NVMe 高速存储的 FPGA 实现

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摘　要：针对当前 SATA 接口数据传输低延迟和读写性能的不足，结合空间应用对主控系统的需求，进行了高速接口设计，本文提出了一种 NVMe 高速存储的 FPGA 实现方案.基于 Xilinx 公司的 ZC706 评估板，参考 NVMe 协议 1.3a，运用 VHDL 硬件描述语言，采用模块化设计理念，完成 NVMe 主控 IP 核的设计.经仿真验证表明，该主控 IP 核能正确完成读、写、设备复位、识别等操作，可应用于嵌入式存储系统.

关键词：NVMe1.3a；主控端；高速；FPGA；VHDL

A high-speed storage system of NVMe based on FPGA

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Abstract：In view of the shortcomings of low-latency data transmission and fast reading and writing of the current SATA interface, combined with the requirement of space application to the host controller, this paper proposed a FPGA implementation scheme for NVMe high-speed storage. It takes NVMe 1.3a protocol for reference and is implemented on the basis of ZC706 evaluation board of Xilinx with modular design concept in VHDL language. According to the simulation verification, it shows that the controller IP core can realize many operations, such as reading, writing, device reset and identification. It can be applied to embedded storage system.

Key words：NVMe1.3a; Host; High-speed; FPGA; VHDL

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