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Poly-$Si_{1-x}Ge_x$ Film Growth for Ni Germanosilicided Metal Gate

H.P. Yu[1], K.L. Pey[1,2], W.K. Choi[1,3], E.A. Fitzerald[1,4], D.A. Antoniadis[1,4]

1. Singapore-MIT alliance, 4 Engineering Drive 3, Singapore 117576
2. School of Electrical & Electronic Engineering, Nanyang Technological University, Nanyang Ave, Singapore 639798
3. Department of Electrical & Computer Engineering, National University of Singapore, 4 Engineering Drive 3, Singapore 117576
4. Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139-66307

***Abstracts* – Scaling down of the CMOS technology requires thinner gate dielectric to maintain high performance. However, due to the depletion of poly-Si gate, it is difficult to reduce the gate thickness further especially for sub-65 nm CMOS generation. Fully silicidation metal gate (FUSI) is one of the most promising solutions. Furthermore, FUSI metal gate reduces gate-line sheet resistance, prevents boron penetration to channels, and has good process compatibility with high-k gate dielectric. Poly-SiGe gate technology is another solution because of its enhancement of boron activation and compatibility with the conventional CMOS process. Combination of these two technologies for the formation of fully germanosilicided metal gate makes the approach very attractive. In this paper, the deposition of undoped poly-$Si_{1-x}Ge_x$ ($0 < x < 30\%$) films onto SiO_2 in a low pressure chemical vapor deposition (LPCVD) system is described. Detailed growth conditions and the characterization of the grown films are presented.**