

SHB Express™

PICMG 1.3 Solution Guide

Adopt PCI Express to increase the throughput



About PICMG 1.3

PICMG 1.3 (SHB Express™) Overview

As a solution, PICMG organization started development of new standard in last year that adopts PCI Express as external expansion.

- PICMG 1.3, so called "SHB Express" takes component side as ISA card that means it is the same as PICMG 1.0. Such setting makes signal routing among processor, memory controller hub and memory is more smoothly and it can leverage chassis design for PICMG 1.0.
- Same as PICMG 1.2 (ePCI-X), SHB Express defined both full-size and half-size SHB.
- Slot for full-size SHB is combination of dual PCI Express x16 (Connector A & C) and dual PCI Express x8 slots (Connector B & D); one PCI Express x16 (Connector A) and one PCI Express x8 (Connector B) for half-size SHB. Therefore, this new standard does not compatible with either PICMG 1.0 or 1.2.
- Electrical Function of edge connectors:
 - Connect A & B: PCI Express Link; configuration could be one x16 or two x8 or one x8 and two x4 or four x4
 - Connect C & B: Additional power and I/O
 - Connect D: One 32-bit PCI(-X) bus
- More +12V power input pins are defined in PICMG 1.3 because new Intel Pentium 4 processor consumes more than 100W and the efficiency is lower for utilized +5V transformation. By the way, 20A up current leads transformation circuit generating more heat; therefore, life-time of the SHB will decrease accordingly.
- Insertion loss of serial type signals are also limited in the specification due to the edge connectors is break point of impedance, therefore, serial type signal has reflection and attenuation issues.
- Miscellaneous I/O ports such as USB, SATA and Gigabit Ethernet can be routed to backplane that features more reliable signal quality and minimum length of cables.
- IPMB (Intelligent Platform Management Bus) and SMBus are also reserved for connection of system management possibility

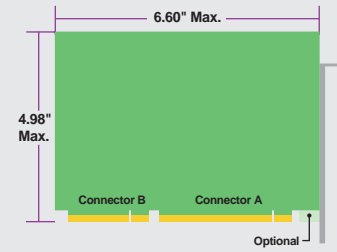


Figure 5: Dimension drawing of half-size SHB

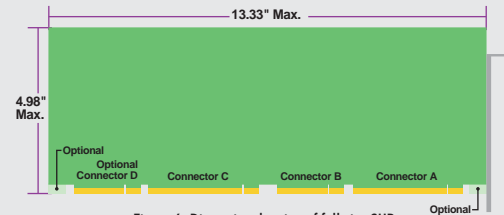


Figure 6: Dimension drawing of full-size SHB

Table: PCIe Link Configurations

Configuration	A0 (x16)				Ref Clks for all Ports (up to 8 Clks)	A0 (x4)			
	A2 (x8)		A0 (x8)			B3 (x1)	B2 (x1)	B1 (x1)	B0 (x1)
	A3 (x4)	A2 (x4)	A1 (x4)	A0 (x4)					
c1	x16				(Ref Clks)	x4			
c2	second x8		first x8		(Ref Clks)	x4			
c3	third x4	second x4	x8		(Ref Clks)	first x4			
c4	fifth x4	fourth x4	third x4	second x4	(Ref Clks)	first x4			

A backplane should plumb the PCIe in the following order to maximize interoperability:

c5	8th	7th	6th	5th	4th	3rd	2nd	1st
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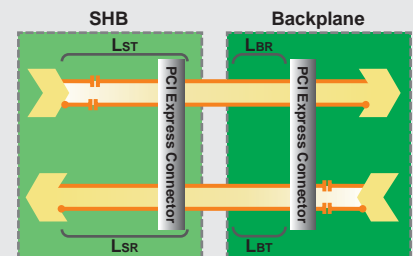
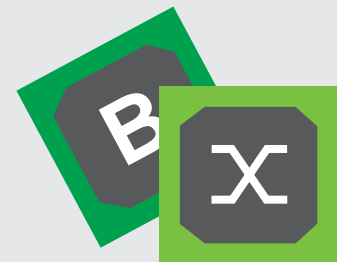


Figure 8: PCIe Insertion loss

Backplane Features

Off course, higher I/O bandwidth is introduced by this new form factor. Take, for example, applications like flight simulation, gaming, medical are need high performance graphics engine. In past, both PICMG 1.0 & 1.2 are not support AGP port on backplane. So, the only solution is having the graphics controller on-board. However, space and thermal constrain the power of graphics engine. For these applications, PICMG 1.3 is the solution that allows system to include latest and mighty graphics add-in card with PCI Express x16 interface.

PCI Express x16 graphics card utilization is just one merit of SHB Express standard. More than that, versatile backplane could fulfill your special requirement immediately. With native expansion interfaces that support by SHB, switch or bridge can be design-in to have more PCI Express slots or different kind of expansion bus such as PCI-X and PCI.



PICMG 1.3 SHB

ROBO-8920VG2



FEATURES

- Extreme computing power with two 2.0GHz dual-core Intel® Xeon® processor LV that only generates 35W TDP each
- Up to 8GB, ECC registered memory assured the computer reliability and benefited the data swapping process
- Maximum I/O throughput via three PCI Express x4, one PCI Express x8 and four PCI external devices
- On-board PCI Express x4 interface server grade dual-port Gigabit Ethernet controller for data streaming and security application
- Relative high performance graphic engine, AMD RADEON 7000 provides solid 2D/3D video acceleration among server market

ROBO-8913VG2AR



FEATURES

- Intel® latest chipset support 1,333MHz FSB Core™ 2 Duo processor
- Four PCI Express x1 links configurable as one PCI Express x4 link, meets most requirements together with one PCI Express x16 & four PCI devices external expansion
- Equipped Intel® Matrix Storage Technology that protects data with configurable RAID levels or combination of two RAID levels to have better efficiency
- One eSATA port allowed external one SATA device or more SATA devices attachment via multiplier


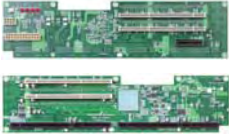













ROBO-8912VG2AR


















FEATURES

- Support Intel® Core™ 2 Duo processor up to 1,066MHz FSB that generates only 65W TDP
- Integrated Intel® GMA 3000 graphics engine that improved 3D multimedia capabilities including DirectX9, Shader Model 3.0, OpenGL 1.5, Advanced De-interlacing & MPEG-2 hardware acceleration
- Four PCI Express x1 links configurable as one PCI Express x4 link, meets most requirements together with one PCI Express x16 & four PCI devices external expansion
- Dual PCI Express x1 interface Intel® Gigabit Ethernet controllers for high efficiency throughput and data streaming
- Equipped Intel® Matrix Storage Technology that protects data with configurable RAID levels or combination of two RAID levels to have better efficiency

PICMG 1.3 Backplane

PBPE-06V 	Vertical 6-Slot [PCI-Ex1 (4), PCI-Ex16 (1)] <ul style="list-style-type: none"> - Fit for 2U chassis - Four USB ports - Dual SATA ports - 24-pin ESP12V power connector - Dimension: 331.94(L) x 84(W)mm
PBPE-06V464 	Vertical 6-Slot [PCI-Ex4 (1), PCI-X (4)] <ul style="list-style-type: none"> - Fit for 2U chassis - Dedicated to ROBO-8920VG2 - Dual PCI-X buses support four PCI-X slots - Dimension: 331.94(L) x 84(W)mm
PBPE-19AG64 	19-Slot [PCI-Ex8 (1), PCI-Ex4 (1), PCI-X (16)] <ul style="list-style-type: none"> - Fit for 4U up chassis - Dedicated to ROBO-8920VG2 - Four PCI-X buses support 16 PCI-X expansion slots - Dimension: 416.56(L) x 302.26(W)mm
PBPE-13A8 	13-Slot [PCI-Ex1 (3), PCI-Ex16 (1), PCI (8)] <ul style="list-style-type: none"> - Fit for 4U chassis - Four USB ports - Dual SATA ports - 24-pin ESP12V power connector - Dimension: 317(L) x 327(W)mm
PBPE-14AD64 	14-Slot [PCI-Ex4 (1), PCI-Ex8 (1), PCI-X (8), PCI (3)] <ul style="list-style-type: none"> - Fit for 4U chassis - Dedicated to ROBO-8920VG2 - Four PCI-X buses support eight PCI-X expansion slot - Dimension: 317(L) x 327(W)mm
PBPE-06P3 	6-Slot [PCI-Ex16 (1), PCI-Ex4 (1), PCI (3)] <ul style="list-style-type: none"> - Fit for Node chassis - Dedicated to ROBO-8912VG2AR - Four USB ports - Dual SATA ports - Dimension: 327(L) x 140.2(W)mm
PBPE-12A9 	12-Slot [PCI-Ex16 (1), PCI-Ex4 (1), PCI (9)] <ul style="list-style-type: none"> - Fit for 4U chassis - Dedicated to ROBO-8912VG2AR - Four USB ports - Dual SATA ports - Dimension: 317(L) x 327(W)mm
PBPE-06P2 	6-Slot [PCI-Ex8 (1, x4 signal), PCI-Ex16 (2, x8 signal), PCI (2)] <ul style="list-style-type: none"> - Fit for Node chassis - Dedicated to ROBO-8920VG2 - Four USB ports - Dimension: 327(L) x 140.2(W)mm
PBPE-06P4 	6-Slot [PCI-Ex8 (1, x4 signal), PCI (4)] <ul style="list-style-type: none"> - Fit for Node chassis - Dedicated to ROBO-8912VG2AR - Four USB ports - Dual SATA ports - Dimension: 327(L) x 140.2(W)mm
PBPE-06A364 	6-Slot [PCI-Ex16 (2, x8 signal), PCI-X (2), PCI (1)] <ul style="list-style-type: none"> - Fit for Node chassis - Dedicated to ROBO-8920VG2 - Four USB ports - Two PCI-X buses support two PCI-X expansion slot - Dimension: 327(L) x 140.2(W)mm
PBPE-05A364 	5-Slot [PCI-Ex16 (1), PCI-X (2), PCI (1)] <ul style="list-style-type: none"> - Fit for Node chassis - Dedicated to ROBO-8912VG2AR - Four USB ports - Dual SATA ports - Two PCI-X buses support two PCI-X expansion slot - Dimension: 327(L) x 140.2(W)mm
PBPE-08P41 	8-Slot [PCI-Ex8 (1, x4 signal), PCI-Ex16 (2, x8 signal), PCI (4)] <ul style="list-style-type: none"> - Fit for Node chassis - Dedicated to ROBO-8920VG2 - Four USB ports - Dimension: 317(L) x 327(W)mm
PBPE-07P4 	7-Slot [PCI-Ex4 (1), PCI-Ex16 (1), PCI (4)] <ul style="list-style-type: none"> - Fit for Node chassis - Dedicated to ROBO-8912VG2AR - Four USB ports - Dual SATA ports - Dimension: 327(L) x 217.96(W)mm
PBPE-12AA64 	12-Slot [PCI-X (8), PCI-Ex16 (1), PCI (2)] <ul style="list-style-type: none"> - Fit for 4U chassis - Dedicated to ROBO-8912VG2AR - Four USB ports - Dual SATA ports - Two PCI-X buses support eight PCI-X expansion slot - Dimension: 317(L) x 327(W)mm
PBPE-06V3 	Vertical 6-Slot [PCI-Ex4 (1), PCI-Ex16 (1), PCI (3)] <ul style="list-style-type: none"> - Fit for 2U chassis - Dedicated to ROBO-8912VG2AR - Four USB ports - Dual SATA ports - Dimension: 331.94(L) x 84(W)mm

PICMG 1.3 Selection Guide

SHB	Backplane	AREMO-4265-D4601NP	AREMO-4196-D4201P	AREMO-2173P-D3501P	AREMO-8164-D3501P	AREMO-6163-D3501P
ROBO-8920VG2	PBPE-19AG64					
	PBPE-14AD64					
	PBPE-06V464					
	PBPE-08P41					
	PBPE-06A364					
	PBPE-06P2					
ROBO-8912VG2AR	PBPE-13A8					
	PBPE-12A9					
	PBPE-12AA64					
ROBO-8913VG2AR	PBPE-06V3					
	PBPE-06V					
	PBPE-07P4					
	PBPE-05A364					
	PBPE-06P4					
	PBPE-06P3					

System Chassis



AREMO-8164

FEATURES

- Two 5.25" drive bays for CD-ROM or mobile rack, easy to install software and mirror disk (RAID 1)
- Two USB ports on the front panel
- One 12cm ball-bearing cooling fan for better ventilation
- One replaceable air filter for easy cleaning

ORDERING GUIDE

- **AREMO-8164-E07P4-8912**
8-slot full-size industrial node chassis for PICMG 1.3 with 350W active PFC power supply, PBPE-07P4 and ROBO-8912VG2AR
- **AREMO-8164-E08P41-8920**
8-slot full-size industrial node chassis for PICMG 1.3 with 350W active PFC ATX power supply, PBPE-08P41 and ROBO-8920VG2



AREMO-6163

FEATURES

- One external 5.25" and two internal 3.5" HDD drive bays
- Two USB ports on the front panel
- One 12cm ball-bearing cooling fan for better ventilation
- One replaceable air filter for easy cleaning

ORDERING GUIDE

- **AREMO-6163-E06P3-8912**
6-slot full-size industrial node chassis for PICMG 1.3 with 350W active PFC ATX power supply, PBPE-06P3 and ROBO-8912VG2AR
- **AREMO-6163-E06A364-8920**
6-slot full-size industrial node chassis for PICMG 1.3 with 350W active PFC ATX power supply, PBPE-06A364 and ROBO-8920VG2



AREMO-2173P

FEATURES

- One slim CD-ROM and two hot-swap 3.5" HDD (SATA)
- Two USB ports on the front panel
- Two 7cm ball-bearing cooling fans for better ventilation
- One power On/Off switch with protection cap and one touch free reset for secure access

ORDERING GUIDE

- **AREMO-2173P-E06V-8912**
19" 2U rack-mount chassis for PICMG 1.3 with 350W active PFC power supply, PBPE-06V and ROBO-8912VG2AR
- **AREMO-2173P-E06V464-8920**
19" 2U rack-mount chassis for PICMG 1.3 with 350W active PFC redundant power supply, PBPE-06V464 and ROBO-8920VG2



AREMO-4196

FEATURES

- Dual 12cm ball-bearing cooling fans for better ventilation
- PS/2 or redundant power supply installable
- Equipped with fan control card to detect fan fail

ORDERING GUIDE

- **AREMO-4196-E13A8-8912**
19" 4U rack-mount chassis for PICMG 1.3 version with active 420W ATX, PFC power supply, PBPE-13A8 and ROBO-8912VG2AR
- **AREMO-4196-E14AD64-8920**
19" 4U rack-mount chassis for PICMG 1.3 version with 420W ATX, PFC power supply, PBPE-14AD64 and ROBO-8920VG2



AREMO-4265

FEATURES

- Two 5.25" and one internal 3.5" HDD drive bay for RAID 0, 1, 5 & CD-ROM
- Four USB ports on the front panel
- One power On/Off switch with LED indicators and one reset switch behind the lockable door
- Lockable front door with thumb lock for dust-proof and better security

ORDERING GUIDE

- **AREMO-4265-E19AG64-8920**
19" 4U industrial chassis for PICMG 1.3 with 460W active PFC ATX power supply, PBPE-19AG64 and ROBO-8920VG2



Portwell, Inc. Headquarters

3F, No. 92, Sec. 1, Nei-Hu Rd.,
114 Taipei, Taiwan
Tel: +886-2-27992020
Fax: +886-2-27991010
E-mail: info@portwell.com.tw
http://www.portwell.com.tw

American Portwell

Tel: +1-510-403-3399 Fax: +1-510-403-3084
E-mail: info@portwell.com
http://www.portwell.com

Portwell Japan, Inc.

Tel: +81-3-5298-8071 Fax: +81-3-5298-8072
E-mail: info@portwell.co.jp
http://www.portwell.co.jp

Beijing Portwell

Tel: +86-10-82701616 Fax: +86-10-82700606
E-mail: info@portwell.com.cn
http://www.portwell.com.cn

Portwell (UK) Ltd.

Tel: +44(0)1202-813816 Fax: +44(0)1202-813817
E-mail: info@portwell.co.uk
http://www.portwell.co.uk

Portwell, B.V.

Tel: +31-252-620790 Fax: +31-252-621325
E-mail: info@portwell.nl
http://www.portwell.nl

Portwell-Laxsons India

Tel: +91-22-2685-9911 Fax: +91-22-2685-9922
E-mail: info@portwellaxsons.com
http://www.portwellaxsons.com