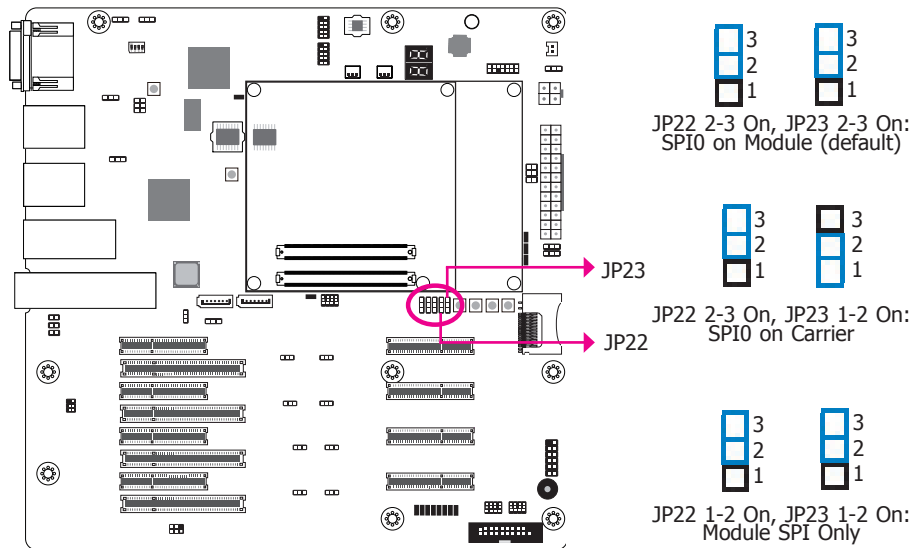
The JP20 is used to select to turn on or off the TPM\_PP on CB.

### ESPI- Enable Select



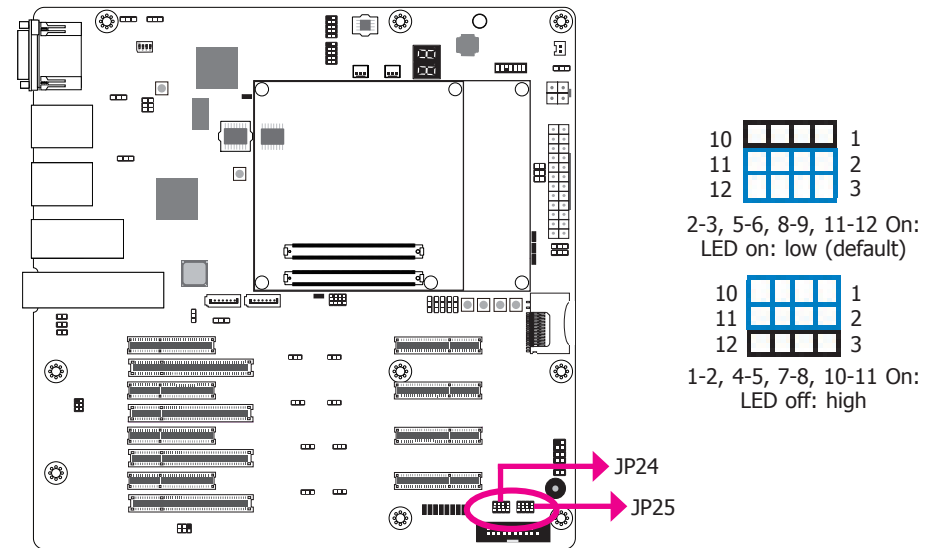
The JP21 signal is used by carrier to indicate the operating mode of the LPC or eSPI bus.

### BIOS Boot Location Select



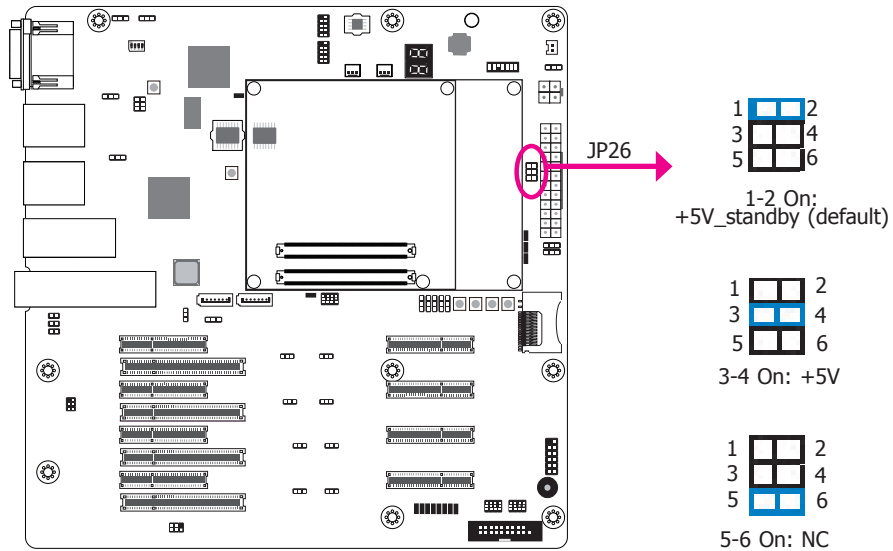
The JP22 and JP23 are used to determine the BIOS boot location.

### PIN 0~3 DIO Output/Input Select



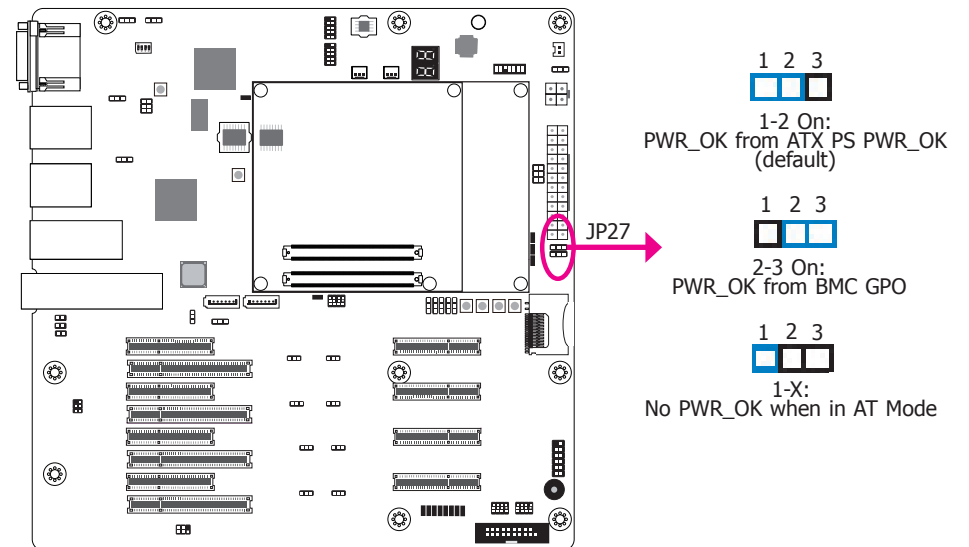
The JP24 and JP25 are used to select PIN 0~3 DIO output and input respectively.

## VCC5\_IN Power Select



The JP26 is used to select the power rail for module VCC5\_IN pins when in ATX or AT mode.

## ATX/AT Mode Select (Power\_OK)

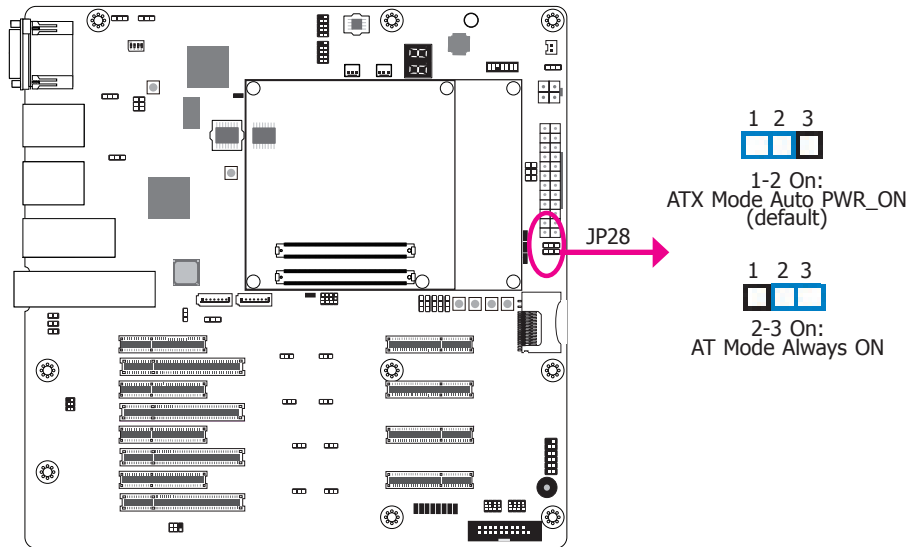


The JP27 allows you to select the PWR\_OK connection state when setting power at ATX or AT mode.

**Note:**

JP27 and JP28 need to be set in the similar mode. Please refer next page for JP28 description.

## PS\_ON Select

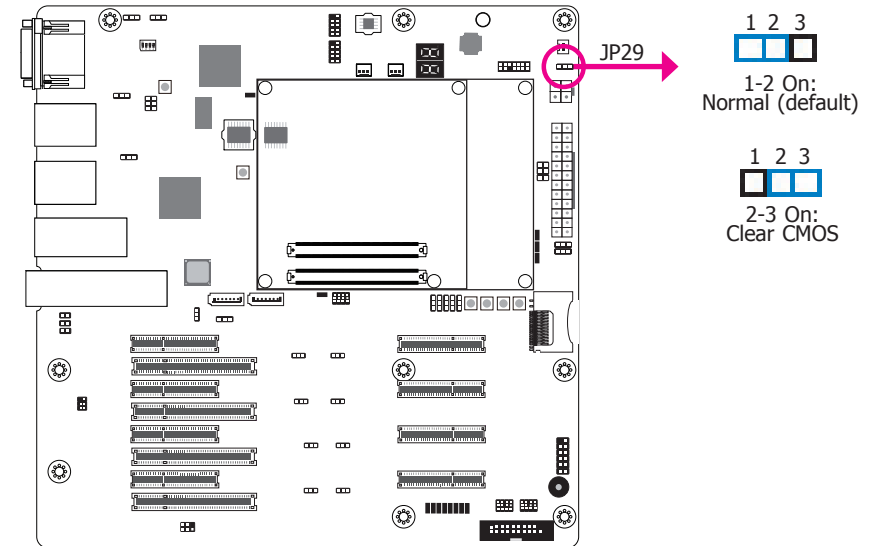


The JP28 allows you to select the ATX mode auto power on or AT mode always on.

**Note:**

JP27 and JP28 need to be set in the similar mode. Please refer last page for JP27 description.

## Clear CMOS



If you encounter the following situations,

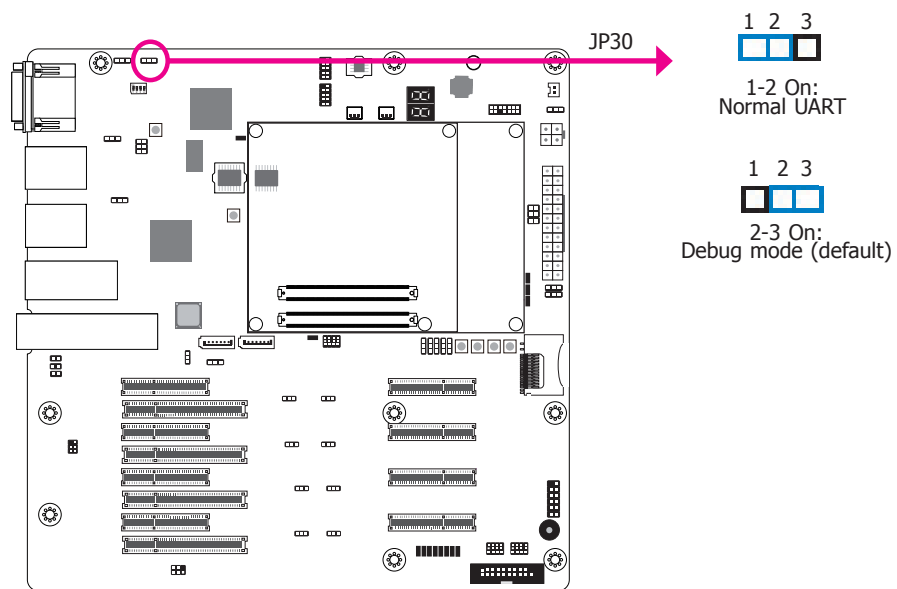
- CMOS data becomes corrupted.
- You forgot the supervisor or user password.

you can reconfigure the system with the default values stored in the ROM BIOS.

To load the default values stored in the ROM BIOS, please follow the steps below:

- Power-off the system and unplug the power cord.
- Set JP29 pins 2 and 3 to On. Wait for a few seconds and set JP29 back to its default setting, pins 1 and 2 On.
- Now plug the power cord and power-on the system.

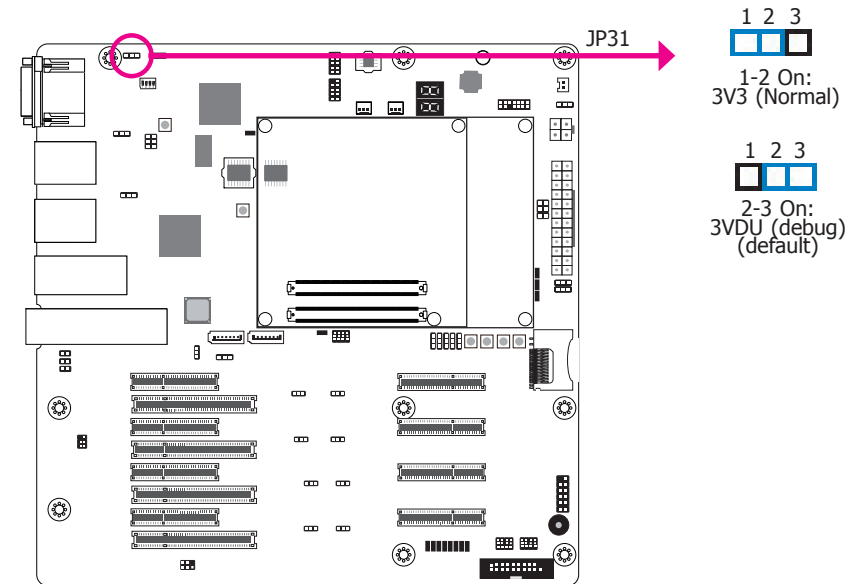
## BMC UART1 Port Mode Select



The JP30 is used to select the mode of BMC UART1 port.

**Note:**  
JP30 and JP31 need to be set simultaneously.

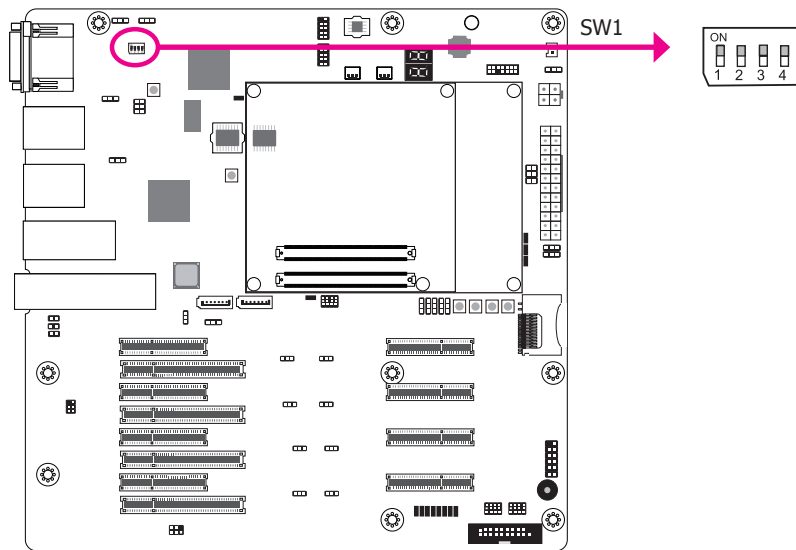
## BMC UART1 Driver's/Receiver's Power Rail Select



The JP31 is used to select the driver's/receiver's power rail of the BMC UART1.

**Note:**  
JP30 and JP31 need to be set simultaneously.

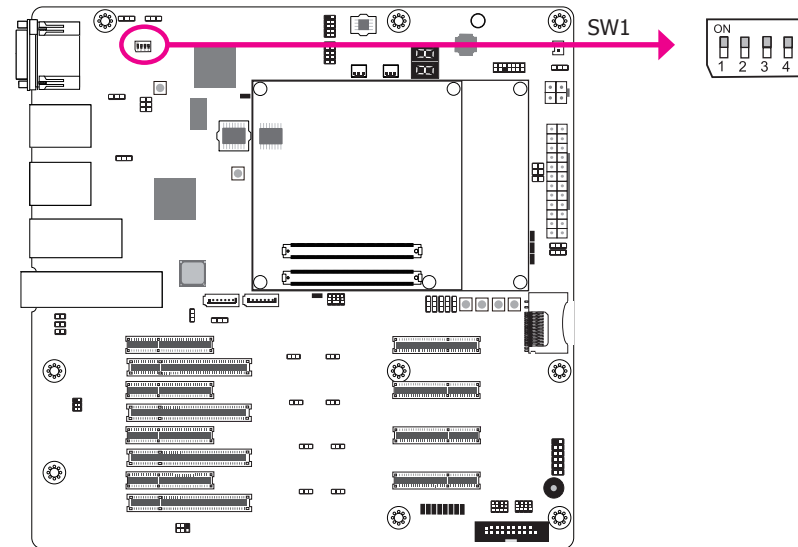
## BMC SPI1 Interface Mode Select



To select BMC SPI1 interface mode, please use pins 1 and 2 of finger switch SW1.

BMC SPI1 Interface Mode Select	SW1 Pins 1 & 2
Disable SPI Interface (default)	1 Off, 2 Off
Enable SPI Master	1 Off, 2 On
Reserved	1 On, 2 Off
Enable SPI Pass Through	1 On, 2 On

## BMC 2nd Boot Watchdog Timer Select

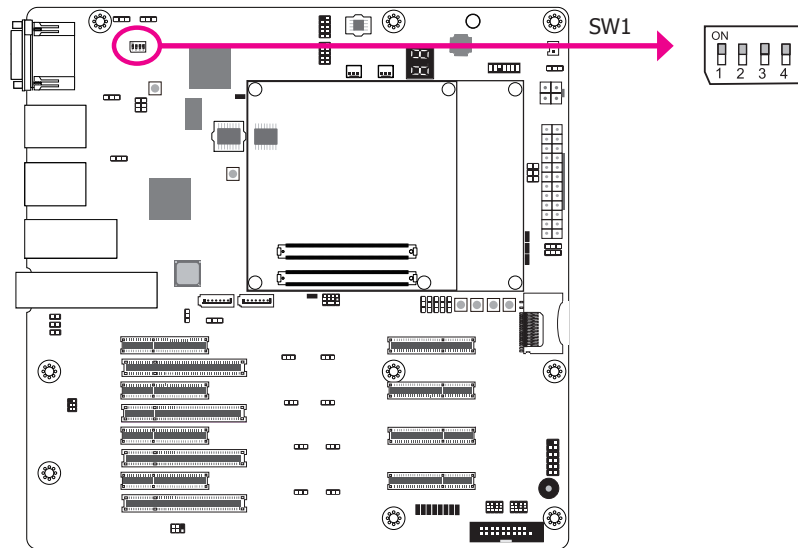


To enable or disable BMC 2nd boot watchdog timer, please use pin 3 of finger switch SW1.

BMC 2nd Boot Watchdog Timer Select	SW1 Pin 3
Disable	Off
Enable (default)	On



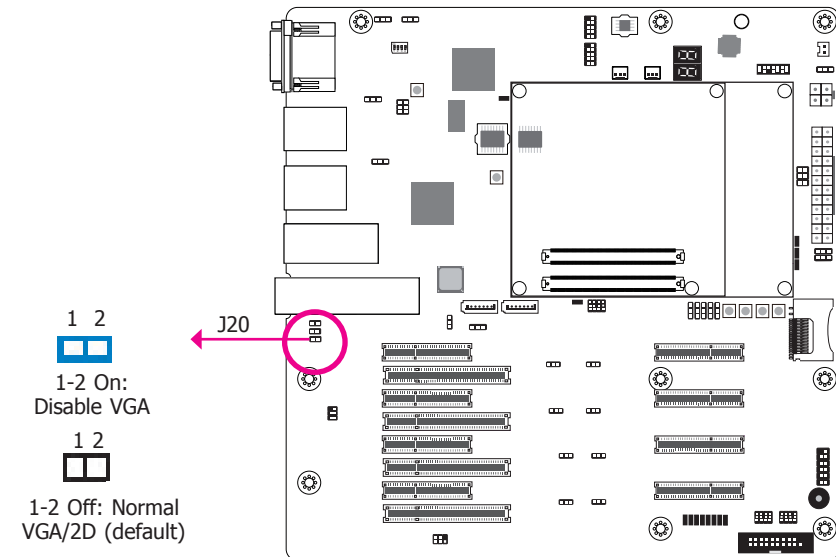
## BMC MAC#1 Interface Type Select



To select BMC MAC#1 interface type, please use pin 4 of finger switch SW1.

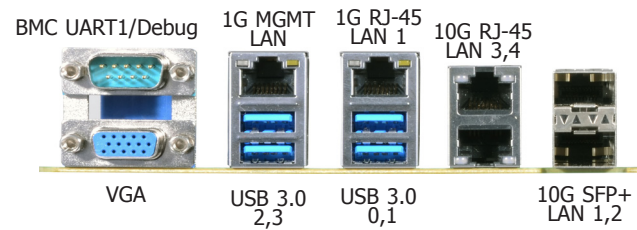
BMC MAC#1 Interface Type Select	SW1 Pin 4
RMII/NCSI	Off
RGMII (default)	On

## BMC VGA Select



This jumper is used to disable BMC integrated VGA.

## Rear Panel I/O Ports



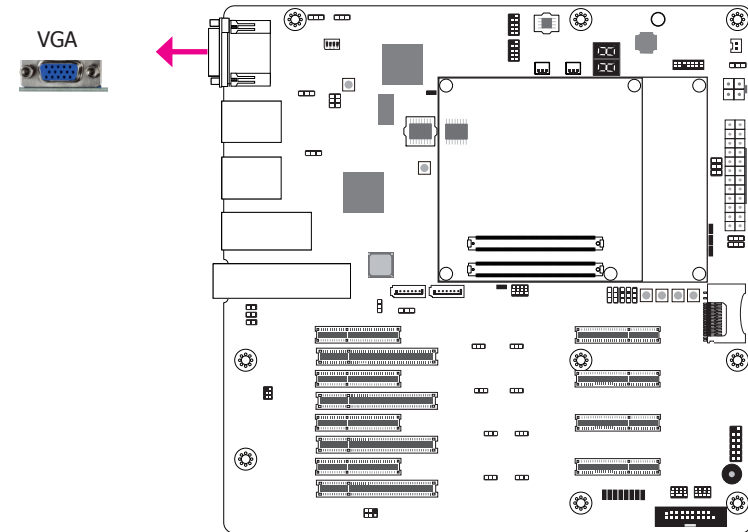
The rear panel I/O ports consist of the following:

- 1 BMC UART1/Debug port
- 1 VGA port
- 1 1G MGMT LAN port
- 1 1G RJ-45 LAN port
- 4 USB 3.0 ports
- 2 10G RJ-45 LAN ports
- 2 10G SFP+ LAN ports

## Graphics Interface

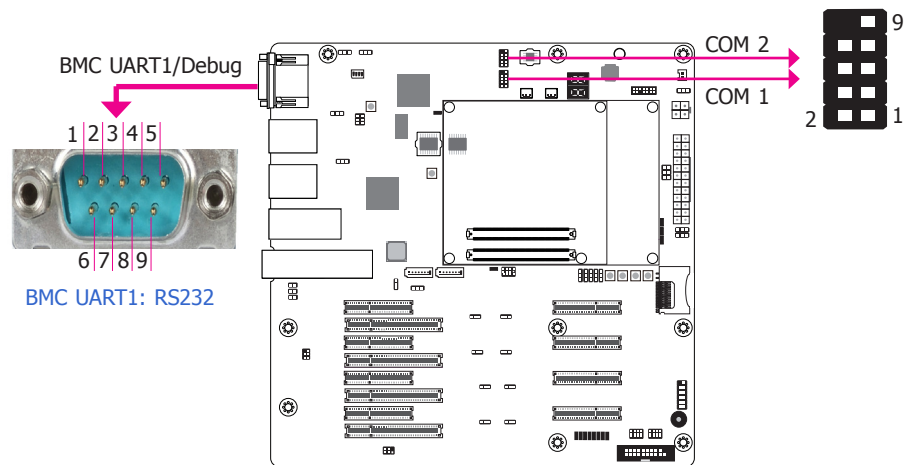
The display port consists of the following:

- 1 VGA port



The VGA port is used for connecting a VGA monitor. Connect the monitor's 15-pin D-shell cable connector to the VGA port. After you plug the monitor's cable connector into the VGA port, gently tighten the cable screws to hold the connector in place.

## COM (Serial) Ports



The serial ports are asynchronous communication ports with 16C550A-compatible UARTs that can be used with modems, serial printers, remote display terminals, and other serial devices.

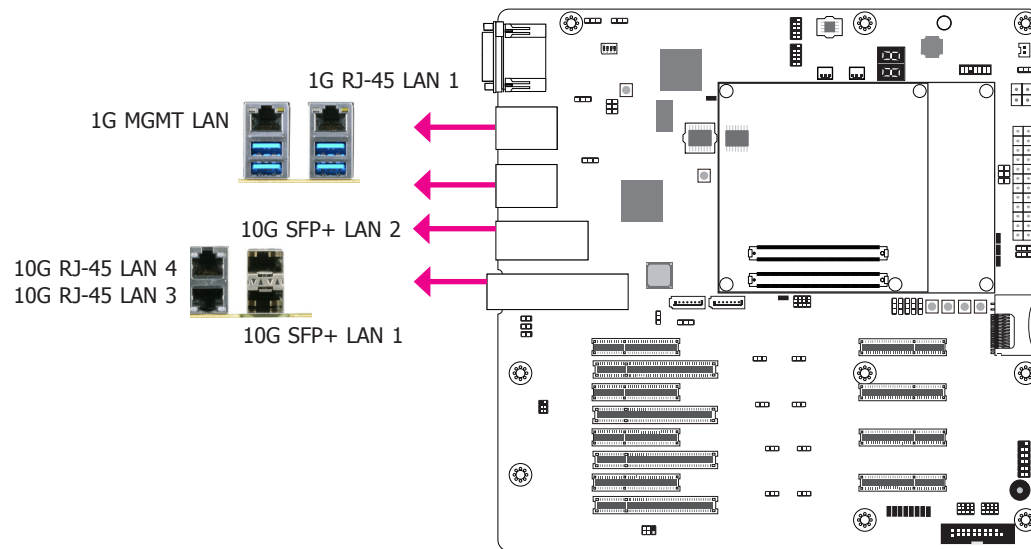
## BMC UART1

Pin	Assignment
1	DCD-
2	RD
3	TD
4	DTR-
5	GND
6	DSR-
7	RTS-
8	CTS-
9	RI-

## COM 1/2

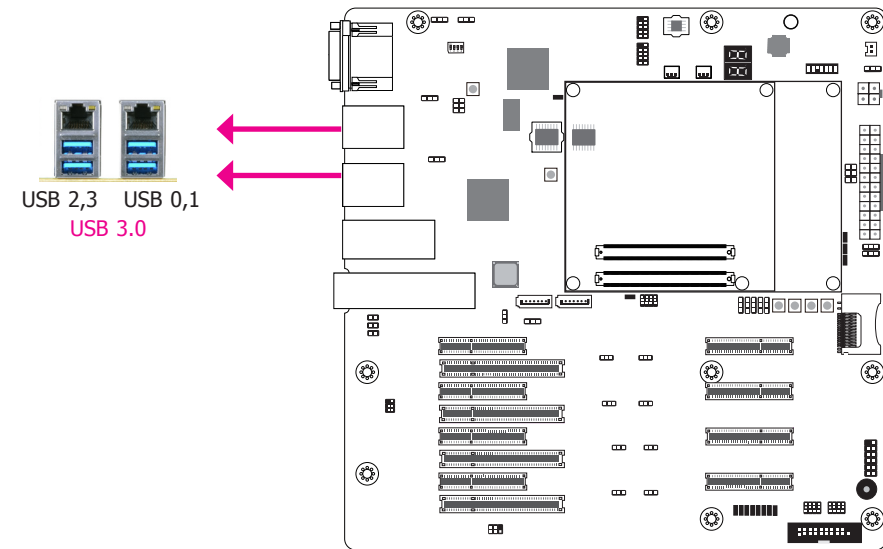
Pin	Assignment	Pin	Assignment
1	NC	2	RX
3	TX	4	NC
5	GND	6	NC
7	NC	8	NC
9	NC	10	---

## LAN Ports



The onboard LAN ports allow the system board to connect to a local area network by means of a network hub.

## USB Ports



USB allows data exchange between your computer and a wide range of simultaneously accessible external plug-and-play peripherals.

The system board is equipped with 4 onboard USB 3.0 ports (USB 0,1/2,3). (Full function depends on module board.)

## Driver Installation

You may need to install the proper drivers in your operating system to use the USB device. Refer to your operating system's manual or documentation for more information.

## Wake-On-USB Keyboard/Mouse

The Wake-On-USB Keyboard/Mouse function allows you to use a USB keyboard or USB mouse to wake up a system from the S3 (STR - Suspend To RAM) state. If your module board supports this function, follow below jumper setting to use it:

- Jumper Setting

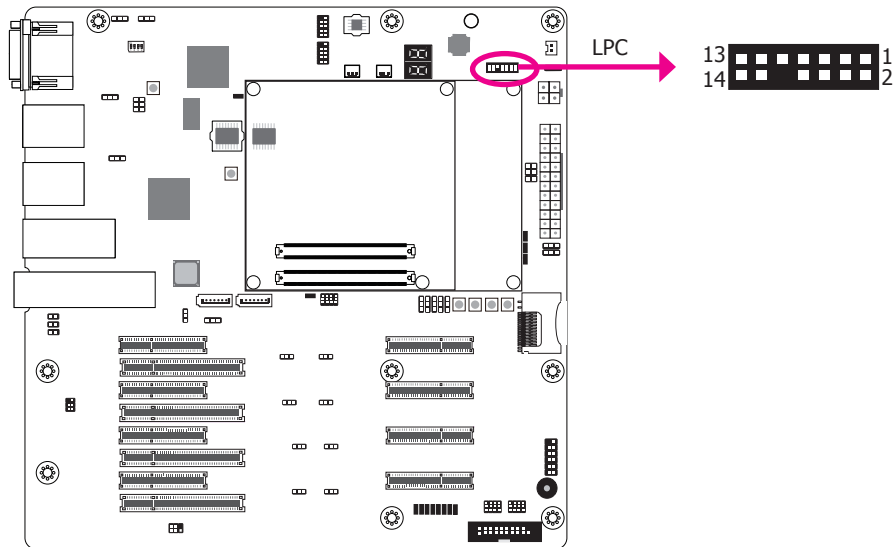
JP1 (for USB 3.0 ports 0,1) and JP2 (for USB 3.0 ports 2,3) must be set to "2-3 On: +5VDU". Refer to "USB Power Select" in this chapter for more information.

**Important:**

If your module board supports Wake-On-USB Keyboard/Mouse function, the +5V<sub>standby</sub> power source of your power supply must support  $\geq 2A$  for 2 USB devices.

## I/O Connectors

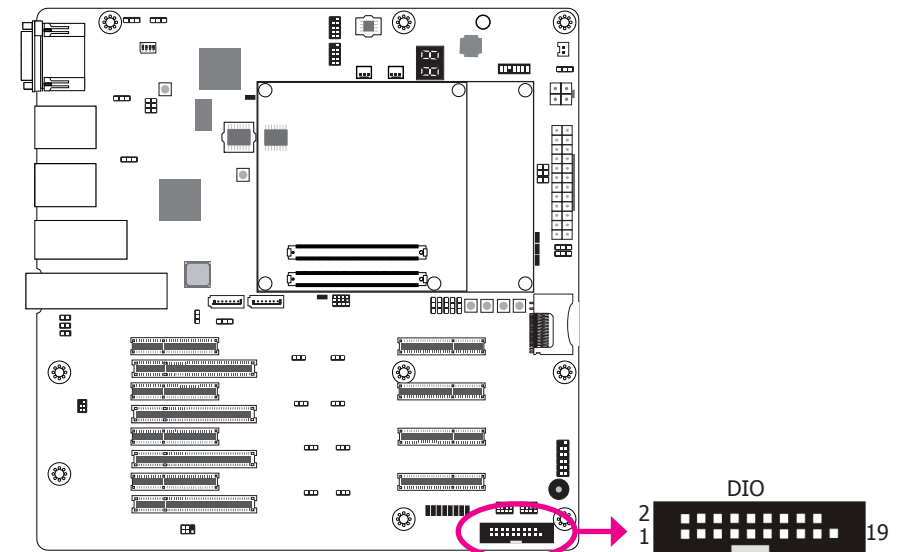
### LPC Connector



The Low Pin Count Interface was defined by Intel® Corporation to facilitate the industry's transition towards legacy free systems. It allows the integration of low-bandwidth legacy I/O components within the system, which are typically provided by a Super I/O controller. Furthermore, it can be used to interface firmware hubs, Trusted Platform Module (TPM) devices and embedded controller solutions. Data transfer on the LPC bus is implemented over a 4 bit serialized data interface, which uses a 24MHz LPC bus clock. For more information about LPC bus refer to the Intel® Low Pin Count Interface Specification Revision 1.1'. The table on the right indicates the pin functions of the LPC connector.

Pin	Assignment	Pin	Assignment
1	L_CLK	2	L_AD1
3	L_RST#	4	L_AD0
5	L_FRAME#	6	3V3
7	L_AD3	8	GND
9	L_AD2	10	---
11	L_SERIRQ	12	CLK_48MHz
13	5VSB	14	5V

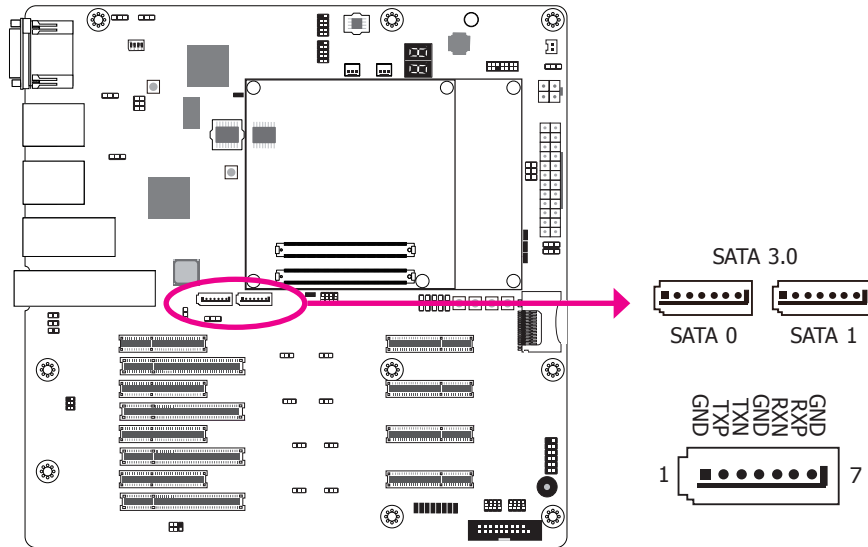
### Digital I/O Connector



The 8-bit Digital I/O connector (4-bit GPI and 4-bit GPO) provides powering-on and control functions to the connected external devices. The pin functions of the connector are listed as the followings:

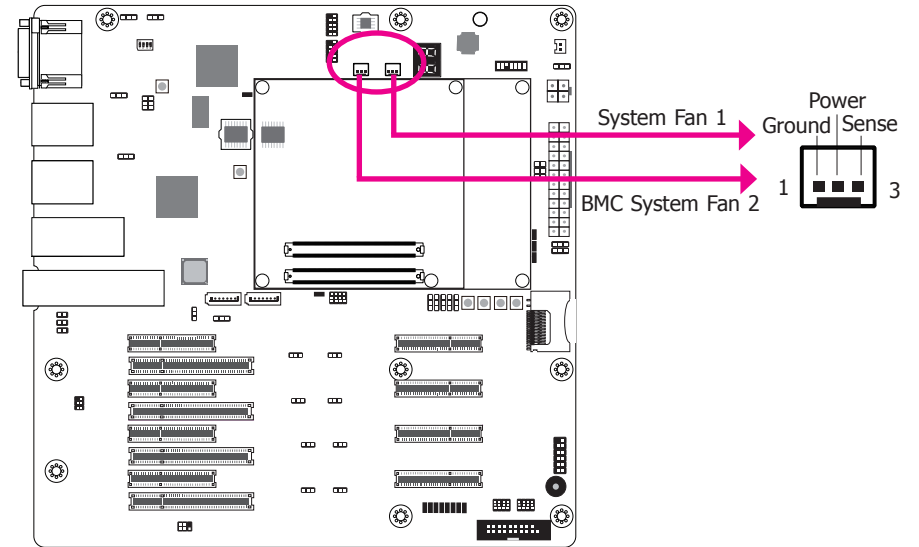
Pin	Assignment	Pin	Assignment
1	GND	2	+12V
3	DIO7 (GPO3)	4	+12V
5	DIO6 (GPO2)	6	GND
7	DIO5 (GPO1)	8	+3.3V
9	DIO4 (GPO0)	10	+3.3V
11	DIO3 (GPI3)	12	GND
13	DIO2 (GPI2)	14	+5V_Standby
15	DIO1 (GPI1)	16	+5V_Standby
17	DIO0 (GPI0)	18	GND
19	GND		

## SATA (Serial ATA) Connectors

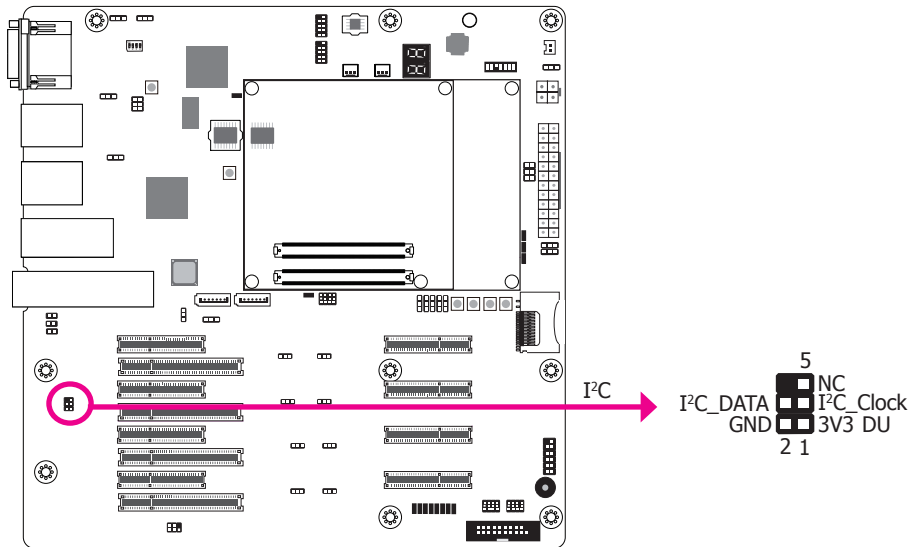


The Serial ATA connectors are used to connect Serial ATA devices. Connect one end of the Serial ATA cable to a SATA connector and the other end to your Serial ATA device.

## Cooling Fan Connectors

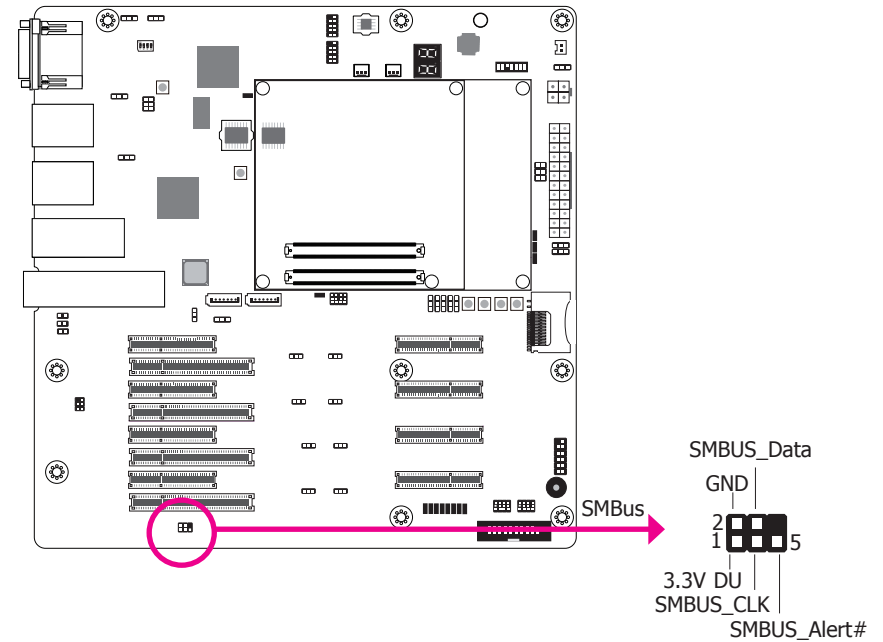


The fan connectors are used to connect cooling fans. The cooling fans will provide adequate airflow throughout the chassis to prevent overheating the CPU and system board components.

I<sup>2</sup>C Header

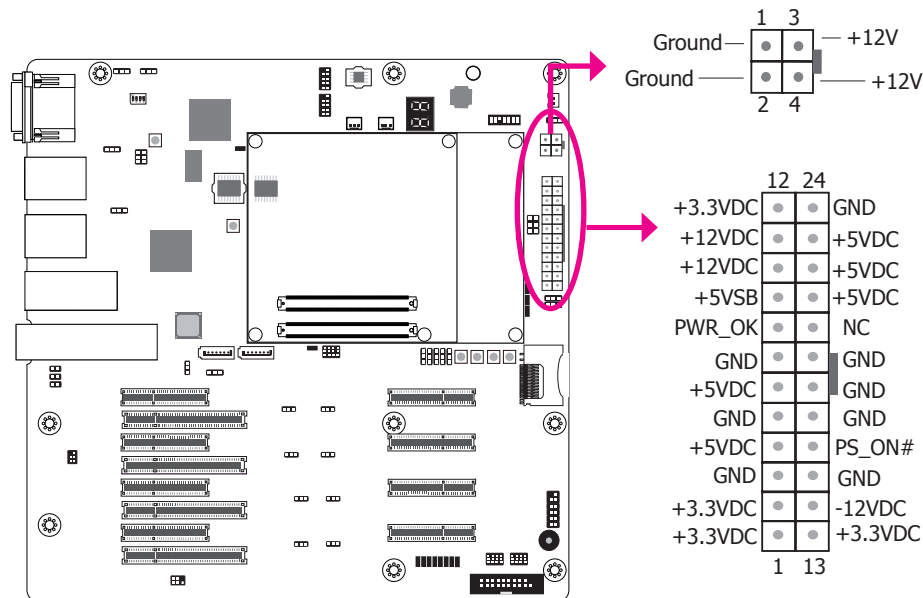
The 1-channel I<sup>2</sup>C bus interface conforms to the version 2.1 I<sup>2</sup>C bus specification. It operates as a master or slave device and supports a multi-master bus.

## SMBus Header



The SMBus (System Management Bus) connector is used to connect the SMBus device. It is a multiple device bus that allows multiple chips to connect to the same bus and enable each one to act as a master by initiating data transfer.

## Power Connectors



Use a power supply that complies with the ATX12V Power Supply Design Guide Version 1.1. An ATX12V power supply unit has a standard 24-pin ATX main power connector that must be inserted into the 24-pin connector. The 4-pin +12V power connector enables the delivery of more +12VDC current to the COM express module board and carrier board's PCIe device.

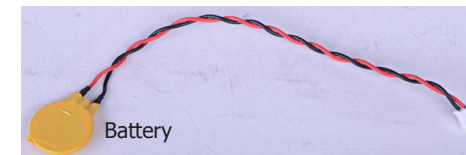
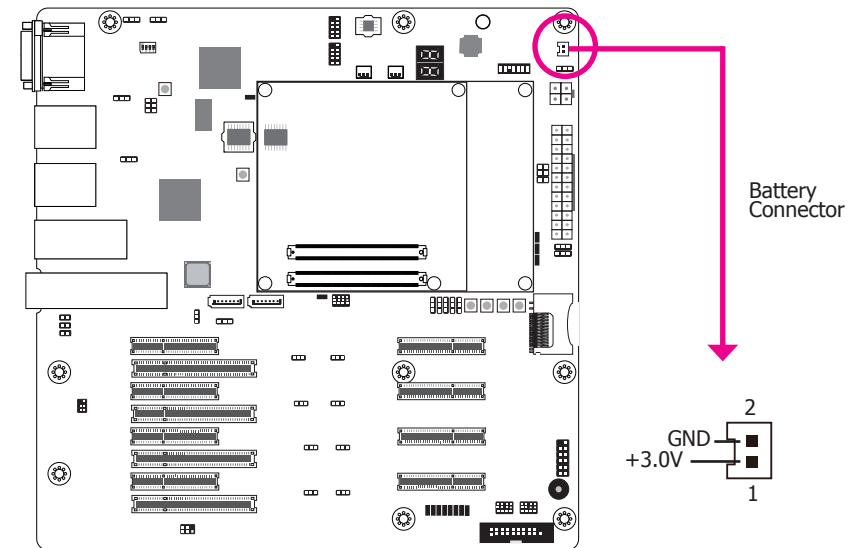
The power connectors from the power supply unit are designed to fit the 24-pin and 4-pin connectors in only one orientation. Make sure to find the proper orientation before plugging the connectors.



### Important:

The system board consumes a minimal amount of power. Due to its low power consumption, you only need a 120W to 150W power supply. Every power supply has its minimum load of power. If you use a greater than 150W power supply, the power consumed by the system board may not attain its minimum load causing instability to the entire system.

## Battery



Connect to the battery connector

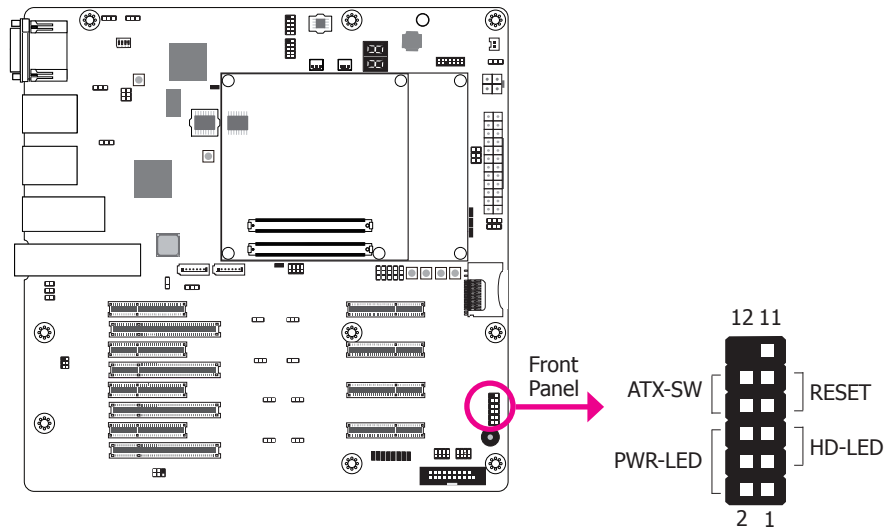
The lithium ion battery (CR2032 coin cell) powers the real-time clock and CMOS memory. It is an auxiliary source of power when the main power is shut off.

### Safety Measures

- Danger of explosion if battery incorrectly replaced.
- Replace only with the same or equivalent type recommended by the manufacturer.
- Dispose of used batteries according to local ordinance.



## Front Panel Connector



	Pin	Pin Assignment		Pin	Pin Assignment
	1	N.C.	PWR-LED	2	LED Power
HD-LED	3	HDD Power		4	LED Power
	5	Signal		6	Signal
RESET	7	Ground	ATX-SW	8	Ground
	9	RST Signal		10	Signal
	11	N.C.			

### HD-LED - Hard Drive LED

This LED will light when the hard drive is being accessed.

### RESET - Reset Switch

This switch allows you to reboot without having to power off the system.

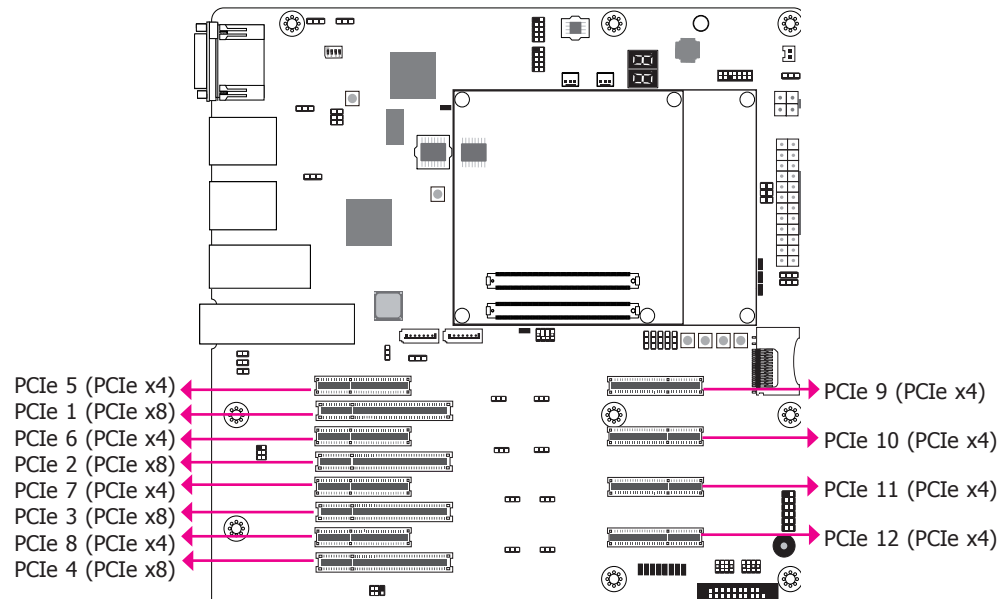
### PWR-LED - Power LED

When the system's power is on, this LED will light.

### ATX-SW - ATX Power Switch

This switch is used to power on or off the system.

## Expansion Slots



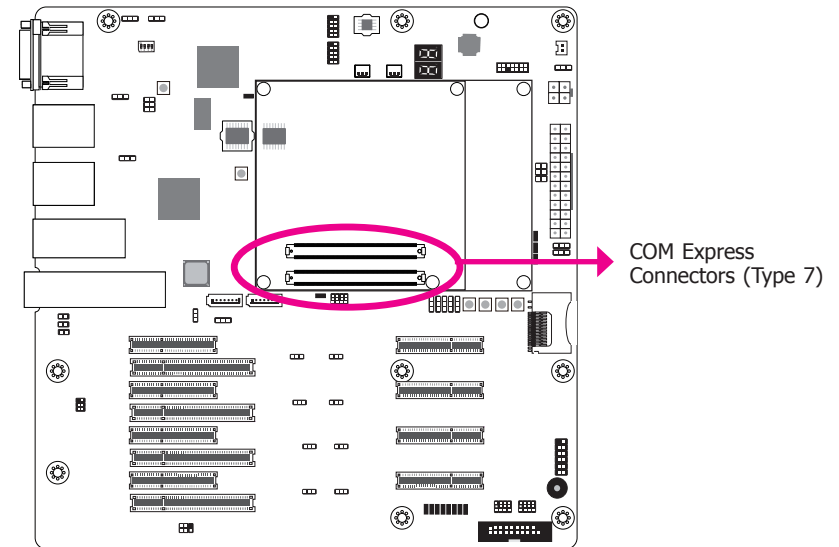
### PCI Express x4 Slot

Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x4 slot.

### PCI Express x8 Slot

Install PCI Express cards such as network cards or other cards that comply to the PCI Express specifications into the PCI Express x8 slot.

## COM Express Connectors



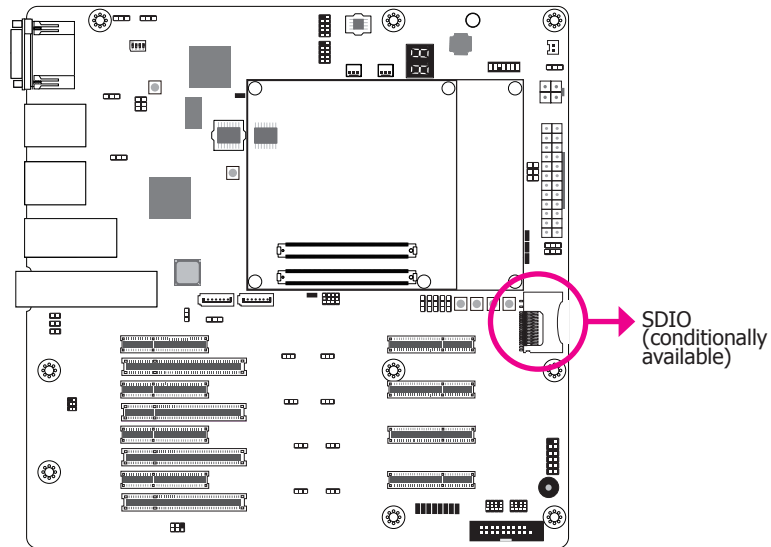
The COM Express connectors are used to interface the carrier board with a COM Express board. Refer to the following pages for the pin functions of these connectors.

Pin	Row A	Row B	Row C	Row D
1	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
2	GBE0_MDI3-	GBE0_ACT#	GND	GND
3	GBE0_MDI3+	LPC_FRAME#/ESPI_CS0#	USB_SSRX0-	USB_SSTX0-
4	GBE0_LINK100#	LPC_AD0/ESPI_IO_0	USB_SSRX0+	USB_SSTX0+
5	GBE0_LINK1000#	LPC_AD1/ESPI_IO_1	GND	GND
6	GBE0_MDI2-	LPC_AD2/ESPI_IO_2	USB_SSRX1-	USB_SSTX1-
7	GBE0_MDI2+	LPC_AD3/ESPI_IO_3	USB_SSRX1+	USB_SSTX1+
8	GBE0_LINK#	LPC_DRQ0#/ESPI_ALERT0#	GND	GND
9	GBE0_MDI1-	LPC_DRQ1#/ESPI_ALERT1#	USB_SSRX2-	USB_SSTX2-
10	GBE0_MDI1+	LPC_CLK/ESPI_CK	USB_SSRX2+	USB_SSTX2+
11	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
12	GBE0_MDI0-	PWRBTN#	USB_SSRX3-	USB_SSTX3-
13	GBE0_MDI0+	SMB_CK	USB_SSRX3+	USB_SSTX3+
14	GBE0_CTREF	SMB_DAT	GND	GND
15	SUS_S3#	SMB_ALERT#	10G_PHY_MDC_SCL3	10G_PHY_MDIO_SDA3
16	SATA0_TX+	SATA1_TX+	10G_PHY_MDC_SCL2	10G_PHY_MDIO_SDA2
17	SATA0_TX-	SATA1_TX-	10G_SDP2	10G_SDP3
18	SUS_S4#	SUS_STAT#/ESPI_RESET#	GND	GND
19	SATA0_RX+	SATA1_RX+	PCIE_RX6+	PCIE_TX6+
20	SATA0_RX-	SATA1_RX-	PCIE_RX6-	PCIE_TX6-
21	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
22	PCIE_TX15+	PCIE_RX15+	PCIE_RX7+	PCIE_TX7+
23	PCIE_TX15-	PCIE_RX15-	PCIE_RX7-	PCIE_TX7-
24	SUS_S5#	PWR_OK	10G_INT2	10G_INT3
25	PCIE_TX14+	PCIE_RX14+	GND	GND
26	PCIE_TX14-	PCIE_RX14-	10G_KR_RX3+	10G_KR_TX3+
27	BATLOW#	WDT	10G_KR_RX3-	10G_KR_TX3-
28	(S)ATA_ACT#	RSVD	GND	GND
29	RSVD	RSVD	10G_KR_RX2+	10G_KR_TX2+
30	RSVD	RSVD	10G_KR_RX2-	10G_KR_TX2-
31	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
32	RSVD	SPKR	10G_SFP_SDA3	10G_SFP_SCL3
33	RSVD	I2C_CK	10G_SFP_SDA2	10G_SFP_SCL2
34	BIOS_DIS0#/ESPI_SAFS	I2C_DAT	10G_PHY_RST_23	10G_PHY_CAP_23
35	THRMTRIP#	THRM#	10G_PHY_RST_01	10G_PHY_CAP_01
36	PCIE_TX13+	PCIE_RX13+	10G_LED_SDA	RSVD
37	PCIE_TX13-	PCIE_RX13-	10G_LED_SCL	RSVD
38	GND	GND	10G_SFP_SDA1	10G_SFP_SCL1
39	PCIE_TX12+	PCIE_RX12+	10G_SFP_SDA0	10G_SFP_SCL0
40	PCIE_TX12-	PCIE_RX12-	10G_SDP0	10G_SDP1
41	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
42	USB2-	USB3-	10G_KR_RX1+	10G_KR_TX1+
43	USB2+	USB3+	10G_KR_RX1-	10G_KR_TX1-
44	USB_2_3_OC#	USB_0_1_OC#	GND	GND
45	USB0-	USB1-	10G_PHY_MDC_SCL1	10G_PHY_MDIO_SDA1

Pin	Row A	Row B	Row C	Row D
46	USB0+	USB1+	10G_PHY_MDC_SCL0	10G_PHY_MDIO_SDA0
47	VCC_RTC	ESPI_EN#	10G_INT0	10G_INT1
48	RSVD	USB0_HOST_PRSENT	GND	GND
49	GBE0_SDP	SYS_RESET#	10G_KR_RX0+	10G_KR_TX0+
50	LPC_SERIRQ/ESPI_CS1#	CB_RESET#	10G_KR_RX0-	10G_KR_TX0-
51	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
52	PCIE_TX5+	PCIE_RX5+	PCIE_RX16+	PCIE_TX16+
53	PCIE_TX5-	PCIE_RX5-	PCIE_RX16-	PCIE_TX16-
54	GPI0/SD_DATA0 (opt.)	GPO1/SD_CMD (opt.)	TYPE0#	RSVD
55	PCIE_TX4+	PCIE_RX4+	PCIE_RX17+	PCIE_TX17+
56	PCIE_TX4-	PCIE_RX4-	PCIE_RX17-	PCIE_TX17-
57	GND	GPO2/SD_WP (opt.)	TYPE1#	TYPE2#
58	PCIE_TX3+	PCIE_RX3+	PCIE_RX18+	PCIE_TX18+
59	PCIE_TX3-	PCIE_RX3-	PCIE_RX18-	PCIE_TX18-
60	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
61	PCIE_TX2+	PCIE_RX2+	PCIE_RX19+	PCIE_TX19+
62	PCIE_TX2-	PCIE_RX2-	PCIE_RX19-	PCIE_TX19-
63	GPI1/SD_DATA1 (opt.)	GPO3/SD_CD# (opt.)	RSVD	RSVD
64	PCIE_TX1+	PCIE_RX1+	RSVD	RSVD
65	PCIE_TX1-	PCIE_RX1-	PCIE_RX20+	PCIE_TX20+
66	GND	WAKE0#	PCIE_RX20-	PCIE_TX20-
67	GPI2/SD_DATA2 (opt.)	WAKE1#	RAPID_SHUTDOWN	GND
68	PCIE_TX0+	PCIE_RX0+	PCIE_RX21+	PCIE_TX21+
69	PCIE_TX0-	PCIE_RX0-	PCIE_RX21-	PCIE_TX21-
70	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
71	PCIE_TX8+	PCIE_RX8+	PCIE_RX22+	PCIE_TX22+
72	PCIE_TX8-	PCIE_RX8-	PCIE_RX22-	PCIE_TX22-
73	GND	GND	GND	GND
74	PCIE_TX9+	PCIE_RX9+	PCIE_RX23+	PCIE_TX23+
75	PCIE_TX9-	PCIE_RX9-	PCIE_RX23-	PCIE_TX23-
76	GND	GND	GND	GND
77	PCIE_TX10+	PCIE_RX10+	RSVD	RSVD
78	PCIE_TX10-	PCIE_RX10-	PCIE_RX24+	PCIE_TX24+
79	GND	GND	PCIE_RX24-	PCIE_TX24-
80	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
81	PCIE_TX11+	PCIE_RX11+	PCIE_RX25+	PCIE_TX25+
82	PCIE_TX11-	PCIE_RX11-	PCIE_RX25-	PCIE_TX25-
83	GND	GND	RSVD	RSVD
84	NCSI_TX_EN	VCC_5V_SBY	GND	GND
85	GPI3/SD_DATA3 (opt.)	VCC_5V_SBY	PCIE_RX26+	PCIE_TX26+
86	RSVD	VCC_5V_SBY	PCIE_RX26-	PCIE_TX26-
87	RSVD	VCC_5V_SBY	GND	GND
88	PCIE_CK_REF+	BIOS_DIS1#	PCIE_RX27+	PCIE_TX27+
89	PCIE_CK_REF-	NCSI_RX_ER	PCIE_RX27-	PCIE_TX27-
90	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)

Pin	Row A	Row B	Row C	Row D
91	SPI_POWER	NCSI_CLK_IN	PCIE_RX28+	PCIE_TX28+
92	SPI_MISO	NCSI_RXD1	PCIE_RX28-	PCIE_TX28-
93	GPO0/SD_CLK (opt.)	NCSI_RXD0	GND	GND
94	SPI_CLK	NCSI_CRS_DV	PCIE_RX29+	PCIE_TX29+
95	SPI_MOSI	NCSI_TXD1	PCIE_RX29-	PCIE_TX29-
96	TPM_PP	NCSI_TXD0	GND	GND
97	TYPE10#	SPI_CS#	RSVD	RSVD
98	SER0_TX	NCSI_ARB_IN	PCIE_RX30+	PCIE_TX30+
99	SER0_RX	NCSI_ARB_OUT	PCIE_RX30-	PCIE_TX30-
100	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)
101	CAN0/SER1_TX	FAN_PWMOUT	PCIE_RX31+	PCIE_TX31+
102	CAN0/SER1_RX	FAN_TACHIN	PCIE_RX31-	PCIE_TX31-
103	LID#	SLEEP#	GND	GND
104	VCC_12V	VCC_12V	VCC_12V	VCC_12V
105	VCC_12V	VCC_12V	VCC_12V	VCC_12V
106	VCC_12V	VCC_12V	VCC_12V	VCC_12V
107	VCC_12V	VCC_12V	VCC_12V	VCC_12V
108	VCC_12V	VCC_12V	VCC_12V	VCC_12V
109	VCC_12V	VCC_12V	VCC_12V	VCC_12V
110	GND (FIXED)	GND (FIXED)	GND (FIXED)	GND (FIXED)

## SDIO (Conditionally Available)



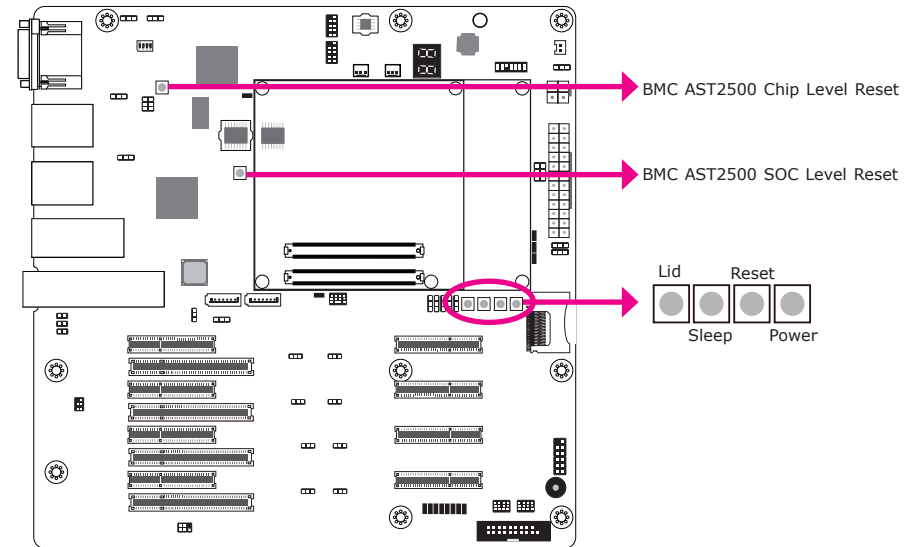
This expansion port is used to insert a Secure Digital Input/Output (SDIO) or Multimedia Card (MMC) device. Aside from storing data files, an SDIO card is also capable of storing powerful software applications.



### Note:

The SDIO function's availability depends on if the module board supports it.

## Switches

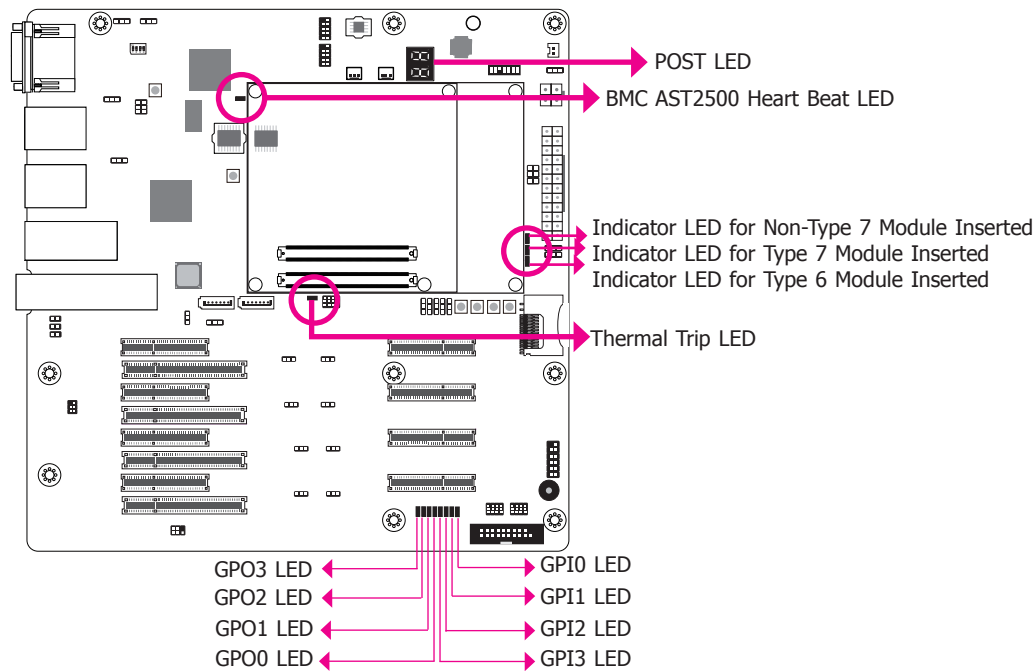


### Note:

The Sleep and Lid functions depend on module board and are supported only when your operating system supports ACPI.

- Lid: It is used to turn the LVDS on or off.
- Sleep: It is used to set the system to "sleep" or "wake-up" mode.

## LEDs



Thermal Trip LED will light to indicate that the processor is on an overheating status.

BMC AST2500 Heart Beat LED indicates if the BMC SPI flash is programmed. The hardware mode includes below blinking modes:

<b>0Hz</b>	Always dark means firmware is not running or dead
<b>0.1Hz</b>	Abnormal mode, some interrupts are not serviced for over 2 seconds.
<b>0.5Hz</b>	Normal operation mode, ARM running on DRAM with interrupt monitor enabled
<b>2Hz</b>	ARM running on DRAM without interrupt enabled (instruction fetch from DRAM)
<b>10Hz</b>	ARM running on Flash (instruction fetch from flash)

## Inphi Configure Pin-Plug

