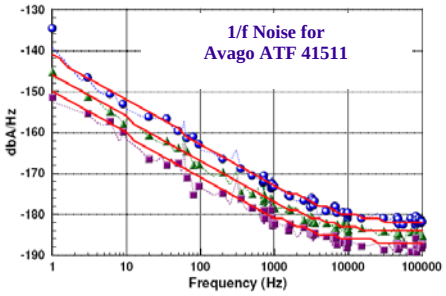
Precision Measurements and Models You Trust

Modelithics Non Linear Transistor NLT Library version 2.1

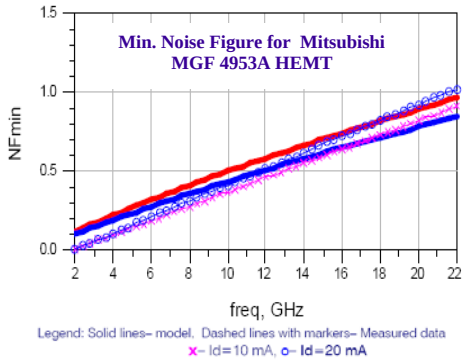
The Modelithics NLT (Non-Linear Transistor) Library contains the industry's most advanced simulation models for transistors. These reliable, measurement-based models maximize the RF/MW electronic design automation (EDA) process, reduce design cycle time, and lower product development costs. The equivalent circuit models have been extracted from precision DC-IV, S-parameter, gain, and noise measurements under various bias conditions across the given frequency range. High-power or low-noise amplifiers, oscillators - all the latest designs - can now be simulated with greater confidence than ever before.

Modelithics models are engineered with robust techniques and measurement-intensive procedures. With built-in features like substrate and temperature scalability and measurement validations that include 2-tone intermodulation, multi-bias S-parameters and power compression, Modelithics models provide unmatched versatility and simulation accuracy. Bench-tuning and prototype iterations are drastically reduced by combining the power of simulation software with the industry's best and most well documented transistor models—designs go from concept to market more cost effectively and faster than ever.

From Low Noise Device Models...



Legend: Red line– Model Data, Dashed lines with markers-Measured Data
■ IC=5 mA, ▲ IC=10 mA, ● IC=25 mA

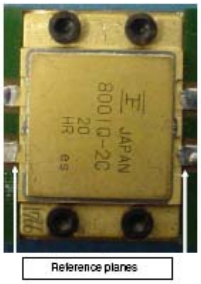


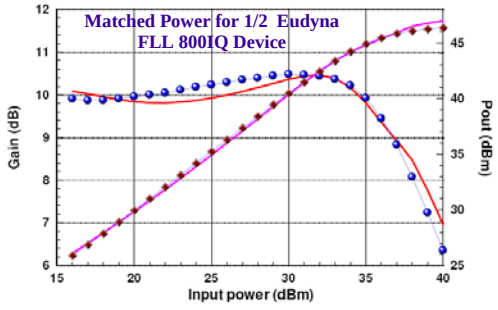
Legend: Solid lines– model, Dashed lines with markers– Measured data
x– Id=10 mA, o– Id=20 mA

To High Power Device Models...

	Pout (dBm)	ZL (ohms)	PAE, %	ZL (ohms)
Measured (Device1)	45.92	4.24-j7.72	50.84	2.59-j2.49
Measured (Device 2)	45.86	4.42-j7.69	51.45	2.75-j2.58
Model	46.08	2.85-j8.21	48.31	3.83-j4.9

Load-pull results at an input power of 35 dBm.
Source impedance set to 7.87-j16.87 ohms at an input frequency of 1.85 GHz





Legend: Solid lines-Model , Markers– Measured data
● Gain, ○ Output power

High Power Applications

The library delivers accurate models for gain, intermodulation distortion, gain compression, heating effects, and efficiency at power levels through 100 watts for use in high power amplifier design. With source-pull and load-pull validations the models empower designers with what's needed to quickly optimize matching circuits to performance requirements.

Non-Linear Capability

State-of-the-art non linear models accelerate the circuit design process when matched with the advanced simulation software capabilities, including: DC, small-signal and large-signal S-parameters, harmonic balance, noise and complex modulation analysis.

Temperature Effects

Carefully engineered transistor circuits are designed to reliably meet performance specifications over a range of environmental conditions. Modelithics models accurately simulate transistor performance at ambient temperature extremes, including self-heating effects. Potential design limitations can be identified and resolved before prototypes get to the temperature chamber.

Substrate Scalability

Modelithics models incorporate advanced features that fully account for substrate-related effects. Where applicable, substrate-scalable models are generated from multiple sets of measurements, made with parts mounted on several fixtures using a variety of PCB materials, or multi-layer board thickness. The models are valid over a continuous range of substrate thickness and dielectric constants, bounded only by the H/Er range of the fixtures used during model measurement.