

QV-PCI32RDK-144 Data Sheet



Development Kit for the 32-Bit PCI Devices in 144 TQFP Packages

last updated 12/15/99

FEATURES

High-Speed 32-bit PCI Add-In Card

- Universal (3.3V/5V) PCI Card
- Programmable Local Clock Speeds (28 MHz to 114 MHz)
- Local clock speed controlled by logic in the QuickPCI device
- 60-pin Expansion Connector (32-bit bus + control)
- 4K deep, 32-bit Synchronous FIFO connected to the QuickPCI device and the expansion connector.
- Serial EPROM for QuickPCI power-on RAM initialization (optional)
- 8 LEDs connected to QuickPCI device
- 144 pin socket for easy prototyping of QuickPCI devices

PCI32RDK - 144

Software Drivers

- QLREF is used to test and demonstrate all QuickLogic's RDK boards and devices
- QLREF supports Windows 95, Windows 98, Windows NT, and Windows 2000
- QLREF uses a driver to communicate with all QuickPCI devices

Complete Documentation

- Source code for software driver and application
- Gerber files and Orcad schematics for the PCB design
- QuickWorks design files for the QuickPCI reference design
- The 32-Bit QuickPCI Design Guide
- The PCI32RDK User's Guide

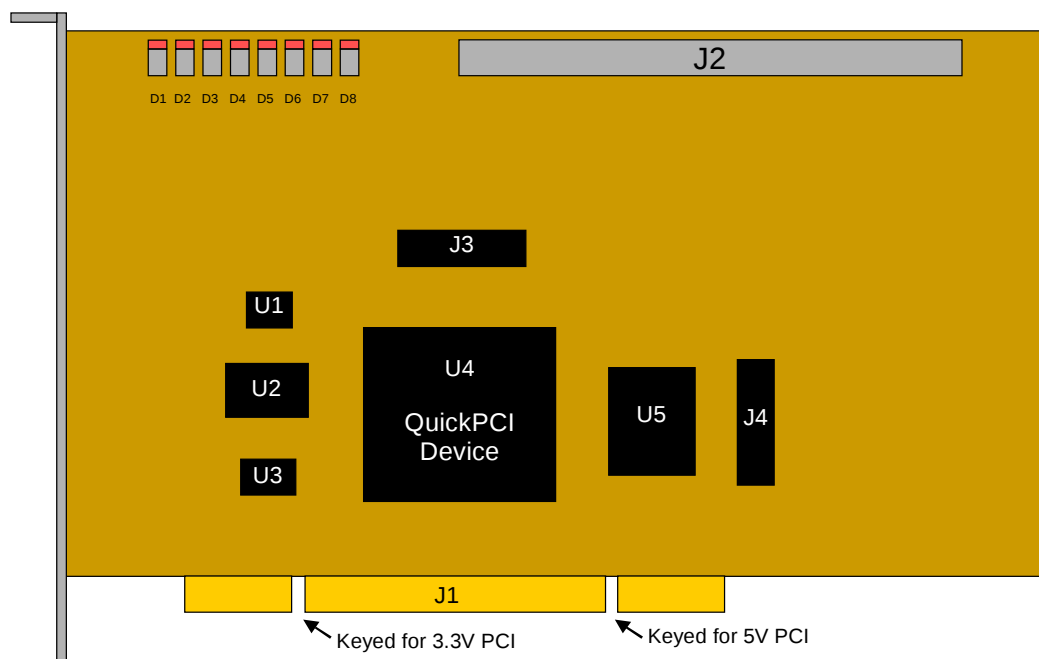


FIGURE 1. QV-PCI32RDK-144 Diagram



QV-PCI32RDK-144 Data Sheet

See Figure 1 for the RDK layout diagram and Table 1 for description of major components.

U1	Programmable PLL Clock Generator Quality Semiconductor: QS5925 Datasheet: http://www.qualitysemi.com/products/clock/3.3Vdrivers.html If the above link is out of date, search from the home page: www.qualitysemi.com
U2	Crystal Oscillator, 14.31818 MHz Epson: SG8002JA Datasheet: http://www.eea.epson.com/products/qd/qdcystalosc.htm If the above link is out of date, search from the home page: www.epson.com
U3	Serial EEPROM, 64K x 1 Atmel: AT17LV65-10PC8P3 Datasheet: http://www.atmel.com/atmel/products/prod22.htm If the above link is out of date, search from the home page: www.atmel.com
U4	QL5xxx QuickPCI Device (in 144 TQFP socket) QuickLogic: QL5030 or QL5130 Datasheet: http://www.quicklogic.com/devices/PCI/Default.htm If the above link is out of date, search from the home page: www.quicklogic.com
U5	Synchronous FIFO, 4K x 36 Integrated Device Technology: IDT72V3660 Datasheet: http://www.idt.com/products/pages/FIFO-72V3660.html If the above link is out of date, search from the home page: www.idt.com
J1	Universal PCI Edge Connector Keyed for 3.3V and 5V PCI
J2	Ribbon Cable Connector, 60 pin AMP: 1-103308-2 Datasheet: http://connect.amp.com/AMP/bin/AMP.Connect?C=1&M=BYPN&I=13&PN=1-103308-2 If the above link is out of date, search from the home page: www.amp.com
J3-J4	MICTOR High Density Logic Analyzer Probe Connectors, 38-bit AMP: 2-767004-2 Datasheet: http://connect.amp.com/AMP/bin/AMP.Connect?C=1&M=BYPN&I=13&PN=2-767004-2 If the above link is out of date, search from the home page: www.amp.com Second source: HP E5346-68701 (set of 5)
D1-D8	LEDs, 3.3V, red

TABLE 1. Major Components of PCI32RDK-144

QV-PCI32RDK-144 Data Sheet

ARCHITECTURE OVERVIEW

The QV-PCI32RDK-144 Reference Board allows for demonstration, testing, and debugging of QuickPCI designs which use 144 pin TQFP packages. QuickPCI devices that use this package include the QL5030 (target) and QL5130 (target).

Eight LEDs visible from the top edge of the card are provided for testing and to help the evaluation process. Test connectors (AMP 2-767004-2) compatible with Hewlett Packard or Tektronix logic analyzers are provided to give the developer total access to the busses and control signals.

A 32-bit multiplexed address/data bus is provided on the local interface to the QL5X30 (U4). 100-MHz synchronous FIFO (36-bit x 4K deep, U5) is connected to the local bus (in a loop back mode) as well as to a 60-pin connector (J2), which can be used for benchmarking, measurements, connection of a simple add-on card, or debugging.

The local bus operates synchronously to the local clock, which is derived from a programmable clock circuit (Quality Semiconductor QS5925, U1). This

clock generator derives its clock from a 14.318 MHz crystal, can drive the clock from 28 MHz to 114 MHz with a configurable PLL. The control for the PLL can be driven from the programmable region of the QL5X30 device.

A serial EEPROM socket (U3) and interface is provided to configure the QL5X30 RAM modules on power-up, based on the application.

The card form factor is compliant with PCI 2.2, (106.68 x 174.63 mm Short Card).

EXPANSION CONNECTOR (J2) PINOUT

Most of the pins on the connector are attached to the QuickPCI device. This allows a daughter-board to be built in order to expand the functionality of the reference board.

See Figure 2 for the expansion connector (J2) pinout, and refer to Table 2 for pinout descriptions.

QV-PCI32RDK-144 Data Sheet

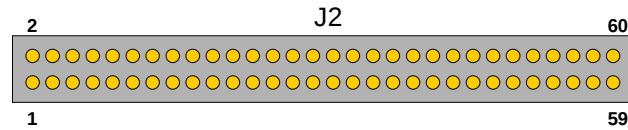


FIGURE 2. Expansion Connector (J2) Pinout

Pin	Name	Function/Connectivity
1	GND	Ground plane
3	GND	Ground plane
5	LED[5]	See QuickPCI Device Pinout (U4 pin 10)
7	LED[4]	See QuickPCI Device Pinout (U4 pin 11)
9	LED[3]	See QuickPCI Device Pinout (U4 pin 12)
11	LED[2]	See QuickPCI Device Pinout (U4 pin 13)
13	LED[1]	See QuickPCI Device Pinout (U4 pin 14)
15	LED[0]	See QuickPCI Device Pinout (U4 pin 16)
17	SPARE[8]	See QuickPCI Device Pinout (U4 pin 144)
19	GND	Ground plane
21	NC	No connect
23	LAD[0]	See QuickPCI Device Pinout (U4 pin 78)
25	LAD[2]	See QuickPCI Device Pinout (U4 pin 81)
27	LAD[4]	See QuickPCI Device Pinout (U4 pin 83)
29	LAD[6]	See QuickPCI Device Pinout (U4 pin 85)
31	VCC	3.3V VCC plane
33	LAD[8]	See QuickPCI Device Pinout (U4 pin 88)
35	LAD[10]	See QuickPCI Device Pinout (U4 pin 96)
37	LAD[12]	See QuickPCI Device Pinout (U4 pin 98)
39	LAD[14]	See QuickPCI Device Pinout (U4 pin 100)
41	LAD[16]	See QuickPCI Device Pinout (U4 pin 103)
43	LAD[18]	See QuickPCI Device Pinout (U4 pin 105)
45	GND	Ground plane
47	LAD[20]	See QuickPCI Device Pinout (U4 pin 107)
49	LAD[22]	See QuickPCI Device Pinout (U4 pin 111)
51	LAD[24]	See QuickPCI Device Pinout (U4 pin 113)
53	LAD[26]	See QuickPCI Device Pinout (U4 pin 116)
55	LAD[28]	See QuickPCI Device Pinout (U4 pin 118)
57	LAD[30]	See QuickPCI Device Pinout (U4 pin 120)
59	GND	Ground plane

Pin	Name	Function/Connectivity
2	LCLK2	Local Bus Clock. Driven by the QS5925 Programmable Clock Generator (U1 pin 14)
4	SPARE[7]	See QuickPCI Device Pinout (U4 pin 142)
6	SPARE[6]	See QuickPCI Device Pinout (U4 pin 141)
8	SPARE[5]	See QuickPCI Device Pinout (U4 pin 140)
10	SPARE[4]	See QuickPCI Device Pinout (U4 pin 139)
12	SPARE[3]	See QuickPCI Device Pinout (U4 pin 4)
14	SPARE[2]	See QuickPCI Device Pinout (U4 pin 3)
16	SPARE[1]	See QuickPCI Device Pinout (U4 pin 2)
18	SPARE[0]	See QuickPCI Device Pinout (U4 pin 1)
20	GND	Ground plane
22	NC	No connect
24	LAD[1]	See QuickPCI Device Pinout (U4 pin 80)
26	LAD[3]	See QuickPCI Device Pinout (U4 pin 82)
28	LAD[5]	See QuickPCI Device Pinout (U4 pin 84)
30	LAD[7]	See QuickPCI Device Pinout (U4 pin 86)
32	VCC	3.3V VCC plane
34	LAD[9]	See QuickPCI Device Pinout (U4 pin 95)
36	LAD[11]	See QuickPCI Device Pinout (U4 pin 97)
38	LAD[13]	See QuickPCI Device Pinout (U4 pin 99)
40	LAD[15]	See QuickPCI Device Pinout (U4 pin 101)
42	LAD[17]	See QuickPCI Device Pinout (U4 pin 104)
44	LAD[19]	See QuickPCI Device Pinout (U4 pin 106)
46	GND	Ground plane
48	LAD[21]	See QuickPCI Device Pinout (U4 pin 108)
50	LAD[23]	See QuickPCI Device Pinout (U4 pin 112)
52	LAD[25]	See QuickPCI Device Pinout (U4 pin 115)
54	LAD[27]	See QuickPCI Device Pinout (U4 pin 117)
56	LAD[29]	See QuickPCI Device Pinout (U4 pin 119)
58	LAD[31]	See QuickPCI Device Pinout (U4 pin 121)
60	GND	Ground plane

TABLE 2. Expansion connector (J2) Pinout Table

QV-PCI32RDK-144 Data Sheet

LOGIC ANALYZER HIGH-DENSITY ADAPTER (J3-J4) PINOUTS

On the PCB, J3 and J4 are known as MICTOR Connectors (Matched-Impedance ConnecTORs), or high-density connectors for logic analyzers. Each connector has 38 pins (32 data, 2 clocks, and 4 others). These connectors are pinned to work with High Density Adapters from HP and Tektronics (Fluke High Density Adapters use a different pinout). Table 3 shows the pinouts of the HP and Tektronics Logic Analyzer Adapters.

Tektronics P6434 Adapter Pinout			
Pin	Logic Analyzer Channel	Logic Analyzer Channel	Pin
1	NC	NC	38
2	NC	NC	37
3	CLK	CLK	36
4	D3:7	D1:7	35
5	D3:6	D1:6	34
6	D3:5	D1:5	33
7	D3:4	D1:4	32
8	D3:3	D1:3	31
9	D3:2	D1:2	30
10	D3:1	D1:1	29
11	D3:0	D1:0	28
12	D2:7	D0:7	27
13	D2:6	D0:6	26
14	D2:5	D0:5	25
15	D2:4	D0:4	24
16	D2:3	D0:3	23
17	D2:2	D0:2	22
18	D2:1	D0:1	21
19	D2:0	D0:0	20

HP E5346A Adapter Pinout			
Pin	Logic Analyzer Channel	Logic Analyzer Channel	Pin
1	+5V	NC	2
3	GND	NC	4
5	CLK:even	CLK:odd	6
7	D15:even	D15:odd	8
9	D14:even	D14:odd	10
11	D13:even	D13:odd	12
13	D12:even	D12:odd	14
15	D11:even	D11:odd	16
17	D10:even	D10:odd	18
19	D9:even	D9:odd	20
21	D8:even	D8:odd	22
23	D7:even	D7:odd	24
25	D6:even	D6:odd	26
27	D5:even	D5:odd	28
29	D4:even	D4:odd	30
31	D3:even	D3:odd	32
33	D2:even	D2:odd	34
35	D1:even	D1:odd	36
37	D0:even	D0:odd	38

TABLE 3. Logic Analyzer Adapters Pinouts

The pinouts in Table 4 are for the MICTOR connectors on the RDK board. These pinouts use pin numbering that is consistent with the HP pinout table. Use the tables above for cross-reference if you are using a Tektronics analyzer. See the QuickPCI Device Pinout Table in the PCI32RDK User's Guide for signal descriptions. Reference to the corresponding QuickPCI device pin number is shown for each signal in Table 4, with the exception of LCLK1, which is not connected to the QuickPCI device and is instead connected to the Programmable PLL Clock Generator (U1), Test Point 12 (TP12), and a pull-up to 3.3V and pull-down to GND.

J3 MICTOR Connector FIFO Control Signals, LEDs, and Spare QuickPCI Device Pins			
Pin	Name	Name	Pin
1	NC	NC	2
3	NC	NC	4
5	LCLK1	LCLK1	6
7	LED[6] (U4 pin 9)	NC	8
9	LED[5] (U4 pin 10)	NC	10
11	LED[4] (U4 pin 11)	LED[7] (U4 pin 8)	12
13	LED[3] (U4 pin 12)	FWFT (U4 pin 137)	14
15	LED[2] (U4 pin 13)	LD (U4 pin 131)	16
17	LED[1] (U4 pin 14)	RT (U4 pin 129)	18
19	LED[0] (U4 pin 16)	OR_N/EF (U4 pin 136)	20
21	SPARE[8] (U4 pin 144)	PAE_N (U4 pin 135)	22
23	SPARE[7] (U4 pin 142)	HF_N (U4 pin 134)	24
25	SPARE[6] (U4 pin 141)	PAF_N (U4 pin 133)	26
27	SPARE[5] (U4 pin 140)	IR_N/FF (U4 pin 132)	28
29	SPARE[4] (U4 pin 139)	OE (U4 pin 128)	30
31	SPARE[3] (U4 pin 4)	REN (U4 pin 127)	32
33	SPARE[2] (U4 pin 3)	WEN (U4 pin 125)	34
35	SPARE[1] (U4 pin 2)	PRS (U4 pin 123)	36
37	SPARE[0] (U4 pin 1)	MRS (U4 pin 124)	38

J4 MICTOR Connector Local Bus Address/Data			
Pin	Name	Name	Pin
1	NC	NC	2
3	NC	NC	4
5	LCLK1	LCLK1	6
7	LAD[31] (U4 pin 121)	LAD[15] (U4 pin 101)	8
9	LAD[30] (U4 pin 120)	LAD[14] (U4 pin 100)	10
11	LAD[29] (U4 pin 119)	LAD[13] (U4 pin 99)	12
13	LAD[28] (U4 pin 118)	LAD[12] (U4 pin 98)	14
15	LAD[27] (U4 pin 117)	LAD[11] (U4 pin 97)	16
17	LAD[26] (U4 pin 116)	LAD[10] (U4 pin 96)	18
19	LAD[25] (U4 pin 115)	LAD[9] (U4 pin 95)	20
21	LAD[24] (U4 pin 113)	LAD[8] (U4 pin 88)	22
23	LAD[23] (U4 pin 112)	LAD[7] (U4 pin 86)	24
25	LAD[22] (U4 pin 111)	LAD[6] (U4 pin 85)	26
27	LAD[21] (U4 pin 108)	LAD[5] (U4 pin 84)	28
29	LAD[20] (U4 pin 107)	LAD[4] (U4 pin 83)	30
31	LAD[19] (U4 pin 106)	LAD[3] (U4 pin 82)	32
33	LAD[18] (U4 pin 105)	LAD[2] (U4 pin 81)	34
35	LAD[17] (U4 pin 104)	LAD[1] (U4 pin 80)	36
37	LAD[16] (U4 pin 103)	LAD[0] (U4 pin 78)	38

TABLE 4. Pinouts for the MICTOR Connectors on the RDK board