

عنوان مقاله:

Voltage-Controlled Differential Ring Oscillator Based on FGMOS

محل انتشار:

اولین کنفرانس بین المللی و هفتمین کنفرانس ملی مهندسی برق و سیستم های هوشمند (سال: 1402)

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خلاصه مقاله:

In this article, a modified differential delay cell (DDC) based on a floating gate MOS (FGMOS) transistor is presented, which can be implemented with only ۶ transistors and its delay characteristics can be easily changed without any additional mechanism. A ۳-stage voltage-controlled differential ring oscillator (VC-DRO) was implemented based on the proposed DDC. The proposed oscillator was simulated with ۱۸۰-nm CMOS technology with ۱V supply voltage. A control voltage was applied to the second input of the FGMOS transistor, and based on the simulation results, it was determined that the oscillation frequency changed in the range from ۱.۰۹۴ GHz to ۱.۵۶۶ GHz. The power consumption in the proposed oscillator changes in the range of frequency adjustment from ۳۳۳.۸۵ μ W to ۷۲۶.۰۳ μ W. Based on the results, the power delay product (PDP) value for the proposed ۳-stage oscillator is in the range of ۴۹.۸۸ fJ to ۷۷.۲۳ fJ. By changing the supply voltage in the range of ۰.۴ V to ۱ V and the control voltage equal to ۰.۴ V, the oscillation frequency varies from ۶.۰۱۳ MHz to ۱.۵۷۷ GHz and the power consumption varies from ۰.۳۳۹ μ W to ۷۲۸.۵۶ μ W. Also, the PDP value varies from ۹.۴۱ fJ to ۷۶.۹۸ fJ

کلمات کلیدی:

Differential Delay Cell (DDC), Floating-Gate MOS (FGMOS) Transistor, Power Delay Product (PDP), Voltage-Controlled Differential Ring Oscillator ((VC-DRO

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