

Modelithics 3D Modeling Services

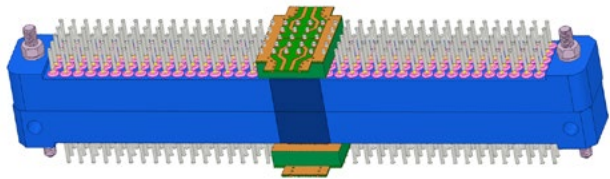


Image of mated IEH Hyperboloid PCB connectors simulated in four port differential mode. Small subset of available pins were enabled in an active region of the simulation.

Modelithics is the industry leader in providing accurate passive and active RF & microwave circuit simulation models. We enable designers to go from concept to product faster and easier.

Meeting the evolving needs of design engineers, Modelithics offers full-wave 3D electromagnetic analysis services to create encrypted 3D models based on detailed physical dimensions and material properties. These models are integrated into powerful 3D simulators, including Ansys® HFSS™.

3D Modeling and Simulation Created from Drawings and Specifications

• Supported Simulation Types

- Electromagnetic (EM) simulation, with validations from DC through 110GHz, or higher.
- Electro-Thermal (ET) simulations with direct linkage to an EM simulation. Includes bidirectional data exchange (RF loss and temperature).

• Measurement Validation

- Comparison to Vendor's performance data.
- Comparison to Modelithics' in-house lab measurements of provided samples.

• Product Delivery

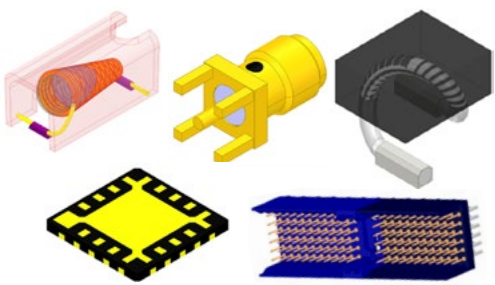
- Project file that includes the Unencrypted 3D Model and interconnect environment. Does not include unauthorized proprietary material, geometric and configuration information.
- Simulation results including S-parameter files, plots, reports and datasheets.

• Encrypted Component

3D Model with available proprietary material, geometric and configuration information.

• Inclusion into the Modelithics COMPLETE+3D Library.

- **Project file** that includes the Encrypted Component 3D Model and interconnect environment.



Various 3D encrypted models.

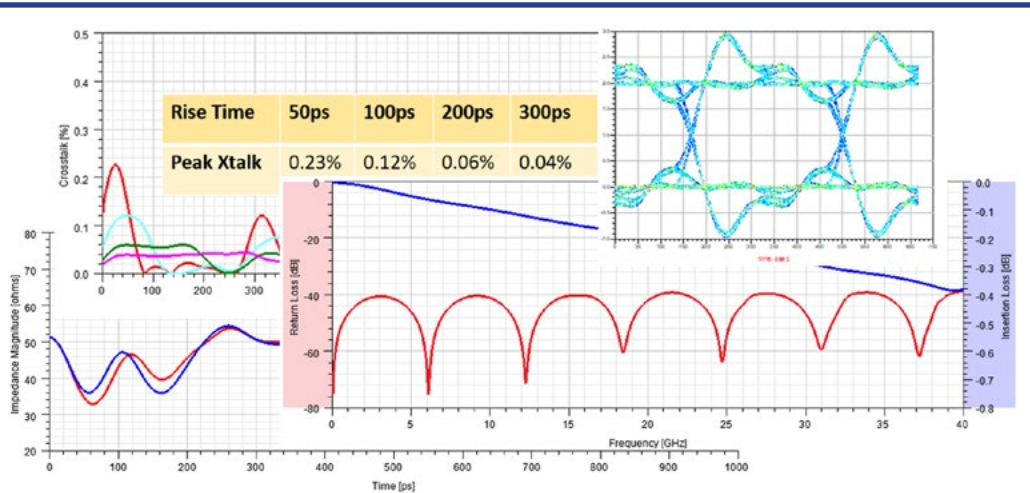
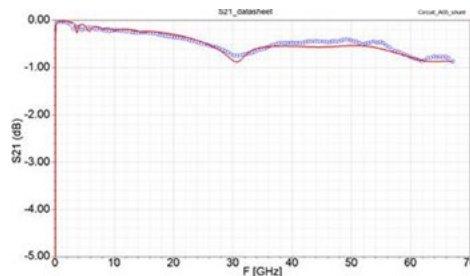
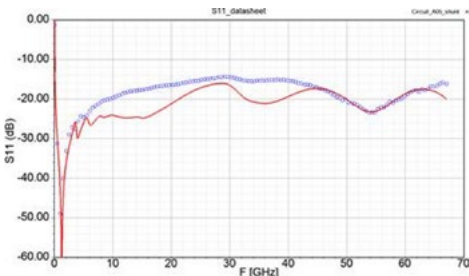


Image of multiple plots typical of simulation results, including an Eye Diagram, Crosstalk, TDR Impedance and S-Parameters.

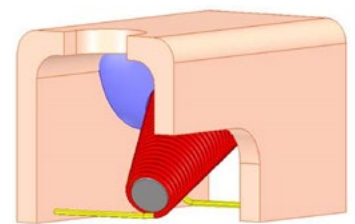
mm-Wave Return Loss and Insertion Loss Prediction with 3D Conical Model



(Left) Legend:

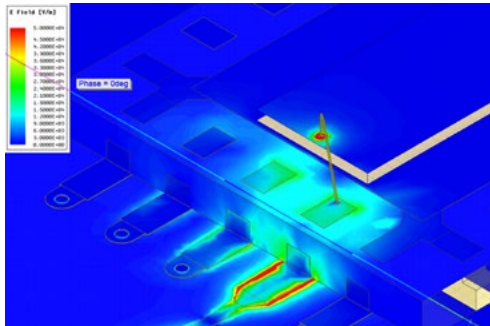
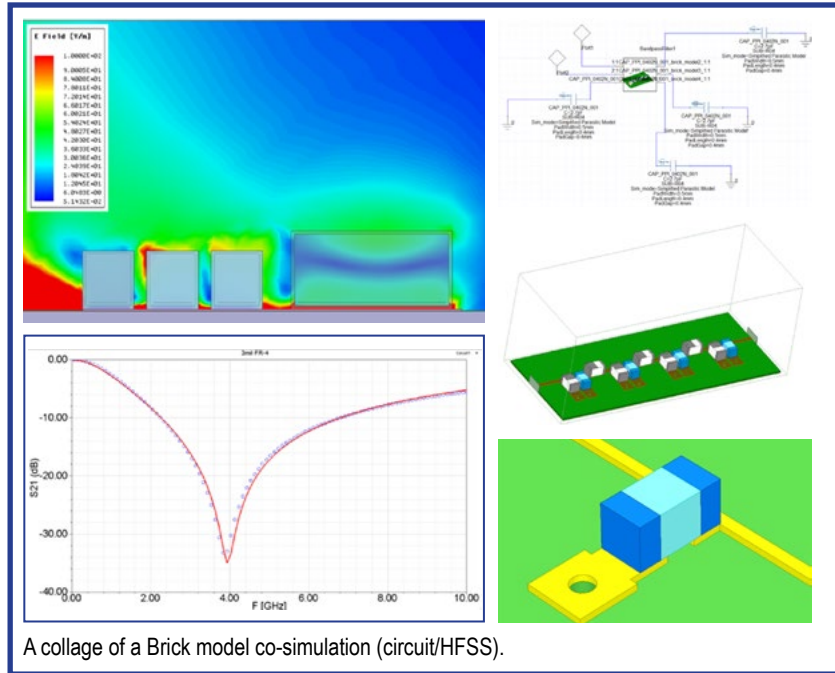
- Red Lines - Model data
 - Blue Symbols - Measured data
- 5mil Alumina (H/Er=0.5 mils, Width=4.6mils): Broadband

(Right) Legend: Image of 3D geometry model for the CC20T47K240G5-C S (0.25 μ H) inductor. Model reference planes are at component lead edge.

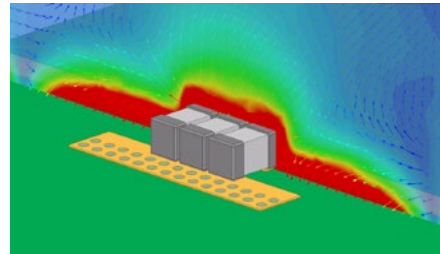
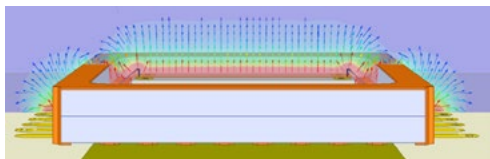


Analytic Data Reports Provided

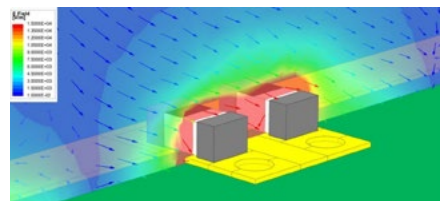
- Standard S-parameter Plots, such as return loss, insertion loss and isolation performance
- ESR (Equivalent Series Resistance)
- Effective Capacitance
- Effective Inductance
- Time Domain Reflectometry Impedance
- Crosstalk
- Eye Diagrams
- Single Ended and Differential Performance
- Coupling
- Thermal Gradients and Peak Temperatures



Surface current density plotted along PCB trace, QFN package, and bondwire thru path of packaged MMIC amplifier 3D co-simulation.



E-field visualization of 3 coupled shunt capacitors.



(Above) E-field visualization of MLG0603 dual-shunt capacitor.
(Left) E-field visualization of a Barry package.

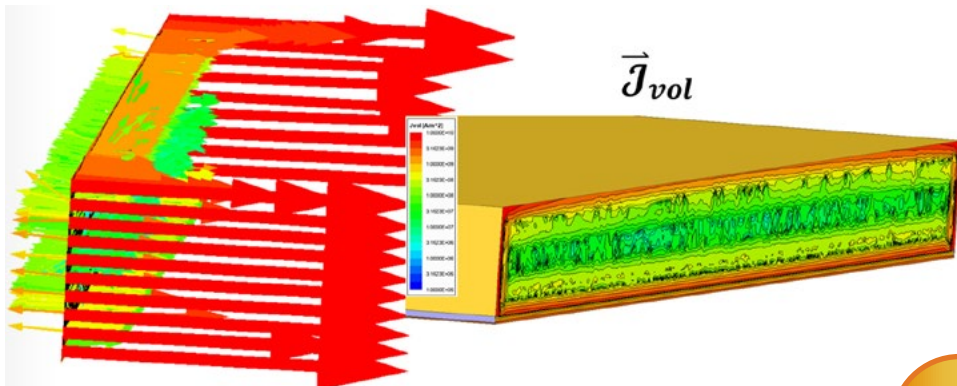


Image of copper microstrip trace cut through to expose an interior face. A topographic map of the volume current density magnitude at 60GHz plotted on the interior face. A vector field map of the volume current density at 60GHz plotted on the interior face.

Supported Components for 3D Modeling

- **Resistors/Terminations** – Ideal for ET simulations
- **Inductors/Coils** – Optimized for performance and reduced RAM usage
- **Capacitors** – Full 3D EM Geometry Models and 3D Brick Models (requires fewer internal details)
- **Filters** – LTCC, Ceramic Microstrip, PCB Microstrip, etc.
- **Coaxial Connectors**
- **High Density Multipin Connectors** – Uses Modelithics' Dynamic Region Selection feature to significantly reduce RAM and simulation time
- **Wire Bonds**
- **Integrated Circuit Packages**
- **Other PCB Components** – Couplers, power dividers, matching networks, resonators, etc.

To request a no obligation quote, please visit:

www.Modelithics.com/Requests/RFQ

For more information on Modelithics' 3D Modeling Services, email Sales@Modelithics.com.