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Licensing Opportunities

- Exclusive
- Non-exclusive
- Research Sponsorship

Lehigh Case #090506-01

Adaptive Bias Technique for Field-Effect Transistors

Overview

This invention uncovers a method of applying a suitable modulated bias to the dummy-gate (or field-plate) in RF-LDMOSFETs to improve the efficiency and output power. Initial tests of this technique show a 60% improvement in the maximum output power, and a 10% improvement in the efficiency of the device. The increase in output power will translate to a greater coverage area for cellular base stations that use this transistor, and the improved efficiency will reduce the heat dissipation and related reliability problems. These improvements will lead to a clearer and stronger signal on the consumer's cell-phone and lower maintenance and deployment costs for the cellular service provider.

Applications and Advantages

- An adaptive dummy-gate bias provides improved output power and efficiency over the source-connected dummy-gate setup.
- An adaptive dummy-gate bias is simpler to implement than an adaptive drain bias due to the low current requirements of the dummy-gate.
- An adaptive dummy-gate bias can be combined with an adaptive drain bias to improve the achievable maximum drain efficiency and RF output power.
- Increase coverage area for cellular base stations
- May be used in other high power RF applications to increase output power and efficiency

Highlights

- Adaptive biasing technique for the dummy-gate based on the envelope information of the input signal
- Combination of adaptive drain and adaptive dummy-gate (field-plate) biasing

Status and Intellectual Property

A patent cooperation treaty (PCT) application has been filed.

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- [James C. Hwang](http://expert1.cc.lehigh.edu/LehighExperts/ExpertDetail.aspx?ExpertID=70120291) -
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