Abstracts

A new linearization technique for MOSFET RF amplifier using multiple gated transistors

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A simple linearization technique using multiple gated common source transistors is proposed where gate width and gate drive (V/sub gs/-V/sub th/) of each transistor are chosen to compensate for the nonlinear characteristics of the main transistor. To demonstrate the feasibility of this approach, a prototype double-gated RF amplifier using two MOSFETs is implemented and its RF characteristics are compared with those of a single one. The results show that, compared with a conventional single-gate transistor amplifier, the third order intermodulation (IMD/sub 3/) is improved by 6 dB with similar gain, fundamental output power, and DC power consumption. Because the auxiliary transistor is smaller than the main one and biased at subthreshold, adding this does not affect amplifier characteristics appreciably other than the nonlinearity. With further optimization using multiple gated transistors, much better nonlinear performance per power consumption would be expected.

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