ABSTRACT

SELECTIVE FORMATION OF HYDROGEN RICH PECVD SILICON NITRIDE FOR IMPROVED NMOS TRANSISTOR PERFORMANCE

A method of selective formation of SiN layer in a semiconductor device comprising the following steps. A semiconductor structure having at least one PMOS transistor and one NMOS transistor formed therein is provided. The PMOS and NMOS transistors each have source/drain regions, a gate, and salicide contact regions. An undoped silicate glass (USG) layer is deposited over the semiconductor structure and the PMOS and NMOS transistors. An H_2-rich PECVD silicon nitride layer is deposited over the undoped silicate glass layer and over the PMOS and NMOS transistors. The H_2-rich PECVD silicon nitride layer is patterned, etched, and removed from over the PMOS transistor. An inter-level dielectric (ILD) layer is formed over the structure. The ILD layer is densified whereby hydrogen diffuses from the H_2-rich PECVD silicon nitride layer overlying the NMOS transistor into the source/drain of the NMOS transistor.

(FIGURE 1 IS SUGGESTED FOR PUBLICATION)