



## **SOITEC AND CEA PARTNER TO DEVELOP AUTOMOTIVE CYBERSECURITY WITH ADVANCED FD-SOI TECHNOLOGY**

***Bernin (Grenoble), France, October 20, 2025*** – As vehicles become increasingly software-defined and connected, ensuring robust hardware cybersecurity is ever more critical. A modern car can contain 100 or more microcontrollers, each of which may introduce vulnerabilities that leave vehicles or even fleets open to dangerous remote hacking.

To address this growing challenge, Soitec and CEA have demonstrated how Fully Depleted Silicon-on-Insulator (FD-SOI) substrates can deliver intrinsic protection against the threat of fault injection attacks, identified as an increasing risk by automotive cybersecurity ISO/SAE 21434 standard setters.

Fault injection attacks occur when a hacker deliberately disrupts a chip's normal operation, for example with a voltage surge or laser pulses. By forcing it to behave incorrectly for a fraction of a second, an attacker can induce hardware to skip security checks, read protected data or run unauthorized code, potentially unlocking or compromising the system.

Among the different attack strategies, Laser Fault Injection (LFI) is the most precise, probing chip vulnerabilities at a sub-micron and sub-nanosecond scale that can later be exploited by other hacking techniques against stationary or moving vehicles.

While traditional bulk silicon substrates remain vulnerable to such attacks, FD-SOI technology offers built-in protection thanks to its buried oxide layer, which isolates the active film from the substrate and eliminates most physical fault mechanisms.

This advantage has been confirmed in research carried out at CEA-Leti laboratories in partnership with Soitec. In tests comparing 22FDX FD-SOI to 28-nanometer bulk silicon, the FD-SOI substrate required up to 150 times more effort and higher laser power to induce a fault, significantly narrowing attack windows and increasing the cost and complexity of intrusion attempts.

This resilience supports compliance with new and emerging automotive cybersecurity standards, including the requirement for a secure "reference chip" storing each vehicle's software encryption codes – an application for which FD-SOI is emerging as the leading platform.

Future substrate innovations, including buried optical barriers, integrated sensors, and Physical Unclonable Functions (PUFs), could further transform the semiconductor wafer into an active security perimeter.

**Christophe Maleville, Chief Technology Officer of Soitec, said:**

*“This study demonstrates how substrate engineering itself can be a security enabler. FD-SOI extends Soitec’s differentiation into the domain of hardware trust, paving the way for wafers that actively contribute to cybersecurity.”*

**Sébastien Dauvé, Chief Executive Officer of CEA-Leti, said:**

*“Our collaboration on FD-SOI bridges advanced research and industrial application, proving that scientific insight can directly translate into safer automotive electronics – a cornerstone of Europe’s strategic autonomy in secure semiconductors.”*

This result is based on research work carried out within the framework of the FAMES Pilot Line of the Chips JU, funded by Horizon Europe under grant agreement 101182279, Digital Europe under grant agreement 101182297, and the ANR NextGen project ANR-22-NEXTG-001 of the France 2030 initiative.

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**About CEA (France)**

The CEA is a unique public research body whose *raison d’être* is two-fold: it helps public policymakers to make informed decisions, and it gives French and European companies – as well as local authorities – the scientific and technological tools they need to face the major societal changes related to the digital and energy transitions, the future of health care, and global defense and security. Its action is based on the three key values that drive the CEA teams in their daily work: curiosity, cooperation, and a keen sense of responsibility.

**For more information:** [www.cea.fr/english](http://www.cea.fr/english)

## **About Soitec**

Soitec (Euronext - Tech Leaders), a world leader in innovative semiconductor materials, has been developing cutting-edge products delivering both technological performance and energy efficiency for over 30 years. From its global headquarters in France, Soitec is expanding internationally with its unique solutions, and generated sales of 0.9 billion Euros in fiscal year 2024-2025. Soitec occupies a key position in the semiconductor value chain, serving three main strategic markets: Mobile Communications, Automotive and Industrial, and Edge and Cloud AI. The company relies on the talent and diversity of more than 2,200 employees, representing 50 different nationalities, working at its sites in Europe, the United States and Asia. Nearly 4,300 patents have been registered by Soitec.

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