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Author Chih Chang Tsai
Author's Email Address No Public.
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Abstract
This paper presents the design of a capacitive sensor signal processing system, which is capable of converting the capacitance change into digital signal output with high accuracy and short conversion time. The system consists the current conveyors, analog switches, current source, A/D converter and 32-bit advanced RISC machine (ARM). The digital readout ranges from 0000 to FFFF corresponding to the capacitance change ranging from 0 pF to 2 pF. Due to the functions of proposed system, the gain of digital readout versus sensor-capacitance change can be calibrated automatically. The effects of offset voltage and parasitic capacitance can be eliminated. Therefore, the relation of digital readout versus sensor-capacitance change exhibits high accuracy. The conversion time and maximum nonlinearity are less than 100 and 24 ppm, respectively.
Keywords—Capacitive sensor , real-time measurement current conveyor, advanced RISC machine.
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