Effects of sensitivity enhancement by oxide passivation layer on SGOI nanowire fabrication

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Abstract

Abstract—Increasing the fraction of Ge in SiGe-on-Insulator (SGOI) using Ge condensation by oxidation significantly increases hole mobility. This effect can be exploited to improve the sensitivity of SGOI nanowire. However, our previous studies found that the sensitivity of an SGOI nanowire is degraded as the Ge fraction increases over 20%, because of the surface state of SiGe is unstable when the Ge fraction is high. In this work, a top surface passtivation SiO2 layer was deposited on an Si0.8Ge0.2 nanowire and successfully improve its sensitivity around 2.5 times that of the nanowire sample without top a passivation layer.

Keyword：SiGe, Ge-condendation, Nanowire, Bisosensor