



### Overview

The Modelithics COMPLETE Library for Keysight PathWave RF Synthesis brings incredible flexibility and accuracy to electronic designs. Modelithics models are highly scalable, taking into account important design considerations, such as substrate and pad characteristics. The Modelithics COMPLETE Library includes thousands of popular passive and non-linear active device models, plus some Keysight X-Parameters\* models, all with accuracy to deliver first-pass design success.

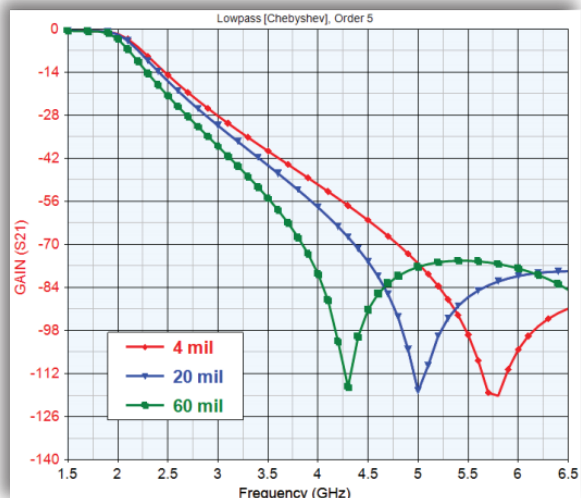
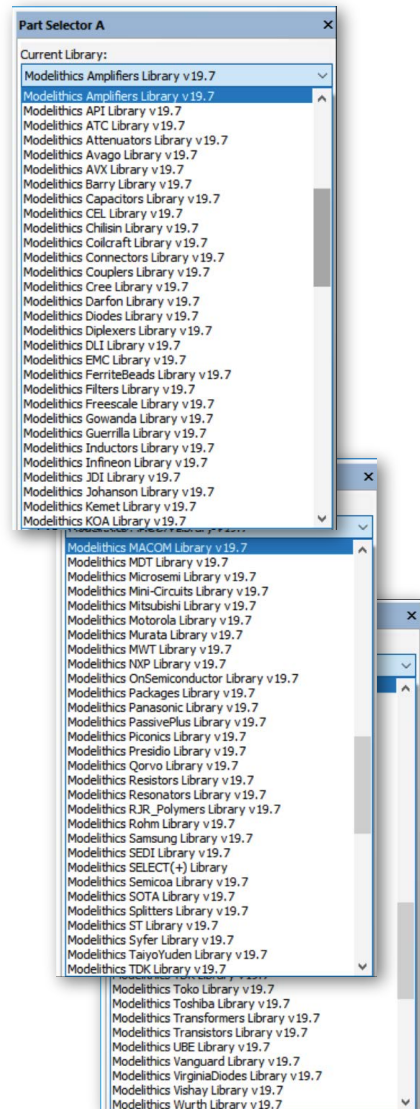
### Library Features

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

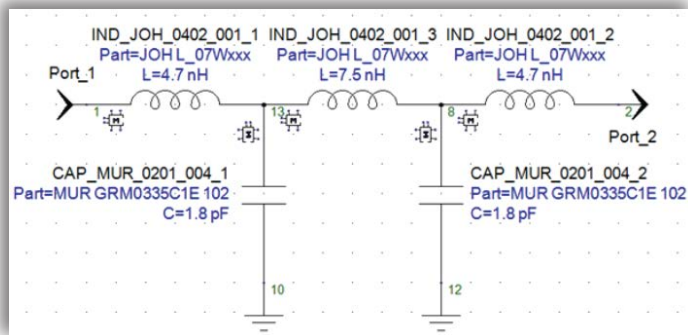
- **Measurement-based**—Each model is developed using specialized measurements under device-specific test conditions.
- **Scalability**—Part-value, substrate, pad-size and temperature scalability are incorporated into many models.
- **Model documentation**—Each model has an associated datasheet which lists the measurement validation ranges, measurement and test fixture details, and model-to-measurement data comparisons.
- **Keysight PNA-X VNA-Based X-Parameters Models**—Extend the capability of certain compact models, enabling them to predict mathematically-correct large-signal conditions.

### Modelithics COMPLETE at a Glance

- **CLR Library**—Capacitor, inductor and resistor Microwave Global Models™
- **NLD Library**—Non-linear diode models
- **NLT Library**—Non-linear transistor models
- **SLC Library**—System level component models (filters, amplifiers, etc)
- **Substrate Library**—Measurement-based MSub substrate definitions



Simulated S21 of a simple low-pass filter on three substrates. Modelithics models account for substrate parasitics.

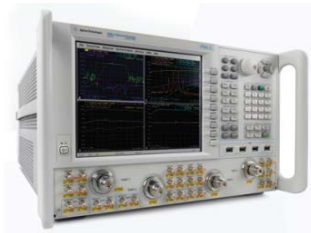


\* "X-parameters" is a trademark of Keysight Technologies, Inc. The X-parameters format and underlying equations are open and documented. For more information, refer to X-parameters Open Documentation, Trademark Usage & Partnerships.

# Example List of Components in the Modelithics COMPLETE Library for Keysight PathWave RF Synthesis

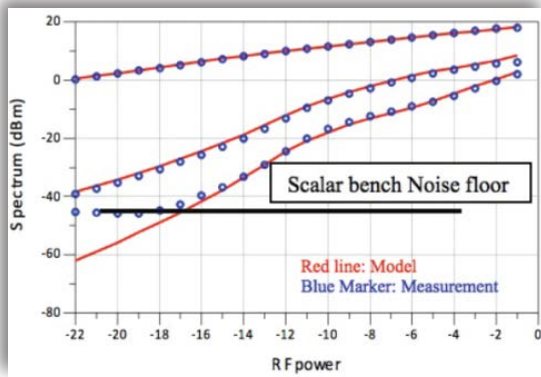
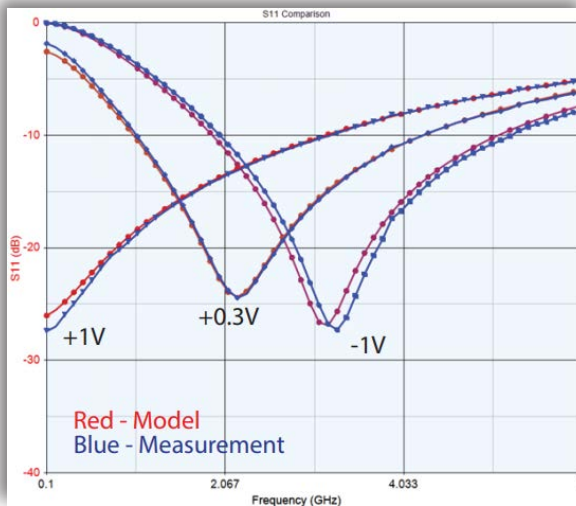
CLR			SLC		
<b>AVX Capacitors</b> COG (NPO), X7R, X5R, CU01, 0402XU, 0603xU, 0805xU, Accu-P (01005, 0201, 0402, 0603), AQ12, UQCA, UQCB, UQCF, UQCL, UQCR, UQCS, SQCA, SQCB, SQCF, SQCS, ML03, DLA (0402, 0603)	<b>AVX Inductors</b> HL002, HLC02, HL02, Accu-L (0201, 0402, 0603, 0805), DLA (0402, 0603, 0805)	<b>Coilcraft Inductors</b> 0201DS, 0302CS, 0402CS, 0603CS, 0402HP, 0402AF, 0402DF, 0403HQ, 0603HP, 0603LS, 0604HQ, 0805CS, 0805HT, 0805HQ, 0805HP, 0906, 1008CS, 1010VS, 1212VS, 1606, 1008HQ, 1008HS, 1008CT, 1206CS, 1812CS, MAXI, MIDI, MINI, 0806/0807/0908SQ, GA309X, 1111/1515/2222/2929SQ, 4310LC, BCL Conical, BCR Conical	<b>API-Inmet</b> PCAx/PCAAx/TCAF Attenuators	<b>Barry Industries</b> AK0405CB, AT0904CB Attenuators, QFN5532 Package	<b>Avago</b> MGA-635P8 (XP), Amplifier
	<b>AVX Resistors</b> RP-series (high power)		<b>AVX</b> CP0603, CP0402, DB0603, PC2025 Couplers, DP03, DP05, DP06 Diplexers	<b>IMS Attenuators</b> A-0402WA-C, IMS2652, A-0603-C, IMS2533, VDR3725SG	<b>Freestyle</b> MWE6IC9100NR1 (XP) Amplifier
<b>ATC Capacitors &amp; Inductors</b> 600L, 600S, 600F, 100A, 100B, 200A, 200B, 520L, 530L, 700A, 700B, 800A, 800B, 800R, 400Z, 400L, 400S Capacitors/ MOL Inductors	<b>Barry Industries</b> RK0603, RE0805, RY0805, RE1005, RY1005, REC1206, RYC1206, RZC1206			<b>Murata</b> DRR/DRMxxx Resonators	<b>UBE</b> K020-03, AO-K016-08 Resonators
	<b>Chilisin</b> CLH1608, CLH2012, CL2012 Inductors, SBY1005, PBY1608, GBY1608 Ferrite beads	<b>KOA</b> HFC1005 Capacitor/ RK73x1H, RK73x1E, RK73x1J, RK73B2A, RK73B2B, RK73x2E, RK73x3A, WK73S3A Resistors	<b>Mini-Circuits</b> HFCN High-Pass Filters (5), LFCN Low-Pass Filters (15), GVA-62+ (XP), GVA-63+ (XP), PHA-1+ (XP), GVA-84+ (XP), PGA-102+ (XP), PGA-103+ (XP), PGA-105+ (XP), PHA-22+ (XP) Amplifiers, RCAT, YAT Attenuators	<b>Southwest Microwave Connectors</b> 1092-01A-5, 1093-04A-5	<b>Vanguard</b> 100205 Transformer
<b>ATC Resistors</b> Style CS, CT, CW, CZ (high power), 504L	<b>Darfon</b> C0402 (01005), C0603 (0201) Capacitors	<b>KEMET Capacitors</b> C0402, C0603, C0805, CBR02, CBR04, CBR05, CBR06, CBR08		<b>Qorvo</b> RF2878 (XP), RF5110G (XP), AH101 (XP) Amplifiers	<b>SPAR (Data Models)</b>
<b>API-Inmet Resistors</b> NPC-, ANC-, PPC- (high power)	<b>Exxelia Capacitors</b> CLX, CLE, SHF251xxx				
<b>NLT</b>					
<b>Knowles-Dielectric Labs</b> C04BL121X, C04UL, C06CF, C06UL, C06BL, C08BL, C08BL102X, C11UL, Millicap, Opticap	<b>IMS Resistors</b> RC4-0302PW, RC3-0402PW, NDX-1020EZW	<b>Avago</b> AT-41511, AT-41533, AT-64023	<b>CEL</b> CE3512K2, CE3514M4, CE3520K3	<b>Infineon</b> BFP420, BF999, BFR949F, BFY420	<b>Murata</b> USBC Silicon Capacitors
	<b>Knowles-Syfer</b> 0402 H-Range, 0603 High-Q	<b>Cree</b> CGH35030F	<b>Motorola</b> MRF1513	<b>Qorvo</b> FPD750	<b>Guerrilla RF Amplifiers</b> GRF2070, GRF2071, GRF2072, GRF2073, GRF2501
<b>Johanson Technology</b> R05L, R07S, R14S, R15S, R15G, S42E Capacitors/ L-05C, L-07W, L-07C Inductors	<b>Panasonic</b> ELJRG, ELJRF, ELJRE, ERJ2G	<b>MwT</b> MwT1-MESFET	<b>Mitsubishi</b> MGF4953A, MGF4953B, RD01MUS1, RD07MUS2B	<b>On Semiconductor</b> MMBT3904LT1	<b>Mini-Circuits Amplifiers</b> AVA-183+, PGA-103+, PMA2-133LN+, PMA2-33LN+, PMA2-43LN+, PMA3-83LN+, PMA-545+, PMA-5451+, PMA-5452+, PMA-5453+, PMA-5454+, PMA-5455+, PMA-5456+, PSA4-5043+
<b>Murata</b> GRM02, GJM02, GJM03, GRM03, GRM15, GJM15, GRM18, GRM21, GRM32, GQM18, ERB21, GQM21, GQM22 Capacitors/ LQP02HQ, LQP02T, LQP02TQ, LQP03T, LQP15, LQP15, LQW18, LQP18, LQG18, LQW04A, LQG15 Inductors/ BLM15, BLM18, BLM21P, BLM31P, BLM41P Ferrite Beads, UBSC-935-152-492-510 (0201M)	<b>Passive Plus Capacitors</b> 0201N, 0402N, 0603N, 0708N, 0805N, 1111N, 0201BB, 01005BB, 0505C, 1111C	<b>MACOM</b> NPT1012, NPTB00004	<b>NXP</b> BFS505, BFS520, BFS540, PBR941, BFO540	<b>Rohm</b> UMIT1NR, EMT1, EMX1	<b>Mini-Circuits Splitters</b> EP2C+, EP2K1+, EP2K+, EP2W1+, EP2W+, EPQ-133+
	<b>Piconics</b> CCxx broadband conical inductors	<b>SEDI</b> FLL120MK, FSX017X		<b>Semicoa</b> 2C2857	<b>Mini-Circuits Filters</b> XBF Series (2), XHF Series (6), XLF Series (2)
	<b>Presidio</b> 0402UP, 0505UP, 0603UP, BB0201, BB0402, BB0502		<b>NLD</b>		
<b>Samsung</b> CL03, CL02	<b>Smiths Interconnect</b> CR and CT series	<b>Aeroflex/Metelics</b> MSSP25250-70, MMP7065-11, MLP7100, -7110, -7120, -7101, MSD710	<b>MACOM</b> MA4PH235-1072, MAVRxx, SMV20413 Varactor	<b>On Semiconductor</b> MMBD301LT1, MBD330DWT1	<b>Mini-Circuits Transformers</b> NCS1-63+, NCS2-83+, NCS1-422+, NCS2-392+
<b>ST Micro</b> PTC	<b>Toko</b> LLV0603, LL1005, LL1608, LL2012	<b>Toshiba</b> 1SVxxx Varactor Diodes (8), JDV25xx Varactor Diodes (4)	<b>Infineon</b> BARxx Pin Diodes, BASxx Schottky Diodes (7), BBxx Varactors (5)	<b>MDI</b> MP6250-P2715	<b>SOTA</b> S0202, S0303, S0505, S0603
<b>Taiyo Yuden</b> EMK042, LMK042, JMK042, TMK063, JMK063, EMK063, LMK105, TVS042 Capacitors / HK0603, HK1005, HK1608, HK2125 Inductors	<b>TDK</b> C0402, C0603, C1005, C3225 Capacitors, MHQ0402, MHQ1005, MLG0402, MLG0603, MLK1005, MLG1005, MLG1608, NLV25T, MLF2012 Inductors	<b>Rohm</b> RB715F	<b>Skyworks</b> SMPxx Pin Diode, SMSxx Schottky Diodes (5), SMVxx Varactors (9)	<b>Microsemi</b> UPP9401 Pin Diode	<b>Vanguard Electronics</b> 26,000 / 26,200 / 27,000 / 30,000 / 33,000 / 34,000 / 50,000
<b>Würth Elektronik Ferrite Beads</b> 74279223560, WE-CBA 0402 (Wide Band/High Current) / 0603 (High Speed/Wide Band/High Current) / 0805 (High Speed/High Current) / 1206 (Wide Band/High Current) / 1806 (High Current)	<b>Würth Elektronik Capacitors</b> WCAP-CSRF 0201 & 0402, WCAP-CSMH 0603 (NPO/X7R) & 0805 (NPO/X7R, 0.8mm & 1.25mm)			<b>Virginia Diodes</b> W Band Single Anode and ZBD	(XP) = X-Parameters-based models
<b>Würth Elektronik Inductors</b> WE-CAIR, WE-MK, WE-KI, WE-KI HC, WE-TCI, WE-AC HC 1010 / 1212	<b>Vishay</b> D10, D11 Resistors/ VJ0402, VJ0603, HPC0402 Capacitors				

**\*\* More to come! New models are added continually. Visit our website for an updated complete list, and see our available Pre-Release models. (www.Modelithics.com)**



Keysight PNA-X Non-Linear VNA. Modelithics' X-parameter models integrate seamlessly with Keysight Genesys design software.

Below: S11 of a Schottky diode using a bias sweep of three voltages



Above: An independent load pull measurement was used to validate the X-Parameter model simulated results. Fundamental, 2nd and 3rd harmonics comparison. (Qorvo RF2878 Amplifier)

Email [sales@Modelithics.com](mailto:sales@Modelithics.com) or visit [www.Modelithics.com](http://www.Modelithics.com) to request a FREE trial.