

## 面向对数与指数函数的可重构阵列结构

吕青, 蒋林, 邓军勇, 李雪婷

(西安邮电大学 电子工程学院, 陕西 西安 710121)

**摘要:** 对数与指数函数等超越函数应用广泛, 但传统实现需要针对每一类函数开发专用硬件, 周期长、成本高、灵活性差, 为了适应体系结构向自主运算发展的趋势, 提高超越函数处理的灵活性, 本文面向对数和指数两种函数提出了一种可重构阵列结构. 通过将两种函数处理算法向阵列结构中的对应处理元 PE (Processing Element) 进行映射完成重构. 仿真结果表明, 可重构计算技术兼顾了计算的灵活性与高效性, 与专用硬件实现性能相当, 最高频率可以达到 210.117 MHz.

**关键词:** 对数函数; 指数函数; 可编程; 可重构; 阵列处理器

## A Reconfigurable Array Structure for Logarithmic and Exponential Functions

LV Qing, JIANG Lin, DENG Jun-yong, LI Xue-ting

(School of Electronic Engineering, Xi'an University of Posts and Telecommunications, Xi'an 710121, China)

**Abstract:** The logarithmic and exponential functions are widely used, but the traditional implementation needs to be developed for each class of functions, which can lead to a long cycle, high cost and poor flexibility. In order to adapt to the development trend of the system structure, improve the flexibility of the transcendental function, this paper presents a reconfigurable array structure with two functions. The logarithmic and exponential functions are realized by programming, and then the reconfiguration is performed by configuring the processing element PE of the array structure. Based on the simulation results, reconfigurable computing technology takes into account the flexibility and efficiency, and it has the same performance with the application specific circuit, the maximum frequency up to 210 MHz.

**Key words:** logarithmic function; exponential function; programmable; reconfigurable; array processor

**作者简介:**

吕青 女, (1989-), 硕士研究生. 研究方向为集成电路系统设计. E-mail: 390396308@qq.com

蒋林 男, (1970-), 教授. 研究方向为专用集成电路设计.

邓军勇 男, (1981-), 副教授. 研究方向为专用集成电路设计.