Abstracts

Linearity analysis of CMOS for RF application (2002 [RFIC])

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The linearity of CMOS is analyzed. Transconductance and output conductance are two dominant nonlinear sources of CMOS. Capacitances and substrate leakage network do not generate any significant distortions. But they reduce the output impedance for the best linearity and the power in at a high frequency and the output conductance nonlinearity is significantly at a high frequency. Up to a few GHz, the output conductance is the dominant nonlinear source, and at a higher frequency, the transconductance is the dominant nonlinearity source. OIP3 is reduced by the effects of those components. OIP3s are calculated for various gate length processes. CMOS linearity is dependent only on current density and drain bias voltage but is not dependent on gate length.

❑ Return to main document.