

Adiabatic logic: future trend and system level perspective

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Abstrak

[Adiabatic logic is a potential successor for static CMOS circuit design when it comes to ultra-low-power energy consumption. Future development like the evolutionary shrinking of the minimum feature size as well as revolutionary novel transistor concepts will change the gate level savings gained by adiabatic logic. In addition, the impact of worsening degradation effects has to be considered in the design of adiabatic circuits. The impact of the technology trends on the figures of merit of adiabatic logic, energy saving potential and optimum operating frequency, are investigated, as well as degradation related issues. Adiabatic logic benefits from future devices, is not susceptible to Hot Carrier Injection, and shows less impact of Bias Temperature Instability than static CMOS circuits. , Adiabatic logic is a potential successor for static CMOS circuit design when it comes to ultra-low-power energy consumption. Future development like the evolutionary shrinking of the minimum feature size as well as revolutionary novel transistor concepts will change the gate level savings gained by adiabatic logic. In addition, the impact of worsening degradation effects has to be considered in the design of adiabatic circuits. The impact of the technology trends on the figures of merit of adiabatic logic, energy saving potential and optimum operating frequency, are investigated, as well as degradation related issues. Adiabatic logic benefits from future devices, is not susceptible to Hot Carrier Injection, and shows less impact of Bias Temperature Instability than static CMOS circuits.]