Modelithics®
Accelerating Your Design Success!

Modelithics Vishay MVP Library
for High Accuracy Electronic Simulation

Modelithics® Vendor Partner

VISHAY
The DNA of tech.™

OVERVIEW

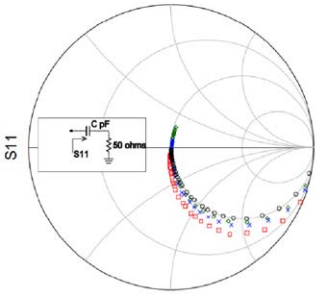
The **Modelithics Vishay MVP Library** is a collection of highly accurate measurement-based models that can be simulated in popular Electronic Design Automation (EDA) software tools. These models offer broadband parasitic prediction from DC up to 67 GHz and offer scalable design parameters such as capacitance value, pad dimensions, and substrate conditions. These state-of-the-art models install seamlessly into the EDA software, placing high accuracy models at your fingertips, which allow for first pass design success!

LIBRARY FEATURES

The Modelithics Vishay 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 inductance value and substrate properties, allowing designers to simulate based on their specific conditions.
- **OPTIMIZATION AND STATISTICAL ANALYSIS** — Model parameters can be tuned and optimized in the EDA software to provide best case parameter selection rapid achievement of design goals. Model parameters can also be set up for statistical analysis.
- **AVAILABLE FOR POPULAR EDA TOOLS** — Keysight Technologies' Advanced Design System (ADS), Cadence® AWR Design Environment®, Keysight Technologies' RF Synthesis (Genesys), Ansys® HFSS™, Sonnet® Suites™, Cadence Spectre RF® Option, Mathworks MATLAB®, and SIMULIA® CST Studio Suite®.
- **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.

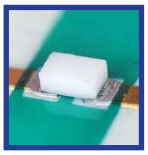
Modelithics Model for Vishay VJ0402 Capacitor Series
Part Value Sweep



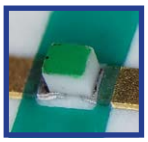
Legend: □ 6.6 mil Rogers 4350B, + 20 mil Rogers 4350B, ◊ 60 mil Rogers 4003C, **O** Ideal

Model S11 at 3 GHz for capacitor values from 0.1 to 82 pF on various Rogers substrates compared to an ideal capacitor response.

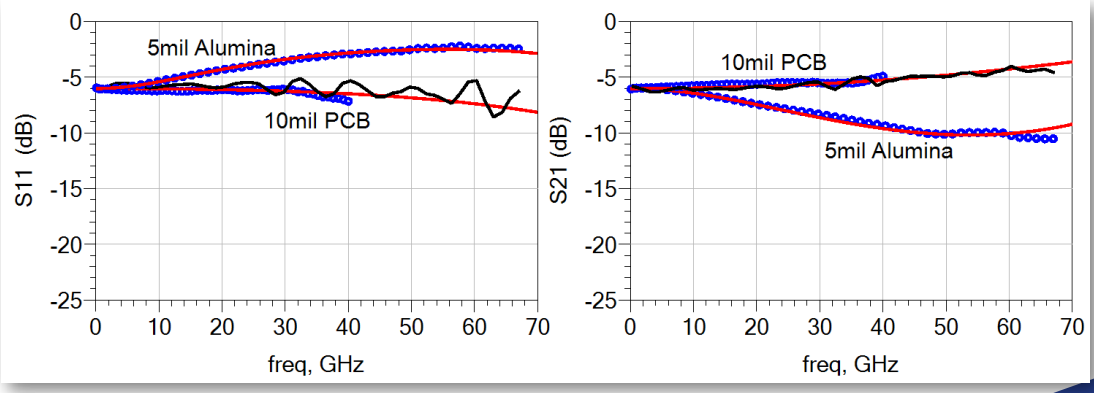
Top: Device image for **CH0402 Resistor**



Bottom: Device image for **CH02016 Resistor**



MDLX Model RES-VIS-0201-001 for Vishay CH02016 Resistor Series



Modelithics model vs measurement data, 100 Ohm. Model performance up to 70 GHz.
(Left: S11, Right: S21) Red Lines - **Model data**, Blue Symbols - **Modelithics data (microstrip)**, Black Lines - **Vishay Data (GCPW)**

Literature Showcasing Modelithics Vishay Models:

Application Note #56: Using Modelithics Models within Sonnet Suites

White Paper: Understanding S-Parameter Vs. Equivalent Circuit-based Models For RLC Component Simulations In Keysight ADS And Genesys

White Paper: Understanding S-Parameter Vs Equivalent Circuit-based Models For RLC Component Simulations With NI/AWR Microwave Office

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List of Components in the Modelithics® Vishay MVP Library

Capacitors	Resistors			
HPC0402A	CH02016*	CHTA02016	D10	FCHP0402xxxxxBTT
VJ0402*	CH0402	CRCW01005	D11	MCS0402
VJ0603D	CH0603	CRCW0201	FC0402	MCT0603
		CRCW0402	FCHP0402	MMA0204
		CRCW1206	FCHP0402xxxxxBGT	TNPW0201

*3D Brick Model version also available for supported Modelithics simulators

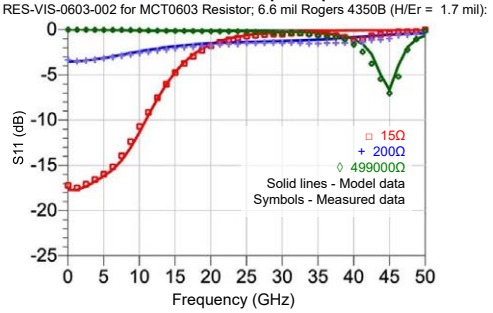
Visit our website for an updated complete list of the Modelithics Vishay models:
www.Modelithics.com/MVP/Vishay

Learn More About 3D Brick EM Models™

App Note #78: Using 3D Brick Models™ for Full-wave EM/Circuit Model Co-simulation of MLCC Capacitors in Ansys® HFSS™

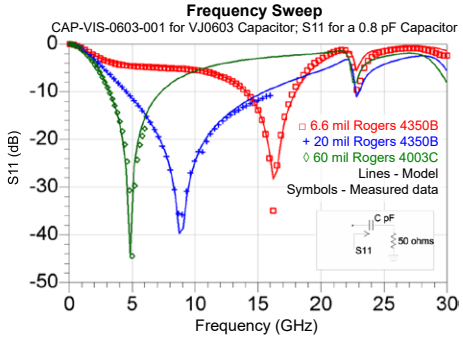
Advanced Model Features for More Accurate High Frequency Design

Part Value Scaling



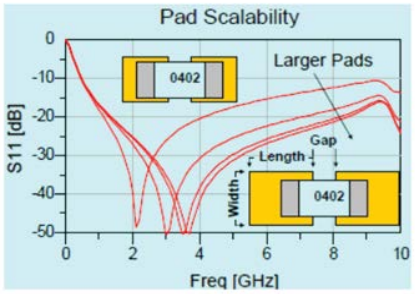
Modelithics Microwave Global Models™ for Vishay components have all values within a part series within one model. This allows for tuning and optimization by capacitance and eliminates the need to manually substitute individual models during a design sequence.

Substrate Scaling



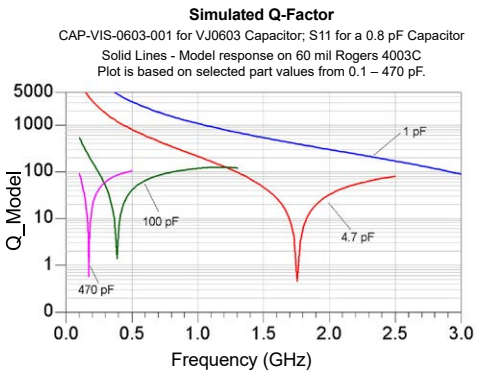
Variations in substrate properties have a significant effect on the response of surface mount capacitors in high frequency designs. Modelithics models are substrate scalable, validated over a continuous range of substrate properties, based on board thickness and dielectric constant.

Pad Size Scaling



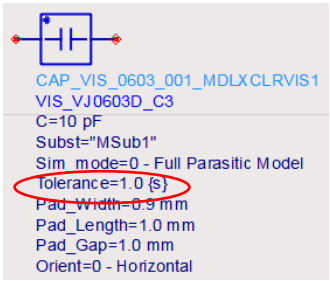
Modelithics models (in default mode) include the PCB pad with reference planes at the outer edges of the pads. The pad scaling feature lets designers adjust the dimensions to match their design, which is important for achieving maximum simulation-to-measurement agreement.

Quality Factor



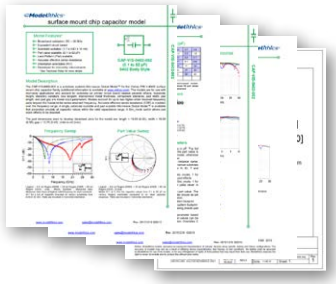
Capacitor models in the Vishay MVP Library incorporate precise Effective Series Resistance (ESR) measurements. Accurate ESR is important in determining the loss factor or Q-factor of low loss circuits.

Statistical Analysis



Modelithics Vishay models have a "Tolerance" parameter which enables compatibility with statistical analysis tools in some EDA software. Powerful analyses, such as yield prediction and tolerance analysis, can be done to help optimize design performance and reduce production cost.

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.

What's in YOUR DREAM LIBRARY?

Help us build ***YOUR*** dream library! Pre-Release models are added based on customer demand. Share your desired models with **sales@modelithics.com**!

Visit the Vishay MVP Page on the Modelithics website to:

- Explore the current list of available Vishay component models
- View model datasheets
- Browse literature collection for application notes, presentations, etc.
- Request a FREE* 90 day trial of the Modelithics Vishay model library: www.Modelithics.com/MVP/Vishay

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*with approval and/or valid registration

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