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(54) **AUTO-CALIBRATION CIRCUIT TO MINIMIZE INPUT OFFSET VOLTAGE IN AN INTEGRATED CIRCUIT ANALOG INPUT DEVICE**

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(58) **Field of Search** 330/9, 51, 69; 327/124, 307

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(57) **ABSTRACT**

An auto-calibration circuit minimizes input offset voltage in an integrated circuit analog input device. The auto-calibration circuit may also calibrate a plurality of analog input devices on an integrated circuit die or in a multi-chip package (MCP). The auto-calibration circuit and analog input device(s) may be fabricated in combination with a microcontroller system on an integrated circuit die or in an MCP. The auto-calibration circuit controls input offset voltage compensation circuit that counteracts or compensates for input offset voltage so as to minimize voltage error at the output of the analog input device. A digital control circuit applies a digital word to the input offset voltage compensation circuit for generating the required input offset voltage compensation. A linear search or binary search of various values of the digital word may be used by the digital control circuit. The digital control circuit switches the inputs, the output and feedback-gain determining resistors for the analog input device during a calibration mode. A voltage comparator compares the output of the analog input device and a voltage reference. When the output of the analog input device is equal to or greater than the voltage reference, the comparator output signals the digital control circuit by changing its output logic level. The input offset voltage compensation circuit of the analog input device has a storage register or memory that retains the digital word which compensates for the input offset voltage.

33 Claims, 4 Drawing Sheets

