

ABSTRACT

CMOS temperature sensor utilizing interface-trap charge pumping

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The objective of this thesis is to introduce an alternative temperature sensor in CMOS technology with small area, low power consumption, and high resolution that can be easily interfaced. A novel temperature sensor utilizing the interface trap charge pumping phenomenon and the temperature sensitivity of generation current is proposed. This thesis presents the design and characterization of the proposed temperature sensor fabricated in 0.18 μm CMOS technology. The prototype sensor is characterized for the temperature range of 27°C to 120°C. It has frequency output and exhibits linear transfer characteristics, high sensitivity, and high resolution. This temperature sensor is proposed for microprocessor thermal management applications.