

A 1-V 3.5-mW CMOS Switched-Opamp Quadrature IF Circuitry for Bluetooth Receivers

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Based on only half-delay switched-capacitor integrators, a 7th-order IF-filter and a 3rd-order $\Sigma\Delta$ modulator using a novel noise-shaping extension technique are implemented for a Bluetooth receiver in a 0.35- μm CMOS process. At a 1-V supply, the quadrature IF circuitry achieves a measured IIP3 of -3 dBm at a nominal gain of 24 dB through a 48-dB variable-gain control with a power dissipation of 3.5 mW.