ROHM speeds automotive product development adopting SystemVision Cloud from Mentor, a Siemens Business

ROHM improves customer engagements, lowers time-to-volume, and enables easy verification of solution circuits by incorporating Mentor’s SystemVision™ Cloud environment into its cutting-edge web simulation tool.

Headquartered in Kyoto, Japan since 1958, ROHM Co., Ltd. is a global semiconductor and electronic components manufacturer. In the early 1970s, ROHM led the expansion of Japanese high-tech companies into the U.S. and other foreign markets and maintains its leadership with persistent investment in modernization and with factories, sales offices, and technical centers around the world.

Today, ROHM is renowned for its wide product lineup, featuring excellent performance and reliability. ROHM has made great contributions to energy saving, miniaturization, and design load reductions in applications. In the power field, they were the first in the industry to commercialize the next-generation power device, SiC MOSFET. In the analog field, they have introduced leading-edge technologies such as the innovative power supply technology “Nano” series and the high noise tolerance amplifiers/comparators in the “EMARMOUR” series.

In addition to driver ICs that maximize power device performance, ROHM is focused on solving customer issues with high-quality, targeted solutions and support tools. Their vertically integrated production system, from wafer manufacturing to circuit design, packaging and testing, ensures a long-term stable supply of products and reliability based on thorough traceability.

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— Ippei Yasutake, ROHM

CUSTOMER PROFILE

ROHM Co., Ltd. is a semiconductor and electronic components manufacturer that supplies high-quality, highly reliable LSIs, discrete, and electronic components to various markets around the world, including automotive, industrial equipment, and consumer goods.

Motivations

- ROHM’s customers asked for an environment that makes simulation easier and more effective.
- Previously, ROHM used only SPICE simulation models to tune their components to their customers’ specifications; however, SPICE models present several challenges.

Solutions

- ROHM created a cutting-edge, web-based simulation environment leveraging the unique features and capabilities of the SystemVision Cloud platform.
- The SystemVision Cloud platform overcomes the limitations of conventional SPICE simulation models, supporting VHDL-AMS, and SPICE simulations.
- The SystemVision Cloud simulator allows customers to reduce the man-hours required to select components and eliminate circuit design failures.

“We with the SystemVision Cloud online collaboration features, we can amplify our customer engagement at a fraction of the cost of onsite visits.”

— Kunihiro Komiya, ROHM

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The Best Ingredients Are More than SPICE

Automotive OEMs and Tier 1 companies are among ROHM’s key customers. They need functional verification using simulation and analysis to ensure the time-to-market, quality, reliability, and safety requirements of circuits and models they develop using model based design. ROHM customers in other industries have similar needs due to model based design becoming a widespread practice.

Simulation is so important for model based design, because it reduces the time and effort of component selection and identifies potential or fundamental issues before physical product validation. Additionally, in the design of electronic circuit boards, simulation significantly decreases time and effort during the board prototyping and evaluation phases.

Previously, ROHM used only SPICE simulation models to tune their components to their customers’ specifications. In turn, their customers downloaded these SPICE models to use in their own SPICE simulation environments.

However, SPICE models present several problems. There is no definitive SPICE standard, making it impractical if not impossible to offer a single, universal model that works in every customer’s SPICE simulator-of-choice. Conversely, providing a different model for every type of simulator is prohibitively expensive. And, importantly, SPICE models predict only electrical performance, while automotive suppliers need to verify broader characteristics, particularly for thermal behavior, which presents many trouble spots in application design.

Therefore, to overcome the limitations of conventional SPICE models, the Analog Power Application Department within the Application Engineer Division at ROHM wanted to offer an innovative, online simulation environment that would help their customers more quickly select, integrate, and validate ROHM components. The ability to provide such a solution not only fulfills ROHM’s “Quality First” mandate but also helps them propose the best components for their customers’ designs.

“We felt that effective application design needs an easy-to-use environment to conveniently and fully simulate our proposed circuits online,” recalls Kunihiro Komiya, Manager of Analog Power Application Department at ROHM.

Understandably, the ROHM team wanted to accelerate the introduction of this more versatile and easier-to-use online simulator environment. So instead of creating an entirely new solution from scratch they looked for an existing platform they could build upon.

“SystemVision enabled us to quickly deliver our high-quality, cloud-based simulation environment.”
— MAKOTO TERADA, ROHM

After careful consideration of the options, the ROHM team determined that only the SystemVision Cloud (SVC) platform from Mentor Graphics, a Siemens Business, offered the features they were looking for. This unique set of features includes:

- A multi-domain simulator that supports model-based development
- Support for SPICE and VHDL-AMS models
- Straightforward expansion to thermal simulation
- ROHM customer cloud simulation hosted on ROHM’s website
- Cost-effective, self-service registration of ROHM components as SystemVision libraries
- Recommendation by the Society of Automotive Engineers of Japan, Inc., supporting ROHM’s strategy to focus on automotive market
- Accelerated simulation using highly abstract models, especially important when simulating a solution circuit with multiple ROHM components
- Support from Mentor application engineers

“We chose Mentor’s SystemVision Cloud platform because it is the only solution that meets all of our requirements,” explains Ippei Yasutake, Group Leader of Analog Power Application Department at ROHM.

The Best Platform for Cloud Based Simulation

SystemVision Cloud is a cloud-based software service provided by Mentor that allows users to perform the latest multi-domain simulations. This system, which can be accessed from a web browser to carry out analysis anytime, anywhere, supports encrypted VHDL/AMS and SPICE models. Because the circuit topology can be imported from SystemVision Cloud into Xpedition, Mentor’s flagship PCB design tool, customer designs can be smoothly connected to the PCB board design flow.
SystemVision Cloud enables ROHM customers to exercise “executable specifications” within a cloud environment. Adaptors can easily change circuit design parameters in the cloud without the time and expense of test equipment. This solution encourages ROHM’s customers to achieve optimal device configuration.

Importantly for ROHM’s automotive customers, the SystemVision Cloud simulator can handle not only electric circuits but also mechanical and thermal circuit models. In addition, it has superb usability characteristics, including circuit diagram creation, graphical waveform display, and tunable design operation (i.e., fixed-topology circuits with tunable design choices that can be embedded and simulated directly on the ROHM website). These all add up to a solution that makes ROHM parts the quick and easy choice for circuit designers.

“SystemVision enabled us to quickly deliver our high-quality, cloud-based simulation environment,” Makoto Terada, Group Leader of Analog Power Application Department at ROHM reports.

By building upon the SystemVision platform, ROHM was able to speed the development of its cutting-edge, web-based simulator, the ROHM Solution Simulator. This cloud-based simulation environment allows users to perform complete circuit verification of power devices and driver ICs at the same time, making it possible to quickly and easily validate ICs along with power devices under close-to-actual conditions.

“Leveraging the feature of being able to simulate in a cloud environment, we embedded the SystemVision system on our official website and started to provide a web simulation tool, the ROHM Solution Simulator in early 2020,” explains Kunihiro Komiya. “This platform enables customers to simulate power devices, driver ICs, and power supply ICs on a solution circuit together.”

These capabilities allow electronic circuit designers and system designers to significantly reduce the number of application development steps and prevent problems before they occur.

“While solving the problems associated with SPICE models, our new solution simulator allows our customers to not only reduce the development time required to select components, but also reduce circuit design issues by tuning and testing their circuits virtually,” says Kunihiro Komiya. “Customer response has been tremendous!”

**More Productive Collaboration**

Because SystemVision Cloud enables ROHM customers to simulate in a cloud environment hosted on ROHM’s website, ROHM is now able to respond to customers’ need for simulation, increase the inflow of engagements to ROHM’s website, and deliver the latest product information directly to its customers.

But it doesn’t stop there. Because the ROHM Solution Simulator is built on SystemVision Cloud, it is easy for circuit designers to leverage the ROHM-provided circuits by seamlessly migrating their design work to the SystemVision Cloud site. ROHM customers can use their personal SystemVision accounts or take advantage of collaboration groups sponsored by ROHM on the SystemVision site. In online groups, ROHM application engineers can engage in design iteration directly (and privately) with customers, ensuring customer success with ROHM components.

**ROHM Solution Simulator GUI**
“Now we can focus on maintaining a single, standardized set of device models and reference circuits,” says Kunihiro Komiya. “With SystemVision’s online collaboration features, we can amplify our customer engagement at a fraction of the cost of onsite visits.”

Supported by the online simulation and other SystemVision Cloud features, ROHM plans to continue to add solution circuits and products, including models for thermal simulation, to the component libraries supported by the ROHM Solution Simulator and SystemVision Cloud platforms.

“We are going to increase our circuit lineup so that we can provide even more customer value, and we already see more customers making more use of SystemVision and our ROHM Solution Simulator as they run simulations again and again by changing component values,” Ippei Yasutake observes. “Most importantly, we believe we will achieve a reduction in customer circuit verification time and circuit design errors.”

“It’s great to be able to provide this simulation service on the ROHM official website!” Makoto Terada concludes.

“Our new solution simulator allows our customers to not only reduce the development time required to select components, but also reduce circuit design issues by tuning and testing their circuits virtually.”

— KUNIHIRO KOMIYA, ROHM