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VLSI Technology, Inc.

VL82C147 Eagle Eye PCI to Infrared Controller

Overview

The VL82C147 PCI to Infrared controller provides an IrDA 1.1 (Fast IR) compatible high-speed 4.0 Mbps wireless link from a notebook or desktop computer to an infrared enabled peripheral. The VL82C147 also includes support for 1.152 Mbs (MIR), 115 Kbs (SIR) transfer rates, and can operate down to 9600 Kbps. The Eagle Eye provides a PCI or legacy 16C550 style UART interface to implement an IR interface for such applications as wireless printing, an important feature for mobile computing, data synchronization between two computers, such as a desktop and mobile system, and wireless LANs.

Manufactured in 0.6-micron CMOS technology, the VL82C147 has a configurable PCI interface that can accomodate a 3.3 V mobile PCI bus for notebook computers or a 5.0 V PCI bus for desktop computers. The device is packaged in an 80-pin VQFP to optimize critical board space in small form factor notebooks. The VL82C147 also integrates an on-board PLL to generate all internal clocks thereby reducing component count.

Power management was not overlooked either. The VL82C147 carries VLSI's Autonomic Clock Synchronization (ACS™) power management technology of localized clock control and full event monitoring that disables all logic that is not in current use and supports the "PCI Clock Run" protocol.

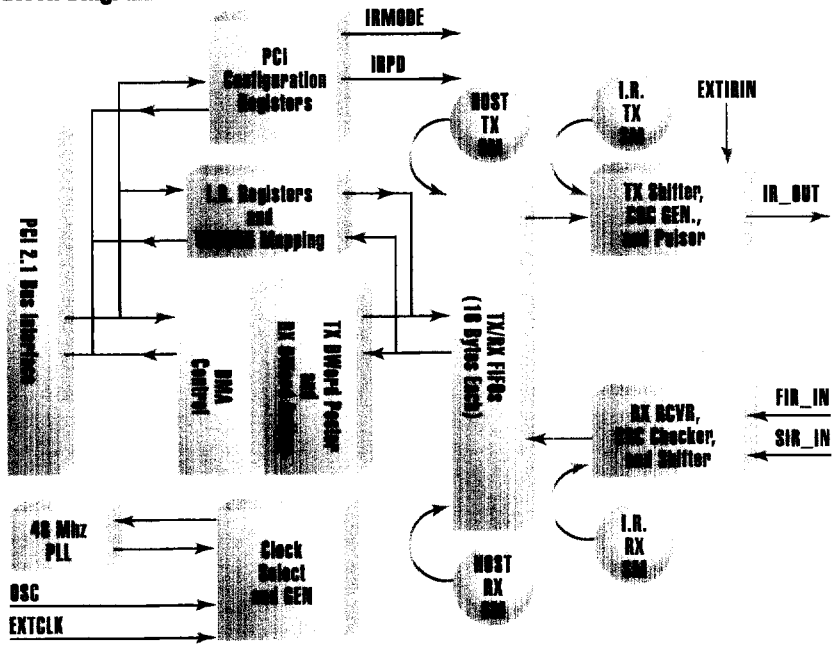
Features

- Supports 3.3-V/5-V PCI to 3.3-V/5-V IR Configuration
- Allows up to 33-MHz operation on PCI bus
- Contains PCI-compatible master/slave interface logic
- Contains 16-byte receive and transmit FIFOs
- Supports PCI address/data parity generation, checking and error reporting
- Locally power managed. Only one of six blocks enabled at a time (including clocks)
- Provides POR options for PLL voltage selection
- Mobile PCI Clock Run support
- 0.6-micron CMOS technology
- 80-pin VTQFP (Very Thin Quad Flat Pack)
- Win95, WinNT, and OS/2 IrDA support

VL82C147 in Detail

The VL82C147 contains a PCI-compatible bus interface and an IrDA-compliant digital serial interface. Together, they control the communication between the system and external IR capable transceiver devices. The PCI interface control consists of two main blocks, a master and a slave. In order for the VL82C147 to become a PCI bus master, it must first arbitrate for control of the bus. Bus arbitration is controlled by a centralized arbiter elsewhere on the PCI bus. Once bus ownership has been granted, the VL82C147 assumes PCI bus master responsibility transfering information to or from the IR interface. The slave interface enables other PCI masters to write directly to the 82C147.

Block Diagram



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The VL82C147 generates IrDA timing from an external 40 or 48 MHz oscillator, or an internally generated 48 MHz clock. The internal 48 MHz clock is generated by an on-board PLL locked to the externally supplied 14.318 MHz clock commonly available in PC systems.

All the data steering functions between the IR FIFOs and the PCI bus are performed within the VL82C147. PCI bus data reads wider than one byte are automatically split into two, three, or four FIFO cycles. During PCI bus data writes, the data bytes from the FIFO are assembled by latches into a double word before being written to the PCI bus.

The 82C147 also preserves the REQ#/GNT# pairs on the PCI bus by providing REQ#/GNT# expansion. By passing the pair of REQ#/GNT# signals through the device another PCI master is allowed to utilize the same REQ#/GNT# pair with a 1 clock delay. An internal aribiter tracks the requesting device.

A 16C550 interface is provided in slave mode that enables the use of legacy communications software.

Supports

- Transceivers that separate slow-speed and high-speed IR as well as single output transceivers with speed switching
- Dual IR inputs with two different filter ranges
- Connection to buffered IR output
- REQ#/GNT# expansion
- 24-ma output driver to transceiver device
- 16C550 legacy interface
- ASK mode support
- IrDA 115.2 Kbps interface
- IrDA 1.152 Mbs interface
- IrDA 4.000 Mbs interface

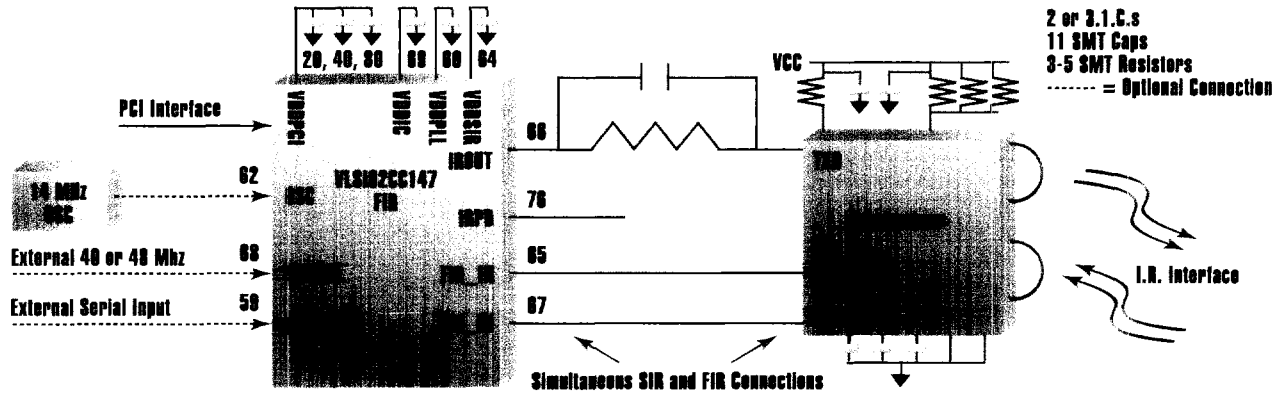
Integrates

- PCI bus interface controller
- PCI data buffers and steering logic
- Multi-mode IrDA controller
- Master mode transfers for all IrDA transfer rates
- 16C550 register mapping to support legacy applications up to 115.2 Kbaud
- On board PLL for internal 48-MHz clock generation
- Optional 40-MHz or 48-MHz external clock source

Test Mode Support

- Three-state outputs for board testing
- In-circuit Test (ICT) capability for verification of device/board connectivity

VLSI VL82C147 to Infrared Transceiver Ckt.



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