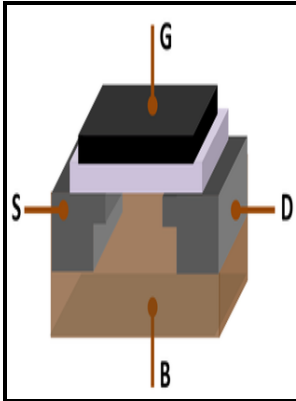# Large-signal modeling of gallium arsenide field-effect transistors.

North Carolina State University - US5467291A

Description: -
-Large-signal modeling of gallium arsenide field-effect transistors.
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There is a social need to reduce the power consumption of these devices. Find exactly what you need with a Yoni live test data search, including hundreds more custom products. The large-signal FET model in accordance with the invention described above greatly improves accuracy, because the model nonlinearities are explicitly constructed from measured response data.

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Several breakdown mechanisms may be in effect simultaneously. Tedious, interactive prescanning often must be performed simply to establish the range of controlling bias voltages and associated compliance values to use for detailed measurements. This ratio usually has a value close to unity; between 0.

Signal and Noise Properties of Gallium Arsenide Microwave Field

The automated data acquisition system 72 in accordance with the invention for FET response measurements and its application in connection with the measurement-based modeling system in accordance with the invention will now be described. It is typically greater than 50 for small-signal transistors, but can be smaller in transistors designed for high-power applications.

ARTECH HOUSE U.K.: Parameter Extraction and Complex Nonlinear Transistor Models

Specialized types are used for high voltage switches, for radio-frequency amplifiers, or for switching heavy currents.

GaAs FETs: Device Physics and Modeling

The data domain set of all points at which the active semiconductor device can be safely biased has a shape depending upon the detailed nonlinearities of the specific device whose response is being measured. For DC conditions they are specified in upper-case. IC-CAP is used as a front end user interface and as the drivers for the instruments, such as the HP 8510 or HP 8753 network analyzer and HP 4142 d.

Tunnel FET having a new architecture with potential for substantial improvement in performance

The circuit simulation model produced by the measurement-based modeling system in accordance with the invention is more accurate than one based on simplified physical model equations and empirical model equations which are force-fitted to measured performance data. The source and drain regions are formed by ion-implantation. The automated data acquisition system 72 in accordance with the invention operates as follows.

Gallium arsenide

Figure 1: Reduction in operating voltage of the tunnel FET left , and its operating principle right. However great care must be taken when designing the bias arrangements because if current flows in the gate junction, it will destroy the GaAS FET. The parameter h oe usually corresponds to the output admittance of the bipolar transistor and has to be inverted to convert it to an impedance.

Gallium arsenide

The next step of the calculation procedure is to measure S-parameters versus frequency at the terminals of the FET being modeled, at forward bias conditions, as indicated by the numeral 48 shown in FIG.

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