

EXHIBIT A

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(54) RING OSCILLATOR DYNAMIC
ADJUSTMENTS FOR AUTO CALIBRATION

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(51) **Int. Cl.⁷** **G01J 5/00**

(52) **U.S. Cl.** **331/66; 331/176; 374/152;**
374/163; 374/170; 374/171; 374/185; 374/208

(58) **Field of Search** 331/66, 176; 374/152,
374/163, 170–171, 185, 208

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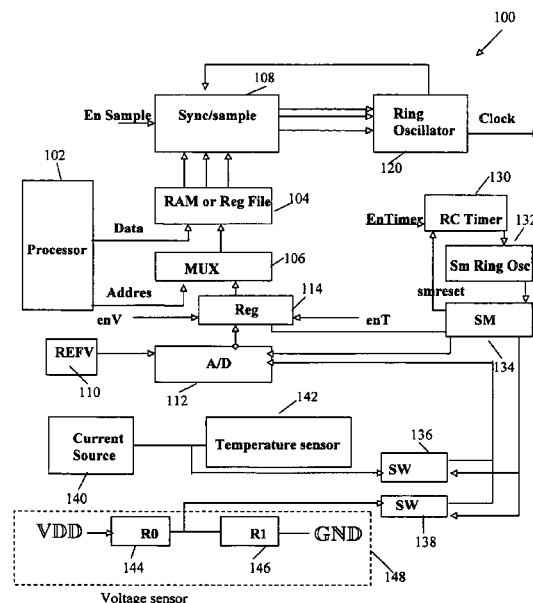
Primary Examiner—Michael Tokar

Assistant Examiner—Khai Nguyen

(57) **ABSTRACT**

An apparatus compensates for voltage and temperature variations on an integrated circuit with: a voltage sensor having a digital voltage output; a temperature sensor having a digital temperature output; a register coupled to the voltage sensor and the temperature sensor, the register adapted to concatenate the digital voltage output and the temperature output into an address output; and a memory device having an address input coupled to the address output of the register, the memory device being adapted to store one or more corrective vectors.

20 Claims, 6 Drawing Sheets



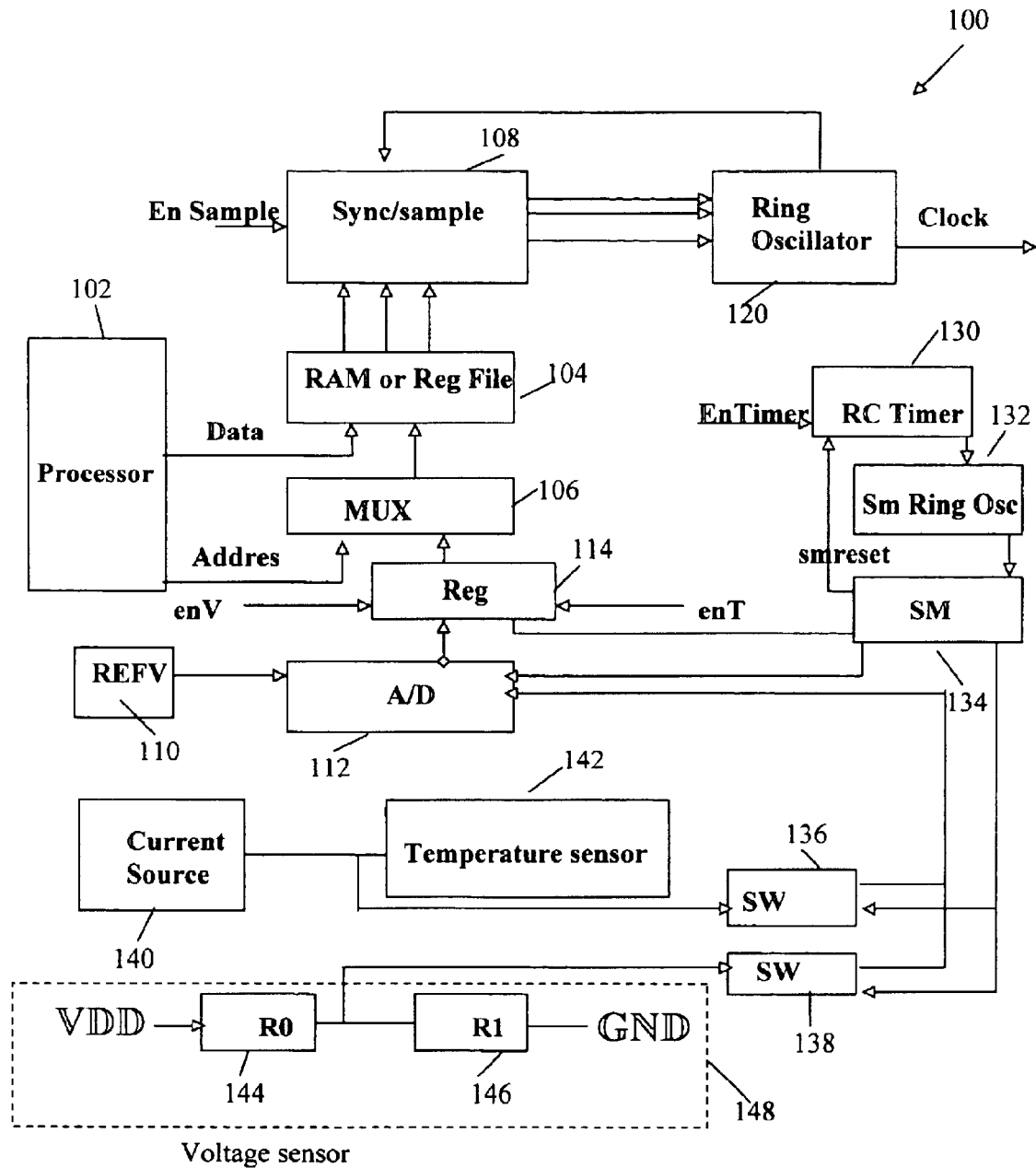


Fig. 1 - Combined V/T with 1 A/D

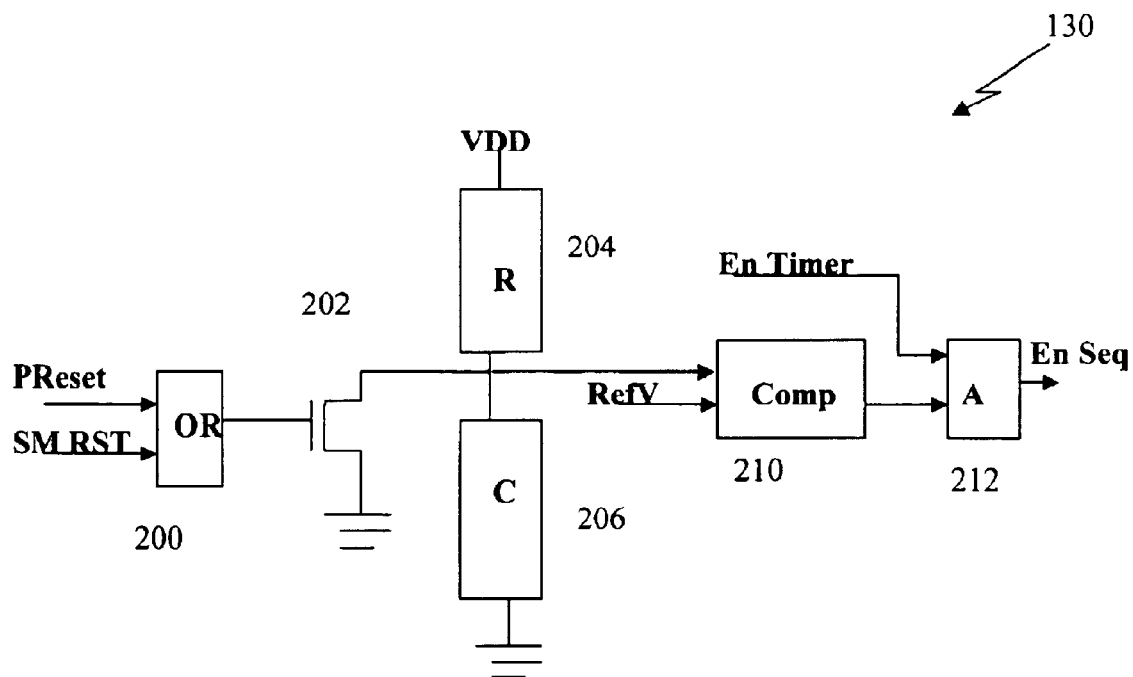


Fig 2 - RC Timer

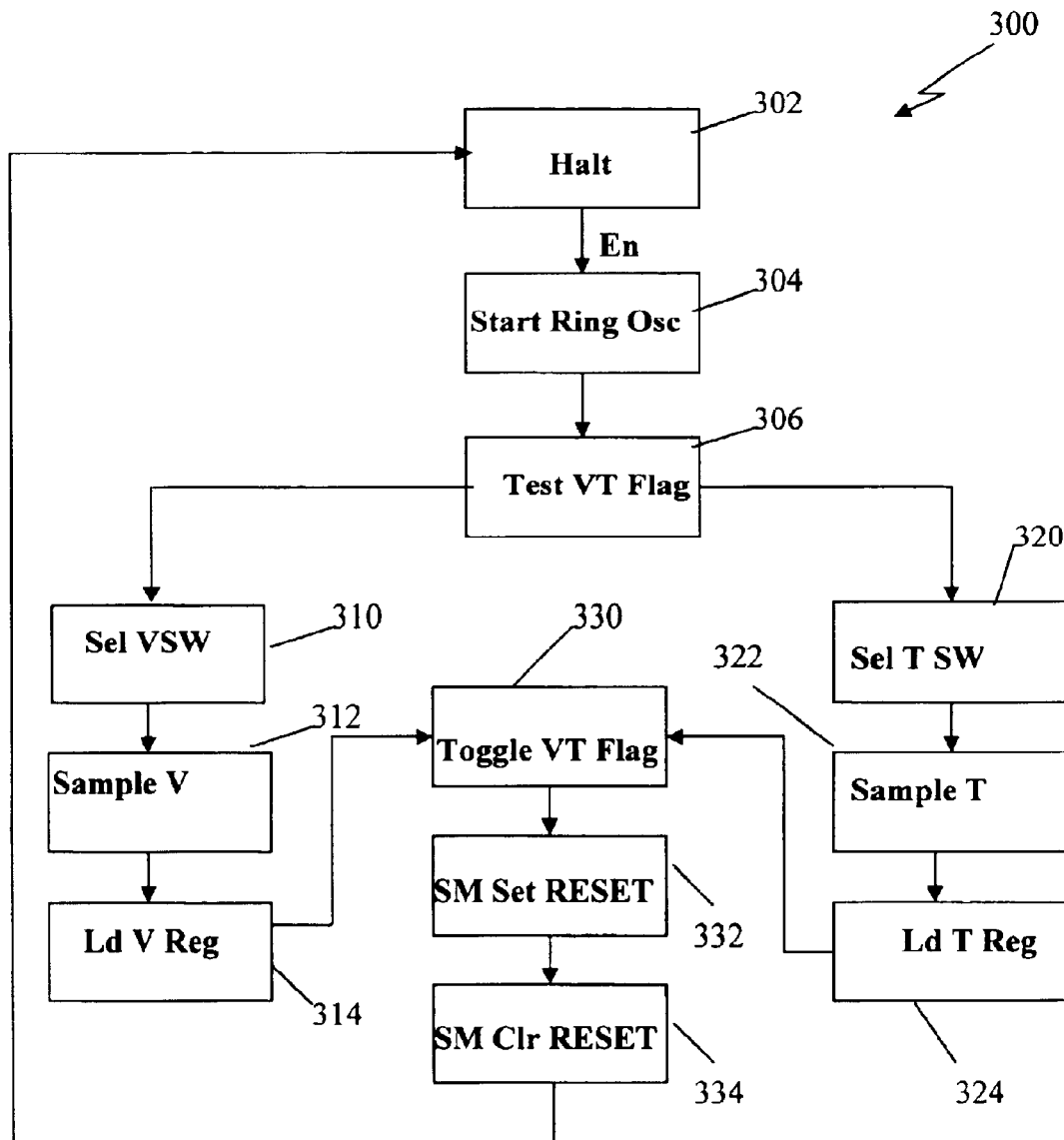


Fig 3 - SM Sequence

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