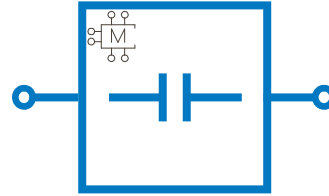


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SURFACE MOUNT CHIP CAPACITOR MODEL

MODEL FEATURES:

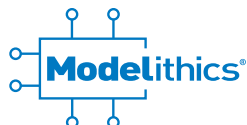
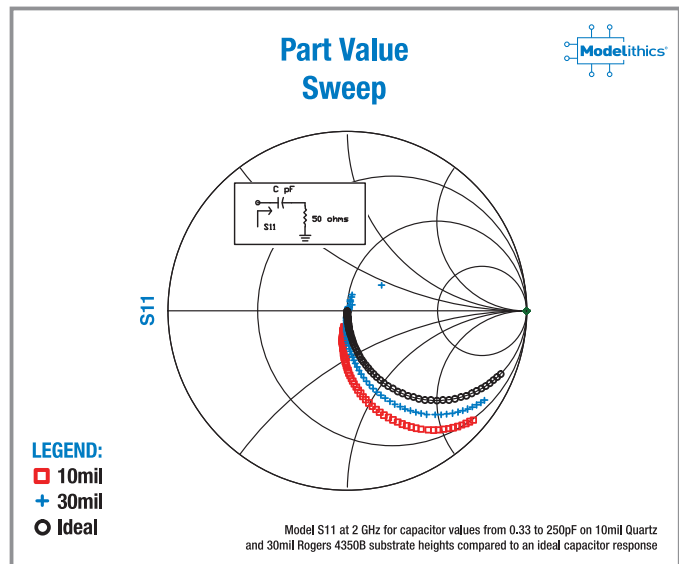
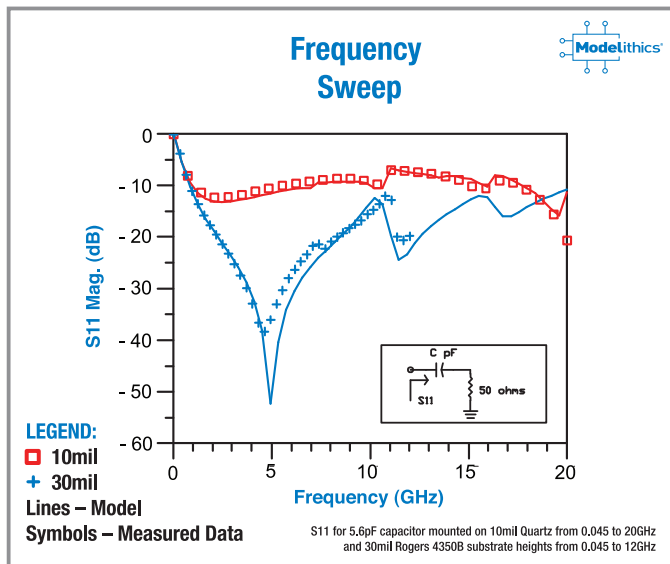
- Substrate scalable
- Broadband (DC to 20 GHz)
- Equivalent circuit topology
- Accurate effective series resistance
- 21 capacitor values (0.33 to 250 pF)
- Developed for microstrip interconnects



CAP-PRS-0505-001
0.33 to 250 pF
0505 Body Style

MODEL DESCRIPTION

The CAP-PRS-0505-001 family are substrate scalable models for 0505 surface mount chip capacitors from Presidio. The models are for use with microstrip applications and account for substrate (or printed circuit board) related parasitic effects. Substrate height, dielectric constant, loss tangent, interconnect metal thickness and component tolerance are model input parameters. Models account for up to two higher-order resonant frequency pairs beyond the fundamental series resonant frequency. Accurate effective series resistance (ESR) is modeled over the frequency range. A single substrate scalable Global Model™ is available that accurately emulates all capacitor values within the valid capacitance range.



<http://www.modelithics.com/mvp/Presidio>

 **PRESIDIO COMPONENTS, INC.**

7169 Construction Court, San Diego, CA 92121 • Tel: 858-578-9390 • Fax: 800-538-3880 or 858-578-6225
www.presidiocomponents.com • info@presidiocomponents.com

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Technical Notes

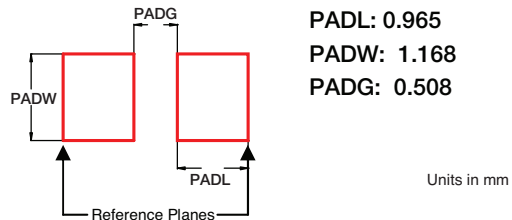
- Two-port S-parameters are measured using a vector network analyzer and on-board probing with calibration referenced to the outside edges of the component pad stack.
- Capacitors are measured in a series microstrip configuration. Models for alternative interconnect configurations (e.g. coplanar waveguide) can be ordered through Modelithics custom services.
- ESR is measured using a 34A Boonton coaxial resonator line.
- Substrates used to extract the models: 10 mil Quartz, 30 mil Rogers 4350B
- Typical range of valid substrate types (substrate height H in mils and dielectric constant Er): $2.6 \leq H/Er \leq 8.1$.
- Additional information about Presidio capacitors is available at www.presidiocomponents.com

Capacitor Values (pF)

0.33	6.8	56	180
0.68	8.2	82	200
1	16	100	250
1.5	18	120	
4.7	43	140	
5.6	47	160	

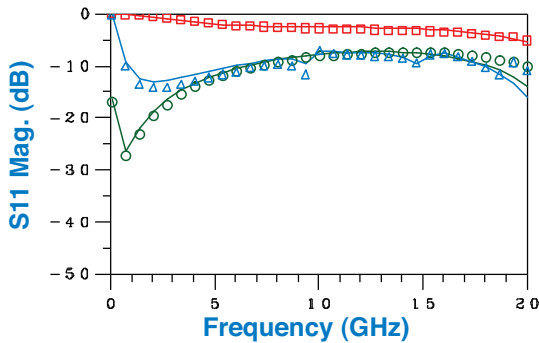
All capacitor values represent measurement-based models.

PC Board Footprint

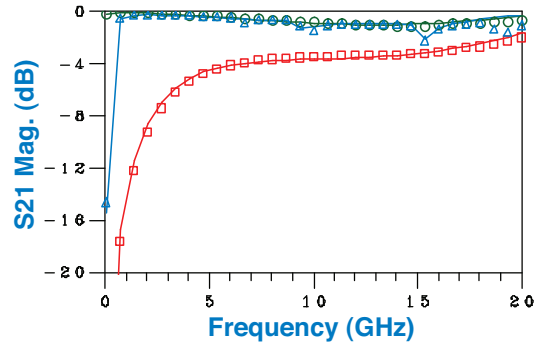


Typical Measured Series 2-port S-Parameter Data Versus Simulated Data

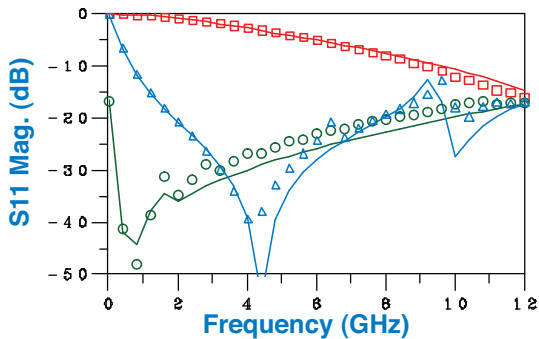
10 Mil Substrate



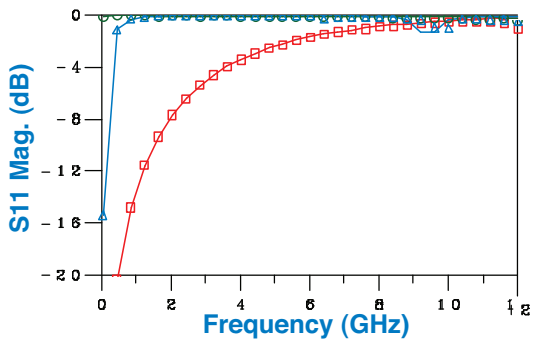
10 Mil Substrate



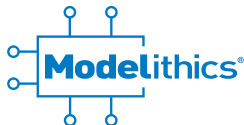
30 Mil Substrate



30 Mil Substrate



Legend: □ 0.33pF, △ 6.8pF, ○ 250pF, Solid line = Model data, Symbol = Measured data



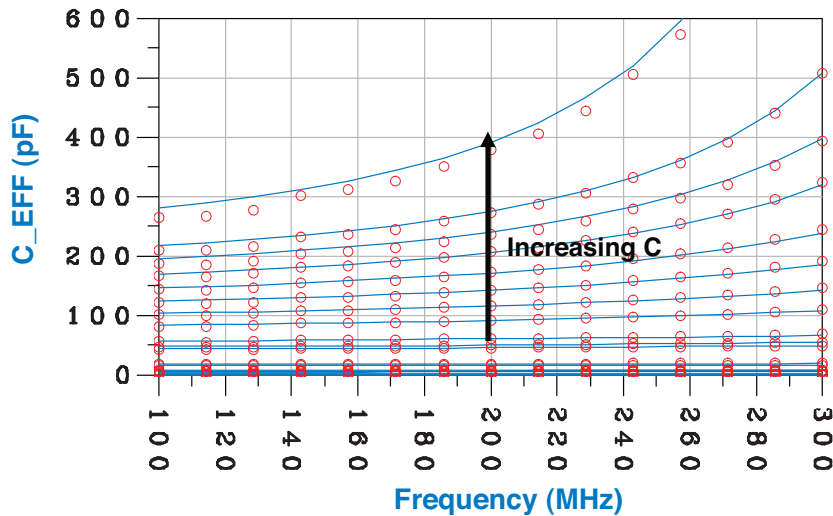
<http://www.modelithics.com/mvp/Presidio>



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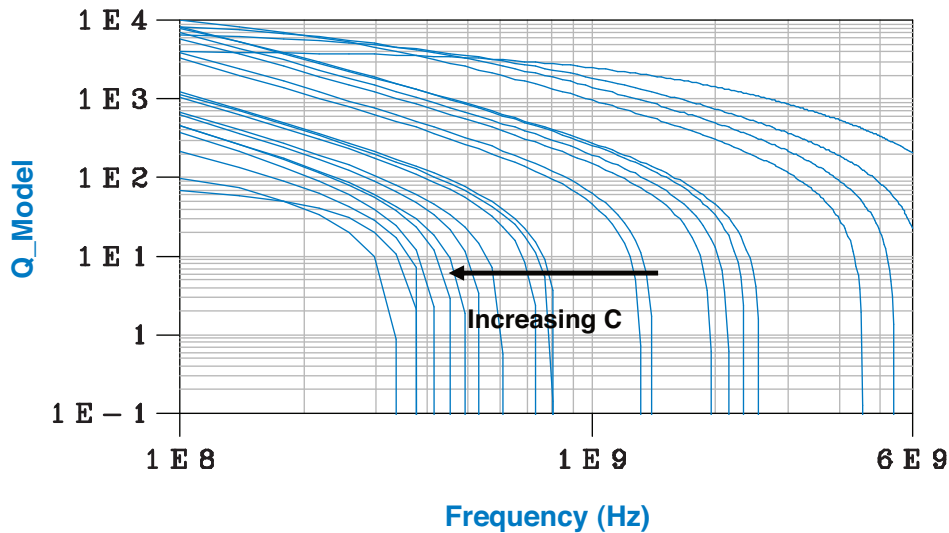
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Effective Capacitance Data

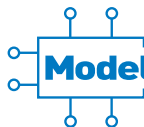


Legend: **Blue** solid lines – Model response on 30mil Rogers 4350B substrate for capacitance sweep
Red circles – Measurement data on 30mil Rogers 4350B substrate for capacitance sweep

Simulated Q-Factor



Legend: **Blue** solid lines – Model response on 30mil Rogers 4350B substrate



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