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Nolan et al.

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[54] **PRECISION TEMPERATURE SENSOR INTEGRATED CIRCUIT**

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[52] **U.S. Cl.** **327/512**

[58] **Field of Search** 327/512, 513; 331/66, 176

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[57] **ABSTRACT**

A precision temperature sensor produces a clock frequency which varies predictably over wide variations of ambient temperature. The invention has a oscillation generator, two independent current generators, a reference oscillator and a frequency counter. The outputs of the two independent current generators are combined to provide an approximately linear capacitor charging current which is directly proportional to changes in temperature. The capacitor charging current is used to drive the oscillation generator which outputs a clock frequency that is approximately linearly dependent on temperature with determinable slope and intercept. The frequency counter compares the output of the oscillation generator with the independent reference oscillator to compute a digital value for temperature. The precision temperature sensor is implemented on a single, monolithic integrated circuit.

35 Claims, 7 Drawing Sheets

