Modelithics®
Accelerating Your Design Success!

Modelithics Passive Plus MVP Library
for High Accuracy Electronic Simulation

Modelithics® Vendor Partner

PPI Passive Plus RF & Microwave Components

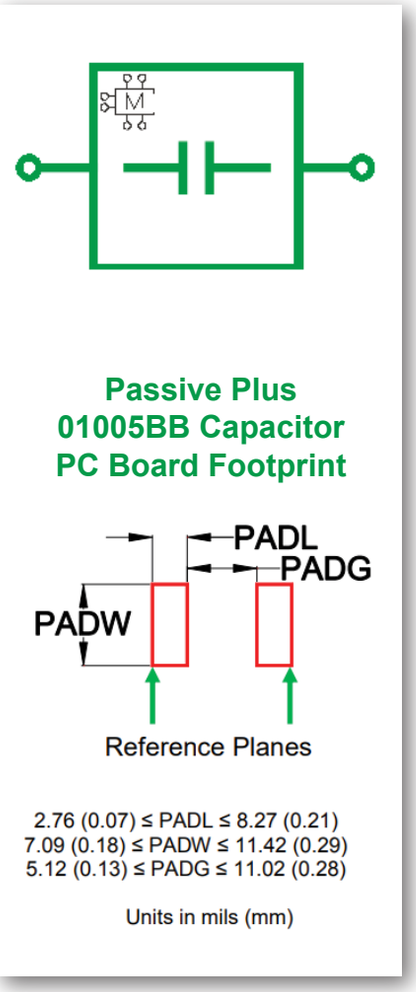
OVERVIEW

The **Modelithics Passive Plus 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 to 12-65 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!

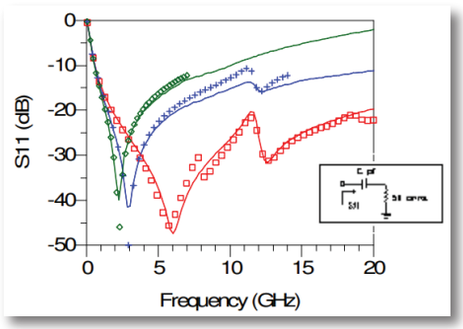
LIBRARY FEATURES

The Modelithics Passive Plus 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 capacitance 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 Advanced Design System (ADS), Cadence® AWR Design Environment®, Keysight RF Synthesis (Genesys), Keysight System Design (SystemVue), Keysight RFPro, Ansys® HFSS™, Sonnet® Suites™, Cadence Spectre RF® Option, Cadence® Clarity™ 3D Solver, and Mathworks MATLAB®.
- **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.

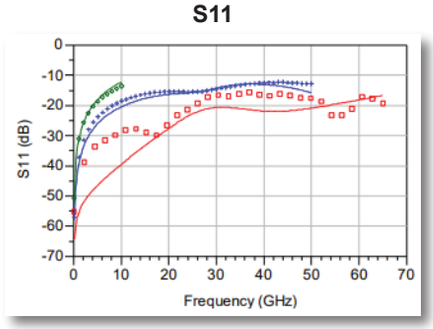


Passive Plus 0201N Capacitor Series
Frequency Sweep



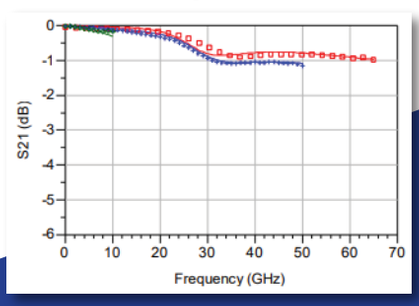
Legend: □ 4mil Rogers 4350B, + 14mil FR4, ◊ 59mil FR4, *Lines - Model, Symbols - Measured data.* Measured data stops at highest valid frequency for each substrate. S11 for 8.2 pF capacitor mounted on various substrates from 0.04 to 20 GHz.

S11



Modelithics model for Passive Plus 01005BB 104 capacitor series. 100nF capacitance simulated on three different substrates from 0.1 to 65GHz.

S21



©Modelithics, Inc. 11/2025

List of Components in the Modelithics® Passive Plus MVP Library

Capacitors			Conical Inductors
01005BB104*	0402N-ultra-low-ESR	0805N-ultra-low-ESR	PPI-070FL0R165-625-G6 (0.165uH)
0201BB104*	0505C	1111C	PPI-100FL-0R26-573-G6 (0.260uH)
0201N	0603N-ultra-low-ESR	1111N-ultra-low-ESR	PPI-050FL-0R28-280-G6 (0.280uH)
0201N-ultra-low-ESR*	0708N	**Resistors**	PPI-050FL0R47-275-G6 (0.470uH)
		R35-1209BB*	PPI-070FL-1R050-150-G6 (1.050uH)
		R35-2010BB*	PPI-100FL-1R54-140-G6 (1.540uH)

*3D version also available for Ansys HFSS / Keysight RFPro / Cadence Clarity

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

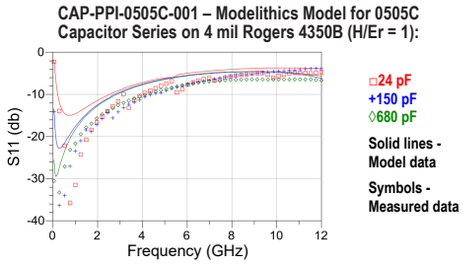
Modelithics® Pre-Release

Capacitors
0201BB103
0402BB103
0402BB104

Also, check out the list of Modelithics Pre-Release models:
www.Modelithics.com/Model/PreRelease

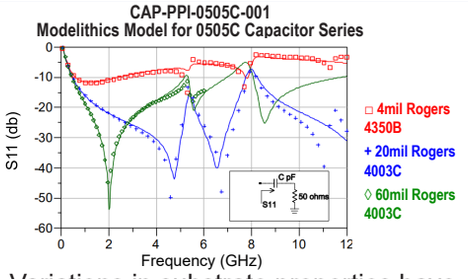
Advanced Model Features for More Accurate High Frequency Design

Part Value Scaling



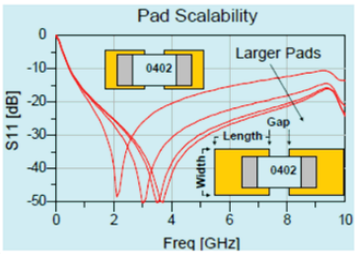
Modelithics Microwave Global Models™ for Passive Plus components have all values within a part series within one model. This allows for tuning and optimization by inductance and eliminates the need to manually substitute individual models during a design sequence.

Substrate Scaling



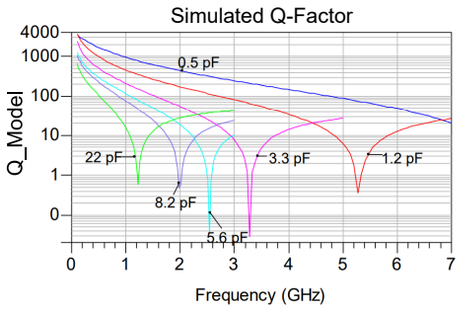
Variations in substrate properties have a significant effect on the response of surface mount components in high frequency designs. Modelithics models are substrate scalable and validated over a continuous range of substrate properties based on board thickness and dielectric constant.

Pad Size Scaling



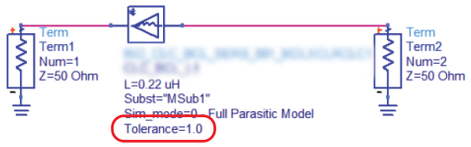
Modelithics models (in default mode) include the PCB pad with reference planes at the outer edges of the pads. The pad scaling feature lets designers adjust the dimensions to match their design, which is important for achieving maximum simulation-to-measurement agreement.

Quality Factor



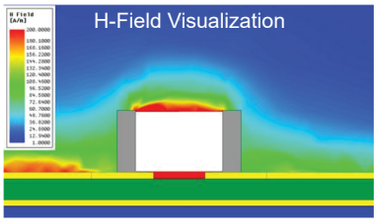
Models in the Passive Plus MVP Library incorporate precise Effective Series Resistance (ESR) measurements. Accurate ESR is important in determining the loss factor or Q-factor of low loss circuits.

Statistical Analysis



The Passive Plus 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.

3D EM Models



The 3D models are based on the physical characteristics of each component and can be used in full wave 3D electromagnetic (EM) simulation, including shielding design, effects of parts in close proximity, and more. Shown above is a 3D EM geometry model for a capacitor on 4 mil Rogers 4350B.

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 Passive Plus MVP Page on the Modelithics website to:

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

Modelithics® Vendor Partner

*with approval and/or valid registration

Excellence in Modeling Since 2001

©Modelithics, Inc. 11/2025