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Research Article

Op-Amps for Pipeline ADCs

Dr. P. Prasad Rao

Corresponding Author:
prasadrao_hod@yahoo.co.in

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ABSTRACT

All electrical signals in nature are analog and since most of the signal processing is done in the digital domain, Analog to Digital (ADC) and Digital to Analog (DAC) converters have become a necessity. Flash ADC makes all bit decisions in a single go while Successive approximation ADC makes single bit decision at a time. Flash ADCs are faster but area increases exponentially with bit length while successive approximation ADC is slow and occupies less area. Between these two extremes, many other architectures exist, deciding a fixed number of bits at a time such as pipeline and multistep ADCs. They balance circuit complexity and speed. For medium speed and with high resolution pipelined ADCs are promising. This paper is devoted to study the op-amp requirements for pipelined ADCs and the comparison of different op-amp architectures.

Keywords: Pipelined ADCs, Open loop gain, Unity gain frequency, folded cascode op-amp, Gain boosting technique.

Professor, Department of Electronics & Communication Engineering
Vaagdevi College Engineering (Autonomous), Affiliated to JNTUH, Warangal - 506 005.

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