Voltage-Mode First-Order Allpass Filter Using Single-Ended OTAs and Grounded Capacitor

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In this paper, a new electronically tunable first-order allpass filter using only three single-ended OTAs and one grounded capacitor, which is suitable for IC implementation, is presented. The pole frequency of the proposed filter can be tuned electronically by changing the transconductance value through the biasing current of OTA. The realization of the allpass filter imposes no component-matching conditions. Also the circuit provides high input impedance which can be directly connected in cascade to applications, i.e., quadrature oscillator, higher order filter, high-Q bandpass filter. Compared to other similar circuits, the proposed circuit employs lesser transistors and is more suitable for IC implementation. Simulation results are included to verify theory.

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