Abstracts

Recrystallized Silicon-on-Alumina as a Monolithic Circuit Technology

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A new microwave monolithic technology based upon zone-melt recrystallization (ZMR) of silicon films on alumina substrates using a phosphosilicate glass (PSG) buffer layer is described. While initial recrystallization results confirm the difficulty of obtaining device-quality films with a thermally mismatched substrate, the planarity and viscoelastic strain relief introduced by the PSG indicates that the technology should be feasible. A surface-oriented PIN diode device structure has been developed which is compatible with the recrystallized silicon films. Results obtained with this process using single-crystal substrates demonstrate the feasibility of the device structure. The potential for high-power monolithic control circuits is discussed.

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