

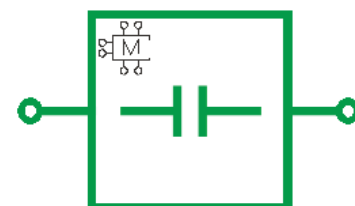
OVERVIEW

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!

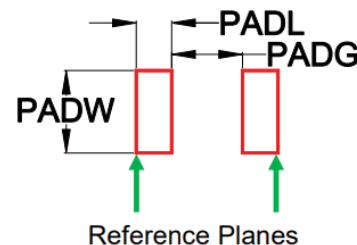
LIBRARY FEATURES

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, pad dimensions, 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 (PathWave ADS), Cadence® AWR Design Environment®, Keysight Technologies' PathWave RF Synthesis (Genesys), Ansys® HFSS™, Sonnet® Suites™, and Cadence Spectre RF® Option.
- **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
01005BB Capacitor
PC Board Footprint



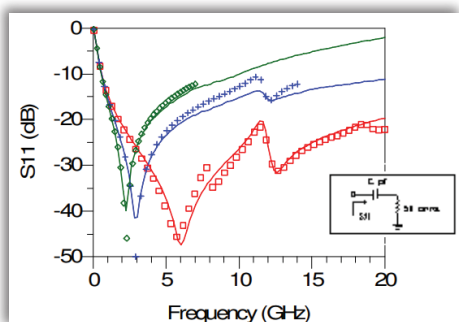
$$2.76 (0.07) \leq \text{PADL} \leq 8.27 (0.21)$$

$$7.09 (0.18) \leq \text{PADW} \leq 11.42 (0.29)$$

$$5.12 (0.13) \leq \text{PADG} \leq 11.02 (0.28)$$

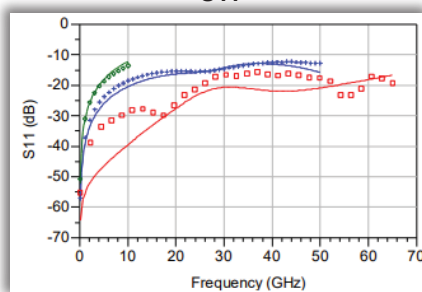
Units in mils (mm)

Passive Plus 0201N Capacitor Series
Frequency Sweep



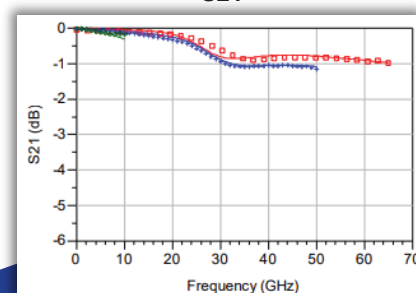
Legend: □ 4mil Rogers 4350B, + 14mil FR4, ◇ 59mil FR4,
Lines - Model, Symbols - Measured data. Measured data stops at
highest valid frequency for each substrate. S11 for 8.2 pF capacitor
mounted on various substrates from 0.04 to 20 GHz.

S11



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

S21



List of Components in the Modelithics® Passive Plus MVP Library

Capacitors			Resistors
01005BB104	0201N-ultra-low-ESR	0603N-ultra-low-ESR	R35-1209BB*
0201BB104	0402N-ultra-low-ESR	0708N	R35-2010BB*
	0505C	0805N-ultra-low-ESR	

*3D version also available for Ansys HFSS

More to come! New models are added continually. Visit our website for an updated complete list. (www.Modelithics.com/MVP/PPI)

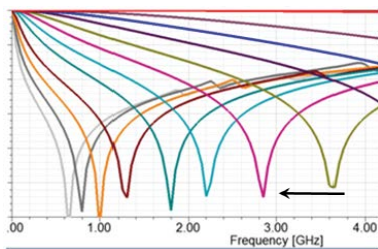


Capacitors		
0201BB103	0402BB103	0402BB104

For more info on Pre-Release models, visit our website. (www.Modelithics.com/Model/PreRelease)

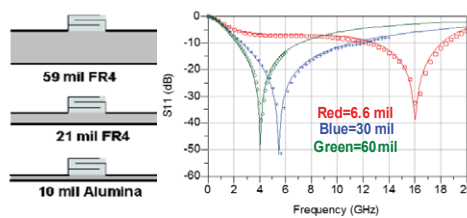
Advanced Model Features for More Accurate High Frequency Design

Part Value Scaling



Modelithics Microwave Global Models™ for Passive Plus capacitors include all values from 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.

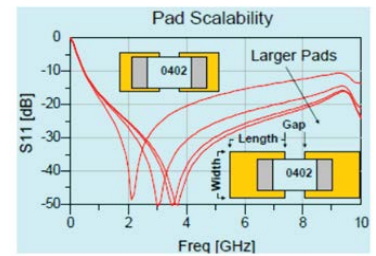
Substrate Scaling



S11 for 1.5pF capacitor. Symbols=measurement, Line=model

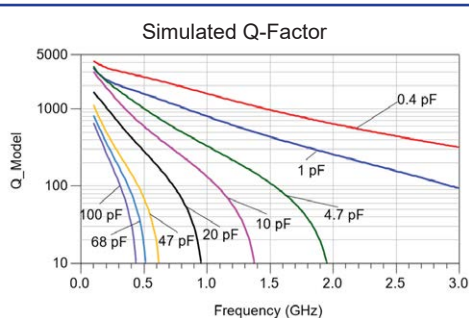
Variations in substrate properties have a significant effect on the response of surface mount components in high frequency designs. Modelithics models are substrate scalable, validated over a continuous range of substrate properties, based on board thickness and dielectric constant.

Pad Size Scaling



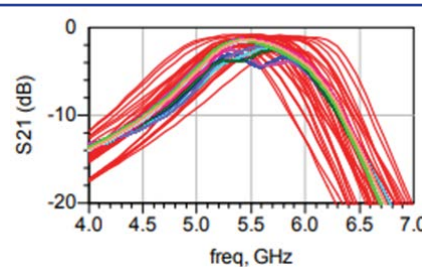
Modelithics models (in default mode) include the PCB pad with reference planes at the outer edges of the pads. The pad scaling feature lets designers adjust the dimensions to match their design, which is important for achieving maximum simulation-to-measurement agreement.

Quality Factor



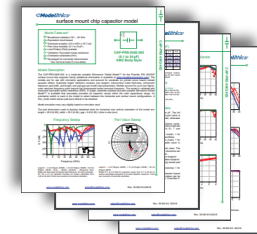
Capacitor models in the Passive Plus MVP library incorporate precise Effective Series Resistance (ESR) measurements. Accurate ESR is important in determining the loss factor or Q-factor of low loss circuits.

Statistical Analysis



Passive Plus capacitor 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 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

*with approval and/or valid registration

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