Universal Multiport Memory Controller (UMMC)-DDR/LPDDR

Overview

Mobiveil’s UMMC Controller is a highly flexible and configurable design. It is targeted for high bandwidth access and low power consumption such as next-generation mobile, networking and consumer applications. The controller architecture is carefully tailored to achieve reliable high-frequency operation with dynamic power management and rapid system debug capabilities.

UMMC Controller is part of Mobiveil’s Storage and Memory controller family of IP solutions which also includes NVM Express (UNEX), Integrated Flash Controller (IFC), and Secured Digital Host Controller (eSDHC) IP cores.

The controller’s configurable and layered architecture is independent of application logic, PHY designs, implementation tools and most importantly the target technology. Mobiveil solution allows the licensees to easily migrate among FPGA, Gate array and Standard cell technologies optimally. Its flexible AXI System interface makes it easy to be integrated into wide range of applications. Mobiveil provides solution for high scalable bandwidth through configurable lanes, widths and frequencies. UMMC controller leverages Mobiveil’s years of experience in HyperTransport, PCI, PCIe, RapidIO technologies and in creating system validated IP solutions with RTL synthesis, simulation, board and software elements to offer lowest risk in terms of compliance and inter-operability.

Features

- Compliant with AXI4 specification
- Compliant with DFI 3.1 Specification
- RLDRAM2/RLDRAM3 support and JEDEC compliant DDR3/DDR4/LPDDR2/LPDDR3 support
- Supports memory data width from 8 to 64 bits for DDR3, DDR4, LPDDR2 & LPDDR3 and x9, x18, x36 devices in any combined data width for RLDRAM2 & RLDRAM3
- Supports single and multi-port host buses AMBA4 AXI up to 32 ports
More Features

- Built-in asynchronous interface support for DRAM frequencies that are not equal to the AXI frequency
- High, medium, normal port priority
- Separate write and read queues
- The AXI ID signals support out-of-order transactions

Specifications

Features

- Supports multiple ranks up to 4
- Supports 16/8/4 banks per rank
- Configurable AXI address width
- Configurable Request queue depth
- Configurable Write and Read data FIFO size
- Configurable QoS through various arbitration schemes
- Supports following MC Clock to PHY Clock ratio
  - 1:1 (Full-rate Mode)
  - 1:2 (Half-rate Mode)
  - 1:4 (Quarter rate Mode)
- Supports self-refresh and partial array self-refresh
- Supports Auto-refresh, per-bank refresh and multi-bank refresh (RLDRAM)
- Supports various power down modes – Active/Precharge/Deep power down
- Supports intelligent request scheduling
- Maximizes bus efficiency through look-ahead command processing and bank-level parallelism

Design Attributes

- Highly modular and configurable design
- Layered architecture
- Fully synchronous design
- Supports both sync and async reset
- Clearly demarcated clock domains
- Software control for key features

Product Package

- Configurable RTL Code
- HDL based test bench and behavioral models
- Test cases
- Protocol checkers, bus watchers and performance monitors
- Configurable synthesis shell

Documentation

- Design Guide
- Verification Guide
- Synthesis Guide

About Mobiveil

Mobiveil is a fast growing Technology company that specializes in creation of Intellectual Properties, Frameworks and Solutions for the Networking, Enterprise and Device Mobility markets. The Mobiveil team leverages decades of experience in delivering high-quality, production-proven, high-speed serial interconnect Silicon IP cores to the leading customers worldwide. With a highly motivated engineering team, dedicated integration support, flexible business models, strong industry presence through strategic alliances and key partnerships, Mobiveil solutions have added tremendous value to the customers in executing their marketing and engineering goals within budget and on time.

Mobiveil is headquartered in the Silicon Valley with engineering development centers located in Milpitas, Chennai, Bangalore and Hyderabad, Sales offices and representatives located in US, Europe, Israel, Japan, Taiwan and Peoples Republic of China.

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Patents and Patents pending.

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