

PRESS INFORMATION

LEM and Semikron Danfoss co-design new current sensor ideal for high-power automotive applications

Geneva, Switzerland, January 30, 2024 – LEM (SIX: LEHN) – The transition to a decarbonized economy is accelerating fast and the demand for innovative technologies is increasing to support the large-scale adoption of electric vehicles (EVs). Lightweight and compact design of power electronic components is key to enabling efficient design and increasing the driving range of EVs – adding value to Tier 1 supplier / OEM system engineers and consumers.

After working closely together for several years, LEM and Semikron Danfoss have designed a new concept, called Nano, that merges the capabilities of LEM's range of current sensors with Semikron Danfoss's DCM half-bridge power module platform for high-power automotive applications. The collaboration results in a core-based sensor that is 60% smaller than anything previously available without any compromise on performance.

“The Nano current sensor is a great example of how LEM is able to work hand-in-hand with industry specialists to tackle customers' system challenges and create innovative current sensing solutions that deliver optimal performance levels. This project was a significant challenge, and the beauty of its success lies in the perfect collaboration with Semikron Danfoss. Both teams have been able to work almost like one single team. We have been able to push the boundaries because we created a synergy from our different expertise.” says Damien Coutellier, Senior electronics engineer and Nano project manager at LEM.

The newly developed sensor makes it possible to completely integrate the sensing function into the power module, minimizing component footprint, simplifying assembly and keeping costs down. It is particularly ideal for use with electric vehicle (EV) traction inverters with the DCM platform, but also compatible with other Semikron Danfoss power module platforms. The innovative idea behind the Nano concept was to design a core-based current sensor that could fit into the unused space between the top side of the power module and the gate driver board.

This enables the footprint of the current sensor to overlap with the footprint of the power module. As a result, the Nano current sensor does not take up additional space in the inverter. Also, no additional components are required to fixate the sensor mechanically and connect it electrically to the driver board. This delivers the highest level of integration that a core-based current sensor can achieve. The Nano current sensor is mounted on the DCM™ power module, which uses the latest generation of 750V and 1200V SiC MOSFETs and has a rated current of 200A to 1000A.





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Characteristics of the DCM platform mean that the new device satisfies insulation coordination requirements for 800V batteries per IEC 60664-1. At the same time, superior mechanical robustness, high-temperature stability and protection from humidity and vibrations enable inverters to deliver stable and reliable performance in a range of environments.

“By working hand-in-hand with LEM, Semikron Danfoss was able to develop a unique solution that combined the best of both worlds – our expertise in power electronics with LEM’s current sensing and metrology knowledge. As a result, this plug-and-play solution will save our customers a great deal of time and effort because they will no longer have to worry about the current sensor footprint, assembly, validation, testing or even performance – they are all taken care of in a single package,” says Thomas Zöls, Senior Electrical Engineers at Semikron Danfoss.

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LEM – Life Energy Motion

A leading company in electrical measurement, LEM engineers the best solutions for energy and mobility, ensuring that its customers’ systems are optimized, reliable and safe. With 1,500 people in over 15 countries transforming technology potential into powerful answers, LEM develops and recruits the best global talent, working at the forefront of mega trends such as renewable energy, mobility, automation and digitization. Through its innovative electrical solutions,

LEM is helping customers and society accelerate the transition to a sustainable future. Listed on the SIX Swiss Exchange since 1986, the company’s ticker symbol is LEHN.

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