Version 1.4 2005

NET2282

PCI to USB 2.0 Hi-Speed Peripheral Controller

Features

- **Overview**
  - o PCI v3.0 – 66MHz, 32-bit Bus
  - o Hi-Speed USB 2.0 Peripheral Port
  - o Integrated 8051 CPU @ 30 MHz
  - o 32K of shared Random Access Memory accessible from the USB Host and the PCI Bus
  - o Descriptor-based DMA Controllers (4) for automatic data transfers
  - o Low Power 0.18u process ideal for USB Bus Powered Operation
  - o Lead Free Packaging
  - o 14x14mm, 120-Pin QFP Package

- **Conventional PCI Interface**
  - o PCI v3.0 - 66MHz, 32-bit PCI Bus
  - o 3.3V interface with 5V tolerance for compatibility with both 3.3 and 5V PCI systems
  - o Plug into existing PCI based systems to instantly add a High Speed USB 2.0 Device Port
  - o PCI Host Option for simple PCI Adapter to USB Peripheral Conversions
  - o Straightforward PC Card to ExpressCard™ Conversions
  - o Mastering PCI Interface
  - o Optional PCI Arbiter included

- **Hi-Speed USB 2.0 Interface**
  - o USB 2.0 Peripheral Interface
  - o Hi-Speed USB with Sustained Bandwidth of up to 40MBytes/sec (at 480 Mbps bursts)
  - o Backwards compatible to Full Speed USB connections
  - o Utilize up to 30 Independent USB Endpoints using Dynamic Virtual Endpoint Technology™
  - o USB Auto-Enumeration Technology
  - o Support for Bulk, Isochronous, and Interrupt Endpoints
  - o Integrated PHY

Simplified Hardware Design

PLX Technology's NET2282 PCI to Hi-Speed USB 2.0 Peripheral Controller is designed for easy integration with existing PCI based systems and silicon. While there are many PCI-based USB hosts on the market, the NET2282 is one of the only PCI-based USB peripheral controllers available. With the NET2282, adding a Hi-Speed USB Device port is just a matter of connecting the PCI signals with the same name together.

The PCI bus on the NET2282 can be either a PCI host or a PCI adapter. As a PCI adapter, the NET2282 can fit into any standard PCI slot (3.3 or 5 Volts). This means that any system with a PCI bus can instantly add a USB 2.0 peripheral port in minutes. As the NET2282 is supported by several operating systems, additional software modification can be minimized.

As a PCI host, the NET2282 can be used to convert existing PCI cards or CardBus adapters to stand alone USB devices or ExpressCard adapters. Rather than relying on a host PC's PCI chipset, the NET2282 has all the resources, including emulated main memory, to configure and bring up a PCI device. Furthermore, the Auto-Enumeration Technology in the NET2282 allows the USB device to be enumerated by a USB host without any interaction on the PCI side.

Tuned for Performance

The NET2282 is designed for high performance transfers, with its USB port able to match the bandwidth of most PCI chips.

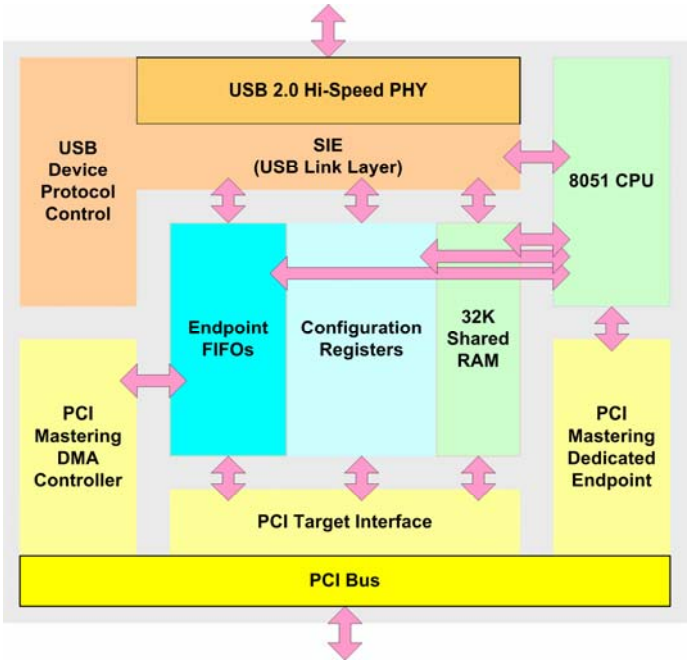

Figure 1: NET2282 Block Diagram

Four mastering, descriptor based DMA controllers, along with the NET2282's true FIFO structure, allow it to sustain transfers of up to 40 MBytes/sec. Even at these speeds, and the full PCI bus running, the low power consumption of the NET2282 allows for its use in USB bus-powered devices.

Design Applications

Add a USB Device Port to PCI-Based Systems

The NET2282 can be used to easily add a USB 2.0 peripheral port to a PCI based embedded system. The standard PCI interface of the NET2282 connects gluelessly to any PCI bus. Standard PCI registers allow the existing BIOS to configure and send data to and from the NET2282.

Firmware is available to configure the NET2282 to resemble a standard USB class device (like a printer or mass storage device) for which no USB host drivers will need to be written. For custom applications, firmware APIs are provided to abstract the USB transactions to reads and writes. This firmware is available for various operating systems.

Migrate PCI and CardBus Designs to USB

The NET2282 is designed to easily convert existing PCI cards or CardBus adapters to stand alone USB devices. Since both PCI and CardBus chips are based around the standard PCI protocol, the NET2282 connects gluelessly with them.

Instead of a PCI host chipset and BIOS on a PC configuring the PCI/CardBus silicon, the NET2282 can itself act as the PCI host, with configuration information coming from its internal 8051 CPU or from the USB host. Auto-Enumeration Technology allows a standard USB host to detect this new USB device even if no firmware has been run. This means that firmware can actually be downloaded to the USB device after initial boot-up.

The NET2282 includes PCI clock, reset, interrupt, and arbitration pins to compensate for the other components usually found in a typical PCI host environment. Shared memory in the NET2282 functions as main memory for holding descriptors or other control data. The integrated 8051 CPU can also be used to configure the device to resemble a standard USB class device (like a communications or video device) even if there is no local intelligence on the peripheral.

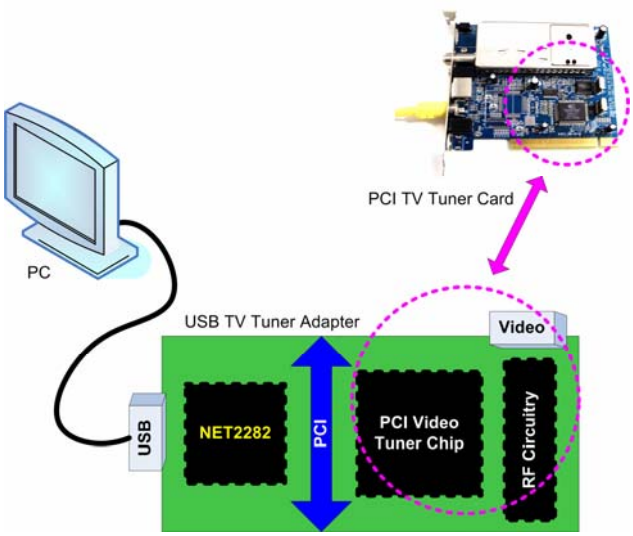

Figure 2: Converting a PCI TV Tuner Board to USB

The NET2282 Rapid Development Kit

The NET2282RDK includes a PCI board that easily plugs into any standard PCI slot (3.3V or 5V). This board also includes an optional PCI slot for plugging other PCI boards into the RDK board itself. That would be for those applications where the NET2282 will be the PCI host.

Both USB host and peripheral-side software is included with the NET2282RDK. The host-side software consists of USB drivers and test applications. The peripheral-side firmware is used to configure the NET2282 to resemble a standard USB class device (like a printer or mass storage device) for which no USB host drivers will need to be written. For custom applications, firmware APIs are provided to abstract the USB transactions to reads and writes. While this software is available for various operating systems, it is written in standard C with portability in mind. A porting guide is shipped with the kit.

Product Ordering Information

Part Number	Description
NET2282-AB33PC F	PCI to USB 2.0 Hi-Speed Peripheral Controller
NET2282-RDK	NET2282 Rapid Development Kit

Please contact your local PLX sales representative for ordering information.

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