



8kbit FeMFET Memory Demonstrator *)
as chip-on board solution

Next-generation Ferroelectric Memories

INTERCONNECTS

HIGH-K DEVICES

NON-VOLATILE MEMORIES

Hafnium oxide-based ferroelectric memories are among the most promising emerging technologies for future ultra-low power non-volatile memory applications. Therefore, Fraunhofer IPMS' CNT business unit develops fully CMOS-compatible hafnium oxide-based ferroelectric (FE) devices for integration into a wide range of chip technologies. This innovative lead-free material enables the manufacturing of cost-efficient and power-saving CMOS chips.

To meet the requirements of future embedded memories and edge applications, Fraunhofer IPMS offers innovative technologies for novel ferroelectric material stacks and device concepts, enhancing key parameters such as retention, endurance, and disturbance properties. These advancements enable reliable performance in harsh environments, such as industrial and automotive applications. For example, Fraunhofer IPMS has developed an 8kbit memory test chip based on the FeMFET device concept, which has been integrated into the metallization layers of standard CMOS technology of project partner XFAB. This demonstrates its compatibility and potential for widespread use.

Applications

- Low power embedded NVM
- Sensor datalogging
- In-memory computing, Edge-AI
- Cost efficient CMOS & RFID tags

Advantages

- Platform for versatile memory device integration, like FRAM, FeMFET, and FeFET
 - CMOS compatible FE material
 - Scalable down to advanced nodes
 - Industrial standard 12" and 8" wafer process
 - Lead free material – no PZT
 - Non-volatile memory concept
 - Fast read/write operation: Switching speed in ns range
 - Low power & low voltage operation
 - 10-year storage capability
 - Innovative FE stacks available for advanced reliability requirements
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- Long-standing experience in process characterization and development
 - Available Electrical and reliability test on wafer level
 - ISO 9001 certified



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