

**PBPE-13A8**  
**Active Backplane**

**User's Manual**  
**Rev 1.1**



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# PBPE-13A8 8 PCI / 3 PCI Express x 1/ 1 PCI Express x 16 / PICMG 1.3 Backplane

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**T**he PBPE-13A8 backplane is fully PICMG 1.3 compliant. It is new family for PICMG 1.3 SHB and is intended to support all PICMG compliant boards on the market.

## Introduction

Traditional PC is outstanding with the all-in-one facility, in which processor seat, chipset, memory sockets, ISA/PCI slots, device and power connectors are accommodated over a single PCB. This would absolutely draw the limitation line on multiple peripheral cards adoption as well as the timing needed for board replacement in the event of system failure. The new generation industrial PC has made a new platform with a combination of two parts – SBC and backplane.

Different from traditional motherboards, industrial PC features on easily removable SBC as the working board that has PICMG or ISA form factor so that users may easily apply or remove the SBC from the system. Reducing the system down time is obviously visible. Backplane is hence designed with PICMG slots to hold the SBC as a system. PBPE13A8 backplanes not only have PCI slots to hold PCI peripheral cards. This design include PCI Express interface to provide far more PCI slots than traditional motherboard could ever holds (One PCI-E x16 and three PCIE x1 slots) to meet the requirement of current technology and market demands, especially in CTI market.

As a matter of fact, with the needs from industrial PC users moving on, applications with SBC and backplane have been fully required and are currently leading the industrial PC market.

## Design philosophy

Portwell backplane is designed to meet customer's demand. Better power distribution, thick PCB with more ruggedness, and user-friendly designed are the key design routes. We hold the remind to produce backplane of trustable quality throughout the design phases, and this is how Portwell backplane is made and presented.

In order to keep good power filtering and avoid fire explosion, Electrolytic capacitor and Ceramic capacitor are used to replace traditional Tantalum capacitor. All Portwell backplane models have 4 layers with separate power layer and ground layer to reduce power noise. Assorted connectors, including keyboard connectors and power connectors, are provided for easy installation and expansion. All backplanes models are made to meet industrial grade environment requirement (temperature, humidity, etc.).

As a matter of fact, with the needs from industrial PC users moving on, applications with SHB and backplane have been fully required and are currently leading the industry market.

## Product features

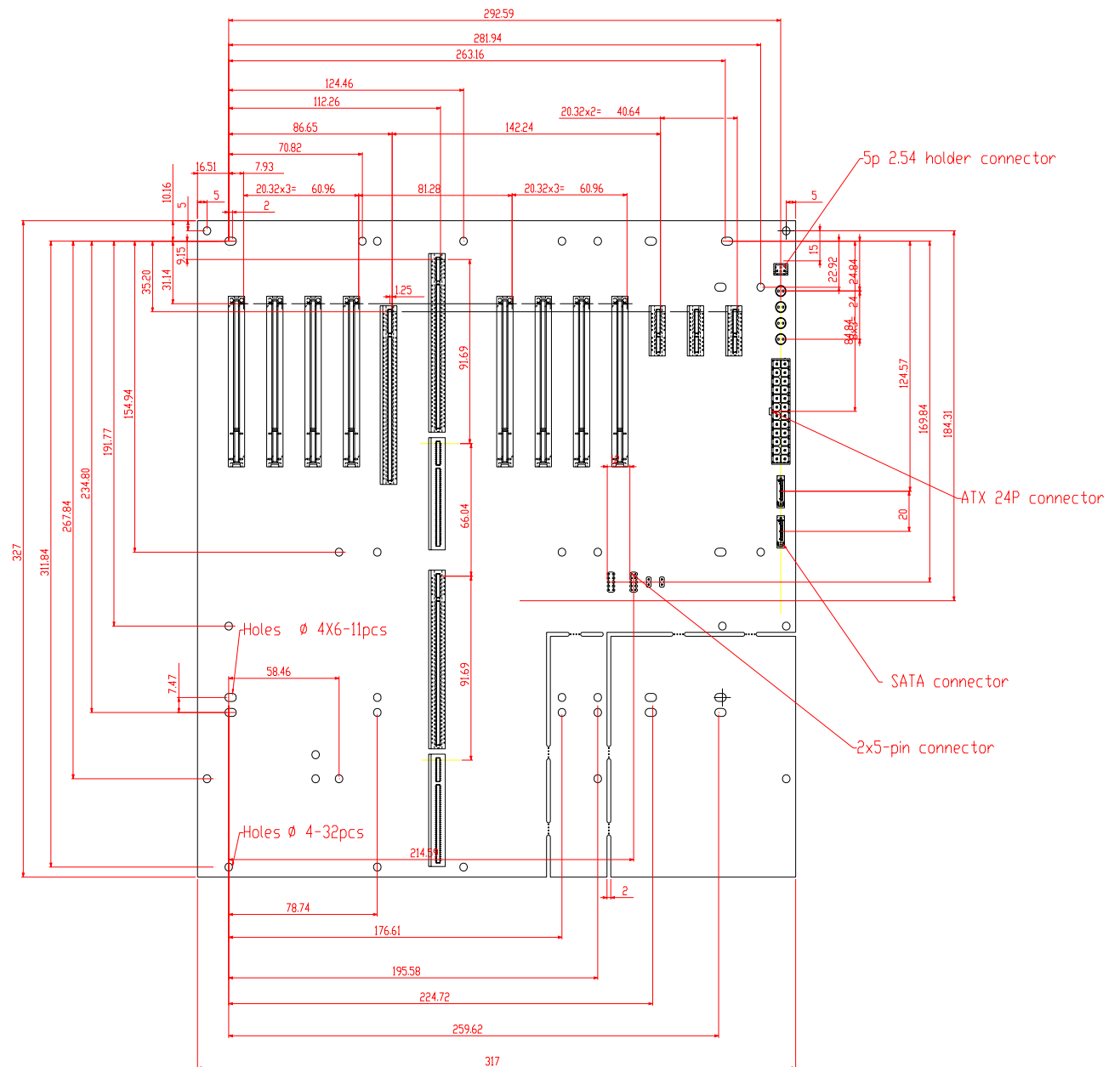
<b>Connector</b>	One PICMG 1.3 slot for the System Host Board
	Three PCI Express x1 slots
	One PCI Express x16 slot
	Eight 5V /3.3V 32-bit PCI slots
	One ATX standard power connector: 24 pins that include +5V, -5V, +12V, -12V, +3.3V, +5VSB voltages, Ground, and Power Good signal.
<b>PCB</b>	The Printed Circuit Board's (PCB) overall dimensions are 317mm x 327mm and total thickness is 1.6mm.
	Thirty-seven mounting holes are provided. Mounting holes are connected to Signal Ground internally.
	Operating Temperature : 0 to 55 degree C (32 to 140 degree F)
	Storage Temperature : -20 to 75 degree C (-4 to 185 degree F)
	Humidity : 5% to 95%, non-condensing
<b>Standard</b>	EMI/Safety : Meets FCC and CE Class A, and UL/CSA/TUV
	PCI Express card electromechanical specification rev 1.0a
	PCI standard, PICMG 1.3 standard

## Routing Table

PCI1~PCI4 SHB PCI routing table				
Interrupt Pin on SHB	PCI4(AD31)	PCI3 (AD30)	PCI2 (AD29)	PCI1 (AD28)
INTA#	INTD#(B8)	INTC#(A7)	INTB#(B7)	INTA#(A6)
INTB#	INTA#(A6)	INTD#(B8)	INTC#(A7)	INTB#(B7)
INTC#	INTB#(B7)	INTA#(A6)	INTD#(B8)	INTC#(A7)
INTD#	INTC#(A7)	INTB#(B7)	INTA#(A6)	INTD#(B8)

PCI5~PCI8 SHB PCI routing table				
Interrupt Pin on Bridge	PCI5(AD24)	PCI6 (AD25)	PCI7 (AD26)	PCI8 (AD27)
INTA#	INTA#(A6)	INTD#(B8)	INTC#(A7)	INTB#(B7)
INTB#	INTB#(B7)	INTA#(A6)	INTD#(B8)	INTC#(A7)
INTC#	INTC#(A7)	INTB#(B7)	INTA#(A6)	INTD#(B8)
INTD#	INTD#(A8)	INTC#(A7)	INTB#(B7)	INTA#(A6)

## Mechanical drawing



## Jumpers setting

JP1,JP2: PCIE1 Link Configuration		
JP1 (CFG0)	JP2 (CFG1)	PCIE1
Pin 2-3 shot	Don't care	X16 (Default)
Pin 1-2 shot	Pin 2-3 shot	X8
	Pin 1-2 shot	X4

JP1: PCI1~PCI4 66MHz Support	
On	33MHz
Off	66MHz

JP2: PCI Slot VIO	
1-2	+3.3V
2-3	5V

JP5: PCI5~PCI8 66MHz Support	
On	33MHz
Off	66MHz

## Pin Assignment

ATX (CN4)			
Pin No.	Signal Description	Pin No.	Signal Description
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-OK	20	-5V
9	5V SB	21	+5V
10	+12V	22	+5V
11	+12V	23	+5V
12	3.3V	24	GND

USB1 & USB2 Pin Description			
PIN No.	Signal Description	PIN No.	Signal Description
1	+5V	2	Ground
3	USBDATA0-	4	Ground
5	USBDATA0+	6	USBDATA1+
7	Ground	8	USBDATA1-
9	Ground	10	+5V

J2 (Reserve for Internal use)	
Pin 1	IPMB_CL
Pin2	GND
Pin 3	IPMB_DA

## Simple Installation guide for Troubleshooting

### SHB

Apply only one SHB over PICMG slot as Fig. 1 shown.

### Power Supply

Please plug the 24 pin ATX power connector on CN4 of Backplane as Fig. 2 shown.



Fig. 1

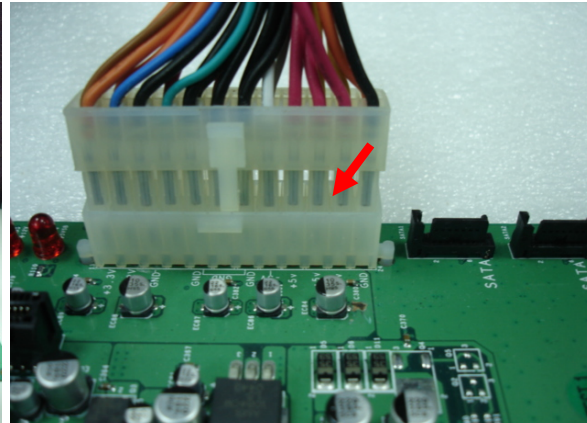


Fig. 2

### Chassis

Make sure the standoffs are placed below all the mounting holes of Backplane.

### PCI-E TO PCI Bridge Concept

The PCI-E to PCI Bridge is a transparent device. It requires no special driver to run a system. It has one PCI-E to transparent four PCI bus (PCI 5-8). It not only provides capability for additional slots but also isolates bus traffic as Fig. 3 shown.

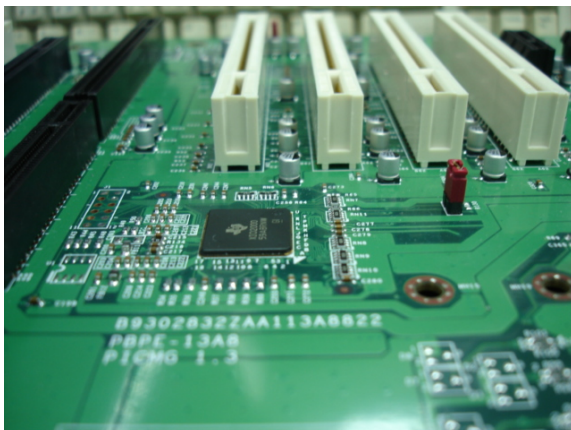


Fig. 3

## Jumpers

**JP3** and **JP4** configure the PCIE 1 Link configuration (x4, x8 and x16) as Fig. 4 shown. By default, the factory setting as this is the standard link configuration (x16) as Fig. 5 shown.

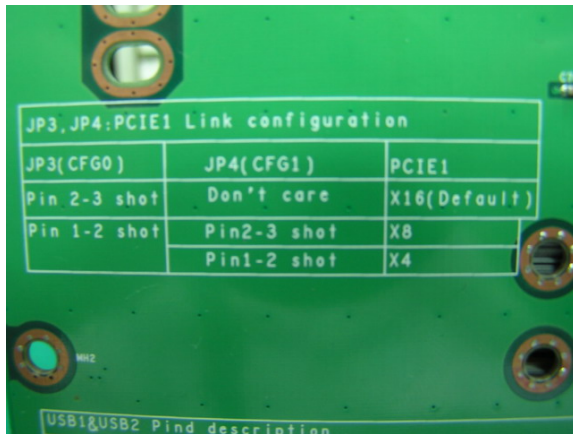


Fig. 4

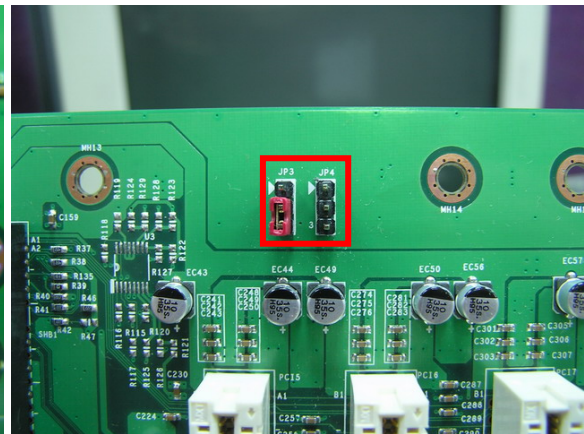


Fig. 5

**JP2** configures the PCI slot working voltage (5V or 3.3V) as Fig. 6 shown. By default, the factory setting as this is the standard working voltage (5V) as Fig. 7 shown.

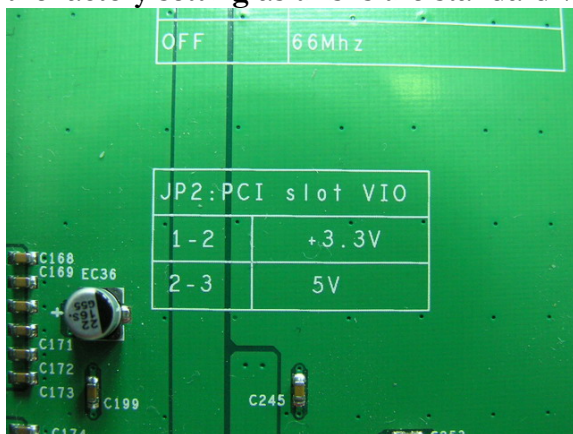


Fig.6

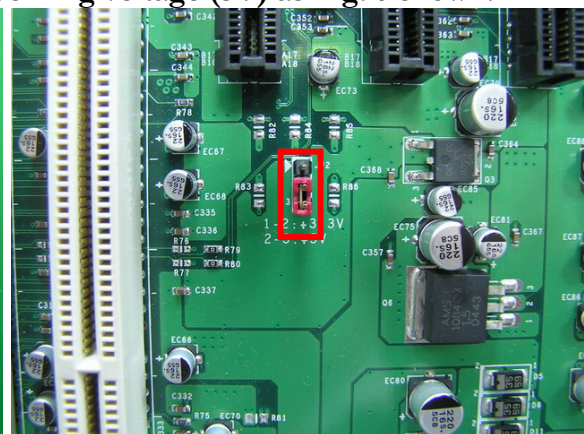


Fig.7



**JP1** configures the SPCI 1-4 slots working frequency (33MHz or 66MHz, Fig. 8). By default, the factory setting as this is the standard working frequency (33MHz) as Fig. 9 shown.

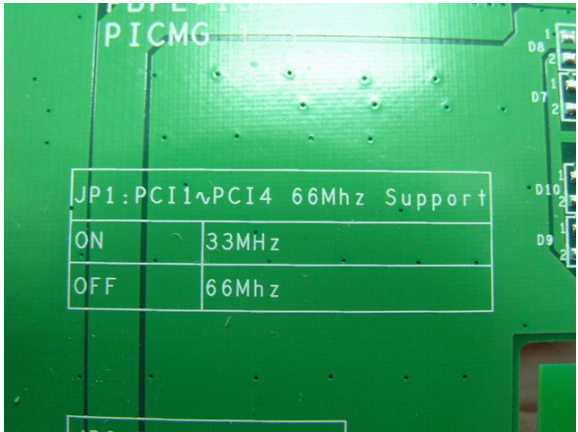


Fig. 8

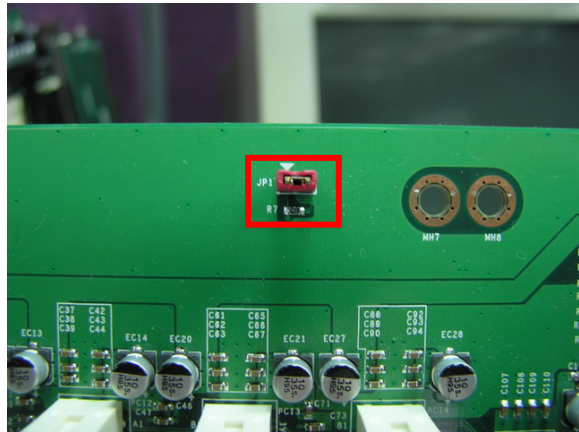


Fig. 9

**JP5** configures the PCI 5-8 slots working frequency (33MHz or 66MHz) as Fig. 10 shown. By default, the factory setting is the standard working frequency is 33MHz as Fig. 11 shown.

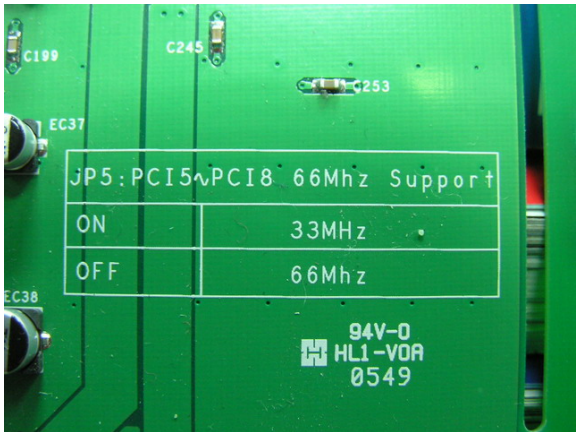


Fig. 10

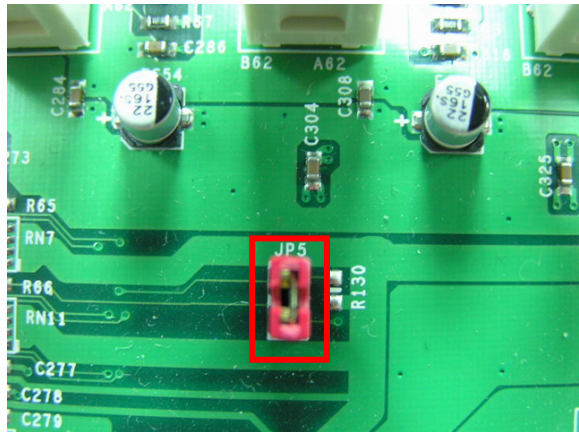


Fig. 11

## How to Power up the system

Connect Power Switch on **CN2** connector of PBPE-13A8 for system power on as Fig. 12 shown. Generally, the Power Switch is located on the front panel of chassis.

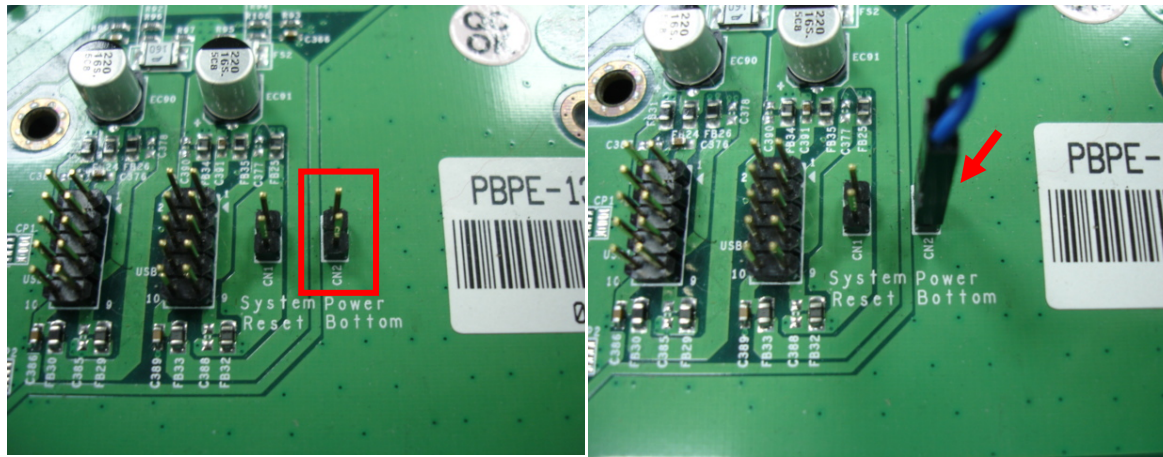


Fig. 12

## LED Indicate

LED 1-4 indicate the voltage status of Power supply. They are +3.3V, +5V, +12V, and +5VSB voltage separately as Fig. 13 shown. LED4 (+5VSB) will light up automatically when 24-pin ATX power connector is plugged on Backplane.

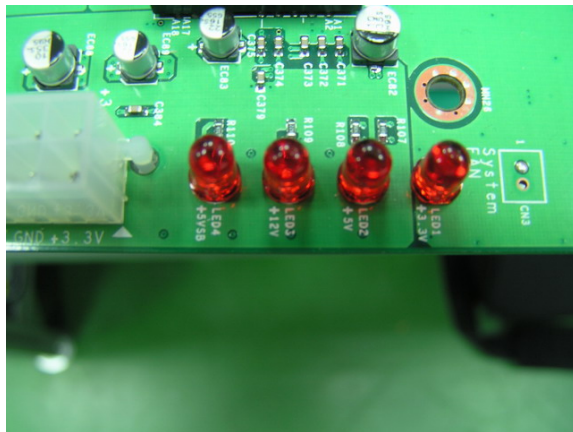


Fig. 13

## Notes:

The PBPE-13A8 Backplane is only able to apply on PICMG 1.3 SHB architecture (ROBO-8910VG2A and ROBO-8911VG2A). But the connectors of PCI Express x16, PCIE1, SATA1 and SATA2 aren't able to support with ROBO-8910VG2A.