QLogic Corporation

ZIRCON

Remote Management Controller

Data Sheet

Product Description

Zircon is the first fully integrated Remote Management Controller (RMC) specifically designed to be integrated into server system boards which support the Intelligent Platform Management Interface (IPMI). In addition to the baseboard management, Zircon provides advanced features that enable the remote management of the host system. Zircon reduces system development time and implementation costs, while increasing system reliability.

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 horsepower needed for the most demanding system management applications. The embedded functions, multiple interfaces, and generous number of general purpose input/output pins, enables customers tailor the Zircon implementation 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 plus a complete IPMI protocol stack. The IPMI software includes support for the Intelligent Platform Management Bus (IPMB) for intra-chassis communications. Software supporting IPMI over LAN for remote access via LAN and the Intelligent Chassis Management Bus (ICMB) for inter-chassis communications is also available.

In addition to baseboard management applications Zircon may be implemented as an ICMB bridge controller which enables external storage chassis to be integrated with the IPMI management architecture. Zircon may also be implemented as a dedicated front panel controller in systems which utilize a distributed system management architecture.

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

Key Benefits

- Complete management of system board including configuration, addressing, asset information and system event log
- Small footprint for embedded management applications
- Management of system from a remote location or LAN-based management station
- Support of 'headless" operation
- Remote fault recovery

Features

- IPMI Version 1.0 and 1.5 compatibility
- IPMI, IPMB , ICMB and IPMI over LAN firmware available
- Up to 60 general purpose input/output pins
- 12 tachometer inputs for fan speed monitoring
- 8 pulse width modulator inputs for fan speed control
- 4 push button inputs for front panel buttons and switches
- 13 channel analog-to-digital converter inputs
- 2 serial ports (16550 compatible UARTS) for remote access and ICMB support
- 3 I^2C master/slave ports
- LPC bus provides access to 3 KCS and 1 Block Transfer interfaces
- 32-Bit RISC processor
- 20 Kbytes internal RAM
- Development board and kit available
- Package: 160-pin LQFP

Zircon Block Diagram

Application

Zircon is the ideal Baseboard Management Controller for customers who need intelligent system management. The drawing below shows Zircon implemented in a server, which supports the IPMI specification.

Connectivity

Low Pin Count (LPC) Bus: Provides access to four internal IPMI-compliant interfaces:

- Three Keyboard Controller Style (KCS) interfaces that are defined as classic 8742 interfaces.
- One Block Transfer (BT) interface. The BT interface is significantly faster than the KCS interfaces and it offloads overhead from the system processor.

Three identical I^2C Master/Slave Ports: These ports may be used as follows:

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

Two Integrated 16550 compatible UARTS supporting RS 485 or RS 232. Used for:

- Connecting to a modem for remote access to Zircon
- As an emergency management port
- To support the ICMB for communication with other chassis.
- As a debug port during development

Input/Output

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

Processor and Memory

Zircon incorporates a 32-bit 40MHz ARM7/TDMI processor core providing the processing power and memory addressability required for IPMI-based system management. 20Kbytes of internal RAM is provided, expandable to 3Mbytes. External Flash ROM capacities from 1 Mbit to 2 Mbytes are supported.

Firmware

The Zircon firmware[1] provides a comprehensive set of features including:

- Complete Baseboard Management, including configuration, address information and system event log
- Remote System Monitoring
- Remote Server Control and Server Down Management
  - System Power Up/Down
  - System Reset
  - Access to System Configuration, status, asset tag information
  - Blue screen or OS core dump capture
  - Remote Diagnostics
  - Text Redirection at system boot
  - Network access
- Console Redirection
  - Redirection of System and BMC consoles
  - Windows XP Emergency Management Services (EMS) support

Zircon firmware is compatible with the Zircon Lite, and Zircon CP. This allows developers to leverage a single code base across their entire line of systems, from workstations and entry-level systems to high-end servers.

[1] Contact QLogic for firmware schedule

Turnkey Development Kit

The Turnkey Development Kit for Zircon is a complete IPMI development environment that includes support for the IPMI 1.0 and 1.5 [1] specifications. The TDK has an extensive set of application programming interfaces (APIs) and libraries as well as drivers for all supported peripherals and connectivity interfaces.

The TDK provides a rich development environment that includes a development board and reference design. All code is written in ANSI C and the Zircon includes a dedicated JTAG port supporting in-circuit emulation that makes customization of the platform code easy.

The TDK includes:

- IPMI Protocol and Framework
- Drivers for embedded hardware
- Platform application firmware supporting common management functions such as:
  - Sensor monitoring: CPU, temperature, voltage, fans, watchdog timer.
  - I/O and System Control Functions
  - Event Logging
- Pre-built SDR
- Configuration files
- Setups for recommended development tools
- Utility software
- Documentation and schematics

Support and Services

QLogic's team of experienced firmware developers and system architects provides world-class development support and integration services. Contact QLogic for details of service offerings.

Ordering Information

Model Number: Zircon-LH2
Part Number: 2405226
Developers Kit: Zircon-TDK
Evaluation Board: Zircon EV-BD

Zircon Baseboard Management Controller Product Line

Feature	Zircon CP	Zircon Lite	Zircon
IPMI Support	Yes	Yes	Yes
Package	128-Pin TQFP	160-Pin LQFP	160-Pin LQFP
Package Size	14mm x 14mm x 1.2mm	24mm x 24mm x 1.6mm	24mm x 24mm x 1.6mm
Processor	40MHz 32-Bit RISC	40MHz 32-Bit RISC	40MHz 32-Bit RISC
Internal RAM	14 Kbtes	14 Kbytes	20 Kbytes
Addressable Memory	3 Mbyte	3 Mbytes	5 Mbytes
GPIO (Maximum)	38 (LPC), 28 (ISA)	40 (LPC), 30 (ISA)	60
Fan Tachometers	4	4	12
Pulse Width Monitors	2	2	8
Analog to Digital Converter Inputs (10-bit resolution)	6	8	13
I^2C ports	2	2	3
UARTs	1	1	2
LPC Bus Interface	Yes	Yes	Yes
ISA Bus Interface	Yes	Yes	No
Block Transfer Interface	Yes	Yes	Yes
KCS Interface	Yes (2)	Yes (2)	Yes (3)
ICMB support	Hardware only	Hardware only	Hardware and Firmware

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