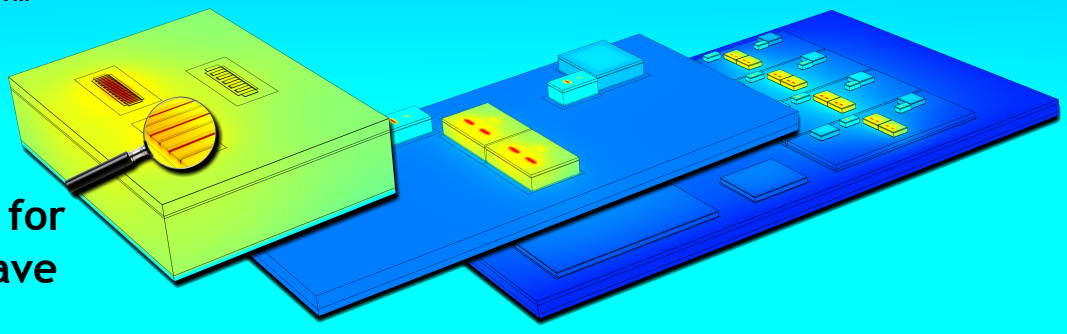
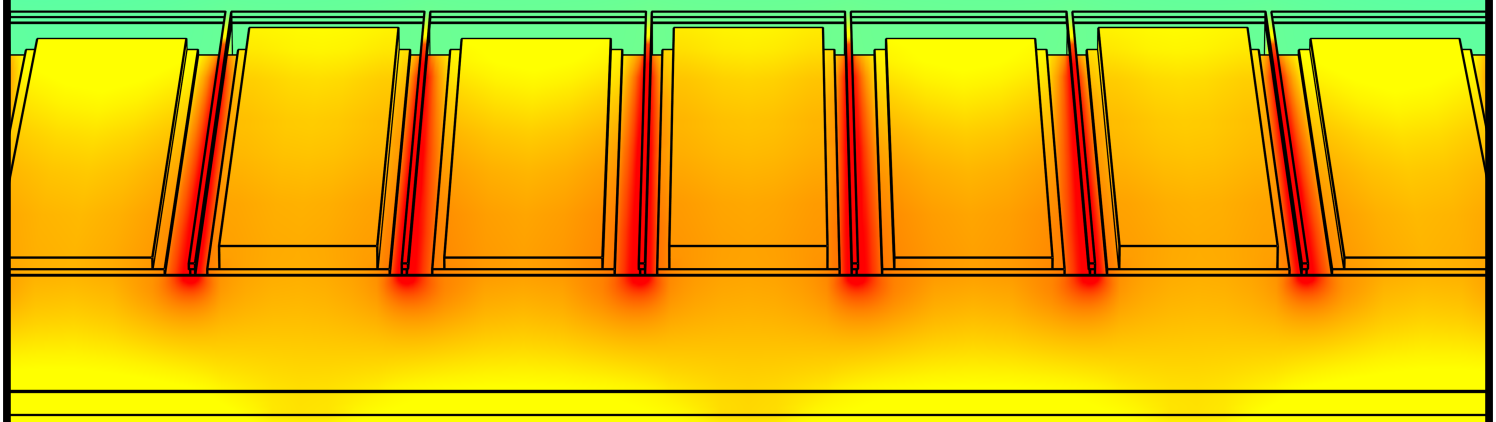
SYMMIC™

Template-Based Thermal Simulator for Monolithic Microwave Integrated Circuits





Thermal analysis of RF transistors, MMICs, & subsystems

is easy with SYMMIC, an uncompromising design-stage tool for microwave engineers. Device templates automate the analysis so long hours are not spent on geometric modeling and meshing. Just set design parameters to configure each transistor and then layout the devices in a MMIC to create a complete finite element model in just a few minutes. **Get the thermal analysis you need today!**

- ✓ **Faster and easier to use than comparable tools**
- ✓ **Integrated with AWR's Microwave Office™**
- ✓ **Closed-loop electro-thermal simulation**
- ✓ **Steady-state and transient solutions**
- ✓ **Temperature-dependent, orthotropic material properties**
- ✓ **Video demonstrations at www.symmic.net**

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CapeSym

Thermal analysis of single transistors, monolithic circuits, and whole subsystems

With SYMMIC, a transistor is placed in a realistic MMIC with other transistors, and easily mounted on a module. Modules can be mounted on other packaging elements, and thermal analysis of every stage is quickly computed from a coarser thermal analysis of the subsystem. SYMMIC automatically extracts boundary conditions on each MMIC in the subsystem, for highly accurate calculation of temperatures in each transistor.

Rapid problem setup

Pre-defined templates of transistors and other devices can be rapidly reconfigured to match a large number of device geometries just by changing a few parameters. Device layouts are easily exported from Microwave Office for rapid setup of whole MMIC thermal analyses.

High-fidelity 3D resolution, fast computation

Each template is an optimized finite-element specification of the full 3D heat transfer PDEs. The high-resolution solution is calculated with advanced techniques to produce an accurate result as quickly as possible.

Easier to use than comparable tools

SYMMIC eliminates defining meshes, setting up boundary conditions, and drawing part geometries. Meshes are automatically generated from pre-optimized, parametrized templates. CapeSym's engineers can create customized design kits for any technology domain.

Efficient design-space exploration

Reconfigurable templates test different device and circuit designs in different thermal environments. The results of a sequence of parameter changes are easily recorded for analysis and plotting in a spreadsheet. Quick reports provide a snapshot of parameter settings and temperature ranges on all components. The sample FET/HEMT template exemplifies parameters that can be modified, which include:

- Gate-to-gate spacing
- Thicknesses of all layers
- Existence and size of vias
- Number of gates
- Channel dimensions
- Source air bridge
- Gate length
- Finger width
- Bus widths
- Dissipated power distribution
- Orthotropic material properties
- Backside heat transfer rates

Automatic extraction of equivalent thermal impedance

SYMMIC performs a layer-by-layer analysis of thermal coupling between devices and outputs a compact thermal model that can be used to estimate peak junction temperatures for a given set of operating conditions.

Steady-state and transient solutions

SYMMIC performs thermal analysis of both constant and pulsed-power conditions. The 3D temperature solution can be plotted or sliced across any axis and the plot or slice can be animated through time.

Closed-loop electro-thermal simulations

Integration with Microwave Office facilitates electro-thermal analysis of MMICs with temperature-dependent transistor models. Electro-thermal simulations can be performed in Microwave Office using the equivalent thermal impedance generated by SYMMIC, or by alternating Microwave Office and SYMMIC simulations to convergence. Contact your AWR sales representative for more details.

Video demonstrations at: www.symmic.net

Class is always in session at www.symmic.net, where instructional videos explain the capabilities of the software and demonstrate how to set up and solve problems using the sample templates provided with the demo software package. Learning to perform finite-element thermal analysis has never been easier!

System requirements

- Microsoft Windows XP/Vista/7 (64-bit version recommended)
- x86 or x64 compatible CPU (2 x64 cores recommended)
- 4 GB RAM (16 GB recommended)
- Hardware-accelerated OpenGL

Machine-locked and floating licenses for SYMMIC are available. Please contact symmic_sales@capesym.com.