Modelithics®
Accelerating Your Design Success!

Modelithics Spectrum Control MVP Library
for High Accuracy Electronic Simulation

Modelithics® Vendor Partner

SPECTRUM CONTROL

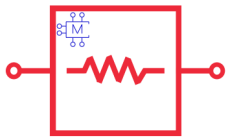
OVERVIEW

The **Modelithics Spectrum Control 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 40 GHz and offer scalable design parameters such as part value, pad value, and substrate properties. These high-performance models integrate seamlessly with the EDA software, providing highly accurate modeling capabilities that help drive first-pass design success.

LIBRARY FEATURES

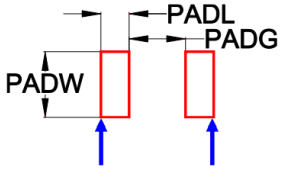
The Modelithics Spectrum Control MVP Library offers a collection of **Microwave Global Models™** that provide many advantages over ideal and S-parameter file-based models. Valuable features of the models include:

- **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, pad 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), Keysight Technologies' RF Synthesis (Genesys), Cadence® AWR Design Environment®, Ansys® HFSS™, Sonnet® Suites™, Cadence Spectre RF® Option, 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.



RES-SCI-CA00WCB01-001
CA00WCB0150R0G
Surface Mount Chip Resistor

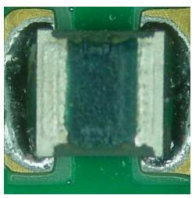
PC Board Footprint



Reference Planes

20.0 (0.51) ≤ PADL ≤ 30.0 (0.76)
70.0(1.78) ≤ PADW ≤ 90.0 (2.29)
26.0 (0.66) ≤ PADG ≤30.0 (0.76)
Units in mils (mm)

Device Image

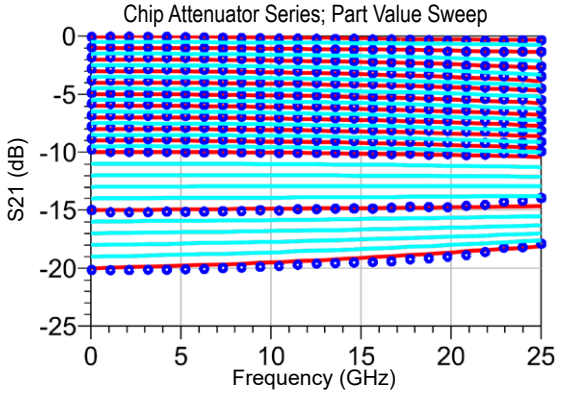


List of Components in the Modelithics® Spectrum Control MVP Library

Attenuators		Resistors	
40PCA3060	PCAA	CA0ZWBR01	CJ0ZWBR01
PCA	PCAAF	CA0ZWCB01	CJ0ZWCB01
	PCAF	CJ0ZSAA01	

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

ATT-SCI-0603-001:
Modelithics Model for 40PCA3060 Thin Film Fixed-Value Chip Attenuator Series; Part Value Sweep



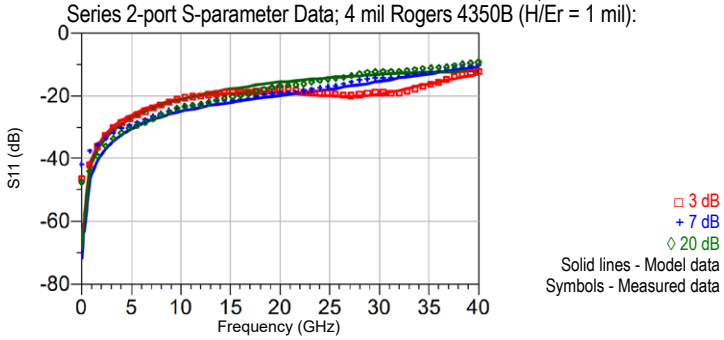
Red solid lines – Modeled values response on 10 mil Rogers 4350B, Blue Symbols – measured data, Aqua solid lines – Interpolated Model data. Temperature: 25 C. Modeled values from 0 to 10dB with step of 1dB, 15dB and 20dB. The model is swept from 0 to 10dB with step of 0.5dB and from 10dB to 20dB with step of 1dB to show the interpolation.

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Advanced Model Features for More Accurate High Frequency Design

Part Value Scaling

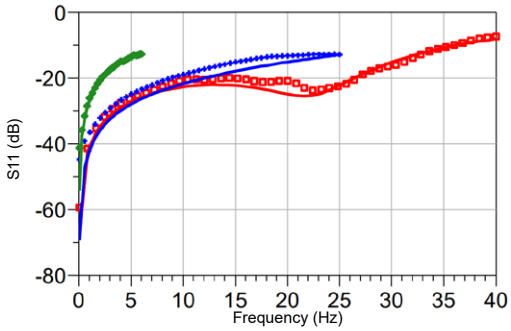
ATT-SCI-0603-001: Modelithics Model for 40PCA3060 Attenuator; Model vs. Measured Series 2-port S-parameter Data; 4 mil Rogers 4350B (H/Er = 1 mil):



Modelithics Microwave Global Models™ for Spectrum Control 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

ATT-SCI-0603-001: Modelithics Model for 40PCA3060 Attenuator; Frequency Sweep

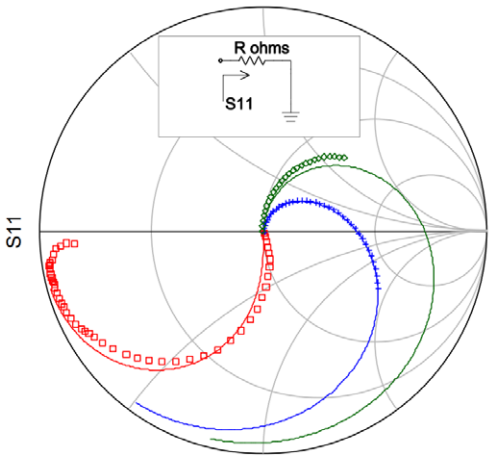


The Attenuator value used for simulation – 2 dB. Model performance on all substrates is shown up to modeled frequency.

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.

Broadband Validation

Frequency Sweep (Smith Chart)



RES-SCI-50100W-002
Modelithics Model for CA00WBR0150R0G Surface Mount Chip Resistor

□ 4mil Rogers 4350B
+ 20mil Rogers 4003C
◊ 60mil Rogers 4003C

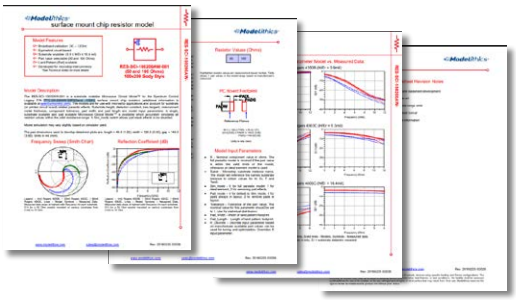
Lines - Model
Symbols - Measured Data

Measured data stops at highest valid frequency for each substrate.

S11 for a 50 Ohm resistor mounted on various substrates from 0.045 to 30 GHz.

Modelithics world class models are developed by performing accurate lab measurements with techniques that have been refined over 25 years. Models are validated against broadband measurements made possible by Modelithics wide array of test capabilities.

Datasheets

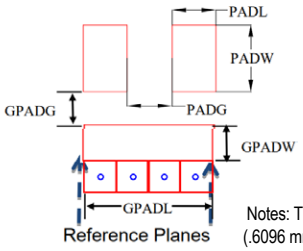


Each Modelithics model has a datasheet that provides detailed information about the model, such as the validation frequencies, reference planes, part value / pad scalability / substrate scalability ranges, model performance, and details about other features and model parameters.

Pad Size Scaling

PCAA Attenuator Device Image





PADL = 30.0 (0.76)
PADW = 35.0 (0.89)
PADG = 35.0 (0.89)
GPADL = 95.0 (2.41)
GPADW = 25.0 (0.635)
GPADG = 20.0 (0.508)
VIA Diameter = 10.0 (0.254)
Units in mils (mm)

Notes: The additional metal added for each via is 24 mil (.6096 mm) square. Ground plane included in the model.

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.

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 Spectrum Control MVP Partner Page on the Modelithics website to:

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

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*with approval and/or valid registration

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