PEX 8114BA RDK
Interoperability
Test Report

Interoperability Lab

Version 1.0

June 2006

1 PURPOSE

This document details interoperability test results of the PEX 8114 bridge Rapid Development Kit (RDK).

2 TEST PHASES

Interoperability testing was done in three phases:

- Motherboards and System BIOS – The testing focuses on testing the RDK in different PCI-Express slots (for the Forward version) and PCI-X slots (for the Reversion version) and checking for LED linkups, system detection and enumeration

- Endpoints – The testing includes endpoints (video graphic adapters, ethernet network cards and SCSI or Fibre-channel controllers) in various RDK ports and driver installation, detection and traffic verification.

- WHQL Certification – This phase requires running the Microsoft certification test suites for video cards as endpoints. This phase also verifies chip-to-chip and board-to-board functionality and running network traffic.

For more detailed information, see the **PEX 8114BA RDK Interoperability Test Procedures**.

3 EQUIPMENT SETUP

The following shows software versions and physical RDK configurations used for testing.

3.1 Software Versions and RDK Identification Information

	Version	Other Identification Information
PEX SDK	1.2.0	
HDK (board+chip)		
- 8114BA (Reverse)	- Board Serial No: 0001 Chip markings: PEX8114-BA13BES 0608 L G65349.1 Malaysia EEPROM version: F2P1	P/N: 90-0051-100-A SMT028705-0014
- 8114BA (Forward)	- Board Serial No: SN 161 Chip markings: PEX8114-BA138BES 0608 L G5349.1 Malaysia EEPROM version: F2P1	P/N 90-0052-100-A SMT025337-0048
Operating Systems		
- Windows XP Professional	- Standard with Service Pack 2 (volume license)	- see MSDN product keys
- Windows Server 2003	- Standard version (volume license)	- see MSDN product keys
- Windows Server 2003	- Standard x64 version (volume license)	- see MSDN product keys
WHQL Test Suite	- HCT ver. 12.1.01 - DCT ver. 5.3	

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3.2 Hardware Switch Settings of RDKs (Default States)

Forward PEX 8114BA RDK	Reverse PEX 8114BA RDK
SW9: PLL BYPASS # = OPEN PCLK-FDBK = OPEN TRAN = OPEN ARBITER = OPEN SW10: PCI-SELl PCIX-SEL M66EN PCI-SEL100	SW5: EE PR# = OPEN M66EN = OPEN PCI SEL100 = CLOSE PLL BYPASS# = OPEN HP_MRL # = CLOSE PEX8114 REFCLK ON = OPEN REFCLK SSC = CLOSE REFCLK STOP # = OPEN
JP14: NO EEPROM PRESENT = NO JUMPER	SW3: (1:2) – OPEN, OPEN -> PCI-X 100/133 (1:2) – OPEN, CLOSED -> PCI-X 66 (1:2) – CLOSED, DON'T CARE -> PCI
	JP7 (2:3) – Last two pins to control V_{TT} value

4 TEST RESULTS

The following checklists show Pass/Fail test results. See the **PEX 8114BA Test Procedures** for detailed test descriptions.

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4.1 Motherboards and System BIOS

4.1.1 Forward PEX8114BA HDK

Product Name: PEX 8114BA HDK

Tester Name: Roger Lai

Date: May 2006

Test Category	**System Number** (Refer to Motherboards and Systems List) : Fill in Pass or Fail (P or F) **For explanation details, refer to the Note Number after P or F below.** **NA = Not Available** **NT = Not Tested**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**WHQL System**
Visual Link-Up Test (DS2, DS4, DS5, DS6)	P	NA	P	P	P	P	P	P	P	P	P	P	P	P	P
Slot Tests	P	NA	P	P	P	P	P	P	P	P	P	P	P	P	P
System Frequencies Tests		NA													
A. Test the Following Using 1 Selected System															
PCI- X 133 MHz															
i. Visual Link-up Test			P												
ii. Device Manager Tests			P												
iii. Video Tests			P												
iv. Ethernet Tests			P												
v. SCSI/FC Tests			P												
PCI-X 100 MHz															
i. Visual Link-up Test			P												
ii. Device Manager Tests			P												
iii. Video Tests			P												
iv. Ethernet Tests			P												
v. SCSI/FC Tests			P												
PCI 66 MHz															
i. Visual Link-up Test			F3												
ii. Device Manager Tests			P												
iii. Video Tests			P												
iv. Ethernet Tests			P												
v. SCSI/FC Tests			P												

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PCI 33 MHz			P												
i. Visual Link-up Test			P												
ii. Device Manager Tests			P												
iii. Video Tests			P												
iv. Ethernet Tests			P												
v. SCSI/FC Tests															
B. Test the Following Across All Systems.															
PCI-X 66 MHz (default)	P		P	P	P	P	P	P	P	P	P	P	P	P	
i. Visual Link-up Test	P		P	P	P	P	P	P	P	P	P	P	P	P	
ii. Device Manager Tests	P		P	P	P	P	P	P	P	P	P	P	P	P	
iii. Video Tests	P		P	P	P	P	P	P	P	P	P	P	P	P	
iv. Ethernet Tests	P		P	P	P	P	P	P	P	P	P	P	P	P	
v. SCSI/FC Tests															
Device Manager Detection Tests		NA													
Devices By Type	P		P	P	P	P	P	P	P	P	P	P	P	P	P
Devices By Connection	P		P	P	P	P	P	P	P	P	P	P	P	P	P
PEX GUI Tests		NA													
Detection	P		P	P	P	P	P	P	P	P	P	P	P	P	P
Read Configuration Registers	P		P	P	P	P	P	P	P	P	P	P	P	P	P
Read Memory-mapped Registers	P		P	P	P	P	P	P	P	P	P	P	P	P	P
EEPROM Programming Status	P		P	P	P	P	P	P	P	P	P	P	P	P	P
EEPPROM Programming	P		P	P	P	P	P	P	P	P	P	P	P	P	P

Notes:

F3 – Green LEDs show “33 MHz” frequency even though the RDK jumpers are set for “66 MHz”. This occurs with all tested PCI video cards. Engineering checked the schematics and determined that PCI video cards pull the signals low, resulting in “33 MHz”. Per System Engineering, this is not a product defect but a behavior of video cards. No video functionality is affected. Ethernet network cards and SCSI/FC adapters do not exhibit this problem.

4.2 Reverse PEX8114BA HDK

Product Name: __PEX 8114BA Reverse HDK_____

Tester Name:_Roger Lai_____

Date:___May 2006_____

Test Category	**System Number** (Refer to Motherboards and Systems List Attachment) : Fill in Pass or Fail (P or F) **For explanation details, refer to the Note Number after P or F below.** **NA = Not Available** **NT = Not Tested**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**WHQL System**
Visual Link-Up Test (DS6, DS7, DS8, DS9)					P										P
Slot Tests					P										P
Device Manager Detection Tests															
Devices By Type					P										P
Devices By Connection					P										P
PEX GUI Tests															
Detection					P										P
Read Configuration Registers					P										P
Read Memory-mapped Registers					P										P
EEPROM Programming Status					P										P
EEPPROM Programming					P										P

Notes:

1. Only System #5 and the WHQL Certification system support 64-bit PCI-X slots. As a result, interoperability testing with the PEX 8114BA Reverse RDK was limited, compared to 15 systems tested for the PEX 8114BA Forward RDK.

4.3 Endpoints Test Results for both Forward and Reverse RDKs

Test Category	**System Number** (Refer to Motherboards and Systems List) : Fill in Pass or Fail (P or F) **For explanation details, refer to the Note Number after P or F below.** **NA = Not Available** **NT = Not Tested**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**WHQL System**
Video Graphic Adapter Tests		NA													
Nvidia NVS 440 (use Reverse RDK)					P										P
Video display on the monitor					P										P
Driver installation					P										P
Driver detection															
ATI VisionTek 9250 (use Forward RDK)															
Video display on the monitor			F1			F2			F1	F1	F1	F1			
Driver installation															
Driver detection															
Matrox Millenium P650 (use Reverse RDK)															
Video display on the monitor	P		P	P							F4				
Driver installation	P		P	P											
Driver detection	P		P	P											
Nvidia GeForce MX4000 (use Forward RDK)															
Video display on the monitor	P		P	P	P		P	P	P	P	P			F5	
Driver installation	P		P	P	P		P	P	P	P	P				
Driver detection	P		P	P	P		P	P	P	P	P				

Notes:

F1 – No video display.

F2 – Very slow display. Monitor does not display until after a whole minute after bootup. Testing without the PEX 8114BA bridge RDK does not exhibit this problem.

F4 – Using the PEX-8114BA Reverse RDK, there is no display if an existing PCI video card is in system. If the existing PCI video card is removed then the Matrox PCI-Express video card displays correctly.

F5 – No video display. Testing with or without the EEPROM does not make a difference. However, if the video card is inserted directly onto the motherboard's slot then the video displays normally.

Test Category	System Number (Refer to Motherboards and Systems List) : Fill in Pass or Fail (P or F) For explanation details, refer to the Note Number after P or F below. NA = Not Available NT = Not Tested														
	1	2	3	4	5	6	7	8	9	10	11	12	14	15	WHQL System
Ethernet Adapter Tests															
SYSKONNECT SK-9E21D (Reverse RDK)__															
Driver installation					P										
Driver detection					P										
Web-page access					P										
SYSKONNECT SK-9S21D (Forward RDK)__															
Driver installation			P					P		P					
Driver detection			P					P		P					
Web-page access			P					P		P					
Intel Gig-E PCI-X adapter (Forward RDK)															
Driver installation			P					P							
Driver detection			P					P							
Web-page access			P					P							
Intel Gig-E PCI-e adapter (Reverse RDK)															
Driver installation					P										
Driver detection					P										
Web-page access					P										
Broadcom Nextreme Gig-E (Forward RDK)															
Driver installation										P					
Driver detection										P					
Web-page access										P					
Broadcom Nextreme Gig-E (Reverse RDK)															
Driver installation					P										
Driver detection					P										
Web-page access					P										

Test Category	System Number (Refer to Motherboards and Systems List) : Fill in Pass or Fail (P or F) For explanation details, refer to the Note Number after P or F below. NA = Not Available NT = Not Tested														
	1	2	3	4	5	6	7	8	9	10	11	12	14	15	WHQL System
SCSI/FC Storage Controller Tests															
LSI Logic 22320 (use Reverse RDK)															
Driver installation															P1
Driver detection															P1
Read/Write data files															P1
Qlogic QLA-2462 (use Forward RDK)															
Driver installation			P												
Driver detection			P												
Read/Write data files			P												
Qlogic QLA-2432 (use Reverse RDK)															
Driver installation					P										
Driver detection					P										
Read/Write data files					P										
TV Tuners															
LifeView Fly TV Platinum (use Forward RDK)															
Driver installation															P
Driver detection															P
Visual Capture & Display															P

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4.4 WHQL Certification, Chip-to-Chip and Board-to-Board Test Results

Test Category	**System Number** (Refer to Motherboards and System BIOS list) : Fill in Pass or Fail (P or F) **For explanation details, refer to the Note Number after P or F below.** **NA = Not Available** **NT = Not Tested**														
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**14**	**15**	**WHQL System**
WHQL Precertification (use Reverse RDK) Video Graphic Adapter Card Name & Model: _Nvidia NVS-280 Quadro PCI-e_____ (see full results in WQHL Precert: Video Graphics Adapter section)															P
Chip-to- Chip Interoperability Configuration #1: __PEX 8111 Rev 3 (Reverse) and PEX 8114BA (Forward)_ PEX GUI Detection Device Manager Detion Video Card (as endpoint) detection Configuration #2: __PEX 8114BA (Reverse) and PEX 8532BB_____ PEX GUI Detection Device Manager Detion Video Card (as endpoint) detection															P P P P P p
Board-to-Board Interoperability Configuration #1 : _PEX-8114BA Forward_and PEX 8518_____ Configuration #2: _PEX 8111 and PEX 8114BA Forward_____ Configuration #3: _PEX 8532 and PEX 8114BA Forward_____															P P P
Fully-loaded Enpoints Configuration Video adapter: _ATI VisionTek 9250_____ Ethernet adapter: _Intel Gig-E Adapter (Ophir)_____ SCSI/FC adapter: _Qlogic QLA-2462_____			P P p												

4.5 WHQL Precertification: Video Graphic Adapters

The following table summarizes WHQL test results from running the DCT Test suite. The Nvidia Quadro-e adapter is the endpoint, and the DUT is the PEX-8114BA Reverse Mode RDK.

Manufacturer: Nvidia Quadro PCI-e adapter **Other Notes:** DCT 5.3 Test Suite
Type (PCI or PCI-e): PCI-e interface NVS-280
Board Revision: Rev A00
Driver version: 6.14.0010.6127 5/29/2004 nv4_disp.dll
System # (see ref): Dell Precision 670
System Information: CPU Xeon 2.8 GigaHertz
Memory size 1 Gigabytes
Operating System Windows XP Professional SP2

Test #	Test Category	Pass/Fail Results	Notes
1	Graphics Bus	PASS	Run in automated mode
2	DirectDraw	PASS	Run in automated mode
3	OpenGL	PASS	Run in automated mode
4	General	PASS	Run in automated mode
5	Win2001 GDI	PASS	Run in automated mode
6	Power Management	PASS	Run in automated mode
7	D3D	PASS	Run in automated mode
8	Stability	PASS	Run in automated mode
9	DXVA	PASS	Run in automated mode
10	VMR	PASS	Run in automated mode

Notes:

The tests above were run using the Nvidia NVS-280 Quadro PCI-e video as a reference card in the Dell 670 WHQL Certification System. If questionable failures or incomplete tests occur, the tests were rerun without the switch HDK. Note that exceptions may occur because they are known test suite problems or product waivers may apply. See the Microsoft web postings for updates.

5 TEST EQUIPMENT

5.1 Motherboards and System BIOS

The following motherboards and system BIOS were used in testing the PEX 8114BA RDKs.

System #	Motherboard	Root Complex	CPU	BIOS	PCI Express Slots	Operating System
1	**MSI** K8N Neo4 Platinum SLI; 512MB SDRAM DDR 266/333/400	Nvidia NForce 4 SLI	AMD	**Phoenix Award** BIOS v6.00PG 7100NMS V3.0 123104	2- x16	Windows XP SP2
2	**SUPERMICRO** X6DAE-G; 512MB SDRAM DDR 266/333	Intel E7525 TumWater	INTEL	**Phoenix Server 3** BIOS V6; X6DAE-G BIOS Revision 1.2	1- x16 1- x4	Windows XP SP2
3	**ABIT** AX-8; DDR 400	VIA K8T890/VT8237	INTEL	**Phoenix Award** BIOS 1.0	1- x16 3- x1	Windows XP SP2
4	**NVIDIA** NF4-CRB; 512MB SDRAM DDR 266/333	Nvidia NForce 4	AMD	**Phoenix Award** BIOS V6.00PG NVIDIA BIOS V4.9x 4/26/2005-NF-CK804-6A61FS02C-00	1- x16 2- x1	Windows XP SP2
5	**INTEL** SE7520BD2; 512MB SDRAM DDR 266/333, DDR2 400	Intel E7520 Lindenhurst	INTEL	**AMIBIOS** V2.53; SE7520BD2 22 86B.P.03.10.0052	1- x8 1- x4	Windows 2003 Server
6	**ASUS** P5GDC-V; 512MB SDRAM DDR 400/533	Intel 915G	INTEL	**AMIBIOS** P5GDC-V Deluxe ACPI BIOS Revision 1007	1- x16 2- x1	Windows XP SP2
7	**ABIT** AA8; 1G DDR2 SDRAM 400/533	Intel Alderwood, 800Mhz FSB; Intel 925X and ICH6R Express	INTEL	**Phoenix AWARD** BIOS V6.00PG 2/10/05-i925x-W83627-6A79FA19C-20	1- x16 3- x1	Windows XP SP2
8	**SUPERMICRO** P8SGA; 512MB DDR 400 SDRAM	Intel Pentium 4, 800Mhz FSB; Intel 915G Chipset	INTEL	**Phoenix Award** BIOS V6.00PG; P8SGA BIOS Revision 1.1; 03/29/2005	1 x16 3- x1	Windows XP SP2
9	**MSI** RS480M2-IL	ATI SB400 IXP400	AMD	**Phoenix Award** BIOS v6.00PG; W8093AMSv30B9	1- x16	Windows XP SP2
10	**ABIT** AW8; 1GB SDRAM DDR2 800/667/533	Intel 955	INTEL	**Phoenix Award** BIOS v6.00PG; 5/23/05-i955-W627EHF-6A79IA1AC-10	1- x16 2- x1	Windows XP SP2
11	**GIGABYTE** GA-8I945P Pro	Intel 945P	INTEL	**Phoenix Award** BIOS v6.00PG	1- x16 2- x1	Windows XP SP2

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System #	Motherboard	Root Complex	CPU	BIOS	PCI Express Slots	Operating System
12	**ULI** EV9567	ULI EV9567	INTEL	**Phoenix Award** BIOS v6.00PG	1- x16 2- x4	Windows XP SP2
14	**Intel** Lakeport	Intel TK53tWJ RU	INTEL	**AMI BIOS** WPLI751.86P 10/13/2005 SMBIOS v2.3	1- x16 2- x1	Windows XP SP2
15	**Winfast** 761GXK8MC	SIS SIS964	AMD	**Phoenix** 6.00 PG 10/11/2005 3 PCI, 1 AGP, 1 PCI-e x16	1- x16	Windows XP SP2
17	**Dell** Precision Workstation 470	Intel E7525 Tumwater	INTEL	**DELL** BIOS Revision A03	1- x16 1- x4	Windows XP SP2
WHQL System	**Dell** Precision Workstation 670	Intel E7525	INTEL	**DELL** Bios A06, 9-12/2005	3 PCI-X, 1 PCI, 1 X16, 1 X8	Windows XP SP2

5.2 Endpoint Devices and Connectivity Kits

The following endpoint devices were successfully tested together with the PEX 8114 HDK in different systems. The PCI-Express devices were used as endpoints while others, such as PCI-based interface adapters, were used as part of the PC systems connectivity components.

Device Category	Product Manufactu-rer	Model Name/Number	Product Details	System Interface	Software Drivers and/or Drivers
Graphic adapters	ATI	FireMV 2400	ATI controller; 128 MB DDR; two VHDCI connectors; half height	PCI	Embedded
	ATI	VisionTek Radeon 9250 (Xtasy)	ATI controller; 128 MB DDR graphics accelerator at 400 MHz; VGA, DVI- I, TV-Out	PCI ; 64 bit memory interface	V5.8
	3D Fuzion	GeForce MX 4000	Nvidia controller 128 MB DDR; VGA, S-video out; 275 MHz core clock; Dual RAMDACs 350MHz	PCI;	Nvidia NVDVD v 2.0
	Kaser	GeForce 6600	Nvidia CineFX 30 engine; 256 MB ; Duall 400 MHz RAMDACs; OpenGL support	PCI-Express	Nvidia version N.5.II.I
	ATI	Diamond Stealth S60 ; S60PCI64	Radeon 7000; DVI/TV-Out; 64 MB DDR; dual monitor display	PCI	Stealth Viper v 6.1
	Mad Dog Multimedia	Mad Dog multimedia Prowler V042605	ATI Radeon 7000; 64 MB graphic accelerator	PCI	ATI Catalyst software suite, Direct X and OpenGL support
	Kaser	Radeon x300SE	ATI Radeon (VPU) ; 128 MB system memory; 15 VGA conneceotr; S-Video/composite connector, DVI connector	PCI-Express	International Installation CD ver A5.7.1
	PNY Technologies	GeForce 6600	Nvidia SLI Ready and CineFX 3.0 Engine; 300 MHz core clock, 128-bit DDR memory interface 256 MB DDR; VGA + DVI+HDTV/S-Video Outputs	PCI-Express	Verto GDRV-7777
	ATI	Diamond Stealth Radeon X300SE	ATI Radeon; 128 MB /Mo Hypermemory; requires 420 W power supply or higher; Dual monitor Display	PCI-Express x16 slot	ATI Catalyst drivers v 6.0
	ATI	ATI 7000	64 MB DDR, TV-OUT 64-bit	PCI slot	ATI Catalyst drivers v6.4
	Nvidia	Quadro NVS-280	Microsoft-certified component; integrated component of Dell Precision 670	PCI-Express x16 slot	Nv4-disp.dll Ver 6.14.0010.6127
	Nvidia	PCI-Express 6200	GEForce 6 Series Turbocache	PCI-Express x16 slot	ForceWare Release 80 Ver 84.21
	Nvidia	Quadro NVS-440	256 DDR3 memory, 4 x DVI-I , 1920x1200; BIOS ver 5.43.02.88.03	PCI-Express x16 slot	Drivers CD ver 81.67
	Matrox	Millenium P650 P65-MDDE128F	128 MB	PCI-Express x16 slot	Matrox Parhelia Series & Matrox P-Series
Ethernet Cards	HP	Broadcom NetXtreme	Gigabit PCI-E	PCI-Express	Broadcom NetXtreme Ethernet drivers v 8.1
	Dlink	DGE-560T	Gigabit PCI-E Ethernet adapter; support 10/100/1000 Mbps transfer rate; low-profile; 256 MB memory	PCI-Express	Wired Ver 1.00

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Device Category	Product Manufactu-rer	Model Name/Number	Product Details	System Interface	Software Drivers and/or Drivers
	Dlink	DGE-530T	10/100/1000MBps Gigabit Desktop Adapter; IEEE 802.3, 802.3u Fast Ethernet, 802.3ab gigabit and 802.3x flow control802.1Q VLAN support	PCI	Wired Ver. 4.00
	SysKonnect	SK-9E21D SK-9E22	10/100/1000Base-T Adapter; autodetect, 802.3ab, u, ad, 802.1pq; ACPi 2.0 compatible; up to 133 MHz Bus Speed; PCI 2.3 compliant Dual-port version	PCI-Express	Installation CD V 4.33
	SysKonnect	SK-9S21	10/100/1000Base-T Adapter; autodetect, 802.3ab, u, ad, 802.1pq; ACPi 2.0 compatible; up to 133 MHz Bus Speed; PCI 2.3 compliant	PCI-X	Installation CD V 4.33
	Intel	Pro/1000 Dual Port PT	Gigabit copper for servers	PCI-Express	Intel Ophir drivers
	Intel	Pro/1000 MT Server Adapter	Gigabit copper connection for servers; low-profile; IEEE 802.3ab, 802.1Q, 802.1p and 802.3x compliant	PCI/PCI-X	Intel Pro/1000 drivers
TV Tuner Cards	LifeView	TV Tuner	Fly TV Platinum Gold; 713 xBDA Analog Capture	PCI-X	AMCAP software
HBAs & Storage Controller	Qlogic	QLA-2462	PCI-X Gigabit Fibre channel adapter	PCI-X	SAN Surfer Management Suite (SMS) ver 2006
	Qlogic	QLA-2432	PCI-Express Gigabit Fibre channel adapter; using FW 4.00.12	PCI-Express	SAN Surfer Management Suite (SMS) ver 2006
	SIIG	SATA II PCIe RAID	SATA II PCIe RAID adapter ; compliant to PCI-e base spec 1.0a; low-profile; uses Silicon Image SIL 3132	PCI-Express	SIIG SATA II PCIe RAID v12.3.1
	LSI Logic	LSI22320	Ultra-320 SCSI Host Bus Adapter	PCI-Express	Driver 1.20.18 for Win XP
Connectivity Devices and Kits	DLink	DGS-1008D	8-port gigabit switch; 10/100/1000Mbps switched ports; IEEE 802.3 flow control for full duplex	Not applicable	Not applicable
	Linksys	EXHUB12S	Stackable Ethernet 100Base TX-12-Port Hub	Not applicable	Not applicable