QLogic Corporation

Zircon Baseboard Management Controller

Data Sheet

Features

- Compliance with *Intelligent Platform Management Interface* (IPMI) draft, version 1.x
- Compliance with PCI industrial computers manufacturers group *(PICMG) System Management Specification 2.9 D1.0 for CompactPCI Solutions*
- Up to 60 general purpose I/O pins
- 12 tachometer inputs for fan speed monitoring
- Eight pulse width modulator inputs for fan speed control
- Four push-button inputs for front panel buttons and switches
- 13 channel analog-to-digital converter inputs
- Two serial ports (16550 compatible universal asynchronous receiver/transmitters [UARTs]) for remote access and intelligent chassis management bus (ICMB) support
- Three I^2C master/slave ports
- Low pin count (LPC) bus provides access to three keyboard controller style (KCS) and one-block transfer interfaces
- 32-bit RISC processor
- 20K-bytes of internal RAM
- Development board and software design kit available
- 160-pin low profile flat pack (LQFP) package
- Firmware is provided for the following interfaces (contact QLogic for availability):
  - ❒ Intelligent platform management interface (IPMI)
  - ❒ Intelligent platform management bus (IPMB)
  - ❒ Intelligent chassis management bus (ICMB)

Product Description

Zircon is the first fully integrated baseboard management controller (BMC) for integration into server system boards that support IPMI. Zircon reduces system development time and implementation costs while increasing system reliability.

The Zircon block diagram is illustrated in figure 1.

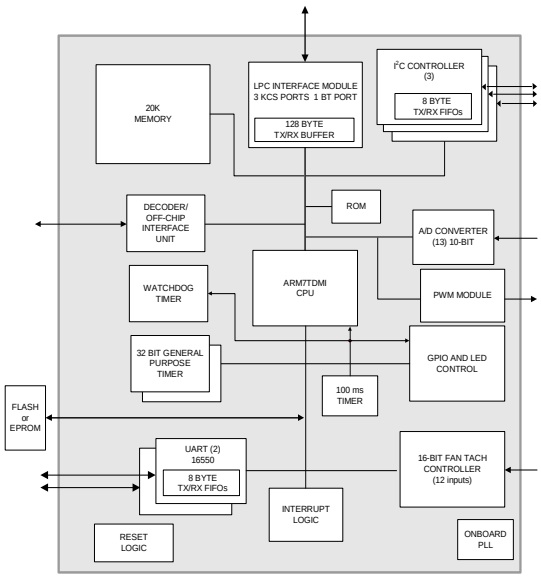

Figure 1. Zircon Block Diagram

The Zircon controller architecture provides maximum design flexibility in the smallest possible package. Incorporating an integral 32-bit RISC microprocessor with support for large addressable memory space, Zircon has the power needed for the most demanding system management applications. The embedded functions, multiple interfaces, and generous number of general purpose I/O pins allows users to implement Zircon to fit a wide range of systems.

QLogic provides a complete hardware and software solution, including drivers for all of the embedded interfaces and functions. QLogic also provides a complete IPMI protocol stack with support for IPMB for intra-chassis communications and ICMB for inter-chassis communications.

All firmware is developed in the C programming language, allowing users to easily enhance QLogic's IPMI microcode or develop custom system management software.

In addition to baseboard management applications, Zircon can be implemented as follows:

- Zircon can be configured as an ICMB bridge controller, which enables the external storage chassis to be integrated with the IPMI management architecture.
- Zircon can be implemented as a dedicated front panel controller in systems that a utilize a distributed system management architecture.
- Zircon is an ideal BMC or peripheral management controller for CompactPCI solutions that require an IPMI implementation.

Zircon's high integration, extensible design, and software support make it the ideal baseboard management solution for current and future servers.

Application

Zircon is the ideal baseboard management controller for customers who need intelligent system management. Figure 2 illustrates Zircon implemented in a server, which supports the IPMI specification.

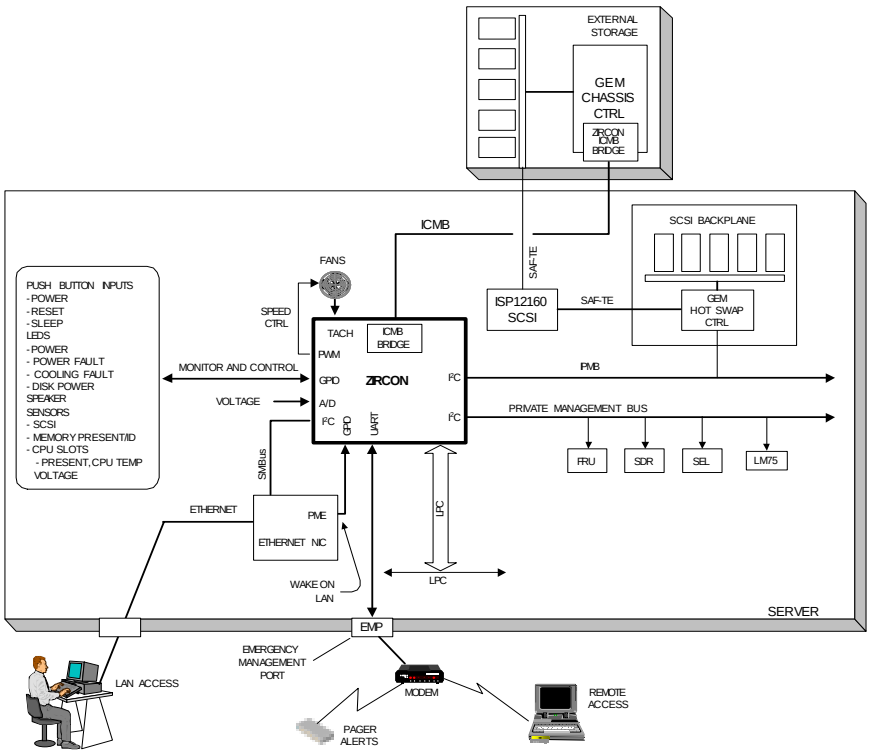

Figure 2. Zircon Application

Connectivity

The Zircon LPC bus provides access to the following internal IPMI-compliant interfaces:

- Three KCS interfaces that are defined as 8742-compliant interfaces.
- One block transfer (BT) interface. The BT interface is significantly faster than the KCS interfaces and it off loads overhead from the system processor.

Zircon has three identical I^2C master/slave ports, which can be used as follows:

- As a private management bus
- As an IPMB interface
- As an SMBus interface which, when connected to an Ethernet controller, provides LAN access to Zircon

Zircon has two integrated 16550-compatible UARTs supporting RS 485 or RS 232. The UARTs can be used for:

- Connecting to a modem for remote access to Zircon
- An emergency management port

- Supporting the ICMB for communication with other chassis.
- A debug port during development

Input/Output

Zircon has the following pin configuration:

- 60 general purpose I/O pins
- 12 tachometer inputs
- Eight pulse-width modulator outputs
- 13 A/D converter inputs (10-bit resolution)
- Four push-button inputs with de-bounce circuitry
- 16-bit external bus interface with four chip selects

Processor and Memory

Zircon incorporates a 32-bit, 40-MHz ARM7/TDMI processor core that provides the processing power and memory addressability required for IPMI-based system management. The internal RAM size is 20K bytes. Zircon provides an external chip select for flash ROM with a range of 128K-1Mbyte, plus four additional chip selects with an address range of 128K-1Mbyte each.

Software/Firmware Support

To accelerate system development, QLogic provides a complete set of software and firmware with the Zircon controller, as listed in the following sections. Please contact QLogic to determine availability.

IPMI Software

Zircon comes with the following IPMI software:

- IPMI protocol
- Block transfer protocol
- System management interface (SMI) , systems management server (SMS), advanced configuration and power interface (ACPI), and event protocols
- Field replaceable unit (FRU), system event log (SEL), and sensor data record (SDR) dbase servers
- Global and event commands
- ICMB bridge commands

Driver Software

Zircon comes with the following drivers:

- I^2C, UART, KCS, BT
- BMC watchdog and EEPROM

Development Environment

QLogic's Zircon software design kit includes the following:

- Zircon development board
- Firmware source code
- Technical manual and programmer's guide
- Reference design schematics

Before using the Zircon software development kit and board, the user must assemble a development environment that consists of the following tools, which are available from their respective vendors:

- Code generation: Green Hills Software development system
- Real time operating system (RTOS): ThreadX from Express Logic, Inc.
- JTAG port: EPI's JTAG embedded in-circuit (ICE) ethernet interface (JEENI)
- Trace port: HP 16700/600A logic analyzer

Ordering Information

Refer to the following model numbers to order Zircon and the development board and kit:

- Zircon chip: Zircon-LH1
- Zircon development board and kit: Zircon-EV-BD