

# Low Power IDE Data Storage Solution

## Application Description

A digital camera needs to balance image quality, power consumption, and processing speed. The Actel IGLOO™ FPGA family combined with the PalmChip Integrated Drive Electronics (IDE) storage solution can be a key part of an optimized integration of multi-megapixel digital imaging on an XScale platform. Power management allows microwatt power consumption in standby mode, reduced power consumption for casual shots, and 66 MB/s performance for continuous shooting.

## Features

- ATA/ATAPI host controller
- PIO mode 4, multi-word DMA mode 2 (17 MB/s)
- Ultra ATA mode 4 (66 MB/s)
- XScale VLIO interface with flow-through DMA
- Single-interrupt DMA command processing
- Power management

## Applications

- Digital camera
- Smartphones
- Security and surveillance

## Power/Performance Optimization

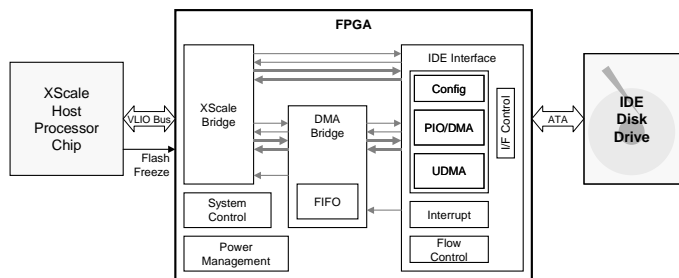
Standard digital cameras offer low storage throughput as a result of cost, power, and storage tradeoffs. High storage capacities and throughputs can be achieved using a SFF HDD or microdrive. Because high throughput is not needed in all modes of operations, the embedded processor can dynamically configure the IDE controller to optimize latency, throughput, or power consumption, depending on the current storage requirements.

## Actel IGLOO Flash\*Freeze™ Technology

Flash\*Freeze technology provides an ultra-low-power static mode that retains all I/Os, SRAM, and register information with rapid recovery to operation mode. The mechanism enables the user to quickly enter and exit Flash\*Freeze mode within one microsecond by activating the Flash\*Freeze pin while all power supplies are kept at their original values. During Flash\*Freeze mode, the IGLOO device consumes as little as 5 µW.

## Block Diagram

The IDE Controller bridges the XScale processor to an ATA/ATAPI device via the VLIO bus. The IDE Interface block manages the ATA protocol while hardware flow control manages interface data transfer. Intelligent interrupt management reduces software overhead. Power management is controlled by software to optimize performance and power consumption.



IDE Controller for XScale Processor

## About PalmChip

PalmChip Corporation is a hardware and software design services company with a portfolio of SoC (system-on-chip) semiconductor IP (intellectual property). PalmChip couples design and integration services with pre-built and pre-verified platforms that dramatically reduce time to silicon and enable a practical design re-use environment. The company is headquartered in San Jose, California.

## About Actel

Actel Corporation is the leader in single-chip FPGA solutions. The company is traded on the NASDAQ National Market under the symbol ACTL and is headquartered at 2061 Stierlin Court, Mountain View, Calif., 94043-4655. For more information about Actel, visit <http://www.actel.com>. Telephone: 1-650-318-4200.