

World's first SOI MOSFET with crystalline Gd₂O₃

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Researchers at AMICA have successfully fabricated the world's first MOSFETs on ultra-thin-body silicon-on-insulator (SOI) material with a crystalline gadolinium oxide (Gd₂O₃) gate dielectric.

In the last years, the semiconductor industry has intensified its search for alternatives to the well known but increasingly limiting SiO₂ as transistor gate insulator. While hafnium dioxide is seen as a hot candidate, there is increasing evidence that yet other materials may be needed, such as rare earth oxides. In crystalline form and grown with molecular beam epitaxy (MBE), rare earth oxides provide the promise of engineered interfaces to the silicon channel - with near perfect lattice matching and extremely low defect density.

AMICA researchers have now been able to integrate - for the first time - crystalline gadolinium oxide in their experimental SOI CMOS technology platform. These devices are utilized to generate important data for the evaluation of these novel promising materials. The films have been grown at partner University of Hannover. Experimental details will be presented at the forthcoming International Semiconductor Device Research Symposium (ISDRS) in Bethesda, USA.

The devices are the result of German national research project "KrisMOS", funded by the Bundesministerium fuer Bildung und Forschung (bmbf), AMD Saxony LLC & Co KG, Infineon Technologies AG and Freescale Halbleiter Deutschland GmbH.

Source: AMO GmbH

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