Modelithics®
Accelerating Your Design Success!

Modelithics System Components Library™

Overview

The **Modelithics System Components Library** is a collection of simulation models for system-level components such as amplifiers, filters, attenuators, and more. These models for real-life components make it possible for designers to simulate system chains that account for real-world factors like amplifier nonlinearity and much more.

System Components Library Supported Simulators

KEYSIGHT TECHNOLOGIES
Advanced Design System (ADS)
RF Synthesis (Genesys)
System Design (SystemVue)

cadence®
AWR Design Environment®

Library Features

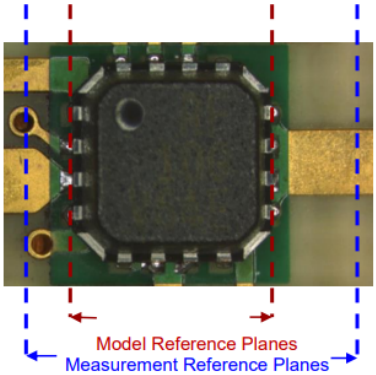
The Modelithics System Components Library offers an extensive selection of models, representing thousands of components. The installed models are fully integrated with various electronic design automation (EDA) software. Modelithics System Components Library also features a substrate library containing measurement-based substrate parameters for many of the most commonly used substrates.

- **Measurement-based** — Each model is developed using specialized measurements under device-specific test conditions.
- **Scalability** — Part-value, substrate, pad-size and temperature scalability are incorporated into many models.
- **Model Documentation** — Each model contains a model datasheet that lists recommended model validity parameters, measurement and test fixture details, and model-to-measurement data comparisons.
- **X-Parameter* Models** — An alternative to compact non-linear equivalent circuit models for transistors that can speed up non-linear simulations and facilitate model portability between simulation platforms. They provide accurate non-linear model representations of complex integrated circuits for which equivalent circuit modeling is not practical.

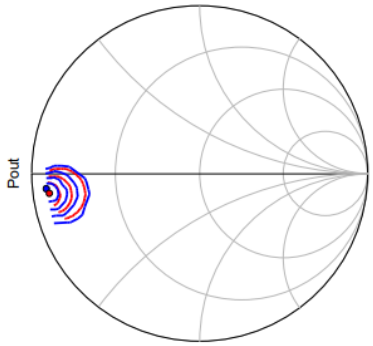
Multiple EDA Tool Compatibility

The Modelithics System Components Library models for discrete die, surface mount and packaged devices are a must-have for anyone involved in PCB-based RF & Microwave circuit or module design. The System Components Library is available for use with Keysight System Design (SystemVue), Keysight Technologies' Advanced Design System (ADS), Keysight Technologies' RF Synthesis (Genesys), and Cadence® AWR Design Environment®.

AMPXP-QOR-RF5110G-001
for Qorvo RF5110G high gain power amplifier in a QFN 3mm by 3mm package



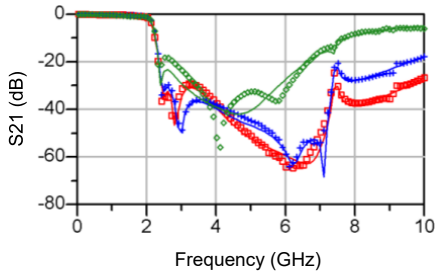
Load Pull Validation: Frequency = 840MHz, VCC = 3.6V, VAPC = 2.7V, Zo = 50Ω, Input Power = 4dBm:
Power Tuning (1dBm contour step)

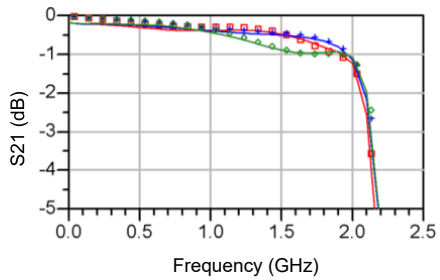


Efficiency Tuning (5% contour step)

LPF-MCL-LFCN1800-001
for LFCN1800+ceramic low-pass surface mount filter

Frequency Sweep





Solid Lines: Model
Symbols: Measured data
Red: 4 mil Rogers 4350B
Blue: 10 mil Rogers 4350B
Green: 60 mil Rogers 4003C

Schematic Representation



Model Input Parameters

- H – Height of the substrate.
- Er – Dielectric Constant of the substrate.
- T – Interconnect metal thickness of the substrate.
- TanD – Loss tangent of the substrate

** "X-parameters" is a trademark of Keysight Technologies, Inc. The X-parameters format and underlying equations are open and documented. For more information, refer to X-parameters Open Documentation, Trademark Usage & Partnerships.*

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Example List of Components in the Modelithics® System Components Library

Modelithics Vendor Partners (MVPs)

Aeroflex
ATTENUATOR
PCA, PCAA, PCAAF, PCAF, TCAF

Alpha
ATTENUATOR
AA101-80

Analog Devices
AMPLIFIERS
ADL8142

Avago
AMPLIFIERS
MGA86576

Freescale
AMPLIFIER
MWE6IC9100NR1

Gigalane
INTERCONNECTS
PSF-S00-000

Guerrilla RF
AMPLIFIERS
GRF2070, GRF2071, GRF2072, GRF2073, GRF2501, GRF2093, GRF2100, GRF2106, GRF4002, GRF4014

Hirose
CONNECTOR
U.FL-R-SMT-1

IMS
ATTENUATORS
A-0402WA-C, A-0603, A-0805, IA3-0805QA, IA3-1206WA, IMS1141, IMS2533, IMS2652, VDR-3725

SPLITTERS
IPS2346-C, IPS2668-C, IPT0402WA-C-U, IPT0603WA-C, IPT0805WA-C

Kyocera-AVX
COUPLERS
CP0402AxxxxAN, CP0402AxxxxBN, CP0402AxxxxCN, CP0402AxxxxDN, CP0402AxxxxEN, CP0402AxxxxFN, CP0402W2700FN, CP0603AxxxxAL, CP0402W2700FN, DB0603N2140ANTR, DB0603N2400ANTR, DB0603N3000ANTR, DB0603N3500ANTR, PC2025A2100A, PC2025A2700A

ATTENUATORS
RP10975AxxDB

MACOM
AMPLIFIER
MAAL010704

LIMITER
2691011

SWITCH
MASWSS0204

COUPLER
MACP-011088

SPLITTER
MAPD-011062

TRANSFORMER
MABA-011125

Marki Microwave
MIXERS
MM1-0626HSM, MM1-1453HSM, MM2-0530HSM

MAXIM
AMPLIFIERS
2371, 2373

MIXER
MAX2681

Mini-Circuits
AMPLIFIERS
AVA-183+, GVA-62+, GVA-63+, GVA-84+, PGA-102+, PGA-103+, PGA-105+, PHA-1+, PHA-22+, PMA-545+, PMA-5451+, PMA-5452+, PMA-5453+, PMA5454+, PMA5455+, PMA-5456+, PMA2-133+, PMA2-33+, PMA2-43+, PMA2-83,PSA4-5043+

BAND PASS FILTERS
XBF-Series (DG1847), XBF-Series (DQ1225)

COUPLER
JRB-D+

LOW PASS FILTERS
XLF-Series (DG1677), XLF-Series (DG1847), XLF-Series (DQ1225), LFCN-1000+, LFCN-120+, LFCN-1200+, LFCN-1200D+, LFCN-1700+, LFCN-1800+, LFCN-1800D+, LFCN-2250+, LFCN-3000+, LFCN-3800+, LFCN-400+, LFCN-4400+, LFCN-490+, LFCN-630+, LFCN-80+

HIGH PASS FILTERS
XHF-Series (DG1677), XHF-Series (DG1847), XHF-Series (DQ1225), HFCN-2700+, HFCN-3800+, HFCN-5500+, HFCN-740+ HFCN-880+, MC1630

ATTENUATORS
KAT, YAT-A

TRANSFORMERS
NCS1-63+, NCS2-83+, NCS1-422+

SPLITTERS
EP2C+, EP2K1+, EP2K+, EP2W1+, EP2W+, EPQ-133+, EP2KADG+

Murata
RESONATORS
DRM020KER930TCTX, DRR02011G450KTC01R9, DRR0201G350KTC01R, DRR0204G100PTC01R, DRR030KE1R225TC

BAND PASS FILTER
SFELA10M7GAA0

TRIPLEXER
LMTP33AA148

Premier Magnetics
TRANSFORMERS
DB2791S, DB2795S

Qorvo
AMPLIFIERS
RF2132, RF2878, RF5110G

RJR
PACKAGE
QFN-01

Sawtek
DIPLEXER
856331

Skyworks
SWITCHES
AS193, AS204, AS211

Smiths Interconnect
ATTENUATORS
AT5xxF, AT7xxF, CA0505D, K2TVA, TS06xxF, TSX, TT9, WTVA, WTVA0X00N05, WTVA0X00N07

EQUALIZER
CExxxxN0xxSMTF

SPLITTERS
RPD02-50EAF, RPD04-50EHF, WPD02-1525EBF, WPD02-1525UDF, WPD02-2535ECF, WPD03-1525EEF, WPD04-1525EFF, WPD04-2535EGF

Southwest Microwave
CONNECTORS
1092-01A-5, 1093-04A-5

RF360
BAND PASS FILTER
B7840 SAW

Susumu
ATTENUATORS
ATS1005-FD

Toko
BAND PASS FILTERS
ELFC455E, ELFY455E, ELFY455G

TRANSFORMER
617DB-1007

Toyocom
BAND PASS FILTERS
HF373A, HFF101A, HFF101B

UBE
RESONATORS
K020-03, AO-K016-08

Vanguard
TRANSFORMERS
K Series, M Series, R Series, S Series, 100205

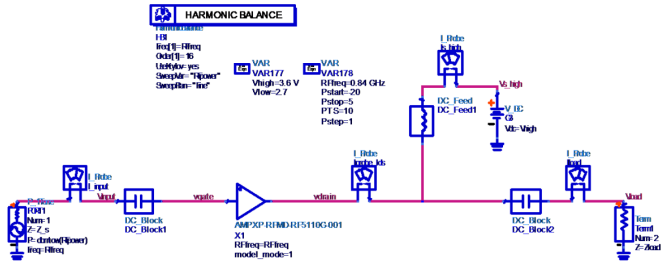
Vishay-Barry
ATTENUATORS
AK0405CB, AT0904CB

PACKAGES
QFN3312-0520, QFN3312-0521, QFN3312-0522, QFN4420-0520, QFN4420-0521, QFN4420-0522, QFN4424-0520, QFN4424-0521, QFN4424-0522, QFN5532-050x, QFN6636-0520, QFN6636-0521, QFN6636-0522, QFN7744-0520, QFN7744-0521, QFN7744-0522, QFN8848-0520, QFN8848-0521, QFN8848-0522

More to come! New models are added continually. Be sure to check out the models on the Modelithics Pre-Release List: www.Modelithics.com/Model/PreRelease

Available models may vary between simulators.

Example X-Parameters Simulation Schematic:

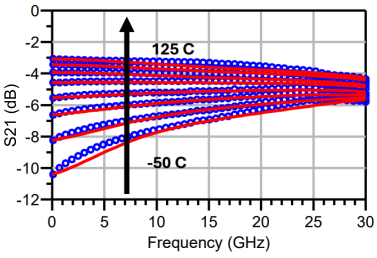


AMPXP-QOR-RF5110G-001 for Qorvo RF5110G high gain power amplifier in a QFN 3mm by 3mm package

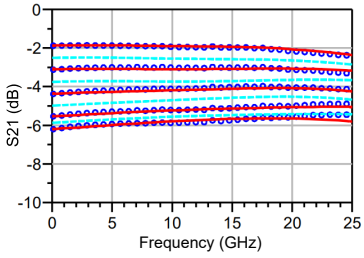
ATT-SINT-WTVA0X00N07-001

for the Smiths Interconnect Thermopad® WTVAxx00N07 with Temperature Coefficient of Attenuation TCA of 0.007 dB/dB/ ˚C SMT series surface mount attenuator family

Temperature Sweep



Part Value Sweep



10 mil Rogers 4350B

Red Symbols – Model
Blue Symbol- Measured data

Attenuator value used for simulation – for 5 dB attenuator of the WTVA series from (-50 ˚C to +125 ˚C, with Step of 25 ˚C).

The Model is validated with measured data over temperature (-50 ˚C to +125 ˚C, with Step of 25 ˚C) for all modeled values.

Red solid lines – Model response on 10 mil Rogers 4350B

Blue Symbols - Measured data

Cyan dash lines – Interpolated model response

The measured data and model response come from the 2,3,4,5 and 6 dB attenuators. The selected attenuator values for interpolation are 2.5, 3.5, 4.5 and 5.5 dB at temperature: 25˚C.

Video: Modelithics COMPLETE Library Overview

Learn More About Modelithics' Library & Licensing Options

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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**!

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