AXIe 高速数据采集传输接口设计

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摘　要：为了解决海量数据的高速传输问题，本文以 AXIe(Advanced TCA Extensions for Instrumentation)总线为传输架构，重点设计数据的高速缓存和传输接口，并设计时间交织数据采集模块完成 AXIe 数据采集传输接口验证.通过两片 ADC 实现时间交织数据采样功能，将 DDR3 作为数据的深存储单元，采用 PCI Express 实现数据高速传输.在 FPGA 上完成设计，使用 ILA 嵌入式逻辑分析仪进行功能验证.结果表明，该设计能很好地实现交织采样功能，完成基于 AXIe 总线的数据传输.

关键词： 交织采样； DDR3；PCI Express；AXIe 接口

The design of high-speed data acquisition and transmission interface of AXIe

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Abstract：In order to solve the problem of high-speed transmission of massive data, this paper uses AXIe (advanced TCA extensions for instrumentation) bus as the transmission architecture, and focuses on the design of data cache and transmission interface, and designs time-interleaved data acquisition module to complete AXIe data acquisition and transmission interface verification. The time-interleaved data sampling function is realized by two ADCs, and DDR3 is used as a deep storage unit of data, and high-speed data transmission is realized by using PCI Express. The design was done on the FPGA and functional verification using the ILA embedded logic analyzer. The results show that the design can achieve the interleaving sampling function well and complete the data transmission based on AXIe bus.

Key words： time-interleaved; DDR3; PCI Express; AXIe interface

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