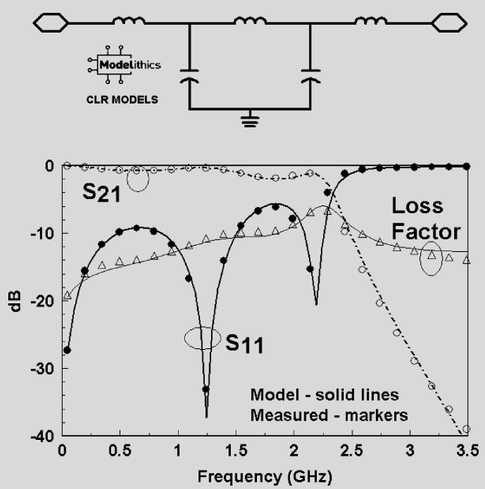
TURBO-CHARGED RF/MICROWAVE DESIGN! — The Modelithics CLR Library™ contains the industry's first and only substrate- and part value-scalable models for surface mount components. These reliable, measurement-based models will help you get the most from your RF/MW electronic design automation (EDA) software, reduce design cycle time, and lower product development costs. With just a few simple steps, the CLR Model Library is ready to use with Applied Wave Technologies™ Microwave Office software. Filters, matching circuits, couplers – whatever your latest design – can then be simulated with greater confidence than ever before.

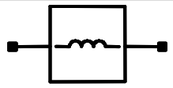
Modelithics' precision measurements produce high-accuracy models you can trust.

LIBRARY DESCRIPTION — The Modelithics CLR Library contains models for a variety of body-sizes and part values for capacitors, inductors, and resistors from most major vendors, including ATC, Coilcraft, Epcos, KOA Speer, Murata, Panasonic, Rohm, TDK, and Toko. If the models you need are not currently available, contact us at sales@modelithics.com to check our development schedule - new models are added continuously.

The models are for use with microstrip applications and account for substrate (or printed circuit board) related parasitic effects. Model input parameters include substrate thickness, relative dielectric constant, loss tangent, and interconnect conductor thickness. Part value tolerance can also be specified to enable Monte Carlo-type simulations.



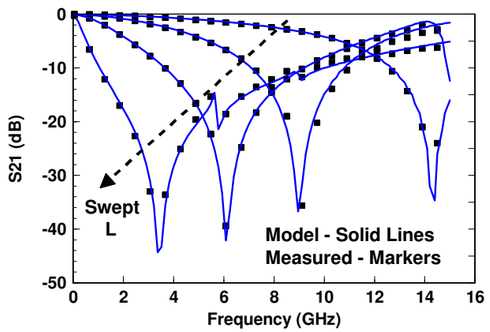
S-parameters for a 5th order lumped element filter.



L=Ind_Value nH
H=H_sub mm
Er=Er_sub
T=T_mtl mm
TanD=Loss_Tan
Sim_mode=0
Tolerance=1

PART VALUE SCALABILITY – With the CLR Library you will add Modelithics' patent-pending Global Model™ technology to your AWR design tool suite. Each Global Model pertains to a given component vendor and body style (e.g., 0201, 0402, etc.) and typically covers values over 2-3 decades (e.g., 1-1800 pF). All equivalent circuit parameters, and therefore the parasitic effects, vary as a function of the nominal part value.

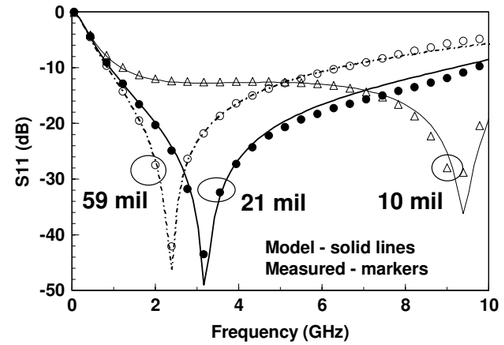
Modelithics Global Models automate parts-value substitution and improve the efficiency of circuit design optimization.



S21 for several values of 0402 surface mount inductors.

SUBSTRATE SCALABILITY — Modelithics Global Models also incorporate advanced features that enable full accounting of substrate-related effects. Each model is generated from multiple sets of Sparameter measurements, made with parts mounted in different PCB fixtures. The models are valid over a continuous range of substrate thickness and dielectric constant, bounded by the fixtures used for model development.

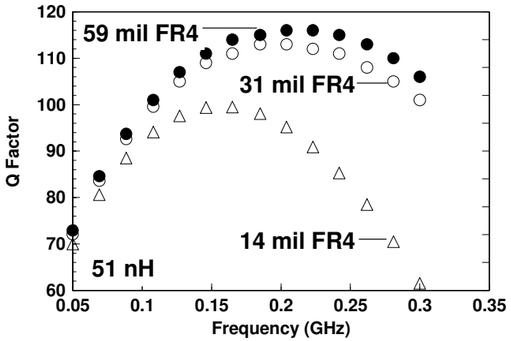
Substrate scalability is critical in achieving accurate simulation results on your chosen PCB, and distinguishes Modelithics Global Models from any other models.



Reflection coefficient of an 0603 chip capacitor using different PCB substrates.

ESR — Along with S-parameter measurements, each model in the Modelithics CLR Library is based on precise Effective Series Resistance (ESR) measurements. The empirical data is used to generate a frequency-dependent expression for ESR that is incorporated into the models. Whether you're concerned about heat dissipation, part failure, or a tight loss budget, Modelithics models will help you design with confidence.

Accurate ESR, combined with the substrate scaling feature of the models, enables prediction of Q-factors in your PCB environment.

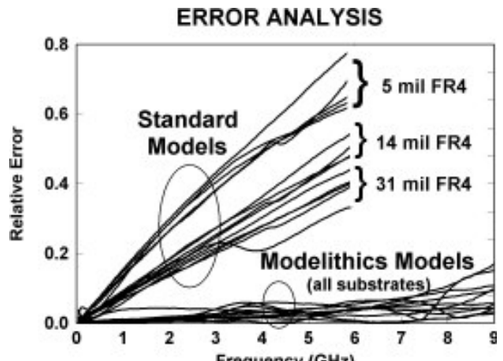


Q-factor of a 51 nH inductor on different PCB substrates.

ACCURACY — The accuracy of Global Models is quantified based on the magnitude of the vector difference between measured (S'i,j) and model-generated (Si,j) S-parameters:

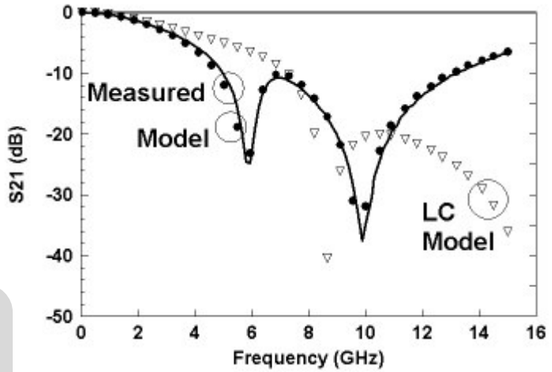
Model Error = |S'i,j – Si,j|

Modelithics models provide dramatic improvements in simulation accuracy when compared to standard librarymodels, and retain accuracy at high microwave frequencies.



substrates (MDLX = Modelithics).

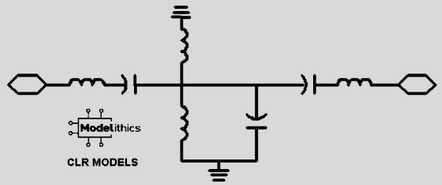
CIRCUIT TOPOLOGY — The models in the Modelithics CLR Library use a physically-motivated equivalent circuit topology. A much simpler, “series L-C” type model may often fit a specific set of measured S-parameters. However, such a model can fail badly when used in a configuration that differs from that used for model extraction. Modelithics models are experimentally validated to ensure accuracy in all common mounting configurations.

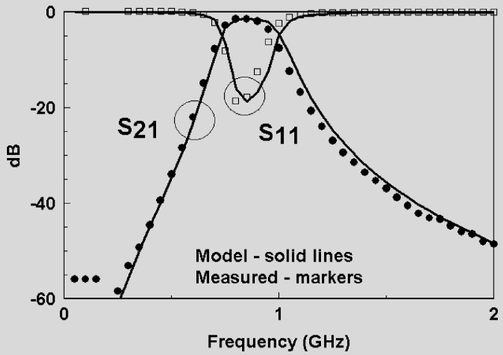


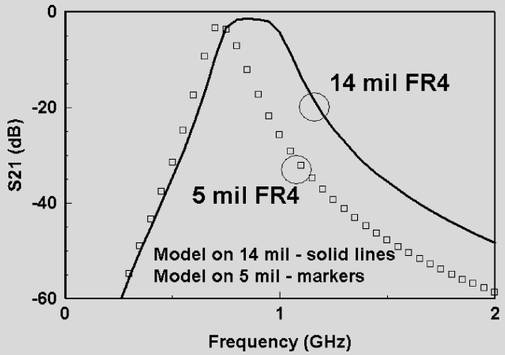
Shunt combination of 0.5 and 1.5 pF 0402 capacitors.

DESIGN SUCCESS! — Modelithics Global Models™ are engineered to help you turbo-charge your design process. Surface mount parts simply do not behave the same on all substrates, regardless of the technology. The versatility and accuracy of substrate- and part value-scalable models help to ensure proper component selection at the simulation stage. Bench-tuning and prototype builds decrease. You can concentrate on designing your next product.

Modelithics models will help you achieve first-pass circuit success.







S-parameters for a 3th order lumped element filter on 5 and 14 mil FR4 (0402 and 0603 components).

A growing library of non-linerar models is also available for diodes (including Schottky, PIN, and Varactor) and transistors (BJT, HBT, MESFET, PHEMT, and MOSFET).

For ordering information, visit **www.modelithics.com** or **www.mwoffice.com**. Custom model development services are also available.

The MDLX Select sample version of the CLR Library is available for free evaluation on a time-limited basis.

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Modelithics CLR Library

High-Performance Results from High-Accuracy Models