Microwave Office Success Story

SKYWORKS®
BREAKTHROUGH SIMPLICITY

Skyworks uses Microwave Office to successfully design front-end multi-chip modules

Customer Background

Skyworks Solutions, Inc. is an industry leader in radio solutions and precision analog semiconductors. The company's power amplifiers, front end modules, and direct conversion transceivers are at the heart of many of today's leading-edge multimedia handsets, cellular base stations, and wireless networking platforms. Skyworks also offers a portfolio of highly innovative linear products, supporting a diverse set of automotive, broadband, industrial, and medical customers.

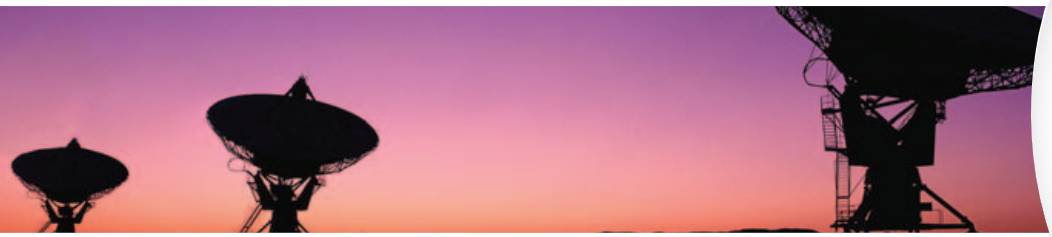
Customer:
Skyworks Solutions Inc.,
Woburn, MA Design Center

Application:
Skyworks Intera Front-End Modules

AWR Products:
Microwave Office® 2006 Design Suite and EMSight electromagnetic (EM) simulator

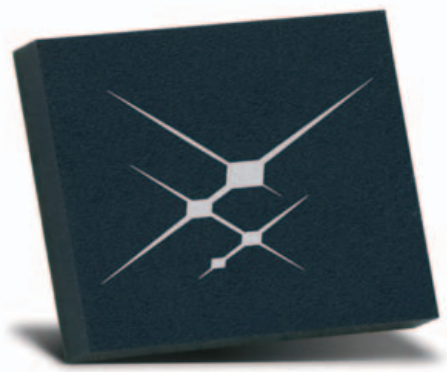
Design Challenge

Skyworks Intera front-end modules were designed with cost and space savings in mind. Skyworks Intera FEMs combine the company's industry-leading power amplifier (PA) module and switch functions into single low-cost, laminate-based multi-chip modules (MCMs). Key features of the



transmit front-end modules include multi-band multi-mode power amplifiers, high-linearity transmit/receive switches, and all associated filtering, and control functions.

Skyworks EDGE Front-End Module
SKY77508



8 x 10 MCM

www.skyworksinc.com

"This is a tool developed with the designer in mind. The concurrent AWR flow enables us to produce more accurate and robust designs three times faster than in other EDA tools, giving us a faster time-to-market, and enabling us to exceed our customers' expectations."

Paul T. DiCarlo
Sr. Director of Engineering
PA/FEM Development
Skyworks Solutions, Inc.

The Solution

What design problem did AWR's software help you to solve?

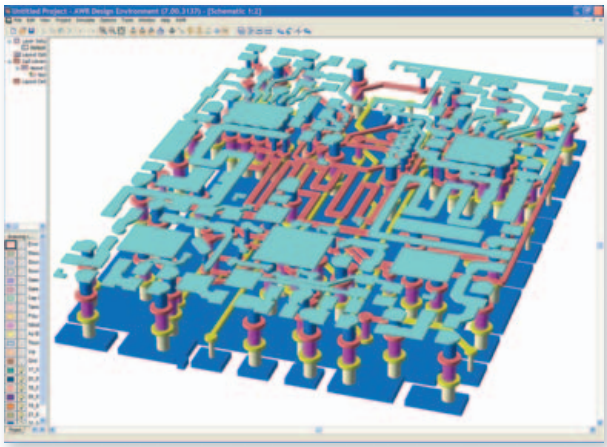
AWR has the only electronic design automation (EDA) environment capable of handling the increasing complexity and higher integration of multiple-band PA modules and switch functions into single MCMs. Microwave Office software has the unique ability to simulate multiple integrated circuits (ICs), operating within a complex package, including bondwires, vias, and interconnects. Seamless integration of EM simulation, circuit simulation, and layout reduces errors which allows for a more robust design and accelerates time-to-market.

What were your reasons for choosing AWR software?

Increased productivity, ease of use and the concurrent design approach which the tool allows us to employ. Lastly, customer service and on-site support is unmatched in the industry.

What were the key benefits of using AWR software?

The resulting Skyworks front-end modules are completed in about one-third the design time of competing tools and reduces the need to employ multiple EDA tools during the design cycle.



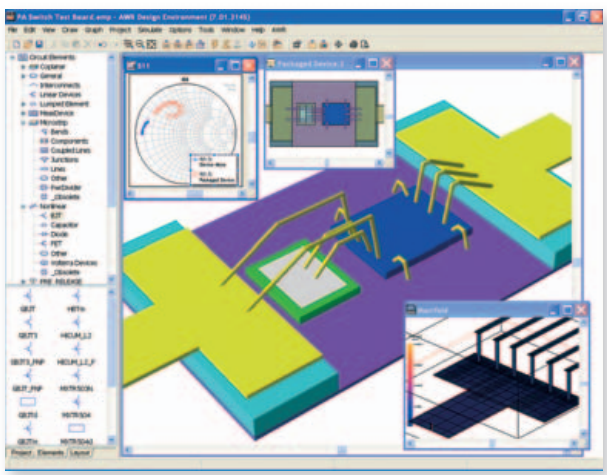
Skyworks modules combine proprietary heterojunction bipolar transistor (HBT) power amplifiers with low-loss pseudomorphic high electron mobility transistor (PHEMT) switch technologies in a multilayer laminate module.

Product Overview

Microwave Office design suite is the industry's fastest growing microwave design platform and has completely revolutionized the communications design world by providing users with a superior choice. Built on the unique AWR high-frequency platform with its open design environment and unified data model, Microwave Office design suite offers unparalleled ease-of-use, powerful technologies, and unprecedented openness and interoperability, enabling integration with best-in-class tools for each part of the design process. Microwave Office software includes all of the essential technology: linear and non-linear circuit simulators, EM analysis tools, integrated schematic and layout, statistical design capabilities, and parametric cell libraries with built-in design rule checking (DRC).

The 2006 product release continues to deliver key productivity improvements, such as faster EM simulation, faster and higher capacity layout, and a more integrated EM editor, that shorten design cycle time and speed time-to-market for RF/microwave products.

With the acquisition of APLAC Solutions, AWR now offers the most powerful and flexible RF/microwave design environment available in the industry. The unique combination of APLAC's incomparable RF simulation technology and AWR's own robust simulators provides designers with the best of both worlds: powerful, speedy simulation capabilities for both large and highly nonlinear designs within an easy-to-use, integrated design platform.



System-in-Package (SiP) technology is becoming firmly established within the wireless industry. Microwave Office 2006 features many new capabilities to automate the development of SiPs including faster EM simulation and support for multiple process design kits that allow dies produced with different process technologies to be easily integrated into a single package.

AWR

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