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ANADIGICS Relies on Agilent's ADS for RFICs Design - a Customer Success Story

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ANADIGICS Relies on Agilent EEsof Advanced Design System for Design of RFICs

Customer Success story

> *"Our decision to use ADS as an exclusive RF front-end design tool has paid off in a big way. It has allowed ANADIGICS to focus on what we do best – develop RFIC products".*

Shihab Al-Kuran
Director of Design Technology Engineering
ANADIGICS, Inc.

Customer: ANADIGICS, Inc. (www.anadigics.com)

Challenge: To optimize the use of design tools for maximum productivity

Solution: Standardize on Agilent EEsof's Advanced Design System

Results:
- Several first-time design successes – including a new 40 Gb/s pre-amplifier for wireline applications.
- Engineering productivity improvements

The Company
ANADIGICS is a leading worldwide supplier of radio frequency integrated circuit (RFIC) solutions for growing broadband and wireless communications markets. The company's innovative high frequency RFICs enable manufacturers of communications equipment to enhance overall system performance by reducing the size and weight of their products, increasing power efficiency, improving reliability, and reducing manufacturing cost and time to market.

The Challenge
RFIC technology is moving fast and being pushed to its limit by tougher requirements on size, performance, and power. In order to remain a leader in this market, ANADIGICS knew they needed to optimize the design productivity tool-set used by the engineers. They realized that they were not being effective supporting five different CAD tools as well as an internal spice tool. "Trying to keep all the different tools and models up to date was a nightmare," explains Shihab Al-Kuran, Director of Design Technology Engineering. "We were fragmented with all of these different tools and it was going to require more resources to support it well."

The Solution
ANADIGICS made a bold decision to switch from using several different design tools to just one front-end RF design tool. They standardized on Agilent EEsof Advanced Design System software and models.

"Agilent is not just a pure software company. It has RF designers, fabrication facilities, and a modeling group. Agilent understands what we are trying to do because they do it themselves," said Al-Kuran. "This was a big factor in choosing to work with Agilent."

To make the transition easier, ANADIGICS formed a relationship with Agilent EEsof in which they became involved in the early development of the Advance Design System. "We were able to get early access to cutting edge technology for our designs as well as provide feedback to the ADS

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tool designers. This arrangement became beneficial for both companies", said Al-Kuran.

One example of accessing cutting edge design technology is a project that ANADIGICS has contracted with the Solution Services Group inside Agilent EEsof. "We have co-developed an advanced solution that allows us to have a more efficient design flow for RFIC integration," explained Al-Kuran. "The project directly links Momentum RF with ADS circuits by allowing circuit and EM co-simulation and co-optimization. This results in faster simulation, with more accurate results, all in the same user interface. We have seen a dramatic reduction in the development time of circuits that require intense EM simulation."

The Results
"Our decision to use ADS as an exclusive RF front-end design tool has paid off in a big way", exclaimed Al-Kuran. "It has allowed ANADIGICS to focus on what we do best – develop RFIC products".

Often, RF design tends to be viewed as black magic. ANADIGICS credits their ability to reduce the number of design iterations with the many features in ADS as well as its ability to improve the IC design flow.

"There are several areas where we have achieved first time design success using ADS. That is very uncommon", said Al-Kuran. One example is a Microwave DC/DC converter circuit where the measured results

matched perfectly with the simulation results. The converter was quickly incorporated into over 80% of ANADIGICS' datacom fiber optic products because of the high degree of confidence they had in the part.

Another first time design success is a new 40 Gb/s fiber optic pre-amplifier. "This was a very challenging design that required the use of almost every simulation technology in ADS", said Al-Kuran. The Convolution Simulator was used to analyze high frequency effects such as dispersion, a capability that is not typically found in standard Spice simulators. The EM tools were used for package modeling and signal integrity for these high data rates. "We are very excited about the results."

Engineering productivity has improved using ADS because tools like Momentum, EM simulation, are built-in. "Our engineers use Momentum to simulate passive matching circuits in the same environment as the active circuitry. They don't have to spend time transferring designs from one tool to another, nor do they need to learn several tools", said Al-Kuran.

The sensitivity analysis capability in ADS has also been an important feature for ANADIGICS' designers. It has enabled them to center a design by adjusting component values to improve the predicted manufacturing yield. Designers can then translate the sensitivity analysis results into

component specifications required from vendors.

"ADS has reduced our design cycle by months. In these economic times, this saves us hundreds of thousands of dollars in cost and more importantly brings in millions in revenue by being early to market", said Al-Kuran.

For more information about ANADIGICS, go to: www.anadigics.com

For more information about Agilent EEsof EDA and Advanced Design System, visit our Website: www.agilent.com/eesof-eda

For more information about other Agilent test and measurement products, go to: www.agilent.com/find/tmdir

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