Abstracts

A novel drain current I-V model for MESFET

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The conventional approach for modeling the dc I-V characteristics of a MESFET transistor usually adopts the hyperbolic tangent dependence on V/sub ds/. On the contrary, our new empirical model describes the device drain current as a polynomial of effective gate-source voltage V/sub eff/. The derived model is capable of accurately modelling the subthreshold effect and the device current-voltage behavior at different operating regions, in particular, the device operation around the pinchoff region. Measured and modeled results of a 0.5-/spl mu/m gatelength MESFET device are compared and good agreement has been obtained. Comparisons between the proposed model, Curtice model, Chalmers model, and Parker model are also made in this paper. In addition, a single-stage class-AB amplifier was built with a commercial high-power MESFET transistor to verify the new model.

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