基于高速数据采集的 NoC 路由器设计

许川佩，刘　标

（桂林电子科技大学电子工程与自动化学院，广西自动检测技术与仪器重点实验室，广西桂林 541004）

摘　要：针对 NoC 数据处理量越来越大，确定性算法在数据量较大时，数据包传输延迟增大，而简单的自适应算法占用过多的片上资源等问题，将改进 XY 自适应算法应用在片上网络中，节点设计基于 2D_Mesh 拓扑结构、虚通道技术的虫洞交换模式.采用 VerilogHdl 语言完成 NoC 路由节点中各个模块的设计，并在 Modelsim 软件上进行仿真，最终在 FPGA 上实现 NoC 路由器功能.实验结果表明，设计的路由器能够满足高速数据的处理，且不会有延迟、死锁等问题的发生.

关键词：NoC；FPGA；改进 XY 自适应路由算法

Design of NoC Router Based on High Speed Data Acquisition

XU Chuan-pei, LIU Biao

(Guangxi Key Laboratory of Automatic Detection Technology and Instrument,School of Electronic Engineering and Automatic,Gulin University of Electronic Technology,Guilin 541004,China)

Abstract：Since the quantity of data process for NoC is more and more large, the packet transmission delay is increased with the deterministic algorithm. However, the simple adaptive algorithm takes too many on-chip resources.To solve the problems, the improved XY adaptive routing algorithm is adopted in this paper. We design node based on 2D_Mesh topology structure and wormhole switching mode of virtual channel technology. In addition, VerilogHdl language is used to complete the design of each part function for NoC routing node. Finally, the simulation experiment is carried out on Modelsim software and the function of NoC routing node is implemented on FPGA. Experimental results show that, the router designed in this paper can satisfy the process of high speed data and avoid the delay and deadlock issues.

Key words：NoC；FPGA；improve XY adaptive routing algorithm

作者简介：

许川佩　女，（1968-），博士，教授，硕士生导师.研究方向为集成电路测试及嵌入式系统应用.

刘　标（通讯作者）　男，（1989-），硕士研究生.研究方向为集成电路设计.E-mail:827677504@qq.com.