Modelithics®
World's Best RF & Microwave Simulation Models

Modelithics MACOM MVP Library
for High Accuracy Electronic Simulation

MACOM®
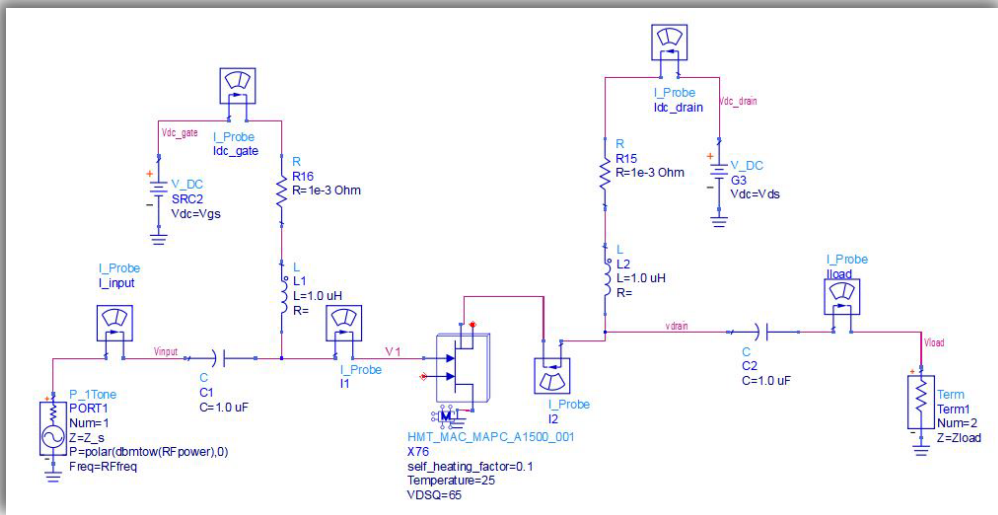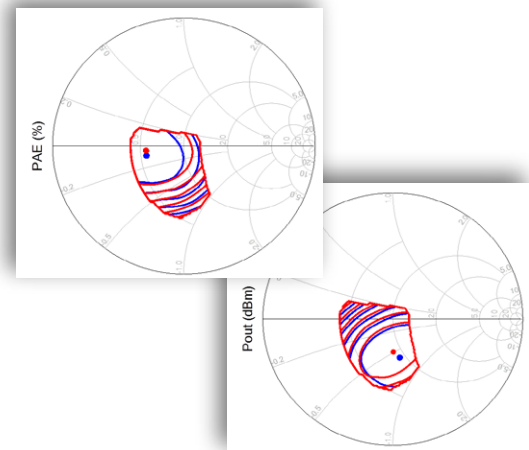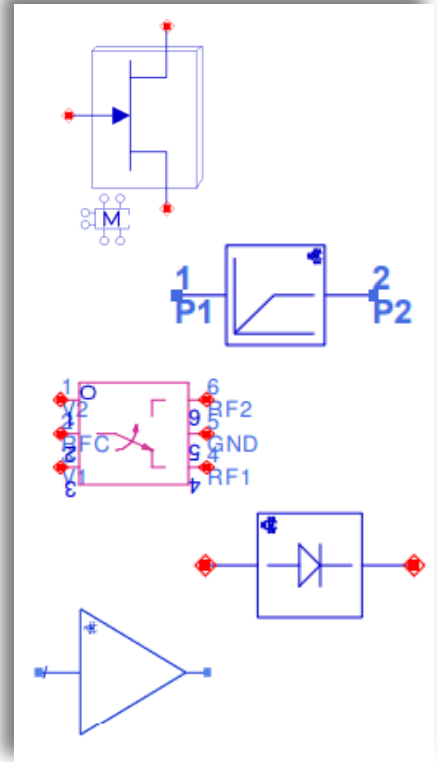
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Overview

The **Modelithics MACOM MVP Library** is a collection of highly accurate measurement-based simulation models that are compatible with popular Electronic Design Automation (EDA) software tools. These models offer accurate broadband prediction including parasitic effects and feature scalable design parameters such as component value, pad dimensions, and substrate properties. These state-of-the-art models install seamlessly into the EDA software, placing high accuracy models at your fingertips and allowing for first pass design success!

Model Features

The Modelithics MACOM MVP Library offers a collection of **Microwave Global Models™** that provide many advantages over ideal and S-parameter file-based models. Valuable features of the models include:

- **MEASUREMENT-BASED** — Each global model is developed using highly accurate measurements across multiple conditions including different substrates and pad dimensions. By developing models using measurements, designers can have confidence that their simulations will represent real-world conditions.

- **SCALABLE** — The models can be scaled for part value (when applicable), pad dimensions, and substrate properties, allowing designers to simulate based on their specific conditions.

- **AVAILABLE FOR POPULAR EDA TOOLS** — Keysight Technologies' PathWave Advanced Design System (ADS), Cadence® AWR Design Environment®, Keysight Technologies' PathWave RF Synthesis (Genesys), and Keysight Technologies' PathWave System Design (SystemVue).

- **COMPLETE DOCUMENTATION** — Each model contains a comprehensive model datasheet that lists recommended model validity parameters, measurement and test fixture details, and model-to-measurement data comparisons.

(Above) Load pull Pout and PAE using MACOM MAPC-A1101 packaged transistor device. **Red = model**, **Blue = measured**

(Left) MAPC-A1500 Model Example

# List of Components in the Modelithics® MACOM MVP Library

Balun Transformer	Diodes		Switch
MABA-011125	MA4E1317	MLP7101	MASWSS0204
Power Divider	MA4P504-132	MLP7110	**Transistors**
MAPD-011062	MA4PH235-1072	MLP7120	NPT1012B
Coupler	MAVR-000230-1141	MMP7065-11	NPTB00004A
MACP-011088	MAVR-001330-1279	MSD710	**Amplifier**
	MLP7100	SMV20413	MAAL-010704
			Limiter
			2690-1011

Visit the Modelithics website to view additional Pre-Release models.
Visit: www.Modelithics.com/MVP/MACOM

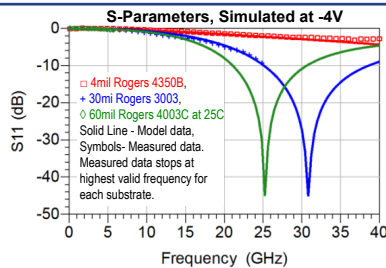# Advanced Model Features for More Accurate High Frequency Design

## Temperature Scaling

Capacitance Change vs. Temperature
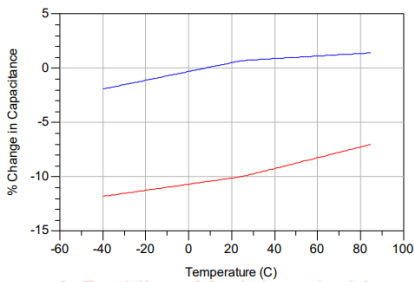
Legend: Red line: Model at -0.5V, Blue line: Model at -8V.
Simulated at 100MHz and 25C. Temperature C-V feature included in model. % change relative to 25C capacitance was based on measured data vs. temperature.

Substrate Scaling

S-Parameters, Simulated at -4V

□ 4mil Rogers 4350B,
+ 30mi Rogers 3003,
◊ 60mil Rogers 4003C at 25C
Solid Line - Model data,
Symbols- Measured data.
Measured data stops at highest valid frequency for each substrate.

Variations in substrate properties have a significant effect on the response of surface mount components in high frequency designs. Modelithics models are substrate scalable, validated over a continuous range of substrate properties, based on board thickness and dielectric constant.

Pad Size Scaling

Pad Scalability
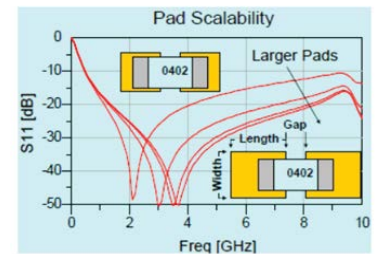
Modelithics models (in default mode) include the PCB pad with reference planes at the outer edges of the pads. The pad scaling feature lets designers adjust the dimensions to match their design, which is important for achieving maximum simulation-to-measurement agreement.

Noise Parameters
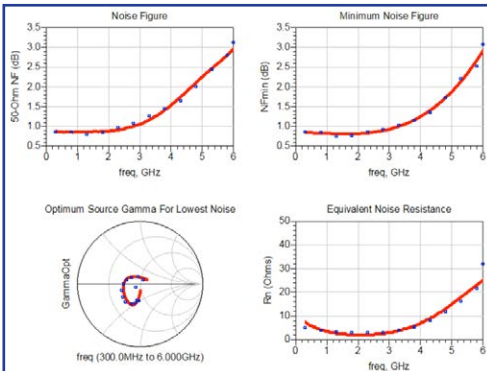
Legend: Red Solid lines - Model data,
O Symbols - Measured data.
Noise Model vs. Measured results mounted on 10mil Rogers 4350B substrate. Noise model lower boundary is 0.3 GHz. Model will return a warning if the noise model is frequency extrapolated. DC Voltage: +3V, 30mA. The Model_Mode=0 used.

Bias Scaling

Model vs. Measured S-Parameters Simulated to 6GHz
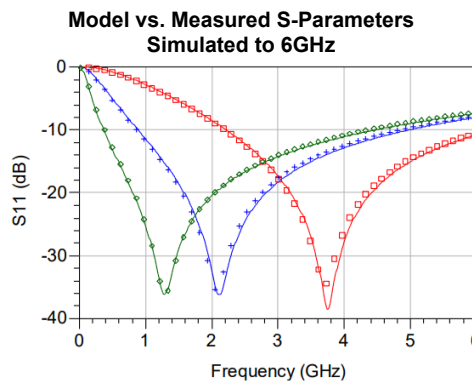
MAVR000230 Varactor Diode – Model vs. Measured S-Parameters, Simulated to 6GHz.
Legend: □:-8V, +:-2V, ◊:0V
Solid Lines - Model, Symbols - Measured data.
Simulated at 25C on 20mil Rogers 4003C

Datasheets
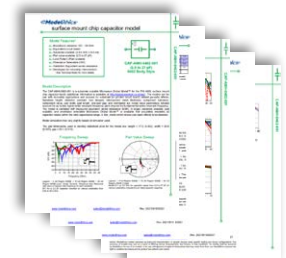
Each Modelithics model has a datasheet that provides detailed information about the model, such as the validation frequencies, reference planes, part value / pad scalability / substrate scalability ranges, model performance, and details about other features and model parameters.

Visit the MACOM MVP Page on the Modelithics website to:
• Explore the current list of available MACOM component models
• View model datasheets
• Browse literature collection for application notes, presentations, etc.
• Request a FREE* 90 day trial of the Modelithics MACOM MVP library:
   www.Modelithics.com/MVP/MACOM

*with approval and/or valid registration

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