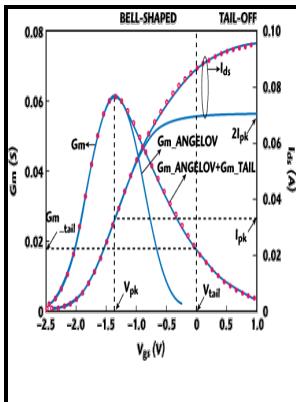


Large-signal modeling of gallium arsenide field-effect transistors.

North Carolina State University - US5467291A



Description: -

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GaAs FETs: Device Physics and Modeling

The automated data acquisition system 72 in accordance with the invention operates as follows.

Gallium Arsenide (GaAs) Field

For high-frequency analyses the inter-electrode capacitances that are important at high frequencies must be added.

Bipolar junction transistor

The measurement-based modeling and simulation system of claim 10 wherein the automated data acquisition system measures response data adaptively within the safe operating range depending upon the specific nonlinearities of the active semiconductor device such that response data points are selected more densely where nonlinearities are severe, such as knees of I-V curves and onset of breakdown, and less densely where characteristics are not changing rapidly.

Signal and Noise Properties of Gallium Arsenide Microwave Field

These functions will later be operated on by model equations to predict future voltages and therefore future values of currents and charges during circuit simulation. The model enables fast and unambiguous construction model generation by explicit calculations applied to raw device response data obtained using an adaptive, automated data acquisition system employed to characterize the device. So h FE or hFE refers to the total; DC collector current divided by the base current, and is dimensionless.

Measurement

That is, given very few specifications about the active semiconductor device, for example, the maximum gate current compliance and maximum power dissipation of an FET, the automated data acquisition system 72 automatically computes the safe operating range of the FET, eliminating the need for tedious prescanning measurements. GaAs FET amplifiers, oscillators, mixers, switches, attenuators, modulators, and limiters are widely

used and highspeed integrated circuits based on GaAs FETs have been developed. Gallium arsenide is used in the manufacture of devices such as frequency , , , and optical windows.

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