

ABSTRACT

Transconductance Amplifier Structures With Very Small Transconductance

A Comparative Design Approach

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A family of nCMOS operational transconductance amplifiers (OTAs) has been designed for very small G_m 's (of the order of nanoamperes per volt) with transistors operating in moderate inversion. Several OTA design schemes such as conventional, using current division, floating-gate, and bulk-driven techniques are discussed, as well as, a wide tuning range OTA architecture. A detailed comparison has also been made among these schemes in terms of performance characteristics such as power consumption, active silicon area, and signal-to-noise ratio. The transconductance amplifiers have been fabricated in a 1.2 μm n-well CMOS process and operate at a power supply of 2.7 V. Chip test results are in good agreement with theoretical results.