

Random Telegraph Signals of the Scaling-down NOR Flash Cells

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The random telegraph signal (RTS) for the NOR flash cell scaling is investigated. An innovative method to suppress the RTS, based on the device engineering, is proposed. By optimizing the channel doping profile and using the high-k tunnel dielectric, it is confirmed from three-dimensional (3-D) simulation, that the V_{th} amplitude, due to RTS, is significantly suppressed, from approximately 0.5 to 0.07 V in the middle of the channel at 45 nm NOR Flash technology. From this result, it is expected that the proposed method to suppress the RTS amplitude is essential for further cell size scaling in Flash memory.