

## 基于新型极性转换技术的XNOR/OR电路面积优化

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## Area Optimization of XNOR/OR Circuits Based on Novel Polarity Conversion Technique

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摘要

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**摘要** 极性转换是Reed-Muller(RM)逻辑电路优化的基本环节, 该操作的具体数量随电路规模增长而增加, 其速度直接影响整体优化算法的效率。针对RM电路的XNOR/OR实现形式, 推导电路面积优化的数学模型; 结合当前极性转换算法的优势, 提出一种新型极性转换技术; 根据新型极性转换的特点, 构建适用于较大规模XNOR/OR电路的面积优化算法。实验结果表明, 与已有极性转换方法相比, 所提新型极性转换技术能明显改善XNOR/OR电路面积优化的效率。

**关键词:** XNOR/OR电路 极性转换 面积优化

**Abstract:** As a kind of basic operation, polarity conversion is largely involved in the polarity optimization of Reed-Muller (RM) logic circuits, especially for large-scale circuits. The rate of polarity conversion has a direct impact on efficiency of the polarity optimization. A mathematical model is established for area optimization of XNOR/OR circuits, which is a kind of basic realization of RM logic circuits. A novel polarity conversion technique is proposed by combining the superiorities of the existing ones. Based on the features of the novel conversion technique, an area optimization is proposed for large-scale XNOR/OR circuits. Experimental results show that compared to other conversion algorithms, the proposed polarity conversion technique can significantly improve the area optimization of XNOR/OR circuits.

**Keywords:** XNOR/OR circuits Polarity conversion Area optimization

Received 2011-12-09;

本文基金:

国家自然科学基金(61076032), 浙江省重点科技创新团队项目(2011R09021-04)和浙江省自然科学基金(Y1101078)资助课题

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引用本文:

张会红, 汪鹏君, 俞海珍. 基于新型极性转换技术的XNOR/OR电路面积优化[J] 电子与信息学报, 2012, V34(7): 1767-1772

Zhang Hui-Hong, Wang Peng-Jun, Yu Hai-Zhen. Area Optimization of XNOR/OR Circuits Based on Novel Polarity Conversion Technique[J], 2012, V34(7): 1767-1772

链接本文:

<http://jeit.ie.ac.cn/CN/10.3724/SP.J.1146.2011.01298> 或 <http://jeit.ie.ac.cn/CN/Y2012/V34/I7/1767>

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