

PCIE3.0 接口的 SSD 硬盘的 FPGA 实现

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摘 要: 设计并实现了一个高性能固态硬盘的硬件原型系统.该固态硬盘以 NAND 闪存为存储介质, 满足 ONFI4.0 相关标准.与主机通过第三代 PCIe 总线接口进行通信.主控部分基于 FPGA 实现.在实现上, 采用了双总线结构, PCIe3.0 接口并介绍了 NAND 闪存转换层的设计.

关键词: 固态硬盘; 闪存; 现场可编程逻辑门阵列; 高速互联总线

Design of High-speed Solid State Drive in FPGA

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Abstract: A high-performance solid state drive(SSD) is designed and implemented in the essay. NAND flash chip that obey the standard of ONFI4.0 is used as the storage media in SSD. SSD communicate with the host through PCIe bus. The control part is implemented based on FPGA. A dual-bus structure and PCIe3.0 IP core are introduced. NAND flash translation layer(FTL) is also described in detail.

Key words: solid state drive; NAND flash; FPGA; PCI express

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