



Press Release

X-FAB Releases Embedded Flash Solution on its 110nm Automotive BCD-on-SOI Technology

New IP combines Flash and EEPROM elements for enhanced data retention and best-in-class operational reliability

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[X-FAB Silicon Foundries SE](#), the leading analog/mixed-signal and specialty foundry, has just announced a major innovation in NVM data storage which draws on the company's best-in-class SONOS technology. Fabricated on its [high-voltage BCD-on-SOI XT011 platform](#), X-FAB can supply customers with an AECQ100 Grade-0 compliant 32KByte capacity embedded Flash IP, combined with an additional 4Kbit EEPROM - all implemented on a 110nm semiconductor process node. Larger cuts of 64 and 128KByte flash and larger EEPROM are planned from 2025 onwards.

By taking a unique approach, both the Flash and EEPROM elements are located inside a single macro and share the necessary control circuitry. This means a much simpler arrangement is realized, leading to a smaller overall footprint for the combined elements and setting a new industry benchmark for grade-0, 175°C capable, 32KBytes storage solution.

The Flash offers customers the most advanced data access available on the market, having the ability to read data across its entire -40°C to 175°C temperature range, with the EEPROM also able to write up to 175°C. The EEPROM is beneficial for applications in which there is a need to write more frequently, increasing Flash endurance and flexibility. It can also effectively act as a cache, with data programmed onto it while operating conditions are not suitable for writing to Flash, before subsequently being written onto the Flash when temperature drops below 125°C. Thanks to the combination of superior robustness



characteristics, continued data storage integrity and significant space savings offered, this IP is designed to fit the requirements of automotive, medical and industrial applications.

The new NVM combo IP features a 64-bit bus with 8-bit ECC for the Flash element, plus a 14-bit ECC for the EEPROM element. This enables zero-PPM error performance in deployed devices integrating it. Dedicated circuitry for easy memory access and DFT allows test times to be shortened significantly, and the associated costs minimized. BIST modules and testing services can also be supplied by X-FAB if needed.

“Through this new NVM IP leveraging our proprietary SONOS technology, X-FAB is enabling the highest levels of reliability. This IP will provide our customers with best-in-class data retention and temperature stability for embedded systems,” explains Thomas Ramsch, Director NVM Development at X-FAB. “By bringing together two different NVM elements onto a single macro, one Flash and the other EEPROM, we can now deliver an embedded data storage solution capable of coping with most difficult operational situations.”

“Through reduced-footprint and accelerated access time, our NVM combo IP will be pivotal in the development of high-logic content applications,” adds Nando Basile, Technology Marketing Manager for NVM solutions at X-FAB. “This will enable next-generation smart sensors and actuators CPU system designs with greater functional scope - whether this is on established CPU architectures, like ARM, or RISC-V, or on customer’s proprietary designs.”

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Acronyms

BCD – Bipolar CMOS-DMOS

BIST – Built-in Self-Test

DFT – Design for Test

ECC – Error Code Correction



EEPROM – Electrically-Erasable Programmable Read-Only Memory

NVM – Non-volatile Memory

PPM – Part Per Million

SOI – Silicon-on-Insulator

SONOS - Silicon-Oxide-Nitride-Oxide-Silicon

About X-FAB

X-FAB is a global foundry group providing a comprehensive set of specialty technologies and design IP to enable its customers to develop world-leading semiconductor products that are manufactured at X-FAB's six wafer fabs located in Malaysia, Germany, France, and the United States. With its expertise in analog/mixed-signal technologies, microsystems/MEMS and silicon carbide (SiC), X-FAB is the development and manufacturing partner for its customers, primarily serving the automotive, industrial and medical end markets. X-FAB has approximately 4,500 employees and has been listed on Euronext Paris since April 2017 (XFAB). For more information, please visit www.xfab.com.

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