

QL80FCRDK-208 Data Sheet



Development Kit for the QL80FC Programmable Fibre Channel

RDK FEATURES

Fibre Channel Serial Bus Features

- Socketed QL80FC for easy prototyping
- Standard GBIC-based architecture supports Fibre Optic or twisted pair interface
- Maximum throughput of up to 2.5 Gbps
- Standard SERDES interface - 10 bit or 20 bit wide
- Interface to 8K receive and transmit FIFOs
- 60-pin Expansion Connector

High Speed PCI Bus Features

- PCI 2.2 Compliant PCI Adapter Board
- Universal PCI Bus Support (3.3V & 5.0V)
- QL5064 PCI Controller for applications at 32-bit/64-bit, 33MHz/66MHz (up to 75MHz)
- Simple bus interface to Fibre Channel device

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Software Drivers

- QLREF is used to test and demonstrate all QuickLogic's RDK boards and devices
- QLREF supports Windows 2000/NT/98
- QLREF uses drivers to communicate with QuickFC devices and QuickPCI devices
- Qlmon Debug Utility

Complete Documentation

- Complete Reference Design and Test Bench in Verilog and VHDL
- Source code for software driver and application
- Gerber files and Orcad schematics for PCB design
- QL80FC Design Guide - for the Device
- QL80FCRDK User's Guide - for the Board

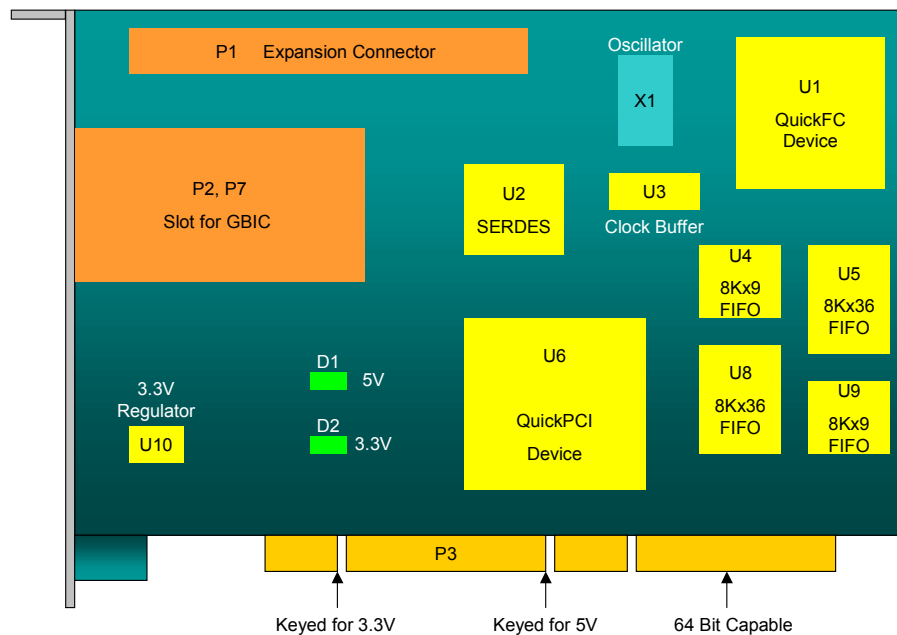


FIGURE 1. Front side of QL80FCRDK-208 board



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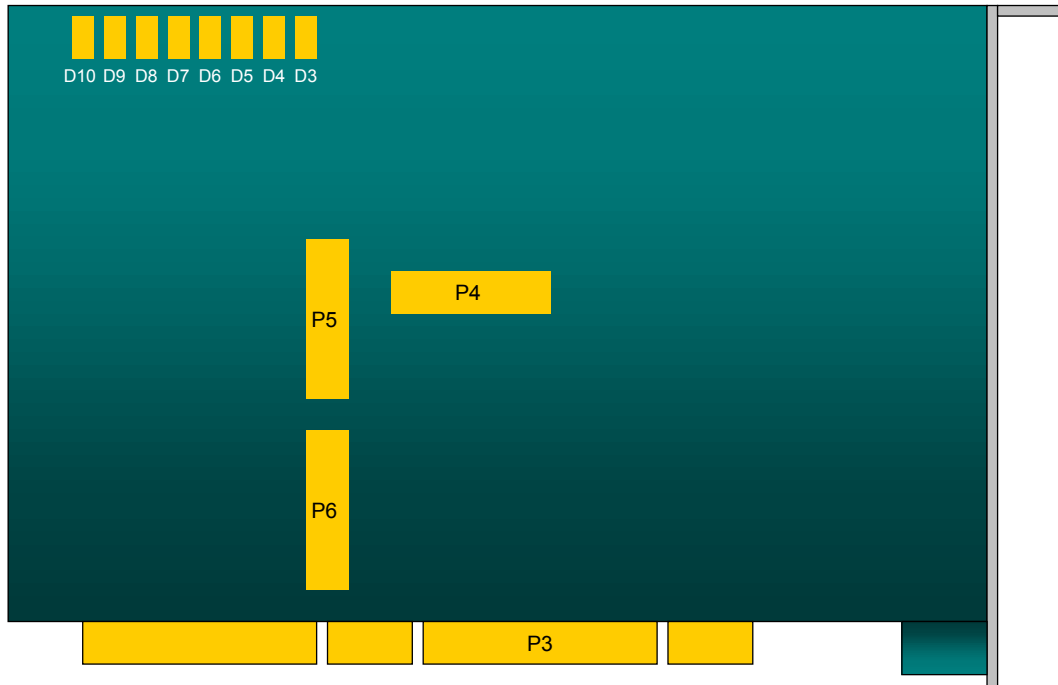


FIGURE 2. Back side of QL80FCRDK-208 board

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

Table 1: Description of Major Components	
U1	QuickLogic: QL80FC-APQ208C QuickFC Device (in 208 PQFP socket) Datasheet: http://www.quicklogic.com/devices/QuickFC/quickfc.pdf If the above link is out of date, search from the home page: www.quicklogic.com
U2	Vitesse: VSC7146RH 20 bit SERDES Datasheet: http://www.vitesse.com/pdfs/vsc7146.pdf If the above link is out of date, search from the home page: www.vitesse.com
U3	ICS: ICS552-01B High speed 1 to 4 clock buffer Datasheet: http://www.icst.com/pdf/ics55201b.pdf If the above link is out of date, search from the home page: www.ics.com
U4, U9	IDT: IDT72V251L15PF 8K x 9 dual port FIFO Datasheet: http://www.idt.com/docs/72V251_DS_78286.pdf If the above link is out of date, search from the home page: www.idt.com

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Table 1: Description of Major Components

U5, U8	<p>IDT: IDT72V3670L15PF 8K x 36 dual port FIFO Datasheet: http://www.idt.com/docs/72V3670_DS_41893.pdf If the above link is out of date, search from the home page: www.idt.com</p>
U6	<p>QuickLogic: QL5064-66APB456C QuickPCI Device Datasheet: http://www.quicklogic.com/PCI/64-bitPCI/5064/ql5064_c.pdf If the above link is out of date, search from the home page: www.quicklogic.com</p>
U10	<p>Linear tech: LTC1622CS8 3.3V Power regulator Datasheet: http://www.linear.com/prodinfo/dslist.html If the above link is out of date, search from the home page: www.linear.com</p>
D1-D10	<p>Lumex: SML-LX1206GC-TR Green LED</p>
P1	<p>3M: 2560-6002UB 60 pin header Datasheet: http://www.linear.com/prodinfo/dslist.html If the above link is out of date, search from the home page: www.linear.com</p>
P2	<p>AMP: 787653-1 Datasheet: http://connect.amp.com/AMP/docs/pdf/2/21/197122.pdf GBIC connector If the above link is out of date, search from the home page: www.amp.com</p>
P4-P6	<p>AMP: 2-767004-2 Datasheet: http://connect.amp.com/AMP/docs/pdf/4/48/204844.pdf Mictor receptacle If the above link is out of date, search from the home page: www.amp.com</p>
P7	<p>AMP: 787663-3 GBIC rail Datasheet: http://connect.amp.com/AMP/docs/pdf/5/03/208305.pdf If the above link is out of date, search from the home page: www.amp.com</p>
X1	<p>Pletronics: P1145-2FV-106.25/53.125 MHz Fibre Channel Oscillator Datasheet: http://www.pletronics.com/pdf/p1100-2f.pdf If the above link is out of date, search from the home page: www.pletronics.com</p>
NA	<p>Yamaichi: ICI49-208-061-55 208 Pin PQFP Prototype Socket Datasheet: http://www.yeu.com/pdf/production/p_ici49.pdf If the above link is out of date, search from the home page: www.yeu.com</p>

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ARCHITECTURE OVERVIEW

The QL80FCRDK is a complete development kit for Fibre Channel applications. It supports data transfers to and from the PCI bus across a Fibre Channel link. The RDK allows customers to quickly and easily test and verify Fibre Channel or general-purpose high-speed serial applications. The board includes a QL5064 PCI controller chip, two 8K x 40 bit FIFOs, the QL80FC ENDEC chip, a Vitesse 20 bit SERDES, and the rails to connect a GBIC.

Featured on the board is the QL80FC, the industry's first programmable ENDEC chip. The ESP core includes Fibre channel functions for 8b/10b encoding and decoding, CRC generation and checking, Fibre Channel Ordered Set recognition, and a Loss of Synchronization state machine. The chip also includes customizable logic, which can be used to implement user defined functions such as modified Fibre Channel upper layer protocols, data massaging and FIFO interface logic. The QL80FC supports a maximum system speed of 125 MHz and a maximum throughput of 2.5Gb per second.

Also prominent on the board is the QuickLogic QL5064 PCI controller, the industry's fastest and most flexible PCI interface controller. The QL5064 supports the full 64-bit address and data capability of the PCI Revision 2.2 Specification at 66 MHz. Burst

transfers to and from the QL5064 can attain bandwidths of up to 533 MB/s (4 Gb/s). The QL5064 incorporates four independent DMA channels with separate 64-deep FIFOs. Three independent 64-bit busses within the FPGA provide an interface to and from these FIFOs, and the QL5064's control registers at local bus speeds of up to 100 MHz.

The QL80FCRDK Reference design Kit includes everything you need to get your application up and running quickly. The QL80FC and QL5064 are shipped with reference designs already programmed into them, so the board is completely functional as shipped. The source code for these designs is available to the customer. Board schematics and layout files are also available in electronic format to provide the customer a starting point for their own board designs.

The QL80FCRDK Reference Design Kit also includes a PCI 2.2-Compliant PWB and the QuickLogic PCI Software Development Kit (SDK). The PCI SDK features a complete set of tools for software development for the Windows 2000/NT/98 operating system, significantly reducing the time necessary to create custom application drivers. All source code is provided.

QL80FCRDK-208 Features	Included
QL80FC chip in socket	Yes
QL5064 high speed PCI controller	Yes
Sample configurable logic designs for QL80FC with source code in both Verilog and VHDL	Yes
Simulation test bench for QL80FC in both Verilog and VHDL	Yes
Sample Windows NT and 98 device drivers with source code	Yes
Board schematics, layout files	Yes
Headers for logic analyzer	Yes
Expansion slot for customer designed daughter board	Yes

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QL80FCRDK-208 Configuration	Description
PCI interface	64/32 bit up to 75 MHz
Fibre Channel interface	Up to 2.5 Gb/s
On board clock frequency	Selectable 53/106 MHz
Transmit FIFO	8K Fibre Channel words deep
Receive FIFO	8K Fibre Channel words deep

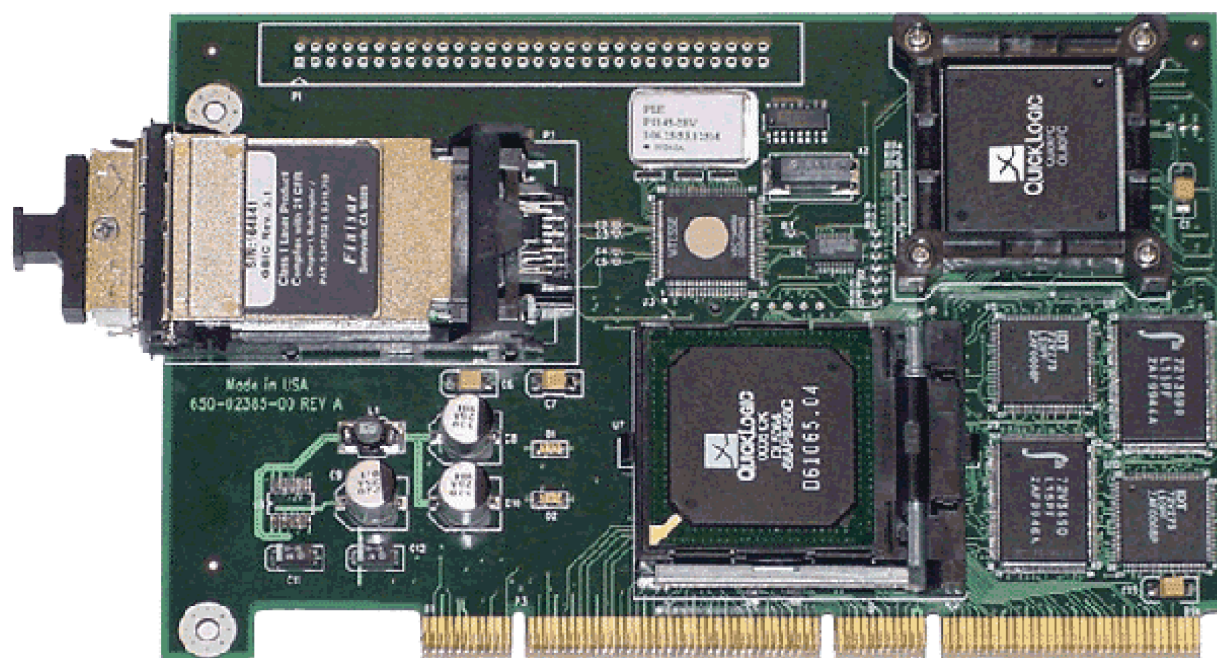


FIGURE 3. QL80FC RDK Board